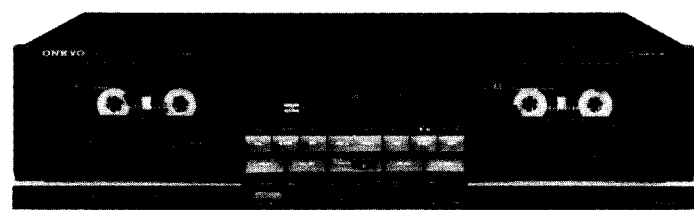


# ONKYO SERVICE MANUAL

## STEREO CASSETTE TAPE DECK

### MODEL TA-RW470



Black model

UD, UD Ⓝ	120V AC, 60Hz
UG	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQA, UQB	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 system: 4-tracks, 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: 0.06% (WRMS)
- Frequency Response: 20-15,000Hz (Normal)  
(30-14,000Hz  $\pm$ 3dB)  
20-16,000Hz (High)  
(30-15,000Hz  $\pm$ 3dB)  
20-17,000Hz (Metal)  
(30-16,000Hz  $\pm$ 3dB)
- 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: Microphone jack: 1  
Input sensitivity: 1mV/600 ohms  
Input impedance: 5.6 kohms  
Line IN: 2  
Input sensitivity: 60mV  
Input impedance: 50 kohms
- Outputs: Headphone jack: 1  
Optimum load impedance: 8 to 200 ohms  
Line OUT: 2  
Standard output level: 500mV (0dB)  
Optimum load impedance: over 50 kohms
- Motors: DC servo motor x 2; DC motor x 2
- Heads: REC/PB: special hard permalloy x 2;  
Erase head: ferrite x 1
- Power Supply Rating: U.K. and Australian models:  
AC 240V, 50Hz  
U.S.A. and Canadian models:  
AC 120V, 60Hz  
Worldwide models:  
AC 120V and 220V switchable, 50/60Hz
- Power Consumption: 27 watts
- Dimensions: 435(W) x 115(H) x 334(D)mm  
(17-1/8" x 4-1/2" x 13-1/8")
- Weight: 6.0 kg. (13.2 lbs.)

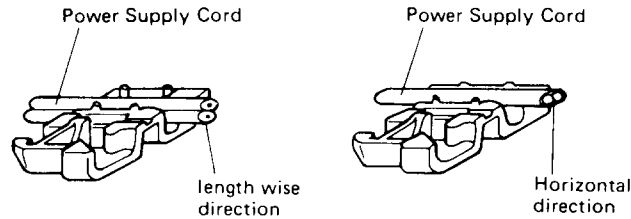


Specifications and external appearance are subject to change without notice because of product improvements.

## SERVICE PROCEDURES

### 1. Replacement of power supply cord

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



### 2. Insulating resistance measurement

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

Specifications; 500V more than 10MΩ

## MECHANISM OPERATION

### 1. Overview of the Cassette Drive Mechanism

The cassette drive mechanism consists of two motors and one solenoid. It is based on the same principle as our previous three-motor mechanisms (which employed separate capstan, reel and assist motors) except that one motor is used for both the reel and assist functions. The solenoid is provided to switch between the two functions. As the mechanism is basically identical to our previous three-motor configuration except for the reel/assist switching function, the discussion below will focus on the switching function's main features.

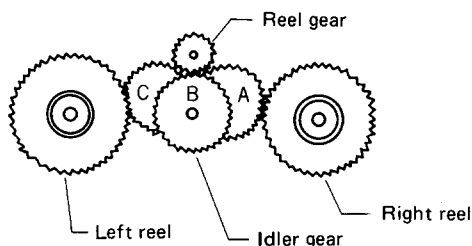


Figure 1: Frontal View of the Assist/Reel Drive Train

In the previous (three-motor) mechanism, the idler gear had two positions: A for fast forward and C for rewind. In the new configuration a third position (B) is added for assist operation.

In the B position, the idler gear is linked to a cam which raises and lowers the heads and rotates them during auto-reverse play. To keep the gear firmly in position, a

notched lever presses up against the gear shaft from below. The gear shaft rests in the notch in the lever, maintaining the idler gear in the B position. This arrangement makes it possible to use a single motor for both the reel and assist functions.

Attraction from the solenoid is used to switch from the assist position (position B in figure 1 above) to either the rewind or fast forward position for reel operation. Attractive force from the solenoid is applied to the notched lever, pulling it downward. This disengages the gear shaft from the notch and frees the gear. Then, by applying voltage to the motor, the idler gear can be moved to either the A or C position for reel operation. The notched lever also acts a brake for the reels when solenoidal attraction is applied.

In order to switch back from reel to assist operation, the polarity of the voltage being applied to the motor is reversed. This causes the gear to jerk in the direction of the opposite reel. When it comes to point B, however, the gear shaft catches in the notch in the lever, holding the gear in position for assist operation. This design ensures that the idler gear always switches initially to the assist position before switching to another operation. This also guarantees that the mechanism will be in the correct position after all operations are completed.

The assist/reel motor uses three different voltages to perform the operations described above. The approximate voltages are as follows: 8V for assist operations; 6V for high-speed fast forward and reverse; and 3.5V for recording and playback. They are controlled by the TRQ1 and TRQ2 signals from the microprocessor. In assist operation, the idler gear turns clockwise (viewed from the front) during forward play and counterclockwise during reverse play.

### 2. Mechanism Drive System

The waveforms which drive the mechanism look rather complicated on an oscilloscope. If we break them down into the basic patterns which indicate separate operations, however, and display the combined result in tabular form, table 1 is the result. When the operations listed under "Mechanism Operations" are performed in the order specified (i.e. left to right), the operation "modules" listed under "Drive Sequence" are activated in the order shown (left to right). Figure 2 through 8 below illustrate the waveforms for the various modules.

**Note:** The polarity of the waveforms differs depending on the direction of tape travel and the type of operation. All durations are given in milliseconds [ms].

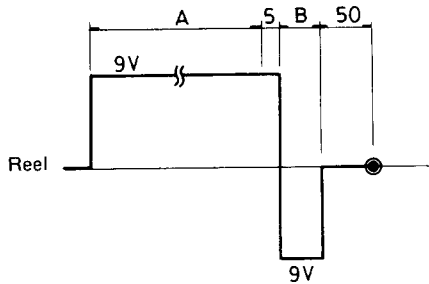
Mechanism Operations		Drive Sequence	
PLAY	→ STOP	A	→ E → G
SEARCH	→ STOP	C	→ B → A
FF/REW	→ STOP	C	→ G
STOP	→ PLAY	A	→ D <sub>2</sub>
PLAY	→ SEARCH	A	→ D <sub>1</sub>
STOP	→ FF/REW	D <sub>1</sub>	

**Table 1: Drive Sequences for Representative Operations**

■ **Drive waveform for assist operation**

- A: While searching for target position
- B: The motor reverses to absorb inertia for 30 ms when the heads are being raised and 70 ms when heads are being lowered.

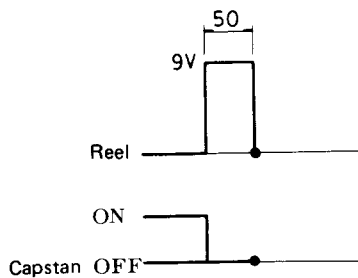
Note: The 5 ms gap between A and B is needed in order to move the tape to the center of the target area. The 50 ms period following B is for resetting the mechanism position. Assist operation is performed again if the position is not correct. In this case (only), B is 10 ms in duration. The (●) mark indicates the mechanism position double-check point.



**Figure 2: Module A**

■ **Drive waveform 1 for changing position of idler gear**

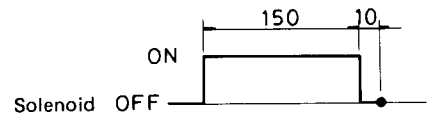
If the capstan motor is turning when the reel drive signal is received, it is shut off.



**Figure 3: Module B**

■ **Drive waveform for brake**

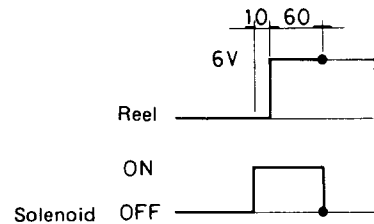
Attraction from the solenoid engages the brake. The final 10 ms gap is the pause before the next operation starts.



**Figure 4: Module C**

■ **Reel drive waveform**

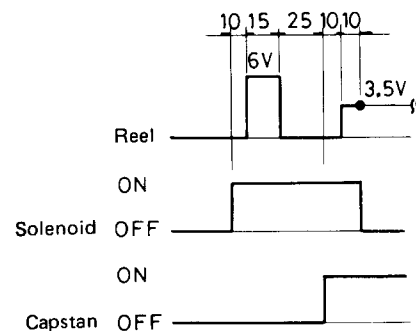
(Used during fast forward, reverse and music search)



**Figure 5: Module D1**

■ **Reel drive waveform**

(Used during record and playback)



**Figure 6: Module D2**

■ **Waveform for taking up tape slack**

The reel drive voltage normally consists of 15 pulses (3.5V: on 5 ms, off 2 ms). The number of pulses is increased to 25 during double-speed operation.

