


ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER MODEL C-05

Titanium and Black models

UP, UDN, UDC	120V AC, 60Hz
UP, UPV, UPF, BHUP, BHUPV, BHUPF	230V AC, 50Hz
UW, BHUW	120/220V AC, 50/60Hz
UQA, BHUQA	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
Decoded bits:	1 BIT PWM
Sampling frequency:	176.4kHz (4 times oversampling)
Number of channels:	2 (Stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.004% (at 1kHz)
Dynamic range:	98 dB
Signal to noise ratio:	96 dB
Channel separation:	86 dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power consumption:	10 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	275×80.5×310 mm 10-13/16"×3-3/16"×12-3/16"
Weight:	3.2kg. 7.1 lbs.

Specifications are subject to change without notice.



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NOTE ON COMPACT DISC

● Holding Compact Discs

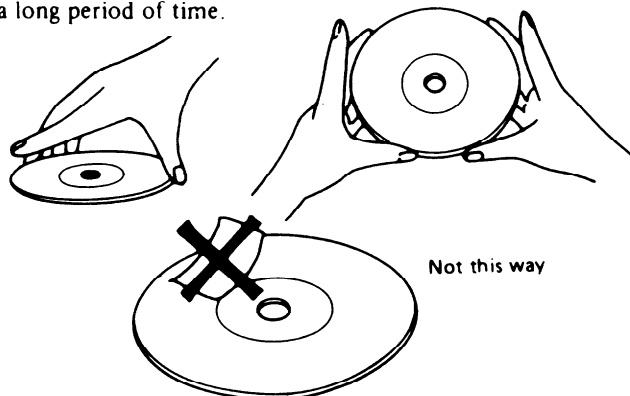
Hold Compact Discs by the edges so that you do not touch the surface of disc. Remember that the side of the disc with the "rainbow" reflection is the side containing the audio information.

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.

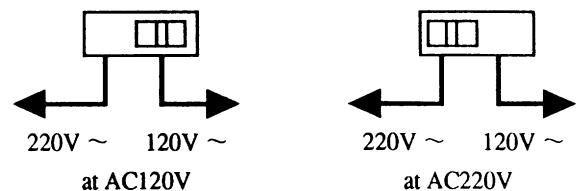
Specifications: More than 10Mohm at 500V.

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.

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.

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.

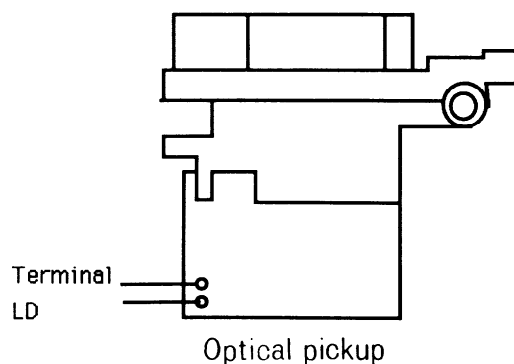
4. Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

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 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!!

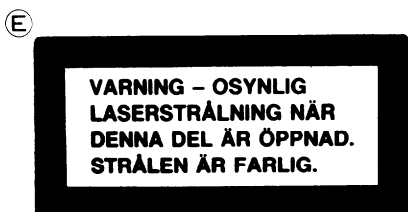
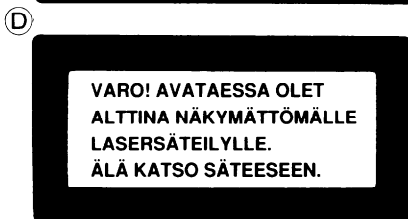
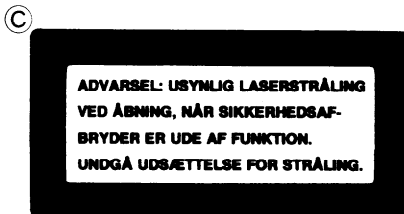
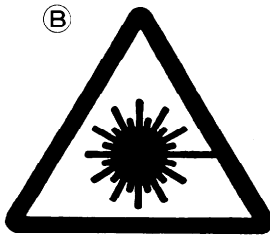
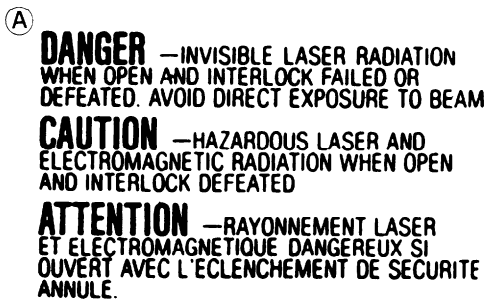
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

LASER WARNING LABEL

The label shown below are affixed.

1. Warning label

This label is located on the arm of mechanism.



- (A) : Danger label
 (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)

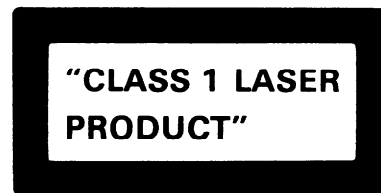
This label is located on the back panel.

PRODUCT IS CERTIFIED BY THE MANUFACTURER TO COMPLY WITH DHHS 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.



ADVARSEL

Denne mærkning 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 utilsigelig kraftig stråling.

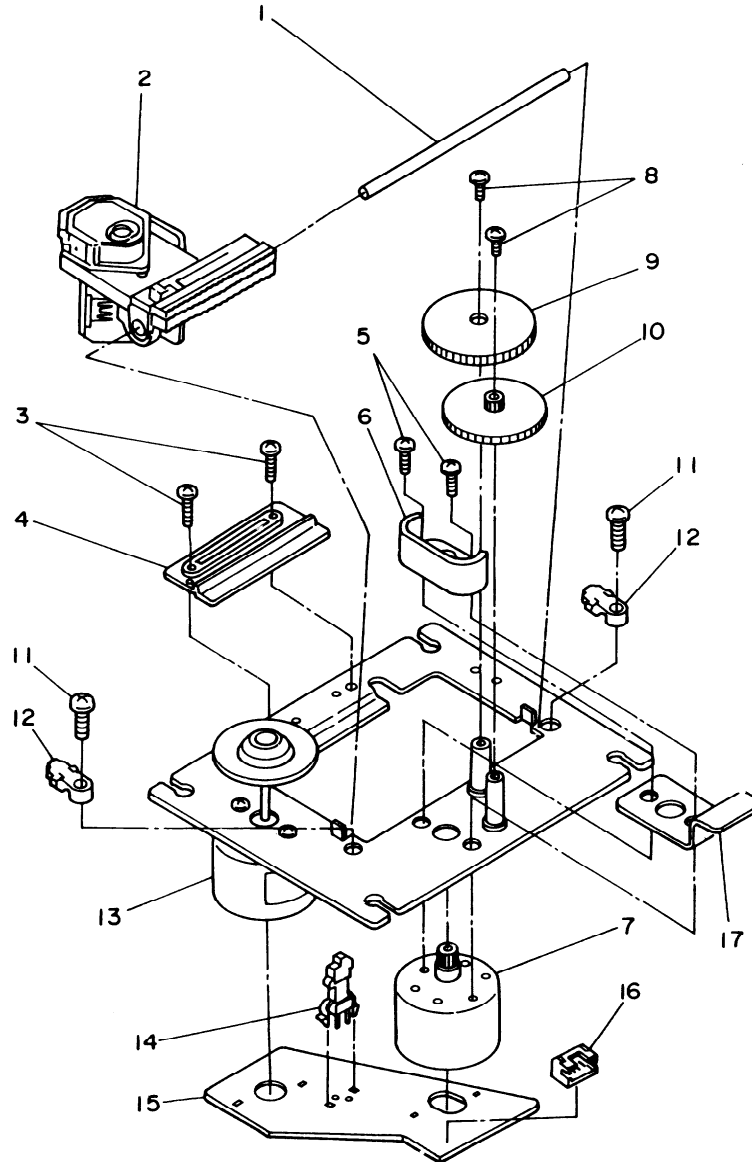
APPARATET BØR KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

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! Laite sisältää laserdiodin, joka lähettää (näkyttöä) silmille vaarallista lasersäteilyä.

