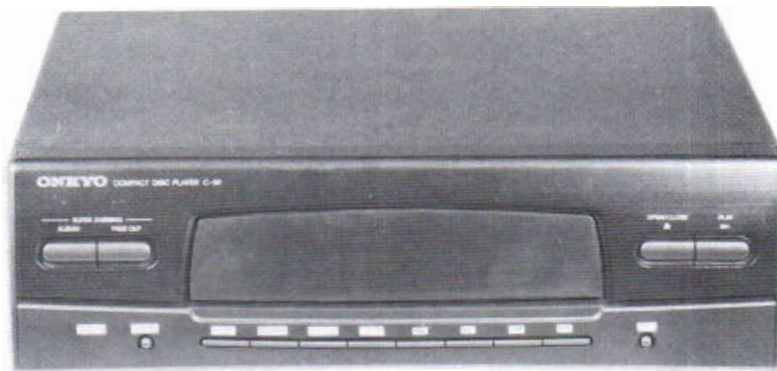


# ONKYO® SERVICE MANUAL


## COMPACT DISC PLAYER MODEL C-30



Black and Silver models

MD, MDN, BHMD, BHMDN	120V AC, 60Hz
MP, MPV, MPF, BHMP, BHMPV, BHMPF	230V AC, 50Hz
MW, BHMW	120/220V AC, 50/60Hz
MQA, BHMQA	240V AC, 50Hz

### 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 PART 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:	1.2~1.4m/s
Error correction system:	Cross interleave readsolomon code
D/A converter:	1 bit PWM
Sampling frequency:	352.8kHz (8 times oversampling)
Number of channels:	2 (Stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.005% (at 1kHz)
Dynamic range:	96dB
Signal to noise ratio:	96dB
Channel separation:	90dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power consumption:	9 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	275×85×307mm (10-13/16"×3-3/8"×12-1/16")
Weight:	3.4kg, 7.5lbs.

Specifications are subject to change without notice.



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## NOTE ON COMPACT DISC

### ● Holding Compact Discs

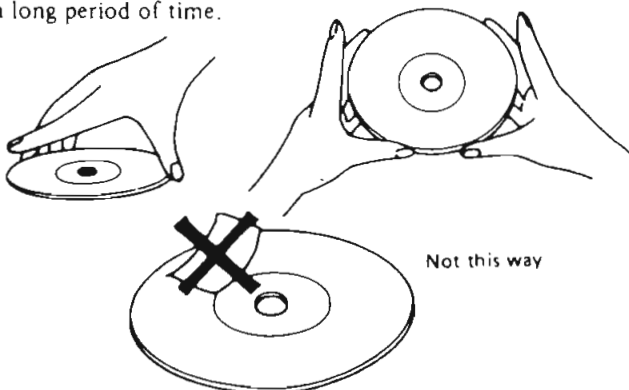
Hold Compact Discs by the edges so that you do not touch the surface of disc. Remember that the side of the disc with the "rainbow" reflection is the side containing the audio information.

Do not attach tape or paper to the label side of the disc and always be careful not to leave fingerprints on the side that is played.

### ● Storing Compact Discs

Store Compact Discs in a location protected from direct sunlight, high heat and humidity and extremely high and low temperatures. Discs should never be left in the trunk or interior of an automobile in the sun since the temperature can become very high in such a closed environment.

Always store Compact Discs in the holders in which they were sold. Never leave a disc in the player's disc holder for a long period of time.



## 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.

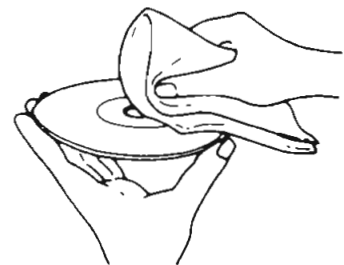
Confirm that the switch has been moved all the way to the right or left before turning the power switch on.



### ● Cleaning Compact Discs

Before playing a disc wipe off the playing surface with a soft cloth to remove dust and other soil. Wipe the surface in straight lines from the center of the disc outward, not in a circular motion as you would with a phonograph record.

Do not use benzene, chemical cleansers or phonograph record cleaning solutions to clean Compact Discs. Also avoid static electricity prevention solutions since they can damage the surface of Compact Discs.



### Problems Caused by Dew

Dew can form inside a Compact player when it is brought from a cold environment into a warm room, when a room is rapidly heated and if a player is left in a humid environment.

This dew can prevent the laser pickup from reading the data contained in the pits in the disc surface. If the player does not operate properly because of dew, remove the disc and leave the player's power switch on for about one hour to remove all moisture.

## 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.)

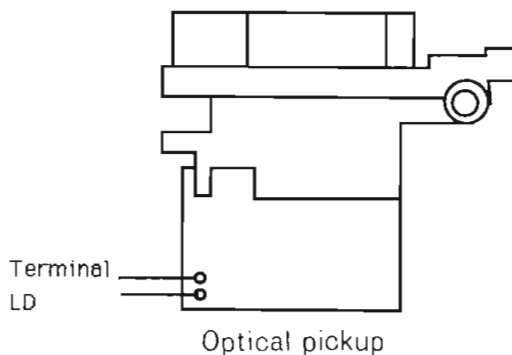
### PRECAUTIONS

- |   |   |
|---|---|
| 1. Ground for the work-desk.<br>Place a conductive sheet such as a sheet of copper (with impedance lower than $10M\Omega$ ) on the work-desk and place the set on the conductive sheet so that the chassis. | 3. Grounding for the human body.<br>Be sure to put on a wrist-strap for grounding whose other end is grounded.<br>Be particularly careful when the workers wear synthetic fiber clothes, or air is dry. |
| 2. Grounding for the test equipment and tools.<br>Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.                              | 4. Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.<br>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 checking the laser terminal, avoid making connections using the probes of a tester or oscilloscope, or an ordinary power supply.
2. 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.



# 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.

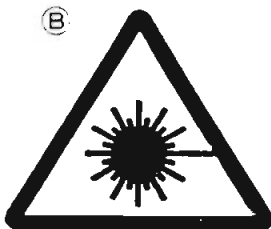
## LASER WARNING LABELS

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.



**(C)**

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSafbryder ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

**(D)**

VARO!  
 AVAITAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALLTUNA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

**(E)**

VARNING  
 OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÅRREN ÄR URKOPPLAD. BETRakta EJ STRÅLEN.

**(A)** : Danger lable

**(B)** : Except 120V model

**(C)** : Except 120V model

**(D),(E)** : Only 230V model

### 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.

### 2. Certification label (120V model)

This label is located on the back panel.

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

MANUFACTURED

### 3. Class 1 label (Except 120V model)

This label is located on the back panel.

"CLASS 1 LASER  
 PRODUCT"

LUOKAN 1  
 LASERLAITE

KLASS 1  
 LASER APPARAT

ADVARSEL

Denna mækning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilsadelig kraftig stråling.

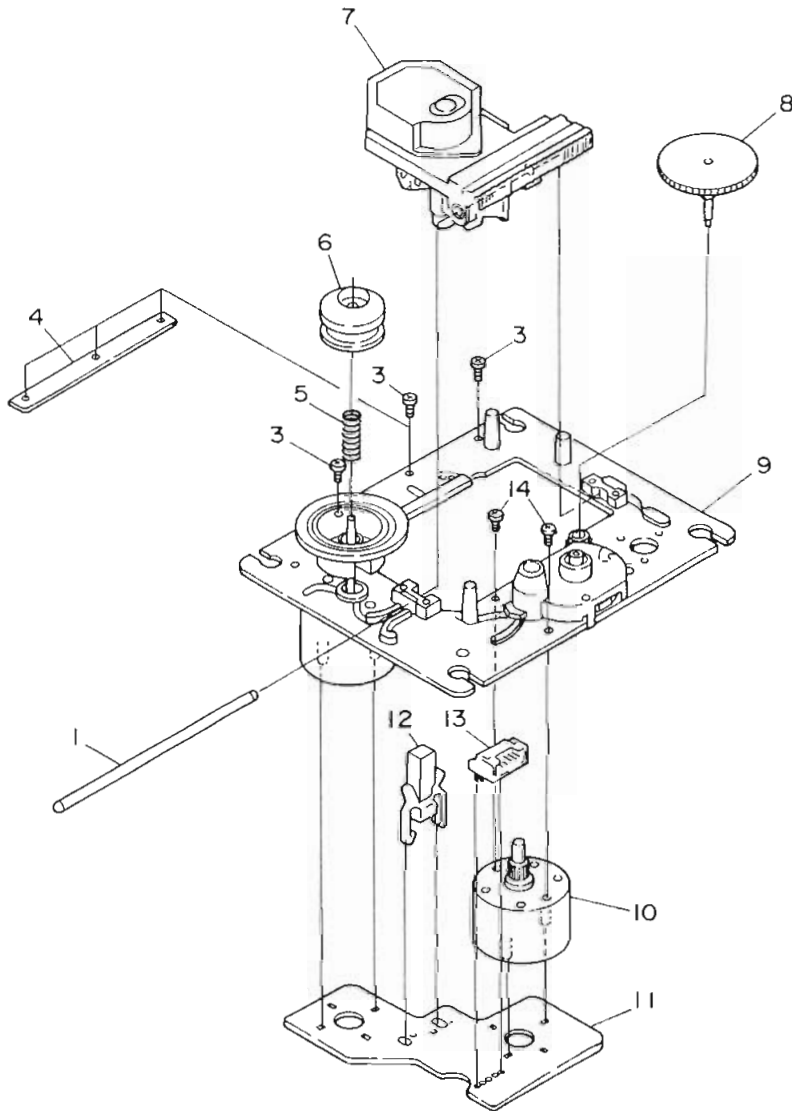
APPARATET BØ/R KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLERI

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

VAROITUS! LAITTEEN KAYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINTULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITÄVÄLLE NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.

