

**ONKYO SERVICE MANUAL****STEREO CASSETTE  
TAPE DECK  
MODEL TA-RW222**

Black model

BMD, BMDN	120V AC, 60Hz
BMP	230V AC, 50Hz
BMW	120V/220V AC, 50/60Hz
BMQA	240V AC, 50Hz

**SAFETY-RELATED COMPONENT WARNING!!**

COMPONENTS IDENTIFIED BY MARK  $\triangle$  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.

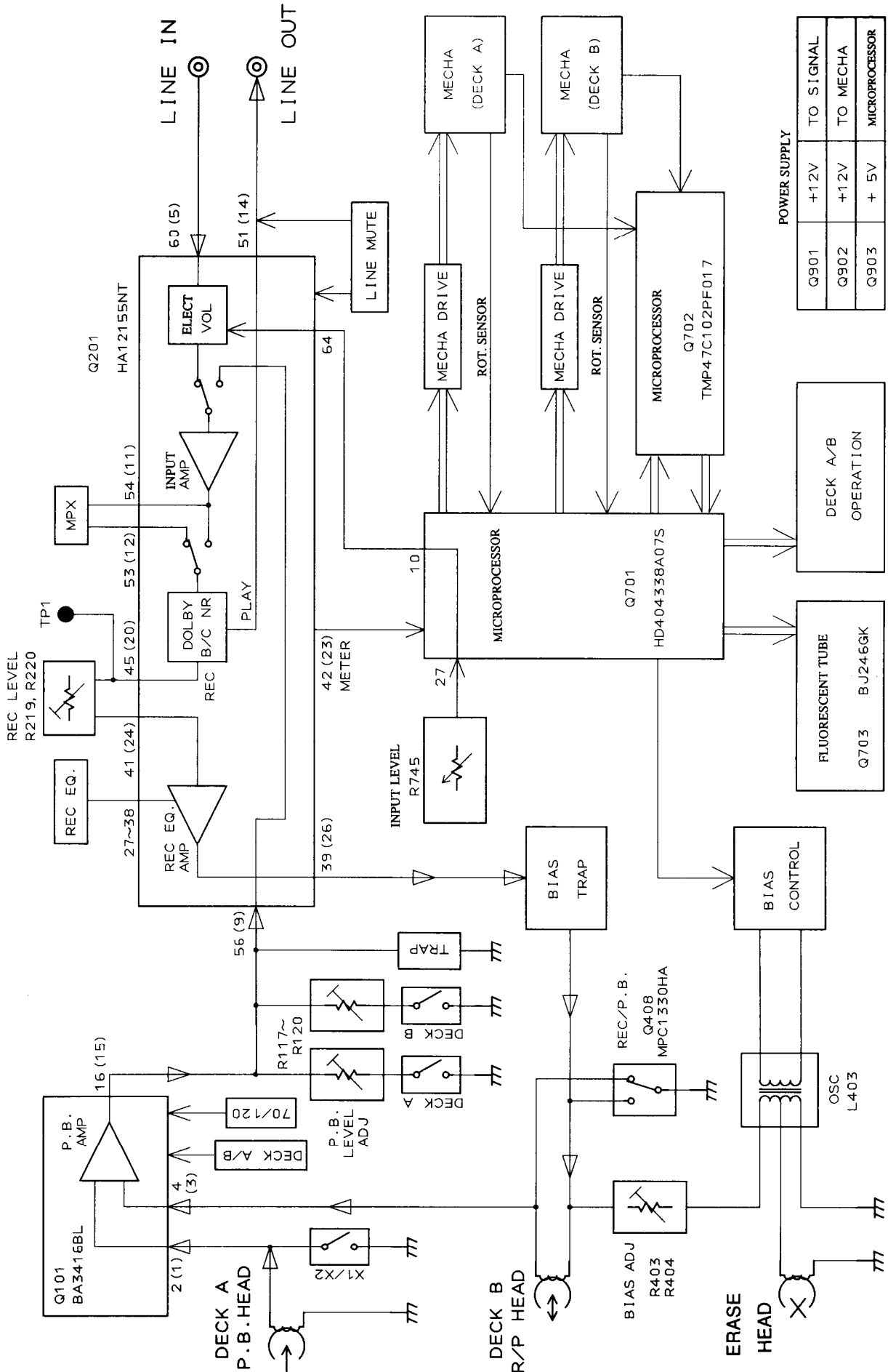
**SPECIFICATIONS**

Track Format:	4-track, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.) 9.6 cm/sec. (3-3/4 i.p.s.) (high speed dubbing)
Wow and Flutter:	0.08% (WRMS)
Frequency Response:	20 - 15,000 Hz (Normal) (30 - 14,000 Hz $\pm$ 3 dB) 20 - 16,000Hz (High) (30 - 15,000Hz $\pm$ 3 dB) 20 - 17,000Hz (Metal) (30 - 16,000Hz $\pm$ 3 dB)
S/N Ratio:	Dolby NR off: 58dB (metal position tape) 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:	Line IN: 2 Input sensitivity: 80mV Input impedance: 50 kohms
Outputs:	Line OUT: 2 Standard output level: 500mV (0dB) Optimum load impedance: over 50 kohms
Motors:	DC servo motor $\times$ 2
Heads:	REC/PB: 1 PB: 1 ERASE: 1
Power Consumption:	17 watts
Dimensions:	455 (W) $\times$ 120 (H) $\times$ 305 (D)mm (17-15/16" $\times$ 4-3/4" $\times$ 12")
Mass:	5.2 kg. (11.5 lbs.)

