

Accuphase

STEREO CONTROL CENTER

C-245

● Current feedback circuit topology provides outstanding high-range phase characteristics ● Six line amplifier units in triple-parallel dual MCS configuration ● Fully modular unit amplifiers with discrete circuitry ● Tone control circuitry ● Option boards allow digital signal input and analog disc reproduction





Optimum match for P-370 power amplifier — This state-of-the-art preamplifier features current feedback technology, six fully separate line amp units in triple-parallel dual MCS configuration, and fully dual-mono construction with separate power supplies. Option board allows digital signal input for top-quality CD reproduction.

Accuphase preamplifiers implement advanced technology such as current feedback and balanced signal transmission, in order to achieve optimum quality reproduction that is true to the spirit of the music. This is the reason why our products continue to enjoy such a high reputation. The C-245 is a stereo control center that fully represents Accuphase technological expertise. As the model name indicates, the amplifier stands in the tradition of the C-200/P300 series that has been the mainstay of the Accuphase product lineup since its inception. An ideally matched power amplifier is found in the model P-370, capable of delivering an amazing 400 watts per channel into an ultra-low-impedance load of 1 ohm.

The line amplifier circuits of the C-245 are based on the current feedback principle, which has consistently received high praise for sonic excellence and top-notch performance. Three line amplifier modules are used for each channel, resulting in a total of six line amp modules, arranged in a triple parallel MCS (Multiple Circuit Summing) configuration. This arrangement provides drastic improvements in S/N ratio, distortion, and other important performance parameters. All parts used in the C-245 have been carefully selected on the basis of extended listening tests. Features such as tone controls and loudness compensator allow precise fine tuning if desired, and facilities for tape recorder connection are also provided. In sound quality and performance, the C-245 is a superbly conceived top-notch product.

The possibility of installing option boards further enhances flexibility. A Digital Input Board using an MDS (Multiple Delta Sigma) D/A converter can directly handle the digital signal from a CD player or similar, for ultra-pure music reproduction. A board for faithful playback of analog records is also available.

Current feedback circuit topology prevents high-range phase shifts and ensures superb sound quality

The C-245 uses the current feedback principle for negative feedback. Figure 2 shows the operating principle of this design.

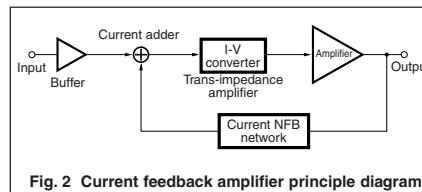


Fig. 2 Current feedback amplifier principle diagram

At the input point of the feedback loop, the impedance is kept low for current detection. A trans-impedance amplifier converts the current into a voltage to be used as the feedback signal. Since the impedance at the current feedback point (current adder in Figure 2) is very low, there is almost no phase shift. Phase compensation therefore can be kept at a minimum. A minimal amount of NFB results in maximum improvement of circuit parameters. The result is excellent transient response and superb sonic transparency, coupled with utterly natural energy balance. Figure 3 shows frequency response for different gain settings of the current feedback amplifier. The graphs demonstrate that that response remains uniform over a wide range.

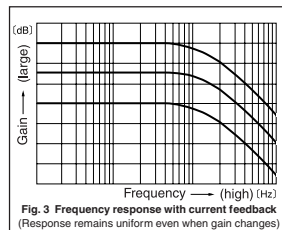


Fig. 3 Frequency response with current feedback (Response remains uniform even when gain changes)

Six discrete line amplifiers in MCS configuration designed for optimum sound

The line amp units of the C-245 (Figure 4)

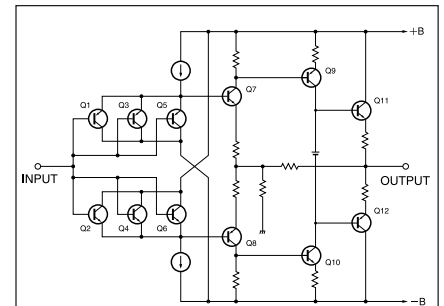


Fig. 4 Line amplifier unit circuit diagram (3 units are used in parallel connection per channel)

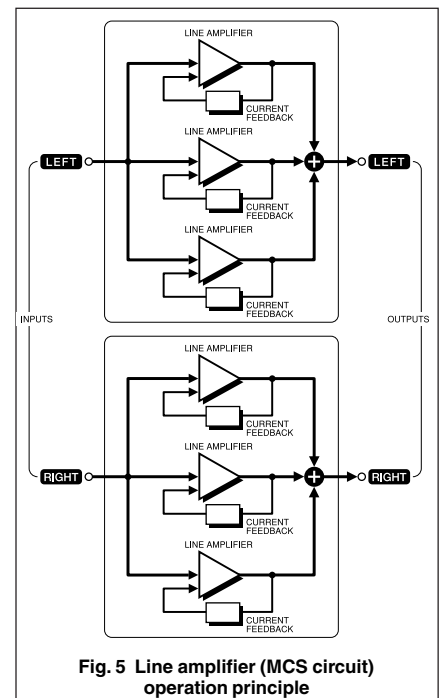


Fig. 5 Line amplifier (MCS circuit) operation principle

employ a pure complementary push-pull circuit topology. Hand-selected discrete parts are used in parallel for minimum noise.