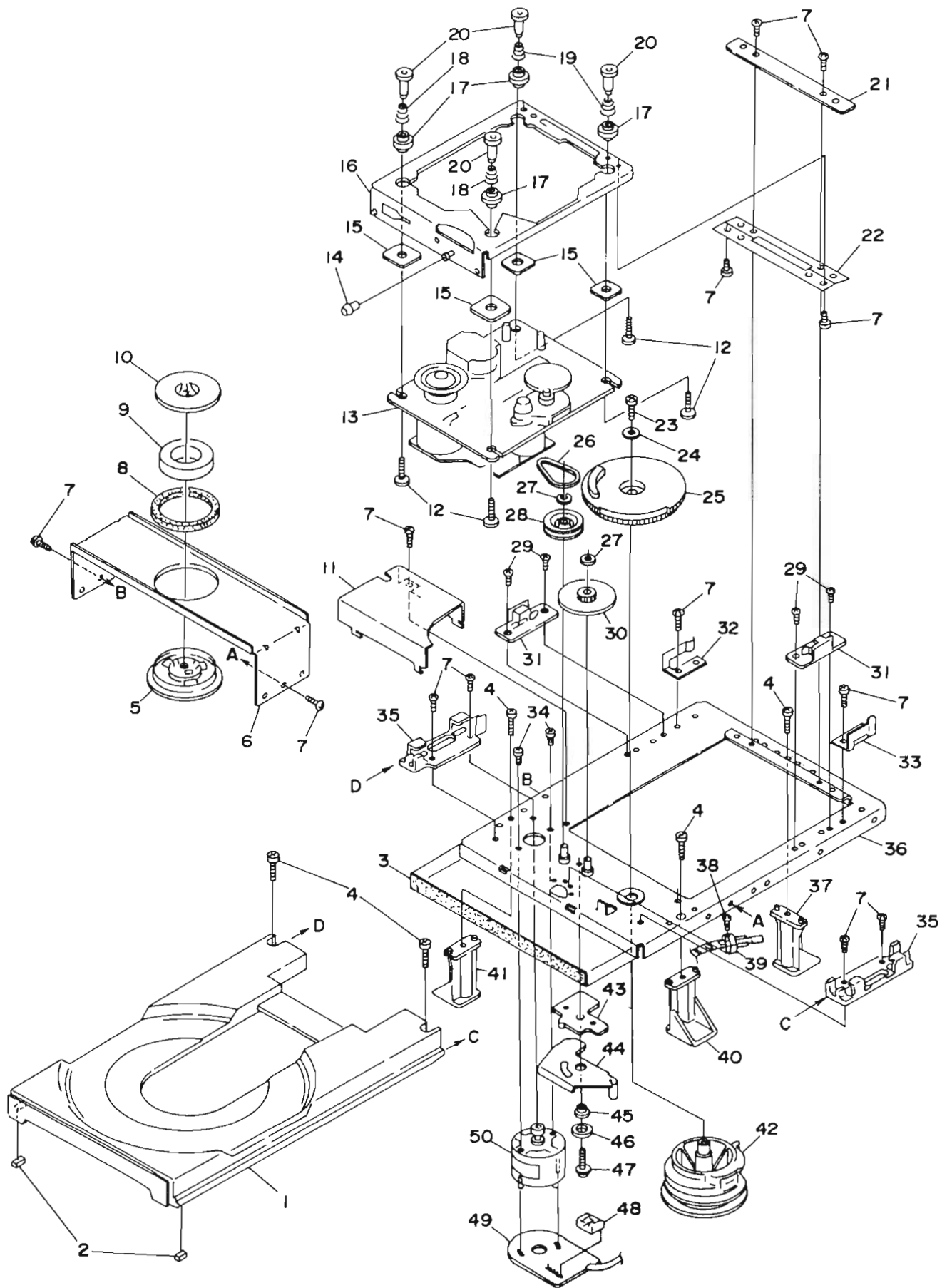
# MECHANISM-EXPLODED VIEW

## PICKUP DRIVE UNIT-EXPLODED VIEW



## PARTS LIST

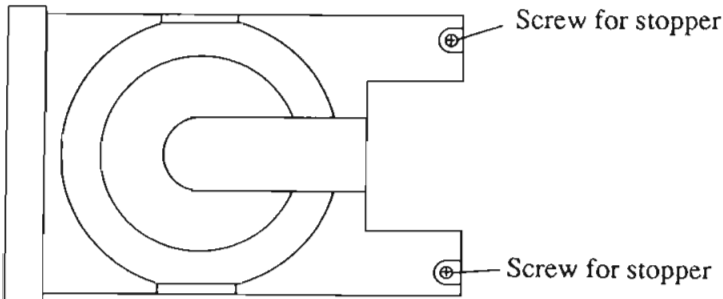
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24828003	Sled shaft	8	24810006	Wheel
2			9	24802003	Turntable chassis
3	801425	2×5,Self-tapping screw	10	24804004	Motor gear
4	24822004	Plate	11	24840007	Motor pc board
5	24820003	Spring	12	24840008	Leafswitch
6	24822005	Center ring	13	25050396	NSCT-4P223,Connector
7	24110008	KSS-210A,Optical pickup	14	82142003	2P+3F(BC),Pan head screw



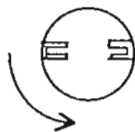
# PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24506878	Tray	26	24602507	Belt
2	24506897	Damper	27	870144	Washer
3	28140980	Front tape	28	24506884	Loading pulley
4	838430108	3TTB+10B(BC),Self-tapping screw	29	833120047	2TTP+4S,Tapping screw
5	24506959	Chucking pulley	30	27301227	Middle gear
6	24506876	Chucking chassis	31	27301230	Tray holder
7	834126069	2.6TTS+6C,Self-tapping screw	32	24506888	Tray guide,left
8	24818004	Yoke damper	33	24506887	Tray guide,right
9	24832003	Magnet	34	838426038	2.6TTB+3C(BC),Self-tapping screw
10	24830001	Chucking yoke	35	27301228	Tray holder,front
11	24506879	Gear cover	36	27301224	Main chassis
12	801424	Screw with washer	37	24506890	Boss,back
13		KSM-2101AAM,Pickup drive unit	38	834120049	2TTS+4C,Self-tapping screw
14	24506870	Roller	39	25065402	Leafswitch
15	24506871	Plate	40	24506889	Boss,right
16	24506898	Sub chassis	41	24506890	Boss,left
17	24509401	Insulator	42	24506883	Control cam
18	27180442	Spring A	43	24506892	Link plate
19	27180441	Spring B	44	24506894	Stopper link
20		Shaft	45	24506893	Boss
21	24506864	Hinge holder	46	24506895	Spacer
22		Hinge	47	83112608	2.6TTW+8S,Self-tapping screw
23	838426108	2.6TTB+10B(BC),Self-tapping screw	48	25050393	Connector pin
24	8761301008	W3 × 10F,Washer	49	24505269	Motor pc board
25	24506882	Drive gear	50	24506886	Motor ass'y

## REMOVEMENT OF DISC TRAY



1. Loosen the screw for stopper until the head of screw and the tray are the same height.
2. Turn POWER switch to on.
3. Press OPEN/CLOSE button to open the tray.
4. Turn POWER switch to off.
5. Remove the tray.



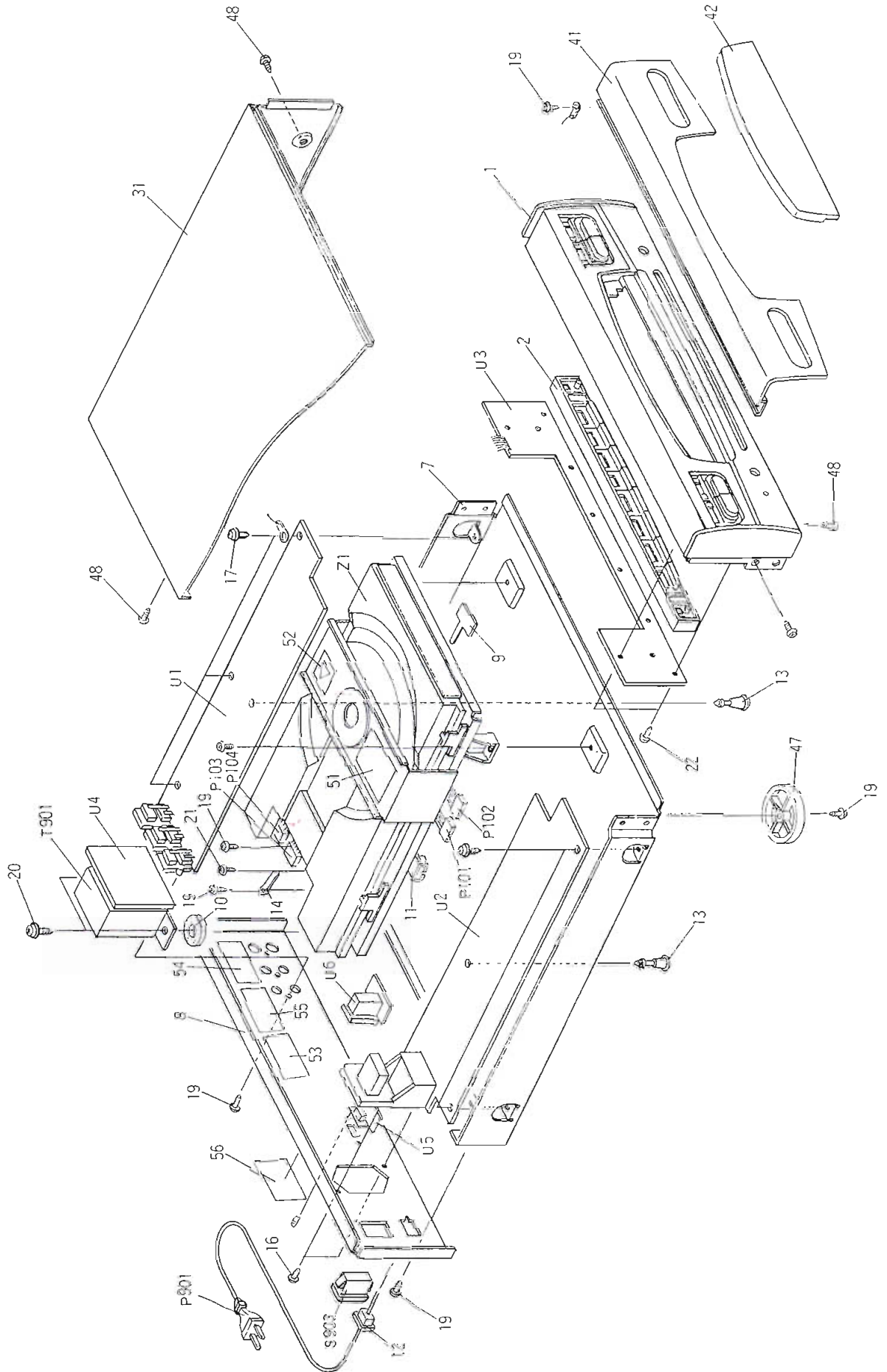
Front panel

Bottom view

(When the trouble of the power supply and tray drive circuit)

1. Loosen the screw for stopper until the head of screw and the tray are the same height.
2. Turn the screw to the arrow mark direction as shown above.
3. Pull out the tray and remove the tray.

# CHASSIS-EXPLODED VIEW





## PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	27110712AY	Front bracket <S>	F901	252075	△ 2.5A-SE-EAK,AC outlet fuse <P>
2	27110713AY	Front bracket <B>	P101	2002390830	NSAS-8P0337,Socket
2	28324650Y	Knob <S>	P102	2002391015	NSAS-10P0338,Socket
3	28324651Y	Knob <B>	P103	2000951	NSAS-8P903,Socket
7	28198783	Facet	P104	2000952	NSAS-8P904,Socket
8	27100261Y	Chassis	P901	253142A	△ AS-UC-7#18,Power supply cord <D>
8	27121604Y	Back panel <D>		253164Y or	△ AS-CEE 250V 2.5A,
	27121605AY	Back panel <P>		253175Y	△ Power supply cord <P/W>
	27121607AY	Back panel <Q>		253170	△ AS-SAA,Power supply cord <Q>
	27121606AY	Back panel <W>	P902	25050346	△ NSCT-2P173,AC outlet <Q>
9	27190882	Holder	S901	25065123	△ NSS-1258P, Voltage selector switch <W>
10	27270213	3×25×6,Spacer	S903	25065340	△ NSS-0001,Power switch
11	27301641	Clamper	T901	2300836AY	△ NPT-1152D,Power transformer <D>
12	27300750	△ Bushing cord		2300837Y	△ NPT-1152P,Power transformer <P>
13	27190428A	KGLS-10RT,Holder		2300839Y	△ NPT-1152Q,Power transformer <Q>
14	27255004	CS-1U,Clip		2300838Y	△ NPT-1152DG,Power transformer <W>
16	833430080	3TTP+8P(BC),Self-tapping screw	U1	1H205533-1	NAAR-4533-1,DAC and audio circuit pc board ass'y
17	831130088	3TTW+8B,Self-tapping screw	U2	1H205534-1	NADG-4534-1,Digital circuit pc board ass'y <D>
19	834430088	3TTS+8B(BC),Self-tapping screw		1H205534-1A	NADG-4534-1A,Digital circuit pc board ass'y <P>
20	830440109	4TTC+10C(BC),Self-tapping screw		1H205534-1B	NADG-4534-1B,Digital circuit pc board ass'y <Q>
21	834426068	2.6TTS+6B(BC),Self-tapping screw		1H205534-1C	NADG-4534-1C,Digital circuit pc board ass'y <W>
22	833426080	2.6TTP+8P(BC),Self-tapping screw	U3	1H205535-1	NADIS-4535-1,Operation switch pc board ass'y
31	28184520Y	Top cover <T>	U4	1H205536-1	NAPS-4536-1,Power transformer terminal pc board ass'y <D/P/Q>
41	27211432	Front panel <S>		1H205536-1A	NAPS-4536-1A,Power transformer terminal pc board ass'y <W>
	27211433	Front panel <B>	U5	1H205538-1	NASW-4558-1, Voltage selector switch pc board ass'y <W>
42	27211435	Tray panel <S>	U6	1H205563-1	NAPS-4563-1,AC outlet terminal pc board ass'y <D>
	27211436Y	Tray panel <B>	Z1	24800001Y	NCD-113S,Mechanism ass'y
47	27175252-1AY	Leg			
48	838430088	3TTB+8B(BC),Self-tapping screw			
51	29360807	Label,danger			
52	29361218	Label laser <P/Q>			
53	29360811A	Label <PV>			
54	29361342A	Label <PV>			
55	29361298A	Label <PV>			
56	29360687	Label class 1 <P/W/Q>			