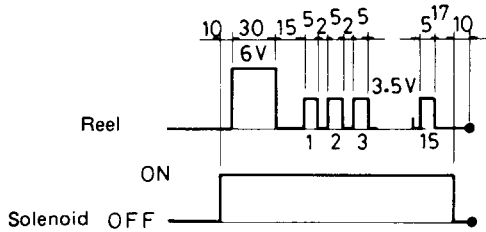


Figure 7: Module E

■ **Drive waveform 2 for changing position of idler gear**

The movement produced is the same as in module B. However, after the first 50 ms peak, the position of the mechanism is checked. If it is not in the stop position, module A is executed. The duration of assist reverse rotation is 10 ms in this case. The (⊙) mark indicates the mechanism position double-check point.

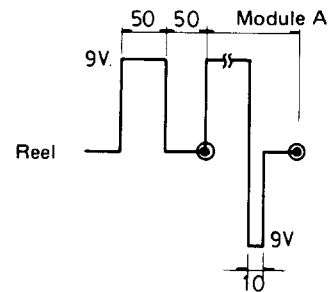


Figure 8: Module G

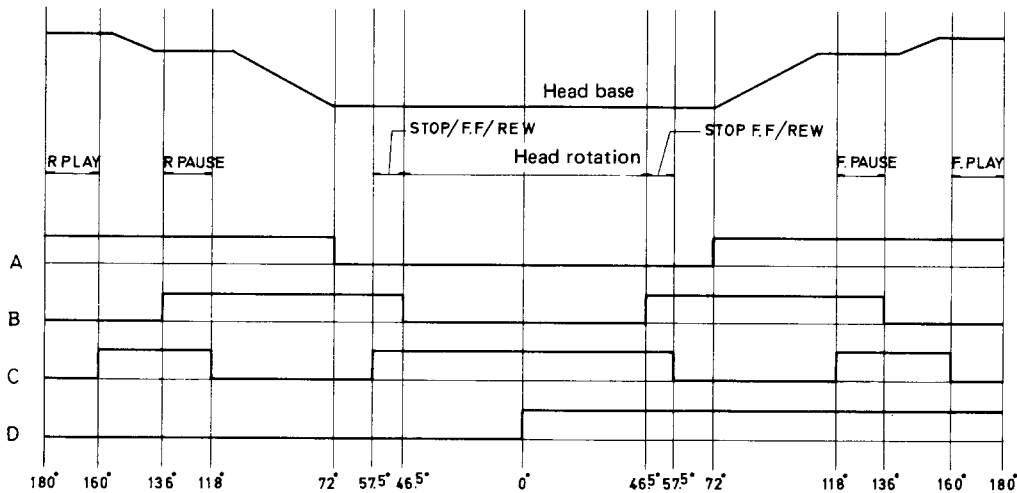
**3. Initialization of the Mechanism**

When power is initially turned on, there is no guarantee that the idler gear is in the assist position. Therefore, signals are issued to move the idler gear first to the left and then to the right, and the gear is secured in position B as shown in figure 1 above. Then modules A, E and G are

executed in succession to put the mechanism in the stop position.

Note: In this particular case, the number of pulses in module E is 25 (the same as during double-speed operation).

