

ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER

MODEL DX-7110/7210



Black and Silver (only DX-7210) model

BMP,SMP		230V AC, 50Hz
BMD	only DX-7210B	120V AC, 60HZ
BMW		120/220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

SPECIFICATIONS

Compact Disc Player Model DX-730

Signal readout system:	Optical non-contact
Reading rotation:	About 500 – 200 r.p.m. (constant linear velocity)
Linear velocity:	1.2 – 1.4 m/s
Error correction system:	Cross Interleave Reed Solomon code
D/A converter:	1 bit PWM ACCUPULSE D/A CONVERTER
Sampling frequency:	352.8 kHz (Eight-times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5 Hz – 20 kHz
Total harmonic distortion:	0.004% (at 1 kHz)
Dynamic range:	96 dB
Signal to noise ratio:	100 dB
Channel separation:	90 dB (at 1 kHz)
Wow and Flutter:	Below threshold of measurability
Output level:	2 volts r.m.s.
Power consumption:	12 watts
Power supply rating:	U.K. and Australian models: AC 240V, 50Hz European model: AC 230V, 50Hz (Except U.K.) USA & Canadian models: AC 120V, 60Hz Worldwide model: AC 120V and 220V switchable 50/60Hz
Dimensions (W × H × D):	455 × 120 × 308 mm
Weight:	4.8 kg, 10.6 lbs.
Specifications and external appearance are subject to change without notice because of product improvements.	

ONKYO

AUDIO COMPONENTS

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SERVICE PROCEDURES

1. Safety-check out

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cord and chassis.

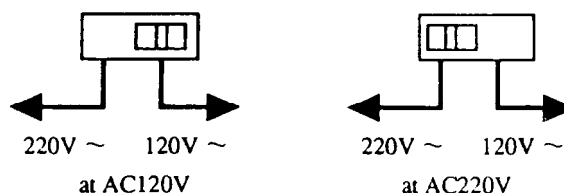
Specifications: More than 10Mohm at 500V.

2. Voltage Selector (Back panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in user's area before turning the power switch on.

Voltage is changed by sliding the groove in the switch with a screw driver to the right or left.

Confirm that the switch has been moved all the way to the right or left before turning the power switch on.



CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity, surge current and etc, that the components are liable to be broken down or its reliability remarkably deteriorated.

During repair, carefully take the following precautions. (The following precautions are included in the service parts.)

PRECAUTIONS

1. Ground for the work-desk.

Place a conductive sheet such as a sheet of copper (with impedance lower than 10MΩ) on the work-desk and place the set on the conductive sheet so that the chassis.

2. Grounding for the test equipment and tools.

Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.

3. Grounding for the human body.

Be sure to put on a wrist-strap for grounding whose other end is grounded.

Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.

4. Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

5. Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

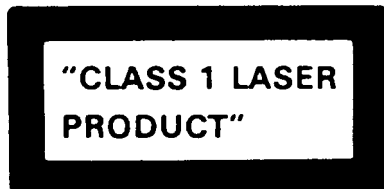
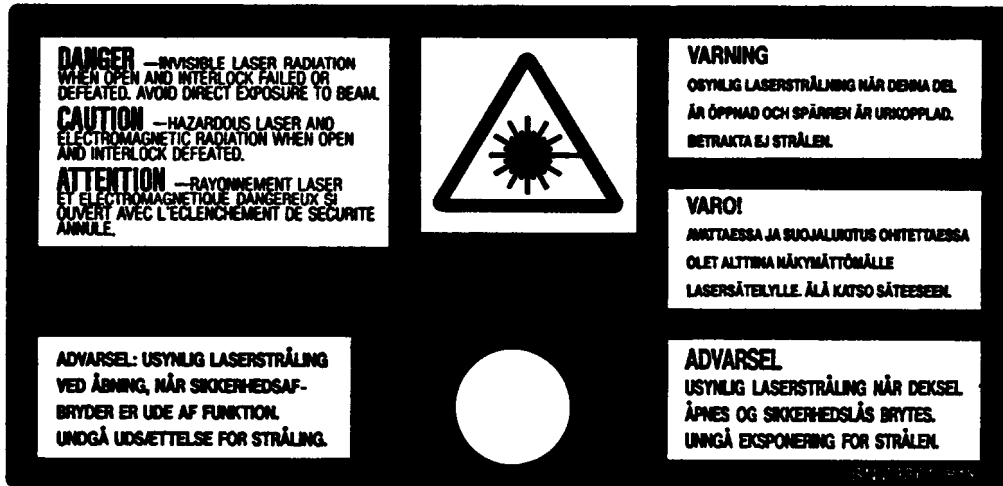
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

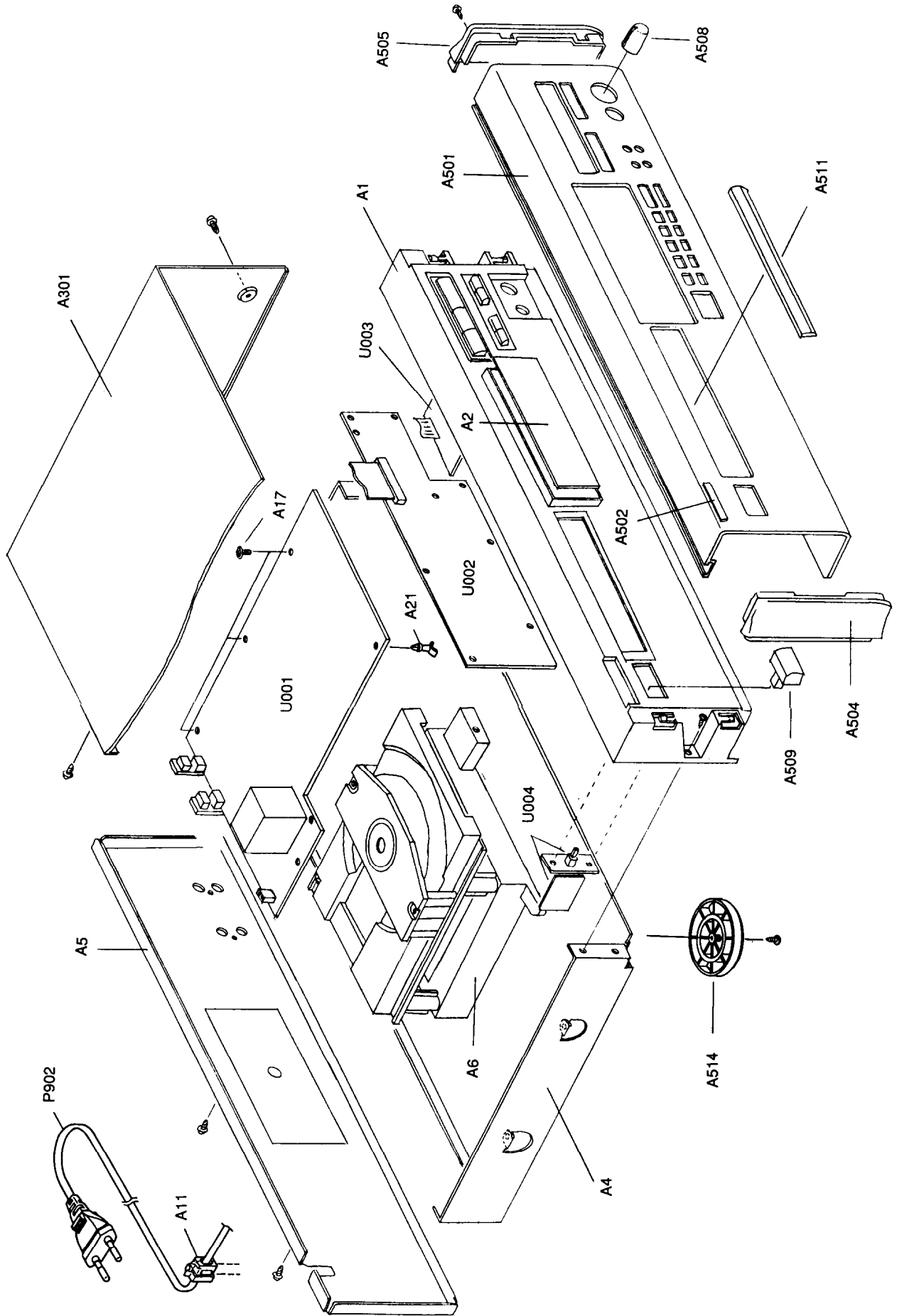
- Material: GaAlAs
- Wavelength: 760 ~800nm
- Emission Duration: continuous
- Laser output: 0.5mW*
 - *This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

LASER WARNING LABELS

The label shown below are affixed.