NOTE:&lt;D&gt;:120V model only

&lt;P&gt;:230V model only

&lt;PV&gt;: 230V model only except Germany model

&lt;W&gt;:Worldwide model only

&lt;Q&gt;:240V model only

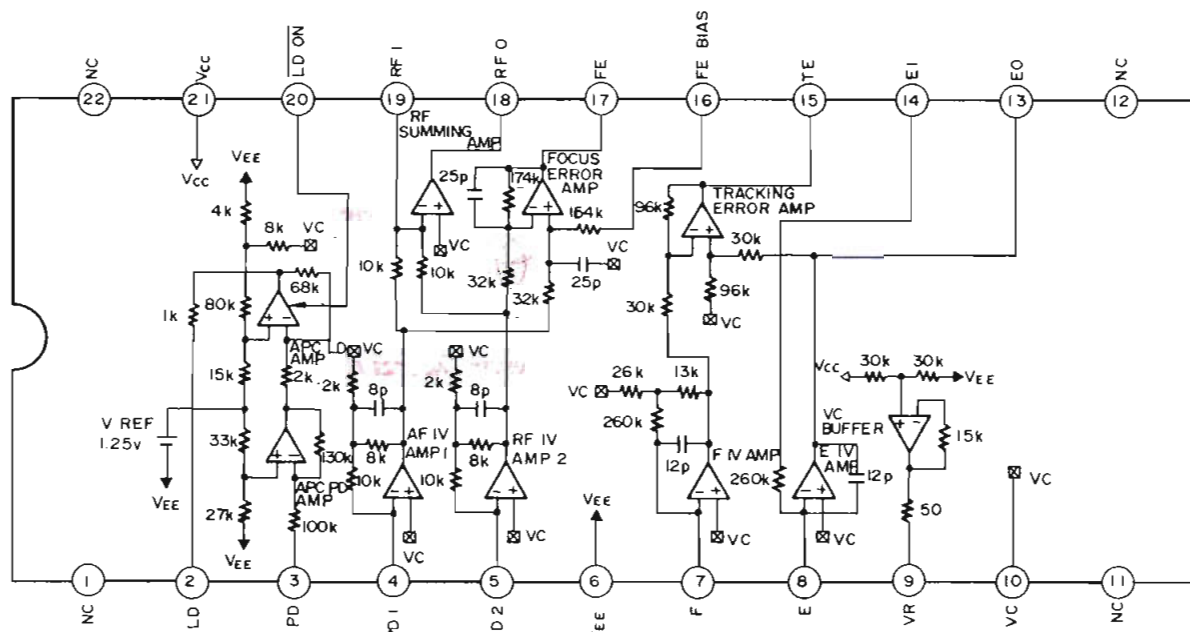
&lt;B&gt;:Black model only

&lt;S&gt;:Silver model only

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

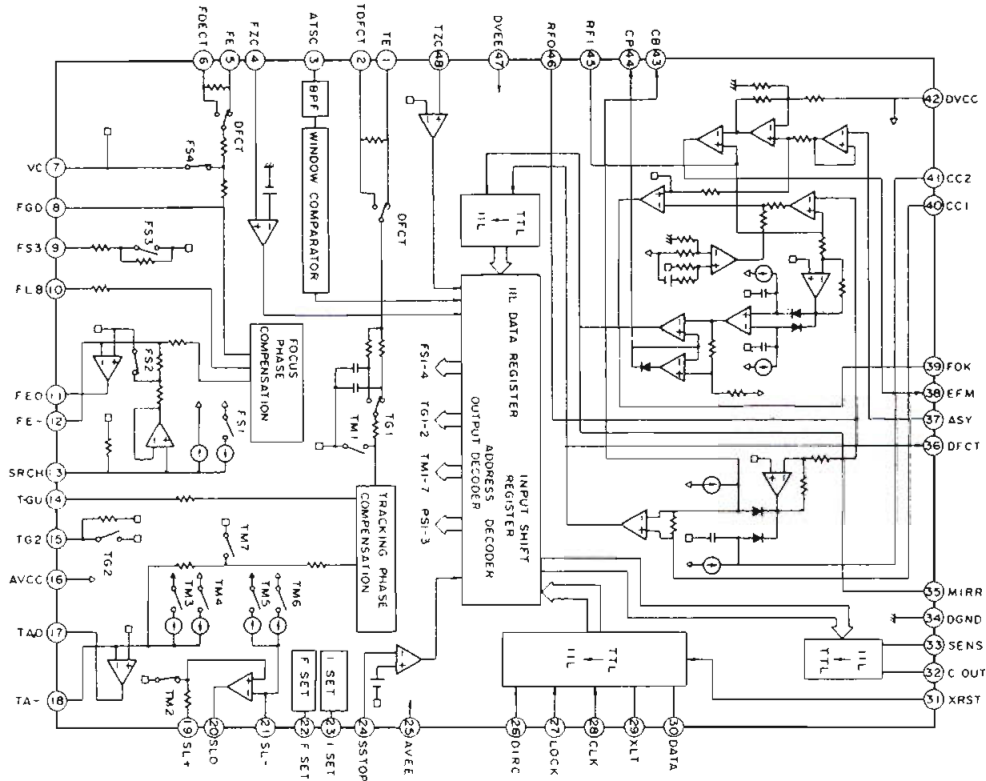
# IC BLOCK DIAGRAM AND DESCRIPTIONS

## CXA1571S (RF Amp)



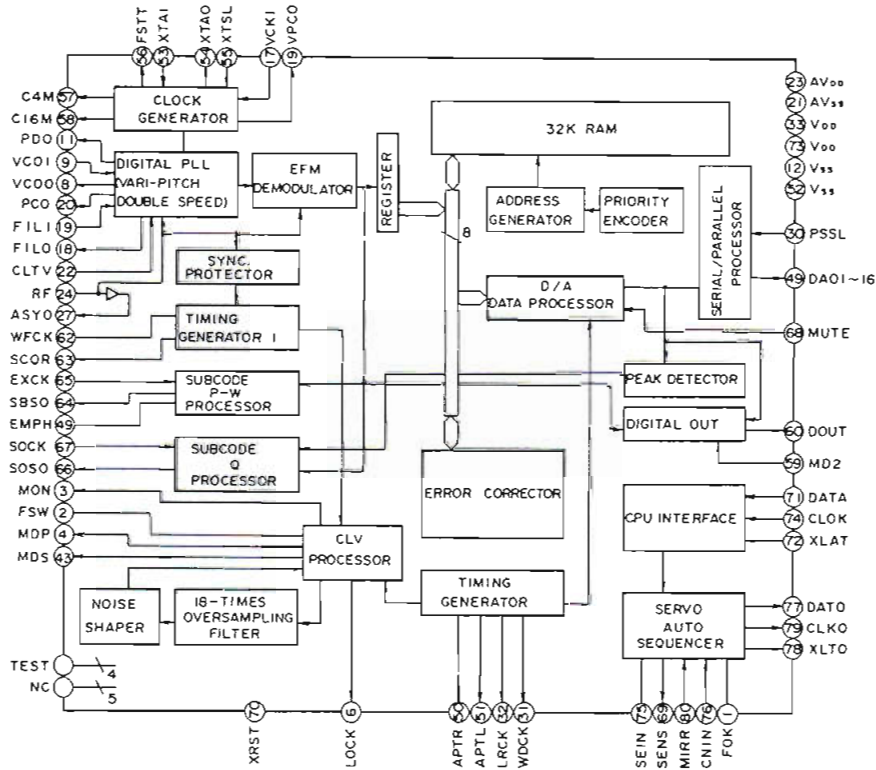
Pin No.	Symbol	I/O	Description
2	LD	O	Output terminal of APC amplifier.
3	PD	I	Input terminal of APC amplifier.
4	PD1	I	Inversion input terminal for RF I-V amplifier. Connect to photo diode A+C.
5	PD2	I	Inversion input terminal for RF I-V amplifier. Connect to photo diode B+D.
7	F-IN	I	Inversion input terminal for F I-V amplifier. Connect to photo diode F.
8	E-IN	I	Inversion input terminal for E I-V amplifier. Connect to photo diode E.
9	VR	O	DC voltage output of $(V_{CC} + V_{EE})/2$ .
10	VC	I	Middle point voltage input terminal.
13	EO	O	Monitor output terminal for I-V amplifier E.
14	EI	-	Gain adjustment terminal for I-V amplifier E.
15	TE	O	Tracking error amplifier output terminal. The signal E-F is output from this terminal.
16	FE-BIAS	I	Bias adjustment terminal for non-inversion side of focus error amplifier.
17	FE	O	Focus error amplifier output terminal.
18	RFO	O	RF amplifier output terminal.
19	RFI	I	Inversion input terminal of RF amplifier.
20	LD-ON	I	Change-over terminal for APC amplifier.

# CXA1372S ( Servo Signal Processor )

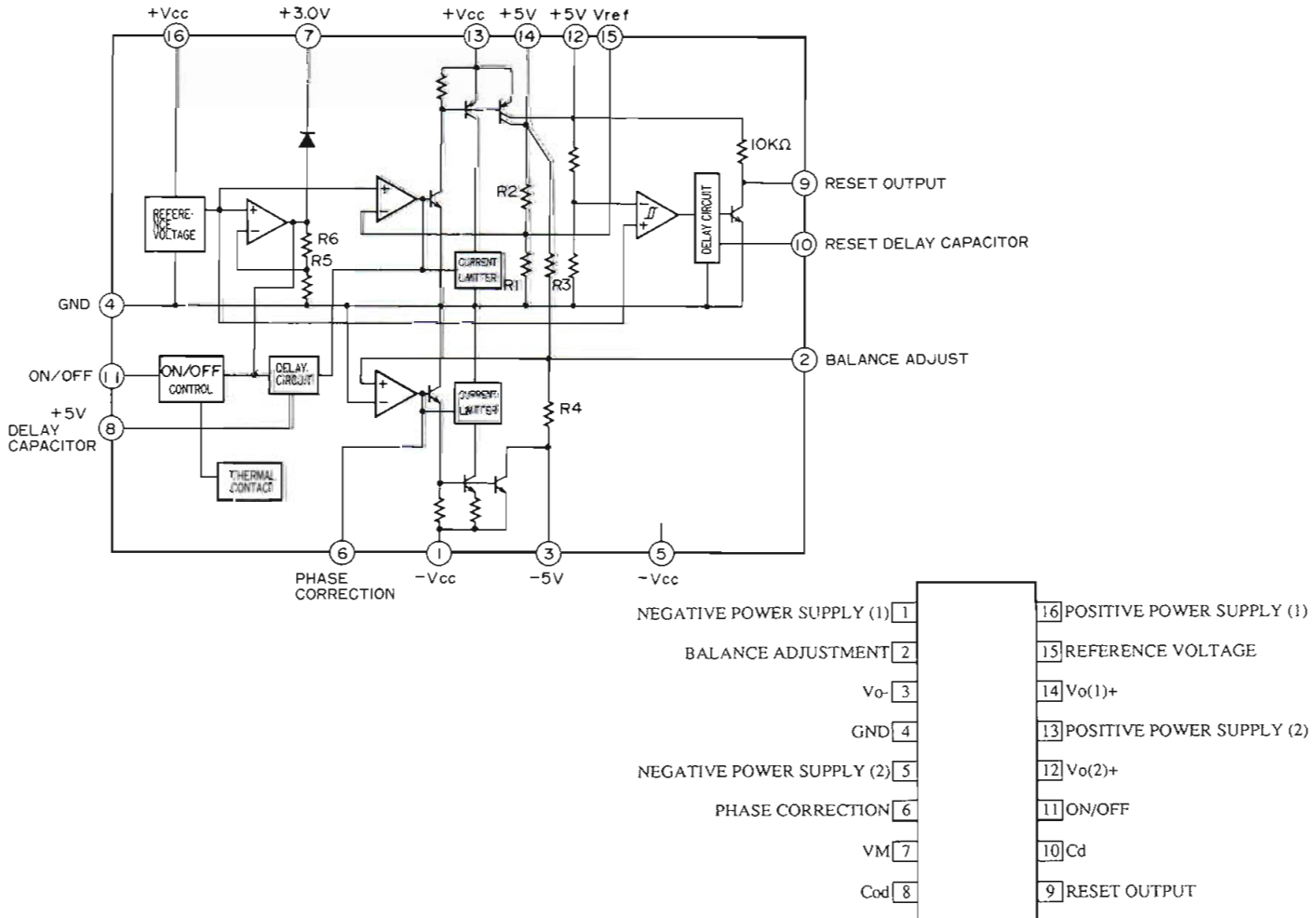


PIN. NO.	SYMBOL	I/O	DESCRIPTION	PIN. NO.	SYMBOL	I/O	DESCRIPTION
1	TE	I	Tracking error input terminal.	22	FSET	I	Peak setting input of phase correction of focus tracking.
2	TDFCT	I	Capacitor connection terminal for time constant when defect.	23	ISET	I	This terminal is flowed the current so that the focus 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 defect.	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	CCI	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 CCI.
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)



