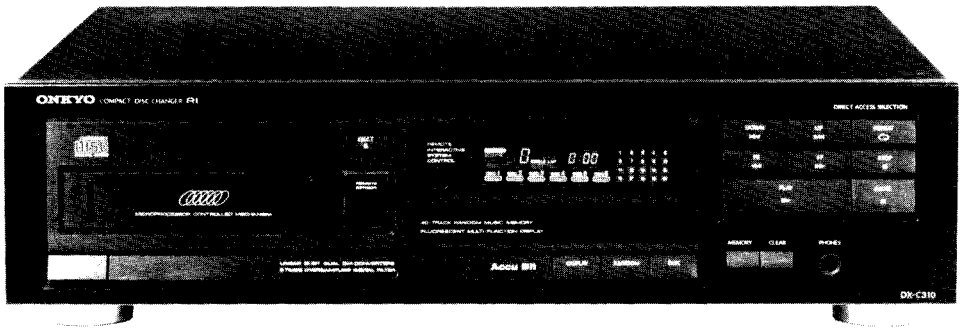
REF.NO. 3373

ONKYO® SERVICE MANUAL

COMPACT DISC AUTOMATIC CHANGER
MODEL DX-C310



UD, UDN	120V AC, 60Hz
UU	110/120/220/240V AC, 50/60Hz
UQA	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:	18 bits linear
Sampling frequency:	352.8kHz (eight-times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.004% (at 1kHz)
Dynamic range:	98dB
Signal to noise ratio:	105dB
Channel separation:	100dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power comsumption:	13 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	435×119×361mm 17-1/8″×4- 2/3″ ×14-1/4″
Weight:	5.8kg, 12.8 lbs.

Specifications are subject to change without notice.

ONKYO
AUDIO COMPONENTS

TABLE OF CONTENTS

SERVICE PROCEDURES

1. Safety-check out

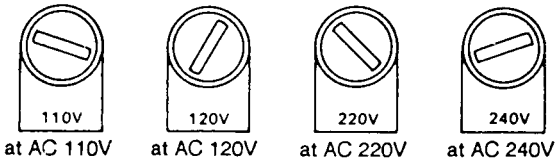
After correcting the original service problem, perform the following safety check before releasing the set to the customer:

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

Specifications: more than 10Mohm at 500V.

2. Voltage selector (rear panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this selector to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by turning the voltage selector with a screwdriver or similar instrument to the 110V, 120V, 220V or 240V position. Confirm that the selector has been set to the correct position before turning the power switch on. If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.



at AC 110V at AC 120V at AC 220V at AC 240V

3. Procedures for replacement of flat packaged ICs

1. Tools to be used:

(1) Soldering iron . . . . Grounded soldering iron or soldering iron with leak resistance of 10 Mohms or more.

Form of soldering iron's tip:

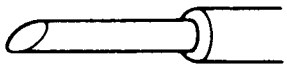


Fig. 2

(2) Magnifying glass . . . for checking of finished works

(3) Tweezers . . . . . for handling of IC and forming of leads

(4) Grounding ring . . . . Countermeasure for electrostatic breakdown

(5) Nipper . . . . . for removing defective IC

(6) Small brush . . . . . for application of flux

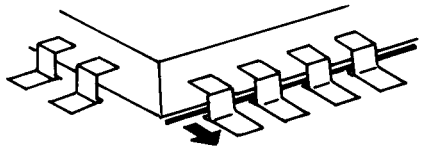
(7) Enamel line

2. Work Procedures:

(1) Remove the defective IC

Cut all leads of the defective IC one by one using a nipper and remove the IC.

1. An enamel line has been pierced between the legs of the flat package IC.
2. Use a soldering iron to unsolder the legs one at a time.
3. Repeat the procedure of 1 and 2 above for the 3 sides only.



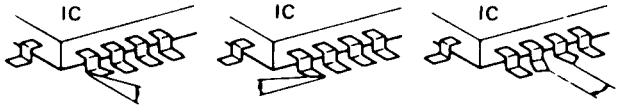
While holding the soldering against the enamel line, pull in the direction of the arrow.

(2) Clean the pattern surface of the PC board.

Get rid of the remaining leads and solder.

(3) Check and from the leads of the new flat packaged IC to be installed.

From every lead on the new IC using a pair of tweezers, so that all of them are aligned neatly without being risen, twisted or inclined toward one side. Especially the rising portion of every lead must be formed with greatest care.

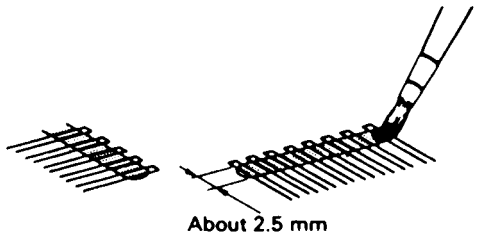


(Rising) (Twisting) (Inclining)

(4) Apply flux to the PC board.

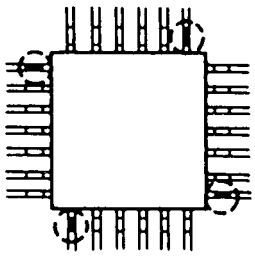
Apply flux to the pattern surface of the PC board which has been cleaned, as shown in the illustration. The area to be applied with flux is the portion of about 2.5mm in width where the IC's leads are to be soldered.

Be careful to apply minimum amount of flux required so as not to smear it on unwanted areas.



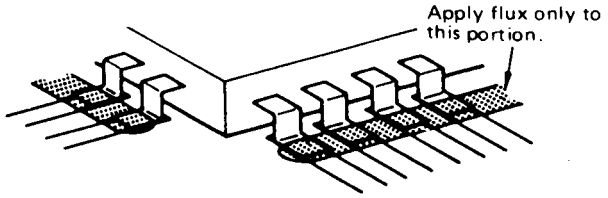
(5) Temporarily tighten the IC

Carefully align the pattern and IC's leads, so that the IC will be temporarily tightened to the pattern on the four leads at the corners. At this time, soldering is required, but no need to apply soldering material.



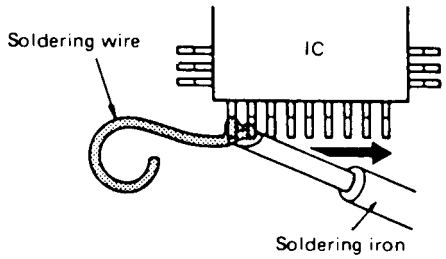
(6) Apply flux to IC's leads

Apply flux to the areas of IC's leads where soldering is to be performed. Be careful not to smear flux on the root portion of any lead or the body of IC.



(7) Soldering

While attaching the tip of the soldering iron to the soldering point as shown in the illustration, feed 2 –5mm of soldering wire. Then, slowly move the iron in the direction indicated by the arrow in the illustration, so that the leads will be soldered to the pattern. Move the iron in the rate of approximately 1cm in 5sec. Proceed with your work while confirming a clean fillet of solder is formed on each lead, subsequent to the melting of flux.



CAUTION

1) If you move the iron too quickly, loose soldering is likely to result.
2) Be especially careful when soldering the first lead where loose soldering is most liable to be formed.