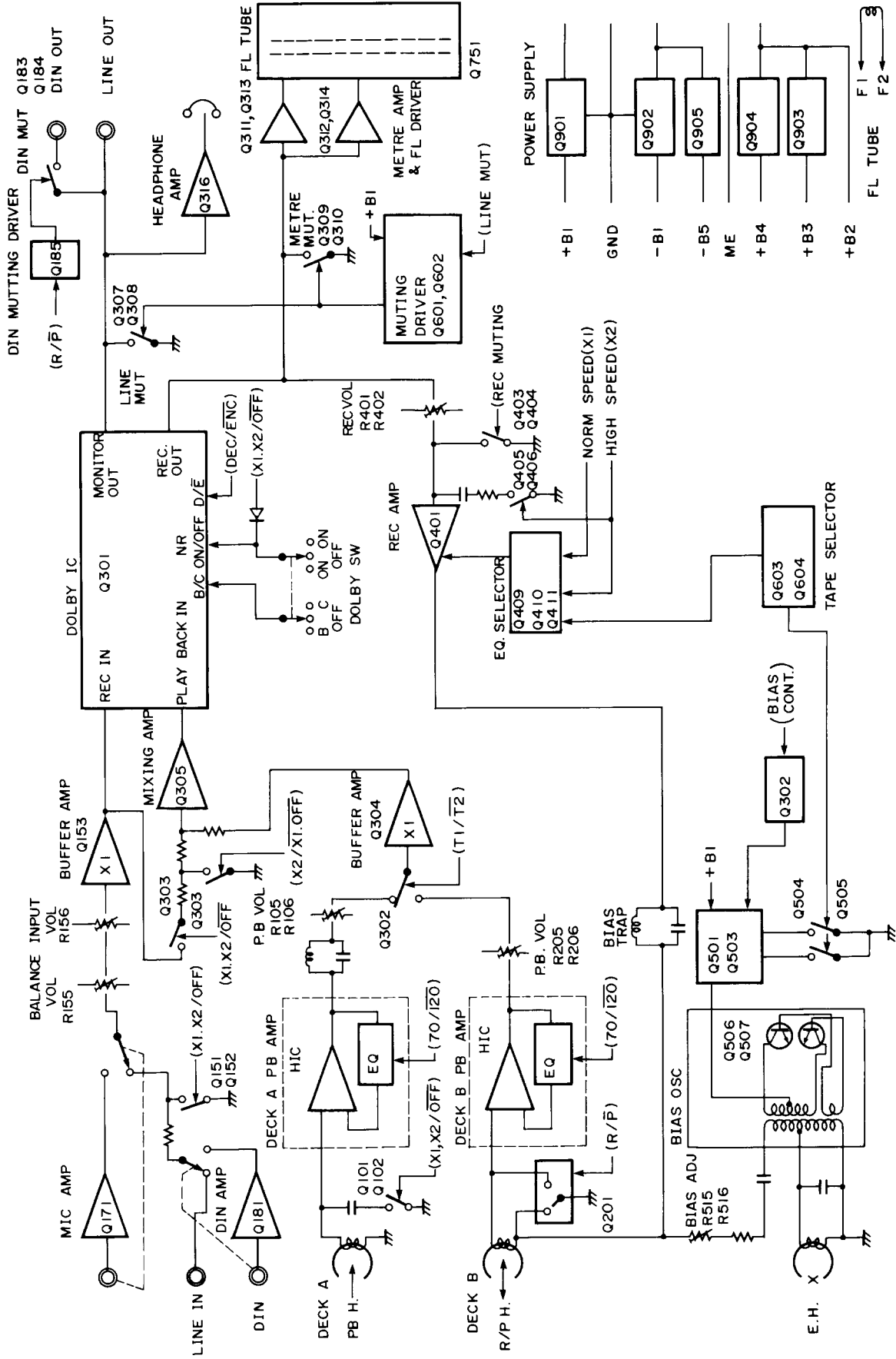
**4. Mechanism Positioning Data**



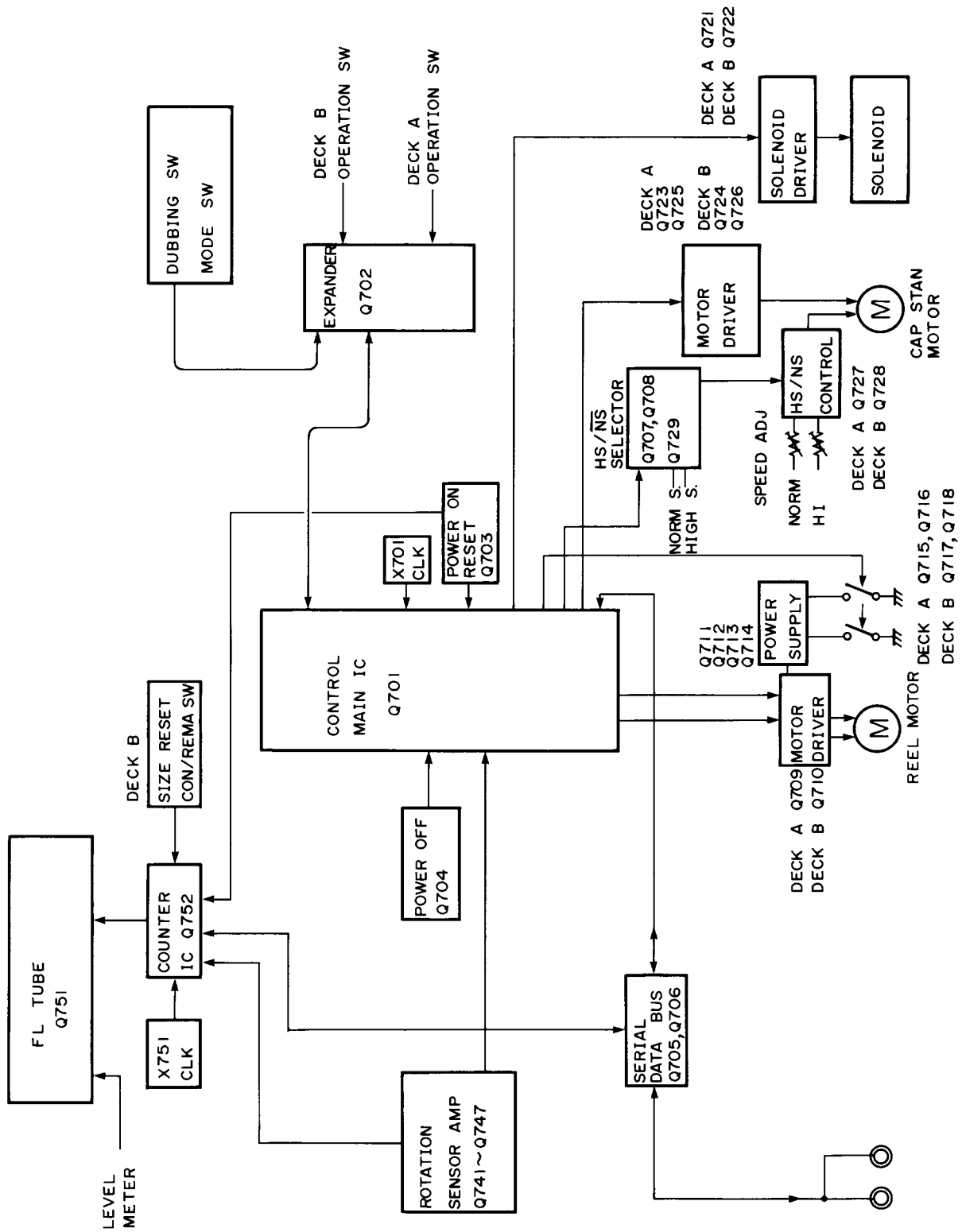
Note: The dotted lines in the positioning data indicate either "OV" or "switch on".

Figure 9: Mechanism Positions and Positioning Data

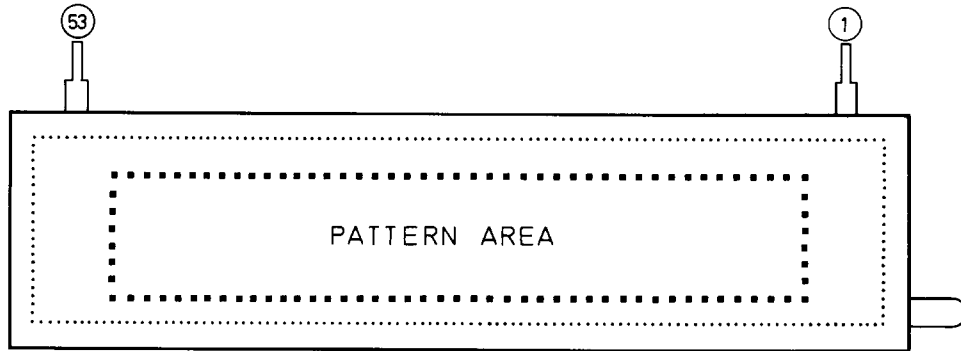
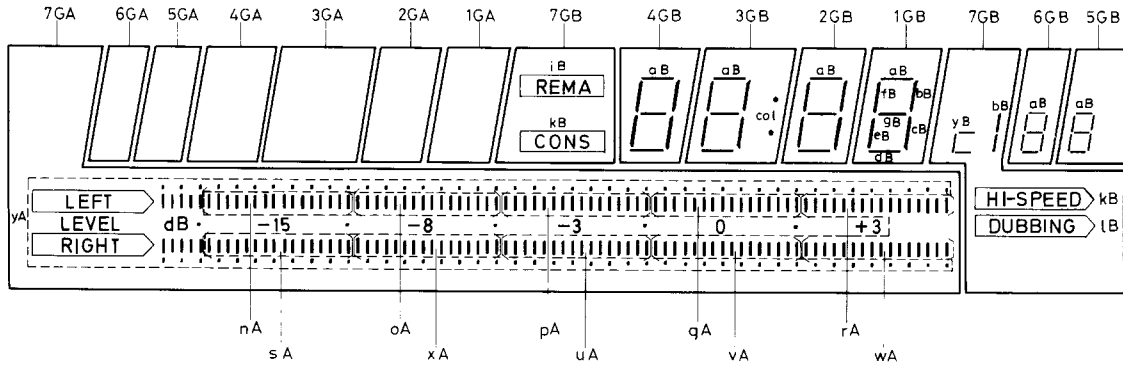
# BLOCK DIAGRAM (AUDIO SECTION)



# BLOCK DIAGRAM (CONTROL SECTION)



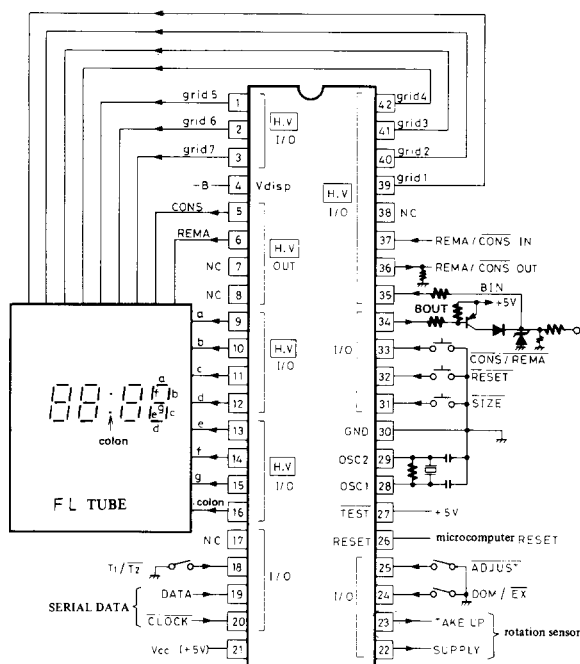
**BG-554G (DISPLAY TUBE)**



**PIN CONNECTION**

PIN NO.	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F2	F2	NP	wA	vA	uA	tA	sA	rA	qA	pA	oA	nA	xA	gA	fA	eA	dA	cA	bA	aA	NP	NP	7GA, yA	6GA	5GA	4GA	3GA	2GA	1GA	xB	iB	hB	gB	fB	eB	dB	cB	bB	aB	7GB, yB	6GB	5GB	4GB	3GB	2GB	1GB	kB	lB	mB	NP	F1	F1

