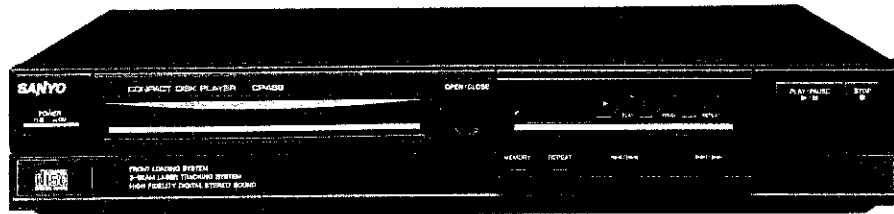


Service Manual

Compact Disc Player

CP888 (AUSTRALIA)



Contents

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PRODUCT CODE No.
137 037 13 (Black)

SPECIFICATIONS

Audio
Channels 2 channels
Frequency response 5 – 20,000 Hz

Channel separation 90 dB (1 kHz)
Distortion 0.03% (1 kHz)
Wow and flutter Undetectable
Outputs 1.8 V/1k ohms

Signal format
Sampling frequency 44.1 kHz
Quantization 16 bits linear/channel

Transmission rate 4.32 Mbit/sec.

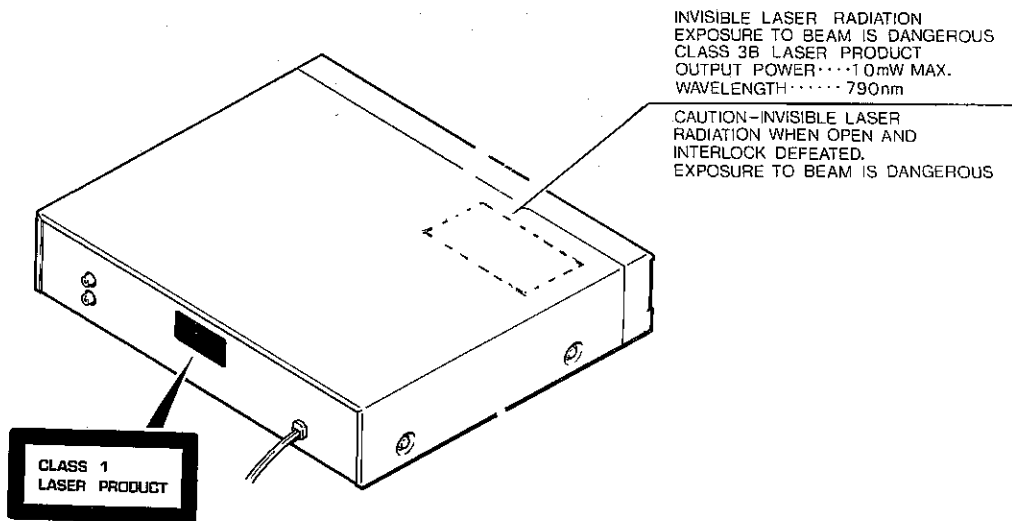
Pickup System Light pickup (3-beam)
Light source Semiconductor laser
Wave length 790 nm

General
Power supply AC 240V, 50Hz
Dimensions (approx.) 420(W) x 75(H) x 270 (D) mm

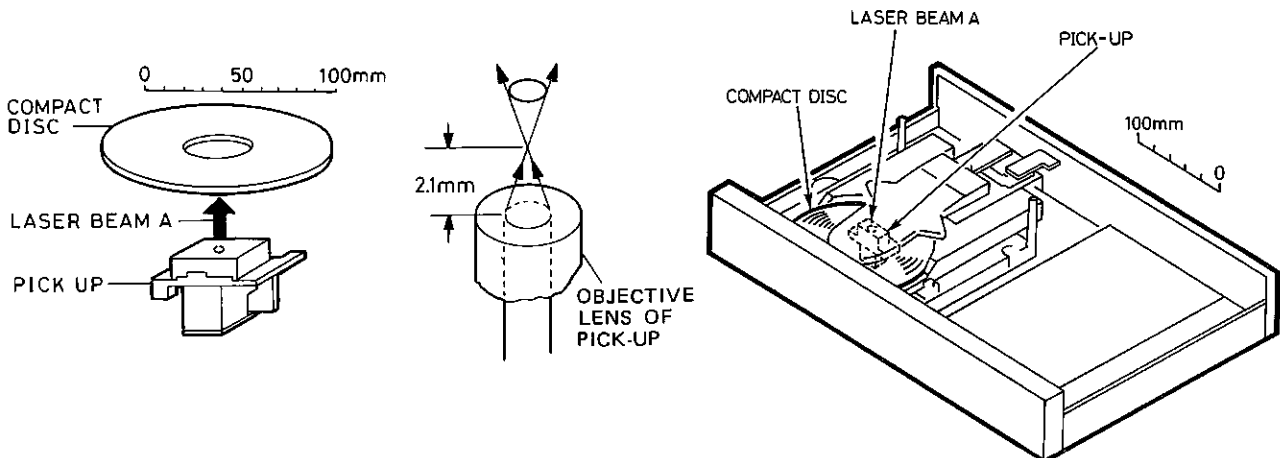
Specifications and design subject to change without notice.

LASER BEAM SAFETY PRECAUTIONS

(1) A Pick-up that emits a laser beam is used in this compact disc player.



(2) The laser beam is emanated from the location shown in the figure.



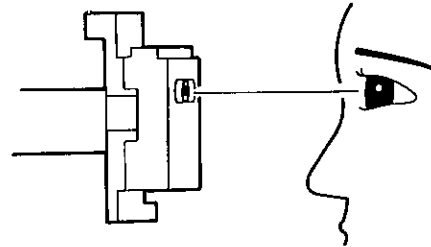
LASER BEAM SAFETY PRECAUTIONS

If the disc chuck lever is removed, the pick-up is exposed.

Do not look at the pick-up with the power switch ON.

Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin, etc.

Do not apply power if there is a broken part in the laser output section of the pick-up.



(3) Description of safety interlock circuit.

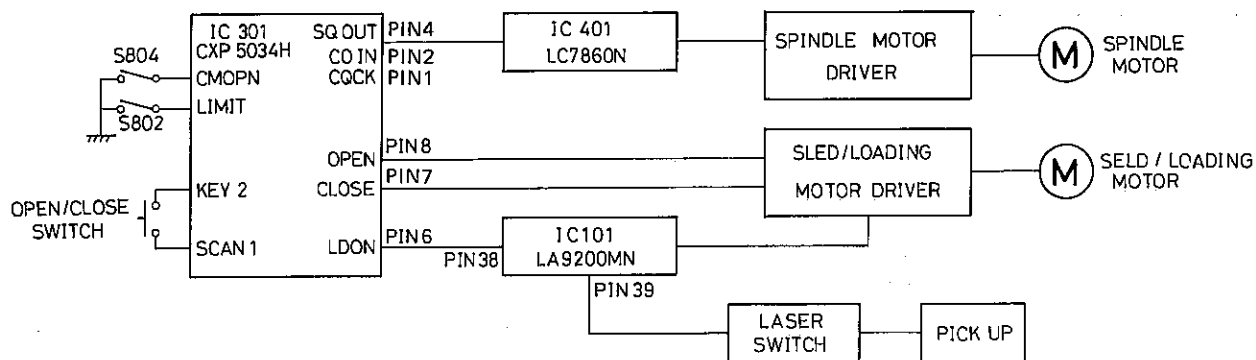


Figure 1 Safety Interlock Circuit Diagram

Function of the IC pins of Figure 1.

IC301

LDON (Pin 6) : Signal which turns laser power ON.

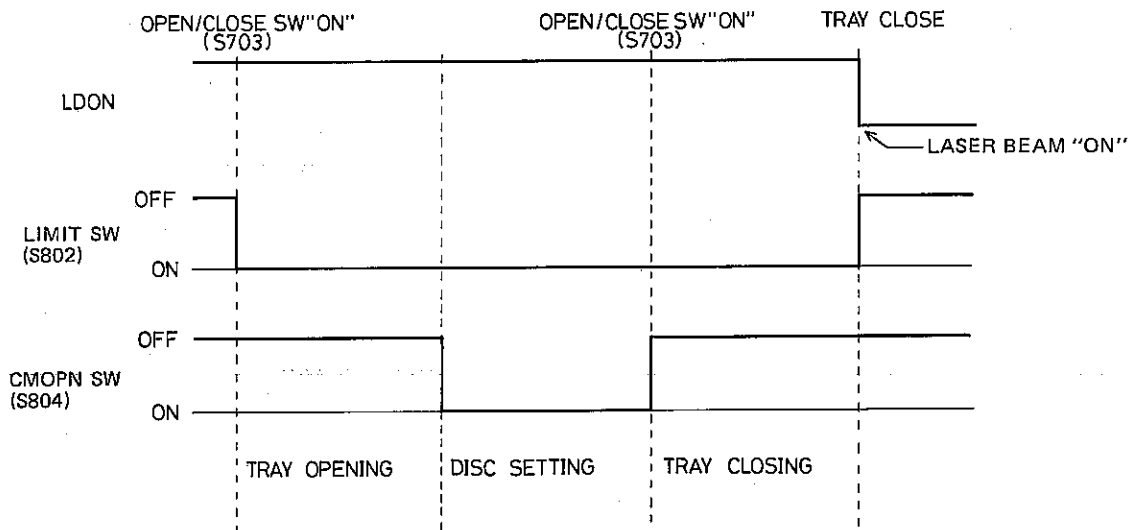


Figure 2 Time Chart of IC pins

Safety Interlock Operation

1. Press OPEN/CLOSE button.
2. When the disc tray is opened, LIMIT switch goes from "off" to "on" by tray OPEN/CLOSE switch (S703).
3. When disc tray is completely open, CMOPN switch becomes "on".
4. Place a disc on disc tray, and press OPEN/CLOSE button.
5. When the disc is closed, CMOPN goes from "on" to "off".
6. When disc tray is completely closed, LIMIT SW goes from "on" to "off".

LASER BEAM SAFETY PRECAUTIONS

Summary

- * A disc is placed on the disc tray.
- * The disc tray is completely closed.
- * Operation button is pressed.

When the above conditions are fulfilled, the IC301 LDON terminal (pin 6) becomes "High", thus emitting the laser beam.

Structural Safety Interlock

This model has a disc chuck lever and top lid. This disc chuck lever and top lid prevent to expose the laser beam for users.

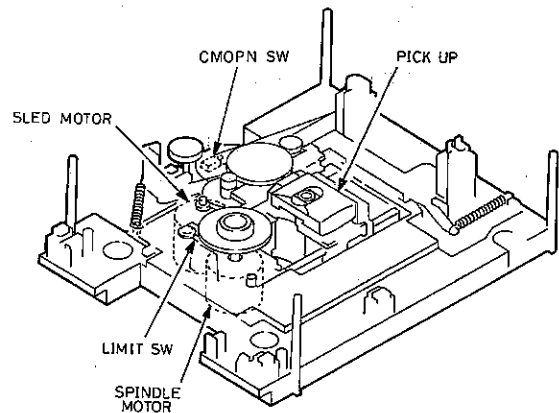


Figure 3 Mechanism Parts Location

BEFORE REPAIRING THE COMPACT DISC PLAYER

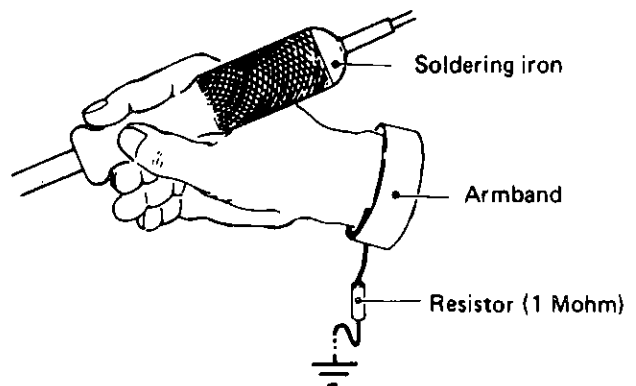
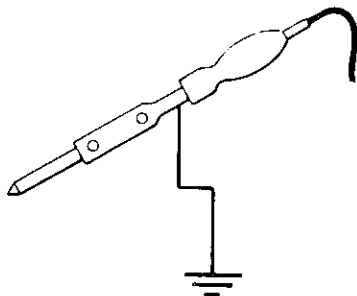
1. Preparations

- a. Many ICs, LSI and the pick-up (laser diode) are used in the compact disc player. These components are sensitive to static electricity, and might be damaged by static electricity or high voltage, so particular care should be taken regarding this point.

- b. Many precision components and the lens are used in the pick-up.

Never attempt to make repairs, or to store parts, where the temperature or humidity is high, where magnetism is strong, or where there is much dust.

