

Accuphase

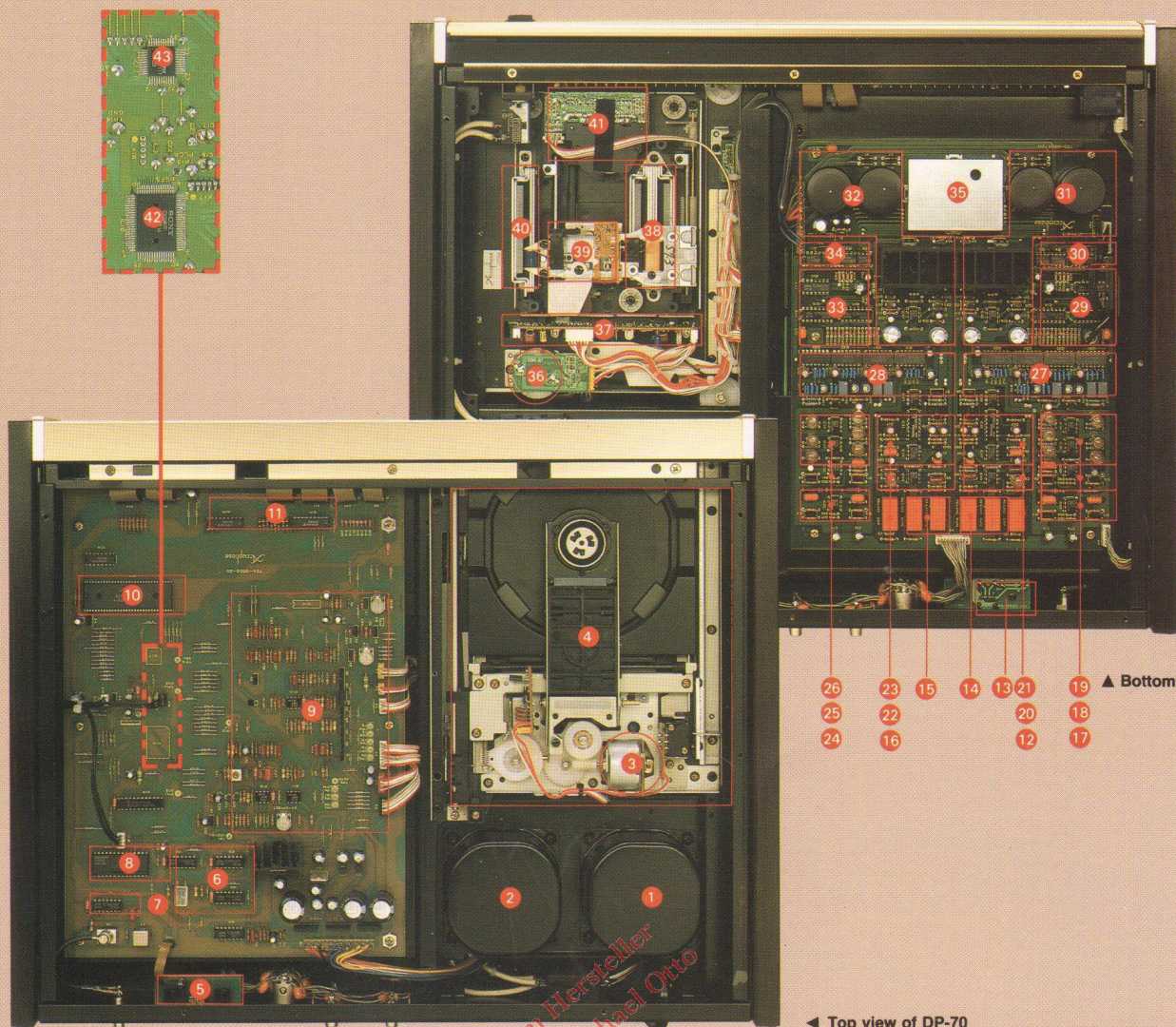
COMPACT DISC PLAYER

DP-70

© beim Hersteller
Archiv Michael Otto



COMPACT
disc
DIGITAL AUDIO



- 1 Power transformer for digital circuits
 - 2 Power transformer for analog circuits
 - 3 Chucking motor
 - 4 CD mechanical deck
- The deck is mounted on a base which is stiff and made of special resin mixed with ceramic to prevent resonance. Also, it is raised from the chassis.

