BA|CA-F1 ULTRA LOW TIM

Sansui DC Stereo Power Amplifier with DD/DC Circuit & Straight DC Stereo Control Preamp with MC Head Amp and DD/DC Phono EQ.

Sansui Only hi-fi, everything hi-fi.

Sansui Straight DC Stereo Control Preamplifier

The spec sheet reads like an engineer's dream. Frequency response is 5 to 600kHz! THD and S/N are better than 0.005% and 90dB respectively. But while these steady-state specs are remarkable in themselves, the *transient* response of the Sansui CA-F1 is even more impressive.

As in our newest DC power amps, we've concentrated on improving slew rate, lowering TIM and envelope distortion, and providing the closest thing possible to "real-time" rise/fall characteristics so that pulsive musical signals are reproduced with more natural sound quality. Achieving all this without sacrificing the steady-state specs is a significant triumph in audio engineering for Sansui, and is the result of our "Straight DC" design in which major circuit blocks are DC.

The CA-F1 features the Sansui-exclusive "Diamond Differential DC" circuit (DD/DC) for its phono equalizer. As you'd expect in a preamplifier of this quality, in spite of its moderate price, there is also a built-in MC head amplifier (or "pre-preamp") for Moving Coil cartridges. And there's a lot more. Visit your Sansui dealer soon.

CA-F1

The Sansui BA-F1: DC Power Amplification with Exclusive DD/DC Circuit.

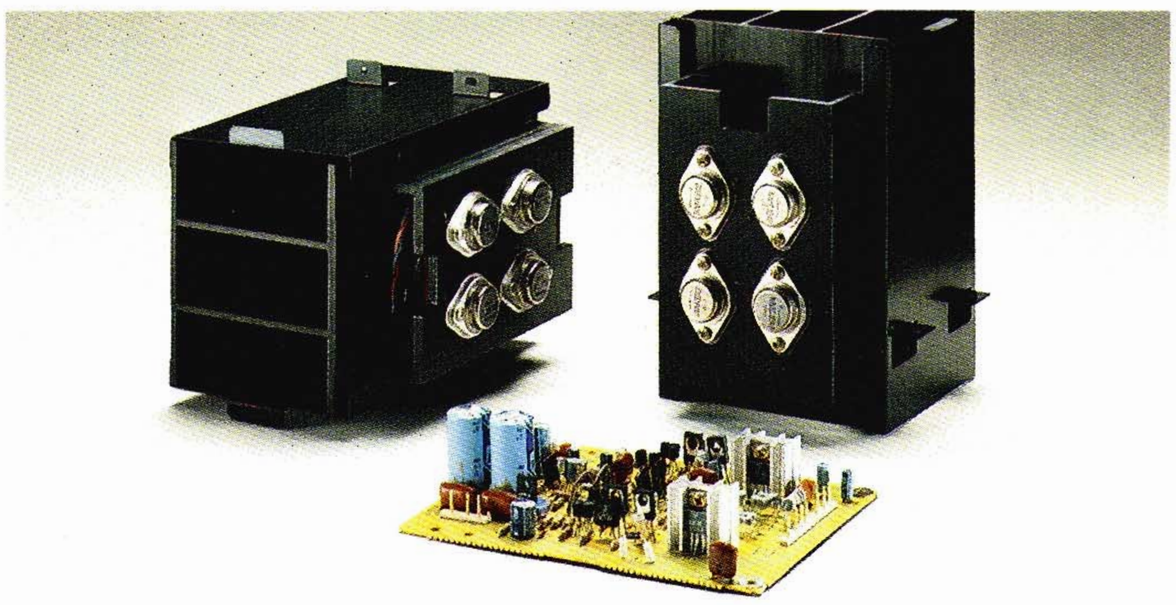
Kiss TIM goodbye and enjoy PURE power high fidelity reproduction in this moderately-priced amplifier featuring Sansui's own DIAMOND DIFFERENTIAL DC circuit.

The Diamond Differential: One little circuit makes one big difference.

Its extraordinary high driving capability gives the Sansui-exclusive DD/DC circuit the edge over any other type. This advanced dual-complementary circuit is the major reason the BA-F1 is able to offer such remarkably pure performance—very low TIM or Transient Intermodulation distortion, an ultra-high slew rate, low envelope distortion, etc. We can't reveal the details of the circuit itself until our worldwide patent application clears. But we can guarantee that no other amplifier on the consumer or professional markets can boast of anything remotely like it.