2. Notes regarding repairs

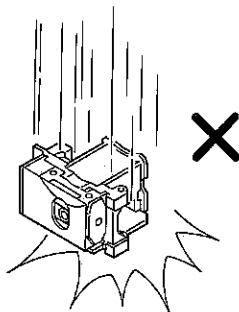
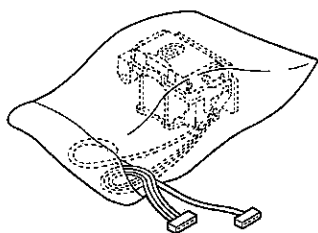


- a. Be sure to first disconnect the power plug before attempting to replace any component.
- b. All tools, instruments, etc., used for measuring must be grounded.
Grounding can be accomplished by using a conductive metal sheet on the work bench.
- c. To prevent AC leakage of the soldering iron, ground its metal part.
- d. Repair personnel must be grounded.
- e. Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin etc.

HANDLING THE PICK-UP

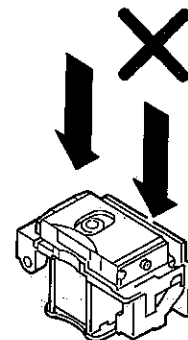
1. Shipping and storage cautions

- a. The pick-up must be stored in a conductive bag until immediately prior to its use.
- b. Do not drop it or subject it to impacts.

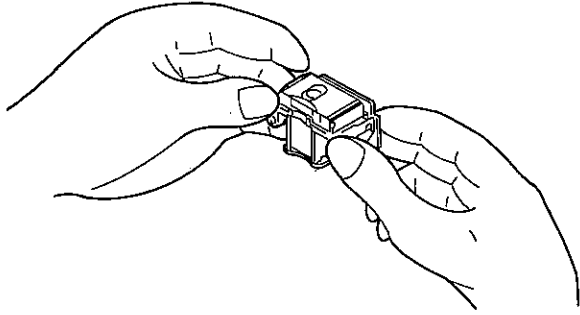


2. Repair cautions

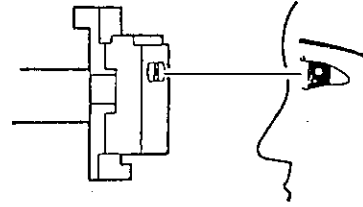
- a. When handling the pick-up, be careful not to give it undue force or shock by your hands. Otherwise the pick-up may malfunction or the PCB may be cracked.



b. The pick-up which has been minutely adjusted before shipment as one part. Never touch and move the adjusting points and setscrews of the pick-up unless otherwise described in the item of adjustment to avoid damage.

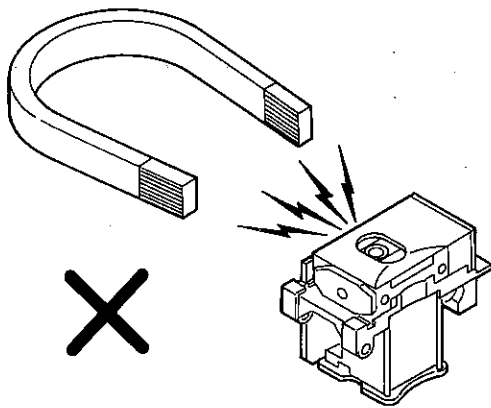


d. Eyes may be injured if the laser beam enters. Take great care to be absolutely sure that the laser beam never enters the eyes. Do not apply power if there is a broken part in the laser output section of the pick-up.



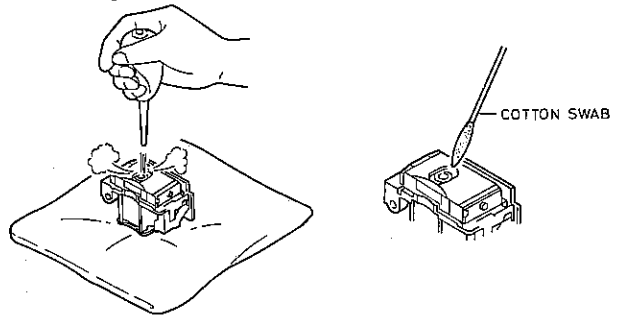
Do not look directly at the laser beam coming from the pick-up or allow it to strike against your fingers, skin, etc.

c. A strong magnet is used in the pick-up. Do not bring a magnet or other magnetized object near to it.



e. Cleaning the lens

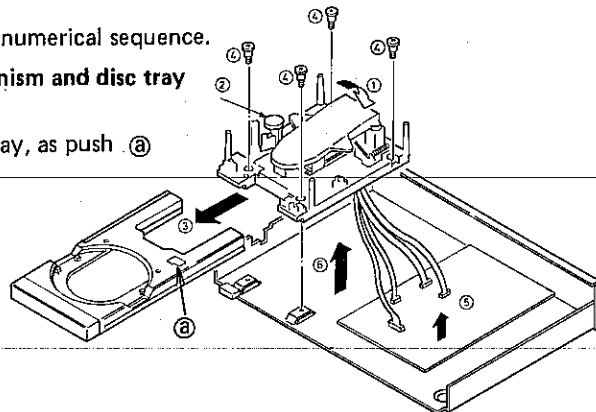
- * If dust gets on the lens, clean it away by using an air brush such as used for a camera lens.
 - * The lens is held in place by a spring.
- If the center of the lens is dirty, carefully clean it using cotton swab moistened with **isopropyl-alcohol**. Since special coating is made on the surface of the lens which is made of plastics, do not use other kind of alcohol and cleaning fluid to prevent damage to the lens. Also, be carefull not to bend the lens spring when cleaning.



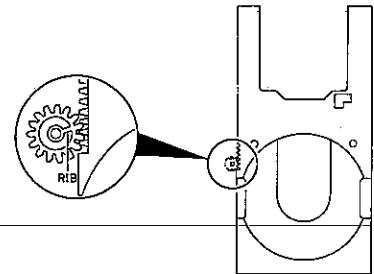
HOW TO DISASSEMBLE THE UNIT

- * Remove the compact disc if there should be one on the disc tray.
 - * Switch the power OFF, and unplug the AC power cord from an AC outlet.
 - * Disassemble in the numerical sequence.
1. Removal of mechanism and disc tray

Pull out the disc tray, as push @ Hook.



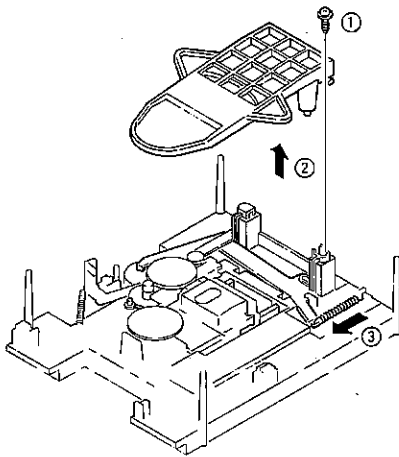
When assemble the unit, set the gear as shown in Figure after reinserting the disc tray.



HOW TO DISASSEMBLE THE UNIT

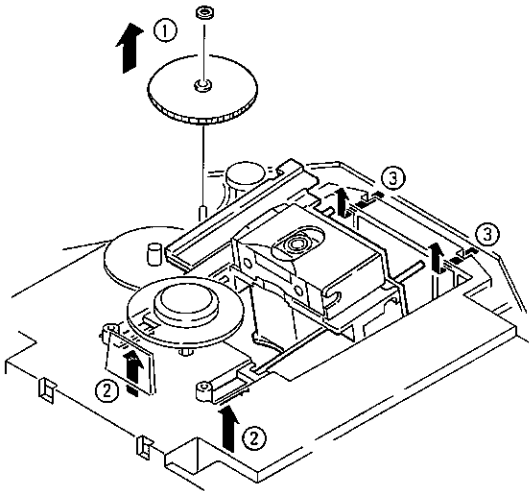
2. Replacement the pick up

a. Removal of disc chuck lever



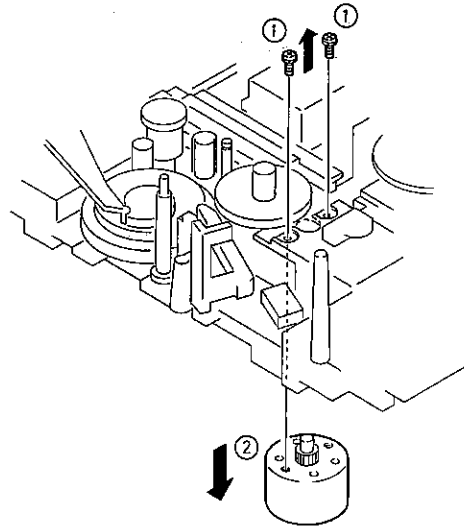
*○ Pull the lever to front side 3, when reassemble disc chuck lever.

b. Removal of pick up



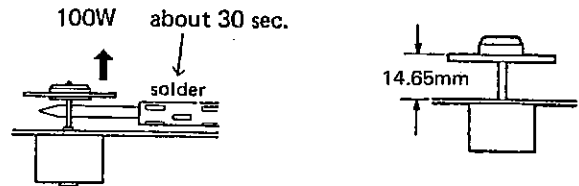
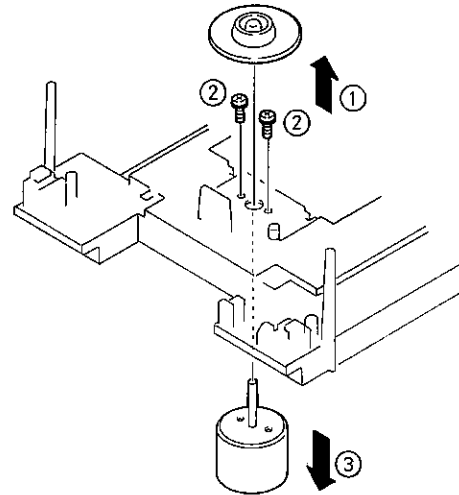
*○ Push the shaft 3 to front side as to push up the lib 2, and be free the shaft.

3. Removal of the sled (& loading) motor



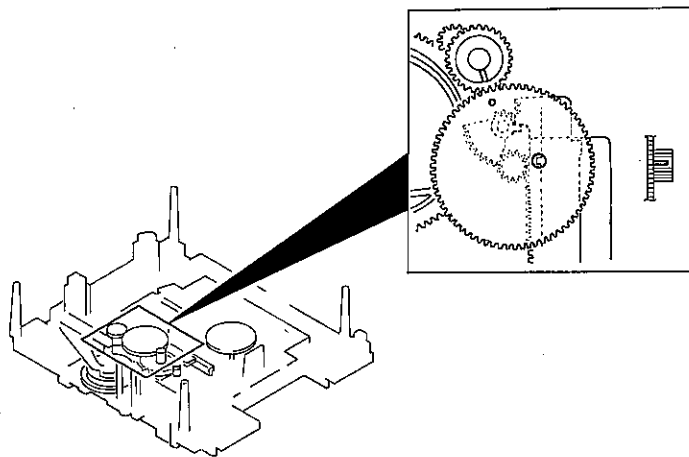
4. Removal of the spindle motor

Insert the solder between turn table and based mechanism chassis when dissolve the adhesive cement. and then, add to heat with 100W solder about 30 sec.



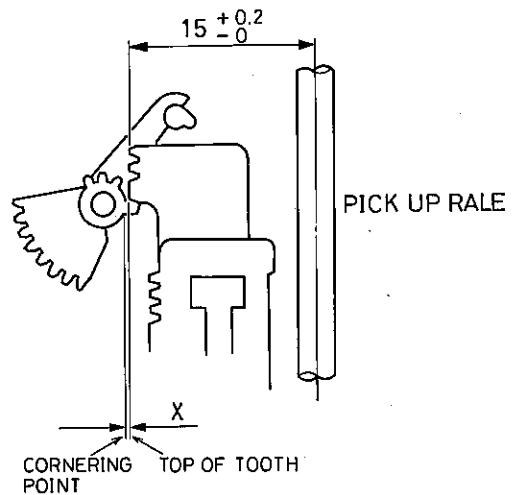
5. Pick up transported gear alignment

With the gears aligned, as shown in the figure at, below insert the pickup drive gear. Match the open space of the pinion with the first gap between gears of the rack.