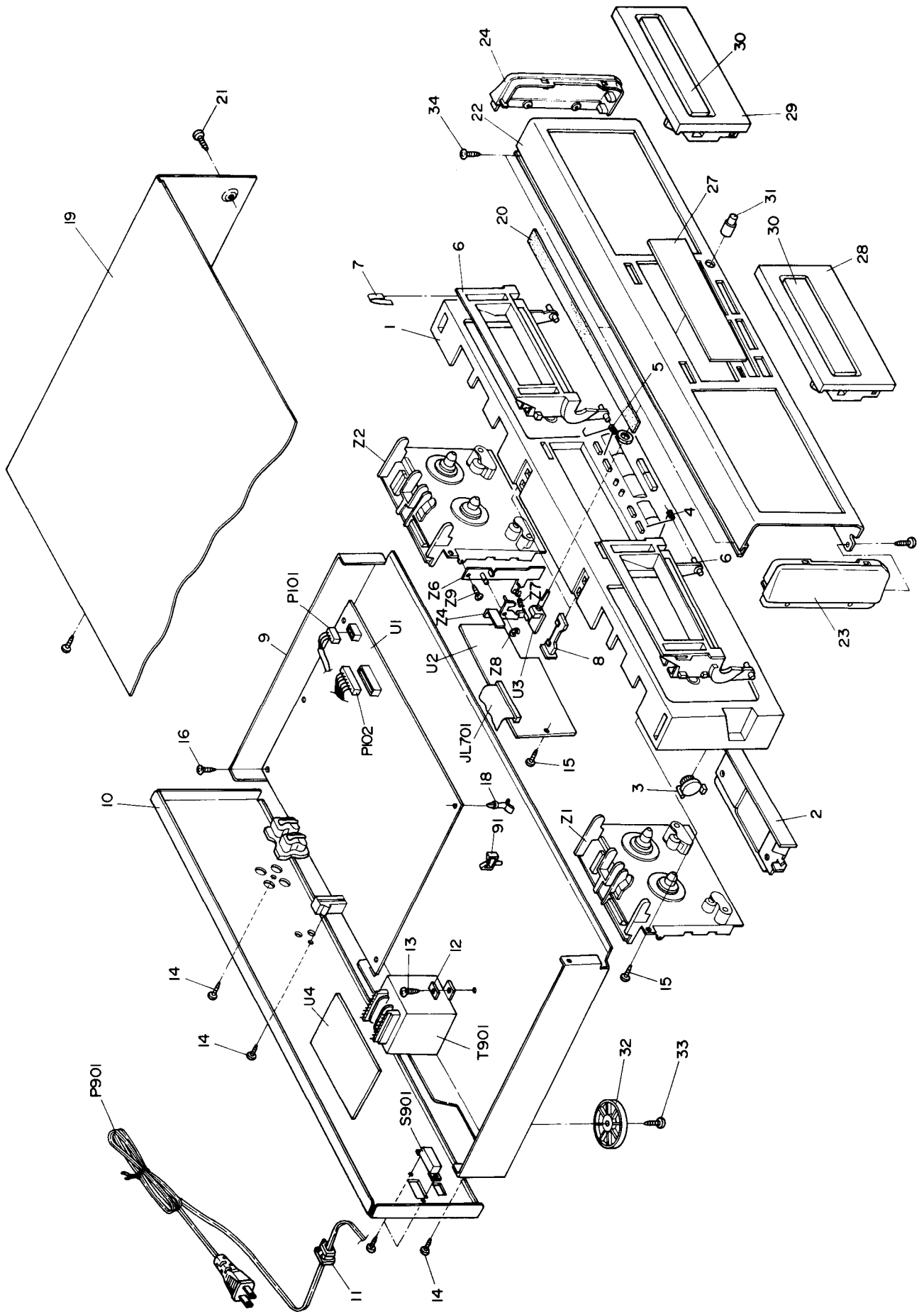
Specifications and external appearance are subject to change without notice because of product improvements.

**ONKYO**  
AUDIO COMPONENTS

**BLOCK DIAGRAM**



CHASSIS-EXPLODED VIEW



# PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	27110796Y	Front bracket	JL701	2047292512Y	NCFC7-292512, Flexible flat cord
2	27262443	Plate T-1	P101	2009990312Y	NSAS-6P0446, Socket
3	28400282	Damper	P102	2009990313Y	NSAS-14P0447, Socket
4	27180476A	Spring B	P901	253192HIT	AS-UC-6 #18, Power supply cord <D>
5	27180477A	Spring A		253193HIT	AS-CEE, Power supply cord <P/W>
6	27130792Y	Cassette frame		253197HIT	AS-SAA, Power supply cord <Q>
7	27180272A	Spring	S901	25065123	NSS-1258P, Voltage selector switch <W>
8	28324943Y	Knob, eject	T901	2301008Y	NPT-1206D, Power transformer <D>
9	27100280Y	Chassis		2301009Y	NPT-1206P, Power transformer <P>
10	27121848Y	Rear panel <D>		2301010Y	NPT-1206DG, Power transformer <W>
	27121849Y	Rear panel <P>		2301011Y	NPT-1206Q, Power transformer <Q>
	27121850Y	Rear panel <W>	U1	1N177576-1Y	NAAR-4976-1, Main circuit pc board ass'y
	27121930Y	Rear panel <Q>	U2	1N177577-1Y	NADIS-4977-1, Display circuit pc board ass'y
11	27300750	⚠ Cord bushing	U3	1N177578-1Y	NAAF-4978-1, Input volume pc board ass'y
12	870065	Flat washer	U4	1N177579-1Y	NAPS-4979-1, Power supply pc board ass'y <D/P/Q>
13	830440089	4TTC+8C(BC), Self-tapping screw	Z1	1N177580-1Y	NAPS-4980-1, Power supply pc board ass'y <W>
14	834430088	3TTS+8B(BC), Self-tapping screw	Z2	244186Y	NDM-177, Deck mechanism A
15	833430080	3TTP+8P(BC), Self-tapping screw	Z3	244187Y	NDM-178, Deck mechanism B
16	831130088	3TTW+8B, Self-tapping screw	Z4	24603402Y	Lever L, eject
17	835430068	3TTS+6B(BC), Self-tapping screw	Z5	24603404Y	Lever R, eject
18	27190480	KGLS-8S, Holder	Z6	24611591Y	Retainer L
19	28184479	Top cover	Z7	24611593Y	Retainer R
20	28140837	Cushion	Z8	24605798Y	Spring
21	834430088	3TTS+8B(BC), Self-tapping screw	Z9	8930301SY	Ring E
22	1N177121Y	Front panel ass'y		833126047	2.6TTP+4S, Self-tapping screw
23	28125248	End cap L			
24	28125249	End cap R			
25	28198802Y	Facet			
26	28135199	Badge			
27	28191676Y	Clear plate			
28	27301793Y	Cassette lid A			
29	27301793-1Y	Cassette lid B			
30	28400625	Window			
31	28324338	Knob, volume			
32	27175254A	Leg			
33	834430088	3TTS+8B(BC), Self-tapping screw			
34	833430080	3TTP+8P(BC), Self-tapping screw			
91	27300833	WS-2NS, Clamp			

