ORDER NO. HAD85052535A4

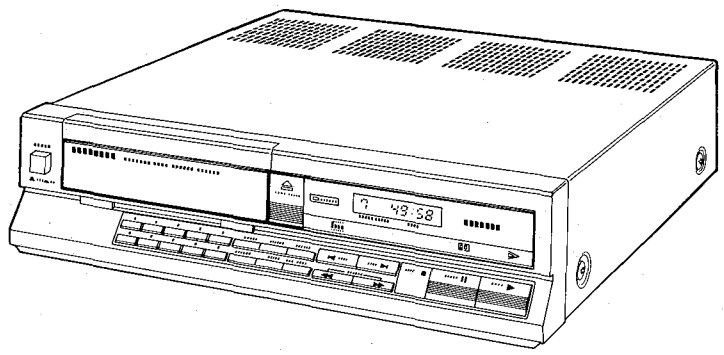
Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ1



Color

(S)	Silver Type
(K)	Black Type

Color	Area	
(S) (K)	[PA]	Far East PX.
(S) (K)	[PE]	European Military
(S) (K)	[PC]	European Audio Club

Please use this manual together with the service manual for model No. SL-PJ1, Order No. HAD85042480C0.

■ CHANGE IN REPLACEMENT PARTS LIST

Notes:

1. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. Ⓚ-marked parts are used for black only, while ○-marked parts are for silver type only.
3. Part other than Ⓚ- and ○-marked are used for both black and silver type.

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SL-PJ1 (Order No. HAD85042480C0)	**SL-PJ1 [PA, PE, PC]**			
POWER TRANSFORMER					
T1	SLT54JL8A SLT54JS8C SLT54JE7E	**SLT54JE7E**	Power Source	1	⚠
SWITCH					
S2	SRDSHXW0251 Except for [M, MC]	**SRDSHXW0251**	Voltage Selector	1	⚠
FUSE					
F1	XBA2C012TR0 Except for [M, MC]	**XBA2C012TR0**	250V, T125 mA	1	⚠
F2	XBA2C025TR0 Except for [M, MC]	**XBA2C025TR0**	250V, T250 mA	1	⚠
CABINET AND CHASSIS PARTS					
4	SRUMJ01N21 [M, MC] ○ SRUMJ01N01 [other] ○	**SRUMJ01N01** ○	Case, Operation Button	1	
5	SRKT001N21 [M, MC] ○ SRKT001N01 [other] ○	**SRKT001N01**	Button, Play/Pause/Stop/Skip	1	

Continued on next page.

Technics

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P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105, Japan

Ref. No.	Change of Part No. SL-PJ1 (Order No. HAD85042480C0)	Change of Part No. → SL-PJ1 [PA, PE, PC]	Part Name & Description	Per Set (Pcs.)	Remarks
6	SRKT001N22 [M, MC] ○ SRKT001N02 [other] ○	**SRKT001N02**	Button, Search	1	
7	SRKT002N21 [M, MC] ○ SRKT002N01 [other] ○	**SRKT002N01**	Button, Repeat	1	
8	SRKT001N24 [M, MC] ○ SRKT001N04 [other] ○	**SRKT001N04**	Button, Number (6 ~ 0)	1	
9	SRKT001N25 [M, MC] ○ SRKT001N05 [other] ○	**SRKT001N05**	Button, Number (1 ~ 5)	1	
10	SRKT001N23 [M, MC] ○ SRKT001N03 [other] ○	**SRKT001N03**	Button, Memory	1	
16	SRUPJ01M02 [M, MC] SRUPJ01S02 [other]	**SRUPJ01S02**	Rear Panel	1	
24	SFDJD04N02 Except for [M, MC]	**SFDJD04N02**	Jack, Synchronize Recording	1	
25	SRUM001M03 [M, MC] SRUM001N03 [other]	**SRUM001N03**	Cover, Power Switch P.C. Board	1	
26	SFDJHSC515-1 [XZ] SFDJHSC0509 [M, MC, XL, XA] SFDJHSC0515 [other]	**SFDJHSC0509**	AC Socket	1	⚠
28	SRNNJ01C01 [MC] SRNNJ01S01 [E] SRNNJ01X01 [XA] SRNNJ01R01 [EG] SRNNJ01G01 [EK, XL, XZ]	**SRNNJ01P02**	Name Plate	1	
ACCESSORIES					
A1	SRNUJ01M01 [M] SRNUJ01C01 [MC] SRNUJ01G01 [EK] SRNUJ01I01 [Ei] SRNUJ01X01 [EG, EF, XL, XZ] SRNUJ01S01E [E, EB, EH]	**SRNUJ01P01**	Instruction Book	1	
A3	SFDAC05M01 [M, MC] SFDAC05X01 [XA] SFDAC05G02 [EK] SFDAC05L01 [XL] SRDA007L01 [XZ] SFDAC05E02 [other]	**SFDAC05N01**	AC Cord	1	⚠
A4	Addition	**QJP0603S**	Adaptor	1	⚠
PACKING PARTS					
P1	SRHPJ01C01 [MC, EF] ○ SRHPJ01M01 [other] ○	**SRHPJ01M01** ○	Carton Box	1	
	SRHPJ01C21 [EF] Ⓚ SRHPJ01S21 [other] Ⓚ	**SRHPJ01S21** Ⓚ	Carton Box	1	

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components., use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.
4. The " Ⓢ " mark is service standard parts and may differ from production parts.
5. Ⓚ marked parts are used for black only, while ○ marked parts are for silver type only.
6. Parts other than Ⓚ and ○ marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Area

[PA] .....Far East PX.
[PE]..... European Military
[PC] .... European Audio Club

Ref. No.	Part. No.	Description
INTEGRATED CIRCUIT		
IC1	AN78M15	Regulator
IC2	AN79N15	Regulator
IC3	AN7805	Regulator
IC4, 5	SVIICP-F15	IC Protector
IC101, 404	AN78L05	Regulator
IC102	AN79N05	Regulator
IC103	AN7677S	Head (Focus) Amplifier
IC104	AN7678S	Head (Tracking) Amplifier
IC105	AN6554NS	Focus and Tracking Error Amplifier
IC201	AN6552	Operational Amplifier
IC301, 303	SVITC40H004P	Inverter
IC302	SVITL082CP	Operational Amplifier
IC304	SVITC40H386P	Exclusive OR Gate
IC305	DN74LS74A	D Flip Flop
IC306	DN74LS107	JK Flip Flop
IC401	MN15844PCW	Microcomputer
IC402	SVIBA6209	Loading Motor Drive
IC403	AN6914	Comparator
IC501	AN6638	Spindle Motor Drive
IC502	AN6552	Operational Amplifier
IC503	MN4066B	Analog Switch
IC504	MN4001B	NOR Gate
IC505	AN90B20	Inverter
IC706	MN4069UB	Inverter
IC801	SVIPCM53JP-L	D/A Converter
IC802, 805	SVIUPD4053BC	Analog Switch
IC803, 806	SVILM833NA	Operational Amplifier
LSI Module	SRDP001N02A	Digital PCB Ass'y
TRANSISTOR		
Q1	2SB644Q	Regulator
Q101	2SD638	Laser Power Control
Q102~104, 191	2SB641	Laser Power Control, Focus Servo
Q105	2SK301	Tracking Control
Q106	UN4212	Tracking Control
Q107, 109	2SD1226M	Actuator Drive
Q108, 110	2SB910M	Actuator Drive
Q201, 202, 407, 503, 655	2SC3311-Q	Traverse Control, Relay Drive and Drop Out Detector
Q203	2SD1266M—P	Traverse Motor Drive
Q204	2SB941	Traverse Motor Drive
Q401, 408, 502	2SA1309Q	Regulator, Drop Out Detector
Q402, 409, 504, 505	UN4212	Switching
Q403~406	UN4112	Switching
Q501	2SC641	Drop Out Detector
Q601, 602	2SD637	Switching
DIODE		
D1 ⚠	SVDS1WB40	Rectifier
D2 ⚠	SVDS2VB20	Rectifier
D3	MA1180	Zener, 18V
D6, 7 Ⓢ	MA162A	Switching

Ref. No.	Part. No.	Description
D101, 301, 407, 408, 420~422, 601~609, 614, 615	MA165	Switching
D303	SVDKV1230Z	Variable Capacitor
D401	MA4047	Zener, 4.7V
D405, 406	SVD1SR35200V	Rectifier
D410, 801, 802	MA4056	Zener, 5.6V
D501	MA4091	Zener, 9.1V
D611	SVDGL-9HY4	Indicator
D612	SVDGL-9PG4	Indicator
D613	SVDBR5531K	Indicator
VARIABLE RESISTOR		
VR101, 103, 104, 106	SVN1C103B01L	Focus Gain, Offset and Tracking Gain, Offset Adj., 10kΩ (B)
VR102	SVN1C222B01L	Focus Balance Adj., 2.2kΩ (B)
VR105	SVN1C472B01L	Tracking Balance Adj., 4.7kΩ (B)
VR501	EVN38CA00B14	11T Adj., 10kΩ (B)
COIL		
L301	SL07KM8R1	PLL Adj.
L401, 402	ELEV180KA	18μH
COMPONENT COMBINATION		
R524	EXBP84333K	33kΩ×4
C11-12, 13-14 ⚠	EXRFS203ZS	0.01μF×2
LOW PASS FILTER		
LPF801, 802	SVIAL016	Filter
RELAY		
RLY801	SFDYG5A237P	Muting
CRYSTAL		
X701	SVQNR8643	8.643MHz
FLUORESCENT DISPLAY TUBE		
FL601	SRD9-ST-10K1	Display
POWER TRANSFORMER		
T1 ⚠	SLT54JE7E	Power Source
SWITCH		
S1 ⚠	ESB823V	Power
S2 ⚠	SRDSHXW0251	Voltage Selector
S101, 102	SRDSBSW-180	Rest and End
S103	SRDSMLS-1	Close
S104	SRDSBSW97-2A	Open
S601~611, 615, 616, 618~628	EVQQS405K	Operation Switch

Ref. No.	Part. No.	Description
FUSE		
F1 ⚠	XBA2C012TR0	250V, T125mA
F2 Except ⚠	XBA2C025TR0	250V, T250mA
HALL ELEMENT		
H501, 502	OH-001	Spindle Motor Control
CABINET AND CHASSIS PARTS		
1 ○	SRACJ01N01E	Front Panel Ass'y (Silver Type) (1)
1 Ⓚ	SRACJ01N31E	Front Panel Ass'y (Black Type) (1)
1-1	SRKT001N06	Button, Open/Close (1)
2	SRKKJ01N01	Ornament Plate, Display (1)
3	SRKK001N03	Filter, Display (1)
4 ○	SRUMJ01N01	Case, Operation Button (1)
4 Ⓚ	SRUMJ01N31	Case, Operation Button (1)
5	SRKT001N01	Button, Play/Pause/ Stop/Skip (1)
6	SRKT001N02	Button, Search (1)
7	SRKT002N01	Button, Repeat (1)
8	SRKT001N04	Button, Number (6~0) (1)
9	SRKT001N05	Button, Number (1~5) (1)
10	SRKT001N03	Button, Memory (1)
11	SRKK001N05	Ornament Plate, Disk Holder (1)
12	SRKT007N04	Knob, Power (1)
13	SRUMJ02N03	Rod, Power Switch (1)
14	SRUPJ02N01	Chassis (1)
15	SRGA008N01	Foot (4)
16	SRUPJ01S02	Rear Panel (1)
17	SRUM001N02	Support, Main P.C. Board (1)
18	SRUM001N10	Spacer, Support (2)
19	SRUMJ02N04	Terminal Plate (1)
21	SRDJ007N05	Jack, Rch. Output (Red) (1)
22	SRDJ007N06	Jack, Lch. Output (White) (1)
23	SRQS001N01	Spring, Ground (1)
24	SFDJD04N02	Jack, Synchronize Recording (1)
25	SRUM001N03	Cover, Power Switch P.C. Board (1)
26 ⚠	SFDJHSC0509	AC Socket (1)
27 ○	SRACJ02N03	Cabinet, Case (Silver) (1)
27 Ⓚ	SRACJ02N33	Cabinet, Case (Black) (1)
28	SRNNJ01P02	Name Plate (1)
29	SRUZ001N03	Sheet, Cabinet (1)

Continued on next page.

Ref. No.	Part. No.	Description	
LOADING MECHANICAL PARTS			
41	SRUP001N05	Base, Clamper	(1)
42	SRUM001N07	Bracket, Switch	(1)
43	SRDJ001N13E	Connector Ass'y (2 pin)	(1)
44	SRUP001N06	Plate, Clamper	(1)
45	SRUZ001N02	Sheet, Clamper Plate	(2)
46	SRUM001N06	Clamper, Disc	(1)
47	SRKD001N01E	Magnet	(1)
48	SRUP001N07E	Plate, Clamp	(1)
49	SRXJ001N01	Clamp Shaft	(1)
50	SRQA001N01	Spring, Clamp	(1)
51	SRQA001N02	Spring, Clamp	(1)
52	SRUM007N05E	Disc Tray Ass'y	(1)
53	SRUM001N09	Disc Case	(1)
54	SRKKJ01N02	Ornament Plate, Disc Case	(1)
55	SRUM007N07	Cam, Disc Case	(1)
56	SRQH007N02	Spring, Cam	(1)
57	SRUP001N09E	Loading Guide	(1)
58	SRGC007N05	Rubber, Loading Guide	(2)
59	SRUM001N13	Rack Gear	(1)
60	SRUM001N08	Switch Arm	(1)
61	SRQS007N02	Spring, Switch Arm	(1)
62	SRUM007N15	Guide Plate	(2)
63	SRUP007N07	Holder	(2)
64	SRUP001N08R	Loading Base	(1)
65	SRUM007N06	Lock Arm	(1)
66	SRQS007N03	Spring, Lock Arm	(1)
67	SRUM007N17	Cover, Switch	(1)
68	SRDJ001N03E	Connector Ass'y (2 pin)	(1)
69	SRUG007N02	Gear, Transmission	(1)
70	SRUG007N03	Gear, Loading	(1)
71	SRUG001N01	Gear, Pulley	(1)
72	SRMH001N02R	Motor Ass'y, Loading	(1)
73	SRDJ001N02E	Connector Ass'y (2 pin)	(1)
74	SRGC001N01	Rubber, Motor	(2)
75	SRGB007N02	Belt, Loading Motor	(1)
76	SFYB-5-32-P	Ball	(8)
77	SRGC007N06	Rubber, Cam	(1)

Ref. No.	Part. No.	Description	
OPTICAL PICK-UP DECK UNIT PARTS			
81	⚠ SRLP007N01A	Optical Pick-Up Ass'y	(1)
82	SRUM007N22	Bracket, Optical Pick-Up	(1)
83	SRQS007N01	Spring, Bracket	(1)
84	SRLC007N03	Cover, P.C. Board	(1)
85	SRUK007N02E	Optical Deck Unit Base	(1)
86	SRMH001N01R	Motor, Pick-Up Drive	(1)
87	SRDJ001N01E	Connector Ass'y (2 pin)	(1)
88	SRGC007N01	Cushion Rubber	(1)
89	SRUM007N19	Holder, Motor	(1)
90	SRTM007N01A	Rotary Magnet	(1)
91	SRDJ001N04E	Connector Ass'y (4 pin)	(1)
92	SRGC007N02	Cushion Rubber	(4)
93	SRXG007N06	Rod	(1)
94	SRXG007N07	Rod	(1)
95	SRQA007N03	Spring, Rod	(2)
96	SRQP007N01	Spring	(1)
97	SRTE007N11E	Turntable	(1)
98	SRTE007N03	Holder, Turntable	(1)
99	SRQA010N04	Spring, Turntable Holder	(1)
100	SRXG007N01E	Worm Gear	(1)
101	SRGB007N03	Belt, Worm Gear	(1)
102	SRXJ007N01	Shaft, Pick-Up Guide	(2)
103	SRUP007N08	Holder, Shaft	(1)
104	SRUP007N09	Holder, Shaft	(1)
105	SRQA007N01	Spring, Cushion Rubber (Yellow)	(2)
106	SRQA007N02	Spring, Cushion Rubber (Silver)	(2)
107	SRUM001N14	Clamper, Lead Wire	(1)
108	SRLH007N08	Clamper, Lead Wire	(1)
109	EMCM0201S	Shorting Pin	(2)
110	SRDJ001N01E	Connector Ass'y (10 pin)	(1)
SCREWS, WASHERS AND NUTS			
N2	XTV3+10BFN	Screw, ⊕3×10	(6)
N3	XTV3+6JFYR	Screw, ⊕3×6	(4)
N4 ○	SRXG007N10	Screw (Silver)	(4)
N4 Ⓚ	SRXG007N51	Screw (Black)	(4)

Ref. No.	Part. No.	Description	
N5	XTV3+6BFZ	Screw, ⊕3×6	(4)
N6	XTV3+6BFN	Screw, ⊕3×6	(8)
N7	XTV3+8BFZ	Screw, ⊕3×8	(2)
N8	XTV3+14BFN	Screw, ⊕3×14	(1)
N9	SRXG001N02	Screw	(2)
N10	SRXG001N01	Screw	(1)
N11	XWA3B	Washer, ϕ3	(1)
N12	XNG3ES	Nut, ϕ3	(1)
N13	SFXGB20-01	Screw	(2)
N14	SRXG007N02	Screw	(1)
N15	XWE4A8BW	Washer, ϕ4	(1)
N16	XTN2+6B	Screw, ⊕2×6	(2)
N17	XTN2+8B	Screw, ⊕3×8	(2)
N18	XXE26D5FZ	Screw	(1)
N19	GTW-3	Washer	(1)
N20	SRXW007N03	Washer	(1)
N21	XYN3+6S	Screw, ⊕3×6	(3)
N22	XYC3+CG10	Screw, ⊕3×10	(1)
N23	SRUP001N10	Washer	(4)
N24	XNG26EBW	Nut, ϕ2.6	(4)
N25	XYE3+EJ8	Screw, ⊕3×8	(2)
N26	XYN3+C8	Screw, ⊕3×8	(3)
N27	XUC3FT	Clip	(1)
N28	XSN3+12BNS	Screw, ⊕3×12	(1)
N29	XTN3+6BFZ	Screw, ⊕3×6	(2)
N30	XTV3+8BFN	Screw, ⊕3×8	(1)
N31	SRXW007N02	Washer	(1)
ACCESSORIES			
A1	SRNUJ01P01	Instruction Book	(1)
A2	SFDHC05N01	Output Cord	(1)
A3	⚠ SFDAC05N01	AC Cord	(1)
A4	⚠ QJP0603S	Adaptor	(1)
PACKING PARTS			
P1 ○	SRHPJ01M01	Carton Box (Silver)	(1)
P1 Ⓚ	SRHPJ01S21	Carton Box (Black)	(1)
P2	SRHHJ02N01	Pad, Front	(1)
P3	SRHHJ02N02	Pad, Rear	(1)
P4	SFYH45X50	Polyethylene Bag, Unit	(1)
P5	SFYF23A35	Polyethylene Bag, Accessories	(1)

Printed in Japan
850500800 Ⓢ AM/HY

ORDER NO. HAD85042480C0
A6

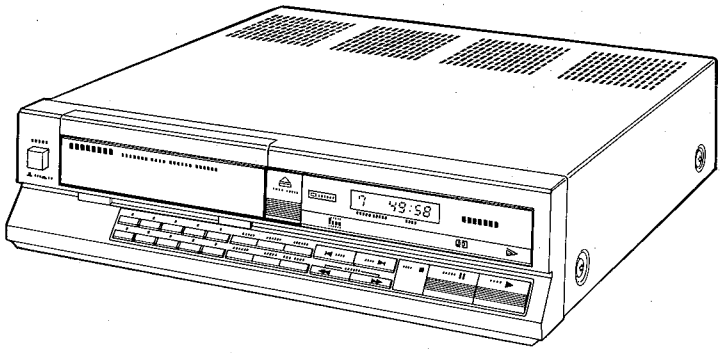
Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ1



Color

(S)	Silver Type
(K)	Black Type

Color	Area
(S)	[M] .....U.S.A.
(S)	[MC]....Canada
(S) (K)	[E].....Switzerland and Scandinavia
(S) (K)	[EK] ....United Kingdom
(S) (K)	[XL] ....Australia
(S) (K)	[EG] ....F.R. Germany
(S) (K)	[EB] ....Belgium
(S) (K)	[EH] ....Holland
(S) (K)	[EF] ....France
(S) (K)	[Ei] .....Italy
(S) (K)	[XA] ....Southeast Asia, Oceania, Africa, Middle Near East and Central South America
(S) (K)	[XZ] ....New Zealand

SPECIFICATIONS

■ Audio

No. of channels: 2 (left and right stereo)
Frequency response: 4–20,000 Hz±0.5 dB
Dynamic range: more than 96 dB
S/N ratio: more than 96 dB
Harmonic distortion: 0.002% (1 kHz, 0 dB)
Total harmonic distortion: 0.004% (1 kHz, 0 dB)
Channel separation: more than 100 dB
Wow and flutter: below measurable limit

■ Signal Format

Sampling frequency: 44.1 kHz
Correction system: Technics Super Decoding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Type: Astigma 3-beam
Light source: Semiconductor laser
Wavelength: 800 nm

■ Functions

Features: Auto play,
Track random access,
Index random access,
Programmable play (15-track memory),
Forward search,
Backward search,
Repeat play,
Forward skip,
Backward skip

Display: (Digital display)
No. of tracks,
Total playing time (min., sec.),
Track being played,
Elapsed playing time,
Remaining time,
Index no.,
Programmed order

Disc loading: Motor-driven horizontal type

■ General

Power supply: For U.S.A. and Canada: AC 120V, 60 Hz
For others: ~110—120/220—240V, 50/60 Hz
Power consumption: 30 W
Output voltage: 2 V (at 0 dB)
Output impedance: 330Ω
Load impedance: more than 5 kΩ
Dimensions (W×D×H): 31.5×33.4×8.2 cm (12 13/32"×13 5/32"×3 7/32")
When disc holder is opened 45.9 cm (18 1/16") (D)
Weight: 4.5 kg (9.9 lb.)

Specifications are subject to change without notice for further improvement. Weight and dimensions are approximate.

Technics

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■ CONTENTS

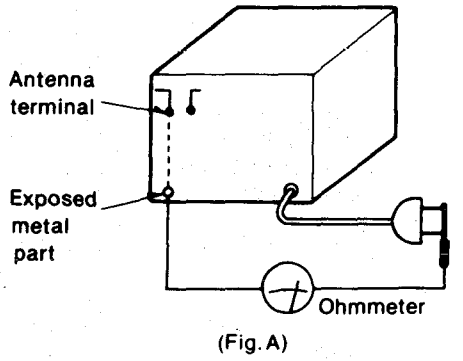
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

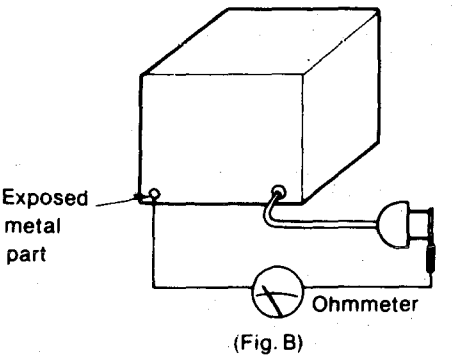
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

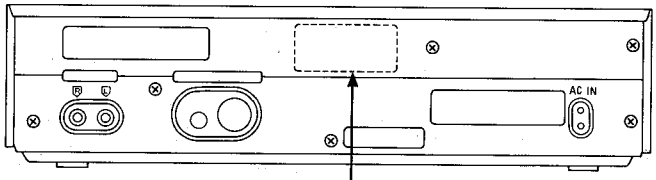
Caution : This product utilizes a laser diode.
ADVARSEL : I dette apparat anvendes laser.

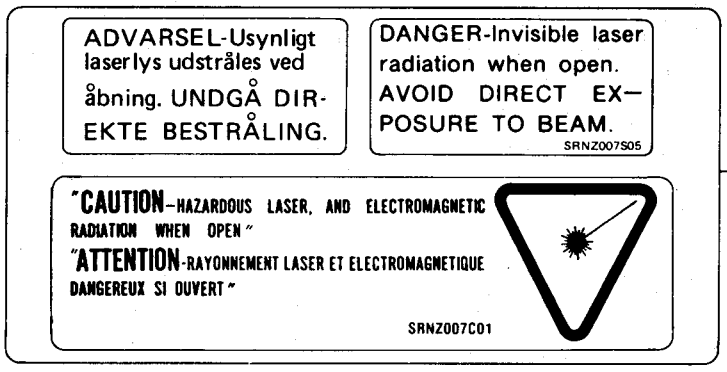
- **Use of caution labels**

	U.S.A.	Canada	Europe	Others
SRNZ010S01	X	X	O	O
SRNZ007S05	O	X	O	O
SRNZ007C01	X	O	X	X
SRNZ010S02	X	X	O	O

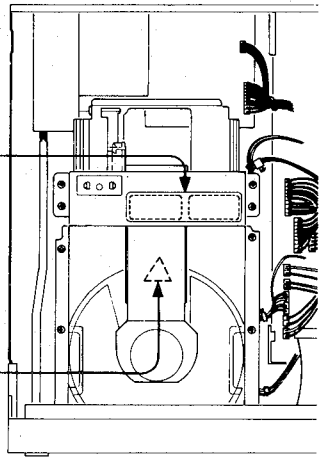
Note: O Mark Label is used. X Mark Label is not used.

Rear panel



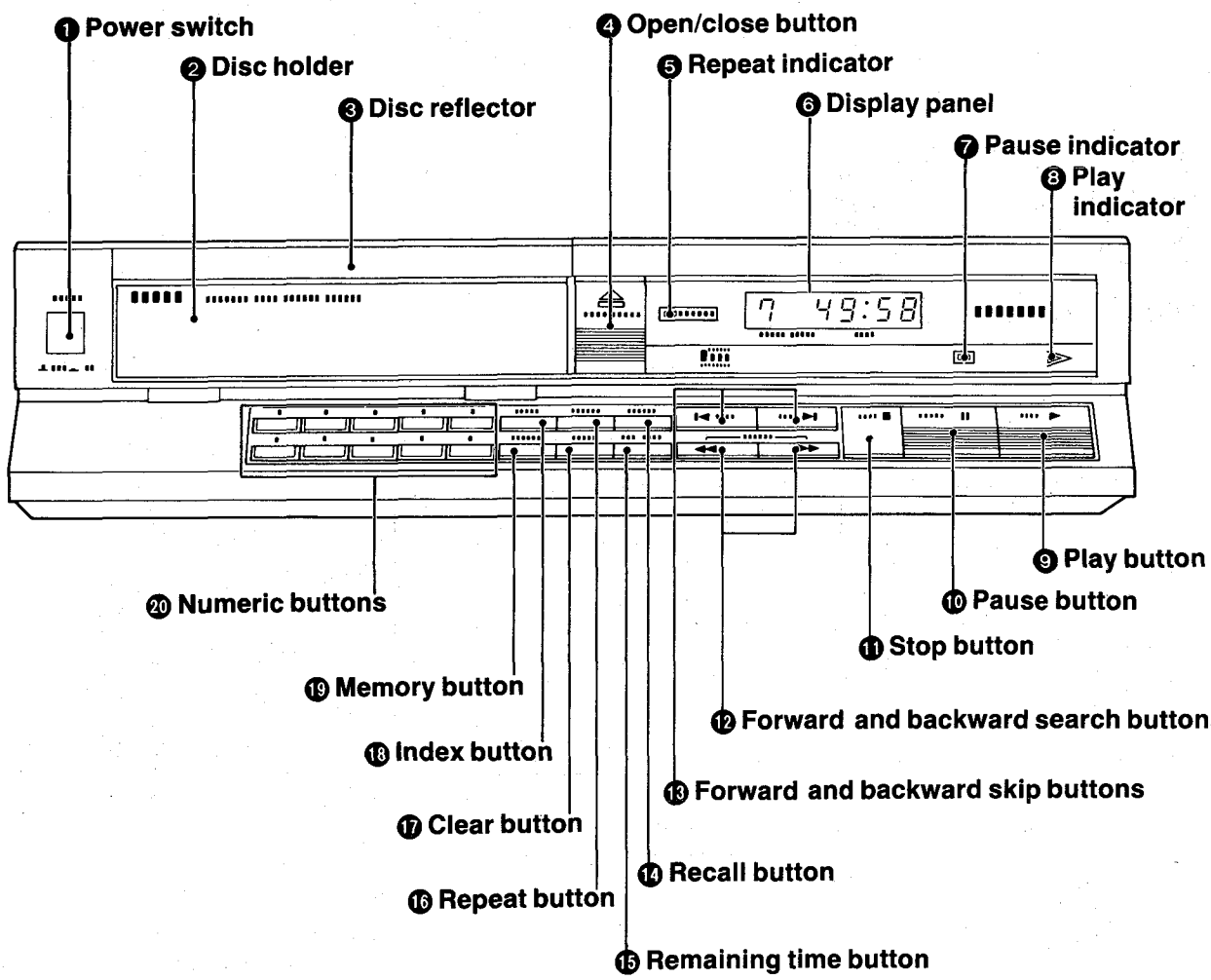


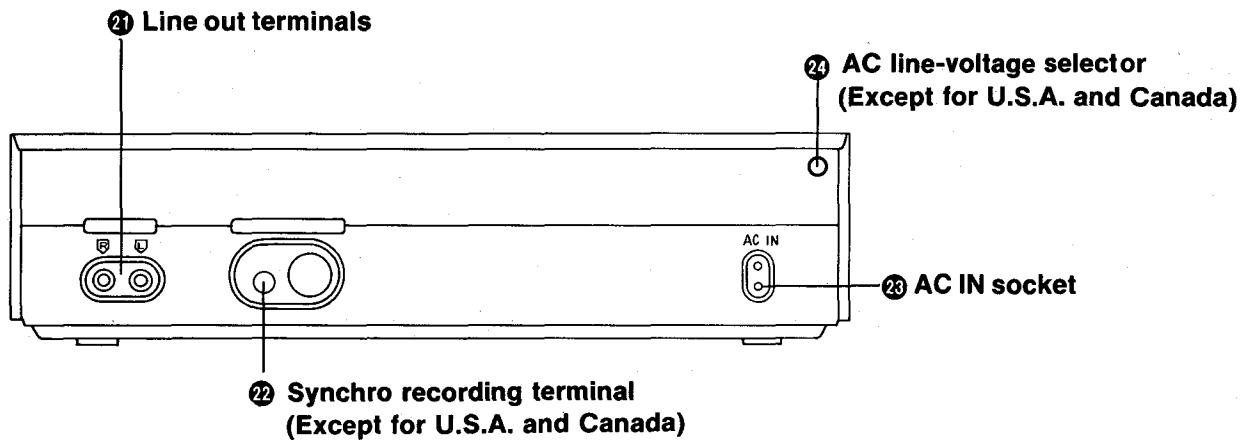
VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya.



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

■ LOCATION OF CONTROLS

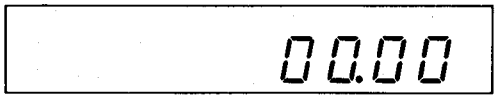




■ FUNCTIONS

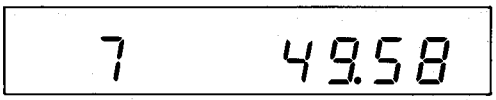
❶ Power switch

- Press (▙_▂) to switch power on and press again (▂_▙) to switch power off.
- When power is turned on, the display panel illuminates as shown below (when there is no disc in the holder):



track index time

If there is a disc in the holder, it will begin spinning, the total number of tracks and total playing time of the disc will be displayed and the unit will switch to the **stop mode.** Shown below is the display reading when a disc having seven tracks and a total playing time of 49 minutes 58 seconds is in the holder.



track index time

Stop mode:

In the stop mode, the pickup is at the beginning of the first track and the display shows the total number of tracks and total playing time of the disc.
The pickup is the device that reads the information on the disc surface using a laser. The pickup moves across the disc as the disc is played, but it is not visible from the outside of the cabinet.

❷ Disc holder

The disc is inserted in this holder with the label side up.

❸ Disc reflector

❹ Open/close button

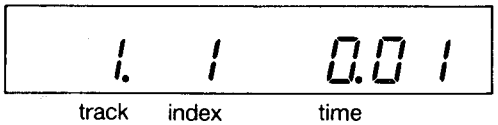
Press this button to open and close the disc holder.
When this button is pressed, the disc holder slides out. Press this button again to close the disc holder.

❺ Repeat indicator

Illuminates when the repeat button is pressed to activate the repeat mode and goes out when the repeat mode is cancelled.

❻ Display panel

Shows a track and index number and a time as shown below.



track index time

Track number: Shows the number of the track.
A maximum of 99 tracks can be displayed.

Index number: Shows the number of the index.
When a disc having no indexes is played, " / " is constantly displayed in the index section.

Time: Shows the minutes and the seconds.

Notes:

- When the remaining time button is pressed during disc play, the remaining time on the disc (min., sec.) is displayed.
- It is not possible to switch to the remaining time display during program disc play.

Index:

In some compact discs, indexes are used to divide tracks into smaller sections for easy access. If a disc includes indexes, a list of the indexes will be contained in the liner note included with that disc.

❼ Pause indicator (❚❚)

Illuminates when the pause button is pressed and goes out when the pause mode is cancelled.

❽ Play indicator (▶)

Illuminates when the play button is pressed and goes out when disc play is stopped.

❾ Play button

Press this button to begin disc play.
When this button is pressed during disc play, the pickup returns to the beginning of the first track and starts playing the disc again.
During program disc play, the pickup returns to the first programmed track and starts playing the programmed sequence again **(auto return play function).**

❿ Pause button

Press this button to briefly stop disc play.

- When this button is pressed, the player switches to the pause mode.
- To continue disc play, press the play button.

⓫ Stop button

Press this button to stop disc play.
When this button is pressed, all previous settings are cancelled and the player returns to the stop mode.

⓬ Forward and backward search buttons

Use these buttons to move the pickup forward and backward (manual search play function).

- When either of these buttons is pressed, the pickup will move slowly at first and then rapidly if the button is held down for more than about three seconds.
- Use the search buttons when the player is in the pause mode or during disc play to move the pickup to a specific point on the disc.
  - Press the forward search (▷▷) button to move the pickup forward.
  - Press the backward search (◁◁) button to move the pickup backward.

  Release the search button when the pickup has moved to the desired location (as shown by the display panel).
- During disc play, search can be performed while listening to the signal from the disc to aid in locating a specific point. The output level is decreased by 12 dB (¼) compared with the level during standard disc play.

⑬ Forward and backward skip buttons

Use these buttons to move the pickup to the beginning of the next track in the forward or backward direction (forward and backward skip play function).

- When one of the skip buttons is pressed during disc play or the pause mode, the pickup will skip the same number of tracks as the number of times the button is pressed.
- When one of the skip buttons is pressed during program disc play, the pickup will move to the beginning of the next or previous programmed track.
  - Press the forward skip (skip ▶▮) button to move the pickup forward.
  - Press the backward skip (▮◀ skip) button to move the pickup backward.
- When either of these buttons is held down, tracks are skipped continuously (quick skip).

⑭ Recall button

Press this button to display the disc play sequence in memory.

When this button is pressed, the tracks stored in memory for program disc play are shown one by one and the corresponding step numbers are shown in the display panel.

⑮ Remaining time button (rem time)

Press this button while a disc is being played to display the remaining playing time (min. and sec.) of a disc.

When this button is pressed, the time indicator illuminates and the display switches to the remaining time display mode. Press this button again to return to the elapsed playing time mode.

⑯ Repeat button (rep)

Press this button to activate the repeat mode.

- When this button is pressed, the repeat mode is activated.
- If this button is pressed after a program has been entered, the programmed tracks will be played repeatedly.
- Press this button again to cancel the repeat mode. It is also possible to cancel the repeat mode by pressing the stop button, but this will cancel all other settings as well.

⑰ Clear button

Press this button to cancel the program disc play sequence currently in the memory.

⑱ Index button

Press this button to enter an index number using the numeric buttons.

⑲ Memory button

Press this button to enter track numbers just specified by the numeric buttons in the memory.

(Remember that programs can contain up to 15 random steps.)

⑳ Numeric buttons

Use these buttons to specify track numbers and index numbers.

㉑ Line out terminals (LINE OUT)

These are the audio output terminals.

- Connect the line out terminals to the AUX/CD/VIDEO or TAPE PLAYBACK terminals on your amplifier or receiver.
- Do not connect to the amplifier PHONO terminals as you would with a conventional turntable.

㉒ Synchro recording terminal (SYNCHRO REC)

The following functions are possible when this terminal is used:

Synchro recording function

Use the MINI-PHONE cord (option) for the synchro rec connection.

- Recording can be synchronized with the beginning and end of disc play and pause operation. Note that this is only possible when using Technics cassette decks which are equipped with a CD-SYNCHRO recording terminal and Technics amplifiers which are equipped with a synchro recording terminal compatible with compact disc players.

Direct operation function

- The amplifier input source can be automatically switched to AUX/CD/VIDEO when the play button is pressed. It is also possible to automatically start disc play when the amplifier input source selector is switched to AUX/CD/VIDEO. Note that this is only possible when using Technics amplifiers which have a direct operation function.

㉓ AC IN socket (AC IN)

Connect this socket to a wall socket using the power cord.

㉔ AC line-voltage selector

■ INSTALLATION

■ This unit incorporates many sensitive optical components. To enjoy optimum performance at all times, avoid using this unit under the following conditions.

- In a closed vehicle or other location where the temperature could exceed 100°F (40°C).
- For long periods of time in direct sunlight.
- Very cold places (below 40°F; 5°C).
- Very humid locations.
- Near a heat outlet or heating appliance.
- Dusty or smoky locations.
- Locations prone to vibrations.
- On an unstable or uneven surface.
- Near appliances generating strong magnetic fields.
- Immediately above or below a radio, tuner, amplifier or television set.
- Within reach of children.
- In locations where ventilation is insufficient.
- In locations where the rear panel is less than 10 cm (about 4") away from the wall or back of an audio rack.

■ Do not place near a tuner or television.

This unit uses high frequency signals and can cause interference with radio and television reception. If this occurs, move this unit farther away from the radio or television or change from an interior to an exterior television antenna.