Six line amplifiers are connected in a triple parallel MCS (Multiple Circuit Summing) configuration developed by Accuphase. By arranging three line amp units for each channel in a parallel connection, the performance advantages of each circuit are added up, resulting in improved S/N ratio, distortion and other vital performance parameters. The overall result is a stereo amplifier with superb characteristics.

Balanced connection reliably blocks induced noise

The longer the cable connections between audio components, the higher is the danger of external noise being introduced into the signal path, which invariably leads to sound quality degradation. The balanced connection principle reliably prevents this danger, by keeping the signal transfer

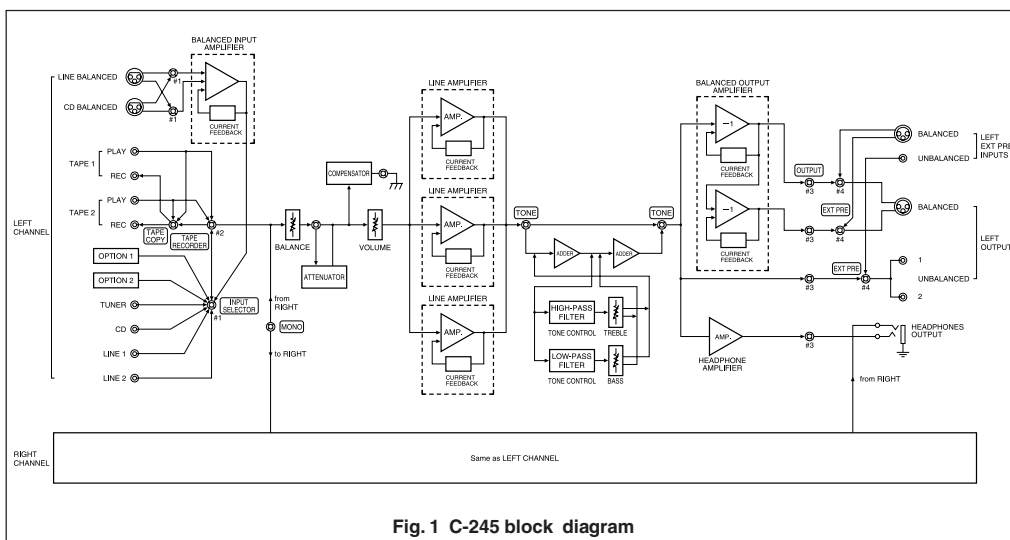


Fig. 1 C-245 block diagram

- Supplied remote commander RC-20
Allows volume adjustment and source switching.



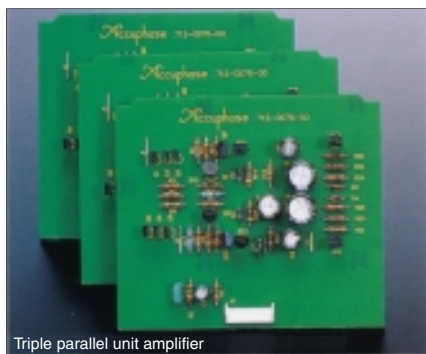
- Line amplifiers and balanced input/output amplifiers arranged on PCB motherboard (total 10 modules)



completely free from any kind of interference.

Modular construction keeps amplifier circuits separate

The six line amplifiers and balanced output amplifiers are housed in a total of 10 separate modules neatly arranged on a motherboard. The units are firmly secured with a frame construction to prevent external vibrations from affecting the sound.



Triple parallel unit amplifier

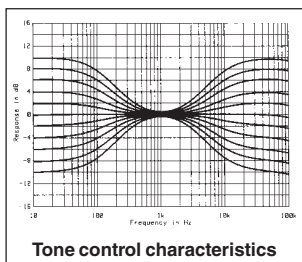
Complete mono construction with separate transformers for left and right channels

The power supply of the C-245 employs a dual-mono approach with separate power transformers and filtering capacitors for the two stereo channels. Each unit amplifier is equipped with a wide-range low-impedance voltage regulator to eliminate any possibility of interference between stages.

Tone controls use summing active filters for highest sound quality

The tone control circuitry in the C-245 was specially designed with summing active filters such as found in high-quality graphic equalizers.