NOTE: (D) : 120V model only  
(P) : 230V model only  
(W) : Worldwide model only  
(Q) : 240V model only

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

# ADJUSTMENT PROCEDURES

## PRECAUTIONS

1. Before adjustment, clean the following parts with an alcohol moistend swab.

- \* record/playback head
- \* erase head
- \* pinch roller
- \* capstan

2. Do not use magnetized screwdriver for adjustments.

3. Demagnetize record/playback head with a lead demagnetizer.

## TEST EQUIPMENT/TOOLS REQUIRED:

- Audio oscillator
- Digital frequency counter
- Oscilloscope
- Attenuator
- AC voltmeter
- Non-magnetic screwdriver
- Test tapes
  - TCC-153 :10kHz, -15dB
  - MTT-111 :3kHz, -10dB
  - MTT-150 :Dolby level calibration  
400Hz, tone 200nWb/m

## Tape speed adjustment

Connect the digital frequency counter to the line output terminal.

Load the test tape MTT-111 into the cassette holder.

Connect the test point TP-2 to the ground to be the unit to adjustment mode.

Press the forward play button. (The unit becomes the high speed.)

Adjust the trim resistors R802(Deck A) and R817(Deck B) so that the frequency counter reading becomes 6000Hz to 6020Hz.

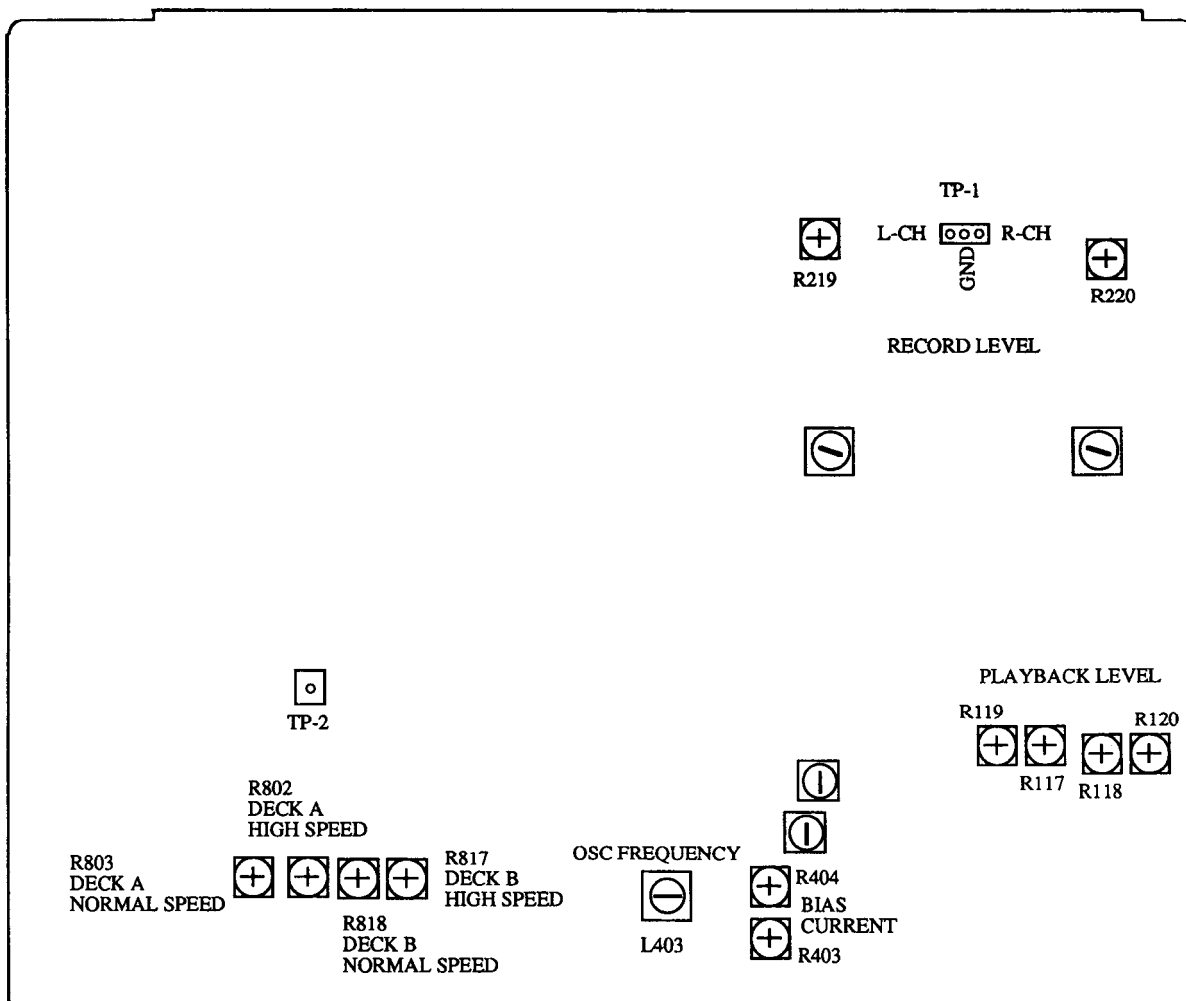
Press the forward play button. (The unit becomes the normal speed.)