(8) Check the results

When soldering of all leads is finished, check the soldered portion on every lead with a magnifying glass. A tester must not be used or checking of any soldered position

3. Safety-check out (U.S.A. model)

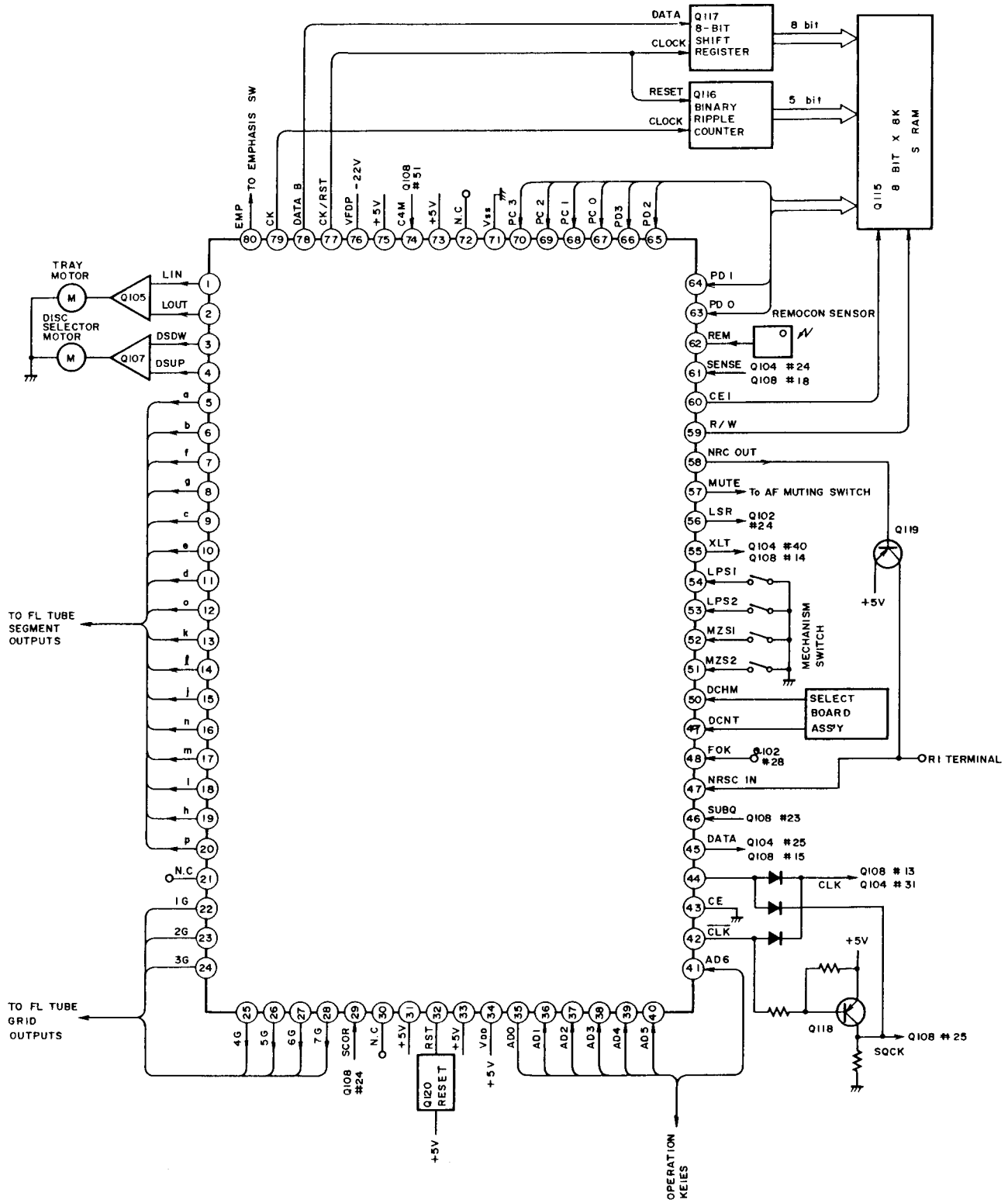
After correcting the original service problem, perform the following safety check before releasing the set to the customer:

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

Specifications: more than 10Mohm at 500V.

MICROPROCESSOR DESCRIPTIONS

CXP50116H-105Q



CONNECTION DIAGRAM

Q114
CXP50116H-105Q (Microprocessor) Terminal Description

Pin No.	Symbol	Descriptions
1 2	LIN LOUT	Disc tray loading IN IN/OUT output terminals. Brake OUT
3 4	DSDW DSUP	Disc selector UP/DOWN UP Brake output terminals. DOWN
5~20	a~p	Segment output terminals for FL tube.
22~28	1G~7G	Digit output terminals for FL tube.
29	SCOR	Subcode sync. SO+SI input terminal. sync
32	RST	Reset input terminal.
34	V_{DD}	Power supply terminal. Connect to 5V.
35~41	AD0~AD6	Key matrix input terminals. (A/D converter)
42 44	CLK	Serial clock output terminal. Subcode clock output terminal.
45	DATA	LSI control data serial output terminal.
46	SUBQ	Subcode Q data serial input terminal.
47	NRSC IN	RI code (Remote control code) input.
48	FOK	Focus OK input terminal. NG OK
49	DCNT	Disc count pulse input terminal. 1 6
50	DCMH	Disc selector home switch input. Not home
51 52	MZS2 MZS1	Magazine discrimination 6 discs single switch input terminals. magazine in eject
53 54	LPS2 LPS1	Load position Load eject switch input. clamp Home
55	XLT	LSI control data latch pulse output.
56	LSR	Laser diode ON/OFF output terminal. ON OFF
57	MUTE	Audio muting output terminal. ON OFF
58	NRC OUT	RI code output terminal.
59	R/W	Read/Write command output terminal for Q115.
60	CE1	Chip enable
61	SENSE	LSI operation input terminal.
62	REM	Remote control code input terminal.
63~70	PD0~3, PC0~3	Memory data input/output terminals.
71	V_{SS}	Connect to GND terminal.
74	C4M	Clock input terminal.
76	VFDP	Power supply terminal for predriver.
77	CK/RST	Clock/Reset output terminal.
78	DATA B	Data output terminal.
79	CK	Clock output terminal.
80	EMP	De-emphasis ON/OFF output. OFF ON

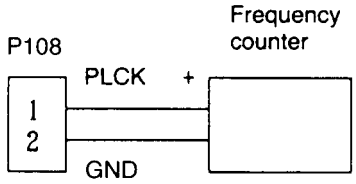
ADJUSTMENT PROCEDURES

Instruments Required

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

1. VCO Frequency Adjustment

Connect the frequency counter to terminal P110.
Turn the power switch to ON. (No load the disc.)
Adjust R154 so that the frequency counter reading becomes 4322 ±5kHz.
After adjustment, disconnect the frequency counter.
Mode: STOP



2. RF Offset Adjustment

Connect the oscilloscope to terminal P106.
Adjust R192 so that the RF signal becomes 100mV ±30mV.
Mode: STOP

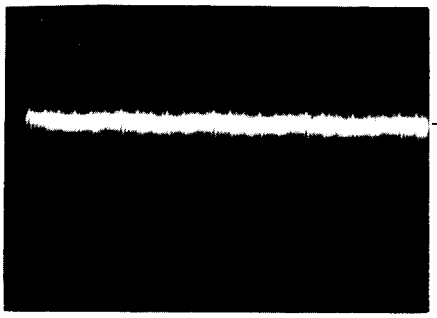
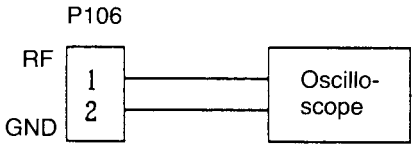
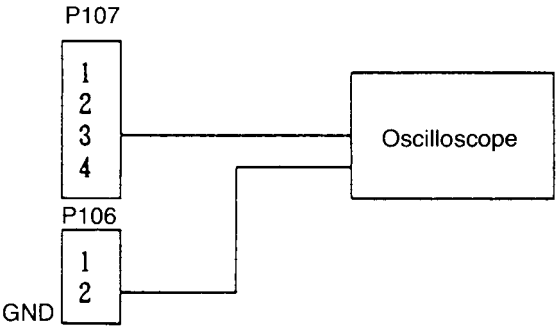


Photo 1
RF Offset 0.2μs/div. 100mV/div.



3. Tracking Balance Adjustment

Turn R108 clockwise 45° from the mechanical center.
Connect the oscilloscope to terminal P107 TR.
Adjust R195 so that the TR signal becomes 0 ±30mV.
Turn R108 to the mechanical center.
Mode: STOP



4. 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 R110 until a clear trace of waveform pattern as shown photo 1 appear on the oscilloscope.
When the amount of jitter is broad, set R110 to mechanical center.
(Jitter meter)
Adjust R110 until the jitter meter reading becomes minimum. (Less than 10ns.)
After adjustment, disconnect the oscilloscope or jitter meter.