EXPLODED VIEW

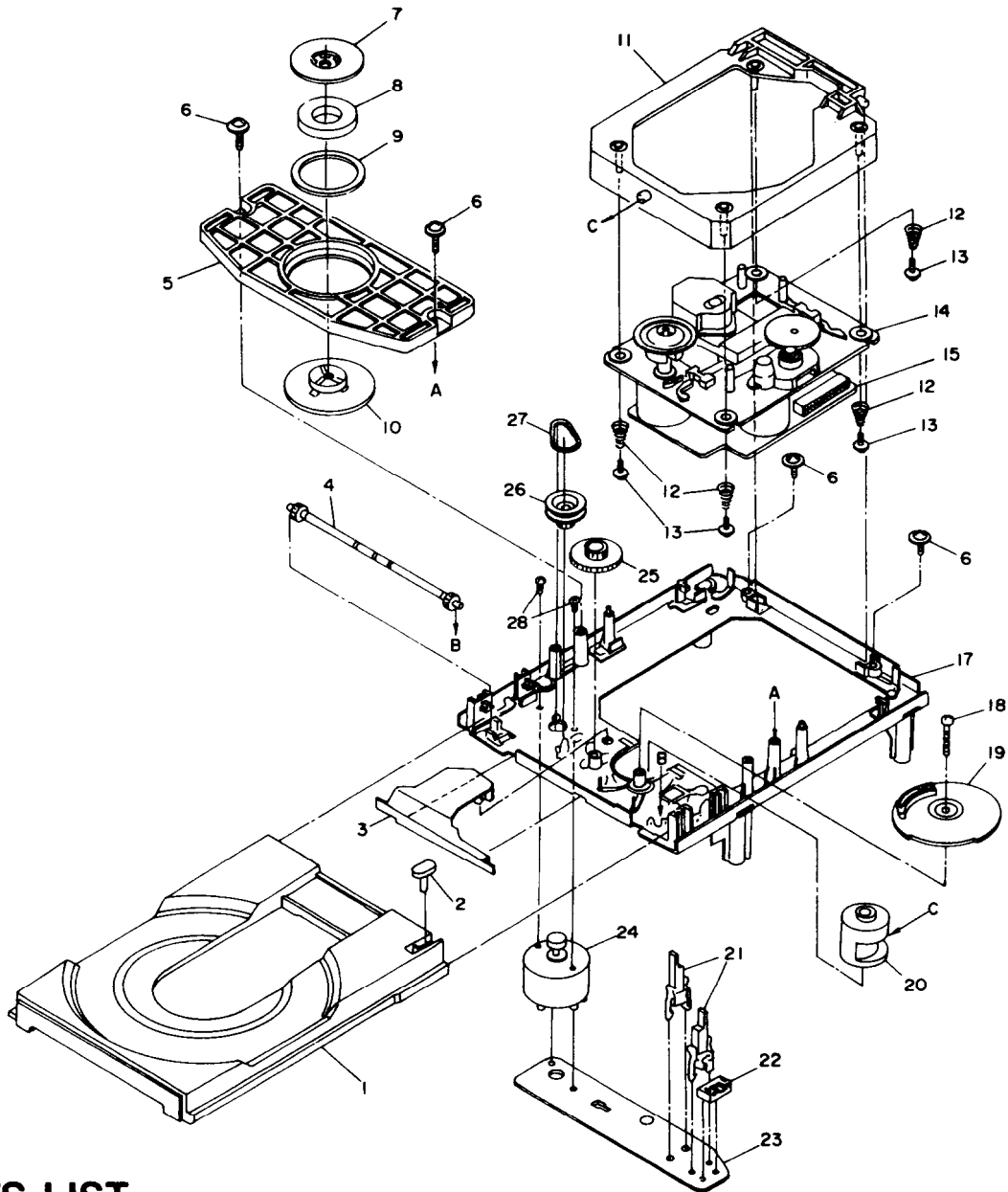


PARTS LIST

REF. NO.	PAERS NO.	DESCRIPTION	REF. NO.	PAERS NO.	DESCRIPTION
A1	27110829AY	FRONT BRACKET, Black model	A520	838130088Y	3TTB + 8B, SCREW
A2	27110830Y	FRONT BRACKET, Silver model	P902	253192HITY	AS-UC-6#18, AC CORD,<D>
A4	28191697Y	CLEAR PLATE		253193HITY	AS-CEE, AC CORD,<V,W>
A5	27100227DY	CHASSIS		251397HIT	AS-SAA, AC CORD, <PA>
	27121969Y	REAR PANEL, DX-7210B		2047381512Y	NCFC7-381512, FFC
	27121965Y	REAR PANEL, DX-7110B		24800009CY	NCD-130S, CDP M
	27121966Y	REAR PANEL, DX-7210S		2047222012Y	NCFC7-222012, FFC
A6	27122035Y	REAR PANEL, DX-7210B, <PT>		2061112100UL	CRIMP AS,<D>
A7	27190950Y	HOLDER (ME)		293606687Y	LABEL (CLASSI) , <V,WT,PT,PA>
A11	27190951Y	HOLDER (PC)		29361581Y	LABEL (ALL) , <D>
A13	27300750	CORD BUSHING		29360117Y	LABEL (CSA) , <DC>
A14	838130088Y	3TTB+8B, SCREW		29361786Y	LABEL, B, <PT>
A17	82143006Y	3P+6FN (BC) , SCREW		29361759Y	LABEL (CUL) , <D,DC>
A18	833430080Y	3TTP+8P (BC) , SCREW	U001	1H252595-1	NAAR-5095-1, AR-AS,DX-7110
A19	833130087Y	3TTP+8S, SCREW		1H252595-1A	NAAR-5095-1A, AR-AS,DX-7110
A20	831430100Y	3TTW+10P (BC) , SCREW		1H252595-1B	NAAR-5095-1B, AR-AS,DX-7110
A21	834430108Y	3TTS+10B (BC) , SCREW		1H254595-2	NAAR-5095-2, AR-AS,<D>,DX-7210
A301	27190524-1Y	LSR-14R, HOLDER		1H254595-2A	NAAR-5095-2A, AR-AS,<V>,DX-7210
	28184479AY	COVER, DX-7210B/7110B		1H254595-2B	NAAR-5095-2B, AR-AS,<W>,DX-7210
A501	28184601Y	COVER, DX-7210S	U002	1H252596-1	NADIS-5096-1, DIS-AS,DX-7110
	27211657Y	FRONT PANEL, DX-7110S		1H254596-2	NADIS-5096-2, DIS-AS,DX-7210
	27211655Y	FRONT PANEL, DX-7210B	U003	1H254597-2	NAAF-5097-2, AF-AS,DX-7210
A502	2711656Y	FRONT PANEL, DX-7210S	U004	1H252598-1	NAPS-5098-1, PS-AS,DX-7110
A503	28135199Y	BADGE		1H254598-2	NAPS-5098-2, PS-AS,DX-7210
A504	8910301	CS-3 (SUS) , CS RING			
	28125248-6Y	END CAP (L) , DX-7210B/7110B			
A505	28125283Y	END CAP (L) , DX-7210S			
	28125249-6Y	END CAP (R) , DX-7210B/7110B			
	28125284Y	END CAP (R) , DX-7210S			
A508	28324845BY	KNOB (LEVEL) , DX-7210B/7110B			
A509	28325054Y	KNOB (LEVEL) , DX-7210S			
	28324140Y	KNOB (POWER) , DX-7210B/7110B			
	28324974Y	KNOB (POWER) , DX-7210S			
A511	28148301Y	DOOR, DX-7210B/7110B			
	28148302Y	DOOR, DX-7210S			
A514	27175292Y	LEG ASSY			
A518	833430080Y	3TTP+8P (BC) , SCREW			
A519	838430088Y	3TTB+8B (BC) , SCREW			