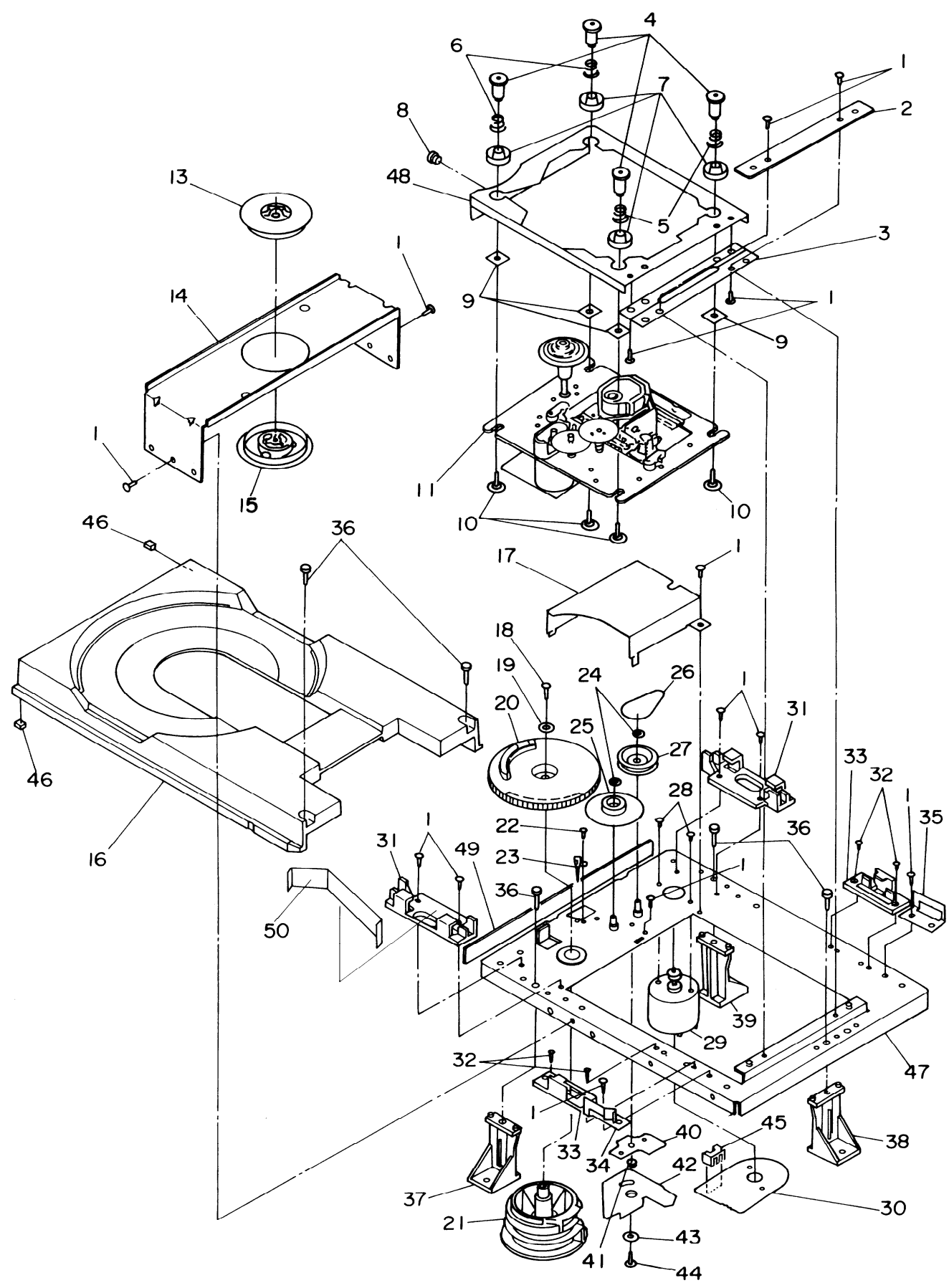
MECHANISM-EXPLODED VIEW

PICKUP DRIVE UNIT-EXPLODED VIEW



PARTS LIST

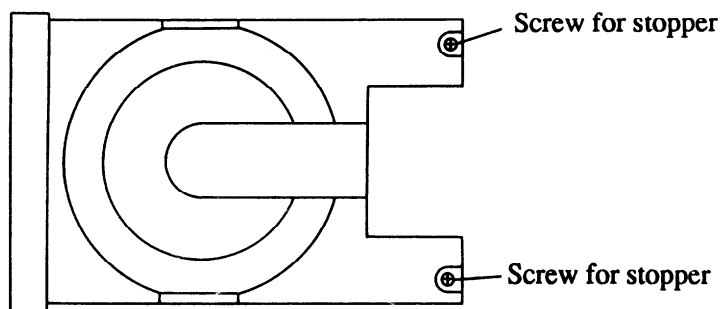
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24506900	Slide shaft	10	24506904	Wheel B
2	24110008	KSS-210A, Optical pickup	11	801427	STP2.6×3, Special screw
3	801425	S2×5, Special screw	12	24506905	Shaft clamp
4	24506901	Slide holder	13	24502263	Spindle motor ass'y
5	82112005	P2×5, Pan head screw	14	25065403	NLF-1220, Leafswitch
6	24506902	Gear cover	15	24505271	Motor pc board
7	24502262	Sled motor ass'y	16	25050396	NSCT-4P223, Socket
8	801426	M1.7×3, Special screw	17	24506906	Stopper
9	24506903	Wheel A			



PARTS LIST

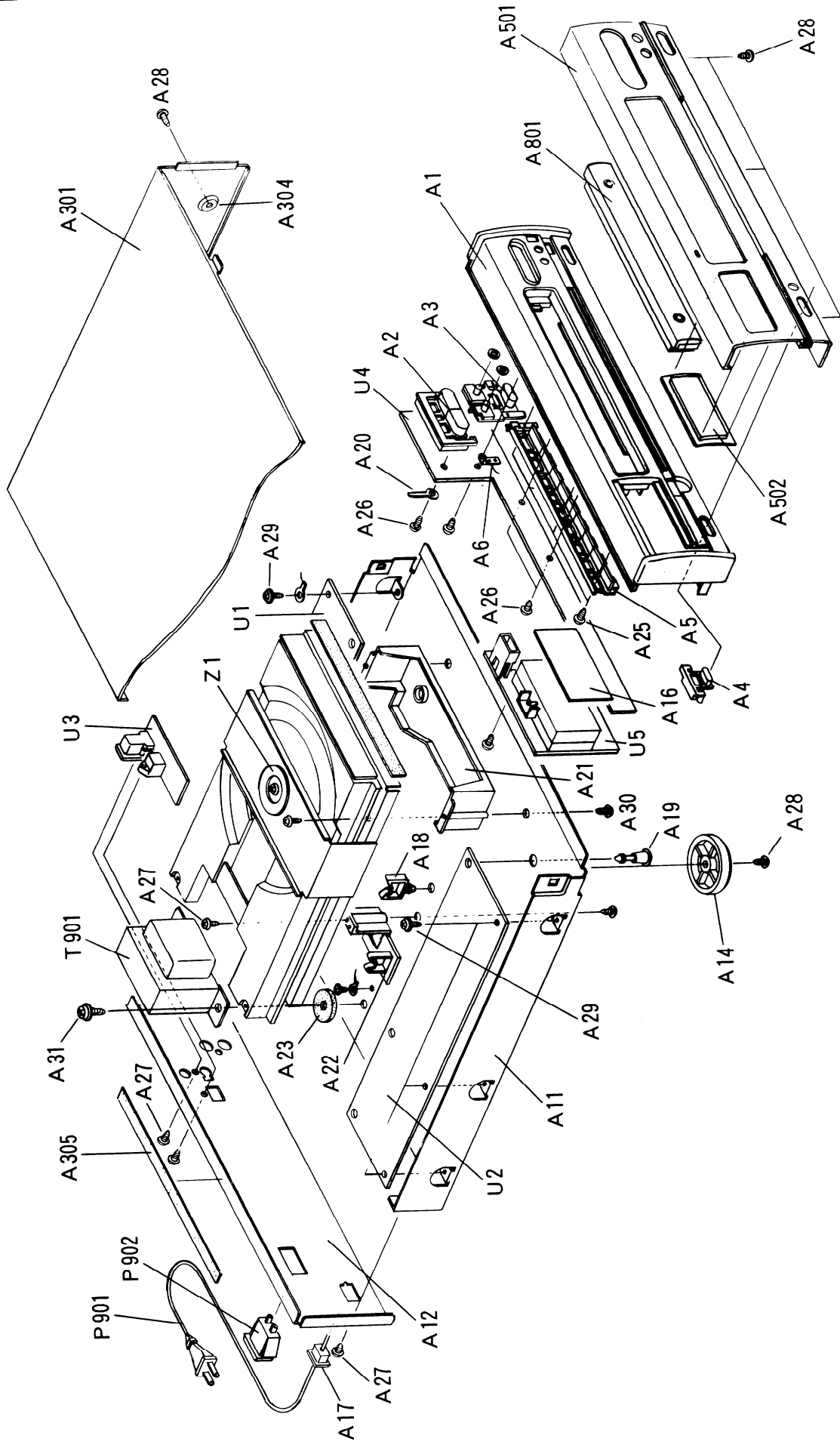
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	834126069	2.6TTS+6C,Self-tapping screw	27	24506884	Pulley,loading
2	24506864	Holder,hinge	28	838426038	2.6TTB+3C(BC),Self-tapping screw
3	24506865	Hinge	29	24506886	Motor ass'y
4	24506866	Shaft	30	24505269	Motor pc board
5	27180441	Spring	31	27301228	Holder,tray
6	27180442	Spring	32	833120047	2TTP+4S,Self-tapping screw
7	24509401	Insulator	33	27301230	Tray holder
8	24506870	Roller	34	24506887	Tray guide R
9	24506871	Plate	35	24506888	Tray guide L
10	801424	Screw with washer	36	838430108	3TTB+10B(BC),Self-tapping screw
11	24506971	KSM-210AFM,Pickup drive unit	37	24506889	Boss R
13	24506875	Magnet	38	24506890	Boss B
14	24506876	Chassis,chucking	39	24506891	Boss L
15	24506959	Pulley,chucking	40	24506892	Link plate
16	24506878	Tray	41	24506893	Boss
17	24506879	Cover	42	24506894	Stopper link
18	838426108	2.6TTB+10B(BC),Self-tapping screw	43	24506895	Spacer
19	8761301008	W3×10F,Washer	44	83112608	2.6TTW+8S,Self-tapping screw
20	24506882	Drive gear	45	25050393	NCNT-5220,Connector
21	24506883	Control cam	46	24506897	Damper
22	834120049	2TTS+4C,Self-tapping screw	47	27301224	Main chassis
23	25065402	NLF-1219,Leafswitch	48	24506898	Sub chassis
24	870144	Washer	49	28140980	Adhesive tape,front
25	27301227	Middle gear	50	27180474	Spring
26	24602507	Belt			

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.

CHASSIS-EXPLODED VIEW



PARTS LIST

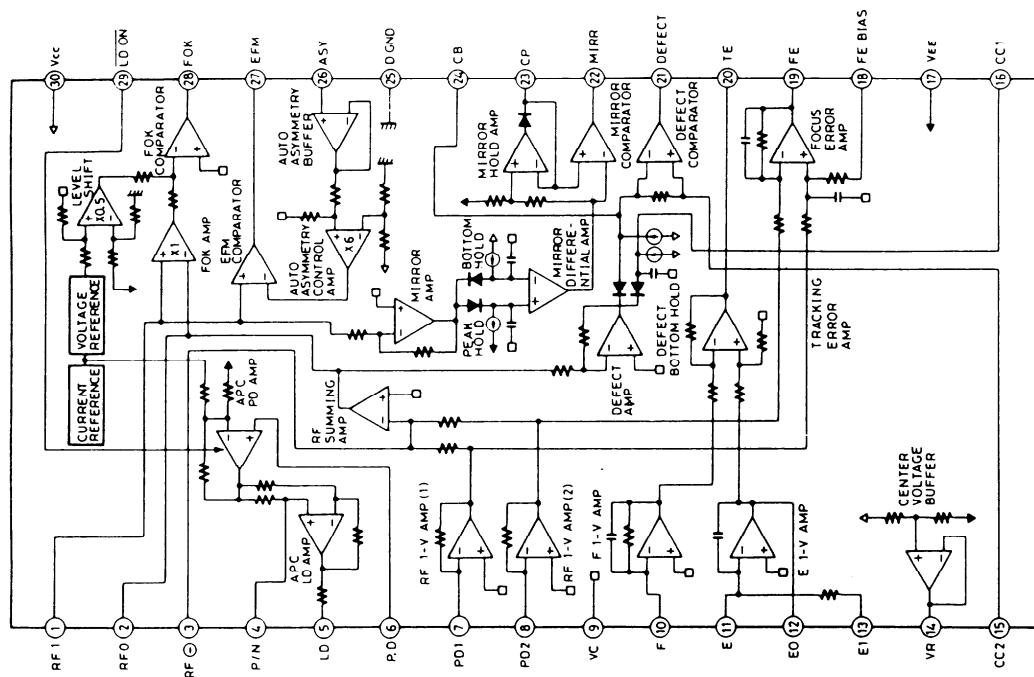
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A1	27110595-1A	Front bracket <T>	A303	28141092	0.5×12×12,Cushion
A2	27110595A	Front bracket 	A304	27270212	Spacer
A3	28324131-1	Play knob <T>	A305	28140720	0.5×10×150,Cushion
A4	28324132-1A	Open knob 	A501	1H168121	Front panel ass'y <T>
A5	28324132A	Open knob 	A502	1H167121	Front panel ass'y
A6	28324090-1	Source knob <T>	A801	28191572A	Clear plate
A7	28324090	Source knob 	F901	27211239-1	Tray panel ass'y <T>
A8	28324135-1	Knob L <T>	F902	252075	Tray panel ass'y
A9	28324135	Knob L 	P101	2009990121A	2.5A-SE-EAK,AC outlet fuse <P>
A10	27150316	Shielded plate <T>	P102	2009990122A	NSAS-16F0186,Socket
A11	27270147	Spacer 	P152	2002340825	NSAS-16P0187,Socket
A12	27150317	Shielded plate M	P153	2002391020	NSAS-8P0189,Socket
A14	27190432	Holder	P901	253142A	NSAS-10P0119,Socket
A16	27190863	Holder	F901	253148	AS-UC7,Power supply cord <D>
A17	27100226A	Chassis	F902	253118	AS-CEE,Power supply cord <P/W>
A18	2712.1463	Back panel <D>	S901	25050290	AS-SAA,Power supply cord <Q>
A19	2712.1464	Back panel <P>	T901	25050337	NSCT-2P118T,AC outlet <D>
A20	2712.1465	Back panel <W>		25050346	NSCT-2P164,AC outlet <P/W>
A21	2712.1466	Back panel <Q>		25065123	NSCT-2P173,AC outlet <Q>
A22	27175252-1AY	Leg		2300702	NSS-1258P, Voltage selector switch <W>
A23	28133252-1	Back plate <T>		2300703	NPT-1089D,Power transformer <D>
A24	28133252	Back plate 		2300704	NPT-1089P,Power transformer <P>
A25	27300750	Bushing cord		2300705	NPT-1089DG,Power transformer <W>
A26	27190541	Holder,clamp	U1	1H168531-2	NPT-1089Q,Power transformer <Q>
A27	27190428A	KGLS-10RT,Holder	U2	1H168532-2	NAAR-4031-2,Main circuit pc board ass'y
A28	27190796	Holder,front	U3	1H168532-2A	NAPS-4032-2,Power supply circuit pc board ass'y <D>
A29	27190797	Holder,back	U4	1H168532-2B	NAPS-4032-2A,Power supply circuit pc board ass'y <P/W>
A30	27270213	3×25×6,Spacer	U5	1H168533-2	NAPS-4032-2B,Power supply circuit pc board ass'y <Q>
A31	28141087	10×20×8,Cushion	Z1	1H168534-2	NADG-4033-2,Optical output pc board ass'y
A32	833426060	2.6TTP+6P(BC),Self-tapping screw	Z2	1H168535-2	NASW-4034-2,Operation switch circuit pc board ass'y
A33	838426088	2.6TTB+8P(BC),Self-tapping screw		24506957	NADIS-4035-2,Indicator circuit pc board ass'y
A34	834430088	3TTS+8B(BC),Self-tapping screw		27180474	NCD-112S,Mechanism ass'y
A35	838430088	3TTB+8B(BC),Self-tapping screw			Spring
A36	831130088	3TTW+8B,Self-tapping screw			
A37	833430080	3TTP+8P(BC),Self-tapping screw			
A38	830440109	4TTC+10C(BC),Self-tapping screw			
A39	82143006	3P+6FN(BC),Pan head screw <W>			
A40	29360807	Label,danger			
A41	29361342	Label <P/W>			
A42	29361218	Label laser <P/W/Q>			
A43	29360811A	Label <P/W>			
A44	29361298	Label <P/W/W>			
A45	29360687	Label class 1 <P/W/Q>			
A46	28184465-3	Top cover <T>			
A47	28184465-2	Top cover 			

