

ONKYO SERVICE MANUAL

STEREO CASSETTE TAPE DECK MODEL TA-R22

Black and silver models

UDN, UDC, UD	120V AC, 60Hz
UG	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQA, UQB	240V AC, 50Hz

SAFTY-RELATED COMPONETN WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ 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

Track Format:	4 tracks, 2 channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.)
Wow & Flutter:	0.07% (WRMS)
Frequency Response:	20 – 15,000 Hz (30 – 14,000 Hz \pm 3dB) (normal position tape) 20 – 16,000 Hz (30 – 15,000 Hz \pm 3dB) (high position tape) 20 – 17,000 Hz (30 – 16,000 Hz \pm 3dB) (metal position tape)
Signal-to-Noise Ratio:	58dB (metal position tape, Dolby NR out) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Mic jacks: 2 Input sensitivity: 0.6mV/ 600 ohms Input impedance: 2.7 kohms Line IN: 2 Input sensitivity: 60mV Input impedance: 50 kohms DIN in jack: 1 Minimum input level: 0.1mV/ 1 kohm Input impedance: 2.7 kohms



- Outputs:**
- Line OUT: 2
 - Std output level: 500mV (0dB)
 - Optimum load impedance: over 50 kohms
 - Headphone jack: 1
 - Optimum load impedance: 8 – 200 ohms
 - DIN out out jack: 1
 - Std output level: 500mV (0dB)
 - Optimum load impedance: over 50 kohms
- Motors:**
- DC servo motor: 1
 - DC motor: 1
- Heads:**
- Rec/PB head: Special Hard Permalloy
 - Erase head: Ferrite
- Power Supply:** AC220V/50Hz, 120/220V, 50/60Hz, 240V/50Hz, 120V/60Hz
- Power Consumption:** 23 watts
- Dimensions:** 435(W) x 112(H) x 258(D)mm (17-1/8" x 4-7/16" x 10-3/16")
- Weight:** 4.5 kg. (9.9 lbs.)

- Models for use with only an AC 120V power supply are not equipped with a DIN terminal.
- Specifications and external appearance are subject to change without notice.

SERVICE PROCEDURES

1. Replacing the lamp

This unit used the lamp listed below.

Circuit No.	Parts No.	Description
PL-601	210090	PL14V 150mA

Caution: Before replacing the lamp. Be sure to unplug the power supply cable.

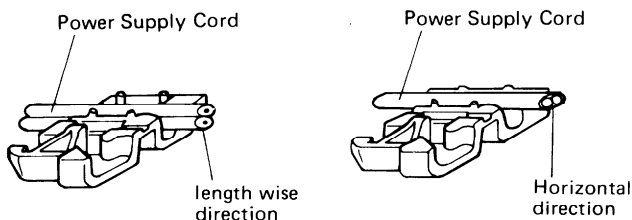
2. Instruction resistance measurement

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

Specifications; 500V more than 10MΩ

3. Replacement of power supply cord

There are two power supply cord outlets on the strain-relief. Insert them in prescribed direction to ensure safety. AS-UC-3 (UD<120V> model) should be inserted length-wise and other types of cords should be inserted horizontal-ly.

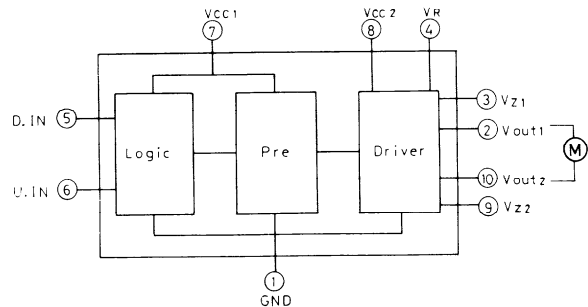


Blank Skip Operation

When no signal is detected on the tape for more than 20 seconds during playback, blank skip functions just as the song location function to locate the beginning of the next song and then return the deck to the play mode. Blank skip operates only when the blank skip switch is on. The same blank tape detection circuit is used during both AMCS and standard playback; the gain is changed depending on whether AMCS or blank skip is being used.

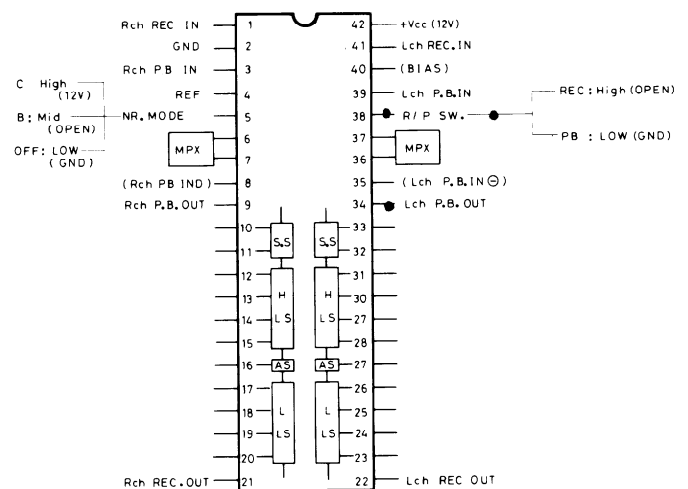
IC BLOCK DIAGRAM

BA6229 (REEL MOTOR DRIVER)

