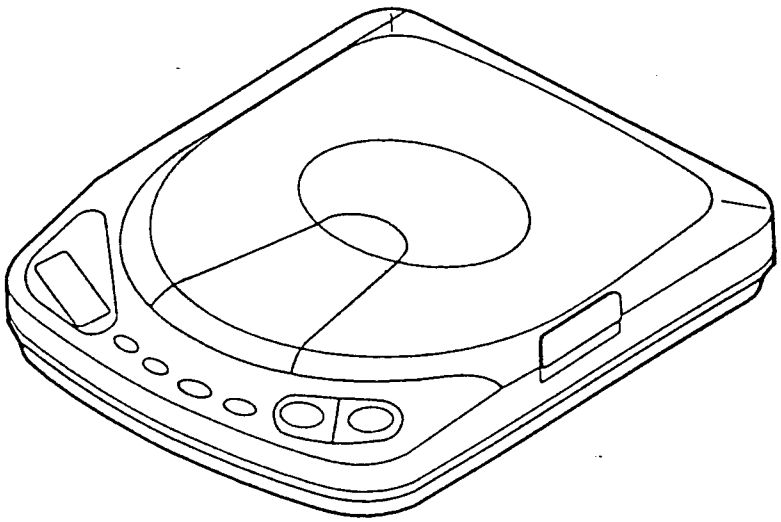
SANYO

FILE NO.

Service Manual

Portable Compact Disc Player

CDP-150 (XE) (UK) (SS) (SP) (AU)



PRODUCT CODE No.
142 989 02 (XE)
142 989 03 (UK)
142 989 04 (SS)
142 989 05 (SP)
142 989 06 (AU)

Specifications

(CD Player Section)

Frequency Responce ..	20 - 20,000 Hz
Wow & Flutter	Below measurable limits
Sampling Frequency ..	44.1 kHz
D/A Converter	1-bit
Error Correction Method	CIRC
Pick-up	Optical 3-beam Semi-conductor laser (790 nm wavelength)
Laser output	Continuous wave max. 0.5 mW

(General)

Maximum Output	
(stereo headphone) ...	15 mW + 15 mW
Power Supply	
AC Adaptor	AC : 230 V, 50 Hz (XE/UK/SP) AC : 240 V, 50 Hz (AU) AC : 115/230 V, 50/60 Hz (SS)
DC	3 V : Using two "AA" batteries 3 V : Using the rechargeable nickel-cadmium battery (only SS/SP)
Dimensions	Approx. 142 (W) x 35 (H) x 160 (D) mm
Weight	Approx. 320 g (Without batteries, main unit only)

Specifications subject to change without notice.

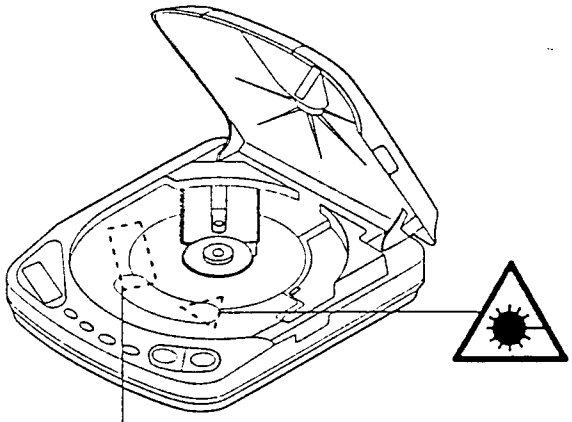
REFERENCE No. SM580552

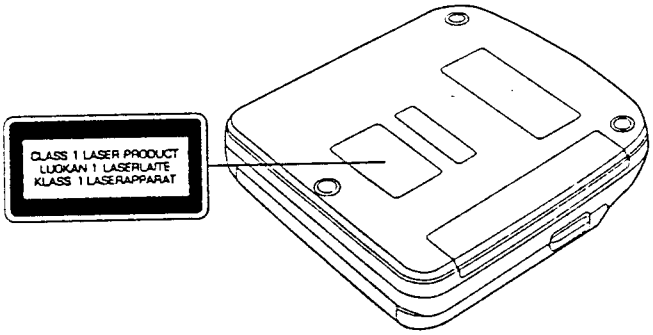
LASER BEAM SAFETY PRECAUTIONS

- Pick-up that emits a laser beam is used in this CD player.

CAUTION :
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE

LASER OUTPUT ..... 0.5 mW Max. (CW)
WAVELENGTH ..... 790 nm



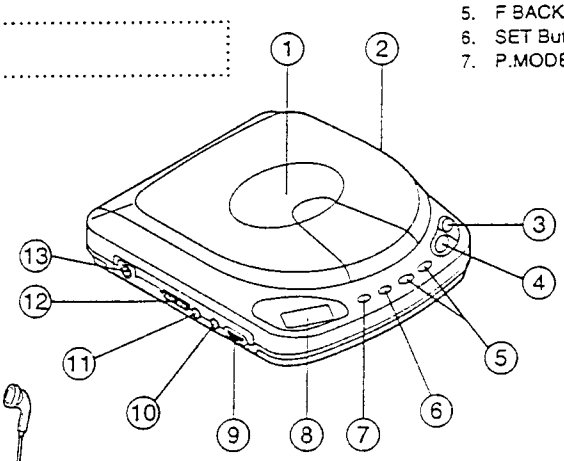


CAUTION – INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL – USYNLIG LASER STRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION, UNDGÅ UDS ÆTTELSE FOR STRÅLING.
VARNING – OSYNLIG LASER STRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRR ÄR URKOPPLAD. STRÅLEN ÄR FARLIG.
VORSICHT – UNSICHTBARE LASERSTRAHLUNG TRITT AUS, WENN DECKEL GEÖFFNET UND WENN SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT IST. NICHT, DEM STRAHL AUSSETZEN.
VARO !– AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

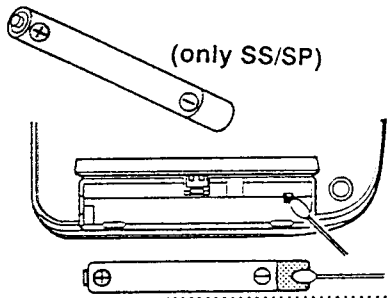
NOTES (ACCESSORIES & CONNECTION)

1. Disc Compartment
2. Battery Compartment (bottom)
3. PLAY/PAUSE Button
4. STOP Button
5. F BACK/F FWD Buttons
6. SET Button
7. P.MODE Button
8. Display
9. VOLUME Control
10. PHONES Jack
11. LINE OUT Jack
12. BASSXPANDER Switch
13. DC 6V Jack

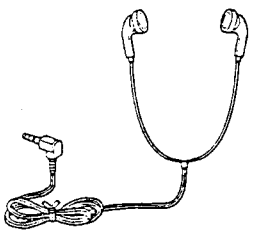
AC adaptor



Rechargeable nickel-cadmium battery (NBP-30B)
Part No. 645 012 1180

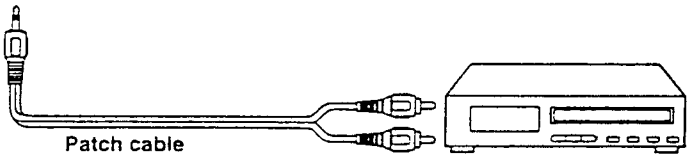


- Always keep the charging terminal clean.



Headphones
Part No. 614 252 7764

LINE OUT



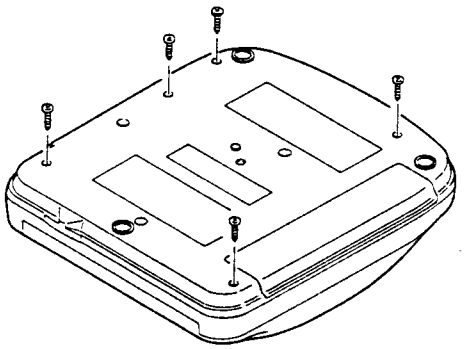
Patch cable
Part No. 645 011 9071

REMOVAL AND INSTALLATION

- Disconnect the AC adaptor's plug.
- Remove the batteries.
- All wiring should be returned to the original position after work is completed.
- First have ready many the new FIXERS (614 129 4971) for replacement.

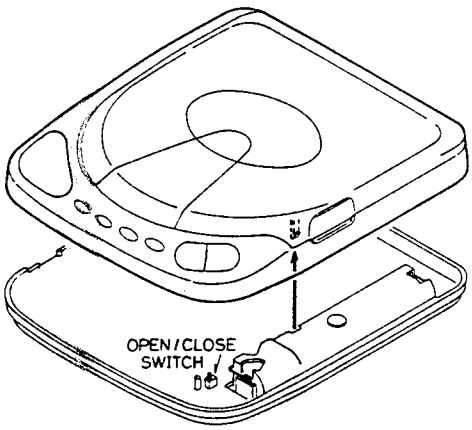
a. CABINET, BOTTOM

(1) Remove the 5 rear cabinet mounting screws.

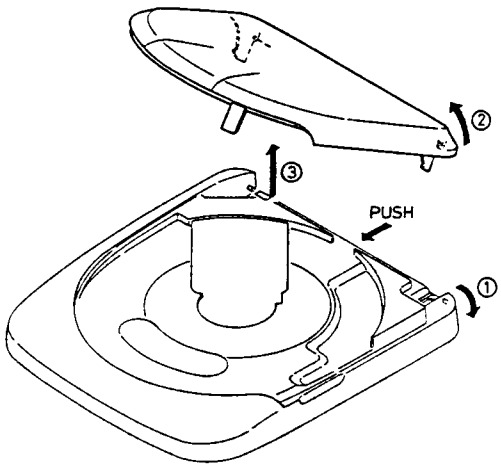


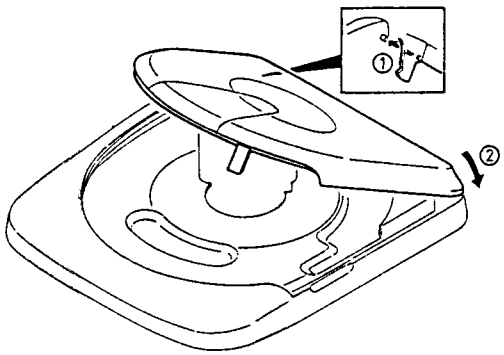
b. CABINET

(1) Remove the bottom cabinet.

