


# ONKYO® SERVICE MANUAL

## QUARTZ LOCKED DIRECT DRIVE FULLY AUTOMTIC TURNTABLE MODEL CP-1500F



UD, UD Ⓜ	120V AC, 60Hz
UG, UGV	220V AC, 50Hz
U, U	110/120/220/240V AC, 50/60Hz
UQA, UQB	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 PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

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

### SPECIFICATIONS

#### Type:

Quartz locked direct drive fully automatic turntable with auto lead-in and return, reject, repeat, cue and search button functions, two-motor micro-computer design  
310 mm (12-1/4") aluminum die-cast.

#### Turntable Platter:

#### Motor:

Quartz locked direct drive brushless DC motor

#### Speeds:

33-1/3, 45 rpm

#### Wow & Flutter:

less than 0.025% (WRMS)

#### Signal-to-Noise Ratio:

better than 75dB (DIN B)

#### Tonearm:

Statically balanced straight type

#### Effective Arm Length:

224 mm (8-7/8")

#### Overhang:

13 mm (1/2")

#### Offset Angle:

21 degrees

#### Maximum Tracking

#### Error:

+3 degrees, -1.5 degrees

#### Suitable Cartridge

#### Weight:

Min. 5, Max. 9 grams

#### Tracking Force:

0 - 3.0 grams

#### Other Features:

Tracking force direct readout scale  
Removable headshell  
Anti-skating device

**ONKYO®**  
**AUDIO COMPONENTS**

Dimensions (W x D x H) 418 x 376 x 132 mm  
(16-1/2" x 14-13/16" x 5-1/5")

Weight: 6.0 kg (13.2 lbs.)

Accessories: Headshell, counterweight, overhang gauge, adapter, instruction manual

Optional Recommended Headshell: SH-21E

Specifications are subject to change for further product improvements.

## SERVICE PROCEDURES

### Insulation resistance measurement

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

Specifications; D model 500 V  $3.3 \pm 0.33 \text{ M}\Omega$   
G/W models 500 V more than  $10 \text{ M}\Omega$

## ADJUSTMENT PROCEDURES

### 1. Return sensitivity adjustment (fig. 1)

Turn the unit upside-down and, with the DD motor and arm motor connector removed, connect a DC voltmeter between TP and GND. Move the arm to the inside of the platter, put the return sensor in the release position and shut out extraneous light. Starting with the semi-fixed resistor R703 set all the way to the left, begin to rotate the resistor clockwise to the point where the voltage between TP and GND rises 2mV above low (a few hundred mV).

### 2. Platter height adjustment (fig. 2)

Return the unit to the upright position and rotate the float base height adjustment screw. Adjust so that the platter height is  $13\text{mm} \pm 2\text{mm}$  above the cabinet.

### 3. Stylus height adjustment

Set the tonearm in the up position and adjust the lifter plate screw so the height of the stylus tip is  $8\text{mm} \pm 1\text{mm}$  above the platter mat.

Note 1: The height should be  $11\text{mm} \pm 2\text{mm}$  measured from the surface of the platter.

Note 2: Rotate the lifter plate screw counterclockwise to lower the stylus height and clockwise to raise the stylus height.

### 4. Lead-in count adjustment (Tracking force: 2 grams Anti-skating force: 2 grams Speed: 45 rpm)

Using test record ONK-1000, adjust so the lead-in count is 10-20 counts for both 30cm and 17cm records. Adjust using the PU pulley shutter and NCDG-1731 printed circuit board jumper lead.

The count changes in the following manner as the jumper leads are cut:

Jumper lead A	3 count changes
Jumper lead B	6 count changes
Jumper lead C	12 count changes
Jumper lead $\pm$	cut: - . connect: +

### 5. Return count adjustment (Speed: 45 rpm)

Using test record ONK-1000, adjust so the 3mm pitch return count is 24-26 counts. Adjust using the PU pulley eccentricity pin. Confirm that the tonearm does not return until 22 counts at a pitch of 1mm.