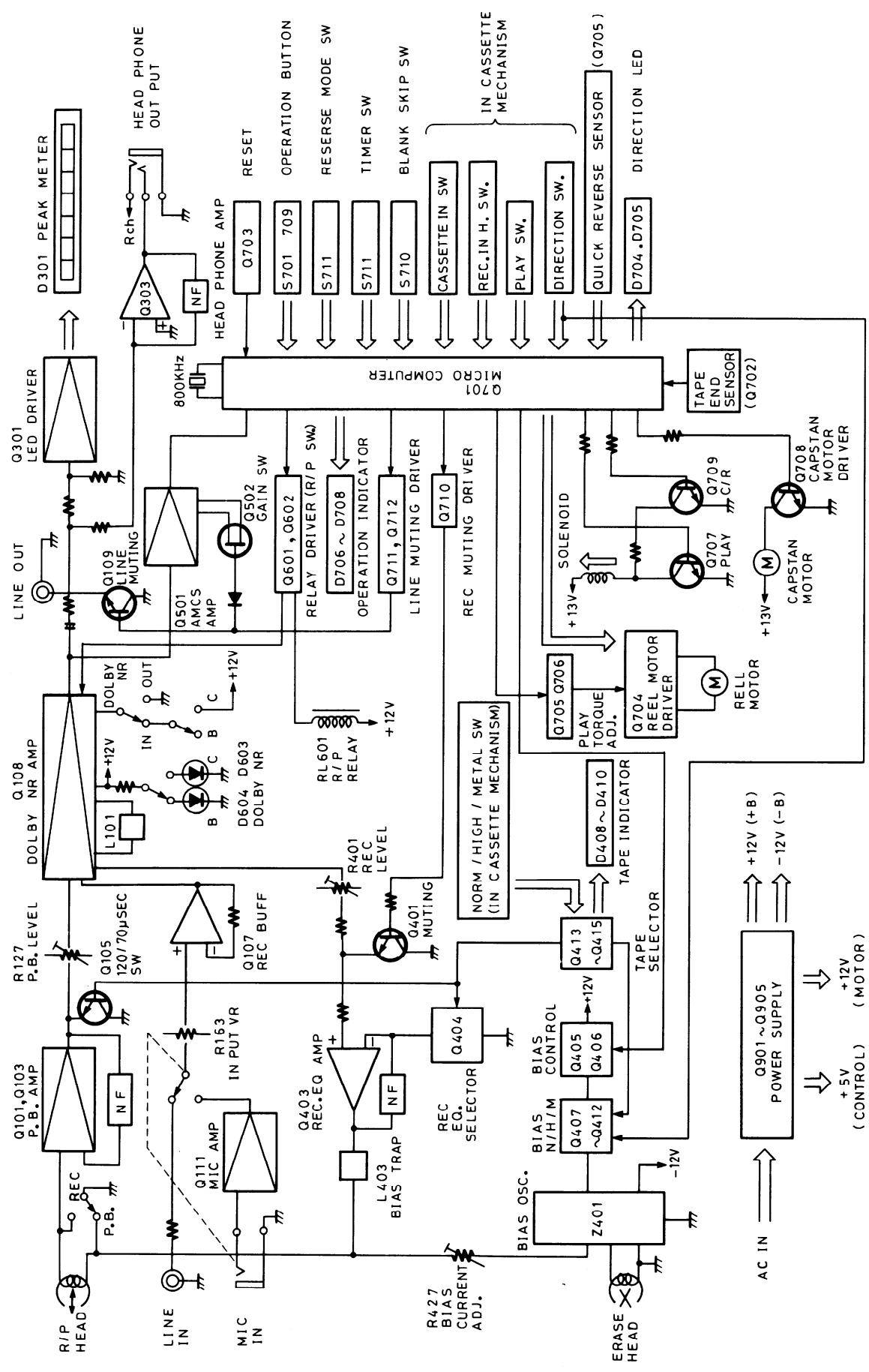


INPUT		OUTPUT		
IN1 (5)	IN2 (6)	OUT1 (2)	OUT2 (10)	
L	L	L	L	STOP
H	L	H	L	REV
L	H	L	H	FOW
H	H	L	L	BRAKE

HA12088NT (DOLBY NR IC 2CH in one package)



BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

PRECAUTIONS

- Before adjustment, clean the following parts with an alcohol moistened swab.
 - * record/playback head
 - * pinch roller
 - * erase head
 - * capstan
- Do not use magnetized screwdriver for adjustments.
- Demagnetize record/playback head with a head demagnetizer.