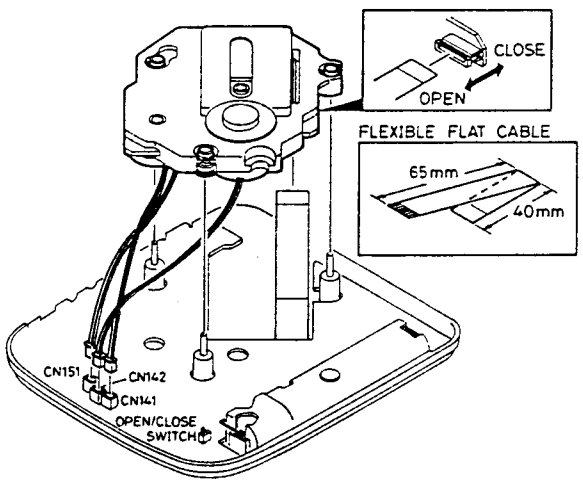


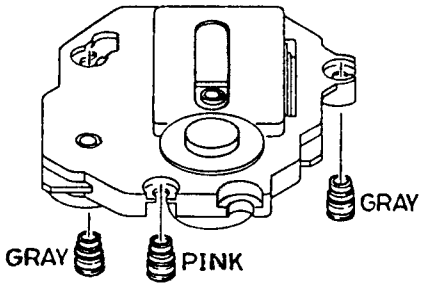
c. CD LID





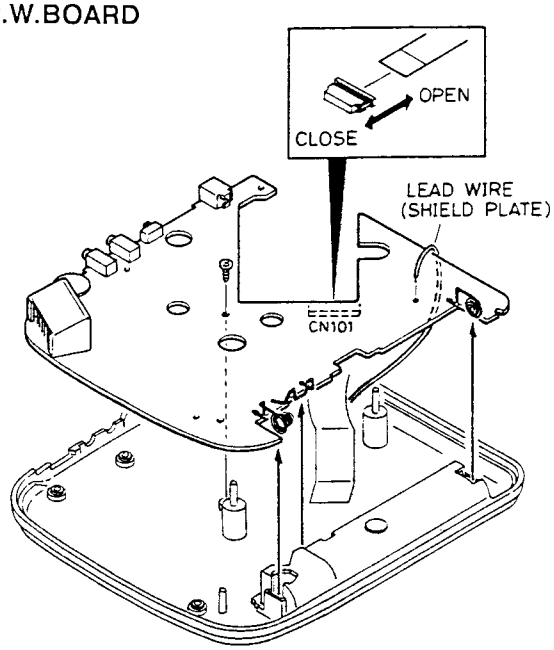
d. CD MECHANISM

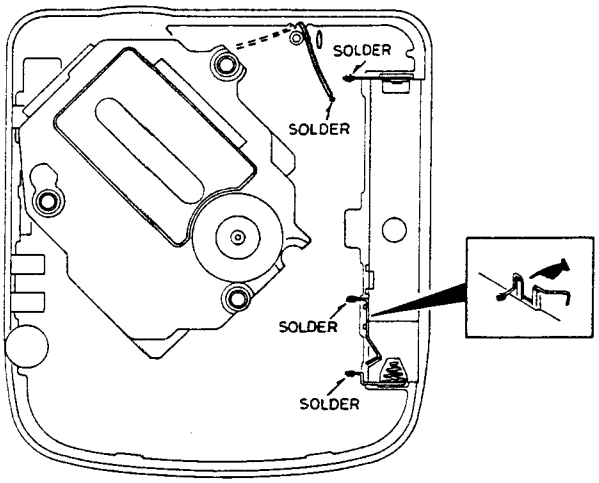




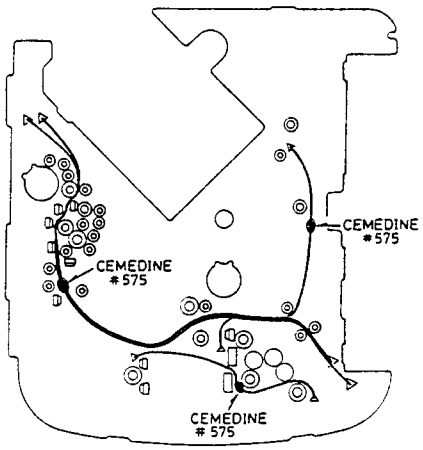
REMOVAL AND INSTALLATION

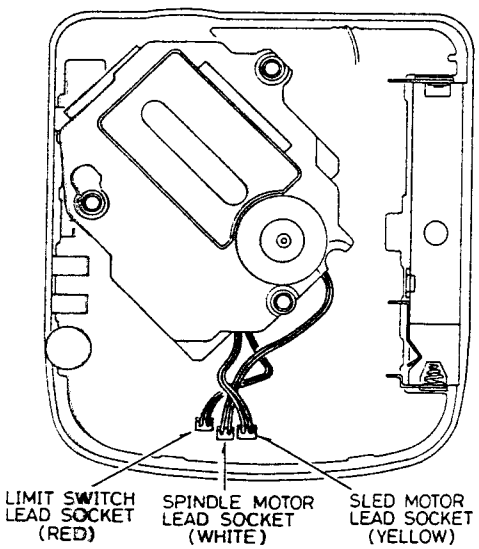
e. CD P.W.BOARD

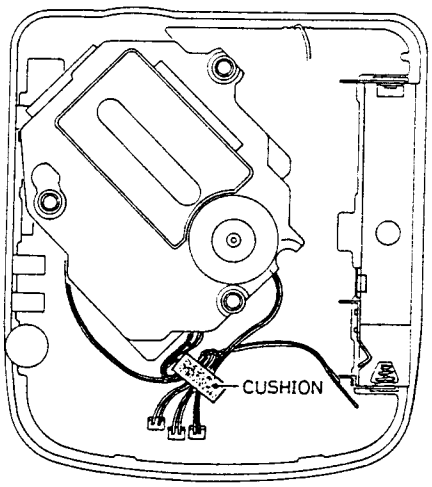


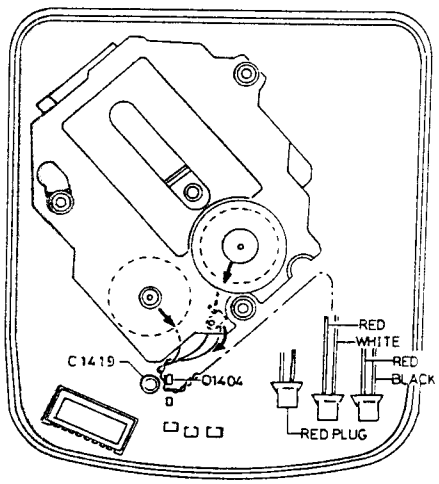


f. WIRING LAYOUT









CD MECHANISM ADJUSTMENTS

a. DISASSEMBLY OF THE CD PLAYER MECHANISM

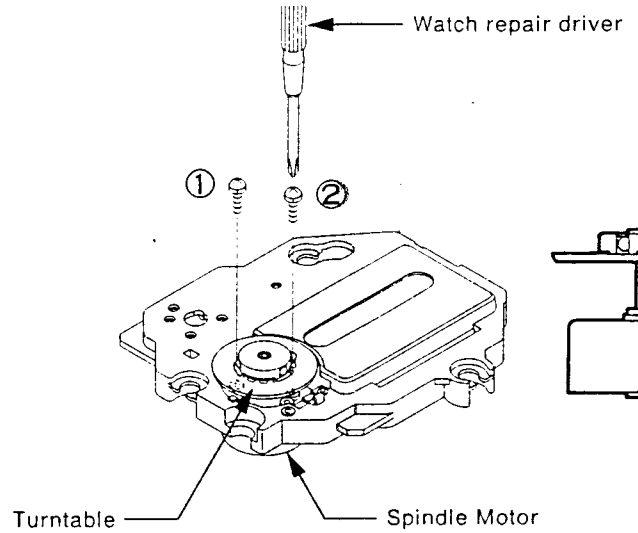
(a) Replacement of the spindle motor assembly

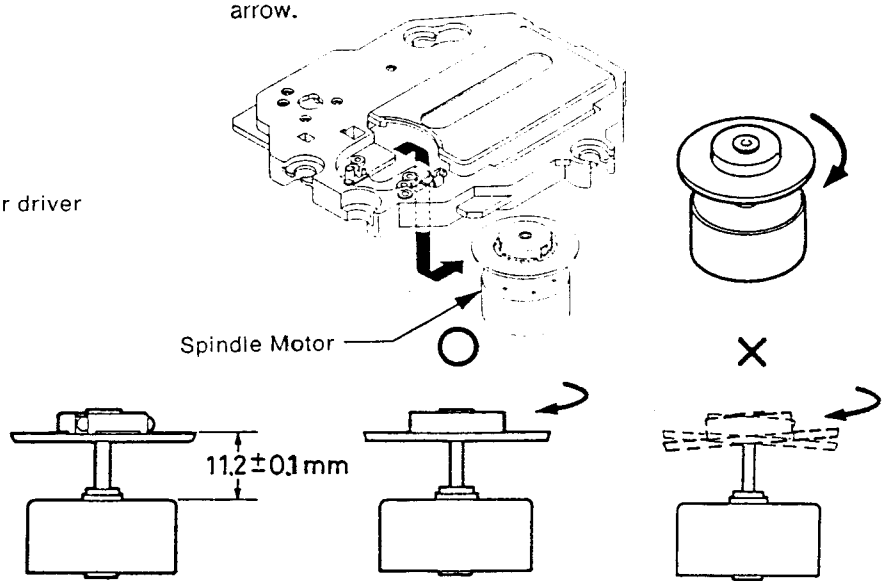
(1) While turning the turntable, align the open hole in the turntable with the position of the spindle motor fastening screw. (①)

(2) Insert the watch repair driver from the screw fastening hole and remove the screw. (①)

(3) Turn the turntable as previously described, align the screw fastening hole with the position of the screw (②) and remove the screw. (②)

(4) Remove the spindle motor in the direction shown by the arrow.





(b) Replacement of the pick-up

(1) Remove the pick-up rail mountingscrew. (①)

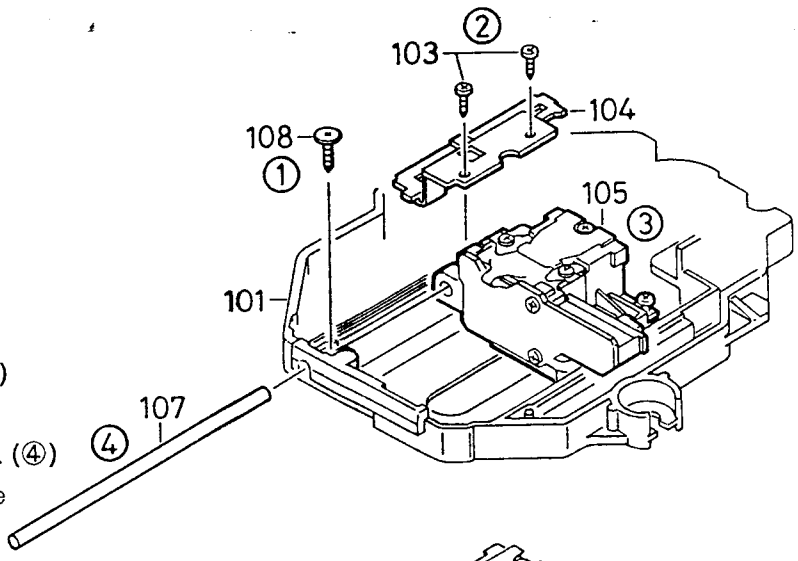
(2) Remove the rack gear (104) mounting screws. (②)

(3) Replacement of the pick-up. (③)

(4) Insert the pick-up rail (107) into the base chassis. (④)

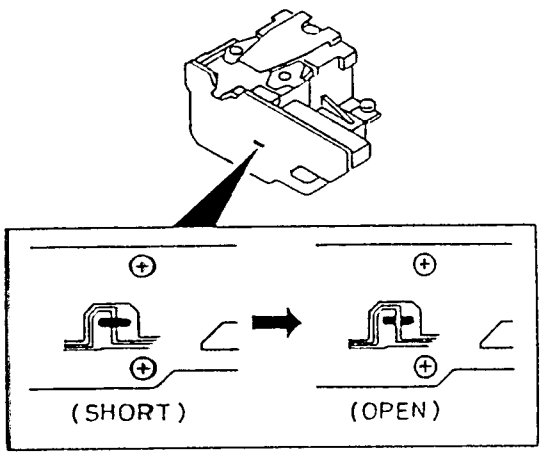
(5) The pick-up rails have been installed, first wipe the tips of the rail with alcohol.

(6) After the pick-up has been replaced, apply grease (FLOIL G-474B) to the rail.



(7) The pick-up P.W.Board pattern is **"shorted"**, as shown in the figure, so that the new pick-up will not be susceptible to the effects of static.

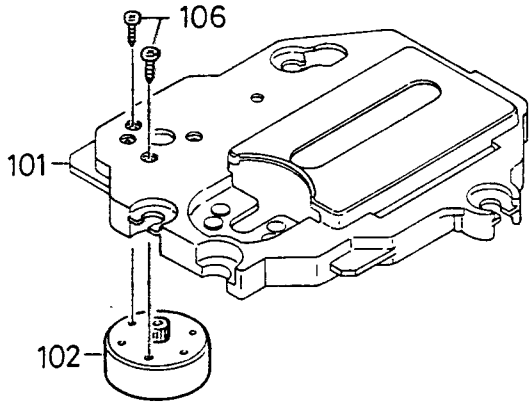
(8) Set the pattern to **"open"** after the pick-up has been replaced.



