CARVER

Powerful • Musical • Accurat

SD/A-390t
5-DISC CAROUSEL
COMPACT DISC PLAYER
SERVICE MANUAL

CONTENTS **Page**

■ SAFETY INFORMATION

WARNING.

Any person performing the procedures described in this manual will be exposed to hazardous voltages and the risk of electric shock.

Carver Corporation assumes that any person who removes the cover from the unit has been properly trained in protecting against avoidable injury and shock.

Therefore, the procedures described here are to be performed by qualified electronics service personnel only.

We recommend that the unit be tested only when line isolation is provided by an isolation transformer. The line cord of the unit must be disconnected and the power supply fully discharged before any components are replaced. Failure to do so may result in severe damage to the unit and the risk of electric shock.

The safety tests described below must be performed properly.

CAUTION:

Before returning the unit to the customer, one of the following safety tests must be performed.

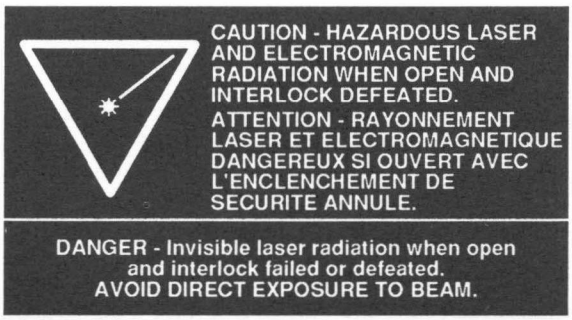
1. Check the leakage current. Connect the unit to 120 VAC supply and turn the power switch "ON". Using an ammeter, measure the current between the neutral side of the AC supply and chassis ground of the unit under test. If leakage current exceeds 0.5mA, the unit is defective.

   Reverse the polarity of the AC supply and repeat.

2. Measure the resistance from either side of the linecord to chassis ground. If it is less than 500k ohms, the unit is defective.

WARNING - DO NOT return the unit to the customer if it fails one of these tests until the problem is located and corrected.

1. **CLASS 1 LASER PRODUCT**
   This compact disc player is classified as a CLASS 1 laser product.
2. **LASER BEAM WARNING**
   When servicing this product, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30 cm from the surface of the objective lens on the optical pick-up block.



CAUTION

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

SPECIFICATIONS

Frequency Response:
20Hz to 20kHz (±0.5 dB), Soft EQ off

Signal-to-Noise Ratio:
More than 95 dB

Total Harmonic Distortion:
≤ 0.15% at 1kHz, 0dB

Wow and Flutter:
Unmeasurable

D/A Conversion:
1 bit MASH

Dynamic Range:
94 dB

Line Output Level at 0dB

Fixed:	1.6V rms (±1 dB), into 100 kilohms
Variable:	0-1.6V rms (±1 dB), into 100 kilohms

Output Impedance:
750 ohms

Maximum Headphone Output:
1.5V rms into 60 ohms (37.5 mW)
2.7V rms into 600 ohms (12 mW)

Laser:
3-beam, 790 nm

Power Consumption:
15W

Power Requirements:
120VAC/60Hz (USA and Canada)
Other voltages as required for export

Size (H x W x D):
4.75" x 17" (19" with handles) x 16"
121mm x 432mm (483mm w/handles) x 406mm

Net Weight: 14.9 lbs. (6.8 kgs)
Shipping Weight: 18.1 lbs. (8.2 kgs)

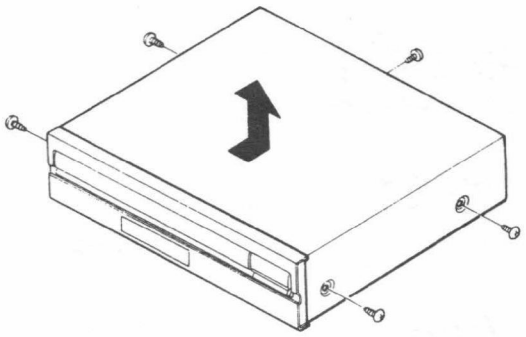
Accessories:
RH-39 Handheld Remote Control,
Two AA batteries, One pair connecting cords.

Features and specifications are subject to change without notice.

DISASSEMBLY

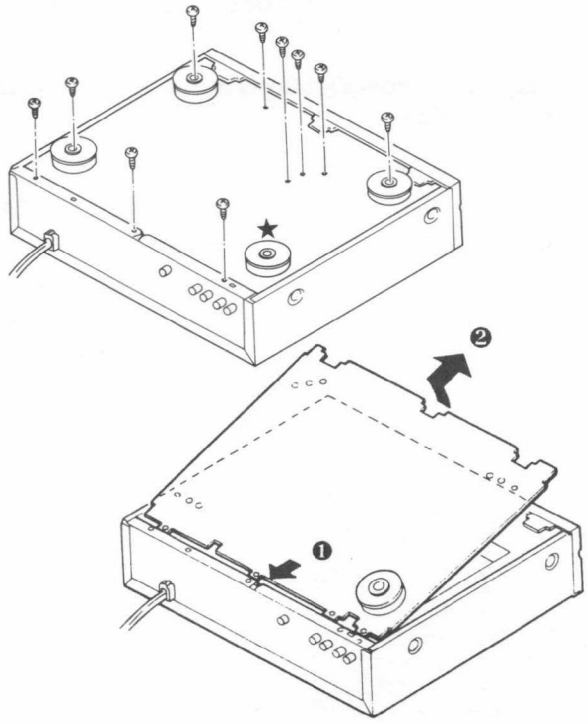
• Top Cover

1. Remove 4 screws from both sides and 1 screw from Rear Panel.
2. Slide Top Cover slightly back (about 5mm) and pull up.



• Bottom Cover

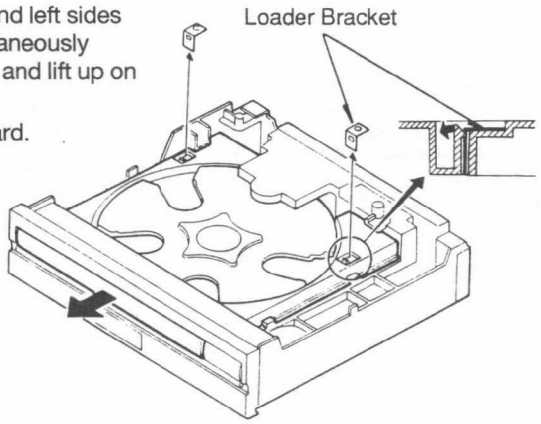
1. Remove screws from Bottom Cover as shown. Slide the Bottom Cover back (about 5mm).
2. When it touches the rear panel lift up on the front side of the cover and pull it up.



• Loader Frame Assembly (Tray)

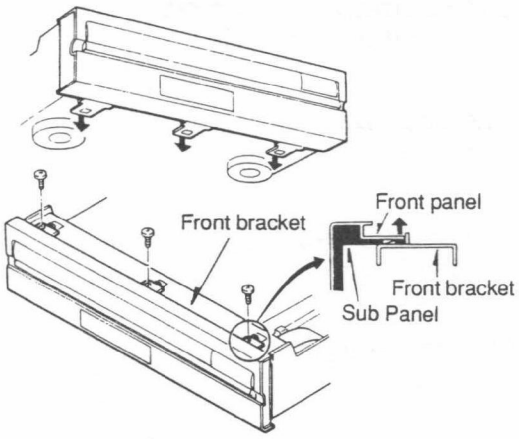
1. Pull out 2 loader brackets from right and left sides (use a flat-blade screwdriver to simultaneously bend back the plastic retaining hooks and lift up on the loader bracket).
2. Disconnect CB103 from the Main Board.
3. Pull the Loader Frame Assembly out toward the front.

Note: The tray has been lubricated where it contacts the track in the main frame. Use care to maintain the integrity of the lubricant by keeping it clean. It may be necessary to apply additional lubricant after reassembly for smooth operation.



• Front Panel

1. Disconnect the 31 position ribbon connector from the main board by carefully pulling it out of CB601.
2. Remove connector CB602.
3. Remove ground lug from the top left corner of the Front Bracket.
4. Disengage 3 hooks from the bottom of unit.
5. Remove 3 screws from the top of the Front Panel.
6. Detach panel from hooks on the front bracket by lifting up on the top edge of panel and pulling away from bracket.



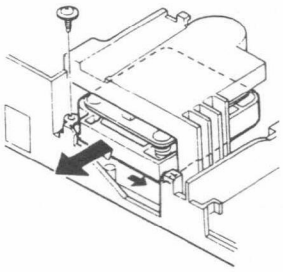
• Rear Panel

1. Remove 3 screws from bottom rear of unit.
2. Remove 2 screws from top rear corners of unit.
3. Remove 3 screws from phono jacks.
4. Disengage two hooks from the bottom of Rear Panel and two hooks from the top. Pull panel back and away from chassis.

• PU Mechanism

After removing Rear Panel:

1. Remove 1 screw from right rear of mechanism.
2. Disconnect CB101 and CB102 from Main Board.
3. Pull PU Mechanism out from rear of chassis.



Caution for Handling the Laser Pick-up

The laser pick-up KSS-240A is assembled and precisely adjusted using a sophisticated manufacturing process in our plant. Do not disassemble or attempt to readjust it. Please follow these instructions carefully when handling the pick-up.

1. Handle with Care

a) Storage

Do not store the pick-up in dusty, high-temperature or high-humidity environments.

b) Avoid shock to the pick-up from dropping or careless handling.

2. Laser Diode (LD)

a) Protect your eyes

The laser beam can damage the eye, since the intensity of the focused spot may reach $7 \times 10^3 W/cm^2$, even though the intensity at the objective lens is 400 μW maximum. As the light beam spreads after passing through the objective lens, the intensity diminishes and is safe beyond 30 cms. However, do not look at the laser light beam either through the objective lens directly or through another lens or a mirror.

b) Poison

The LD chip contains As (Arsenic), in the form of GaAs + GaAlAs. Avoid handling the chip, putting it in an acid or alkali solution, or heating it over 200°C.

c) Surge current or electrostatic discharge

The LD may be damaged if a large current is supplied to it, even if it is only a short pulse.

Be careful when handling the pick-up as it can be damaged by electrostatic discharge. Handle the laser pick-up by grasping it by the side (rosin molded part).

For safe handling of the laser pick-up, follow electrostatic safety precautions such as using a grounded wrist strap and mat, and grounding the measuring equipment.

The pins of the LD are short circuited by solder for protection during shipment. To open the short circuit, quickly remove the solder with solder wick and a grounded soldering iron. The temperature of the soldering iron should be less than 320°C (30W).

3. Actuator

The performance of the actuator may be affected if magnetic material is located nearby, since the operation of the actuator is electro-magnetic in nature. Do not permit dust to enter through the clearance of the cover.

4. Lens

The performance may change if dust obstructs the objective lens. Clean the lens with a cotton swab or lens cleaning paper dampened with lens cleaning fluid (or distilled water). Be careful not to press too hard against the lens so as not to damage the delicate mechanism.

5. Deterioration

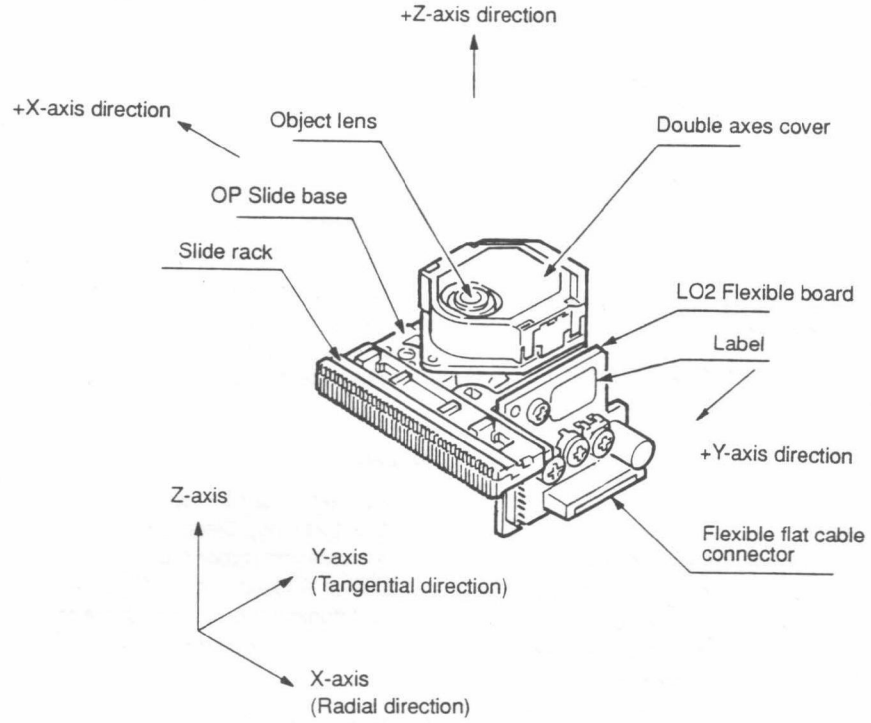
The KSS-240 contains a built-in RF Amp and APC circuit, making it more resistant to external electro-static damage than previous versions. However, there is the possibility of pick-up deterioration in the following cases.

a) Low HF level, or high jitter reading.

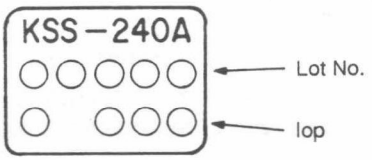
b) Tracking offset (EF Balance) is out of adjustment Refer to "Adjustment Procedures" for confirmation of a) and b).

NOTE FOR HANDLING OF LASER PICK-UP

DESCRIPTION OF THE COMPONENTS



Label



year
(last figure)

day month quality control No.

○○ ○ ○ ○

but Oct. Nov.and Dec. are expressed by alphabetical letters of X, Y and Z.

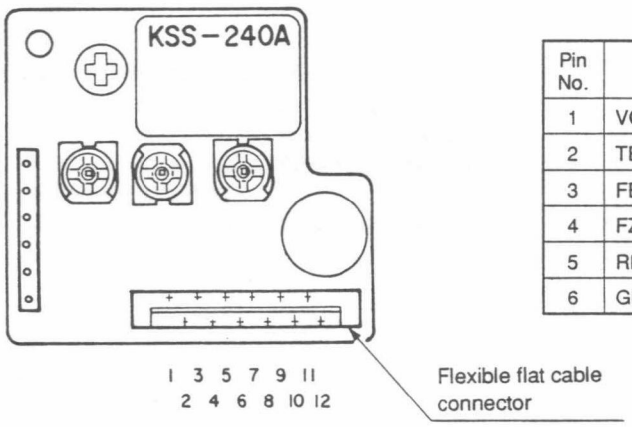
10 1 10^{-1}

quality control ○ ○ ○ ○

LD drive current

The unit shown is in mA, but with the omission of the decimal point. For example, 56.5mA will be expressed as 565. The prefix letter is for manufacturing control.

PIN CONNECTOR



Pin No.	Description	Input/ Output	Pin No.	Description	Input/ Output
1	VC (+2.5V)	OUT	7	Vcc (+5V)	IN
2	TE (TRK ER signal)	OUT	8	LDC (LD Control)	IN
3	FE (FCS ER signal)	OUT	9	FCS+ (Double axes)	IN
4	FZC (FZC signal)	OUT	10	TRK+ (Double axes)	IN
5	RF (RF signal)	OUT	11	TRK– (Double axes)	IN
6	GND	IN	12	FCS– (Double axes)	IN

(2) Necessary equipment for adjustment

1. Dual trace oscilloscope
2. Reference disc (i.e. Sony Test C.D. Type 4 YEDS 18).
3. Oscillator (10 Hz – 10 kHz, 0 – 3 Vp-p)
4. Frequency counter (readable more than 5 kHz)

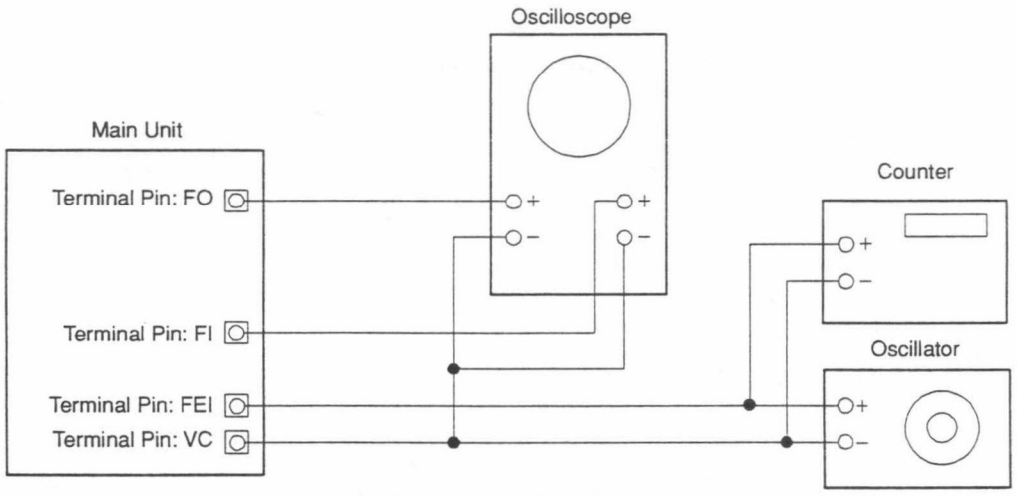
" ⊙ " is Terminal Pin on Main Unit.