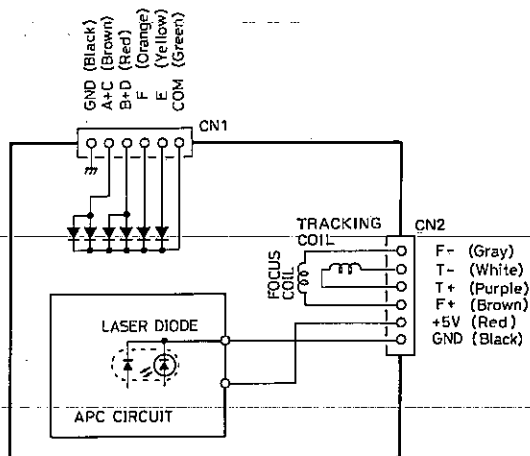
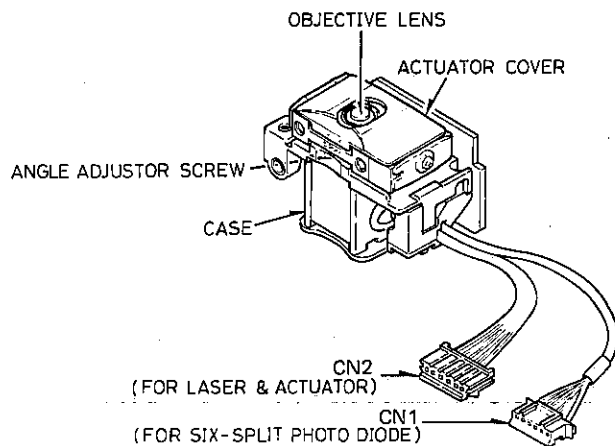
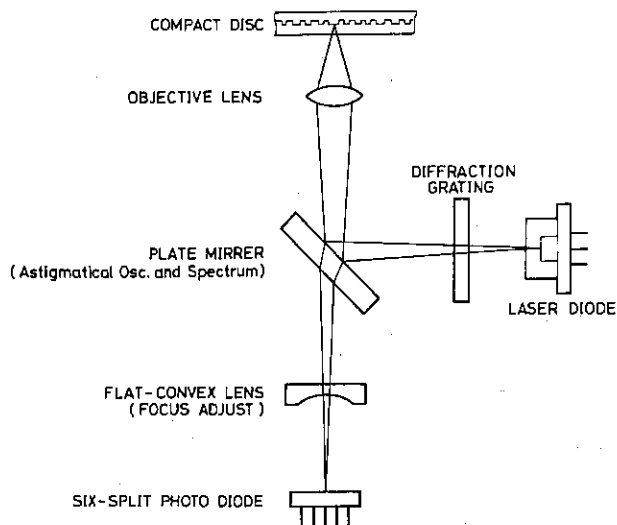


6. Pick up transported rack gear alignment.

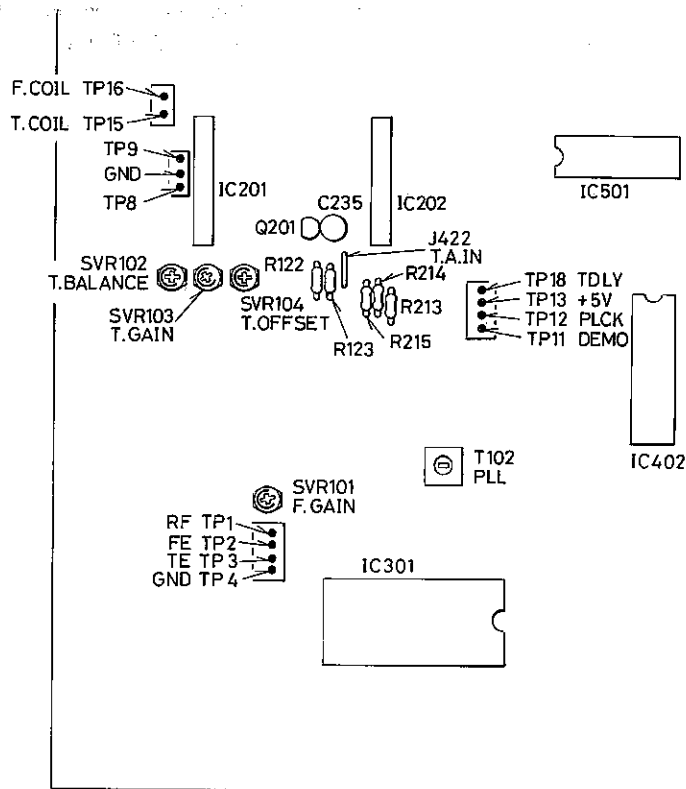
Should be $X = 0 \sim 0.1$ mm.



DETAILS OF PICK-UP



PARTS LOCATION



NOTE: Initial setting positions for SVR are indicated above.

ADJUSTMENTS

⊙ Mechanism Adjustment

Adjustments of pressure against ratchet gear.

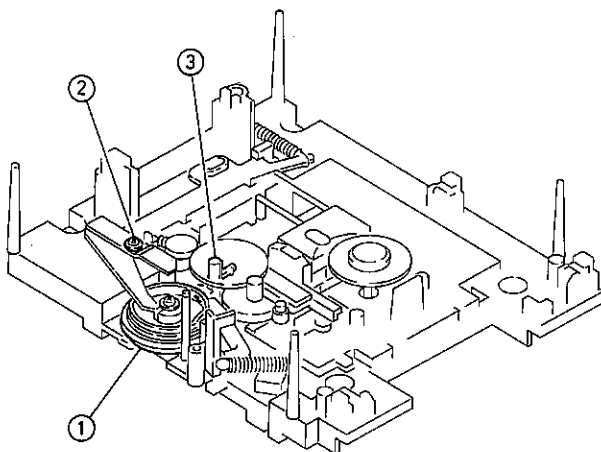


Fig-1

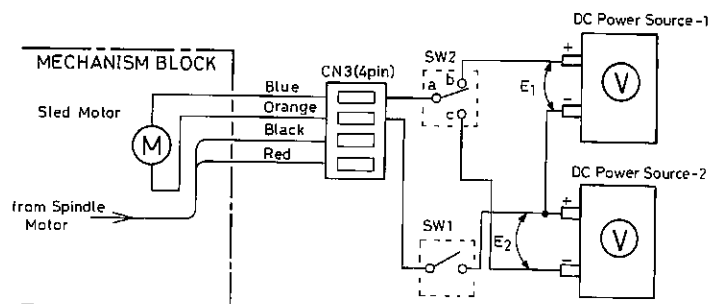


Fig-2

1. Connect the Mechanism to the instrument (DC Power Source & SW) as shown in Fig-2.
2. With $E1 = 5.0 \pm 0.05V$, operate SW2 to close contacts a-b. Then switch on SW1 and, after securing the pickup at the innermost position, initiate the mechanism open operation so that the cam gear stops at the open end position.

ADJUSTMENTS

3. With voltage applied as described in (2), loosen the adjustment screw ② and operate the ratchet.
4. Tighten the adjustment screw until the operation of the ratchet gear ① stops.
5. Then, with $E2 = 4.2V$, operate SW2 to close contacts a-c. Switch off SW1 when the chucking lever starts to move.
6. With $E1 = 4.6 \pm 0.05V$, operate SW2 to close contacts a-b, switch on SW1, and check to be sure that the ratchet does not operate even if the cam gear is at the open end position.
7. Operate SW2 to close contacts a-c, and switch off SW1 if the chucking lever begins to move.
8. With $E1 = 5.3 \pm 0.05V$, operate SW2 to close contacts a-b, and switch on SW1. Check to be sure that the ratchet operates when the cam gear reaches the open end position.
9. Use Cemedine #575 to secure the space between the outer circumference of the adjustment nut and the spring plate.

○ The ratchet is operating if the gear sounds are heard three times or more.

Two times or less: not operating

○ The starting voltage of ratchet operating must be between 4.6V and 5.5V.

If the adjustment described above is difficult to make, repair as described below.

Case 1 The adjustment screw is tightened almost for the adjustment (4), but the check in (6) is NG.

Countermeasure

The problem may be that the play of the vertical two-step ratchet gear is excessive, so add a 0.13t washer to the 0.25t washer located beneath the ratchet gear.

As a confirmation, other than the adjustment described previously, the pickup transport current must be within the allowable range.

Pick up transport current: 8.0 mA ~ 20 mA

Case 2 If, as a result of the confirmation in (8), the ratchet is not operating, or if the pickup transport current is high, follow the steps below.

Countermeasure

Because it is possible that the problem is not play of the vertical two-step ratchet gear, but that the ratchet gear is being constantly pressed, replace the 0.25t washer (located beneath the ratchet gear) with a 0.13t washer.

ADJUSTMENTS

© Electrical Adjustment

So far we have presented explanations regarding compact disc player handling, notes prior to repair, handling the pick-up and

disassembly of the unit. Be sure to carefully read these instructions before making any adjustments.

Test Discs Required for Adjustments and Checks

No.	Designation	Description (manufacturer)
1	414 245-2	for demonstration (Polygram)

NOTE: Test discs are subject to change without notice.

Measuring Instruments Required for Adjustments

Designation	Model	(manufacturer)
Oscilloscope	SS5711 (100 MHz, 3 phenomena observation)	(Iwasaki Communications)
Storage scope	DSS6521 (memory scope)	(Kikusui Electric)
AF oscillator	Low frequency oscillator	
Band pass filter	See attached figure on page 9 Fig. 12.	
Frequency counter	More than 5 MHz	
Driver for adjustment	Must be non-metallic.	

NOTE: Use a probe when using an oscilloscope, storage scope, digital voltmeter to observe the signal. Be sure to connect the probe ground to the indicated ground line.

Order	Adjustment
1	PLL-VCO
2	Tracking offset (pre-adjustment)
3	Tracking Balance
4	Focus gain
5	Tracking gain
6	Tracking offset

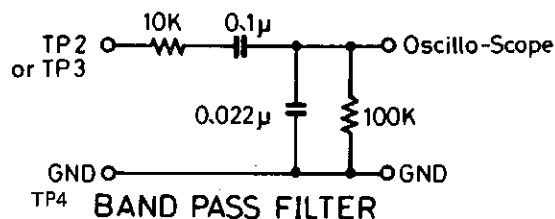


Figure 12

NOTE: The initial set positions of the adjustment controls are shown in "Parts Location" on page 7.

1. PLL-VCO (Phase Locked Loop Voltage Control Oscillator) Adjustment

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Frequency counter	TP12 (PLL-LPF output signal)	T102	$4.30 \pm 0.005\text{MHz}$

(Frequency counter ground . . . TP4)

1. Connect the frequency counter to TP12 and TP4 (or chassis).
2. Turn on the power of the unit.
3. Adjust T102 so that the frequency counter shows $4.30 \pm 0.005\text{ MHz}$.

PARTS LIST

Ref. No.	Part No.	Description
Q302	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q303	405 011 8500	TR 2SC1740S-R
or	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q304	405 004 4601	TR 2SA608-F-SPA
or	405 006 1806	TR 2SA933S-R
or	405 006 1905	TR 2SA933S-S
Q501	405 011 8500	TR 2SC1740S-R
or	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q502	405 011 8500	TR 2SC1740S-R
or	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q503	405 011 8500	TR 2SC1740S-R
or	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q504	405 021 0600	TR 2SD1012-G-SPA
or	405 033 6805	TR 2SD1468S-S
Q505	405 021 0600	TR 2SD1012-G-SPA
or	405 033 6805	TR 2SD1468S-S
Q601	405 036 3108	TR 2SA1503
or	405 082 4619	TR DTA123YS-TP
Q602	405 018 2600	TR 2SC3400
or	405 000 4407	TR DTC124ES
Q604	405 004 4601	TR 2SA608-F-SPA
or	405 006 1806	TR 2SA933S-R
or	405 006 1301	TR 2SA933S-S
D101	408 000 0103	VA SVC211SP-B2-AUD
D102	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D103	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D104	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D105	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D106	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D201	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D202	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D203	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D204	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D302	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D311	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D601	408 007 9307	DIODE 1SR35-200A-HP
or	407 005 2006	DIODE DS135D-KB1
D602	408 007 9307	DIODE 1SR35-200A-HP
or	407 005 2006	DIODE DS135D-KB1
D603	408 007 9307	DIODE 1SR35-200A-HP
or	407 005 2006	DIODE DS135D-KB1
D604	408 007 9307	DIODE 1SR35-200A-HP
or	407 005 2006	DIODE DS135D-KB1
D605	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D606	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D607	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D608	407 053 6308	ZENER DIODE MTZ5.1B
D609	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
D610	407 007 9904	DIODE GMA01
or	407 012 4406	DIODE 1SS133
C117	403 067 6204	MT-COMPO 0.15U J 50V
C133	403 080 5000	POLYPRO 1000P J-100V
C235	403 086 2607	NP-ELECT 1U M 50V

Ref. No.	Part No.	Description
C507	403 063 5706	POLYESTER 8200P K 50V
C508	403 063 5706	POLYESTER 8200P K 50V
C511	403 056 7908	POLYESTER 1000P K 50V
C512	403 056 7908	POLYESTER 1000P K 50V
C610	403 085 4008	NP-ELECT 10U M 16V

P.T.PRIMARY P.C.BOARD ASSY

Ref. No.	Part No.	Description
52	614 202 5772 614 017 6964	P.C BOARD ASSY, P.T.PRIMARY TERMINAL BOARD

P.T.SECONDARY P.C.BOARD ASSY

Ref. No.	Part No.	Description
53 CN6	614 202 5796 614 020 6555	P.C BOARD ASSY, P.T.SECONDARY SOCKET, 3P

