


# ONKYO® SERVICE MANUAL

## COMPACT DISC PLAYER MODEL DX-M505

BHUD, BHUDN, BHUC

120V AC, 60Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  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

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 read-solomon code
Decoded bits:	8 bits linear
Digital filter:	352.8 kHz (8 times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5 Hz-20 kHz
Total harmonic distortion:	0.004% (at 1 kHz)
Dynamic range:	98 dB
Signal to noise ratio:	100 dB
Channel separation:	92 dB (at 1 kHz)
Wow and Flutter:	Below threshold of measurability
Output level:	2 volts r.m.s.
Power consumption:	13 watts
Dimensions (W × H × D):	455 × 120 × 306 mm 17-15/16" × 4-3/4" × 12-1/16"
Weight:	5.7 kg, 12.6 lbs.

Specifications are subject to change without notice.



**ONKYO**  
**AUDIO COMPONENTS**

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# SERVICE PROCEDURES

## 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.

# 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 EMMISION, 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: GaAS/GaAlAs
- Wavelength: 780nm
- Emission Duration: continuous
- Laser output: max. 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 LABEL

The label shown below are affixed.

### 1. Warning lable

This label is located on the arm of mechanism.

(A) **DANGER** —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM

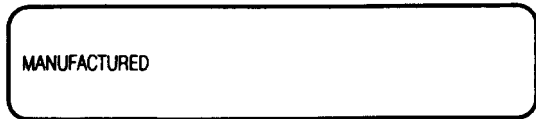
**CAUTION** —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED

**ATTENTION** —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L'ECLenchement DE SECURITE ANNULE.

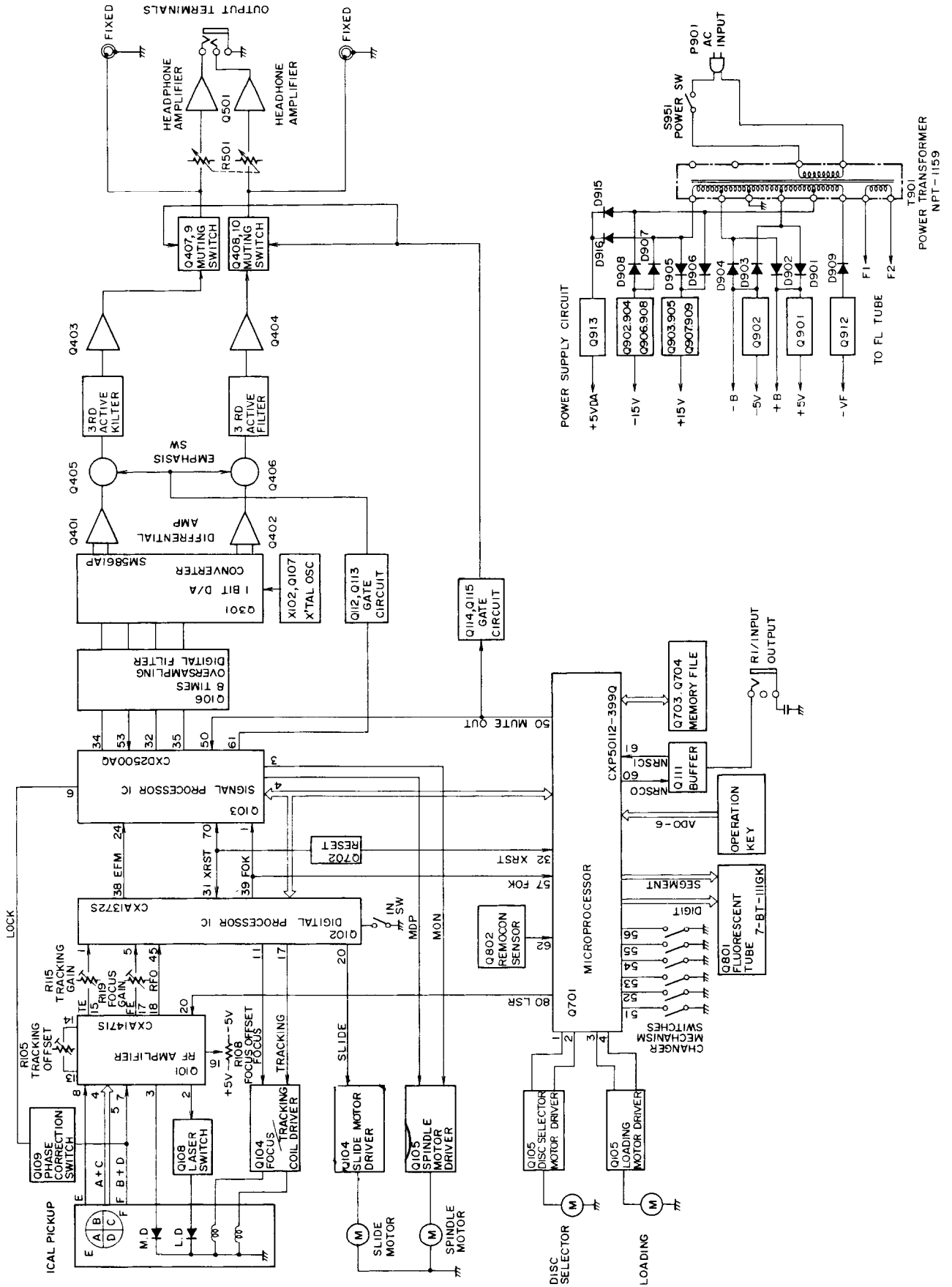
### 2. Certification label

This label is located on the back panel.

PRODUCT IS CERTIFIED BY THE MANUFACTURER TO COMPLY WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT THE DATE OF MANUFACTURE.