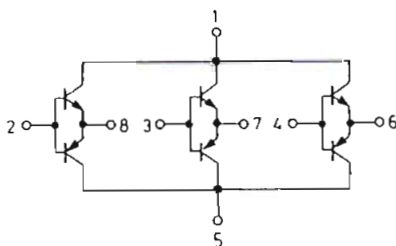
### M5294P (SYSTEM RESET AND ±5V POWER SUPPLY)



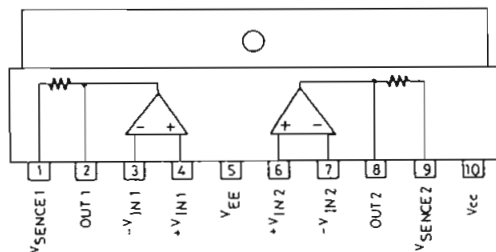
NO.	SYMBOL	I/O	DESCRIPTION	NO.	SYMBOL	I/O	DESCRIPTION
1	FOK	I	Focus OK input	42	DA08	O	DA08 GFS output
2	FSW	O	Output filter changeover output of spindle motor	43	DA07	O	DA07 RFCK output
3	MON	O	Spindle motor control output	44	DA06	O	DA06 C2P0 output
4	MDP	O	Spindle motor servo control	45	DA05	O	DA05 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 Rch.
10	TEST	I	Test terminal	51	APTl	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 16.934MHz or 33.8688MHz input
13-15	NC			54	XTAO	O	Crystal oscillation circuit output of 16.934MHz
16	VPCO	O	PLL charge pump output for variable pitch	55	XTSl	I	Crystal selection input terminal. L when 16.934MHz. 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	1.2336MHz output
19	FIL1	I	Filter input for master PLL.	58	C16M	O	16.934MHz 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	TEST2	I	Connect to the ground.	64	SBSO	O	Serial output of sub code (P-W)
26	TEST3	I	Connect to the ground.	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	TEST4	I	Connect to the ground.	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. L.R 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	CNCL	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 L.R 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

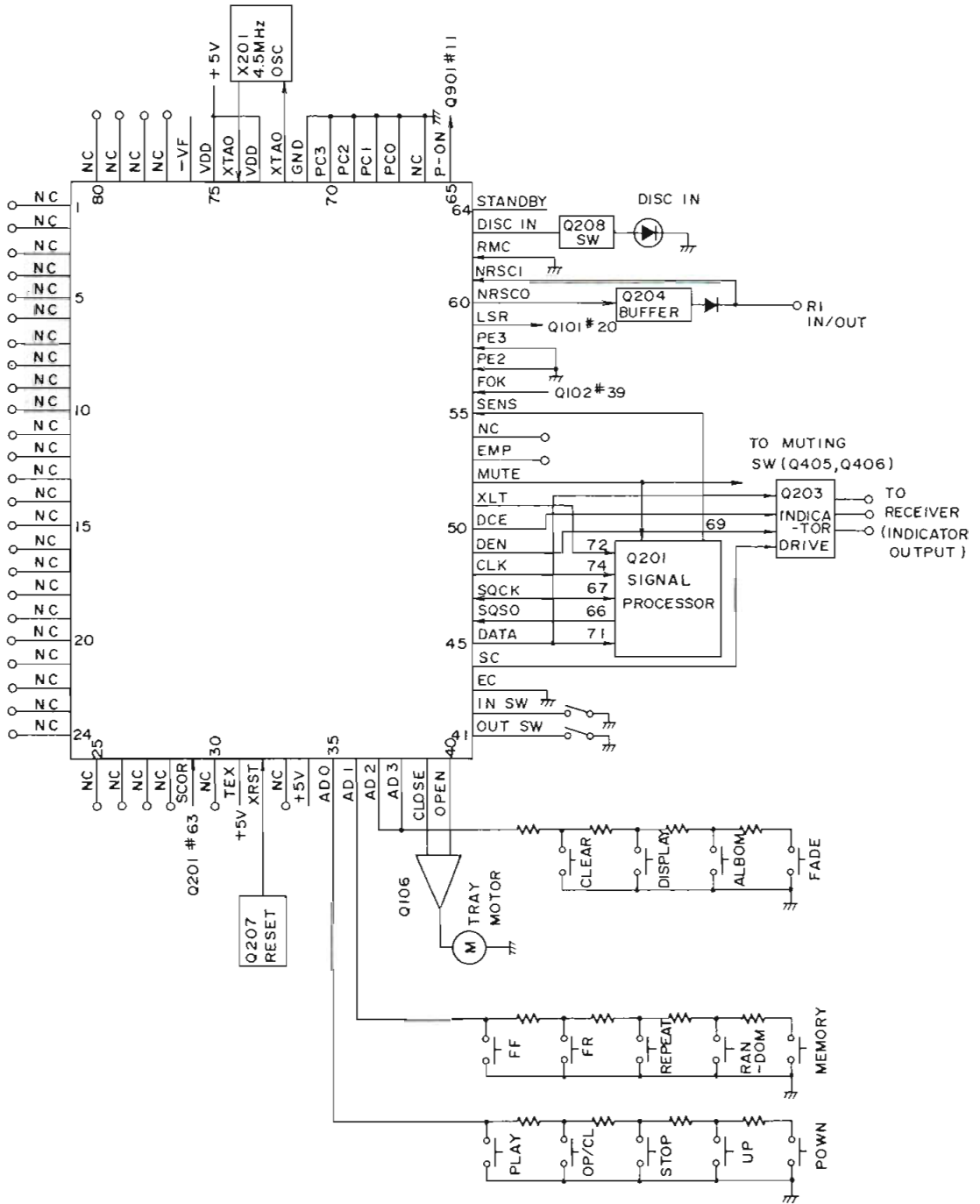
**STA341M-L (Transistor Array)**



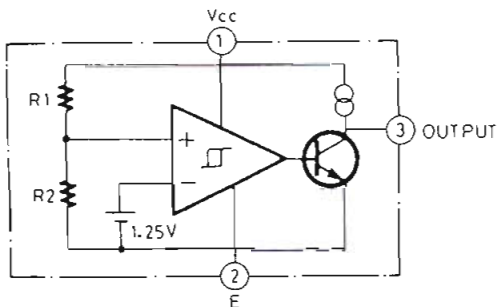
**LA6510 (Power OP Amp)**



### CXP50112-379Q (Microprocessor)

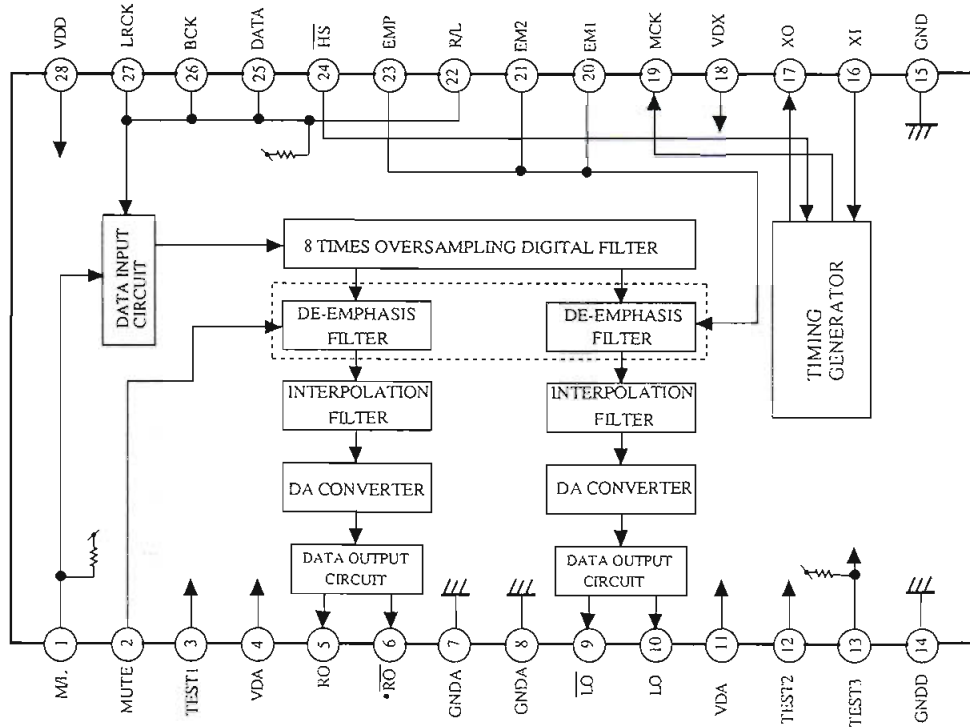


### M51943ASL (Rest IC)



Pin No.	Symbol	I/O	Description
1~28	NC		Not used.
29	SCOR	I	Synchronizing signal detection input terminal for sub code frame.
30	NC		Not used.
31	TEX		Not used.
32	XRST	I/O	Reset input terminal. Reset at the high level.
33	NC		Not used.
34	VDD		Power supply terminal (+5V)
35~37	AD0~AD2	I	Operation key connection terminals.
38	AD3	I	Not used.
39	CLOSE	O	Disc tray control signal output terminal. OPEN:5V CLOSE:0V
40	OPEN	O	Disc tray control signal output terminal. OPEN:0V CLOSE:5V
41	OUT SW	I	Tray open detection input terminal.
42	IN SW	I	Tray close detection input terminal.
43	GND		Ground terminal.
44	SC	O	Clock supply terminal of serial transmitter
45	DATA	O	Serial data output terminal of command to the signal processor IC.
46	SQSO	I	Serial data input terminal of sub code Q from the signal processor IC.
47	SQCK	O	Serial transfer clock output terminal of sub code Q to the signal processor IC.
48	CLK	O	Serial transfer clock output terminal of command to the signal processor IC.
49	DEN	O	Enable output terminal of display clock output. L:Inhibit
50	DCE	O	Display enable signal output terminal
51	XTL	O	Serial transfer latch signal output terminal to the signal processor IC.
52	MUTE	O	Muting control output terminal. H:ON
53	EMP	O	Emphasis output terminal. Not used.
54	NC		Not used.
55	SENS	I	Sense signal input terminal from the signal processor IC.
56	FOK	I	Focus OK input terminal
57	GND		Ground terminal
58	GND		Ground terminal
59	LSR	O	Optical pickup control output. L:ON
60	RI OUT	O	Output terminal of control signal RI
61	RI IN	I	Input terminal of control signal RI
62	GND		Ground terminal
63	DISC IN	O	DISC IN display control output terminal
64.66	NC		Not used.
65	P-ON		Power source control output terminal
67	PC0		Not used.
68	PC1		Not used.
69	PC2		Not used.
70	PC3		Not used.
71	Vss		Ground terminal
72	XTAL	O	System clock output terminal
73	VDD		Power supply terminal. (+5V)
74	EXTAL	I	System clock input terminal. Connect the 4.5MHz ceramic resonator.
75	Vref		Reference voltage supply terminal.
76~80	NC		Not used.