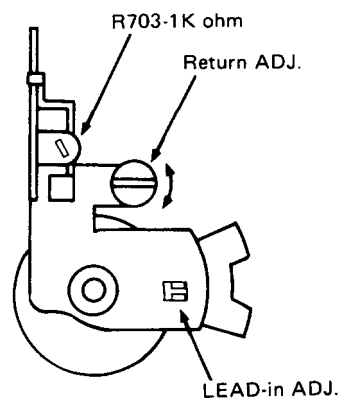


fig. 1

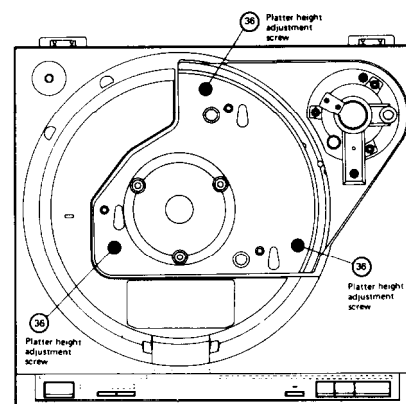
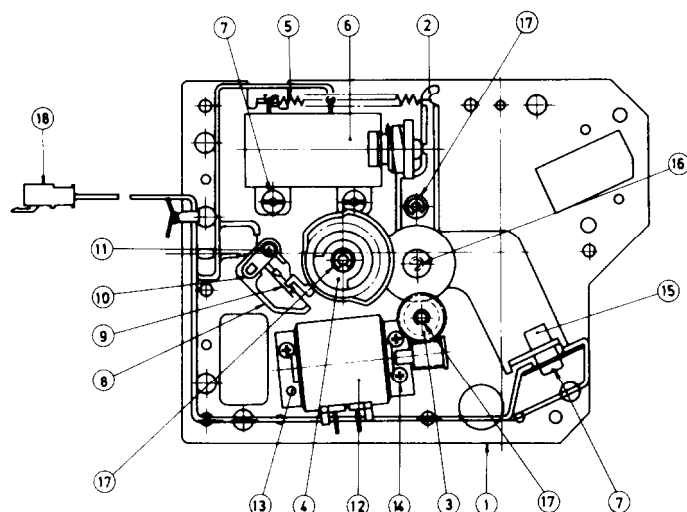


fig. 2

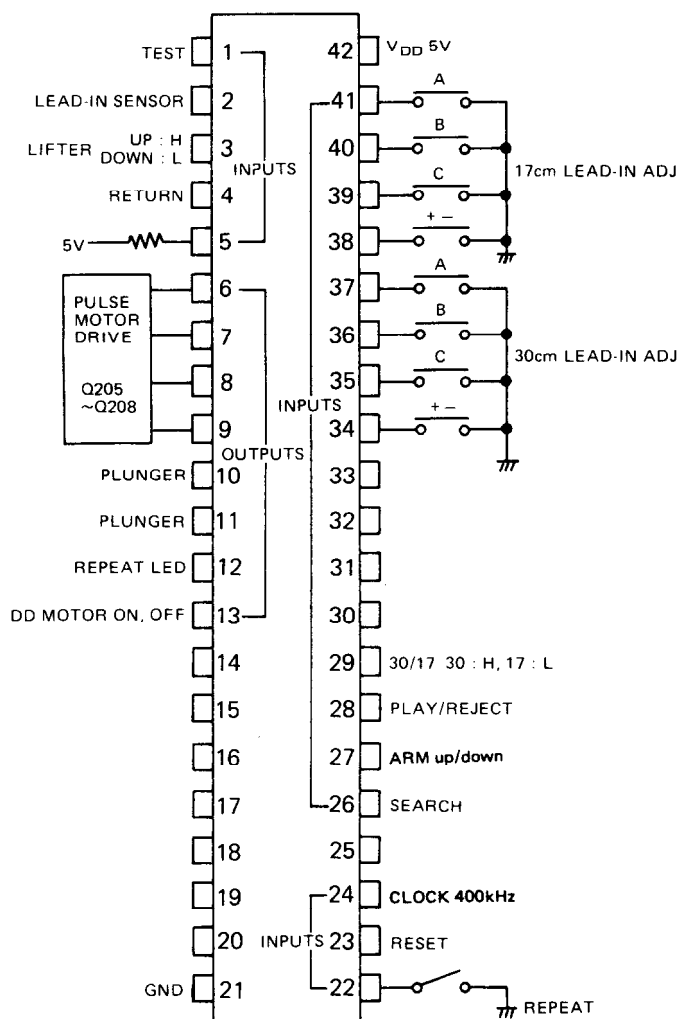
# MECHANISM COMPONENT LOCATION



REF. NO.	PARTS NO.	DESCRIPTION
1	24506644	Chassis
2	24504310	Lever
3	24503097	Wheel
4	24503098	Cam wheel
5	24503100	Tension spring
6	24506474	Solenoid
7	24506437	Screw
8	24506463	Cover
9	24503102	Switch
10	24509234	Spacer
11	82112024	2P-24FN, Pan head screw
12	24502125B	Motor ass'y
13	24506464	Rubber plate
14	82142306	2.3P + 6FN (BC), Pan head screw
15	24506596	Photo diode/transistor ass'y
16	893030	E-3, Circlip
17	893020	E-2, Circlip
18	2000241	NSAS-8P179, Socket
19		Belt
20		Label
21	24506658	Screw
22	24506659	Toothed washer
23	24506461	Rubber ring