■ Do not block the ventilation openings.

This unit is equipped with ventilation openings to prevent the internal temperature from rising too high. Therefore, do not operate it with a tablecloth or other covering placed over the top or with the unit placed on a bed, deep carpet or other soft surface. If proper ventilation is obstructed, the internal temperature will rise and the laser diode protection circuit will be activated to shut off the player.

■ CONCERNING COMPACT DISCS

Handling precautions

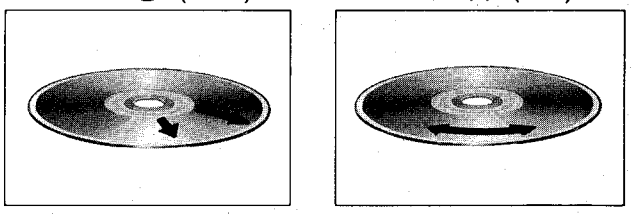
Only compact discs having this mark can be used with this player.

COMPACT disc DIGITAL AUDIO

Observe the following precautions to enjoy the same outstanding sonic performance from your compact discs for many years.

- Hold compact discs by the edges so the surface is not soiled with fingerprints.
- Be careful not to scratch the surface with fingernails or other sharp objects, particularly when inserting and removing discs from their cases.
- Do not bend the disc.
- Do not use record cleaning sprays or static electricity prevention liquids.
- Do not wipe with benzine, thinner or any other solvent. If the surface is soiled, wipe gently with a soft, damp (water only) cloth.
- When wiping discs, always move the cloth directly outward from the center of the disc, not in a circular motion as with standard phonograph records.

O (Yes) ✖ (No)



(In compact discs, a circular scratch along a line of pits is more likely to cause errors than a straight scratch across many lines of pits.)

- If the disc is brought from a cold environment into a warm room, dew may form on the disc. Wipe this off with a soft, dry cloth before using the disc.
- Do not try to dry discs with a hair dryer.
- Do not write on the label side with a ball-point pen, hard pencil or other writing utensil.

Storage precautions

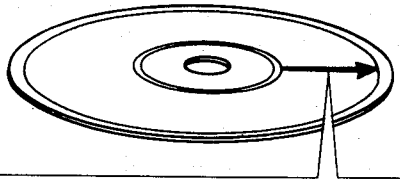
- Be sure to store discs in their cases to protect them from dust, scratches and warping.
- Do not place or store discs in the following places:
  1) Locations exposed to direct sunlight.
  2) Locations with high humidity or a lot of dust.
  3) Locations directly exposed to a heat outlet or heating appliance.
  4) In the glove compartment or rear ledge of an automobile.

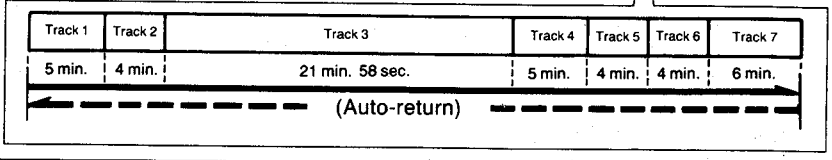
Playing a disc

The following explanation is for a disc containing 7 tracks having a total playing time of 49 minutes and 58 seconds.

Press all buttons firmly.

Basic operation





■ Automatic Play

■ To play a disc from beginning to end

Procedure	Function/Notes
1 power **Press.** off on	•Display illuminates as shown below. 00.00 track index time
2 open/close **Press.**	•Disc holder opens.
3 **Insert a disc with the label side facing upward.** disc	**Notes:** •Always handle discs by the edges, being careful not to touch the section containing the audio information. •Insert the disc only after the disc holder has opened all the way. If the disc is inserted too soon, it may be damaged. •Do not tilt the player while the disc holder is opening or closing since the disc could fall out of the holder.
4 open/close **Press.**	•Step 4 can be skipped by pressing the play button after inserting a disc. In this case, the holder will close and disc play will begin immediately from track 1 but the tracks and total playing time will not be displayed.
	•Disc data are being read. 00.00 track index time
	•After disc data have been read (stop mode). 7 49.58 track index time

Go to next page.

Procedure	Function/Notes
5 play ► **Press.**	•The play indicator (►) illuminates and disc play begins. •When a disc having no indexes is played, " / " is constantly displayed in the index section. 1. 1 0.01 track index time •A maximum of 99 tracks can be displayed. •If the play button is pressed during disc play, disc play is started again from the first track.
After the disc has been played.	•When the end of the disc is reached, the pickup returns to the beginning of track one and the player switches to the stop mode. 7 49.58 track index time
6 power **Press.** off on	**•Turn off the power if the player is not to be used again for a while.**
•Since steps 1, 2, 3 and 6 in this procedure are the same for all disc play procedures, they are not included in the following explanations.	

Procedure	Function/Notes
■ To briefly interrupt disc play pause ❚❚ **Press.** ⇩ play ► **Press the play button to resume disc play.**	•The pause indicator (❚❚) illuminates and the player switches to the pause mode. •The pause mode is cancelled and disc play continues. (Pause indicator (❚❚) turns off and play indicator (►) illuminates.)
■ To stop disc play stop ■ **Press.**	•The pickup will return to the beginning of the first track and the player will switch to the stop mode.

Using the various disc play functions

1. To display the remaining time on a disc during disc play (remaining time display function)

Procedure	Function/Notes
■ For example, to check the remaining time on a disc when the 2 min. 10 sec. point of index 1 of track 5 is being played. 5. 1 2.10 track index time Remaining time button rem time **Press.** To return to the elapsed time display, press the remaining time button once more.	•The time display switches to the remaining time mode. 1 1.50 track index time Remaining time 7 tracks—49 min. 58 sec. 5 min. 4 min. 21 min. 58 sec. 5 min. 4 min. 4 min. 6 min. Track 1 Track 2 Track 3 Track 4 Track 5 Track 6 Track 7 2 min. 10 sec. point of track 5 (•5 min.+4 min.+21 min. 58 sec.+5 min.+2 min. 10 sec.= 38 min. 8 sec. •49 min. 58 sec.−38 min. 8 sec.=11 min. 50 sec.) •It is not possible to display the remaining time during program disc play.

2. To play a disc from a specific track (track random access)

■ Example: To play a disc from track 3 when the player is in the stop or pause mode.

Track 1 Track 2 Track 3 Track 4 Track 5 Track 6 Track 7

(Auto-return)

(The pickup is at the beginning of track 1.)

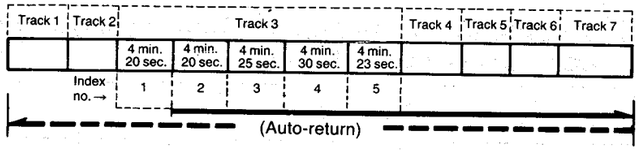
Procedure	Function/Notes
1 Numeric button 3 **Press.** ⇩ **2** play ► **Press.**	•The number 3 is shown in the track indicator display. 3. track index time •The play indicator (►) illuminates and disc play begins from track 3. 3. 1 0.01 track index time

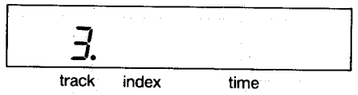
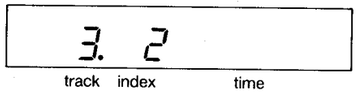
3. To play a disc from a specific index (index random access)

(This is possible only on discs having indexes.)

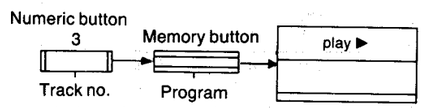
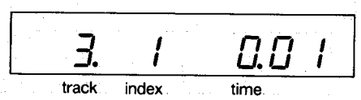
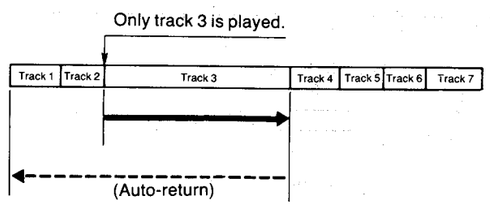
■ When specifying an index number obtained from the disc's liner note

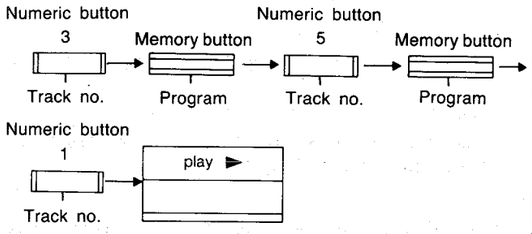
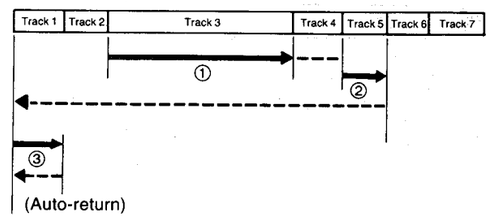
For example, to start disc play from the beginning of index 2 of track 3 (having a total of 5 indexes) to the end of the disc.



Procedure	Function/Notes
1 Numeric button 3 → **Press.**	•Confirm that the desired track and index numbers are shown in the display.  •When playing discs having only one track, remember to enter track number 1.
2 Index button → **Press.**	•Enter index 2. 
3 Numeric button 2 → **Press.**	•Disc play begins from index 2 of track 3.
4 play ► → **Press.**	
Program disc play using index numbers is not possible.	

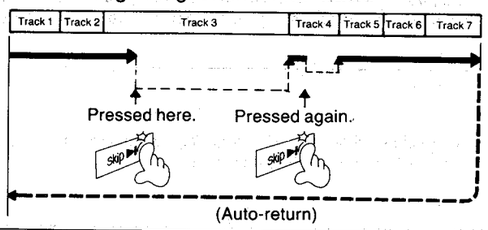
4. To program only one track (single program)

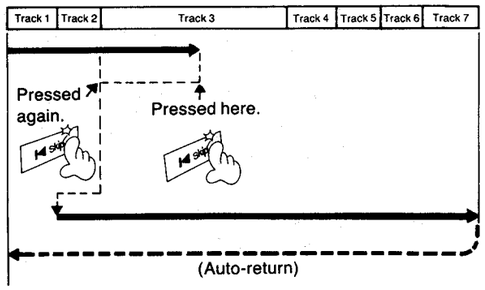
Procedure	Function/Notes
■ To play one track from beginning to end. **Example:** To play track 3 from the beginning.  	 •If you enter the wrong number, press the stop button to cancel it and then enter the correct number. •The player switches to the stop mode after track 3 has been played.

Procedure	Function/Notes
■ To play several tracks out of order: **Example:** To play track 3, track 5 and track 1 in that order.  •To play the same track several times in succession, using the program function, it is possible to enter that track by pressing the corresponding numeric button once and then the memory button the desired number of times.	 The disc is played in the above order (①, ② and ③). A maximum of 15 tracks can be programmed. •If you make a mistake when entering a multi-step program, press the "0" numeric button and then enter that step again. It is not necessary to re-enter the program from the beginning.
■ To enter a program during disc play A new program can be entered while a disc is being played. When the new program is entered, the previous programs will be erased and disc play based on the new program will begin.	**Note:** •When entering a program during disc play, the program buttons must be operated without interruption. If there is a gap of more than 30 seconds between the time two program buttons are pressed, the new program will not be entered and disc play will continue in the normal manner. •If the numeric buttons are pressed during program disc play, all program settings are cancelled. •It is impossible to program index numbers. •If an incorrect program step is entered, the letter "E" (error) will appear in the display. **■ To cancel a program** Press the stop button. The program will be cleared.

5. Skip play

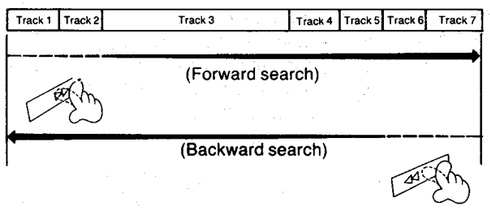
Skip play can be performed when the player is in the play or pause mode.
Skip play is not possible during repeat play of a single track.

Procedure	Function/Notes
■ To move to the beginning of the next track or several tracks ahead (forward skip) **Example:** While listening to the third track, the forward skip button is pressed to advance to the beginning of the fourth track and then again to advance to the beginning of the fifth track. 	**•The pickup skips the same number of tracks as the number of times the button is pressed.** •Watch the display to be sure the desired track has been located. •During program disc play, the pickup moves to the beginning of the next programmed track when the forward skip button is pressed. •The pickup moves to the beginning of the next track (or programmed track) each time the skip button is pressed. •To skip directly from the third track to the beginning of the fifth track, press the forward skip button twice in a row. (Skips to the beginning of the next programmed track during program disc play.) •Holding down the skip button activates the quick skip mode. •When the forward skip button is pressed during the last track, the pickup will go to the beginning of the last track (unless the repeat function is on).

Procedure	Function/Notes
■ To return to the beginning of the present track or any previous track (backward skip) **Example:** While listening to the third track, the backward skip button is pressed to return to the beginning of that track and then again, to return to the beginning of the second track.  	**•The pickup skips the same number of tracks as the number of times the button is pressed.** •Watch the display to be sure the desired track has been located. •During program disc play, the pickup moves to the beginning of the previous programmed track when the backward skip button is pressed. •The pickup returns to the previous track (or programmed track) each time this button is pressed. •To return quickly to the beginning of track 2 when listening to track 4, quickly press the backward skip button three times. •Remember that for backward skip, the present track is included in the count. •Holding down the skip button activates the quick skip mode.

6. Manual search play

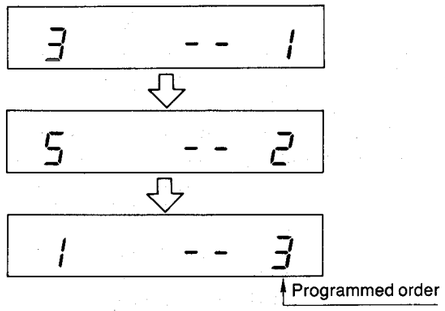
Manual search play can be performed when the player is in the play or pause mode.

Procedure	Function/Notes
■ To play the disc from a specific point •Press the forward or backward search button to move the pickup forward or backward. The pickup moves slowly at first and then rapidly if a search button is held down for more than about 3 seconds. •Release the button when the desired point has been reached (as shown by the display).	•If a search button is pressed while a disc is being played, sound from the disc can be heard as the pickup moves. The output level at this time is decreased by 12 dB (¼) compared with the level during standard disc play.  •During program disc play, the pickup can only be moved between the beginning and end of the track currently being played, using the search buttons.

7. Repeat play

Procedure	Function/Notes
■ Entire disc and programmed track repeat play •Press the repeat button before beginning disc play. •Press the repeat button again to cancel repeat play. (Pressing the stop button also cancels repeat play, but this stops disc play, too.)	•Repeat indicator illuminates and the repeat play mode is activated. •Indicator goes out. •If the unit is in the program disc play mode, only the programmed tracks will be played repeatedly.

8. To check the contents of a program (programmed track display function)

Procedure	Function/Notes
■ To check which tracks are programmed, press the recall button. **For example,** the display advances as shown on the right each time the recall button is pressed for a program of track 3, track 5 and track 1.	•The programmed tracks are displayed together with the step number one by one each time the recall button is pressed. The display returns to its original mode after the last track has been displayed. 

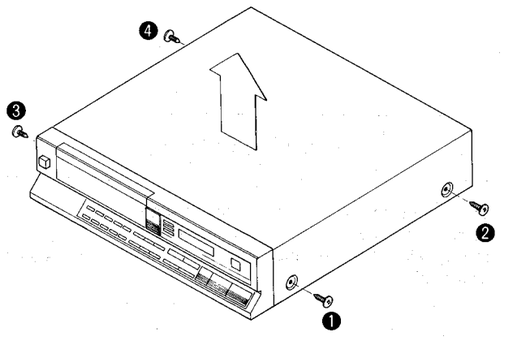
■ DISASSEMBLY INSTRUCTIONS

CAUTION:
It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)

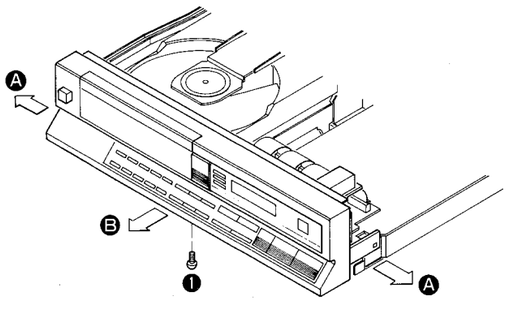
With the unit turned "on", laser radiation is emitted from the pickup lens.

When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

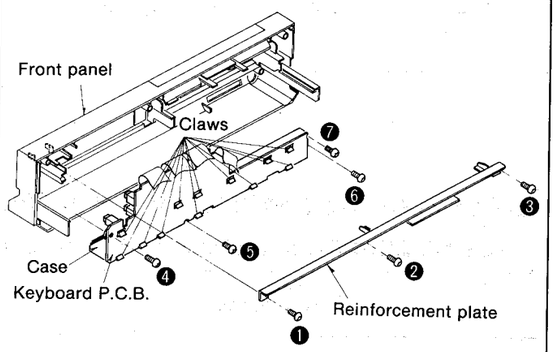
Ref. No 1	How to remove the cabinet
Procedure 1	1. Remove the 4 setscrews (❶ ~ ❹). 2. Remove the cabinet in the direction of the arrow.



Ref. No 2	How to remove the front panel
Procedure 1 ➧ 2	1. Remove the front panel setscrew ❶. 2. Slightly open the front panel on both sides (arrow Ⓐ), then remove the front panel from the projection on the chassis. 3. Remove the front panel in the direction of arrow Ⓑ, with care not to scratch the disc holder.



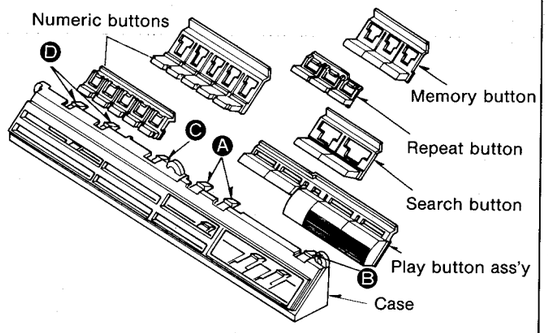
Ref. No 3	How to remove the operation buttons
Procedure 1 ➧ 2 ➧ 3	1. Remove the 3 setscrews (❶ ~ ❸). 2. Remove the 4 setscrews (❹ ~ ❼). 3. Release the 13 claws of the operation button case to remove the operation button case from the keyboard P.C.B.



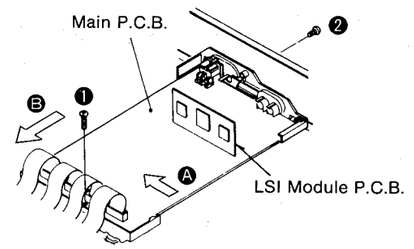
4. The search button can be removed by releasing claws Ⓐ.
5. The play button ass'y can be removed by releasing claw Ⓑ.

Note: Remove the search button before removing the play button ass'y.

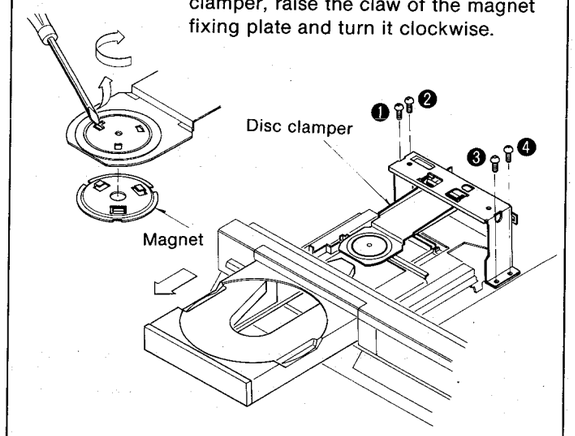
6. The memory button can be removed by releasing claw Ⓒ.
7. The repeat button can be removed by removing the memory button.
8. The numeric buttons can be removed by releasing claws Ⓓ.



Ref. No 4	How to remove the main P.C.B.
Procedure 1 ➧ 2 ➧ 5	1. Remove the 2 setscrews (❶, ❷). 2. The main P.C.B is secured with the claws of the main P.C.B. support. So, release the claws to remove the main P.C.B. from the main P.C.B. support. 3. Remove the main P.C.B. in the direction of the arrows (Ⓐ, Ⓑ). **Note:** The supplied LSI module P.C.B. is assembly Part No. SRDP001N02A.



Ref. No 5	How to remove the disc clamper
Procedure 1 ➧ 5	1. Shift the disc holder forward. 2. Remove the 4 setscrews (❶ ~ ❹). **Note:** Shift the disc holder forward to remove the disc clamper. 3. To remove the magnet of the disc clamper, raise the claw of the magnet fixing plate and turn it clockwise.

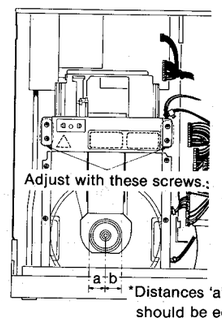


CAUTION:

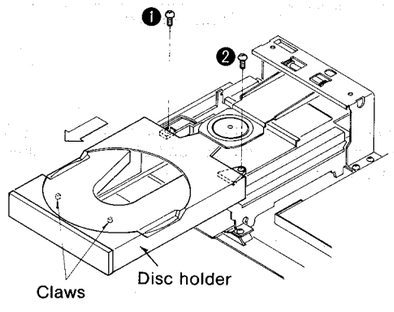
Precautions for disc clamper fitting.
When fitting the disc clamper again, follow the procedure given below. (Be sure to turn the power switch "off.")

1. Remove the magnet of the disc clamper.
2. Temporarily tighten the 4 setscrews of the disc clamper with the disc holder projected.
3. Close the disc holder.
4. Move the disc clamper so that the distance between the turntable platter center spindle and the disc clamper is as shown below. Then tighten the disc clamper setscrews.

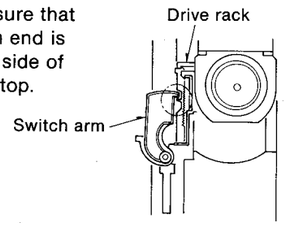
Note: If the above-mentioned distance is deflected, noise might be produced from the disc clamper when in the play mode.



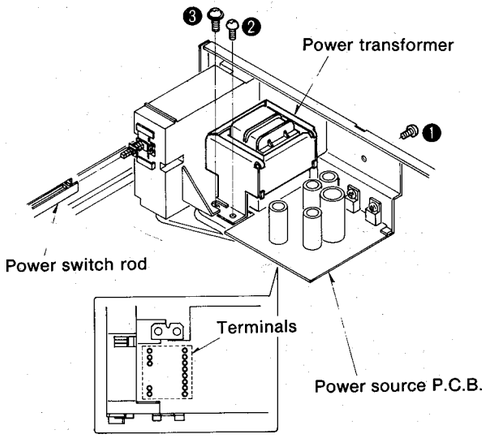
Ref. No 6	How to remove the disc holder
Procedure 1 ➧ 2 ➧ 6	1. Shift the disc holder forward. 2. Remove the 2 setscrews (❶, ❷). 3. Release the 2 claws from the bottom. 4. Remove the disc holder in the direction of the arrow.



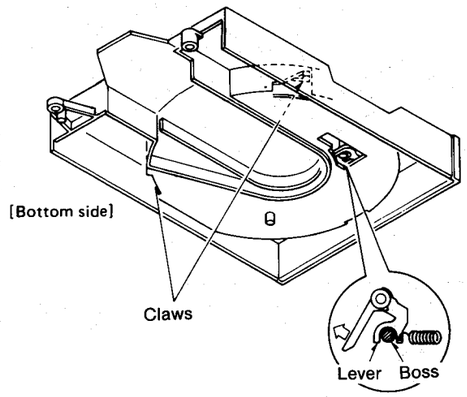
Note: Before fitting the disc holder, make sure that the switch arm end is on the groove side of the drive rack top.



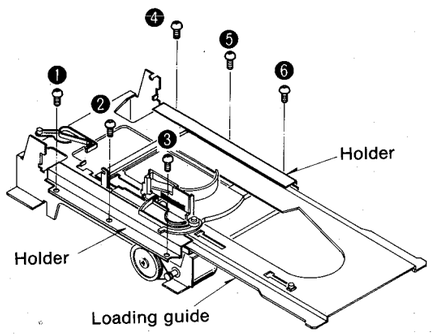
Ref. No 7	How to remove the power transformer
Procedure 1 ➧ 7	1. Shift the disc holder forward. 2. Release the power switch rod from the power switch. 3. Remove the 3 setscrews (❶ ~ ❸). 4. Take the power transformer block out of the chassis. 5. Unsolder the power transformer terminals of the power source P.C.B. The power transformer can then be removed.



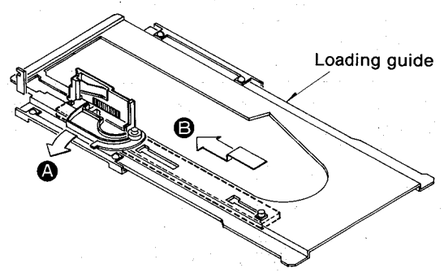
Ref. No 8	How to remove and set the disc tray
Procedure 1➧2➧6➧8	1. Release the 2 claws from the bottom of the disc holder and then remove the disc tray. 2. When setting the disc tray, accurately fit the lever onto the boss as illustrated. * It can be easily set by pushing the lever in the direction of the arrow.



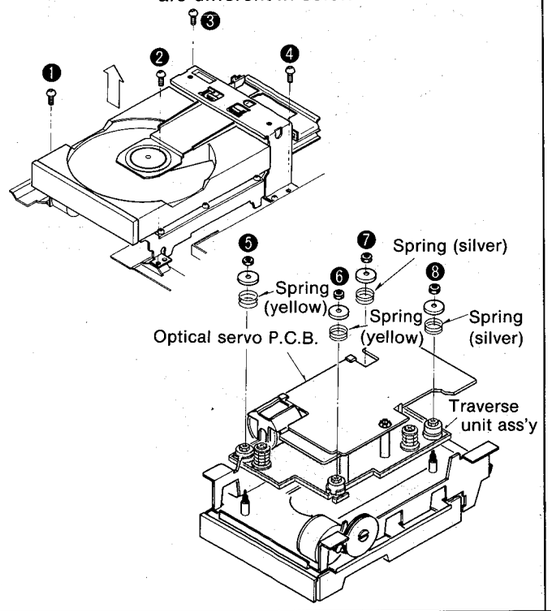
Ref. No 9	How to remove the loading guide
Procedure 5 ➧ 6 ➧ 9	• Remove the 6 setscrews (❶ ~ ❻) on the right and left sides of the loading guide holder. Then the loading guide can be removed.



Ref. No 10	How to remove the drive rack
Procedure 2➧6➧ 9 ➧10	1. Move the drive rack in the direction of arrow Ⓐ while opening the switch arm in the direction of arrow Ⓑ, and then pull out the drive rack downward. 2. When the drive rack is fitted, the switch arm end should be on the groove side of the drive rack top. **(See Ref. No. 9.)**

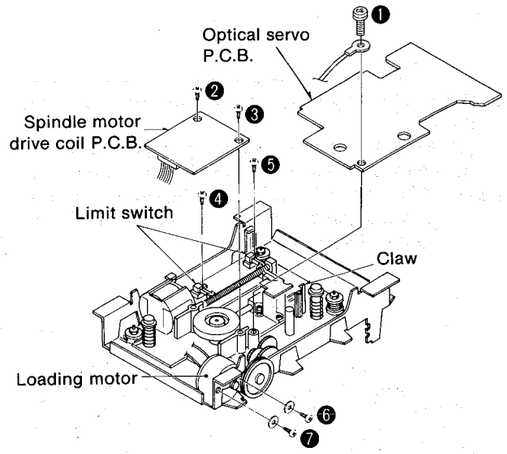


Ref. No 11	How to remove the traverse unit ass'y (optical deck unit)
Procedure 1 ➧ 2 ➧ 11	1. Remove the 4 setscrews (❶ ~ ❹). Screws ❶ ~ ❹ are red. 2. Pull out the 8 connectors (CN405 ~ CN409, CN411, CN412, CN501) connected from the traverse unit to the main P.C.B. 3. Turn over the traverse unit and remove the nuts (❺ ~ ❽). Note that the front and rear springs are different in color.

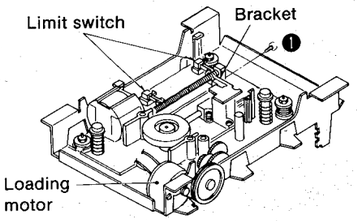


Ref. No 12	How to rem… and spin…
Procedure 1➧2➧11➧12	1. Remo… setscre… 2. Release t… servo P.C.B. … P.C.B. can be … 3. Remove the 2 se… Then the spindle m… P.C.B. can be remove…

★ To remove the limit switch, remove th… (❹, ❺).
After fitting the limit switch again, it is nec… readjust the position.
★ To remove the loading motor, remove the belt … 2 setscrews (❻, ❼).



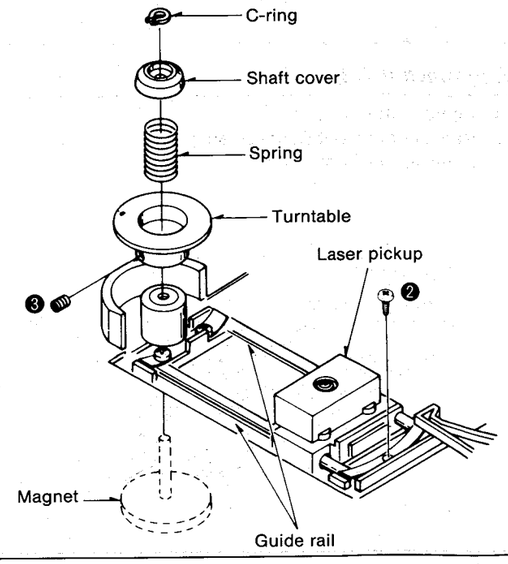
Ref. No 13	How to remove the laser pickup
Procedure 11 ➧ 12 ➧ 13	1. Pull out the connectors (CN101, CN102) of the optical servo P.C.B. 2. Remove the bracket setscrew (❶). 3. Remove the guide rail retainer setscrew ❷ and pull out the laser pickup from the two guide rails. *** The pickup must be readjusted when it is replaced or fitted after removal.**



★ To remove the turntable.
1. Remove the C ring.
2. Remove the screw ❸ by use of a hexagonal wrench.

• **If the turntable is removed, it is necessary to readjust the height of the turntable.**

Caution:
For details regarding the laser pickup, refer to "Handling Precautionfor Optical Pickup" on page 30.



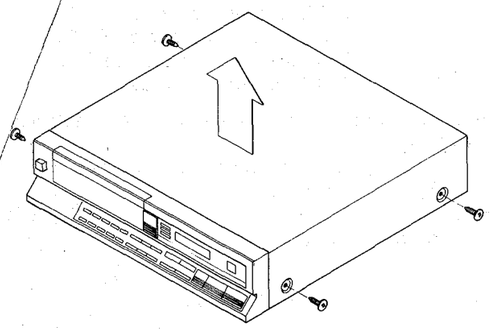
SL-PJ1
■ HOW T
*For removal o
• Main P.C
1. Remo
2. Cher

O CHECK THE PRINTED CIRCUIT BOARD

each part, refer to disassembly instructions on pages 15 ~ 18.

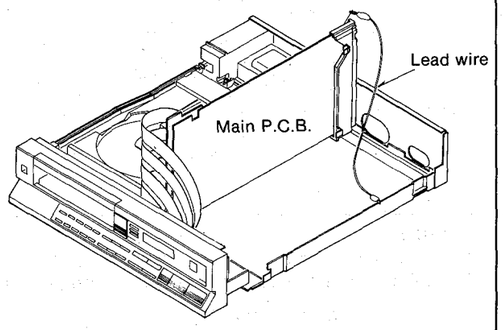
.B.

ve the cabinet.
k each part. (Part side)

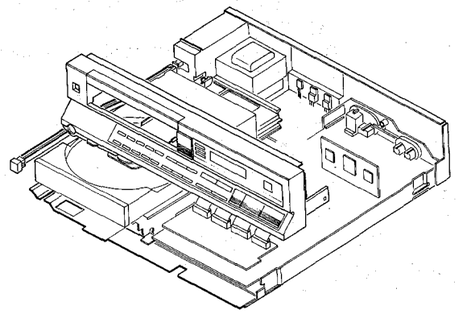


3. When checking the soldered parts and replacing them,
   (1) Remove the front panel and main P.C.B.
   (2) Place the main P.C.B. as shown in the figure.

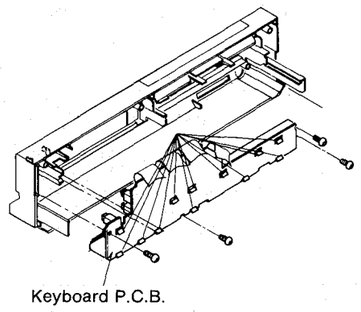
Note: When checking as in the figure, be sure to connect the ground spring of the main P.C.B. to the chassis lead wire.



4. Check the P.C.B. as shown in the figure.

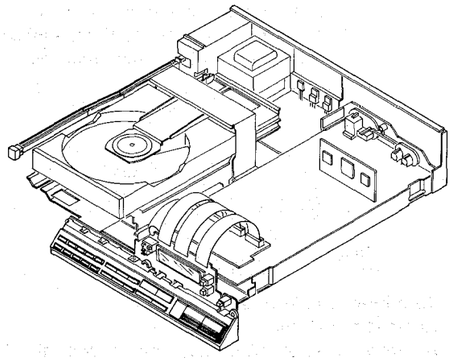


5. Also remove the 7 setscrews of the reinforcement plate and keyboard P.C.B.



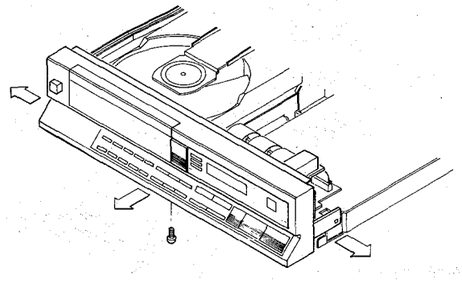
6. Shift it as in the figure and check.

Note: Take care not to damage the F. L.



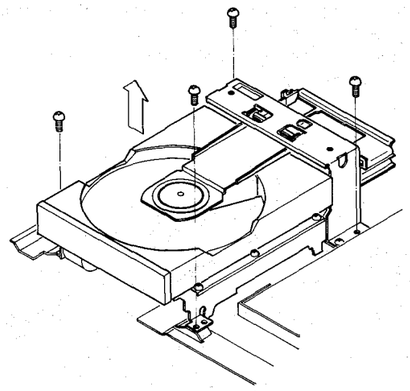
• Keyboard P.C.B.

1. Remove the cabinet.
2. Remove the front panel setscrew.
3. Remove the front panel.

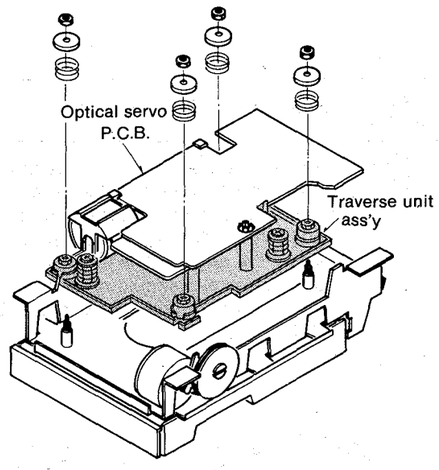


• Optical servo (head amplifier) P.C.B.

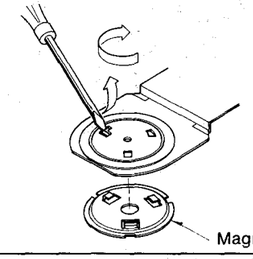
1. Remove the cabinet and front panel.
2. Disconnect connectors (CN405 ~ CN409, CN411, CN412, CN501) of the main P.C.B.
3. Remove the traverse unit. The entire traverse unit can then be removed from the unit.



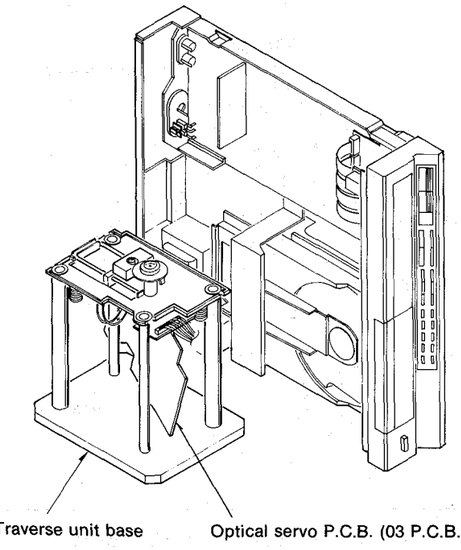
4. Turn over the traverse unit and remove the nuts. The tray and the traverse unit can then be separated.



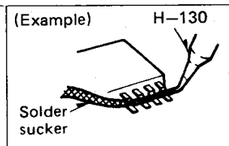
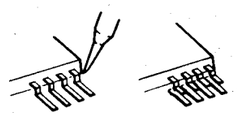
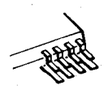
5. Remove the disc clamper magnet from the disc clamper.



6. Temporarily fasten the tray and front panel. After than, connect only connectors (CN405, CN406 and CN408) removed in step 2.
7. Remove the insulator rubber and optical servo P.C.B. of the traverse unit.
8. Mount the traverse unit on the traverse unit base.
9. Connect connectors (CN407, CN409, CN411, CN412, CN501) removed in step 2.
10. Shift it as shown in the figure.