TC9237BN (D/A Converter)

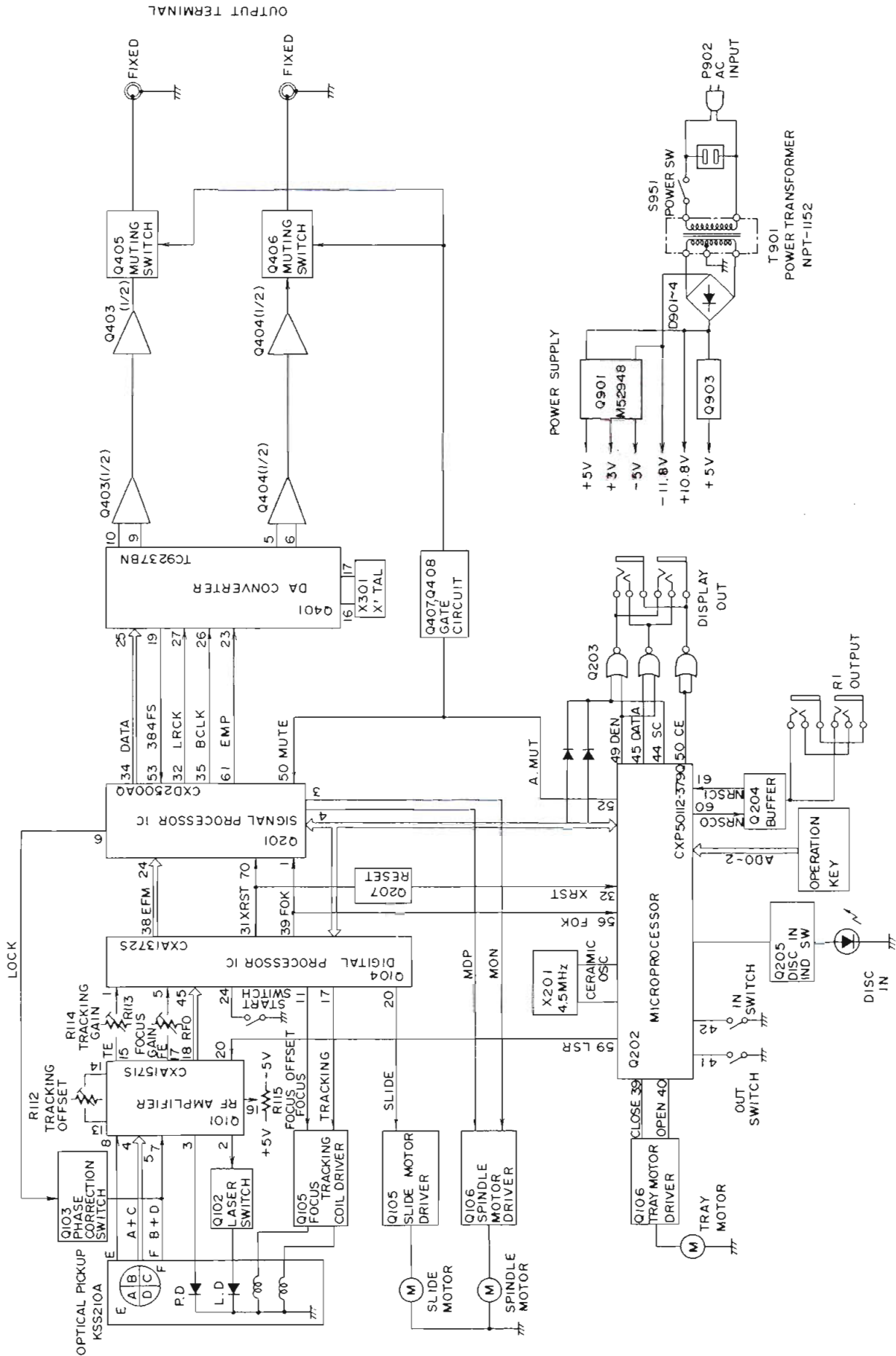


No.	Symbol	I/O	Description
1	M/L	I	Selection terminal for input data. MSB first at the high level and LSB first at the low level.
2	MUTE	I	Muting terminal.ON at the high level.
3	TEST1	I	Test terminal
4	VDA	-	Analogue section power supply terminal for DA converter.(Right channel)
5	RO	O	Non inversion output terminal of right channel data.
6	RO	O	Inversion output terminal of right channel data.
7	GND	-	Ground terminal for DA converter.(Right channel)
8	GND	-	Ground terminal for DA converter.(Left channel)
9	LO	O	Inversion output terminal of left channel data.
10	LO	O	Non inversion output terminal of left channel data.
11	VDA	-	Analogue power supply for DA converter
12	TEST2	I	Test terminal
13	TEST3	I	Test terminal
14	GND	-	Ground terminal for logic section
15	GND	-	Ground terminal for oscillation section
16	XI	I	Crystal oscillation connection terminal.
17	XO	O	
18	VDX	-	Power supply for oscillation section
19	MCK	O	System clock output terminal.(384fs)

No.	Symbol	I/O	Description															
20	EM1	I	Selection terminal for de-emphasis filter mode. <table border="1" style="margin-left: 20px;"> <tr> <td>EM1</td> <td>L</td> <td>L</td> <td>H</td> <td>H</td> </tr> <tr> <td>EM2</td> <td>L</td> <td>H</td> <td>H</td> <td>L</td> </tr> <tr> <td>MODE</td> <td>44.1kHz</td> <td>32kHz</td> <td>48kHz</td> <td></td> </tr> </table>	EM1	L	L	H	H	EM2	L	H	H	L	MODE	44.1kHz	32kHz	48kHz	
EM1	L	L	H	H														
EM2	L	H	H	L														
MODE	44.1kHz	32kHz	48kHz															
21	EM2	I																
22	R/L	I	Selection terminal for channel data <table border="1" style="margin-left: 20px;"> <tr> <td rowspan="2">R/L INPUT</td> <td colspan="2">LRCK</td> </tr> <tr> <td>L</td> <td>H</td> </tr> <tr> <td>L</td> <td>R ch. data</td> <td>L ch. data</td> </tr> <tr> <td>R</td> <td>L ch. data</td> <td>R ch. data</td> </tr> </table>	R/L INPUT	LRCK		L	H	L	R ch. data	L ch. data	R	L ch. data	R ch. data				
R/L INPUT	LRCK																	
	L	H																
L	R ch. data	L ch. data																
R	L ch. data	R ch. data																
23	EMP	I	Changeover terminal for de-emphasis filter. ON at the high level and OFF at the low level.															
24	HS	I	Speed mode selection terminal. Standard speed at the high level and twice speed at the low level.															
25	DATA	I	Data input terminal															
26	BCK	I	Bit clock input terminal															
27	LRCK	I	LR clock input terminal															
28	VDD	-	Power supply terminal for logic circuit															



# BLOCK DIAGRAM



# ADJUSTMENT PROCEDURES

## Instruments required

Dual trace oscilloscope, Frequency counter, AF oscillator, Test disc (SONY YEDS-18), AC voltmeter, Jitter meter, 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 or jitter meter to terminal P106.

(Oscilloscope)

Adjust R115 until a clear trace of waveform pattern as shown photo 1 appear on the oscilloscope.

When the amount of jitter is broad, set R115 to mechanical center.

(Jitter meter)

Adjust R115 until the jitter meter reading becomes minimum.(Less than 10ns.)

After adjustment, disconnect the oscilloscope or jitter meter.

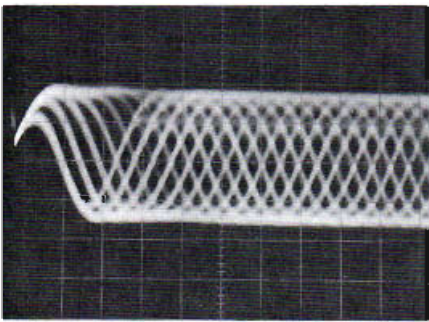
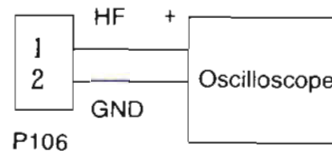
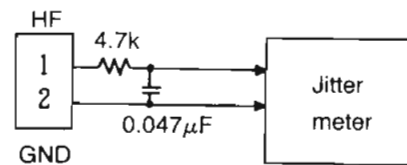


Photo 1



Oscilloscope range  
Vertical : 0.5V/div.  
Horizontal : 0.2  $\mu$ s/div.  
DC, Ground: Center



### 2. Tracking offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.  
Turn R114 to minimum position.(Counter clockwise)  
Connect the oscilloscope between pin 3 (TR) of P105 and pin 2 (GND) of P106.

Adjust R112 until the center of tracking error signal on the oscilloscope becomes GND level.

Turn R114 to the mechanical center.

After adjustment, disconnect the oscilloscope.

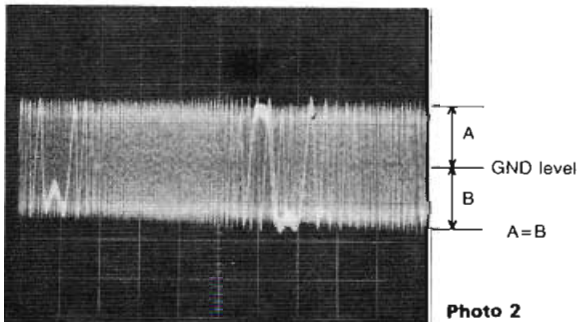
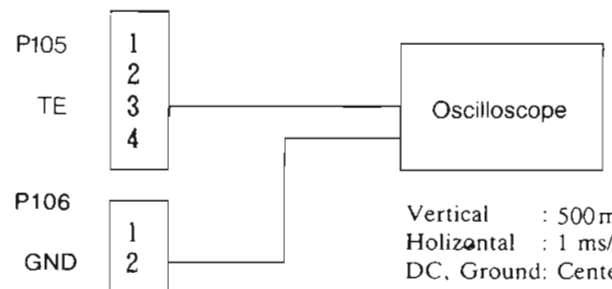


Photo 2



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

**3. Focus gain adjustment**

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

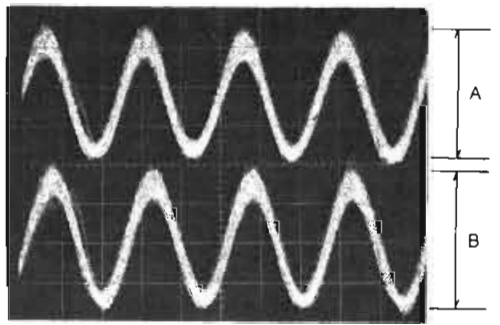
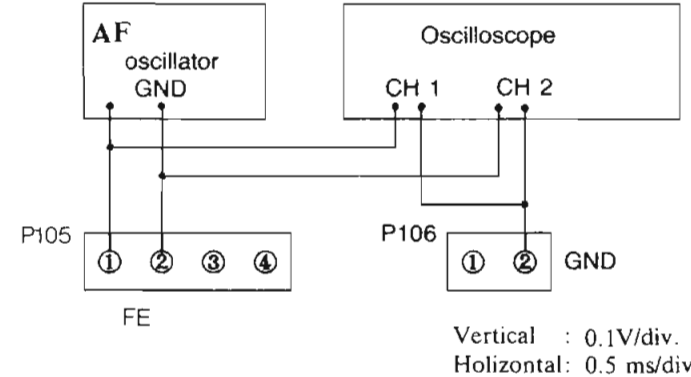


Photo 3



Adjust R113 until 1kHz 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.