Adjust the trim resistors R803(Deck A) and R818(Deck B) so that the frequency counter reading becomes 3000Hz to 3010Hz.

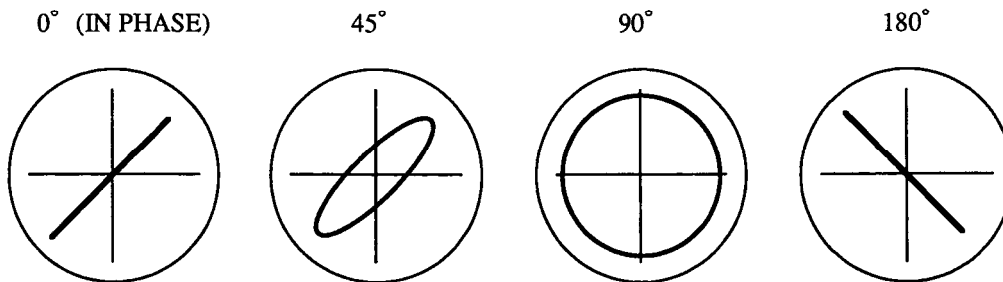
Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks	
1	Head azimuth		TCC-153	PB	AC voltmeter Oscilloscope	Head azimuth acrew	Maximum and same phase at channels L and R	fig-1	
2	Playback level		MTT-150	PB	AC voltmeter	DECK A R117 (ch. L) R118 (ch. R) DECK B R119 (ch. L) R120 (ch. R)	300mV		
3	Bias frequency		METAL TAPE XS-C90	REC	Frequency counter	L403	85kHz±2kHz		
4	Bias current	fig-2	1kHz, -23dB and 12kHz, -23dB	UD-1 C-90	REC/PB	AC voltmeter	R403 (ch. L) R404 (ch. R)	Same level at 1kHz and 12kHz	Repeat the recording and play back until the 1kHz and 12kHz playback signals are same level.
5	Record level	fig-2	1kHz	UD-1 C-90	REC	AC voltmeter	Attenuator or AF OSC output	350mV	
					REC/PB	AC voltmeter	R219 (ch. L) R220 (ch. R)	Same level at REC/PB	

Blank tape NORMAL .....UD-1 C-90  
HIGH .....XL-II C-90  
METAL .....XS C-60

PLAY torque.....30~70g/cm  
FF. REW torque.....80~180g/cm  
Back tention .....6~12g/cm