CD MECHANISM ADJUSTMENTS

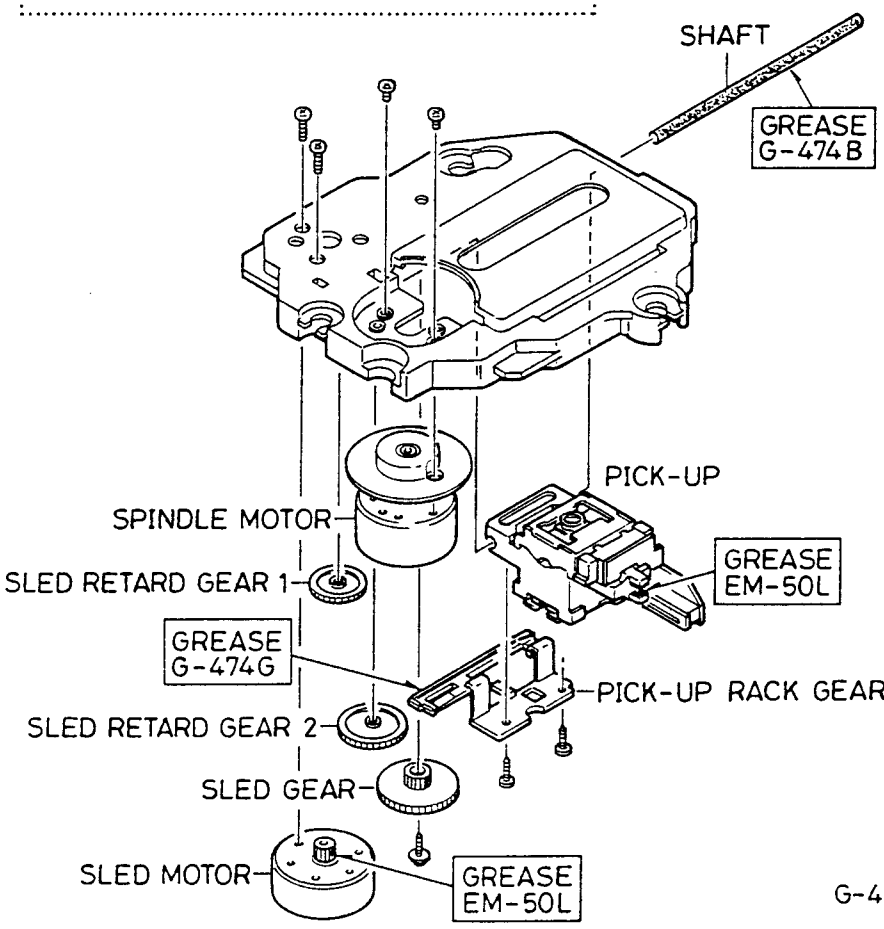
(c) Sled motor replacement

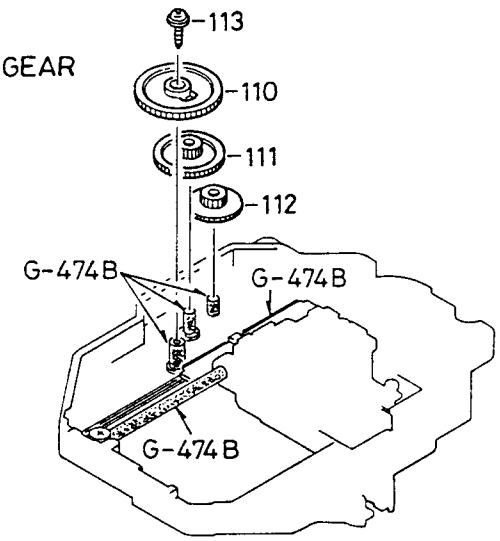
(1) See illustration at right.



b. REPLACEMENT AND LUBRICATION OF THE CD MECHANISM

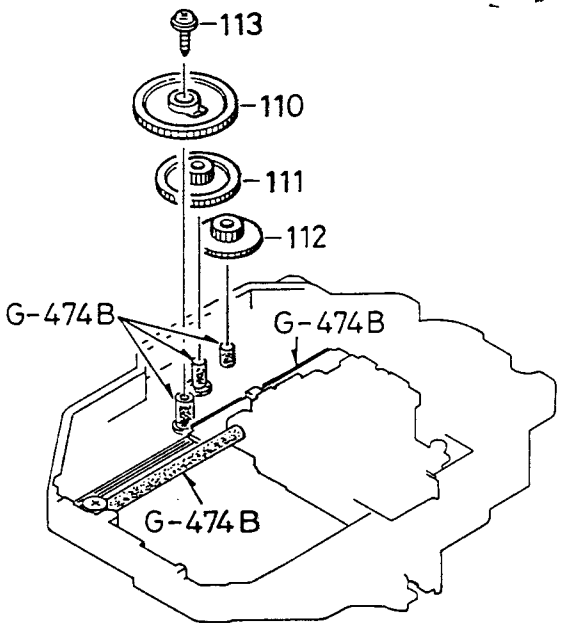
Note :
EM-50L ..... MOLYKOTE, EM-50L
G-474B ..... FLOIL OIL, G-474B





BE SURE, AT THIS TIME, NOT TO TOUCH ANY OTHER PART.

c. CHECKING THE CD MECHANISM



(a) Checking the operation of the CD mechanism

(1) Disconnect the sled motor socket from the printed-circuit board.

(2) Apply a voltage of DC **0.7 V** to the sled motor's terminal.

(3) Measure the current during sled motor operation.

- The direction of movement of the pick-up (outer groove or inner groove) can changed by changing the battery polarity.

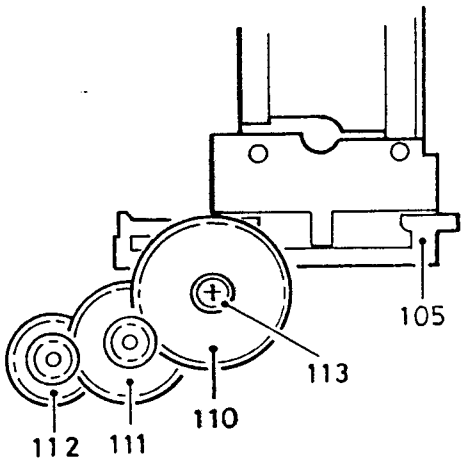
(4) The current during sled motor operation varies according to the positional relationship of gears (110 and 111).

(5) If the current exceeds **20 - 50 mA** , remove the gear (111) and gear (110).

(6) Apply a small amount of a **FLOIL (G-474B)** bonding materials to the chassis shafts.

(7) Install the gears as shown in the illustration.

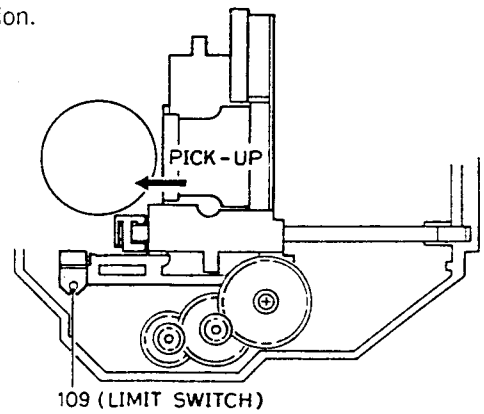
Direction of pick-up movement	Sled motor current
Outer groove	20 - 50 mA
Inner groove	20 - 50 mA

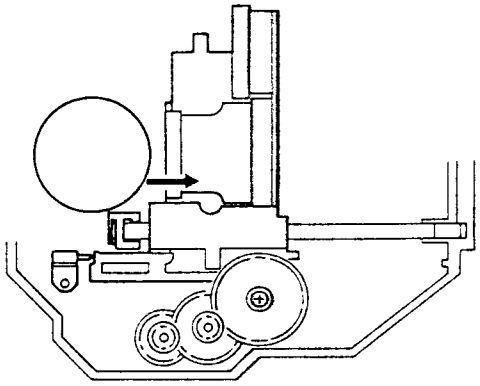


(b) Resetting the pick-up to the home position

(1) The LIMIT switch is switched ON by the projection of the rack gear secured to the returned pick-up, after which the sled motor continues to operate (by the circuit) for approximately 20 ~ 30 milliseconds ; there is then again a reverse operation, and movement to the position at which the switch is switched OFF.

(2) Rotation continues for about 20 ~ 30 milliseconds after the switch is switched OFF, and then the pick-up stop at home position.





CHECKING THE CD PLAYER EYE PATTERN

a. PREPARATIONS

(a) Measuring instruments, tools and filter

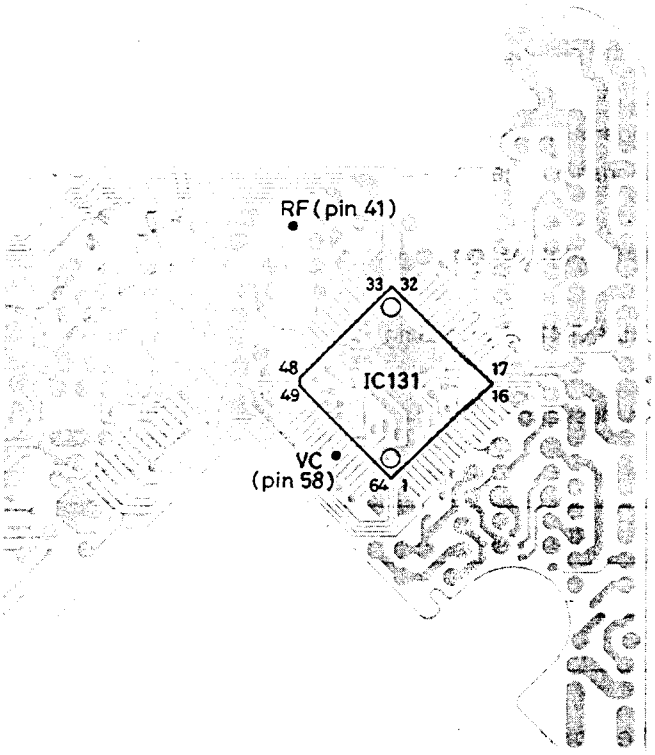
(1) Test disc. : YEDS 18 (SONY) or etc.

(2) Oscilloscope : SS5711 (10 MHz or dual-phenomenon)
or Memoryscope : DSS6521 (Storagescope)

(3) Resistor, Carbon 2.2 K ohm, 1/4W

(4) EXT. DC POWER : DC 6 V, 1A

b. PARTS LOCATION



c. CHECKING THE EYE PATTERN

(1) Switch ON the DC power.

(2) Connect an oscilloscope to IC131 (pin 41) (RF) and IC131 (pin 58) (VC).

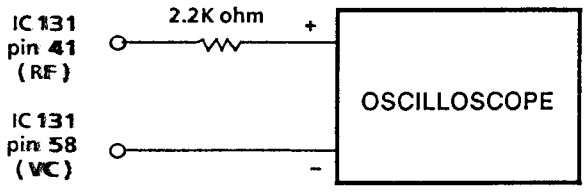
(3) Load the test disc.

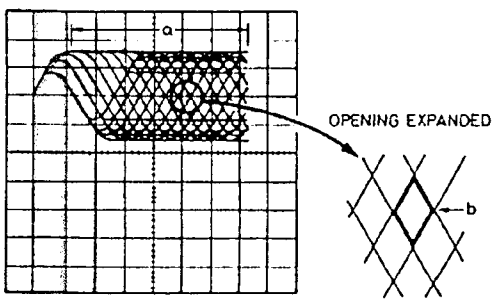
(4) PLAY switch push ON.

(5) Check to be sure that the " **eye** " pattern is at the center of waveform and that the diamond shape is clearly defined.