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

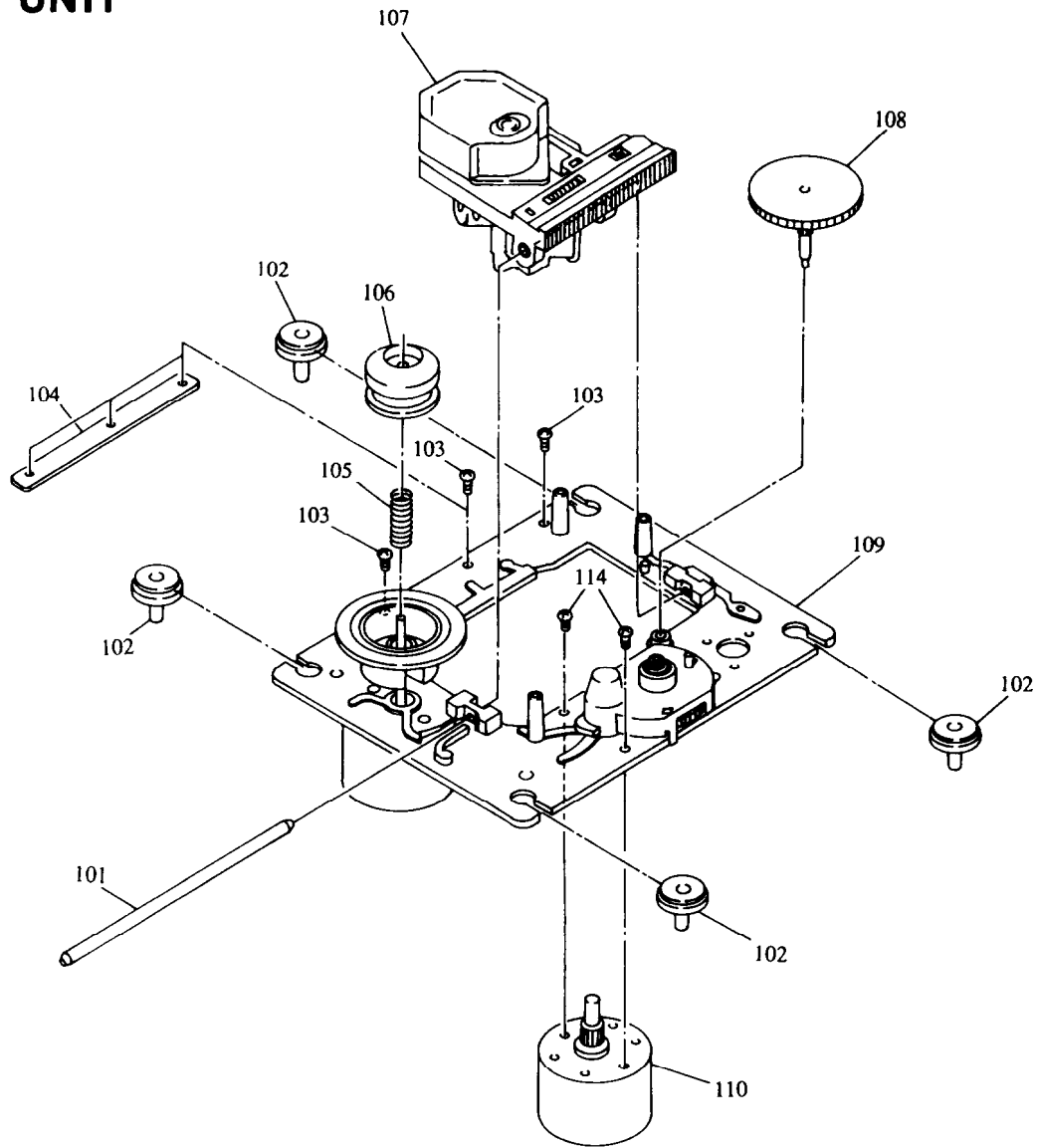
MECHANISM-EXPLODED VIEW



PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24840060	Tray	21	24840064	Leafswitch
2		Stopper	22	25055369	NPLG-5P352, Plug
3	24822014	Gear cover	23	24840066	Loading motor pc board
4	24810020	Tray gear	24	24840067	Loading motor
5	24840061	Chucking plate	25	24810022	Middle gear
6		2.6TTW+7B, Self-tapping screw	26	24810025	Loading
7	24830003	Chucking yoke	27	24816008	Belt
8	24832004	Magnet	28		2.6B+2.5F, Screw
9	24836013	Damper	101	24828006	Sled shaft
10	24810024	Chucking P	102	24836014	Insulator
11	24802012	Sub chassis	103	24840068	2 × 5, Special screw
12	24820023	Spring	104	24822015	Plate S
13	24840062	Screw with washer	105	24820024	Spring
14		KSM-2401, Pickup drive unit	106	24824003	Center ring
15	24840075	CD servo pc board ass'y	107	24110011	KSS-240A, Optical pickup
17	24802013	Main chassis	108	24810023	Wheel
18		2.6TTW+16B, Self-tapping screw	109	24802014	Chassis
19	24810021	Drive gear	110	24804012	Motor gear ass'y
20	24840063	Control cam	114	82112003	2P+3FN, Pan head screw

DRIVE UNIT



REMOVAL OF TRAY ASS'Y

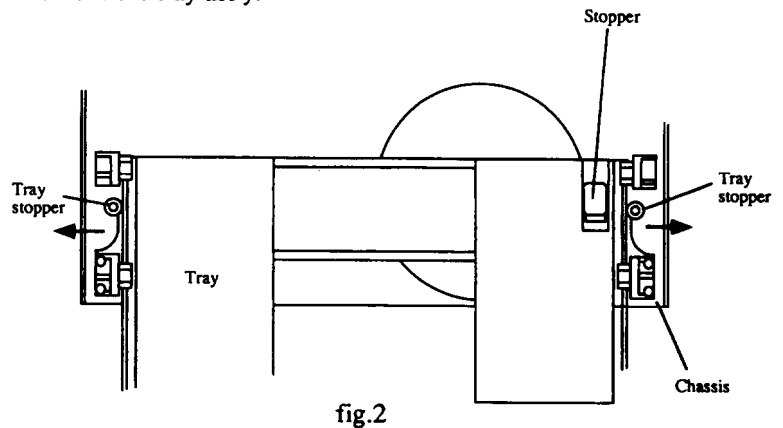
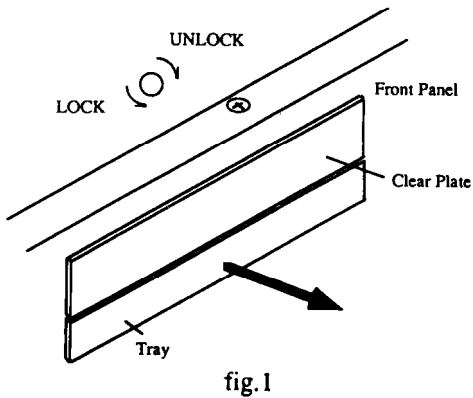
Remove the top cover.

Turn the locked screw to the clockwise to release the lock of gear.(Refer fig.1)

Pull out the tray ass'y.

