

Accuphase

STEREO CONTROL CENTER

C-200V

- Class-A push-pull circuits on all stages, DC servo directly coupled
- Presence equalizer incorporated delicately controls music
- Balanced input/output circuits equipped



The Long-run Selling Series of Accuphase Stereo Control Centers.

C-200V is equipped all the conditions required from today's preamplifiers and

The preamplifier C-200 was the first Accuphase product, introduced in August 1973 along with its companion model, the power amplifier P-300. After three model changes, these components are still going strong today, and their popularity is as great as ever. They are regarded as exemplary products in their respective category. This esteem is proven by countless awards in Japan as well as abroad. In the fast-changing world of audio, such endurance for well over a decade is highly uncommon. An important reason for this popularity is the fact that model changes for Accuphase mean continuity - preserving the essence of a product and its best features - combined with innovation - making latest technology and selected components work towards further improved sound quality and

performance. A solid technological foundation and extensive know-how accumulated over the years provide the basis for Accuphase excellence.

Needless to say, the C-200V employs the all-stage push-pull configuration developed by Accuphase, which traditionally forms the base of all our amplifiers. This principle is taken to new heights with the cascode bootstrap complementary class A push-pull design. Originally developed for our world-renowned ultimate preamplifiers, the C-280 and C-280L, the overall characteristics of this circuit assure sound reproduction of the highest order.

The C-200V also offers balanced input and output circuits, a principle that is being advocated by Accuphase since several years. On the input side, two balanced

connectors, one each for CD and LINE are provided, rivalling professional-quality systems.

Many "bare bones" preamplifiers do not incorporate any tone controls in order to achieve flat characteristics. But the energy balance of various program sources as well as loudspeaker or listening room characteristics often make a means for judicious adjustment quite desirable. Conventional bass and treble controls, however, do not fill the bill. To meet the needs of a true audiophile, Accuphase introduces a new tone control concept in the C-200V. The "Presence Equalizer" is a four-point, six-frequency circuit designed to permit delicate and precise adjustments. Its subtle yet effective operation can be appreciated especially with high-quality music sources.



The equalizer amplifier and line amplifier boards housed in the respective aluminum cases, for the right and left channels are secured to the mother board. Components are interconnected through the printed wiring on the mother board. The mother board is fixed to the main enclosure via a metal frame.