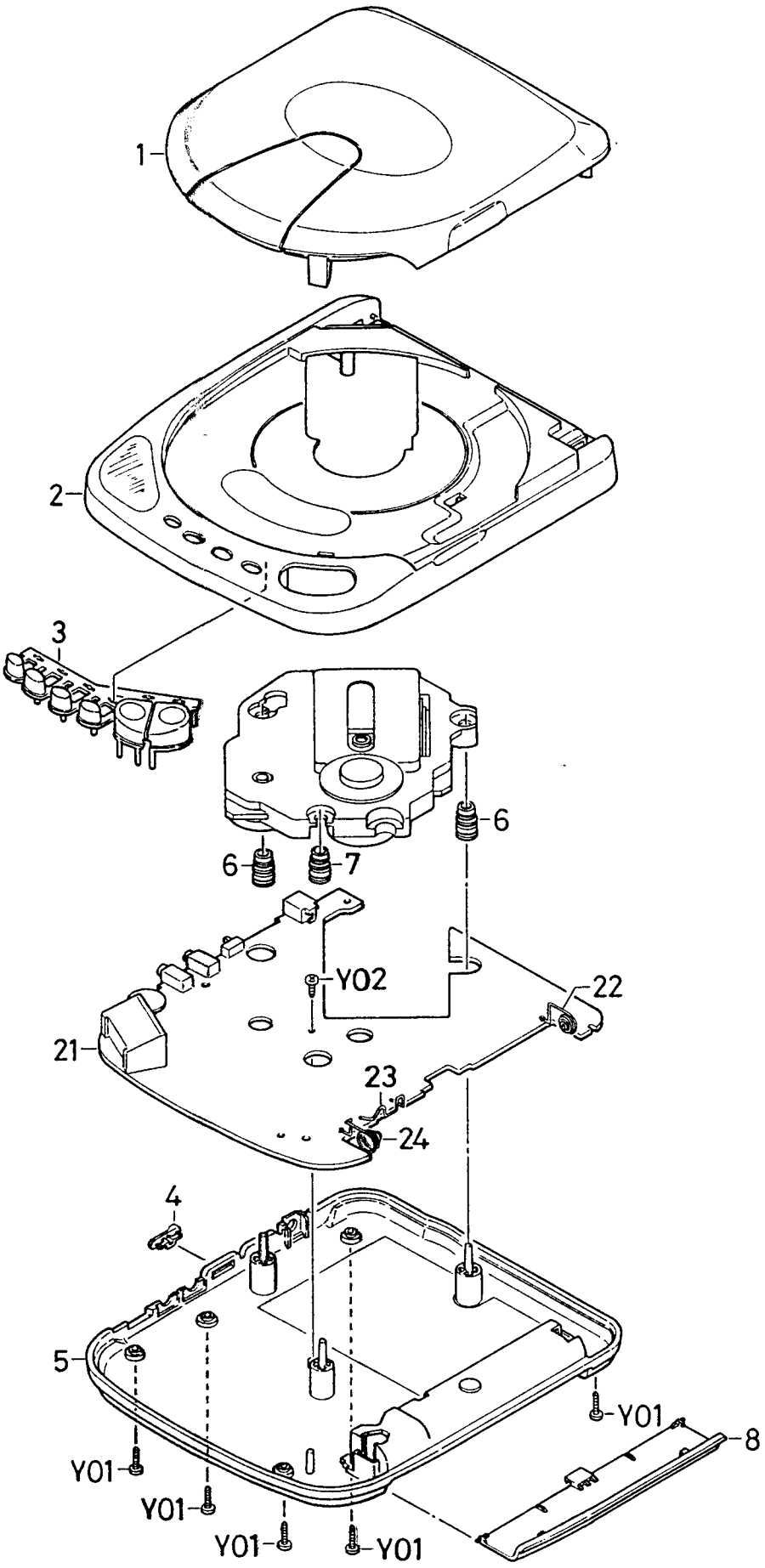
(6) Press the STOP button.center

(7) Switch OFF the DC power.





EXPLODED VIEW (CABINET & CHASSIS)



PARTS LIST

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

CAUTION : Regular type resistors and capacitors are not listed. To know those values, refer to the schematic diagram.
Regular type resistors are less than 1/4W carbon type and 0 ohm chip resistors.
Regular type capacitors are less than 50V and less than 1000μF type of Ceramic type and Electrical type.

N.S.P : Not available as service parts.

PACKING & ACCESSORIES

Ref. No.	Part No.	Description
	614 273 2274	CARTON CASE,INNER (XE)
	614 273 2281	CARTON CASE,INNER (UK)
	614 273 2311	CARTON CASE,INNER (AU)
	614 273 2298	CARTON CASE,INNER (SS)
	614 273 2274	CARTON CASE,INNER (SP)
	614 273 2380	INSTRUCTION MANUAL (XE)
	614 273 2397	INSTRUCTION MANUAL (UK)
	614 273 2427	INSTRUCTION MANUAL (AU)
	614 273 2403	INSTRUCTION MANUAL (SS)
	614 273 2380	INSTRUCTION MANUAL (SP)
	614 271 1026	CAUTION,DISC,PROTECTIVE SHEET
	645 011 4168	POLY SHEET,450X250MM,SET (XE)
	645 011 9880	POLY SHEET,450X250MM,SET (UK/AU/SS/SP)
	614 252 7764	HEADPHONE (UK/AU/SP)
	⚠645 011 8678	ADAPTOR,AC-DC,6CV-230XE, 500 MA (XE/SP)
	⚠645 011 8685	ADAPTOR,AC-DC,6CV-230UK, 500 MA (UK)
	⚠645 011 8647	ADAPTOR,AC-DC,6CV-240AU, 500 MA (AU)
	⚠645 011 8654	ADAPTOR,AC-DC,6CV-230SS, AC 115/230V, DC 6V,500 MA (SS)
	⚠645 011 8326	PLUG,ADAPTOR,AC (SS)
	645 011 9071	CABLE,PATCH CABLE,RCA-2P,Y
	645 012 1180	BATTERY,RECHARGE,2.4V, NBP-30B (SS/SP)
	614 276 8778	LABEL,NI-CD,BATTERY (SP)
	614 277 9590	INSTRUCTION SHEET,NI-CD(SP)

CABINET & CHASSIS

Ref. No.	Part No.	Description
1	614 271 0111	ASSY,LID,CD
2	614 273 1758	ASSY,CABINET,TOP
3	614 270 3724	BUTTON OPERATION
4	614 270 4035	KNOB,SLIDE,BASSXPANDER
5	614 273 1765	ASSY,CABINET,BOTTOM (XE)
5	614 273 1260	ASSY,CABINET,BOTTOM (UK/AU)
5	614 273 1772	ASSY,CABINET,BOTTOM (SS)
5	614 273 1765	ASSY,CABINET,BOTTOM (SP)
6	614 271 0203	SPACER,MECHANISM (GRAY)
7	614 271 0210	SPACER,MECHANISM (PINK)
8	614 270 4066	LID,BATTERY
22	614 270 4196	TERMINAL SPRING,BATTERY(+)
23	614 270 4219	TERMINAL,NI-CD BATTERY
	614 125 2285	CUSHION,SHEET,8X26MM
	614 231 6832	LABEL,SAFETY,LASER,CLASS

FIXING PARTS

Ref. No.	Part No.	Description
Y01	411 022 6800	SCR S-TPG PAN 2X10MM, CABINET-BOTTOM
Y02	411 098 5202	SCR S-TPG PAN 2X5MM, CD P.W.BOARD-BOTTOM

CD P.W.BOARD ASSY

Ref. No.	Part No.	Description
21	614 271 0029	ASSY,PWB,CD
	614 270 4127	MOUNTING,LCD
A1501	645 011 8906	LCD,DISPLAY
24	614 270 4202	TERMINAL SPRING,BATTERY (-)
CN101	645 011 8913	SOCKET,FPC 13P,PICK UP
CN141	645 005 9995	PLUG,2P,SLED/YELLOW
CN142	645 005 7366	PLUG,2P,SPINDLE/WHITE
CN143	645 011 8890	SOCKET,DC,EXT POWER
CN151	645 005 7380	PLUG,2P,LIMIT/RED
CN191	645 000 1413	JACK,PHONE D3.6,LINE OUT
CN192	645 000 1413	JACK,PHONE D3.6,PHONES
D1301	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D1401	407 080 4209	DOODE SB10-03A
D1402	407 080 4209	DOODE SB10-03A
D1403	407 080 4209	DOODE SB10-03A
D1404	407 080 4209	DOODE SB10-03A
D1405	407 080 4209	DOODE SB10-03A
D1406	407 080 4209	DOODE SB10-03A
D1407	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D1511	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D1512	407 050 7209	ZENER DIODE GZA8.2X
D1901	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
IC131	409 350 9808	IC LA9230MS
IC141	409 303 2504	IC LB8108M
IC145	409 361 4601	IC LC78621E
IC151	409 369 7000	IC LC5876-1G59