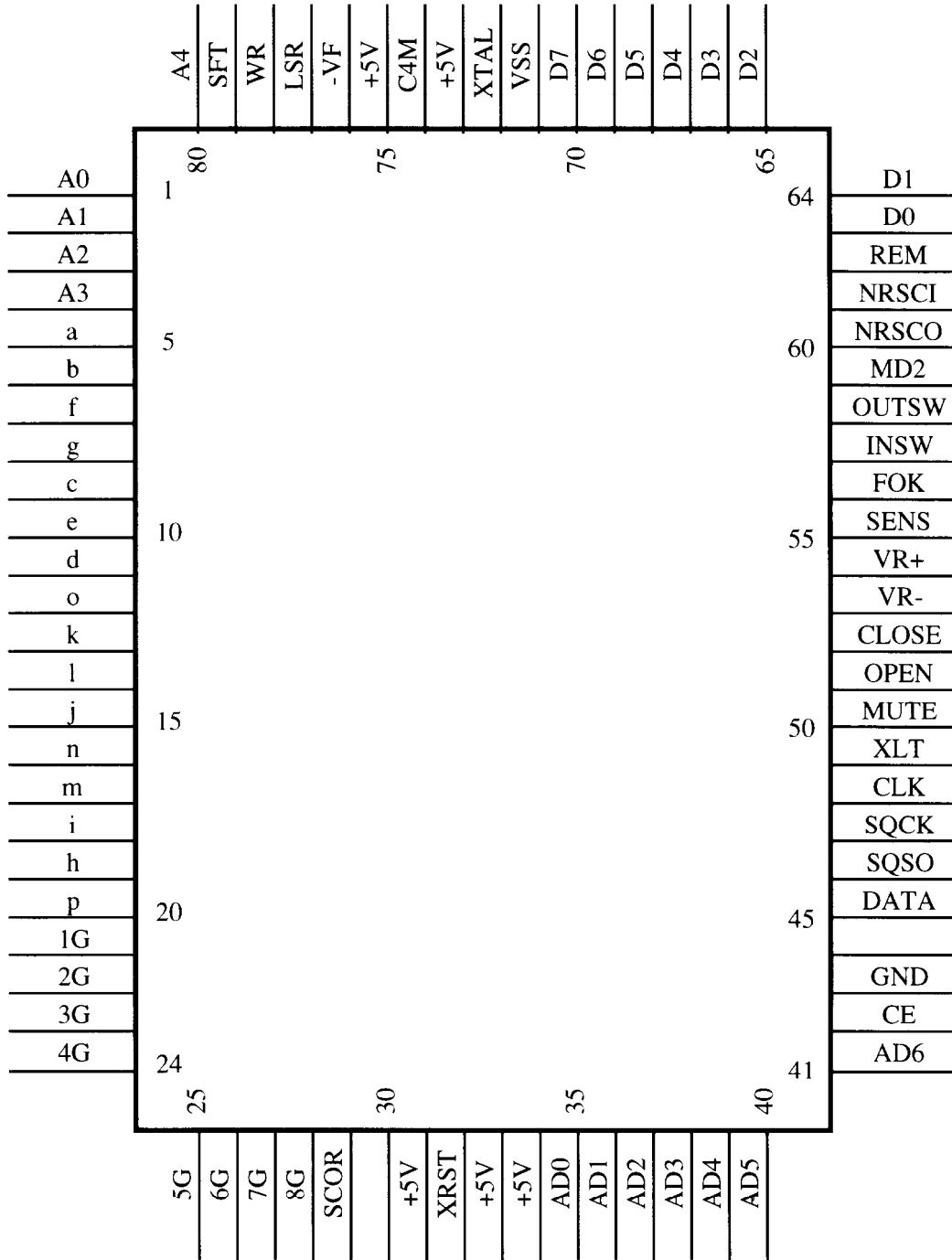
Remove the stopper.(Refer fig.2)

Press the tray stopper to the arrow mark direction and remove the tray ass'y.



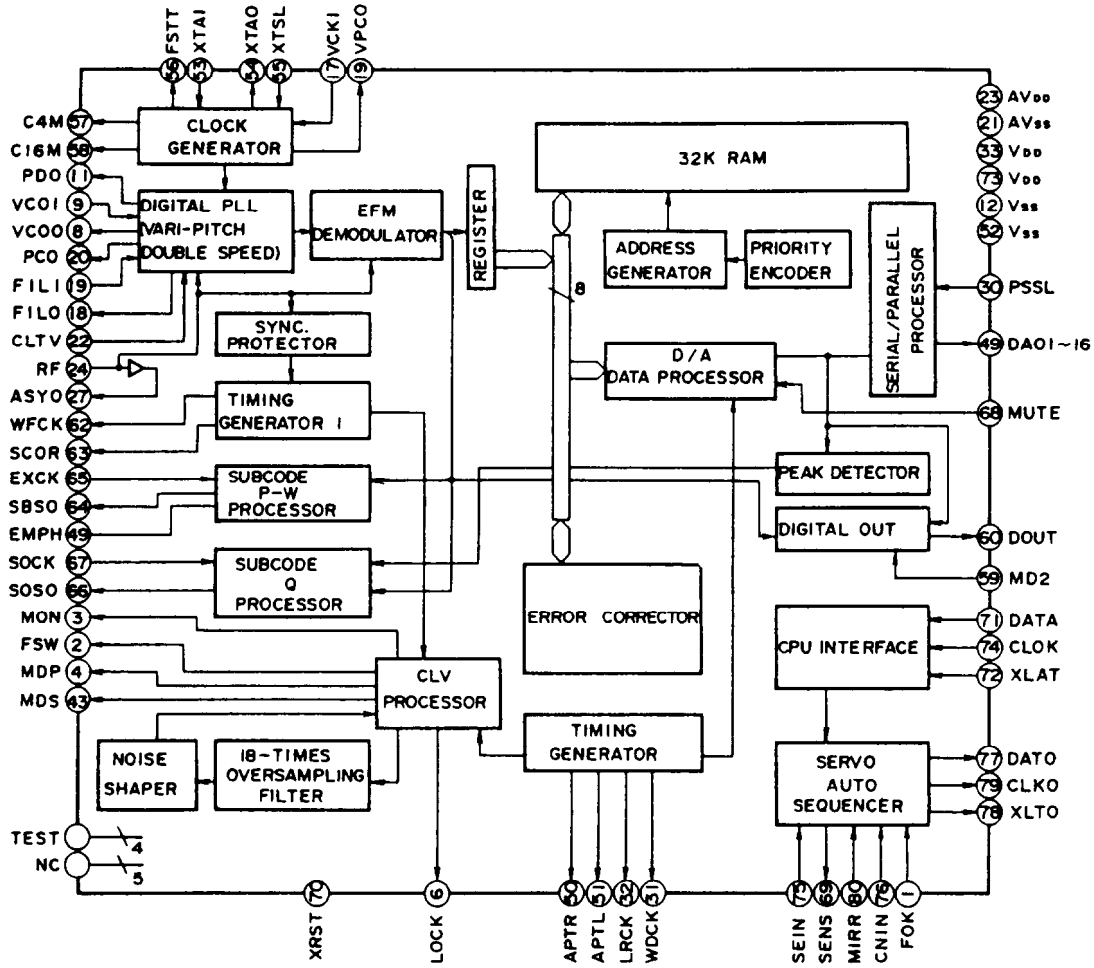
MICROPROCESSOR CONNECTION DIAGRAM

CXP50116-546Q (Microprocessor)



Pin No.	Symbol	I/O	Logic	Description
1~4	A0~A3	O	H	Music file address signal
5~20	a~p	O	H	FL tube segment drive output terminals
21~28	1G~8G	O	H	FL tube grid drive output terminals
29	SCOR	I	Neg	Synchronizing signal detection input terminal of sub code frame
30		O		Not used (Open)
31	+5V	I		Not used (+5V)
32	XRST	I/O	L	Reset input terminal
33				
34	+5V	I	L	Positive power supply
35~41	AD0~A6	I	6 value	A/D port for operation keys
42	CE	I	L	Chip enable terminal for Music file
43	GND	I	Neg	Not used (Ground)
44		O	Neg	Clock supply terminal for serial transport
45	DATA	O	H	Serial data output terminal
46	SQSO	I	H	Subcode Q input terminal
47	SQCK	O	Neg	Subcode Q read clock input/output terminal
48	CLK	O	Neg	Serial data transmission clock output terminal
49	XLT	O	L	Command execution output terminal
50	MUT	O	H	Muting ON/OFF control output terminal / H=ON
51	OPEN	O	L	Tray open control output / H=STOP H=CLOSE L=OPEN L=disable
52	CLOSE			H L H L
53	VR-	O	L	Volume control output / H=STOP H=UP L=DOWN L=disable
54	VR+			H L H L
55	SENS	I	H/L	Interface of signal processor and microprocessor ICs
56	FOK	I	H	Focus OK input terminal / H=Focus OK
57	INSW	I	L	Tray close selection input terminal
58	OUTSW	I	L	Tray open selection input terminal
59	DOFF	O	H	Digital output control output / H=OFF
60	NRSCO	O	L	Remote control signal (RI) output terminal
61	NRSCI	I	H	Remote control signal (RI) input terminal
62	RMCN	I	L	Remote control signal input terminal
63	D0	I/O	H	Music file data signal & type control / H=USA L=Europe
64~70	D1~7			Music file data signal
71	VSS	I		Negative power supply
72	XTAL	O	CLK	Clock output terminal Unused Open
73	+5V			
74	C4M	I	CLK	System clock input terminal
75	+5V	I		Reference power supply terminal to check
76	-V	I		Negative power supply terminal for FL tube
77	LSR	O	L	Optical pickup control output terminal / L=ON
78	WR	O	L	Write signal for music file RAM
79	SFT	O	Neg	Shift clock of shift-resister for music file RAM address-bus
80	A4	O	H	Address-bus for music file RAM & Shift data for shift resister