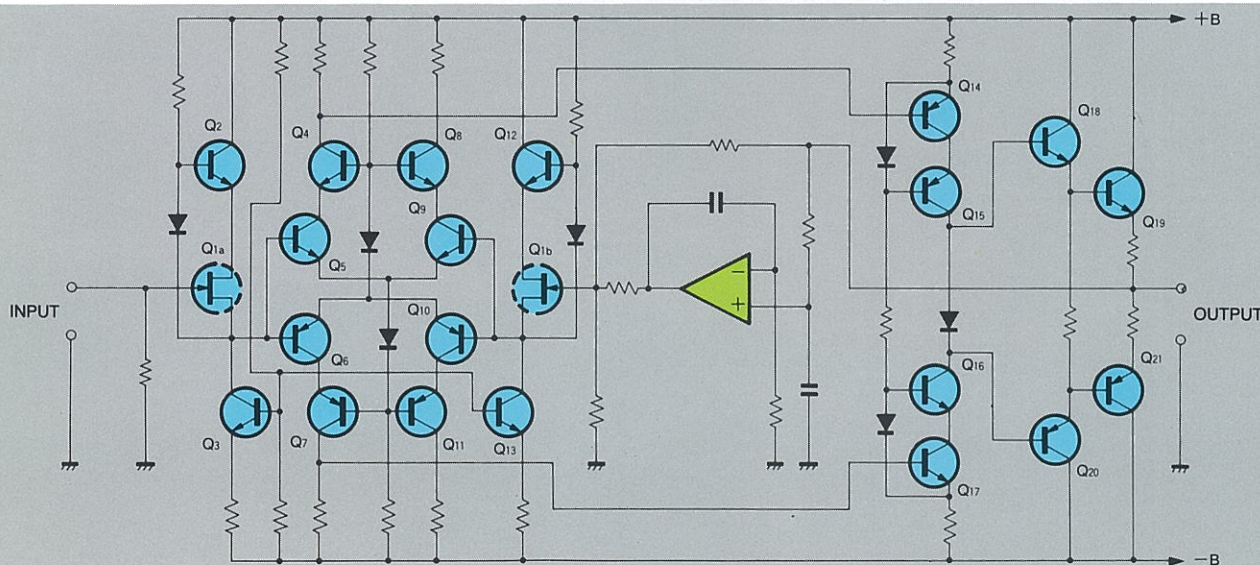
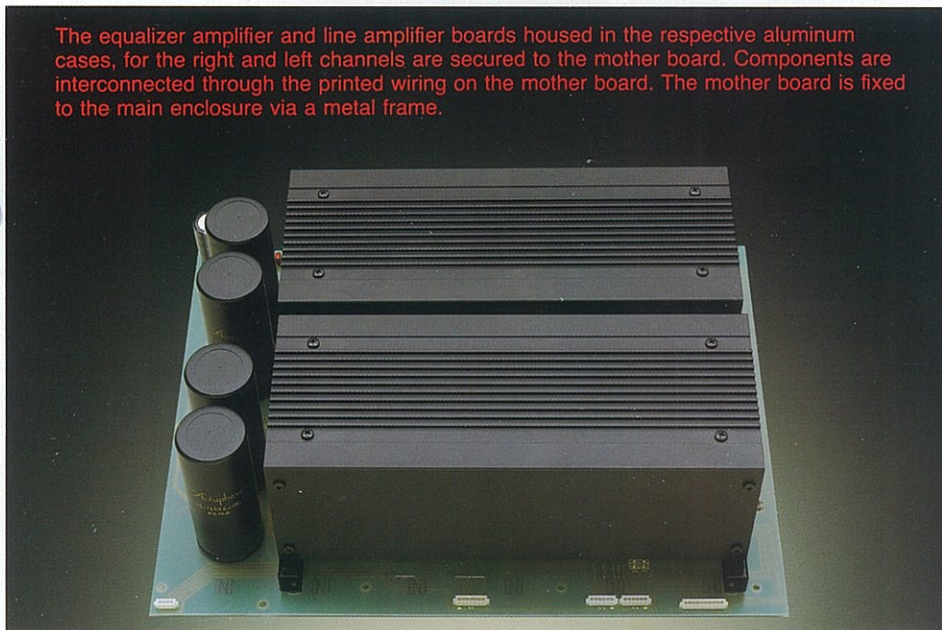
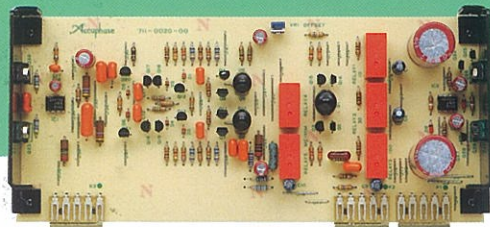


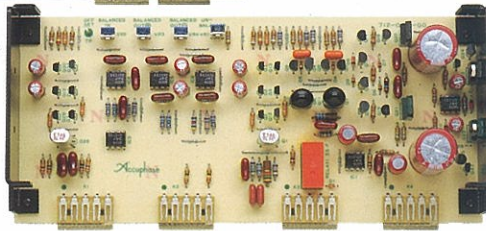
Fig. 1 Circuit Diagram of Line Amplifier

numerous useful functions including the presence equalizer and balanced circuits for ideal signal tran



▲ Equalizer amplifier board equipped with separate voltage regulators to improve the power supply so that various cartridges can be used

► Balanced line amplifier board provided with excellent power circuit



Like every model of the C-200 series, the C-200V offers outstanding versatility and an impressive array of features. A total of 12 inputs (including two balanced types) and 4 outputs (including 1 balanced type) are more than sufficient for even the most demanding setup, including testing of other equipment.

The sub panel on the front side of the amplifier with terminals for connection of other components and a tape recorder also is a traditional feature appreciated by many users.

The power supply is extremely well endowed for a preamplifier, featuring a massive transformer with low-resistance winding, filter capacitors with 72,000 μF , and a high-performance voltage regulator circuit. The glass epoxy main circuit board is mounted to an extremely sturdy chassis, and the separate amplifier units are shielded by a thick aluminum enclosure, for perfect protection against external vibrations and noise.

In spite of its many features, signal paths in the C-200V are kept straight and simple, which is made possible by ample use of logic-controlled relays. Overall, this is a preamplifier built for superior signal purity and impeccable performance.