NOTE: (D): Only 120V Model
 (P): Only 230V Model
 (W): Only Worldwide Model
 (Q): Only 240V Model
 (P): European Model except Germany Model
 (T): Only Titanium Model
 (B): Only Black Model

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

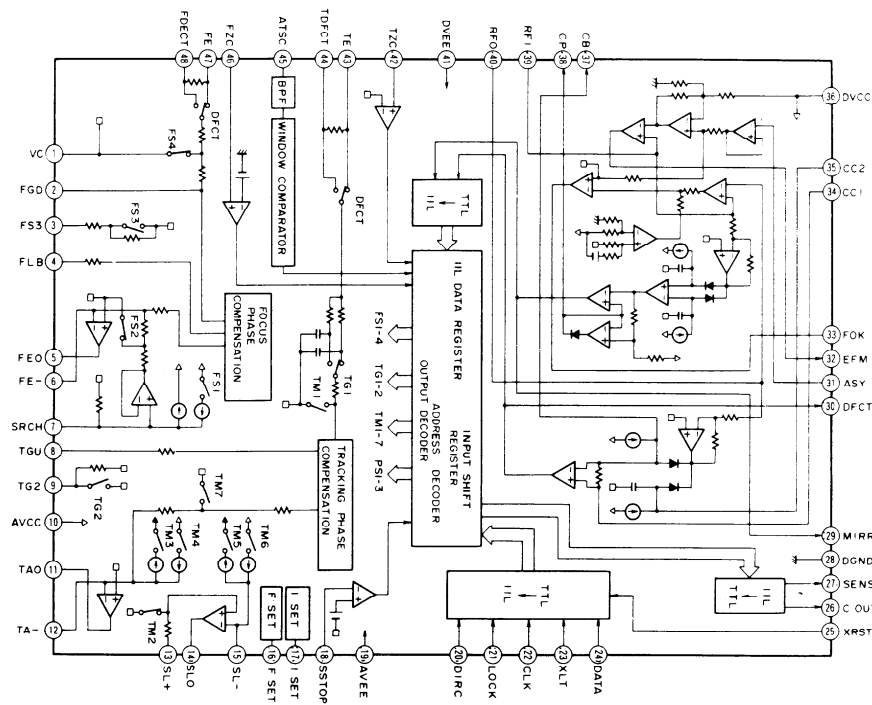
IC BLOCK DIAGRAM AND DESCRIPTIONS

CXA1081M (RF Amp)



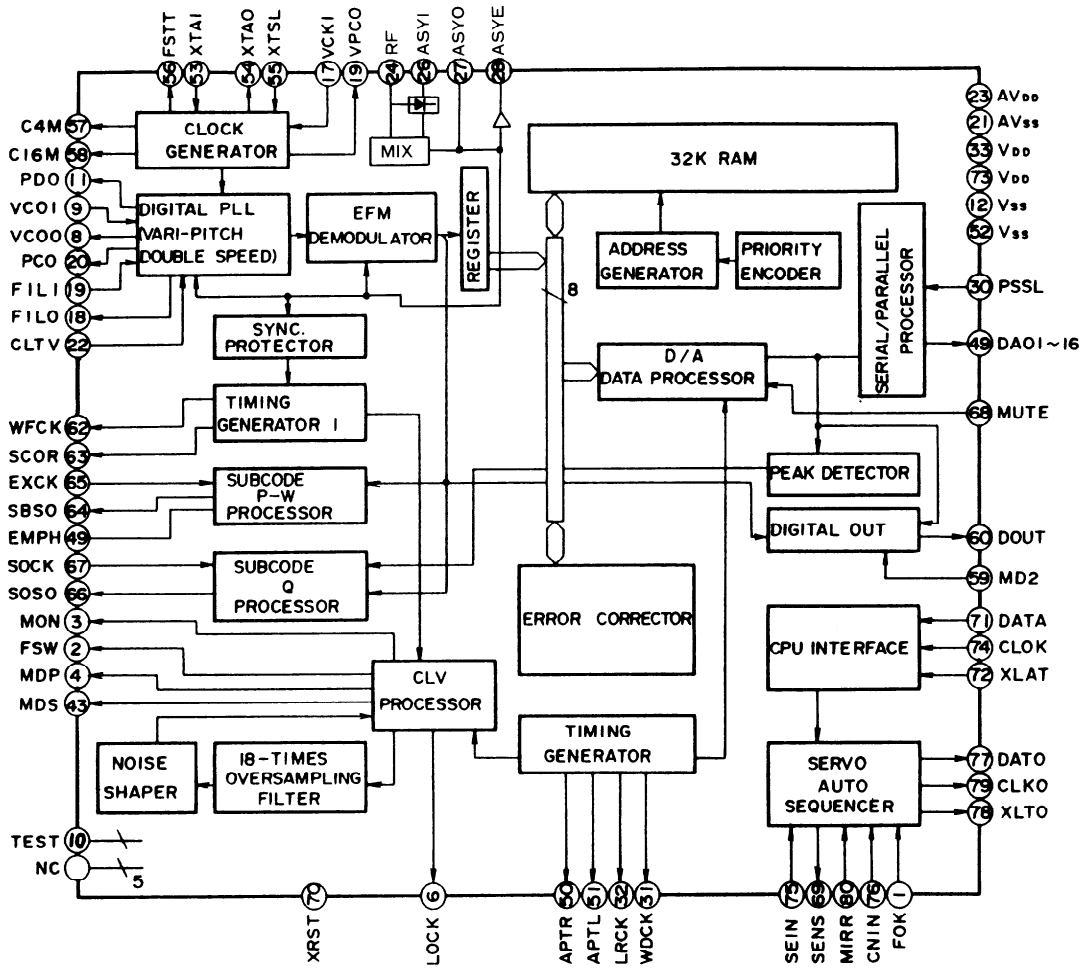
Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	RF I	Input terminal of output signal of RF ⁺ summing amplifier via the coupling capacitor	16	CC1	Defect bottom hold output terminal
2	RFO	Output terminal of RF ⁺ summing amplifier	17	V _{EE}	Negative power supply terminal
3	RF -	Input terminal of RF summing amplifier feedback	18	FE BIAS	Non-inversion bias terminal of focus error amplifier CMR adjustment of focus error amplifier
4	P/N	Switching terminal of P-SUB/N-SUB of LD (laser diode)	19	FE	Output terminal of focus error amplifier
5	LD	Output terminal of APC LD amplifier	20	TE	Output terminal of tracking error amplifier
6	PD	Input terminal of APC PD (Pin diode) amplifier	21	DEFECT	Output terminal of defect comparator
7	PD1	Inversion input terminal of RF I-V amplifier (1) Connect to A+C of PIN diodes.	22	MIRR	Output terminal of mirror comparator
8	PD2	Inversion input terminal of RF I-V amplifier (2) Connect to B+D of PIN diodes.	23	CP	Connection terminal of capacitor for mirror hold Non-inversion input of mirror comparator
9	VC	Connect to GND.	24	CB	Connection terminal of capacitor for defect bottom hold
10	F	Inversion input terminal of F I-V amplifier Connect to F of PIN diode.	25	DGND	Connect to GND
11	E	Inversion input terminal of E I-V amplifier Connect to E of PIN diode.	26	ASY	Auto asymmetry control input terminal
12	E0	Output terminal of E I-V amplifier	27	EFM	Output terminal of EFM comparator
13	E1	Feedback input terminal of E I-V amplifier Gain adjustment of E I-V amplifier	28	FOK	Output terminal of FOK comparator
14	VR	DC voltage output terminal of $(V_{CC} + V_{EE})/2$	29	LD ON	ON/OFF switching terminal of laser diode
15	CC2	Input terminal from defect bottom hold output signal via the coupling capacitor	30	V _{CC}	Positive power supply

CXA1372Q (Servo Signal Processor)



PIN NO.	SYMBOL	I/O	DESCIRPTION	PIN NO.	SYMBOL	I/O	DESCIRPTION
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,tarcking 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	Focos zero-cross comparator input terminal.
				47	FE	I	Focus error input terminal.
				48	FDFCT	I	Capacitor connection terminal for time constant when defect.