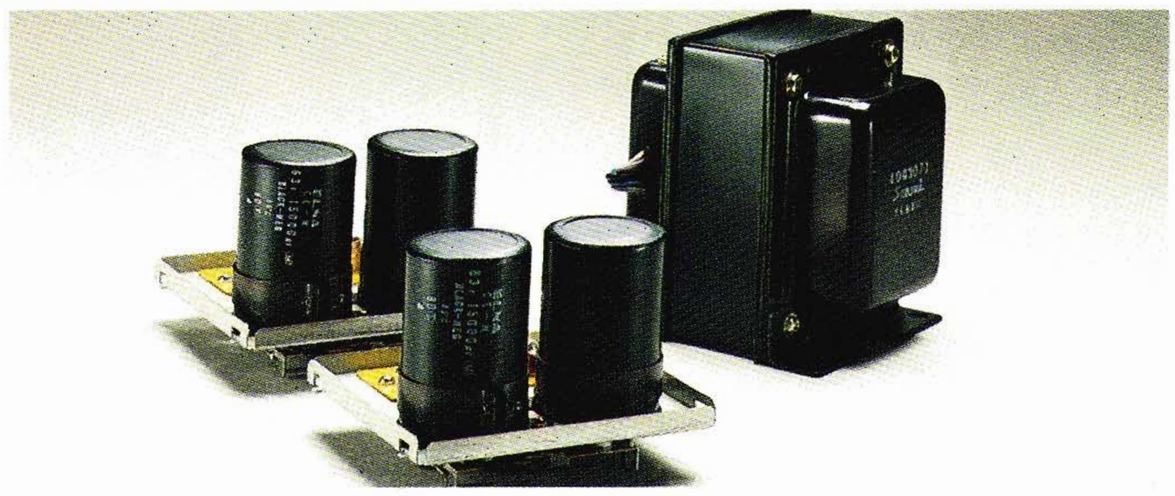
Preceeding the DD/DC in the BA-F1 is a capacitor-less input formed of a differentially-arranged Dual FET with a current source. This sophisticated ICL design is capable of supplying large amounts of current with clean, low-noise characteristics. Then a cascode bootstrap circuit keeps the DD/DC operating at its best.

The final output—a dependable 3-stage Darlington-connected parallel push-pull configuration—is driven by the current differential amplifier. Power output is a continuous 110 watts per channel, min. RMS, both channels driven into 8 ohms, from 5 to 20kHz with no more than 0.008% THD. Together with this new circuit we've employed high-quality, non-magnetic transistors of a Sansui-exclusive design.



The Power Supply: Separate coil windings for each channel back up the advanced audio circuitry.

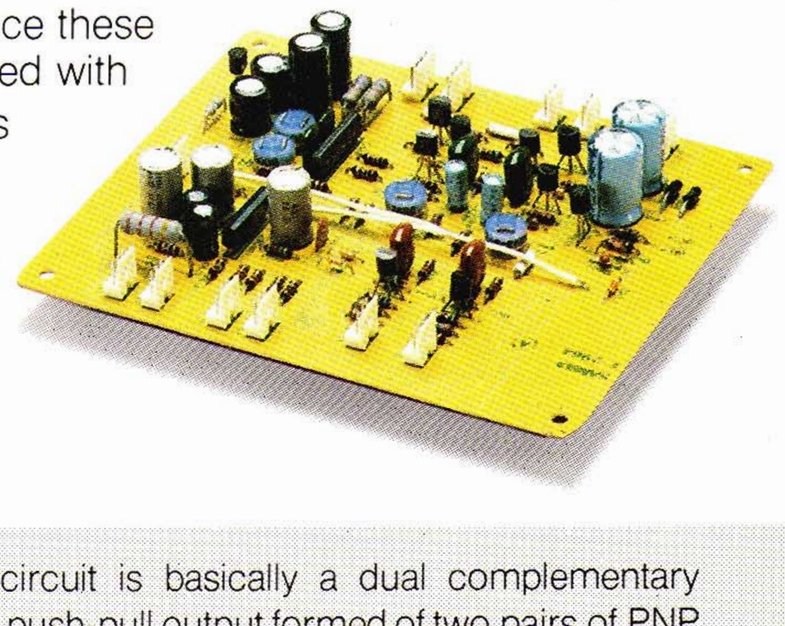
Power regulation is the key to clean DC performance, and we've given the BA-F1 an extra large EI-core transformer and four 15,000μF electrolytic capacitors to ensure it. The transformer has separate windings—two entirely independent coils which send constant power to the left and right channels of the power output section for cleaner, more dependable reproduction. Two additional transformer coils, connected to the active filter circuit, feed power to the driver stage independently. In this way, each circuit receives its energy needs with plenty to spare, however heavy the demands of your music.