1 Cascode bootstrap complementary class A push-pull design for ideal performance

Fig. 1 shows the circuit configuration of the C-200V's amplifier. Transistors Q_{1a} , Q_2 , and Q_3 for positive input, and Q_{1b} , Q_{12} , and Q_{13} form an FET input buffer stage, which is provided with low-current load, cascode bootstrap and effectively suppresses noises and distortion. The luxurious "Class-A cascode, differential push-pull circuit" are respectively made up of Q_4 through Q_7 , and Q_8 through Q_{11} . Moreover, Q_{14} through Q_{17} constitute a "Class-A cascode push-pull circuit", and drive the Class-A Darlington push-pull circuit, which consists of Q_{18} through Q_{21} .

Fig. 2 shows the basic cascode connection. As is apparent, Q_1 and Q_2 are connected in series so that they operate as if they were a single transistor. The input impedance of Q_2 whose base is grounded is low. Thus, the load impedance of Q_1 is equally low, stabilizing the operation of the overall circuit.

An important advantage of the cascode connection approach is minimum feedback between the input and output of a circuit, which in turn assures good performance up to very high frequencies. The gain of such a circuit can also be very high, permitting the circuit components to function in the linear range until close to their operation limit. All of these benefits add up to assure high S/N ratio, minimum distortion and ideal amplification characteristics. In the C-200V, these characteristics are further enhanced by the use of class A push-pull design, for a dramatic leap in performance.

The power supply also was further improved, with separate voltage regulators for the left and right channel, which are located directly on the circuit boards.

2 Refined MC/MM phono stage faithfully reproduces even the most subtle nuances of analog records

Although digital program sources are now well established, there is still a place for analog records, which contain some of the most moving moments in musical history. The equalizer amplifiers of the C-200V are luxuriously configured in almost the same manner as the circuit shown in Fig. 1. The phono stage in the C-200V is designed as a high-gain equalizer amplifier that can be switched for MM or MC operation. Separate input circuits for the two cartridge types provide performance that rivals the best of MC head amplifiers. An MC LOAD selector permits switching between 10, 30, and 100 ohms, for best matching to the impedance of the MC cartridge. As the phono stage handles very low-level signals, its power supply must also be designed with utmost care. A dedicated voltage regulator circuit located on the circuit board ensures optimum performance.

3 Balanced input and output circuits prevent sound quality degradation by connecting cables

Balanced input and output circuits for home-use audio components are being actively promoted by Accuphase, as they offer a number of advantages. The C-200V possesses two balanced inputs (CD and LINE) and one balanced output. Fig. 3 shows the principle of balanced signal transmission which is used extensively in professional applications, such as recording studios or broadcasting. For balanced transmission, two signals are created which are at the same potential vs. ground, but have exactly opposite phase. These signals are then sent via three separate lines. In the input stage of the receiving component, the signals are supplied to a positive and negative amplifier whose outputs are mixed. Because any noise which is

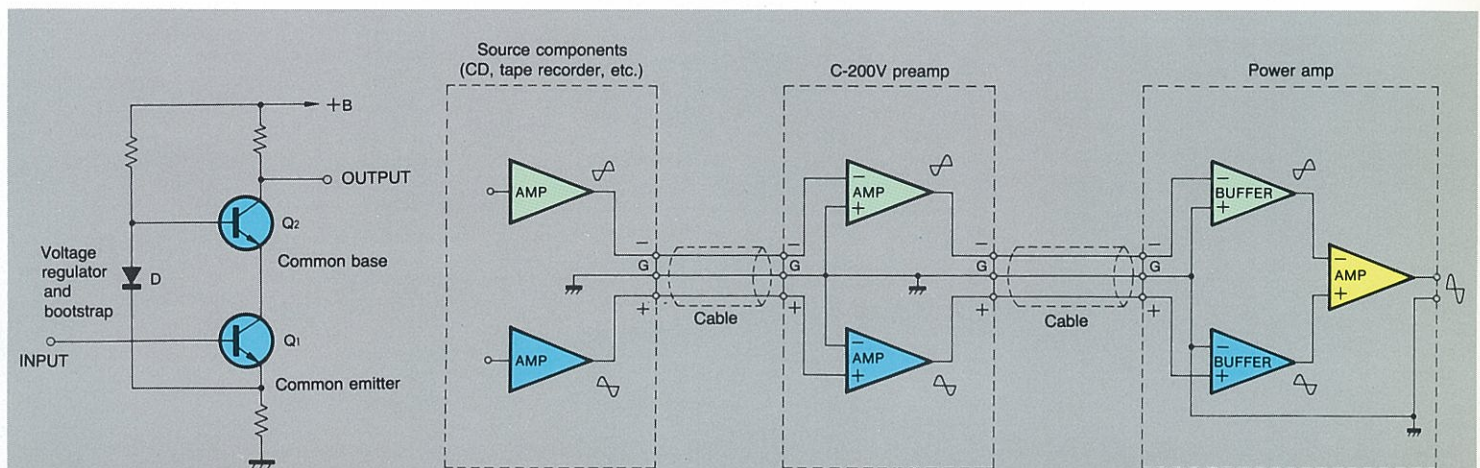
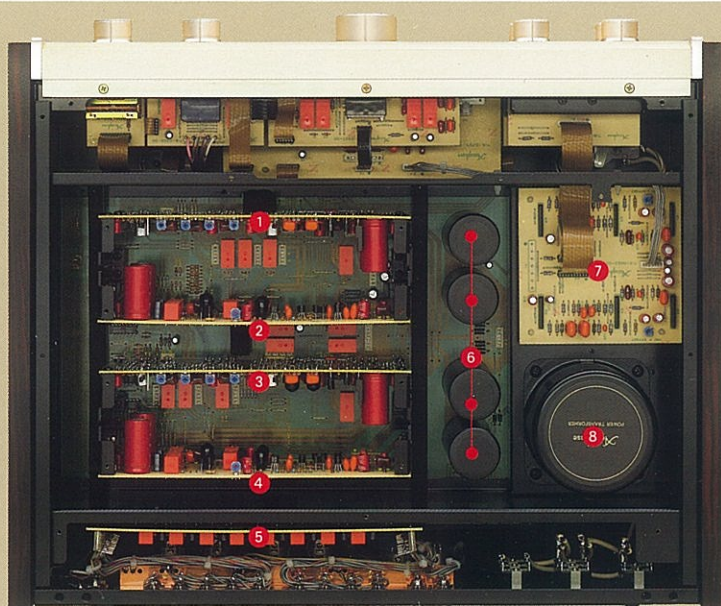