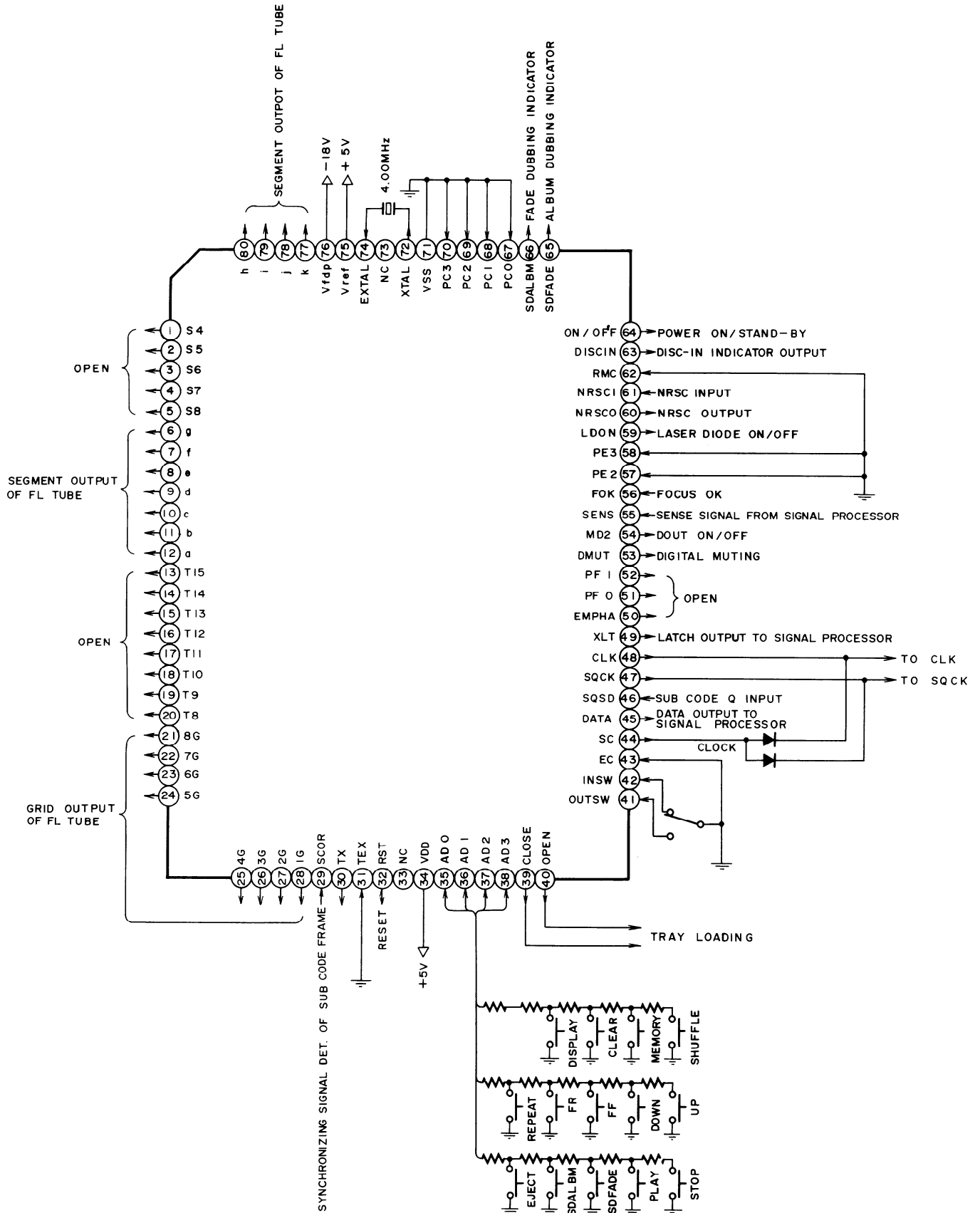
CXD2500AQ (Digital Signal Processor)



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 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	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	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 & 54
18	FILO	O	Filter output for master PLL	57	C4M	O	4.2336MHz output
19	FILI	I	Filter input for master PLL	58	C16M	O	16.9344MHz 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	CLOK	I	Serial data transfer clock input from microprocessor
34	DA16	O	DA16	75	SEIN	I	Sens input from SSP
35	DA15	O	DA15	76	CNCI	I	Track jump numbers count signal input
36	DA14	O	DA14	77	DATO	O	Serial data output to SSP
37	DA13	O	DA13	78	XLTO	O	Serial data latch output to SSP. Latch at trailing.
38	DA12	O	DA12	79	CLKO	O	Serial data transfer clock output to SSP
39	DA11	O	DA11	80	MIRR	I	Mirror signal input
40	DA10	O	DA10				
41	DA09	O	DA09				

Note:SSP:Q105 CXA1372Q

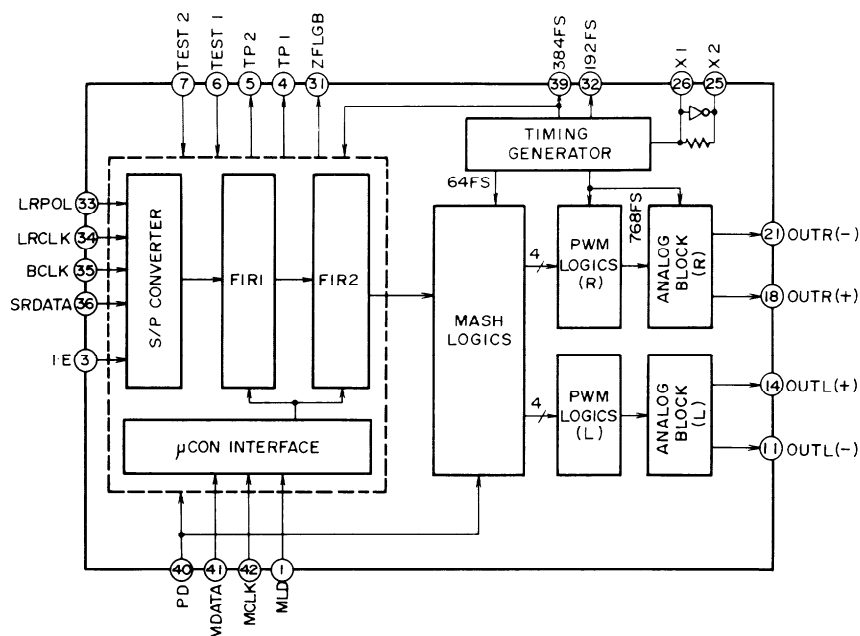
CXP50112-170Q (Microprocessor)



TERMINAL DESCRIPTION

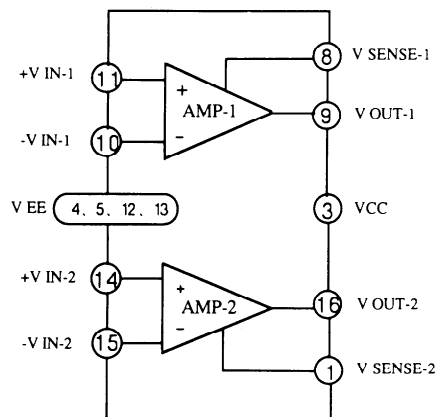
PIN.NO.	SYMBOL	I/O	DESCRIPTION	PIN.NO.	SYMBOL	I/O	DESCRIPTION
1~5		O	Not used.(Open)	45	DATA	O	Serial data output of command to signal processor IC.
6	g	O	FL tube segment output.	46	SQSO	I	Serial data input of sub code Q from signal processor IC.
7	f	O	FL tube segment output.	47	SQCK	O	Serial transfer clock of sub code Q to signal processor IC.
8	e	O	FL tube segment output.	48	CLK	O	Serial transfer clock of command to signal processor IC.
9	d	O	FL tube segment output.	49	XLT	O	Serial transfer latch to signal processor IC.
10	c	O	FL tube segment output.	50~52		O	Not used.(Open)
11	b	O	FL tube segment output.	53	DMUT	O	Muting control signal.Active H.
12	a	O	FL tube segment output.	54	MD2	O	Inhibiting signal of digital output of signal processor.
13~20		O	Not used.(Open)	55	SENS	I	Sense input from signal processor.
21	8G	O	FL tube grid output.	56	FOK	I	Focus OK input.
22	7G	O	FL tube grid output.	57~58		I	Not used.(Open)
23	6G	O	FL tube grid output.	59	LDON	O	Laser control output.On at low level.
24	5G	O	FL tube grid output.	60	NRSCO	O	NRSC output.
25	4G	O	FL tube grid output.	61	NRSCI	I	NRSC input.
26	3G	O	FL tube grid output.	62	RMC	I	Not used.(Connect the ground.)
27	2G	O	FL tube grid output.	63	DISCIN	O	Disc-in indicator output.
28	1G	O	FL tube grid output.	64	ON/OFF	O	Power supply control output.On at H.
29	SCOR	I	Synchronizing signal detection of sub code frame.	65	SDFADE	O	Fade dubbing indicator output.
30	TX	O	Not used.(Open)	66	SDALBM	O	Album dubbing indicator output.
31	TEX	I	Not used.(Connect the ground.)	67~70		I	Not used.(Connect the ground.)
32	RST	I/O	Reset terminal. H when power turns on.	71	Vss		Ground terminal.
33	NC			72	XTAL	O	System clock output terminal.
34	VDD		5V	73	NC		
35~38	AD0-AD3	I	Key input terminals.	74	EXTAL	I	System clock input terminal.
39	CLOSE	O	Tray open/close control output.	75	Vref	I	Reference voltage supply terminal.
40	OPEN	O	Tray open/close control output.	76	Vfdp	I	Negative power supply terminal for FL tube.
41	OUTSW	I	Tray open operation completion signal.	77	k	O	FL tube segment output.
42	INSW	I	Tray close operation completion signal.	78	j	O	FL tube segment output.
43	EC	I	Not used.	79	i	O	FL tube segment output.
44	SC	O	Clock supply terminal of serial transfer.	80	h	O	FL tube segment output.

MN6474 (D/A Converter)

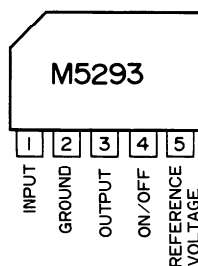
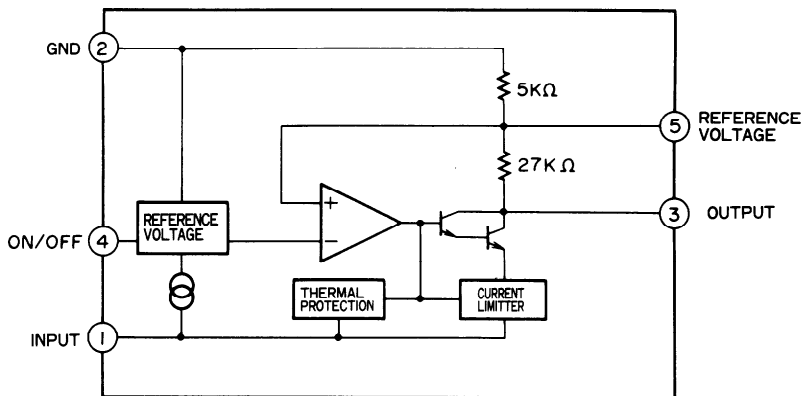