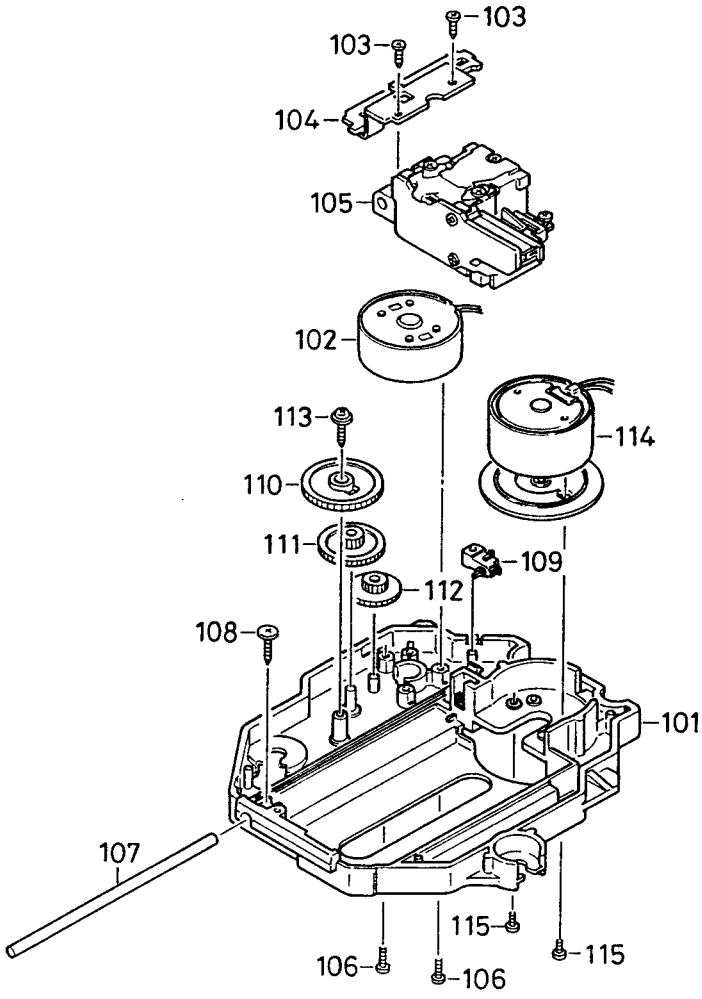
PARTS LIST

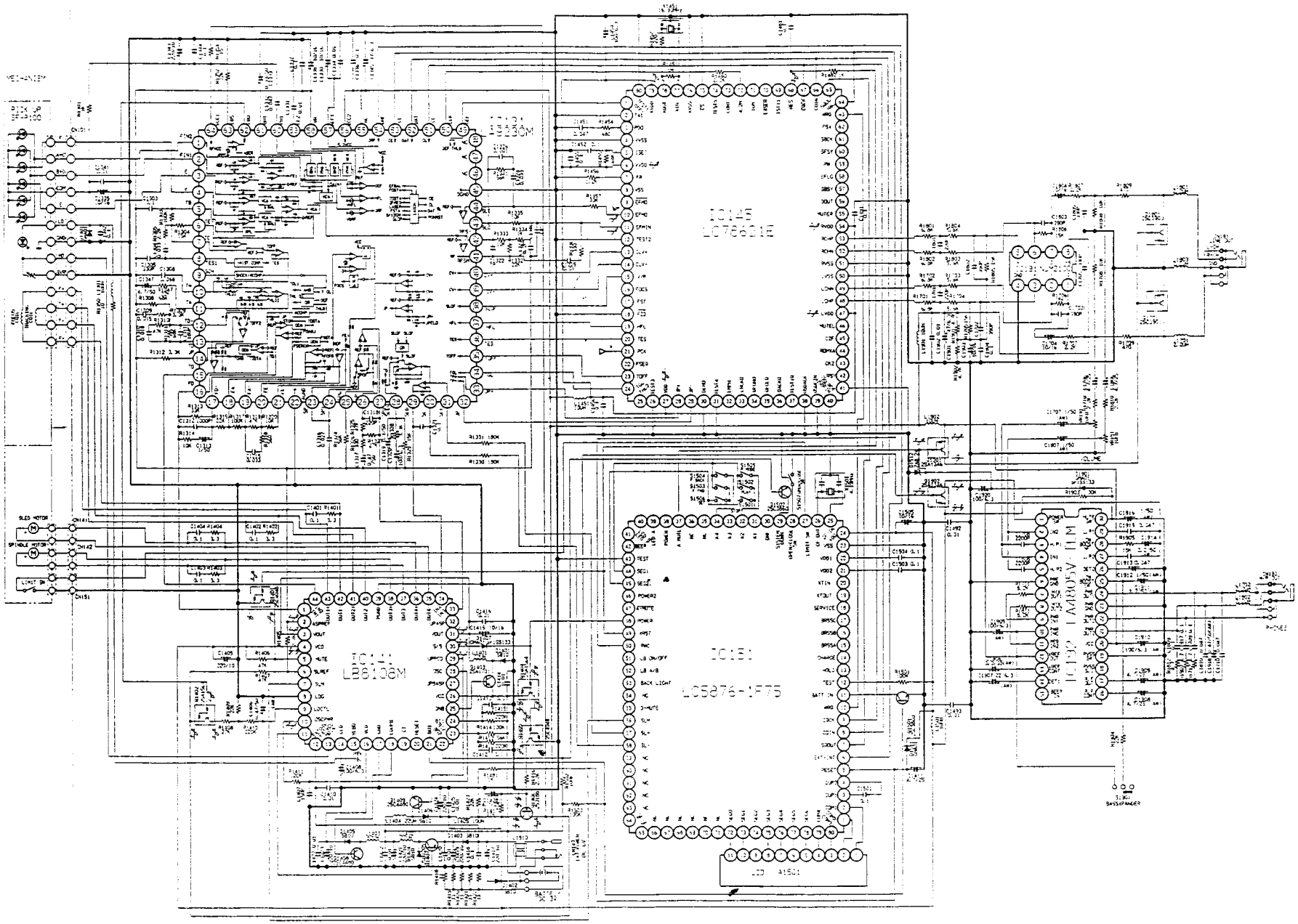
Ref. No.	Part No.	Description
IC191	409 228 9206	IC NJM2100M
IC192	409 297 7608	IC LA4805V
IN101	614 271 0227	SPACER,PWB,MOTOR
IN102	614 271 0227	SPACER,PWB,MOTOR
L1301	645 001 4550	INDUCTOR,10U K
L1401	645 011 8944	INDUCTOR,22U K
L1402	645 011 8951	INDUCTOR,27U K
L1403	645 011 8968	INDUCTOR,82U K
L1404	645 011 8944	INDUCTOR,22U K
L1405	645 001 4550	INDUCTOR,10U K
L1451	645 001 4550	INDUCTOR,10U K
L1501	645 001 4550	INDUCTOR,10U K
L1701	645 001 5441	INDUCTOR,2.2U K
L1702	645 001 5441	INDUCTOR,2.2U K
L1801	645 001 5441	INDUCTOR,2.2U K
L1802	645 001 5441	INDUCTOR,2.2U K
L1901	645 001 4550	INDUCTOR,10U K
L1902	645 001 4550	INDUCTOR,10U K
L1903	645 001 5441	INDUCTOR,2.2U K
L1910	614 212 3171	INDUCTOR,FERITE
or	645 006 9864	INDUCTOR,80UH,1A
Q1401	405 037 0809	TR 2SC4048
Q1402	405 036 3702	TR 2SA1564
Q1403	405 088 8502	TR 2SA1701-T
or	405 088 8601	TR 2SA1701-U
or	405 088 8403	TR 2SA1701-S
Q1404	405 036 3702	TR 2SA1564
Q1405	405 037 0809	TR 2SC4048
Q1406	405 106 2802	TR 2SJ188
Q1407	405 047 9304	TR 2SB1205-S
or	405 047 9403	TR 2SB1205-T
Q1408	405 089 1304	TR 2SC4480
Q1409	405 089 1304	TR 2SC4480
Q1501	405 037 0205	TR 2SC3860
Q1502	405 037 0205	TR 2SC3860
Q1701	405 018 9500	TR 2SC3901
Q1801	405 018 9500	TR 2SC3901
Q1901	405 003 7702	TR 2SA1346
Q1902	405 003 7702	TR 2SA1346
S1501	614 240 0944	SWITCH,TACT,STOP
S1502	614 240 0944	SWITCH,TACT,PLAY
S1503	614 240 0944	SWITCH,TACT,F FWD
S1504	614 240 0944	SWITCH,TACT,F BACK
S1505	614 240 0944	SWITCH,TACT,P.MODE
S1506	614 240 0944	SWITCH,TACT,SET
S1507	614 230 8578	SWITCH,PUSH,OPEN/CLOSE
S1901	645 008 8728	SWITCH,SLIDE 1P-2T, BASSXPANDER
VR191	614 232 2000	VR,ROTARY,10K"A",VOLUME
X1451	614 231 2667	RESONATOR,16.93MHZ
X1501	614 215 5561	RESONATOR,CERAMIC,4.19MHZ

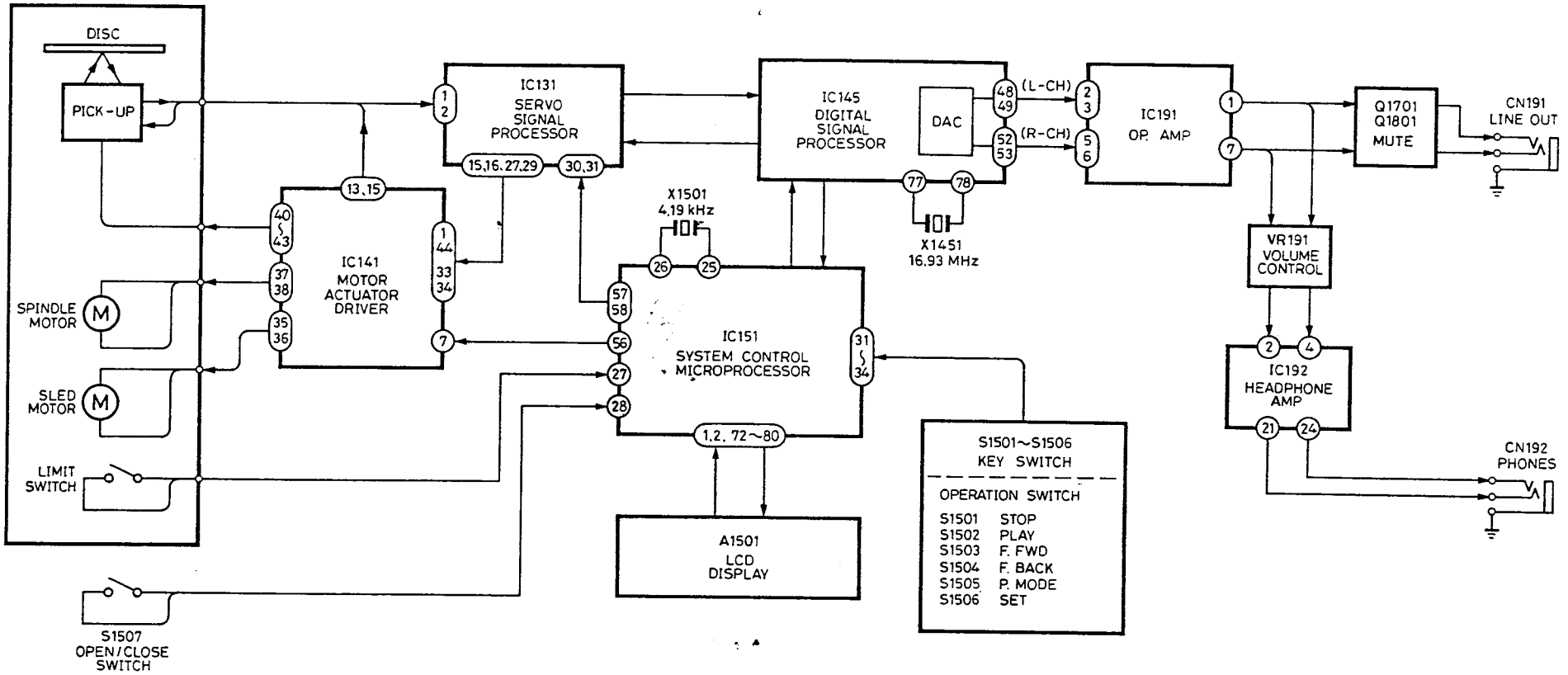
CD MECHANISM (PM-CDB150-SH)

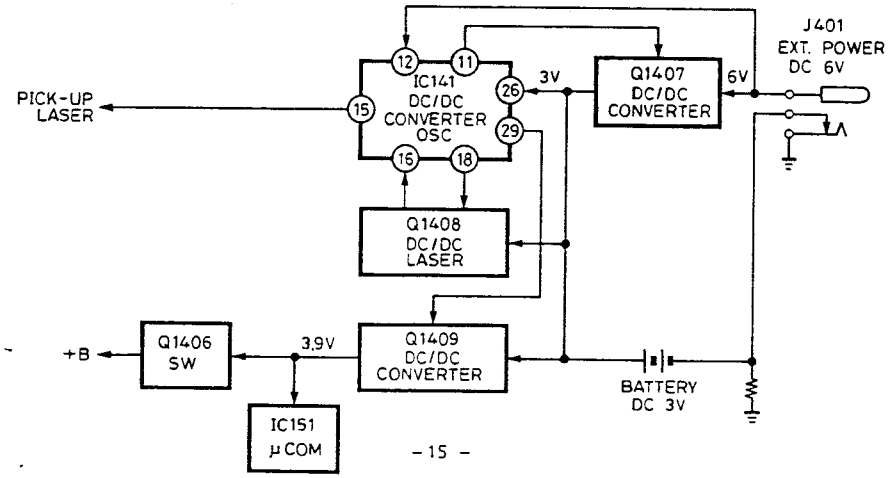
Ref. No.	Part No.	Description
101	614 270 4752	CHASSIS,BASE MECHANISM
102	645 011 0689	ASSY,MOTOR CD,SLED MOTOR
103	411 152 4301	SCR S-TPG PAN PCS 1.7X6MM, PICKUP RACK GEAR FIX
104	614 270 4875	GEAR,PICKUP RACK GEAR
105	645 006 7983	PICKUP,LASER SF-P100
106	614 271 0494	SPECIAL SCREW-1.7X5.5MM, SLED MOTOR FIX
107	614 270 4912	SHAFT,PICKUP RAIL
or	614 277 7992	SHAFT,PICKUP RAIL
108	411 024 3807	SCR S-TPG PAN+FLG 2X8MM, PICKUP RAIL FIX
109	645 012 5881	SWITCH,LIMIT SWITCH
110	614 270 4837	GEAR,SLED GEAR
111	614 270 4820	GEAR,SLED RETARD GEAR 2
112	614 270 4813	GEAR,SLED RETARD GEAR 1
113	412 047 3904	SPECIAL SCREW,2X8MM, SLED GEAR FIX
114	645 011 0672	ASSY,MOTOR, SPINDLE MOTOR WITH TURNTABLE
	N.S.P	MOTOR,CD DC 0.2W, SPINDLE MOTOR
	N.S.P	SPECIAL WASHER,1.9X5X0.3MM
	N.S.P	ASSY,TURNTABLE,SPINDLE
115	614 273 1734	SPECIAL SCREW-1.7X3.0MM, SPINDLE MOTOR FIX
	614 271 0364	CORD,2P CONNECTOR,SWITCH LEAD
	645 011 2829	FLEXIBLE FLAT CABLE,13P, PICKUP