■ HOW TO REPLACE IC'S (Small outline type)

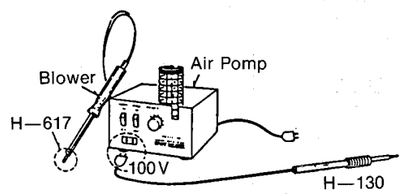
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 	● **Recommended tool** .....Special soldering iron *H605M and H—130. *H605E and H—130. ● Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. ● When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. ● When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

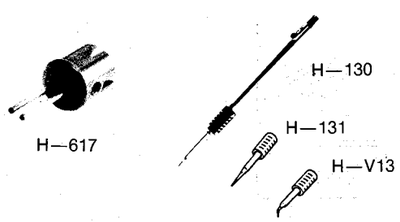
*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

● H—605 Spot Heater (hot-air solder iron)

This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)





● H—617 Twin Nozzle (for spot heater)

Special nozzle for the removal of RHCs and chip resistors.
(Nozzle diameter : 1.0 mm x 2)

● H—130 Slim Pencil Solder Iron

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs, etc., to high-density circuit boards.
Features:

- Rated power: 100V, 15W
- Max. temp.: 400°C
- Heater: ceramic (long life)
- Insulation resistance: 100MΩ
- Length: 178 mm
- Weight: 16 g (not including cord)

● H—131, H—V13 Cap Bits

Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

- Solder tip: 0.3 mm

■ MEASUREMENTS AND ADJUSTMENTS

Caution
It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pick-up lens. Be careful during adjustments in particular.

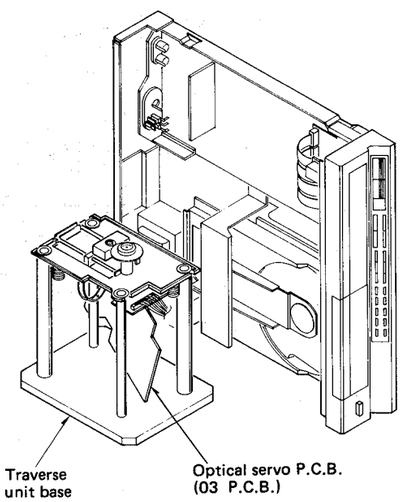
★ Perform these adjustments by use of a traverse unit base in accordnace with the traverse unit servicing method to improve the workability.
★ In case the optical pick-up is individually replaced, it is necessary to perform mechanism adjustment before these adjustment, refer to pages 29 ~ 34.

Adjustment	Main symptom of maladjustment	Purpose of this circuit (adjustment)
Focus servo 1. Focus gain 2. Focus balance 3. Focus offset 4. Best eye Note: Make sure to perform the Focus Servo adjustment in the order 1~4.	•No reading of T.O.C. (Table of Contents) •Slow reading of T.O.C. •Unstable reading of T.O.C.	•Makes the laser beam to follow up as against facial deflection of disc. •Focus error signal is generated by matrix amplifier IC (AN7677S) with the signal from optical pickup and the servo circuit operates through focus error amplifier → coil drive. •Matrix amplifier IC also functions as a switch for auto focus and servo loop gain and offset amplifier.
Tracking servo 1. Tracking gain 2. Tracking offset temporary 3. Tracking balance 4. Tracking offset Note: Make sure to perform the Tracking Servo adjustment in the order 1~4.	•Noise due to track jump (sound skip). •No reading of T.O.C. (Table of Contents) •Disc rotation does not stop (searching)	•Makes the laser beam to follow up as against off-centering of disc. •Tracking error signal is generated by matrix amplifier IC (AN7678S) with the signal from optical pickup and the servo circuit operates through tracking error amplifier → coil drive. •Matrix amplifier IC also functions as a servo loop switch as well as servo loop gain and offset amplifier.
Drop-out detection. Offset in drop-out Note: Perform this adjustment after that for Focus servo and Tracking servo.	•Noise due to scratched disc •No reading of T.O.C. (Table of Contents)	•The drop-out detection circuit generates control signals to make corrections so that the servo operation is not disturbed due to various drop-outs generated during play mode.
PLL and 11T servo PLL (Phase Locked Loop)	•No reading of T.O.C. (Table of Contents) •Abnormal operation of pickup •Abnormal rotation of spindle motor •Noise (disengagement of PLL) •Sound skip	•RF signal taken out by optical pickup enters PLL circuit from matrix amplifier where it is wave-shaped. Also, clock pulse necessary for the digital processing circuit to read the data are made in PLL circuit. •The 11T servo functions by comparing crystal frequency dividing signal and synchronizing signal in disc signal for the purpose of linear speed constant rotation.

Traverse unit servicing method

★ For removal of each part, refer to disassembly instructions.

1. Remove the cabinet and front panel.
2. Disconnect connectors (CN405 ~ CN409, CN411, CN412 and CN501) of main P.C.B.
3. Remove the traverse unit. The entire traverse unit can then be removed from the unit.
4. Turn over the traverse unit and remove the nuts. The tray and the traverse unit can then be separated.
5. Remove the disc clamper magnet from the disc clamper.
6. Temporarily fasten the tray and front panel. After that, connect only connectors (CN405, CN406, CN408) removed in step 2.
7. Remove the insulator rubber and optical servo P.C.B. of traverse unit.
8. Mount the traverse unit on the traverse unit base.
9. Connect connectors (CN407, CN409, CN411 and CN501) removed in step 2.



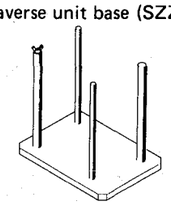
Testers and Jigs for Adjustments

Testers:

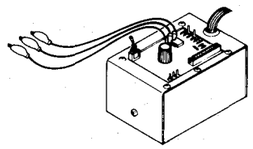
1. Two-channel oscilloscope (with trigger) of 30 MHz or over.
2. Low frequency oscillator.
3. Digital voltmeter.

Jigs:

1. Traverse unit base (SZZP1016F)

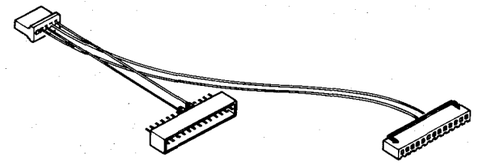


2. Servo gain adjuster (SZZP1017F)

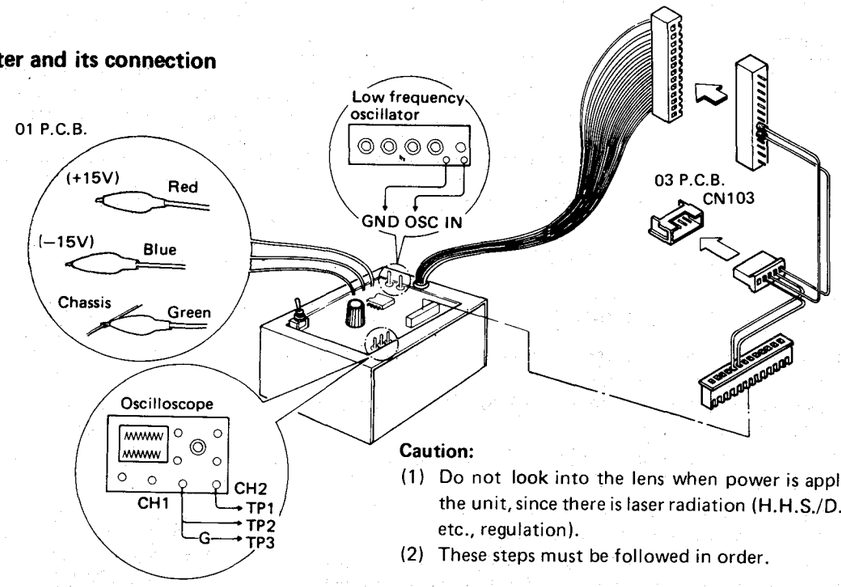


3. Test disc (SZZP1014F)

4. Short leads with clip.
5. Ordinary disc.
6. Conversion connector (SZZP1032F)



- **Servo gain adjuster and its connection**



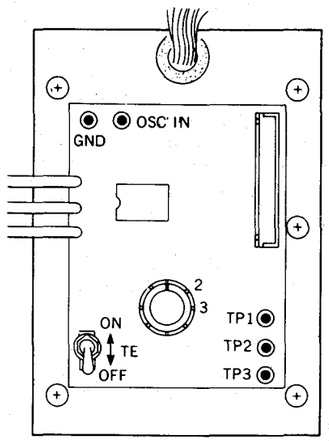
Caution:

(1) Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./ etc., regulation).

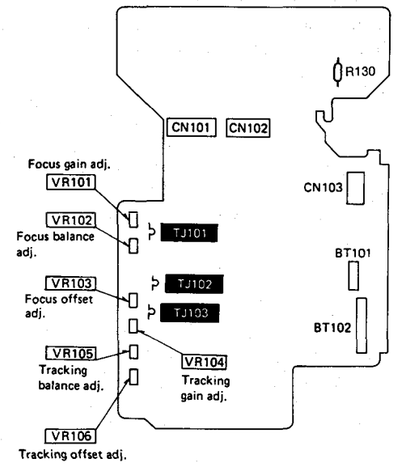
(2) These steps must be followed in order.

Adjustment points

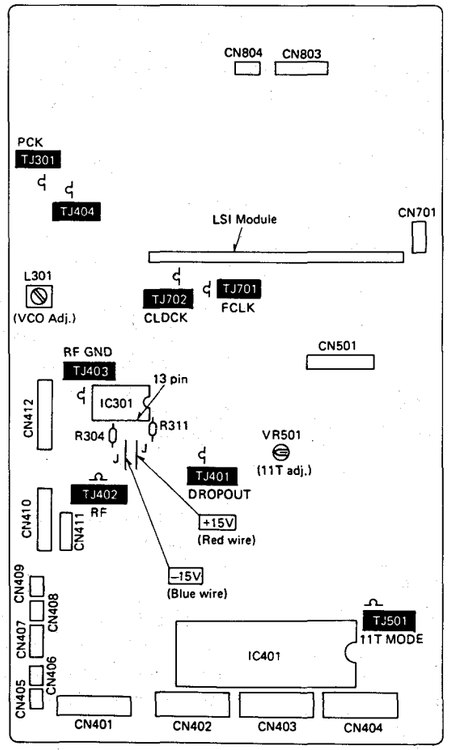
- **Servo gain adjuster**



- **03 (Optical servo) P.C.B.**



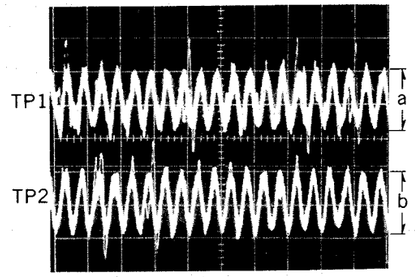
- **01 (Main) P.C.B.**



Adjustment Procedure

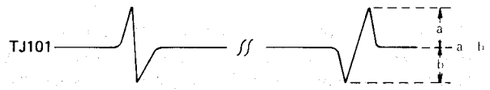
1. Focus gain adjustment

1. Connect the gain adjusting jig with conversion connector to the set.
   Red ..... Jumper beside IC301 pin 13 on 01 P.C.B.
   Blue ..... Jumper beside IC301 pin 12 on 01 P.C.B.
   Green ..... Chassis
   Connector ..... Pull out the shorting pins of CN103 on 03 P.C.B. and connect the conversion connector to the jig and then connect the connector (5P) from conversion connector to CN103.
2. Adjust the low frequency oscillator to 750 Hz frequency and 150 mV p-p output voltage, and connect it to TEST pin OSC IN and GND of the servo gain adjuster.
3. Connect CH1 and CH2 of oscilloscope to TP1 and TP2 of the servo gain adjuster. (TP3 is GND).
   Oscilloscope setting:
   VOLT 100 mV (both channels), SWEEP 2 ms, Input AC, Mode CHOP
4. Set the servo gain adjuster power SW "on" and the rotary selector switch to "1" and place the disc on turntable.
5. Turn power switch ON. When turntable begins to rotate, a 750 Hz signal appears on the oscilloscope. Then adjust VR101 so that the waveforms of both channels are equal to each other.



2. Focus balance adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "2" and disconnect the input from the oscillator.
2. Connect TJ102 on 03 P.C.B. to ground by use of clip lead.
3. Pull out connector CN501 on 01 P.C.B.
4. Connect the oscilloscope to TJ101 on 03 P.C.B. and place the disc on the turntable.
   Oscilloscope setting:
   VOLT 500 mV, SWEEP 5 ms, Input AC
5. Turn power switch ON. When the laser lights up, a S-shaped waveform appears on the oscilloscope. Then adjust VR102 so that the top and bottom peak values are equal to each other.



Note: The above-mentioned S-shaped waveform will continue for about 2 minutes if CN412 pin 7 (01 P.C.B.) is connected to ground while LD is lighted as LD stops in 5~6 sec.

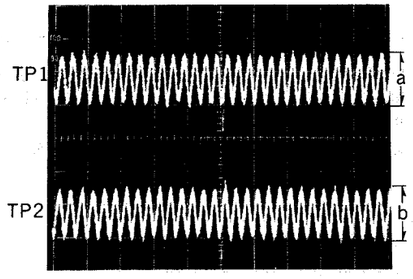
6. After the adjustment, shift the clip lead and CN501 back as they were.

3. Focus offset adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch at "2".
2. Place the unit in the Eject mode (tray open).
3. Connect a voltmeter to TJ101 on 03 P.C.B.
4. Turn power switch ON, and adjust VR103 so that DC voltage is 0±10 mV.

4. Tracking gain adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "3".
2. Adjust the low frequency oscillator to 1.5 kHz and 150 mVp-p output. And connect it to TEST pin OSC IN and GND of servo gain adjuster.
3. Connect CH1 and CH2 of the oscilloscope to TEST pins TP1 and TP2 of the servo gain adjuster (TP3 is GND), and place the disc on turntable.
   Oscilloscope setting: VOLT 100 mV (both channels), SWEEP 2 ms, Input AC, Mode CHOP
4. Turn power switch ON. When turntable begins to rotate, a 1.5 kHz signal appears on the oscilloscope. Then adjust VR104 so that the waveform amplitudes of both channels are equal to each other.

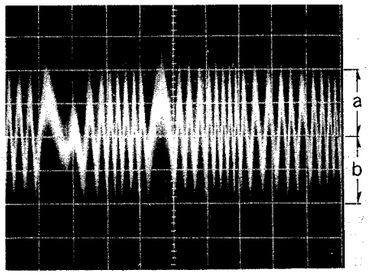


5. Tracking offset temporary adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch to "2", and disconnect the input from the oscillator.
2. Place the unit in the Eject mode (tray open).
3. Connect a voltmeter to TJ103 on 03 P.C.B.
4. Turn power switch ON, and adjust VR106 so that DC voltage is 0±3 mV.

6. Tracking balance adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch at "2".
2. Connect the oscilloscope to TJ103 on 03 P.C.B. and then place the disc on the turntable.
   Oscilloscope setting:
   VOLT 200 mV, SWEEP 5 ms, Input DC
3. Turn power switch ON. When turntable begins to rotate and the tracking servo switch of the servo gain adjuster is turned OFF, TE (tracking error) signal appears on the oscilloscope. Then adjust VR105 so that the top and bottom peak values are equal to each other.



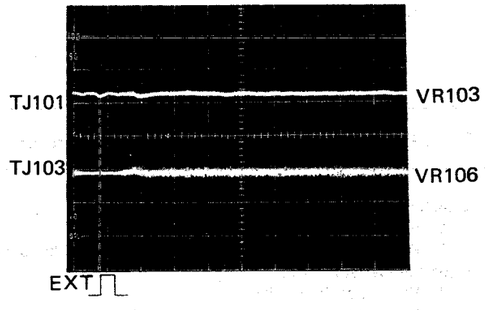
7. Tracking offset adjustment

1. Set the servo gain adjuster power SW "on" and the rotary selector switch at "2".
2. Place the unit in the Eject mode (tray open).
3. Connect a voltmeter to TJ103 on 03 P.C.B.
4. Turn power switch ON, and adjust VR106 so that the DC voltage is 0±3 mV.

Note: After completing the above-mentioned adjustment, remove the servo gain adjuster and insert the sorting pin into CN103 as it was.

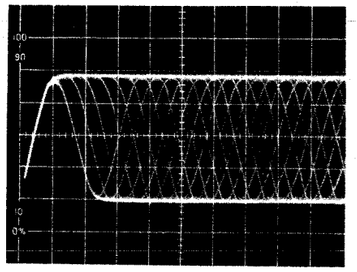
8. Offset adjustment in drop-out

1. Connect the oscilloscope to the points specified below.
   CH1 ..... TJ101 (03 P.C.B.)
   CH2 ..... TJ103 (03 P.C.B.)
   EXT ..... TJ401 (01 P.C.B.)
   Oscilloscope setting:
   VOLT 1V (both channels), SWEEP 0.5 ms, Input AC, Trigger EXT. NORM
2. Play hand 13 (0.5 mm black spot) of the test disc.
3. Watching the waveform of CH1 of the oscilloscope, adjust VR103 so that the waveform amplitude near the trigger point is minimized. If not minimized, adjust so that the waveform top and bottom are nearly symmetrical.
4. Watching the waveform of CH2 of the oscilloscope, adjust VR106 so that the waveform amplitude near the trigger point is minimized. If not minimized adjust so that the waveform top and bottom are nearly symmetrical.



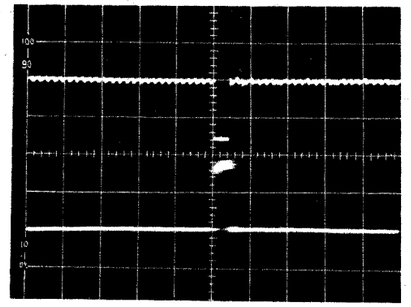
9. Best eye adjustment

1. Connect CH1 of oscilloscope to TJ402 on main P.C.B.
   Oscilloscope setting:
   VOLT 1V, SWEEP 0.5μs, Input AC
2. Insert disc and place unit in play mode.
3. Adjust VR102 so that the eye pattern of the RF signal is the open widest.



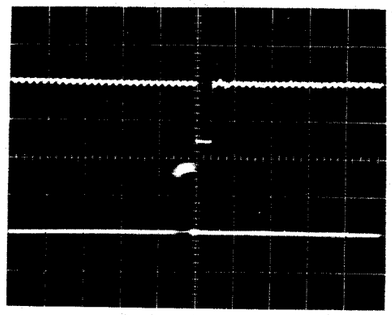
10. PLL adjustment

1. Place the unit in the Eject mode (tray open).
2. Connect CH1 and CH2 of the oscilloscope to test points TJ701 "FCLK" and TJ702 'CLDCK" on 01 P.C.B.
   Oscilloscope setting:
   VOLT 2V (both channels), SWEEP 20μs, Input AC, Trigger CH1+CH2 (NORM) ⊖ slope, Mode ALT
3. Connect IC301 pin 13 on 01 P.C.B. to GND.
4. Adjust L301 so that the timing waveform appears as shown.



Match the centers of both waveforms.

5. After the above-mentioned adjustment, remove the short lead in step 3.
6. Maximize VR501 by turning it fully clockwise.
7. Place the disc on the turntable and press the Play button (play mode).
8. In the play mode, connect TJ501 on 01 P.C.B. to GND.
9. In the same oscilloscope mode as in step 2, adjust VR501 so that the oscilloscope wave is formed as shown.



Match the negative edges of both waveforms.

11. Check of play operation after adjustment

Check of skip search
1. Play an ordinary disc.,
2. Press the skip button and check to see that skip search function (forward and reverse).

Check of manual search
1. Play an ordinary disc
2. Press the manual search button and check to see that smooth manual search can be done at low and high speeds (forward and reverse).

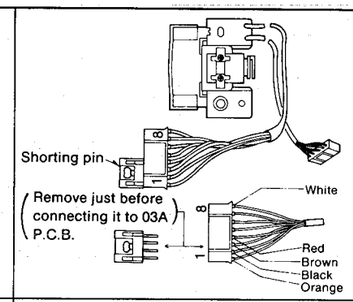
Check for defects
1. Play band 12 of the test disc, and check to see that there is no sound skip or noise (black spot).
2. Play band 14 of the test disc, and check to see that there is no sound skip or noise (fingerprint).

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP
(Part No. SRLP007N01A)

• It is desirable to handle the parts as follows:

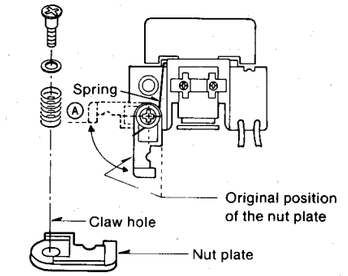
(1) REMOVAL OF SHORTING PIN:

To prevent damage to the laser pick-up, shorting pin removal and connection of the pick-up cable to CN305 should be performed within 20 seconds.
- Disconnect the old pick-up cable from CN305, on the 03A P.C.B.
- Remove the shorting pin, for static prevention, from the new pick-up.
- Connect the pick-up cable to CN305, on the 03A P.C.B.



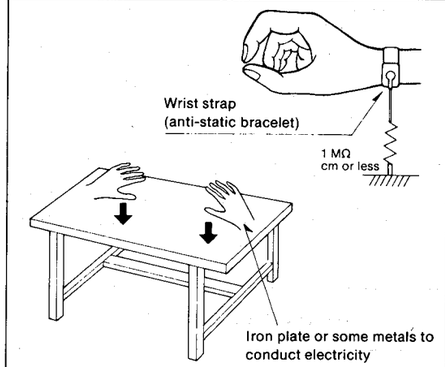
(2) MOUNTING OF THE NUT PLATE:

The spring should not go through the claw hole.
- While tightening the screw, to mount the nut place, be sure that the spring does not go through the nut plate's hole.
- How to check the nut plate's operation.
  Shift the nut plate to position Ⓐ.
  The nut plate should smoothly return to its original position after shifting to position Ⓐ.



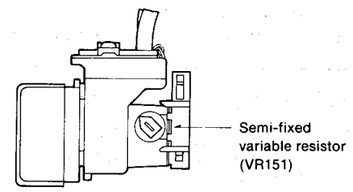
(3) USE OF THE ANTI-STATIC WRIST STRAP:

In order to reduce the risk of static damage, a conductive wrist strap, connected to ground via a 1M OHMS resistor should be used.
- If a strap is not available, be sure to touch and maintain contact with a grounded metal object.



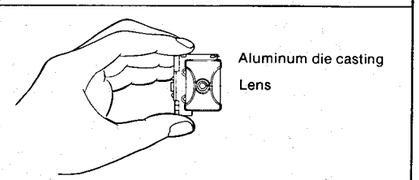
(4) DO NOT TOUCH OR TURN THE SEMI-FIXED RESISTOR VR151 (LASER POWER ADJUSTMENT).

This is a Factory adjustment only.



(5) DUE TO IT'S EXTREMELY DELICATE STRUCTURE, DO NOT GIVE EXCESSIVE SHOCKS TO THE OPTICAL PICK-UP.

When handling the pick-up, hold it as illustrated.



(6) USE OF THE ANTI-STATIC BAG

The pick-up is enclosed in a blue anti-static bag.

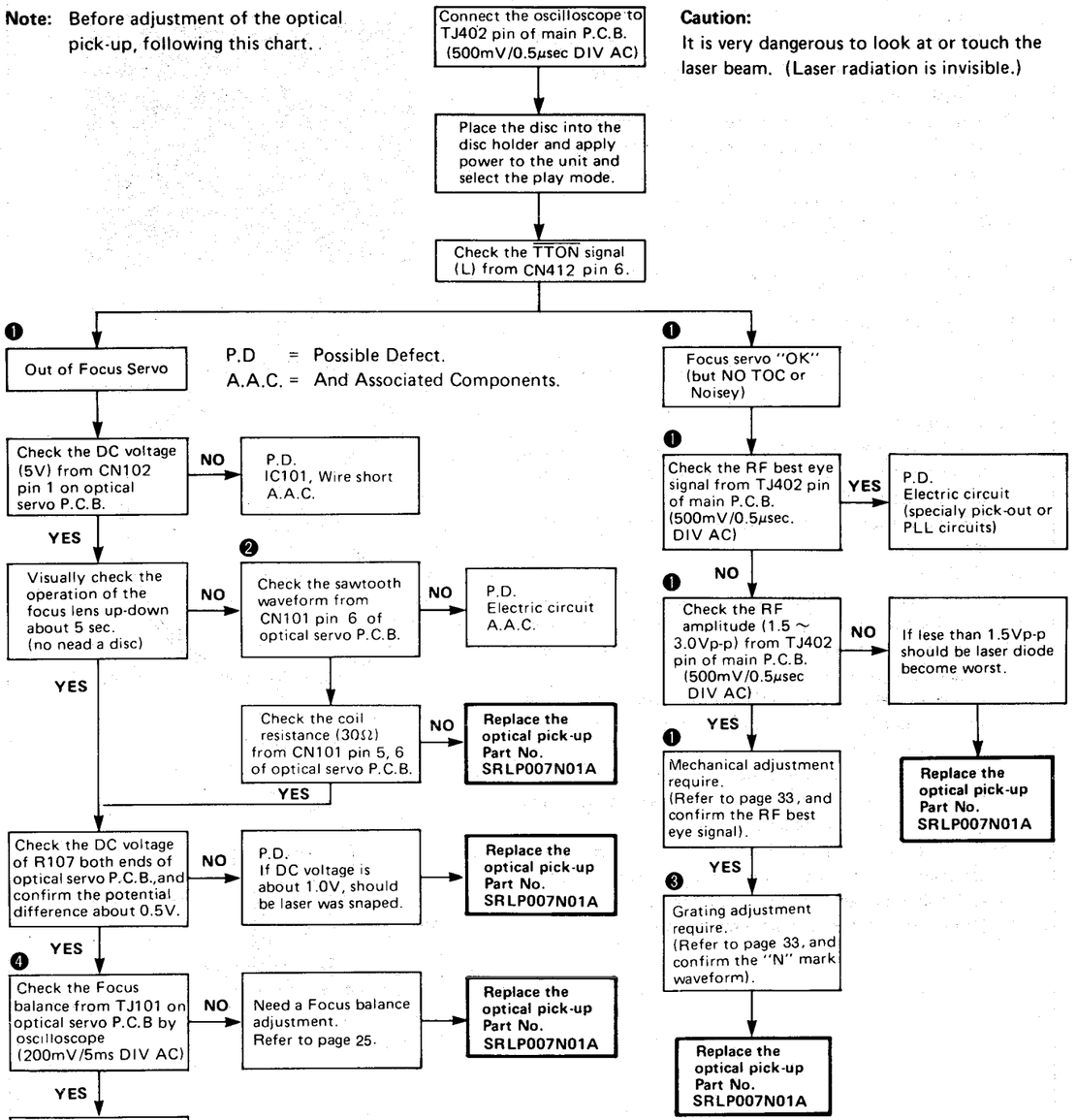
■ ADJUSTMENT OF OPTICAL PICK-UP

Approval Judgement of defect for Optical Pick-up

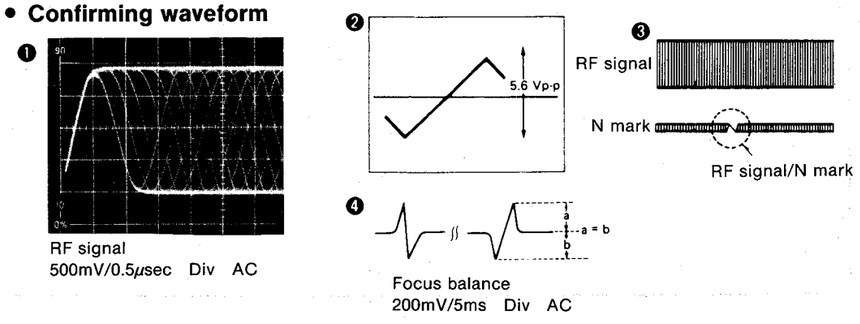
Note: Before adjustment of the optical pick-up, following this chart.

Caution:
It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)

P.D = Possible Defect.
A.A.C. = And Associated Components.



• Confirming waveform



Replacement Procedure

1. Mount the traverse unit on the traverse unit base, and make sure mounting screw is tight.
2. Position the assembly as shown in **Fig. 1.**
3. Remove the optical nut plate and screw from the optical pick-up body as shown in **Fig. 2.**

Note: A) Be careful when removing the screw, the spring can snap out very fast and be lost.
B) Also note the position of the spring so that when ready to re-assembly it, you will remember its position.

4. Remove the shaft fixed screw as shown in **Fig. 3.**
5. Remove the two suspension shafts by lifting and pulling to the left. Optical pick-up body can be separated from the deck as shown in **Fig. 3.**
6. Before proceeding to replace the optical pick-up, observe the following precautions:
   A) The laser diode can be destroyed if P101 remains open too long (about 20 seconds).
   Do not remove the shorting pin from P101 until you are ready to connect it to 03 module CN101 as shown in **Fig. 4.**
   B) Be certain that rest detection switch (S101) and end detection switch (S102) have not been bent. If they have, traverse motor will remain on. **(Fig. 5)**
7. Reassemble the optical pick-up to the traverse unit by following step 6 through 1 in reverse procedure.

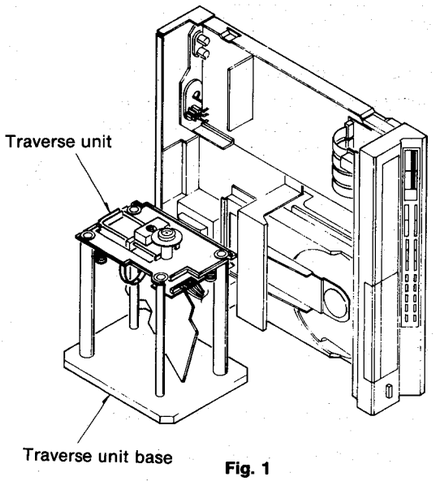


Fig. 1

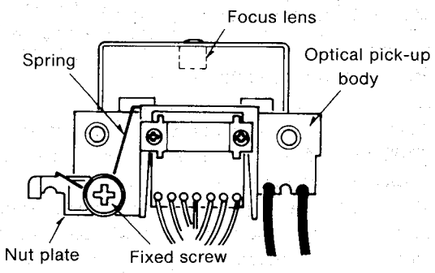


Fig. 2

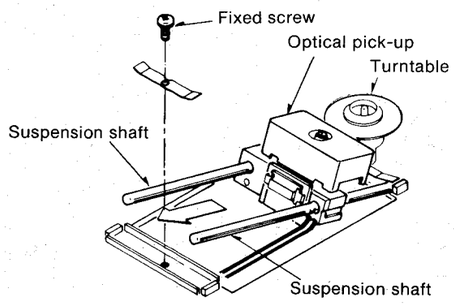


Fig. 3

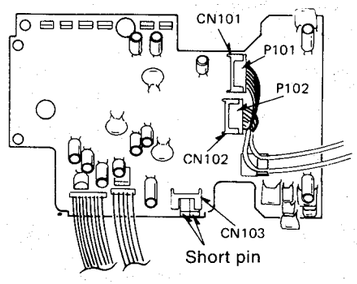


Fig. 4

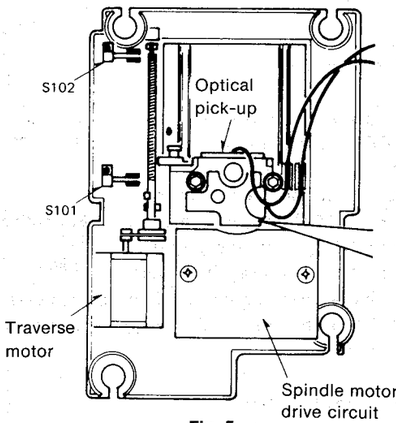
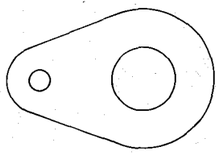


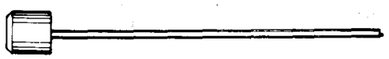
Fig. 5

Testers and jigs for adjustments

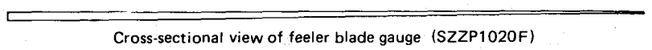
1. Two-channel oscilloscope of 30 MHz or over.
2. Ordinary disc and test disc (SZZP1014F)
3. Hexagonal wrenches (1.27mm and 2 mm)
4. Gauge ket (SZZP1022F)



REST position gauge (SZZP1019F)



Grating adjustment tool (SZZP1018F)



Cross-sectional view of feeler blade gauge (SZZP1020F)

Top view of feeler blade gauge (SZZP1020F)

Caution

It is very dangerous to look at or touch the laser beam.
(Laser radiation is invisible.)
With the unit turned "on", laser radiation is emitted from the pick-up lens. Be careful during adjustments in particular.

* Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).

Adjustment Procedure

* These steps must be followed in order.

1. Rest position adjustment

1. Assure that leaf switches S101 (Rest detection) and S102 (End detection) have not been mashed during reassembly and therefore set to "ON".
   If they are, carefully separate the contacts about 2 mm.
2. Apply power to the unit. This will cause the traverse motor to wind the optical pick-up to the REST position.
3. Turn the power switch "OFF".
4. Place the REST position gauge on the turntable.
5. Assure that the lens is concentric within the hole of the REST position gauge as shown in **Fig. B**.

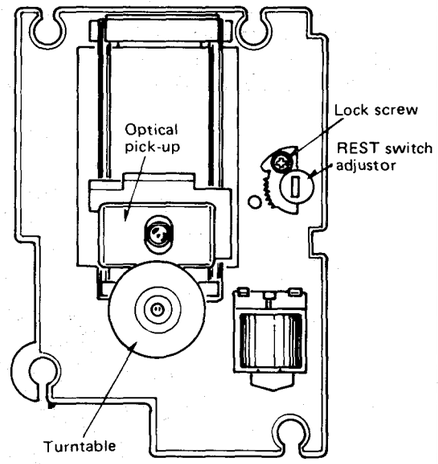


Fig. A

Optical pick-up is too close to the turntable. (Fig. B)
To adjust:

1. Loosen the lock screw and turn the REST switch adjustor clockwise.
2. Note that if the Rest detection switch (S101) is too much toward S102, then the pick-up will Rest too far away from the turntable at Rest position. If so, apply power and repeat step 1 above until Rest detection is detected when the lens is connectric with the hole of the REST position gauge.

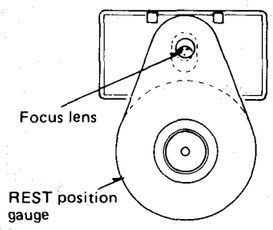


Fig. B "NG" (too close)

No adjustment required (Fig. C)

Optical pick-up is too far from the turntable. (Fig. D)
To adjust:
Loosen the lock screw and turn the Rest switch adjustor counter-clockwise.

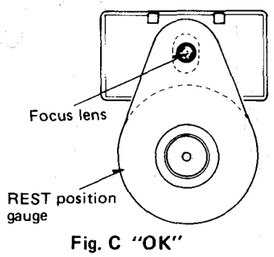


Fig. C "OK"

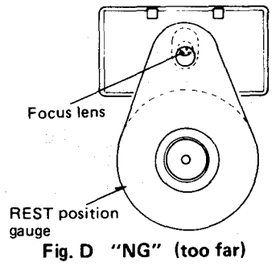


Fig. D "NG" (too far)

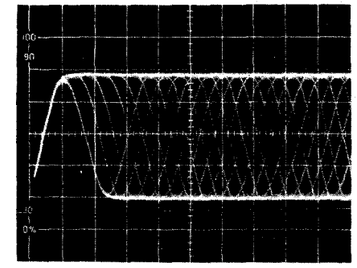
6. To verify correct adjustment, place the disc on the turntable and apply power to the unit. This will auto cycle the optical pick-up. Re-check alignment with the REST position gauge as shown in **Fig. C**.

2. Turntable height adjustment

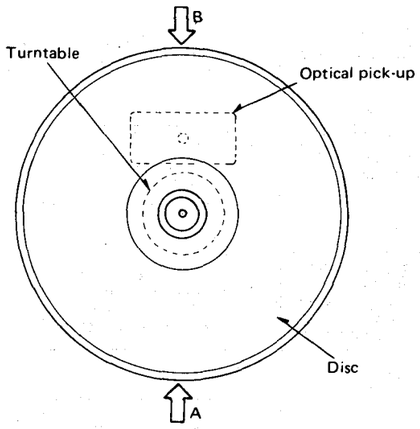
Note: Necessary after Direct Drive spindle motor is replaced or RF signal is not obtained.

1. Disable focus search by remove the R130 on 03 P.C.B.
2. Insert the thin end of Feeler blade gauge between the turntable and the shaft bearing.
3. Slide the Feeler blade gauge toward the thick end and mark the gauge with a pencil, where it and the turntable touch and until the blade can not be fed anymore than remove the gauge.
4. Connect the oscilloscope to TJ402 pin 01 (Main) P.C.B.
5. Place a disc on the turntable and clamp it with the magnet.
6. Apply power to the unit.
7. Press eject "out" and eject "IN".
8. Confirm if RF signal is present. If not, proceed to the next step.
9. To confirm:
   Gently tap the disc at point "A". If RF signal appears, the turntable is too low. If RF signal does not appear, tap the disc at point "B".
   RF signal should appear indicating that the turntable is too high.
10. To adjust:

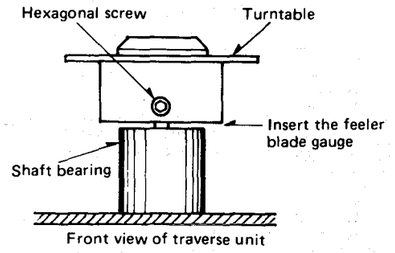
(1) Insert the Feeler blade gauge between the turntable and the shaft bearing to the previously marked point.
(2) Loosen the hexagonal screw of turntable set screw. (Use a hexagonal wrench 1.27 mm)
(3) If the turntable is too low, slide the Feeler blade gauge about 4 mm (5/32") towards the thick end and remove feller blade gauge.
   Reapply power and check for RF signal.
   (This is a "trial and error" adjustment, several attempts may be required to obtain RF signal).
(4) If the turntable is too high, insert the Feeler blade gauge and move about 4 mm (5/32") towards the thin end, using the same method as in step 3.
(5) Reconnect R130 to enable focus search.



RF signal



Top view of disc set up



Front view of traverse unit

3. Mechanical adjustment

1. Place the Test disc on the turntable with clamper magnet.
2. Connect the oscilloscope to TJ402 pin on 01 (Main) P.C.B.
3. Apply power to the unit and select the play mode.
4. Confirm that RF signal is as shown in **Fig. A.** If it is not present, proceed to next step.
   If RF signal is as shown, skip step 5.
5. Adjust hexagonal screw (Use a hexagonal wrench 2 mm) to the right or left to obtain the RF signal (Visual check) as shown in Fig. B.