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	MLD	Microprocessor command load input terminal. Load at "L".	24	DVSS1	Ground terminal 1 for digital system. (Ground for oscillation circuit)
2	RSTB	Reset terminal. Reset at "L".	25	X2	Crystal oscillation terminal.
3	I-E	Signal processing LSI format at "L", and 1S format at "H".	26	X1	Crystal oscillation terminal. (External clock input terminal)
4	TP1	Output terminal 1 for digital filter portion test.	27	NC	
5	TP2	Output terminal 2 for digital filter portion test.	28	DVDD2	Power supply terminal 2 for digital system. (+5V)
6	TEST1	Test signal input terminal 1 for testing digital filter portion. Normally "L".	29	DVSS2	Ground terminal 2 for digital system.
6			30	NSUB	Connect to D-VDD. (Potential fixing terminal for Silicon circuit board)
7	TEST2	Test signal input terminal 2 for testing digital filter portion. Normally "L".	31	ZFLGB	Output terminal for zero output detector.
7			32	192FS	192FS(=8.4672MHz) output terminal.
8	NC		33	LRPOL	Polarity switching terminal for LRCLK. L ch at "H", R ch at "L".
9	NC		34	LRCLK	Input terminal for LRCLK.
10	AVDD4	Power supply terminal 4 for analog system. (+5V)	34		At LR-POL "H": Lch data input at "H", Rch data input at "L".
11	OUTL(-)	PWM output terminal for L ch negative phase.	34		At LR-POL "L": Lch data input at "L", Rch data input at "H".
12	AVSS4	Ground terminal 4 for analog system.	35	BCLK	Serial bit clock input terminal.
13	AVSS3	Ground terminal 3 for analog system.	36	SRDATA	Input terminal for serial input data.
14	OUTL(+)	PWM output terminal for L ch positive phase.	37	DVSS	Ground terminal for digital system.
15	AVDD3	Power supply terminal 3 for analog system. (+5V)	38	DVDD	Power supply terminal for digital system. (Terminal for COM potential fixing) (+5V)
16	NC		39	384FS	384FS=16.9344MHz output terminal.
17	AVDD2	Power supply terminal 2 for analog system. (+5V)	40	PD	Power down terminal. Active H.
18	OUTR(+)	PWM output terminal for R ch positive phase.	41	MDATA	Microprocessor command data input terminal.
19	AVSS2	Ground terminal 2 for analog system.	42	MCLK	Clock input terminal for microprocessor command.
20	AVSS1	Ground terminal 1 for analog system.			
21	OUTR(-)	PWM output terminal for R ch negative phase.			
22	AVDD1	Power supply terminal 1 for analog system. (+5V)			
23	DVDD1	Power supply terminal 1 for digital system. (+5V) (Power supply for oscillation circuit)			

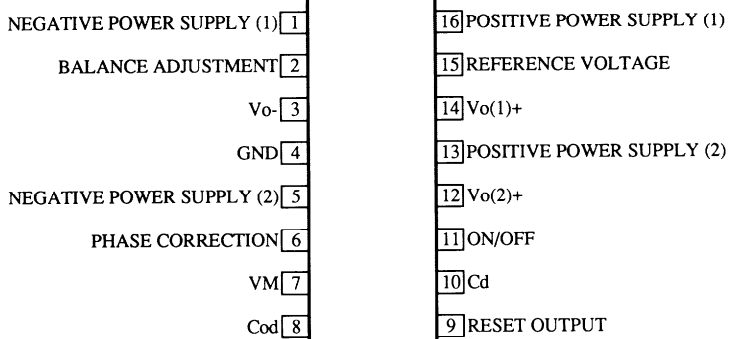
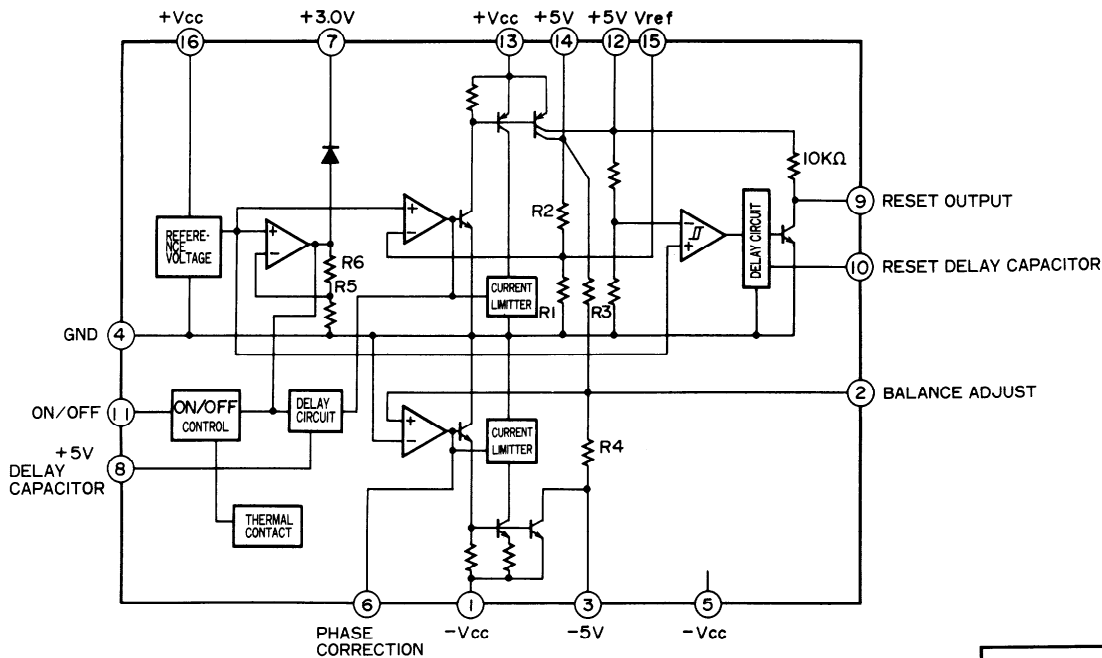
TA8406P (OP AMP)



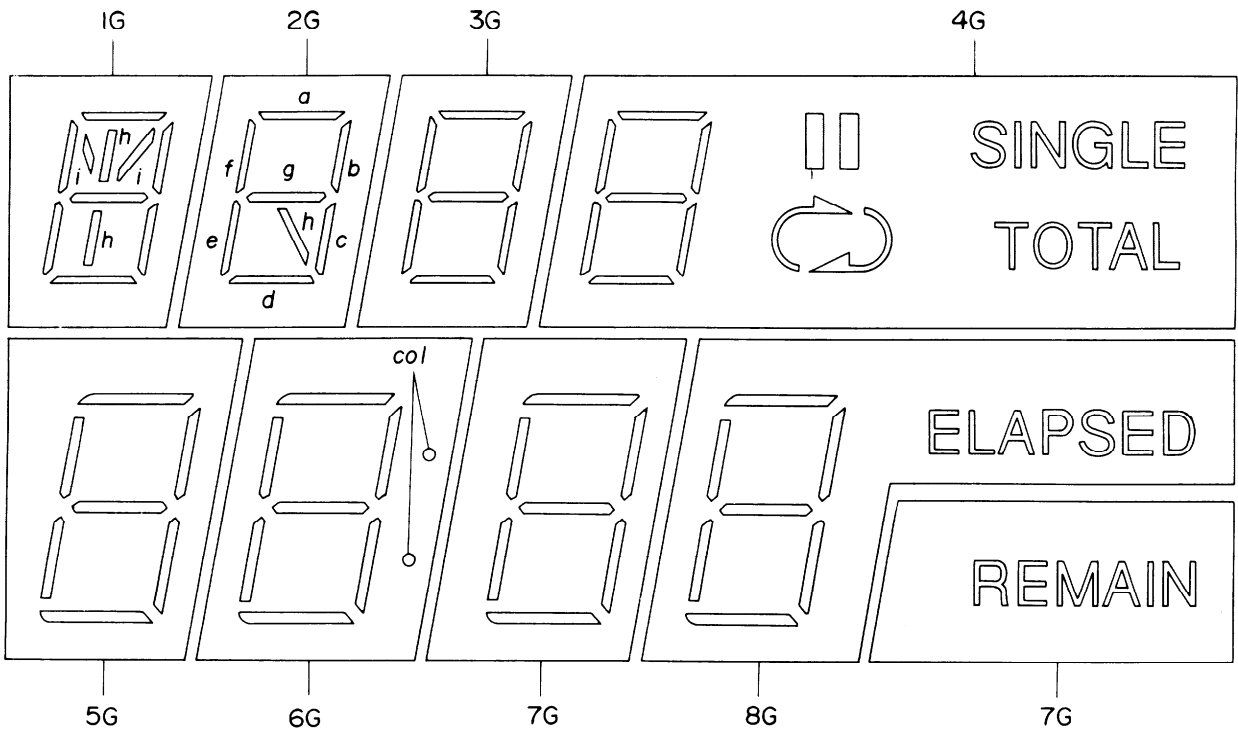
M5293P (REGULATOR IC)



M5294P (SYSTEM RESET AND ±5V POWER SUPPLY)



8-BT-103GK (FL Tube)



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CONNECTION	F1	F1	NP	1G	2G	3G	4G	5G	6G	7G	8G	a	b	c	d	e	f

18	19	20	21	22	23	24	25
g	h REMAIN ELAPSED	i	SINGLE	TOTAL	NP	F2	F2

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 P103.

Adjust R112 until RF waveform as shown photo 1 becomes maximum.

When the amount of RF Signal is broad, set R112 to mechanical center.

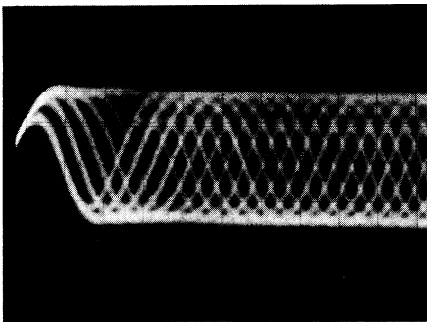
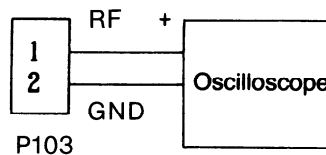


Photo 1



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

2. Tracking offset adjustment

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

Turn R117 to minimum position.(Counter clockwise)

Connect the oscilloscope between pin 3 (TR) of P104 and pin 2 (GND) of P103.

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

Turn R117 to the mechanical center.

After adjustment, disconnect the oscilloscope.

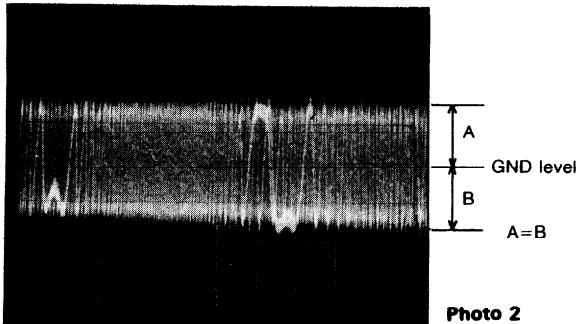
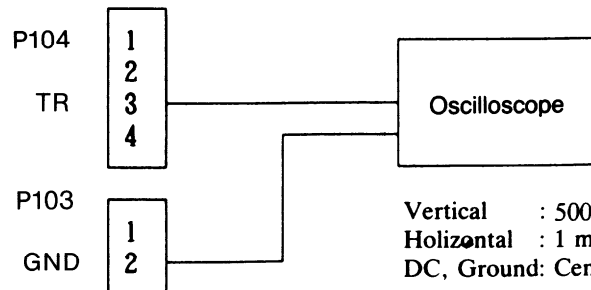


Photo 2



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.

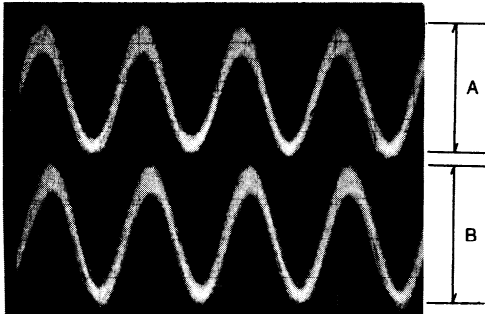
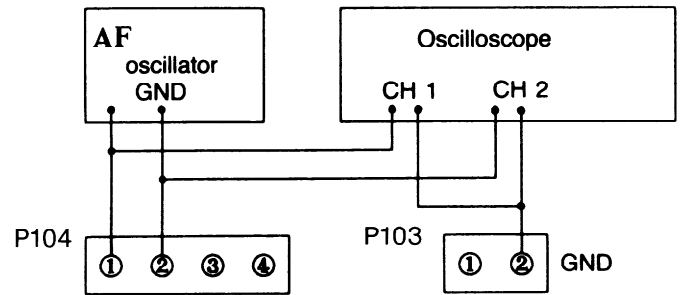


Photo 3



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

Adjust R116 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.