Adjustment point



Confirming phase relationship

Fig. 1

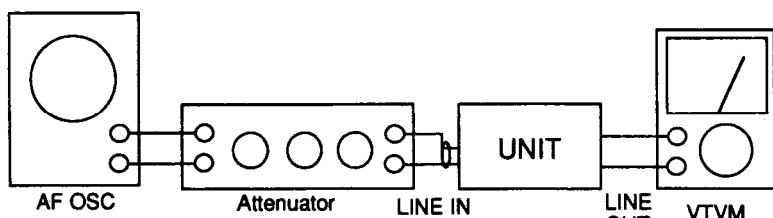


Fig. 2

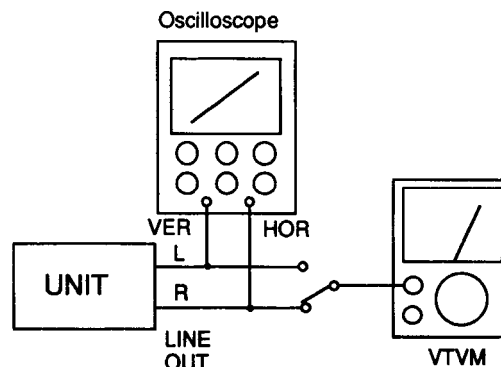
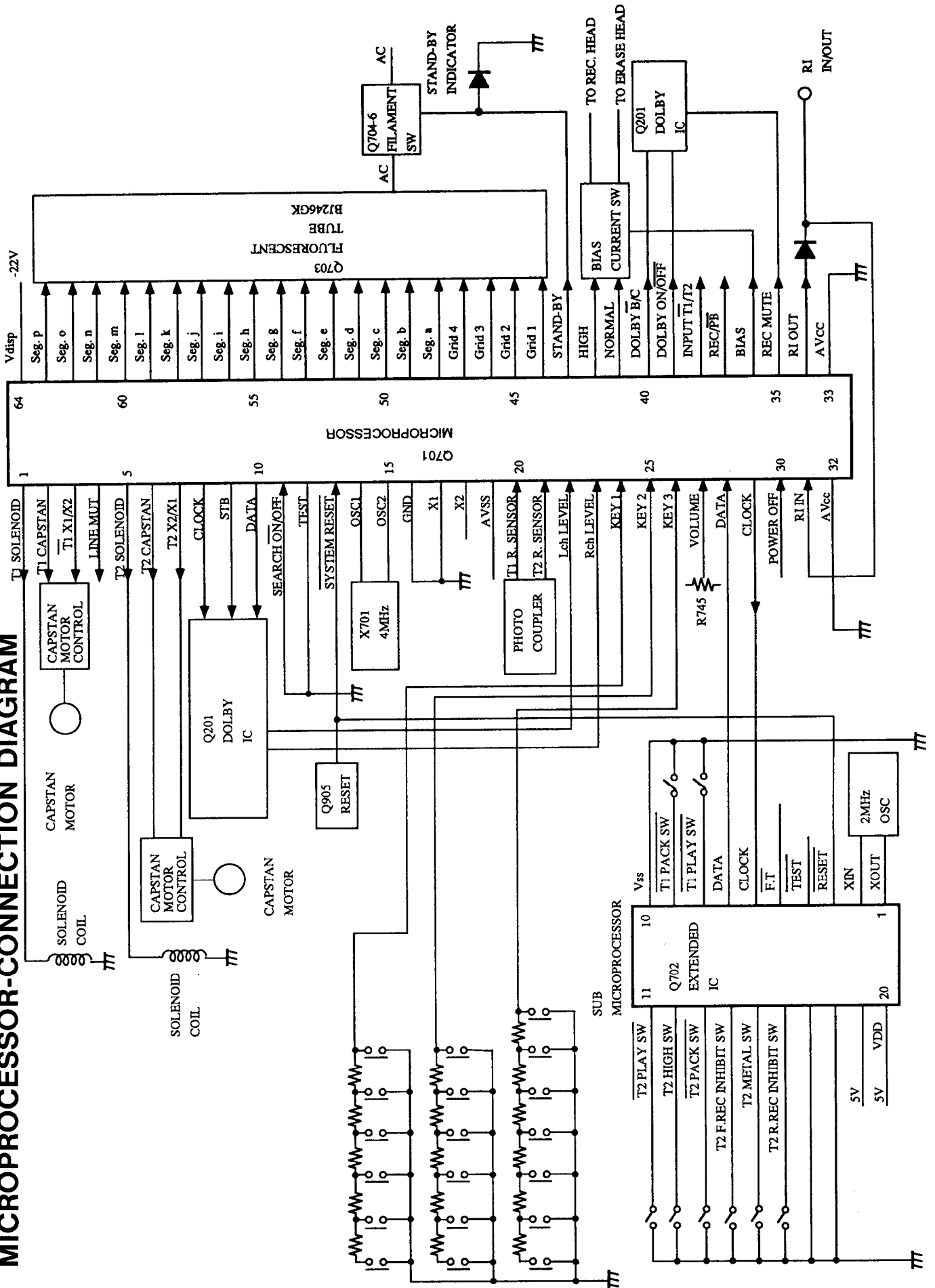
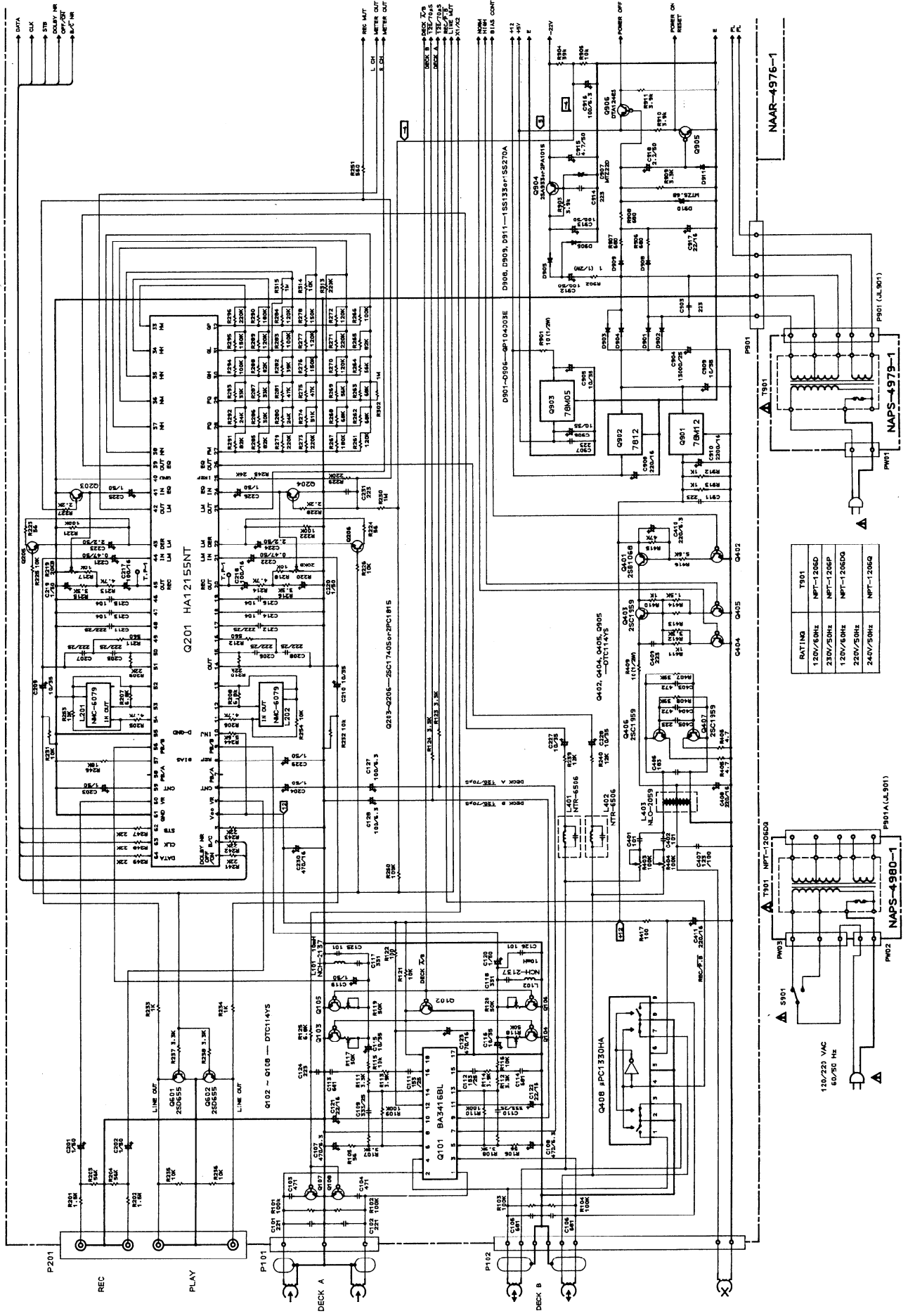