(3) Preset

1.	Preset VR101, 102 as per right figure.	VR101 (F-GAIN) 12 O'clock VR102 (T-GAIN) 12 O'clock

2. Focus gain

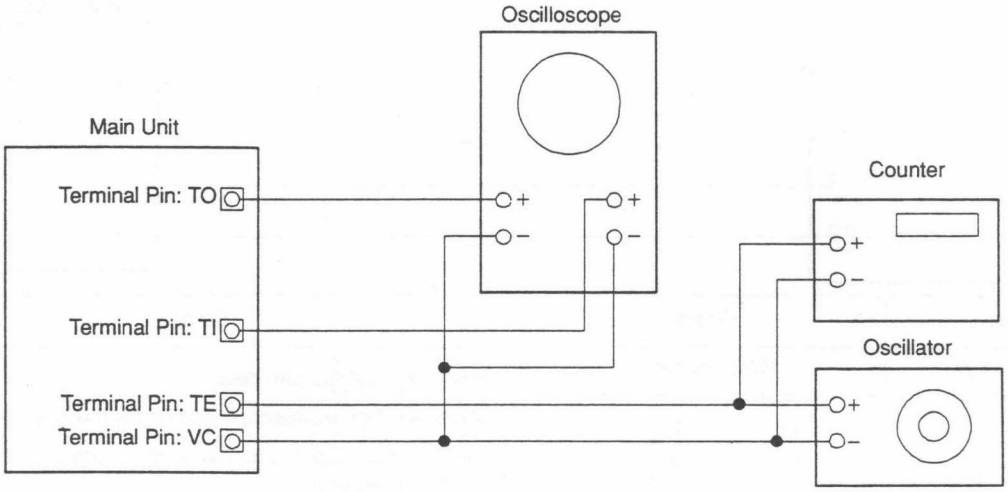
Connection



Oscillator	Counter	Oscilloscope V	Oscilloscope H	Adjust	Check	Step
930 Hz 4 Vp-p (±0.1 V)	930 Hz	● DC range ● X-Y mode		VR101	(Oscilloscope) Y axis / X axis Phase 90° Waveform not right Y axis / X axis	1. Push [≙ OPEN/CLOSE] and load reference disc. 2. Push [≙ OPEN/CLOSE] and close disc holder. 3. Push [II PAUSE] 4. Connect oscillator. 5. Set oscillator to 930 Hz/4 Vp-p. 6. Switch oscilloscope input to X-Y mode. 7. Adjust VR101 [F-GAIN] to symmetrize Lissajous figures to X-Y axes.

3. Tracking gain

Connection

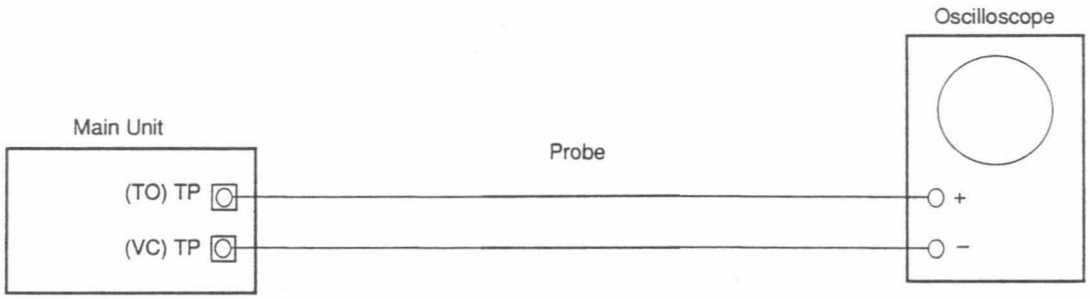


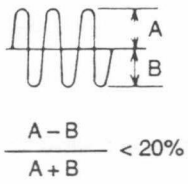
• Caution: Connect oscillator after [II PAUSE] pushed and servo function started.

Oscillator	Counter	Oscilloscope V	Oscilloscope H	Adjust	Check	Step
				(Volume)	(Oscilloscope)	1. Push [II PAUSE].
● 2.9 kHz (±120 Hz) ● 1.5 Vp-p (±0.1V)	2.9 kHz (±120 Hz)	● DC range ● X-Y mode		VR102	Y axis / X axis Phase 90° Waveform not right X axis / Y axis	2. Connect oscillator. 3. Set oscillator to 2.9 kHz/1.5 Vp-p. 4. Switch oscilloscope input to X-Y mode. 5. Adjust VR102 [T-GAIN] to symmetrize Lissajous figures to X-Y axes.

4. Tracking offset (E/F Balance)

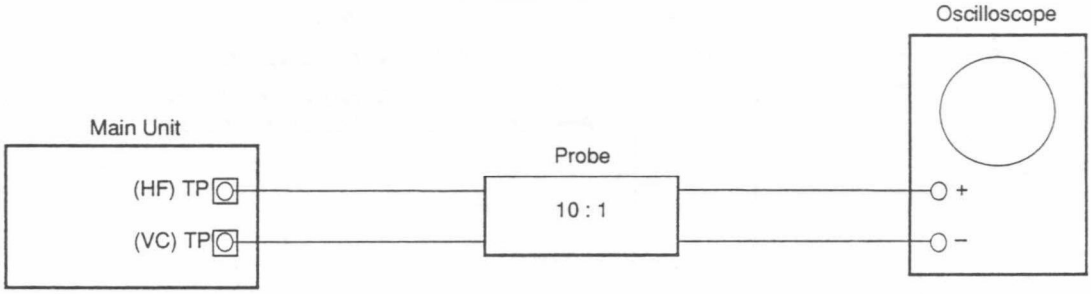
Connection

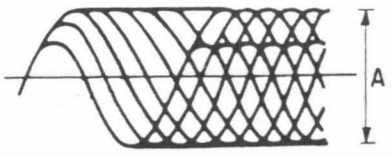
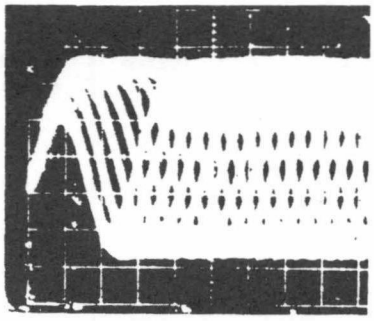


Osciloscope		Check	Step
V	H	(Oscilloscope)	1. Push ▶ PLAY to turn disc. 2. Short (+)(−) of oscilloscope and check the base line. 3. Confirm that upper and lower amplitude of the waveform is symmetric against 0V.
0.1v/div	1~2 ms/div	 $\frac{A-B}{A+B} < 20\%$	

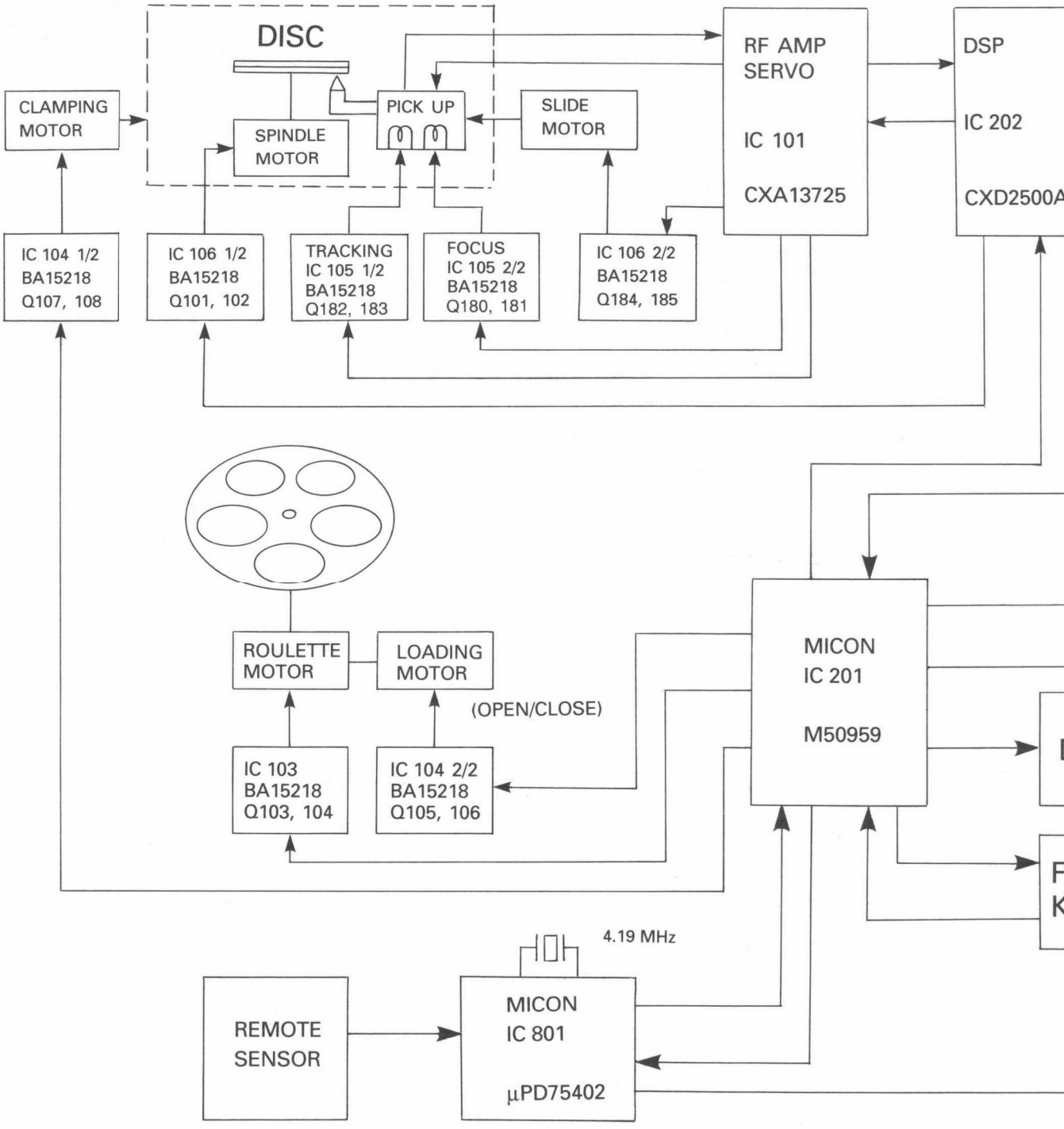
5. HF level

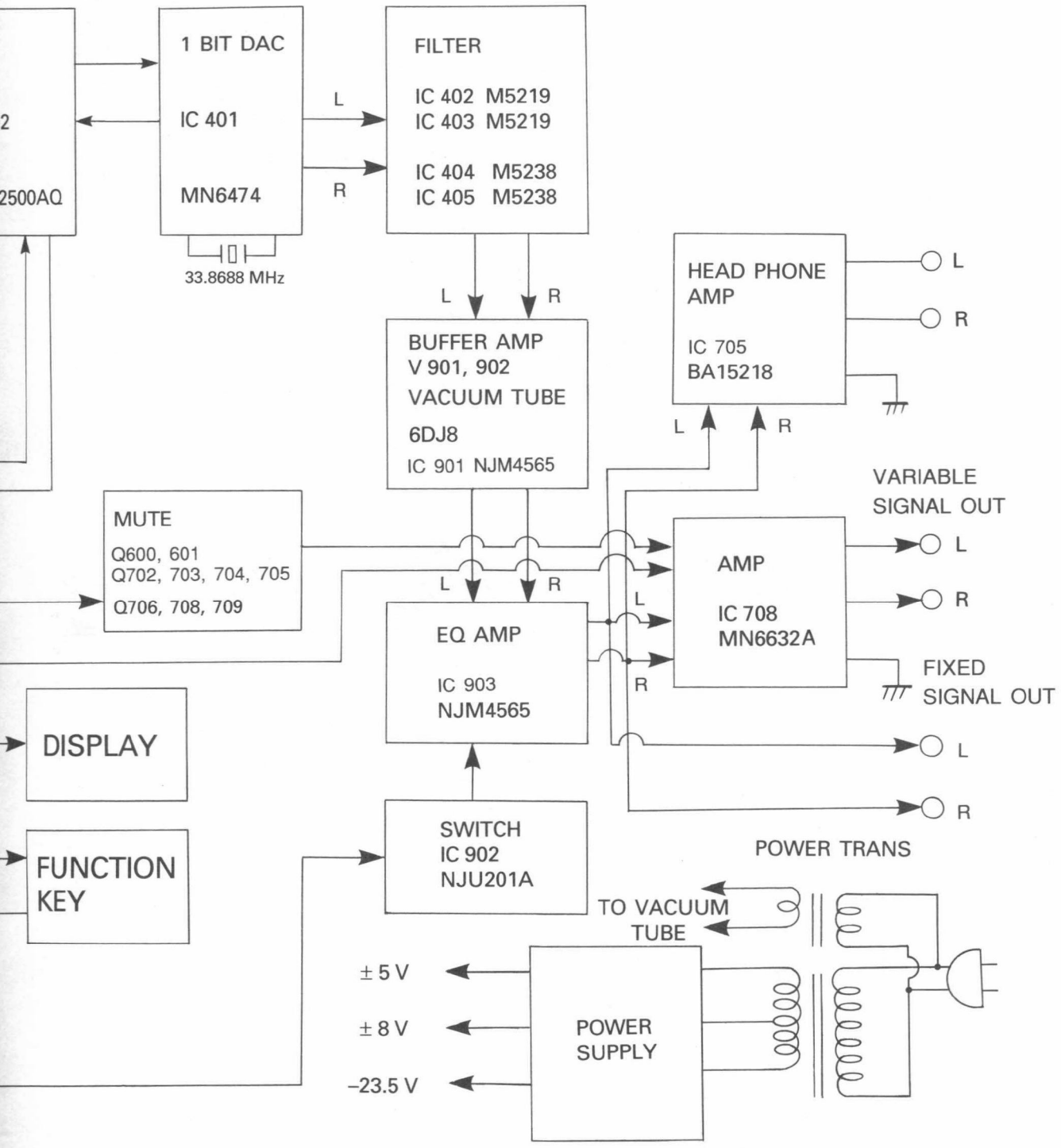
Connection



Osciloscope		Check	Step
V	H	(Oscilloscope)	1. Push II PAUSE 2. Check HF level of oscilloscope. 3. Confirm that the waveform is in good shape. (◊ pattern in center must be able to discriminate clearly.)
50mv/div or 20mV/div	0.2μ/div or 0.5μ/div	 A=1.2+0.3Vp-p	
• Set input mode to ALTERNATE or CHOPPER.			

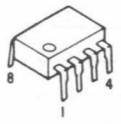
BLOCK DIAGRAM

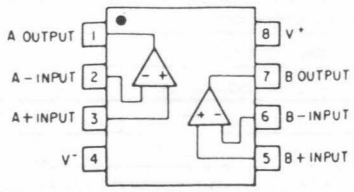



2
2500AQ
1 BIT DAC
IC 401
MN6474
33.8688 MHz
L
R
FILTER
IC 402 M5219
IC 403 M5219
IC 404 M5238
IC 405 M5238
L
R
BUFFER AMP
V 901, 902
VACUUM TUBE
6DJ8
IC 901 NJM4565
HEAD PHONE
AMP
IC 705
BA15218
L
R
L
R
MUTE
Q600, 601
Q702, 703, 704, 705
Q706, 708, 709
L
R
EQ AMP
IC 903
NJM4565
L
R
AMP
IC 708
MN6632A
VARIABLE
SIGNAL OUT
L
R
FIXED
SIGNAL OUT
L
R
DISPLAY
FUNCTION
KEY
SWITCH
IC 902
NJU201A
POWER TRANS
TO VACUUM
TUBE
± 5 V
± 8 V
–23.5 V
POWER
SUPPLY