EXPLODED VIEW (CD MECHANISM)

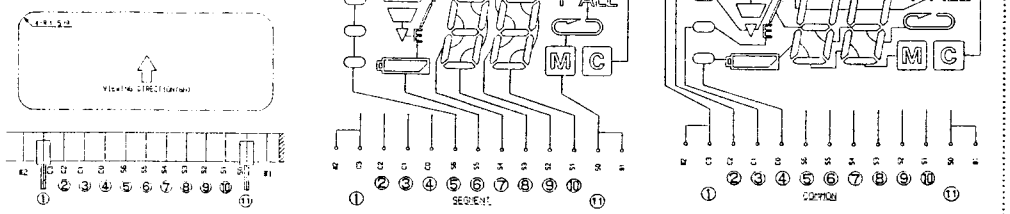




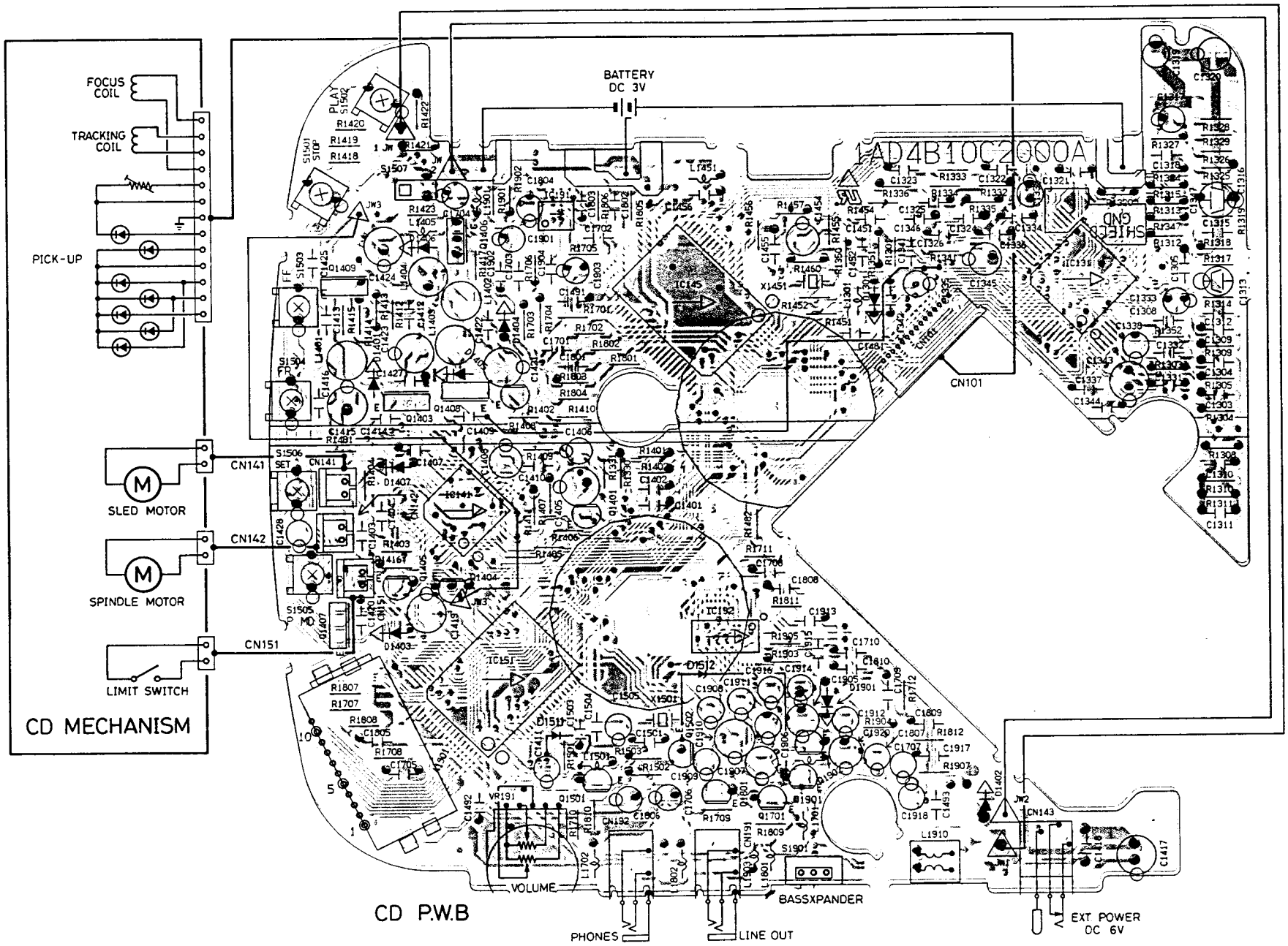


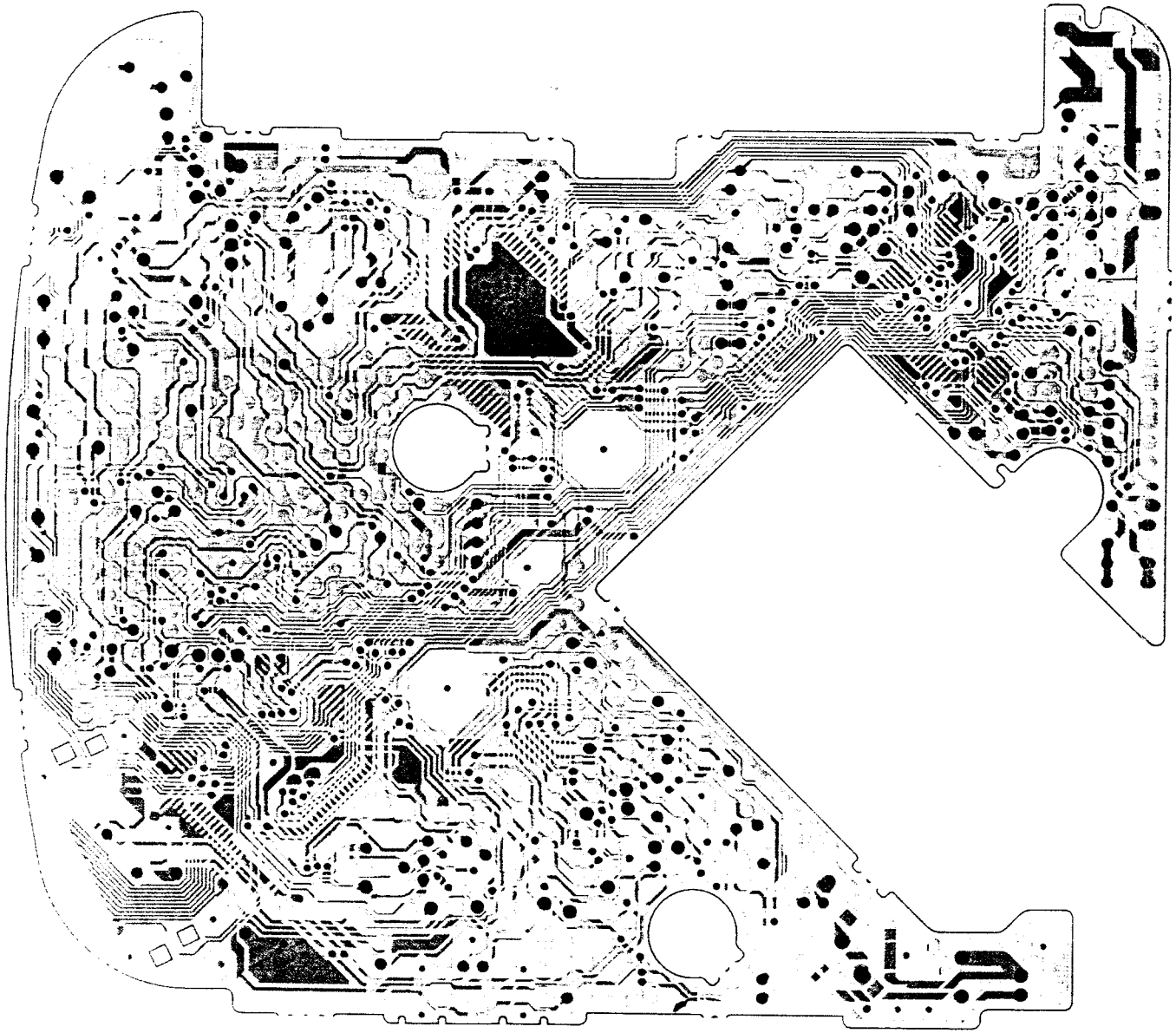


LCD CONNECTION

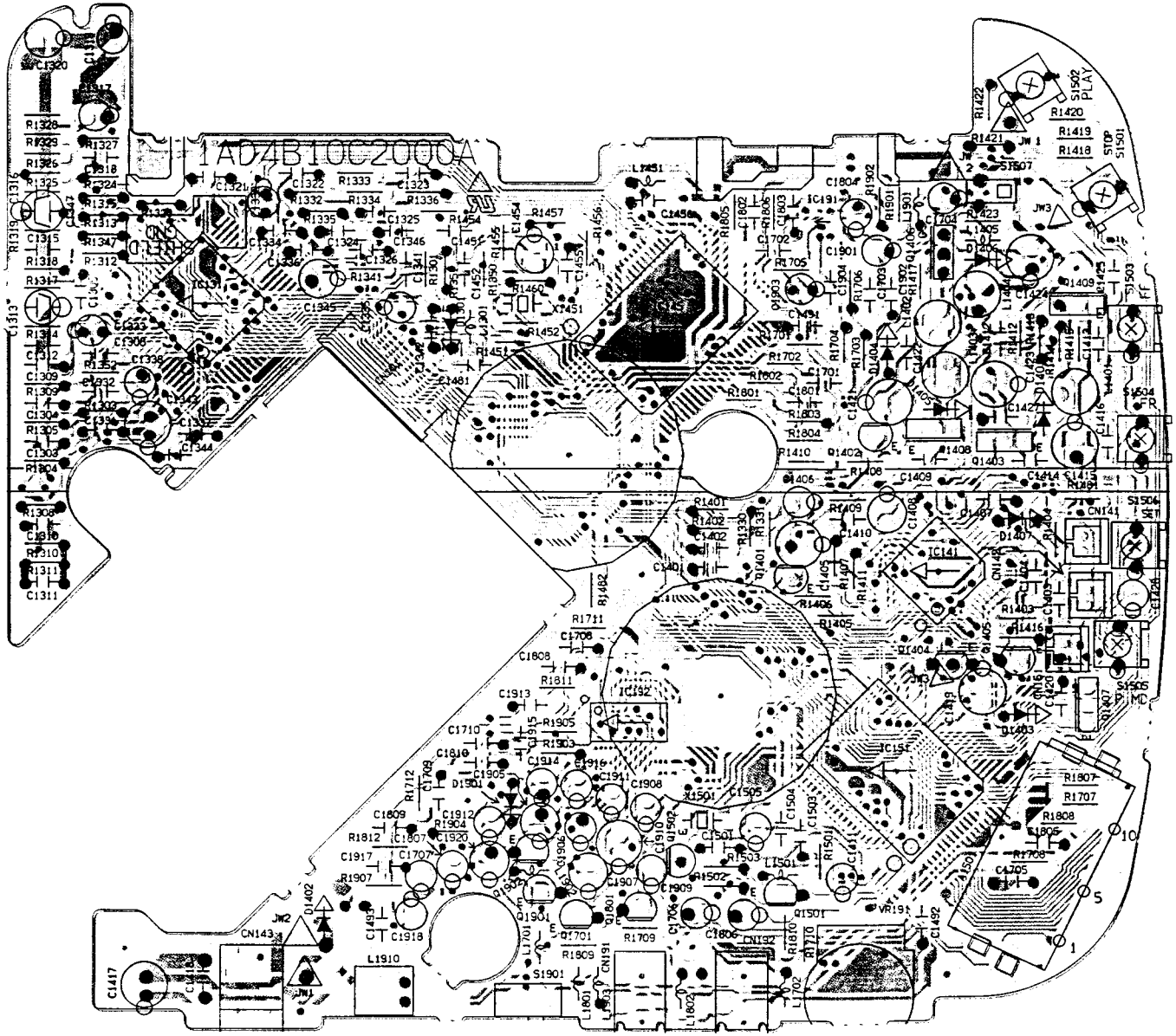


WIRING DIAGRAM (1) (BOTTOM VIEW 1/2)