Power Level Meters: Analog scales and bar-type peak indicators (pat. pend.) for left and right channels.

Are power meters nothing but "cosmetics" on a power amp? *In many cases, the answer is yes. But for the BA-F1* we have selected an especially useful and accurate team of indicators which do a lot more than simply present a "pretty face."

The large, analog meters (one for each channel) show moment-to-moment power output over a wide 0.01W to 220W range. There are also two bar-type indicators which flash to warn when the *peaks* in either channel reach the amp's rated level of 110 watts. Since these indicators are integrated with the analog dial scales themselves, you can read average and peak levels at a glance.



Low TIM, Low Envelope Distortion: Proof of pure DD/DC superiority.

Diamond Differential DC Circuit for Low TIM

The secret behind the BA/CA-F1's greatly improved transient response is its Diamond Differential DC circuit in their power and phono amplifiers, respectively, so called because of the shape it forms in a schematic diagram. In essence, electrical current is always sufficient, no matter how demanding and pulsive the signal. Clipping is also eliminated; hence, there is drastically reduced TIM. And low TIM has led to a higher slew rate and faster rise/fall time.

The circuit is basically a dual complementary differential circuit with push-pull output formed of two pairs of PNP and NPN transistors. As its schematic indicates, the input is voltage-amplified by the left and right pairs of transistors. These symmetrical differentials feature perfect CMRR (Common Mode Rejection Ratio). When an input demands a large power output, the upper and lower pairs of transistors work as current differential to achieve high drive current.

The combination of high current drive capability and stable application of negative feedback makes the BA/CA-F1 virtually TIM distortion-free.

Envelope Distortion

Discovered by Sansui researchers in 1978, envelope distortion is a kind of amplitude-modulated transient dis-

The Sansui CA-F1: DC Preamplification with Exclusive DD/DC Circuit.

Truer and more delicate pre-amplification thanks to our STRAIGHT DC design, MC head amp and the DD/DC Phono EQ and DC flat amp using original Sansui circuit techniques.

Massive Heat Sinks: Safe operation is assured over countless hours of high-power driving.

Since the BA-F1 is a high-power amp, its power transistors generate considerable heat—the bane of amplifier engineers the world over. To dissipate that heat we have developed a new "chimney-type" heat sink, massive and effective, and have coupled it thermally with the bonnet for still more assurance of safe transistor operation.

Twin Power Protection: Transistors and connected speaker systems are safeguarded from power-related mishaps.

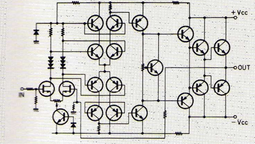
There are two protector circuits in the BA-F1, a DC Detector and an Overload Current Detector. These, together with a relay circuit, offer complete protection for the power transistors and your connected speaker systems at all times, even at the highest output levels.

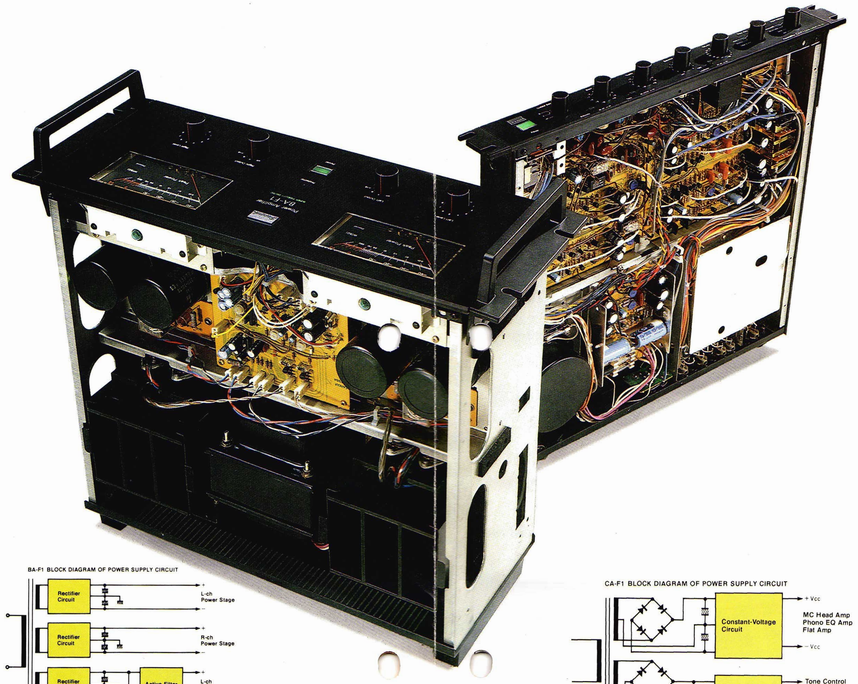
"Mono × 2" Construction: The signal path couldn't be cleaner even if we built the amp in two parts.