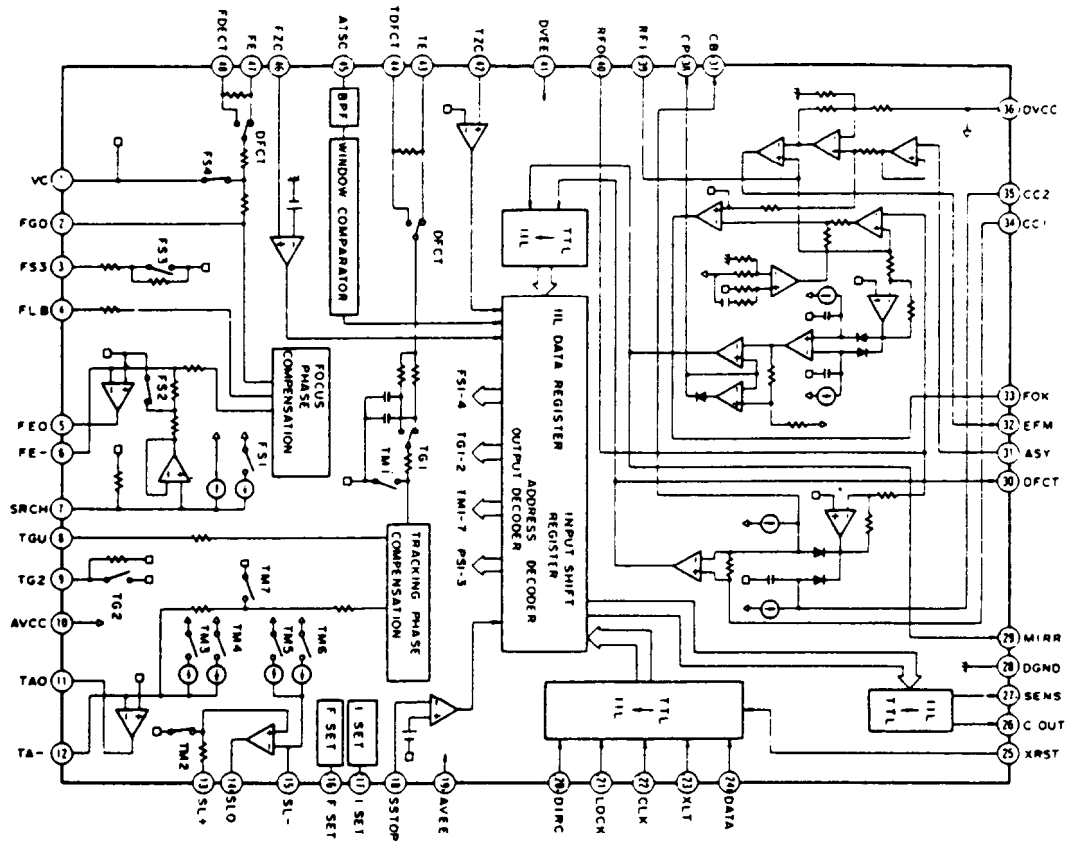
CXD2500BQ (Digital Signal Processor)



NO.	SYMBOL	I/O	DESCRIPTION	NO.	SYMBOL	I/O	DESCRIPTION
1	FOK	I	Focus Ok input	42	DA08	O	DA08 GFS output
2	FSW	O	Output filter changeover output for spindle motor	43	DA07	O	DA07 RFCK output
3	MON	O	Spindle motor control output	44	DA06	O	DA06 C2P0 output
4	MDP	O	Spindle motor servo control	45	DA05	O	DA05 XRAOF output
5	MDS	O	Spindle motor control	46	DA04	O	DA04 MNT 3 output
6	LOCK	O	H when GFS is the high level	47	DA03	O	DA03 MNT 2 output
7	NC			48	DA02	O	DA02 MNT 1 output
8	VCOO	O	Oscillation circuit output for analog EFM PLL.	49	DA01	O	DA01 MNT 0 output
9	VCOI	I	Oscillation circuit input for analog EFM PLL. (8.6436MHz)	50	APTR	O	Control output for aperture correction. H when R ch.
10	TEST	I	Test terminal	51	APTL	O	Control output for aperture correction. H when L ch.
11	PDO	O	Charge pump output analog EFM PLL	52	Vss		Ground terminal
12	Vss		Ground terminal	53	XTAI	I	Crystal oscillation circuit input of 16.9344MHz or 33.8688MHz input.
13-15	NC			54	XTAO	O	Crystal oscillation circuit output of 16.9344MHz.
16	VPCO	O	PLL charge pump output for variable pitch	55	XTSL	I	Crystal selection input terminal. L when 16.9344MHz. H when 33.8688MHz.
17	VCKI	I	Clock input for variable pitch from VCO (16.934MHz)	56	FSTT	O	2/3 divided output of pins 53 and 54.
18	FILO	O	Filter output for master PLL.	57	C4M	O	4.2336 MHz output
19	FILI	I	Filter input for master PLL.	58	C16M	O	16.9344 MHz output
20	PCO	O	Charge pump output of master PLL	59	MD2	I	Digital output control input. On at high level.
21	AVss		Analog ground	60	DOUT	O	Digital output
22	CLTV	I	VCO control voltage input for master	61	EMPH	O	Emphasis control output. Active high.
23	AVDD		Analog section power supply (+5V)	62	WFCK	O	Write frame clock output
24	RF	I	EFM signal input	63	SCOR	O	Sub-code detection output. H when is detected SO or SI.
25	BIAS	I	Asymmetry circuit constant current input	64	SBSO	O	Serial output of sub-code (P~W)
26	ASYI	I	Asymmetry comparator voltage input	65	EXCK	I	Clock input for read out SQSO.
27	ASYO	O	EFM full swing output	66	SQSO	O	Sub Q 80 bits, PCM peak, and level data 16 bits output.
28	ASYE	I	Asymmetry control circuit	67	SQCK	I	Clock input for read out SQSO
29	NC			68	MUTE	O	Muting control output. Active H.
30	PSSL	O	Audio data output mode changeover input Serial data at L and parallel data at H.	69	SENS		Sens output. Output to the microprocessor
31	WDCK	I	D/A interface for 48 bits slot. Word clock $f=2Fs$.	70	XRST	I	System reset. Reset at the low level.
32	LRCK	I	D/A interface for 48 bits slot. LR clock $f=Fs$.	71	DATA	I	Serial data input from the microprocessor.
33	VDD		Power supply terminal (+5V)	72	XLTA	I	Latch input from the microprocessor. Latch the serial data at the trailing.
34-49			Data output terminals	73	VDD		Power supply terminal
			PSSL=1	74	CLOK	I	Serial data transfer clock input from microprocessor
			PSSL=0	75	SEIN	I	Sens input from SSP
34	DA16	O	DA16	76	CNCI	I	Track jump numbers count signal input
35	DA15	O	DA15	77	DATO	O	Serial data output to SSP
36	DA14	O	DA14	78	XLTO	O	Serial data latch output to SSP. Latch at trailing.
37	DA13	O	DA13	79	CLKO	O	Serial data transfer clock output to SSP.
38	DA12	O	DA12	80	MIRR	I	Mirror signal input
39	DA11	O	DA11				
40	DA10	O	DA10				
41	DA09	O	DA09				