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter

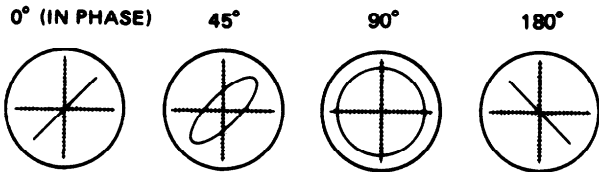
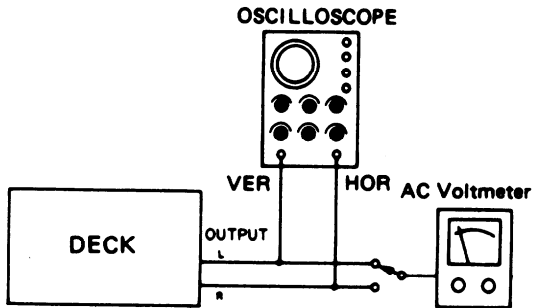
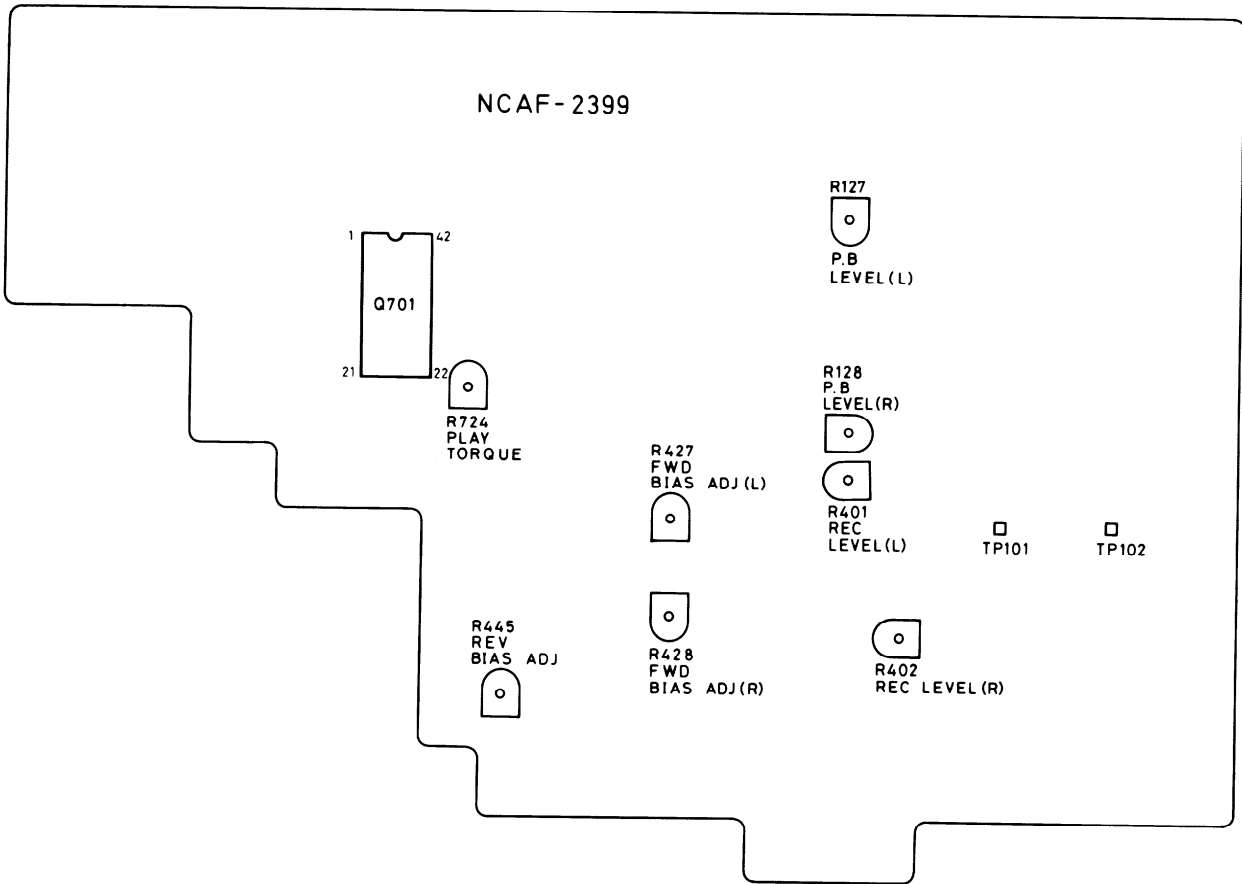
Oscilloscope
Attenuator
AC voltmeter
Non-magnetic screw driver
Blank tapes (completely erased)

NORMAL	NEW UD90
HIGH	NEW XL-II90
METAL	NEW MX60

Test tapes

VTT-658	: 10 KHz, -15dB
MTT-111	: 3 kHz, -10dB
MTT-150	: Dolby level calibration 400Hz, tone 200nWb/m

	Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Playback torque			RW-2111	PB	TW-2111	R-724	35 to 55gcm	
2	Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the moter	3,010 to 3,020Hz	
3	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		VTT-658	PB	AC voltmeter	Haed azimuth screw	Maximum and same phase at channels L and R	See fig. 1
4	Playback level	AC voltmeter to terminal TP-101 and TP-102		MTT-150	PB	AC voltmeter	R-127 (Ch. L) R-128 (Ch. R)	380mV <i>520mV</i>	
5	Bias current	Fig. 2	1kHz, -20dB and 12kHz, -20dB	NEWXL-II90	REC/PB (FWD)	AC voltmeter	R-427 (Ch. L) R-428 (Ch. R) R-445 (L, R)	Same level at REC/PC	Input VR maximum
6	Record level	Fig. 2	1 kHz		REC PAUSE	AC voltmeter	Attenuator or AF OSC output	350mV	Input VR maximum
					REC/PB	AC voltmeter	R-401 (Ch. L) R-402 (Ch. R)	Same level at REC/PB	
7	Reverse operation sensitivity	DC voltmeter to sockets C706 (-) (P703 Pin 2)		TDK AD-120 Magnetic substance	FWD PB	DC voltmeter	Semi-fixed on the mechanism P.C.B	2 ~ 2.5V	



Confirming phase relationship

fig-1

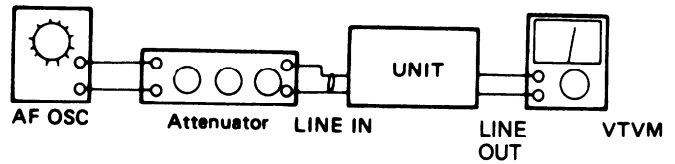
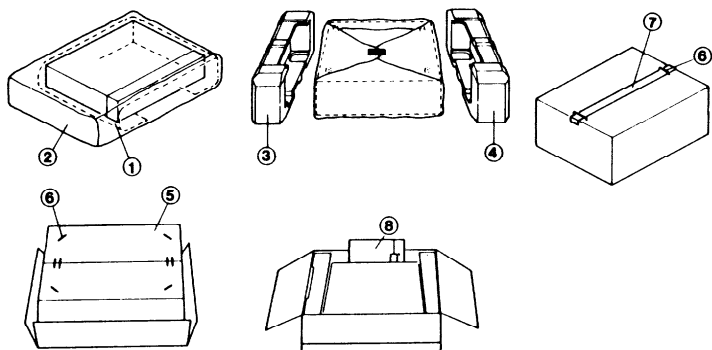


fig-2

PACKING VIEW



D Model

REF. NO.	PARTS NO.	DESCRIPTION
1	29051194	Master carton box (S)
	29051195	Master carton box (B)
2	29090987	Pad (L)
3	29090988	Pad (R)
4	29100037A	650 x 500, Poly bag
5	282301	Sealing hook
6	260012	Damplon tape