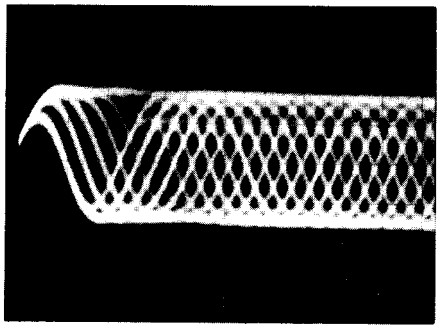
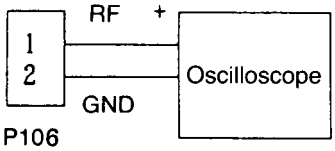
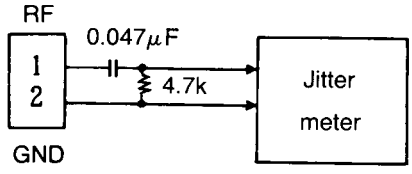


Photo 2



Oscilloscope range
Vertical : 0.5V/div.
Holizontal : 0.5μs/div.
AC



5. Tracking Offset Adjustment

Load the test disc YEDS-18 on the tray and play the track 2. Turn R132 to minimum position. (Counter clockwise)
Connect the oscilloscope between pin 3 (TR) of P107 and pin 2 (GND) of P106.
Adjust R108 until the center of tracking error signal on the oscilloscope becomes GND level.
Turn R132 to the mechanical center.
After adjustment, disconnect the oscilloscope.

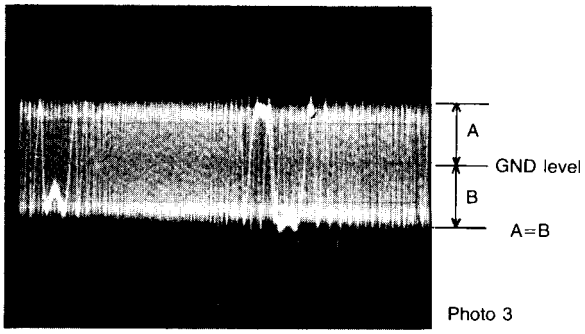
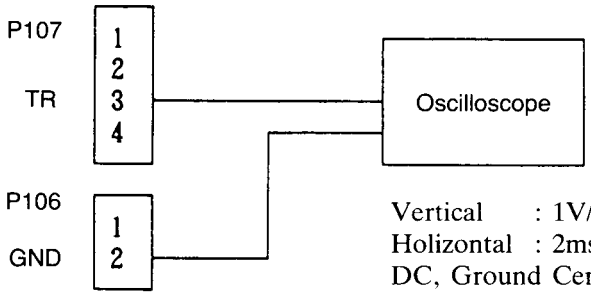


Photo 3



Vertical : 1V/div.
Holizontal : 2ms/div.
DC, Ground Center

6. Focus Gain Adjustment

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

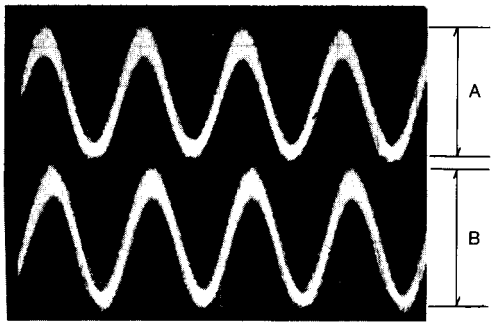
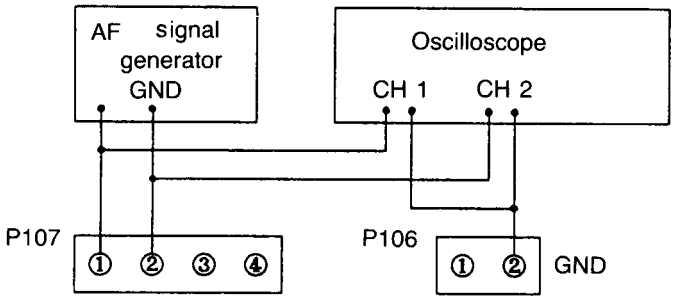


Photo 4



Vertical : 0.5V/div.
Holizontal : 0.5ms/div.

Adjust R122 until 800Hz components of channels 1 and 2 on oscilloscope become same level.
After adjustment, disconnect the AF signal generator and the oscilloscope.

7. Tracking Gain Adjustment

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

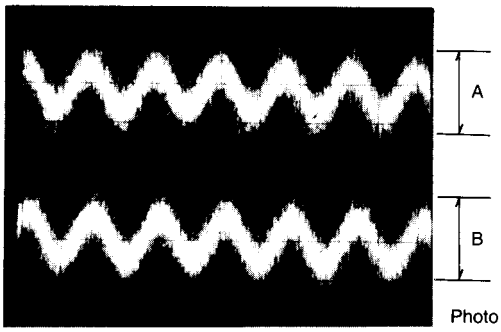
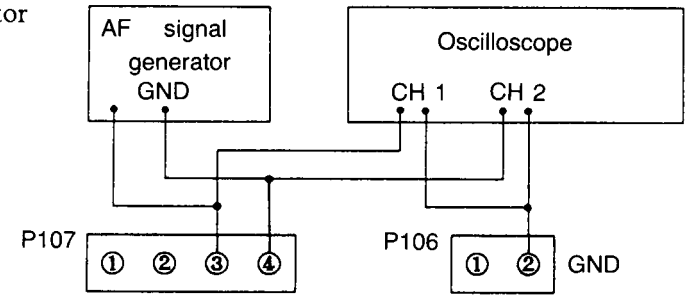


Photo 5

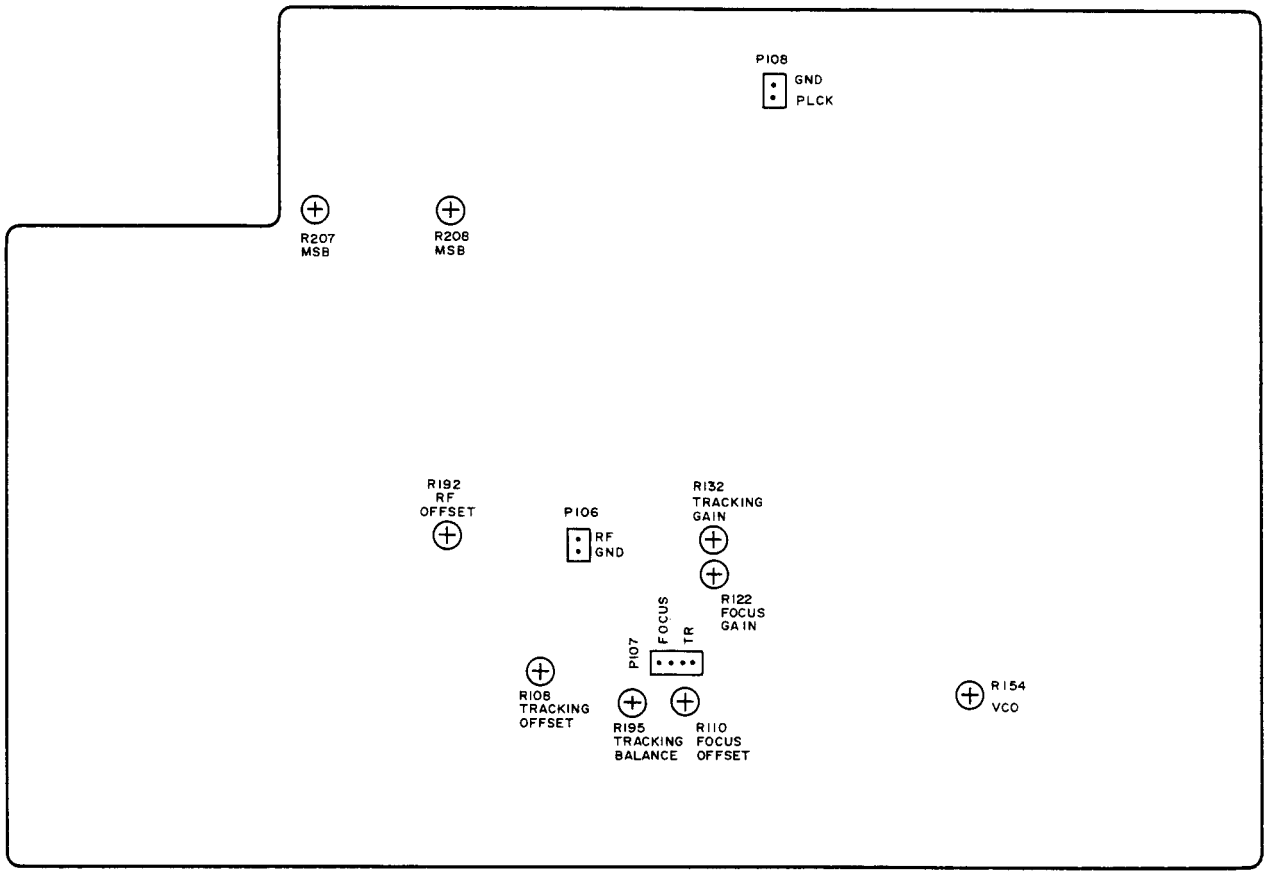


Vertical : 1V/div.
Holizontal: 0.5 ms/div.