IC BLOCK DIAGRAMS
SEMICONDUCTORS

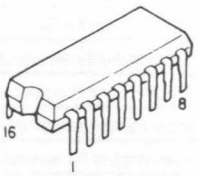
- IC's



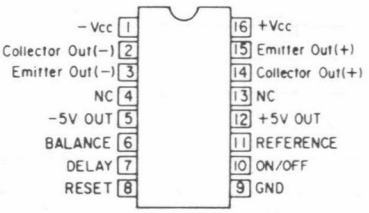


BA15218

IC 103, 104, 105, 106
IC 705, 706, 707

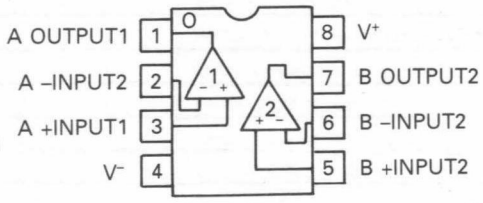


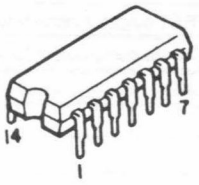
PCM61P-L
M5290P
IC 501



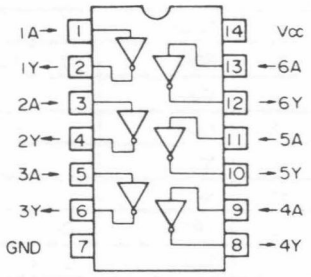
M5290P

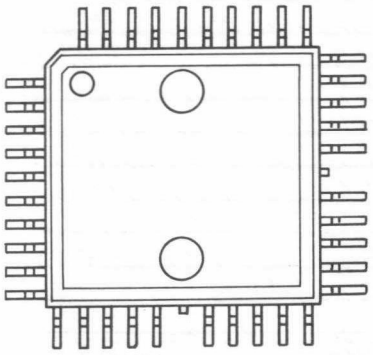
M5238
(M5219FP)
IC 402, 403



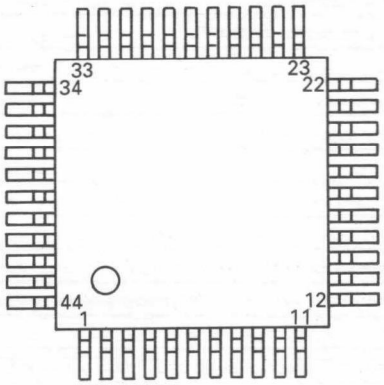


TC74HCU04AP
IC 205

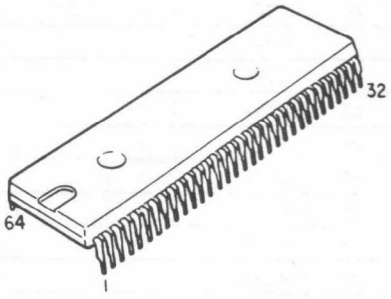




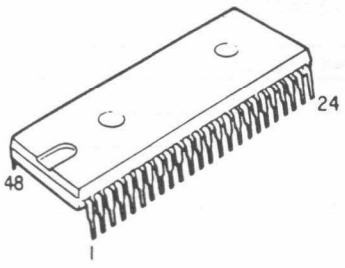
MN6474
IC 401



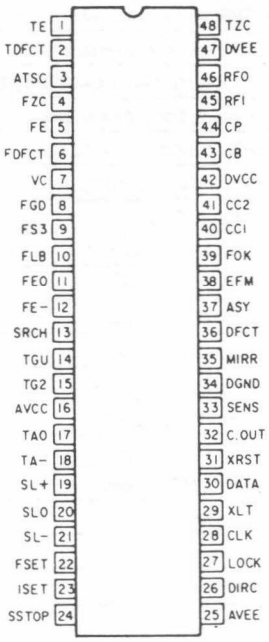
μPD75402
IC 801



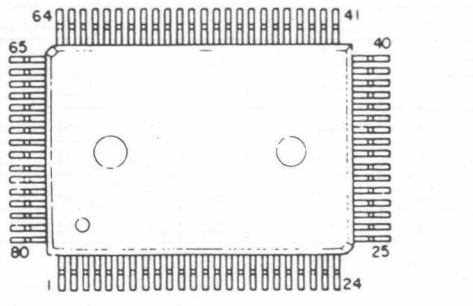
M50959
IC 201



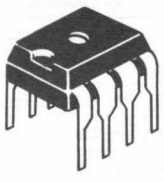
CXA1372S
IC 101



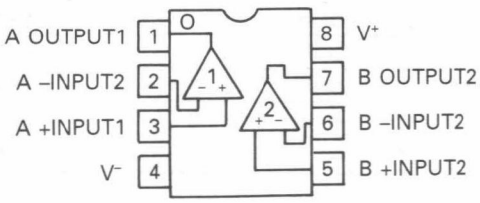
CXA1372S



CXD2500AQ
IC 202



M5238DIL
IC 404, 405



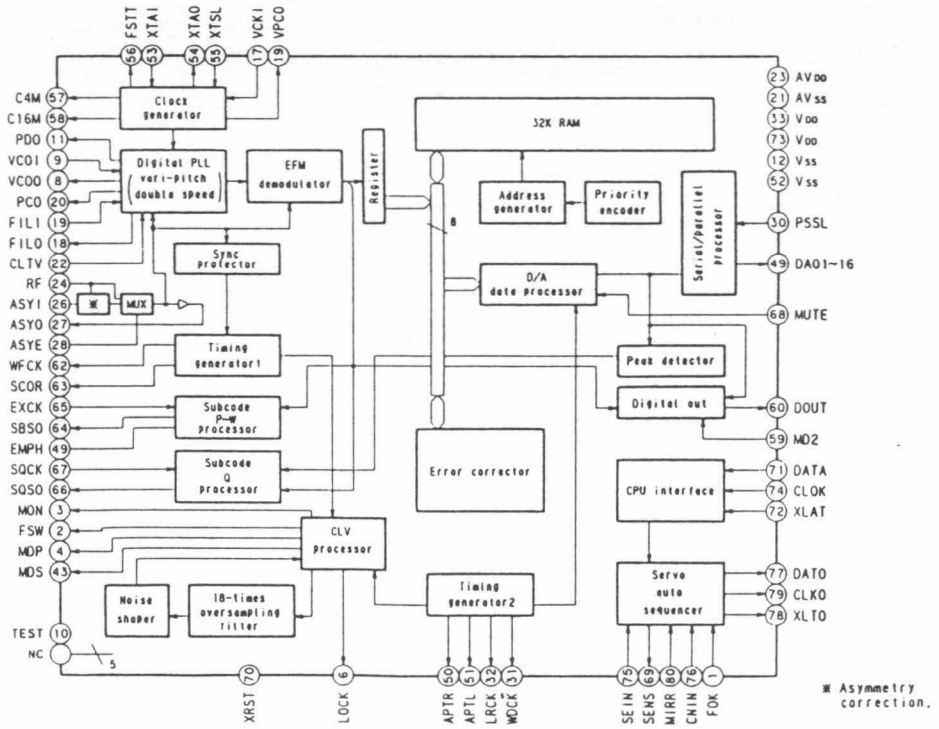
IC 202
IC TERMINAL FUNCTION LIST
CXD2500AQ Terminal Function

Terminal No.	Symbol	I/O		Terminal Function
1	FOK	I		Input terminal for OK focussing. Use for Servo-autosequencer.
2	FSW	O	Z,0	Output to shift time constant of output filter for spindle motor.
3	MON	O	1,0	ON/OFF control output for spindle motor.
4	MDP	O	1,Z,0	Servo control for spindle motor.
5	MDS	O	1,Z,0	Servo control for spindle motor.
6	LOCK	O	1,0	Sampling GFS by 460 Hz and if it is "H", delivers "H" ; if it is continuously "L" 8 times, delivers "L".
7	NC		—	
8	VCOO	O	1,0	Oscillation current output for analog EFM PLL.
9	VCOI	I		Oscillation current output for analog EFM PLL. f LOCK=8.6436MHz.
10	TEST	I		TEST output. Normally GND.
11	PDO	O	1,Z,0	Charge pump output for analog EFM PLL.
12	Vss			GND.
13	NC		—	
14	NC		—	
15	NC		—	
16	VPCO	O	1,Z,0	Charge pump output for variable pitch PLL.
17	VCKI	O		Clock input from external VCO for variable pitch. fc center=16.9344MHz.
18	FILO	O	Analog	Filter output for master PLL. (slave=digital PLL)
19	FILI	I		Filter input for master PLL.
20	PCO	O	1,Z,0	Charge pump output for master PLL.
21	AVss			Analog GND.
22	CLTV	I		Control voltage input for master VCO.
23	AVDD			Analog power supply (+5V).
24	RF	I		EFM signal input.
25	BIAS	I		Constant-current input for Asymmetry circuit.
26	ASYI	I		Comparate voltage input for Asymmetry.
27	ASYO	O	1,0	Full swing output for EFM. (L=Vss, H=VDD).
28	ASYE	I		L: Asymmetry circuit → OFF. H: Asymmetry cirquit → ON.
29	NC		—	
30	PSSL	I		Input to shift output mode of audio data. Serial output at L; parallel output at H.
31	WDCK	O	1,0	D/A Interface for 48 bit slot. Word-clock f=2 Fs.
32	LRCK	O	1,0	D/A Interface for 48 bit slot. LR-clock f= Fs.
33	VDD			Power supply (+5V).
34	DA16	O	1,0	At PSSL=1 for DA16 (MBS) output; PSSL=0 for serial data of 48 bit slot. (2s'COMP, MSB first).
35	DA15	O	1,0	At PSSL=1 for DA15 output; PSSL=0 for bit clock of 48 bit slot.
36	DA14	O	1,0	At PSSL=1 for DA14 output; PSSL=0 for serial data of 64 bit slot. (2s'COMP, LSB first).
37	DA13	O	1,0	At PSSL=1 for DA13 output; PSSL=0 for bit clock of 64 bit slot.
38	DA12	O	1,0	At PSSL=1 for DA12 output; PSSL=0 for LR clock of 64 bit slot.
39	DA11	O	1,0	At PSSL=1 for DA11 output; PSSL=0 for GTOP output.
40	DA10	O	1,0	At PSSL=1 for DA10 output; PSSL=0 for XUGF output.
41	DA09	O	1,0	At PSSL=1 for DA09 output; PSSL=0 for XPLCK output.
42	DA08	O	1,0	At PSSL=1 for DA08 output; PSSL=0 for GFS output.
43	DA07	O	1,0	At PSSL=1 for DA07 output; PSSL=0 for RFCK output.
44	DA06	O	1,0	At PSSL=1 for DA06 output; PSSL=0 for C2PO output.
45	DA05	O	1,0	At PSSL=1 for DA05 output; PSSL=0 for XRAOF output.
46	DA04	O	1,0	At PSSL=1 for DA04 output; PSSL=0 for MNT3 output.
47	DA03	O	1,0	At PSSL=1 for DA03 output; PSSL=0 for MNT2 output.
48	DA02	O	1,0	At PSSL=1 for DA02 output; PSSL=0 for MNT1 output.
49	DA01	O	1,0	At PSSL=1 for DA01 output; PSSL=0 for MNT0 output.
50	APTR	O	1,0	Control output for aperture compensation. In H for R-ch.
51	APTL	O	1,0	Control output for aperture compensation. In H for L-ch.

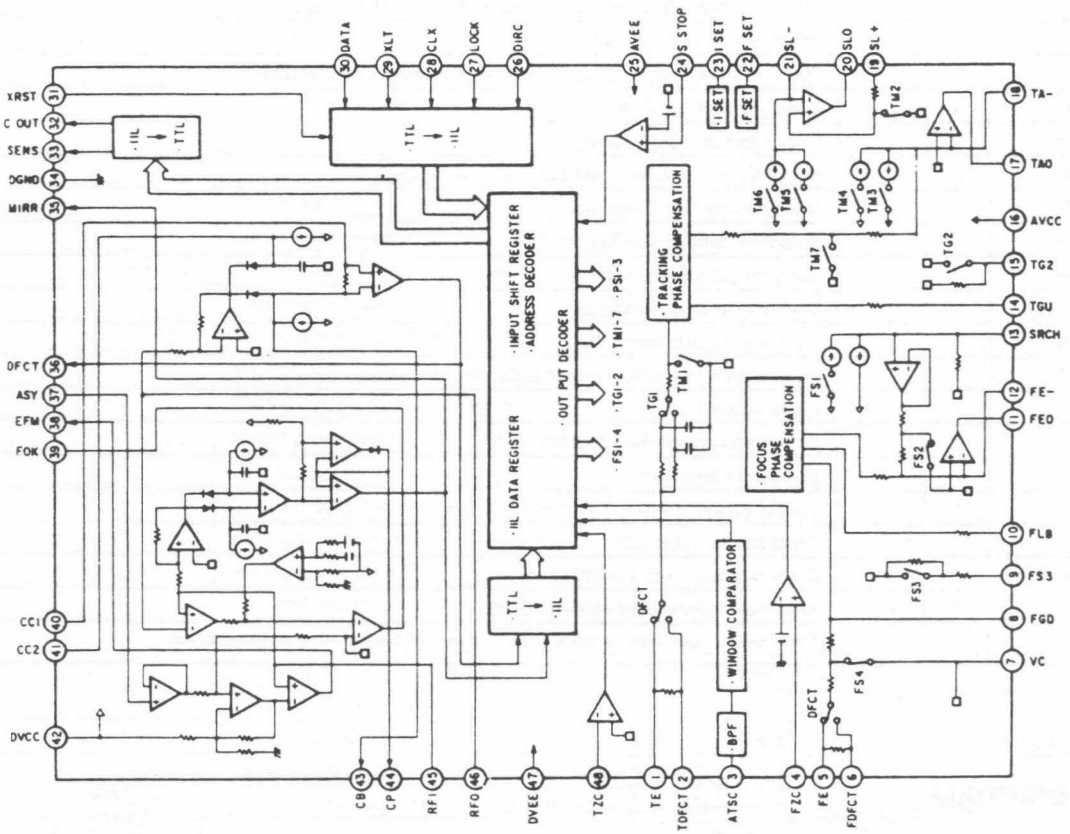
Terminal No.	Symbol	I/O		Terminal Function
52	Vss			GND.
53	XTAI	I		X'tal oscillation circuit input. By selecting of mode, f=16.9344MHz or 33.8688MHz.
54	XTAO	O	1,0	X'tal oscillation circuit input. f=16.9344MHz.
55	XTSL	I		Selection input terminal of X'tal. "L" for X'tal 16.9344MHz; H for 33.8688MHz.
56	FSTT	O	1,0	2/3 Dividing output of 53 and 54 terminal. No change by variable pitch.
57	C4M	O	1,0	4.2336MHz output. When variable pitched, simultaneously changes.
58	C16M	O	1,0	16.9344MHz output. When variable pitched, simultaneously changes.
59	MD2	I		Digital-out ON/OFF control. ON at H; OFF at L.
60	DOUT	O	1,0	Digital-out output terminal.
61	EMPH	O	1,0	When playback disc emphasized, outputs H; otherwise outputs L.
62	WFCK	O	1,0	WFCK (Write Flame Clock) output.
63	SCOR	O	1,0	Output of subcode sync. S0+S1. H output when either one detected.
64	SBSO	O	1,0	Serial output of Sub P~W.
65	EXCK	I		Clock iutput for SBSO read-out.
66	SQSO	O	1,0	Output for Sub Q 80 bits and PCM peak level 16 bits.
67	SQCK	I		Clock input for SQSO read-out.
68	MUTE	I		Mute at H; remove mute at L.
69	SENS	—	1,Z,0	SENS output. Outputs to CPU.
70	XRST	I		System reset input. Resets at "L".
71	DATA	I		Input of serial data from CPU.
72	XLAT	I		Input for latch from CPU. Latches serial data at release.
73	VDD			Power supply (+5V).
74	CLOK	I		Serial data transfer clock input from CPU.
75	SEIN	I		SENS input from SSP.
76	CNIN	I		Input of tracking pulse.
77	DATO	O	1,0	Serial data output to SSP.
78	XLTO	O	1,0	Serial data latch output to SSP.
79	CLKO	O	1,0	Serial data transfer clock output to SSP.
80	MIRR	I		Mirror signal input. Use for track jump for over 128 tracks, using autosequencer.

CXD2500AQ

BLOCK DIAGRAM



IC 101
CXA1372S BLOCK DIAGRAM



IC 101
CXA1372S TERMINAL FUNCTION

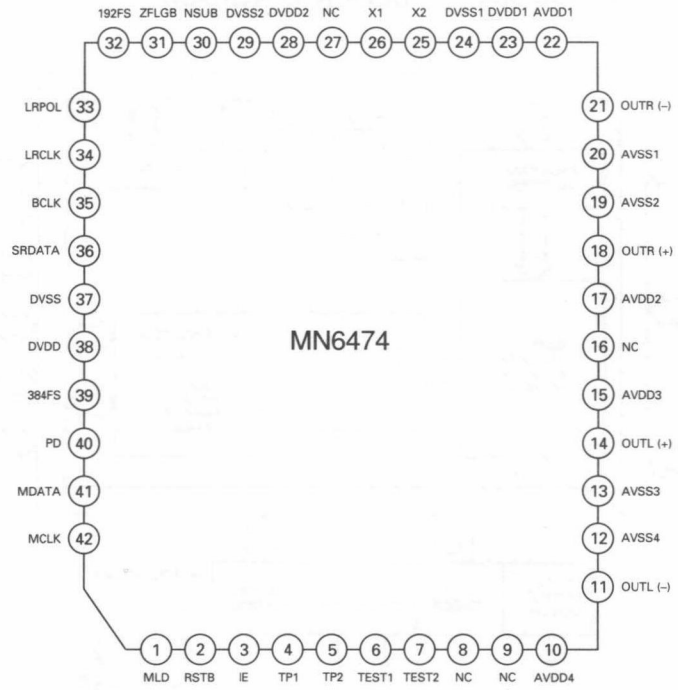
Terminal No.	Symbol	I/O	Terminal Function
1	TE	I	Tracking error signal input terminal.
2	TDFCT	I	Capacitor connecting terminal for time constant at the time of defect.
3	ATSC	I	Input terminal of ATSC detecting window comparator.
4	FZC	I	Input terminal of focus zero-cross comparator.
5	FE	I	Focus error signal input terminal.
6	FDFCT	I	Capacitor connecting terminal for time constant at the time of defect.
7	Vc	I	Mid-point voltage input terminal.
8	FGD	I	In case of reducing higher range gain of focus servo, connect a capacitor between this terminal and terminal number (9).
9	FS3	I	Shifts higher range gain of focus servo by FS3 ON/OFF.
10	FLB	I	Terminal for external time constant to increase lower range of focus servo.
11	FEO	O	Focus drive output.
12	FE–	I	Reverse input terminal for focus amplifier.
13	SRCH	I	Terminal for external time constant to make focus search waveform.
14	TGU	I	Terminal for external time constant to shift higher range gain of tracking.
15	TG2	I	Terminal for external time constant to shift higher range gain of tracking.
17	TAO	O	Tracking drive output.
18	TA–	I	Reverse input terminal for tracking amplifier.
19	SL+	I	Non-reverse input terminal for sled amplifier.
20	SLO	O	Sled drive output.
21	SL–	I	Reverse input terminal for sled amplifier.
22	FSET	I	Terminal to compensate peak in focus/tracking phase.
23	ISET	I	Delivers a current to set the height of focus search, track jump, and sled kick.
24	SSTOP	I	Terminal for limit switch ON/OFF to detect disc innermost circle.
26	DIRC	I	Terminal is used at the time of 1 track jump. A 47 kohm pull up resistor is included.
27	LOCK	I	Reckless drive protection circuit of sled; activates at "L". A 47k ohm pull up resistor is included.
28	CLK	I	Serial data transfer clock input from CPU.
29	XLT	I	Latch input from CPU.
30	DATA	I	Serial data input from CPU.
31	XRST	I	Reset input terminal. Resets at "L".
32	C.OUT	O	Terminal to output signal for track number count.
33	SENS	O	Terminal to output FZC, AS, TZC, SSTOP by command from CPU.
35	MIRR	O	Output terminal for MIRR comparator.
36	DFCT	O	Output terminal for DEFECT comparator.
37	ASY	I	Input terminal for auto-symmetric control.
38	EFM	O	Output terminal for EFM comparator.
39	FOK	O	Output terminal for focus OK (FOK) comparator.
40	CC1	O	DEFECT bottom hold output terminal.
41	CC2	I	Input terminal to input DEFECT bottom hold output by capacitance combination.
43	CB	I	Capacitor connecting terminal for DEFECT bottom hold.
44	CP	I	MIRR hold capacitor connecting terminal. A non-reverse input terminal for MIRR comparator.
45	RFI	I	Input terminal to input RF summing amplifier output by capacitance combination.
46	RFO	O	Output terminal for RF summing amplifier. Check point for eye pattern.
48	TZC	I	Tracking zero-cross comparator input terminal.