7	Accessory bag ass'y
	29340921 Instruction manual
	2010095 Connection cable
	29365006-7 Warranty card (N)
	29358002C Service station list (N)
	29100006A 350 x 250, Poly bag

G/W Model

REF NO.	PART NO.	DESCRIPTION
1	29051194	Master carton box (S)
	29051195	Master carton box (B)
2	29090987	Pad (L)
3	29090988	Pad (R)
4	29100037A	650 x 500, Poly bag
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessory bag ass'y	
	29340922 Instruction manual	
	2010095 Connection cable	
	25055040 Conversion plug (CV-K-2) (W)	
	29100006A 350 x 250, Poly bag	

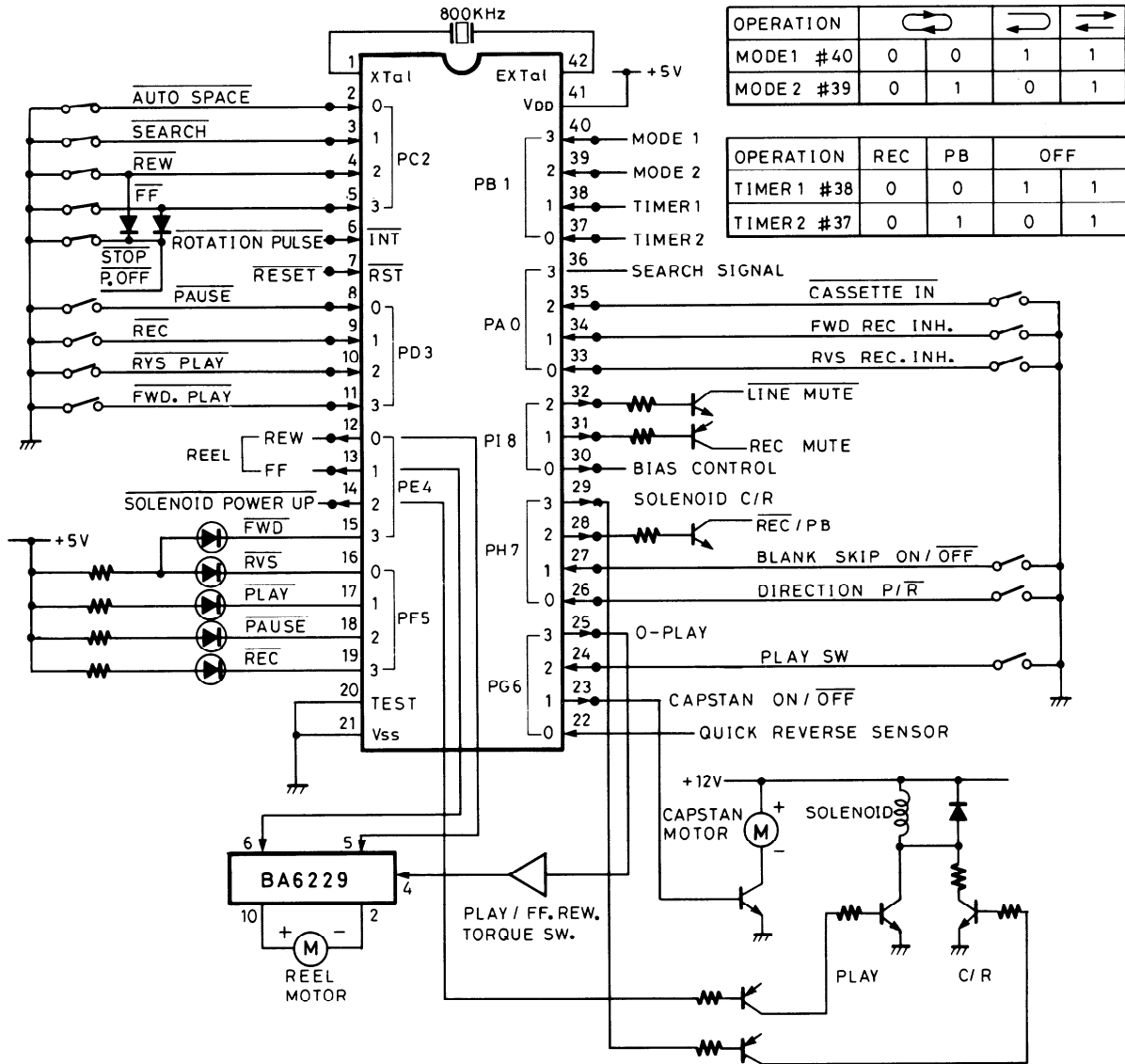
NOTE:

- (N): Only U.S.A. Model
- (W): Only 120/220V Model
- (S): Silver Model
- (B): Black Model