- 5 Transmitter for optical fiber transmission (digital output)
- 6 Master clock generator
- 7 Optical fiber transmission driver
- 8 IC for modulating digital audio signals
- 9 Servo control ICs
- 10 8-bit microprocessor
- 11 Display driver
- 12 De-emphasis selector relay for right channel
- 13 Transmitter for optical fiber transmission
- 14 Muting relay for right channel
- 15 Muting relay for left channel
- 16 De-emphasis selector relay for right channel
- 17 De-emphasis circuit for right channel
- 18 Umbalanced output circuit for right channel
- 19 5-pole GIC type Butterworth low-pass filter
- 20 Balanced output circuit for right channel

- 21 I/V converter and deglitching circuit for right channel
- 22 Balanced output circuit for left channel
- 23 I/V converter and deglitching circuit for left channel
- 24 De-emphasis circuit for left channel
- 25 Imbalanced output circuit for left channel
- 26 5-pole Butterworth low-pass filter for left channel
- 27 Discrete 16-bit D/A converter for right channel
- 28 Discrete 16-bit D/A converter for left channel
- 29 Serial/parallel converter for right channel
- 30 Optoisolator for right channel
- 31 Analog power supply for right channel
- 32 Analog power supply for left channel
- 33 Serial/parallel converter for left channel
- 34 Optoisolator for left channel
- 35 Four-times oversampling digital filter in shielded case
- 36 Disc turntable driver motor
- 37 RF amplifier assy.
- 38 Linear motor
- 39 Bottom of laser pickup
- 40 Linear motor position sensor
- 41 Bottom of spindle motor and driver circuit board
- 42 IC for processing digital signals
- 43 4-bit microprocessor for mechanical control

6 De-emphasis circuit consisting of passive elements and buffer amplifier

On some CD discs, the recording level is emphasized towards the higher frequency when recorded. This is called pre emphasis. When playing a pre-emphasized disc, measures to offset the pre emphasis must be taken. This is called de-emphasis. These procedures are to improve the signal-to-noise ratio through the recording and reproducing processes. However, pre-emphasis and de-emphasis are not necessary for all digital recordings.

A disc whose contents are pre-emphasized contains a special signal which indicates that the contents are pre-emphasized. This signal is detected by the player, and the response characteristics are automatically changed. Fig.

3 shows the de-emphasis circuit which is important for the sound quality. The de-emphasis circuit consists of a passive filter and buffer amplifiers so that excellent sound quality is maintained.

7 Fixed level audio output and variable level audio output and additional XLR-type balanced output are provided

Two pairs of RCA type phono jacks, one for fixed level output and the other for controlled output level, are provided. The output level for the controlled output can be adjusted by the volume control on the subpanel. The XLR-type balanced output connectors are also provided for commercial use. These outputs are low impedance (50 ohms: 25/25) (Fig. 3).

8 In addition to a standard 75-ohm coaxial cable connector, a wide-band optical fiber output connector is provided

Digital output pins are provided for a connection with other independent digital processors or amplifiers having built-in converters. The digital signals are output from a standard 75-ohm coaxial cable connector, which outputs the digital signal in accordance with the standard format, and an Accuphase dedicated optical fiber connector. The optical fiber output can transmit digital signals without being affected by spurious radiation which lowers the quality of the sound. The optical fiber cable is sold separately. When you order, specify the part number LF-10.

9 One master clock control system is employed for all operation timing to avoid beat which deteriorates the sound quality.

The reference signal which controls operations inside the player is generated by the crystal clock oscillator. Generally, two clock oscillators are used, one for digital signal processing and the other for microprocessor. However, if the frequencies of the two oscillators differ even slightly, beat is generated and the sound quality may be affected. This unit uses only one clock oscillator as shown in Fig. 1, so that no beat can be generated.

10 Selection time of less than 1 second is achieved by employing a linear motor laser pickup and 8-bit microprocessor

The direct key selection is an attractive feature of the CD player. This unit employs the most advanced linear motor mechanism which can operate swiftly and smoothly for the tracking of the laser pickup. Thanks to the linear motor mechanism and an 8-bit microprocessor specially developed for this CD player, selection time of less than 1 second is achieved. Additionally, the disc compartment can be opened or closed swiftly so that minimum effort is required to enjoy the

player.

11 The moving mechanism is mounted on a ceramic composite, special resin mountings floated from the chassis, to virtually eliminate the effect of vibration and resonance on the sound quality.

The disc rotates at 200 to 500rpm. Therefore, if measures to eliminate vibration and resonance are not taken, components inside the unit will vibrate and cause deterioration of the sound quality. In this CD player, the mechanism itself is attached to a very hard ceramic, special resin mountings floated from the chassis so that vibration is almost totally dampened. Together with the mechanism, the disc compartment is also floated from the chassis to minimize the external shock to the mechanism.