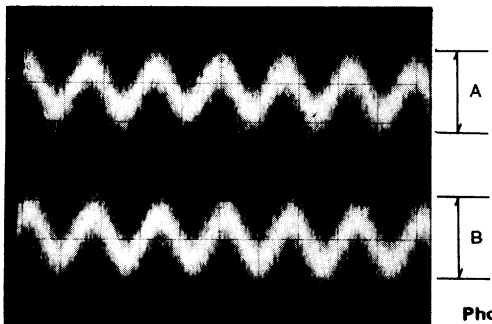
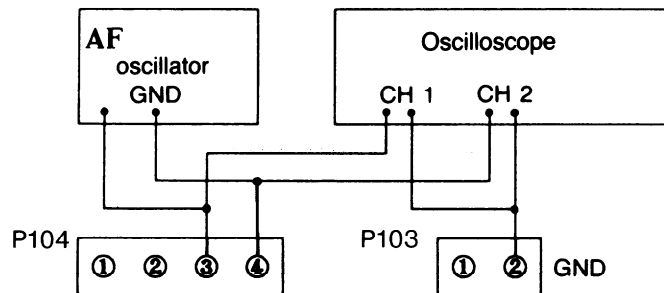


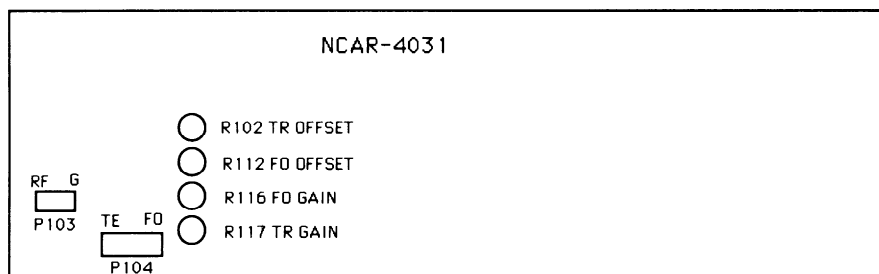
Photo 4



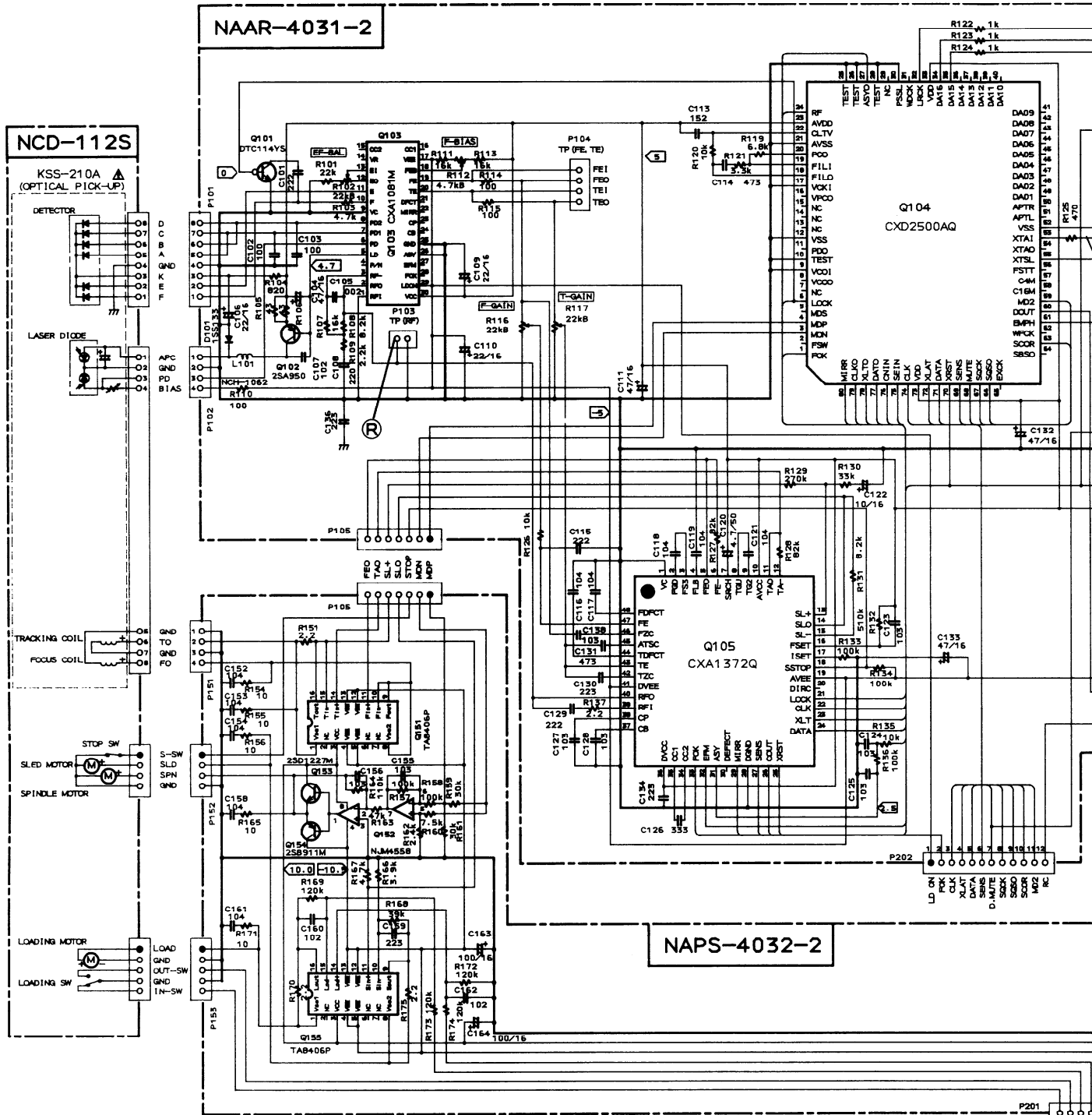
Vertical : 0.2V/div.
 Horizontal: 0.5 ms/div.

Adjust R117 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.
 After adjustment, disconnect the AF oscillator and the oscilloscope.

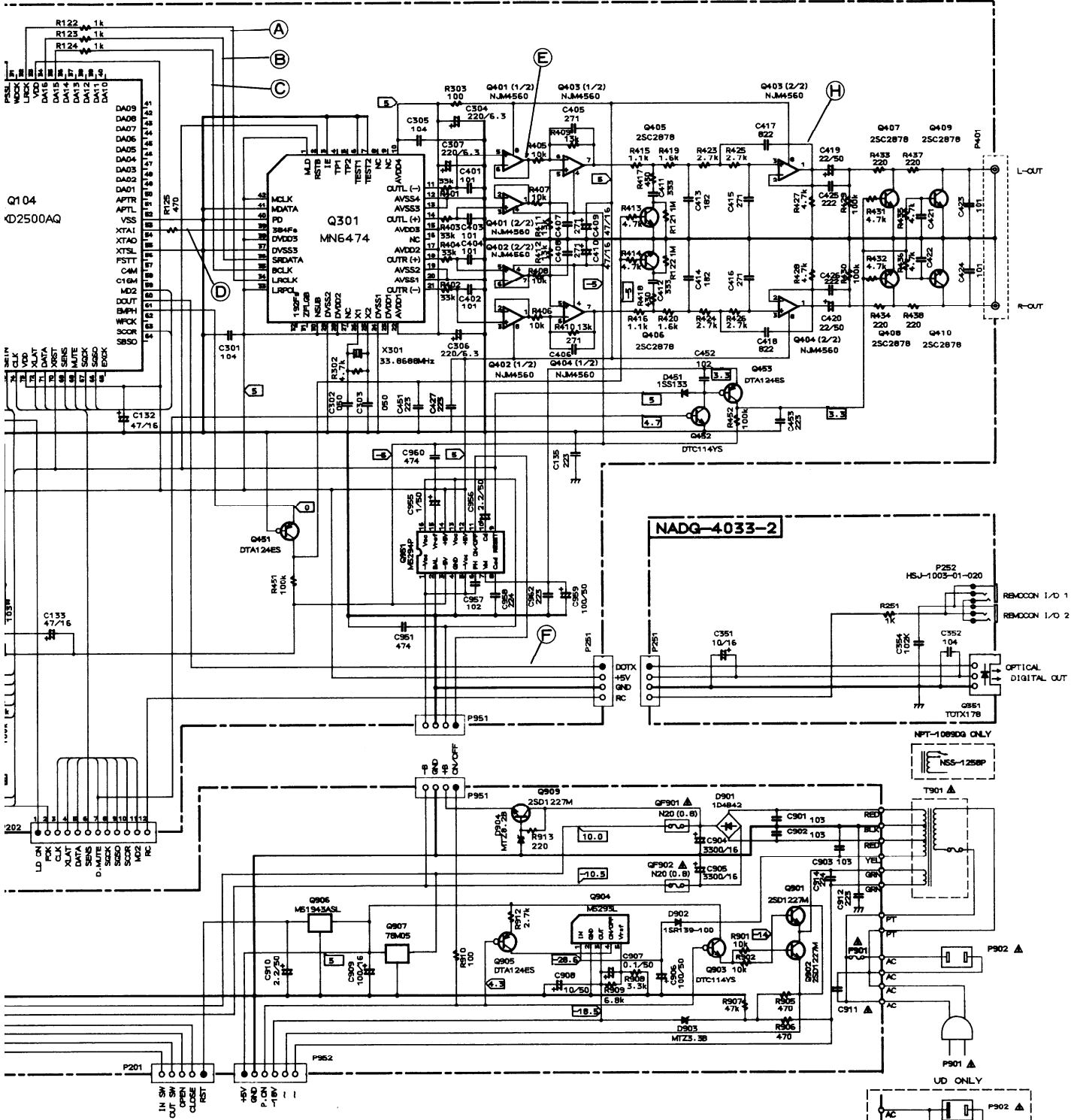
After adjustment, confirm that the center of tracking error signal becomes GND level.



SCHEMATIC DIAGRAM

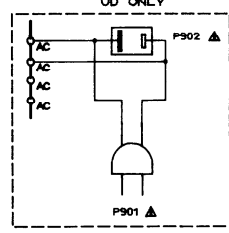


- NOTE**
- THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
 - VOLTAGE (MEASURED WITH VOLTMETER) \square IS DC VOLTAGE (NO INPUT SIGNAL)
 - ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
 - ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
 - ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
 - ELECTROLYTIC CAPACITORS (Ψ) ARE IN μ F/VV.
 - ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
 - EX) 3pF \rightarrow 030, 33pF \rightarrow 330, 330pF \rightarrow 331, 0, 033 μ F \rightarrow 333
 - ALL RESISTORS ARE IN Ω MMS 1/4 WATTS UNLESS OTHERWISE NOTED.
 - THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
 - EX) \square PRINTING SIDE
 - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.