Adjust R125 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.
After adjustment, disconnect the AF signal generator and the oscilloscope.
After adjustment, confirm that the center of tracking error signal becomes GND level.

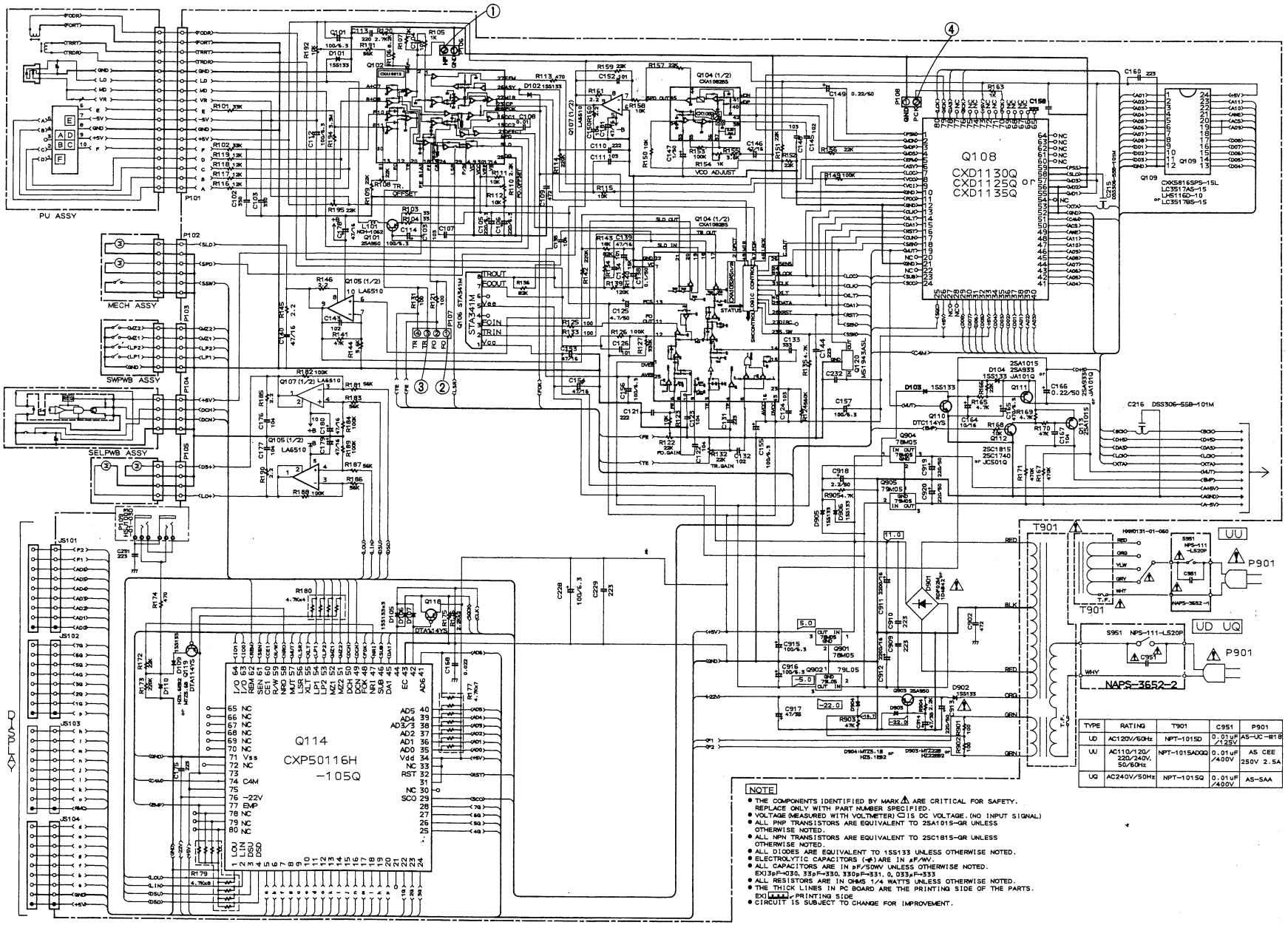
8. Audio circuit adjustment

Connect the AC voltmeter to output terminal of left channel (right channel).
Load the test disc and play the track 2.
Next, play the track 17.
Adjust R207 (R208) so that the output discrepancy between track 2 and track 17 is 60 ±0.25dB.