12 Heavy chassis kills resonance

The DP-70 CD player weighs 21kg and can be classed to belong among heavy CD players. The rotating section is supported by a thick metal frame, and the entire unit is designed to resist vibration. The sturdy frame construction employed in the entire unit and the legs lathed

out from a pure brass bar are also effective against resonance. Therefore, the sound quality is not affected by the sound pressure from the speakers or location. These guarantee stable operation.

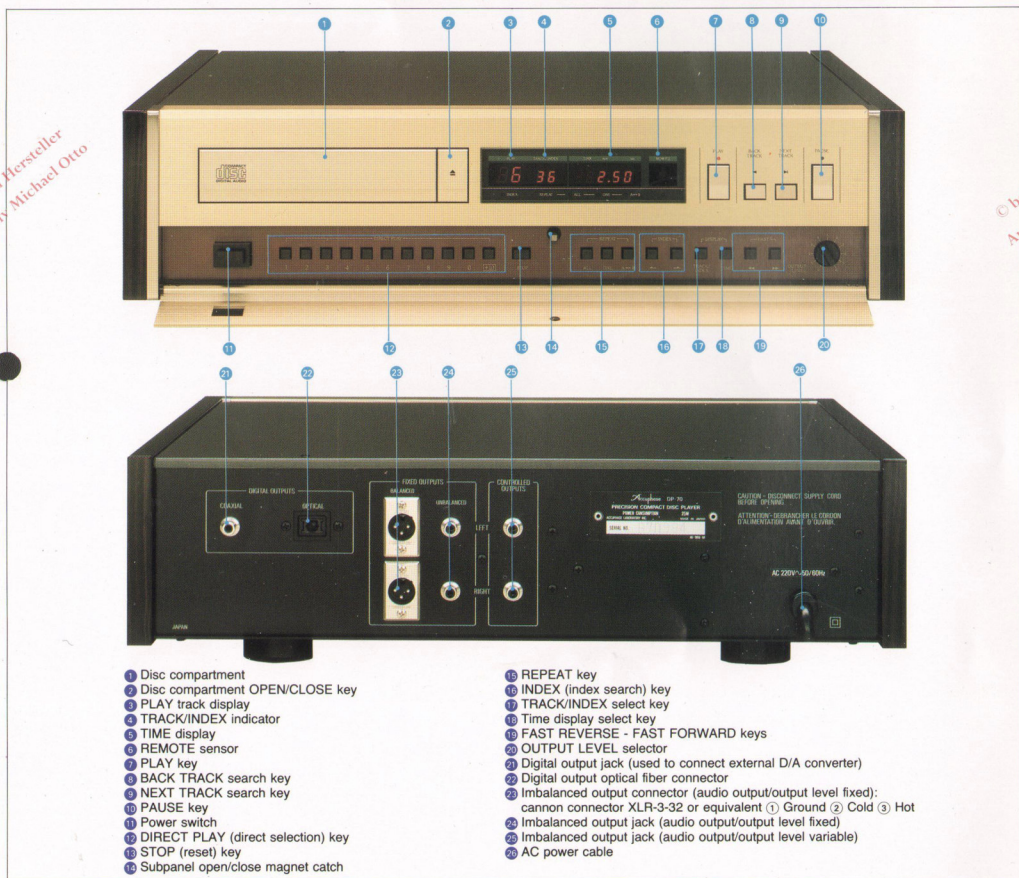
13 Operation is as simple as an analog player

The external appearance is designed to be much simpler than the general CD players. As can be seen in the photograph on the cover, only the PLAY, TRACK SEARCH, and PAUSE keys are on the front panel. With these keys, you can operate this CD player as though you are operating an analog player. Other control keys are hidden behind the subpanel. All functions can be controlled from the supplied remote commander.

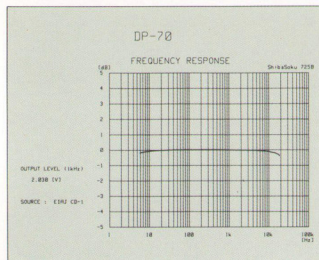
14 Simple, beautiful appearance of the CD player harmonizes with other Accuphase products

A hairline finish golden panel and natural persimmon sideboard offer good coordination with other Accuphase products, and blend right into the room to add comfort to listening.