CHASSIS-EXPLODED VIEW-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27110256B	Front bracket	A34	28133144	Plate
A2	27140992A	Bracket (HT)	A35	27170201	Bottom board
A3	27140993	Bracket (C)	A36	27175028	Leg
A4	24601194	Counter	A37	28321928	Knob (POW) (S)
A5	27190365A	Holder		28321905B	Knob (POW) (B)
A6	27190280	Holder (LED)	A38	28322035	Knob (Timer) (S)
A7	28133143	Back plate		28322044	Knob (Timer) (B)
A8	28130230A	Dial plate	A39	28322244A	Knob (EJ) (S)
A9	27115130	Side bracket		28322241A	Knob (EJ) (B)
A10	27120753	Back bracket (D)	A40	28322037A	Knob (Push) (S)
	27120754	Back bracket (G)		28322042A	Knob (Push) (B)
	27120755	Back bracket (W)	A41	28322240	Knob (BA) (S)
A11	△ 27300750	Strainrelief		28322043	Knob (BA) (B)
A12	870065	Special washer	T901	△ 2300010	NPT-886D, Power transformer (D)
A13	86414010	FWN 4x10FN, Flange nut		△ 2300011	NPT-886G, Power transformer (G)
A14	27273037A	Joint (L)		△ 2300012	NPT-886DG, Power transformer (W)
A15	2840553	Cushion	P1	△ 253099C	AS-UC-3, Power supply cord (D)
A16	27190351	Holder (POW)		△ 253128	AS-CEE, Power supply cord (G/W)
A17	27190356	Holder	S902	△ 25065123	NSS-1258P, Voltage selector (W)
A18	880011	Rivert	Z1	244083	NDM-75, Tape mechanism ass'y
A19	834430068	3TTS+6B (BC), Screw	U1	11568599	NAAF-2399, Main circuit pc board (D)
A20	834430108	3TTS+10B (BC), Screw		11568599A	NAAF-2399A, Main circuit pc board (G/W)
A21	831430088	3TTW+8B (BC), Screw	U2	11568500	NADIS-2400, Display pc board
A22	833430080	3TTP+8P (BC), Screw	U3	11568501	NAVR-2401, Operation switch pc board
A23	830440109	4TTC+10C (BC), Screw	U4	11568502	NASW-2402, Timer switch pc board
A24	82142604	2.6P+4F (BC), Screw	U5	11568503	NASW-2403, Reverse mode switch pc board
A25	82143006	3P+6FN(BC), Screw	U6	11568504	NALED-2404, Direction indicator pc board
A26	28184277	Top cover (S)	U7	11568506	NAHP-2406, Headphone terminal pc board
	28184278	Top cover (B)	U8	11568505	NAPL-2405, Edge light pc board
A27	11568121	Front panel ass'y (S)	U9	11568507	NAPS-2407, Power switch pc board
	11588121	Front panel ass'y (B)			
A28	28322031	Knob (Slide) ass'y (S)			
	28322045	Knob (Slide) ass'y (B)			
A29	28322236	Knob (Guide) ass'y (S)			
	28322237	Knob (Guide) ass'y (B)			
A30	28191298A	Clear plate			
A31	27190368	Holder (Decoration)			
A32	28400215	Cassette lid			
A33	28191322	Window ass'y			

MICRO COMPUTER (LM-640251-1885)



TAPE MECHANISM-PARTS LIST

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
1	801318	Screw w/washer M2x5	61	24605599	Spring
2	24600055	Head AS	62	24605590	Spring
3	24611038	Adjusting nut	63	24605594	Spring (A)
4	24611021	Tape guide	64	24607043	Arm (A)
5	24611020	Sensor AS	65	24607044	Arm (B)
6	24605484	Adjusting spring (R)	66	24611182	Cap
7	24605483	Adjusting spring (L)	67	24611034	Reflector
8	24611176	Plate AS (Head)	68	24605591	Spring (Ground)
9	24605584	Spring (Head base)	69	24607030	Bracket (R)
10	838120130	Wave screw 2x13	70	24607029	Bracket (L)
11	87712206	Washer 2.2x6x0.4	71	24607047	Eject arm
12	24602339	Pinch roller AS	72	24605600	Spring Eject Arm
13	24605585	Spring (Pinch roller) R	73		Wire connector
14	24602349	Pinch roller AS	74	24611192	Cassette holder AS
15	24605598	Spring (Pinch roller) L	75	24611174	Plate
16		Wire connector	76	24606233	P.C.B. AS
17		Wire connector	77	82113057	Tap-tight screw M3x5
18	24611177	Plastic washer 1.7x3.2x0.25	78	82112047	Tap-tight screw M2x4
19	24602353	Reel AS	79	24607040	Bracket (P.C.B.)
20	24602345	Take up reel AS	80	24602337	Belt (Counter)
21	24611175	Plastic washer 2.1x7x0.25	81	82113006	Tap-tight screw M3x6
22	24610926	Oil seal	82	24611193	Damper AS
23	838130080	Wave screw 3x8	83	833120127	Tap-tight screw M2x12
24	24604048	Spacer	84	801293	Tap-tight screw M2.6x12
25	24607041	Arm (Protect) L	85	24602343	Flywheel AS
26	24605586	Spring (L)		24602352	(After change 2000 ~)
27	24603326	Lever (Hold) C	86	24611188	Oil seal ϕ 2.2
28	833130047	Tap-tight screw M3x4	87	24611189	Bairder
29	24604075	Tube			
30		Wire connector			
31	24606235	Push Switch			
32	24611191	Chassis AS			
33	24602342	Idler AS			
34	24606236	Push switch			
35	24605587	Spring (Hold)			
36	24605588	Spring (Cassette)			
37	801355	Screw/w M2.6x3.5			
38	24611178	Cap			
39	24611179	Plate AS (Slide)			
40	24605589	Spring (Slide)			
41	24606231	Leaf switch			
42	838120070	Wave screw 2x7			
43	24611180	Base AS (Sensor)			
44	24611041	Plastic washer 2.6x0.25			
45	24602343	Flywheel AS			
46	24602344	Cam gear (B)			
47	24604076	Spacer			
48	24607039	Bracket (Flywheel) B			
49	24603330	Lever (Reader)			
50	24603329	Lever (Reader)			
51	24606232	Solenoid coil PKA16122			
52	838126080	Screw 2.6x8			
53	24611033	LUG AS			
54	24605593	Spring (Play arm)			
55	24607042	Arm AS (Play)			
56	24602351	Main belt			
57	24601193	Motor AS (Main)			
58	24601190	Motor AS (Reel)			
59	24611181	Holder (Lead)			
60	24603328	Lever (Read)			

PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD (NAAF-2399)			CIRCUIT NO.	PART NO.	DESCRIPTION
			Q904, Q905	2201074 or 2201385	2SD880 (Y) or 2SD330 (E)
					Diodes
Q107	222465 or 222808	NJM4558D M5218P	D101, D102	223145, 223124 or 223150	1S2076, (G/W) 1S2473 or VS1040
Q108	222910	HA12088		223155	1SS138
Q303	222652	M5218L	D401	2239671,	RD15EB1,
Q403	222808	M5128P	D402-D404	2242912 or 2243251	EQA02-13B or MTZ15A
Q404	222918	BA6251		223155	1SS138
Q501	222681 or 222695	IR3702 or LA6324	D405-D407	2239472,	RD5.6EB1,
Q702	222909	LM6402H-1885	D501	2242844 or 2243152	EQA02-06A or MTZ5.6B
Q704	222775	BA6229		223155	1SS136
Q705	222465 or 222808	NJM4558D M5218P	D502, D503 D504	223145, 223124 or 223150	1S2076TD 1S2473 or US1040
Q901	222780122	78M12		2239591, 2242877 or 2243211	RD10EB1, (GW) EQA02-09D or MTZ10A
				223155	1SS138
				223155	1SS138
				223132	1K60
				223155	1SS138
				223145, 223124 or 223150	1S2076TD, 1S2473 or US1040
				223862 or 223890	WL01 or W01RL
				223842 or 223891	GP15B or RL152
				2239473, 2242845 or 2243153	RD5.6EB1, EQA02-06B or MTZ5.6C
				2239671, 2242912 or 2243251	RD15EB1, EQA02-13B or MTZ15A
					Coils
				233313 or 233306	NMC-6048 or NMC-6043
				233245	NMC-2029
				24606069 or 231039	NCH-1007 or NCH-2079
				233314	NCH-2097
					OSC Block
				231070	NOB-035
					Ceramic oscillator
				3010092	CSB800K
					Capacitors
				352750479	4.7 μ F, 25V, Elect.
				352741009	10 μ F, 16V, Elect.
				352742209	22 μ F, 16V, Elect.
				352783399	0.33 μ F, 50V, Elect.
				352780109	1 μ F, 50V, Elect.
				352741009	10 μ F, 16V, Elect.
				352780109	1 μ F, 50V, Elect.
				352786899	0.68 μ F, 50V, Elect.
				357280229	2.2 μ F, 50V, Elect.
				352786899	0.68 μ F, 50V, Elect.
				352780229	2.2 μ F, 50V, Elect.
				352741009	10 μ F, 17V, Elect.
				352780109	1 μ F, 50V, Elect.
				352781599	0.15 μ F, 50V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C403, C404	352750479	4.7 μ F, 20V, Elect.
C413, C414	352750479	4.7 μ F, 25V, Elect.
C504	352780229	2.2 μ F, 50V, Elect.
C601	352734719	470 μ F, 10V, Elect.
C602	352742209	22 μ F, 16V, Elect.
C605	352741009	10 μ F, 16V, Elect.
C703	352780199	0.1 μ F, 50V, Elect.
C706	352780109	1 μ F, 50V, Elect.
C707	352741009	10 μ F, 16V, Elect.
C708-C710	352780109	1 μ F, 50V, Elect.
C711	352780229	2.2 μ F, 50V, elect.
C903, C904	352751029	1000 μ F, 25V, Elect.
C905	352783399	0.33 μ F, 50V, Elect.
C906	352741009	10 μ F, 16V, Elect.
C907	352780109	1 μ F, 50V, Elect.
C908	352741009	10 μ F, 16V, Elect.
C909	3504166	6800 μ F, 35V, Elect.
C911	352741009	10 μ F, 16V, Elect.
C913-C914	352741009	10 μ F, 16V, Elect.
C915-C918	352734709	47 μ F, 10V, Elect.
C919, C920	352741009	10 μ F, 16V, Elect.
C912	352742219	220 μ F, 16V, Elect. (G/W)
C921	352744719	470 μ F, 16V, Elect.
Resistors		
R127, R128	5215046 or 5215023	N08HR 50KBC, Semi-fixed
R163, R164	6142042	N60LGL 50kA15Z, Slide variable
R401, R402	5215044 or 5215020	N08HR 5KBC, Semi-fixed
R427, R428	5215047 or 5215024	N08HR 100KBC, Semifixed
R429	441521004	10 Ω , 1/2W, Metal oxide film
R455	5215003 or 5215022	N08HR 20KBC, Semi-fixed
R701, R702	49163392413	3.9k Ω x13.1/10W, Network
R703	49163392404	3.9k Ω x4.1/10, Network
R720	441623904	3.9 Ω , 1W, Metal oxide film
R724	5215022 or 5215003	N08HR 20KBC, Semi-fixed
R727	441724704	47 Ω , 2W, Metal oxide film
R901, R902	441520224	2.2 Ω , 1/2W, Metal oxide film
R908		
R906	441628204	82 Ω , 1W, Metal oxide film
Relay		
RL601	25065174	NRL-2P1A-DC12V-09
Plugs		
P401	25055100	NPLG-3P-84
P601	25055103	NPLG-6P-87
P701	25055184	NPLG-3P-168
P702, P703	25055133	NPLG-3P-117
P704, P706	25055138	NPLG-8P-122
P705	25055132	NPLG-2P-116
Terminals		
P601	25045134	HLJ-4337-01-010, Mic
P603	25045142	NPS-4PDBL55, Input/output
P604	25050064	NSCT-5P18, DIN (G/W)