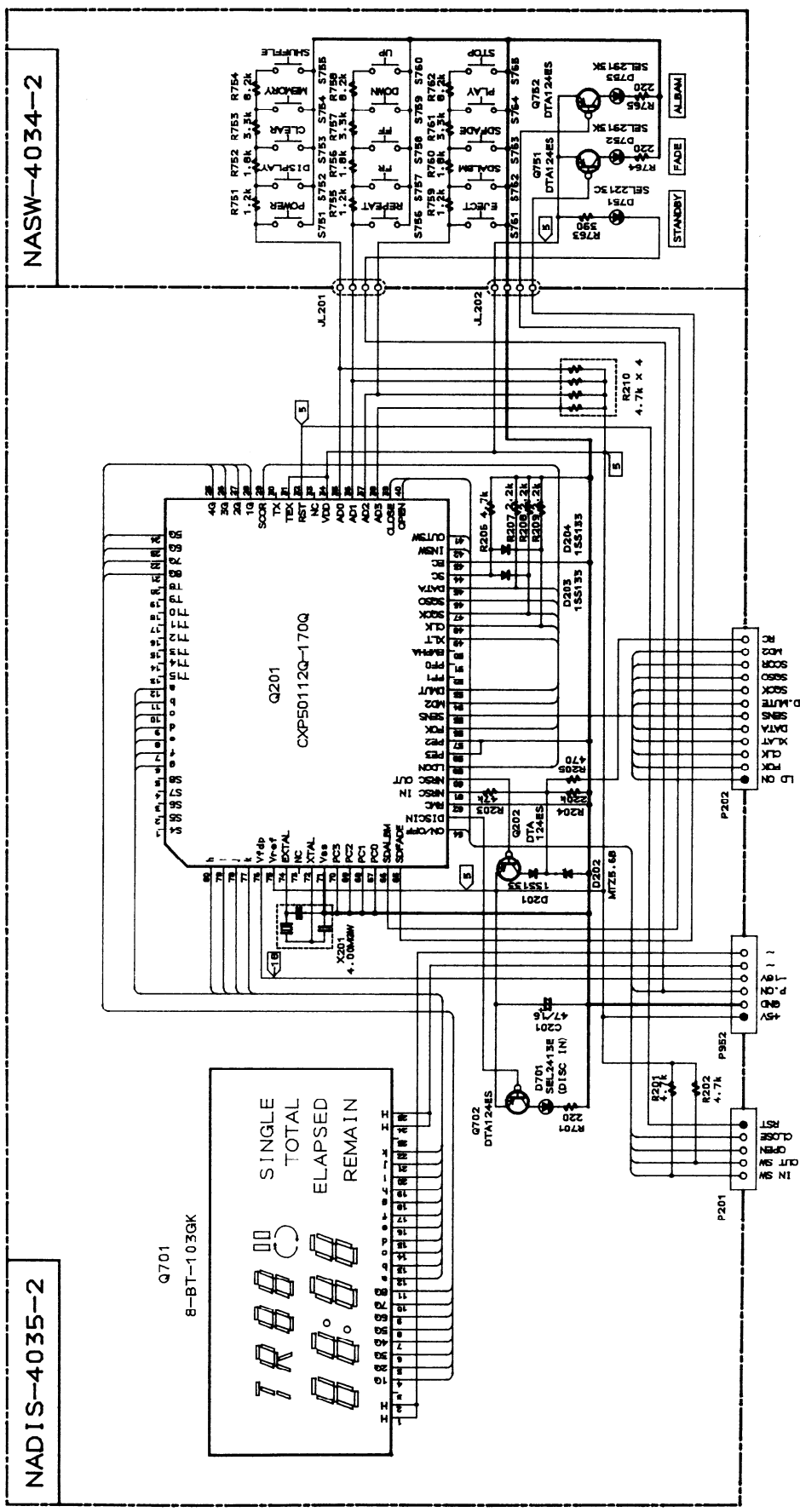
SAFETY.
 INPUT SIGNAL)
 SS
 SS
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 NOTED.
 THE PARTS.

	RATING	T901	F901	QF901, 902	P901	P902	C911
UD	AC120V/60Hz	NPT-1089D	WITHOUT	WITHOUT	AS-UC7	NSCT-2P118T	472/125V
UP	AC230V/50Hz	NPT-1089P	WITH	WITH	AS-CEE	NSCT-2P164	472/400V
UW	AC120/220V 50/60Hz	NPT-1089DG	WITHOUT	WITH	AS-CEE	NSCT-2P164	472/400V
UQ	AC240V/50Hz	NPT-1089Q	WITHOUT	WITH	AS-SAA	NSCT-2P173	472/400V



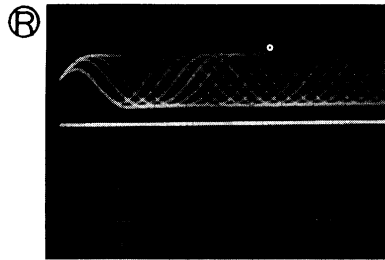
6 | 5 | 4 | 3 | 2 | 1

SCHEMATIC DIAGRAM

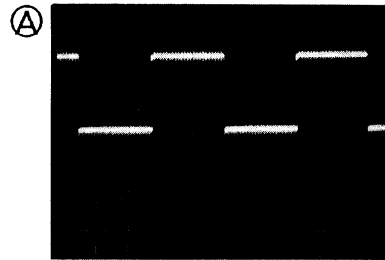


- NOTE**
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 - VOLTAGE (MEASURED WITH VOLTMETER) \square IS DC VOLTAGE. (NO INPUT SIGNAL)
 - ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
 - ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
 - ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
 - ELECTROLYTIC CAPACITORS (Φ) ARE IN μ F/WV.
 - ALL CAPACITORS ARE IN PF/50WV UNLESS OTHERWISE NOTED.
 - EX30PF-030, 330PF-330, 330PF-331, 0.053 μ F-333
 - ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
 - THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EXCEPT PRINTING SIDE
 - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

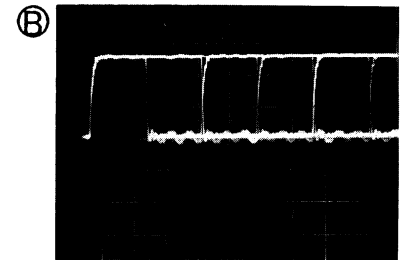
WAVEFORM OF EACH SECTION



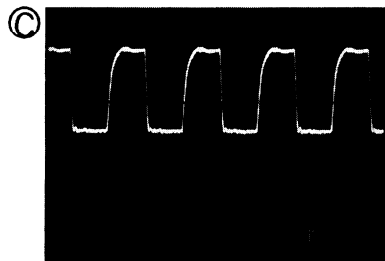
V:50mv H:0.5 μs



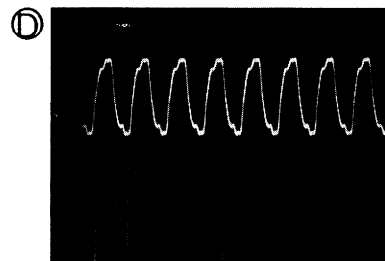
V:0.2V H:0.5 μs



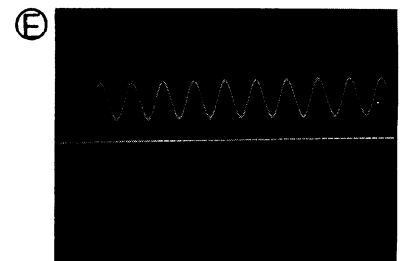
V:0.2V H:0.2 μs



V:0.2V H:0.2 μs



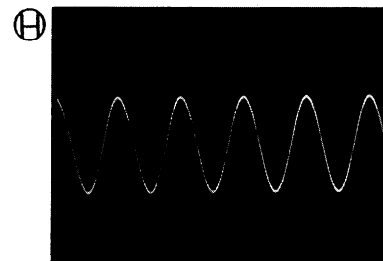
V:0.2V H:0.05 μs



V:0.2V H:1ms



V:0.2V H:0.1 μs



V:0.2V H:0.5ms

VOLTAGE OF IC TERMINAL

Q151

0V	1	16	0V
NC	2	15	0V
9.5V	3	14	0V
-10.4V	4	13	-10.7V
-10.5V	5	12	-10.7V
NC	6	11	-41mV
NC	7	10	-41mV
-32mV	8	9	-41mV

Q155

12.5mV	1	16	14mV
NC	2	15	2.5V
10V	3	14	2.5V
-10.7V	4	13	-10.6V
-10.7V	5	12	-10.6V
NC	6	11	0V
NC	7	10	0V
68mV	8	9	81mV

Q951

-10.4V	1	16	7.4V
0V	2	15	1.2V
-5V	3	14	5V
0V	4	13	7.4V
-10.7V	5	12	5V
-8.8V	6	11	4V
3.2V	7	10	1V
1.0V	8	9	5V

Q152

0.47V	1	8	10V
0V	2	7	0V
0V	3	6	0V
-10.7V	4	5	0V

Q904

1	-27V
2	0V
3	-18V
4	-5V
5	-5V

PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD(NAAR-4031-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
		ICs
Q103	22240029	CXA-1081M
Q104	22240487	CXD2500QA
Q105	22240394	CXA1372Q
Q301	22240389	MN6474
Q401-Q404	222579	NJM4560D
Q951	22240391	M5294P
		Transistors
Q101,Q452	221281 or 2213570	DTC114YS or RN1207
Q102	2211503 or 2211504	2SA950-O or 2SA950-Y
Q405-Q410	2212285	2SC2878-A
Q451,Q453	2212600 or 2213580	DTA124ES or RN2203
		Diodes
D101,D451	223163	1SS133
		Coil
L101	231023	NCH-1062
		X'tal
X301	3010170	KD4693FGA
		Capacitors
C101,C115	371122224	2200pF ± 5%,50V,Mylar
C104,C111	354744709	47 μ F,16V,Elect.
C106	354742209	22 μ F,16V,Elect.
C109,C110	354742209	22 μ F,16V,Elect.
C113	374721524	1500pF ± 5%,50V,Plastic
C114	374724734	0.047 μ F ± 5%,50V,Plastic
C116-C118	374721044	0.1 μ F ± 5%,50V,Plastic
C119	371121044	0.1 μ F ± 5%,50V,Mylar
C120	354780479	4.7 μ F,50V,Elect.
C121	374721044	0.1 μ F ± 5%,50V,Plastic
C122	354741009	10 μ F,16V,Elect.
C123,C125	374721034	0.01 μ F ± 5%,50V,Plastic
C124,C138	371121034	0.01 μ F ± 5%,50V,Mylar
C126	371123334	0.033 μ F ± 5%,50V,Mylar
C127,C128	371121034	0.01 μ F ± 5%,50V,Mylar
C129	371122224	2200pF ± 5%,50V,Mylar
C130	371122234	0.022 μ F ± 5%,50V,Mylar
C131	374724734	0.047 μ F ± 5%,50V,Plastic
C132,C133	354744709	47 μ F,16V,Elect.
C304,C306	354722219	220 μ F,6.3V,Elect.
C307	354722219	220 μ F,6.3V,Elect.
C401-C404	373301014	100pF ± 5%,125V,Plastic
C405-C408	373302714	270pF ± 5%,125V,Plastic
C409,C410	354744709	10 μ F,16V,Elect.
C411,C412	374723334	0.033 μ F ± 5%,50V,Plastic
C413,C414	374721824	1800pF ± 5%,50V,Plastic
C415,C416	373302714	270pF ± 5%,125V,Plastic
C417,C418	374728224	8200pF ± 5%,50V,Plastic
C419,C420	354782209	22 μ F,50V,Elect.
C421,C422	374722224	2200pF ± 5%,50V,Plastic
C423,C424	373301014	100pF ± 5%,125V,Plastic
C425,C426	374722224	2200pF ± 5%,50V,Plastic
C451,C453	374722234	0.022 μ F ± 5%,50V,Plastic
C951	374724744	0.47 μ F ± 5%,50V,Plastic
C955	354780109	1 μ F,50V,Elect.
C956	354780229	2.2 μ F,50V,Elect.
C958	374722244	0.22 μ F ± 5%,50V,Plastic
C959	354781019	100 μ F,50V,Elect.
C960	374724744	0.47 μ F ± 5%,50V,Plastic
C962	374722234	0.022 μ F ± 5%,50V,Plastic