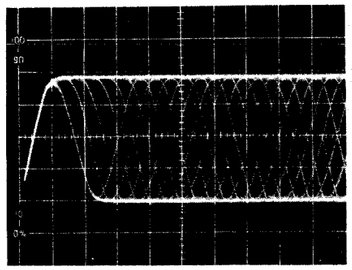


Fig. A. RF signal

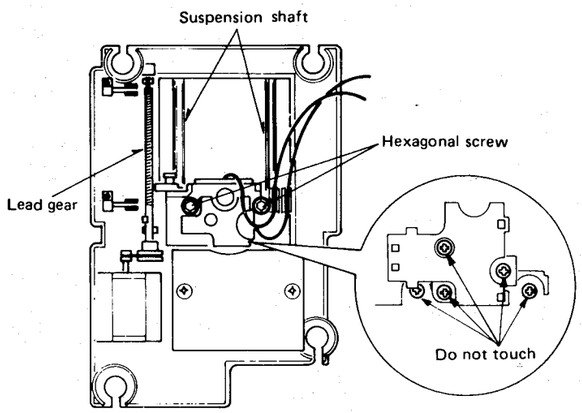


Fig. B. Bottom view of traverse unit

4. Grating adjustment

1. Place the Test disc on the turntable and clamper with the magnet.
2. Connect the oscilloscope as follows:
   Sweep speed. . . . . .2μs.
   CH1 . . . . . .TJ402 pin on 01 (Main) P.C.B.
   CH2 . . . . . .C164 on 03 P.C.B. (IC104 17 pin)
3. Apply power to the unit and select play mode.
4. If RF signal and "N" mark are present no adjustment is required as in **Fig. A.**
   If RF signal and "N" mark are not present, perform step 5.
5. Insert the Grating adjustment tool into the hole on the left side of the optical pick-up body as shown in **Fig. B.**
6. Rotate the Grating adjustment tool toward right or left until the "N" mark is sharpest (200mV ~ 250 mVp-p) and maximum RF signal is obtained.

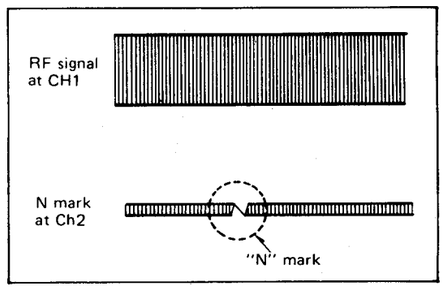


Fig. A RF signal and "N" mark

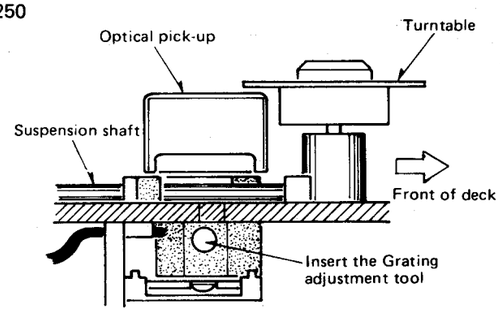
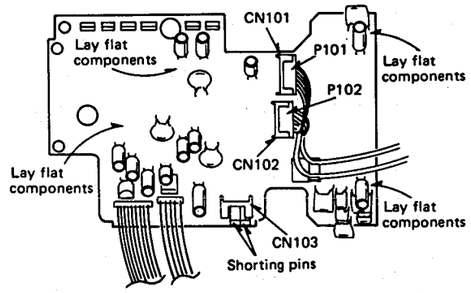


Fig. B. Left side view of traverse unit

5. Electrical alignment of main unit. Follow the adjustment, refer to pages 25 ~ 27.

6. Check of the 03 P.C.B. (Head amplifier module)

* After adjustment dress all components to lay flat on 03 P.C.B., and reassemble on the traverse unit.
* Once the 03 P.C.B. is mounted, assure that the bottom of the pick-up does not interfere with any of the components.
  Therefore make sure that the tracks in the outer edges of the disc are accessible.

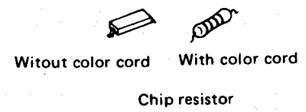


■ HOW TO REPLACE CHIPS

(Resistor, capacitor and jumper)

- **Removing procedure**

1. Completely remove the solder from both ends of the chip by use of solder sucker.
2. Touch the soldering iron to the end of the chip as shown in Fig. 6, then turn the tweezers in the direction of the arrow.



Do not re-use chip resistor or capacitor without color cord.

- **Replacing procedure**

1. Place solder on the foil where the chip is fitted.
   Then solder the chip by holding the soldering iron as shown in Fig. 7.

Note:

1. If the chip jumper is removed, connect a coated lead wire to the part. (See Fig. 8).
   Chip jumper is marked with "J" on the printed circuit board.

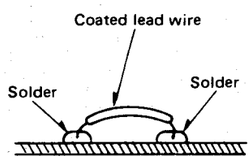


Fig. 8

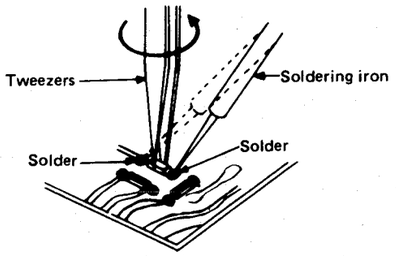


Fig. 6

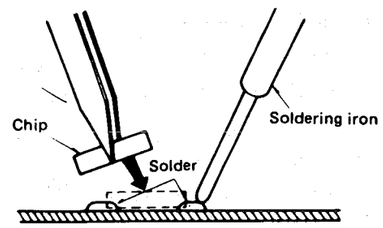


Fig. 7

- **Note for replacing chips**

1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron. And use soldering iron less than 60W.

■ REPLACEMENT PARTS LIST
(Cabinet, chassis and Optical deck unit parts)

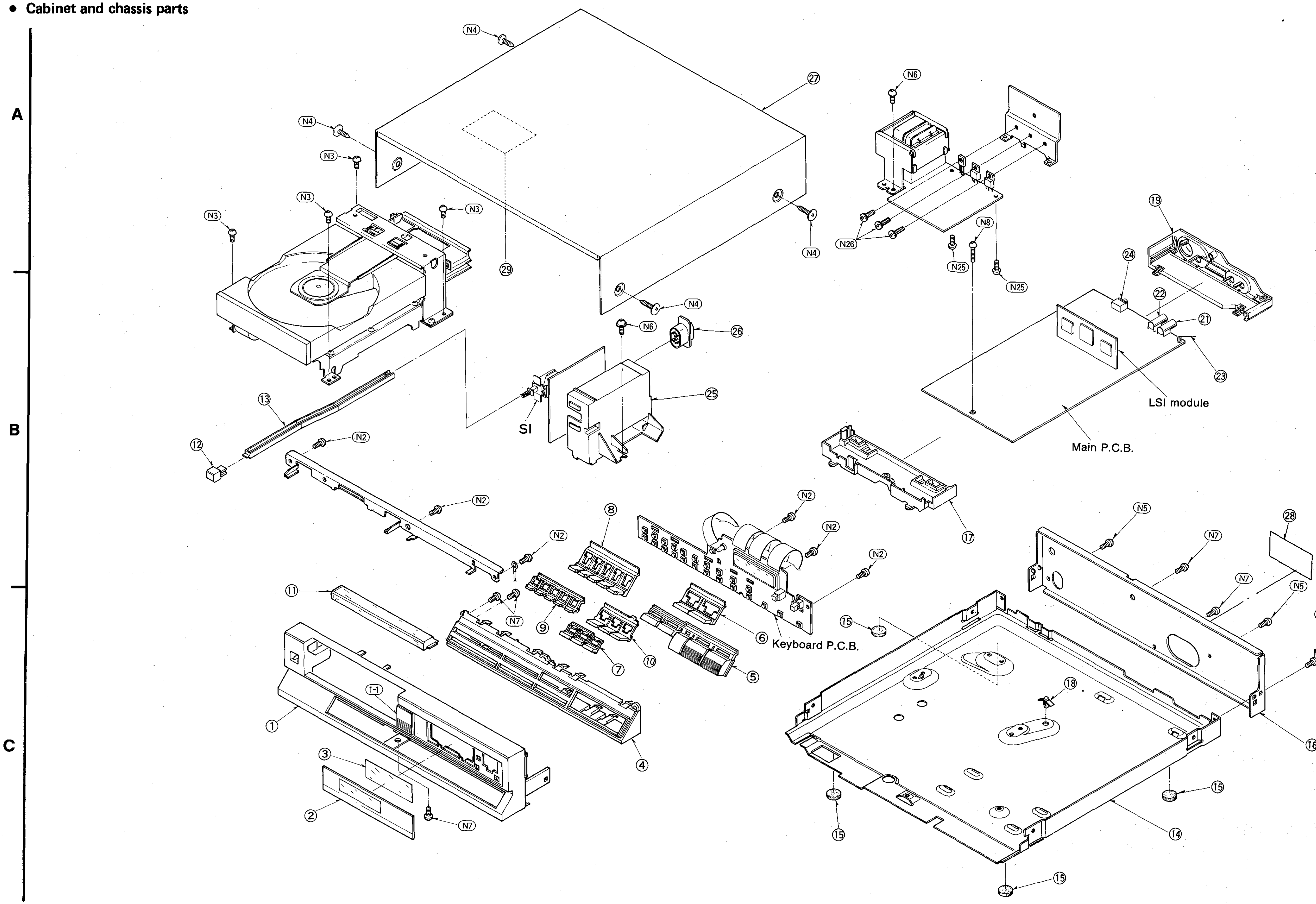
Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The " Ⓢ " mark is service standard parts and may differ from production parts.
5. Ⓚ -marked parts are used for black only, while ○marked parts are for silver type only.
6. Parts other than Ⓚ -and ○marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Color	Area
(S)	[M] .....U.S.A.
(S)	[MC]....Canada
(S) (K)	[E].....Switzerland and Scandinavia
(S) (K)	[EK] ....United Kingdom
(S) (K)	[XL] ....Australia
(S) (K)	[EG] ....F.R. Germany
(S) (K)	[EB] ....Belgium
(S) (K)	[EH] ....Holland
(S) (K)	[EF] ....France
(S) (K)	[Ei] .....Italy
(S) (K)	[XA] ....Southeast Asia, Oceania, Africa, Middle Near East and Central South America
(S) (K)	[XZ] ....New Zealand

Ref. No.		Part No.	Description	
CABINET AND CHASSIS PARTS				
1	○	SRACJ01N01E	Front Panel Ass'y (Silver Type)	(1)
1	Ⓚ	SRACJ01N31E	Front Panel Ass'y (Black Type)	(1)
1-1		SRKT001N06	Button, Open/Close	(1)
2		SRKKJ01N01	Ornament Plate, Display	(1)
3		SRKK001N03	Filter, Display	(1)
4 [M, MC]	○	SRUMJ01N21	Case, Operation Button	(1)
4 [other]	○	SRUMJ01N01	Case, Operation Button	(1)
4	Ⓚ	SRUMJ01N31	Case, Operation Button	(1)
5 [M, MC]	○	SRKT001N21	Button, Play/Pause/ Stop/Skip	(1)
5 [other]	○	SRKT001N01	Button, Play/Pause/ Stop/Skip	(1)
5	Ⓚ	SRKT001N01	Button, Play/Pause/ Stop/Skip	(1)
6 [M, MC]	○	SRKT001N22	Button, Search	(1)
6 [other]	○	SRKT001N02	Button, Search	(1)
6	Ⓚ	SRKT001N02	Button, Search	(1)
7 [M, MC]	○	SRKT002N21	Button, Repeat	(1)
7 [other]	○	SRKT002N01	Button, Repeat	(1)
7	Ⓚ	SRKT002N01	Button, Repeat	(1)
8 [M, MC]	○	SRKT001N24	Button, Number (6~0)	(1)
8 [ohter]	○	SRKT001N04	Button, Number (6~0)	(1)
8	Ⓚ	SRKT001N04	Button, Number (6~0)	(1)
9 [M, MC]	○	SRKT001N25	Button, Number (1~5)	(1)
9 [ohter]	○	SRKT001N05	Button, Number (1~5)	(1)
9	Ⓚ	SRKT001N05	Button, Number (1~5)	(1)
10 [M, MC]	○	SRKT001N23	Button, Memory	(1)
10 [ohter]	○	SRKT001N03	Button, Memory	(1)
10	Ⓚ	SRKT001N03	Button, Memory	(1)
11		SRKK001N05	Ornament Plate, Disk Holder	(1)
12		SRKT007N04	Knob, Power	(1)
13		SRUMJ02N03	Rod, Power Switch	(1)
14		SRUPJ02N01	Chassis	(1)
15		SRGA008N01	Foot	(4)
16 [M, MC]		SRUPJ01M02	Rear Panel	(1)
16 [other]		SRUPJ01S02	Rear Panel	(1)
17		SRUM001N02	Support, Main P.C. Board	(1)
18		SRUM001N10	Spacer, Support	(2)
19		SRUMJ02N04	Terminal Plate	(1)
21		SRDJ007N05	Jack, Rch. Output (Red)	(1)
22		SRDJ007N06	Jack, Lch. Output (White)	(1)
23		SRQS001N01	Spring, Ground	(1)
24 [Except for [M, MC]		SFDJD04N02	Jack, Synchronize Recording	(1)
25 [M, MC]		SRUM001M03	Cover, Power Switch P.C. Board	(1)
25 [other]		SRUM001N03	Cover, Power Switch P.C. Board	(1)
26 [XZ]	⚠	SFDJHSC515-1	AC Socket	(1)
26 [M, MC, XL, XA	⚠	SFDJHSC0509	AC Socket	(1)
26 [other]	⚠	SFDJHSC0515	AC Socket	(1)
27	○	SRACJ02N03	Cabinet, Case (Silver)	(1)
27	Ⓚ	SRACJ02N33	Cabinet, Case (Black)	(1)
28 [MC]		SRNNJ01C01	Name Plate	(1)
28 [E]		SRNNJ01S01	Name Plate	(1)
28 [XA]		SRNNJ01X01	Name Plate	(1)
28 [EG]		SRNNJ01R01	Name Plate	(1)
28 [EK, XL, XZ		SRNNJ01G01	Name Plate	(1)
29		SRUZ001N03	Sheet, Cabinet	(1)
LOADING MECHANICAL PARTS				
41		SRUP001N05	Base, Clamper	(1)
42		SRUM001N07	Bracket, Switch	(1)
43		SRDJ001N13E	Connector Ass'y (2 pin)	(1)
44		SRUP001N06	Plate, Clamper	(1)
45		SRUZ001N02	Sheet, Clamper Plate	(2)
46		SRUM001N06	Clamper, Disc	(1)
47		SRKD001N01E	Magnet	(1)
48		SRUP001N07E	Plate, Clamp	(1)
49		SRXJ001N01	Clamp Shaft	(1)
50		SRQA001N01	Spring, Clamp	(1)
51		SRQA001N02	Spring, Clamp	(1)
52		SRUM007N05E	Disc Tray Ass'y	(1)
53		SRUM001N09	Disc Case	(1)
54		SRKKJ01N02	Ornament Plate, Disc Case	(1)
55		SRUM007N07	Cam, Disc Case	(1)
56		SRQH007N02	Spring, Cam	(1)
57		SRUP001N09E	Loading Guide	(1)
58		SRGC007N05	Rubber, Loading Guide	(2)
59		SRUM001N13	Rack Gear	(1)
60		SRUM001N08	Switch Arm	(1)
61		SRQS007N02	Spring, Switch Arm	(1)
62		SRUM007N15	Guide Plate	(2)
63		SRUP007N07	Holder	(2)
64		SRUP001N08R	Loading Base	(1)
65		SRUM007N06	Lock Arm	(1)
66		SRQS007N03	Spring, Lock Arm	(1)
67		SRUM007N17	Cover, Switch	(1)
68		SRDJ001N03E	Connector Ass'y (2 pin)	(1)
69		SRUG007N02	Gear, Transmission	(1)
70		SRUG007N03	Gear, Loading	(1)
71		SRUG001N01	Gear, Pulley	(1)
72		SRMH001N02R	Motor Ass'y, Loading	(1)
73		SRDJ001N02E	Connector Ass'y (2 pin)	(1)
74		SRGC001N01	Rubber, Motor	(2)
75		SRGB007N02	Belt, Loading Motor	(1)
76		SFYB-5-32-P	Ball	(8)
77		SRGC007N06	Rubber, Cam	(1)
OPTICAL PICK-UP DECK UNIT PARTS				
81	⚠	SRLP007N01A	Optical Pick-Up Ass'y	(1)
82		SRUM007N22	Bracket, Optical Pick-Up	(1)
83		SRQS007N01	Spring, Bracket	(1)
84		SRLC007N03	Cover, P.C. Board	(1)
85		SRUK007N02E	Optical Deck Unit Base	(1)
86		SRMH001N01R	Motor, Pick-Up Drive	(1)
87		SRDJ001N01E	Connector Ass'y (2 pin)	(1)
88		SRGC007N01	Cushion Rubber	(1)
89		SRUM007N19	Holder, Motor	(1)
90		SRTM007N01A	Rotary Magnet	(1)
91		SRDJ001N04E	Connector Ass'y (4 pin)	(1)
92		SRGC007N02	Cushion Rubber	(4)
93		SRXG007N06	Rod	(1)
94		SRXG007N07	Rod	(1)
95		SRQA007N03	Spring, Rod	(2)
96		SRQP007N01	Spring	(1)
97		SRTE007N11E	Turntable	(1)
98		SRTE007N03	Holder, Turntable	(1)
99		SRQA010N04	Spring, Turntable Holder	(1)
100		SRXG007N01E	Worm Gear	(1)
101		SRGB007N03	Belt, Worm Gear	(1)
102		SRXJ007N01	Shaft, Pick-Up Guide	(2)
103		SRUP007N08	Holder, Shaft	(1)
104		SRUP007N09	Holder, Shaft	(1)
105		SRQA007N01	Spring, Cushion Rubber (Yellow)	(2)
106		SRQA007N02	Spring, Cushion Rubber (Silver)	(2)
107		SRUM001N14	Clamper, Lead Wire	(1)
108		SRLH007N08	Clamper, Lead Wire	(1)
109		EMCM0201S	Shorting Pin	(2)
110		SRDJ001N10E	Connector Ass'y (10 pin)	(1)
SCREWS, WASHERS AND NUTS				
N2		XTV3+10BFN	Screw, ⊕3×10	(6)
N3		XTV3+6JFYR	Screw, ⊕3×6	(4)
N4	○	SRXG007N10	Screw (Silver)	(4)
N4	Ⓚ	SRXG007N51	Screw (Black)	(4)
N5		XTV3+6BFZ	Screw, ⊕3×6	(4)
N6		XTV3+6BFN	Screw, ⊕3×6	(8)
N7		XTV3+8BFZ	Screw, ⊕3×8	(2)
N8		XTV3+14BFN	Screw, ⊕3×14	(1)
N9		SRXG001N02	Screw	(2)
N10		SRXG001N01	Screw	(1)
N11		XWA3B	Washer, φ3	(1)
N12		XNG3ES	Nut, φ3	(1)
N13		SFXGB20-01	Screw	(2)
N14		SRXG007N02	Screw	(1)
N15		XWE4A8BW	Washer, φ4	(1)
N16		XTN2+6B	Screw, ⊕2×6	(2)
N17		XTN2+8B	Screw, ⊕3×8	(2)
N18		XXE26D5FZ	Screw	(1)
N19		GTW-3	Washer	(1)
N20		SRXW007N03	Washer	(1)
N21		XYN3+6S	Screw, ⊕3×6	(3)
N22		XYC3+CG10	Screw, ⊕3×10	(1)
N23		SRUP001N10	Washer	(4)
N24		XNG26EBW	Nut, φ2.6	(4)
N25		XYE3+EJ8	Screw, ⊕3×8	(2)
N26		XYN3+C8	Screw, ⊕3×8	(3)
N27		XUC3FT	Clip	(1)
N28		XSN3+12BNS	Screw, ⊕3×12	(1)
N29		XTN3+6BFZ	Screw, ⊕3×6	(2)
N30		XTV3+8BFN	Screw, ⊕3×8	(1)
N31		SRXW007N02	Washer	(1)
ACCESSORIES				
A1 [M]		SRNUJ01M01	Instruction Book	(1)
A1 [MC]		SRNUJ01C01	Instruction Book	(1)
A1 [EK]		SRNUJ01G01	Instruction Book	(1)
A1 [Ei]		SRNUJ01I01	Instruction Book	(1)
A1 [EG, EF, XL, XZ]		SRNUJ01X01	Instruction Book	(1)
A1 [E, EB, EH		SRNUJ01S01E	Instruction Book	(1)
A2		SFDHC05N01	Output Cord	(1)
A3 [M, MC]	⚠	SFDAC05M01	AC Cord	(1)
A3 [XA]	⚠	SFDAC05X01	AC Cord	(1)
A3 [EK]	⚠	SFDAC05G02	AC Cord	(1)
A3 [XL]	⚠	SFDAC05L01	AC Cord	(1)
A3 [XZ]	⚠	SRDA007L01	AC Cord	(1)
A3 [other]	⚠	SFDAC05E02	AC Cord	(1)
PACKING PARTS				
P1 [MC, EF]	○	SRHPJ01C01	Carton Box (Silver)	(1)
P1 [other]	○	SRHPJ01M01	Carton Box (Silver)	(1)
P1 [EF]	Ⓚ	SRHPJ01C21	Carton Box (Black)	(1)
P1 [other]	Ⓚ	SRHPJ01S21	Carton Box (Black)	(1)
P2		SRHHJ02N01	Pad, Front	(1)
P3		SRHHJ02N02	Pad, Rear	(1)
P4		SFYH45X50	Polyethylene Bag, Unit	(1)
P5		SFYF23A35	Polyethylene Bag, Accessories	(1)

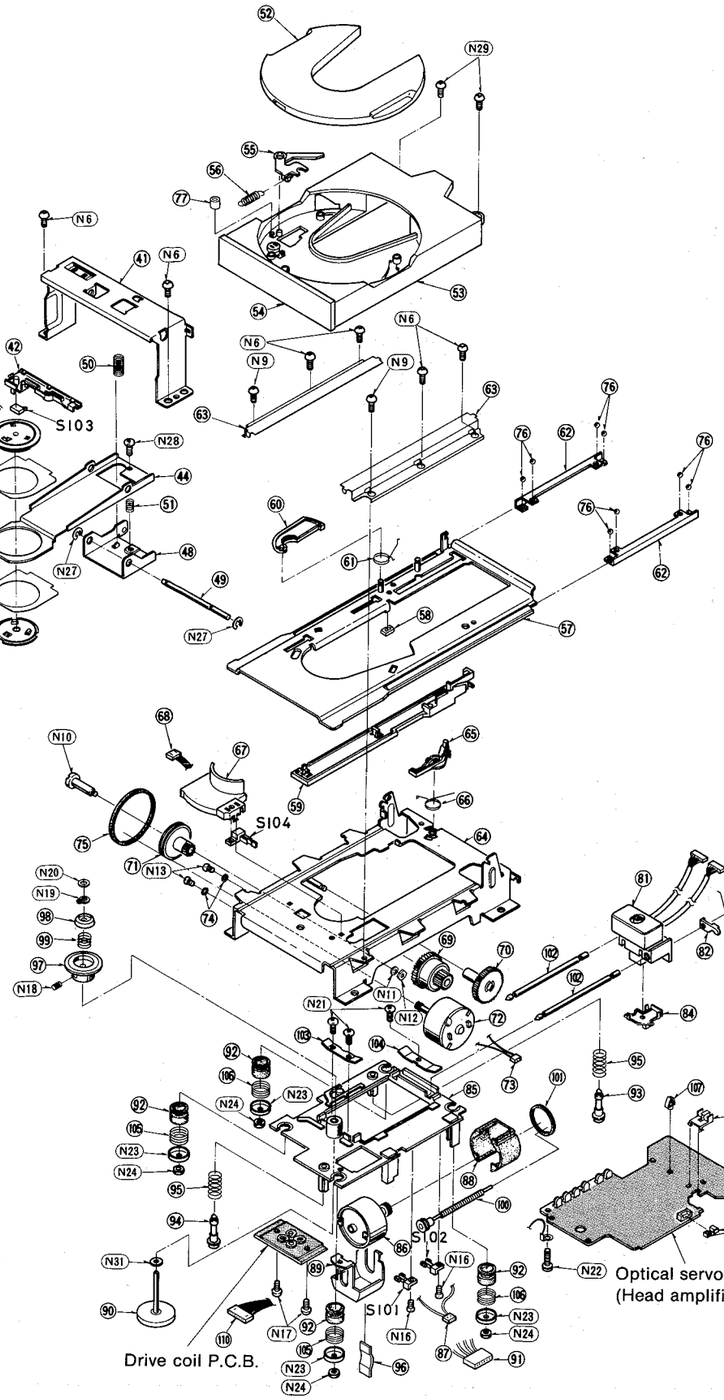
■ EXPLODED VIEW

• **Cabinet and chassis parts**



A	㉙ ㉗ ㉔ ⑲
B	⑫ ⑬ ⑧ ㉕ ㉖ ⑰ ㉒ ㉑ ㉓ ㉘
C	① ⑪ ② ③ ①-1 ⑨ ⑦ ④ ⑩ ⑤ ⑥ ⑮ ⑮ ⑱ ⑭ ⑮ ⑯

- **Loading drive mechanism and optical deck unit parts**



A B C

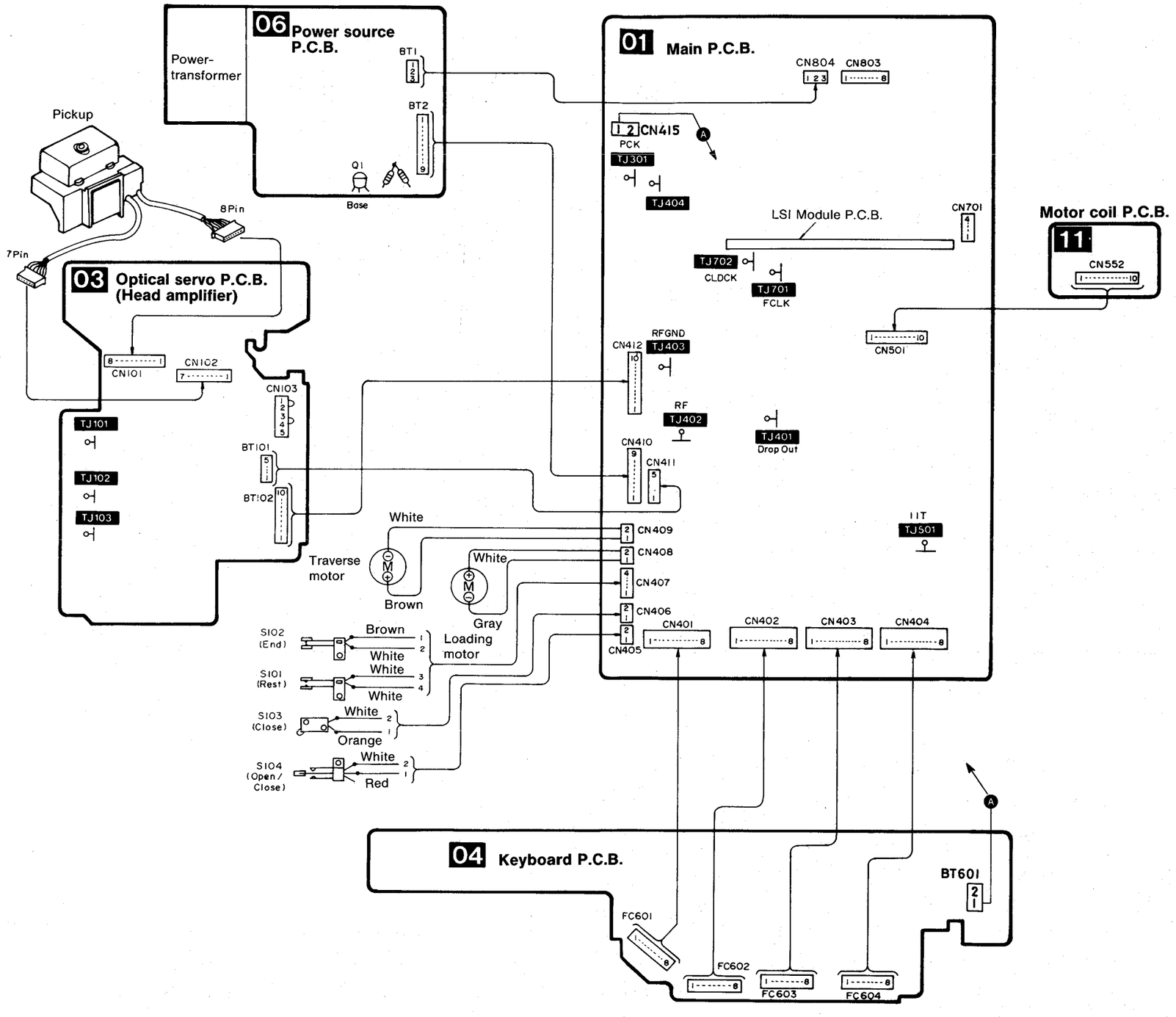
■ REPLACEMENT PARTS LIST (Electric parts)

Notes: 1. Part numbers are indicated on mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
3. The Ⓢ mark is service standard parts and may differ from production parts.
4. Bracketed indications in Ref. No. columns specify the areas. Parts without these indications can be used for all areas.

Ref. No.	Part. No.	Description
INTEGRATED CIRCUIT		
IC1	AN78M15	Regulator
IC2	AN79N15	Regulator
IC3	AN7805	Regulator
IC4, 5	SVIICP-F15	IC Protector
IC101, 404	AN78L05	Regulator
IC102	AN79N05	Regulator
IC103	AN7677S	Head (Focus) Amplifier
IC104	AN7678S	Head (Tracking) Amplifier
IC105	AN6554NS	Focus and Tracking Error Amplifier
IC201	AN6552	Operational Amplifier
IC301, 303	SVITC40H004P	Inverter
IC302	SVITL082CP	Operational Amplifier
IC304	SVITC40H386P	Exclusive OR Gate
IC305	DN74LS74A	D Flip Flop
IC306	DN74LS107	JK Flip Flop
IC401	MN15844PCW	Microcomputer
IC402	SVIBA6209	Loading Motor Drive
IC403	AN6914	Comparator
IC501	AN6638	Spindle Motor Drive
IC502	AN6562	Operational Amplifier
IC503	MN4066B	Analog Switch
IC504	MN4001B	NOR Gate
IC505	AN90B20	Inverter
IC706	MN4069UB	Inverter
IC801	SVIPCM53JP-L	D/A Converter
IC802, 805	SVIUPD4053BC	Analog Switch
IC803, 806	SVILM833NA	Operational Amplifier
LSI Module	SRDP001N02A	Digital PCB Ass'y
TRANSISTOR		
Q1	2SB644	Regulator
Q101	2SD638	Laser Power Control
Q102~104, 191	2SB641	Laser Power Control, Focus Servo
Q105	2SK301	Tracking Control
Q106	UN4212	Tracking Control
Q107, 109	2SD1226M	Actuator Drive
Q108, 110	2SB910M	Actuator Drive
Q201, 202, 407, 503, 655	2SC3311-Q	Traverse Control, Relay Drive and Drop Out Detector
Q203	2SD1266M	Traverse Motor Drive
Q204	2SB941	Traverse Motor Drive
Q401, 408, 502	2SA1309Q	Regulator, Drop Out Detector
Q402, 409, 504, 505	UN4212	Switching
Q403~406	UN4112	Switching
Q501	2SC641	Drop Out Detector
Q601, 602	2SD637	Switching
DIODE		
D1	⚠SVDS1WB40	Rectifier
D2	⚠SVDS2VB20	Rectifier
D3	MA1180	Zener, 18V
D6, 7 Ⓢ	MA162A	Switching
D101, 301, 407, 408, 420~422, 601~609, 614, 615	MA165	Switching
D303	SVDKV1230Z	Variable Capacitor
D401	MA4047	Zener, 4.7V
D405, 406	SVD1SR35200V	Rectifier
D410, 801, 802	MA4056	Zener, 5.6V
D501	MA4091	Zener, 9.1V
D611	SVDGL-9HY4	Indicator
D612	SVDGL-9PG4	Indicator
D613	SVDBR5531K	Indicator
VARIABLE RESISTOR		
VR101, 103, 104, 106	SVN1C103B01L	Focus Gain, Offset and Tracking Gain, Offset Adj., 10kΩ (B)
VR102	SVN1C222B01L	Focus Balance Adj., 2.2kΩ (B)
VR105	SVN1C472B01L	Tracking Balance Adj., 4.7kΩ (B)
VR501	EVN38CA00B14	11T Adj., 10kΩ (B)
COIL		
L301	SL07KM8R1	PLL Adj.
L401, 402	ELEBV180KA	18μH
COMPONENT COMBINATION		
R524	EXBP84333K	33kΩ×4
C11-12, 13-14	⚠EXRFS203ZS	0.01μF×2

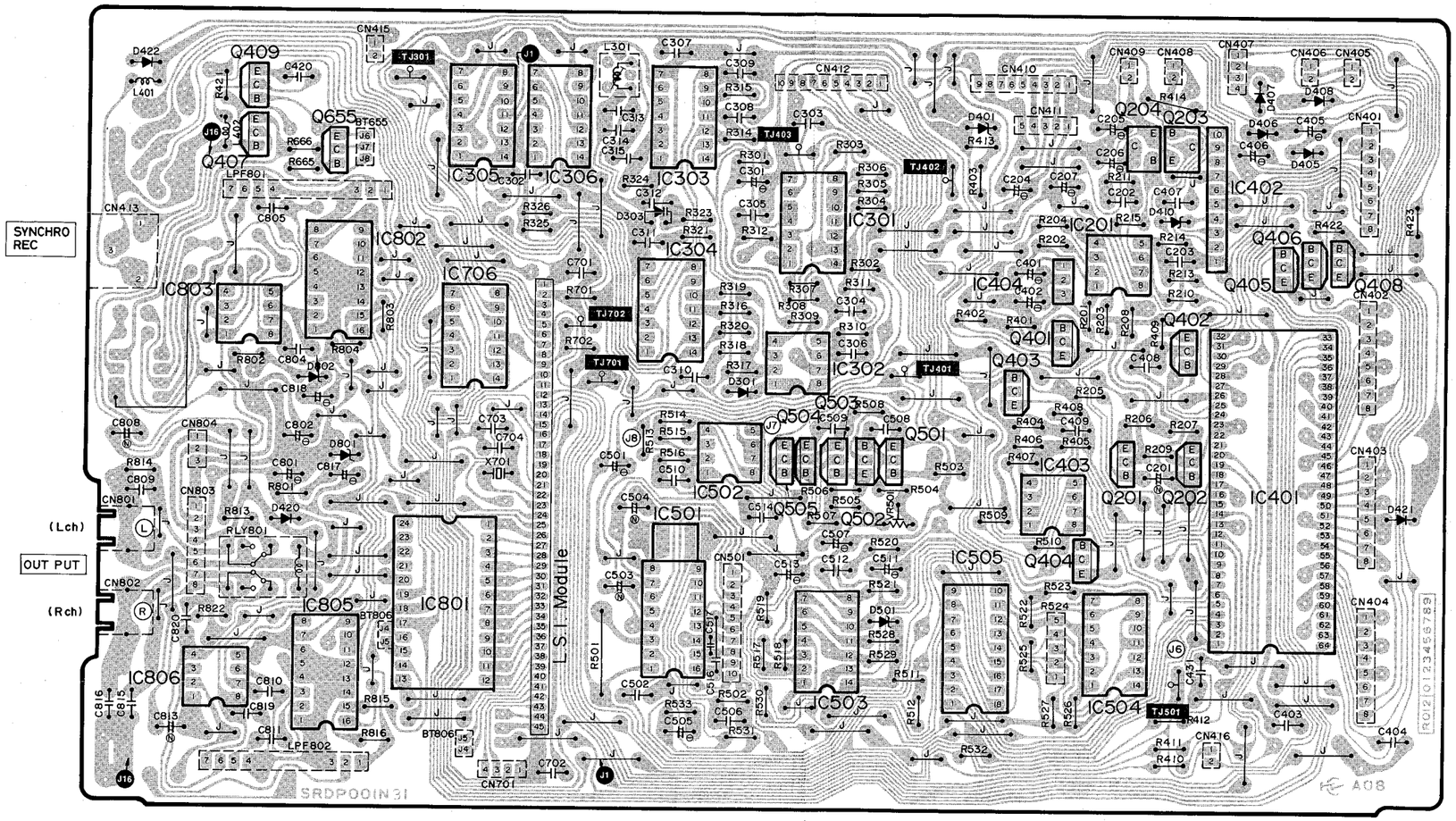
Ref. No.	Part. No.	Description
LOW PASS FILTER		
LPF801, 802	SVIAL017	Filter
RELAY		
RLY801	SFDYG5A237P	Muting
CRYSTAL		
X701	SVQNR8643	8.643MHz
FLUORESCENT DISPLAY TUBE		
FL601	SRD9-ST-10K1	Display
POWER TRANSFORMER		
T1 [M]	⚠SLT54JL8A	Power Source
T1 [MC]	⚠SLT54JS8C	Power Source
T1 [other]	⚠SLT54JE7E	Power Source
SWITCH		
S1	⚠ESB823V	Power
S2 Exclude [M, MC]	⚠SRDSHXW0251	Voltage Selector
S101, 102	SRDSBSW-180	Rest and End
S103	SRDSMLS-1	Close
S104	SRDSBSW97-2A	Open
S601~611, 615, 616, 618~628	EVQQS405K	Operation Switch
FUSE		
F1 Except for [M, MC]	XBA2C012TR0	250V, T125mA
F2 Except for [M, MC]	XBA2C025TR0	250V, T250mA
HALL ELEMENT		
H501, 502	OH-001	Spindle Motor Control

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

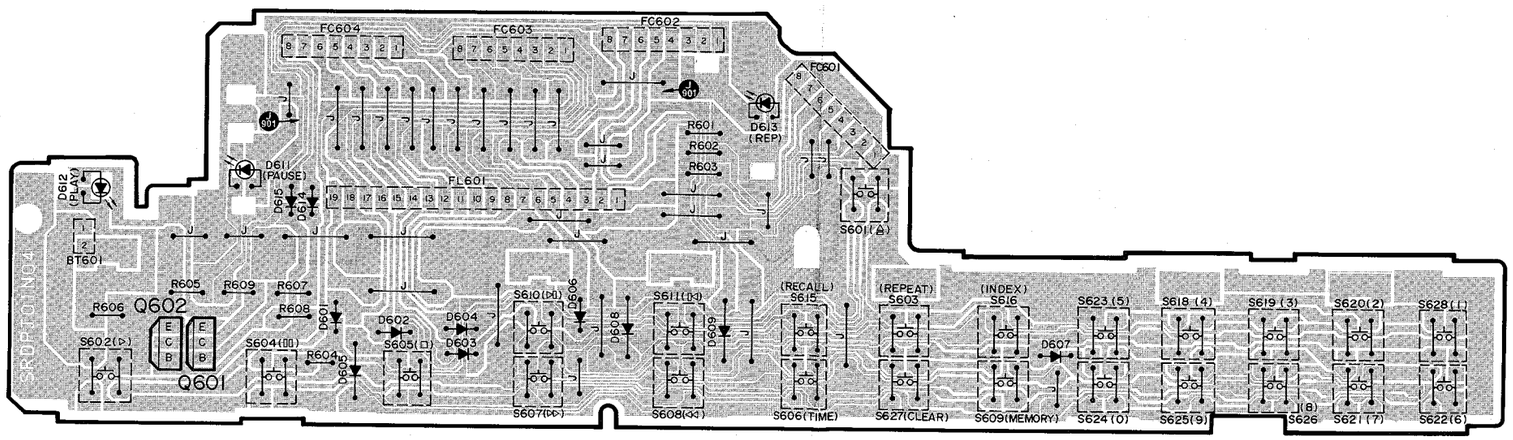


■ PRINTED CIRCUIT BOARDS

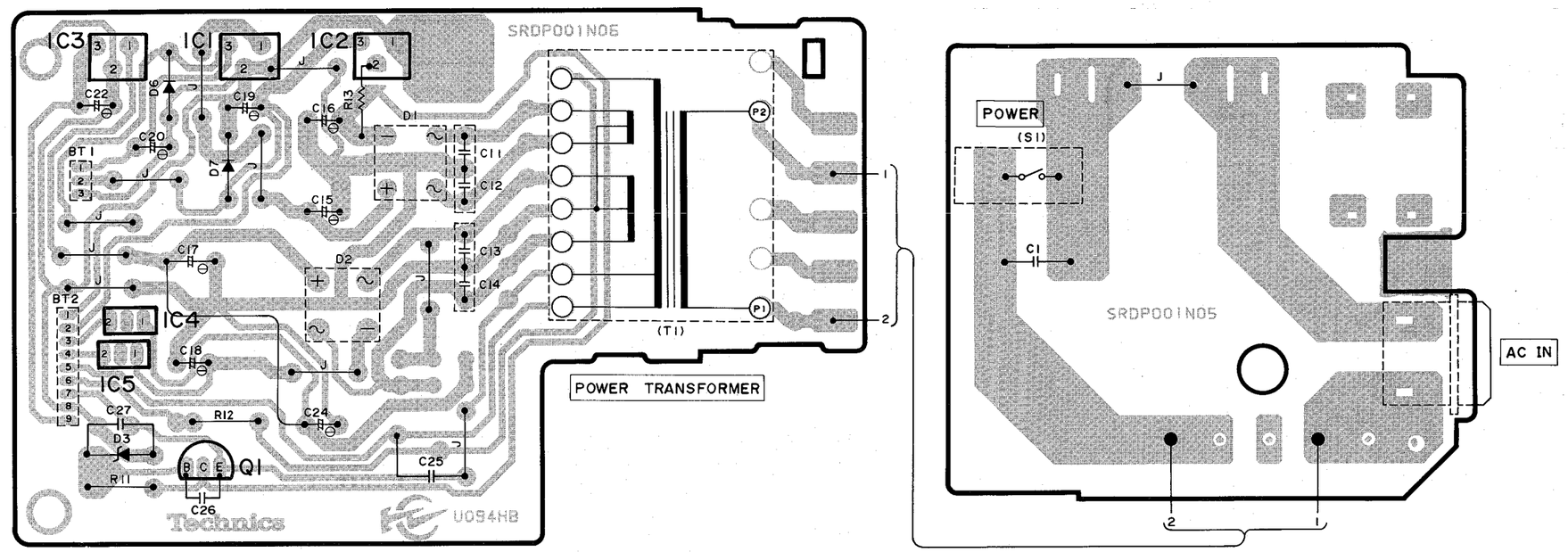
01 (Main P.C.B.)