ADJUSTMENT POINT

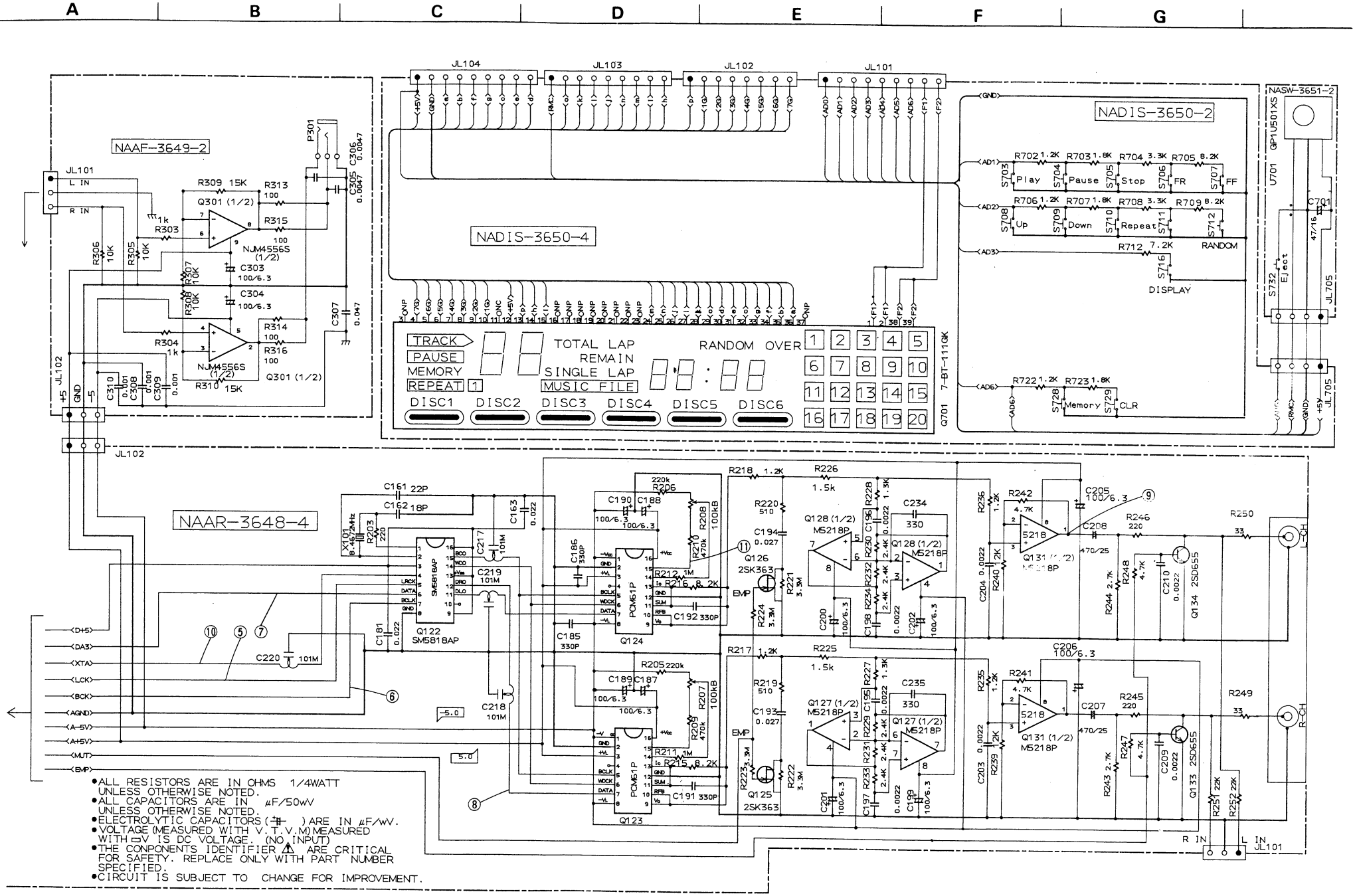
SCHEMATIC DIAGRAM



NOTE

- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH VOLTMETER) C15 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 (-#) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX)3pF→030, 33pF→330, 330pF→331, 0.033μF→533
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EX) ▬▬ /PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

SCHEMATIC DIAGRAM



MAIN CIRCUIT PC BOARD (NAAR-3648-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q102	22240180	CXA1081S
Q104	22240263	CXA1082BS
Q105, Q107	22240034	LA6510
Q106	22240168	STA341M-L
Q108	22240095	CXD1130Q
Q109	22240178,	CXK5816SPS-15L,
	22240118,	LC3517AS-15,
	22240234 or	LC3517BS-15 or
	22240255	LH5116D-10
Q114	22240306	CXP50116H-105Q
Q120	22240018	M51943ASL
Q122	22240362	SM5818AP
Q123, Q124	22240324	PCM61P
Q127, Q128	222808 or	M5218P or
Q131	22240369	M5218AP
Q901	222780052	78M05
Q902	222790053	79L05
Q904	222780055MIT	M5F78M05
Q905	222790055MIT	M5F79M05
	Transistors	
Q101, Q903	2211503 or	2SA950-O or
	2211504	2SA950-Y
Q110	221281	DTC114YS
Q111, Q113	2211454,	2SA1015-Y,
	2211455,	2SA1015-GR,
	2213074 or	2SA933-R or
	2212495	JA101-Q
Q112	2211254,	2SC1815-Y,
	2211255,	2SC1815-GR,
	2211183 or	2SC1740-R or
	2212485	JC501-Q
Q118, Q119	2213090	DTA114YS
Q125, Q126	2212524 or	2SK363-GR or
	2212525	2SK363-BL
Q133, Q134	2211705 or	2SD655-E or
	2211706	2SD655-F
	Diodes	
D101-D107	223163	1SS133
D109, D902	223163	1SS133
D110	224650562 or	HZ5.6EB2 or
	224450562	MTZ5.6B
D901	22380013 or	RDF02M or
	22380039	1D4B42

CIRCUIT NO.	PART NO.	DESCRIPTION
D903	224652202 or	HZ22EB2 or
	224452202	MTZ22B
D904	224650512 or	HZ5.1EB2 or
	224450512	MTZ5.1B
D905, D906	223163	1SS133
	X'tal	
X101	3010153	KD3913FFA
	Coil	
L101	231023	NCH-1062
	Capacitors	
C101	354721019	100 μF, 6.3V, Elect.
C104	371121034	0.01μF 5%, 50V, Mylar
C105, C106	354721019	100 μF, 6.3V, Elect.
C107, C108	371121034	0.01μF 5%, 50V, Mylar
C109	371124724	4700pF 5%, 50V, Mylar
C110	371126824	6800pF 5%, 50V, Mylar
C111	371121034	0.01μF 5%, 50V, Mylar
C112, C114	354721019	100 μF, 6.3V, Elect.
C121	371122224	2200pF 5%, 50V, Mylar
C122, C123	371121044	0.1 μF 5%, 50V, Mylar
C124	371121034	0.01μF 5%, 50V, Mylar
C125	354780479	4.7 μF, 50V, Elect.
C131	371122234	0.022 μF 5%, 50V, Mylar
C132	371121024	1000pF 5%, 50V, Mylar
C133	371123334	0.033 μF 5%, 50V, Mylar
C135	371121044	0.1 μF 5%, 50V, Mylar
C138	354781099	0.1 μF, 50V, Elect.
C139	354744709	47μF, 16V, Elect.
C140	352944706	47μF, 16V, Non-polar elect.
C143	371121024	1000pF 5%, 50V, Mylar
C146	354744709	47μF, 16V, Elect.
C147	354780109	1 μF, 50V, Elect.
C148	371121034	0.01μF 5%, 50V, Mylar

CIRCUIT NO.	PART NO.	DESCRIPTION
C149	354782299	0.22μF, 50V, Elect.
C150	371121044	0.1 μF 5%, 50V, Mylar
C153, C154	354744709	47μF, 16V, Elect.
C155-C157	354721019	100 μF, 6.3V, Elect.
C159	354721019	100 μF, 6.3V, Elect.
C164	354741009	10μF, 16V, Elect.
C165	354724719	470 μF, 6.3V, Elect.
C166	354782299	0.22μF, 50V, Elect.
C167	371121034	0.01μF 5%, 50V, Mylar
C176, C177	371121044	0.1 μF 5%, 50V, Mylar
C178-C181	354744709	47μF, 16V, Elect.
C187-C190	354722219	220 μF, 6.3V, Elect.
C191, C192	373303314	330pF 5%, 125V, Plastic (PP)
C193, C194	371122734	0.027 μF 5%, 50V, Mylar
C195-C198	371122224	2200pF 5%, 50V, Mylar
C199-C202	354721019	100 μF, 6.3V, Elect.
C203, C204	371122224	2200pF 5%, 50V, Mylar
C205, C206	354742219	220 μF, 16V, Elect.
C207, C208	354782219	220 μF, 50V, Elect.
C209, C210	371122224	2200pF 5%, 50V, Mylar
C228	354721019	100 μF, 6.3V, Elect.
C911, C912	354742229	2200μF, 16V, Elect.
C913	354782219	220 μF, 50V, Elect.
C914, C917	354764709	47μF, 35V, Elect.
C915, C916	354721019	100 μF, 6.3V, Elect.
C918	354780229	2.2 μF, 50V, Elect.
C919, C920	354754719	470 μF, 25V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Filters	
C215-C220	3030002	DSS306-55B-101M
	Resistors	
R108, R195	5210066	N06HR22KBD, Semi-fixed
R110	5210060	N06HR2.2KBD, Semi-fixed
R122, R132	5210066	N06HR22KBD, Semi-fixed
R154	5210058	N06HR1KBD, Semi-fixed
R177	49121472407	4.7kohm ×7, 1/8W, Network
R179	49163472408	4.7kohm ×8, 1/10W, Network
R180	49121472404	4.7kohm ×4, 1/8W, Network
R192	5210064 or 5210217	N06HR10KBD, Semi-fixed
R207, R208	5210070 or 5210221	N06HR100KBD, Semi-fixed
	Plugs	
P102	25055426	NPLG-6P408
P103	25055149	NPLG-5P133
P104	25055148	NPLG-4P132
P105	25055424	NPLG-4P406
P106, P108	25055038	NPLG-2P29
P107	25055045	NPLG-4P33
	Terminals	
P109	25045172	HSJ1003-01-020, RI output/input
P110	25045259	NPJ-2PDBL128, Output
	Sockets	
P101	25050360 or 25050480	NSCT-17P187 or NSCT-17P303
JS101, JS103	25050273	NSCT-9P101
JS104	25050273	NSCT-9P101
JS102	25050272	NSCT-8P100
	Radiator	
	27160176	RAD56
	Screw	
	82143006	3P+6FN(BC), Pan head