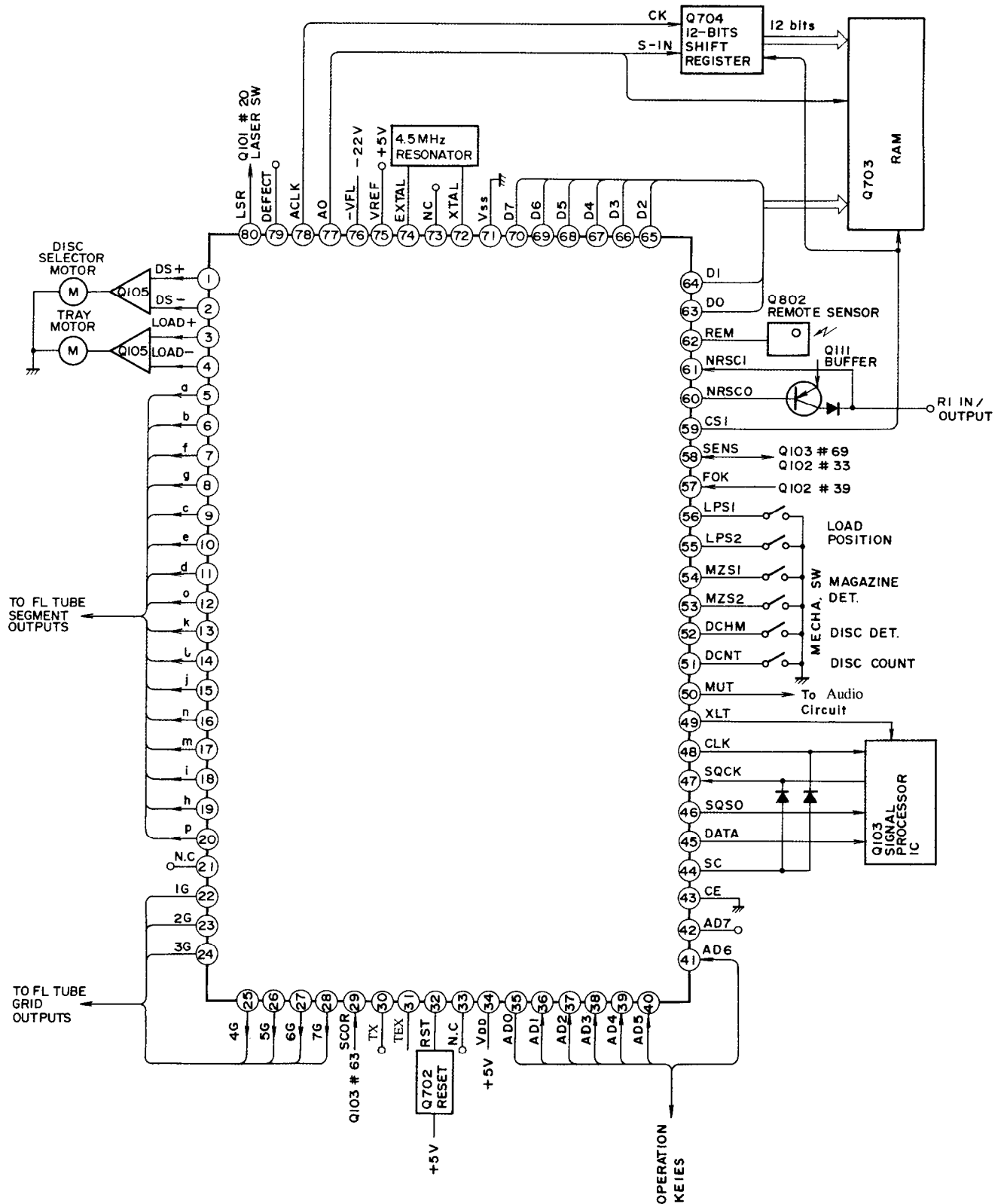


# BLOCK DIAGRAM

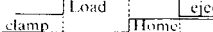


# MICROPROCESSOR CONNECTION DIAGRAM

## CXP50116-399Q (MICROPROCESSOR)

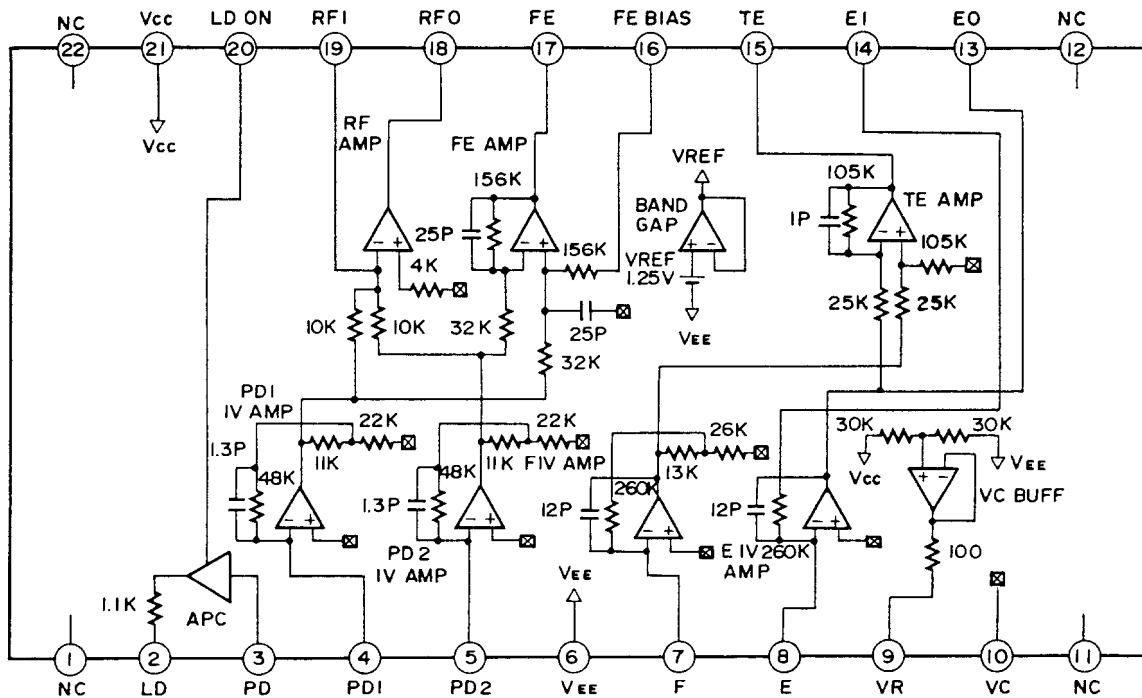


## Terminal Description

PIN.NO.	SYMBOL	I/O	DESCRIPTION	PIN.NO.	SYMBOL	I/O	DESCRIPTION
1	DS+	O	Disc selector UP/DOWN	41	AD6	I	Operation key input terminal
2	DS-	O	output terminals.	42	AD7	O	Emphasis control output. Not used.
3	LOAD+	O	Disc tray loading IN/OUT	43	EC	I	Not used.
4	LOAD-	O	output terminals.	44	SC	O	Clock supply terminal of serial transfer.
5	a	O	FL tube segment output.	45	DATA	O	Serial data output of command to signal processor IC.
6	b	O	FL tube segment output.	46	SQSO	I	Serial data input of sub code Q from signal processor IC.
7	f	O	FL tube segment output.	47	SQCK	O	Serial transfer clock of sub code Q to signal processor IC.
8	g	O	FL tube segment output.	48	CLK	O	Serial transfer clock of command to signal processor IC.
9	c	O	FL tube segment output.	49	XLT	O	Serial transfer latch to signal processor IC.
10	e	O	FL tube segment output.	50	MUT	O	Muting control signal.Active H.
11	d	O	FL tube segment output.	51	DCNT	I	Disc count pulse input terminal. 
12	o	O	FL tube segment output.	52	DCHM	I	Disc selector home switch input.
13	k	O	FL tube segment output.	53	MZS2	I	Magazine discrimination
14	l	O	FL tube segment output.	54	MZS1	I	switch input terminals. 
15	j	O	FL tube segment output.	55	LPS2	I	Load position
16	n	O	FL tube segment output.	56	LPS1	I	switch input 
17	m	O	FL tube segment output.	57	FOK	I	Focus OK input.
18	i	O	FL tube segment output.	58	SENS	I	Sense input from signal processor.
19	h	O	FL tube segment output.	59	CS1	O	Latch signal of chip enable/shift register of RAM
20	p	O	FL tube segment output.	60	NRSCO	O	NRSC output.
21	NC		Not used.	61	NRSCI	I	NRSC input.
22	1G	O	FL tube grid output.	62	REM	I	Not used.(Connect the ground.)
23	2G	O	FL tube grid output.	63	D0	I/O	Music file data input/output terminal
24	3G	O	FL tube grid output.	64	D1	I/O	Music file data input/output terminal
25	4G	O	FL tube grid output.	65	D2	I/O	Music file data input/output terminal
26	5G	O	FL tube grid output.	66	D3	I/O	Music file data input/output terminal
27	6G	O	FL tube grid output.	67	D4	I/O	Music file data input/output terminal
28	7G	O	FL tube grid output.	68	D5	I/O	Music file data input/output terminal
29	SCOR	I	Synchronizing signal detection of sub code frame.	69	D6	I/O	Music file data input/output terminal
30	TX	O	Not used.	70	D7	I/O	Music file data input/output terminal
31	TEX	I	Not used.	71	Vss		Ground terminal.
32	XRST	I/O	Reset terminal. L when power turns on.	72	XTAL	O	System clock output terminal.
33	NC			73	NC		
34	VDD		Power supply terminal (+5V)	74	EXTAL	I	System clock input terminal.
35	AD0	I	Operation key input terminal	75	Vref	I	Reference voltage supply terminal.
36	AD1	I	Operation key input terminal	76	-VFL	I	Negative power supply terminal for FL tube.
37	AD2	I	Operation key input terminal	77	A0	O	Shift data of A0 and shift register of RAM
38	AD3	I	Operation key input terminal	78	ACLK	O	Shift clock of write signal/shift register of RAM.
39	AD4	I	Operation key input terminal	79	DEFECT	O	Inhibiting signal of operation for defect circuit of servo IC
40	AD5	I	Operation key input terminal	80	LSR	O	Laser control output.On at low level.

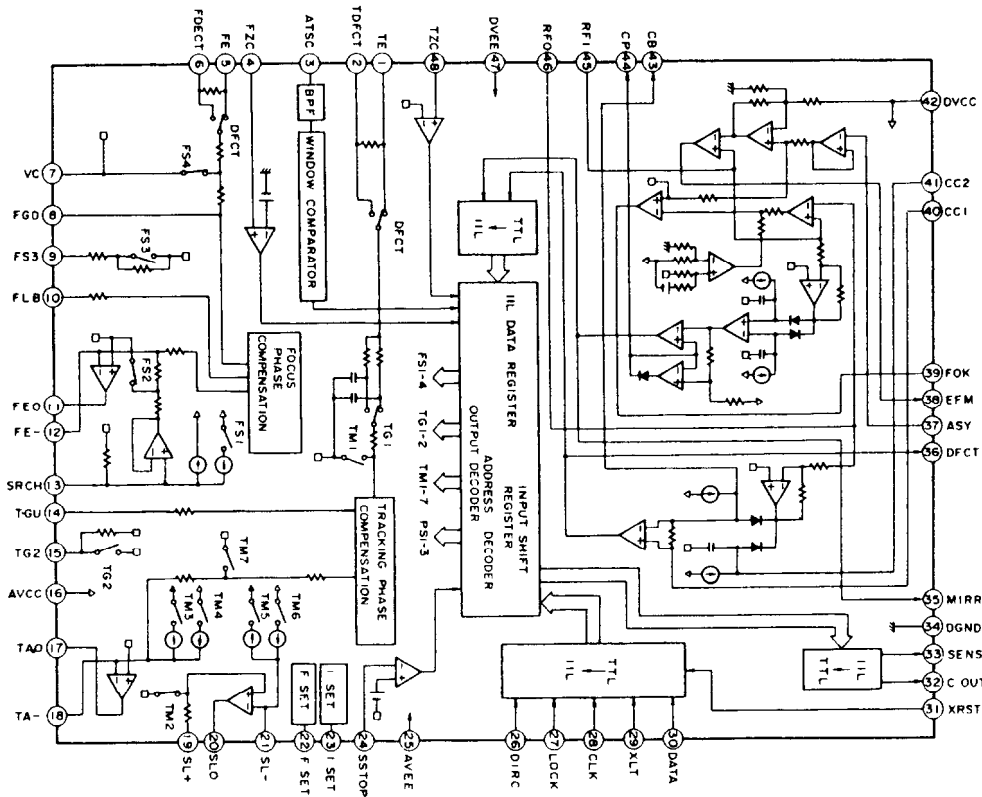
# IC BLOCK DIAGRAMS AND DESCRIPTIONS

## CXA1471S (RF amplifier)



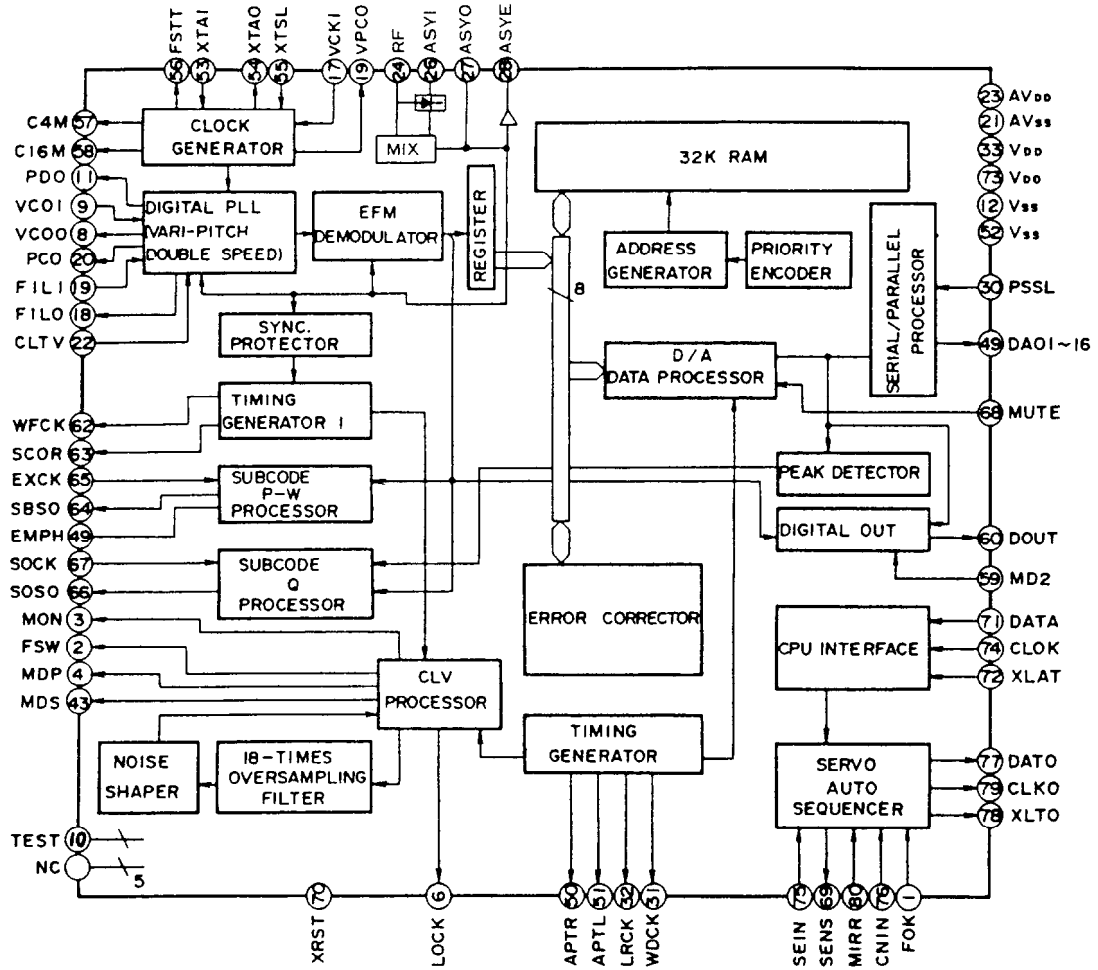
Pin No.	Symbol	Description
2	LD	Output terminal of APC LD amplifier APC:Automatic power control LD:Laser diode
3	PD	Input terminal of APC PD amplifier PD:Pin diode
4	PD1	Inversion input terminal of RF I-V amplifier (1).Connect to A+C of pin diodes.
5	PD2	Inversion input terminal of RF I-V amplifier (2).Connect to B+D of pin diodes.
6	VEE	Negative power supply terminal
7	F	Inversion input terminal of F I-V amplifier.Connect to F of pin diode.
8	E	Inversion input terminal of E I-V amplifier.Connect to E of pin diode.
9	VR	DC voltage output terminal of $(V_{CC}+V_{EE})/2$ .
10	VC	Ground terminal
13	EO	Output terminal of E I-V amplifier
14	EI	Feedback Input terminal of E I-V amplifier.Gain adjustment input of E I-V amplifier.
15	TE	Output terminal of tracking error amplifier
16	FE BIAS	Non-inversion bias terminal of focus error amplifier for CRM adjustment of focus error amplifier.
17	FE	Output terminal of focus error amplifier
18	RFO	Output terminal of RF summing amplifier
19	RFI	Input terminal of output signal of RF summing amplifier via the coupling capacitor
20	LD ON	ON/OFF control terminal of laser diode
21	VCC	Positive power supply terminal