IC 401
MN6474: DIGITAL FILTER & D/A CONVERTER

Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	PSTB	I	Reset command
3	IE	I	Not used, connected to GND
4	TP1	—	TEST terminal
5	TP2	—	TEST terminal
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	—	Not connected
9	NC	—	Not connected
10	AVDD4	I	Power supply (connected to +4.8V)
11	OUTL(–)	O	Lch data output, (–) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTL (+)	O	Lch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +4.8V)
16	NC	—	Not connected
17	AVDD2	I	Power supply (connected to +4.8V)
18	OUTR (+)	O	Rch data output, (+) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTR (–)	O	Rch data output, (–) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +4.8V)
23	DVDD1	I	Power supply (connected to +4.9V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not connected
28	DVDD2	I	Power supply (connected to +4.9V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Substrate terminal (Not used, connected to +4.9V)
31	ZFLGB	O	Zero input detector terminal (Not used, open)
32	192 fs	O	192 fs (8.4672 MHz) (Not used, open)
33	LRPOL	I	LR clock selector (Not used, connected to +4.9V)
34	LRCLK	I	LR discrimination signal input
35	BCLK	I	Serial bit clock input
36	SRDATA	I	Serial data input (MSB first)
37	DVSS3	I	GND terminal (digital system)
38	DVDD	I	Power supply (connected to +4.9V)
39	384 fs	O	384 fs (16.9344 MHz) output
40	PD	I	Power down terminal (Not used, connected to GND)
41	MDATA	I	Mode control data
42	MCLK	I	Data clock for MDATA

IC 401



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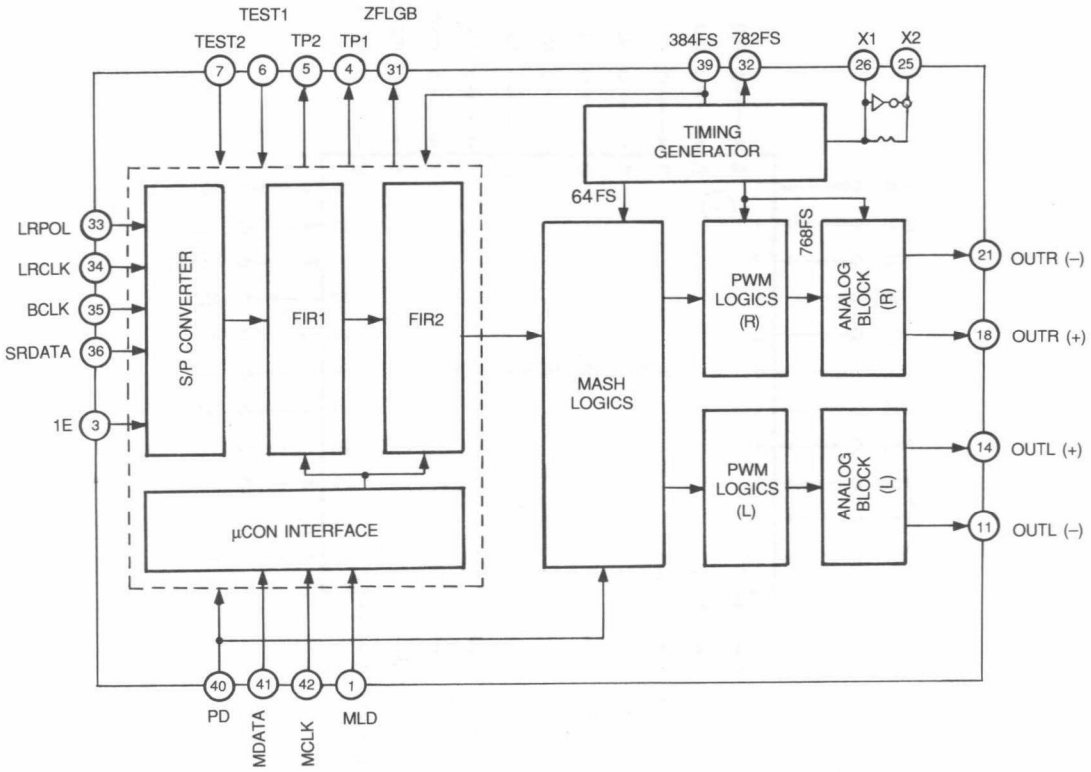
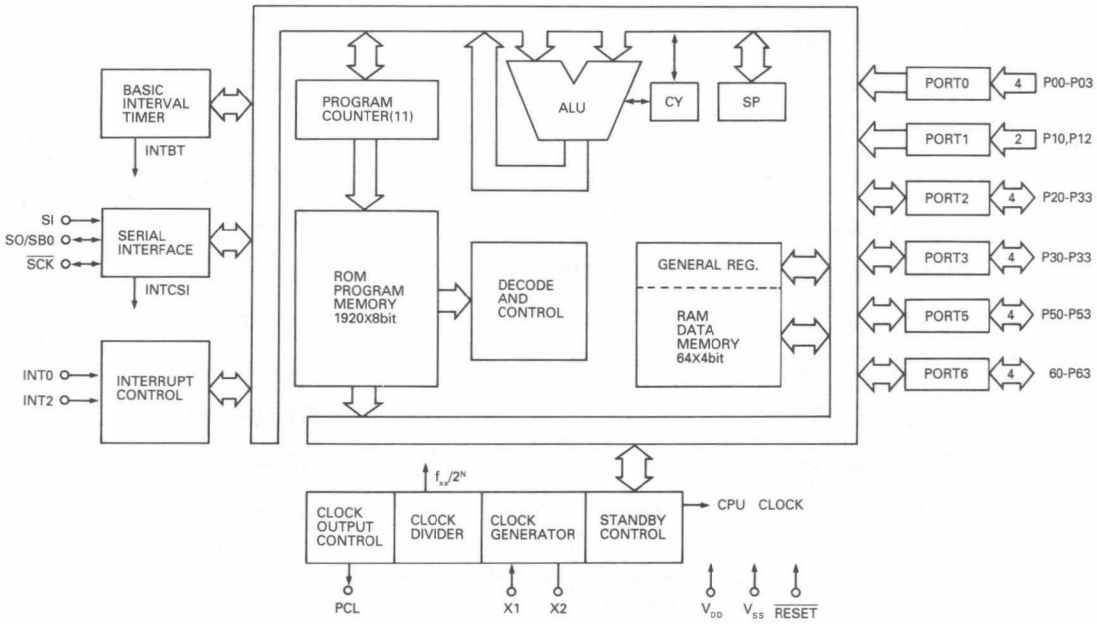
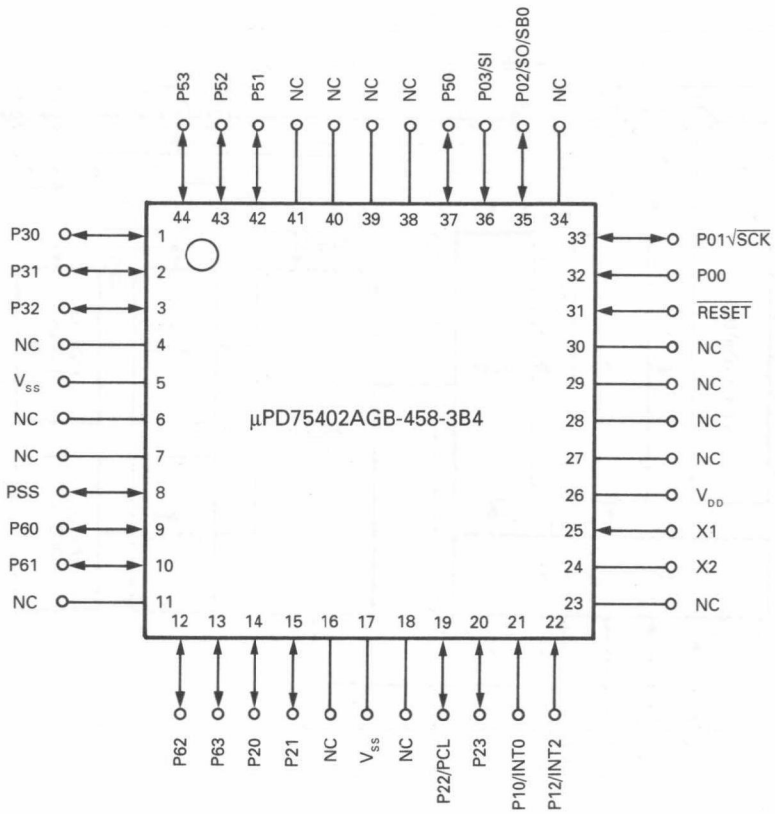
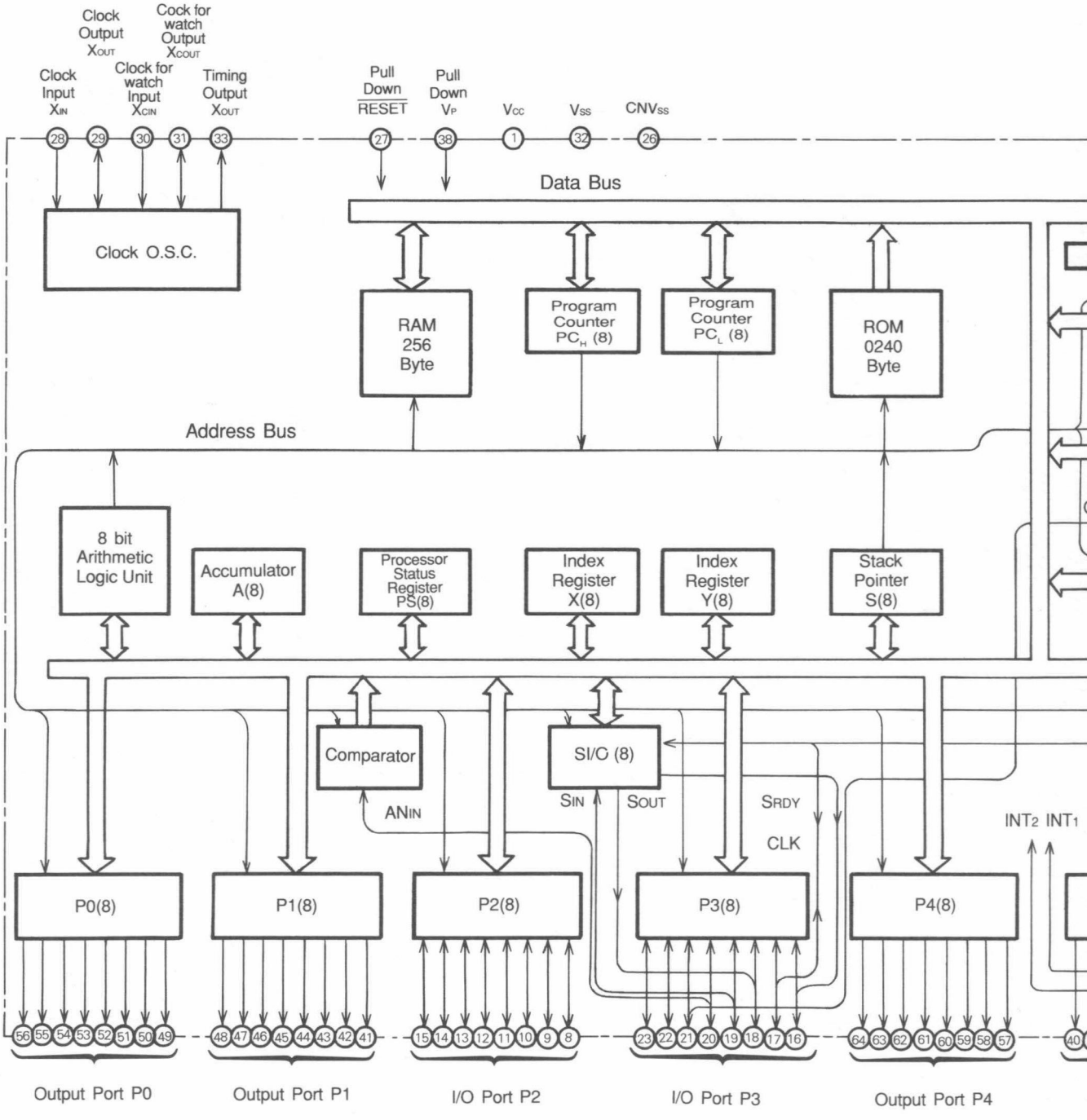


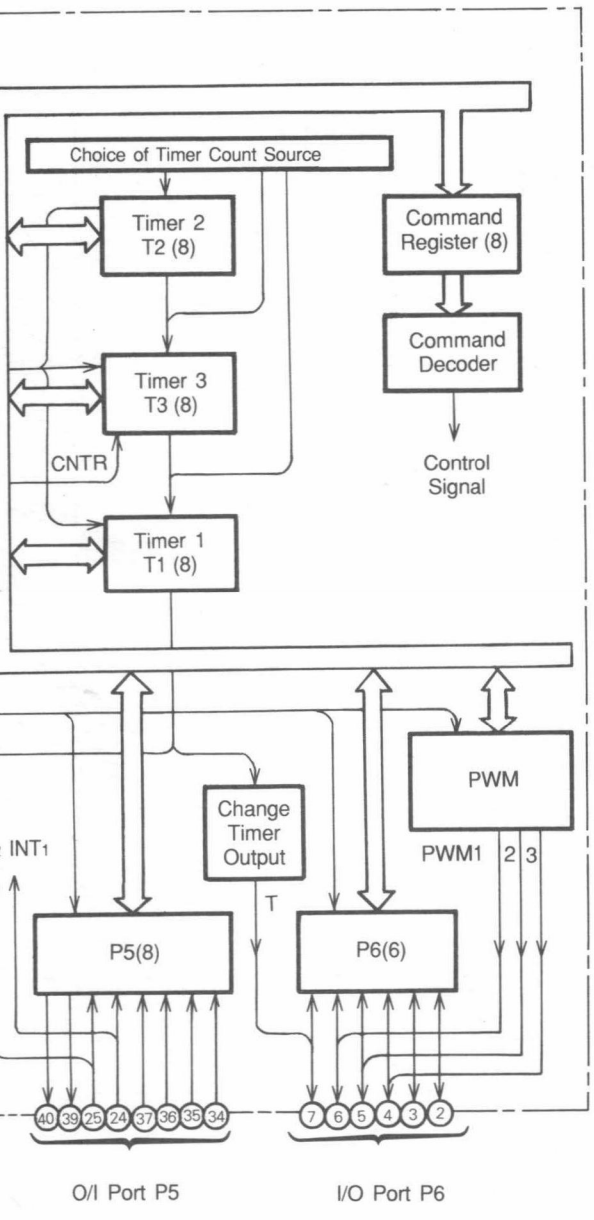
IC 801
μPD75402AGB-458-3B4 BLOCK DIAGRAM

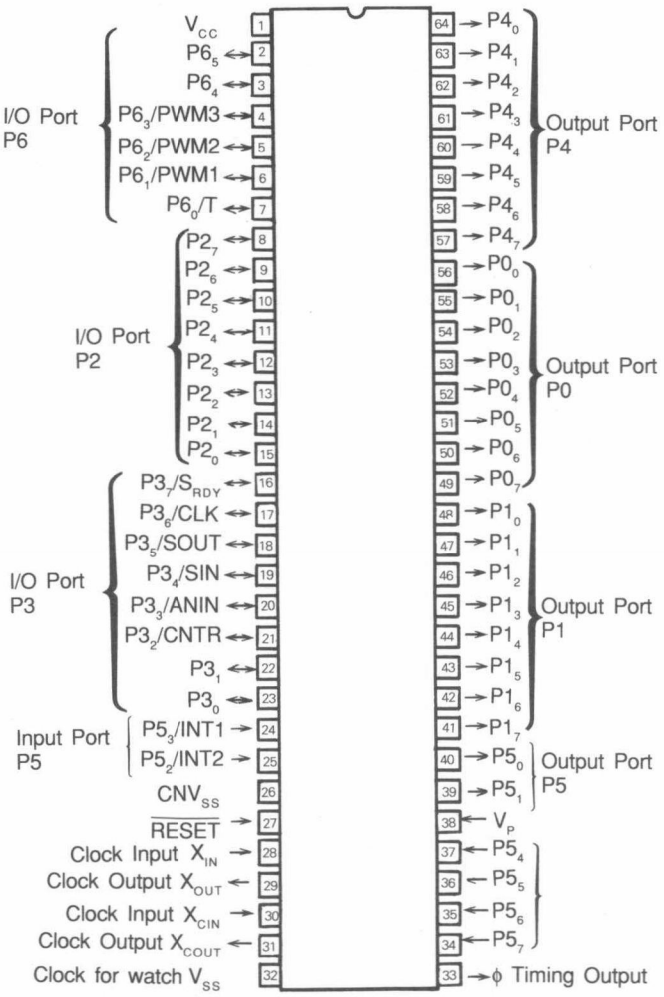




IC 202
BLOCK DIAGRAM



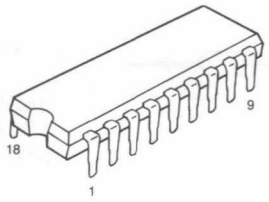




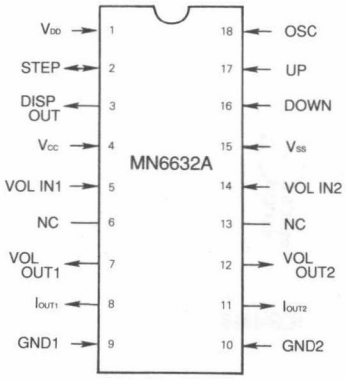
IC 202
M50959-462

SINGLE-CHIP 8-BIT MOS MICROCOMPUTER

IC 708



MN6632A



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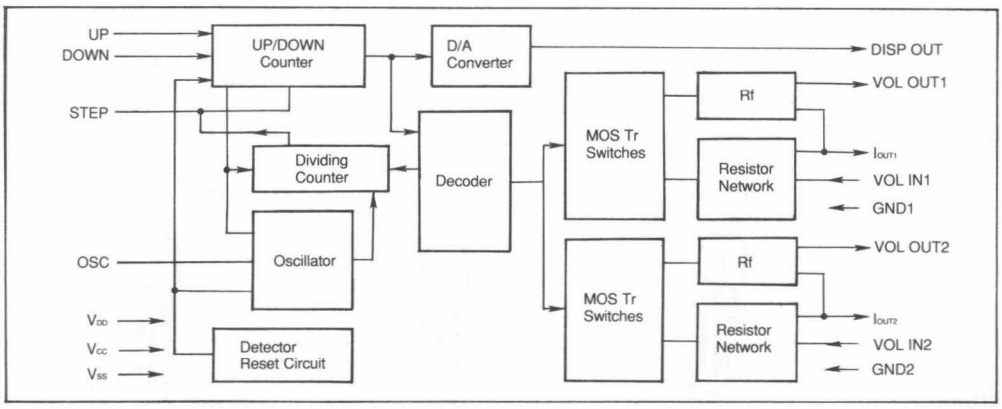
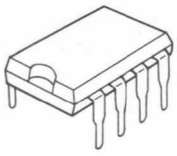
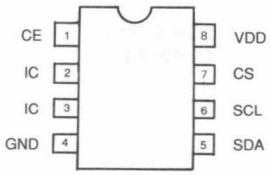