## HD614128S-A41 (COUNTER)

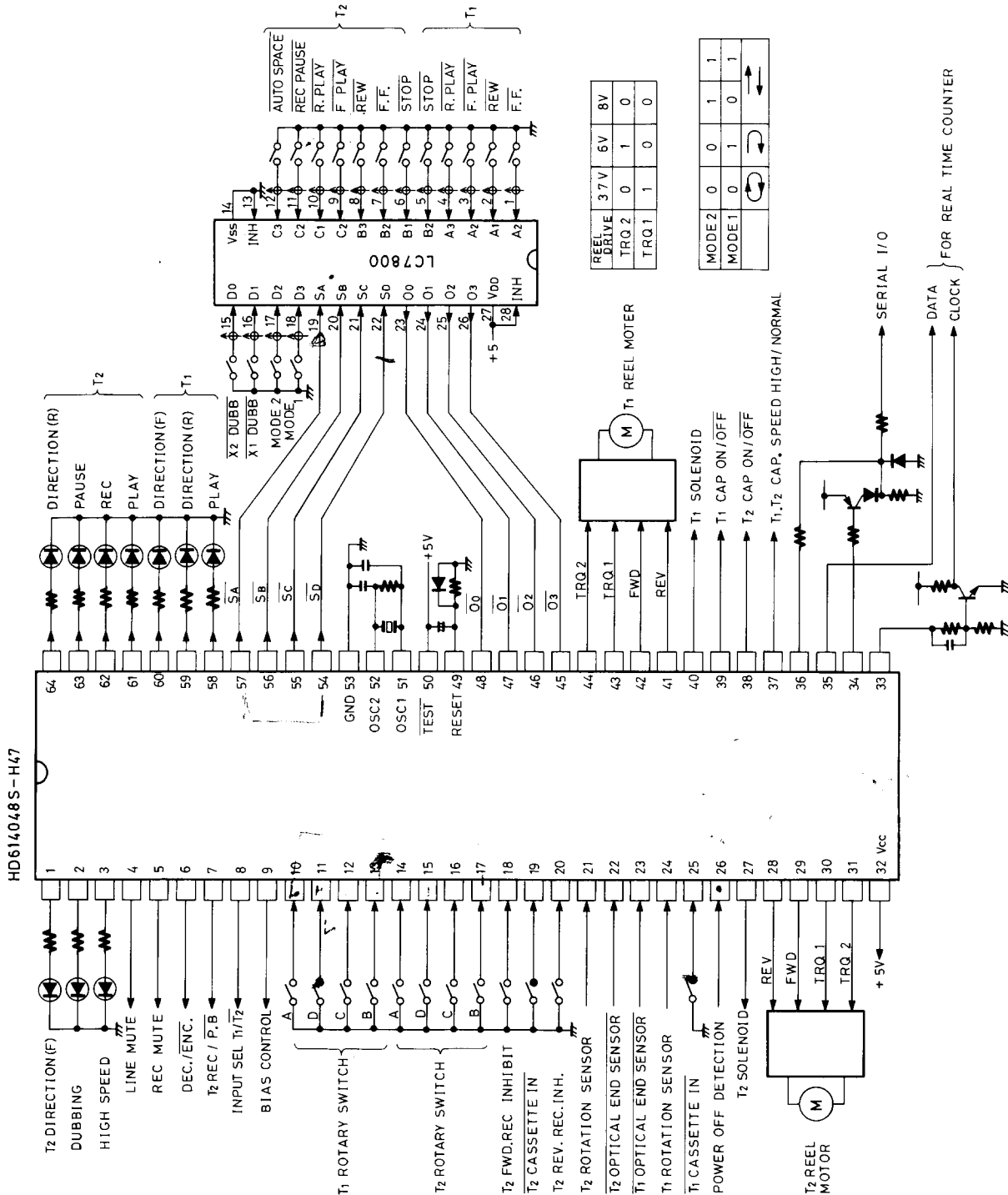


## Terminal Name and Function

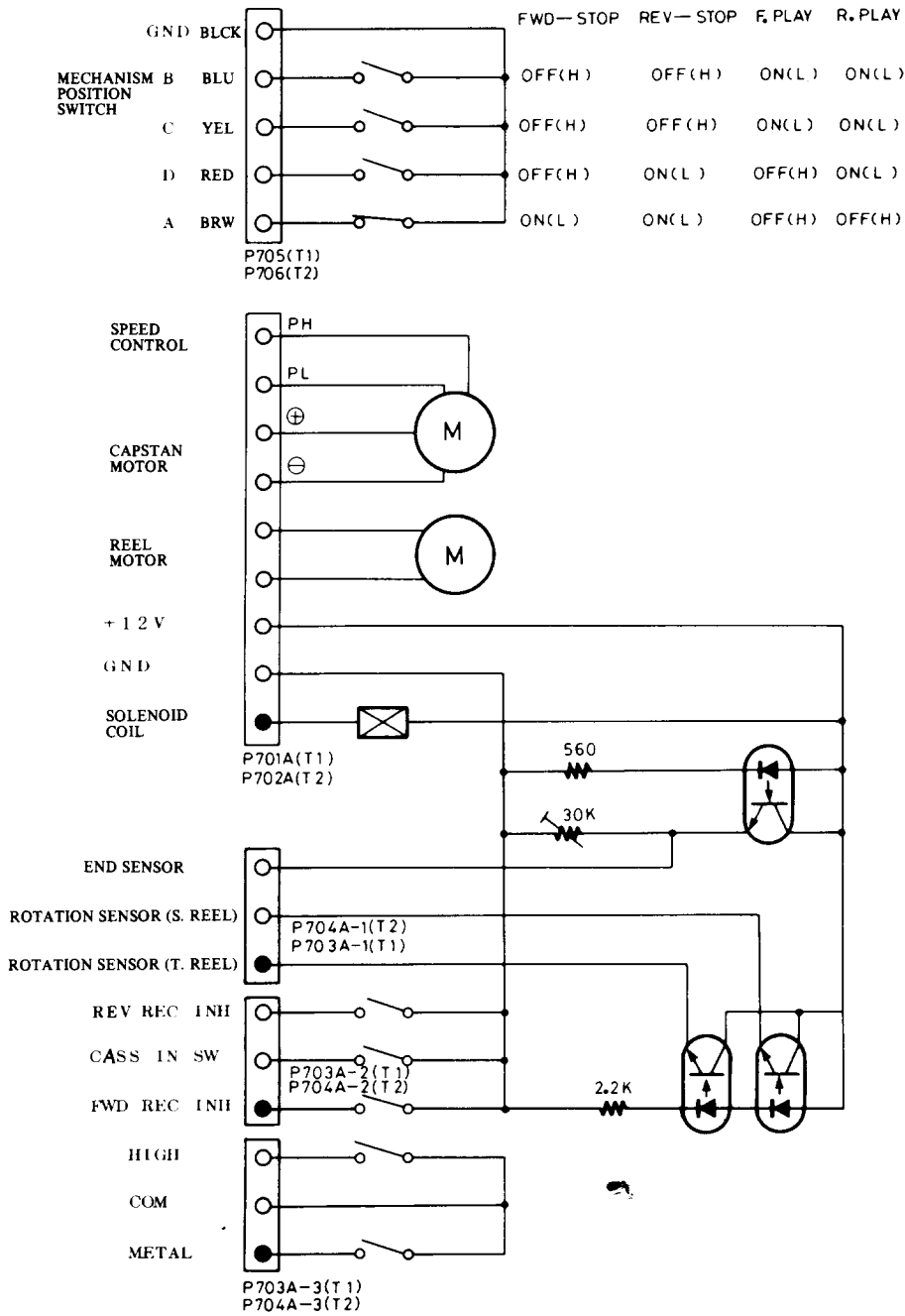
Pin No.	Name	Function
1 ~ 3	Grid 5 ~ 7	FL tube grid (DIGIT) drive use output
4	V <sub>disp</sub>	Input (FL tube use) for minus bias voltage to pin Nos. 1 ~ 3, 5, 6, 9 ~ 16, 39 ~ 42
5	CONS	FL tube <b>CONS</b> display use output (time lapse)
6	REMA	FL tube <b>REMA</b> display use output (time remaining)
9 ~ 15	a ~ g	FL tube segment drive use output
16	Colon	FL tube ":" drive use output
18	T <sub>1</sub> /T <sub>2</sub>	Microcomputer T <sub>1</sub> /T <sub>2</sub> function selection input (With T <sub>2</sub> , system I/O receiving)
19	DATA	Deck mechanism status input (8 bit serial data) from mechanism control micro-computer
20	CLOCK	Clock input for reading above DATA (DATA taken on pulse wave dropping)
21	V <sub>cc</sub>	Microcomputer power source (+5V)
22	SUPPLY	Cassette mechanism tape feed side turning pulse input
23	TAKE UP	Cassette mechanism tape windup side turning PULSE INPUT
24	DOM/EX	Domestic/export setting use selector input (Tape size type selector use) Domestic: With power ON C46 → C54 → C60 → C80 → C90 → C120
25	ADJUST	Remaining time calculation buffer compensating value input (normally open, compensating ground)
26	RESET	Microcomputer system reset
27	TEST	Microcomputer internal test use port, normally connected to V <sub>cc</sub>
28, 29	OSC1, OSC2	Microcomputer clock oscillator terminal
30	GND	Microcomputer power source (GND)
31	SIZE	Tape size selector input
32	RESET	Lapsed time reset input (When <b>CONS</b> displays, digits are □ : □ □)
33	CONS/REMA	Lapsed time ← → remaining time selector input (toggle display)
34	BOUT	System bus output
35	BIN	System bus input
36	REMA/CONS OUT	Remaining time display/lapsed time display status output (when T <sub>2</sub> )
37	REMA/CONS IN	Remaining time display/lapsed time display status input (when T <sub>2</sub> )
39 ~ 42	Grid 1 ~ 4	FL tube grid (DIGIT) drive use output



# HD614048S-H47 (MICROCOMPUTER)



# TAPE MECHANISM CONNECTION



## ADJUSTMENT PROCEDURES

### PRECAUTIONS

- Before adjustment, clean the following parts with an alcohol moistend swab.
  - \* record/playback head      \* erase head
  - \* pinch roller                \* 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  
 Test tapes