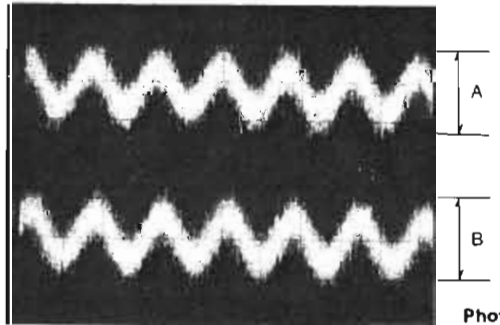
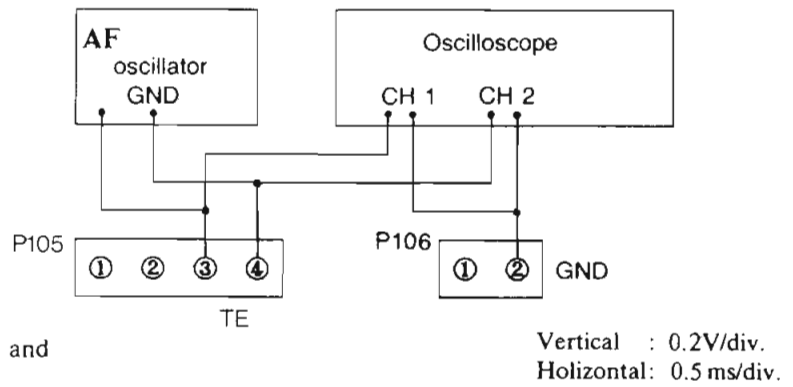
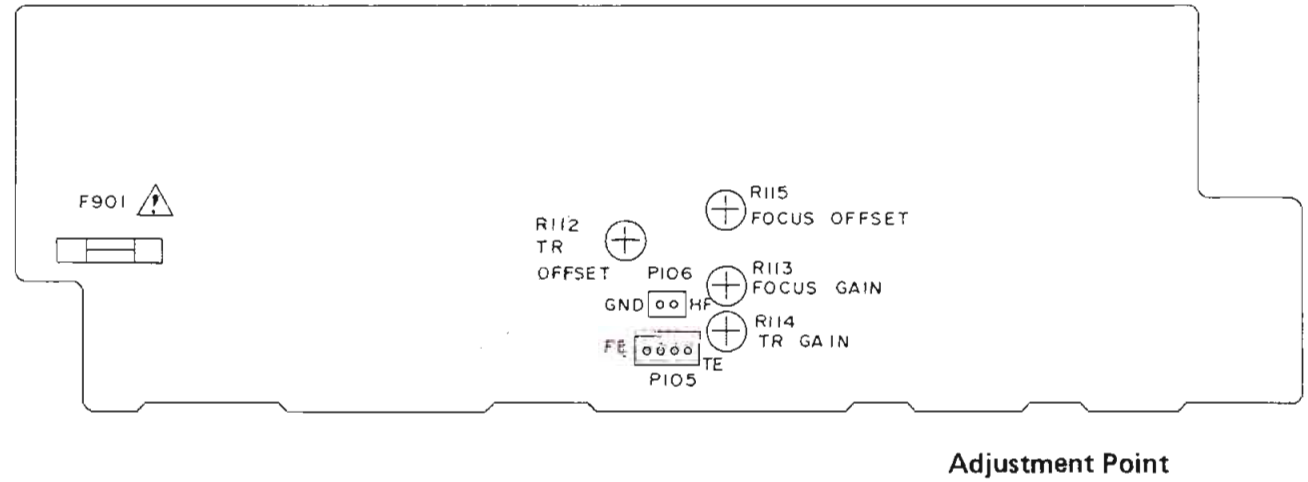


Photo 4

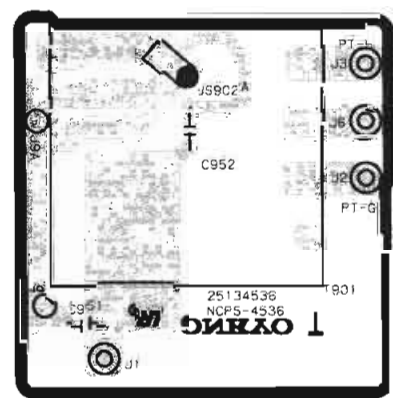


Adjust R114 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.  
 After adjustment, disconnect the AF oscillator and the oscilloscope.

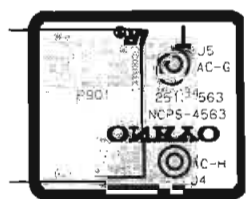
After adjustment, confirm that the center of tracking error signal becomes GND level.



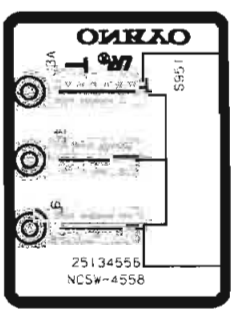
**PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE**



**POWER TRANSFORMER TERMINAL PC BOARD**

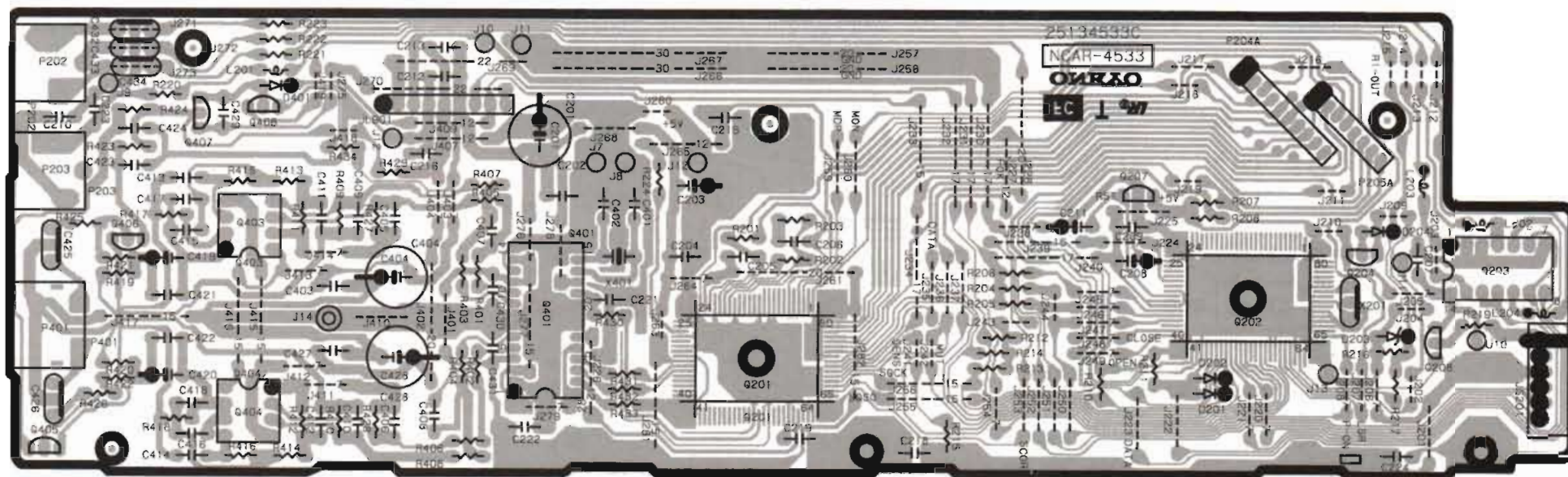


**AC OUTLET TERMINAL PC BOARD**

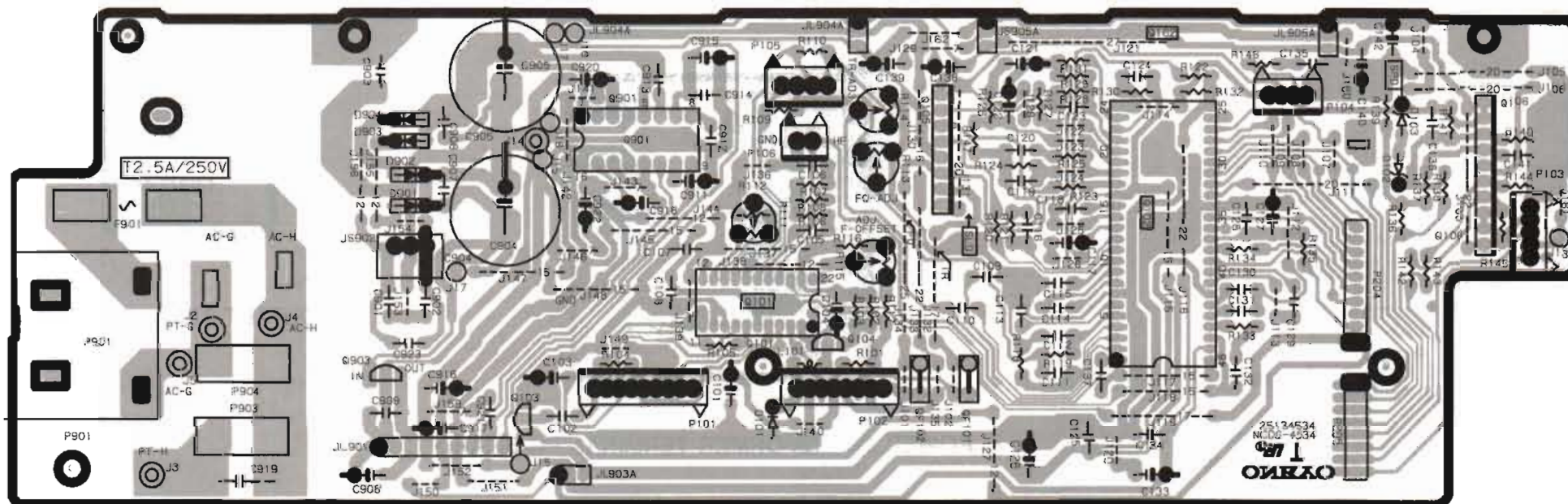


**VOLTAGE SELECTOR SWITCH PC BOARD**

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



DAC AND AUDIO CIRCUIT PC BOARD



DIGITAL CIRCUIT PC BOARD



OPERATION SWITCH PC BOARD

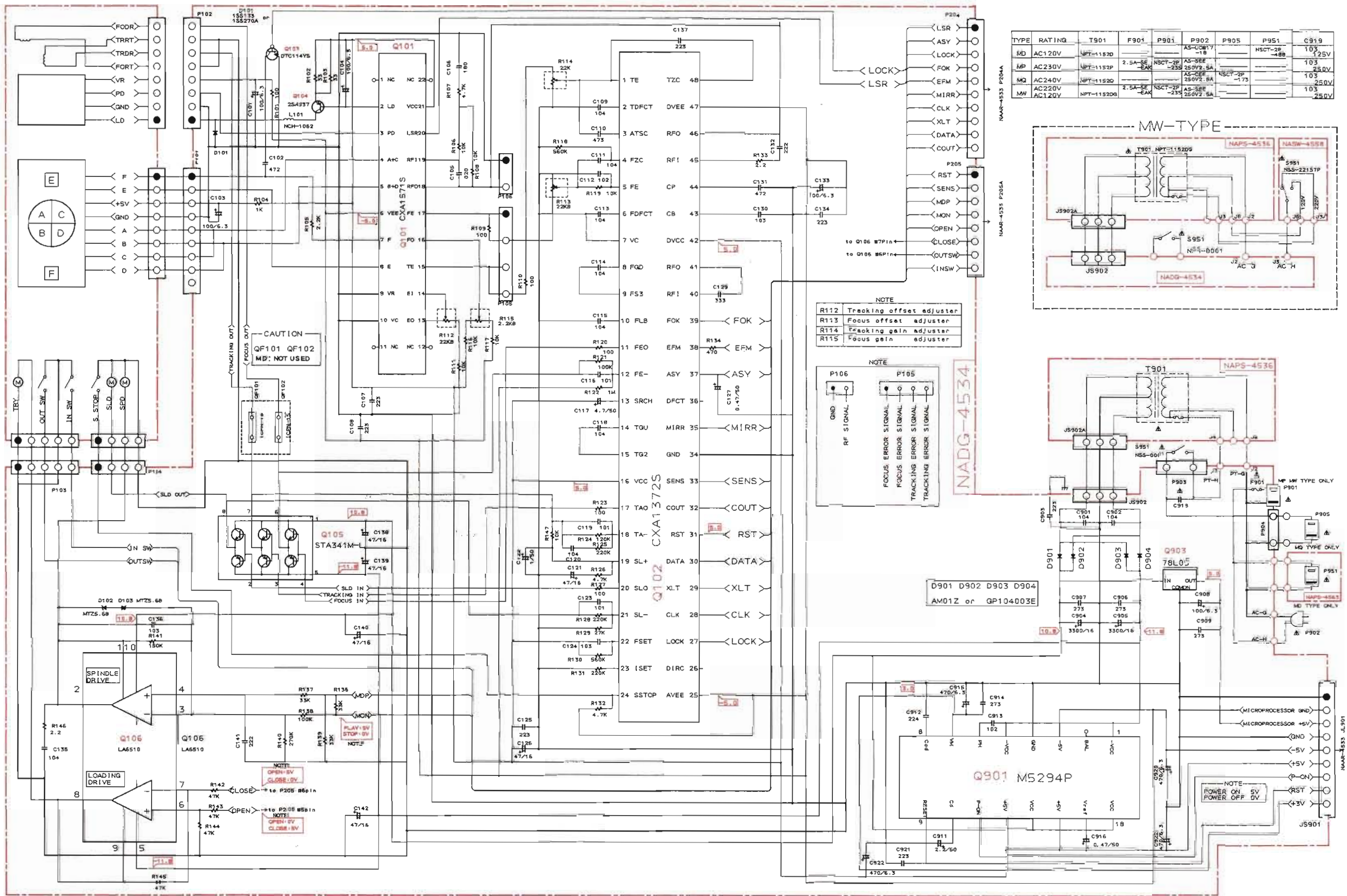
PARTS LIST

DAC AND AUDIO CIRCUIT PC BOARD(NAAR-4533-1)