Circuitry for the left channel is *completely* independent from that for the right because the BA-F1 is actually two monophonic amplifiers sharing one chassis.

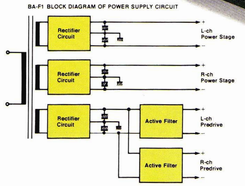
Crosstalk and other forms of mutual interference between the two channels are all eliminated. This design also features the Sansui "short path" technique in which the circuits are arrayed to provide the shortest possible signal path from input to output. This is especially significant in the last stages, as the amplified signals leave the transistors to appear at the output terminals without transmission loss and with no sign of "dual" slew rate.

BA-F1 DD/DC CIRCUIT (POWER AMP)

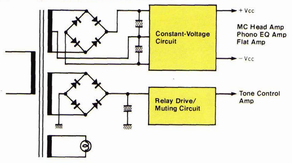




BA-F1 BLOCK DIAGRAM OF POWER SUPPLY CIRCUIT

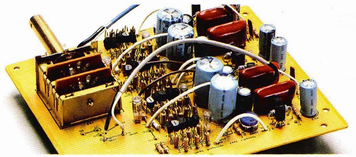


CA-F1 BLOCK DIAGRAM OF POWER SUPPLY CIRCUIT



MC Head Amp: Its parallel-connected FET input handles Moving Coil cartridge signals with respect.

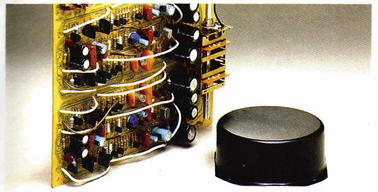
The good news in the Sansui CA-F1, if you are an MC cartridge fan, is its *built-in* MC head amp. It features a push-pull input/output combination in a Sansui-exclusive design which arranges the circuit configuration symmetrically throughout. In addition, we have employed P-channel/N-channel FETs of particularly low-noise and high-gm characteristics. The payoff is in remarkable improvements in lower TIM (Transient Intermodulation), envelope and other forms of transient distortion, plus a high 75dB or better signal-to-noise ratio. MC inputs are handled with respect for their more transient, purer tonal quality and wider dynamic range.



The Power Supply: A new "low-profile" toroidal transformer to fill the bill.

Good looks or good sound? Some of the latest "decorator hi-fi" preamps limit your choice to the former, making compromises in circuitry—especially in power supply—to give you a slim, unobtrusive cabinet. Sansui believes that power should *never* be sacrificed, however, and has come up with a new "low-profile" power transformer thin enough to fit the attractively styled cabinet of the CA-F1 without causing an energy crisis of its own.

That transformer is of the toroidal type, featuring ideally high power regulation; impedance is kept low across the widest possible frequency range to protect musicality. Each amp block is fed constantly with the energy it requires, on demand, for distinct and distinctive hi-fi performance.



DC Phono Equalizer: As many as twenty transistors and FETs in the Sansui Diamond Differential DC circuit.

Featured in the "Straight DC" design of the CA-F1—the DC design which permits us to avoid the use of input capacitors—is this outstandingly clean phono equalizer, using as many as twenty FETs and transistors. The input is formed of a low-noise, high-gm Dual FET, paired for ideally matched thermal characteristics, operating as a differential amp followed by a cascode bootstrapping circuit to shut off any input impedance variations which might threaten the stability of the input.

The following intermediate stages couple the Sansui-exclusive Diamond Differential DC circuit (please see information for the BA-F1) with a current-differential push-pull driver. The final output is of the Darlington-connected SEPP design. Since the latter features low output impedance, dynamic range is always wider than sufficient, no matter how heavily the load impedance may vary.