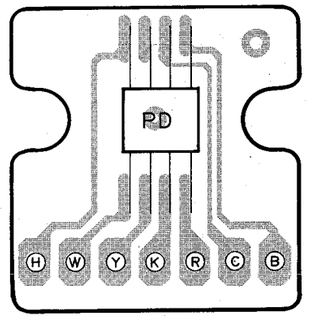
04 (Keyboard P.C.B.)



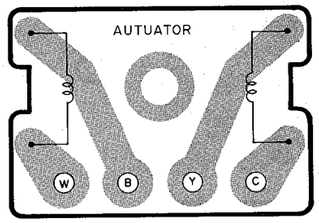
06 • Power supply P.C.B. (For U.S.A. and Canada)



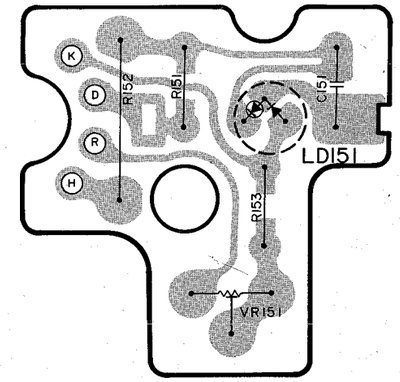
32 (Photo detector P.C.B.)



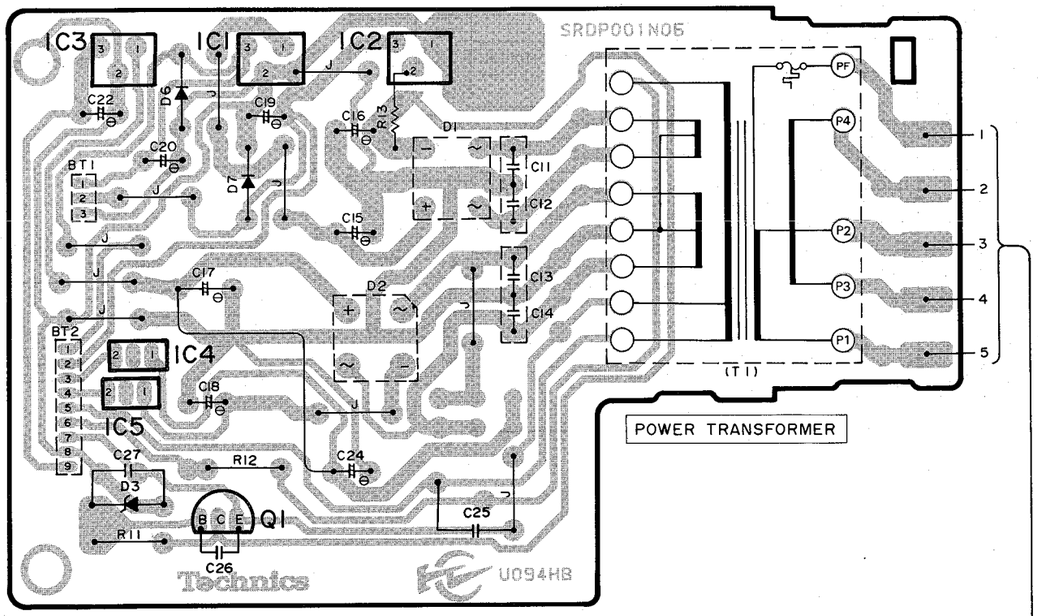
33 (Actuator coil P.C.B.)

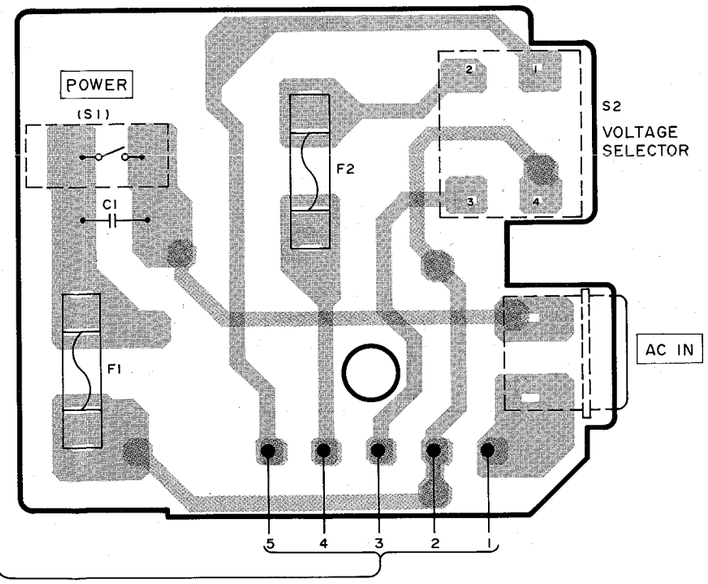


35 (Laser P.C.B.)

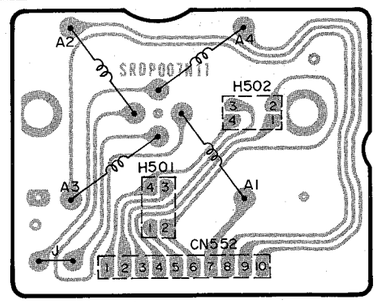


06 • Power supply P.C.B. (For others)

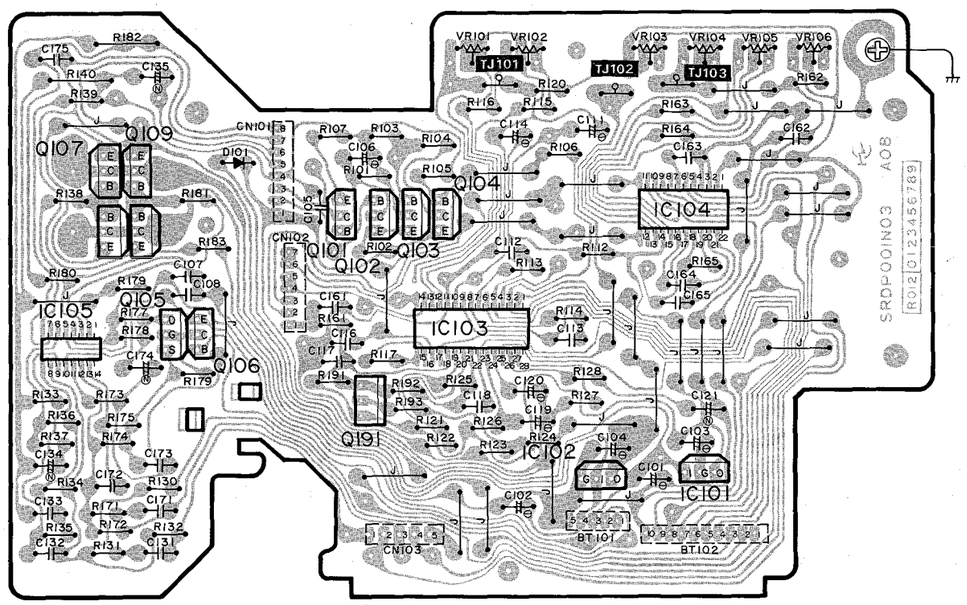




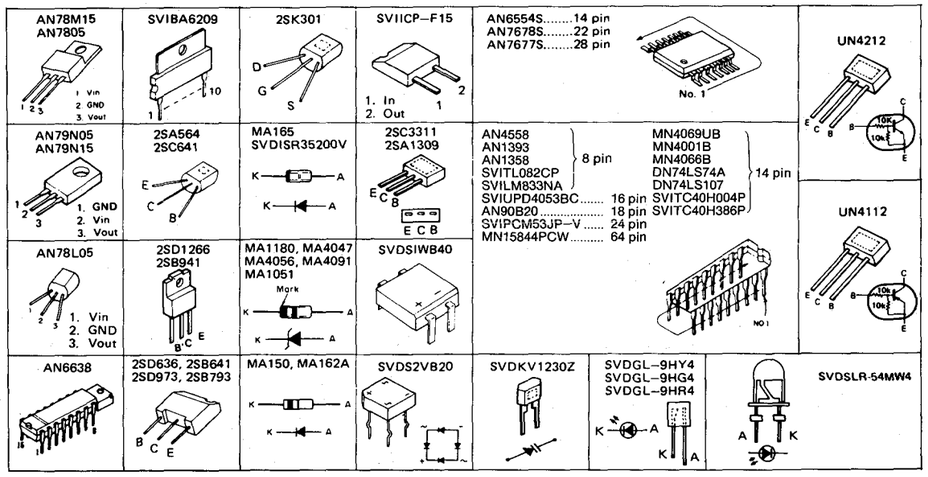
11 (Spindle motor drive coil P.C.B.)



03 (Optical servo P.C.B.)



• Terminal guide of IC's, transistors and diodes

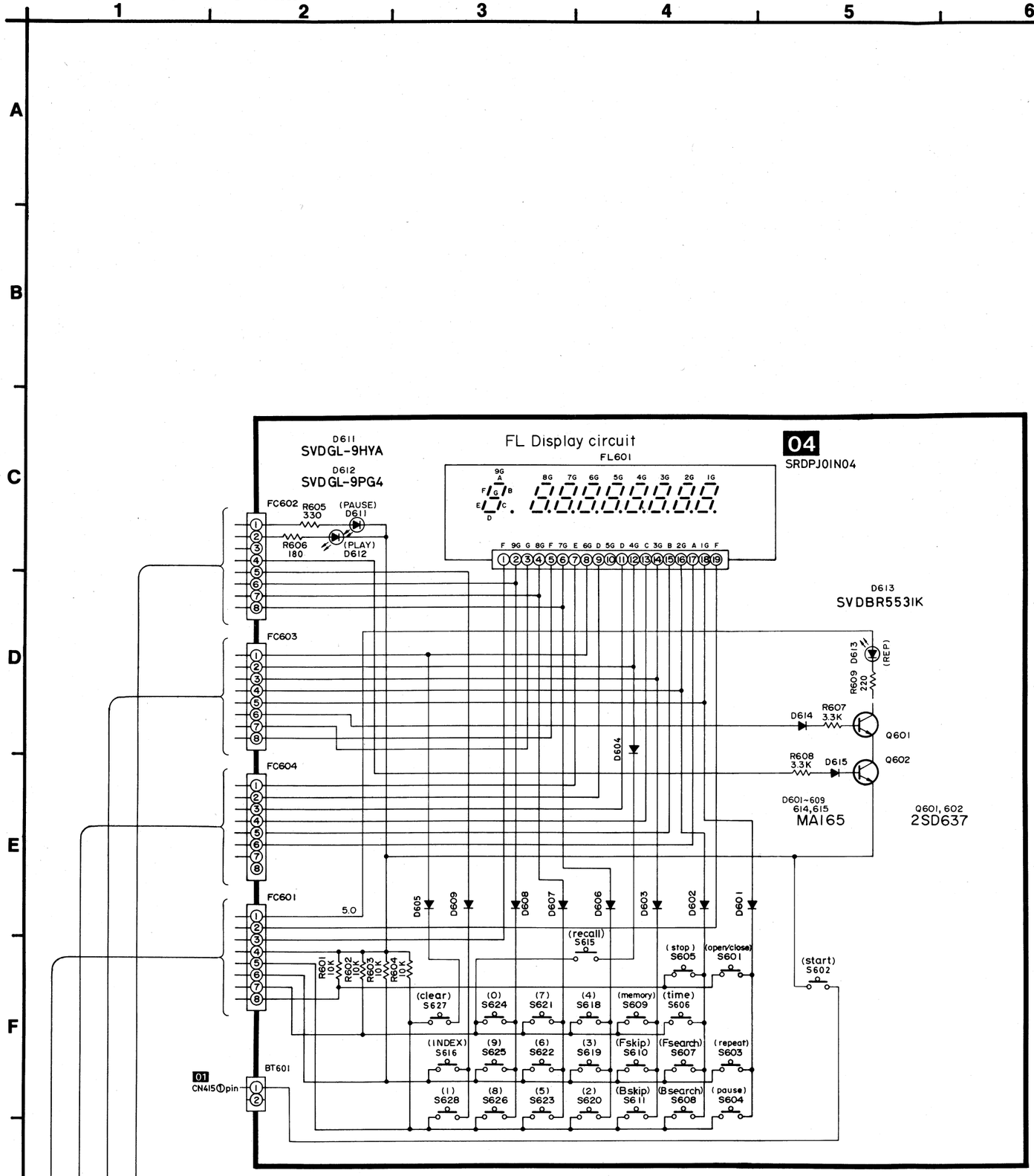


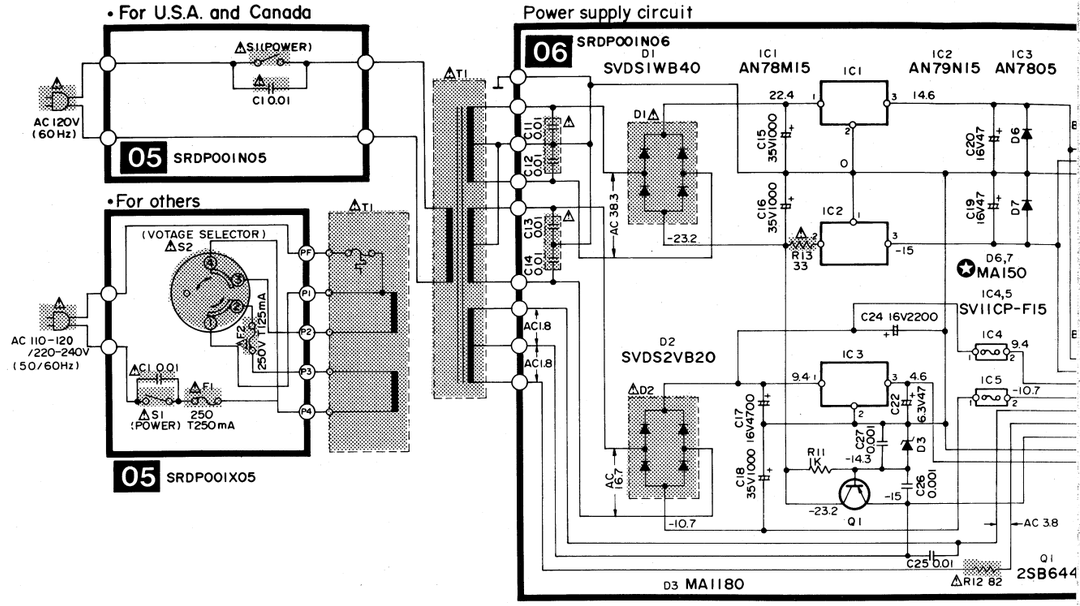
■TERMINAL FUNCTION OF MICRO COMPUTER

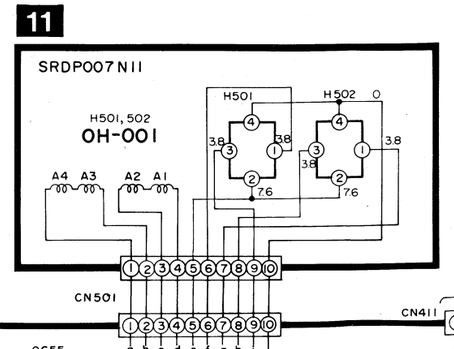
• MN15844PCW

Pin No.	Name of pin	Signal	I/O Devision	Function
1	VSS	——	——	Ground
2	PO0	$\overline{TTON}$	O	Turntable ON/OFF select. (ON at "L")
3	PO1	BREAK	O	Turntable stop command (stop at "L")
4	PO2	ACC	O	Turntable drive command (ON at "H")
5	PO3	FREE	O	CLV servo selection command
6	P10	$\overline{TRON}$	O	Tracking servo ON/OFF select
7	P11	$\overline{THOLD}$	O	Tracking servo ON/OFF select
8	P12	KICKR	O	Kick direction (Reverse) command
9	P13	KICKF	O	Kick direction (Forward) command
10	SYNC	——	——	Not used
11	$\overline{RST}$	——	I	Reset terminal (Micom is reset at "L")
12	$\overline{IRQ}$	$\overline{BLKCK}$	I	Sub-code terminal
13	P50	$\overline{TTSTOP}$	I	Turntable stop command.
14	P51	——	——	Not used
15	P52	$\overline{RFDEL}$	I	RF signal detection, effective at "L"
16	P53	CLOSS	I	Track jump control
17	XI	TCNT	I	Track counter
18	XO	——	——	Not used
19	$\overline{SBT}$	$\overline{CLDCK}$	I	Synchronizing signal extracted from disc
20	$\overline{SB1}$	SUBQ	I	Input for sub-code test from EFM demodulator.
21	$\overline{SB0}$	——	——	Not used
22	P60	TRVE	I	Tracking error signal input terminal
23	P61	——	——	
24	VREF	——	I	Traverse servo standard detection
25	P20	$\overline{STROBE}$	O	Traverse servo standard detection
26	P21	$\overline{LDON}$	O	Laser diode, focus servo ON/OFF
27	P22	REV	O	Traverse Reverse command, effective with "H" pulse
28	P23	FWD	O	Traverse Forward command, effective with "H" pulse
29	P30	——	I	Key scan input
30	P31	——		
31	P32	——		
32	P33	——		
33	P40	ATSB	O	Attenuation ON/OFF, effective at "H"
34	P41	MUTE	O	Muting relay ON/OFF
35	P42	SYNCREC	O	Synchro-recc control
36	P43	EMPH	O	Effective with de-emphasis switch ON/OFF at "H"
37	P70	OPEN	O	Disc holder open command
38	P71	CLOSE	O	Disc holder close command
39	P72	PAUSE	O	Pause indicator display (Light up at "H")
40	P73	PLAY	O	Play indicator display (Light up at "H")
41	DA	11G	O	Display data (Digit) and key matrix data output
42	D9	10G		
43	D8	9G		
44	D7	8G		
45	D6	7G		
46	D5	6G		
47	D4	5G		
48	D3	4G		
49	D2	3G		
50	D1	2G		
51	D0	1G		
52	S8	j	O	Display data (segment) output
53	S7	g		
54	S6	f		
55	S5	e		
56	S4	d		
57	S3	h		
58	S2	c		
59	S1	b		
60	S0	a		
61	VPP	——	I	Power supply
62	OSC2	——	——	Not used
63	OSC1	TTCK	I	Clock (4.32 MHz) input
64	VDD	——	I	Power Supply (+5V)

■ SCHEMATIC DIAGRAM



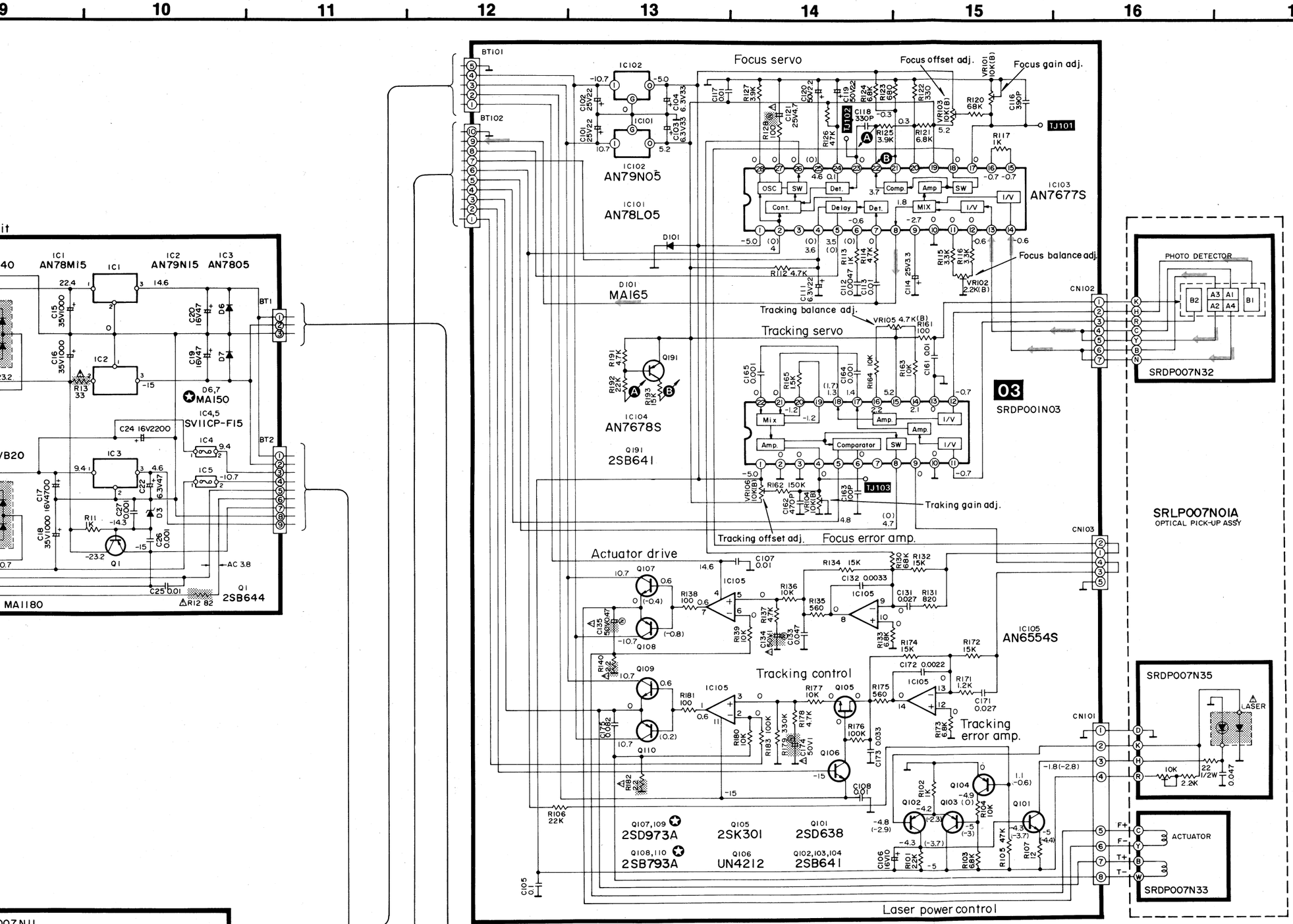




Traverse servo

Loading motor drive

11T Servo



Notes:

1. **S1:** Power switch
2. **S2** Voltage selector switch. (Except for [M], [MC] areas.)
3. **S101** Reset switch. (Disc innermost position detection.)
4. **S102** End switch, (Disc outside detection.)
5. **S103** Disc holder close detection switch.
6. **S104** Disc holder open detection switch.
7. **S601** Disc holder open/close switch.
8. **S602** Play (start) switch.
9. **S603** Repeat switch.
10. **S604** Pause switch.
11. **S605** Stop switch.
12. **S606** Remaining time switch.
13. **S607** Forward search switch.
14. **S608** Backward search switch.
15. **S609** Memory switch.
16. **S610** Forward skip switch.
17. **S611** Backward skip switch.
18. **S615** Recall switch.
19. **S616** Index switch.
20. **S618 ~ S626** Nemeric switch.
21. **S627** Clear switch.
22. **S628** Nemeric (No. 1) switch.
23. This schematic diagram may be modified at any time with the development of new technology.
24. The voltage value, and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
    Accordingly, there may arise some error in the voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing. Others are the voltage values in stop mode.
25. Part No. with ✪ mark are not identical between regular part No. and repair part No. supplied.
    So, when placing an order for repair parts, use the part No. in the replacement part list of repair parts.
26. —— : Positive voltage lines and negative voltage lines.
    ⟹ Audio signal lines
27. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety.

Caution!

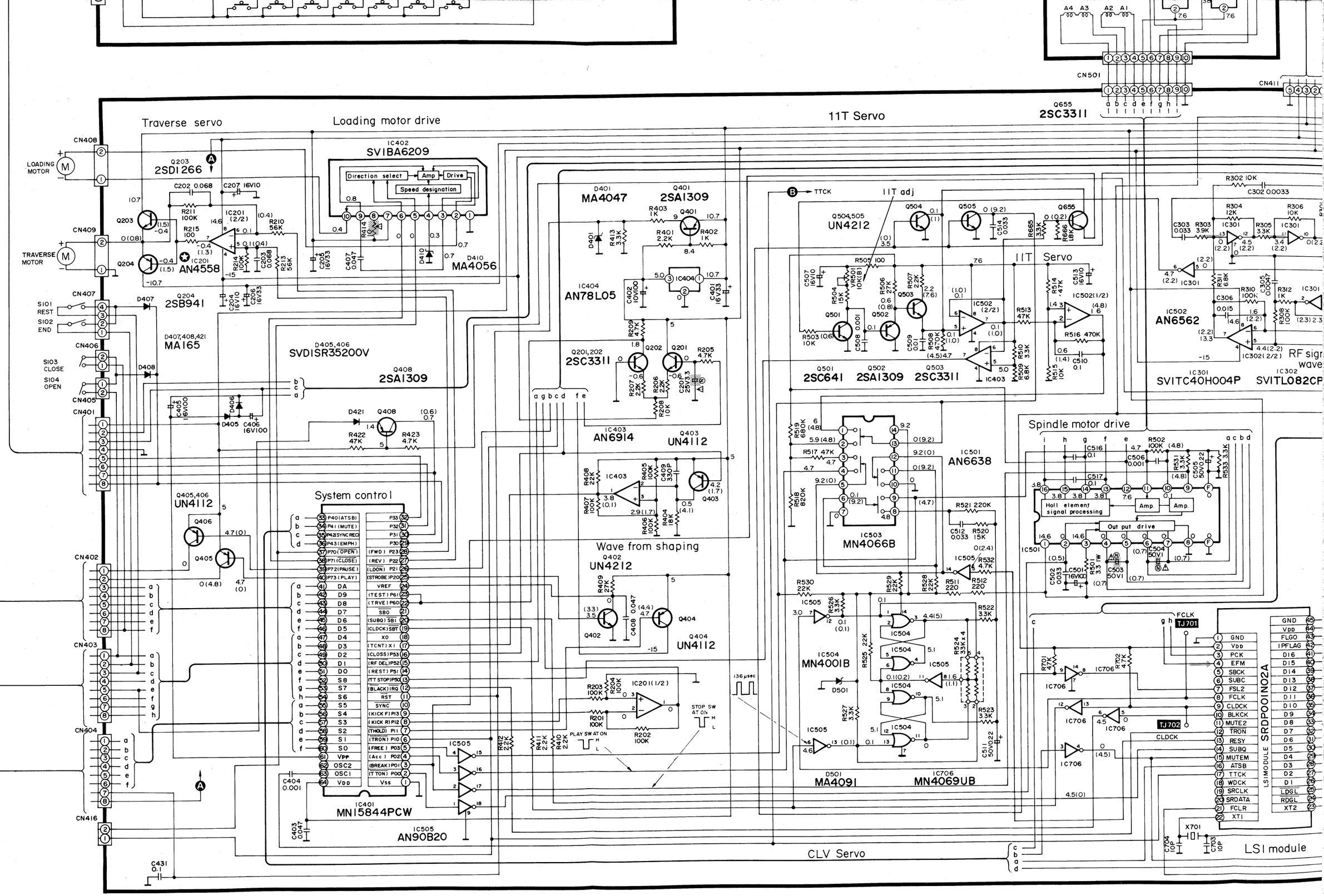
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

- **Product for MC only**



• IC401 MN15844PCW

NO	1	2	3	4	5	6	7	8,9	10	11	12	13	14	15	16	17	18	19	20	21	22,23	24	25	26	27	28	29	30~32	33~35	36~38	39	40	41 ~ 51	52 ~ 60	61	62	63	64
STOP	0	4.8	0.1	0.1	0.1	4.7	4.7	0.1	2.7μsec 4.4Vp-p	1.2	4.7	4.7	4.6	3.6	0.1msec 1V/DIV	0.1msec 0.1msec	0.1msec 1V/DIV	136μsec	0.1msec 1V/DIV	10msec 1V/DIV	1.8	0	3.5	4.0	0.1	0.1	5.7msec	0.7	4.6	0	4.7	4.7	5.6msec		-16	0	0.23μsec (4.32MHz)	5.0
PLAY	0	0	0	0	0	0	4.4	0		1.0	13msec	4.5	4.4	0							1.0	0	3.3	0	0	1.42msec		0.6	0	0	4.5	0			-16	0	3.7Vp-p	5.0

• LSI Module

NO	1	2	3	4	5
STOP	0	4.6	0.23μsec (4.32MHz)	0.5μsec 2V/DIV	C
PLAY	0	4.6			

from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

- **Product for MC only**

FUSE REPLACEMENT

▮▮ symbol located near the fuse indicates fast-operating type. For continued protection against fire hazard, replace with same type fuse. Refer to the symbol for fuse rating.

FUSIBLE REMPLACEMENT

▮▮ Le symbole qui se trouve pres du fusible singifie un fusible à action rapide. Pour une protection continue contre les risques d'incendie, n'utiliser que des fusibles du même type. Se rapporter au symbole pour la valeur des fusibles.