DISPLAY PC BOARD (NADIS-2400)

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q301, Q302	222623	IR2E02
LEDs		
D301, D302	225159	SEL9720MB01, Array
D408-D410	225179	GL3NG28
D603, D604	225178	GL3HY28
D706	225179	GL3NG28
D707, D708	225177	GL3PR28
Capacitors		
C301, C302	352750479	4.7 μ F, 25V, Elect.
C303, C304	352780109	1 μ F, 50V, Elect.

OPERATION SWITCH PC BOARD (NAVR-2401)

CIRCUIT NO.	PART NO.	DESCRIPTION
Resistor		
R171	5146050	N12RMC250KW15Z, Variable
Switches		
S601, S602	25035399	NPS-122-L364, Push
S701-S709	25035389	NPS-111-5353, Push
S710	25035399	NPS-122-L364, Push
Bracket		
	27141025	PC board

TIMER SWITCH PC BOARD (NASW-2402)

CIRCUIT NO.	PART NO.	DESCRIPTION
S712	25065224	NSS-2398, Slide switch

REVERSE MODE SWITCH PC BOARD (NASW-2403)

CIRCUIT NO.	PART NO.	DESCRIPTION
S711	25030268	NRSF-123-15MP

DIRECTION IND. PC BOARD (NALED-2404)

CIRCUIT NO.	PART NO.	DESCRIPTION
D704, D705	225192	GLING1, LED
P701	2000490	NSAS-6P446, Socket

HEADPHONE TERMINAL PC BOARD (NAHP-2406)

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	25045139	HLJ0540-010-010

EDGE LIGHT PC BOARD (NAPL-2405)

CIRCUIT NO.	PART NO.	DESCRIPTION
PL601	210090	PL14V150mA

POWER SWITCH PC BOARD (NAPS-2407)

CIRCUIT NO.	PART NO.	DESCRIPTION
C901	3500065A	DE7150FZ, 0.01 μ F, 400V, IS
S901	25035375	NPS-111-L339P, Power
	25060092	NTM-1533, Terminal

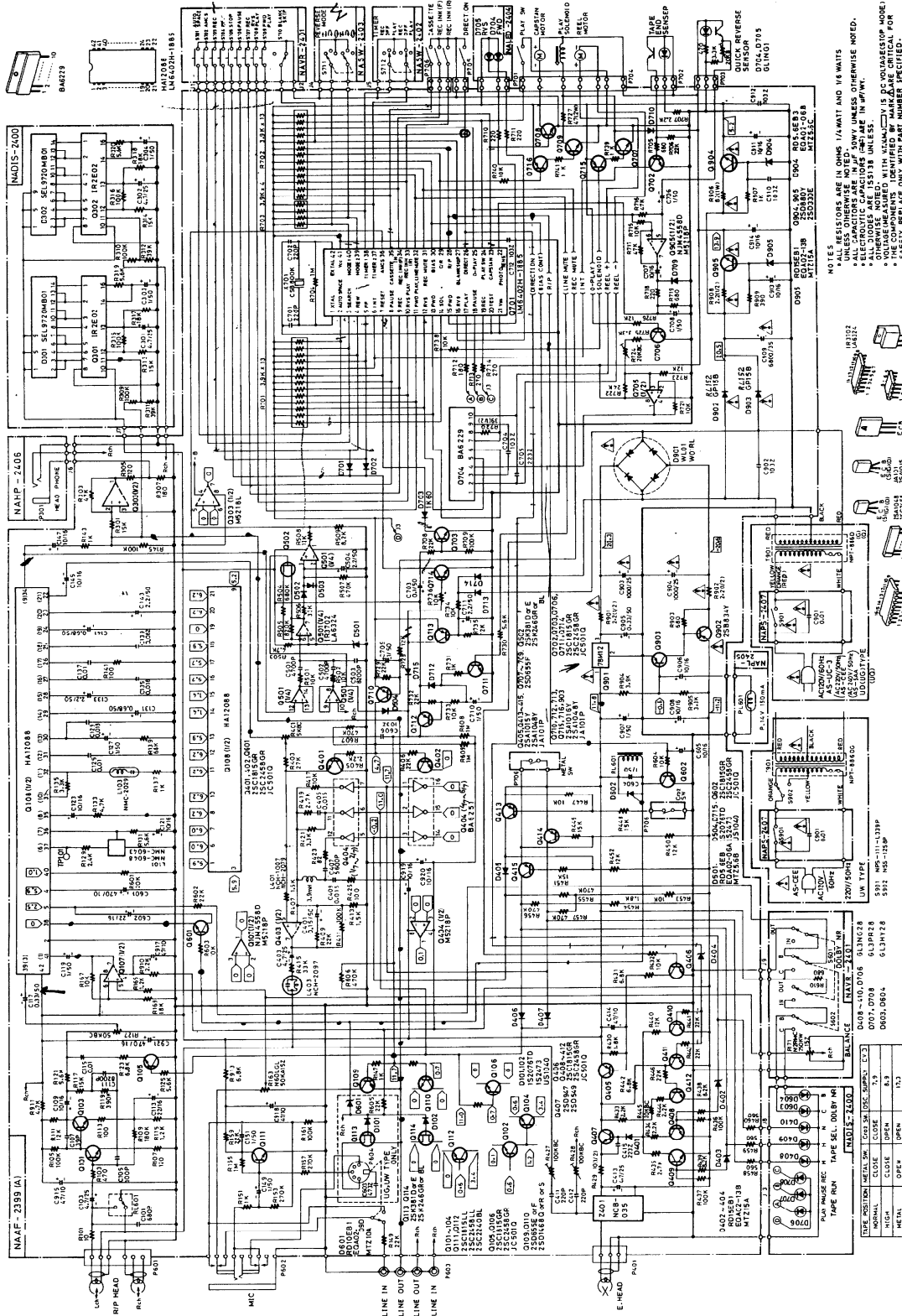
ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, 3-chome, Nishi-Sinbashi, Minato-ku, Tokyo, Japan
Telex: 2423551 ONKYO J. Phone: 03-432-6981