In such an elaborate circuit you'd expect outstanding specifications. And we won't disappoint you: signal-to-noise ratio is a high 90dB; transient response is excellent with very low TIM, low envelope distortion, high slew rate and a very fast rise/fall time; RIAA equalization is accurate ±0.2dB across the 20 to 20kHz spectrum; and the phono overload is a high and useful 350mV.

The DC Flat Amp: Again a Dual-FET input for clear sound and smooth response.

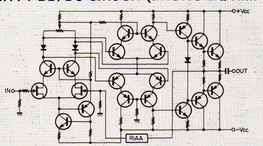
Keeping the characteristics of the flat amp well within the parameters necessary for pure DC hi-fi is made easier with the use of another newly developed, low-noise Dual FET type input, followed by a cascode connection and a current-differential circuit. The input then passes signals to a differential-push-pull circuit featuring a current mirror stage (Pat. Pend.) and a 2-stage Darlington-connected SEPP output.

Overall, this flat amp offers excellent open-loop response for better transients, and because the boost/cut of the tone controls is actually done by varying the applied negative feedback itself, adjusted BASS/TREBLE responses are as smooth and natural as can be. A Tone Defeat switch is provided so you may bypass the tone control circuit entirely for a completely flat response at a touch.

Sansui's attention to the last detail: Wiring throughout is thicker, better.

Clean chassis layout suggests advanced circuitry. But does it indeed? Most circuit board foils are a mere 0.35mm thick, too thin for the highly capable BA-F1. So we've used an abundant amount of twisted-strand wirings throughout to assures low-error, low-loss transmission of signals. Cluttered layout in the BA-F1 is indeed suggestive of Sansui's meticulousness in every respect, from selecting components to actually mounting them, since it's the hallmark of a hand-built component.

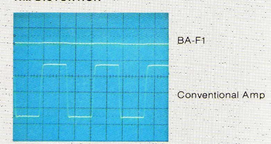
CA-F1 DD/DC CIRCUIT (PHONO EQ AMP)



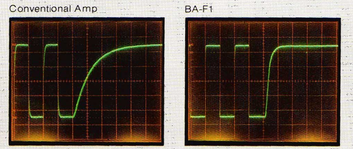
tortion that is particularly noticeable in low frequencies. When pulsive signals (similar to actual music signals) are fed into an amplifier, a transient power voltage fluctuation develops at the input and causes a shift in circuit operation potentials. Since this type of distortion occurs when short-duration transient pulses form a long-duration enveloping wave, the name "envelope distortion" is appropriate.

We've greatly reduced envelope distortion in the BA/CA-F1 by, one, utilizing elaborate circuits—symmetrical configuration, push-pull drive, differential circuits—which are independent of external environment and in/output impedance; and two, by separating the power supplies.

TIM DISTORTION



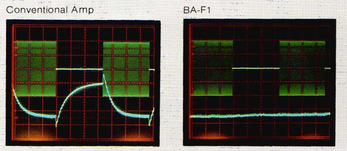
SLEW RATE & RISE TIME



Slew Rate: ±50V/μSec.
Rise Time: 2.4μSec.

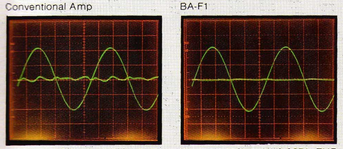
Slew Rate: ±200V/μSec.
Rise Time: 0.5μSec.

ENVELOPE DISTORTION



In the measuring arrangement, a filter to eliminate tone burst components is set at the output; there should thus be no output. Photo shows, however, that there *is* an output: envelope distortion is generated. There's almost no signal at the output of the BA-F1; envelope distortion is insignificant.

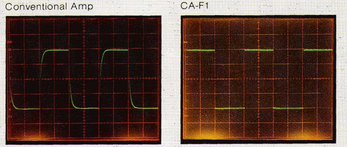
OUTPUT AND DISTORTION WAVEFORMS



Power at 110W with 0.01% THD

Power at 110W with 0.007% THD

DC PHONO EQUALIZER (MM) 1kHz Square-Wave Response (20Vp-p)



Sansui DC Stereo Power Amplifier

When you stop to think of it, one of the several good reasons for owning a separate stereo power amplifier stands out from all the others. That reason turns out to be the very same one today's high-performance power amplifiers are featuring DC circuitry. Summed up in a word, and exemplified in the BA-F1 DC Stereo Power Amplifier from Sansui, that reason is *purity.*

To accomplish pure high fidelity amplification at high power output, the BA-F1 takes advantage of the best of Sansui's original DC circuitry techniques. Featured are the Sansui-exclusive "Diamond Differential DC" circuit (Pat. Pend.), a rock-steady power supply, the symmetrical "mono ×2" construction and hand-selected components throughout.