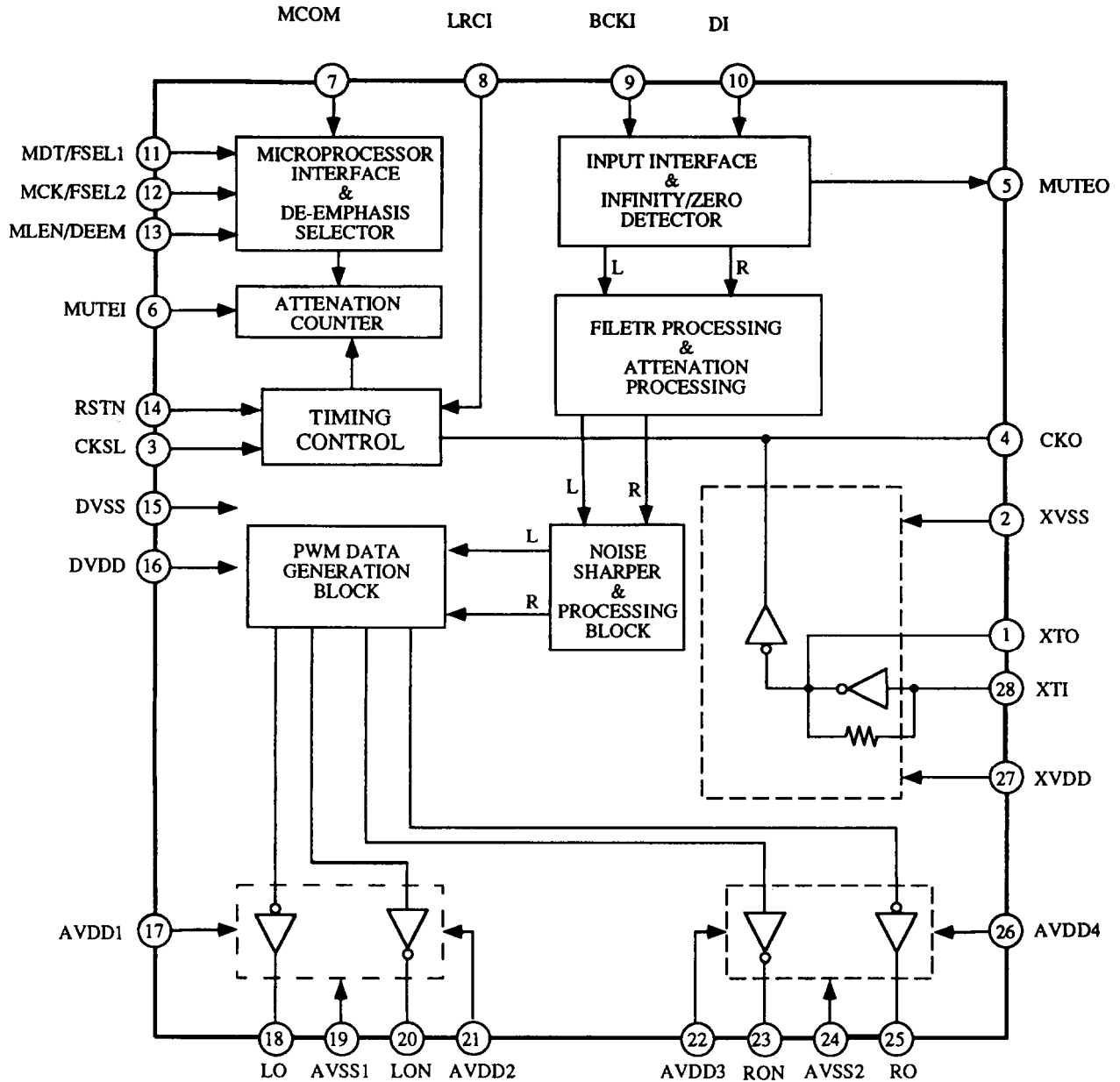
Note: SSP: IC101 CXA1372Q

CXA1372Q (Servo Signal Processor)



PIN NO.	SYMBOL	I/O	DESCRIPTION	PIN NO.	SYMBOL	I/O	DESCRIPTION
1	VC	I	Mid-point voltage input terminal.	23	XLT	I	Latch input terminal for microprocessor.
2	FGD	I	Connect the capacitor between FS3 and this pin when the high frequency gain focus servo is dropped.	24	DATA	I	Serial data input terminal for microprocessor.
3	FS3	I	Focus servo high frequency gain changeover input terminal.	25	XRST	I	Reset input terminal.Active low.
4	FLB	I	Input terminal for the low frequency boost of focus servo.	26	C.OUT	O	Signal output to count the track numbers.
5	FEO	O	Focus drive output terminal.	27	SENS	O	This terminal outputs FZC, and SSTOP to according command from the microprocessor.
6	FE-	I	Inversion input terminal of focus amplifier.	29	MIRR	O	Mirror comparator output terminal.
7	SRCH	I	Time constant terminal to make the focus search waveform.	30	DFCT	O	Defect comparator output terminal.
8	TGU	I	Tracking high frequency changeover input terminal.	31	ASY	I	Auto asymmetry control input terminal.
11	TAO	O	Tracking drive output terminal.	32	EFM	O	EFM comparator output terminal.
12	TA-	I	Inversion input terminal of tracking amplifier.	33	FOK	O	Focus OK comparator output terminal.
13	SL+	I	No-inversion input terminal of sled amplifier.	34	CC1	O	Defect bottom hold output terminal.
14	SLO	O	Sled drive output terminal.	35	CC2	I	Defect bottom hold input terminal from CC1.
15	SL-	I	Inversion input terminal of sled amplifier.	37	CB	I	Defect bottom hold capacitor connection terminal.
16	FSET	I	Peak setting input of phase correction of focus tracking.	38	CP	I	Mirror hold capacitor connection terminal.
17	ISET	I	This terminal is flowed the current so that the focus search, tracking jump, and sled kick height is decided.	39	RFI	I	RF summing amplifier input terminal.
18	SSTOP	I	Inner switch selection input terminal.	40	RFO	O	RF summing amplifier output terminal.
20	DIRC	I	This terminal is used when track jump.	42	TZC	I	Tracking zero-cross comparator input terminal.
21	LOCK	I	The sled runaway prevention circuit operates at the low level.	43	TE	I	Tracking error input terminal.
22	CLK	I	Serial data transfer clock input from microprocessor.	44	TDFCT	I	Capacitor connection terminal for time constant when defect.
				45	ATSC	I	Window comparator input terminal for ATSC detection.
				46	FZC	I	Focus zero-cross comparator input terminal.
				47	FE	I	Focus error input terminal.
				48	FDFCT	I	Capacitor connection terminal for time constant when defect.

SM5872CN (D/A Converter)



Pin No.	Terminal	I/O	Function	Pin No.	Terminal	I/O	Function
1	XTO	O	Resonator section	28	XTI	I	Resonator section
2	XVSS		Ground for resonator system	27	XVDD		5V for resonator system
3	CKSL	I		26	AVDD4		5V for analog section
4	CKO	O	Output clock of resonator section: 384fs	25	RO	O	R ch PWM output (+)
5	MUTEO	O	Infinity zero detector output	24	AVSS2		Ground for analog section
6	MUTEI	I	Muting output	23	RON	O	R ch PWM output (-)
7	MCOM	I	Interface switching control	22	AVDD3		5V for analog section
8	LRCI	I	Sampling rate clock of input data: H=L ch, L=R ch	21	AVDD2		5V for analog section
9	BCKI	I	Bit clock of input data	20	LON	O	L ch PWM output (+)
10	DI	I	Input data	19	AVSS1		Ground for analog section
11	FSEL1	I	Sampling frequency=44.1 kHz	18	LO	O	L ch PWM output (-)
12	FSEL2	I	When FSEL1.FSEL2, and MCOML are the low level.	17	AVDD1		5V for analog section
13	DEEM	I	De-emphasis control input	16	DVDD		5V for digital section
14	RSTN		System reset: L=Reset	15	DVSS		Ground for digital section

DISASSEMBLING PROCEDURES

1. Tray ass'y

Remove the top cover.

Remove the holder T and the retainer M.

Turn the power switch to ON.

Press the OPEN/CLOSE button to open the tray ass'y.

Remove the chucking ass'y.

Remove the stopper.

Press the tray stopper to the arrow mark direction and remove the tray ass'y.