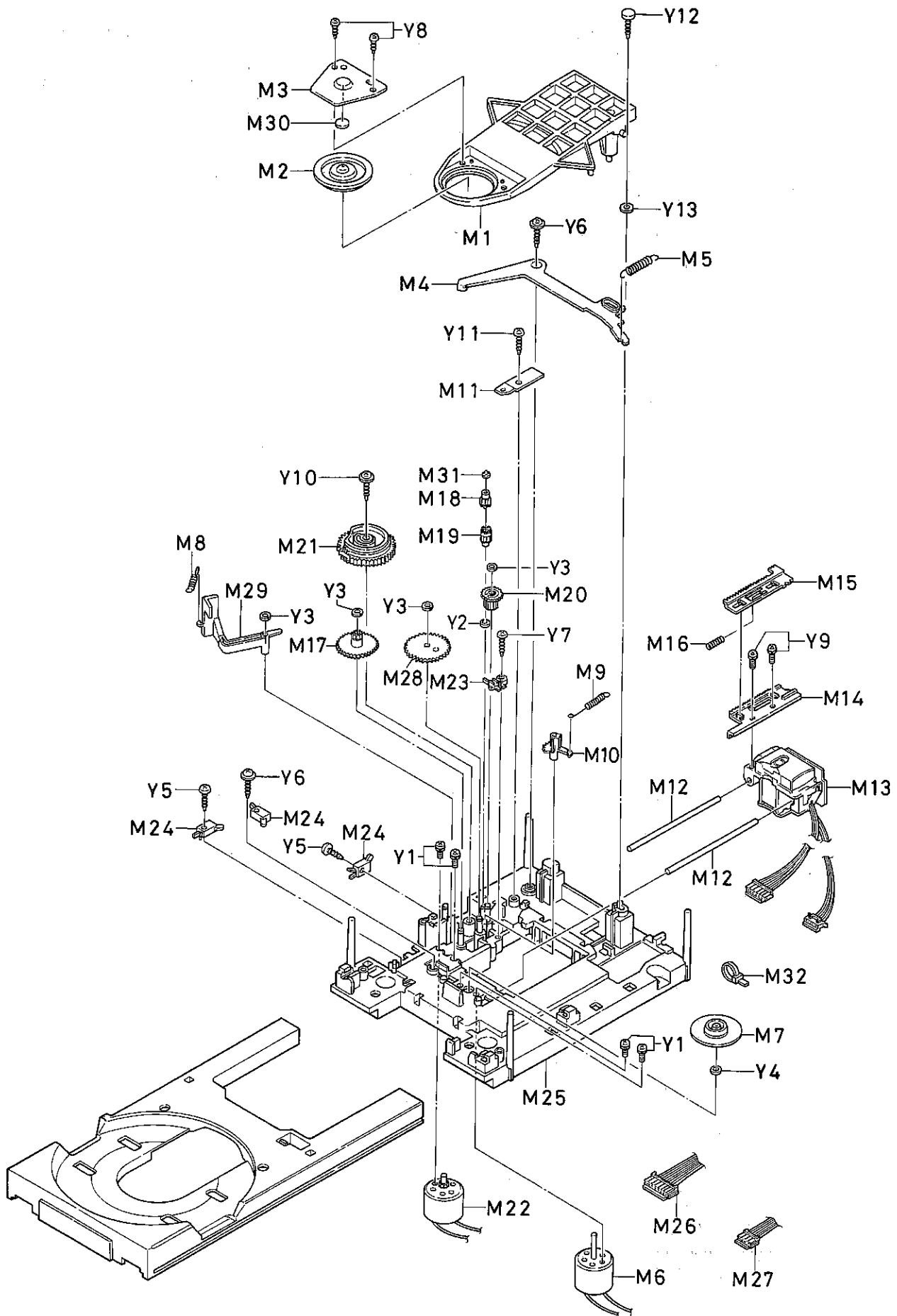
POWER SW P.C.BOARD ASSY

Ref. No.	Part No.	Description
54 CN5 CN6	614 202 5819 614 019 0656 614 020 6562 614 020 6555	P.C BOARD ASSY, POWER SW PUSH SWITCH SOCKET, 4P SOCKET, 3P

SW DISPLAY P.C.BOARD ASSY

Ref. No.	Part No.	Description
55	614 197 3944	P.C BOARD ASSY, SW DISPLAY
S701	614 018 9056	SWITCH
S702	614 018 9056	SWITCH
S703	614 018 9056	SWITCH
S704	614 018 9056	SWITCH
S705	614 018 9056	SWITCH
S706	614 018 9056	SWITCH
S707	614 018 9056	SWITCH
CN7	614 035 4973	SOCKET, 8P
CN8	614 035 4980	SOCKET, 9P
Q701	405 082 4619	TR DTA123YS-TP
Q702	405 036 3108	TR 2SA1503
or	405 036 3108	TR 2SA1503
or	405 082 4619	TR DTA123YS-TP
Q703	405 036 3108	TR 2SA1503
or	405 082 4619	TR DTA123YS-TP
D701	407 082 7505	LED SL-6283
D702	407 005 4505	DIODE DS442X
or	407 013 7109	DIODE 1S2473
D703	407 005 4505	DIODE DS442X
or	407 013 7109	DIODE 1S2473
D704	407 033 4409	LED SLP-382F-50
D705	407 036 6608	LED SLP-982A-50
D706	407 036 6608	LED SLP-982A-50

MECHANISM EXPLODED VIEW



ADJUSTMENTS

2. Tracking Offset pre-Adjustment (pre-adjustment of SVR104)

1. Take off the CN3 (Sled, Spindle Motor)
2. Connect the oscilloscope to TP15 (Tracking coil) and TP4 (Gnd).
3. Connect TP11 (DEMO) to TP13 (+5V) with 10K ohm, and TP18 (TDLY) to TP4 (Gnd).
4. Turn on the power.
5. Adjust SVR102 so that the voltage of TP15 is shown $50\text{mV} \pm 20\text{mV}$.

3. Tracking Balance Adjustment (SVR102)

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Oscilloscope	TP3 (TE signal)	SVR102	Symmetrical waveform

(Oscilloscope ground . . . TP4)

1. Connect the oscilloscope to TP3 (TE) and TP4 (Gnd).
2. Turn on the power of the unit.
3. Play the test disc.
4. Continue doing to press the SEARCH \gg or \ll button to do it.
5. Adjust SVR102 so that the TE (Tracking Error) signal waveform of TP3 on the oscilloscope is vertically symmetrical relative to 0V. (See Figure 13-a)

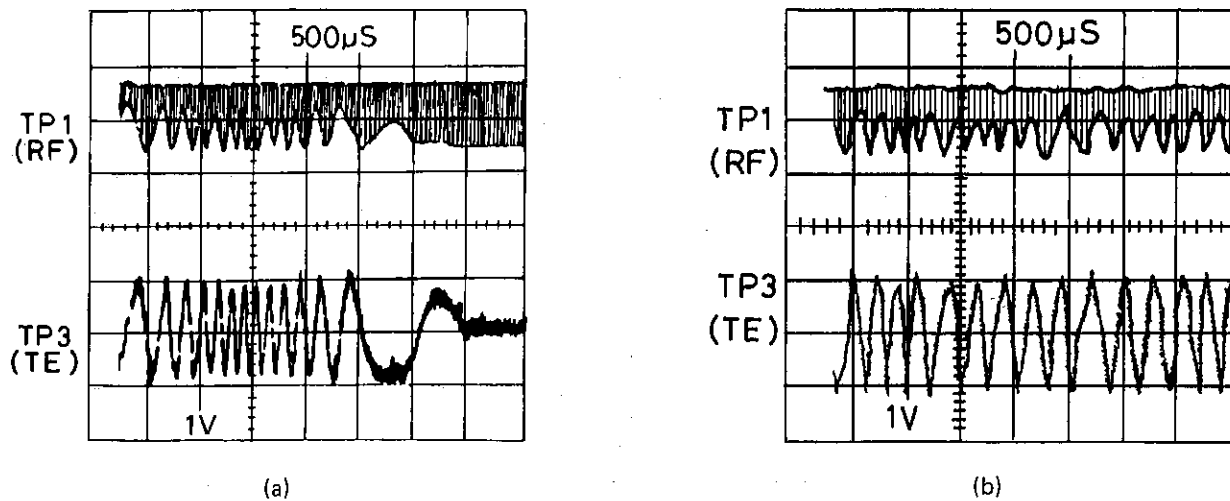


Figure 13

Adjustment by the traverse waveform

1. Follow steps 1, 2 and 3 as above.
2. Rotate SVR103 (Tracking gain) to the left end, or connect the STW 10mm (J422, T.A.IN) to GND. (see PARTS LOCATION)
3. At the same time to load the test disc, it is observed the traverse waveform at TP3 during 4 sec. Adjust SVR102 so that its waveform on the oscilloscope is vertically symmetrical relative to 0V. (see Figure 13-b).

ADJUSTMENTS

4. Focus Gain Adjustment (SVR101)

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Storage scope AF oscillator	TP2 (FE signal) TP8 (IC201 pin 3)	SVR101	1V p-p

(Storage scope ground . . . TP4)

1. Connect the storage scope to TP2 (F.E) by the Band pass filter (see Figure 15).
2. Turn on the power of the unit.
3. Play back the test disc.
4. Set the output of AF oscillator to 400Hz, 0.5V rms and connect to TP8 (IC201 pin 3) by Resistor 120K ohm.
5. Adjust SVR101 so that the voltage of FE signal waveform on the storage scope is 1V p-p.

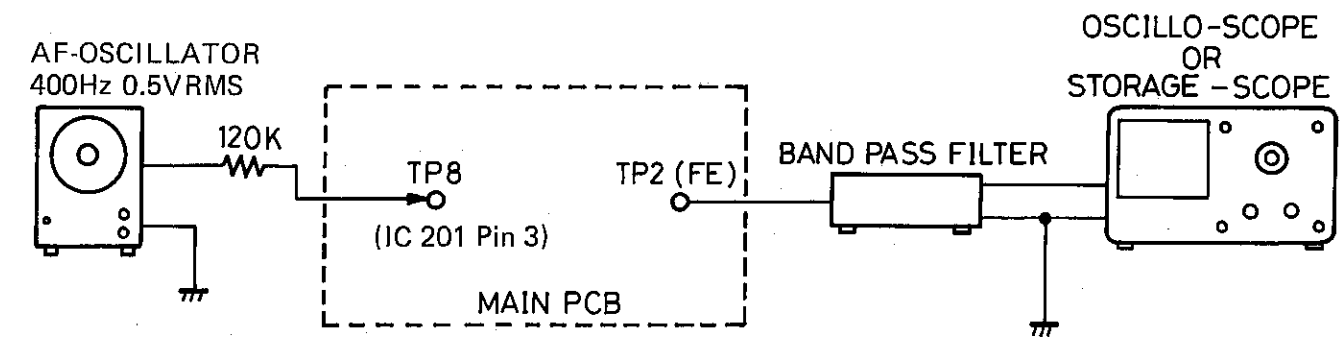


Figure 15

5. Tracking Gain Adjustment (SVR103)

Test disc	Measuring instrument	Connection point	Adjustment location	Adjustment value
No. 1	Storage scope AF oscillator	TP9 (IC201 pin 7) TP3 (TE signal)	SVR103	1V p-p

(Storage scope ground . . . TP4)

1. Connect the storage scope to TP3 (T.E) by the Band pass filter (see Figure 16).
2. Turn on the power of the unit.
3. Play back the test disc.
4. Set the output of AF oscillator to 400Hz, 0.5V rms and connect to TP9 (IC201 pin 7) by Resistor 820K ohm.
5. Adjust SVR103 so that the voltage of the TE signal waveform on the storage scope is 1V p-p.