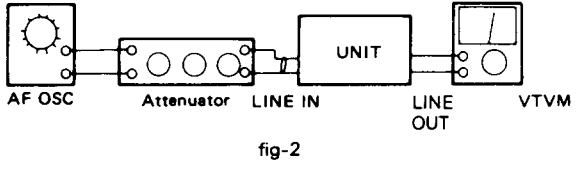
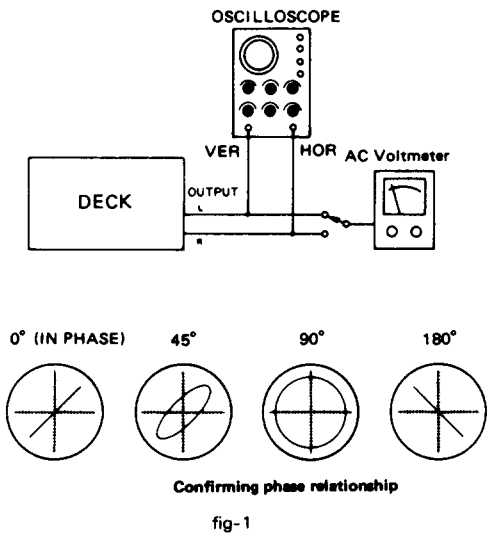
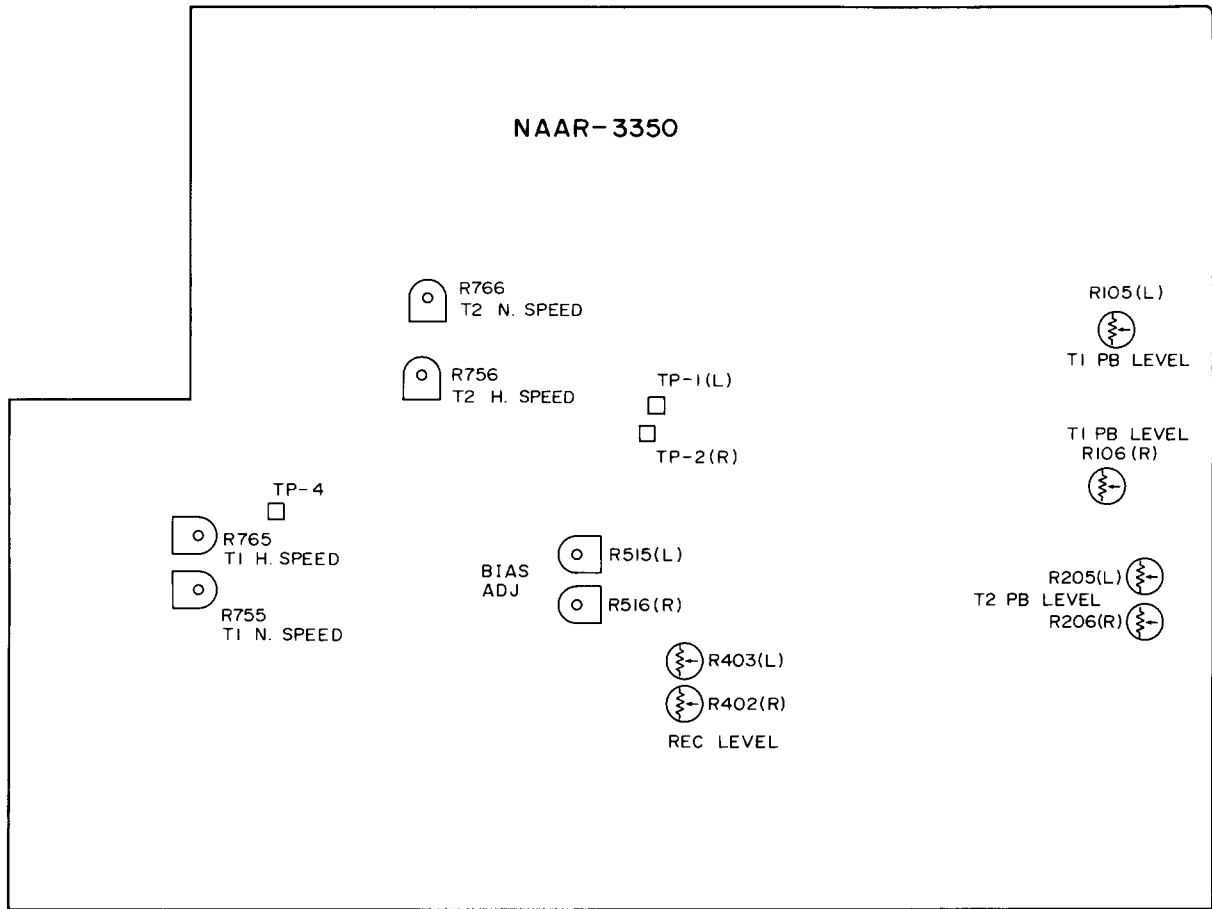
VTT-658 : 10 KHz, -15dB  
 MTT-111 : 3 kHz, -10dB  
 MTT-150 : Dolby level calibration  
 400Hz, tone 200nWb/m

Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks	
1	Tape speed	Frequency counter to LINE output terminal	MTT-111	PB	Frequency counter	T1 Normal R755 T1 High R765 T2 Normal R756 T2 High R766	3010 ± 5Hz 6020 ± 10Hz 2990 ± 5Hz 5980 ± 10Hz	High speed connect the TP-4 to GND	
2	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal	VTT-658	PB	AC voltmeter	Head azimuth screw	Maximum and same phase at channels L and R	fig-1	
3	Playback level	AC voltmeter to terminals TP-1 and TP-2	MTT-150	PB	AC voltmeter	T1 R105 (Ch.L) T1 R106 (Ch.R) T2 R205 (Ch.L) T2 R206 (Ch.R)	245mV		
4	Bias current	fig-2	1kHz, -20dB and 12kHz, -20dB	XL-II C-90	REC/PB	AC voltmeter	T2 R515 (Ch.L) T2 R516 (Ch.R)	Same level at REC/PB	Input VR maximum.
5	Record level	fig-2	1kHz	XL-II C-90	REC	AC voltmeter	Attenuator or AF OSC output	350mV	
					REC/PB	AC voltmeter	T2 R403 (Ch.L) T2 R404 (Ch.R)	Same level at REC/PB	
6	Reverse operation sensitivity	DC voltmeter to sockets P703A-1(T1) #1 P704A-1(T2) #1	TDK AD-120 Magnetic substance	FWD PB	DC voltmeter	Semi-fixed VR (T-1, T-2) on the mechanism P.C.B.	2 ~ 2.5V		

#### Blank tape

NORMAL ---- UD-1 C-90  
 HIGH ----- XL-II C-90  
 METAL ----- MX C-90

PLAY torque ----- 30 ~ 60 g/cm  
 FF. REW torque ----- 70 ~ 140 g/cm  
 Back tension ----- 2 ~ 5 g/cm