01 SRDP001N31

PLL circuit

IC303 SVITC40H004P

D303 SVDKV1230Z

D301,422 MA165

Q409 UN4212

IC305 DN74LS74A

IC304 SVITC40H386P

IC306 DN74LS107

IC502 AN6562

IC301 SVITC40H004P

IC302 SVITL082CP

RF signal waveform shaping

Except for U.S.A. and Canada

SYNCHRO RECORD

Audio circuit

Deglitch

D801 MA4056

IC801 SVIPCM53JP-V

IC802,805 SVIμPD4053BC

IC803,804,806 SVILM833NA

LSI module

D/A Converter

Muting

D420 MA165

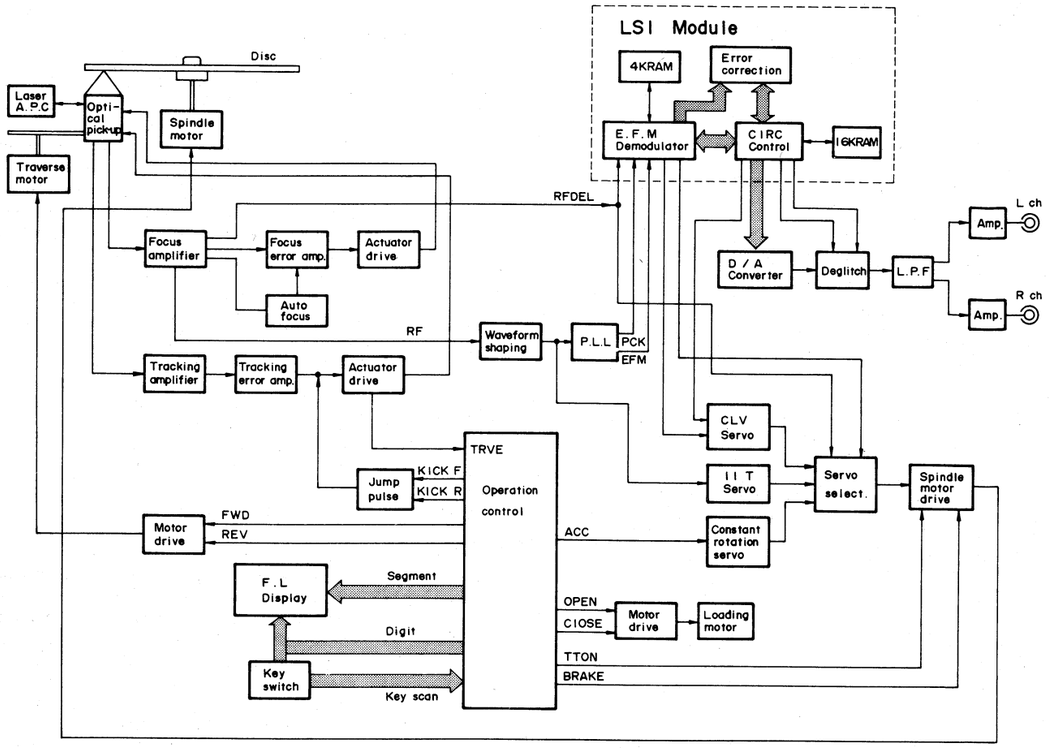
D802 MA4056

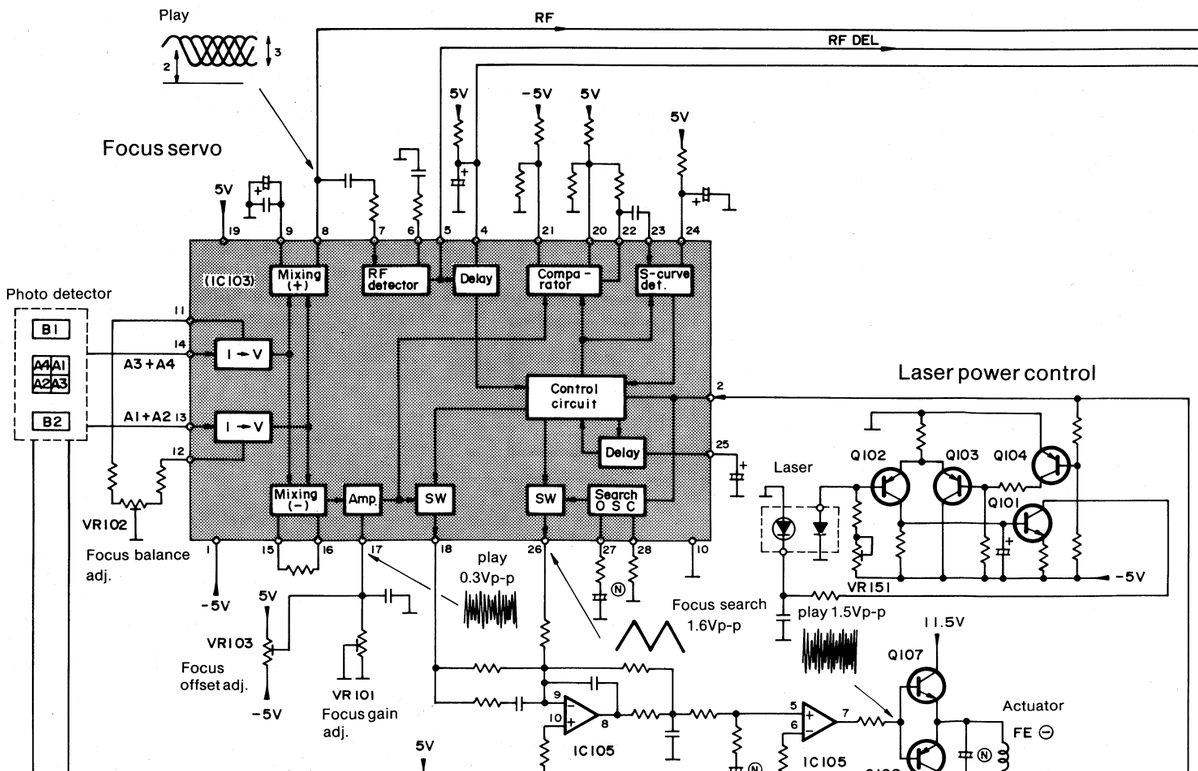
Q407 2SC3311

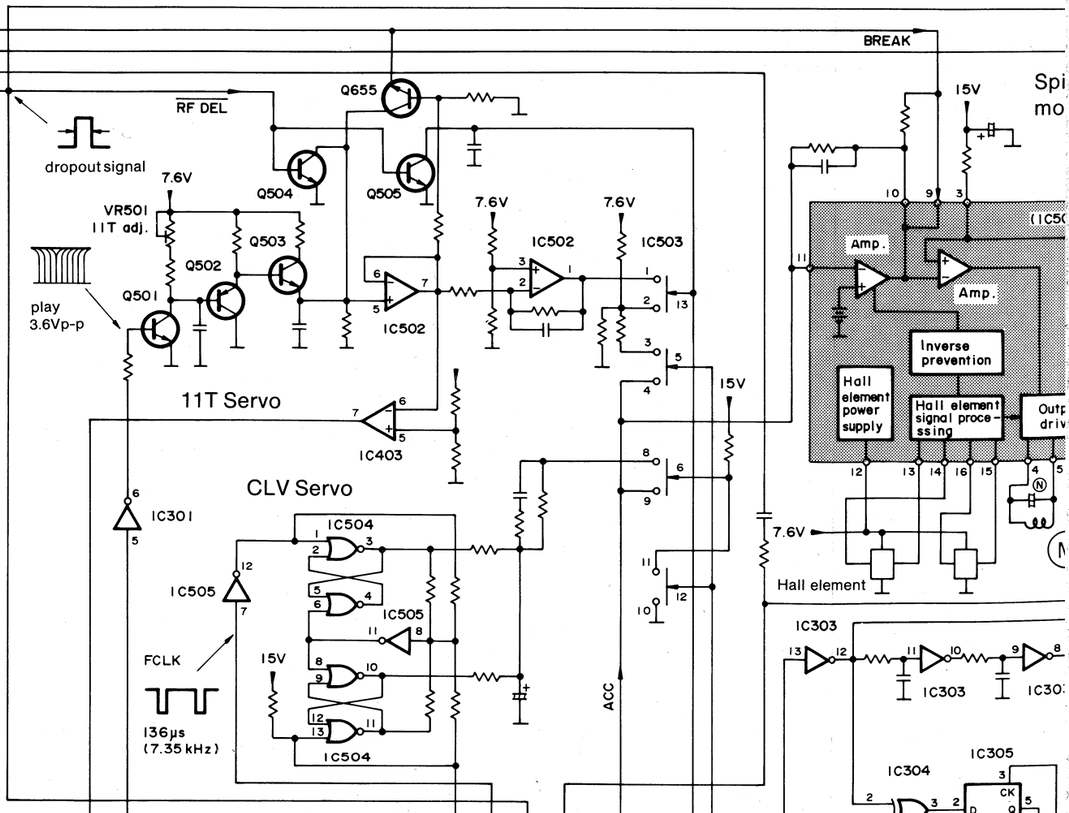
- **LSI Module**

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24,25	26	27	28~41	42	43	44	45
STOP	0	4.6	0.23μsec (4.32MHz)		0	0	0	136μsec (7.35kHz)		0	0	4.7	0		0	4.6	0.23μsec (4.32MHz)	11.6msec	0.46μsec (8.64MHz)	11.6msec	136μsec			22.7μsec	4.4	0	0	4.4	4.4	4.6	0
PLAY	0	4.6		0.5μsec 2V/DIV	0	13.2msec	4.6		136μsec (7.35kHz)	13.2msec	4.6	0	3.1	50μsec 2V/DIV	4.5	0				4.2		3.4Vp-p	0.2μsec DIV		1msec 0.2msec,DIV	4.4	5μsec.DIV	20μsec, DIV	136μsec	4.6	0

■ BLOCK DIAGRAM







■ RESISTORS AND CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics importnat for safety. When replacing any of these components use only manufacturer's specified parts.
3. This "Ⓢ" mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (µF) P = 10^{-6} µF.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERG	1	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	F : ±1%
ERG : Metal Oxide	1 : 1W	J : ±5%
ERX : Metal Film		G : ±2%

ERDS2TJ □□□ ——→ Small type carbon (1/4W)
EROS2TKF □□□ ——→ Small type metal film (1/4W)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage: ECEA Type	Voltage: Others	Tolerance
ECEA : Electrolytic	1A : 10V	1H : 50V DC	J : ±5%
ECKD : Ceramic	1C : 16V	2H : 500V DC	K : ±10%
ECQM : Polyester	1E : 25V	1 : 100V	Z : +80%, −20%
ECCD : Ceramic	1V : 35V	AL: 125V AC	P : +100%, −0%
ECKF : Ceramic	1H : 50V	MY: 125V AC	M : ±20%
	1J : 63V	KC: 400V AC	
	50 : 50V		

s otherwise specified.
sistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ
pacitors are in MICROFARADS (μF) P = 10^{-6}μF.

tor

F
nce Peculiarity

R47 R
Value Special use

Voltage		Tolerance
ECEA Type	Others	
1A : 10V	1H : 50V DC	J : ±5%
1C : 16V	2H : 500V DC	K : ±10%
1E : 25V	1 : 100V	Z : +80%, −20%
1V : 35V	AL: 125V AC	P : +100%, −0%
1H : 50V	MY: 125V AC	M : ±20%
1J : 63V	KC: 400V AC	
50 : 50V		

• RESISTORS

Ref. No.	Part No.	Value
RESISTORS		
R11 Ⓢ	ERD25FJ102	1K
R12 ⚠Ⓢ	ERD25FJ820	82
R13 ⚠Ⓢ	ERD25FJ330	33
R101	ERDS2TJ222	2.2K
R102	ERDS2TJ102	1K
R103	ERDS2TJ682	6.8K
R104	ERDS2TJ103	10K
R105	ERDS2TJ473	47K
R106	ERDS2TJ223	22K
R107	ERDS2TJ120	12
R112	ERDS2TJ472	4.7K
R113	ERDS2TJ102	1K
R114	ERDS2TJ472	4.7K
R115, 116	ERDS2TJ332	3.3K
R117	ERDS2TJ102	1K
R120	ERDS2TJ683	68K
R121	ERDS2TJ682	6.8K
R122	ERDS2TJ331	330
R123	ERDS2TJ681	680
R124	ERDS2TJ682	6.8K
R125	ERDS2TJ392	3.9K
R126	ERDS2TJ473	47K
R127	ERDS2TJ392	3.9K
R128	ERDS2TJ101	100
R130	ERDS2TJ683	68K
R131	ERDS2TJ821	820
R132	ERDS2TJ153	15K
R133	ERDS2TJ682	6.8K
R134	ERDS2TJ153	15K
R135	ERDS2TJ561	560
R136	ERDS2TJ103	10K
R137	ERDS2TJ472	4.7K
R138	ERDS2TJ101	100
R139	ERDS2TJ103	10K
R140 ⚠Ⓢ	ERD25FJ2R2	2.2
R161	ERDS2TJ101	100
R162	ERDS2TJ154	150K
R163, 164	ERDS2TJ103	10K
R165	ERDS2TJ152	1.5K
R171	ERDS2TJ122	1.2K

Ref. No.	Part No.	Value
R172	ERDS2TJ153	15K
R173	ERDS2TJ682	6.8K
R174	ERDS2TJ153	15K
R175	ERDS2TJ561	560
R176	ERDS2TJ104	100K
R177	ERDS2TJ103	10K
R178	ERDS2TJ472	4.7K
R179	ERDS2TJ334	330K
R180	ERDS2TJ103	10K
R181	ERDS2TJ101	100
R182 ⚠Ⓢ	ERD25FJ2R2	2.2
R183	ERDS2TJ104	100K
R191	ERDS2TJ472	4.7K
R192	ERDS2TJ223	22K
R193	ERDS2TJ153	15K
R201, 202	ERDS2TJ104	100K
R203, 204	ERDS2TJ104	100K
R205	ERDS2TJ472	4.7K
R206, 207	ERDS2TJ222	2.2K
R208	ERDS2TJ103	10K
R209	ERDS2TJ472	4.7K
R210	ERDS2TJ563	56K
R211	ERDS2TJ104	100K
R213	ERDS2TJ563	56K
R214	ERDS2TJ104	100K
R215	ERDS2TJ101	100
R301	ERDS2TJ560	56
R302	ERDS2TJ103	10K
R303	ERDS2TJ392	3.9K
R304	ERDS2TJ123	12K
R305	ERDS2TJ332	3.3K
R306	ERDS2TJ103	10K
R307	ERDS2TJ472	4.7K
R308	ERDS2TJ104	100K
R309	ERDS2TJ472	4.7K
R310	ERDS2TJ104	100K
R311	ERDS2TJ682	6.8K
R312	ERDS2TJ102	1K
R314, 315	ERDS2TJ102	1K
R316	ERDS2TJ103	10K
R317	ERD25TJ473	47K

Ref. No.	Part No.	Value
R318	ERDS2TJ182	1.8K
R319	ERDS2TJ103	10K
R320	ERDS2TJ473	47K
R321	ERDS2TJ182	1.8K
R323	ERDS2TJ222	2.2K
R324	ERDS2TJ183	18K
R325, 326	ERDS2TJ222	2.2K
R401	ERDS2TJ222	2.2K
R402, 403	ERDS2TJ102	1K
R404	ERDS2TJ183	18K
R405, 406	ERDS2TJ104	100K
R407	ERDS2TJ104	100K
R408	ERDS2TJ223	22K
R409	ERDS2TJ273	27K
R410, 411	ERDS2TJ222	2.2K
R412	ERDS2TJ222	2.2K
R413	ERDS2TJ332	3.3K
R414 ⚠Ⓢ	ERD25FJ100	10
R421	ERDS2TJ103	10K
R422	ERDS2TJ473	47K
R423	ERDS2TJ472	4.7K
R501 Ⓢ	ERX1ANJ3R3	3.3
R502	ERDS2TJ104	100K
R503	ERDS2TJ103	10K
R504	ERDS2TJ153	15K
R505	ERDS2TJ101	100
R506	ERDS2TJ273	27K
R507	ERDS2TJ222	2.2K
R508	ERDS2TJ474	470K
R509	ERDS2TJ682	6.8K
R510	ERDS2TJ332	3.3K
R511, 512	ERDS2TJ221	220
R513, 514	ERDS2TJ473	47K
R515	ERDS2TJ103	10K
R516	ERDS2TJ474	470K
R517	ERDS2TJ473	47K
R518	ERDS2TJ824	820K
R519	ERDS2TJ684	680K
R520	ERDS2TJ153	15K
R521	ERDS2TJ224	220K
R522, 523	ERDS2TJ332	3.3K

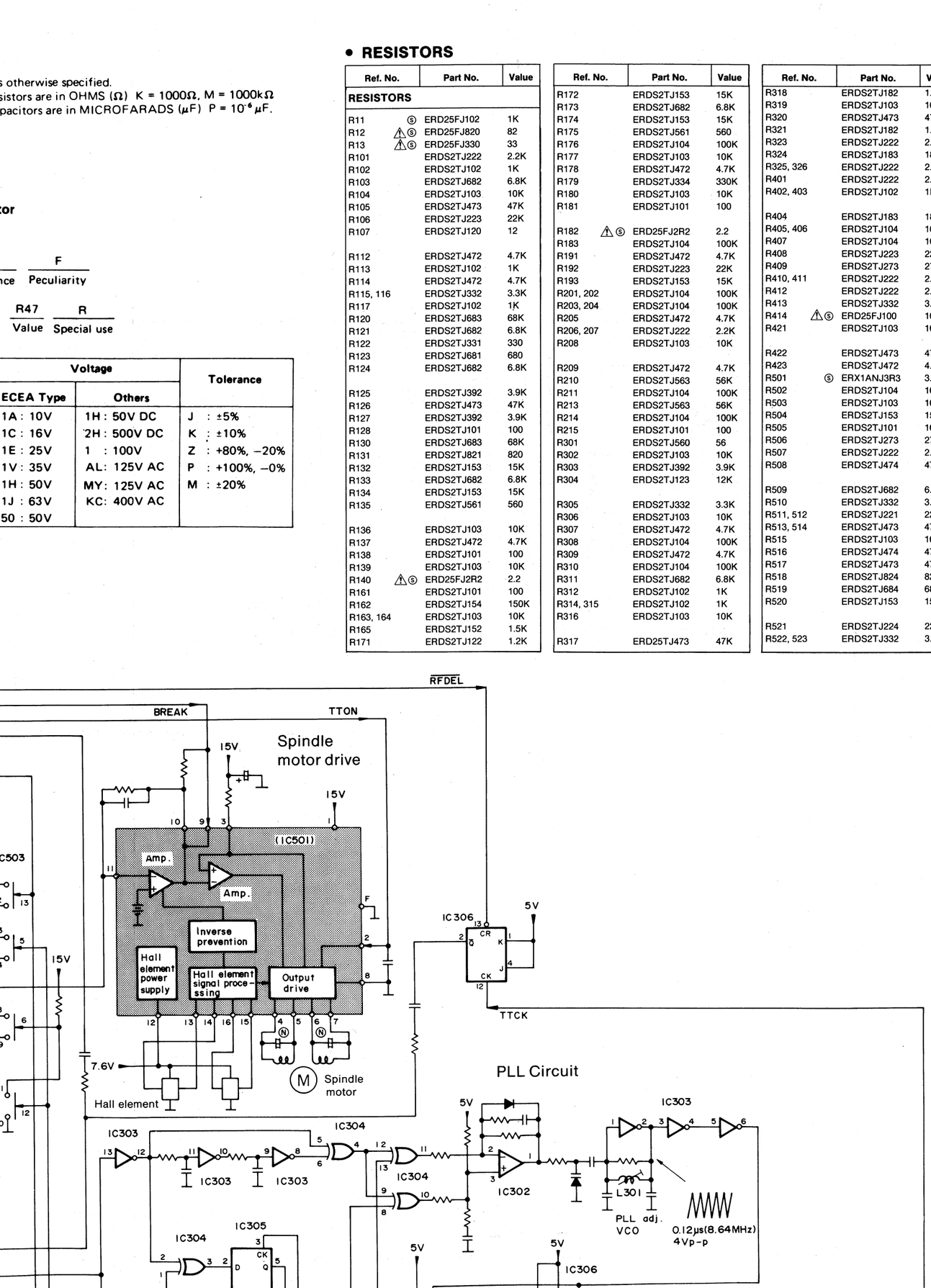
Ref. No.	Part No.	Value
R525	ERDS2TJ223	22K
R526, 527	ERDS2TJ332	3.3K
R528, 529	ERDS2TJ223	22K
R530	ERDS2TJ223	22K
R531	ERDS2TJ332	3.3K
R532	ERDS2TJ472	4.7K
R533	ERDS2TJ332	3.3K
R601, 602	ERDS2TJ103	10K
R603, 604	ERDS2TJ103	10K
R605	ERDS2TJ331	330
R606	ERDS2TJ181	180
R607, 608	ERDS2TJ332	3.3K
R609	ERDS2TJ221	220
R665	ERDS2TJ332	3.3K
R666	ERDS2TJ182	1.8K
R701, 702	ERDS2TJ472	4.7K
R801	ERDS2TJ102	1K
R802	ERDS2TJ222	2.2K
R803	ERDS2TJ682	6.8K
R804	ERDS2TJ222	2.2K
R813	ERDS2TJ561	560
R815	ERDS2TJ682	6.8K
R816	ERDS2TJ222	2.2K
R822	ERDS2TJ561	560

• CAPACITORS

Ref. No.	Part No.	Value
CAPACITORS		
C1 ⚠	ECKDKC103PF	0.01
C15, 16	ECEA1VU102	1000
C17	ECEA1CU472	4700
C18	ECEA1VU102	1000
C19, 20	ECEA1CU470	47
C22	ECEA0JU470	47
C24	ECEA1CU222	2200
C25	ECKD1H102KB	0.001
C26	ECKD1H102ZF	0.001
C27	ECKD1H103ZF	0.01
C101, 102	ECEA1EK220	22
C103, 104	ECEA0JK330	33
C105	ECQM1H104KV	0.1
C106	ECEA1CK100	10
C107, 108	ECKD1H103ZF	0.01
C111	ECEA0JK220	22
C112	ECKD1H472KB	0.0047
C113	RCBC1C103NYY	0.01
C114	ECEA1EK3R3	3.3
C116	ECQM1H332KV	0.0033
C117	ECKD1H103ZF	0.01
C118	ECKD1H331KB	330P
C119, 120	ECEA1HK2R2	2.2
C121 ⚠	ECEA1CN100S	10
C131	ECQM1H273KV	0.027
C132	ECQM1H332KV	0.0033
C133	ECQM1H473KV	0.047
C134 ⚠	ECEA1HN010S	1
C135 ⚠	ECEA1HNR47S	0.47
C161	ECKD1H103ZF	0.01
C162	ECKD1H471KB	470P
C163	ECKD1H101KB	100P
C164, 165	ECBS1H102KB	0.001
C171	ECQM1H273KV	0.027
C172	ECQM1H222KV	0.0022
C173	ECQM1H333KV	0.033
C174 ⚠	ECEA1HN010S	1
C175	ECQM1H823KV	0.082
C201 ⚠	ECEA1EN3R3	3.3
C202, 203	ECQM1H683KV	0.068

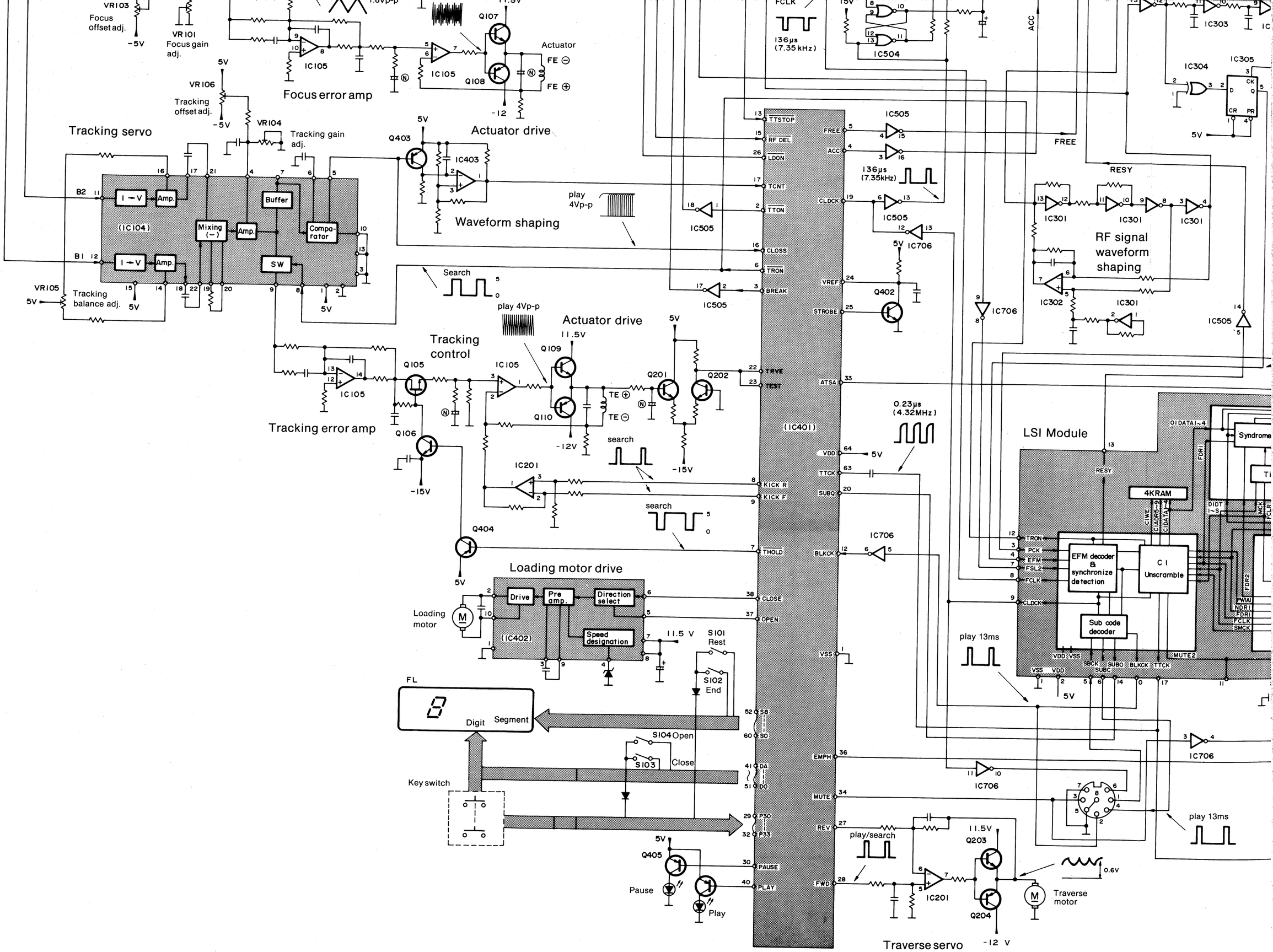
Ref. No.	Part No.	Value
C204	ECEA1CU100	10
C205, 206	ECEA1CU330	33
C207	ECEA1CU100	10
C301	ECEA1CU100	10
C302	ECKD1H332KV	0.0033
C303	ECQM1H333KV	0.033
C304	ECQM1H153KV	0.015
C305	ECKD1H472KB	0.0047
C306	ECQM1H153KV	0.015
C307	ECKD1H473ZV	0.047
C308, 309	ECCD1H470JC	47P
C310, 311	ECQM1H223KV	0.022
C312	ECQM1H472KV	0.0047
C313	ECCD1H270JU	27P
C314	ECCD1H680JU	68P
C315	ECQM1H102KV	0.001
C401	ECEA1CU330	33
C402	ECEA1AU101	100
C403	ECKD1H473ZV	0.047
C404	ECKD1H102KV	0.001
C405, 406	ECEA1CU101	100
C407	ECKD1H473ZV	0.047
C408	ECQM1H473KV	0.047
C409	ECKD1H331KB	330P
C420	ECKD1H102KB	0.001
C431	ECFR1H104ZF	0.1
C501	ECEA1CU101	100
C502	ECKD1H333ZF	0.033
C503, 504 ⚠	ECEA1HN010	1
C505	ECEA1HUR22	0.22
C506	ECKD1H102KB	0.001
C507	ECEA1CU100	10
C508	ECQM1H102KV	0.001
C509	ECQM1H103KV	0.01
C510	ECQM1H104KV	0.1
C511	ECEA1HUR22	0.22
C512	ECQM1H333KV	0.033
C513	ECEA1CU100	10
C514	ECQM1H333KV	0.033
C516, 517	ECFF1H104ZF	0.1
C701, 702	ECKD1H473ZV	0.047

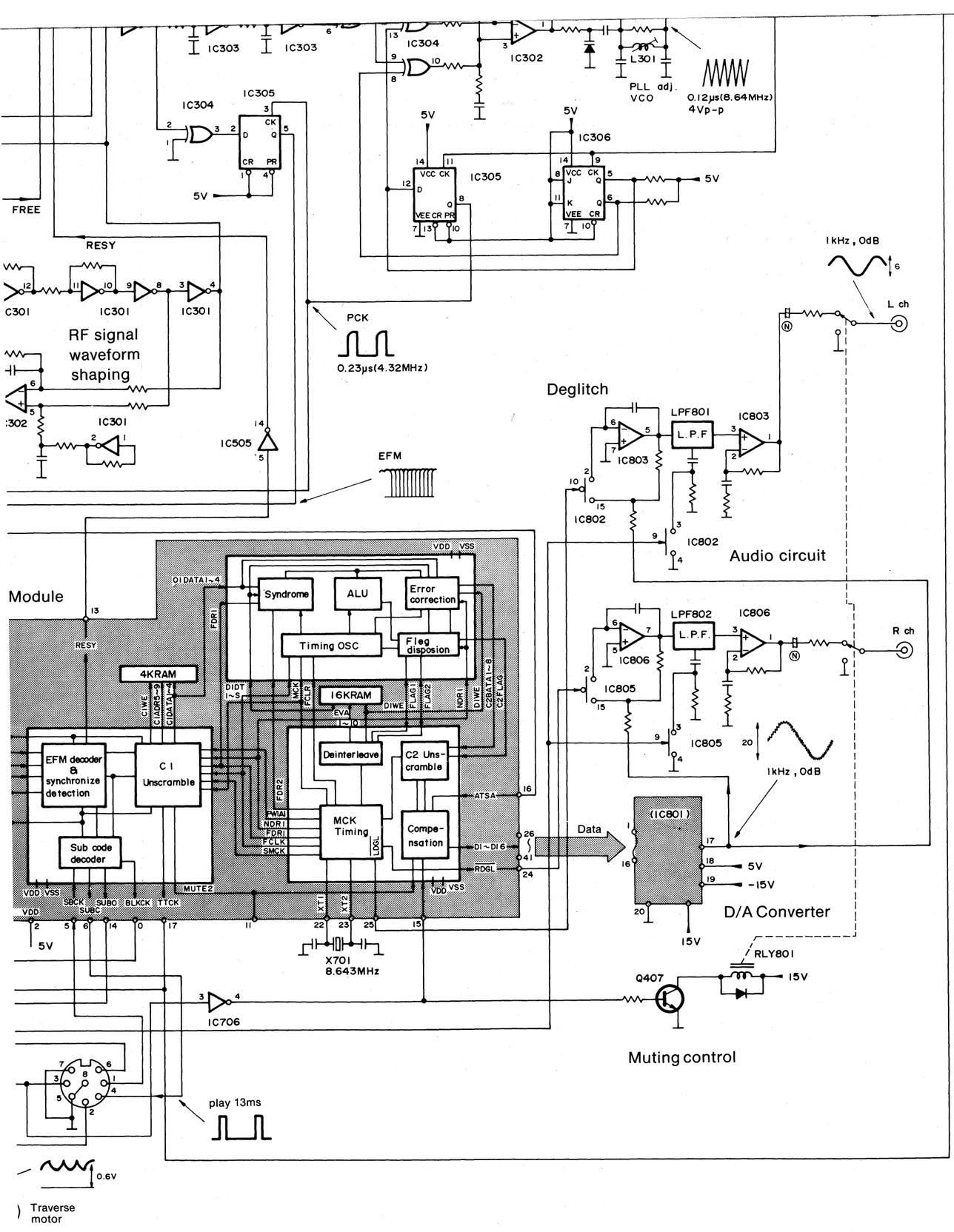
Ref. No.	Part No.	Value
C703, 704	ECCD1H100D	10P
C801, 802	ECEA1CU470	47
C804	ECKD1H471KB	470P
C805	ECQM1H103KV	0.01
C808 ⚠	ECEA1CN101S	100
C810	ECKD1H471KB	470P
C811	ECQM1H103KV	0.01
C813 ⚠	ECEA1CN101S	100
C815, 816	ECFR1H104ZF	0.1
C817, 818	ECEA1EU3R3	3.3
C819, 820	ECFF1H104ZF	0.1



SL-PJ1

■ PACKING

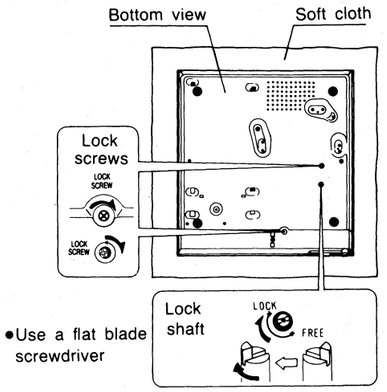

VR103
Focus offset adj.
-5V
VR101
Focus gain adj.
IC105
Focus error amp
Q107
Q108
Actuator
FE ⊖
FE ⊕
-12
VR106
Tracking offset adj.
5V
-5V
VR104
Tracking gain adj.
Tracking servo
Actuator drive
Q403
IC403
Waveform shaping
play 4Vp-p
B2
B1
I→V
Amp.
(IC104)
Mixing (−)
Buffer
Comparator
SW
VR105
Tracking balance adj.
Search
Tracking control
Tracking error amp
Q105
Q106
Q109
Q110
Q201
Q202
-12V
-15V
IC201
TE ⊕
TE ⊖
Q404
Loading motor drive
Drive
Pre amp.
Direction select
Speed designation
(IC402)
Loading motor
11.5 V
S101 Rest
S102 End
S103 Close
S104 Open
Key switch
FL
Digit
Segment
Pause
Play
Q405
TTSTOP
RF DEL
LDON
TCNT
TTON
CLOSS
TRON
BREAK
FREE
ACC
CLDCK
VREF
STROBE
TRVE
TEST
ATSA
(IC401)
VDD
TTCK
SUBQ
KICK R
KICK F
THOLD
BLKCK
VSS
CLOSE
OPEN
SBCK
SUBC
SQ
DA
DO
EMPH
MUTE
REV
PLAY
PAUSE
FWD
FCLK
136µs (7.35kHz)
IC504
IC505
IC706
Q402
RESY
RF signal waveform shaping
IC301
IC302
IC303
IC304
IC305
0.23µs (4.32MHz)
LSI Module
4KRAM
EFM decoder & synchronize detection
C1 Unscramble
Sub code decoder
Syndrome
play 13ms
play/search
Traverse motor
Q203
Q204
IC201
0.6V
Traverse servo
-12 V



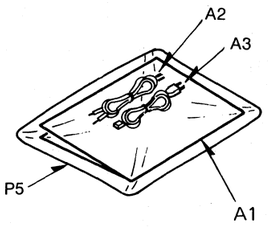
SL-PJ1

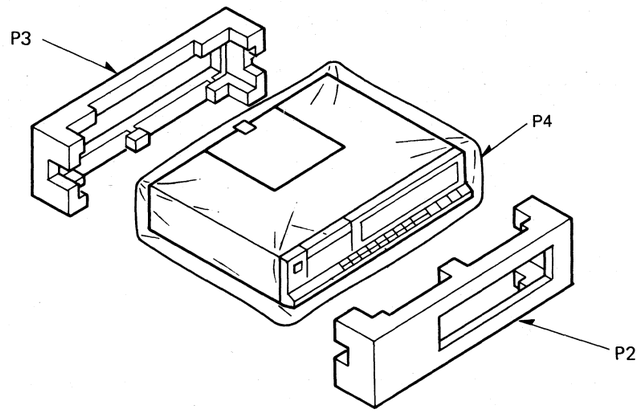
■ PACKING

1. Put a soft cloth under the unit to protect it from scrathes.
2. Turn the lock shaft 180° clockwise.
3. Turn the lock screws (about 5 to 6 times) clockwise.

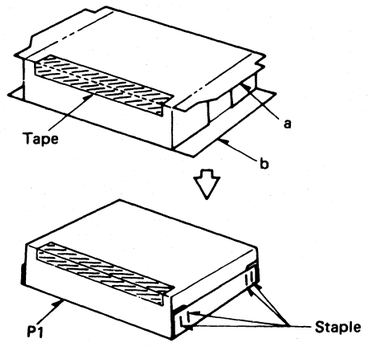


●Use a flat blade screwdriver

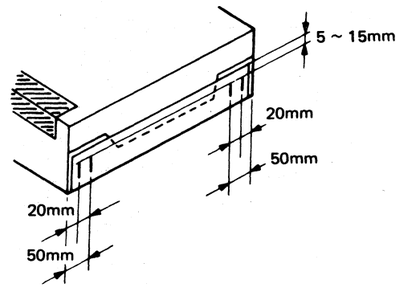




4. Plase the unit (with cushions attached, as illustrated.
5. Fold the flaps according to the line marks.
6. Seal the top with adhesive tape.
   * Use gum tape or adhesive cloth tape of 50mm wide at least.
7. For the edges, first fold the flap "a" and then flap "b", and staple. Remember to staple only flap "b". (Use 15 or 16mm staple)



* Stapling positions are shown below.



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ORDER NO. HAD85042480C0-A

SL-PJ1

Compact Disc Player

- This booklet contains the specifications and adjusting procedures for SL-PJ1, written in German, French and Spanish.
- File this manual together with the SL-PJ1 service manual (Order No. HAD85042480C0).

- Das vorliegende Büchlein enthält die technische Daten und Justierverfahren für den SL-PJ1 in deutscher, französischer und spanischer Sprache.
- Bewahren Sie das Büchlein zusammen mit der Bedienungsanleitung für den SL-PJ1 auf (Bestell-Nr, HAD85042480C0).

- Cette brochure contient les spécifications et les procédures de mises au point pour le SL-PJ1, écrites en allemand, en français et en espagnol.
- Classer ce manuel en même temps qu'avec le manuel de service du SL-PJ1 (N° d'order: HAD85042480C0).

- Este librito contiene la especificaciones y procedimientos de ajuste para SL-PJ1, escritos en alemán, francés y español.
- Guardar este manual juntamente con el manual de servico de SL-PJ1 (Pedido N°. HAD85042480C0).

DEUTSCH

■ TECHNISCHE DATEN

(Die technischen Daten können infolge von Verbesserungen ohne Ankündigung geändert werden.)

■ Audio

Kanalanzahl:	2 (links und rechts, Stereo)
Frequenzgang:	4–20 000 Hz±0,5 dB
Dynamikbereich:	mehr als 96 dB
Rauschabstand:	mehr als 96 dB
Klirrverzerrung:	0,002% (1 kHz; 0 dB)
Totalklirrverzerrung:	weniger als 0,004% (1 kHz, 0 dB)
Kanaltrennung:	mehr als 100 dB
Gleichlaufschwankungen:	unterhalb Messbarkeit

■ Signalgröße

Probefrequenz:	44,1 kHz
Korrektionssystem:	Technics Super Decoding Algorythm
D-A Umwandlung:	16-Bit linear

■ Tonabnehmer

Typ:	Astigma 3-Bündel
Lichtquelle:	Halbleiterlaser
Wellenlänge:	800 nm

■ Funktionen

Eigenschaften:	Autom. Abspielen, Spur- und Indexbestimmung, Programmabspiel (15-Spur-Speicher), Vorwärts- und Rückwärtssprung, Vowärts- und Rückwärtssuche, Wiederholtes Abspielen, A–B Wiederholung, Musikübersicht
Anzeigefunktionen:	(Digitalanzeige) Spuranzahl, Gesamtspieldauer (Min., Sek.), gespielt werdende Spur, verstrichene Abspielzeit, Indexnummer, verbleibende Abspielzeit
Disc-Einlegung:	Motorangetriebener, horizontaler Typ
Kopfhörer-Ausgangspegel:	Max. 80 mW (einstellbar), 32Ω

■ Allgemeines

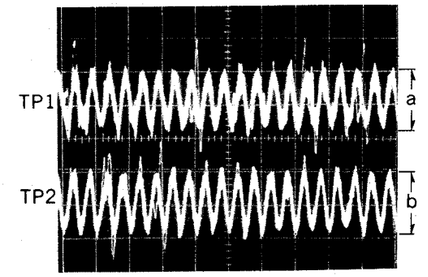
Stromversorgung:	~110–127/220–240 V, 50/60 Hz
Strombedarf:	30 W
Ausgangsspannung:	2 V (bei 0 dB)
Ausgangsimpedanz:	330Ω
Lastimpedanz:	mehr als 5 kΩ
Abmessungen (B×T×H)	31,5×33,4×8,2 cm (Wenn Disc-Halter offen ist 45,9 cm (T)
Gewicht:	4,8 kg

DEUTSCH

■ MESSUNGEN UND JUSTIERUNGEN

1. Justierung der Fokus-Verstärkung

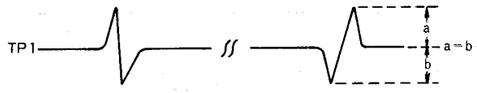
1. Die Verstärkungs-Justiervorrichtung mit Umschaltanschluß an das Gerät anschließen.
   Rot. . . . . Kurzschlußbrücke (+15V) neben Stift 13 von IC301 auf der 01-Platine.
   Blau . . . . . Kurzschlußbrücke (–15V) neben Stift 12 von IC301 auf der 01-Platine.
   Grün . . . . . Chassis
   Steckverbindung . . . . Den kurzen Stift von CN103 auf der 03-Platine herausziehen und den Umschaltanschluß am die Justiervorrichtung anschließen; dann den Anschluß (5P) vom Umschaltanschluß an CN103 anschließen.



2. Den Niederfrequenz-Oszillator auf eine Frequenz von 750Hz und 150 mVss Ausgangsspannung einstellen und TEST pin OSC IN und GND der Justiereinheit anschließen.
3. Kanal 1 und Kanal 2 des Oszilloskops an TP1 und TP2 der Justiereinheit anschließen. (TP3 ist Masse.)
   Einstellungen am Oszilloskop:
   VOLT. . . . . .100 mV (beide Kanäle), SWEEP . . . . . .2 ms, Input. . . . . AC (Wechselspannung)
4. Den Netzschalter der Justiereinheit einschalten und den Drehschalter der Justiereinheit auf "1" stellen; danach eine Platte auflegen.
5. Den Netzschalter einschalten. Wenn der Plattenteller sich zu drehen beginnt, erscheint 750Hz-Signal auf dem Oszilloskop. Dann VR101 so einstellen, daß die Wellenform beider Kanäle gleich ist.