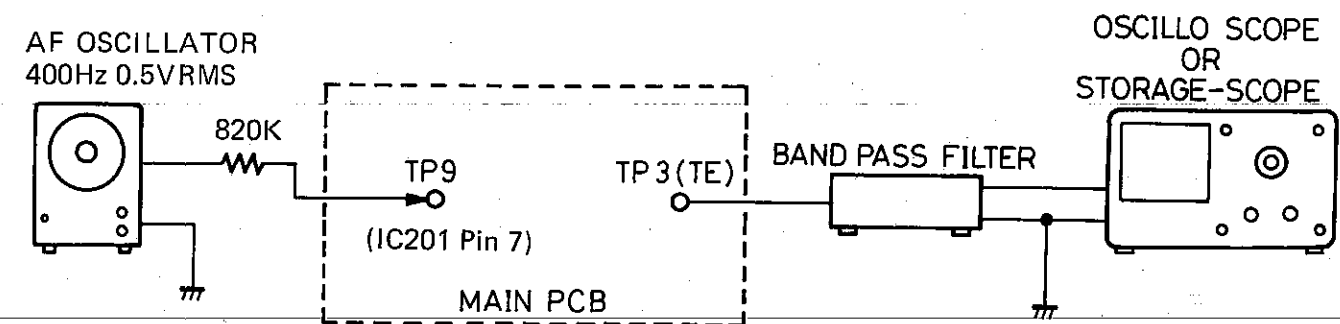
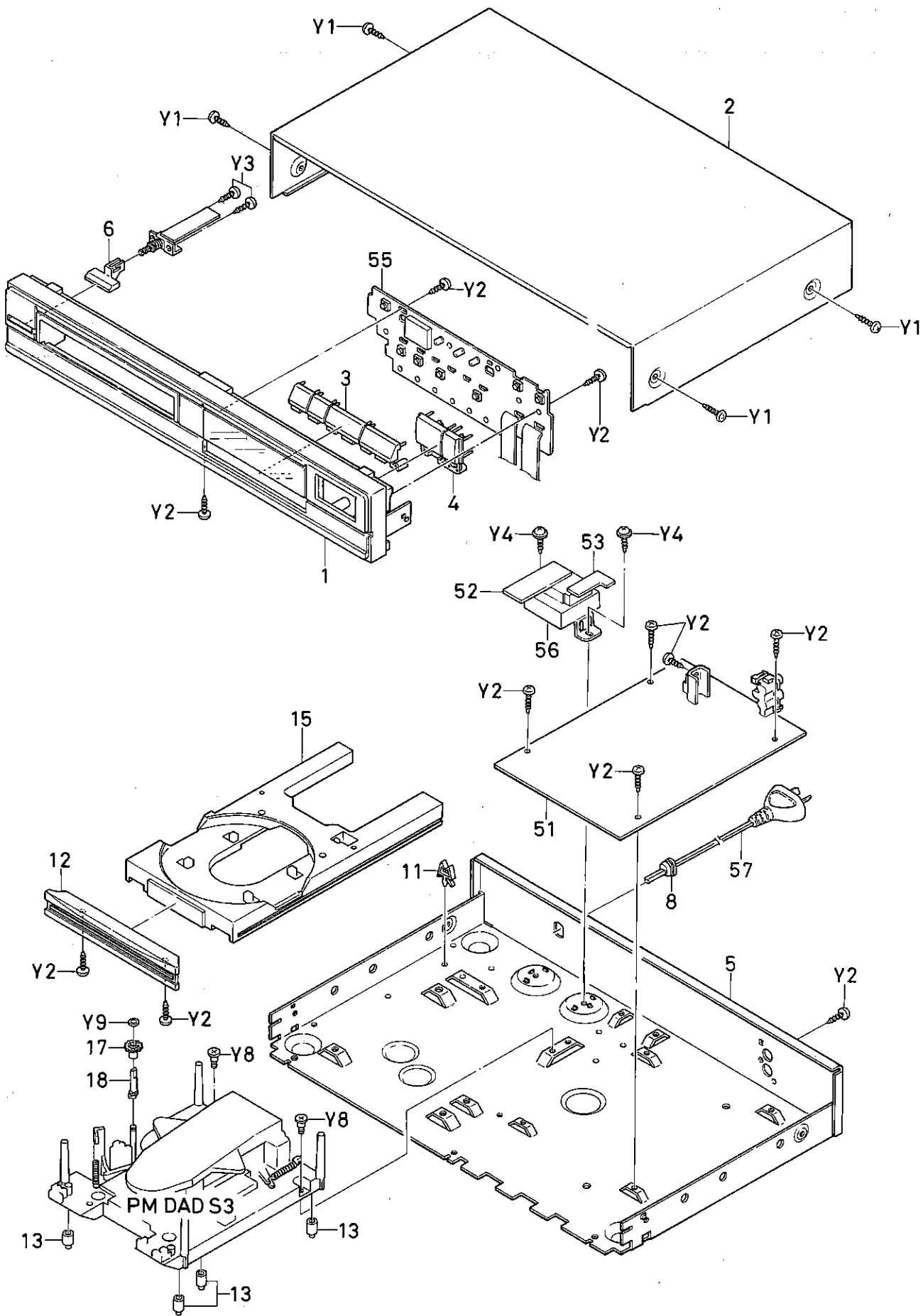


Figure 16

6. Tracking Offset Adjustment (SVR104)

Follow step "3. Tracking offset pre-adjustment" again.

CABINET & CHASSIS EXPLODED VIEW



PARTS LIST

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol Δ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with Δ , 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.

•Regular type resistors and capacitors are omitted, check the schematic diagram for the value.

PACKING & ACCESSORIES

Ref. No.	Part No.	Description
	614 201 1027	INNER CORR CASE
	614 201 1959	FOAM PLASTIC CASE, LEFT
	614 201 1966	FOAM PLASTIC CASE, RIGHT
	614 201 1195	INST MANUAL
	614 176 8625	INNER POLYE LAMINA COVER
	614 201 0303	RATING PLATE
	614 176 2708	INNER POLYE COVER,200X300
or	614 191 3681	LABEL, CLASS 1
	614 201 3403	PAD
	614 190 6812	LABEL
	614 192 1068	LABEL
	614 200 3466	LABEL, 8CM
	614 022 7598	LEAD CORD
or	614 022 9554	LEAD CORD
or	614 023 0567	LEAD CORD

CABINET & CHASSIS

Ref. No.	Part No.	Description
1	614 200 9901	FRONT PANEL ASSY
2	614 056 6222	CABINET ASSY
3	614 200 1660	PUSH BUTTON, PLAY/STOP
4	614 200 1677	PUSH BUTTON, MEMO/REP/FF/REW
5	614 200 9956	BOTTOM LID ASSY
6	614 194 4517	PUSH BUTTON, POWER
8	614 129 1901	FIXER, AC CORD
9	614 191 4381	LABEL, CABINET
11	614 129 3509	FIXER, LEAD RETAINER
12	614 200 3602	ESCUTCHEON, TRAY FRONT
13	614 195 6978	RUBBER CUSHION, MECHANISM FLOAT
15	614 069 8831	SLIDE ASSY, TRAY
17	614 134 8858	GEAR, TRAY CTR
18	614 134 8865	GEAR, TRAY CTR
Y8	412 004 5705	SPECIAL SCREW, MECHANISM MOUNTING
Y9	412 027 1906	SPECIAL WASHER, TRAY CTR

FIXING PARTS

Ref. No.	Part No.	Description
Y1	411 021 6603	SCR S-TPG BIN 3X8
Y2	411 021 6405	SCR S-TPG BIN 3X8
Y3	411 022 2802	SCR S-TPG FLT 3X10
Y4	411 020 9902	SCR S-TPG BRZ + FLG 3X8

ELECTRICAL PARTS

Ref. No.	Part No.	Description
56	Δ 614 043 9564	P.T
57	Δ 614 023 2929	POWER CORD

MAIN P.C.BOARD ASSY

Ref. No.	Part No.	Description
51	614 202 5758	P.C BOARD ASSY, MAIN
	614 020 1604	SOCKET, LINE OUT
	614 121 6829	HEAT SINK
	614 017 2539	PLUG, 2P EFM
	614 017 2546	PLUG, 3P
	614 016 3865	PLUG, 4P TP
	614 016 4084	PLUG 2P
	614 016 8235	PLUG, 4P AUTO FUNCTION
	614 020 6562	SOCKET, 4P TO P.T.SECONDARY
	614 017 2119	PLUG, 4P TO MOTOR
	614 017 2157	PLUG, 8P TO MECHA SW
T101	614 194 3596	FILTER, RF COIL
T102	614 194 3619	O.S.C COIL, PLL
T501	614 194 3602	FILTER, LPF
T502	614 194 3602	FILTER, LPF
L401	614 028 4133	FILTER
L701	614 028 4256	FILTER
X301	614 194 2902	CERAMIC RESONATOR, 4.19MHZ
X302	614 035 1637	CERAMIC RESONATOR, 2MHZ
X401	614 194 2919	CERAMIC RESONATOR, 8.64MHZ
X419	614 194 2902	CERAMIC RESONATOR, 4.19MHZ
X864	614 194 2919	CERAMIC RESONATOR, 8.64MHZ
SVR101	614 003 3083	SEMI V.R, 10K OHM FOCUS GAIN
SVR102	614 003 3120	SEMI V.R, 100K OHM TRACKING BALANCE
SVR103	614 003 3113	SEMI V.R, 10K OHM TRACKING GAIN
SVR104	614 003 3090	SEMI V.R, 100K OHM TRACKING OFFSET
CN1	614 017 2577	PLUG
CN2	614 017 2133	PLUG
CN7	614 035 5994	SOCKET
CN8	614 035 6007	SOCKET
IC101	409 124 6507	IC LA9200NM
IC201	409 018 5500	IC LA6510
IC202	409 018 5500	IC LA6510
IC301	410 043 5106	IC CXP5034H-065S
IC302	410 050 0002	IC TMP42C40P-1327
IC401	409 120 4002	IC LC7860N
IC402	409 089 5201	IC LC3517AS-15
IC501	409 067 0709	IC LC7880
IC502	409 018 4503	IC LA6458DS
IC503	409 018 4503	IC LA6458DS
IC601	409 026 8500	IC L78M05
IC602	409 077 5305	IC L79M05
Q101	405 080 7107	TR DTA113ZS
Q201	405 011 8500	TR 2SC1740S-R
or	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q202	405 011 8500	TR 2SC1740S-R
or	405 011 8609	TR 2SC1740S-S
or	405 019 3705	TR 2SC536-G-AUD-SPA
Q203	405 018 2600	TR 2SC3400
or	405 000 4407	TR DTC124ES
Q204	405 018 2600	TR 2SC3400
or	405 000 4407	TR DTC124ES
Q205	405 018 2600	TR 2SC3400
or	405 000 4407	TR DTC124ES
Q206	405 021 0600	TR 2SD1012-G-SPA
Q302	405 011 8500	TR 2SC1740S-R

MECHANISM PARTS LIST

MECHANISM

Ref. No.	Part No.	Description
M1	614 139 8280	LEVER
M2	614 135 8710	PULLEY
M3	614 113 5496	BRACKET
M4	614 140 1324	LEVER
M5	614 151 7063	SPRING COIL
M6	614 045 2105	COMMUTATE MOTOR
M7	614 073 7011	TURN TABLE
M8	614 151 7025	SPRING COIL
M9	614 151 7056	SPRING COIL
M10	614 140 1317	LEVER
M11	614 195 7814	SPRING PLATE
M12	614 145 9622	SHAFT
M13	614 002 1417	PICK UP
M14	614 134 8902	GEAR
M15	614 134 8919	GEAR
M16	614 151 7223	SPRING COIL
M17	614 134 8889	GEAR
M18	614 197 7645	GEAR
M19	614 134 8834	GEAR
M20	614 134 8827	GEAR
M21	614 134 8841	GEAR
M22	614 195 8101	COMMUTATE MOTOR ASSY
M23	614 024 1600	SWITCH
M24	614 018 9223	SWITCH

Ref. No.	Part No.	Description
M25	614 195 0716	CHASSIS ASSY
M26	614 036 8611	SOCKET
M27	614 036 8604	SOCKET
M28	614 134 8872	GEAR
M29	614 140 1331	LEVER
M30	614 111 7317	SHEET
M31	614 197 7539	SPACER

FIXING PARTS (MECHANISM)

Ref. No.	Part No.	Description
Y1	411 044 7205	SCR PAN+SW 2X4
Y2	412 012 7005	SPECIAL WASHER
Y3	412 013 0609	SPECIAL WASHER
Y4	614 127 5765	SPECIAL WASHER
Y5	411 078 2405	SCR TPG PAN 1.7X8
Y6	411 020 9902	SCR S-TPG BRZ+FLG 3X8
Y7	411 022 8408	SCR S-TPG PAN 2X8
Y8	411 021 2407	SCR S-TPG BIN 2.6X4
Y9	411 044 7502	SCR PAN+SW 2X5
Y10	411 021 5705	SCR S-TPG BIN 3X6
Y11	411 021 3503	SCR S-TPG BIN 3X10
Y12	412 026 8401	SPECIAL SCREW
Y13	411 087 8108	WASHER V 3X8X0.5

IC BLOCK DIAGRAM

Pin Function of IC301 (CXP5034H-065S)