IC 203



μPD6254



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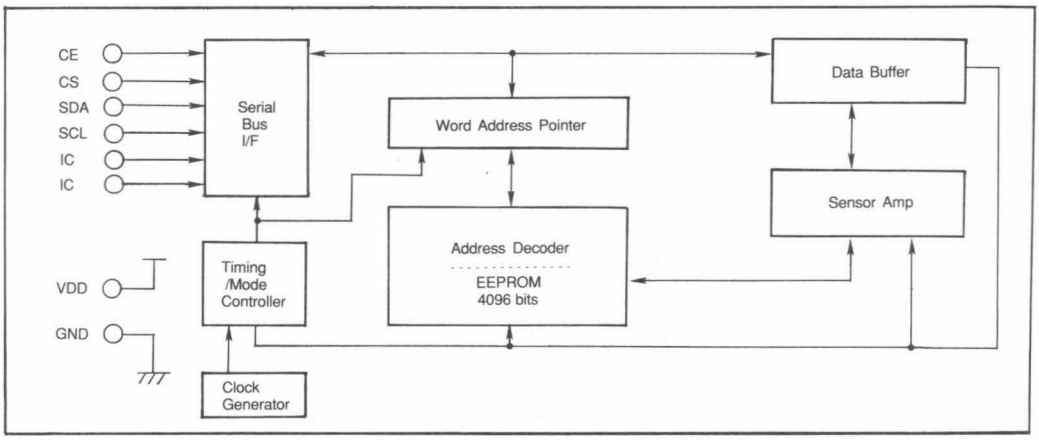
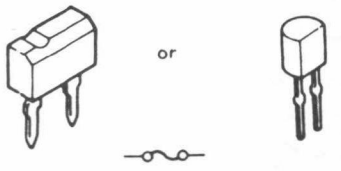


• IC PROTECTOR



ICP-F15 ICP-N15

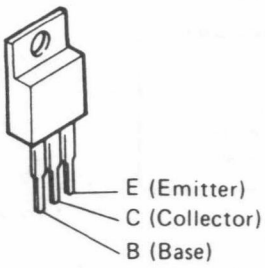
IC 502-IC 505

• DIODES

1S2076A
1SS270A
1SR139

HZS7B-2
HZS24-2

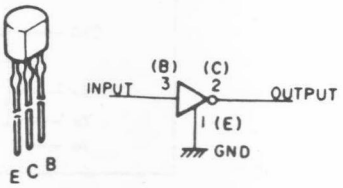
• TRANSISTORS



2SD1913
2SB1274

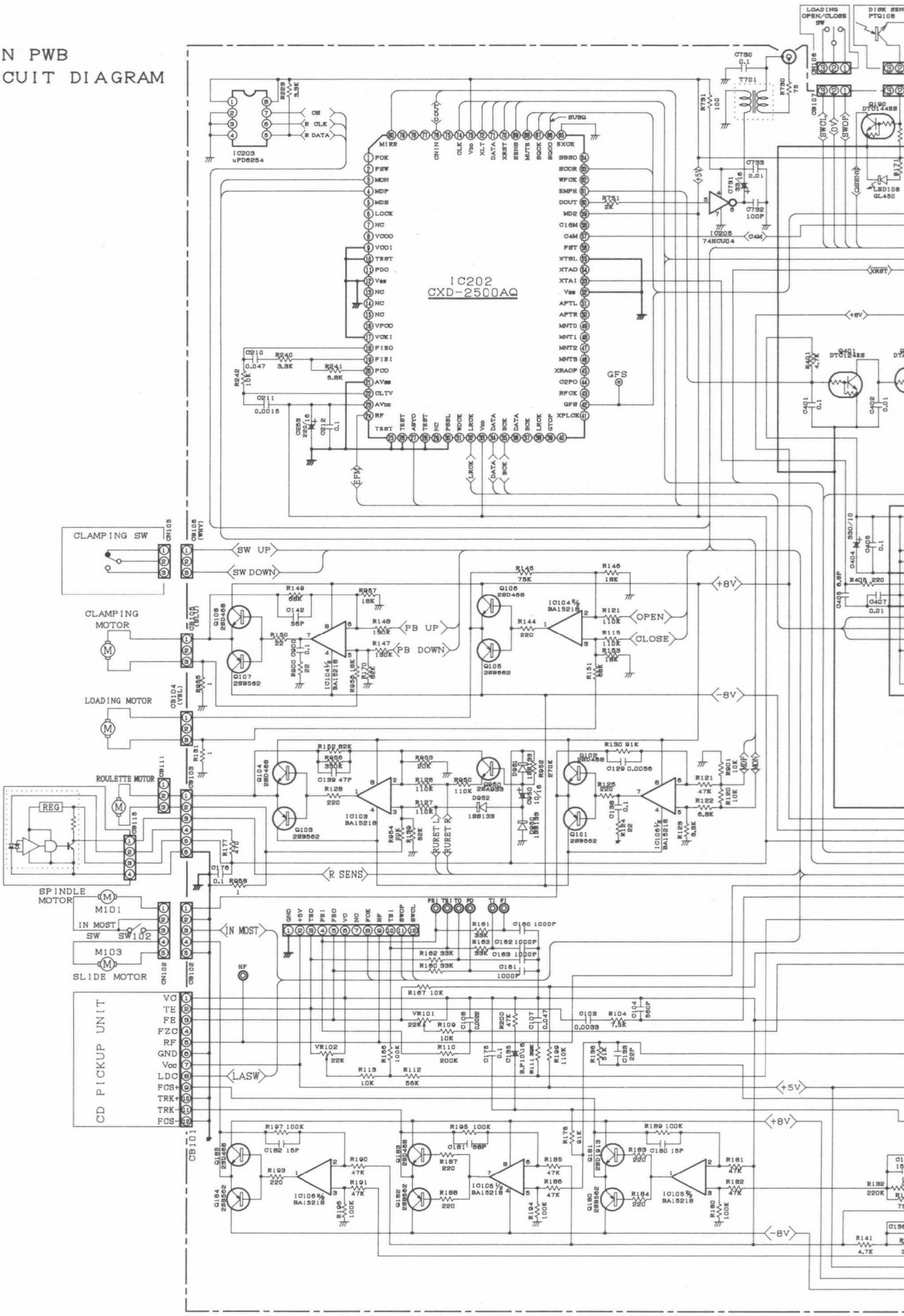
2SA933(Q)
2SD2144

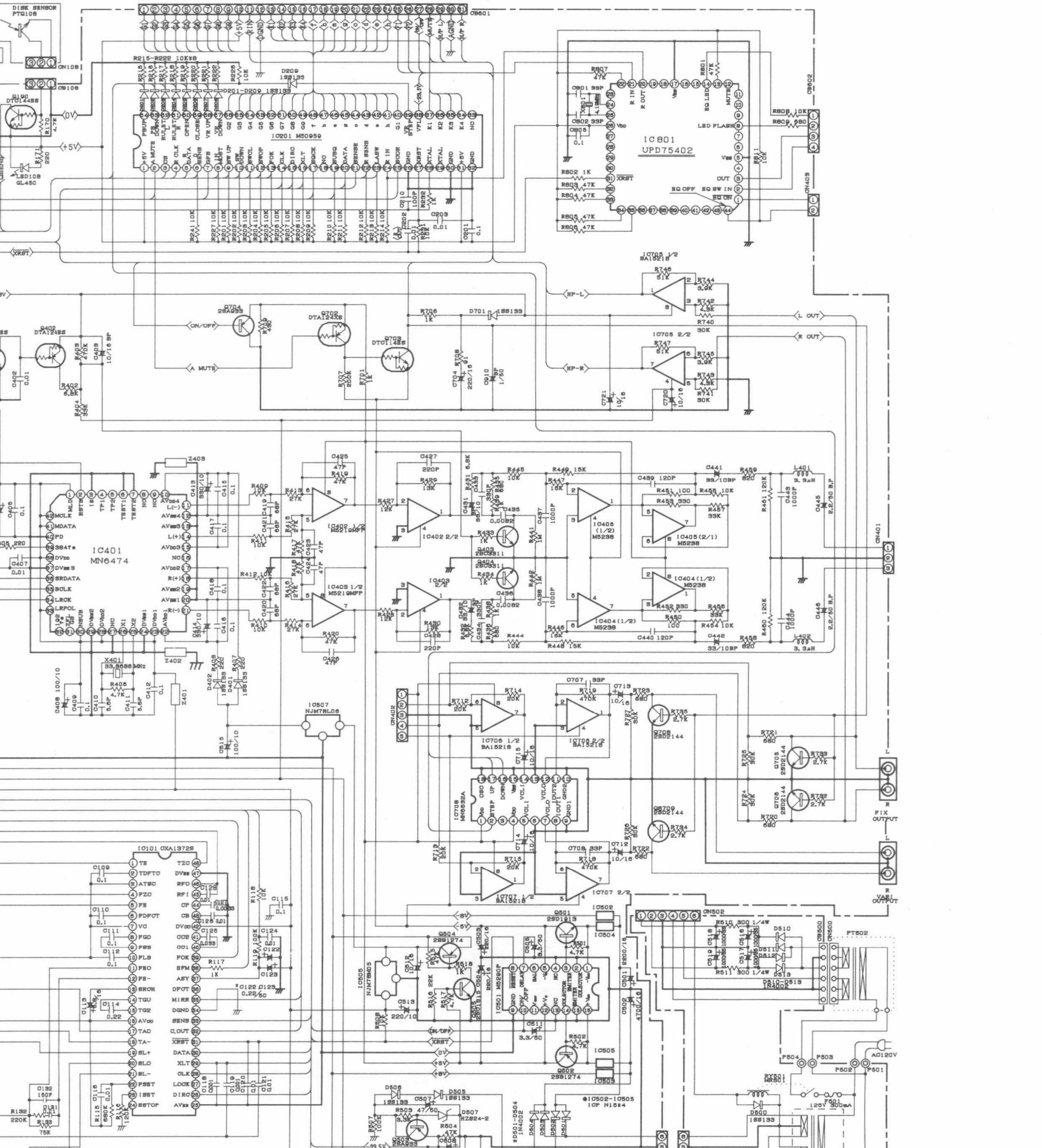
2SB562
2SD468(C)



RN1202(10K-10K)NPN
DTA124XS(22K-47K)

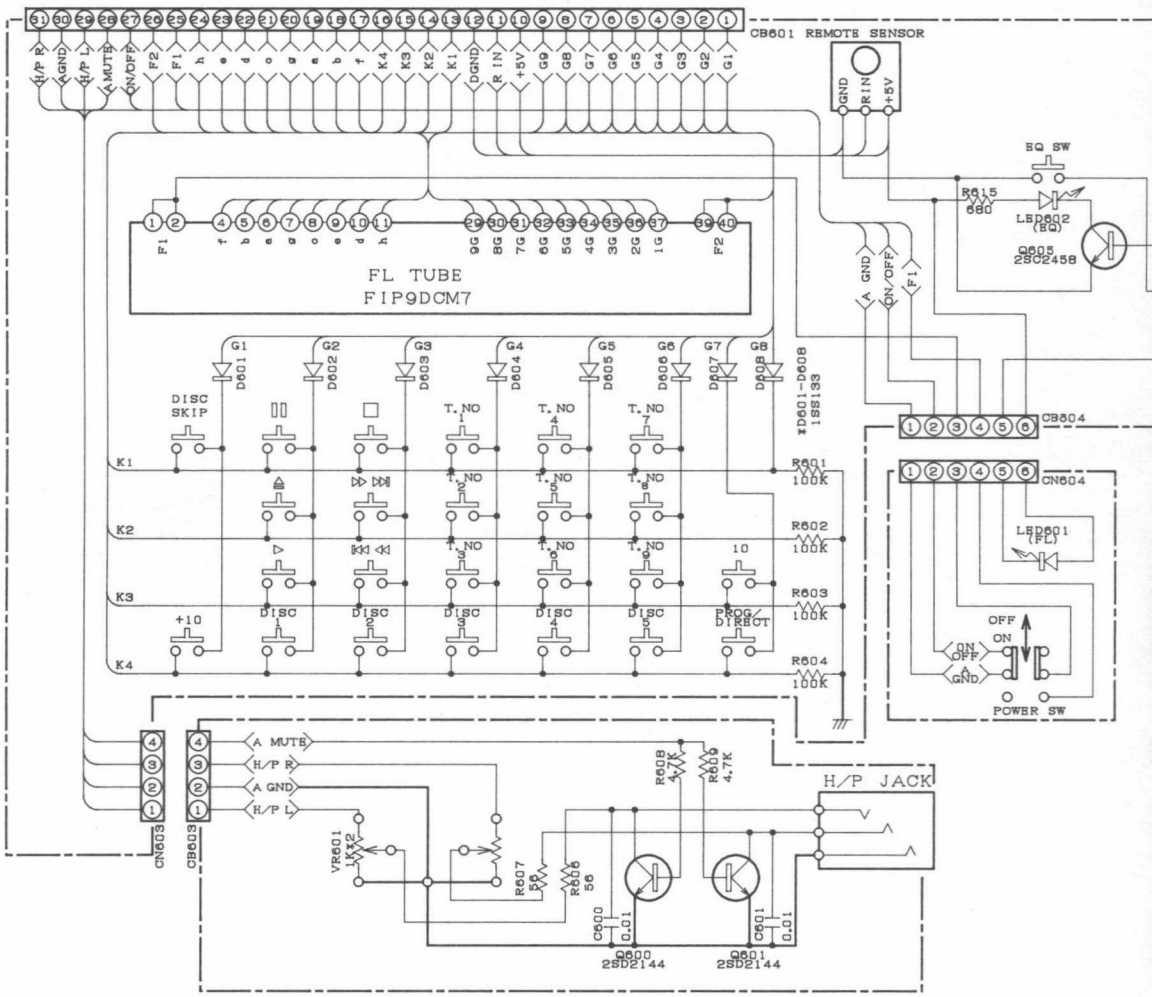
MAIN PWB
CIRCUIT DIAGRAM





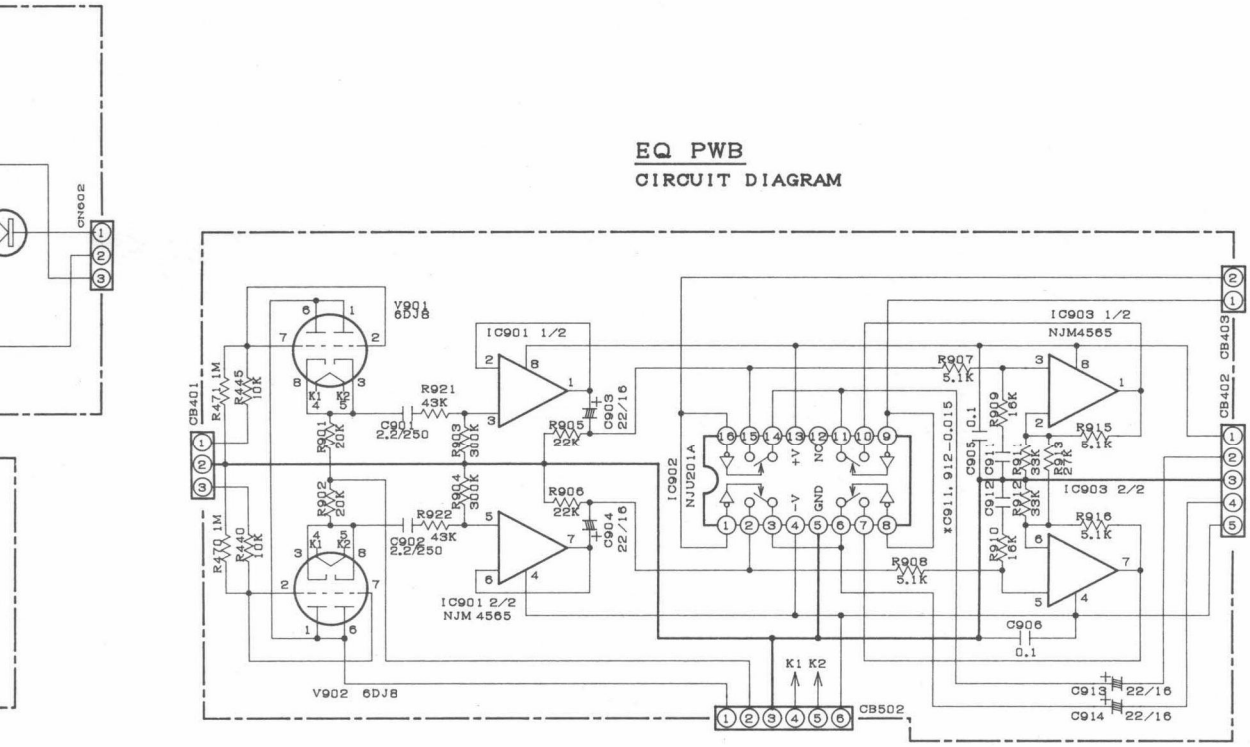
DISK SENSOR PTQ108
CN108
CB108
CB601
R215-R222 10K×8
D201-D209 1SS133
IC201 M50959
IC801 UPD75402
CB602
CN403
IC705 1/2 BA15218
IC705 2/2
HP-L
HP-R
L OUT
R OUT
ON/OFF
A MUTE
D701 1SS133
IC401 MN6474
X401 33.8688 MHz
IC402 1/2 M5219MFP
IC402 2/2
IC403 1/2 M5219MFP
IC403 2/2
IC405 (1/2) M5238
IC405 (2/1) M5238
IC404 (1/2) M5238
CN401
CN402
IC507 NJM78L06
IC706 1/2 BA15218
IC706 2/2 BA15218
IC708 MN6632A
IC707 1/2 BA15218
IC707 2/2
FIX OUTPUT
VARI OUTPUT
IC101 CXA1372S
IC505 NJM78M05
IC501 M5290P
CN502
CB500
CN500
PT502
D510-D513 1N4002
AC120V
RY501 MR501
F501 125V 300mA
IC502-IC505 ICP N15×4
D501-D504 1N4002
CB501
CN501
PT501