## CXA1372S ( Servo Signal Processor )

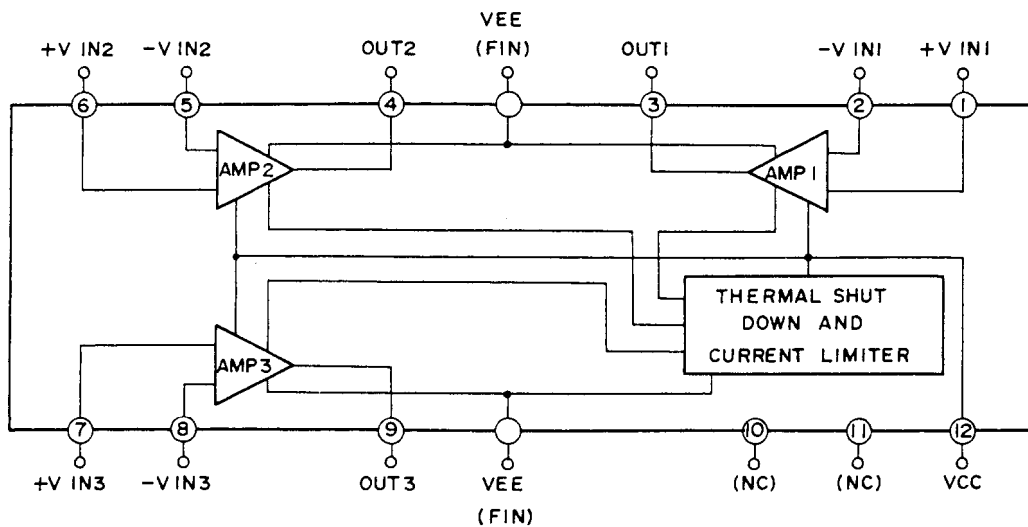


PIN. NO.	SYMBOL	I/O	DESCRIPTION	PIN. NO.	SYMBOL	I/O	DESCRIPTION
1	TE	I	Tracking error input terminal.	22	FSET	I	Peak setting input of phase correction of focus tracking.
2	TDFCT	I	Capacitor connection terminal for time constant when defect.	23	ISET	I	This terminal is flowed the current so that the focus search, tracking jump, and sled kick height is decided.
3	ATSC	I	Window comparator input terminal for ATSC detection.	24	SSTOP	I	Inner switch selection input terminal.
4	FZC	I	Focus zero-cross comparator input terminal.	26	DIRC	I	This terminal is used when a track jump.
5	FE	I	Focus error input terminal.	27	LOCK	I	The sled runaway prevention circuit operates at the low level.
6	FDFCT	I	Capacitor connection terminal for time constant when detect.	28	CLK	I	Serial data transfer clock input from microprocessor.
7	VC	I	Mid-point voltage input terminal.	29	XLT	I	Latch input from microprocessor.
8	FGD	I	Connect the capacitor between pin 9 and this pin when the high frequency gain of focus servo is dropped.	30	DATA	I	Serial data input from microprocessor.
9	FS3	I	Focus servo high frequency gain changeover input terminal.	31	XRST	I	Reset input terminal. Active low.
10	FLB	I	Input terminal for the low frequency boost of focus servo.	32	C. OUT	O	Signal output to count the track numbers.
11	FEO	O	Focus drive output terminal.	33	SENS	O	This terminal outputs FZC, and SSTOP to according command from microprocessor.
12	FE-	I	Inversion input terminal of focus amplifier.	35	MIRR	O	Mirror comparator output terminal.
13	SRCH	I	Time constant terminal to make the focus search waveform.	36	DFCT	O	Defect comparator output terminal.
14	TGU	I	Tracking high frequency gain changeover input terminal.	37	ASY	I	Auto asymmetry control input terminal.
15	TG2	I	Tracking high frequency changeover input terminal.	38	EFM	O	EFM comparator output terminal.
17	TAO	O	Tracking drive output terminal.	39	FOK	O	Focus OK comparator output terminal.
18	TA-	I	Inversion input terminal of tracking amplifier.	40	CC1	O	Defect bottom hold output terminal.
19	SL+	I	No-inversion input terminal of sled amplifier.	41	CC2	I	Defect bottom hold input terminal from CC1.
20	SLO	O	Sled (slide) drive output terminal.	43	CB	I	Defect bottom hold capacitor connection terminal.
21	SL-	I	Inversion input terminal of sled amplifier.	44	CP	I	Mirror hold capacitor connection terminal.
				45	RFI	I	RF summing amplifier input terminal.
				46	RFO	O	RF summing amplifier output terminal.
				48	TZC	I	Tracking zero-cross comparator input terminal.

### CXD2500AQ (Digital Signal Processor)



### LA6520 (Operational Amplifier)

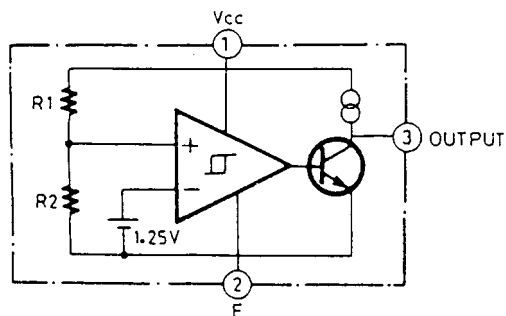




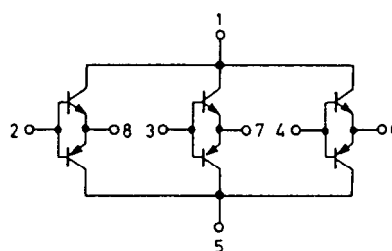
NO.	SYMBOL	I/O	DESCRIPTION	NO.	SYMBOL	I/O	DESCRIPTION
1	FOK	I	Focus OK input	42	DA08	O	DA08 GFS output
2	FSW	O	Output filter changeover output of spindle motor	43	DA07	O	DA07 RFCK output
3	MON	O	Spindle motor control output	44	DA06	O	DA06 C2P0 output
4	MDP	O	Spindle motor servo control	45	DA05	O	DA05 XRAOF output
5	MDS	O	Spindle motor servo control	46	DA04	O	DA04 MNT3 output
6	LOCK	O	H when GFS is high	47	DA03	O	DA03 MNT2 output
7	NC			48	DA02	O	DA02 MNT1 output
8	VCOO	O	Oscillation circuit output for analog FEM PLL	49	DA01	O	DA01 MNT0 output
9	VCOI	I	Oscillation circuit input for analog EFM PLL (8.6436MHz)	50	APTR	O	Control output for aperture correction. H when Rech.
10	TEST	I	Test terminal	51	APTI	O	Control output for aperture correction. H when L.ch.
11	PDO	O	Charge pump output for analog EFM PLL	52	Vss		Ground
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	XTSI	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 & 54
18	FIL0	O	Filter output for master PLL	57	C1M	O	4.2336MHz output
19	FIL1	I	Filter input for master PLL	58	C16M	O	16.9314MHz output
20	PCO	O	Charge pump output for master PLL	59	MD2	I	Digital output control input. On at H & Off at L.
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 H.
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 S0 or S1.
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 SBSO
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	I	Audio data output mode changeover input. Serial data at L and parallel data at H.	69	SENS	-	Sens output. Output to microprocessor
31	WDCK	O	D/A interface for 48 bits slot. Word clock f=2Fs.	70	XRST	I	System reset. Rest at low level.
32	LRCK	O	D/A interface for 48 bits slot. LR clock f=Fs.	70	DATA	I	Serial data input from microprocessor
33	VDD		Power supply terminal (+5V)	72	XLTA	I	Latch input from microprocessor. Latch the serial data at trailing.
34-49			Data output terminals	73	VDD		Power supply
			PSSL=1 PSSL=0	74	CLOCK	I	Serial data transfer clock input from microprocessor
34	DA16	O	DA16 Serial data of 48 bits slot	75	SEIN	I	Sens input from SSP
35	DA15	O	DA15 Bit clock of 48 bits slot	76	CNCI	I	Track jump numbers count signal input
36	DA14	O	DA14 Serial data of 64 bits slot	77	DATO	O	Serial data output to SSP
37	DA13	O	DA13 Bit clock of 68 bits slot	78	XLTO	O	Serial data latch output to SSP. Latch at trailing.
38	DA12	O	DA12 LR clock of 68 bits slot	79	CLKO	O	Serial data transfer clock output to SSP
39	DA11	O	DA11 GTOP output	80	MIRR	I	Mirror signal input
40	DA10	O	DA10 XUGF output				
41	DA09	O	DA09 XPLCK output				

Note:SSP:Q102 CXA1372S

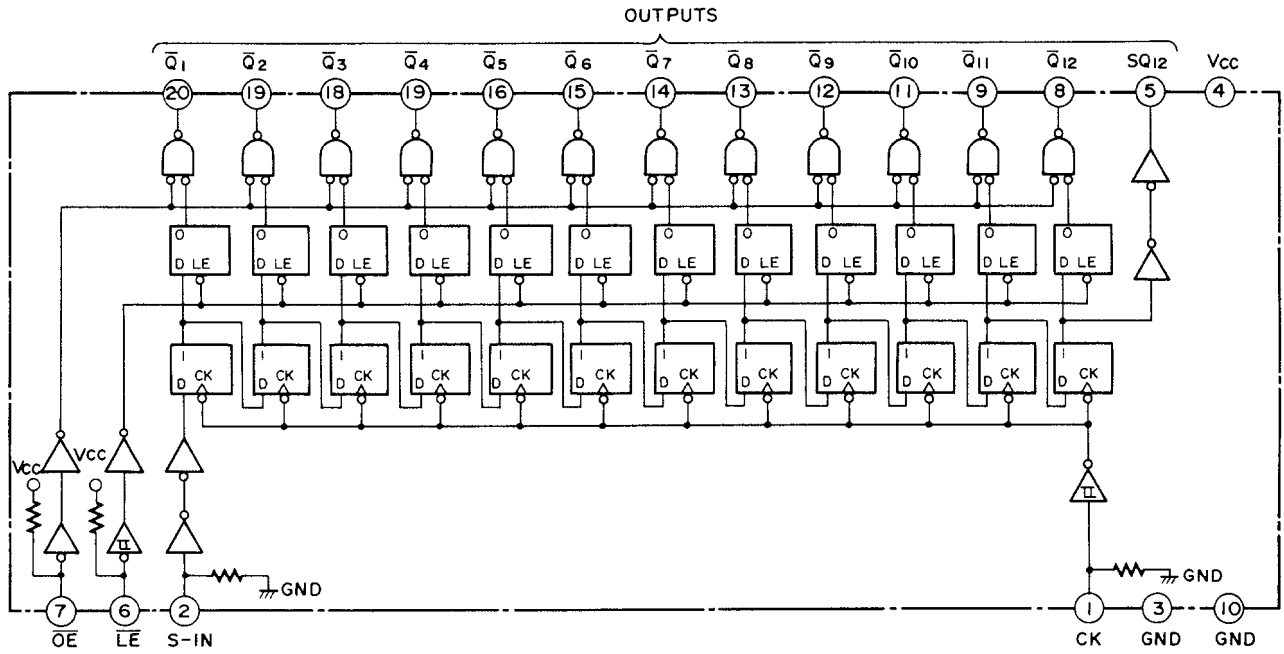
M51943ASL (System Reset)