Fig. 2 Basic Cascode Amplifier

Fig. 3 Operating Principle of Balanced Transmission



- ① L-channel line amp board
- ② L-channel equalizer amp board
- ③ R-channel line amp board
- ④ R-channel equalizer amp board
- ⑤ Logic relay control board
- ⑥ Filter capacitors
- ⑦ Presence equalizer board
- ⑧ Power transformer

◀ Internal layout

imposed during the transmission appears with identical phase in both lines, it is completely cancelled when the two signals are combined. This ingenious principle ensures high-quality signal transmission of utmost purity.

4 Logic-control relays permit straight and short signal paths

Long signal paths for functions such as input switching and tape monitoring tend to degrade high-frequency response and impair imaging. In the C-200V, all switching is performed by relays which are arranged so as to permit the shortest possible signal paths. These relays are controlled electronically by a logic circuit to assure accurate and precise operation.

The relays in the C-200V are hermetically sealed units developed specifically for demanding audio applications and offering outstanding long-term reliability.

5 "Presence Equalizer" offers versatile four-point, six-frequency control

Even with high-quality program sources, tone controls which permit subtle adjustments of the reproduced sound are quite desirable. Graphic equalizers are originally intended for this purpose, but their numerous controls often make them difficult to use.

The newly developed "Presence Equalizer" of the C-200V is specially designed for program source equalization, to achieve the most pleasing aural impression during music reproduction. Adjustment is possible with four controls which govern six frequency ranges. (Refer to the frequency response chart at the end of this catalog.)

In the midrange, the 500-Hz control affects for example the timbre of rhythm instruments and the 2-kHz control can be used to emphasize vocals or reduce traces of stringency. Extensive listening tests were carried out to determine the Q factor for these controls, which expresses the steepness of the tone control curve. A value of 0.707 was finally chosen, as it provides the most natural sounding results with a wide variety of program sources.

The overall tonal energy balance can be adjusted with the Bass and Treble controls, which possess two switchable turnover frequencies. The circuit configuration of the Presence Equalizer is shown in Fig. 4. It consists of a combination of summing filters such as used in high-performance graphic equalizers. All parts were strictly selected on the basis of their sonic performance, so that signal quality is not degraded in any way. When the Presence Equalizer is not used, it can be entirely removed from the signal path by setting the Presence Equalizer switch to OFF.

6 Loudness Compensator restores proper sonic balance at low listening levels

A Loudness Compensator, switches give a choice of two curves, to restore proper sonic balance in accordance with the selected volume

setting or the characteristics of the listening room. The COMP-1 switch is for the +3 dB at 100 Hz, while the COMP-2 is for the +8 dB at 100 Hz or +6 dB at 20 kHz (with the volume adjusted to -30 dB in all the cases). Both switches automatically compensates the loudness in accordance with the position of the VOLUME control.