Fig. 3

# MICROPROCESSOR-CONNECTION DIAGRAM



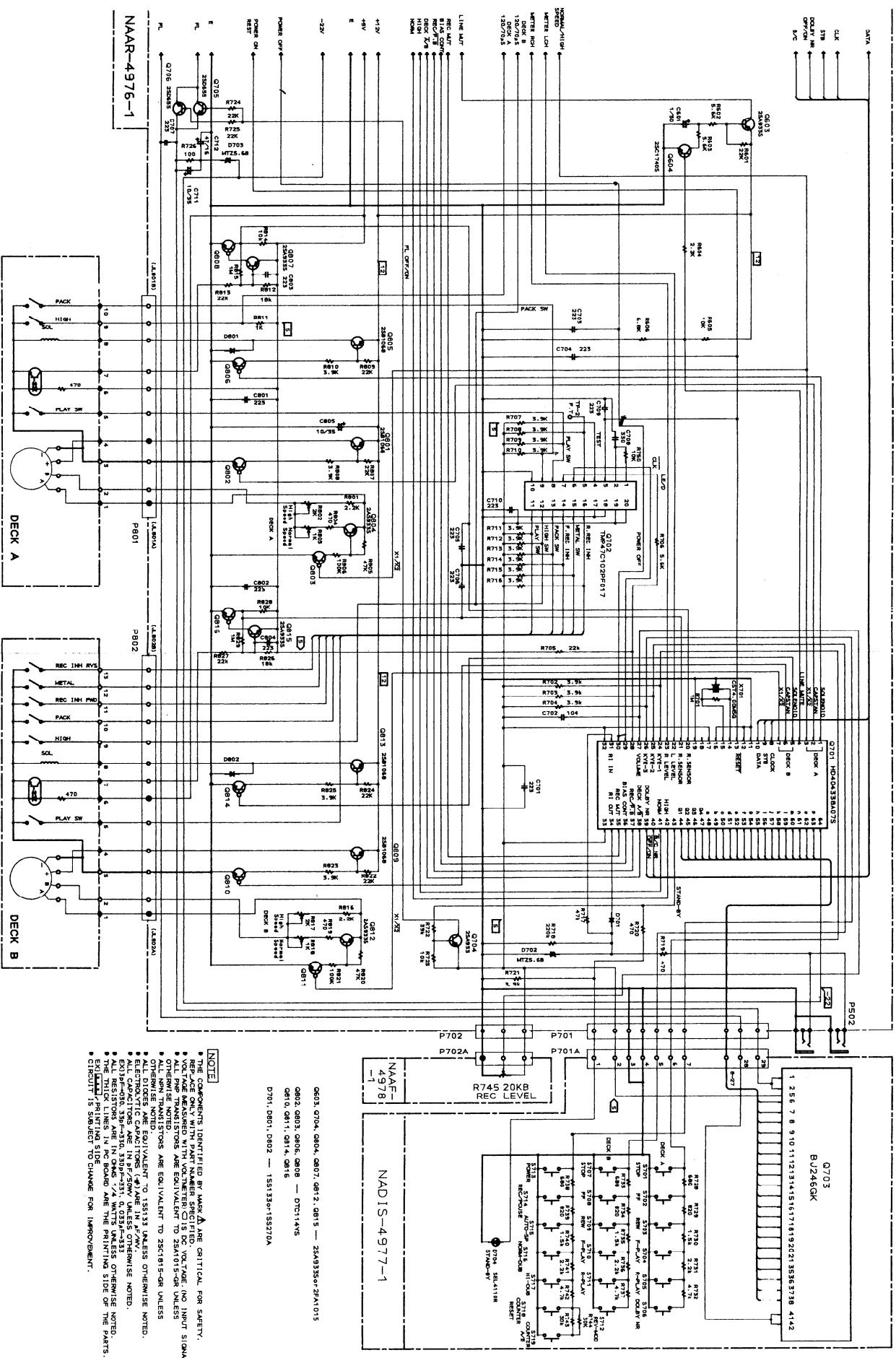
SCHEMATIC DIAGRAM





SCHEMATIC DIAGRAM

TA-RW222 TA-RW222



# PRINTED CIRCUIT BOARD-PARTS LIST

## MAIN CIRCUIT PC BOARD (NAAR-4976-1)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs			Coils	
Q101	22240767	BA3416BL	L101,L102	231089	NCH-2137
Q201	22240544	HA12155NT	L201,L202	233407	NMC-6079
Q408	22240147	$\mu$ PC1330HA	L401,L402	231165	NTR-6506
Q701	22240765	HD404388A-07S	L403	231215	NLO-2059
Q702	22240766	TMP47C102P-F017		Resonator	
Q901	222780125	78M12	X701	3010150	CST4.00MGW,Ceramic
Q902	222780120	7812		Capacitors	
Q903	222780055	78M05	C107,C108	354722219	220 $\mu$ F,6.3V,Elect.
	Transistors		C115,C116	354761009	10 $\mu$ F,35V,Elect.
Q102-Q108	221281	DTC114YS	C119,C120	354780109	1 $\mu$ F,50V,Elect.
Q203-Q206	2213285,	2SC1740S-S,	C121,C917	354742209	22 $\mu$ F,16V,Elect.
	2213284 or	2SC1740S-R or	C122	354761009	10 $\mu$ F,35V,Elect.
	2214915	2PC1815-GR	C123,C230	354744719	470 $\mu$ F,16V,Elect.
Q401,Q801	2212853 or	2SB1068-K or	C127,C128	354721019	100 $\mu$ F,6.3V,Elect.
Q805	2212855	2SB1068-U	C201-C204	354780109	1 $\mu$ F,50V,Elect.
Q402	221281	DTC114YS	C209,C210	354761009	10 $\mu$ F,35V,Elect.
Q403	2211544	2SC1959-Y	C213-C216	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
Q404,Q405	221281	DTC114YS	C217,C218	354741019	100 $\mu$ F,16V,Elect.
Q406,Q407	2211544	2SC1959-Y	C219,C220	354780109	1 $\mu$ F,50V,Elect.
Q601,Q602	2211705 or	2SD655-E or	C221,C222	354784799	0.47 $\mu$ F,50V,Elect.
Q705,Q706	2211706	2SD655-F	C223,C224	354780229	2.2 $\mu$ F,50V,Elect.
Q603,Q704	2213355,	2SA933S-S,	C225,C226	354780109	1 $\mu$ F,50V,Elect.
Q804,Q807	2213354 or	2SA933S-R or	C227,C228	354761009	10 $\mu$ F,35V,Elect.
Q812,Q815	2214905	2PA1015-GR	C229,C601	354780109	1 $\mu$ F,50V,Elect.
Q604	2213285	2SC1740S-S	C403,C404	374724725	4700pF $\pm$ 10%,50V,Plastic
Q802,Q803	221281	DTC114YS	C405	374722234	0.022 $\mu$ F $\pm$ 5%,50V,Plastic
Q806,Q808	221281	DTC114YS	C406	374721834	0.018 $\mu$ F $\pm$ 5%,50V,Plastic
Q809,Q813	2212853 or	2SB1068-K or	C407	370131234	0.012 $\mu$ F $\pm$ 5%,100V,Plastic