Figure 6 illustrates the operation principle of this circuit. The flat signal is passed straight through, and only when an adjustment is required, the characteristics are created at F_1 and F_2 and added to



Tone control characteristics

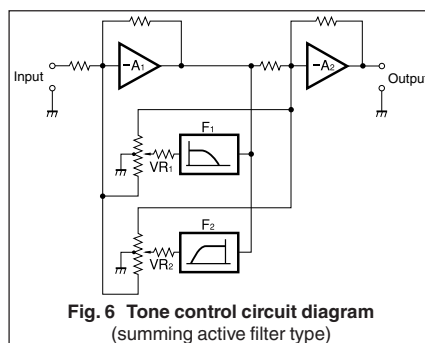
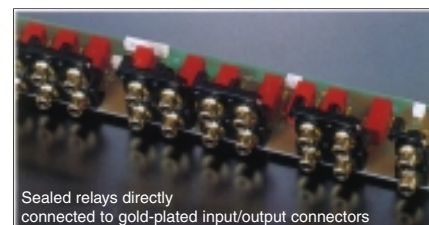


Fig. 6 Tone control circuit diagram
(summing active filter type)

the signal, thereby producing the desired change. This design provides efficient control without degrading signal purity.

Logic-controlled relays for signal switching assure high sound quality and long-term reliability

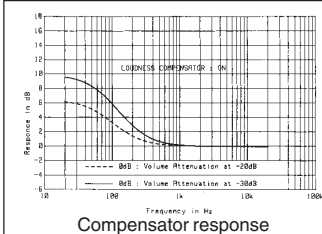
The use of logic-controlled relays at strategic locations makes it possible to keep signal paths extremely short. The relays used in the C-245 are high-performance hermetically sealed types as used in professional communication applications. The contacts are twin crossbar types plated with gold and silver palladium alloy, for minimum contact resistance and outstanding long-term reliability.



Sealed relays directly connected to gold-plated input/output connectors

Other features and functions

- Option board available for direct digital signal input for high-grade CD reproduction
- Option board available for analog record reproduction
- High-quality volume control. Supplied remote commander for volume adjustment and source switching.
- High carbon cast-iron insulator feet for high sound quality
- Dedicated headphone amplifier for optimum sound
- EXT PRE function permits use of external preamplifier for playback
- Loudness compensator for enhanced bass at low listening levels



Option Boards

Three types of option boards are available for the C-245: Digital Input Board DAC-10, Analog Input Board AD-10, and Line Input Board LINE-10. Insert the desired board in a rear-panel option board slot.

- The DAC-10 cannot be used in the models E-407, E-406V, E-306V, E-211, C-265.
- The Analog Disc Input Board AD-9 and the Line Input Board LINE-9 can also be used.



Option board shown in photo is DAC-10

Digital Input Board DAC-10

This board features an MDS (Multiple Delta Sigma) D/A converter and has inputs for coaxial and optical fiber connections.

It can accept the digital output signal from components such as a CD player, MD recorder, DAT recorder, etc. (sampling frequency range 32 - 96 kHz, 24 bits).

Analog Disc Input Board AD-10

This board contains a high-performance, high-gain phono equalizer.

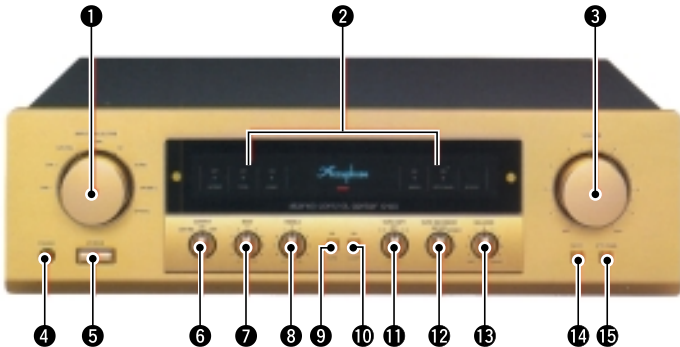
Internal DIP switches control MM/MC operation, MC input impedance, and subsonic filter on/off.

MM	Gain : 36 dB
	Input impedance : 47 kilohms
MC	Gain : 62 dB
	Input impedance : 10/30/100 ohms (selectable)

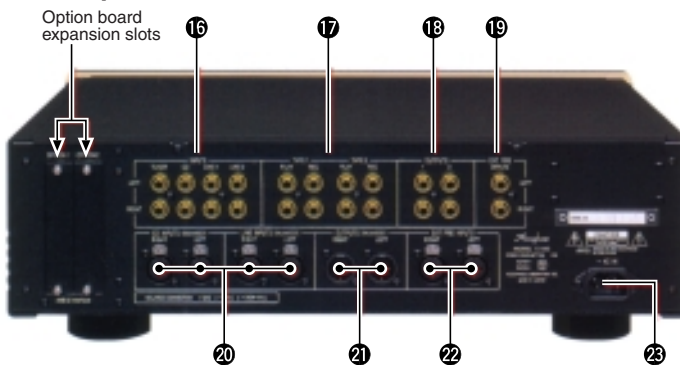
Line Input Board LINE-10

This option board provides an additional set of conventional unbalanced line inputs which can be used to connect a CD player, tuner, or other component with analog output.