7 Useful tape input/output configuration

The C-200V offers provisions for connection of up to three tape recorders (including one set of front-panel jacks on the sub panel). Dubbing can be freely carried out between all units. This is ideal for recording a variety of program sources.

8 Unsurpassed input/output versatility for multiple program sources

The C-200V was designed to accommodate a wide variety of input and output combinations, and also to permit testing of other audio components. Besides the three sets of TAPE jacks, one AD (Analog Disc) input, two CD inputs, one TUNER input and five LINE inputs are provided. The output configuration includes four output terminals and the headphone output. One set of tape jacks, a line input and the headphone jack are arranged on the front-side sub panel. The balanced CD and LINE inputs use XLR type connectors. A separate output selector permits easy switching between several connected power amplifiers.

9 Persimmon sideboards

In the Accuphase tradition, the front panel of the C-200V is finished in hairline-scratched gold, and the subpanel in hairline-scratched black. The side panels of exquisite persimmon wood further enhance the refined visual appeal for a harmonious blend with your listening room.

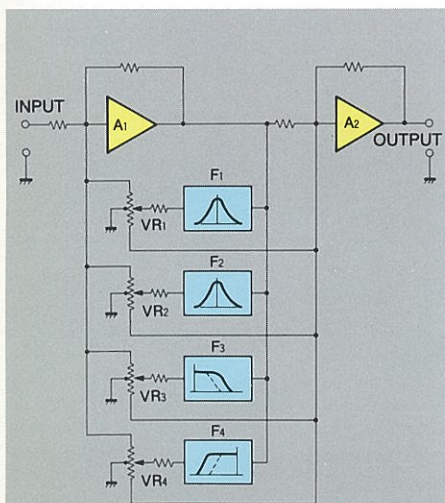
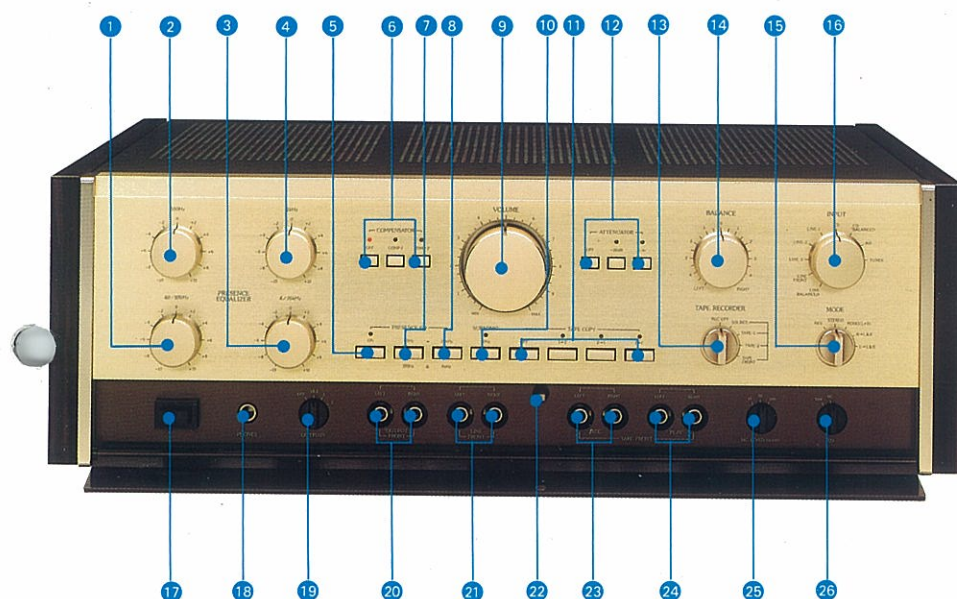
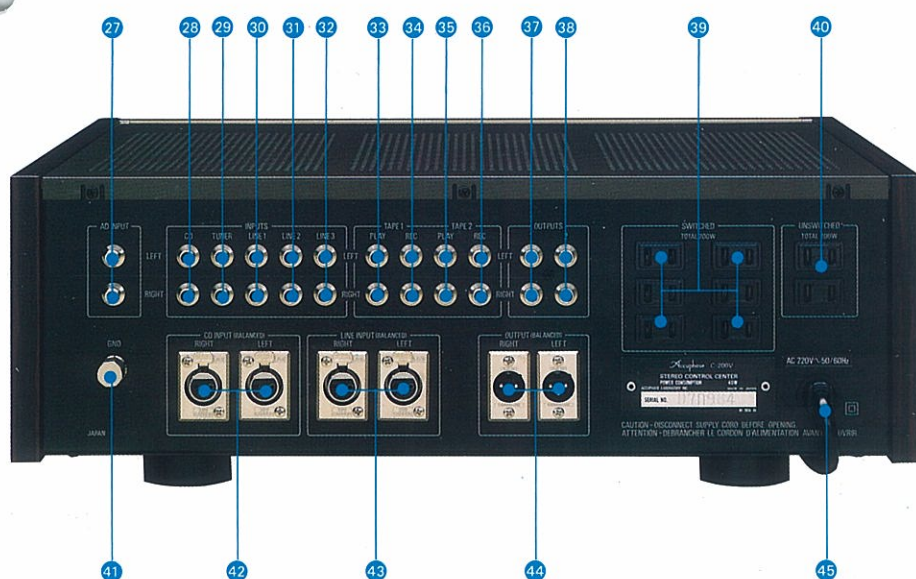