## MICROCOMPUTER

### TMP4315BP (1033)



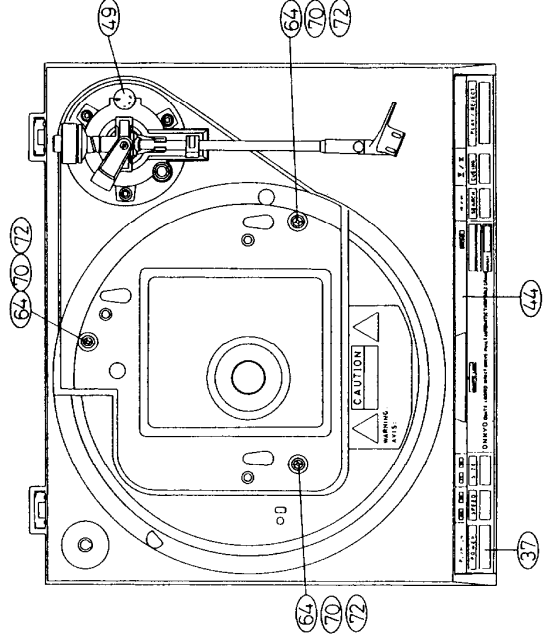
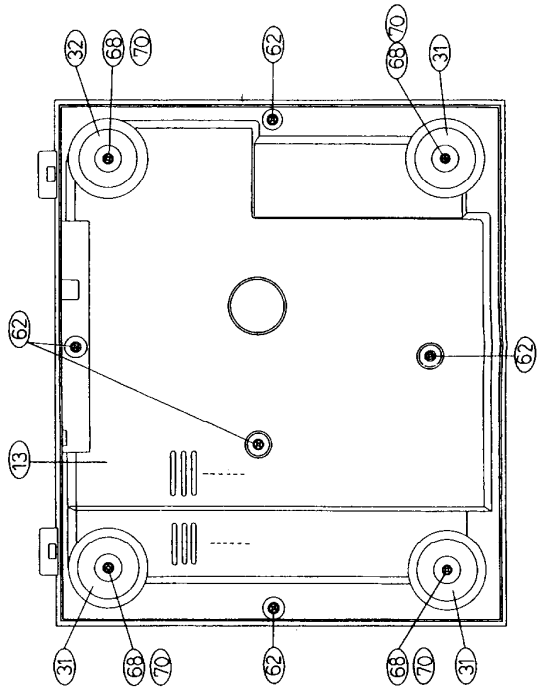
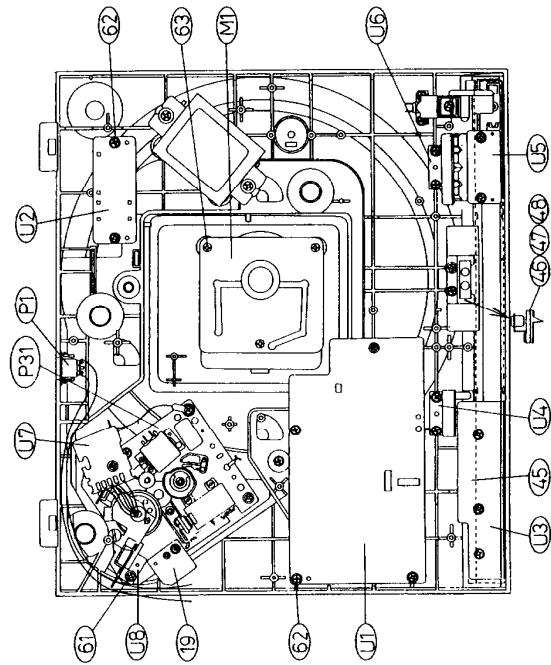