2. Justierung der Fokus-Balance

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" eistellen; danach den Eingangsanschluß vom Oszillator trennen.
2. TJ102 auf der 03-Platine mit einem Klemmenkabel an Masse anschließen.
3. Anschluß CN501 auf der 01-Platine herausziehen.
4. Oszilloskop an TP1 auf 03-Platine anschließen und Platte auflegen.
   Anmerkung: TP1 befindet sich zwischen VR102 und VR103.
   Einstellungen am Oszilloskop:
   VOLT. . . . . .200 mV, SWEEP. . . . . 5 ms, Input. . . . . Wechselspannung
5. Den Netzschalter einschalten. Wenn der Laser aufleuchtet, erscheint eine S-förmige Wellenform auf dem Oszilloskop. VR102 dann so einstellen, daß die untere und obere Spitze der Wellenform gleich sind.



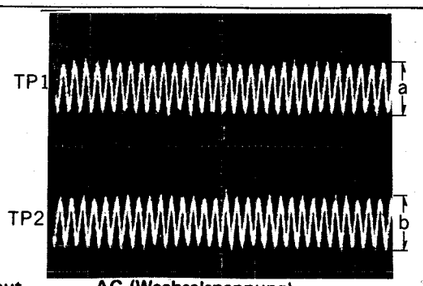
   Anmerkung: Die oben erwähnte S-förmige Wellenform dauert ca. 2 Minuten lang an, wenn Stift 7 von CN412 an Masse angeschlossen wird, während LD leuchtet, da die LD nach 5 ~6 Sekunden stoppt.
6. Nach erfolgter Justierung ist das Klemmenkabel und CN501 wieder in den ursprünglichen Zustand zu versetzen.

3. Justierung der Fokus-Abweichung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" stellen.
2. Das Gerät auf Auswurf (Eject) schalten.
3. Ein veränderliches Voltmeter an TJ101 auf der 03-Platine anschließen.
4. Den Netzschalter einschalten und VR103 so einstellen, daß die Gleichspannung des Voltmeters 0 ± 10 mV beträgt.

4. Justierung der Spurlage-Verstärkung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "3" stellen.
2. Den Niederfrequenz-Oszillator auf 1,5 kHz und 150 mVss Ausgangsleistung einstellen, und ihn dann an TEST pin OSC IN und GND (Masse) der Justiereinheit anschließen.
3. Kanal 1 und Kanal 2 des Oszilloskops an TEST pin TP1 und TP2 der Justiereinheit anschließen.
   (TP3 ist Masse.)
   Einstellungen am Oszilloskop:
   VOLT. . . . . 100 mV (beide Kanäle), SWEEP. . . . . 2 ms, Input . . . . . AC (Wechselspannung)



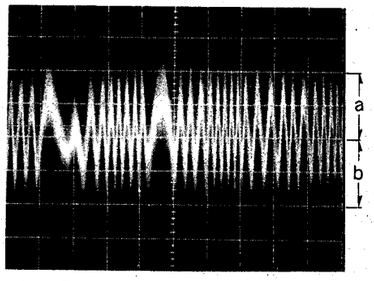
4. Den Netzschalter einschalten. Wenn der Plattenteller sich zu drehen beginnt, erscheint 1,5 kHz-Signal auf dem Oszilloskop. Danach VR104 so einstellen, daß die Wellenform-Amplituden beider Kanäle identisch sind.

5. Provisorische Justierung der Spurlage-Abweichung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" einstellen; den Eingangsanschluß vom Oszillator trennen.
2. Das Gerät auf Plattenauswurf (Eject) schalten.
3. Ein veränderliches Voltmeter an TJ103 auf der 03-Platine anschließen.
4. Den Netzschalter einschalten und VR106 so einstellen, daß die Gleichspannung des Voltmeters 0 ± 3 mV beträgt.

6. Justierung der Spurlage-Balance

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" einstellen.
2. Das Oszilloskop an TJ103 auf der 03-Platine anschließen und dann eine Platte auflegen.
   Einstellungen am Oszilloskop:
   VOLT. . . . . .200 mV
   SWEEP . . . . . .5 ms
   Input . . . . . .DC (Gleichspannung)



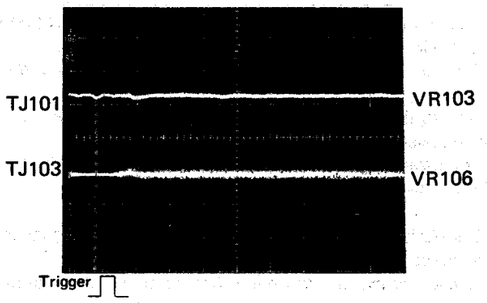
3. Den Netzschalter einschalten. Wenn der Plattenteller sich zu drehen beginnt, und der Spurlage-Servo-Schalter (Tracking Servo) der Justiereinheit sich in der OFF-Position befindet, erscheint das TE-Signal (Tracking Error = Spurlagefehler) auf dem Oszilloskop. VR105 dann so einstellen, daß die oberen und unteren Spitzenwerte gleich sind.

7. Justierung der Spurlage-Abweichung

1. Den Netzschalter der Justiereinheit einschalten und den Drehschalter auf "2" einstellen.
2. Das Gerät auf Plattensuswurf (Eject) schalten.
3. Ein veränderliches Voltmeter an TJ103 auf der 03-Platine anschließen.
4. Den Netzschalter einschalten und VR106 so einstellen, daß die Gleichspannung des Voltmeters 0 ± 3 mV beträgt.
   Anmerkung: Nach obiger Justierung ist die Verstärkungs-Justiereinheit zu entfernen, und CN103 ist so anzuschließen, daß der Originalzustand des Gerätes wiederhergestellt wird.

8. Offset-Justierung des Signalausfalls

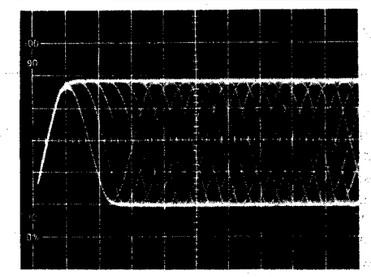
1. Das Oszilloskop an die nachstehenden Punkte anschließen.
   CH1 (Kanal 1) TJ101 (03-Platine)
   CH2 (Kanal 2) TP103 (03-Platine)
   EXT. TJ401 (01-Platine)
   Einstellungen am Oszilloskop:
   VOLT. . . . . 1V (beide Kanäle)
   SWEEP . . . . . .0,5 ms
   Trigger . . . . . .EXT. NORM



2. Programm 13 (0,5 mm-großer schwarzer Punkt) auf der Testplatte abspielen.
3. Die Wellenform von CH1 auf dem Oszilloskop beobachten und VR103 so einstellen, daß die Wellenform-Amplitude nahe dem Triggerpunkt auf ein Mindestmaß reduziert wird.
   Falls sie nicht auf ein Mindestmaß reduziert wird, so einstellen, daß Unter- und Oberteil der Wellenform beinahe symmetrisch sind.
4. Die Wellenform von CH2 auf dem Oszilloskop beobachten und VR106 so einstellen, daß die Wellenform-Amplitude nahe dem Triggerpunkt auf ein Mindestmaß reduziert wird. Falls sie nicht auf ein Mindestmaß reduziert wird, so einstellen, daß Unter- und Oberteil der Wellenform beinahe Symmetrisch sind.

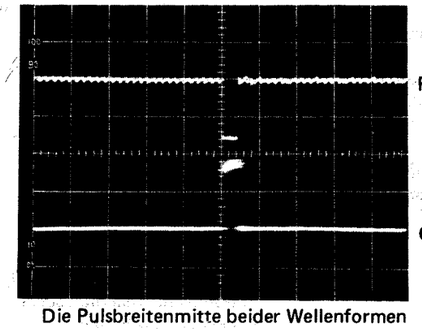
9. Justierung auf "bestes Auge"

1. HF-Signal auf dem Oszilloskop beobachten.
2. Das Oszilloskop an die nachstehenden Punkte anschließen
   CH1 (Kanal 1) ⊕ TJ402 (01-Platine)
   CH1 (Kanal 1) ⊖ TJ403 (01-Platine)
   Einstellungen am Oszilloskop:
   VOLT. 1V
   SWEEP . . . . . .0,5 μs
   Input . . . . . .AC (Wechselspannung)
3. VR102 so einstellen, daß das Augenmuster des HF-Signals am weitesten offen ist.



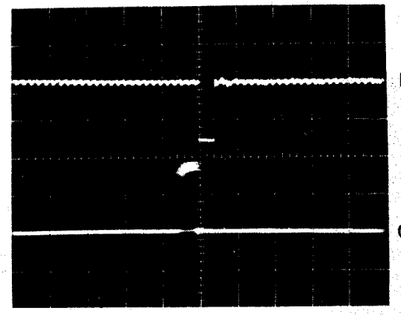
10. PLL-Justierung

1. Das Geräteschloß in die EJECT-Betriebsart stellen.
2. Kanal 1 und Kanal 2 des Oszilloskops an TJ701 (FCLK) und TJ702 (CLDCK) auf der 01-Platine anschließen.
   Einstellung des Oszilloskops:
   VOLT. 2V
   SWEEP 20μs
   Input . . . . . AC (Wechselspannung)
   Trigger . . . . . CH1 + CH2 (NORM)
   Mode . . . . . ALT
3. Stift 13 von IC301 auf der 01-Platine an Masse anschließen.
4. L301 (VCO) so justieren, daß die Oszilloskopwelle so geformt ist, wie nachstehend gezeigt.



Die Pulsbreitenmitte beider Wellenformen aufeinander ausrichten.

5. Nach der obigen Justierung ist die Kurzschlußbrücke (in Schritt 3) zu entfernen.
6. VR501 (11T) durch Drehung im Uhrzeigersinn bis zum Anschlag auf Maximum einstellen.
7. Die Platte auflegen und die Taste PLAY drücken.
8. In der Wiedergabe-Betriebsart TJ501 (11TMODE) auf der 01-Platine an Masse anschließen.
9. In der gleichen Oszilloskop-Betriebsart wie in Schritt 2) ist VR501 so zu justieren, daß die Oszilloskop-Wellenform so wird, wie nachstehend gezeigt.



11. Überprüfung des Wiedergabebetriebs nach der Justierung

Prüfen des Überspring-Suchlaufs
1. Eine gewöhnliche Platte abspielen.
2. Die Überspring-Taste drücken und überprüfen, ob Überspring-Suchlauf ausgeführt wird. (Vorwärts und rückwärts)

Prüfen des manuellen Suchlaufs
1. Eine gewöhnliche Platte abspielen.
2. Die Taste für manuellen Suchlauf drücken und überprüfen, ob glatter manueller Suchlauf mit niedriger und hoher Geschwindigkeit ausgeführt werden kann. (Vorwärts und rückwärts)

Prüfen auf Defekte
1. Programm 12 der Testplatte abspielen und überprüfen, daß kein Tonausfall oder Rauschen auftritt. (Schwarzer Punkt)
2. Programm 14 der Testplatte abspielen und überprüfen, daß kein Tonausfall oder Rauschen auftritt. (Fingerabdruck)

• Justierung der Optischen Abtastung

1. Justierung der Ruheposition

1. Sicherstellen, daß die Blattschalter S101 (Ruhedetektion) und S102 (Endedetektion) während des Zusammenbaus nicht zerdrückt wurden und daher auf "ON" einstellen.
   Falls sie zusammengedrückt wurden, die Kontakte ca. 2 mm trennen.
2. Dem Gerät Strom zuführen. Dies verursacht, daß der Traversenmotor den optischen Abtaster zur Ruheposition umspult.
3. Den Netzschalter ausschalten.
4. Die Ruhepositions-Schablone auf den Plattenteller auflegen.
5. Überprüfen, ob die Linse im Loch der Ruhepositions-Schablone konzentrisch liegt., wie in **Abb. B** gezeigt.

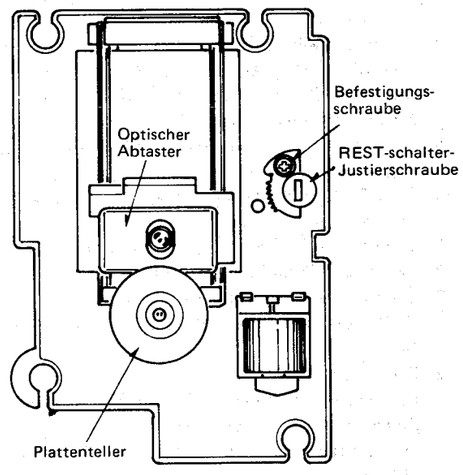


Abb. A

Wenn der optische Abtaster zu nahe beim Plattenteller ist (Abb. B):
Justierung:

1. Die Befestigungsschraube lösen und die REST-Schalter-Justierschraube im Uhrzeigersinn drehen.
2. Falls der Ruhedetektionsschalter (S101) zu nahe bei S102 ist, ist zu beachten, daß der Abtaster in der Ruheposition zu weit weg vom Plattenteller zu liegen kommt. In diesem Fall ist die Stromzufuhr einzuschalten, und Schritt 1 oben ist zu wiederholen, bis die Ruheposition erfaßt wird, wenn die Linse konzentrisch im Loch der Ruhepositions-Schablone liegt.

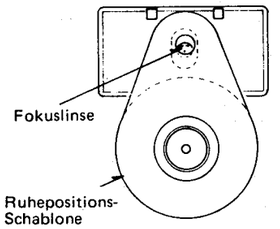


Abb. B: schlecht (zu nahe)

Justierung ist nicht nötig (Abb. C):

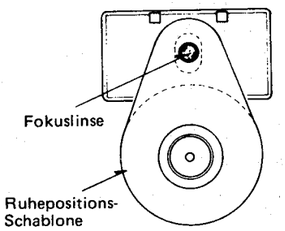


Abb. C: gut

Der optische Abtaster ist zu weit weg vom Plattenteller (Abb. D):
Justierung:

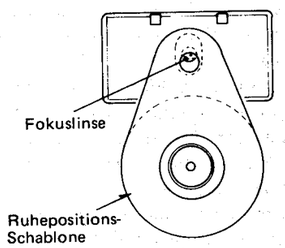


Abb. D: schlecht (zu weit weg)

Die Befestigungsschraube lösen und die REST-Schalter-Justierschraube entgegen dem Uhrzeigersinn drehen.

6. Um richtige Justierung zu überprüfen, die Platte auf den Plattenteller legen und Stromzufuhr einschalten. Dadurch wird der optische Abtaster in den Auto-Zyklus versetzt. Die Abgleichung mit der Ruhepositions-Schablone erneut überprüfen, wie in **Abb. C** gezeigt.

2. Justierung der Tonarmhöhe

Anmerkung: Dies ist nötig nach Ersetzen des Direktantrieb-Spindelmotors, oder wenn kein HF-Signal vorhanden ist.

1. Den kurzen Stift von R130 auf der 03-Platine herausziehen.
2. Das dünne Ende der Fühleklingenlehre zwischen dem Plattenteller und dem Achslager einführen.
3. Die Fühlerklingenlehre gegen das dicke Ende schieben und die Stelle, wo sie den Plattenteller berührt und bis sie nicht mehr weitergeschoben werden kann, mit Bleistift markieren. Dann die Lehre entfernen.
4. Das Oszilloskop an den TJ402-Stift am 01-Platine (Servo) anschließen.
5. Eine Platte auf den Plattenteller legen und sie mit dem Magneten festklemmen.
6. Die Stromzufuhr zum Gerät einschalten.
7. "Eject Out" und "Eject In" drücken.
8. Überprüfen, ob HF-Signal vorhanden ist.
   Falls nicht vorhanden, mit dem nächsten Schritt weiterfahren.
9. Zu überprüfen:
   Die Platte am Punkt "A" leicht antippen. Fall HF-Signal auftritt, ist der Plattenteller zu tief. Falls kein HF-Signal auftritt, an Punkt "B" auf die Platte tippen. HF-Signal sollte auftreten um anzuzeigen, daß der Plattenteller zu hoch ist.
10. Justierung:

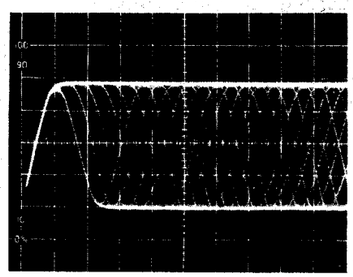
(1) Die Fühlerklingenlehre zwischen dem Plattenteller und dem Achslager bis zum vorher markierten Punkt einführen.

(2) Die Sechskant-Plattenteller-Befestigungsschraube lösen. (1,27mm-Sechskantschlüssel verwenden.)

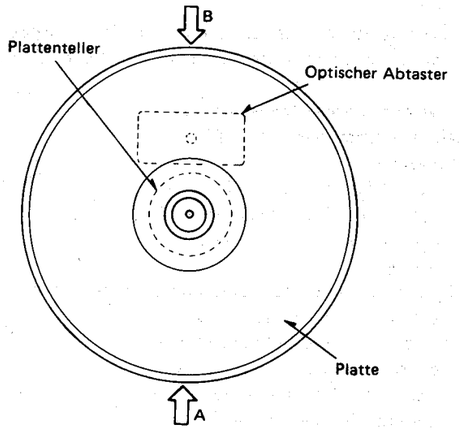
(3) Falls der Plattenteller zu tief ist, die Fühler-klingenlehre ca. 4mm gegen das dicke Ende hin schieben und sie dann entfernen.
Stromzufuhr wieder einschalten und prüfen, ob HF-Signal vorhanden ist.
(Es handelt sich hier um eine Justierung "auf gut Glück"; es dürften daher mehrere Versuche nötig sein, bis ein HF-Signal auftritt.)

(4) Der Plattenteller ist zu hoch; die Fühlerklingenlehre einführen und ca. 4mm gegen das dünne Ende hin schieben, d.h. auf gleiche Weise vorgehen, wie in Schritt 3.

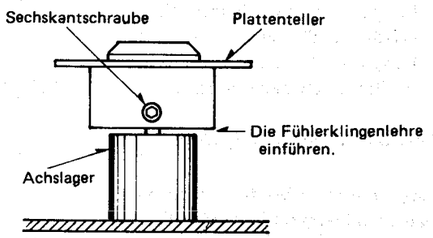
(5) R130 wieder anschließen, damit Fokus-Suchlauf funktioniert.



HF-Signal



Ansicht von oben bei aufgelegter Platte



Vorderansicht der Traverseneinheit

3. Mechanische Justierung

1. Die Testplatte auf den Plattenteller legen und mit dem Magneten festklemmen.
2. Das Oszilloskop an den TJ402 am 01-Platine (Servo) anschließen.
3. Die Stromzufuhr zum Gerät einschalten und Wiedergabe-Betriebsart wählen.
4. Überprüfen, ob das HF-Signal so ist, wie in **Abb. A** gezeigt. Falls nicht vorhanden, mit dem nächsten Schritt weiterfahren.
   Falls HF-Signal wie gezeigt ist, Schritt 5 überspringen.
5. Die Sechskantschraube (mit einem 2mm-Sechskantschlüssel) nach links oder rechts drehen, bis HF-Signal auftritt (Prüfung von Auge), wie in **Abb. B** gezeigt.

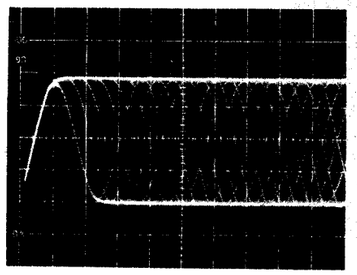


Abb. A: HF-Signal

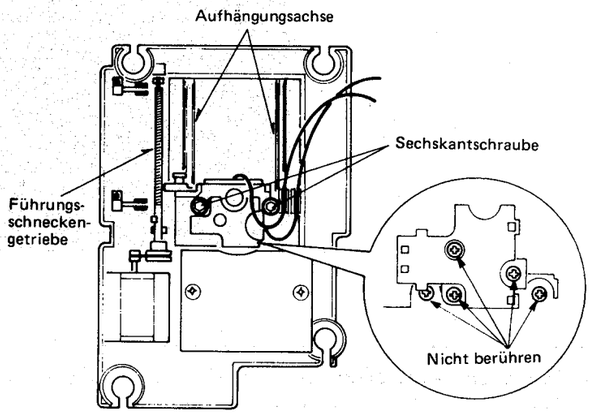


Abb. B: Traverseneinheit von unten gesehen

4. Gitterjustierung

1. Die Testplatte auf den Plattenteller legen und mit dem Magneten festklemmen.
2. Das Oszilloskop wie folgt anschließen:
   SWEEP 2μs
   CH1 (Kanal 1) . . . . . TJ402 an 01-Platine
   CH2 (Kanal 2) . . . . . C164 an 03-Platine (Stift 17 von IC104)
3. Stromzufuhr des Gerätes einschalten und Wiedergabe-Betriebsart wählen.
4. Falls HF-Signal und "N"-Marke vorhanden sind, wie in **Abb. A** gezeigt, ist keine Justierung nötig.
   Falls HF-Signal und "N"-Marke nicht vorhanden sind, Schritt 5 durchführen.
5. Den Gitterjustierstift in das Loch auf der linken Seite des Gehäuses des optischen Abtasters einführen, wie in **Abb. B** gezeigt.
6. Den Gitterjustierstift links- oder rechtsherum drehen, bis die "N"-Marke am schärfsten und das HF-Signal maximal ist.

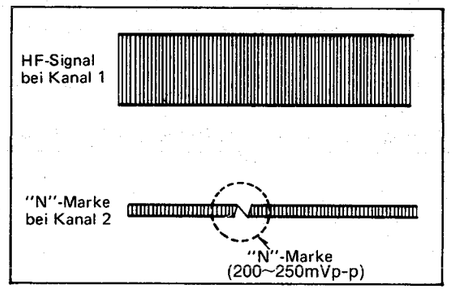


Abb. A: HF-Signal und "N"-Marke

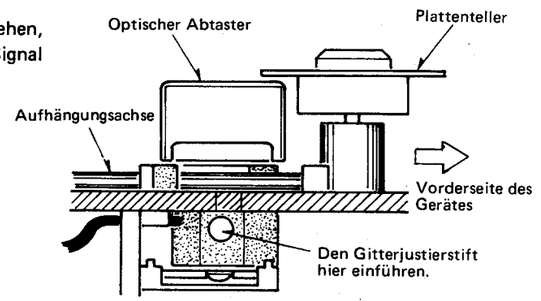
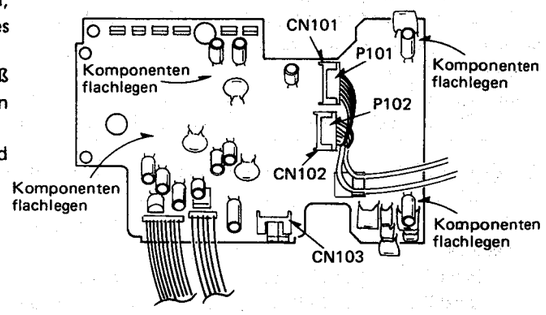


Abb. B: Ansicht der linken Seite der Traverseneinheit

5. Elektrische Justierung der Haupteinheit. Für die Durchführung der Justierung, siehe Seite 2 ~ 5.

6. Prüfung des 03-Platine

* Nach der Justierung sind alle Komponenten umzubiegen, so daß sie flach auf dem 03-Platine liegen, und dieses wieder in die Traverseneinheit einbauen.
* Nach Montieren des 03-Platine ist sicherzustellen, daß die Unterseite des Abtasters keine der Komponenten behindert.
Daher ist sicherzustellen, daß die Spuren am Außenrand der Platte erreichbar sind.



FRANÇAIS

■ CARACTERISTIQUES (Sujet à changement sans préaris)

■ Audio

Nombre de canaux: 2 (droite et gauche stéréo)
Réponse en fréquence: 4–20.000 Hz±0,5 dB
Gamme dynamique: plus de 96 dB
Rapport signal/bruit: plus de 96 dB
Distorsion harmonique: 0,002% (1 kHz, 0 dB)
Distorsion harmonique totale: 0,004% (1 kHz, 0 dB)
Ecart des canaux: plus de 100 dB
Scintillation et pleurage: au-dessous de la limite mesurable

■ Formation des signaux

Fréquence de commutation: 44,1 kHz
Système de correction: Système algorithmique de superdécodage Technics
Conversion de numérique à analogique: 16 bits linéaires

■ Lecteur de disques

Type: Astigmatique à 3 faisceaux
Source lumineuse: Laser à semi-conducteurs
Longueur d' onde: 800 nm

■ Fonctions

Caractéristiques: Audition automatique,
Accès aléatoire d'une piste,
Accès sélectif d'un repère,
Audition programmable (mémorisation de 15 pistes),
Saut vers l'avant,
Saut vers l'arrière,
Recherche vers l'avant,
Recherche vers l'arrière,
Audition répétée,

Affichage: (Affichage numérique),
Nos des pistes,
Durée d'audition totale (min., sec.),
Piste en train d'être jouée,
Durée d'audition écoulée,
Durée d'audition restante,
Nos des repères

Chargement du disque: Type horizontal à commande par moteur

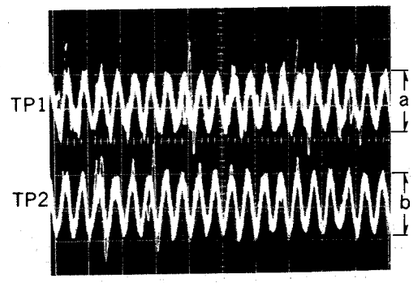
■ Généralités

Alimentation: 110–127/220–240 V, 50/60 Hz
Consommation: 30 W
Tension de sortie: 2 V (à 0 dB)
Impédance de sortie: 330Ω
Impédance de charge: plus de 5 kΩ
Dimensions (L×P×H): 31,5×33,4×8,2 cm
[Lorsque le support du disque est ouvert: 31,5×45,9×8,2 cm.]
Poids: 4,8 kg

■ MESURAGES ET RÉGLAGES

1. Ajustement de l'amplification de focalisation

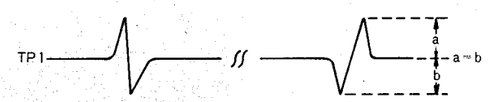
1. Raccorder le gabarit d'ajustement de gain avec le connecteur de changement de l'appareil.
   Rouge . . . . . Fil d'interconnexion (+15V) à côté de la broche 13 IC301 sur la plaquette à circuits imprimés 01.
   Bleu . . . . . Fil d'interconnexion(—15V) à côté de la broche 12 IC301 sur la plaquette à circuits imprimés 01.
   Vert . . . . . Châssis
   Connecteur . . . Retirer la broche de court-circuitage de CN103 sur la plaquette à circuits imprimés 03 et raccorder le connecteur de changement au gabarit. Puis, raccorder le connecteur (5P) à partir du connecteur de changement à CN103.



2. Régler l'oscillateur à basse fréquence sur la fréquence de 750 Hz et sur une tension de sortie de crête à crête de 150 mV, et le raccorder à la masse (GND) et a l'entrée d'oscillateur (OSC IN) de labroche d'essai (TEST) de l'élément d'étalonnage.
3. Raccorder les canaux 1 et 2 (CH1/CH2) de l'oscilloscope à TP1 et TP2 de l'élément d'étalonnage (TP3 est la masse).
   Réglage de l'oscilloscope:
   Tension . . . . . 100 mV (les deux canaux) Mode . . . . . CHOP
   Balayage . . . . . 2 ms
   Entrée. . . . . C.A.
4. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élement d'étalonnage sur "1" et installer le disque.
5. Mettre en marche l'interrupteur d'alimentation. Lorsque la platine commence à tourner, un signal de 750 Hz apparaît sur l'oscilloscope. Ajuster ensuite VR101 de telle sorte que les formes d'ondes des deux canaux soient réciproquement égales.

2. Ajustement de l'équilibrage de focalisation

1. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2" et débrancher l'entrée provenant de l'oscillateur.
2. Raccorder TJ102 sur la plaquette à circuits imprimés 03 à la masse (GND) en utilisant un fil de raccordement à pince.
3. Retirer le connecteur CN501 situé sur la plaquette à circuits imprimés 01.
4. Raccorder l'oscilloscope à TJ101 sur la plaquette à circuits imprimés 03 et placer le disque.
   Réglage de l'oscilloscope: Tension. . . . . 500 mV
   Balayage . . . . . 5 ms
   Entrée . . . . . C. A.
5. Mettre en marche l'interrupteur d'alimentation. Lorsque le laser s'éclaire, une forme d'onde en forme de S apparaît sur l'oscilloscope. Ajuster alors VR102 de telle sorte que les valeurs de crête supérieure et inférieure soient mutuellement égales.



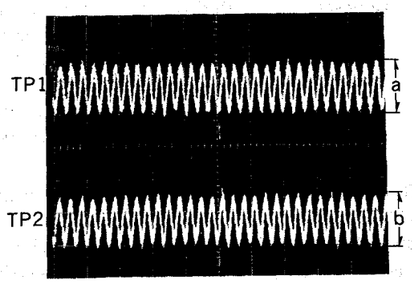
Nota: La forme d'onde en forme de S ci-dessus mentionnée continuera pendant à peu près 2 minutes si la broche 7 de CN412 est raccordée à la masse (GND) alors que LD est éclairé dès que LD s'arrête en 5 ou 6 secondes.
6. Après la mise au point, remettre en place le fil de raccordement à pince ainsi que CN501, comme ils étaient.

3. Ajustement du décentrement de focalisation

1. Maintenir l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2".
2. Placer l'appareil sur le mode "EJECT" (éjection).
3. Raccorder un voltmètre réglable à TJ101 sur la plaquette à circuits imprimés 03.
4. Mettre en marche l'interrupteur d'alimentation et régler VR103 de telle sorte que la tension de C.C. du voltmètre soit de 0 ± 10 mV.

4. Ajustement du gain d'alignement

1. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "3".
2. Ajuster l'oscillateur à basse fréquence sur 1,5 kHz et sur une puissance de sortie de crête à crête de 150 mV et le raccorder à la masse (GND) et à l'entrée d'oscillateur (OSC IN) de la broche d'essai (TEST) de l'élément d'étalonnage.
3. Raccorder les canaux 1 et 2 (CH1/CH2) de l'oscilloscope à la broche d'essai (TEST) TP1 et TP2 de l'élément d'étalonnage (TP3 est la masse).
   Réglage de l'oscilloscope:
   Tension. . . . . 100 mV (les deux canaux)
   Balayage. . . . . 2 ms
   Entrée . . . . . C. A. Mode . . . . . CHOP



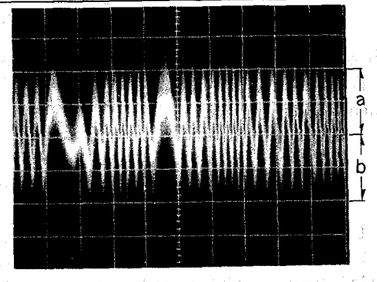
4. Mettre en marche l'interrupteur d'alimentation. Lorsque la platine commence à tourner, un signal de 1,5 kHz apparaît sur l'oscilloscope. Ajuster ensuite VR104 de telle sorte que les amplitudes des formes d'ondes des deux canaux soient réciproquement égales.

5. Ajustement temporaire du décentrement d'alignement

1. Régler l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2" et débrancher l'entrée provenant de l'oscillateur.
2. Placer l'appareil sur le mode "EJECT" (éjection).
3. Raccorder un voltmètre réglable à TP2 sur la plaquette à circuits imprimés 03.
4. Mettre en marche l'interrupteur d'alimentation et ajuster VR106 de telle sorte que la tension de C.C. du voltmètre soit de 0 ± 3 mV.

6. Ajustement de l'équilibrage d'alignement

1. Maintenir l'interrupteur d'alimentaiton "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2".
2. Raccorder l'oscilloscope à TJ103 sur la plaquette à circuits imprimés 03, puis installer le disque.
   Réglage de l'oscilloscope:
   Tension . . . . . 200 mV
   Balayage . . . . . 5 ms
   Entrée . . . . . C.C.



3. Mettre en marche l'interrupteur d'alimentation. Lorsque la platine commence à tourner et que l'interrupteur asservi d'alignement de l'élément d'étalonnage est mis hors circuit, le signal TE (erreur d'alignement) apparaît sur l'oscilloscope.
   Puis, ajuster VR105 de telle sorte que les valeurs de crête supérieure et inférieure soient égales mutuellement.

7. Ajustement du décentrement d'alignement

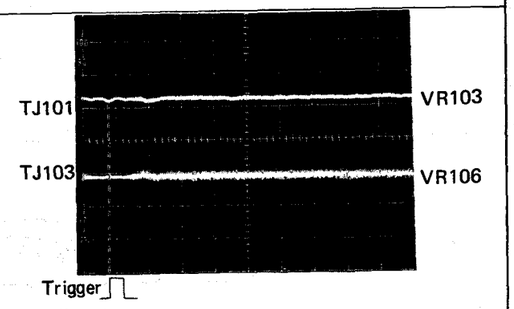
1. Maintenir l'interrupteur d'alimentation "on" (mise en circuit) de l'élément d'étalonnage et l'interrupteur rotatif de l'élément d'étalonnage sur "2".
2. Placer l'appareil sur le mode "EJECT" (éjection).
3. Raccorder un voltmètre réglable à TJ103 sur la plaquette à circuits imprimés 03.
4. Mettre en marche l'interrupteur d'alimentaiton et ajuster VR106 de telle sorte que la tension de C.C. du voltmètre soit de 0 ± 3 mV.

Nota: Après l'ajustement mentionné ci-dessus, retirer l'élément d'étalonnage de l'ajustement du gain et raccorder CN103 pour rétablir la condition initiale de l'appareil.

8. Ajustement du décentrement dans l'intensité de désexcitation

1. Raccorder l'oscilloscope aux points mentionnés ci-dessous.
   Canal 1 . . . . TJ101 (Plaquette à circuits imprimés 03)
   Canal 2 . . . . TJ103 (Plaquette à circuits imprimés 03)
   EXT . . . . . TJ401 (Plaquette à circuits imprimés 01).

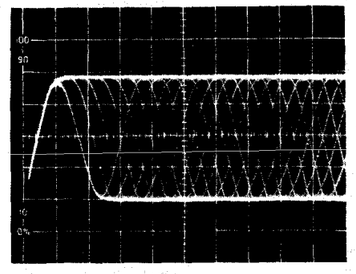
   Réglage de l'oscilloscope:
   Tension. . . . . 1V (les deux canaux)
   Balayage. . . . . 0,5 ms
   Entrée . . . . . C. A.
   Déclenchement . . . . EXT. NORM



2. Faire jouer la plage 13 (zone de piste noire de 0,5 mm) du disque d'essai.
3. Tout en observant la forme d'onde du canal 1 de l'oscilloscope, ajuster VR103 de telle sorte que l'amplitude de la forme d'onde à proximité du point de déclenchement soit réduite au minimum.
   Si elle n'est pas réduite au minimum, ajuster de telle sorte que le haut et que le bas de la forme d'onde soient sensiblement symétriques.
4. Tout en observant la forme d'onde du canal 2 de l'oscilloscope, ajuster VR106 de telle sorte que l'amplitude de la forme d'onde à proximité du point de déclenchement soit réduite au minimum. Si elle n'est pas réduite au minimum, ajuster de telle sorte que le haut et que le bas de la forme d'onde soient sensiblement symétriques.

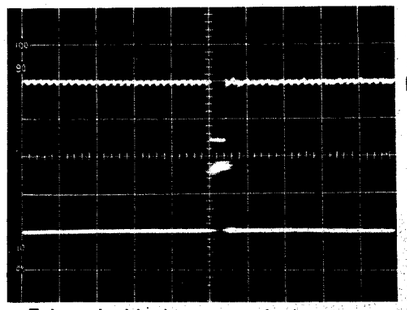
9. Ajustement le meilleur de l'oeil

1. Signal de hautes fréquences du moniteur d'analyse sur l'oscilloscope.
2. Raccorder l'oscilloscope aux points mentionnés ci-dessous.
   Canal 1 (+) . . . . . TJ402 (Plaquette à circuits imprimés 01)
   Canal 1 (—) . . . . . TJ403 (Plaquette à circuits imprimés 01)
   Réglage de l'oscilloscope:
   Tension. 1V
   Balayage. . . . . 0,5 μs
   Entrée. . . . . C. A.
3. Ajuster VR102 de telle sorte que le modèle d'oeil du signal de hautes fréquences soit le plus largement ouvert possible.



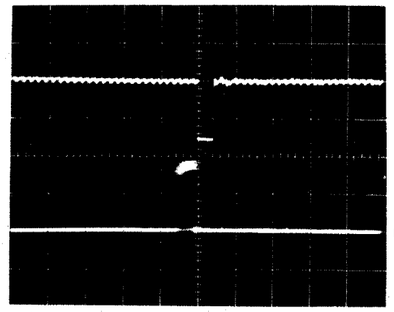
10. Réglage du circuit d'asservissement de phase (PLL)

1. Placer le dispositif de verrouillage sur le mode "EJECT" (éjection).
2. Raccorder le canal 1 et le canal 2 de l'oscilloscope à TJ701 (FCLK) et à TJ702 (CLDCK) sur la plaquette à circuits imprimés 01.
   Réglage de l'oscilloscope:
   Tension 2V
   Balayage 20μs
   Entrée. . . . . C.A.
   Trigger . . . . . Canal 1 + Canal 2 (NORM)
   Mode . . . . . ALT
3. Raccorder la broche 13 de IC301 sur la plaquette à circuits imprimés 01 à la masse (GND).
4. Régler L301 (Oscillateur commandé par variation de tension), de telle sorte que l'onde de l'oscilloscope soit formée telle qu'elle est montrée ci-dessous.



Faire coincider les centres des largeurs d'impulsions des deux formes d'ondes.

5. Après la mise au point mentionnée ci-dessus, retirer le fil de court-circuitage de l'étape 3).
6. Maximaliser VR501 (11T) en le tournant complètement dans le sens des aiguilles d'une montre.
7. Installer le disque et appuyer sur la touche "PLAY" (audition).
8. Sur le mode d'autition, raccorder TJ501 (11TMODE) sur la plaquette à circuits imprimés 01 `a la masse (GND).
9. Sur le même mode d'oscilloscope que celui de l'étape 2), régler VR501 de telle sorte que l'onde de l'oscilloscope soit formée comme il est montré ci-dessous.