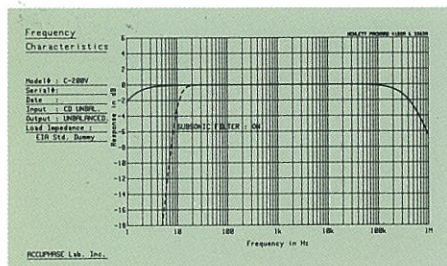
Fig. 4 Operating Principle of Presence Equalizer



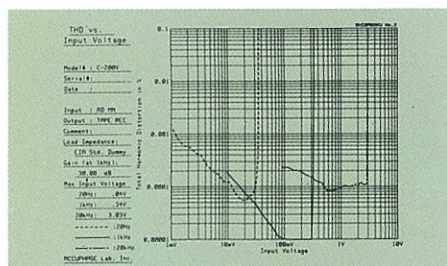
- 1 40-/100-Hz presence equalizer control
- 2 500-Hz presence equalizer control
- 3 8-/20-kHz presence equalizer control
- 4 2-kHz presence equalizer control
- 5 PRESENCE Equalizer ON switch
- 6 COMPENSATOR switches (OFF, COM-1, COMP-2)
- 7 PRESENCE Equalizer frequency selector switch (for 100/40 Hz)
- 8 PRESENCE Equalizer frequency selector switch (for 8/20 kHz)
- 9 VOLUME control
- 10 SUBSONIC filter (10 Hz, -18 dB/oct.)
- 11 TAPE COPY switches (OFF, 1→2, 2→1, 1→F)
- 12 ATTENUATORS (OFF, -20 dB, -∞)
- 13 TAPE RECORDER selector switch (REC OFF, SOURCE, TAPE-1, TAPE-2, TAPE FRONT)
- 14 BALANCE control
- 15 MODE selector switch (REV, STEREO, MONO (L+R), R→L&R, L→L&R)
- 16 INPUT selector switch (LINE (BALANCED), LINE FRONT, LINE-3, LINE-2, LINE-1, CD, CD (BALANCED), AD TUNER)
- 17 POWER switch
- 18 HeadPHONES jack
- 19 OUTPUTS selector switch (OFF, 1&2, 1, 2)
- 20 OUTPUT FRONT jacks
- 21 LINE FRONT jacks
- 22 Magnet catch for subpanel
- 23 TAPE FRONT REC output jacks
- 24 TAPE FRONT PLAY input jacks
- 25 MC LOAD (cartridge) input impedance selector switch (10, 30, 100 ohms)
- 26 AD (equalizer gain) selector switch (MM, MC)



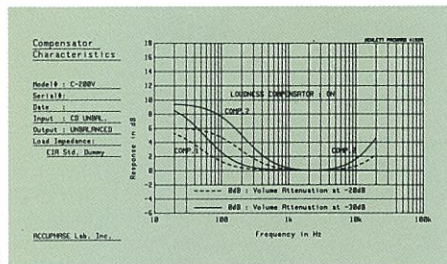
- 27 AD (analog disc) input jacks
- 28 CD (unbalanced) input jacks
- 29 TUNER input jacks
- 30 LINE-1 input jacks
- 31 LINE-2 input jacks
- 32 LINE-3 input jacks
- 33 TAPE-1 PLAY input jacks
- 34 TAPE-1 REC output jacks
- 35 TAPE-2 PLAY input jacks
- 36 TAPE-2 REC output jacks
- 37 OUTPUT jacks (unbalanced, 1 ohm)
- 38 OUTPUT jacks (unbalanced, 1 ohm)
- 39 AC outlets (SWITCHED)
- 40 AC outlets (UNSWITCHED)
- 41 GND terminal
- 42 CD INPUT (BALANCED) connectors XLR-3-31 or equivalent: ① GND, ② Cold, ③ Hot Applicable connector: XLR-3-12C or equivalent
- 43 LINE INPUT (BALANCED) connectors
- 44 OUTPUT (BALANCED) connectors XLR-3-32 or equivalent: ① GND, ② Cold, ③ Hot Applicable connector: XLR-3-11C or equivalent
- 45 Power cable