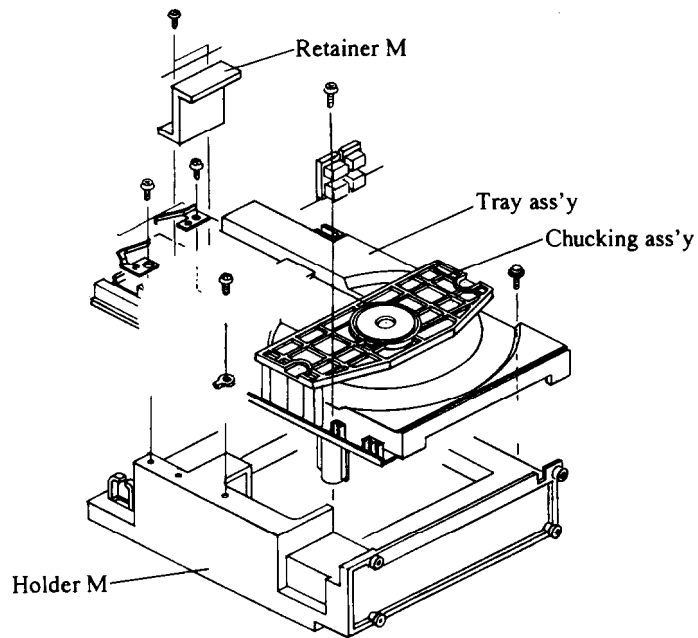


fig.1

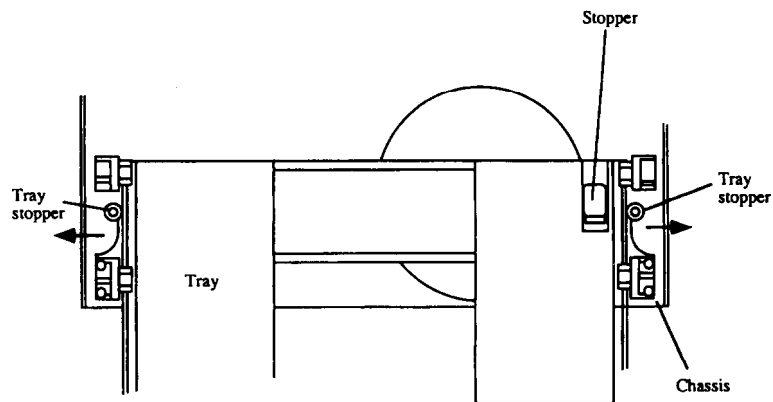


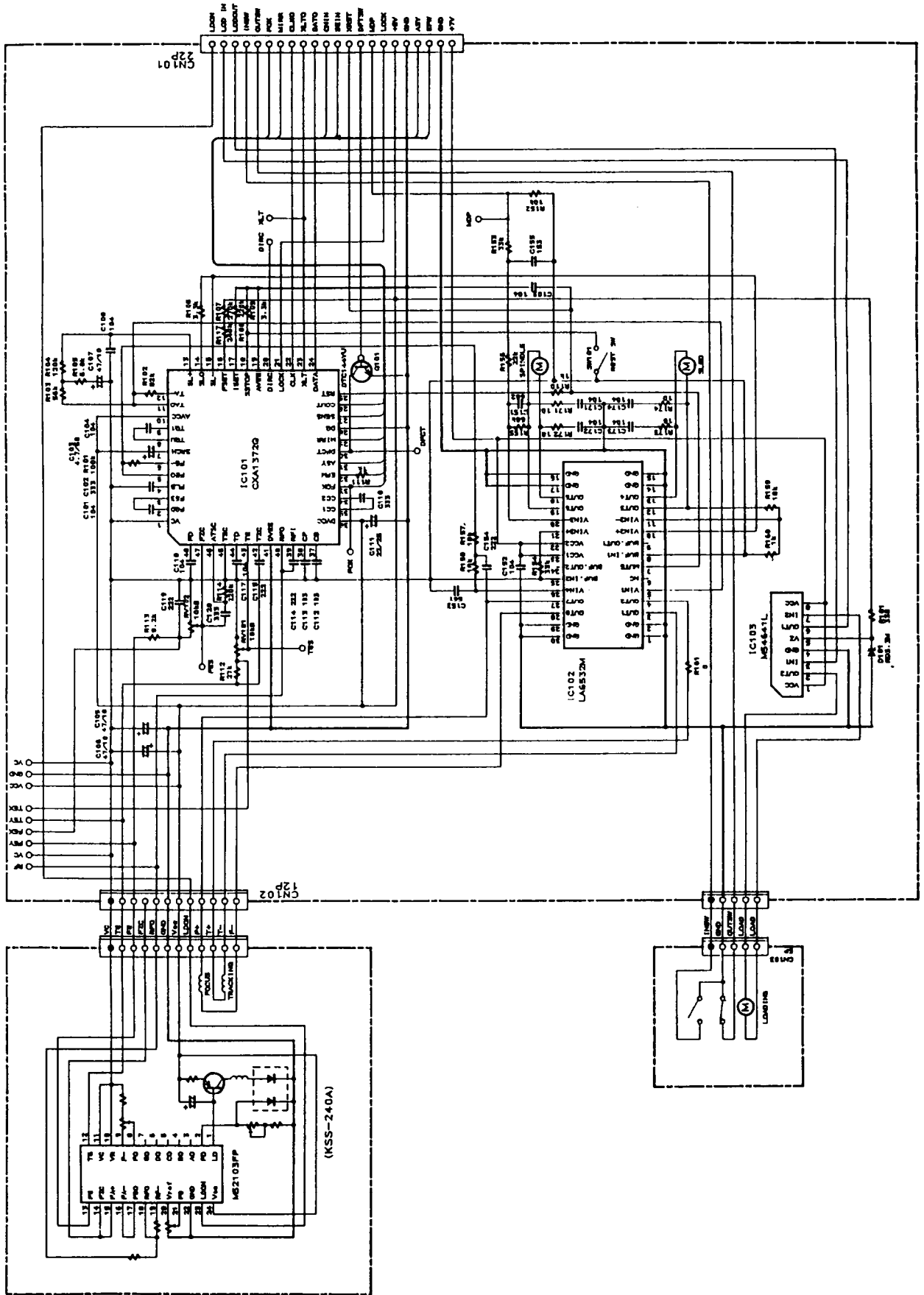
fig.2

2. CD mechanism ass'y

Remove the tray ass'y.

Remove the four screws holding the mechanism and the holder M.

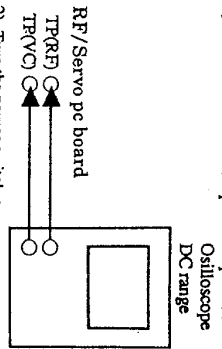
SCHEMATIC DIAGRAM MECHANISM BLOCK



ADJUSTMENT PROCEDURES

It is not necessary to perform the adjustment of optical pickup. This confirmation should be made when replacing the optical pickup.

- 1). Connect the oscilloscope to test points RF and VC.



- 2). Turn the power switch on.
- 3). Load the test disc YEDS-18 on the tray and press the play button.
- 4). Confirm that the waveform on the oscilloscope is optimum eye pattern and optimum level as shown photo 1.

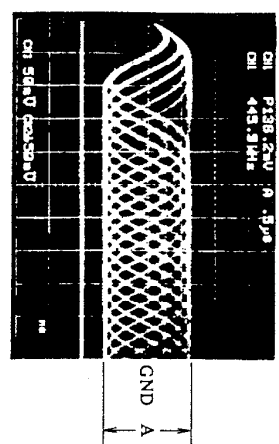


Photo 1

A=1.2±0.3Vp-p

REFERENCE

Focus/Tracking Gain Adjustment

A frequency response analyzer is necessary in order to perform this adjustment exactly. However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pickup follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

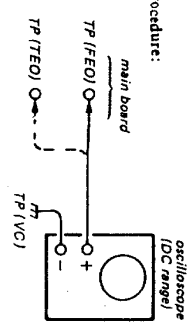
- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

Symptoms	Gain	Focus	Tracking
• The time until music starts becomes longer for STOP →PLAY or automatic selection (←▶) buttons pressed. (Normally takes about 2 seconds.)	low	low	low or high
• Music does not start and disc continues to rotate for STOP →PLAY or automatic selection (←▶) buttons pressed.)	—	—	low
• Sound is interrupted during PLAY. Or time counter display stops progressing.	—	—	low
• More noise during 2-axis device operation.	high	high	high

The following is a simple adjustment method.

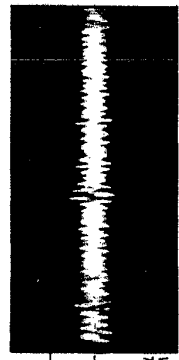
- Simple Adjustment -

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the simple adjustment are only a little different, return the controls to the original position.