In terms of performance, this all-DC amp offers superb transient response: an ultra-high slew rate of ±200V/μSec., ultra-fast rise/fall time of 0.5μSec. and almost no measurable TIM and envelope distortion. Steady-state specs are at the top of the state of the art. It all adds up to pure power performance in the BA-F1 from Sansui, where it's *all* hi-fi.

BA-F1

Specifications

BA-F1

POWER OUTPUT*
Min. RMS, both channels driven, from 5 to 20,000Hz, with no more than 0.008% total harmonic distortion
110 watts per channel into 8 ohms

LOAD IMPEDANCE* 8 ohms

TOTAL HARMONIC DISTORTION* less than 0.008% at or below rated min. RMS power output
less than 0.003% at 1kHz, 110W power output

INTERMODULATION DISTORTION
(70Hz:7,000Hz=4:1 SMPTE method)
less than 0.008% at or below rated min. RMS power output

DAMPING FACTOR 100 into 8 ohms

FREQUENCY RESPONSE (at 1 watt)
DC to 600,000Hz +0dB, −3dB

SLEW RATE ±200V/μSec.

RISE TIME 0.5μSec.

INPUT SENSITIVITY AND IMPEDANCE
1V/25k ohms

HUM AND NOISE (IHF) 125dB

CHANNEL SEPARATION 105dB (at 1kHz)
98dB (at 10kHz)

AC OUTLETS switched max. 100 watts
unswitched total 250 watts

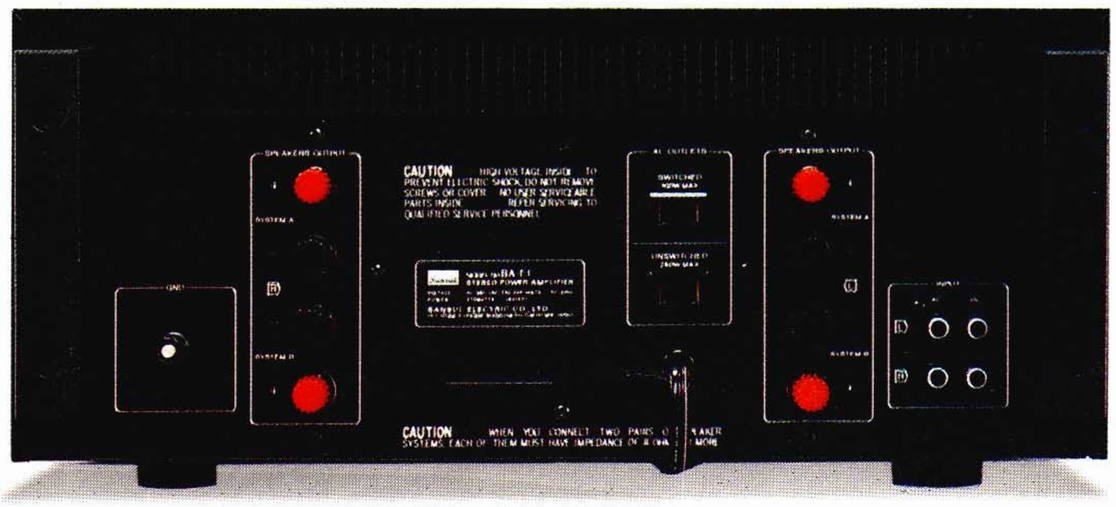
POWER REQUIREMENTS
POWER VOLTAGE 100, 120, 220, 240V 50/60Hz
POWER CONSUMPTION 470 watts