STA341M-L (Transistor Array)



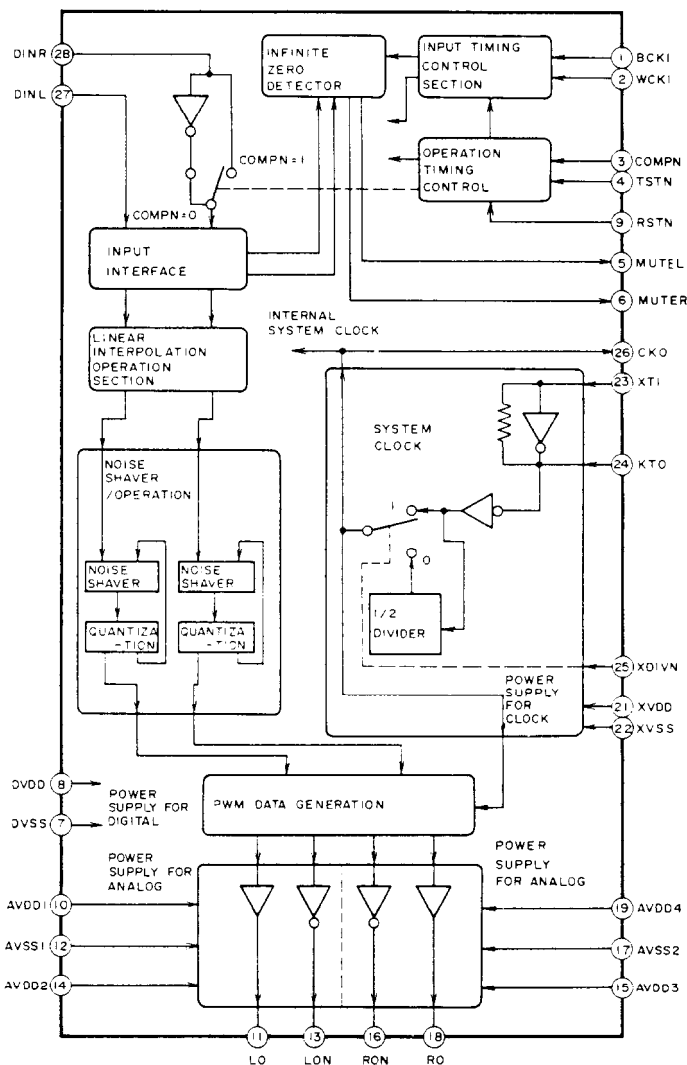
**M66320P (12 bit Shift Register with Output latch)**



**Truth table**

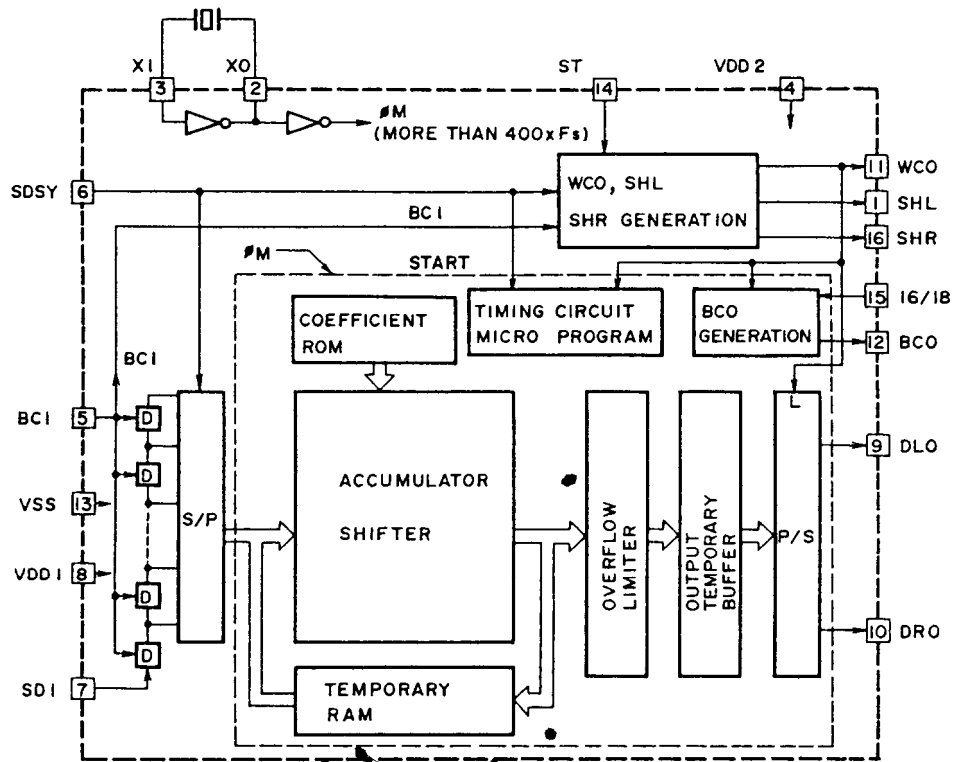
INPUT				OUTPUT												
CK	$\overline{LE}$	S-IN	$\overline{OE}$	$\overline{Q_1}$	$\overline{Q_2}$	$\overline{Q_3}$	$\overline{Q_4}$	$\overline{Q_5}$	$\overline{Q_6}$	$\overline{Q_7}$	$\overline{Q_8}$	$\overline{Q_9}$	$\overline{Q_{10}}$	$\overline{Q_{11}}$	$\overline{Q_{12}}$	SQ <sub>12</sub>
↑	H	H	L	L	$\overline{Q_1^0}$	$\overline{Q_2^0}$	$\overline{Q_3^0}$	$\overline{Q_4^0}$	$\overline{Q_5^0}$	$\overline{Q_6^0}$	$\overline{Q_7^0}$	$\overline{Q_8^0}$	$\overline{Q_9^0}$	$\overline{Q_{10}^0}$	$\overline{Q_{11}^0}$	$q_{11}^0$
↑	H	L	L	H	$\overline{Q_1^0}$	$\overline{Q_2^0}$	$\overline{Q_3^0}$	$\overline{Q_4^0}$	$\overline{Q_5^0}$	$\overline{Q_6^0}$	$\overline{Q_7^0}$	$\overline{Q_8^0}$	$\overline{Q_9^0}$	$\overline{Q_{10}^0}$	$\overline{Q_{11}^0}$	$q_{11}^0$
X	L	X	L	$\overline{Q_1^0}$	$\overline{Q_2^0}$	$\overline{Q_3^0}$	$\overline{Q_4^0}$	$\overline{Q_5^0}$	$\overline{Q_6^0}$	$\overline{Q_7^0}$	$\overline{Q_8^0}$	$\overline{Q_9^0}$	$\overline{Q_{10}^0}$	$\overline{Q_{11}^0}$	$\overline{Q_{12}^0}$	$q_{12}^0$
X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	$q_{12}$

## SM5861AP (D/A converter)



Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	BCKI	Serial input data bit clock	15	AVDD3	5V supply for analogue section
2	WCKI	Input data word clock	16	RON	Data output
3	COMPN	Mode select of PWM output	17	AVSS2	Ground for analogue section
4	TSTN	Test terminal	18	RO	Data output
5	MUTEL	Muting output for left channel	19	AVDD4	Ground for analogue section
6	MUTER	Muting output for right channel	20	NC	
7	DVSS	Ground for digital section	21	XVDD	5V supply for clock section
8	DVDD	5V power supply for digital section	22	XVSS	Ground for clock section
9	RSTN	Reset input	23	XTI	Crystal oscillator input
10	AVDD1	5V supply for analogue section	24	XTO	Crystal oscillator output
11	LO	Data output	25	XDIVN	System clock select
12	AVSS1	Ground for analogue section	26	CKO	Clock output
13	LON	Data output	27	DINL	Serial data input for left channel
14	AVDD2	5V supply for analogue section	28	DINR	Serial data input for right channel

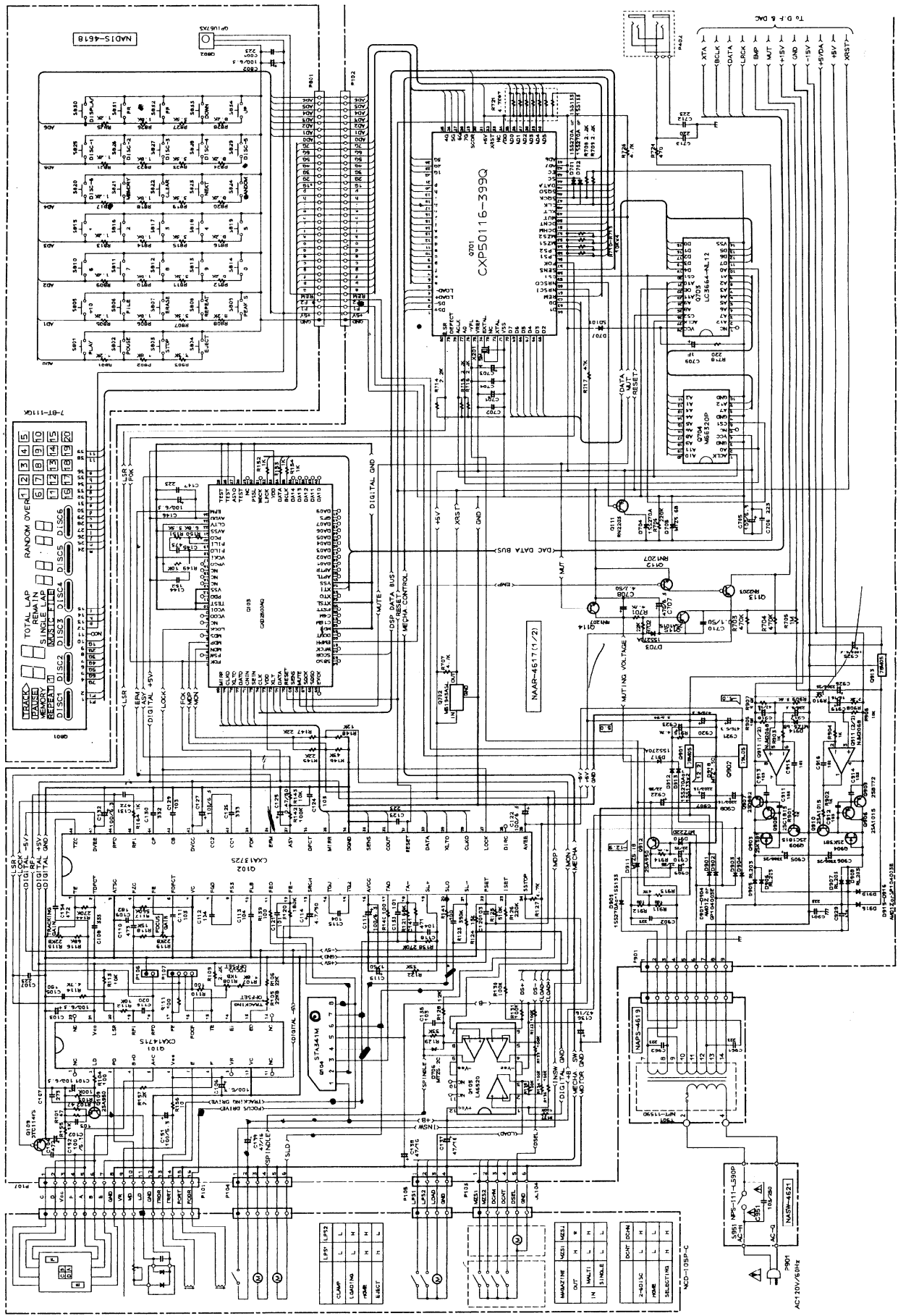
## YM3433 (18 bits/8 times Oversampling Digital Filter)