Front panel



Rear panel



- | | |
|--|---|
| <p>1 INPUT SELECTOR</p> <p>2 Function LED indicators</p> <p>3 VOLUME Control</p> <p>4 PHONES Jack</p> <p>5 POWER Switch</p> <p>6 EXT PRE and output ON/OFF Switch</p> <p>7 BASS Control</p> <p>8 TREBLE Control</p> <p>9 TONE Controls ON/OFF Button</p> <p>10 COMP (Compensator) ON/OFF Button</p> <p>11 TAPE COPY Selector 1→2 OFF 2→1</p> <p>12 TAPE RECORDER Selector REC OFF SOURCE 1 2</p> | <p>13 BALANCE Control</p> <p>14 STEREO/MONO Button</p> <p>15 Attenuator Button</p> <p>16 Line inputs</p> <p>17 TAPE 1, 2 Play/Record Connectors</p> <p>18 OUTPUTS (Unbalanced)</p> <p>19 EXT PRE (External Preamplifier) input (Unbalanced)</p> <p>20 CD/LINE INPUTS (BALANCED)</p> <p>21 OUTPUTS (Balanced)</p> <p>22 EXT PRE (External Preamplifier) Inputs (Balanced)</p> <p>23 AC Power Supply Connector*</p> |
|--|---|

Remarks

- * This product is available in versions for 120/230 V AC. Make sure that the voltage shown on the rear panel matches the AC line voltage in your area.
- * The shape of the AC inlet and plug of the supplied power cord depends on the voltage rating and destination country.

- Supplied accessories:
- AC power cord
 - Audio cable with plugs (1 m)
 - Remote commander RC-20

GUARANTEED SPECIFICATIONS

[Guaranteed specifications are measured according to EIA standard RS-490.]

- **Frequency Response** BALANCED/UNBALANCED INPUT
3 - 300,000 Hz +0, -3.0 dB
20 - 20,000 Hz +0, -0.2 dB
- **Total Harmonic Distortion** (for all inputs) 0.005%
- **Input Sensitivity, Input Impedance**

Input	Sensitivity		Input impedance
	For rated output	For 0.5 V output	
BALANCED	252 mV	63 mV	40 kΩ
UNBALANCED	252 mV	63 mV	20 kΩ
- **Rated Output, Output Impedance** BALANCED/UNBALANCED OUTPUT 2 V, 50 ohms
TAPE REC 252 mV, 200 ohms
- **Signal-to-Noise Ratio**

Input	Input shorted, IHF-A weighting S/N ratio at rated input	S/N ratio (EIA)	Residual noise
BALANCED	108 dB	97 dB	1.0 μV
UNBALANCED	121 dB	97 dB	1.0 μV
- **Maximum Output Level (0.005% THD, 20 - 20,000 Hz)**

BALANCED/UNBALANCED OUTPUT	: 5.0 V
TAPE REC	: 5.0 V
- **Minimum Load Impedance** BALANCED/UNBALANCED OUTPUT : 600 ohms
TAPE REC : 10 kilohms
- **Gain**

BALANCED/UNBALANCED INPUT → BALANCED / UNBALANCED OUTPUT	: 18 dB
BALANCED/UNBALANCED INPUT → REC OUTPUT	: 0 dB
- **Loudness Compensation** +6 dB (100 Hz)
- **Tone Controls**

Turnover frequency and adjustment range	
BASS	: 300 Hz ±10 dB (50 Hz)
TREBLE	: 3 kHz ±10 dB (20 kHz)
- **Attenuator** -20 dB
- **Headphones Jack** Suitable impedance: 8 - 100 ohms
- **Power Requirements** AC 120 V / 230 V (Voltage as indicated on rear panel)
50/60 Hz
- **Power Consumption** 16 watts
- **Maximum Dimensions**

Width	475 mm (18-11/16")
Height	150 mm (5-7/8")
Depth	409 mm (16-1/8")
- **Weight** 16.8 kg (37.0 lbs) net
21.0 kg (46.3 lbs) in shipping carton
- **Supplied Remote Commander RC-20**

Remote control principle: Infrared pulse

Power supply : 3 V DC (IEC R6 batteries x 2)

Dimensions : 55 mm (W) x 194 (H) x 18 (D) mm

Weight : 100 g (including batteries)



ACCUPHASE LABORATORY INC.

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