Pin No.	Pin name (Symbol)	I/O	Description
1	COCK	O	LC7860N Interface: Clock
2	COIN	O	LC7860N Interface: Command data
3	SAFETY	I	Input pin for changing the characteristic to Sled Motor drive (access mode)
4	SQOUT	I	LC7860N Interface: SUB Q data
5	RWC	O	LC7860N Interface: Data latch
6	LDON	O	LASER control ON/OFF
7	CLOSE	O	Control Tray drive motor (Sled motor)
8	OPEN	O	Control Tray drive motor (Sled motor)
9	CMOPN	I	Input pin for Open sw
10	CMCLS	I	Input pin for Close sw
11	LIMIT	I	Input pin for Pick up limit sw
12	SLEEP	I	Input pin for changing the function (to, 3-in-1 model)
13	12cm	I	Input pin for detecting thd disc size (8cm/12cm)
14	CLVG	O	Output pin for changing the gain of CLV
15	RDATA	I	Serial data input from IC302
16	RCLK	O	Serial clock output to IC302.
17	SCAN0	O	Scan output, 0 (key scan and display)
18	SCAN1	O	Scan output, 1 (key scan and display)
19	SCAN2	O	Scan output, 2 (key scan and display)
20	SCAN3	O	Scan output, 3 (key scan and display)

Pin No.	Pin name (Symbol)	I/O	Description
21	Vss	-	Gnd
22	KEY0	I	Input pin from key matrix, 0
23	KEY1	I	Input pin from key matrix, 1
24	KEY2	I	Input pin from key matrix, 2
25	KEY3	I	Input pin from key matrix, 3
26	SEG f	O	Segment output
27	SEG a	O	Segment output
28	SEG b	O	Segment output
29	SEG g	O	Segment output
30	SEG h	O	Segment output
31	SEG c	O	Segment output
32	SEG d	O	Segment output
33	SEG e	O	Segment output
34	XTAL	O	Output of oscillator circuit
35	EXTAL	I	Input of oscillator circuit
36	RST	I	Input pin for system reset
37	THLD	I	Input pin for tracking hold monitor
38	REC	O	Output pin for the auto function
39	TRAY	O	Output pin for changing
40	DRF	I	Input pin for detecting, RF signal (ON/OFF)
41	WRa	I	LC7860N Interface: SUB Q trigger
42	VDD	-	+5V

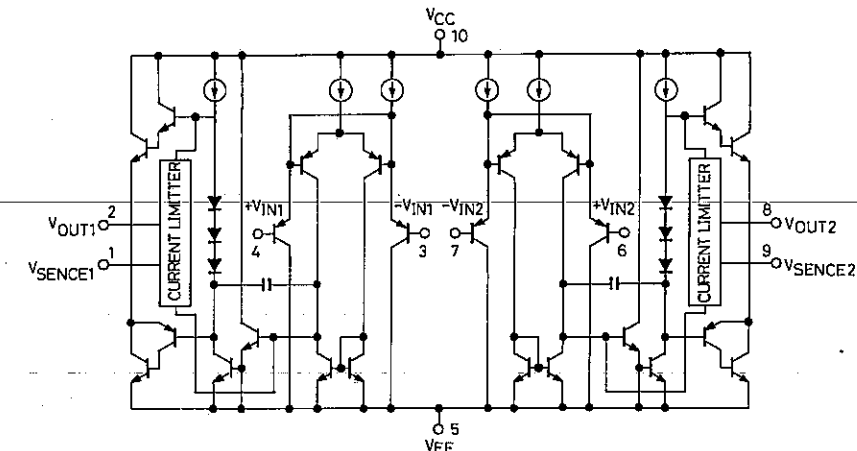
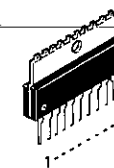
IC BLOCK DIAGRAM

Pin Function of IC401 (LC7860N)

Pin No.	Pin Name	I/O	Functions
1	TEST1	I	Test pin. Normally not connected.
2	AO	O	VCO is generated by connecting resonance circuit between AI and AO. (8.6436MHz) is phase output with EFM signal, and is set to increase frequency when "+".
3	AI	I	
4	PDO	O	
5	Vss	-	GND
6	EFMO	O	1 to 2Vpp HF signal is input to EFMIN. Output from EFMO and BFMO passes through amplitude limiter and reverse phase EFM signal is obtained from both. This performs slice level control.
7	EFMO	O	
8	EFMIN	I	
9	TEST2	I	Test pin. Normally not connected.
10	VDD	-	+5V
11	CLV+	O	Disk motor control output
12	CLV-	O	
13	FOCS	O	Focus servo is off when FOCS is HIGH. The lens is lowered by FST and then FST is HIGH, the lens is gradually pulled up. FOCS is reset when FZD is generated. For focus-in.
14	FST	O	
15	FZD	I	
16	HFL	I	*1 Kick pulses, JP+ and JP-, are generated according to track jump command. A jump of the pre-scribed number of tracks is (1, 4, 16 64).
17	TES	I	
18	FSEQ/PCK	O	*2 When 4.3218MHz PCK monitor terminal/DEMO is HIGH both SYNC detected from EFM signal and SYNC of counter are the same at HIGH.
19	TOFF	O	
20	TGL	O	
21	THLD	O	
22	JP+	O	
23	JP-	O	
24	DEMO	I	Set and sound output adjustment pin function.
25	TEST3	I	Test pin. Normally not connected.
26	EMPH	O	De-emphasis is necessary when HIGH.
27	DFOFF	I	ON/OFF switch for digital filter. No filtering when HIGH.
28	DSPOFF	I	Test pin. Normally not connected.
29	SMP2	O	*3 Signal output to DAC and signal for L/R switching and sample hold.
30	LRCLK	O	*3
31	VDD	-	*4 +5V
32	SMP3	O	*3
33	SMP1	O	*3
34	DFOUT	O	*3
35	DACLK	O	*3
36	DFIN	I/O	*5
37	LRSY	O	*6
38	MSBF	I	*3
39	CK2	O	2.1609MHz
40	AD10	O	*7 RAM address output
41	AD10	O	*8 Output state when WE = L and input state when WE = H. OE is for input/output control.
42	OE	O	*8
43	AD9	O	*7

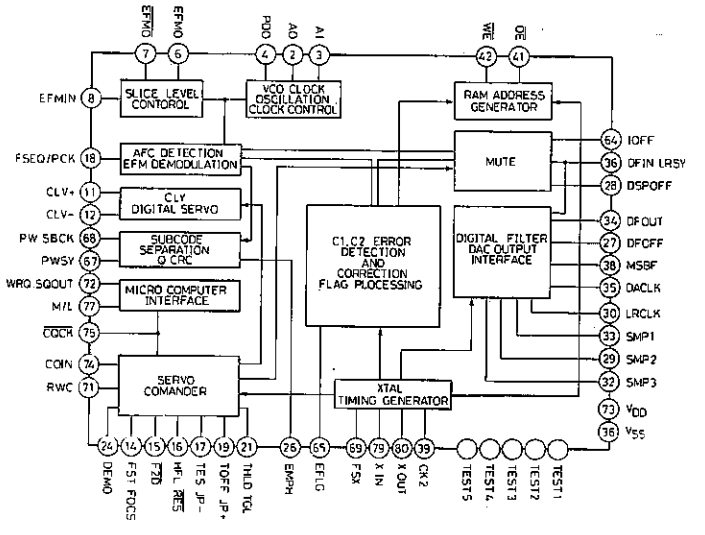
Pin No.	Pin Name	I/O	Functions
44	AD8	O	*7
45	AD7	O	*7
46	AD6	O	*7
47	AD5	O	*7
48	AD4	O	*7
49	AD3	O	*7
50	AD2	O	*7
51	AD1	O	*7
52	AD0	O	*7
53	DB7	I/O	*9 DB7 to DB0: connected to RAM data pins.
54	DB6	I/O	*9
55	DB5	I/O	*9
56	Vss	-	*10 GND
57	DB4	I/O	*9
58	DB3	I/O	*9
59	DB2	I/O	*9
60	DB1	I/O	*9
61	DB0	I/O	*9
62	TEST4	I	Test pin. Normally not connected.
63	TEST5	I	
64	IOFF	I	For CD ROM. HIGH time interpolation and holding of previous value not performed.
65	EFLG	O	C1/C2 1-level and 2-level error correction
66	PW	O	PWSY is SYNC combining main and sub and change from HIGH to LOW is taken externally. The P, Q, R, S, T, U, V, and W subcodes are read by sending 8 clock pulses to SBCK.
67	PWSY	O	
68	SBCK	I	
69	FSX	O	7.35kHz sync signal output
70	WRQ	O	*11 WRQ goes HIGH when data of subcode Q passes CRC check. This is taken externally and the data from SQOUT is read by sending CQCK. When data is required with LSB first, M/L is driven LOW. After the micro-processor sets RWC to HIGH, the command is given by output synchronized with the CQCK command data.
71	RWC	I	*11
72	SQOUT	O	*11
73	VDD	-	*11
74	COIN	I	*11
75	CQCK	I	*11
76	RES	I	*12
77	M/L	I	*11
78	Vss	-	GND
79	XIN	I	Pin for connection to 8.6436MHz crystal oscillator
80	XOUT	O	

IC201/IC202 LA6510 (Dual Power Operational Amplifier)



IC BLOCK DIAGRAM

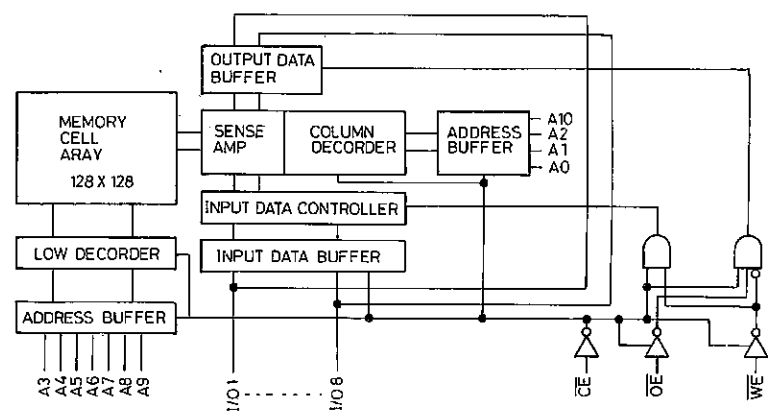
IC401 LC7860N Digital Signal Processor



Pins Functions of IC302 (TMP42C40P-1367)

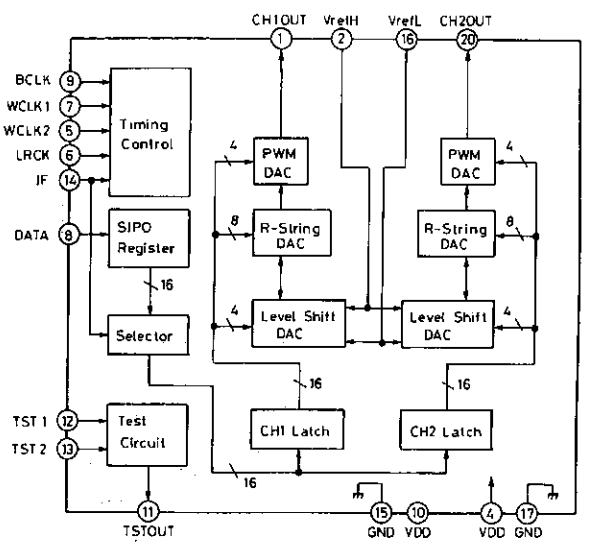
Pin No.	Pin name (Symbol)	I/O	Function Name	Allocated Function
1	Xout	O	Xout	Connected to oscillator
2	Xin	I	Xin	Connected to oscillator
3	RST	I	RESET	Initialized Signal input
4	P00	O	RDATA	Remote control data signal Decord output
5	P01	-	(NC)	(Open)
6	P02	-	(NC)	(Open)
7	P03	-	(NC)	(Open)
8	VSS	-	VSS	Ground
9	P10	I	RCLK	Clock for decoded Remote control signal
10	P11	-	-	(Pull up)
11	P12	-	-	(Pull up)
12	P13	-	-	(Pull up)
13	P20	-	-	(Pull up)
14	P21	-	(NC)	(Open)
15	P22	I	IR	Remote control signal input
16	VDD	-	VDD	+5 V

IC402 LC3517AS-15 (STATIC RAM)



TERMINAL NAME	TERMINAL DESCRIPTION
A0-A10	ADDRESS INPUT
I/O1-I/O8	DATA INPUT/OUTPUT
CE	CHIP ENABLE INPUT
WE	WRITE ENABLE INPUT
OE	OUTPUT ENABLE INPUT
Vcc	+5V POWER SOURCE
GND	GROUND

IC501 LC7880 (16-bit D-A Converter for CD)



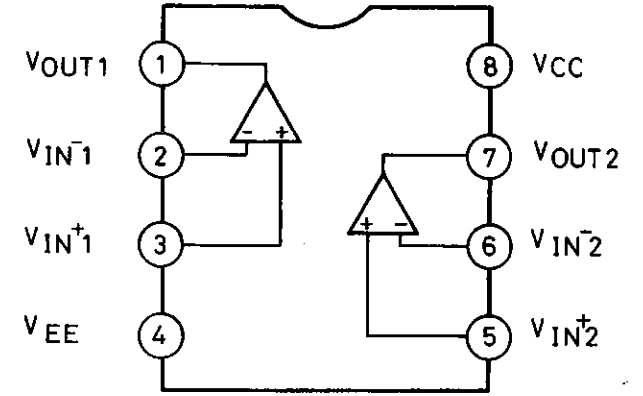
IC BLOCK DIAGRAM

Pins Functions of IC501 (LC7880)