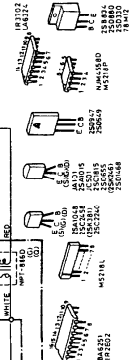
ONKYO U.S.A. CORPORATION

200 Williams Drive, Ramsey, N.J. 07446 Tel. 201-825-7950

SCHEMATIC DIAGRAM

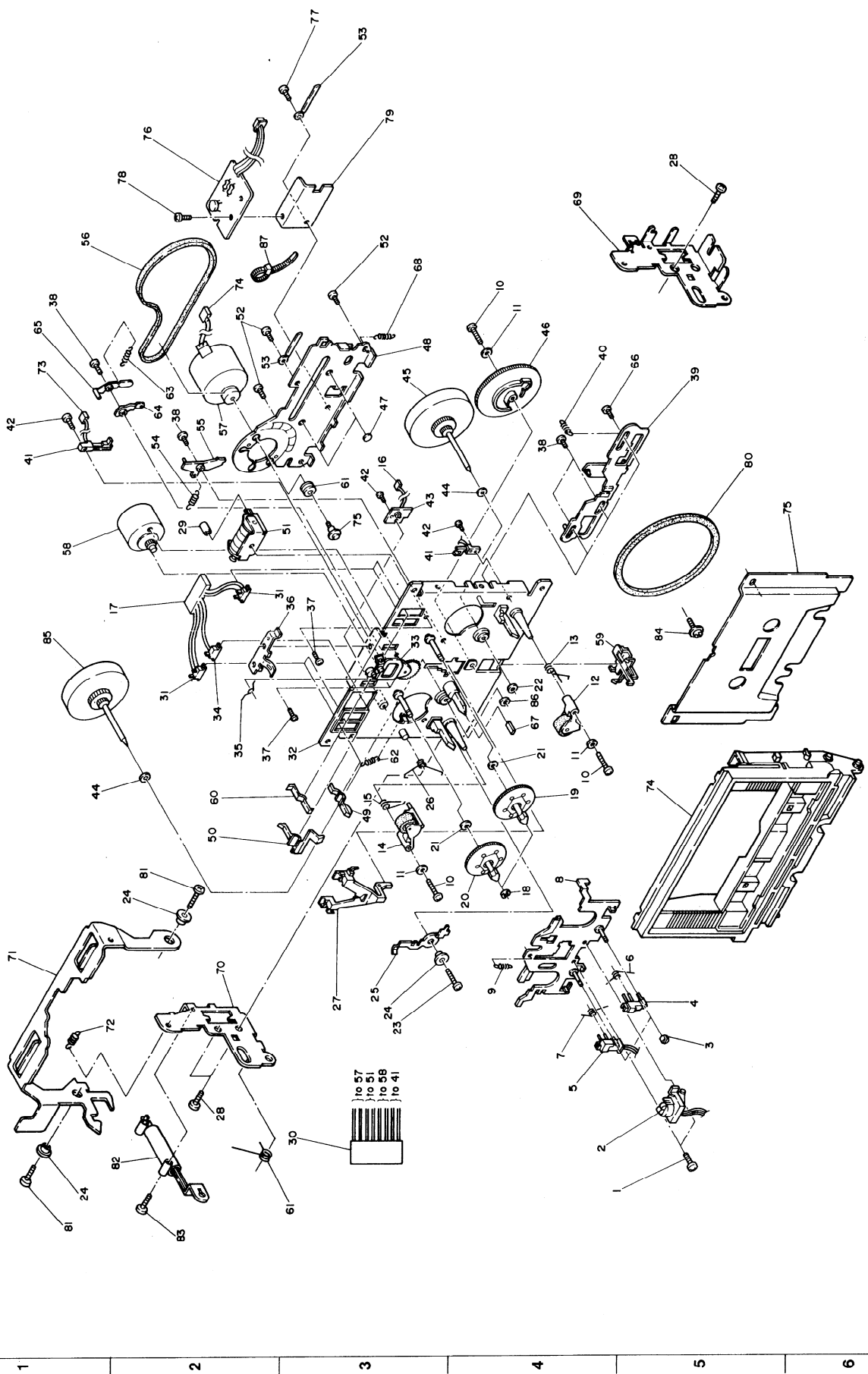


NOTES:
 * RESISTORS ARE IN OHMS 1/4WATT AND 1% TOLERANCE UNLESS OTHERWISE NOTED.
 * CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE NOTED.
 * ELECTRONIC CAPACITORS ARE IN P.P.M.
 * ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 * DIMENSIONS IN PARENTHESES ARE CRITICAL FOR ASSEMBLY.
 * SAFETY REPLACE ONLY WITH PART NUMBER SPECIFIED.



ONKYO CORPORATION

TAPE MECHANISM-EXPLODED VIEW



CHASSIS-EXPLODED VIEW