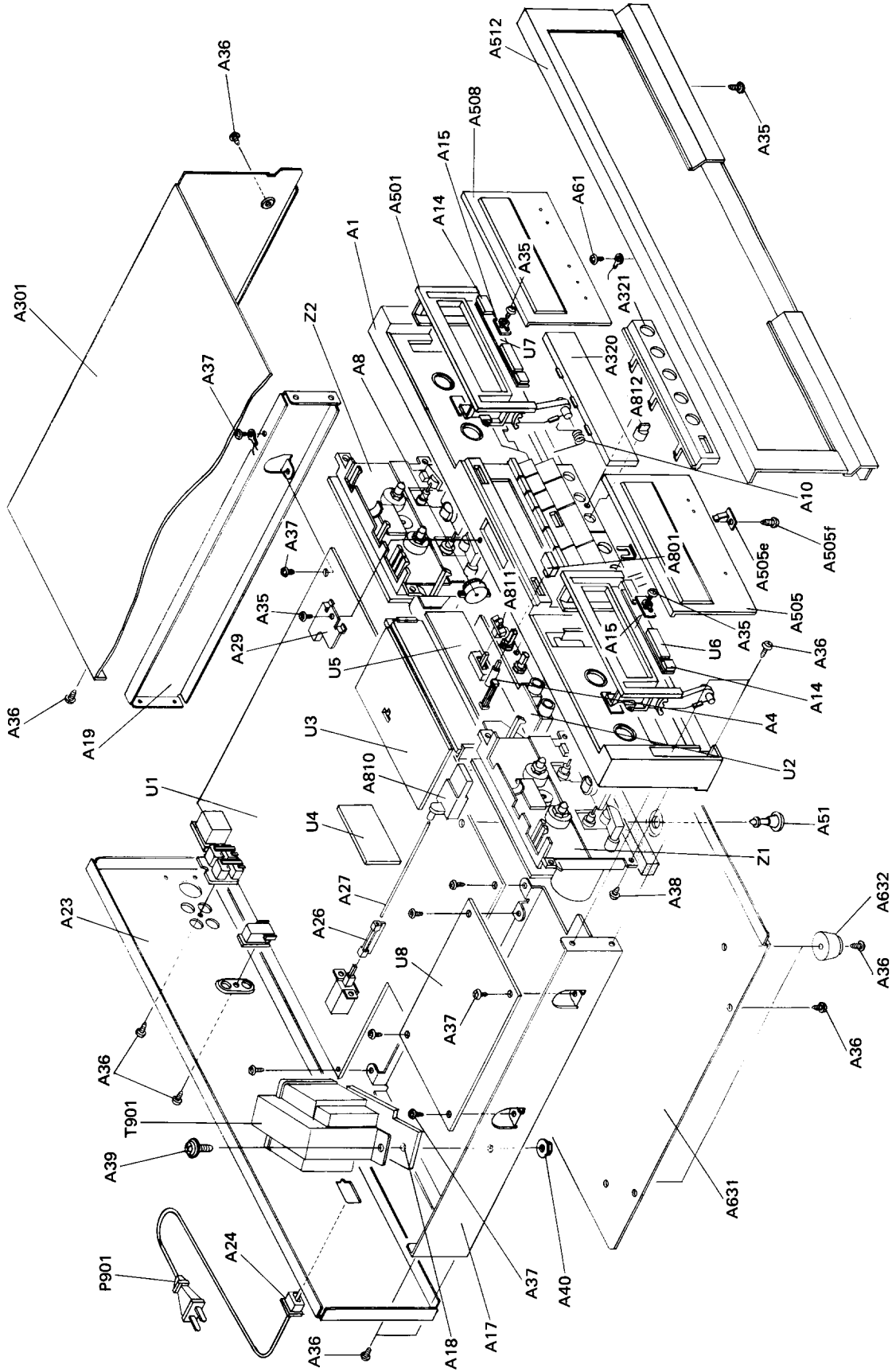
## CHASSIS EXPLODED VIEW PART LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A1	27110423	FRONT BRACKET AS	P701A	2000881	NSAS-18P837
A4	27273082	JOINT (EJECT)	P702A	2000882	NSAS-18P838
A8	28400282	DAMPER	△ P901	253112A	AC CORD AS-UC-4 (D)
A9	27180314	SPRING (T1)		253148	AC CORD AS-CEE (G/W)
A10	27180315	SPRING (T2)		253104	AC CORD C2.5BS2 (QB)
A14	27190563	HOLDER (L.E.D.-5)	△ T901	2300265B	NPT-976D (D)
A15	27141159	BRACKET		2300266A	NPT-976G (G)
A17	27130500	BRACKET (PT)		2300267A	NPT-976DG (W)
A18	27270214A	SPACER		2300274A	NPT-976Q (QB)
A19	27115194-1	SIDE BRACKET(R)	△ S902	25065123	NSS-1258P (W)
A23	27121121	BACK PANEL (D)	U1	1N044550-1	NAAR-3350-1 (D)
	27121122	BACK PANEL (G)		1N044550-1A	NAAR-3350-1A (G)
	27121124	BACK PANEL (W)	U2	1N044551-1	NAAF 3351-1
A24	27300750	BUSHING (CORD)	U3	1N044552-1	NADIS-3352-1
A26	27273084	JOINT (POW)	U4	1N044553-1	NADG-3353-1
A27	27260084	SHAFT	U5	1N044554-1	NASW-3354-1
A29	27141158	BRACKET (FL)	U6	1N044555-1	NADIS-3355-1
A35	833430080	TAP-TIGHT SCREW 3TTP+8P(BC)	U7	1N044556-1	NADIS-3356-1
A36	834430088	TAP-TIGHT SCREW 3TTS+8B(BC)	U8	1N044557-1	NAETC-3357-1
A37	831130088	TAP-TIGHT SCREW 3TTW+8B	Z1	<u>244115</u>	NDM-107,CASSETTE DECK MECHANISM
A38	831430100	TAP-TIGHT SCREW 3TTW+10P(B)			NDM-102,CASSETTE DECK MECHANISM
A39	838440129	TAP-TIGHT SCREW 4TTB-12C(B)			
A40	86414010	FLANGE NUT FWN4+10FN	Z2	244110A	
A51	27190524	HOLDER			
A61	834230088	TAP-TIGHT SCREW 3TTS+8B(Ni)			
A301	28184373	COVER (B)			
	28184396	COVER (S)			
A320	28191473	CLEAR PLATE			
A321	28400347	COSMETIC PLATE (B)			
	28400347	COSMETIC PLATE (S)			
A501	28400339	FRAME AS (CASSETTE)			
A505	28400407	CASSETTE LID AS (A)			
A505e	27180362	SPRING			
A505f	834230108	TAP-TIGHT SCREW 3TTS+10B(Ni)			
A508	28400408	CASSETTE LID AS (B)			
A512	27210960	FRONT PANEL			
A631	27170243	BOTTOM BOARD			
A632	27175009A	LEG			
A634	28140805	CUSHION			
A801	28323149	KNOB (EJECT) L			
A802	28323150	KNOB (EJECT) R			
A810	28323151	KNOB (POW) (B)			
	28323347	KNOB (POW) (S)			
A811	28323152	KNOB (MODE)			
A812	28323163	KNOB (DOLBY) (B)			
	28323349	KNOB (DOLBY) (S)			

NOTE (D): Only 120V model  
(G): Only 220V model  
(W): Only Worldwide model  
(S): Silver model  
(QB): Only U.K. model  
(B): Black model

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

# CHASSIS EXPLODED VIEW



## PRINTED CIRCUIT BOARD PART LIST

## NAAR-3350-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Ics</b>	
Q111,Q211	222078	NHIC-3205
Q181	222917	NJM-4558SD (G)
Q201	22240147	μPC1330HA
Q301	222999	CX-20187
Q302,Q303	222840661 or	4066B or
	222933	BU-4066B
Q304,Q305	222917	NJM-4558SD
Q316	222652	M5218L
Q401	222808 or	M5218P or
	22240111	BA15218
Q409-Q411	222918	BA6251
Q701	22240144	HD614048SH47
Q702	222810	LC-7800
Q709,Q710	222953	M-54544AL

**Transistors**

Q101,Q102	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q151,Q152	2212794 or 2212795	2SD1468-R or 2SD1468-S
Q183,Q184	2212304 or 2211945	2SK381-D or (G) 2SK246-GR
Q185	221281	DTC114YS (G)
Q306	221282	DTC144ES
Q307,Q308	2212794 or 2212795	2SD1468-R or 2SD1468-S
Q309,Q310	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q403,Q404	2212794 or 2212795	2SD1468-R or 2SD1468-S
Q405,Q406	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q501	2211455 or 2212495	2SA1015-GR or JA101Q
Q502	221281	DTC114YS
Q503	2201540	2SD947
Q504,Q505	221281	DTC114YS
Q506,Q507	2211544	2SC1959-Y
Q601	221281	DTC114YS
Q602-Q604	2211455 or 2212495	2SA1015-GR or JA101Q
Q605	221281	DTC114YS
Q703-Q705	2211455 or 2212495	2SA1015-GR or JA101Q
Q706	221281	DTC114YS
Q707	2213090	DTA114YS
Q708	221281	DTC114YS
Q711,Q712	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q713,Q714	2201285 or 2201286	2SD882-Q or 2SD882-P
Q715-Q718	221282	DTC144ES
Q721,Q722	2213170	2SD1809
Q723,Q724	2212853, 2212855, 2212845 or 2212846	2SB1068-K, 2SB1068-U, 2SB598-E or 2SB598-F
Q725,Q726	221281	DTC114YS
Q727,Q728	2212304 or 2211945	2SK381-D or 2SK246-GR
Q729	221282	DTC144ES

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Diodes</b>	
D181,D182	223163	1SS133 (G)
D183	224451503, 224151503 or 224651503	MTZ15C, (G) 05AZ15EB3 or HZ-15E-B3
D184	223150, 223124 or 223145	US1040, (G) 1S2473 or 1S2076TD
D301,D302	224450753, 224150753 or 224650753	MTZ7.5C, 05AZ7.5EB3 or HZ7.5EB3
D401-D403	223163	1SS133
D601-D605	223163	1SS133
D607	223163	1SS133
D608,D609	223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
D610	223163	1SS133
D701,D702	223163	1SS133
D703	224450561, 224650561 or 224150561	MTZ5.6A, HZ-5.6E-B1 or 05AZ5.6EB1
D704-D707	223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
D708,D709	223163	1SS133
D912	224150331 or 224650331	05AZ3.3EB1 or HZ3.3EB1

**Coils**

L101,L102	231091	NCH-2139
L301,L302	233313	NMC-6048
L303,L304	233382	NMC-2069
L401,L402	231086 or 24606070	NCH-2134 or NCH-1008
L403,L404	231083 or 24606080	NCH-2131 or NCH-1022
L405,L406	231080 or 233191	NCH-2128 or NCH-1036
L407,L408	231083 or 24606080	NCH-2131 or NCH-1022
L409,L410	233314	NCH-2097
L501	231063	NLO-2037
X701	3010136	PRS-6.00RM06-00

**Capacitors**

C105,C106	354744709T	47μF16V,ELECT.
C107,C108	354741009T	10μF16V,ELECT.
C115,C116	354744719T	470 μF16V,ELECT.
C181,C182	354741009T	10μF16V,ELECT. (G)
C185,C186	354780229T	2.2 μF50V,ELECT. (G)
C187,C188	354741009T	10μF16V,ELECT. (G)
C205,C206	354741019T	100 μF16V,ELECT.
C207,C208	354741009T	10μF16V,ELECT.
C209,C210	354744719T	470 μF16V,ELECT.
C211	354741019T	100 μF16V,ELECT.
C301,C302	352980226S	2.2 μ50V,NP.
C303,C304	352980226S	2.2 μ50V,NP.
C305,C306	352980476S	4.7 μ50V,NP.
C327-C330	354780479T	4.7 μF50V,ELECT.
C331,C332	354741009T	10μF16V,ELECT.
C337,C338	354741019T	100 μF16V,ELECT.
C339,C340	354744709T	47μF16V,ELECT.
C341,C342	354741009T	10μF16V,ELECT.
C351,C352	354780109T	1 μF50V,ELECT.
C403,C404	354741009T	10μF16V,ELECT.
C405,C406	354781099T	0.1 μF50V,ELECT.