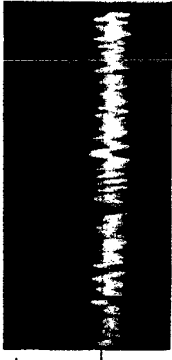


1. Keep the set horizontal. (If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2 axis device.)

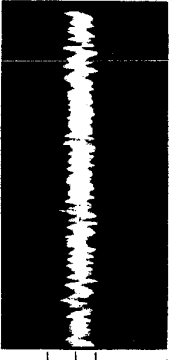
2. Insert disc (YEDS-18) and press ▷PLAY button.
3. Connect oscilloscope to RF/Servo board TP(FE).
4. Adjust RV102 so that the waveform is as shown in the figure below. (focus gain adjustment)



- Incorrect Examples (DC level changes more than on adjusted waveform)

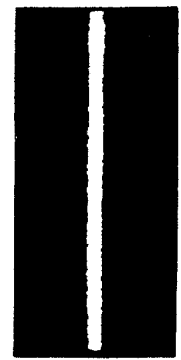


low focus gain



high focus gain

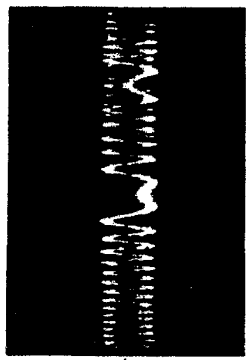
5. Connect oscilloscope to RF/Servo board TP (TE).
6. Adjust RV101 so that the waveform is as shown in the figure below. (tracking gain adjustment)



- Incorrect Examples (fundamental wave appears)

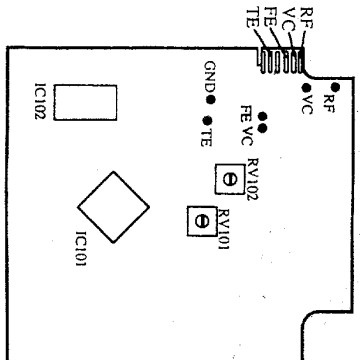


low tracking gain

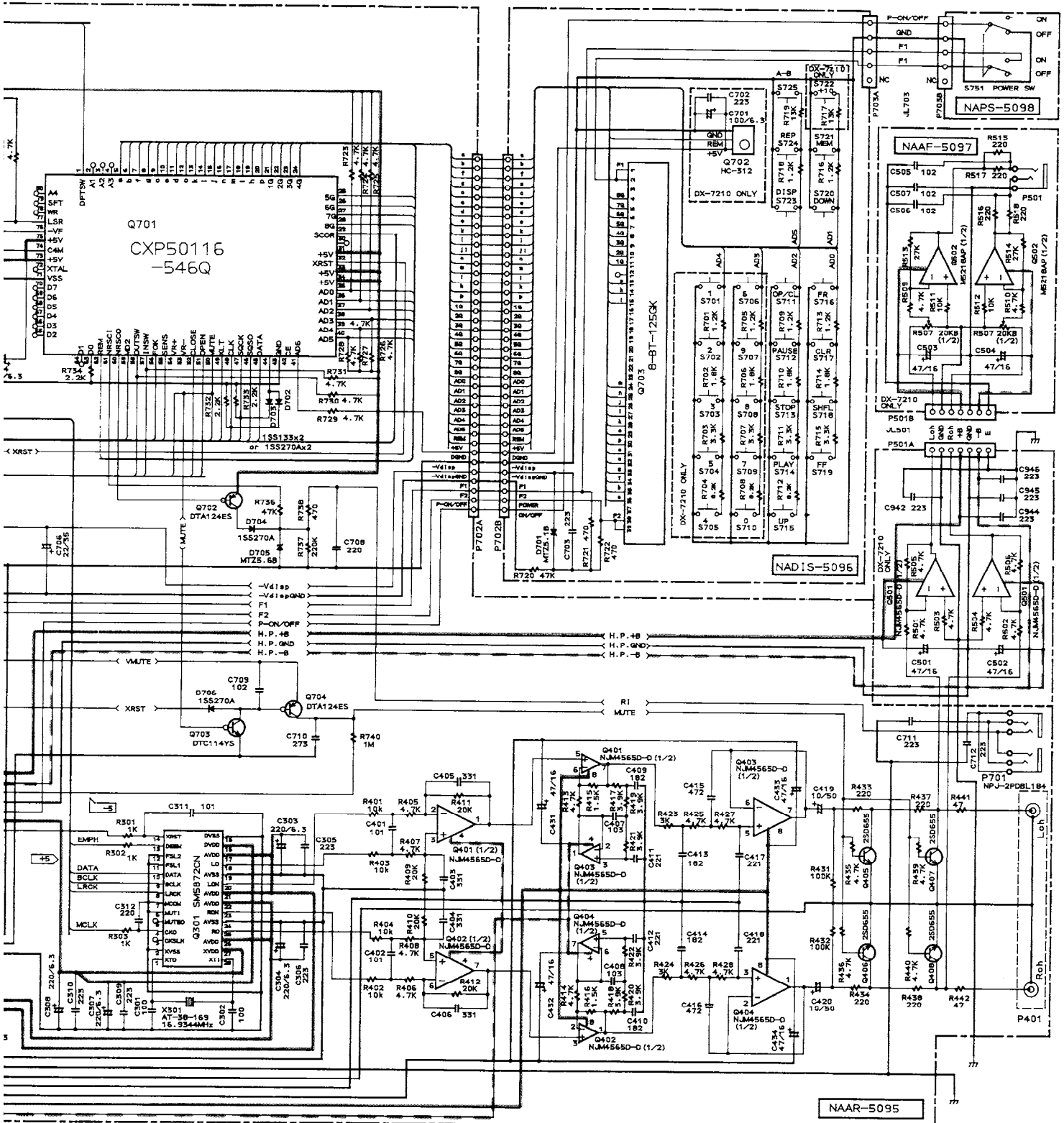


high tracking gain (higher fundamental wave than for low gain)

Adjustment Location: RF/Servo board



D E F G

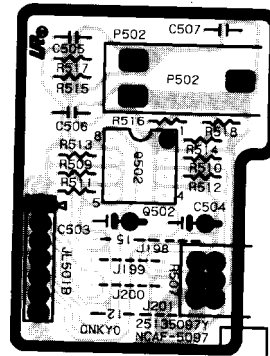


- (NOTE)**
- THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
 - VOLTAGE (MEASURED WITH VOLTMETER) IS DC VOLTAGE (NO INPUT SIGNAL).
 - ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
 - ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
 - ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
 - ELECTROLYTIC CAPACITORS (Φ) ARE IN μ F/V.
 - ALL CAPACITORS ARE IN P/F/50WV UNLESS OTHERWISE NOTED. EX330-030, E330-030, E330-030-031, D, D33A-033.
 - ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
 - THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EXAMINE PRINTING SIDE.
 - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

DX-7110 (B) MP, MPV
 DX-7210 (B) MD, MP, MPV
 MWT, MGK, MPA
 DX-7210 (S) MP, MPV
 RC-20279

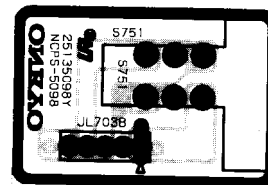
PRINTED CIRCUIT BOARD-PARTS LIST

P702A	25051225Y or 25050978Y Holder 27190754AY	NSCT-38P1015 or NSCT-38P765 HOLDER(FL)
P901A	25055675 25065425 27301216	NPLG-2P631, PLUG SCREW TRMM3 C COVER
pc board ass'y (NAAF-5097-2)		
Q502	22240369 Capacitor	M5218AP
C503,504	354744709TY Resistor	CE04W16V, 47M, ELECT
R507	5104301Y Jack	N09RGL20KB20F,VARIABLE
P502	25045255	YKB26-5009
pc board ass'y (NAPS-5098-2)		
S751	25035481Y	NPS-122-L443, PUSH SW



NCAF-5097

NOTE : THE COMPONENTS IDENTIFIED BY MARK
ARE CRITICAL FOR RISK OF FIRE AND
ELECTRIC SHOCK. REPLACE ONLY WITH
PART NUMBER SPECIFIED.



**POWER SWITCH PC BOARD
NC PS-5098**