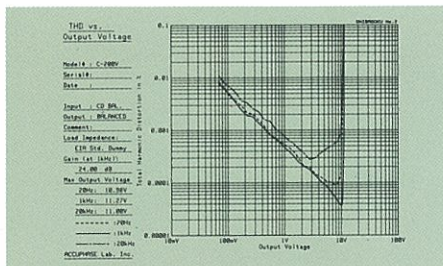
● FREQUENCY CHARACTERISTIC



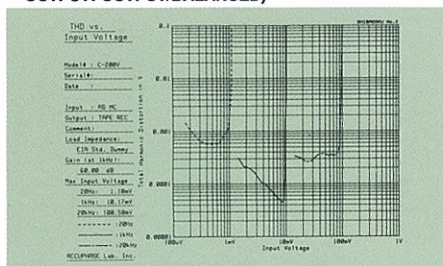
● INPUT VOLTAGE vs TOTAL HARMONIC DISTORTION CHARACTERISTIC (INPUT: MM, OUTPUT: TAPE REC)



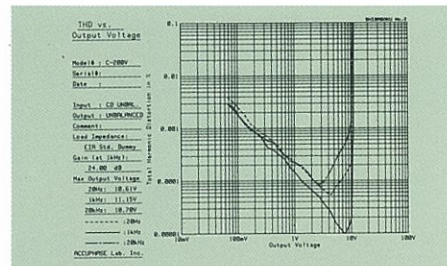
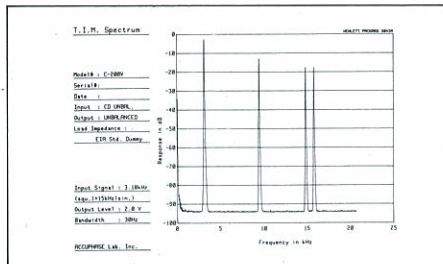
● COMPENSATOR CHARACTERISTIC



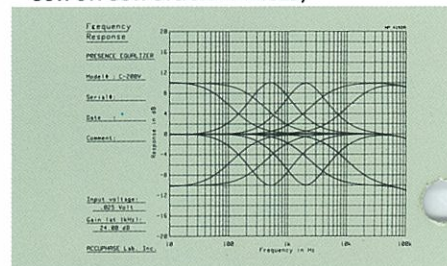
● OUTPUT VOLTAGE vs TOTAL HARMONIC DISTORTION CHARACTERISTIC (INPUT: LINE INPUT/BALANCED, OUTPUT: OUTPUT/BALANCED)



● INPUT VOLTAGE vs TOTAL HARMONIC DISTORTION CHARACTERISTIC (INPUT: MC, OUTPUT: TAPE REC)



● OUTPUT VOLTAGE vs TOTAL HARMONIC DISTORTION CHARACTERISTIC (INPUT: LINE INPUTS/UNBALANCED, OUTPUT: OUTPUTS/UNBALANCED)



● PRESENCE EQUALIZER CHARACTERISTIC

The graph on the left shows the transient intermodulation distortion (TIM) spectrum. To measure this parameter, a square wave of 3.18 kHz and a sine wave of 15 kHz are mixed and supplied to the input. The square wave signal contains almost infinite odd-number higher harmonics, with components at 9.54 kHz (third harmonic), 15.9 kHz (fifth harmonic), etc. When these components intermodulate with the 15-kHz signal, modulation products show up at frequencies where there is no input signal. For example, if the third harmonic of the 3.18 kHz square wave (9.54 kHz) and the 15 kHz input signal intermodulate, a spectrum can appear at the difference of their frequencies, or at 5.46 kHz (15 kHz - 9.54 kHz). As the graph shows, however, there are no distortion products at all above -93 dB, which means that TIM distortion is less than 0.0022%.

GUARANTY SPECIFICATIONS

(Guaranty specifications are measured according to EIA standard RS-490. AD denotes Analog Disc input.)