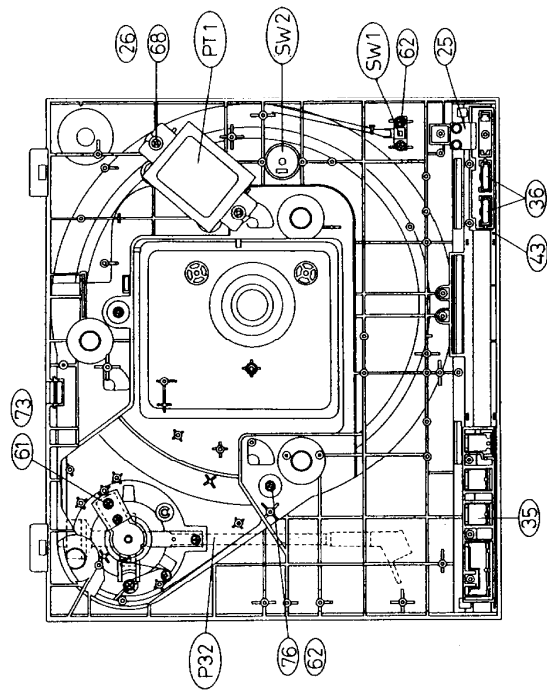
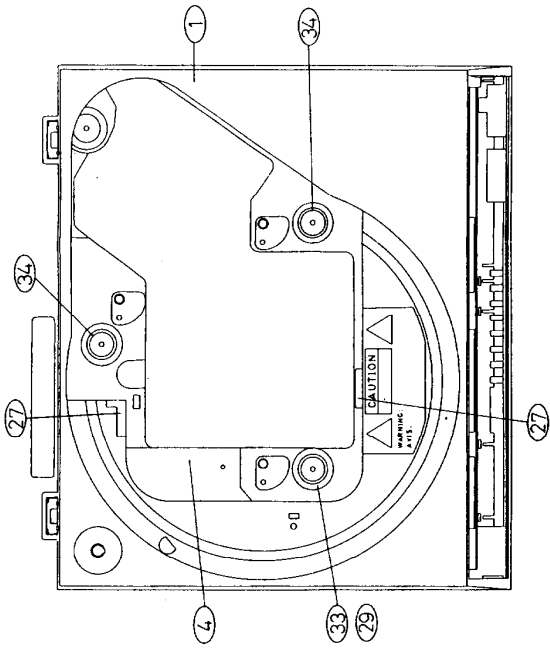
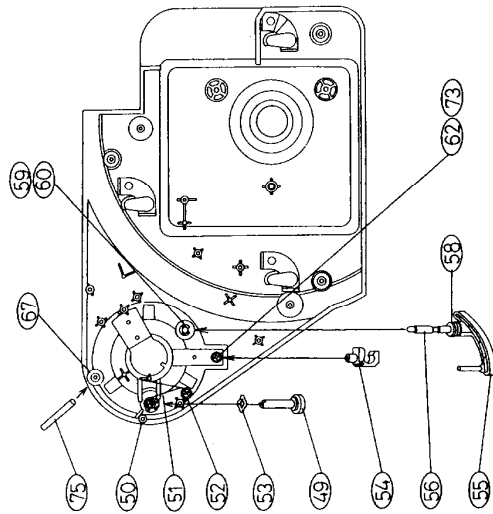
# COMPONENT LOCATION PART LIST