# PRINTED CIRCUIT BOARD PART LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
C407,C408	354780479T	4.7 $\mu$ F50V,ELECT.
C501	354721019S	100 $\mu$ 6.3V,ELECT.
C506	370131234S	0.012 $\mu$ F100V,APS
C601	354744709T	47 $\mu$ F16V,ELECT.
C602,C603	354780479T	4.7 $\mu$ F50V,ELECT.
C604,C605	354780109T	1 $\mu$ F50V,ELECT.
C606	354780479T	4.7 $\mu$ F50V,ELECT.
C607,C608	354780109T	1 $\mu$ F50V,ELECT.
C609	354741009T	10 $\mu$ F16V,ELECT.
C611,C612	354780109T	1 $\mu$ F50V,ELECT.
C701	354741009T	10 $\mu$ F16V,ELECT.
C705	354741009T	10 $\mu$ F16V,ELECT.
C706,C707	354742219T	220 $\mu$ F16V,ELECT.
C712	354780229T	2.2 $\mu$ F50V,ELECT.
C901	3500065A	0.01 $\mu$ F400VAC,IS
<b>Resistors</b>		
R105,R106	5210062	N06HR 4.7KBD
R205,R206	5210062	N06HR 4.7KBD
R401,R402	5210064	N06HR 10KBD
R509	442520104	RS1/2WBJ 1.0 $\Omega$
R515,R516	5215047 or 5215024	N08HR 100KBC N08HR 100KBC
R703	49163392411	3.9k $\Omega$ ×11,1/10W,NETWORK
R726	49163392404	3.9k $\Omega$ ×4,1/10W,NETWORK
R727	49163392412	3.9k $\Omega$ ×12,1/10W,NETWORK
R737,R738	441722704	RS 2 WBJ 27 $\Omega$
R755,R756	5215044 or 5215020	N08HR 5KBC N08HR 5KBC
R759-R762	4000118, 4000119 or 4000112	TDS-090, SDT-09 or TD5-A090D
R765,R766	5215044 or 5215020	N08HR 5KBC N08HR 5KBC
R767,R768	4000115	LT3600 1/4S 1.8K $\Omega$
<b>Plugs</b>		
P101	25055102	NPLG-5P86
P102	25045142	NPJ-4PDBL55
P104	25050064	NSCT5P18,DIN (G)
P105-P107	25055133	NPLG-3P117
P201	25055102	NPLG-5P86
P301,P303	25055133	NPLG-3P117
P501	25055100	NPLG-3P84
P601	25055148	NPLG-4P132
P701,P702	25055139	NPLG-9P123
P705,P706	25055135	NPLG-5P119
P709	25055147	NPLG-3P131
P710	25055152	NPLG-8P136
P711	25055185	NPLG-4P169
P712,P713	25055187	NPLG-6P171
P715	25055148	NPLG-4P132
P902	25055136	NPLG-6P120
<b>Miscellaneous</b>		
P717	25045172	HSJ-1003-01-020
S901	25035558	NPS-111L520P,POWER SWITCH
P901	2000760A	NSAS-12P716,SOCKET
P703A	2000761	NSAS-18P717,SOCKET
P704A	2000762	NSAS-18P718,SOCKET
	27160029-1	RAD-07B,RADIATOR
	82143006	3P+6FN,SCREW
	27141059	BRACKET
	27150189	SHIELD PLATE
	25060092	NTM-1S33,TERMINAL

<b>NAAF-3351-1</b>		
CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Ics</b>		
Q153,Q171	222811 or 222502	NJM4558DD or NJM4558DX
<b>Capacitors</b>		
C171	353783399S	0.33 $\mu$ 50V,ELECT
C174	353780109S	1 $\mu$ 50V,ELECT
C175,C176	353741009S	10 $\mu$ 16V,ELECT
<b>Resistors</b>		
R155	5104213	N09RLC250KW15F
R156	5104214	N09R2L50KA15F
<b>Miscellaneous</b>		
P103	25045130	HLJ4308-01-010,MIC.
P105A	2000521	NSAS-6P477,SOCKET
P106A	2000522	NSAS-6P478,SOCKET
P107A	2000428	NSAS-6P387,SOCKET
P301A	2000524	NSAS-6P480,SOCKET
P302	25045187	HLJ0541-01-010
P601A	2000754	NSAS-8P710,SOCKET
S601	25030295 27141160A	NRSF-223-15MP,SWITCH BRACKET(VR)
<b>NADIS-3352-1</b>		
CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Ics</b>		
Q311,Q312	22240087 or 22240088	BA6137 or LB1423N
Q315	222687	LB1241
Q751	212058	BG-554G
Q752	22240084	HD614128S-A41
<b>Transistors</b>		
Q313,Q314	2212600	DTA124ES
Q753	2211255 or 2210746	2SC1815-GR or 2SC945A-P
<b>Xtal</b>		
X751	3010118 or 3010129	CSA3.00MG or PRS-3.00RM03
<b>Capacitors</b>		
C343,344	354741009T	10 $\mu$ 16V,ELECT
C754	354761009T	10 $\mu$ 35V,ELECT
<b>Miscellaneous</b>		
P303A	2000524	NSAS-6P480
P708A	2000751	NSAS-4P707
P709A	2000600	NSAS-6P556
P710A	2000728	NSAS-16P684
P716	25055147 27190564	NPLG-3P131 HOLDER(FL)
<b>NADG-3353-1</b>		
CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Ics</b>		
Q741	222465	NJM-4558D
Q742,Q744	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q743,Q745	221281	DTC114YS
Q746	2211255 or 2210746	2SC1815-GR or 2SC945-AP
Q747	221281	DTC114YS



## PRINTED CIRCUIT BOARD PART LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Diodes</b>	
D741,D742	223163	1SS133
	<b>Capacitors</b>	
C743,C744	352982296S	0.22 $\mu$ 50V,NP.
	<b>Plugs</b>	
P703-1	25055133	NPLG-3P117
P704-1	25055133	NPLG-3P117
P707	25055322	NPLG-8P305
P708	25055146	NPLG-2P130

## NASW-3354-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Switch</b>	
S701-S710	25035548	NPS-111S510,PUSH
S711,S712	25035570	NPS-111S532,PUSH
S713	25065325	NSS-23128
S714-S718	25035570	NPS-111S532,PUSH
	<b>Socket</b>	
P713A	2000775	NSAS-12P731
P714A	2000818	NSAS-14P774
P715A	2000599	NSAS-8P555
P716A	2000600	NSAS-6P556

## NADIS-3355-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>LED</b>	
D721-D723	225192	GL1NG1
	<b>Socket</b>	
P711A	2000605	NSAS-8P561

## NADIS-3356-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>LED</b>	
D724	225192	GL1NG1
D725,D726	225190	GL1PR1
D727,D728	225192	GL1NG1
	<b>Socket</b>	
P712A	2000738A	NSAS-12P694