HEADPHONE AMPLIFIER PC BORAD (NAAF-3649-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q301	222887	NJM4556S
	Capacitors	
C303, C304	354721019	100 μF, 6.3V, Elect.
	Jack	
P301	25045256	YKB21-5010

DISPLAY CIRCUIT PC BOARD(NADIS-3650-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL tube	
Q701	212078	7-BT-111GK
	Switches	
S703-S712 S716, S728 S729	25035548	NPS-111-S510
	Holder	
	27190696	FL tube

REMOCON SENSOR TERMINAL PC BOARD (NASW-3651-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
U701	24130001 or 24130003	GP1U501S or GP1U50XS, Remocon sensor
C701	355744709	47μF, 16V, Elect. capacitor
S732	25035548	NPS-111-S510, Push switch

POWER SUPPLY PC BOARD(NAPS-3652-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
C951	3500065A	⚠ DE7150FZ103P AC400V/125V, Capacitor IS
S951	25035558	⚠ NPS-111-L520P, Power switch

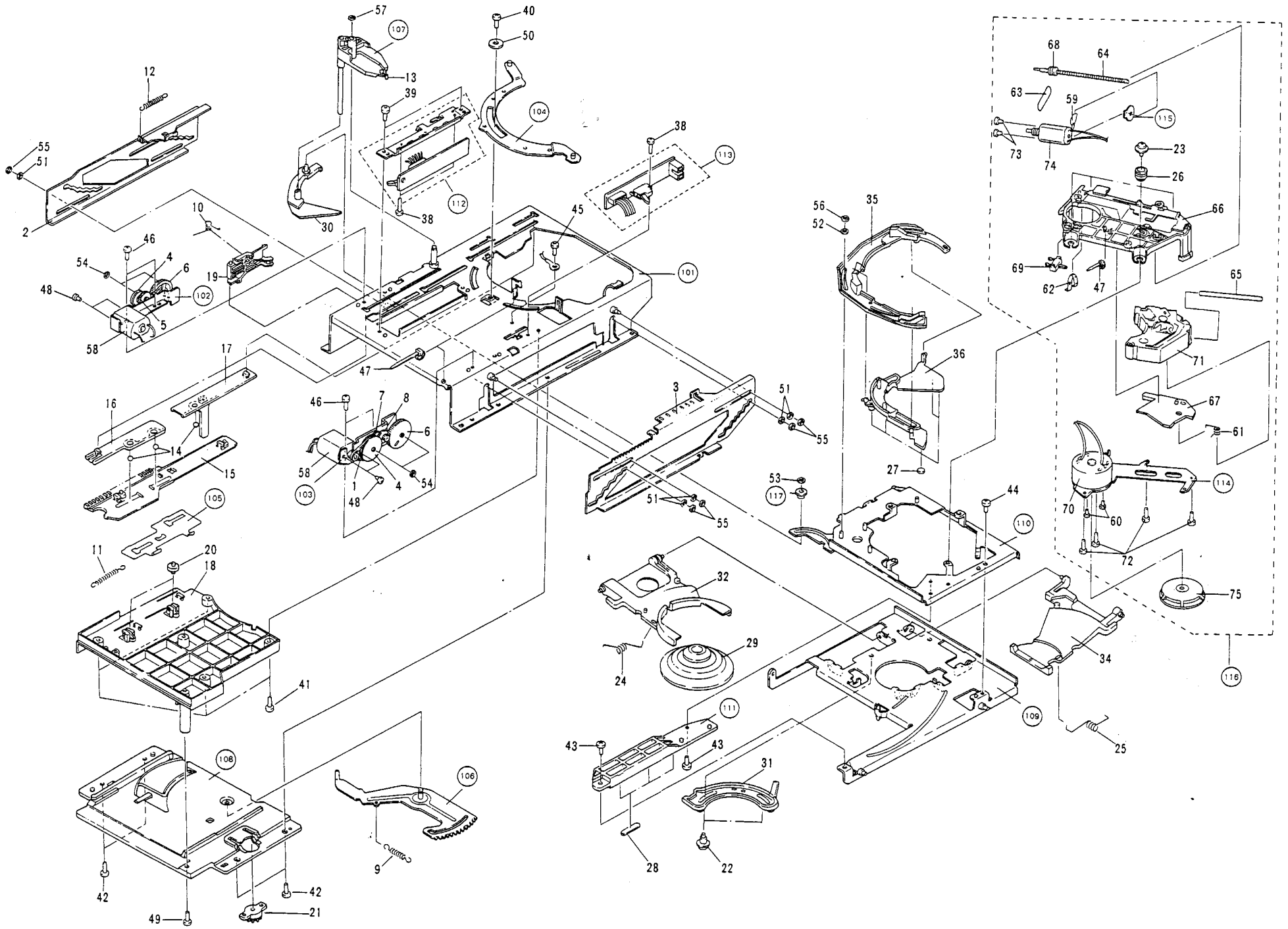
NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK REPLACE ONLY WITH PART NUMBER SPECIFIED.

PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
1	24602505	Belt
2	24506795	Stair L
3	24506796	Stair R
4	24506797	Gear pulley
5	24506798	Gear
6	24506799	Gear
7	24506800	Gear
8	24506801	Idler gear
9	24503167	Spring, eject
10	24503168	Spring, lock
11	24503169	Spring SM
12	24503170	Spring, stair
13	24503171	Spring, drive
14	24506807	Steelball
15	24506808	Rack
16	24506809	Drive plate
17	24506810	Operation plate
18	24506811	Top guide
19	24506812	Lock lever
20	24506813	Idler roller
21	24506814	Damper ass'y
22	801419	Motor mounting screw
23	801420	Float screw
24	24503172	Clamper spring T
25	24503173	Clamper spring B
26	24509400	Float rubber
27	28140978	Cushion A
28	28140979	Cushion B
29	24506822	Clamper
30	24506823	Rotary lever
31	24506824	Clamper cam
32	24506825	Clamper holder T
34	24506826	Clamper holder B
35	24506827	Pressure cam
36	24506828	Upper tray
38	838120088	2TTB+8B, Pan head screw
39	801421	3TTB+6B(BC), Pan head screw
40	838130068	3TTB+6B, Tapping screw
41	838130068	3TTB+6B, Tapping screw
42	838130068	3TTB+6B, Tapping screw
43	838130068	3TTB+6B, Tapping screw
44	838130068	3TTB+6B, Tapping screw
45	838130068	3TTB+6B, Tapping screw
46	833130049	3TTP+4C, Tapping screw
47	260208	Binder
48	82112003	2P+3F, Pan head screw
49	833130080	3TTP+8P, Tapping screw
50	8771301210	W3×12, Washer
51	870085	Washer
52	870085	Washer
53	27270295	Washer
54	27270132	Washer
55	27270294	Washer
56	27270294	Washer
57	27270296	Washer
58	24506829	Motor ass'y (LOADING/DISC SELECT)
59	335011047	0.1 μF, 25V, Ceramic capacitor
60	801422	Screw
61	24503174	Drive spring
62	24503175	Spring
63	24602506	Belt
64	24506834	Drive screw
65	24506835	Guide bar
66	24506836	Chassis
67	24506837	Carriage plate
68	24506838	Pulley

REF.NO.	PART NO.	DESCRIPTION
69	25065376	Slide switch (INSIDE)
70	24506840	Spindle motor
71	24506841	Pickup ass'y
72	801423	Screw
73	82112003	2P+3F, Pan head screw
74	24506842	Carriage motor
75	24506843	Disc table ass'y
101	24506845	Main chassis
102	24506846	Gear bracket L
103	24506847	Gear bracket R
104	24506848	Lever
105	24506849	Select SM
106	24506850	Eject lever
107	24506851	Drive lever
108	24506852	Bottom guide
109	24506853	Sub chassis
110	24506854	Upper chassis
111	24506855	Upper guide
112	24506856	Switch pc board ass'y
113	24506857	Select pc board ass'y
114	24506858	Base pc board
115	24506859	Carriage motor ass'y
116	24506860	Servo mechanism ass'y
117	24506861	Roller