REF.NO.	PART NO.	DESCRIPTION			
1	28110500	CABINET (D)	PT1	△ 230734A	NPT-816D (D)
	28110501-1	CABINET (G/U/UQ)		△ 230795	NPT-816G (G)
4	28110303A	FLOATING BASE AS (D)		△ 230735	NPT-816ADGQ (U)
	28110290	FLOATING BASE AS (G/U/UQ)		△ 230736	NPT-816Q (UQ)
9	24509320A	DUST COVER AS	P31	24506642B	FULL-AUTO MECHANISM AS
11	28180080	HINGE AS			N-35
13	28153082	BOTTOM BOARD (D)	P32	24501457A	TONE ARM
	28153076A	BOTTOM BOARD (G/U/UQ)		24501325	HEAD SHELL
17	24502159A	PLATTER		24501460	COUNTER WEIGHT
19	27140866	BRACKET (B)		24501330	COMBINING ACCESSORY
23	27141348A	BRACKET (RI)		242960	OC-61VE CARTRIDGE AS
24	27141349	BRACKET (G)			(G/U/UQ)
25	27140856	BRACKET (A)		242959	DN-61STE STYLUS (G/U/UQ)
26	28140209	CUSHION (PT)	SW1	△ 25035385	NPS-111-L349P (D)
27	28140496A	CUSHION		△ 25035386	NPS-111-L350P (G/U/UQ)
29	28140507	CUSHION	SW2	△ 25065168	HXW0131-01-060 VOLTAGE
31	24509325	INSULATOR AS (H)			SELECTOR (U)
32	24509326	INSULATOR AS (I)	U1	1H089531-2	NADG-1731-2
33	24509314	INSULATOR AS (Y)	U2	△ 1H089584-2	NAPS-1684-2 (D)
34	24509327	INSULATOR AS (J)		△ 1H089584-2A	NAPS-1684-2A (G/U)
35	28323778B	KNOB AS (R)		△ 1H089584-2B	NAPS-1684-2B (UQA)
36	28321549-1	KNOB (S)		△ 1H089584-2C	NAPS-1684-2C (UQB)
37	28321330-1	KNOB (L)	U3	1H089532-2	NASW-1732-2
38	27260119B	SHAFT (POW)	U4	1H089533-2	NALED-1733-2
39	27140794A	BRACKET (POW)	U5	1H089534-2	NASW-1734-2
40	27260120A	SHAFT (S)	U6	1H089535-2	NALED-1735-2
42	8930301S	E WASHER ES-3S	U7	1H089510-2	NAPI-1010-2 (D)
43	27267335	GUIDE (L)		1H089510-2A	NAPI-1010-2A (G/U/UQ)
44	28191525	CLEAR PLATE (D)	U8	1H089550-7	NARET-2350-7
	28191525-1	CLEAR PLATE (G/U/UQ)			
45	27262513	PLATE			
46	28198596	FACET			
47	28133078	BACK PLATE (A)			
48	28133079	BACK PLATE (B)			
49	28321163-1	KNOB AS (I.F.C.)			
50	28400012B	I.F.C. CAM			
51	27180175-1	SPRING (I.F.C.)			
52	27267271	GUIDE (I.F.C.)			
53	870071	WAVE WASHER WW-6			
54	24506645A	ARM REST AS			
55	24506648	PLATE (LIFTER)			
56	27260121A	SHAFT (S)			
57	27180156	SPRING			
58	27180140-1	SPRING			
59	8930301S	E WASHER ES-3S			
60	87644012	WASHER W4×12			
61	831430120	TAP-TIGHT SCREW			
		3TTW+12P(BC)			
62	831430100	TAP-TIGHT SCREW			
		3TTW+10P(BC)			
63	833440120	TAP-TIGHT SCREW			
		4TTP+12P(BC)			
64	833440200	TAP-TIGHT SCREW			
		4TTP+20P(BC)			
66	834430108	TAP-TIGHT SCREW			
		3TTS+10B(BC)			
68	801275	SPECIAL P-TIGHT SCREW			
70	87644012	WASHER W4×12F(BC)			
71	8761401816	WASHER W4×18F			
72	27270115	SPACER			
73	87313006	TOOTH LOCK WASHER M3-B			
74	87643010	WASHER W4×10F(BC)			
75	27265083	RING 4×5.3×14L			
76	870060	FIBER WASHER W3×15 BLACK			
P1	25045262	HSJ0780-01-010 ST JACK (D)			
M1	24502155B	787V MOTOR AS			