KEY/FRONT PWB
CIRCUIT DIAGRAM

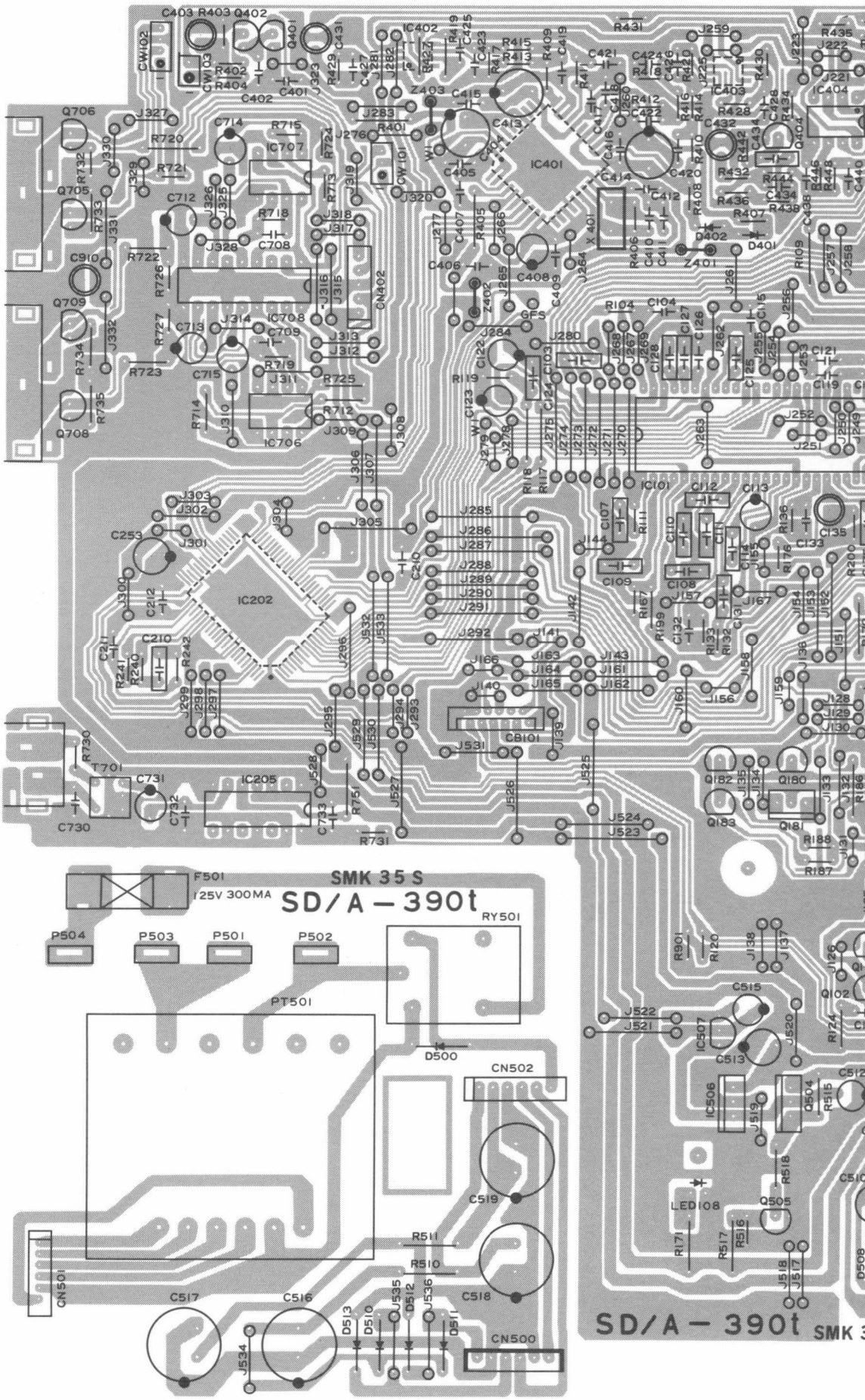


EQ PWB

CIRCUIT DIAGRAM

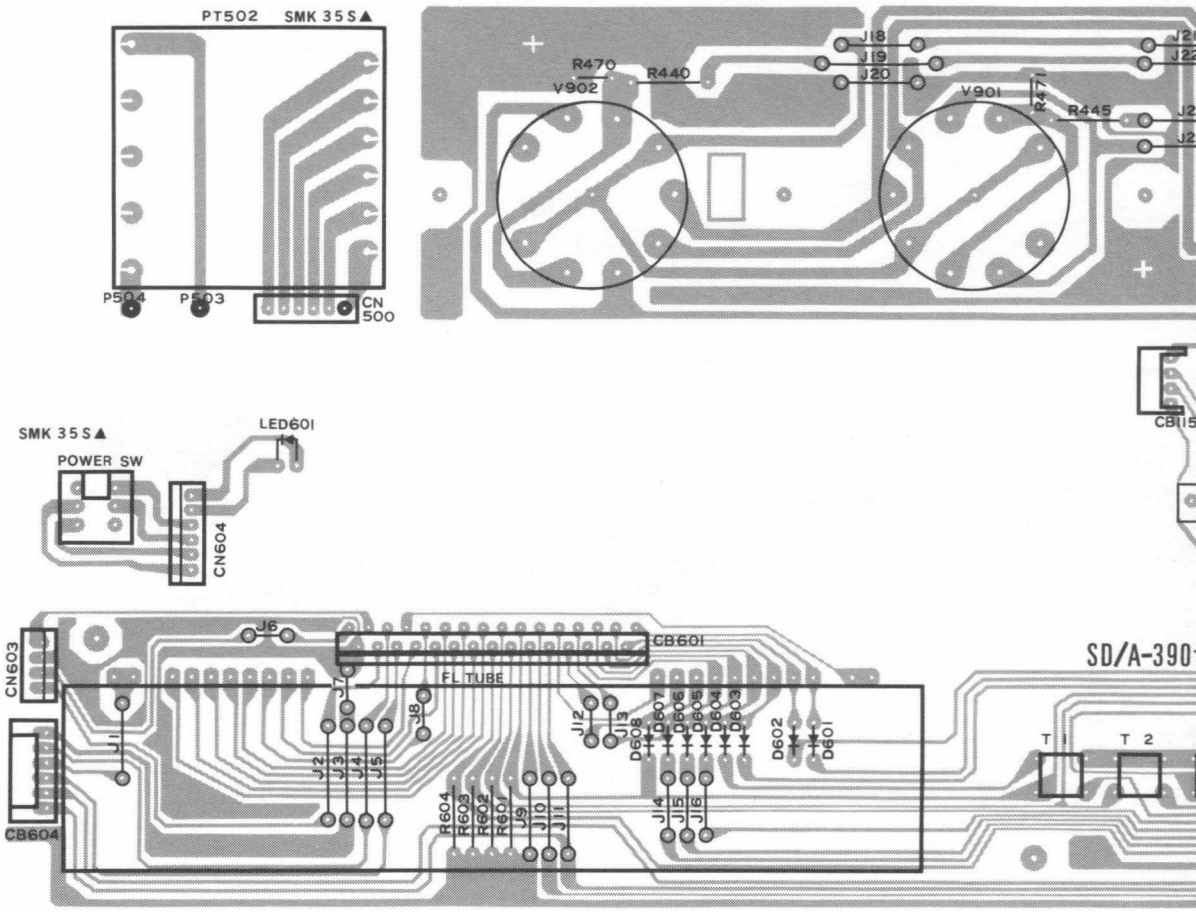


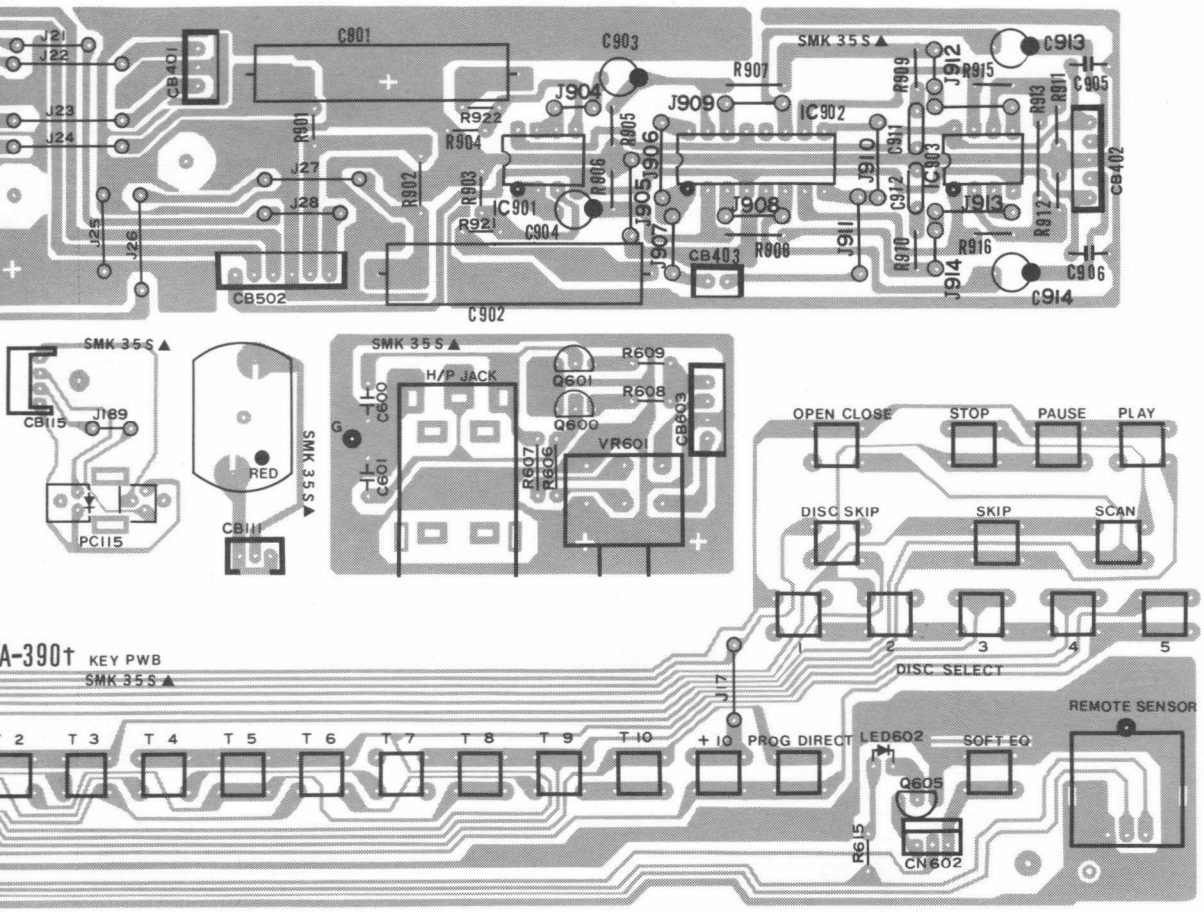
PCB COMPONENT SIDE VIEWS (1)



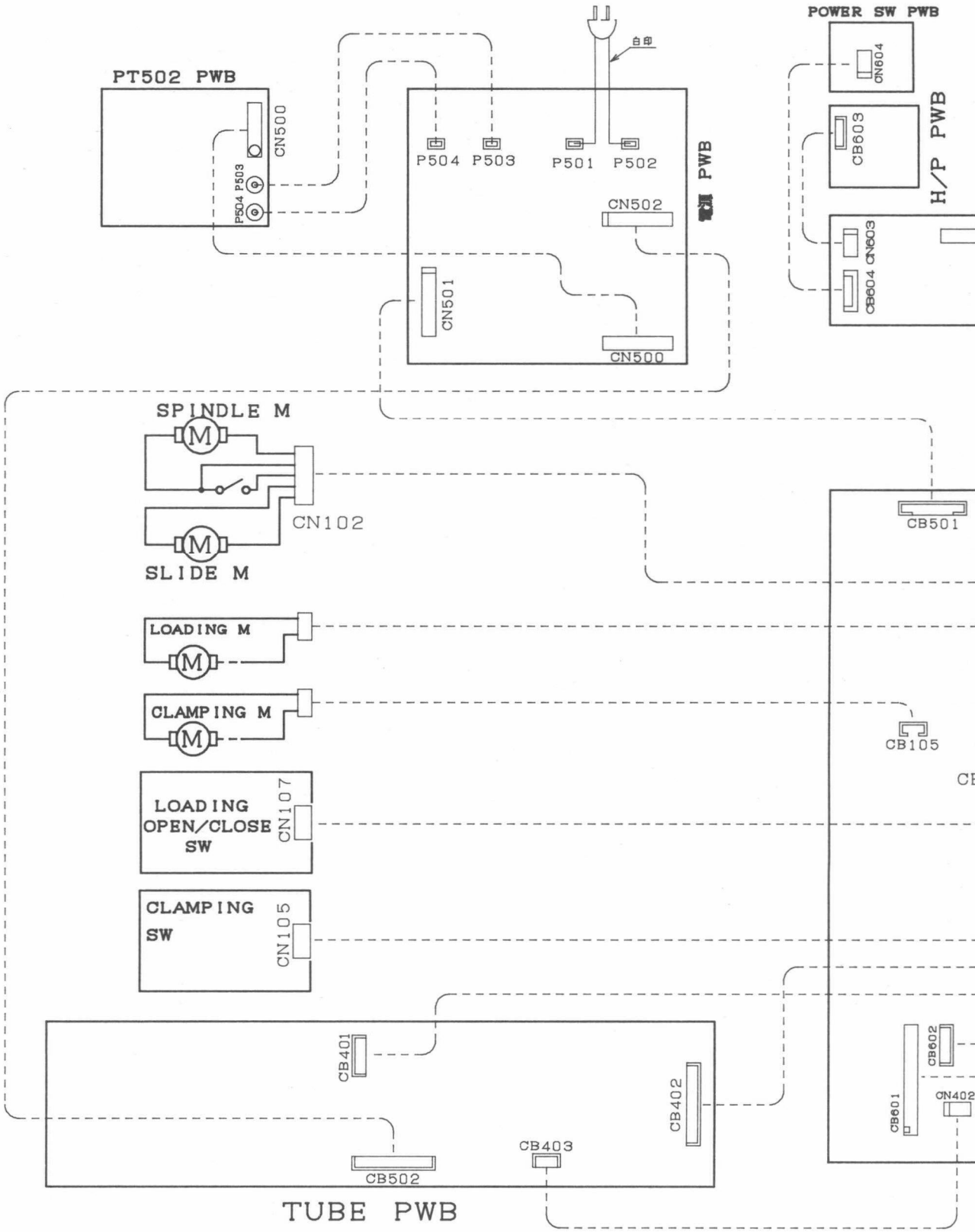
S106
SMK 35 S
CN106
PTQ108
SMK 35 S
CN108
S105
SMK 35 S
CN105
PC115
SMK 35 S
CB115
SMK 35 S
RED
M111
CB111
SMK 35 S

PCB COMPONENT SIDE VIEWS (2)

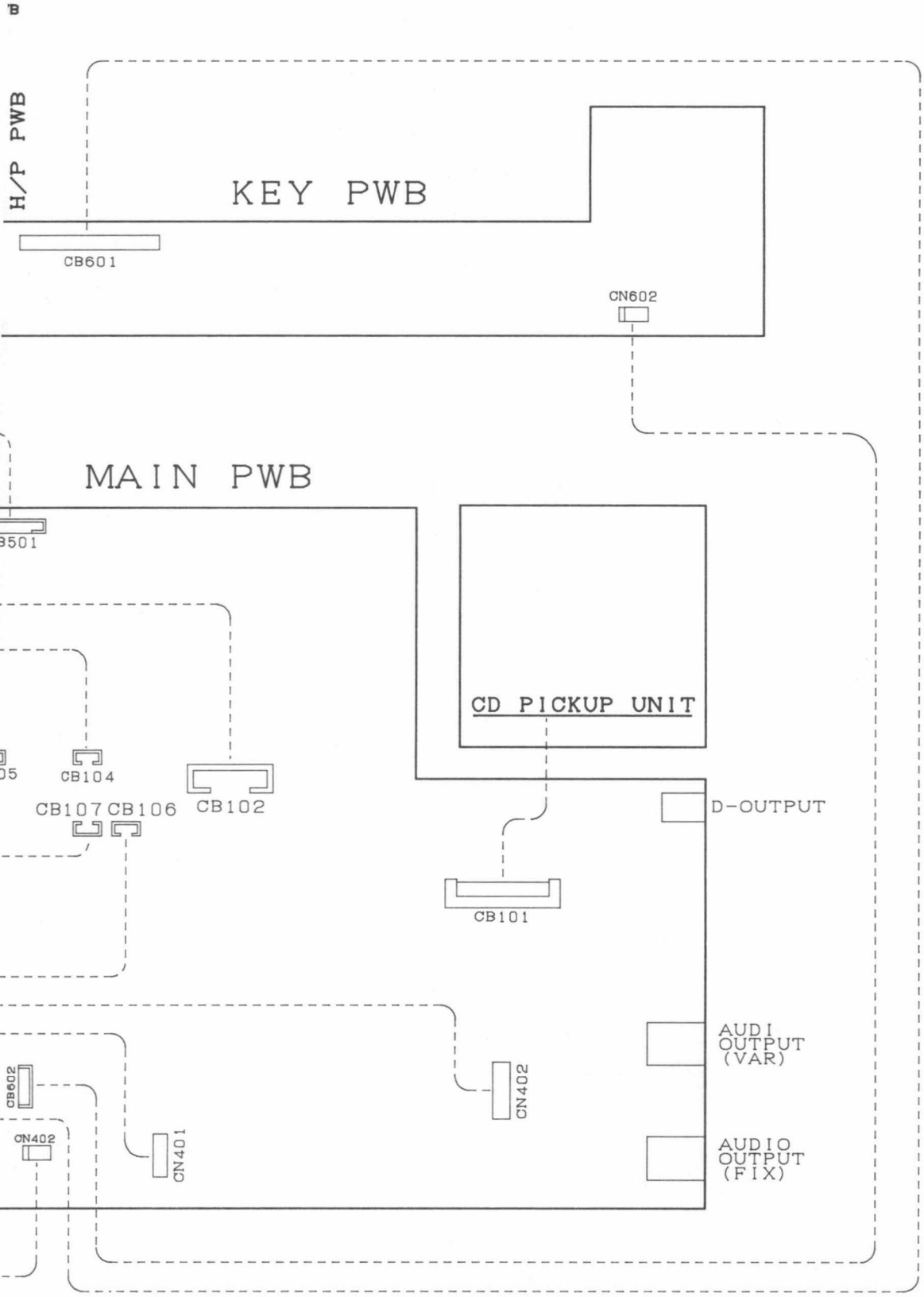




A-390† KEY PWB
SMK 35S▲


POWER SW PWB
CN604
CB603
H/P PWB
CB604 CN603
PT502 PWB
CN500
P504 P503
P504 P503 P501 P502
CN502
CN501
CN500
SPINDLE M
CN102
SLIDE M
CB501
LOADING M
CLAMPING M
CB105
LOADING OPEN/CLOSE SW
CN107
CLAMPING SW
CN105
CB401
CB402
CB403
CB502
CB602
CB601
CN402
TUBE PWB