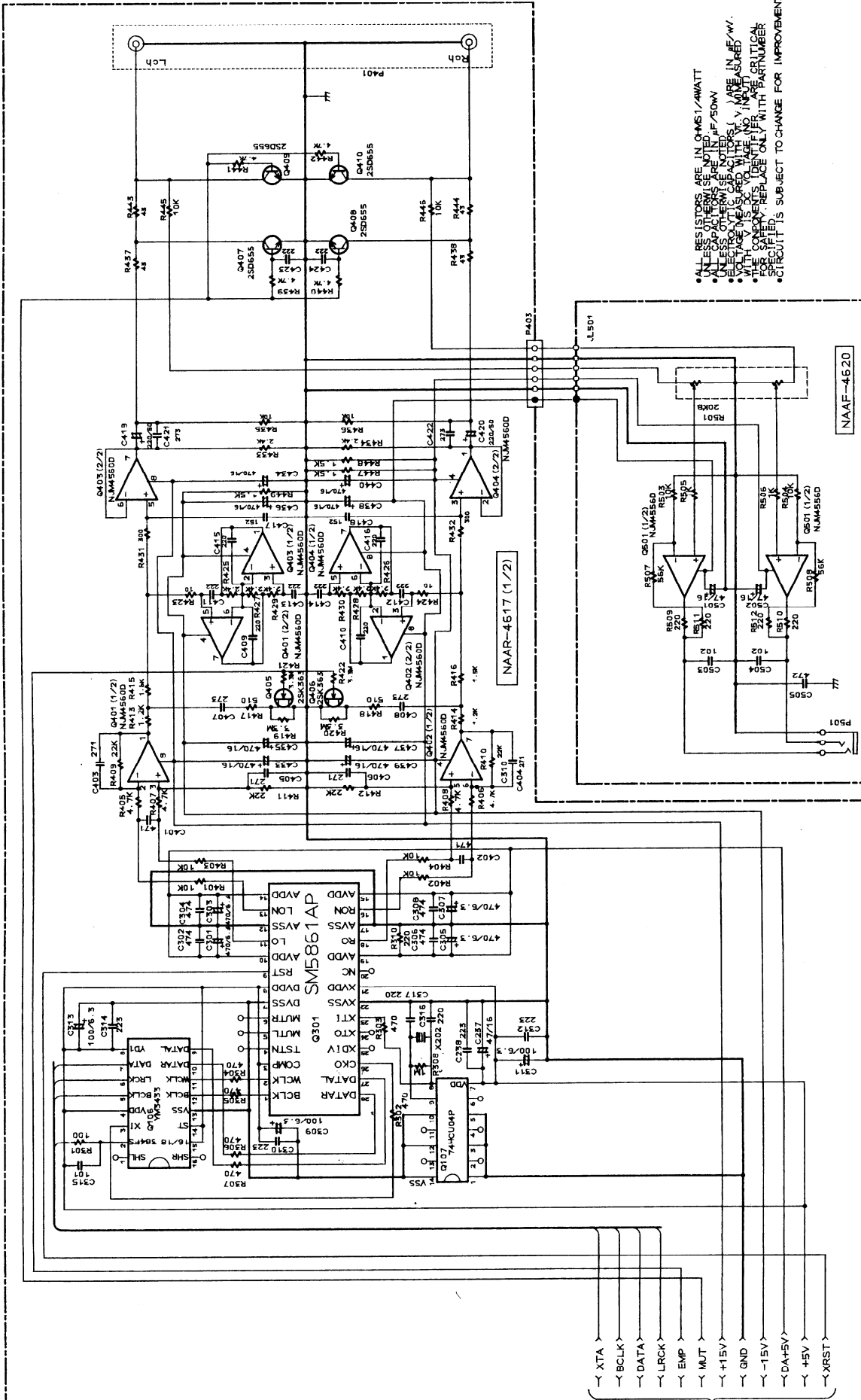
Pin No.	Terminal	Function
1	SHL	ST=L(1 DAC):L channel deglitch signal output. ST=H(2 DACs):L and R channels deglitch signal output. (Not used.)
2	X0	Connect the crystal oscillator for the system clock to these terminals.
3	XI	
4	VDD2	Power supply terminal for crystal oscillator and deglitch signal system.
5	BCI	Bit clock input terminal of input data.
6	SDSY	Clock input terminal to show the input timing and L/R channels partitioned of input data.
7	SDI	Data input terminal.
8	VDD1	Power supply terminal.(Connect to 5V.)
9	DLO	ST=L(1 DAC):L and R channels data output terminal. ST=H(2 DAC):L channel data output terminal.
10	DRO	R channel data output terminal.
11	WCO	Word clock output terminal for output data DLO/DRO.
12	BCO	Bit clock output terminal for output data DLO/DRO.
13	VSS	Ground terminal.
14	ST	1 DAC/2 DAC selection terminal.(1 DAC at low level and 2 DAC at high level.)
15	16/18	Bit number selection terminal.(16 bits at low level and 18 bits at high level.)
16	SHR	1 DAC(ST=L):R channel deglitch signal output.(Not used.)

A B C D E F G H

SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



- ALL RESISTORS ARE IN OHMS UNLESS NOTED OTHERWISE.
- ALL CAPACITORS ARE IN P.F. UNLESS NOTED OTHERWISE.
- ELECTROLYTIC CAPACITORS ARE IN MICROFARADS UNLESS NOTED OTHERWISE.
- VOLTAGE MEASURED WHILE NO INPUT SIGNAL IS APPLIED.
- THE COMPONENT IDENTIFIERS ARE CRITICAL. DO NOT REPLACE ANY PART NUMBER SPECIFIED. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- CIRCUITS SUBJECT TO CHANGE FOR IMPROVEMENT.

# PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD(NAAR-4617-1)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
				X'tal	
	ICs		X202	3010159	AT-38-169
Q101	22240618	CXA1471S		Ceramic resonator	
Q102	22240366	CXA1372S	X201	3010188	CTS4.50MGW040
Q103	22240487	CXD2500AQ		Capacitors	
Q105	22240620	LA6520	C101	393321017	100 $\mu$ F,6.3V,Elect.
Q106	22240321	YM3433	C103	393321017	100 $\mu$ F,6.3V,Elect.
Q107	222755	74HCU04P	C104,C131	374624724	4700pF $\pm$ 5%,50V,Plastic
Q301	22240520	SM5861AP	C106	393321017	100 $\mu$ F,6.3V,Elect.
Q401-Q404	222579	NJM4560D	C108	374623334	0.033 $\mu$ F $\pm$ 5%,50V,Plastic
Q701	22240643	CXP50116-399Q	C109	374621824	1800pF $\pm$ 5%,50V,Plastic
Q702	22240018	M51943A-SL	C110	374624734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
Q703	22240198	LC3664NL-12	C111,C120	374621034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
Q704	22240644	M66320P	C112,C113	374621044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
Q901,Q913	222780055MIT	M5F78M05L	C114	393380477	4.7 $\mu$ F,50V,Elect.
Q902	222790053	79L05	C115,C118	374621044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
Q912	222956	NJM2068D-D	C117	393321017	100 $\mu$ F,6.3V,Elect.
	Transistors		C119	393380107	1 $\mu$ F,50V,Elect.
Q104	22240168	STA341M-L	C122	393321017	100 $\mu$ F,6.3V,Elect.
Q108,Q912	2211503 or 2211504	2SA950-O or 2SA950-Y	C124	374621034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
Q109,Q112	221281 or	DTC114YS or	C125	393384797	0.47 $\mu$ F,50V,Elect.
Q114	2213570	RN1207	C126	374623334	0.033 $\mu$ F $\pm$ 5%,50V,Plastic
Q111,Q113	2212600 or 2213580	DTA124ES or RN2203	C127	393321017	100 $\mu$ F,6.3V,Elect.
Q115,Q906	2211454 or	2SA1015-Y or	C129	374621034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
Q910	2211455	2SA1015-GR	C130	374623324	3300pF $\pm$ 5%,50V,Plastic
Q405,Q406	2212524	2SK363-GR	C132	393321017	100 $\mu$ F,6.3V,Elect.
Q407-Q410	2211705 or 2211706	2SD655-E or 2SD655-F	C134	374624724	4700pF $\pm$ 5%,50V,Plastic
Q903,Q904	2212304	2SK381-D	C135	374621034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
Q905,Q909	2211255 or 2211254	2SC1815-GR or 2SC1815-Y	C136-C139	393344707	47 $\mu$ F,16V,Elect.
Q907	2201285 or 2201284	2SD882-Q or 2SD882-R	C144	374621524	1500pF $\pm$ 5%,50V,Plastic
Q908	2201275 or 2201274	2SB772-Q or 2SB772-R	C145	374624734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
	Diodes		C146	393321017	100 $\mu$ F,6.3V,Elect.
D701-D704	223163 or	1SS133 or	C151,C152	393321017	100 $\mu$ F,6.3V,Elect.
D909	223205	1SS270A	C301	393324717	470 $\mu$ F,6.3V,Elect.
D705,D914	224450562	MTZ5.6B	C302,C304	374724744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic
D706	224450623	MTZ6.2C	C303	393324717	470 $\mu$ F,6.3V,Elect.
D707	223191	SD101	C305	393324717	470 $\mu$ F,6.3V,Elect.
D901-D904	22380046	AM01Z	C306,C308	374724744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic
D905-D908	22380045	RL203	C307	393324717	470 $\mu$ F,6.3V,Elect.
D910	224452204	MTZ22D	C309	393321017	100 $\mu$ F,6.3V,Elect.
D911	224450512	MTZ5.1B	C311,C313	393321017	100 $\mu$ F,6.3V,Elect.
D912,D913	223163 or	1SS133 or	C407,C408	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
D917	223205	1SS270A	C411-C414	374722224	2200pF $\pm$ 5%,50V,Plastic
D915,D916	22380046	AM01Z	C417,C418	374721524	1500pF $\pm$ 5%,50V,Plastic
			C419,C420	393382217	220 $\mu$ F,50V,Elect.
			C421,C422	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
			C423,C424	374722224	2200pF $\pm$ 5%,50V,Plastic
			C427,C428	393343317	330 $\mu$ F,16V,Elect.
			C433-C440	393344717	470 $\mu$ F,16V,Elect.
			C701	393321017	100 $\mu$ F,6.3V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C703	393362207	22 $\mu$ F,35V,Elect.
C705	393321017	100 $\mu$ F,6.3V,Elect.
C707	393322227	2200 $\mu$ F,6.3V,Elect.
C708	393380477	4.7 $\mu$ F,50V,Elect.
C709	393381097	0.1 $\mu$ F,50V,Elect.
C710	3000058	1 $\mu$ F,5.5V,Super
C711	374622734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
C905,C906	393353327	3300 $\mu$ F,25V,Elect.
C907,C908	393342227	2200 $\mu$ F,16V,Elect.
C909,C910	393362207	22 $\mu$ F,35V,Elect.
C915,C916	374721024	1000pF $\pm$ 5%,50V,Plastic
C917	393322217	220 $\mu$ F,6.3V,Elect.
C918	393344707	47 $\mu$ F,16V,Elect.
C919	393341007	10 $\mu$ F,16V,Elect.
C920,C921	393324717	470 $\mu$ F,6.3V,Elect.
C922	393362207	22 $\mu$ F,35V,Elect.
C923	393380227	2.2 $\mu$ F,50V,Elect.
C925	393321027	1000 $\mu$ F,6.3V,Elect.
C926	393352227	2200 $\mu$ F,25V,Elect.
C929	374722244	0.22 $\mu$ F $\pm$ 5%,50V,Plastic
	Resistors	
R105	5210066	N06HR22KBD,Semi-fixed
R108	5210058	N06HR1KBD,Semi-fixed
R115,R119	5210066	N06HR22KBD,Semi-fixed
R721	49163472407	RM1/101J 4.7K $\times$ 7,Array
R725	49163103404	RM1/101J 10K $\times$ 4,Array
	Plugs	
P104	25055444	NPLG-6P426
P105	25055442	NPLG-4P424
P106	25055045	NPLG-4P33
P107	25055038	NPLG-2P29
	Jack	
P402	25045330	NPJ-2PDBL184
	Terminal	
P401	25045353	NPJ-2PDBL199,Output
	Sockets	
P101	25050848	NSCT-16P643
P102	25050865	NSCT-35P660
	25050271	NSCT-7P99
	Holder	
	27190751	