NOTE: (D) : Only 120V model  
 (G) : Only 220V model  
 (U) : Only Universal model  
 (Q) : Only 240V model  
 (QA) : Only Australia model  
 (QB) : Only U.K. model

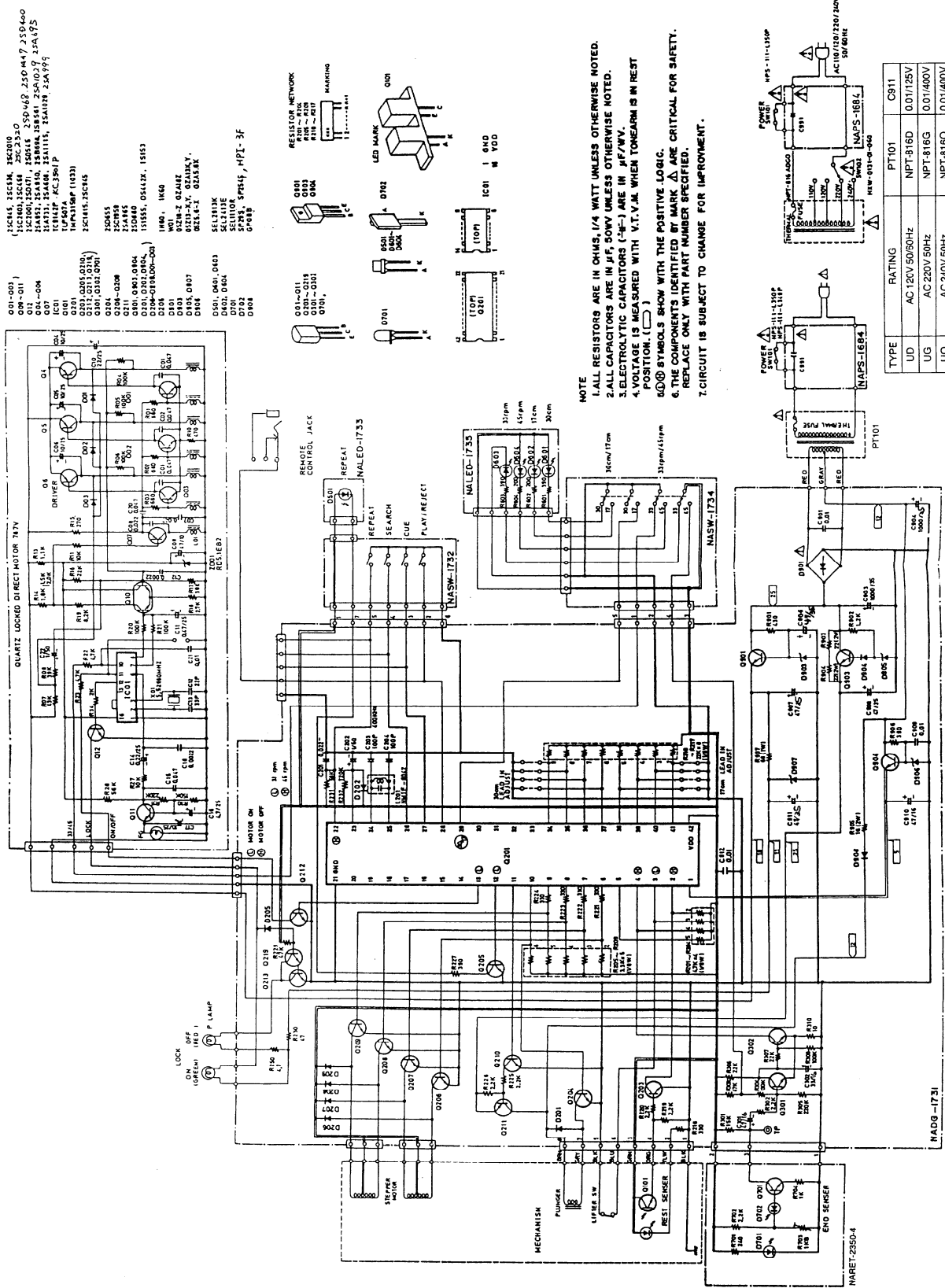
NOTE : THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR LISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

# COMPONENT LOCATION

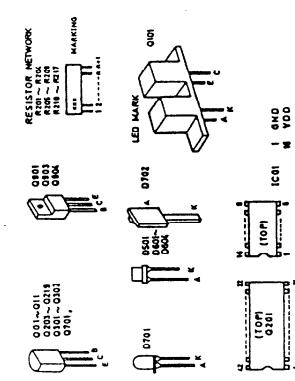


SCHEMATIC DIAGRAM

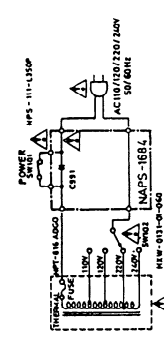
A B C D E F G



- Q101, Q102, Q103, Q104, Q105, Q106, Q107, Q108
- R101, R102, R103, R104, R105, R106, R107, R108
- C101, C102, C103, C104, C105, C106, C107, C108
- IC101, IC102, IC103, IC104, IC105, IC106, IC107, IC108
- Q109, Q110, Q111, Q112, Q113, Q114, Q115, Q116, Q117, Q118
- R109, R110, R111, R112, R113, R114, R115, R116, R117, R118
- C109, C110, C111, C112, C113, C114, C115, C116, C117, C118
- IC109, IC110, IC111, IC112, IC113, IC114, IC115, IC116, IC117, IC118



NOTE  
1. ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.  
2. ALL CAPACITORS ARE IN  $\mu$ F, 50V UNLESS OTHERWISE NOTED.  
3. ELECTROLYTIC CAPACITORS ("E") ARE IN  $\mu$ F/WV.  
4. VOLTAGE IS MEASURED WITH V.T.V.M. WHEN TONEARM IS IN REST POSITION. ( )  
5.  $\Delta$  SYMBOLS SHOW WITH THE POSITIVE LOGIC.  
6. THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.  
7. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.