G DIAGRAM


H/P PWB
KEY PWB
CB601
CN602
MAIN PWB
CD PICKUP UNIT
CB104
CB107
CB106
CB102
D-OUTPUT
CB101
AUDI
OUTPUT
(VAR)
CN402
CN401
AUDIO
OUTPUT
(FIX)

PARTS LIST

REF. NO.	PART NO.	Q'TY	DESCRIPTION
SD-A390t	A390t-M	1	MAIN PCB
IC201	M50959-462	1	IC M50959-462
IC706	MN6632A	1	IC MN6632A
IC202	CXD2500AQ	1	IC CXD2500AQ
IC101	CXA1372S	1	IC CXA1372S
IC501	M5290P	1	IC M5290P
IC103, 104, 105, 106, 705, 706, 707	BA15218	7	IC BA15218
IC203	μPD6254	1	IC μPD6254
IC801	μPD75402	1	IC μPD75402
IC205	74HCUD4AP	1	IC 74HCU04AP
IC401	MN6474	1	IC MN6474
IC402, 403	M5219MFP	2	IC M5219MFP
IC404, 405	M5238DIP	2	IC M5238DIP
IC505	NJM78M05	1	IC NJM78M05
IC507	NJM78L06	1	IC NJM78L06
IC502, 503, 504, 505	ICPN-15	4	ICPN-15
Q190	DTC144ES	1	Tr. DTC144ES
Q401	DTC124ES	1	Tr. DTC124ES
Q402	DTA124ES	1	Tr. DTA124ES
Q702	DTA124XS	1	Tr. DTA124XS
Q203	DTC114ES	1	Tr. DTC114ES
Q503, 704, 950	2SA933SS	3	Tr. 2SA933SS
Q101, 103, 105, 107, 180, 182, 184	2SB562CTF	7	Tr. 2SB562CTF
Q102, 104, 106, 108, 183, 185	2SD468CTF	6	Tr. 2SD468CTF
Q501, 1B1	2SD1913R	2	Tr. 2SD1913R
Q502, 504	2SD1274R	2	Tr. 2SB1274R
Q705, 706, 708, 709	2SD2144	4	Tr. 2SD2144
Q505	2SC1815	1	Tr. 2SC1815
Q403, 404	2SC3311	2	Tr. 2SC3311
L401, 402	LAL02NS3R3K	2	INDUCTOR
D201~209, 401, 402, 505, 506, 701, 950, 951, 952	1SS133	17	DIODE1SS133
LED108	GL-450	1	GL-450 or 451
PTQ108	PT-491F	1	PT-491F
D507	HZS24-2	1	HZS24-2
D508	HZS7B-2	1	HZS7B-2
D501~504	1N4002	4	1N4002
	T4-4840	1	FIN
	YKC21	2	2P PIN JACK
	109544-5	1	1P PIN JACK
CB601	HLEM31S-1	1	FPC SOCKET
CB101	CFP0112-0101	1	FPC SOCKET
X801	KBR-4.19MSA	1	RESONATOR
X401	HC-49/μ33.8688	1	XTAL
T701	R12-M644X	1	PULSE TRANS
	φ1 x 22	7	PIN φ1 L = 22
VR101, 102	RH0681C	2	SEMI-FIXED VR 22KΩ

PARTS LIST

REF. NO.	PART NO.	Q'TY	DESCRIPTION
TP	B12B-EH	1	POST EH12P
	B6B-EH	1	POST EH6
CB501	B6B-PH-K-S	1	POST PH6P WHITE
CB103	B6B-PH-K-E	1	POST PH6P BLUE
CB102	B5B-PH-K-S	1	POST PH5P WHITE
CB106	B3B-PH-K-S	1	POST PH3P WHITE
CB107	B3B-PH-K-R	1	POST PH3P RED
CB108	B3B-PH-K-K	1	POST PH3P BLACK
CB105	B3B-PH-K-E	1	POST PH3P BLUE
CB104	B3B-PH-K-Y	1	POST PH3P YELLOW
CB602	B4B-EH	1	EH4P
Z401, 402, 403	EXCELDR35V	3	EMI BEADS CORE
C502	S7-16TW472M	1	ELECTROLYTIC CAPACITOR 16V/4700μF
C501	S7-16TW472M	1	16V/2200μF
C505, 511	S7-50TW3R3M	2	50V/3.3μF
C503, 504, 253, 704	S7-16TW221M	4	16V/220μF
C508	S7-50TW101M	1	50V/100μF
C509, 510	S7-50TW330M	2	50V/33μF
C507	S7-50TW470M	1	50V/47μF
C512, 712, 713, 714, 715, 720, 721, 950	S7-16TW100M	8	16V/10μF
C113	S7-50TW6R8M	1	50V/6.8μF
C122, 123	S7-50TWR22M	2	50V/0.22μF
C731	S7-16TW330M	1	16V/33μF
C408, 515	S7-10TW101M	2	10V/100μF
C513	S7-10TW221M	1	10V/220μF
C404, 413, 414	S7-10TW331M	3	10V/330μF
C135, 403	NP-16TW100M	2	16V/10μF BP
C910	NP-50TW1R0M	1	50V/1μF BP
C431, 432, 441, 442	NP-10TW330M	4	10V/33μF BP
C445, 446	NP-50TW2R2M	2	50V/2.2μF BP
C115, 138, 176, 201, 212, 401, 405, 409, 412, 415, 416, 417, 418, 730, 805, 900	CK45F1H104Z	16	CERAMIC CAPACITOR 0.1
C120, 121, 126, 202, 203, 402, 407, 733	CK45E2H103D	8	0.01
C211	CK45B2H152K	1	0.0015
C104	CK45B2H561K	1	560P
C433, 434	CK45B2H331K	2	330P
C136, 427, 428	CK45B2H221K	3	220P
C132	CK45B2H151K	1	150P
C210, 732	CK45B2H101K	2	100P
C142	CK45B2H560K	1	56P
C139, 423, 424, 425, 426	CK45B2H470K	5	47P
C708, 709	CK45B2H330K	2	33P
C133	CK45B2H220K	1	22P
C118, 119, 160, 161, 162, 163, 437, 438, 443, 444	CK45B2H102K	10	0.001
C180, 182	CK45B2H150K	2	15P
C181, 419, 420, 421, 422	CK45B2H680K	5	68P
C439, 440	CK45B2H121K	2	120P
C410, 411	CC45CH1H5R6D	2	5.6P
C406	CC45SL1H6R8D	1	6.8P
C801, 802	CC45CH1H330J	2	33P
C114	ELQV1H224JM	1	TF CAPACITOR 224
C109, 110, 111, 112, 176	ELQV1H104JM	5	104
C107, 210	ELQV1H473JM	2	473
C125	ELQV1H333JM	1	333

PARTS LIST

REF. NO.	PART NO.	Q'TY	DESCRIPTION
C116, 124, 128, 131	ELQV1H103JM	4	103
C435, 436	ELQV1H822JM	2	822
C129	ELQV1H562JM	1	562
C103, 127	ELQV1H332JM	2	332
C108	ELQV1H222JM	1	222
R441, 442	KA16ST105J	2	Res. 1/6 1M
R115	KA16ST684J	1	Res. 1/6 680K
R403, 718, 1719	KA16ST474J	3	Res. 1/6 470K
R952	KA16ST274J	1	Res. 1/6 270K
R132	KA16ST224J	1	Res. 1/6 220K
R110, 707	KA16ST204J	2	Res. 1/6 200K
R956	KA16ST334J	1	Res. 1/6 330K
R147, 148	KA16ST134J	2	Res. 1/6 130K
R116, 460, 461	KA16ST124J	3	Res. 1/6 120K
R115, 121, 126, 127, 199, 950	KA16ST114J	6	Res. 1/6 110K
R119, 166, 180, 189, 194, 195, 196, 197, 507	KA16ST104J	9	Res. 1/6 100K
R130, 176	KA16ST913J	2	Res. 1/6 91K
R139, 152, 170	KA16ST823J	3	Res. 1/6 82K
R133, 145	KA16ST753J	2	Res. 1/6 75K
R149, 151	KA16ST683J	2	Res. 1/6 68K
R112	KA16ST563J	1	Res. 1/6 56K
R136, 746, 747	KA16ST513J	3	Res. 1/6 51K
R121, 181, 182, 185, 186, 190, 191, 200, 417, 418, 419, 420, 504, 515, 801, 803, 8-4, 805, 806, 807	KA16ST473J	20	Res. 1/6 47K
R111	KA16ST393J	1	Res. 1/6 39K
R140, 160, 161, 162, 163, 404, 456, 457	KA16ST333J	8	Res. 1/6 33K
R724, 725, 726, 727, 740, 741	KA16ST303J	6	Res. 1/6 30K
R413, 414, 415, 416	KA16ST273J	4	Res. 1/6 27K
R712, 713, 714, 715, 953, 954	KA16ST203J	6	Res. 1/6 20K
R146, 153, 956, 957	KA16ST183J	4	Res. 1/6 18K
R446, 447, 448, 449	KA16ST153J	4	Res. 1/6 15K
R429, 430	KA16ST133J	2	Res. 1/6 13K
R427, 428	KA16ST123F	2	Res. 1/6 1% 12K
R109, 113, 118, 120, 167, 201~222, 226, 227, 231, 241, 242, 409, 410, 411, 412, 444, 445, 454, 455, 508, 808, 811, 901	KA16ST103J	44	Res. 1/6 10K
R104	KA16ST752J	1	Res. 1/6 7.5K
R122, 241, 402, 431, 432	KA16ST682J	5	Res. 1/6 6.8K
R141, 170, 401, 406, 501, 502, 517	KA16ST472J	7	Res. 1/6 4.7K
R744, 745	KA16ST392J	2	Res. 1/6 3.9K
R123, 223, 240, 503	KA16ST332J	4	Res. 1/6 3.3K
R742, 743	KA16ST432J	2	Res. 1/6 4.3K
R751	KA16ST202J	1	Res. 1/6 2K
R117, 232, 433, 434, 438, 439, 518, 701, 706, 802	KA16ST102J	10	Res. 1/6 1K
R435, 436, 720, 721, 722, 723, 809	KA16ST681J	7	Res. 1/6 680
R458, 459	KA16ST821J	2	Res. 1/6 820
R177	KA16ST471J	1	Res. 1/6 470
R709	KA16ST431J	1	Res. 1/6 430
R125, 128, 144, 171, 183, 184, 187, 188, 193, 405, 407, 408	KA16ST221J	12	Res. 1/6 220
R450, 451, 505, 506, 731	KA16ST101J	5	Res. 1/6 100
R708	KA16ST910J	1	Res. 1/6 91
R452, 453	KA16ST331J	2	Res. 1/6 330
R730	KA16ST750J	1	Res. 1/6 75
R124, 150, 900	KA16ST220J	3	Res. 1/6 22
R131, 955, 958	KA16ST1R0J	3	Res. 1/6 1
R516	KA16ST223J	1	Res. 1/6 22K

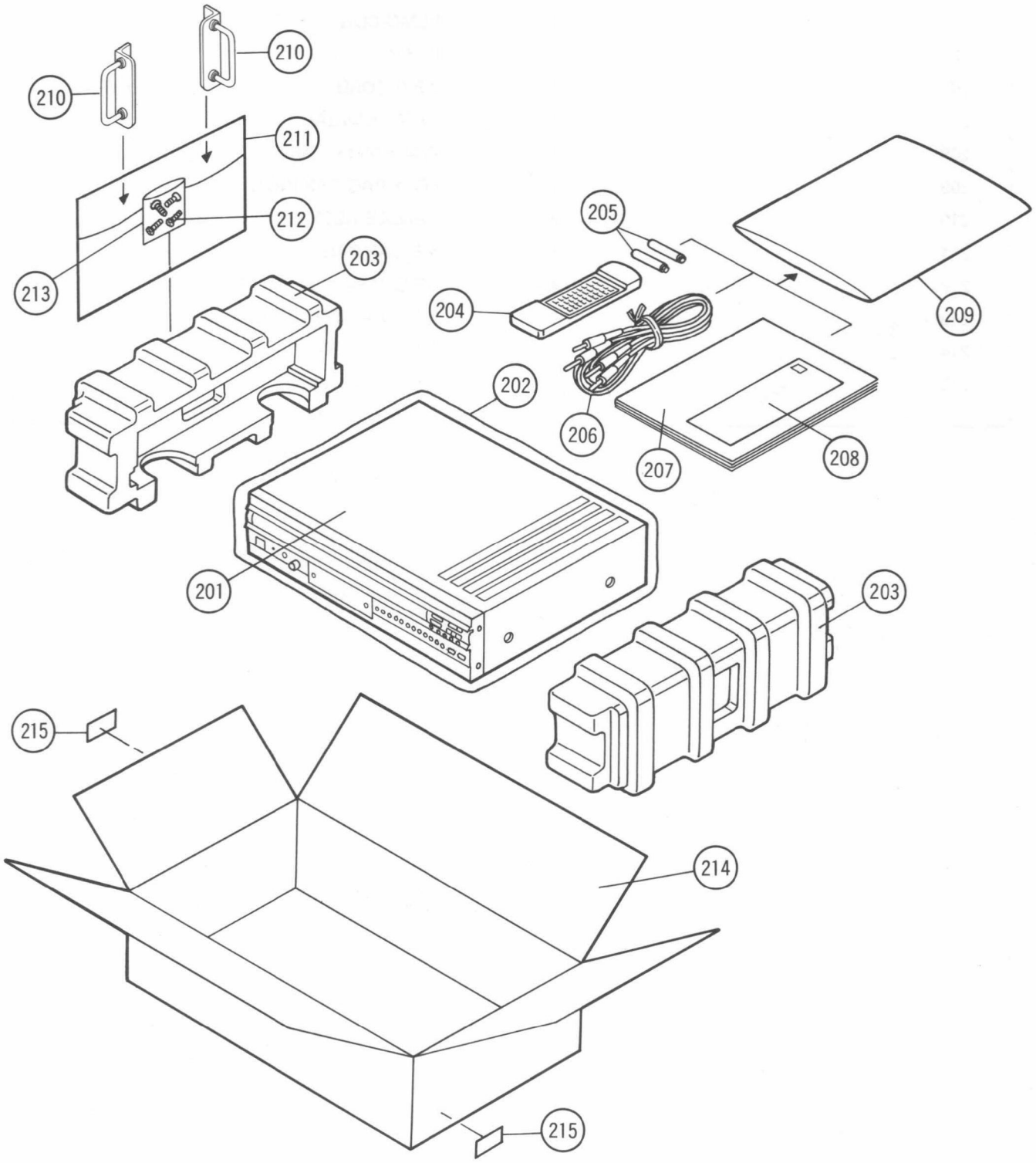
PARTS LIST

REF. NO.	PART NO.	Q'TY	DESCRIPTION
R732, 733, 734, 735	KA16ST272J	4	Res. 1/6 2.7K
	A390t-P	1	POWER PWB
D510~513	1N4002	4	DIODE 1N4002
D500	1SS133	1	DIODE 1SS133
P501~504	IPS-5007	4	DIODE IPS-5007
			ELECTROLYTIC CAPACITOR
C516~519	S7-35TW102M	4	35V/1000μF
PT501	2335907009	1	P.T.
	A390t-PT	1	PT502 PWB
PT502	ST-9134	1	P.T.
F501	125V 300m	1	FUSE
	2727974	2	FUSE HOLDER
CN500	B6B-EH	1	POST EH6P
R510, 511	KA14ST301J	2	Res. 1/4 300
RY501	MR301	1	RELAY
	A390t-SW	1	POWER SW PCB
	SPPM13024A	1	POWER SW
LED601	TLR206	1	LED TLR206
	LH-5-14	1	LED HOLDER
	A390t-K	1	KEY PCB
	ICC06-03-393-T	1	ROUND PIN IC SOCKET
	ϕ1 x 9.5	1	ϕ1.0 *9.5L
	S6B-PH-K-S	1	POST PH6P
LED602	TLR206	1	LED TLR206
	LH-5-14	1	LED HOLDER
D601~608	ISS133	8	DIODE ISS133
	SKHHAJ	25	TACT SW
	FIP9DCM7	1	FL TUBE
CB601	HLEM31S	1	FPC SOCKET
	1PFF31	1	FPC
	SPS-420-1	1	REMOTE SENSOR
R601~604	KA16ST104J	4	Res. 1/6 100K
R615	KA16ST681J	1	Res. 1/6 680
Q605	2SC2458	1	TRANSISTOR 2SC2458
	A390t-HP	1	H/P PWB
Q600, 601	2SD2144	2	TRANSISTOR 2SD2144
R608, 609	KA16ST472J	2	Res. 1/6 4.7K
R606, 607	KA16ST560J	2	Res. 1/6 56
C600, 601	CK45E2H103P	2	CERAMIC CAPACITOR 0.01
VR601	RK16312A0	1	H/P VOL.
	EJU6ZLK-B	1	H/P JACK
	A390t-SWA	1	SW PCB A SSCF21
S105	SSCF21P-1	1	DETECTOR SW