● PERFORMANCE GUARANTY

All Accuphase product specifications are guaranteed as stated.

● Frequency Response

CD, LINE (BALANCED INPUT)
1.0 to 400,000 Hz: +0, -3.0 dB
20 to 20,000 Hz: +0, -0.2 dB
CD, LINE, TUNER, TAPE PLAY (UNBALANCED INPUT)
1.0 to 500,000 Hz: +0, -3.0 dB
20 to 20,000 Hz: +0, -0.2 dB
AD (UNBALANCED INPUT)
20 to 20,000 Hz: ±0.2 dB

● Total Harmonic Distortion

0.005% (for all inputs)

● Input Sensitivity, Input Impedance

Input Terminal	Sensitivity		Impedance
	Rated Output	EIA (0.5V Output)	
AD:MM	4.0 mV	1.0 mV	47k ohms
AD:MC	0.13 mV	0.032 mV	10/30/100 ohms
UNBALANCED	126 mV	31.5mV	20k ohms
BALANCED	126 mV	31.5 mV	40k ohms (20k/20k ohms)

● Rated Output Level and Impedance

OUTPUT (BALANCED): 2.0V
50 ohms (25 ohms/25 ohms)/XLR connector
OUTPUT (UNBALANCED): 2.0V
1 ohm/RCA-type phono jack
TAPE REC: 126 mV
200 ohms/AD source/RCA-type phono jack

● Headphone Output

Suitable load impedance: 4 to 100 ohms

● Signal-to-Noise Ratio

Input Terminal	Rated Input	EIA
AD:MM	90 dB	85 dB
AD:MC	74 dB	83 dB
UNBALANCED	110 dB	91 dB
BALANCED	97 dB	91 dB

● Maximum Output Level

(THD 0.005%, 20 to 20,000 Hz)
OUTPUT (BALANCED): 8.0V (XLR connector)
OUTPUT (UNBALANCED): 8.0V (RCA-type phono jack)
TAPE REC: 9.0V (AD source)

● Maximum AD Input Level (1 kHz, THD 0.005%)

AD (MM): 300 mV
AD (MC): 9.5 mV

● Minimum Load Impedance

OUTPUT (BALANCED): 600 ohms (300 ohms/300 ohms)
OUTPUT (UNBALANCED): 1k ohms
TAPE REC: 10k ohms

● Gain

CD, LINE, TUNER, TAPE PLAY (UNBALANCED)
→ OUTPUT (UNBALANCED): 24 dB
CD, LINE, TUNER, TAPE PLAY (UNBALANCED)
→ OUTPUT (BALANCED): 24 dB
CD, LINE (BALANCED)
→ OUTPUT (UNBALANCED): 24 dB
CD, LINE (BALANCED)
→ OUTPUT (BALANCED): 24 dB
CD, LINE, TUNER, TAPE PLAY (UNBALANCED)
→ REC OUTPUT: 0 dB

CD, LINE (BALANCED)

→ REC OUTPUT: 0 dB

AD (MM) → OUTPUT (UNBALANCED): 54 dB

AD (MM) → OUTPUT (BALANCED): 54 dB

AD (MM) → REC OUTPUT: 30 dB

AD (MC) → OUTPUT (UNBALANCED): 84 dB

AD (MC) → OUTPUT (BALANCED): 84 dB

AD (MC) → REC OUTPUT: 60 dB

● Presence Equalizer Characteristics

4-band principle
Frequencies: 40 Hz/100 Hz selectable, 500 Hz, 2 kHz, 8 kHz/20 kHz selectable
Variable Range: ±10 dB

● Loudness Compensator Characteristics (volume setting -30 dB)

COMP-1: +3 dB (100 Hz)
COMP-2: +8 dB (100 Hz), +6 dB (20 kHz)

● Subsonic Filter Characteristics

Cutoff frequency 10 Hz, -18 dB/oct.

● Attenuator Characteristics

-20 dB, infinite

● Semiconductor Complement

117 Tr's, 20 FETs, 28 ICs, 104 Di's

● Power Requirements

100 V, 117 V, 220 V, 240 V 50/60 Hz AC

● Power Consumption

40 watts

● Dimensions

475 mm (18-13/32 inches) width, 170 mm (6-11/16 inches) height (including leg), 375 mm (14-3/4 inches) depth

● Weight

15.5 kg (34.1 lb) net, 20.0 kg (44.0 lb) in shipping carton

Accuphase

ACCUPHASE LABORATORY INC.