TYPE	RATING	PT101	C911
UD	AC 120V 50/60Hz	NPT-816D	0.01/125V
UG	AC 220V 50Hz	NPT-816G	0.01/400V
UQ	AC 240V 50Hz	NPT-816Q	0.01/400V
UU	AC 110/120/220/240V 50/60Hz	NPT-816ADGQ	0.01/400V

# PRINTED CIRCUIT BOARD PART LIST

## NADG-1731-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>IC</b>	
Q201	222925	TMP-4315BP (1033)
	<b>Transistors</b>	
Q203	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q204	2211706	2SD655-F
Q205	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q206-Q209	2211544	2SC1959-Y
Q210	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q211	2211644	2SA965-Y
Q212, Q213	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q219	2211253, 2211254, 2211255, 2210746, 2210747 or 2210748	2SC1815-O, 2SC1815-Y, 2SC1815-GR, 2SC945-AP, 2SC945-A-Q or 2SC945-A-K
Q301, Q302	2211255	2SC1815-GR
Q901	2201074	2SD880-Y
Q903, Q904	2201074	2SD880-Y
	<b>Diodes</b>	
D201, D202	223145, 223150, 223105 or 223133	1S2076TD, US1040, 1S1555 or DS-442X
D205	223103 or 223132	1N60 or 1K60
D206-D209	223145, 223150, 223105 or 223133	1S2076TD, US1040, 1S1555 or DS-442X
D901	223890 or 223869	W01RL or W-01
D903	224151803, 2241193 or 224452002	05AZ18Z, GZA-18Z or MTZ-20B
D904	223145, 223150, 223105 or 223133	1S2076TD, US1040, 1S1555 or DS-442X
D905	2241132 or 224151302	GZA-13Y or 05AZ13Y
D906	2240951 or 224150561	GZA-5.6X or 05AZ5.6X
D907	2241132 or 224151302	GZA-13Y or 05AZ13Y
D908	223848	GP-08B
	<b>Coil</b>	
L201	232108	NMIF-6042
	<b>Capacitors</b>	
C202	354780109	1 $\mu$ F50V, ELECT.
C301	354734709	47 $\mu$ F10V, ELECT.
C302	354733309	33 $\mu$ F10V, ELECT.
C903, C904	352761029S	1000 $\mu$ F35V, ELECT.
C906-C908	352764709	47 $\mu$ F35V, ELECT.
C910	354744709	47 $\mu$ F16V, ELECT.
C911	354764709	47 $\mu$ F35V, ELECT.
	<b>Resistors</b>	
R201-R204	49121472404	4.7k $\Omega$ $\times$ 4, 1/8W
R205-R209	49121332405	3.3k $\Omega$ $\times$ 5, 1/8W
R210-R217	49121223408	22k $\Omega$ $\times$ 8, 1/8W
R903, R904	441722204F	RS2WBJ, 22 $\Omega$
R905	441721804F	RS2WBJ, 18 $\Omega$
R907	441626804F	RS2WBJ, 68 $\Omega$
	<b>Socket, Plugs</b>	
	2000239	NSAS-5P177
	2000236	NSAS-3P174
	2000237	NSAS-3P175
	25055089	NPLG-3P73
	25055091	NPLG-5P75

CIRCUIT NO.	PART NO.	DESCRIPTION
	25055093	NPLG-7P77
	25055094	NPLG-8P78
	<b>Lamp</b>	
	210175	14v60mA
	<b>Miscellaneous</b>	
	27160029	RAD07, RADIATOR
	82143006	3P + 6FN(BC), SCREW
	27140790	BRACKET
	79136	S21E12

## NAPS-1684-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Capacitor</b>	
C911	3500065A	0.01 $\mu$ F, AC400V, IS.
	<b>Miscellaneous</b>	
	253112A	AS-UC-4, POWER SUPPLY CORD
	270280	SR-4K-4, STRAINRELIEF
	27140393	BRACKET(AC)

## NASW-1732-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	25035291	NPS-111-S257, PUSH SWITCH
	2000240	NSAS-7P178, SOCKET

## NALED-1733-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	225142	SEL2913K, LED
	27250062	LAMP CASE
	27140795	BRACKET(U)
	833430080	3TTP+8P, SCREW

## NASW-1734-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	25035399	NPS-122-L364, PUSH SWITCH
	2000249	NSAS-5P187, SOCKET

## NALED-1735-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>LED</b>	
D601	225142	SEL2913K
D602	225137CG or 225137DG	SEL2413E-CG or SEL2314E-DG
D603	225142	SEL2913K
D604	225137CG or 225137DG	SEL2413E-CG or SEL2314E-DG
	<b>Miscellaneous</b>	
	27250061	LAMP CASE
	27140795	BRACKET(U)
	833430080	3TTP+8P(BC), SCREW