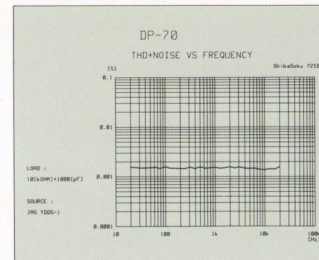
Accuphase DP-70



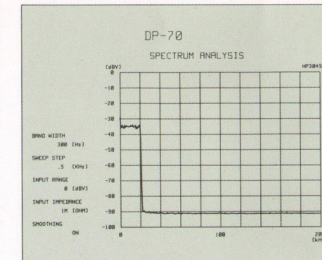
- 1 Disc compartment
- 2 Disc compartment OPEN/CLOSE key
- 3 PLAY track display
- 4 TRACK/INDEX indicator
- 5 TIME display
- 6 REMOTE sensor
- 7 PLAY key
- 8 BACK TRACK search key
- 9 NEXT TRACK search key
- 10 PAUSE key
- 11 Power switch
- 12 DIRECT PLAY (direct selection) key
- 13 STOP (reset) key
- 14 Subpanel open/close magnet catch
- 15 REPEAT key
- 16 INDEX (index search) key
- 17 TRACK/INDEX select key
- 18 Time display select key
- 19 FAST REVERSE - FAST FORWARD keys
- 20 OUTPUT LEVEL selector
- 21 Digital output jack (used to connect external D/A converter)
- 22 Digital output optical fiber connector
- 23 Imbalanced output connector (audio output/output level fixed): cannon connector XLR-3-32 or equivalent ① Ground ② Cold ③ Hot
- 24 Imbalanced output jack (audio output/output level fixed)
- 25 Imbalanced output jack (audio output/output level variable)
- 26 AC power cable



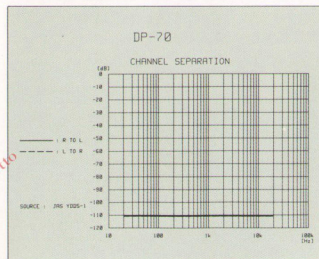
● Frequency Response



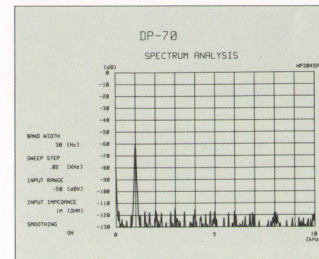
● THD + Noise vs. Frequency Characteristic



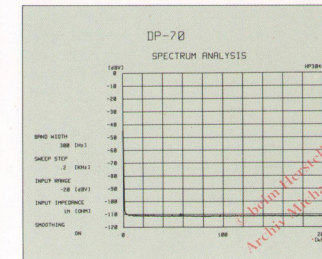
● Spectrum Analysis of -20dB White Noise



● Channel Separation Characteristic



● Spectrum Analysis of reproducing Signal at 1kHz: -60dB



● Spectrum Analysis of Non-signal Reproduced Noise vs. Frequency Characteristic

GUARANTY SPECIFICATIONS

- **PERFORMANCE GUARANTY:**
All Accuphase product specifications are guaranteed as stated.
This system complies with the EIAJ CP-307.
- **Product type:** Digital CD playback unit
Format: Compact disc Standard format
Quantization: 16 bit
Sampling frequency: 44.1 kHz
Error correction principle: CIRC
Number of channels: 2
Revolution speed: 200 to 500 rpm (constant linear velocity)
Scan velocity: 1.2 to 1.4 m/s, constant
- **Data extraction principle**
Non-contact optical pickup (semiconductor laser)
- **Laser type:** GaAlAs (double heterodyne diode)
- **Frequency response:** 4.0 to 20,000 Hz ± 0.3 dB
- **Total harmonic distortion + noise:** 0.002% (20 to 20,000 Hz)
- **Signal-to-noise ratio:** 115 dB
- **Dynamic range:** 95 dB
- **Channel separation:** 110 dB
- **Rated output level and impedance**
FIXED BALANCED: 2.5V/50 ohms (25/25 ohms), balanced XLR type connector
UNBALANCED: 2.5V/50 ohms RCA type phono jack
VARIABLE UNBALANCED: 0 to 2.5V/1.25k ohms max. RC type phono jack
- **Digital signal output format and level**
Format: Digital audio interface
OPTICAL: output -20 dBm wavelength 660 nm
COAXIAL: 0.5 Vp-p, 75 ohms
- **Semiconductor complement:**
51 transistors, 77 ICs, 94 diodes
- **Power requirements:** 100/117/220/240V, 50/60 Hz
- **Power consumption:** 25W
- **Dimensions:**
475 mm (18-23/32 inches) width, 135 mm (5-5/16 inches) height (incl. Legs), 373 mm (14-11/16 inches) depth
- **Weight:**
21 kg (46.4 lb) net, 26 kg (57.5 lb) in shipping carton
- **Supplied Remote Commander RC-1**
Remote control system: Infrared control
Power supply: 3V DC with two batteries IEC designation R6 (size AA)
Dimensions: 64 mm (2-9/16 inches) width, 149 mm (5-15/16 inches) height, 18 mm (6/8 inch) depth
Weight: 115g (4.1 oz)