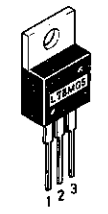
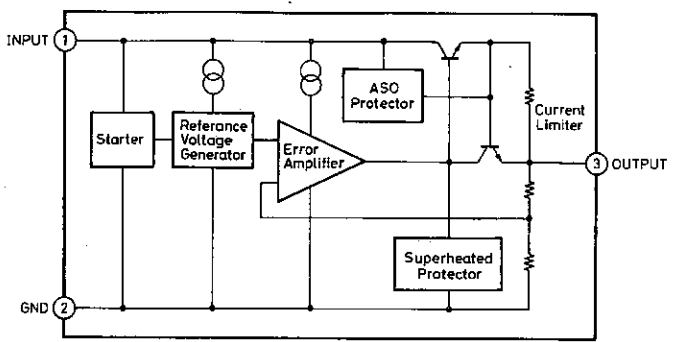
Pin No.	Pin name (Symbol)	Description
1	CH1OUT	Output Terminal of CH-1.
2	VrefH	Input Terminal of Reference Voltage "H".
3	NC	No Connection
4	VDD	+5V Power Supply Terminal.
5	WCLK2	Input Terminal of Word-Clock 2. When IF is in "L", internal signal for latching CH-1 data of digital signal is made by using trailing edge of WCLK2. When IF is in "H", it needs WCLK2 to "L".
6	LRCK	Input Terminal of LR Clock. Indicates CH-1 and CH-2 of input digital audio data : indicate CH-1 when LRCK is in "H", indicate CH-2 when LRCK is in "L".
7	WCLK1	Input Terminal of Word-Clock 1. When IF is in "L", internal signal for latching CH-2 data of digital signal is made by using trailing edge of WCLK1. When IF is in "H", internal signal for latching CH-1 and CH-2 data of digital signal is made by trailing edge of WCLK1.
8	DATA	Input Terminal of Digital Audio Data. When IF is in "L", digital audio data is input in bit serial from LSB. When IF is in "H", digital audio data is input in bit serial from MSB.

Pin No.	Pin name (Symbol)	Description
9	BCLK	Bit-Clock Terminal. This clock is for reading digital audio data into LSI in bit serial and is for PWM DAC.
10	VDD	+5V Power Supply Terminal.
11	TSTOUT	Output Terminal for Testing. Ordinarily, leave this terminal open.
12	TST1	Input Terminal for Testing. Ordinarily, ground these terminals.
13	TST2	Input Terminal for Testing. Ordinarily, ground these terminals.
14	IF	Interface Select Terminal. When IF is in "L", digital audio data is input from LSB side. When IF is in "H", digital audio data is input from MSB side.
15	GND	Ground Terminal
16	VrefL	Input Terminal of Reference Voltage "L".
17	GND	Ground Terminal
18	NC	No Connection
19	NC	No connection
20	CH2OUT	Output Terminal of CH-2.

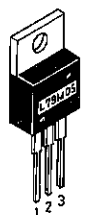
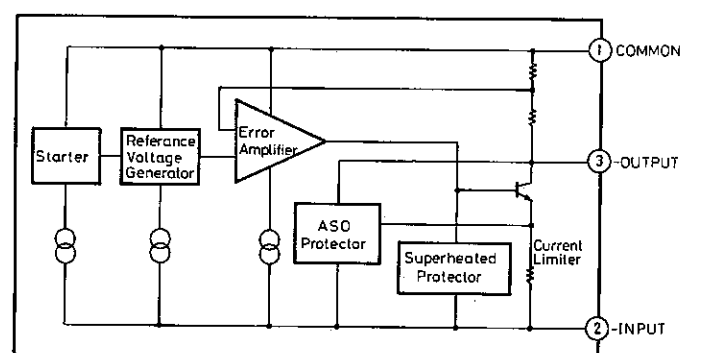
IC502/IC503 LA6458DS (DUAL OPERATIONAL AMPLIFIER)



IC601 L78M05 (5V 3-Terminal Constant Voltage Regulated Power Supply)



IC602 L79M05 (-5V 3-Terminal Constant Voltage Regulated Power Supply)



VOLTAGES OF IC & TRANSISTORS

IC101 (LA9200NM)

(Unit: Volt)

Measuring Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stop voltages	0		0.3	0	0	0	0	0	0	0	0	0	0	4.8	4.3	4.1
Play voltages	-0.3	Fluc	0.2	0											0	3.8
Measuring Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Stop voltages	4.1	4.0	-5.0	0	4.9	3.6	1.5	1.5	0	2.4	0	2.4	2.4	0	0	0.6
Play voltages	0	4.0	-5.0	0	4.9	2.5	2.6	2.4	0	2.4	4.16	2.5	2.4	Fluc	-0.3	0.3
Measuring Pin No.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Stop voltages	0.6	0.2	-0.2	-0.1	0	4.2	4.9	5.0	0	0	-5.0	0	0	0	0	0
Play voltages	0.3	0.8	2.9	1.7		0.3	-5.0	5.0			-5.0					

IC301 (CXP5034H)

Measuring Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stop voltages	4.92					4.21	0.25	0.26	4.96	4.96	4.95	4.95	4.90	1.86	4.96	4.86
Play voltages				Fluc	0.1	0.3	¹ 4.78	² 4.79	² 0	² 0	0					
Measuring Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Stop voltages	3.36	3.32	3.35	4.95	0	4.95	4.95	4.95	4.95							
Play voltages	0.8	2.26								³ 0.7	³ 0.7	³ 0.7	³ 0.7	³ 1.9	³ 0.4	³ 0.4
Measuring Pin No.	33	34	35	36	37	38	39	40	41	42						
Stop voltages	³ 0.8	2.26	2.26	5.0		3.76	3.82	0		4.96						
Play voltages						0		4.16	Fluc							

※ ¹: close ²: open ³: all LED become bright

IC302 (TMP42C40P-1367)

Measuring Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stop voltages	2.1	2.2	4.9	4.9	4.9	4.9	4.9	0	4.9	4.9	4.9	4.9	0	4.9	4.7	4.9

IC401 (LC7860N)

Measuring Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stop voltages		2.5	2.4	2.4	0	1.4	1.2	2.5	0	4.9				3.0	4.2	4.2
Play voltages		2.5	2.4	2.4	0	2.4	2.4	2.5	0	4.9	0.8	0	0	3.0	4.2	0
Measuring Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Stop voltages		2.5	4.86	0	0	0	0	0	0	0	0	0	1.0	2.5	4.9	2.0
Play voltages	4.17	2.5	4.86										1.0	2.5	4.9	2.0
Measuring Pin No.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Stop voltages	1.0	2.0	2.4		2.4	0	2.4	2.4	3.57	4.5	2.4	2.4	2.4	2.4	2.4	2.4
Play voltages	1.0	2.3	2.4		2.4	0	2.4	2.4	3.57	4.5	2.4	2.4	2.4	2.4	2.4	2.4
Measuring Pin No.	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Stop voltages	1.6	1.6	1.6	1.6	1.4	1.4	1.4	0	3.6	3.6	3.6	1.6	3.6			
Play voltages	1.6	1.6	1.6	1.6	2.6	2.6	2.6	0	2.4	2.4	2.4	2.4	2.4			
Measuring Pin No.	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Stop voltages	2.3		0.3		2.4	0			4.9		4.9	5.0	0	0	2.3	2.3
Play voltages	Fluc		0.3	Fluc	2.4	0.2	Fluc	Fluc	4.9	Fluc	4.9	5.0	0		2.3	2.3

※ Fluc: Fluctuation

VOLTAGES OF IC & TRANSISTORS

IC402 (LC3517AS)

Measuring Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stop voltages	2.4	2.4	2.4	2.4	1.6	1.6	1.6	1.6	2.5	1.4	1.4	0	3.6	3.6	3.6	1.7
Play voltages										2.2	2.5		2.6	2.6	2.6	2.4
Measuring Pin No.	17	18	19	20	21	22	23	24								
Stop voltages	3.6	0	2.4	3.5	4.5	2.5	2.5	4.9								
Play voltages	2.3		2.4	3.5												

IC501 (LC7880)

Measuring Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stop voltages	2.0	4.0		5.0	1.0	2.5	1.0	0	2.3	5.0		0	0	0	0	0
Measuring Pin No.	17	18	19	20												
Stop voltages	0			2.0												

IC502 (LA6458)

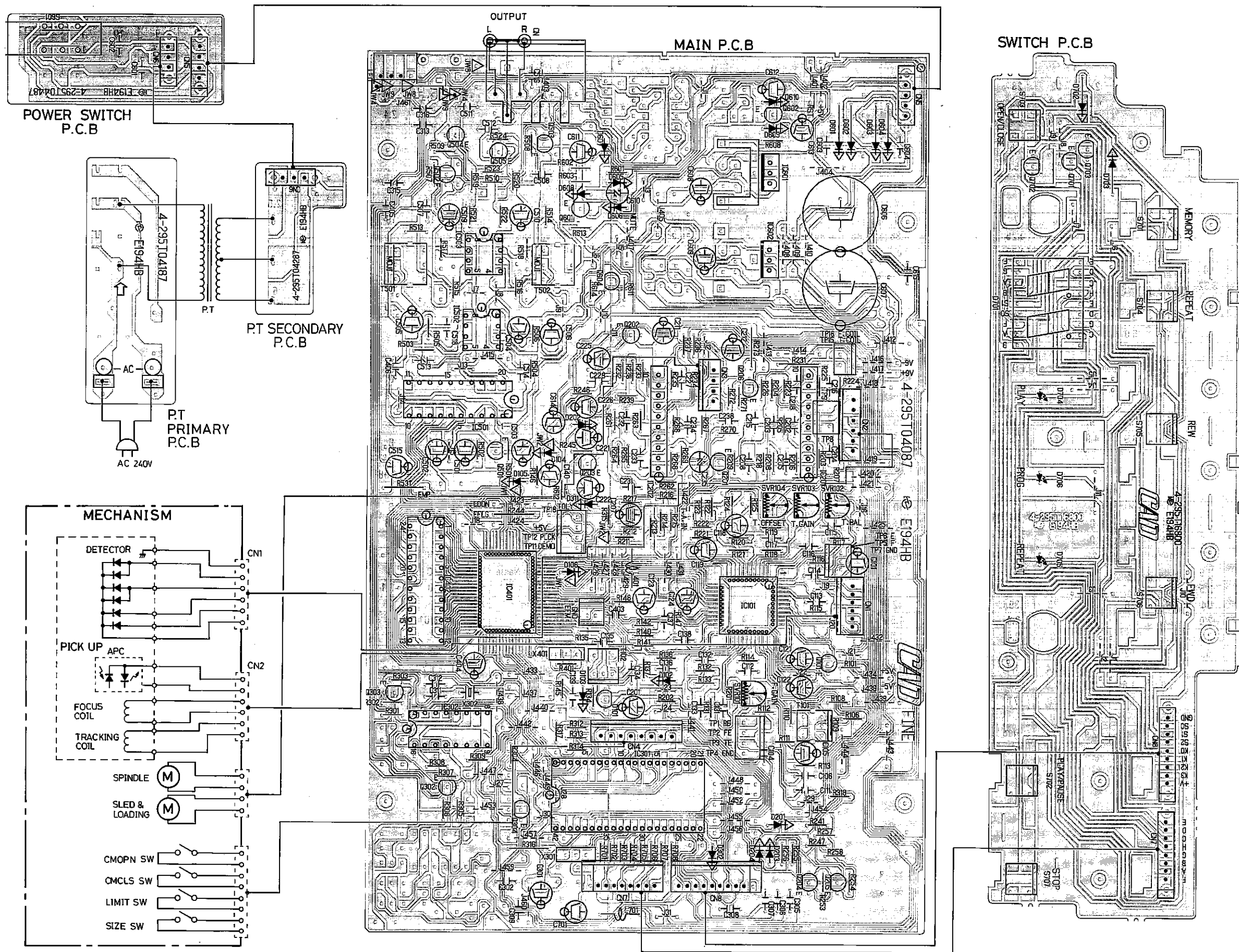
Measuring Pin No.	1	2	3	4	5	6	7	8
Stop voltages	2.0	2.0	2.0	-5.0	2.0	2.0	2.0	5.0

IC503 (LA6458)