	2212855	2SB1068-U	C408,C411	354742219	220 $\mu$ F,16V,Elect.
Q810,Q811	221281	DTC114YS	C410	354722219	220 $\mu$ F,6.3V,Elect.
Q814,Q816	221281	DTC114YS	C702	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
Q904	2213355,	2SA933S-S,	C711,C805	354761009	10 $\mu$ F,35V,Elect.
	2213354 or	2SA933S-R or	C712	354744709	47 $\mu$ F,16V,Elect.
	2214905	2PA1015-GR	C903,C911	374722734	0.027 $\mu$ F $\pm$ 5%,50V,Plastic
Q905	221281	DTC114YS	C904	3504168	13000 $\mu$ F,25V,Elect.
Q906	2212600	DTA124ES	C905,C906	354761009	10 $\mu$ F,35V,Elect.
	Diodes		C908	354742219	220 $\mu$ F,16V,Elect.
D701	223163 or	1SS133 or	C909	354761009	10 $\mu$ F,35V,Elect.
D702,D703	223205	1SS270A	C910	393342227	2200 $\mu$ F,16V,Elect.
D801,D802	224450562	MTZ5.6B	C912,C913	354781019	100 $\mu$ F,50V,Elect.
D901-D906	22380035	GP104003E	C915	354780479	4.7 $\mu$ F,50V,Elect.
D907	224452204	MTZ22D	C916	354721019	100 $\mu$ F,6.3V,Elect.
D908,D909	223163 or	1SS133 or	C918	354780229	2.2 $\mu$ F,50V,Elect.
D911	223205	1SS270A			
D910	224450562	MTZ5.6B			

CIRCUIT NO.	PART NO.	DESCRIPTION
Resistors		
R117-R120	5210265	N06HR50KBC,Trim
R219,R220	5210263	N06HR20KBC,Trim
R403,R404	5210266	N06HR100KBC,Trim
R409,R901	443521004	10 $\Omega$ ,1/2W,Metal oxide
R802,R817	5210259	N06HR2KBC,Trim
R803,R818	5210258	N06HR1KBC,Trim
R902	453530104	1 $\Omega$ ,1/2W,Metal
Plugs		
P101,TP1	25055133	NPLG-3P117
P102	25055138	NPLG-8P122
Terminals		
P201	25045329	NPJ-4PDBL183,Output
P502	25045330	NPJ-2PDBL184,RI
Socket		
P701	25050861	NSCT-29P656
Wire holders		
	25051087	NSCT-3P874
	25051104	NSCT-10P891
	25051129	NSCT-13P916

## DISPLAY CIRCUIT PC BOARD (NADIS-4977-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q703	212130	BJ246GK,FL tube
D704	225290	SEL4110R,LED
S701-S719	25035652	NPS-111-S604,Switches
P701A	25050893	NSCT-29P688,Socket
	27190939Y	Holder FL

## INPUT VOLUME PC BOARD (NAAF-4978-1)


CIRCUIT NO.	PART NO.	DESCRIPTION
R745	5104337Y	N09RL20KB15,Variable resistor
P702a	25051087	NSCT-3P874,Wire holder

## POWER SUPPLY PC BOARD (NAPS-4979-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P901	25051109	NSCT-5P896,Wire holder
PW01	25055676	NPLG-2P632,Plug