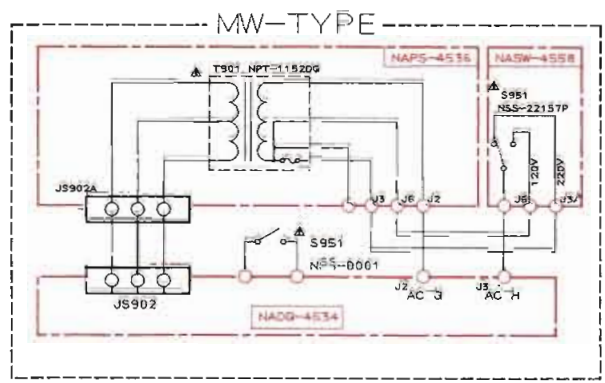
CIRCUIT NO.	PART NO.	DESCRIPTION
		ICs
Q201	22240487	CXD2500AQ
Q202	22240613A	CXP50112-504Q
Q203	222740025	74HC02P
Q207	22240018	M51943ASL
Q401	22240535	TC9237BN
Q403,Q404	22240201	NJM4565D-B
		Transistors
Q204,Q208	2212600	DTA124ES
Q405,Q406	2211706	2SD655-F
Q407	2212600	DTA124ES
Q408	221281	DTC114YS
		Diodes
D201,D202	223163 or	1SS133 or
D204,D401	223205	1SS270A
D203	224450562	MTZ5.6B
		Cores
L201-L204	230906	BL02RN2-R62
		X'tal
X401	3010159	AT-38-169
		Ceramic resonator
X201	3010188	CST4.50MGW040
		Capacitors
C201,C404	354782219	220 $\mu$ F,50V,Elect.
C202	374724744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic
C203	354722219	220 $\mu$ F,6.3V,Elect.
C204,C403	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
C205	374721524	1500pF $\pm$ 5%,50V,Plastic
C206	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C208	354721019	100 $\mu$ F,6.3V,Elect.
C211	354780229	2.2 $\mu$ F,50V,Elect.
C215	374721034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
C411,C412	374721524	1500pF $\pm$ 5%,50V,Plastic
C415-C418	374722724	2700pF $\pm$ 5%,50V,Plastic
C419,C420	354782209	22 $\mu$ F,50V,Elect.
C421,C422	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
C423,C424	374722224	2200pF $\pm$ 5%,50V,Plastic
C427	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
C428	354782219	220 $\mu$ F,50V,Elect.
C429	374721024	1000pF $\pm$ 5%,50V,Plastic
C430,C431	374724744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic
		Filters
C425,C426	3030002	DSS306-55B 101M
C432-C434	3030002	DSS306-55B 101M
		Sockets
JS201	25050270	NSCT-6P098
P204A	2002392050	NSAS-20P0374
P205A	2002391650	NSAS-16P0375
		Jacks
P202	25045370	NPJ-2PDGR213
P203	25045330	NPJ-2PDBL184
P401	25045371	NPJ-2PDWR214

# SCHEMATIC DIAGRAM

1  
2  
3  
4  
5  
6

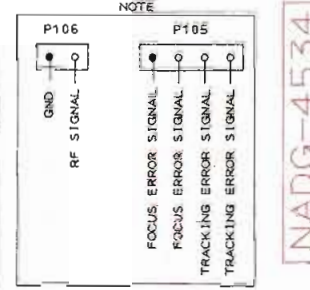


TYPE	RATING	T901	F901	P901	P902	P905	P951	C919
MD	AC120V	NPT-11520	2.5A-SE-EAK	NSCT-2P-235	AS-SEE-250V2.5A	NSCT-2P-173	NSCT-2P-48B	103 125V
MP	AC230V	NPT-1152P	2.5A-SE-EAK	NSCT-2P-235	AS-SEE-250V2.5A	NSCT-2P-173	NSCT-2P-48B	103 250V
MQ	AC240V	NPT-1152D	2.5A-SE-EAK	NSCT-2P-235	AS-SEE-250V2.5A	NSCT-2P-173	NSCT-2P-48B	103 250V
MW	AC120V	NPT-1152DQ	2.5A-SE-EAK	NSCT-2P-235	AS-SEE-250V2.5A	NSCT-2P-173	NSCT-2P-48B	103 250V

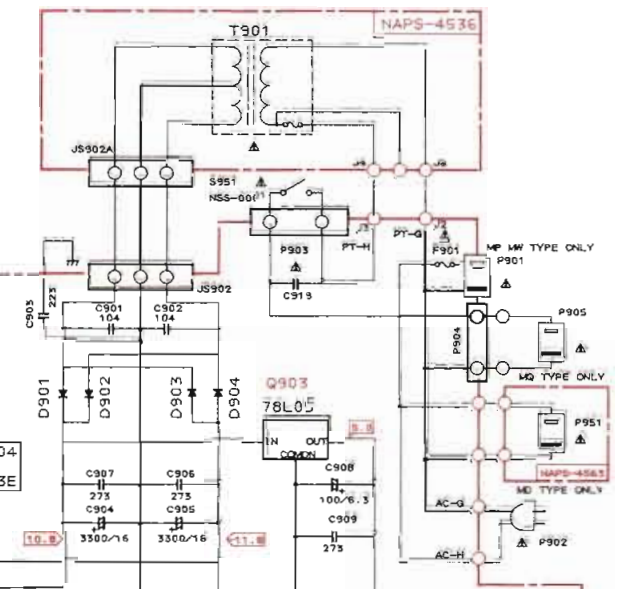


**NOTE**

- R112 Tracking offset adjuster
- R113 Focus offset adjuster
- R114 Tracking gain adjuster
- R115 Focus gain adjuster



NADG-4534



**NOTE**

POWER ON 5V  
POWER OFF 0V

# SCHEMATIC DIAGRAM

1

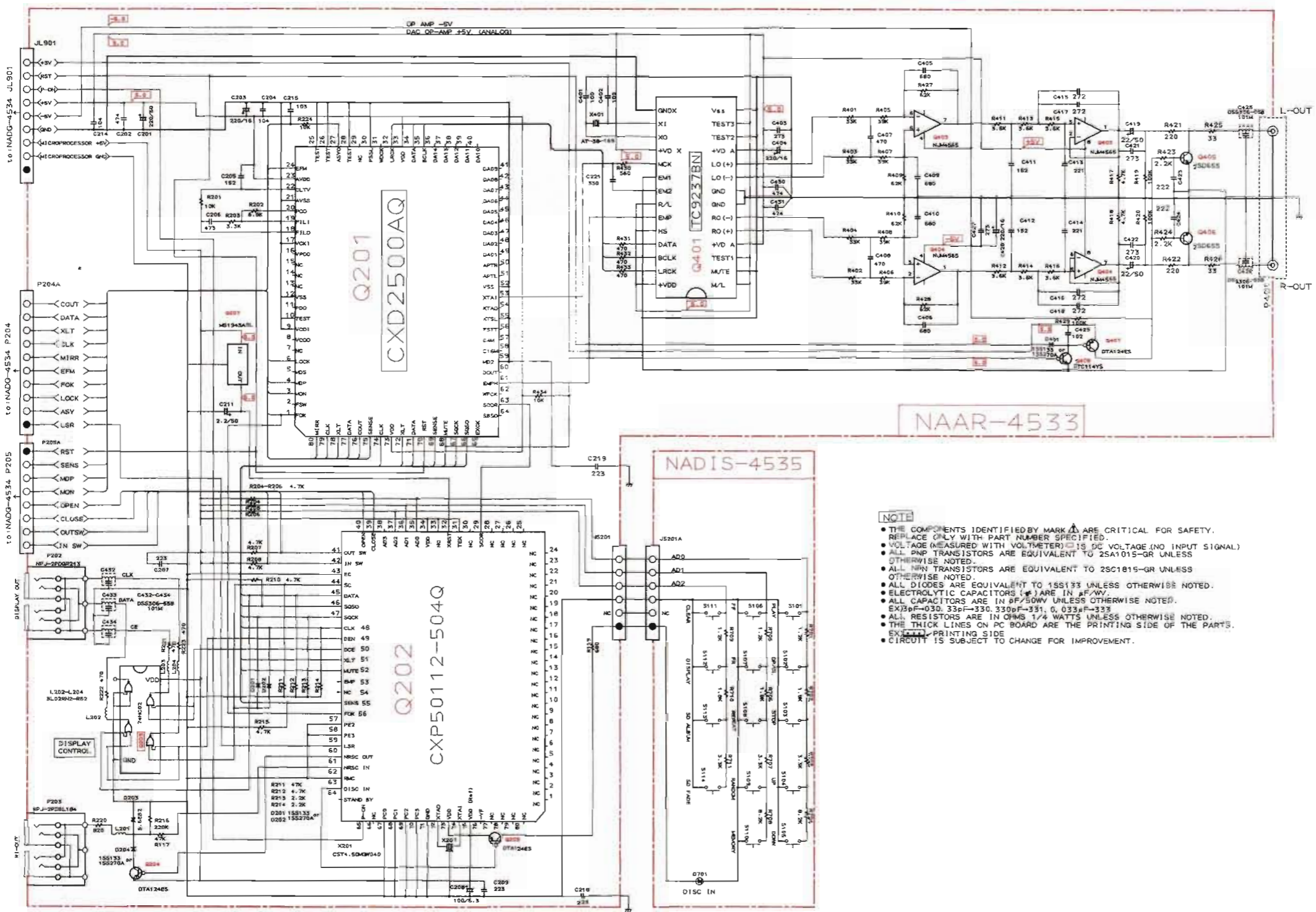
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3

4

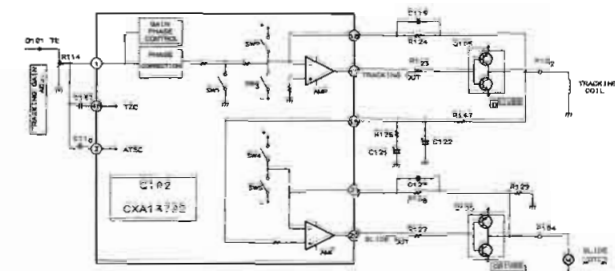
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6

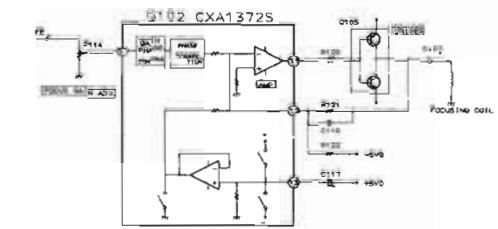


NAAR-4533

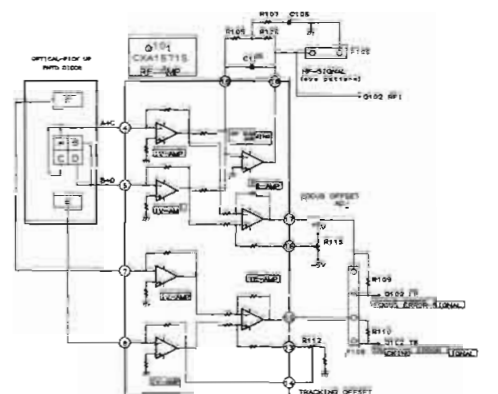
- NOTE**
- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
  - VOLTAGE (MEASURED WITH VOLTMETER)  $\square$  IS DC VOLTAGE (NO INPUT SIGNAL).
  - ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
  - ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
  - ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
  - ELECTROLYTIC CAPACITORS ( $\mu$ ) ARE IN  $\mu$ F/V.
  - ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
  - EX: 10pF-030, 33pF-330, 330pF-331, 0.033 $\mu$ F-333
  - ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
  - THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
  - EX: PRINTING SIDE
  - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.