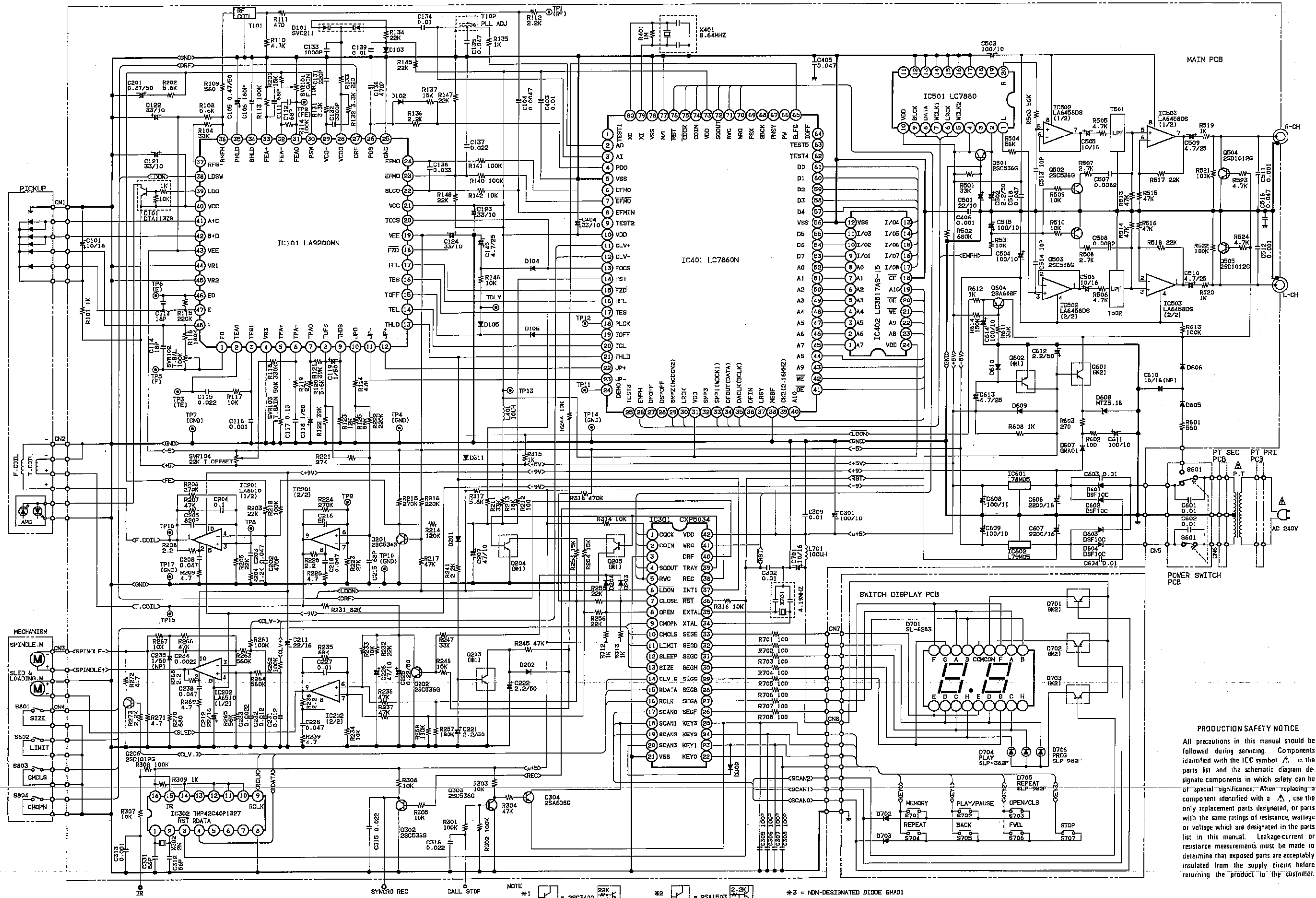
Measuring Pin No.	1	2	3	4	5	6	7	8
Stop voltages	0	0	0	-5.0	0	0	0	5.0

Transistor No.	Q101			Q201			Q202			Q203			Q204			
Measuring Pin Name	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	
Stop voltages	4.98	0.5	4.98	0	0.3	-0.6	0	0	0.6	0	2.2	0	0	0	3.8	
Play voltages		4.86	-4.98				0	0	0	0	0	0				
Transistor No.	Q205			Q206			Q501			Q502			Q503			
Measuring Pin Name	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	
Stop voltages	0	0	3.8	0	0	0.6	4.0	4.9	4.7	0	Fluc	0	0	Fluc	0	
Play voltages										¹ 0	¹ 0	¹ 0.6	¹ 0	¹ 0	¹ 0.6	
Transistor No.	Q504			Q505			Q601			Q602			Q604			
Measuring Pin Name	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	
Stop voltages	0	0	-3.1	0	0	-3.1	5	-3	5	0	5	0	2.5	2.5	1.9	
Play voltages													0.5	-3.2	0	
Transistor No.	Q701			Q702			Q703									
Measuring Pin Name	E	C	B	E	C	B	E	C	B							
Stop voltages																
Play voltages	¹ 4.6	² 1.7	² 3.2	² 4.8	² 1.7	² 3.2	² 1.7	² 3.2	² 3.2							

※ ¹: Emphasis ON, ²: all LED become bright



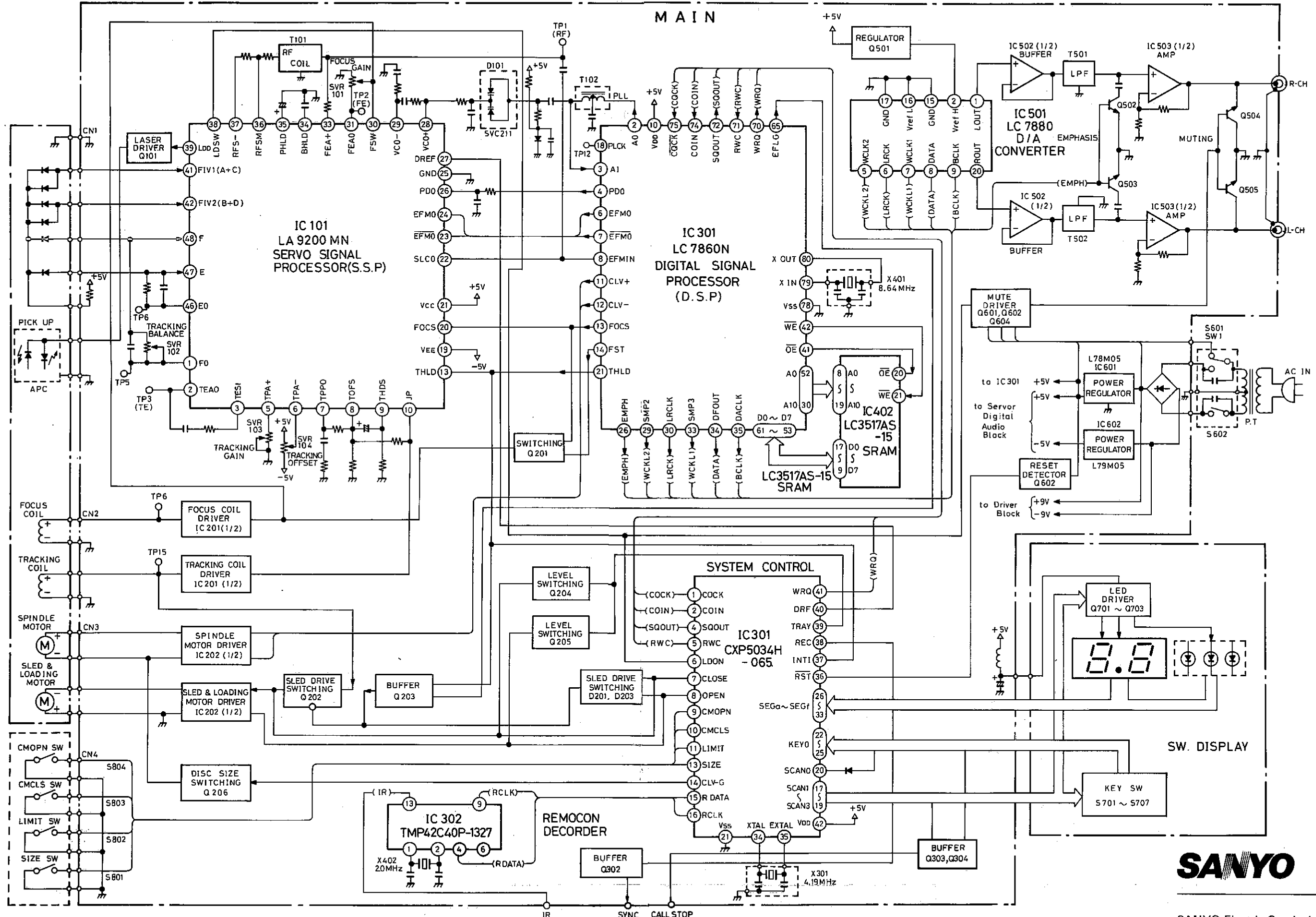
SCHEMATIC DIAGRAM



PRODUCTION SAFETY NOTICE

All precautions in this manual should be followed during servicing. Components identified with the IEC symbol Δ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with a Δ , use the only replacement parts designated, or parts with the same ratings of resistance, wattage or voltage which 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.

NOTE #1 Δ = 25C3400 $\frac{22k}{22k}$ #2 Δ = 2SA1503 $\frac{2.2k}{10k}$ #3 = NON-DESIGNATED DIODE 6HA01



SANYO Electric Co., Ltd.
Osaka, Japan

Production Change Notice

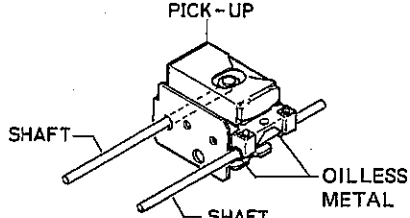
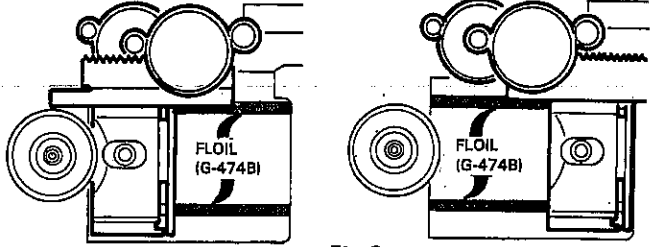
Please add this notice to the Service Manuals listed below.

Category: Compact Disc Player	Date: Dec. 21, '88
Model: CP33 CP888	Effective from: 1988 production
Destination: AUSTRALIA	Issue Number 1
REF:WM- 580069(CP33) 580074(CP888)	

The following changes have been made in the products listed above model.

1. Replacement of Pick-up.

Notes about pick-up replacement and grease coating
 If the material of the shaft guide hole of the pick-up has changed
 If the pick-up is replaced, follow the steps below.

TYPE	CONDITION OF THE PICK-UP RAIL	REPLACEMENT PICK-UP	STEPS
1	If there is a molykote coating on one of the shafts on which the pick-up is mounted (and there is OIL LESS METAL: see Fig. 1)	The former pick-up is being reused.	<p>After replacement, apply a coating of molykote (X5-6020) to the one shaft, as before.</p>  <p>Fig. 1</p>
2		A new pick-up is being used.	<ol style="list-style-type: none"> (1) When replacing the pick-up, carefully wipe away the grease from the shafts on which the pick-up is mounted. (2) Replace the pick-up. (3) Move the pick-up to the position at the left side, and then apply a coating of foilil (G-474B) to the two shafts.  <p>Fig. 2</p>
3	If foilil is coated on the two shafts on which the pick-up is mounted		<ol style="list-style-type: none"> (4) Move the pick-up to the right side and apply foilil to the remaining parts of the shafts.

Continued next page

2. HOW TO DISASSEMBLE THE UNIT

See the corresponding part as shown in Fig-1: at page 4 in service manual.

OLD:

When assemble the unit, set the gear as shown in Figure after reinserting the disc tray.

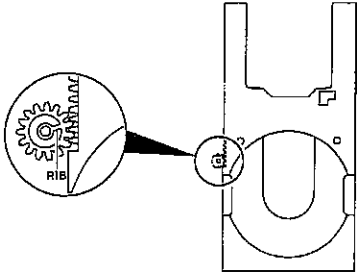


Fig-1

NEW:

When assemble the unit, set the gear as shown in Figure after reinserting the disc tray.

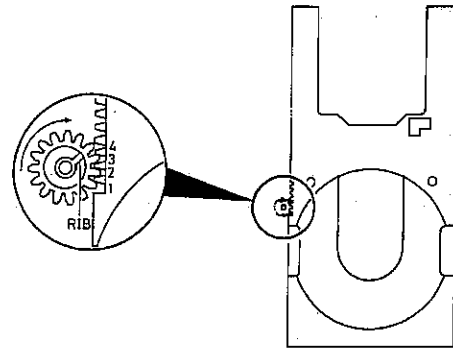


Fig-2

Note: Match the lid of gear to the fourth ditch of the tray in Fig-2.

SANYO

SANYO Electric Co., Ltd.
Osaka, Japan