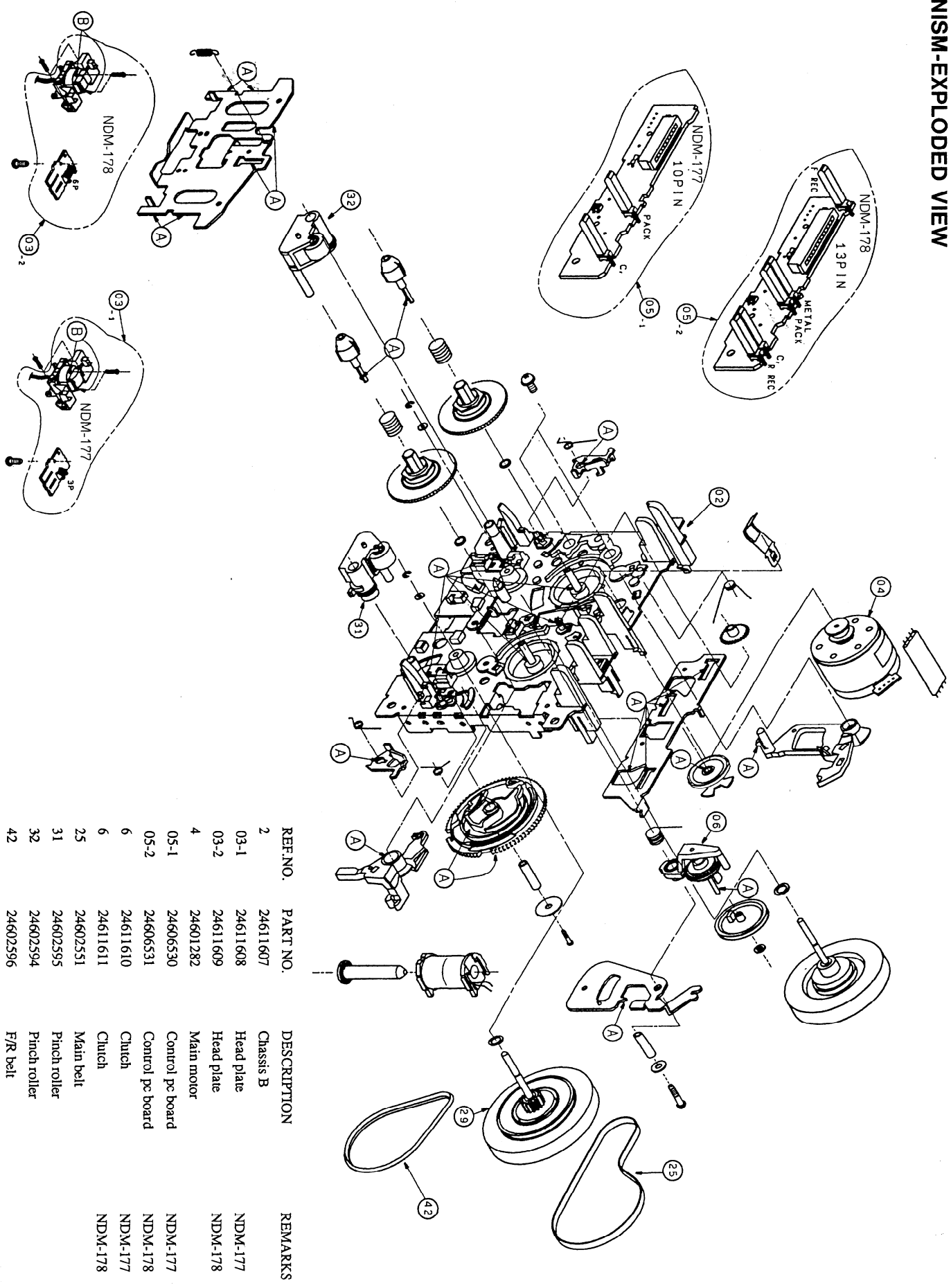
## POWER SUPPLY PC BOARD (NAPS-4980-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P901A	25051109	NSCT-5P896,Wire holder
PW02	25055676	NPLG-2P632,Plug

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

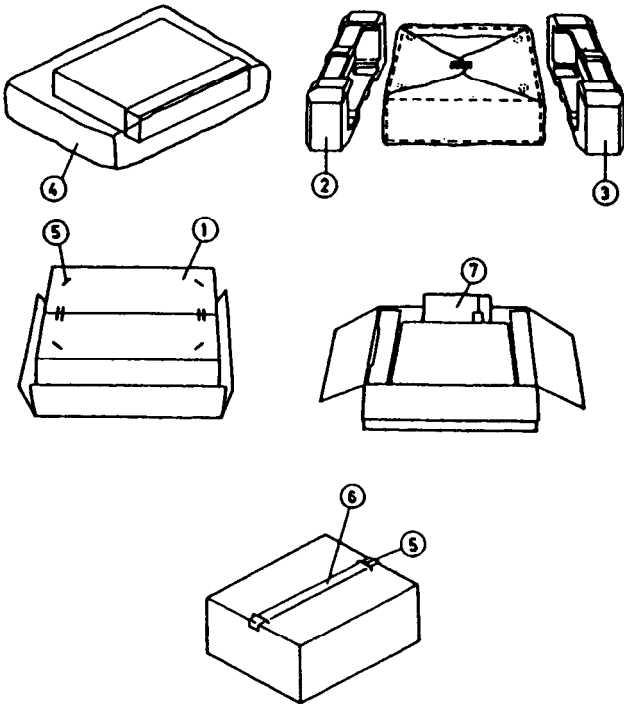
MECHANISM-EXPLODED VIEW

TA-RW222



REF.NO.	PART NO.	DESCRIPTION	REMARKS
2	24611607	Chassis B	
03-1	24611608	Head plate	NDM-177
03-2	24611609	Head plate	NDM-178
4	24601282	Main motor	
05-1	24606530	Control pc board	NDM-177
05-2	24606531	Control pc board	NDM-178
6	24611610	Clutch	NDM-177
6	24611611	Clutch	NDM-178
25	24602551	Main belt	
31	24602595	Pinch roller	
32	24602594	Pinch roller	
42	24602596	F/R belt	

**PACKING VIEW**



REF.NO.	PART NO.	DESCRIPTION
1	29052723Y	Carton box
2	29091637-1AY	Pad R
3	29091636-1AY	Pad L
4	29100034-1Y	650×850, Poly bag
5	282301	Staples
6	29110071	PP tape
	Accessory bag ass'y	
	2010244	Connection cord
	29341930AY	Instruction manual
	29341931AY	Instruction manual <C/W>
	29341932AY	Instruction manual <P>
	29365019A	Warranty card <N>
	29358002J	Service station list <N>
	29361706Y	Label UPC <N>
	25055040	CV-K-2, Conversion plug <W>
	29100097-1Y	320×250, Poly bag

NOTE: <P>:230 V model only  
 <W>:Worldwide model only  
 <C>:Canadian model only  
 <N>:US.A. model only

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## **ONKYO CORPORATION**

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