PARTS LIST

REF. NO.	PART NO.	Q'TY	DESCRIPTION
	A390t-SWB	1	SW PCB B
S106	SSCF21P-1	1	DETECTOR SW
	A390t-RS	1	ROULETTE SENSOR PWB
PC115	GP1A52HR	1	PHOTOINTERRUPTER GP1A52HR
CB115	S4B-PH-K-S	1	POST PH4P
	A390t-RM	1	ROULETTE MOTOR PWB
CB111	B3B-PH-K-S	1	POST PH3P
	A390t-T	1	TUBE PWB
V901, 902	6DJ8	2	TUBE 6DJ8
IC901, 903	NJM4565	2	IC NJM4565
IC902	NJU201A	1	IC NJU201A
C903, 904, 913, 914	S7-16TW220M	4	ELECTROLYTIC CAPACITOR 16V/22μF
C901, 902	DFWA2E225K	2	MF CAPACITOR 250V/2.2μF
C905, 906	CK45F2H104Z	2	CERAMIC CAPACITOR AX 104
C911, 912	MY-50VU153K	2	MYLER CAPACITOR 153
R901, 902	KA16ST203J	2	Res. 1/6 20K
R903, 904	KA16ST304J	2	Res. 1/6 300K
R905, 906	KA16ST223J	2	Res. 1/6 22K
R907, 908, 915, 916	KA16ST512J	4	Res. 1/6 5.1K
R909, 910	KA16ST163J	2	Res. 1/6 16K
R911, 912	KA16ST333J	2	Res. 1/6 33K
R913	KA16ST273J	1	Res. 1/6 27K
R440, 445	KA16ST103J	2	Res. 1/6 10K
R921, 922	KA16ST433J	2	Res. 1/6 43K
R470, 471	KA16ST105J	2	Res. 1/6 1M
CB403	B2B-EH	1	POST EH2P
CB401	B3B-EH	1	POST EH3P
CB402	B5B-EH	1	POST EH5P
CB502	B6B-EH	1	POST EH6P
	CW104	1	CONNECTOR ASS'Y (ROULETTE)
	CW105	1	CONNECTOR ASS'Y (CN105-LO-SW)
	CW106	1	CONNECTOR ASS'Y (CN105-CL-SW)
	CW107	1	CONNECTOR ASS'Y (CN501)
	CW108	1	CONNECTOR ASS'Y (CN108)
	CW109	1	CONNECTOR ASS'Y (CN105-CL-M)
	CW110	1	CONNECTOR ASS'Y (CN104)
	CW111	1	CONNECTOR ASS'Y (CN602)
	CW112	1	CONNECTOR ASS'Y (CN403)
	CW113	1	CONNECTOR ASS'Y (CN401)
	CW114	1	CONNECTOR ASS'Y (CN502)
	CW115	1	CONNECTOR ASS'Y (CN402)
	CW116	1	CONNECTOR ASS'Y (CN604)
	CW117	1	CONNECTOR ASS'Y (CN603)
	CW118	1	CONNECTOR ASS'Y (CN500)
	W1	1	WIRE
	W2	1	WIRE
	W3	1	WIRE
	CW101	1	WIRE
	CW102	1	WIRE
	CW103	1	WIRE
	CW104	1	WIRE

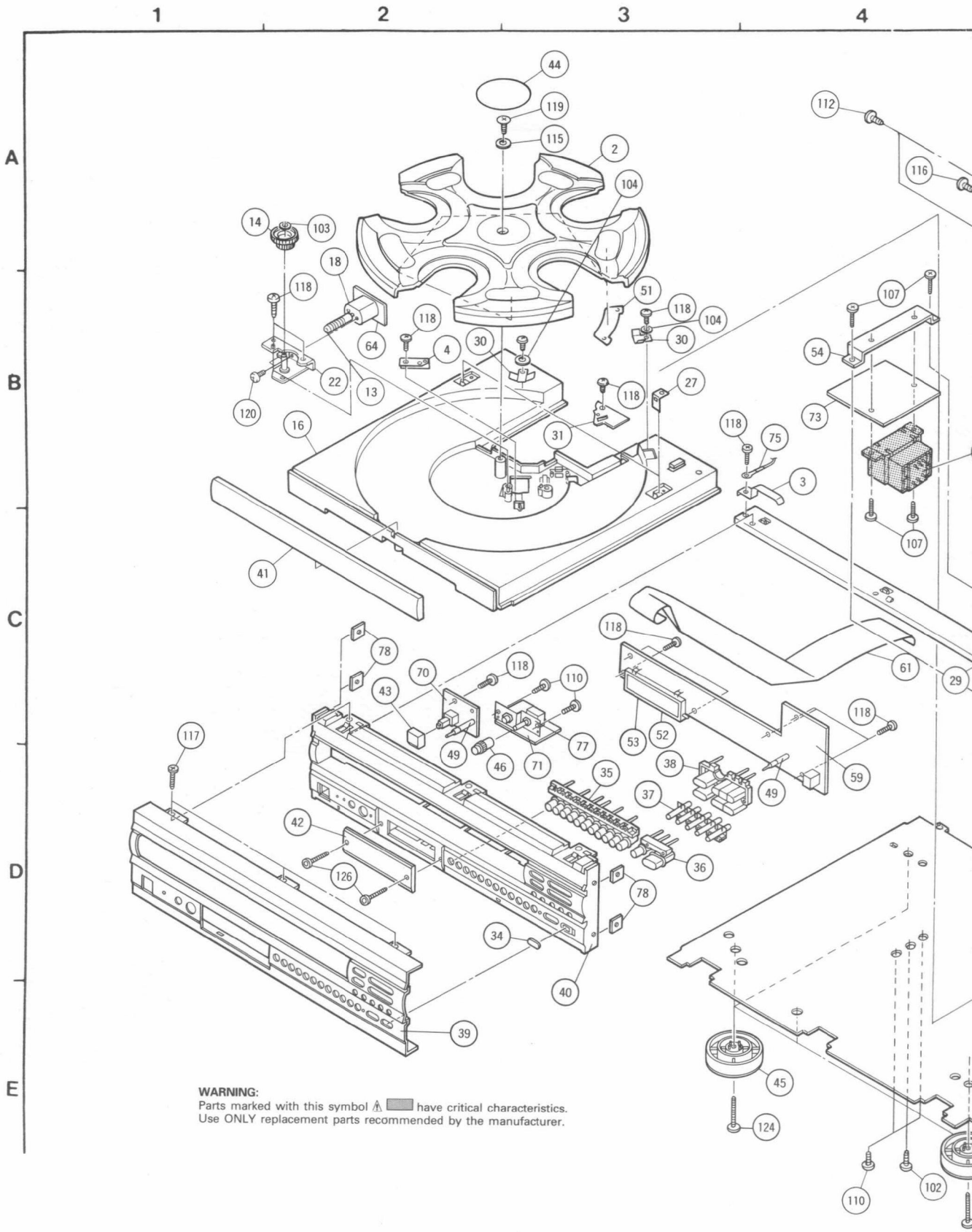
EXPLODED VIEWS
Front Panel and Packing



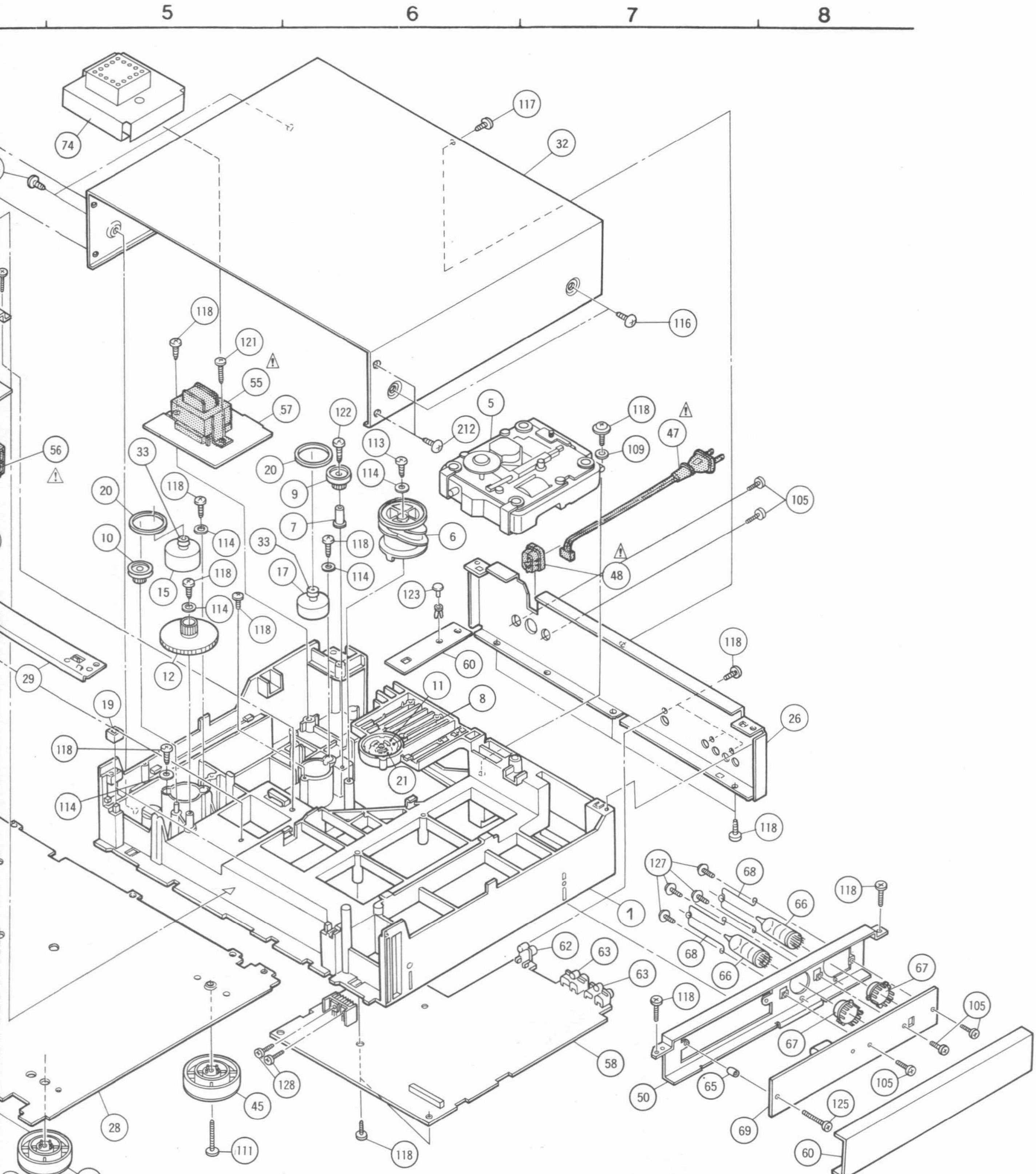
PARTS LIST

REF. NO.	PART NO.	Q'TY	DESCRIPTION
201	SD/A-390t	1	UNIT
202		1	POLY BAG FOR UNIT
203	5030946207	1	CUSHION
204	RH-85	1	REMO-CON
205	UM-4	2	BATTERY
206		1	2 PIN CORD
207		1	INST. MANUAL
208		1	WARRANTY CARD
209		1	POLY BAG FOR INST.
210		2	HANDLE ASSY
211		1	AIR CAP BAG
212		4	SCREW S4 X 12 ST
213		1	POLY BAG FOR SCREW
214		1	CARTON BOX
215		2	SERIAL NO. LABEL

EXPLODED VIEW



WARNING:
Parts marked with this symbol ⚠ ▭ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.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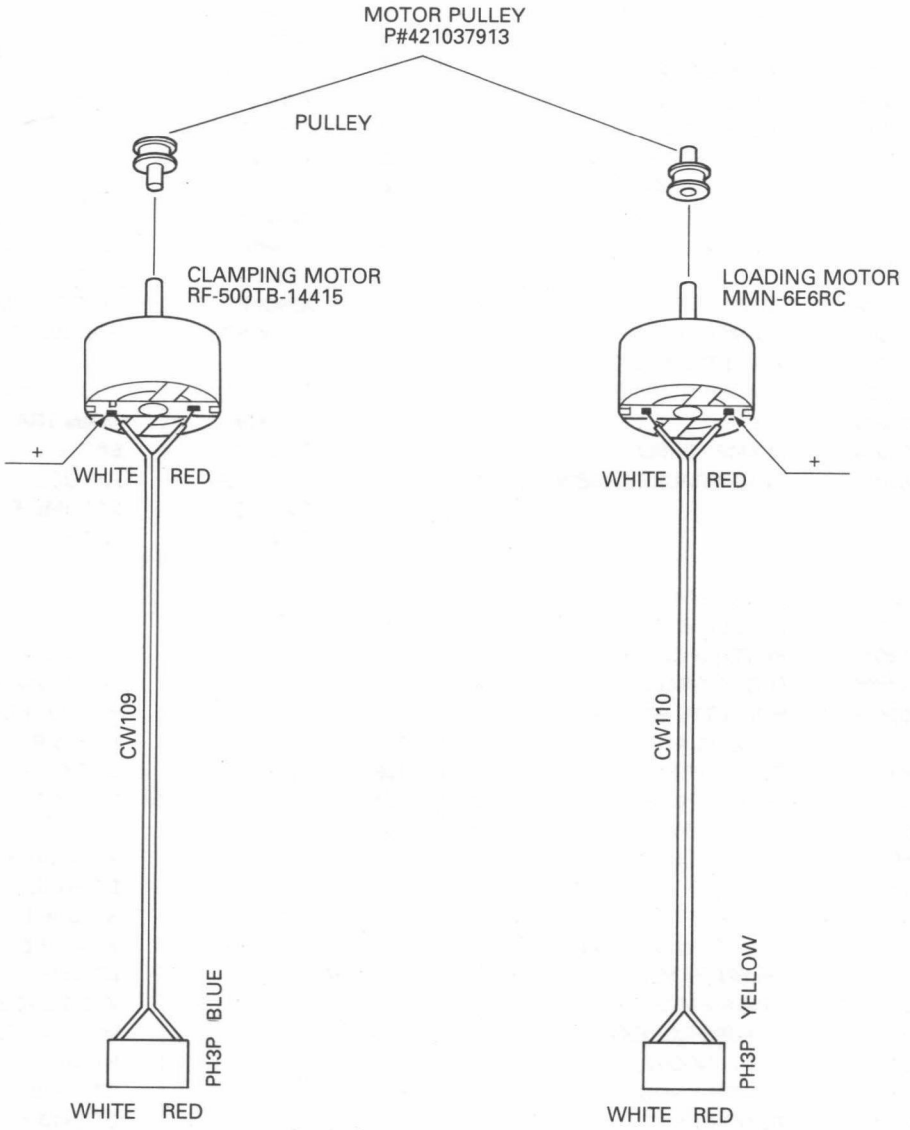
PARTS LIST

Ref. No.	Part No.	Part Name	Q'ty
1	1031483705	MECH. CHASSIS	1
2	4210593303	ROULETTE	1
3	4123400004	EARTH PLATE	1
4	4610690107	MOTOR SPRING	1
5	FG30	CD MECH. UNIT	1
6	4240172202	CLAMPING CAM	1
7	4431161006	COLLAR	1
8	4210574306	CLAMPER PRESS	1
9	4240130008	PULLEY GEAR	1
10	4240130011	PULLEY GEAR	1
11	4210573006	CLAMP YOKE	1
12	4240173104	LOADER GEAR	1
13	4240093129	WORM GEAR ASS'Y	1
14	4240174307	HERICAL GEAR	1
15	2170158000	LOADING MOTOR	1
16	4310313409	LOADER FRAME	1
17	2170181006	CLAMPING MOTOR	1
18	2170172002	ROULETTE MOTOR UNIT	1
19	4610659009	LOADER STOPPER	2
20	4230061006	BELT	2
21	4310205009	CLAMP FERRO	1
22	4123484004	GEAR BRACKET ASS'Y	1
23			
24			
25			
26	T2-0830	BACK PANEL	1
27	4123350109	LOADER BRACKET	2
28	1050989507	BOTTOM COVER	1
29	4123348108	FRONT BRACKET	1
30	4411402002	ROULETTE STOPPER	2
31	4123442004	BLIND PLATE	1
32	T3-1089	TOP COVER	1
33	4210379103	MOTOR PULLEY	2
34	T4-4622	SENSOR WINDOW	1
35	T3-1088	PRESET BUTTON	1
36	T4-4618	EQ KNOB	1
37	T3-1087	DISC BUTTON	1
38	T3-1086	FUNCTION BUTTON	1
39	T2-0833	FRONT PANEL	1
40	T1-0520	INNER PANEL	1
41	T2-0832	LOADER COVER	1
42	T2-1090	FLT WINDOW	1
43	T4-4617	POWER KNOB	1
44	T4-4931	BLIND SHEET	
45	T4-4619	LEG	4
46	N44260-T-BK1	VOLUME KNOB 12	1
47	T4-4932	AC CORD	1
48	2271	CORD BUSH	1
49	T4-4933	LED COLLAR	2
50	T3-1104	TUBE BKT	1
51	T4-4813	ROULETTE SHEET	
52	T4-4934	RUBBER PAD 2.5t	1
53	T4-4935	RUBBER PAD 9t	2
54	T4-4827	TRANS BKT	1

Ref. No.	Part No.	Part Name	Q't
55	2335907009	POWER TRANS-A	1
56	ST-9134	POWER TRANS-B	1
57	A390t-PT	TRANS PWB	1
58	A390t-M	MAIN PWB	1
59	A390t-K	KEY PWB	1
60	T4-4870	TUBE COVER	1
61	1PFF31	31P FPC CABLE	1
62	109544-5	1P PIN JACK	1
63	YKC21	2P PIN JACK	1
64	A390t-RM	MOTOR PWB	1
65	T4-4929	PC COLLAR 3x6x6	1
66	6DJ8	TUBE	2
67	T4-4928	TUBE SOCKET	2
68	T4-4900	TUBE HOLDER	1
69	A390t-T	TUBE PWB	1
70	A390t-P	SWITCH PWB	1
71	A390t-HP	VOLUME PWB	1
72			
73	T4-4903	TUBE TRANS COVER	1
74	T3-1119	MAIN TRANS COVER	1
75	T4-4930	EARTH LUG	1
76	FIP9DCM7	FL TUBE	1
77	T4-4620	VOLUME BKT	1
78	T4-4621	FIXER	4
101			
102		BT 3x30 Z	1
103		POLY WASHER 3ϕ	1
104		W 4x13x1 B	2
105		ST 3x5 B	3
106		BT 2.6x10 Z	2
107		ST 3x6 Z	4
108			
109		W 3x12x0.8 Z	1
110		BT 3x6 Z	2
111		ST 3x10 B	1
112		ST 4x12 B	4
113		BT 3x14 Z	1
114		W 3.5x9x0.5 Z	5
115		W 3x10x0.8 Z	1
116		BT 4x10 B	4
117		ST 3x8 B	4
118		BT 3x10 B	34
119		BT 3x12 B	1
120		ST 2x3 Z	2
121		BT 3x18 Z	1
122		BT 3x20 B	1
123		PUSH RIVET 3.5x5.5	1
124		BT 3x15 B	3
125		ST 3x12 B	5
126		TPA 3x12 SPECIAL	2
127		ST 3x6 Z	4
128		BT 3x8 Z	2

MOTOR ASSY


MOTOR PULLEY
P#421037913
PULLEY
CLAMPING MOTOR
RF-500TB-14415
LOADING MOTOR
MMN-6E6RC
+
WHITE
RED
WHITE
RED
+
CW109
CW110
PH3P BLUE
PH3P YELLOW
WHITE
RED
WHITE
RED