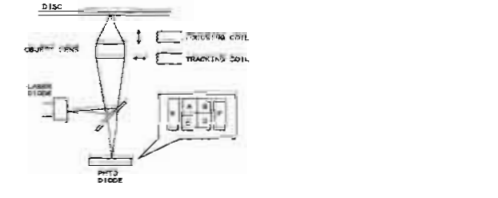
— TRACKING SLIDE SERVO CIRCUIT —



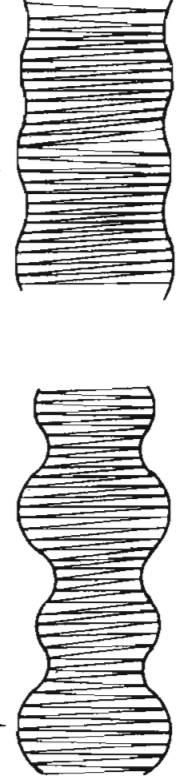
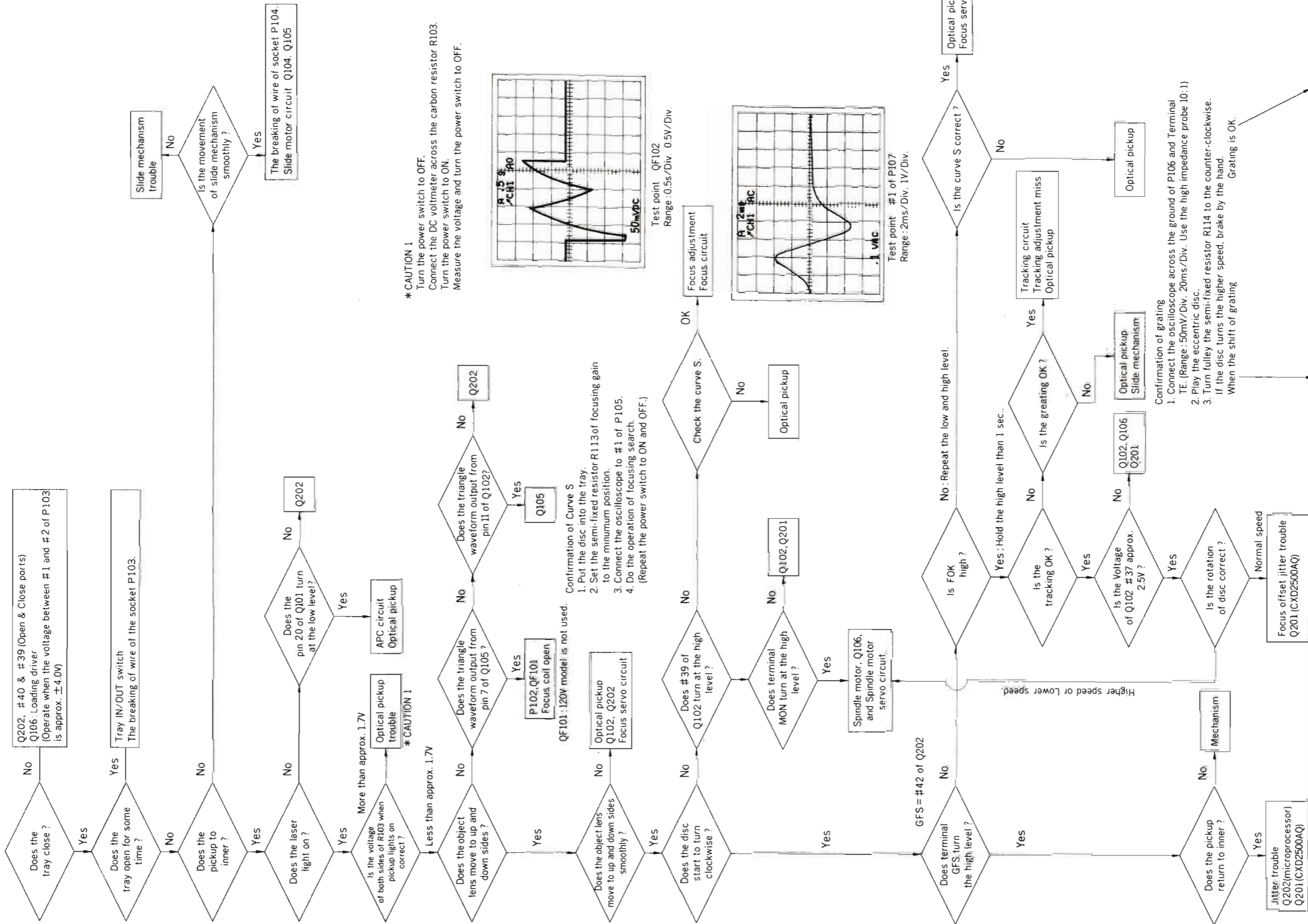
— FOCUS SERVO CIRCUIT —



— HF FE TE Amplifier circuit —



— OPTICAL PICK UP —



# PRINTED CIRCUIT BOARD PARTS LIST

DIGITAL CIRCUIT PC BOARD ASS'Y (NADG-4534-1/1A/1B/1C)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q101	22240404	CXA1571S
Q102	22240366	CXA1372S
Q106	22240034	LA6510
Q901	22240391	M5294P
Q903	222780053	78L05
	Transistors	
Q103	221281	DTC114YS
Q104	2213184 or 2213183	2SA937-R or 2SA937-Q
Q105	22240168	STA341M-L
	Diodes	
D101	223163 or 223205	1SS133 or 1SS270A
D102,D103	224450562	MTZ5.6B
D901-D904	22380046 or 22380035	AM01Z or GP104003E
	Coil	
L101	233411K100	NCH-1383
	Capacitors	
C101,C103	354721019	100 $\mu$ F,6.3V,Elect.
C102,C131	374724724	4700pF $\pm$ 5%,50V,Plastic
C104,C126	354721019	100 $\mu$ F,6.3V,Elect.
C109,C111	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C110	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C112	374721024	1000pF $\pm$ 5%,50V,Plastic
C113-C115	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C117	354780479	4.7 $\mu$ F,50V,Elect.
C118,C120	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C121	354744709	47 $\mu$ F,16V,Elect.
C122	354780109	1 $\mu$ F,50V,Elect.
C124,C130	374721034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
C127	354784799	0.47 $\mu$ F,50V,Elect.
C129	374723334	0.033 $\mu$ F $\pm$ 5%,50V,Plastic
C132,C141	374722224	2200pF $\pm$ 5%,50V,Plastic
C133	354721019	100 $\mu$ F,6.3V,Elect.
C135	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C136	374721034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
C137	374722234	0.022 $\mu$ F $\pm$ 5%,50V,Plastic
C138-C140	354744709	47 $\mu$ F,16V,Elect.
C142	354744709	47 $\mu$ F,16V,Elect.
C901,C902	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C904,C905	354743329	3300 $\mu$ F,16V,Elect.
C906,C907	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C909,C914	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
C911	354780229	2.2 $\mu$ F,50V,Elect.
C912	374722244	0.22 $\mu$ F $\pm$ 5%,50V,Plastic
C913	374721024	1000pF $\pm$ 5%,50V,Plastic
C915	354724719	470 $\mu$ F,6.3V,Elect.
C918	354784799	0.47 $\mu$ F,50V,Elect.
C920,C922	354724719	470 $\mu$ F,6.3V,Elect.
C923	374724744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R112-R114	5210066	N06HR22KBD,Semi-fixed
R115	5210060	N06HR2.2KBD,Semi-fixed
	IC protectors	
QF101,QF102	252112	△ ICP-N15 <P/Q/W>
	Plugs	
P101	25055153	NPLG-9P137
P102	25055152	NPLG-8P136
P103	25055149	NPLG-5P133
P104	25055148	NPLG-4P132
P105	25055045	NPLG-4P33
P106	25055038	NPLG-2P29
	AC outlet	
P901	25050410	△ NSCT-2P235 <P/W>
	Fuse	
F901	252075	△ 2.5A-SE-EAK <P/W>
	Fuseholders	
	25050065	△ YSH403T <P/W>

OPERATION SWITCH PC BOARD(NADIS-4535-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D702	225255B,	SEL3110S-B,
	225255C or	SEL3110S-C or
	225255D	SEL3110S-D
S701-S714	25035548	NPS-111-S510

VOLTAGE SELECTOR PC BOARD(NASW-4558-1)

(Worldwide model only)

CIRCUIT NO.	PART NO.	DESCRIPTION
S951	25065437	△ NSS-22157P,Slide switch

AC OUTLET PC BOARD(NAPS-4563-1)

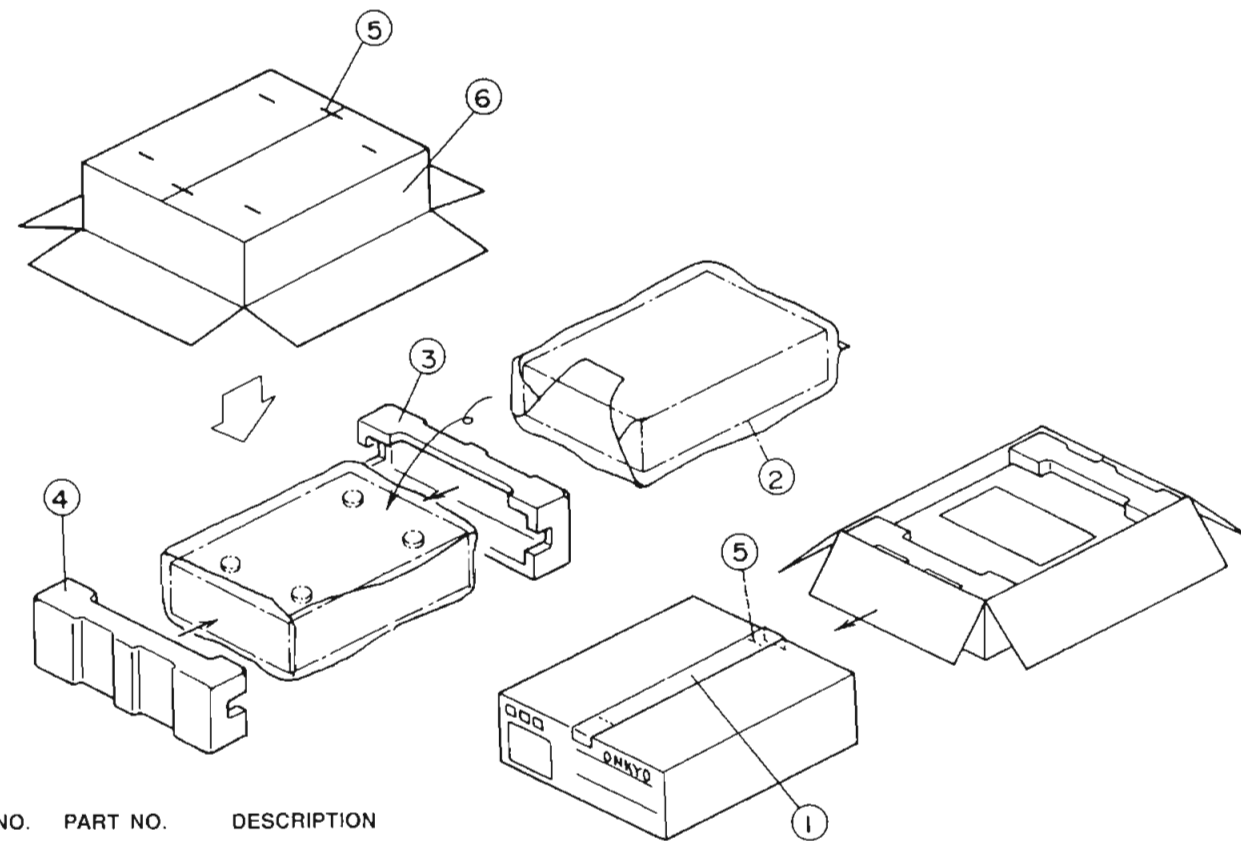
(120V model only)

CIRCUIT NO.	PART NO.	DESCRIPTION
P901	25050684	△ NSCT-2P488

NOTE: <P>:Only 230V model  
<Q>:Only 240V model  
<W>:Only Worldwide model

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	29110071	Tape PP
2	29100037A	Styrene bag
3	29091581Y	Pad F
4	29091582Y	Pad B
5	282301	Sealing hook
6	29052432Y	Master carton box <S>
	29052433Y	Master carton box <B>
	29091596Y	Pad,tray (Insert on the tray panel)
		Accessory bag ass'y
	29341752Y	Instruction manual <C/P>
	29100097	Styrene bag <C/P>

NOTE: <C>:Canadian model only  
<P>:230V model only  
<S>:Silver model only  
<B>:Black model only

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