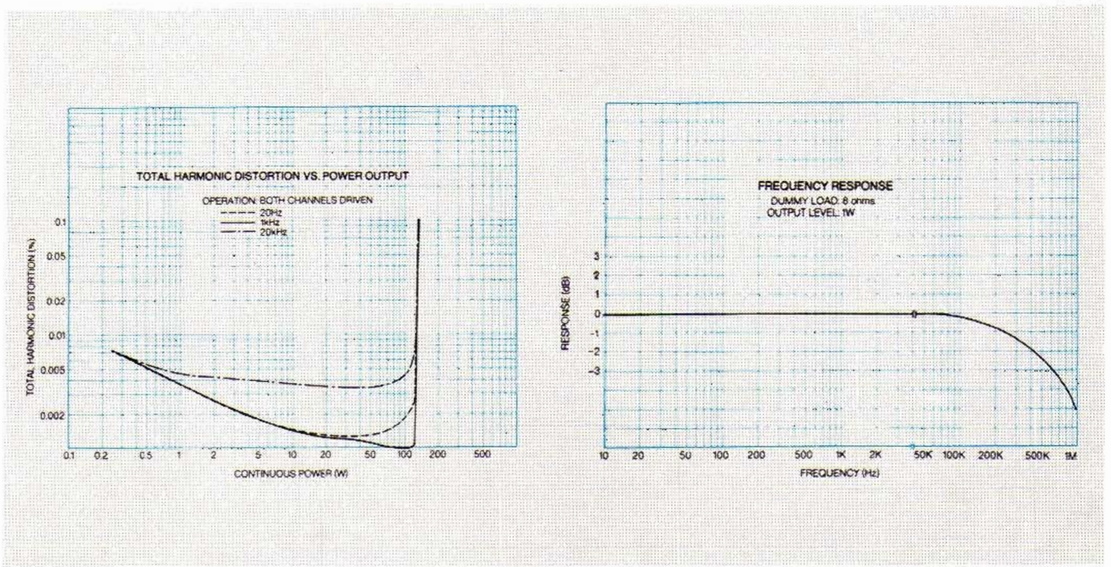
SEMICONDUCTORS 54 Transistors; 36 Diodes; 2 FETs; 2 ICs; 1 LED

DIMENSIONS 430mm (16 15/16") W
187mm (7 3/8") H
430mm (16 15/16") D
with Rack-mounting Adaptors
482mm (19") W
187mm (7 3/8") H
450mm (17 3/4") D

WEIGHT 20kg (44.1lbs.) Net
with Rack-mounting Adaptors
20.4kg (45lbs.) Net
22.8kg (50.3lbs.) Packed

*Power specifications measured pursuant to U.S. Federal Trade Commission trade regulation on power output claims for amplifiers.
●For European models, some specifications might change to comply with local safety regulations and standards.
●Design and specifications subject to change without notice for improvements.





CA-F1

TOTAL HARMONIC DISTORTION
OVERALL (AUX to PRE OUTPUT)
less than 0.005% at or below rated output level

INTERMODULATION DISTORTION
(70Hz:7,000Hz=4:1 SMPTE method)
OVERALL (AUX to PRE OUTPUT)
less than 0.005% at or below rated output level

FREQUENCY RESPONSE (at 1 watt)
OVERALL (from AUX) 5 to 600,000Hz +0dB, −3dB
5 to 100,000Hz +0dB, −0.2dB

RIAA CURVE DEVIATION (20 to 20,000Hz)
+0.2dB, −0.2dB

INPUT SENSITIVITY AND IMPEDANCE (at 1,000Hz)
PHONO (MC) 0.1mV (10 ohms cartridge termination)
33 ohms (for MC cartridges having internal impedance of up to 200 ohms)
PHONO (MM) 2.5mV, 47k ohms
AUX 150mV, 47k ohms

MAXIMUM INPUT CAPABILITY
PHONO (MC) 24mV RMS (at 1,000Hz 0.03% THD)
PHONO (MM) 350mV RMS (at 1,000Hz 0.008% THD)

OUTPUT VOLTAGE AND IMPEDANCE (at 1,000Hz)
TAPE REC (PIN) 150mV/600 ohms into 47k ohm load
PREAMPLIFIER OUTPUT 1V/600 ohms into 47k ohm load
MAXIMUM PREAMPLIFIER OUTPUT (at 0.005% THD)
10V/600 ohms into 47k ohm load

HUM AND NOISE (IHF)
PHONO (MC) 75dB
PHONO (MM) 90dB
AUX 100dB

CHANNEL SEPARATION (at 1,000Hz)
PHONO (MC) 75dB
PHONO (MM) 85dB
AUX 88dB

CONTROLS
BASS +7dB, −9dB at 50Hz
TREBLE +7dB, −7dB at 15kHz
LOUDNESS (volume control at −30dB position)
+9dB at 50Hz
+5dB at 10kHz
SUBSONIC FILTER −3dB at 16Hz (6dB/oct.)