## DISPLAY CIRCUIT PC BOARD(NADIS-4618-1)


CIRCUIT NO.	PART NO.	DESCRIPTION
Q801	212078	7-BT-111GK,FL tube
Q802	24130007	GPIU571X,Remote control sensor
C802	353721019	100 $\mu$ F,6.3V,Elect. capacitor
S801-S834	25035548	NPS-111-S510,Push switches
P801	25050897	NSCT-35P692,Socket
	27190696	Holder L

## HEADPHONE AMPLIFIER PC BOARD(NAAF-4620-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q601	222654	NJM4556D,IC
C501,C502	393344707	47 $\mu$ F,16V,Elect. capacitor
R501	5104316	N09RGL20KB20F, Variable resistor
P501	25045139	HSJ-0540-01-010, Headphone jack

## POWER SWITCH PC BOARD(NASW-4621-1)

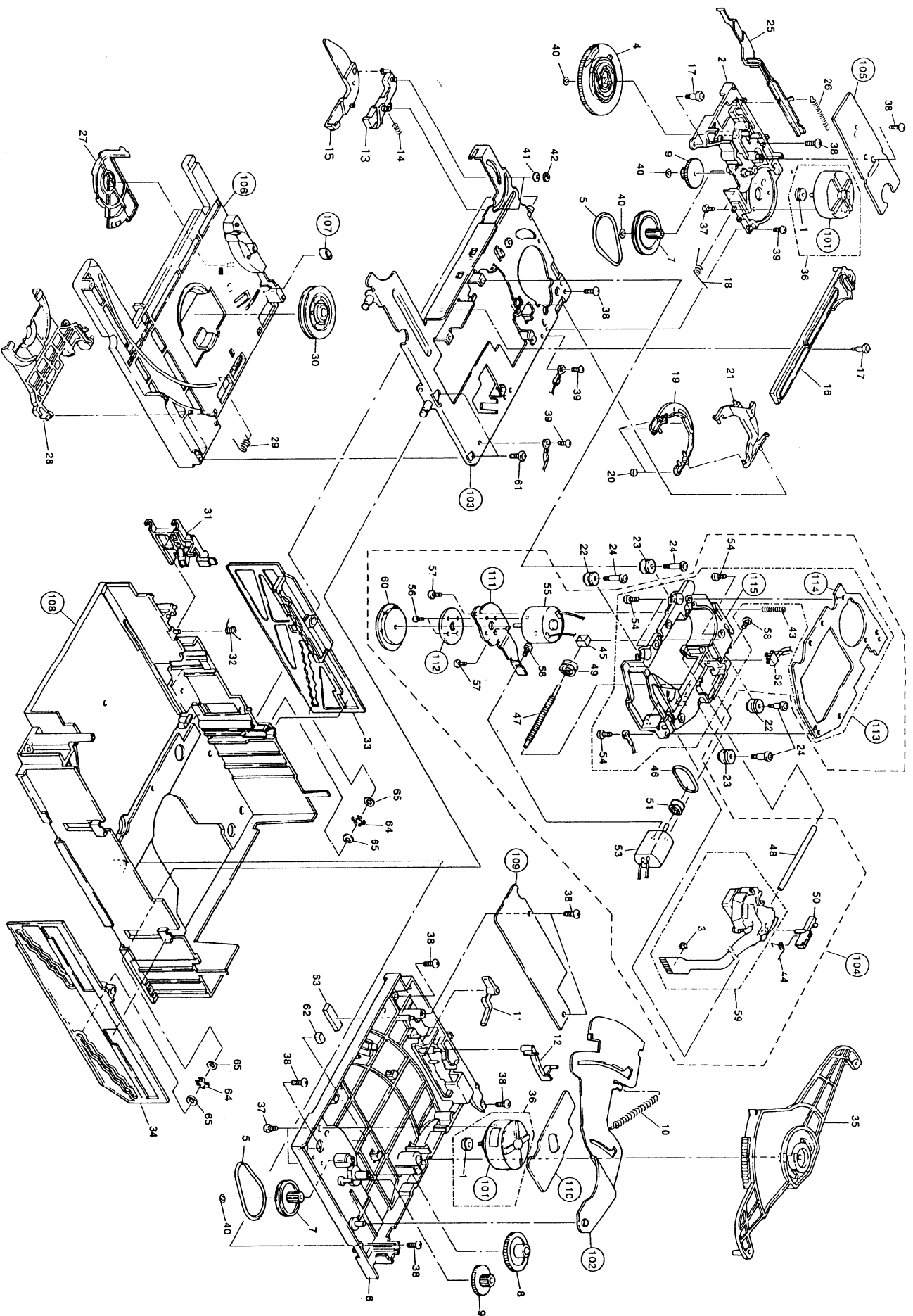
CIRCUIT NO.	PART NO.	DESCRIPTION
S951	25035636	 NPS-111-590P, Power switch

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



MECHANISM-EXPLODED VIEW

DX-M505 DX-M505



# PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
2	24840023	Gear holder	1	24810018	Motor pulley
4	24810013	Cam gear	43	24820015	Spring GND
5	24816006	Belt	44	24820016	Spring
6	24840024A	Top guide	45	24820017	Spring
7	24810014	Gear pulley	46	24602506	Belt
8	24810015	Gear S	47	24810019	Screw
9	24810016	Gear L	48	24828005	Guide bar
10	24820009	Eject spring	49	24506838	Pulley
11	24840025	Switch lever	50	24040044	Half nut
12	24840026	Seven bar	52	24840045	Push switch
13	24840027	Lever	53	24804007	Motor,carriage
14	24820010	Lever spring	54	833130088	3TTB+8B,Self-tapping screw
15	24840028	Lever	55	24804008	Motor,spindle
16	24840029	Drive plate	56	82912004	2N+4F,Screw
17	801516	Motor mounting screw	57	801423	Screw
18	24820011	Spring	58	82112003	2P+3F,Screw
19	24840030	Disc holder	59	24110014	Optical pickup
20	28140978	Cushion A	60	24806001	Disc table
21	24840031	Holder lever	66	24804009	DC motor
22	24509400	Floating rubber	111	24840047	Motor base
23	24818005	Floating rubber	112	24830002	Yoke M
24	801517	Floating screw	113	24802009	Mechanism base ass'y
25	24840032	Lever	114	24802010	Mechanism base
26	24820012	Spring	115	24802011	Mechanism chassis
27	24840033	Cam,clamper	105		Loading pc board ass'y
28	24840034	Holder,clamper		24840039	Push switch
29	24820013	Spring,clamper		24840040	Connector
30	24824002	Clamper	106	24802007A	Sub chassis
31	24840035	Lock lever	107	24818008	Rubber tube
32	24820014	Lock spring	108	24802008A	Main chassis
33	24840036	Steerer L	109		Selector pc board ass'y
34	24840037	Steerer R		24840039	Push switch
35	24840038	Synchronizing lever		24840041	Lead wire
36	24804006	Motor ass'y	110		Motor pc board ass'y
37	82112604	2.6P+4F,Pan head screw		24840042	Connector
38	833130080	3TTP+8P,Self-tapping screw		24840043	Pc board
39	838130068	3TTB+6B,Self-tapping screw			
40	24834007	Washer			
41	24834008	Washer			
42	8390251S	ES-2.5S,E ring			
61	831130080	3TTW+8P,Self-tapping screw			
62	24818006	Spacer			
63	24818007	Spacer			
64	24834009	Ring			
65	24834010	Washer			
102	24840046	Eject lever			
103	24802006A	Upper chassis			
104	24800005	Servo mechanism ass'y			

# ADJUSTMENT PROCEDURES

## Instruments required

Dual trace oscilloscope, Frequency counter, AF oscillator, Test disc (SONY YEDS-18), AC voltmeter, and Socket P4(Part no. 25050138)

### 1. Focus offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.

Connect the oscilloscope to terminal P107.

Adjust R108 until RF waveform as shown photo 1 becomes maximum.