MECHANISM-EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTON
1	27110577A	Front bracket ass'y
2	27100196A	Chassis
3	27130586	Bracket, center
4	27130587	Bracket F
5	27141345	Bracket PC
10	27121363	Back panel <D>
	27121363-1	Back panel <W>
	27121363-2	Back panel <Q>
12	27190470	KGLS-18S, Holder
13	27190724	KGPS-12S, Holder
15	27300750	⚠ Bushing(strainrelief)
20	834430068	3TTS+6B(BC), Tapping screw
21	834430088	3TTS+8B(BC), Tapping screw
22	831130088	3TTW+8B, Tapping screw
23	830440069	4TTC+6C(BC), Tapping screw
24	834430108	3TTS+10B(BC), Tapping screw
25	833426060	2.6TTP+6P(BC), Tapping screw
26	833430080	3TTP+8P(BC), Tapping screw
27	27273123A	Joint, power
28	27255004	CS-1U, Clip
29	27150284	Shield plate (Mechanism)
31	28184445A	Top cover
32	834430088	3TTS+8B(BC), Tapping screw
33	28140720	Cushion
51	1H128121	Front panel ass'y
55	833430080	3TTP+8P(BC), Tapping screw
61	28191527	Clear plate
62	28133229	Back plate
63	27262512	Plate
65	27175153	Leg
66	834430088	3TTS+8B(BC), Tapping screw
72	29360807	Label DANGER
81	27141090A	Bracket U <W>
82	834430088	3TTS+8B(BC), Tapping screw <W>
P901	253112A	⚠ AS-UC-4#18, Power supply cord <D>
	253148 or 253150	⚠ AS-CEE, Power supply cord <W>
	253118	⚠ AS-SAA, Power supply cord <Q>
S902	25065168	⚠ HXW0131-01-060, Voltage selector switch <W>
L901	230908	TR-23-11-14, Core <D>
L901a	260223	NK-16N, Clamp <D>
T901	2300384B	⚠ NPT-1015D, Power transformer <D>
	2300387B	⚠ NPT-1015ADGQ, Power transformer <W>
	2300386B	⚠ NPT-1015Q, Power transformer <Q>

REF. NO.	PART NO.	DESCRIPTON
U1	1H128548-4	NAAR-3648-4, Main circuit pc board ass'y
U2	1H128549-4	NAAF-3649-4, Headphone amplifier pc board ass'y
U3	1H128550-4	NADIS-3650-4, Display circuit pc board ass'y
U4	1H128551-4	NASW-3651-4, Remocon sensor terminal pc board ass'y
U5	1H128552-4	NAPS-3652-4, Power supply circuit pc board ass'y
Z1	24506789	NCD-100P-Pic, Mechanism ass'y
	260208	Binder

NOTE: <D>: Only 120V model
<W>: Only Wolrdwide model
<Q>: Only 240V model

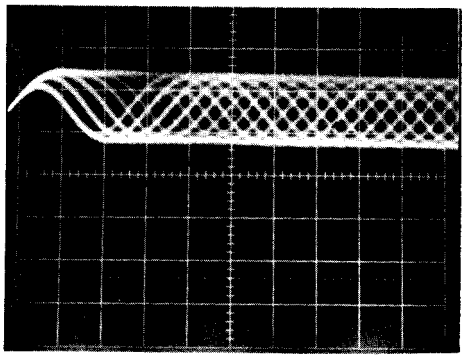
NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

WAVEFORM OF EACH SECTION

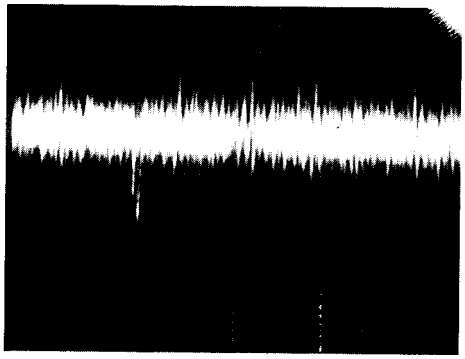
Note: The encircled numbers denote measuring points in the schematic diagram.

Play the track 2 of test disc YEDS-18.
Use the high impedance probe (10:1)

① RF signal
0.5μs/div.
1V/div.

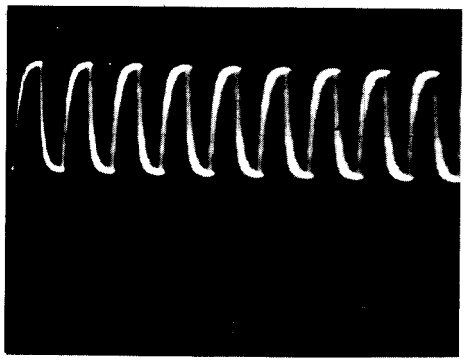


② Focus error signal
5ms/div.
200mV/div.

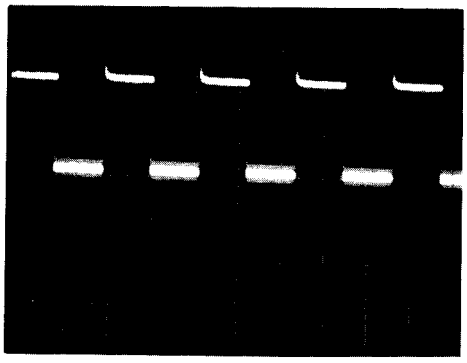


③ Tracking error signal
5ms/div.
0.5V/div.

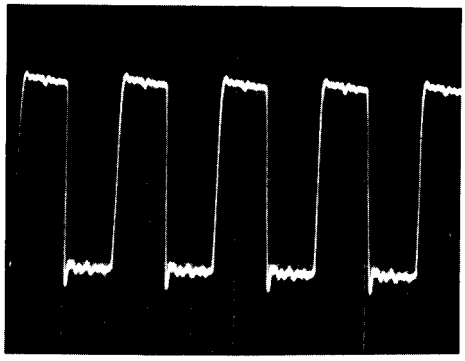
④ PLCK
0.2μs/div.
2V/div.



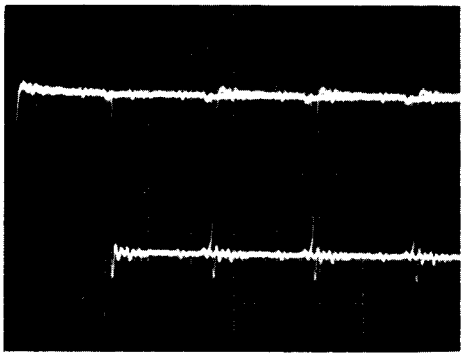
⑤ LRCK
Q122 #5
10μs/div.
2V/div.



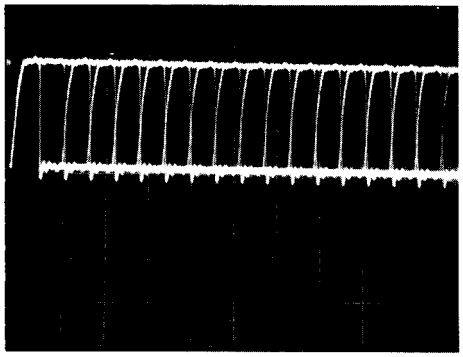
⑥ BCLK
Q122 #7
0.2μs/div.
1V/div.



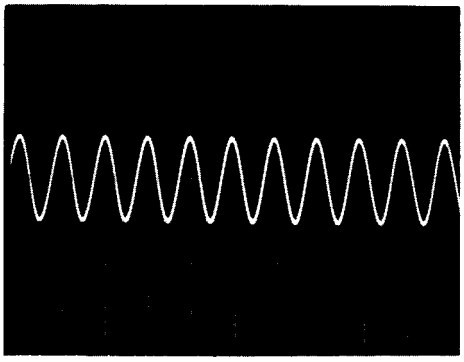
⑦ DATA
Q122 #6
0.2μs/div.
1V/div.



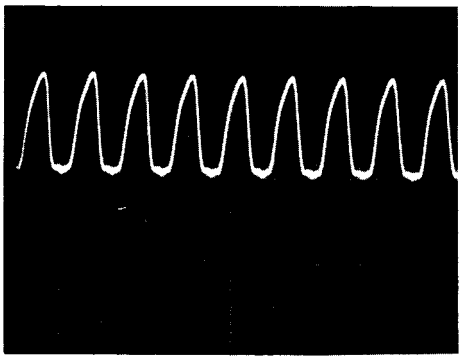
⑧ Q122 #11/#12
0.2μs/div.
2V/div.