RISE TIME 0.6μSec.

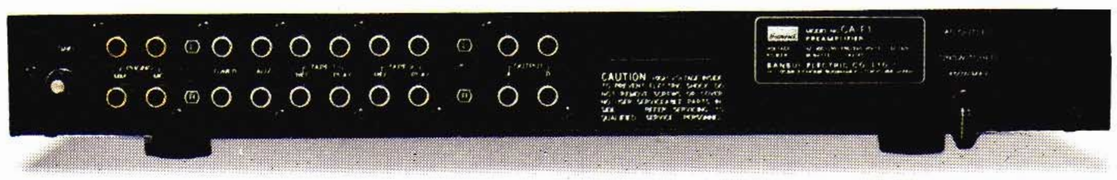
AC OUTLETS unswitched total 450 watts

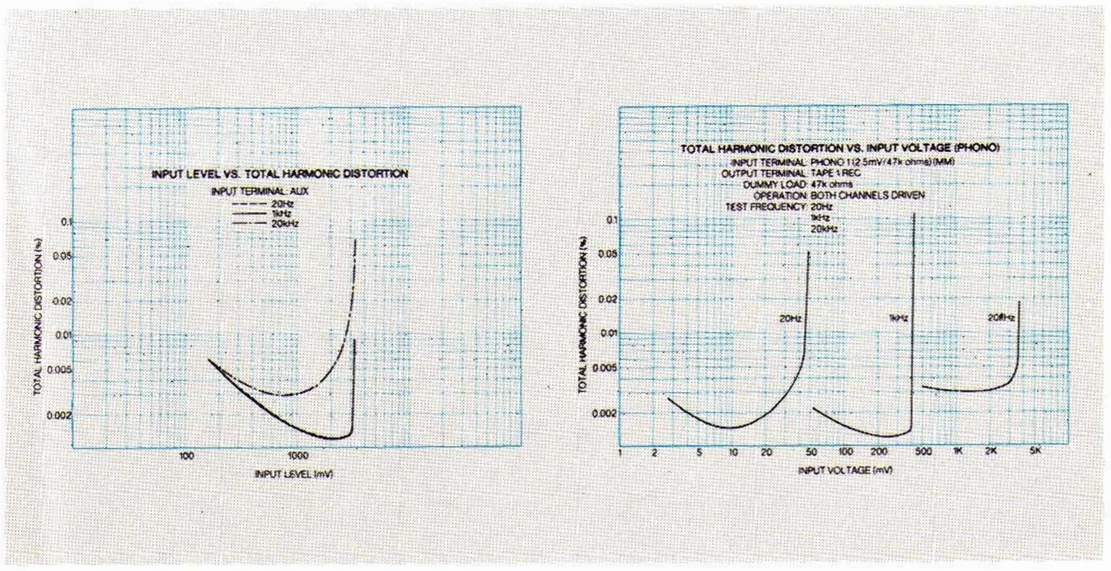
POWER REQUIREMENTS
POWER VOLTAGE 100, 120, 220, 240V 50/60Hz
POWER CONSUMPTION 45 watts

SEMICONDUCTORS 85 Transistors; 28 Diodes; 29 FETs; 2 ICs

DIMENSIONS 430mm (16 15/16") W
60mm (2 3/8") H
435mm (17 3/16") D
with Rack-mounting Adaptors
482mm (19") W
60mm (2 3/8") H
435mm (17 3/16") D

WEIGHT 6kg (13.2lbs.) Net
with Rack-mounting Adaptors
6.1kg (13.4lbs.) Net
7.5kg (16.5lbs.) Packed





Sansui
Printed in Japan (A9005K)

SANSUI ELECTRIC CO., LTD.
14-1 IZUMI 2-CHOME, SUGINAMI-KU, TOKYO 168 JAPAN/TELEPHONE: 323-1111/TELEX 232-2076

SANSUI ELECTRONICS CORPORATION
1250 VALLEY BROOK AVENUE, LYNDHURST, NEW JERSEY 07071, U.S.A./TELEX: NEW JERSEY 422633 SEC UI

SANSUI AUDIO EUROPE N.V.
NORTH TRADE BUILDING, NOORDERLAAN 133-BUS 1, 2030 ANTWERP, BELGIUM/TELEX: 33538