CIRCUIT NO.	PART NO.	DESCRIPTION
		Resistors
R102	5210066	N06HR22KBD,Semi-fixed
R112	5210062	N06HR4.7KBD,Semi-fixed
R116,R117	5210066	N06HR22KBD,Semi-fixed
		Plugs
P101	25055152	NPLG-8P136
P102	25055148	NPLG-4P132
P103	25055038	NPLG-2P29
P104	25055045	NPLG-4P33
P202	25055156	NPLG-12P140
		Sockets
P105	2002391430	NSAS-14P0233
P251	2009990120A	NSAS-8P0179
		Terminal

POWER SUPPLY CIRCUIT PC BOARD(NAPS-4032-2/2A/2B)

CIRCUIT NO.	PART NO.	DESCRIPTION
		ICs
Q151	22240392	TA8406P
Q152	222465	NJM4558D
Q155	22240392	TA8406P
Q904	22240390	M5293L
Q906	22240018	M51943ASL
Q907	222780052	78M05
		Transistors
Q153,Q901	2213063 or	2SD1227M-Q or
Q902,Q909	2213064	2SD1227M-R
Q154	2212703 or	2SB911M-Q or
	2212704	2SB911M-R
Q903	221281 or	DTC114YS or
	2213570	RN1207
Q905	2212600 or	DTA124ES or
	2213580	RN2203
		Diodes
D901	22380039	1D4B42
D902	22380032	1SR139-100
D903	224450332	MTZ3.3B
D904	224450822	MTZ8.2B
		Capacitors
C152-C154	374721044	0.1 μ F ± 5%,50V,Plastic
C155,C156	371121034	0.01 μ F ± 5%,50V,Mylar
C158,C161	374721044	0.1 μ F ± 5%,50V,Plastic
C159	374722234	0.022 μ F ± 5%,50V,Plastic
C160,C162	371121024	1000pF ± 5%,50V,Mylar
C163,C164	354741019	100 μ F,16V,Elect.
C904,C905	354743329	3300 μ F,16V,Elect.
C906	354781019	100 μ F,50V,Elect.
C907	354781099	0.1 μ F,50V,Elect.
C908	354781009	10 μ F,50V,Elect.
C909	354741019	100 μ F,16V,Elect.
C910	354780229	2.2 μ F,50V,Elect.
C911	3500077	DE7150F472M,IS
C914	374722244	0.22 μ F ± 5%,50V,Plastic
		Plugs
P151,P152	25055148	NPLG-4P132
P153,P201	25055149	NPLG-5P133
P952	25055150	NPLG-6P134
		Socket
P951	2002280820	NSAS-8P0234
		IC protectors
QF901,QF902	252113	△ ICP-N20 <P/W/Q>
		Fuse
F901	252075	△ 2.5A-SE-EAK <P>

CIRCUIT NO.	PART NO.	DESCRIPTION
F901a	Fuseholders 25050065	△ YSH403T <P>

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

OPTICAL OUTPUT PC BOARD(NADG-4033-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q351	24120031	TOTX178,IC
C351	354741009	10 μ F,16V,Elect. capacitor
C352	374721044	0.1 μ F \pm 5%,50V, Plastic capacitor
P252	25045172	HSJ-1003-01-020, Terminal RI

NOTE: THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.
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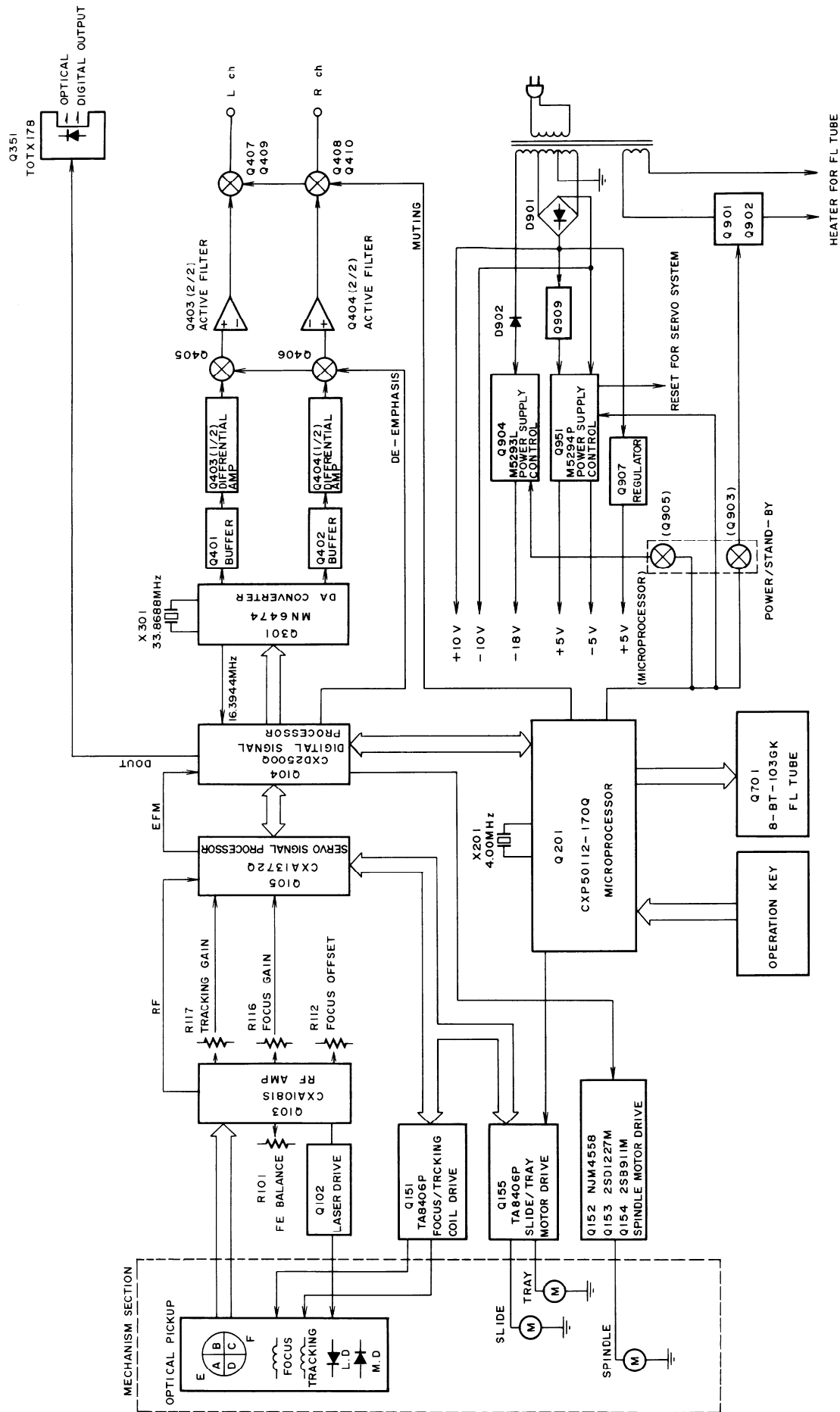
OPERATION SWITCH CIRCUIT PC BOARD(NASW-4034-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q751,Q752	2212600 or 2213580	DTA124ES or RN2203,Transistors
D751	225141	SEL2213C,L.E.D
D752,D753	225142	SEL2913K,L.E.Ds
S751-S765	25035548	NPS-111-S510,Push switches

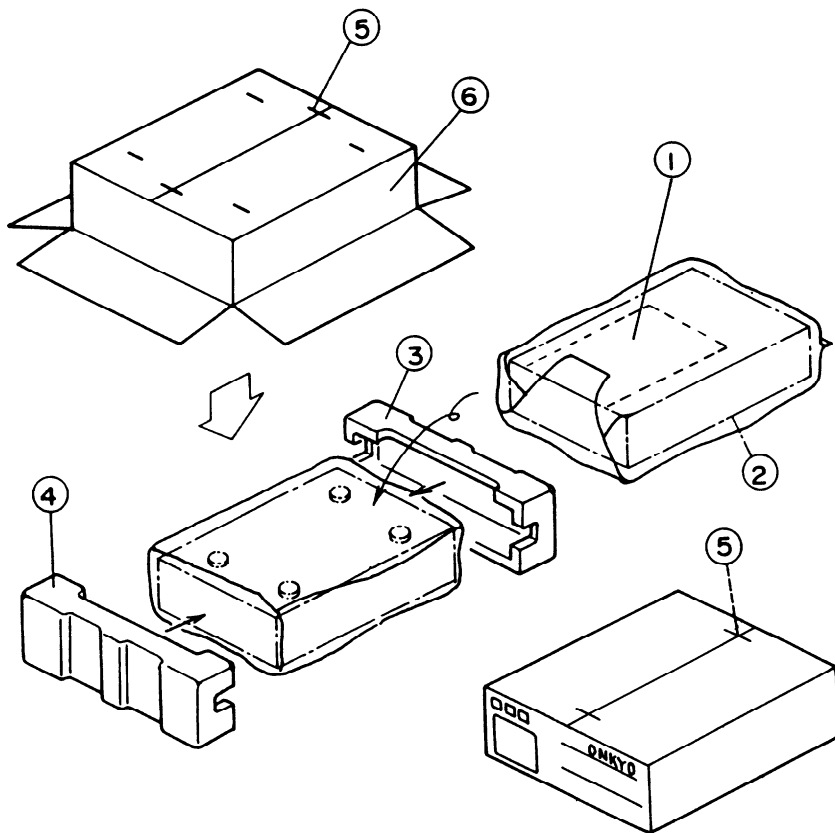
INDICATOR CIRCUIT PC BOARD(NADIS-4035-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q201	IC 22240393	CXP50112-170Q
Q202,Q702	Transistors 2212600 or 2213580	DTA124ES or RN2203
Q701	FL tube 212089	8-BT-103GK
D201	Diodes 223163	1SS133
D202	224450562	MTZ5.6B
D203,D204	223163	1SS133
D701	L.E.D 225137CG or 225137DG	SEL2413ECG or SEL2413EDG
C201	Capacitor 354744709	47 μ F,16V,Elect.
X201	X'tal 3010150	CST4.00MGW
R210	Resistor 49163472404	4.7k Ω \times 4,1/10W,Network
P201	Sockets 2006391010	NSAS-10P0158
P202	2006392435A	NSAS-24P0182
P952	2006341210	NSAS-12P0232
	Holder 27190800	Display
	27190801	L.E.D

BLOCK DIAGRAM



PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29355175	Caution sheet
2	29100123	Styrene bag
3	29091506	Pad F
4	29091507	Pad R
5	282301	Sealing hook
6	29052222	Master carton box
		Accessory bag ass'y
	29341646	Instruction manual <P>
	29100097	350×250mm, Styrene bag

NOTE:<P>:230V and 240V models
(Except Germany and French models)

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