## NAPI-1010-2

CIRCUIT NO.	PART NO.	DESCRIPTION
P802	24505155	PU CORD

## NAPI-1010-2A

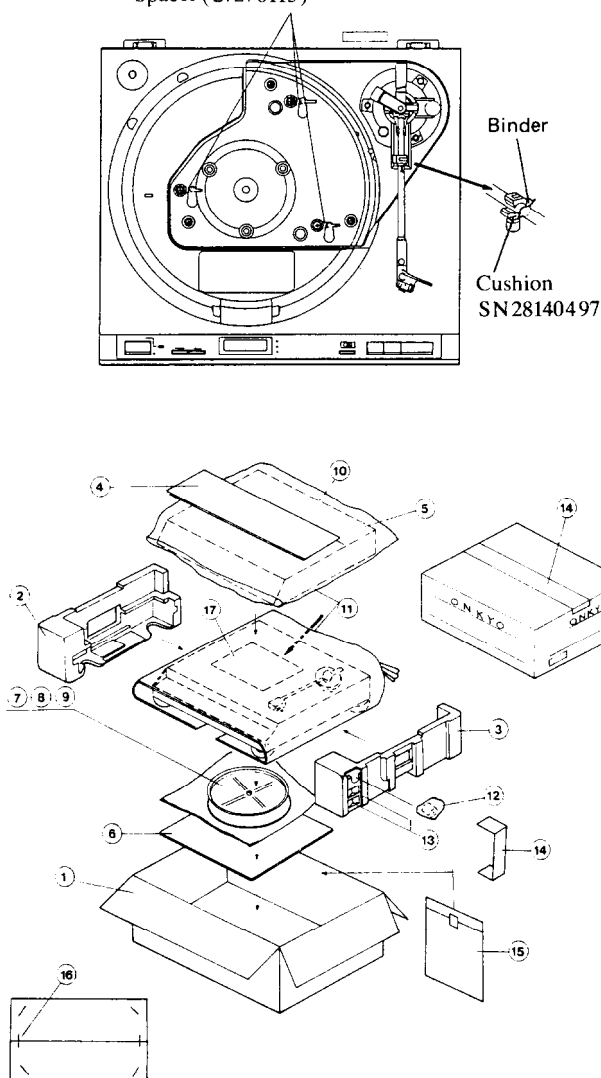
CIRCUIT NO.	PART NO.	DESCRIPTION
P802	24505158A	PU CORD

## NARET-2350-7

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Transistor</b>	
Q701	2211255	2SC1815GR
	<b>LED</b>	
D701	225053 or 225054	SEL1110R-B or SEL1110R-C
	<b>Diode</b>	
D702	225226	HPL-3F
	<b>Resistor</b>	
R703	5215051	N08HR1kBF
	<b>Miscellaneous</b>	
	2000238	NSAS-3P176, SOCKET
	27140411A	BRACKET(L)
	834430068	3TTS+6B(BC), SCREW

## PACKING VIEW

4 TTP+25P 801434  
W4×12F(BC) 87644012 Tapping screw  
Spacer (27270115)



REF.NO	PART NO.	DESCRIPTION
1	29051972	Master carton box
2	29090916A	Pad(L)
3	29090917A	Pad(R)
4	29090918A	Pad Sheet(Up)
5	29095366	Pad Sheet(Tone arm)
6	29095286	Pad sheet(Bottom)
7	24502159A	Turntable platter
8	24509328	T.T Mat ( Only 120V model )
	24509286A	T.T Mat ( Only 220V model )
9	29100046	Poly-vinyl bag
10	24509320A	Dust cover
11	290008-1	Protection sheet
12	24501460	Counter weight
	29100072	80×150 poly bag
13	28180080	Hinge
	29095363	70×140 ×0.15t sheet
14	29110051	P.P Tape(W60×220mm)
	260012	P.P Tape(W50×1000mm)
15		Accessory bag complete
	120V model	
	29341450	Instruction manual
	24501330	Cartridge attachment parts ass'y
	24509197	Overhang gauge
	29365019	Warranty card(Only USA model)
	29358002G	Service station list(Only USA model)
	29100006A	250×350 Poly bag
	292049A	45 Adaptor
	220V model	
	29341451	Instruction manual
	29365020A	Warranty card(Only West Germany model)
	29100094	Poly bag
	29100006A	250×350 Poly bag
	292049A	45 Adaptor
	Universal model	
	29341451	Instruction manual
	25055040	CVK-2, Conversion plug
	29100006A	250×350 Poly bag
	29365022	Warranty card (Only U.K.model)
	292049A	45 Adaptor
16	282301	Sealing hook
17	29355101B	Caution label

# ONKYO CORPORATION

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