When the amount of RF Signal is broad, set R108 to mechanical center.

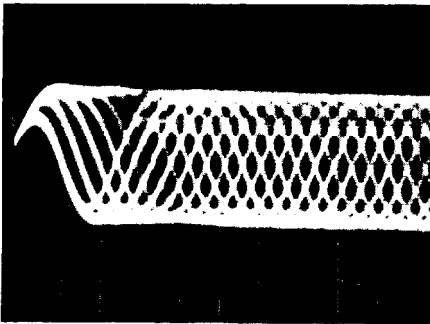
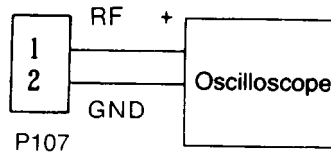


Photo 1



Oscilloscope range  
 Vertical : 0.5V/div.  
 Horizontal : 0.2 μs/div.  
 DC, Ground: Center

### 2. Tracking offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.

Turn R115 to minimum position.(Counter clockwise)

Connect the oscilloscope between pin 3 (TR) of P106 and pin 2 (GND) of P107.

Adjust R102 until the center of tracking error signal on the oscilloscope becomes GND level.

Turn R105 to the mechanical center.

After adjustment, disconnect the oscilloscope.

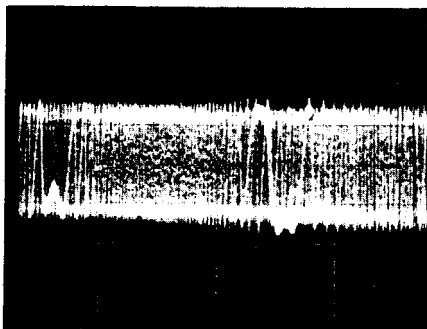
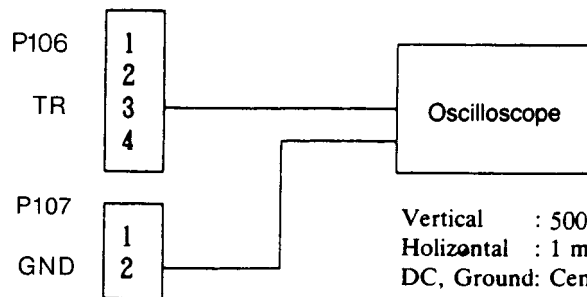


Photo 2



Vertical : 500mV/div.  
 Horizontal : 1 ms/div.  
 DC, Ground: Center

### 3. Focus gain adjustment

Set the output of AF oscillator to 800Hz, 1~1.5Vp-p.  
 Play the track 2 of test disc.  
 Connect the oscilloscope and the AF oscillator as shown below.

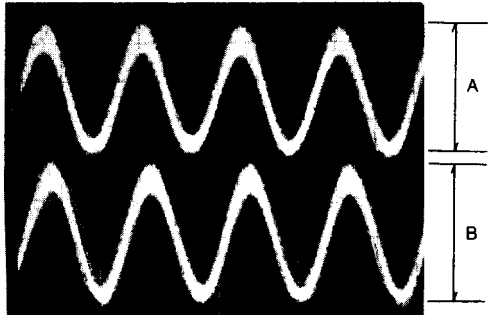
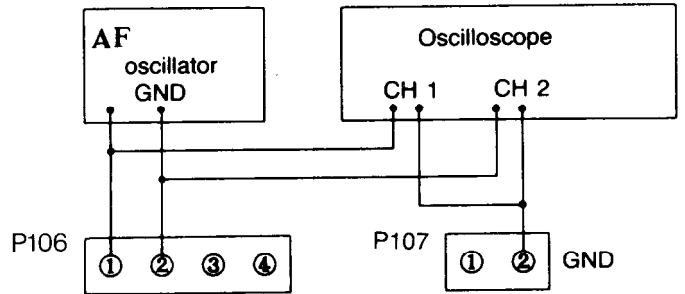


Photo 3



Vertical : 0.2V/div.  
 Horizontal: 0.5 ms/div.

Adjust R119 until 800Hz components of channels 1 and 2 on oscilloscope become same level.  
 After adjustment, disconnect the AF oscillator and the oscilloscope.

### 4. Tracking gain adjustment

Set the output of AF oscillator to 1.2kHz, 1~1.5Vp-p.  
 Play the track 2 of test disc.  
 Connect the oscilloscope and the AF oscillator as shown below.

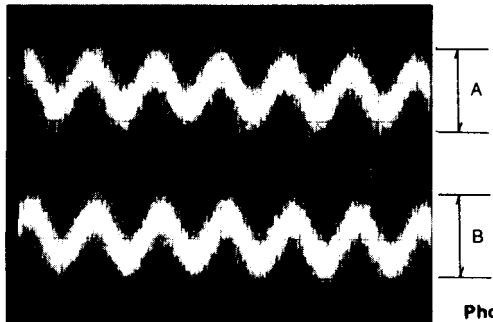
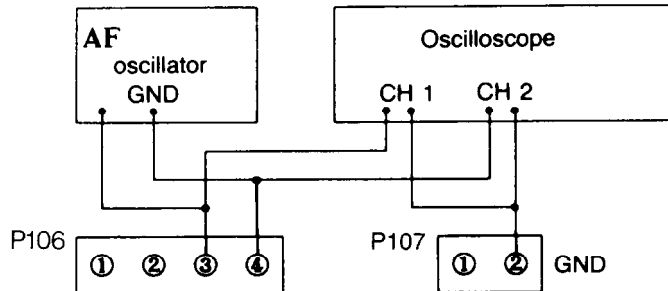


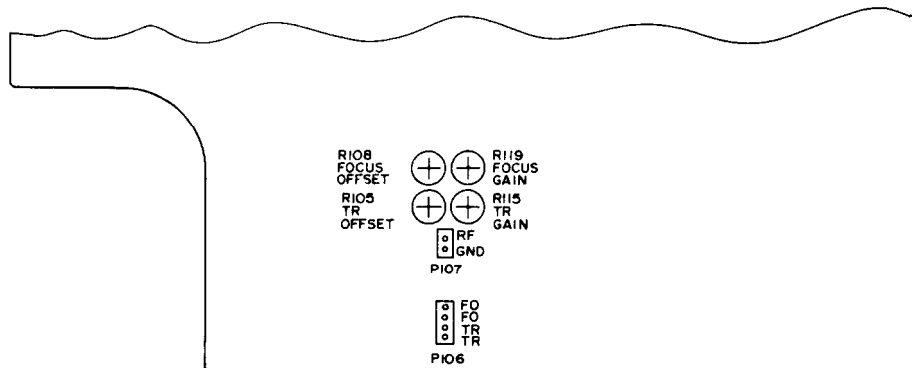
Photo 4



Vertical : 0.2V/div.  
 Horizontal: 0.5 ms/div.

Adjust R115 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.  
 After adjustment, disconnect the AF oscillator and the oscilloscope.

After adjustment, confirm that the center of tracking error signal becomes GND level.



**5. Grating adjustment**

WHEN REPLACING THE OPTICAL PICKUP ASS'Y ( PART NO. 24110014), IT IS NECESSARY TO CHECK THE GRATING ADJUSTMENT ON THE NEW PICKUP.

1. After replacing the optical pickup ass'y, disconnect the blue and green wires from connector P102 (P102 is located in the back right corner of the main PCB when the unit is viewed from the front.) Connect these 2 wires to a 1 1/2 volt battery (Blue + Green -) or 1 1/2 volt D.C. power supply. These wires go to the sled motor and now the optical pickup ass'y will begin to move. When the grating adjustment screw appears in the center of the oval slot on top of the mechanism (see Figure 5-1) stop the sled motor by disconnecting your battery or power supply. Leave the blue and green wires disconnected for now.

2. Per figure 5-2 connect a low pass filter consisting of a 39 kohm resistor and 0.001  $\mu$  F capacitor to pin 4 of P106 and pin 2 of P105. Connect a oscilloscope probe to this filter per figure 5-2.

3. Turn the power switch on and load a disc. (use SONY Test disc YEDS 18). The disc will start spinning. Adjust the grating screw for maximum amplitude of the waveform on the scope (3 to 4 V<sub>P-P</sub>). The adjustment range is very small so turn the screw driver slowly. The entire adjustment range is less than 1/2 of a screw turn. (See photo 5 for waveform)

4. Press the EJECT button to stop the disc. Reconnect the blue and green wires to P102 (Blue is the outermost pin and green 2nd in from the end.)

5. Play a disc. (NOTE: If the unit will not read the TOC then repeat steps 1 thru 4). If the grating adjustment is incorrect the optical pickup will produce an excessive amount of mechanical noise while the disc is playing. Disconnect your scope and filter from P106 and P105.

6. Reconnect the scope (no filter) to P105, probe to pin 1 RF and ground to pin 2 GND. While playing the last track of outermost edge of a TEST disc, using a 1.5 mm HEX wrench adjust the tangential adjustment screw for the clearest EYE PATTERN. See Photo 6 for waveform and Figure 5-4 for adjustment.

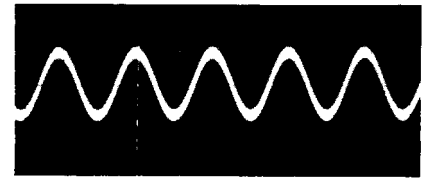
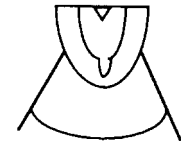


Photo 5



Adjustment Range

Fig. 5-3



Photo 6

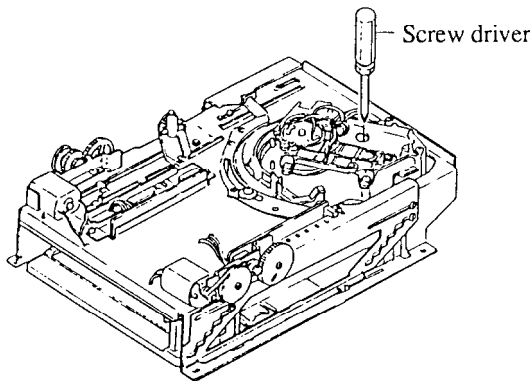
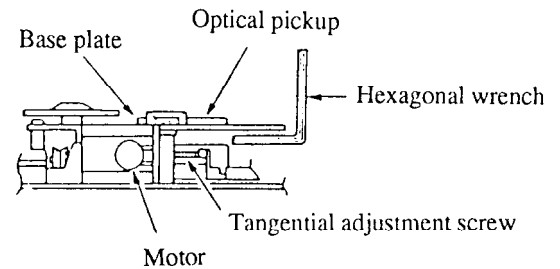


Fig. 5-1



In the figure below, the top and bottom is opposite to that of the actual product.