11. Vérification du fonctionnement de l'audition après l'ajustement

Vérification de la recherche par saut
1. Faire jouer un disque normal.
2. Appuyer sur la touche de saut et vérifier si la recherche par saut est obtenue. (Marches en avant et en arrière)

Vérification de recherche manuelle
1. Faire jouer un disque normal.
2. Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle facile peut être obtenue à des vitesses faible et élevée. (Marches en avant et en arrière)

Vérification des défauts
1. Faire jouer la plage 12 du disque d'essai et vérifier s'il n'y a pas de bruit ou de zone de silence du son. (Zone de piste noire)
2. Faire jouer la plage 14 du disque d'essai et vérifier s'il n'y a pas de bruit ou de zone de silence du son. (Impression par touche)

• Ajustement du Pickup Optique

1. Réglage de la position de repos

1. S'assurer que les interrupteurs à lames S101 (détection du repos) et S102 (détection terminale) n'ont pas été mélangés pendant le réassemblage et par conséquent réglés sur "ON" (en circuit).
   S'ils le sont, séparer avec soin les contacts d'à peu près 2 mm.
2. Mettre l'appareil en marche. Cela entraînera le moteur transversal à enrouler le capteur optique à la position de REPOS.
3. Tourner le commutateur d'alimentation sur "OFF" (hors circuit).
4. Placer le calibre de positionnement de REPOS sur la platine.
5. S'assurer que la lentille est concentrique en deçà de l'orifice du calibre de positionnement du REPOS, comme il est montré à la **Fig. B.**

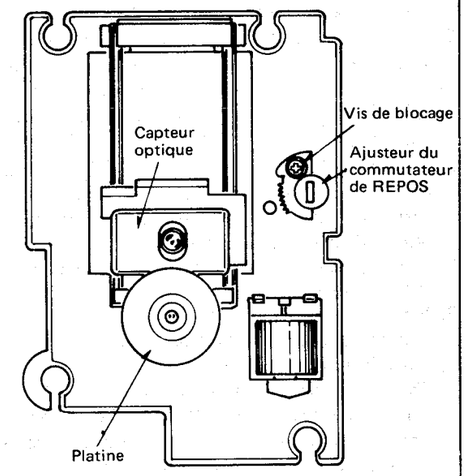


Fig. A

Le capteur optique est trop proche de la platine. (Fig. B)
Pour régler:

1. Desserrer la vis de blocage et tourner l'ajusteur du commutateur de REPOS dans le sens des aiguilles d'une montre.
2. Noter que si l'interrupteur de détection de repos S101 est trop proche de S102, le capteur sera alors trop éloigné de la platine à la position de repos. Si c'est le cas, appliquer l'énergie et répéter l'étape 1 ci-dessus jusqu'à ce que la détection de repos soit détectée lorsque la lentille est concentrique avec l'orifice du calibre de positionnement du REPOS.

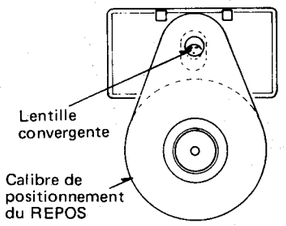


Fig. B "Incorrect" (trop proche)

Aucun réglage n'est nécessaire. (Fig. C)

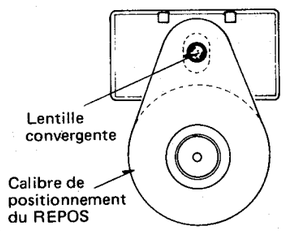


Fig. C "Correct"

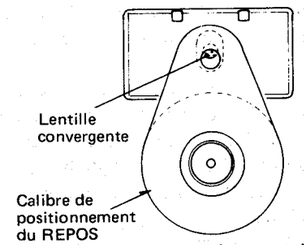


Fig. D "Incorrect" (trop loin)

Le capteur optique est trop éloigné de la platine. (Fig. D)
Pour régler:
Desserrer la vis de blocage et tourner l'ajusteur du commutateur de repos dans le sens inverse des aiguilles d'une montre.

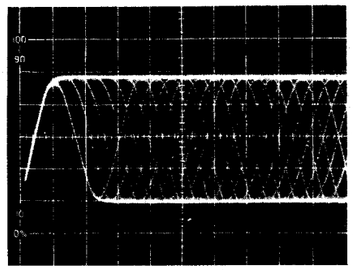
6. Pour vérifier si le réglage est correct, placer le disque sur la platine et appliquer l'énergie à l'appareil. Cela provoquera la cyclisation automatique du capteur optique. Vérifier à nouveau l'alignement avec le calibre de positionnement du REPOS, comme il est montré à la **Fig. C.**

2. Réglage de la hauteur de la platine

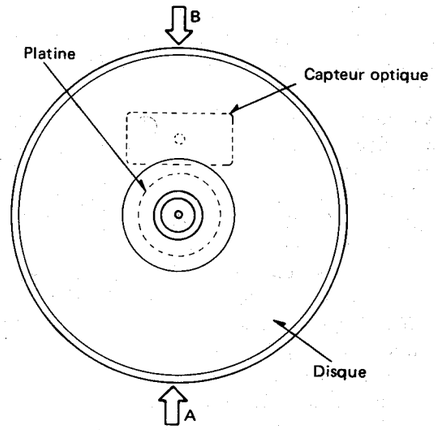
Nota: Réglage nécessaire après que le moteur sur pivot à entraînement direct soit remplacé ou qu'un signal à haute fréquence ne soit pas obtenu.

1. Retirer la broche de court-circuitage de R130 sur la plaquette à circuits imprimés 03.
2. Insérer l'extrémité mince du calibre à lame d'épaisseur entre la platine et le support de l'axe.
3. Faire glisser le calibre à lame d'épaisseur vers l'extrémité épaisse et faire un trait de repère sur le calibre avec un crayon là où il touche la platine et jusqu'à ce que la lame ne puisse s'introduire davantage. Puis, retirer le calibre.
4. Raccorder l'oscilloscope à TJ402 sur la plaquette à circuits imprimésol.
5. Placer un disque sur la platine et le fixer avec l'aimant.
6. Mettre l'appareil en marche.
7. Appuyer sur l'éjection "OUT" (extérieur) et l'éjection "IN" (intérieur).
8. S'assurer si un signal à haute fréquence est présent. Dans la négative, passer à l'étape suivante.
9. Pour s'assurer:
   Tapoter doucement le disque au point "A". Si un signal à haute fréquence apparaît, la platine est disposée trop bas. Si un signal à haute fréquence n'apparaît pas, tapoter doucement le disque au point "B".
   Un signal à haute fréquence apparaîtra indiquant que la platine est disposée trop haut.
10. Pour régler:

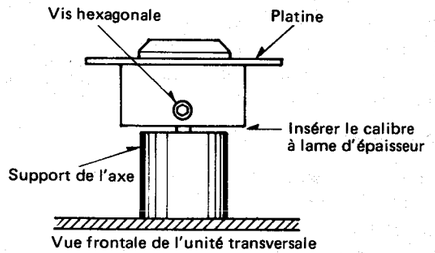
(1) Insérer le calibre à lame d'épaisseur entre la platine et le support de l'axe au point de repère marqué préalablement.
(2) Desserrer la vis hexagonale de la vis de réglage de la platine. (Utiliser une clé hexagonale de 1,27mm.)
(3) Si la platine est trop basse, glisser le calibre à lame d'épaisseur d'à peu près 4mm (5/32 de pouce) vers l'extrémité épaisse, puis retirer le calibre à lame d'épaisseur.
   Remettre en marche l'énergie et vérifier s'il y a un signal à haute fréquence.
   (Ceci étant une mise au point "d'essai et d'erreur", plusieurs tentatives devront être effectuées pour obtenir un signal à haute fréquence.)
(4) Si la platine est trop haute, insérer le calibre à lame d'épaisseur et déplacer d'à peu près 4 mm (5/32e de pouce) vers l'extrémité mince, en utilisant la même méthode qu'à l'étape 3.
(5) Reconnecter R130 pour permettre la recherche de focalisation.



Signal à haute fréquence



Vue de haut de l'installation du disque



Vue frontale de l'unité transversale

3. Mise au point mécanique

1. Installer le disque d'essai sur la platine avec l'aimant de fixation.
2. Raccorder l'oscilloscope à TJ402 sur la plaquette à circuits imprimés 01.
3. Mettre l'appareil en marche et choisir le mode d'audition.
4. S'assurer que le signal à haute fréquence est tel que celui montré à la **Fig. A.** S'il n'y a pas de signal, passer à l'étape suivante.
   Si le signal à haute fréquence est tel qu'il est montré, sauter l'étape 5.
5. Ajuster la vis hexagonale (utiliser une clé hexagonale de 2 mm) vers la droite ou vers la gauche pour obtenir un signal à haute fréquence (vérification visuelle) tel qu'il est montré à la **Fig. B.**

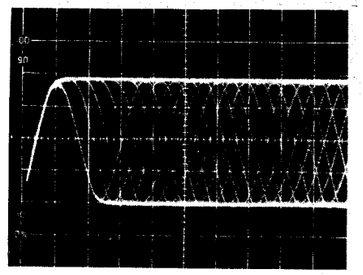


Fig. A Signal à haute fréquence

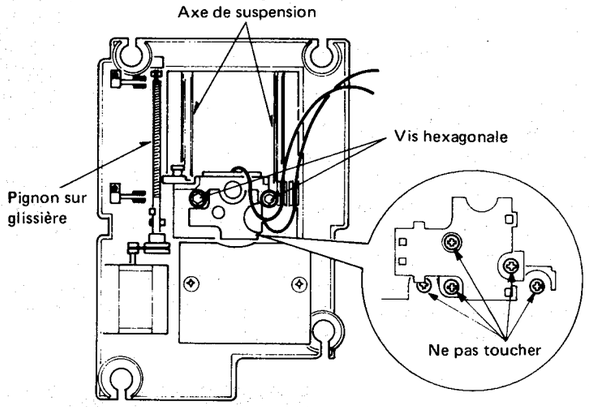


Fig. B Vue de dessous de l'unité transversale

4. Mise au point de la trame

1. Placer le disque d'essai sur la platine et fixer avec l'aimant.
2. Raccorder l'oscilloscope de la manière suivante:
   Tension 2μs
   Canal 1 . . . . . TJ402 (Plaquette à circuits imprimés 01)
   Canal 2 . . . . . C164 sur la plaquette à circuits imprimés 03. (broche 17 de IC104)
3. Mettre l'appareil en marche et choisir le mode d'audition.
4. Si le signal à haute fréquence et le repère "N" sont présents aucune mise au point n'est nécessaire, comme il est montré é la **Fig. A.**
   Si le signal à haute fréquence et le repère "N" sont absents, passer à l'étape 5.
5. Insérer l'outil d'ajustement de la trame dans l'orifice situé sur le côté gauche du corps du capteur optique, comme il est montré à la **Fig. B.**
6. Tourner l'outil d'ajustement de la trame vers la droite ou vers la gauche, jusqu'à ce que le repère "N" soit le plus net possible et qu'un signal à haute fréquence maximal soit obtenu.

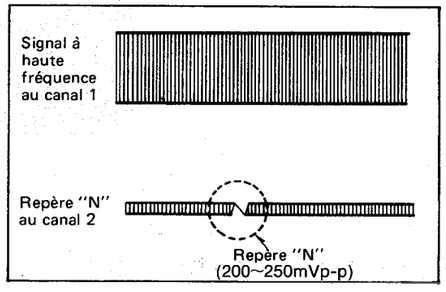


Fig. A Signal haute fréquence et repère "N"

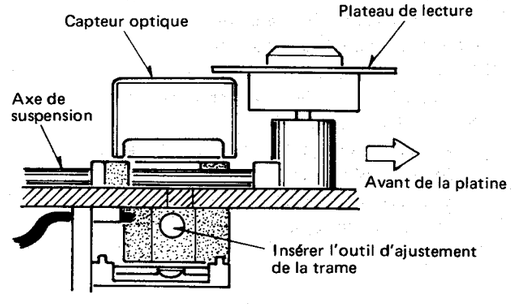
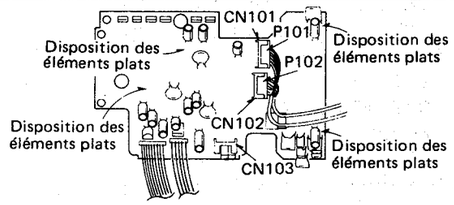


Fig. B Vue latérale gauche de l'unité transversale

5. Alignement électrique de l'unité principlale. Suivre le réglage, en se référant aux pages 10 ~ 13.

6. Vérification du module 03

* Après le réglage, dresser tous les éléments du montage en les disposant à plat sur le odule 03 et réassembler sur l'unité transversale.
* Une fois que le module 03 est monté, s'assurer que la face inférieure du capteur n'interfère avec aucun des éléments du montage.
Par conséquent, s'assurer que les pistes sur le bord extérieur du disque soient accessibles.



ESPAÑOL

■ ESPECIFICACIONES (Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

■ Audio

Cantidad de canales:	2 (derecho e izquierdo, estéreo)
Respuesta de frecuencia:	4–20.000 Hz ±0,5 dB
Gama dinámica:	más de 96 dB
Relación de señal a ruido:	más de 96 dB
Distorsión armónica:	0,002% (1 kHz, 0 dB)
Distorsión armónica total:	menos de 0,004% (1 kHz, 0 dB)
Separación de canales:	más de 100 dB
Ululaciones y trémolo:	Inferior a límite medible

■ Formato de las señales

Frecuencia de muestreo:	44,1 kHz
Sistema de corrección:	Algoritmo superdescodificador Technics
Conversión numérica-analógica:	Lineal de 16 bitios

■ Fonocaptor

Tipo:	Astigmático de 3 haces
Fuente de luz:	Laser de semiconductor
Longitud de onda:	800 nm

■ Funciones

Ventajas	Ejecución automática, Acceso libre a las piezas, Acceso libre a los índices, Ejecución programable (memoria para 15 piezas), Salto hacia adelante Salto hacia atrás Búsqueda hacia adelante Búsqueda hacia atrás Ejecución repetida,
Exhibición:	(Exhibición digital) Núm. de piezas, Tiempo total (min., seg.) de ejecución, Pieza que se está ejecutando, Tiempo de ejecución transcurrido, Tiempo remanente Núm. de índice,
Carga del disco:	Tipo horizontal con accionamiento por motor

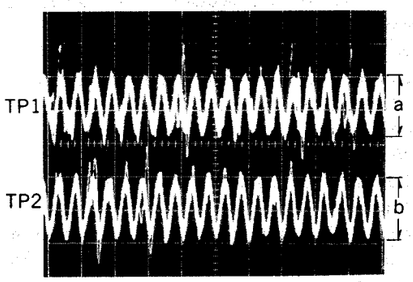
■ En general

Fuente de alimentación:	110–127/220–240 V, 50/60 Hz
Consumo de corriente:	30 W
Tensión de salida:	2 V (a 0 dB)
Impedancia de salida:	330Ω
Impedancia de carga:	más de 5 kΩ
Dimensiones (An.×Prof.×Al.):	31,5×33,4×8,2 cm (Cuando el compartimiento del disco está abierto: 45,9 cm (prof.))
Peso:	4,8 kg

■ MEDICIONES Y AJUSTE

1. Ajuste de ganancia de enfoque

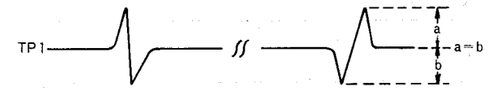
1. Conectar la plantilla de ajuste de ganancia con conectar de cambio al aparato.
   Rojo . . . . . Puente conectar (+15V) junto a perno 13 de IC301 en P.C.B. 01.
   Azul . . . . . Puente conectar (–15V) junto a perno 12 de IC301 en P.C.B. 01.
   Verde . . . . . Chasis
   Conector . . . Saque el perno corto de CN103 en P.C.B. 03 y conecte el conectar de cambio a la plantilla y luego conecte el conectar (5P) del conectar de cambio a CN103.



2. Ajustar el oscilador de baja frecuencia a frecuencia de 750 Hz y voltaje de salida de 150 mVp-p, y conectarlo a ENTRADA DE OSC. (OSC IN) de perno de PRUEBA y TIERRA (GND) de la plantilla.
3. Conectar CH1 y CH2 de osciloscopio a TP1 y TP2 de la plantilla (TP3 et TIERRA.)
   Puesta de osciloscopio: VOLTAJE. . . . . 100 mV (ambos canales)
   BARRIDO. . . . . 2 ms
   Entrada. . . . . CA
4. Poner le INTER. de corriente en "on" (conectado) de plantilla y el interruptor rotatorio de plantilla en "1" y colocar el disco.
5. Prender el interruptor de corriente. Cuando el plato giradiscos comienza a girar, una señal de 750 Hz aparece en el osciloscopio. Luego adustar VR101 de manera que las formas de onda de ambos canales sean iguales una a otra.

2. Ajuste de equilibrio de enfoque

1. Poner el INTER. de corriente en "on" de plantilla y el interruptor rotatorio de plantilla en "2" y desconectar la entrada del oscilador.
2. Conecte TJ102 en P.C.B. 03 a tierra (GND) mediante cordón de prueba con presilla.
3. Saque el conectar CN501 en P.C.B. 01.
4. Conectar el osciloscopio a TJ101 en P.C.B. 03 y colocar el disco.
   Puesta de osciloscopio: VOLTAJE. . . . . 500 mV
   BARRIDO. . . . . 5 ms
   Entrada. . . . . CA
5. Prender el interruptor de corriente. Cuando el laser se ilumina, la forma de onda de forma-S aparece en el osciloscopio. Entonces ajustar VR102 de manera que los valores de cresta máximos y mínimos sean iguales uno al otro.



Nota: La forma de onda de forma-S, antes mencionada, continuará por unos 2 minutos si perno 7 de CN412 es conectado a tierra mientras LD está iluminado como paradas LD en 5 ~6 seg.

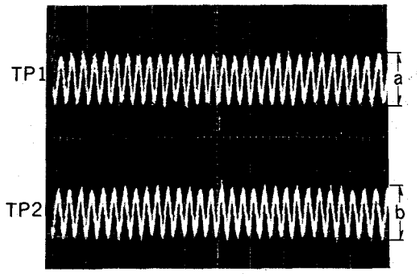
6. Después del ajuste, cambie el cordón de prueba con presilla y CN501 de nuevo como estaban antes.

3. Ajuste de desviación de enfoque

1. Mantener el INTER'. de corriente en "on" (encendido) de fog. y el interruptor rotatorio de plantilla en "2".
2. Cambiar el aparato a modalidad de EYECCION (eject).
3. Conectar un voltímetro variable a TJ101 en P.C.B. 03.
4. Prender el interruptor de corriente y ajustar VR103 de manera que el voltàje CC del voltímetro se 0 ± 10 mV.

4. Ajuste de ganancia de seguimiento

1. Poner el INTER. de corriente en "on" de plantilla y el interruptor rotatorio de la plantilla en "3".
2. Ajustar el oscilador de baja frecuencia a salida de 1.5kHz y 150 mVp-p. Y conectarlo a ENTRADA DE OSC. de perno de PRUEBA y TIERRA (GND) de la plantilla.
3. Conectar osciloscopio de CH1 y CH2 a TP1 y TP2 de perno de PRUEBA de la plantilla. (TP3 está puesto a TIERRA GND.)
   Puesta de osciloscopio:
   VOLTAJE. . . . 100 mV (ambos canales)
   Barrido. . . . . 0,5 ms
   Entrada. . . . . CA
4. Prender el interruptor de corriente. Cuando el plato giradiscos comienza a girar, una señal de 1,5 kHz aparece en el osciloscopio. Entonces ajustar VR104 de manera que las amplitudes de forma de onda de ambos canales son iguales una a la otra.

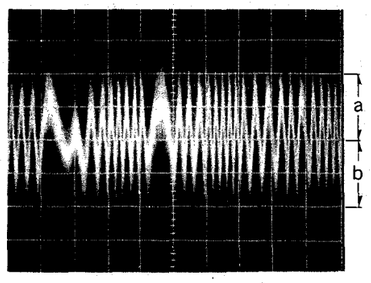


5. Ajuste provisional de desviación de seguimiento

1. Poner el INTER. de corriente en "on" y el interruptor rotatorio de plantilla en "2", y desconectar la entrada del oscilador.
2. Cambiar el aparato a modalidad de EYECCION (eject).
3. Conectar un voltímetro variable a TJ103. en P.C.B. 03.
4. Prender el interruptor de corriente y ajustar VR106 de manera que el voltaje CC del voltímetro sea 0 ± 3 mV.

6. Ajuste de equilibrio de seguimiento

1. Poner el INTER. de corriente en "on" de plantilla y el interruptor rotatorio de plantilla en "2".
2. Conectar el osciloscopio a TJ103 en P.C.B. 03 y luego colocar el disco.
   Puesta de osciloscopio:
   VOLTAJE. . . . 200 mV
   BARRIDO. . . . 5 ms
   Entrada. CC
3. Prender el interruptor de corriente. Cuando el plato giradiscos comienza a girar y el servointerruptor de seguimiento de plantilla se desconecta, la señal TE (error de seguimiento) aparece en el osciloscopio.
   Entonces ajustar VR105 de manera que los valores de cresta máximos y mínimos sean iguales uno al otro.



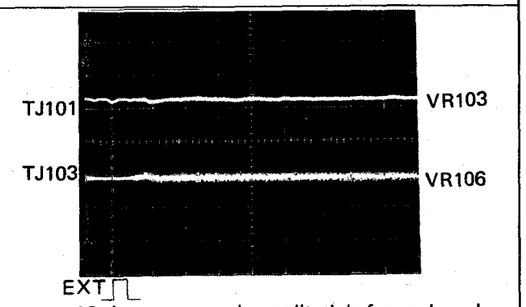
7. Ajuste de desviación de seguimiento

1. Mantener el INTER. de corriente "encendido" de plantilla y el interruptor rotatorio de plantilla en "2".
2. Cambiar el aparato a modalidad de EYECCION (eject).
3. Conectar un voltímetro variable a TJ103. en P.C.B. 03.
4. Prender el interruptor de corriente y ajustar VR106 de manera que el voltaje CC de voltímetro sea 0 ± 3 mV.

Nota: Después del ajuste antes mencionado, remover la plantilla de ajuste de ganancia y conectar el estado original de la unidad.

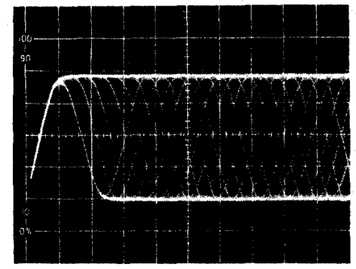
8. Ajuste de desviación en desexcitación

1. Conectar el osciloscopio a los puntos mencionados abajo.
   CH1 . . . . . TJ101 (P.C.B. 03.)
   CH2 . . . . . TJ103 (P.C.B. 03.)
   EXT. . . . . TJ401 (P.C.B. 01.)
   Puesta de osciloscopio:
   VOLTAJE. . . . 1V
   BARRIDO. . . . 0,5 ms
   Entrada. . . . . CA
   Disparador. . . . NORMA EXT.
2. Interpretar la banda 13 (punto negro de 0,5 mm) del disco de prueba.
3. Observando la forma de onda de CH1 dèl osciloscopio, ajustar VR103 de manera que la amplitud de forma de onda, cerca del punto de disparo, se minimice.
   Si no se minimiza, ajustar de manera que la parte superior e ingerior de la forma de onda sean casi simétricas.
4. Observando la forma de onda de CH2 del osciloscopio, ajustar VR106 de manera que la amplitud de forma de onda, cerca del punto de disparo, se minimice. Si no se minimiza, ajustar de manera que la parte superior e inferior de forma de onda sean casi simétricas.



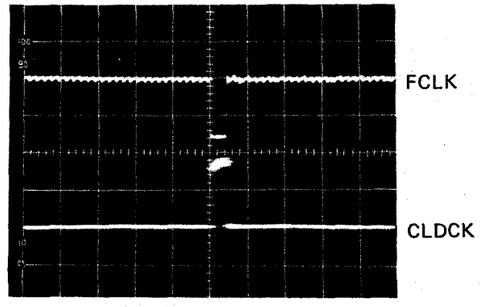
9. Ajuste de ojo óptimo

1. Señal RF de monitor en osciloscopio.
2. Conectar CH1 de osciloscopio a los puntos TJ402 en P.C.B.
   Puesta de osciloscopio:
   VOLTAJE. . . . 1V
   BARRIDO. . . . 0,5 ms
   Entrada. . . . . CA
3. Ajustar VR102 de manera que el patrón de ojo de señal RF esté lo máximo abierta.



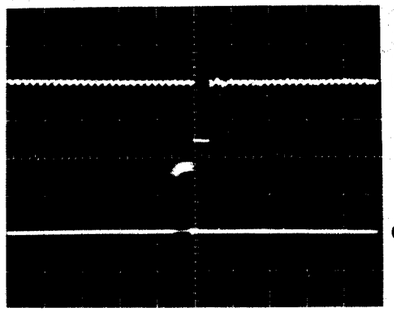
10. Ajuste PLL (bucle de enganche de fase)

1. Cambie el bloqueo de aparato a modalidad de EYECCION.
2. Connecte CH1 y CH2 de osciloscopio a TJ701 (FCLK) y TJ702 (CLDCK) en P.C.B. 01.
   Puesta de osciloscopio:
   VOLTAJE 2V
   BARRIDO 20μs
   Entrada . . . . . CA
   Disparador . . . . . CH1 + CH2 (NORM.)
   Modalidad . . . . . ALT:
3. Connecte perno 13 de IC301 en P.C.B. 01 a tierra (GND).
4. Ajuste L301 (VCO) de manera que la onda de osciloscopio se forme como se muestra abajo.



Aparee los centros de anchura de impulso de ambas formas de onda.

5. Después del ajuste arriba mencionado, remueva el cable corto en paso 3).
6. Maximice VR501 (11T) girándolo completamente a la derecha.
7. Ponga el disco y apriete el botón de INTERPRETACION.
8. En la modalidad de interpretación, conecte TJ501 (11TMODE) en P.C.B. 01 a tierra (GND).
9. En la misma modalidad de osciloscopio como en paso 2), ajuste VR501 de manera que la onda de osciloscopio se forme como abajo.



11. Comprobación de operación de interpretación después

Comprobación de busca de salto
1. Interpretar un disco ordinario.
2. Oprimir el botón de salto y comprobar para ver si se da busca de salto. (Adelante y atrás)

Comprobación de busca manual
1. Interpretar un disco ordinario.
2. Optimir el botón de busca manual y comprobar para ver si se puede hacer busca de salto suave a las velocidades baja y alta. (Adelante y atrás)

Comprobación para defectos
1. Interpretar la banda 12 de disco de prueba y comprobar para ver si no hay salto de sonido o ruido. (Punto negro)
2. Interpretar la banda 14 de disco de prueba y comprobar para ver si no hay salto de sonido o ruido. (Huella digital)

• Ajuste de la Toma Óptica

1. Ajuste de posición de reposo

1. Asegúrese de que los interruptores de hoja S101 (posición de reposo) y S102 (posición de fin) no han sido magullados durante el rearme y, por lo tanto, puestos en "ON".
   Si están, cuidadosamente separe los contactos unos 2 mm.
2. Aplique energía a la unidad. Esto hará que el motor de movimiento transversal enrolle el fonocaptor óptico a la posición de REPOSO.
3. Desconecte el interruptor de alimentación.
4. Coloque la galga de posición de REPOSO sobre el plato giradiscos.
5. Asegúrese de que la lente está concéntrica dentro del agujero de la galga de posición de REPOSO, como mostrado en la **Fig. B**.

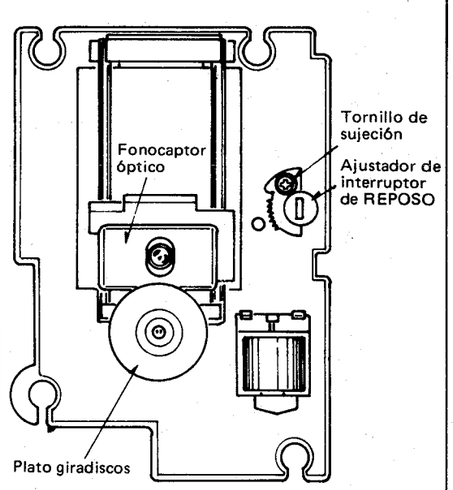


Fig. A

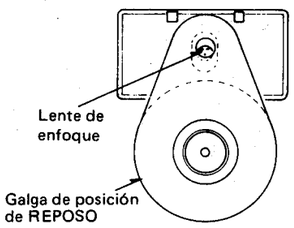


Fig. B "NG" (demasiado cerca)

Fonocaptor óptico está demasiado cerca del plato giradiscos. (Fig. B)
Para ajustar:
1. Afloje el tornillo de sujeción y gire el ajustador de interruptor de REPOSO a la derecha.
2. Observe que si el interruptor de detección de Reposo (S101) está demasiado hacia S102, entonces el fonocaptor reposará demasiado apartado del plato giradiscos en la posición de Reposo. Si así fuera, aplique energía y repita el paso 1 de arriba hasta que se detecta la detección de Reposo cuando la lente está concéntrica con el agujero de la galga de posición de REPOSO.

No se requiere ningún ajuste (Fig. C)

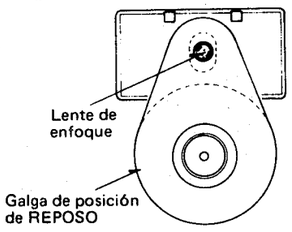


Fig. C "Ok"

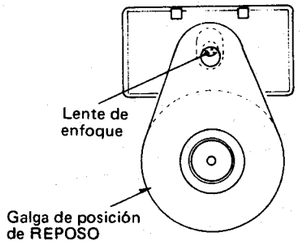


Fig. D "NG" (demasiado apartado)

Fonocaptor óptico está demasiado apartado del plato giradiscos. (Fig. D)
Para ajustar:
Afloje el tornillo de sujeción y gire el ajustador de interruptor de Reposo a la izquierda.

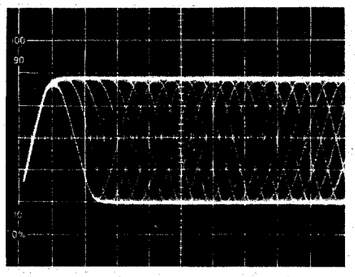
6. Para verificar el ajuste correcto, coloque el disco sobre el plato giradiscos y aplique energía a la unidad. Esto autociclará el fonocaptor óptico. Vuelva a comprobar alineamiento con la galga de posición de REPOSO, como mostrado en la Fig. C.

2. Ajuste de altura de plato giradiscos

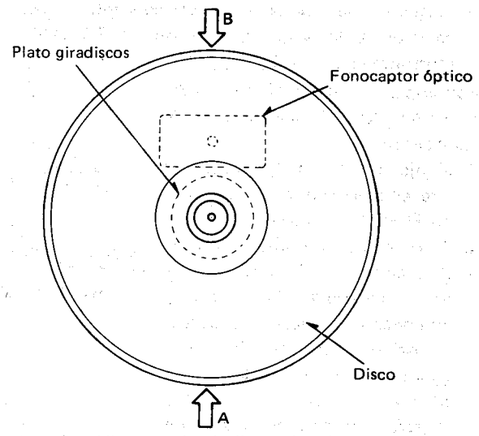
Nota: Necesario después que el motor de huso de accionamiento directo es reemplazado o no se obtiene señal RF.

1. Saque el perno corto de R130 en P.C.B. 03.
2. Inserte el extremo fino de la galga de cuchilla palpadora entre el plato giradiscos y el cojinete de eje.
3. Deslice la galga de cuchilla palpadora haca el extremo grueso y marque la galga con un lápiz donde ésta y el plato giradiscos se toquen y hasta que la cuchilla no se pueda meter ya más, entonces remueva la galga.
4. Connecte el osciloscopio a perno TJ402 en P.C.B. 01 (Servo).
5. Coloque un disco sobre el plato giradiscos y fíjelo con el imán.
6. Aplique energía a la unidad.
7. Apriete eyección "out" y ejección "IN".
8. Confirme si se presenta señal RF. Si no, proceda al siguiente paso.
9. Para confirmar:
   Suavemente golpee el disco en el punto "A". Si aparece señal RF, el plato giradiscos está demasiado bajo. Si no aparece señal RF, golpee el disco en el punto "B". La señal RF debe aparecer indicando que el plato giradiscos demasiado alta.
10. Para ajustar:

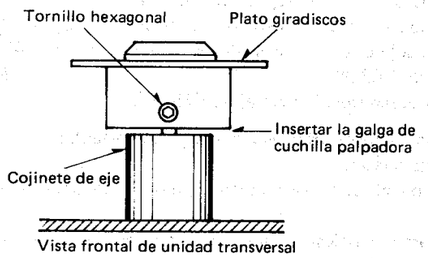
(1) Inserte la galga de cuchilla palpadora entre el plato giradiscos y el cojinete de eje al punto previamente marcado.
(2) Afloje el tornillo hexagonal del tornillo de ajuste de plato giradiscos. (Use una llave hexagonal 1,27 mm)
(3) Si el plato giradiscos está demasiado bajo, deslice la galga de cuchilla palpadora unos 4 mm (5/32") hacia el extremo grueso y remueva la galga de cuchilla palpadora.
   Vuelva a aplicar energía y compruebe por señal de RF. (Este es un ajuste de "prueba". Puede requerirae varios tanteos para obtener señal RF).
(4) Si el plato giradiscos está demasiado alto, inserte la galga de cuchilla palpadora y mueva unos 4 mm(5/32") hacia el extremo fino, usando el mismo método que en el paso 3.
(5) Vuelva a conectar R130 para habilitar exploración de enfoque.



Señal RF



Vista superior de disco colocado



Vista frontal de unidad transversal

3. Ajuste mecánico

1. Coloque el Disco de prueba sobre el plato giradiscos con fijador de imán.
2. Conecte el osciloscopio a perno TJ402 en P.C.B. 01 (Servo).
3. Aplique energía a la unidad y seleccione la modalidad de interpretación.
4. Confirme que la señal RF es como mostrado en la **Fig. A.**
   Si ésta no se presenta, proceda al siguiente paso.
   Si la señal RF es como mostrada, salte el paso 5.
5. Ajuste el tornillo hexagonal (use una llave hexagonal 2 mm) a la derecha o izquierda para obtener la señal RF (comprobación visual), como mostrado en la **Fig. B.**

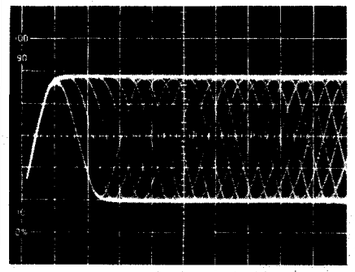


Fig. A Señal RF

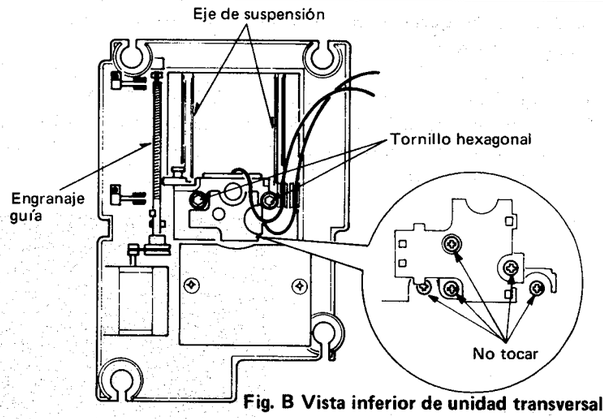


Fig. B Vista inferior de unidad transversal

4. Ajuste de rejilla

1. Coloque el Disco de prueba sobre el plato giradiscos y fije con el imán.
2. Conecte el osciloscopio como sigue:
   BARRIDO . . . . . 2μs.
   CH1 . . . . . TJ402 (P.C.B. 01)
   CH2 . . . . . C164 en P.C.B. 03 (Perno 17 de IC104).
3. Aplique energía a la unidad y seleccione la modalidad de interpretación.
4. Si se presentan señal RF y marca "N", no se requiere ningún ajuste como en la Fig. A.
   Si no se presentan señal RF y marca "N", efectúe el paso 5.
5. Inserte la herramienta de ajuste de rejilla dentro del agujero del lado izquierdo del cuerpo de fonocaptor óptico como mostrado en la Fig. B.
6. Haga girar la herramienta de ajuste de rejilla hacia la direcha o izquierda hasta que la marca "N" es lo más nítida y se obtenga la máxima señal RF.

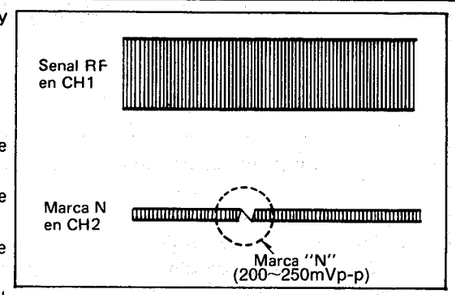


Fig. A Señal RF y marca "N"

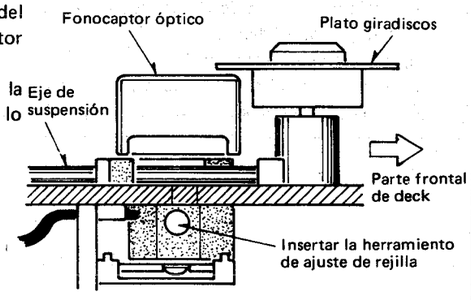
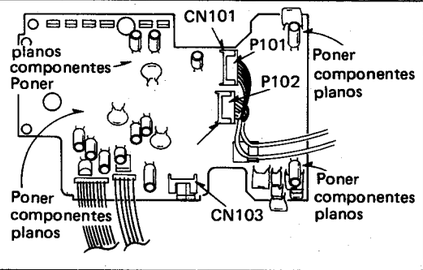


Fig. B Vista lateral izquierda de unidad transversal

5. Alineamiento eléctrico de unidad principal. Siga el ajuste, refiera a la páginas 18 ~ 21.

6. Comprobación del P.C.B. 03

* Después del ajuste, ordene todos los componentes para que estén planos sobre P.C.B. 03, y rearme sobre la unidad transversal.
* Una vez se ha montado el P.C.B. 03, asegúrese de que la parte inferior del fonocaptor no interfiere con ninguno de los componentes.
   Por lo tanto, asegúrese de que los surcos en los bordes externos del disco son accesibles.



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