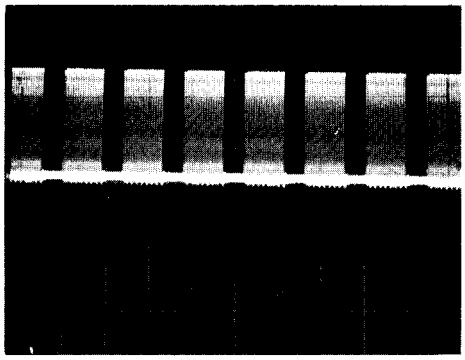
⑨ Q131 #1
1ms/div.
2V/div.



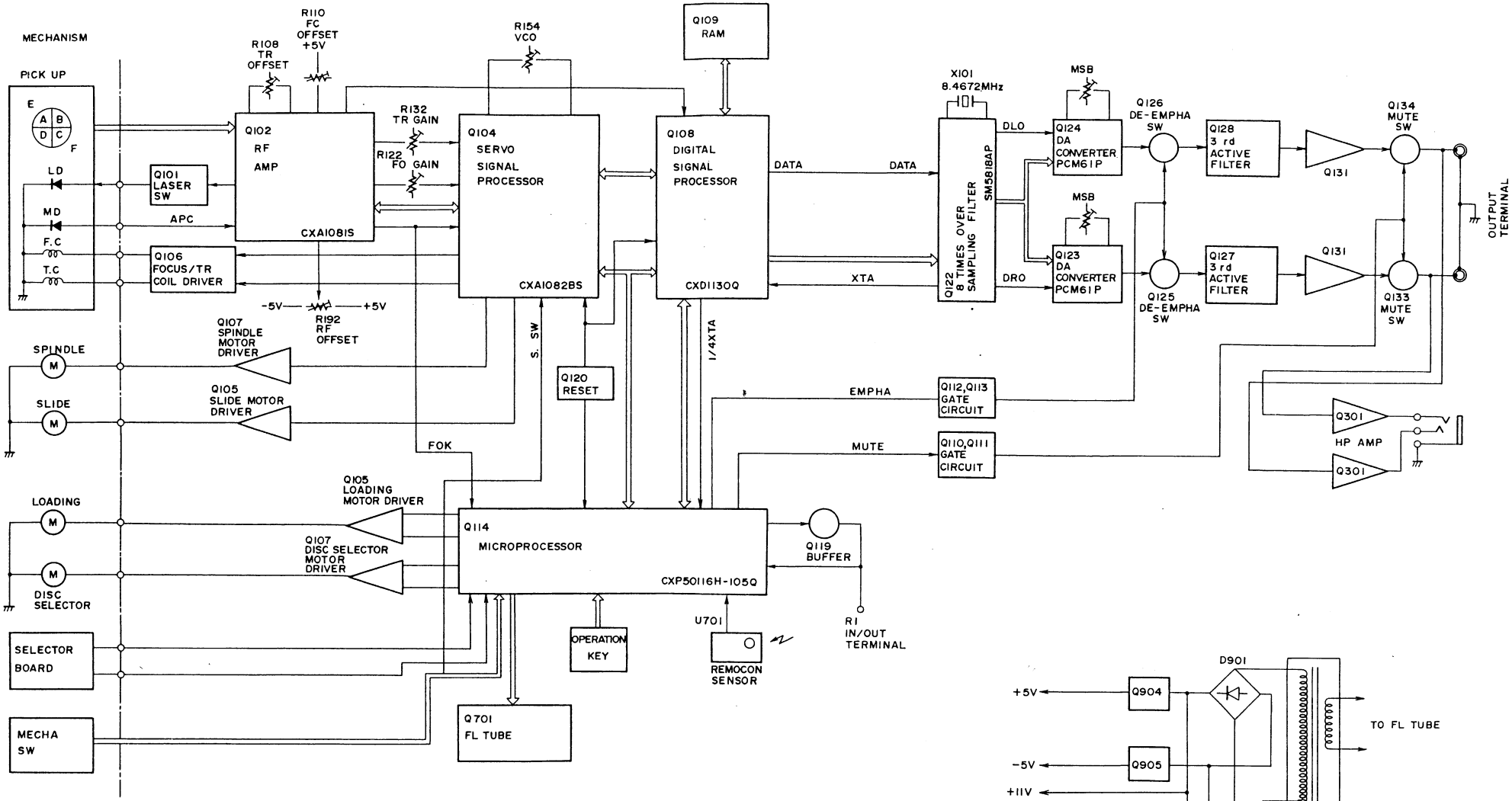
⑩ Q122 #4
0.1μs/div.
2V/div.

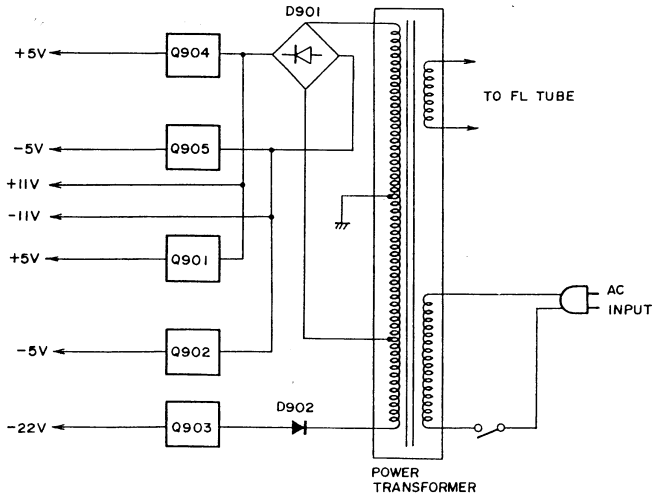


⑪ Q124 #15
2μs/div.
2V/div.



BLOCK DIAGRAM





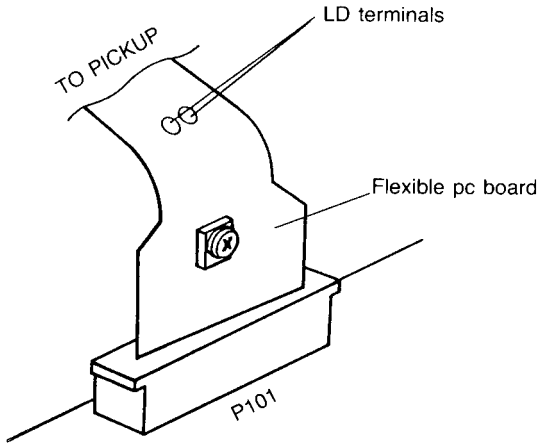
CAUTION ON REPLACEMENT OF PICK-UP

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, carefulley 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 atatching the new optical pickup, after attaching the connector, unsolder the LD terminals.
2. Do not touch the optical pickup object lens with the hands.

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

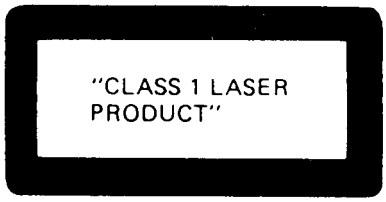
The label shown below are affixed.

1. **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

2. **Class 1 lable (Worldwide model)**
   This label is located on the back panel.



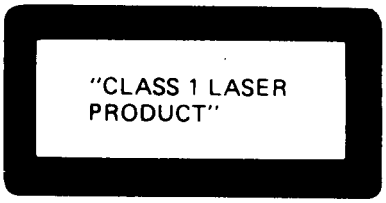
3. **Warning lable**
   This label is located on the chassis of mechanism.

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.

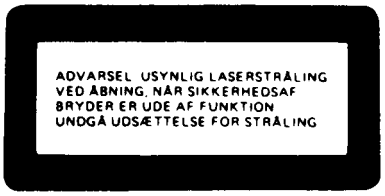
ADVARSEL



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 utilladelig 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 sadanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.



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