WIRING DIAGRAM (TOP VIEW)



IC BLOCK DIAGRAM & DESCRIPTION

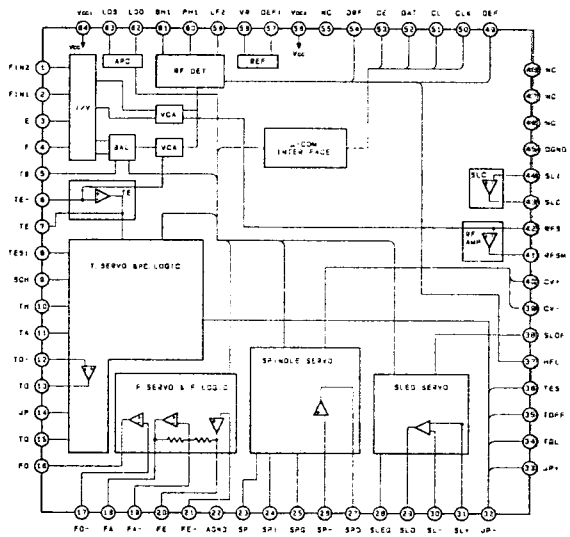
IC131 LA9230MS (SERVO SIGNAL PROCESSOR)

No.	Name	Description
1	FIN2	Photo diode A + C input of pickup.
2	FIN1	Photo diode B + D input of pickup.
3	E	E signal input of pickup.
4	F	F signal input of pickup.
5	TB	DC ingredient input of TE signal.
6	TE-	Gain control of TE signal.
7	TE	TE signal output.
8	TESI	Tracking error sense comparator input.
9	SCI	Shock detection input.
10	TH	Tracking gain set up.
11	TA	TA amplifier output.
12	TD-	Tracking "-" phase compensation set up.
13	TD	Tracking " + " phase compensation set up.
14	JP	Tracking jump pulse adjustment.
15	TO	Tracking servo signal output.
16	FD	Focus drive output (Focus servo amplifier).
17	FD-	Focus drive "-" terminal (Focus servo amplifier).
18	FA	Focus " + " phase compensation set up.
19	FA-	Focus "-" phase compensation set up.
20	FE	FE signal output.
21	FE-	FE signal gain set up.
22	AGND	GND of analog signal section.
23	SP	Signal end output of CV " + " CV "-" output.
24	SPI	Spindle motor servo amplifier input.
25	SPG	Spindle motor gain set up. (12 cm Disc mode)
26	SP-	Spindle phase compensation set up.
27	SPD	Spindle motor drive servo signal output.
28	SLEQ	Sled phase compensation set up.
29	SLD	Sled motor drive servo signal output.
30	SL-	Sled motor drive amplifier "-" input.
31	SL +	Sled motor drive amplifier " + " input.
32	JP-	Tracking jump signal "-" input from DSP.

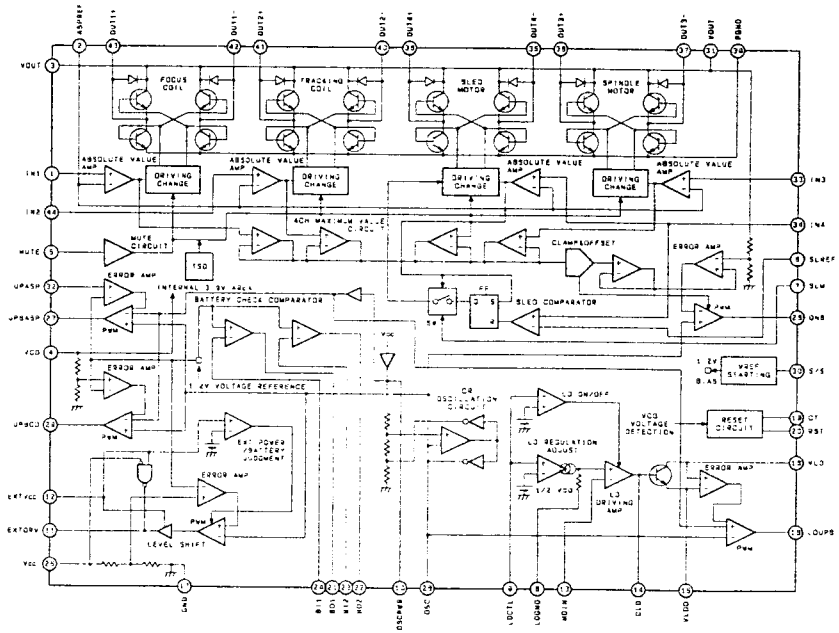
No.	Name	Description
33	JP +	Tracking jump signal " + " input from DSP.
34	TGL	Tracking gain control signal input from DSP. H : Gain down
35	TOFF	Tracking off control signal input from DSP. H : servo off.
36	TES	TE "S" curve signal output to DSP.
37	HFL	High frequency level bottom hold output.
38	SLOF	Sled motor servo off control input.
39	CV-	CLV error signal input "-" from DSP.
40	CV +	CLV error signal input " + " from DSP.
41	RFSM	RF sum amplifier output.
42	RFS-	RF sum amplifier "-" terminal.
43	SLC	Slice level control output.
44	SLI	Slice level control input.
45	DGND	GND of digital section.
46	NC	No connection.
47	NC	No connection.
48	NC	No connection.
49	DEF	Defect detection output of disc.
50	CLK	VCO reference clock input. (4.23 MHz from DSP)
51	CL	Microprocessor command clock input.
52	DAT	Microprocessor command data input.
53	CE	Microprocessor command chip enable input.
54	DRF	RF level detection output.
55	NC	No connection.
56	VCC2	VCC of servo control digital section.
57	REFI	Reference voltage.
58	VR	Reference voltage output.
59	LF2	Defect detection set up of disc.
60	PH1	RF signal peak hold.
61	BH1	RF signal bottom hold.
62	LDD	APC circuit output terminal.
63	LDS	APC circuit input terminal.
64	VCC1	VCC of RF section.

IC BLOCK DIAGRAM & DESCRIPTION

IC131 LA9230MS (SERVO SIGNAL PROCESSOR)



IC141 LB8108M (FOCUS/TRACKING COIL MOTOR DRIVER)



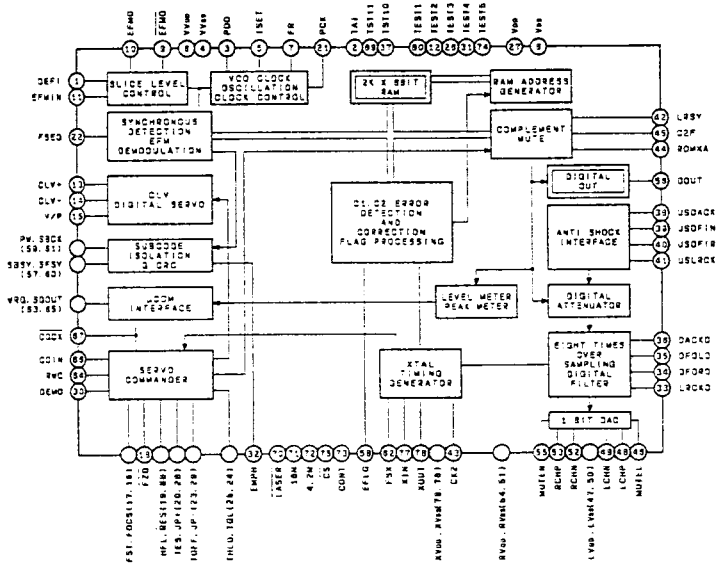
C BLOCK DIAGRAM & DESCRIPTION

IC141 LB8108M (FOCUS/TRACKING COIL MOTOR DRIVER)

No.	Name	Description
1	IN1	Actuater control signal input from ASP (DSP). IN1 : FOCUS
2	ASPREF	Actuater control reference voltage input (ASP).
3	VOUT	4 channel H bridge drive power supply.
4	VCD	Output voltage of voltage up circuit (DSP Microprocessor).
5	MUTE	4 channel actuater muting signal input (H : Mute).
6	SLREF	No connection.
7	SLM	Select terminal of Sled motor drive from (H : V mode / L : step).
8	LDGND	GND of Laser Diode for APC control standard voltage.
9	LDCTL	No connection.
10	OSCPWR	Self oscillating circuit (CR power terminal).
11	EXTDRV	PNP transistor drive output for voltage down.
12	EXTVCC	External power supply input.
13	MDIN	No connection.
14	CLD	No connection.
15	VLDO	No connection.
16	VLD	No connection.
17	GND	Signal GND.
18	LDUPB	No connection.
19	CT	No connection.
20	RST	No connection.
21	BO1	Open collector output of Battery check comparator.
22	BO2	Open collector output of Battery check comparator.

No.	Name	Description
23	BI2	Input terminal of Battery check comparator.
24	BI1	Input terminal of Battery check comparator.
25	DNB	PNP transistor base drive output for voltage down.
26	VCC	VCC
27	UPBASP	PNP transistor base drive output for voltage up.
28	OSC	Self oscillating circuit (CR input terminal).
29	UPBCD	No connection.
30	S/S	Trigger input for LB8108M.
31	VOUT	4 channel H bridge drive power supply.
32	UPASP	Voltage feedback input for voltage up circuit.
33	IN3	Actuater control signal input from ASP (DSP). IN3 : SPINDLE
34	IN4	Actuater control signal input from ASP (DSP). IN4 : SLED
35	OUT4-	Motor drive output (Sled Motor).
36	OUT4 +	Motor drive output (Sled Motor).
37	OUT3-	Motor drive output (Spindle Motor).
38	OUT3 +	Motor drive output (Spindle Motor).
39	PGND	GND of output transistor for 4 channel H bridge drive.
40	OUT2-	Actuater drive output (Tracking Coil).
41	OUT2 +	Actuater drive output (Tracking Coil).
42	OUT1-	Actuater drive output (Focus Coil).
43	OUT1 +	Actuater drive output (Focus Coil).
44	IN2	Actuater control signal input from ASP (DSP). IN2 : TRACKING

IC145 LC78621ED (DIGITAL SIGNAL PROCESSOR)



IC BLOCK DIAGRAM & DESCRIPTION

IC145 LC78621ED (DIGITAL SIGNAL PROCESSOR)