Tangential adjustment screw

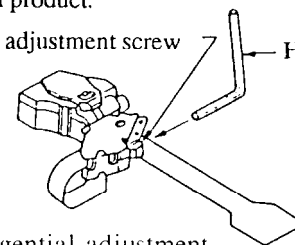


Fig. 5-4 Tangential adjustment

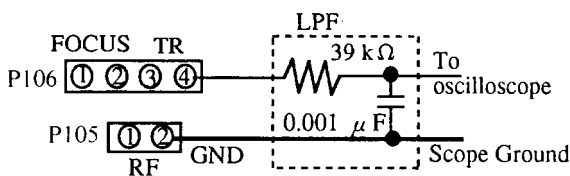
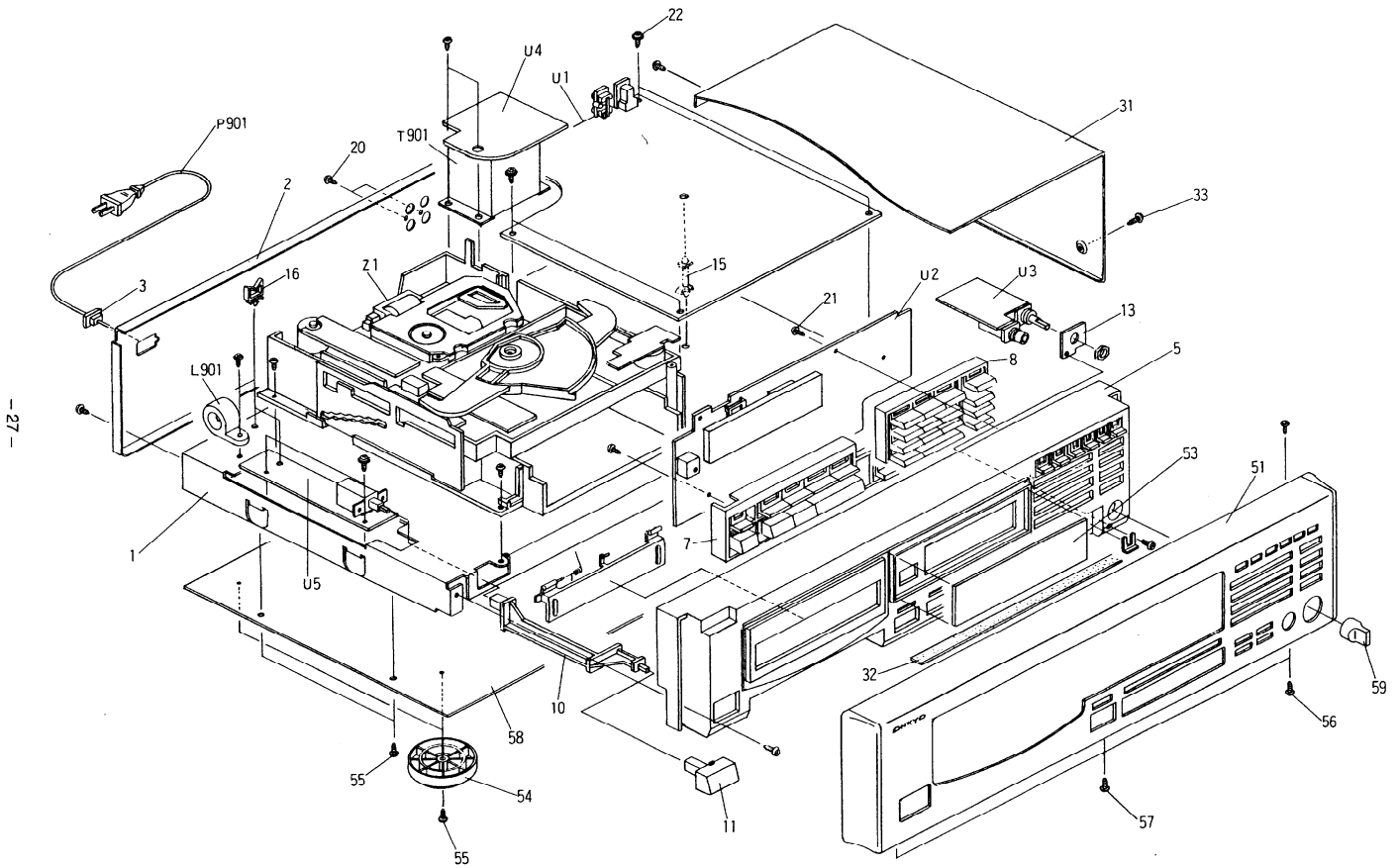


Fig. 5-2

# CHASSIS-EXPLODED VIEW

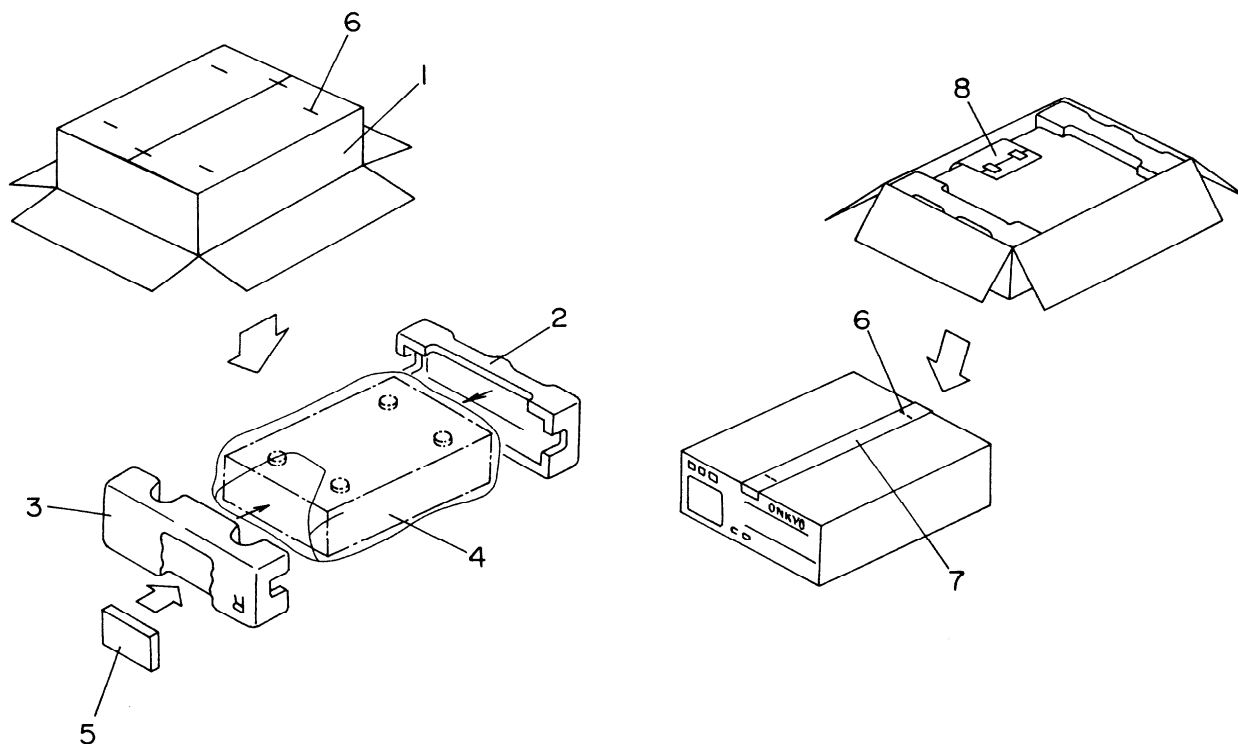


## PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	27100264	Chassis	54	27175254	Leg
2	27121675	Back panel	55	834430088	3TTS+8B(BC),Self-tapping screw
3	27300750	▲ Bushing,cord	56	834430080	3TTP+8P(BC),Self-tapping screw
5	27110746	Front bracket ass'y	57	834230108	3TTS+10B(Ni),Self-tapping screw
7	28324740	Knob,play	58	27170296A	Bottom panel
8	28324574	Knob,ten	59	28324492	Knob,level
10	27273100A	Joint	61	2041351010	NCFC1-351010,Flat cable
11	28324140	Knob,power	62	2061112140	Cord ass'y
13	27141578	Bracket,volume	63	29360807	Label,danger
14	27141576	Bracket IN	L901	230910	▲ ESD-R-25DB,Core
15	27190480	KGLS-8S,Holder	P901	253168 or 253146	▲ AS-UC-6#18,Power supply cord
16	27190541	WS-1NS,Holder,clamp	T901	2300870	▲ NPT-1159D,Power transformer
20	833430088	3TTS+8B(BC),Self-tapping screw	U1	1H211517-1	NAAR-4617-1,Main circuit pc board ass'y
21	833430080	3TTP+8P(BC),Self-tapping screw	U2	1H211518-1	NADIS-4618-1,Display circuit pc board ass'y
22	831130088	3TTW+8B,Self-tapping screw	U3	1H211520-1	NAAF-4620-1,Headphone amplifier pc board ass'y
23	834430068	3TTS+6B(BC),Self-tapping screw	U4	1H211519-1	NAPS-4619-,Power transformer pc board ass'y
31	28184479	Top cover	U5	1H211521-1	NASW-4621-1,Power switch pc board ass'y
32	28140837	Cushion	Z1	24506982	NCD-105P-C,Mechanism ass'y
33	834430088	3TTS+8B(BC),Self-tapping screw			
51	1H211701K	Front panel ass'y			
51a	28125226A	End cap L			
51b	28125227A	End cap R			
53	28191645	Clear plate			

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

# PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29052524	Master carton box
2	29091594A	Pad L
3	29091595A	Pad R
4	29100105	650×550, Vinyl bag
5	24506790A	KC-M6, Magazine
6	282301	Sealing hook
7	29110071	PP tape
8	Accessory bag ass'y	
	29341781	Instruction manual
	2010200	Cord RI
	2010098A	Connection cord
	24140239	RC-239C, Remote control transmitter
	3010054	UM-3, Two batteries
	29100097	Vinyl bag for accessory
	29365019A	Warranty card <N>
	29358002J	Service station list <N>

NOTE: <N>:U.S.A model only

## CAUTION ON REPLACEMENT OF PICK-UP

The laser diode in the optical pick-up 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  $10^6 \Omega$ ) 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.

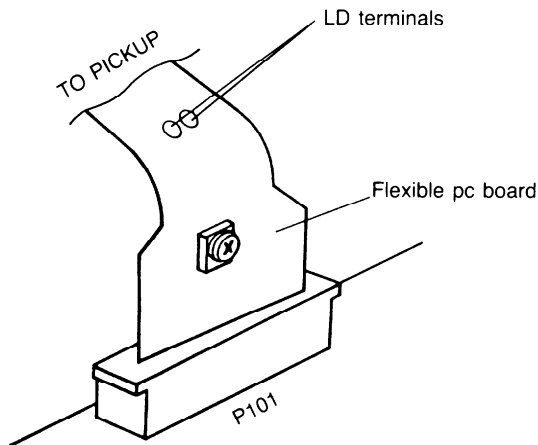
#### 3. Grounding for the human body.

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.



#### (Care should be taken with the optical pickup.)

The optical pickup is sensitive to static electricity, surge currents, and other high electrical noise, and because there is the possibility of damage to performance, in the handling of the pickup, the utmost care must be taken, particularly with regard to static electricity.

1. When replacing the optical pickup, first short the LD terminals and remove the connector. Also, when attaching the new optical pickup, after attaching the connector, unsolder the LD terminals.
2. Do not touch the optical pickup object lens with the hands.

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