No.	Name	I/O	Description
1	DEF1	I	Defect detect signal input pin.
2	TAI	I	LS1 test input pin. (for PLL use)
3	PDO	O	VCO output built in phase comparison output pin. (for PLL use)
4	VVSS		VCO built in power supply (ground) pin. (for PLL use)
5	ISET	AI	PDD output power supply adjustment resistor connect pin. (for PLL use)
6	VVDD		VCO built in power supply (+ 5V) pin. (for PLL use)
7	FR	AI	VCO frequency range adjustment pin. (for PLL use)
8	VSS		Digital (ground) pin.
9	$\overline{EFMO}$	O	EFM signals of mutually opposite phase output pin. (for slice level control)
10	EFMO	O	EFM signals output pin. (for slice level control)
11	EFMIN	I	EFM signals input pin. (for slice level control)
12	TEST2	I	LS1 test input pin.
13	CLV +	O	Spindle motor servo control (acceleration) output pin.
14	CLV-	O	Spindle motor servo control (deceleration) output pin.
15	V / P	O	"H" output at time of the CLV rough servo operation. "L" output at the time of phase control.
16	FOCS	O	Focus servo ON / OFF switch output pin. "L" output at time of the Focus servo ON.
17	FST	O	Focus start pulse output pin. Open drain output.
18	$\overline{FZD}$	I	Focus error zero cross signal input pin. Not used for "L".
19	HFL	I	Track detect signal input pin.
20	TES	I	Tracking error signal input pin.
21	PCK	O	4.3218 MHz PCK monitor pin.
22	FSEQ	O	"H" is produced with the agreement of SYNC (true FS) detected from the EFM signal and SYNC (built in FS) of the counter.
23	TOFF	O	Tracking OFF output pin.
24	TGL	O	Tracking gain change output pin. "L" output at the time of gain up.
25	THLD	O	Tracking hold output pin.
26	TEST3	I	LSI test input pin.
27	VDD		Digital power supply pin. (normally + 5V)
28	JP +	O	Produces the kick pulse. JP + and JP- corresponding to the track jump command.
29	JP-	O	Produces the kick pulse. JP + and JP- corresponding to the track jump command.
30	DEMO	I	Used for the adjustment procedure of the set ; sound output function.
31	TEST4	I	LSI test input pin.
32	EMPH	O	De-emphasis is required at time of "H".
33	LRCKO	O	Word clock output pin. (for digital filter output).
34	DFORO	O	R-ch data output pin. (for digital filter output)
35	DFOLO	O	L-ch data output pin. (for digital filter output)
36	DACKO	O	Bit clock output pin. (for digital filter output)
37	TST10	O	LSI test output pin. Open (normally "L" output)
38	USDACK	I	Bit clock input pin. (for Anti-Shock control input)
39	USDFIN	I	L, R-ch data input pin. (for Anti-Shock control input)
40	USDFIR	I	LSI test input pin. (for Anti-Shock control input. normally "L")

No.	Name	I/O	Description
41	USLRCK	I	Word clock input pin. (for Anti-Shock control input. normally "L")
42	LRSY	O	L / R clock output pin. (for ROMXA output)
43	CK2	O	Bit clock output pin. (for ROMXA output)
44	ROMXA	O	Data output pin. (for ROMXA output)
45	C2F	O	C2 flag output pin. (for ROMXA output)
46	MUTEL	O	Mute output pin. (for 1 Bit DAC use)
47	LVDD		L-ch power supply (+ 5V) pin. (for 1 Bit DAC use)
48	LCHP	O	L-ch P output pin. (for 1 Bit DAC use)
49	LCHN	O	L-ch N output pin. (for 1 Bit DAC use)
50	LVSS		L-ch (ground) pin. (for 1 Bit DAC use)
51	RVSS		R-ch (ground) pin. (for 1 Bit DAC use)
52	RCHN	O	R-ch N output pin. (for 1 Bit DAC use)
53	RCHP	O	R-ch P output pin. (for 1 Bit DAC use)
54	RVDD		R-ch power supply (+ 5V) pin. (for 1 Bit DAC use)
55	MUTER	O	Mute output pin. (for 1 Bit DAC use)
56	DOUT	O	Digital output pin.
57	SBSY	O	Sync signal of the sub code block.
58	EFLG	O	Used for correction monitor of C1, C2, 1 multiplex, and 2 multiplex.
59	PW	O	SFSY is the sync signal of the sub code frame. The sub codes of P,Q,R,S,T,U,V and W are read by sending the clock to SBCK 8 times.
60	SFSY	O	SFSY is the sync signal of the sub code frame. The sub codes of P,Q,R,S,T,U,V and W are read by sending the clock to SBCK 8 times.
61	SBCK	I	SFSY is the sync signal of the sub code frame. The sub codes of P,Q,R,S,T,U,V and W are read by sending the clock to SBCK 8 times.
62	FSX	O	7.35 kHz sync signal output.
63	WRQ	O	Sub cord Q output stand-by output pin.
64	RWC	I	Read / Write control input pin.
65	SQOUT	O	Sub cord Q output pin.
66	COIN	I	Command data input pin from the microprocessor.
67	$\overline{COCK}$	I	Clock command data input or SQOUT sub cord output clock input pin.
68	$\overline{RES}$	I	Chip reset input pin. This is set once to "L" when the power is switched on.
69	TST11	O	LSI test output pin. Open (normally "L" output)
70	$\overline{LASER}$	O	Laser ON / OFF output pin. This output pin can be controlled by serial control from the microprocessor.
71	16M	O	16.9344 MHz output pin.
72	4.2M	O	4.2336 MHz output pin.
73	CONT	O	This output pin can be controlled by serial command data control from the microprocessor.
74	TEST5	I	LSI test input pin.
75	$\overline{CS}$	I	Chip select input pin.
76	XVSS		Crystal oscillation (ground) pin.
77	XIN	I	16.9344 MHz input pin.
78	XOUT	O	33.8688 MHz output pin.
79	XVDD		Crystal oscillation power supply (+ 5V) connect pin.
80	TEST1	I	LS1 test input pin normally not connect.

IC BLOCK DIAGRAM & DESCRIPTION

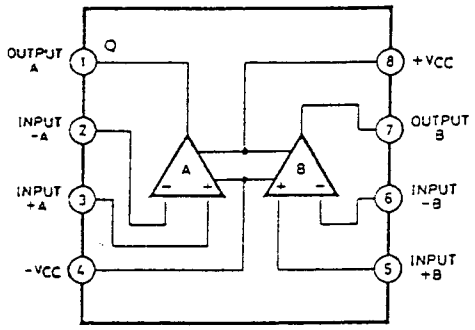
IC151 LC5876-1G59 (MICRO PROCESSOR)

No.	Name	I / O	Description
1	COM2	O	LCD common 2 output
2	COM1	O	LCD common 1 output
3	CUP1	-	Switching terminal for LCD driving voltage
4	CUP2	-	Switching terminal for LCD driving voltage
5	RES	I	Reset terminal (L→H)
6	EXT-INT	I	EXT-INT terminal
7	SQOUT	I	Data bus for DSP output
8	COIN	O	Data bus for DSP input
9	CQCK	O	Data bus for DSP input
10	WRQ	O	Data bus for DSP input
11	BATT IN	I	Input for battery mark on LCD
12	TEST	I	Input for adjustment of CD player (Normally H)
13	HOLD	I	Input for key hold (Normally H)
14	CHARGE	I	Input for battery charge mark on LCD
15	BRSSA	-	No connection
16	BRSSB	-	No connection
17	BRSSC	-	No connection
18	SERVICE	-	No connection
19	XTOUT	-	No connection
20	XTIN	-	No connection
21	VDD2	-	Power supply for LCD driver
22	VDD1	-	Power supply for LCD driver
23	VSS	-	Ground
24	VDD	-	Power supply
25	CF-IN	I	Connect ceramic resonator for 4.19 MHz clock
26	CF-OUT	O	Connect ceramic resonator for 4.19 MHz clock
27	LIMIT SW	I	Input for LIMIT switch of laser pick up
28	OPEN / CLOSE SW	I	Input for lid switch (OPEN / CLOSE)
29	SYS.DOWN	I	Input of voltage monitor of battery
30	DRF	-	No connection
31	K1	I	Key scan input
32	K2	I	Key scan input
33	K3	I	Key scan input
34	K4	I	Key scan input
35	NC	-	No connection
36	NC	-	No connection
37	A-MUTE	O	Mute signal output
38	POWER	-	No connection
39	LED A	-	No connection
40	LED B	-	No connection

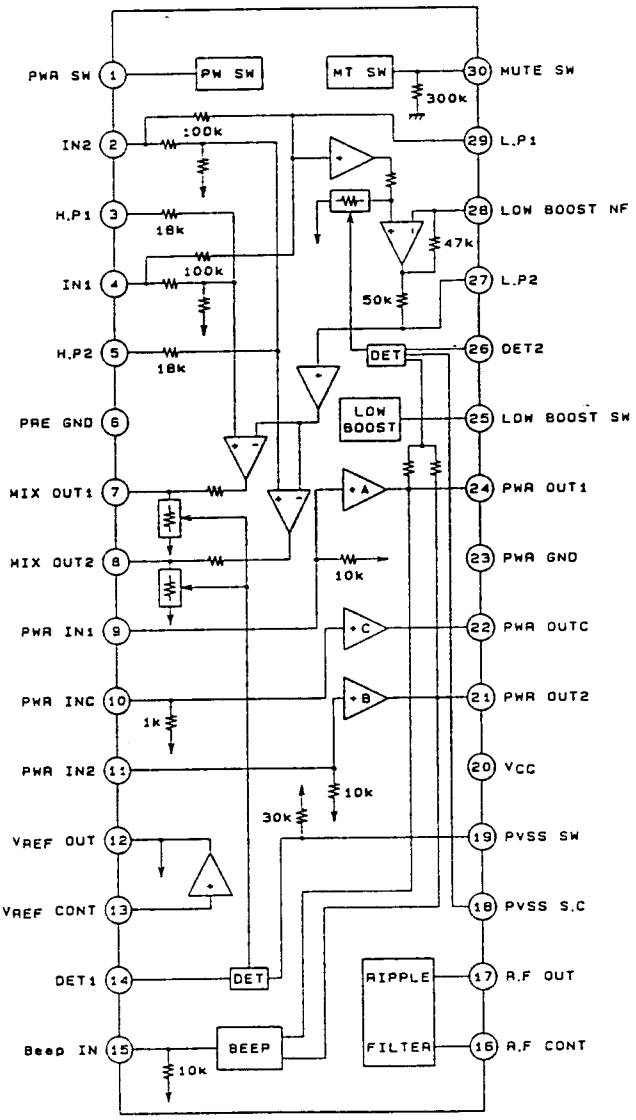
No.	Name	I / O	Description
41	LED C	-	No connection
42	BEEP	-	No connection
43	TEST	-	LSI test terminal, normal ground
44	SEG1	O	Key scan output
45	SEG2	O	Key scan output
46	POWER 2	-	No connection
47	$\overline{\text{A-MUTE}}$	-	No connection
48	POWER	O	Output signal for power "ON"
49	XRST	O	Output signal for DSP reset terminal
50	RWC	O	Output signal for DSP read / write command
51	LB ON/OFF	-	No connection
52	LB A/B	-	No connection
53	BACK LIMIT	-	No connection
54	NC	-	No connection
55	D-MUTE	-	No connection
56	SLM	O	Select terminal of sled motor drive
57	SL +	-	Sled motor drive amplifier " + " output
58	SL-	-	Sled motor drive amplifier "-" output
59	NC	-	No connection
60	NC	-	No connection
61	NC	-	No connection
62	NC	-	No connection
63	NC	-	No connection
64	NC	-	No connection
65	NC	-	No connection
66	NC	-	No connection
67	NC	-	No connection
68	NC	-	No connection
69	NC	-	No connection
70	NC	-	No connection
71	NC	-	No connection
72	LCD SEG0	O	LCD segment data
73	LCD SEG1	O	LCD segment data
74	LCD SEG2	O	LCD segment data
75	LCD SEG3	O	LCD segment data
76	LCD SEG4	O	LCD segment data
77	LCD SEG5	O	LCD segment data
78	LCD SEG6	O	LCD segment data
79	COM4	O	LCD common 4 output
80	COM3	O	LCD common 3 output

IC BLOCK DIAGRAM & DESCRIPTION

IC191 NJM2100M (OP. AMP.)



IC192 LA4805V (HEADPHONE STEREO POWER AMP.)



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