## NAETC-3357-1

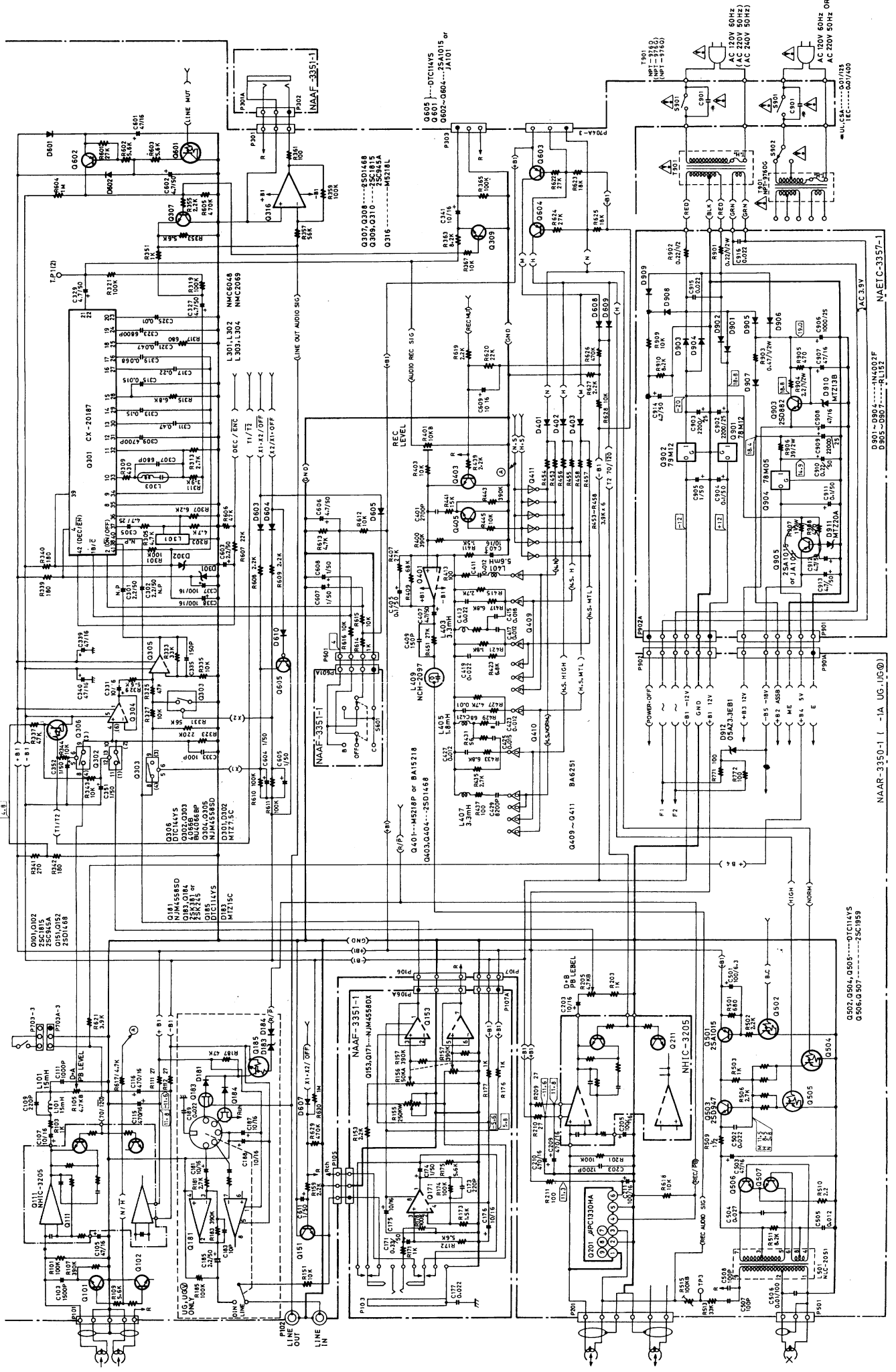
CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>ICs</b>	
Q901,Q902	222780122	78M12
Q904	222780052	78M05
	<b>Transistors</b>	
Q903	2201285 or 2201286	2SD882-Q or 2SD882-P
Q905	2211455 or 2212495	2SA1015-GR or JA101Q

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Diodes</b>	
D901-D904	223894	1N4002F
D905-D907	223891	RL-152
D908,D909	223163	1SS133
D910	224451302, 224651302 or 224151302	MTZ13B, HZ-13E-B2 or 05AZ13Y
D911	224452001, 224652001 or 224152001	MTZ20A, HZ20EB1 or 05AZ20X
	<b>Capacitors</b>	
C902,C903	354752229S	2200 $\mu$ F25V,ELECT.
C904	354781099T	0.1 $\mu$ F50V,ELECT.
C905	354780109T	1 $\mu$ F50V,ELECT.
C906	354751029S	1000 $\mu$ F25V,ELECT.
C907,C908	354744709T	47 $\mu$ F16V,ELECT.
C909	3504211S	22000 $\mu$ 25V,ELECT.
C910	354782299T	0.22 $\mu$ F50V,ELECT.
C911	354781099T	0.1 $\mu$ F50V,ELECT.
C912-C914	354780479T	4.7 $\mu$ F50V,ELECT.
	<b>Resistors</b>	
R901,R902	442522294	RS1/2WBJ 0.22 $\Omega$
R903	442524794	RS1/2WBJ 0.47 $\Omega$
R904	442520224	RS1/2WBJ 2.2 $\Omega$
	<b>Miscellaneous</b>	
P901	25055136	NPLG-6P120
P902A	2000398	NSAS-12P357
	27160211-1	RAD-68B,RADIATOR
	27160029	RAD-07,RADIATOR
	82143006	3P+6FN(BC),SCREW

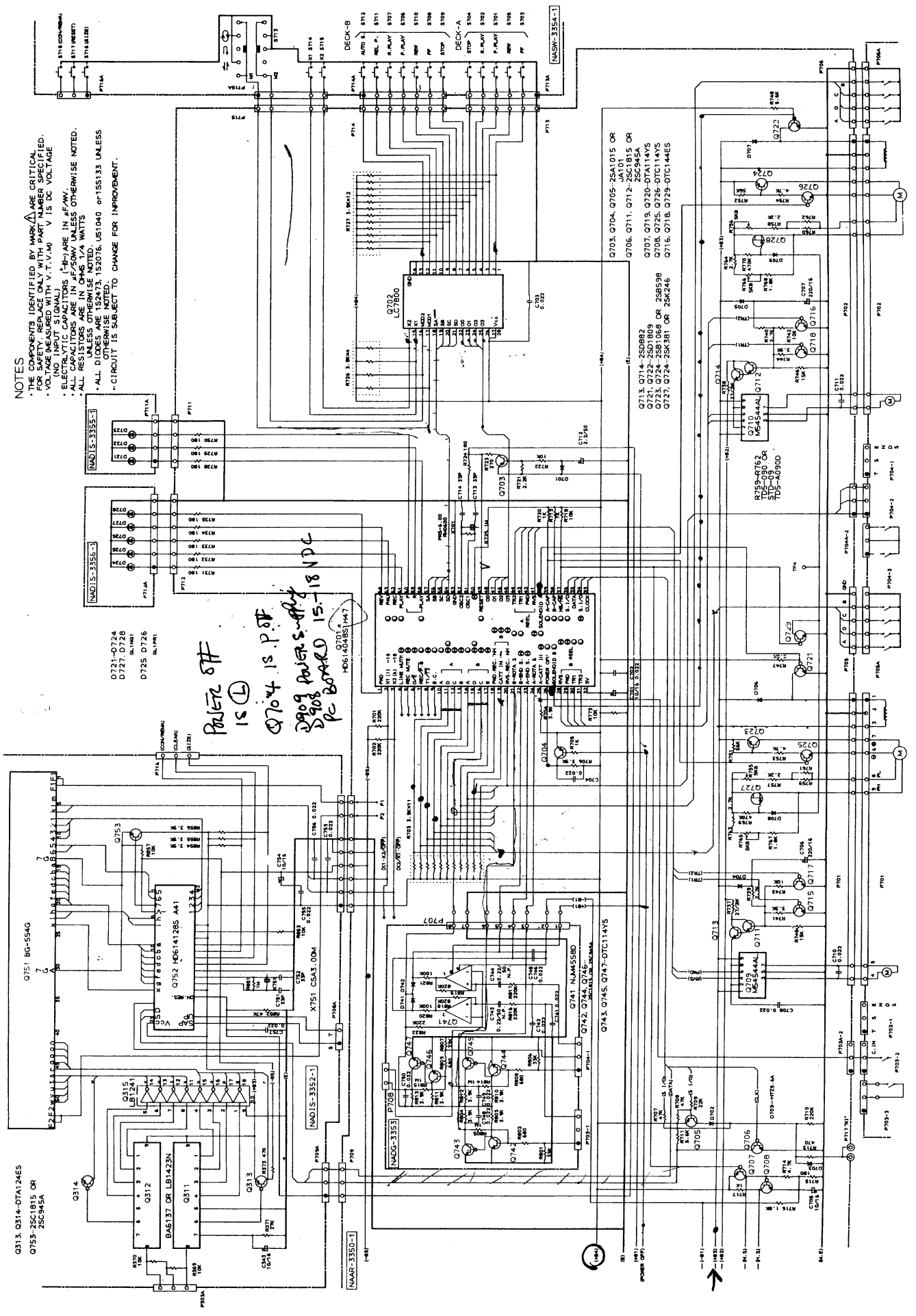
## NOTE

(G) : Only 220V model

SCHEMATIC DIAGRAM (AUDIO SECTION) 1/2



CHEMATIC DIAGRAM (CONTROL SECTION) 2/2



**NOTES**

- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE INDICATED WITH V, T, V, M, W IS DC VOLTAGE (NO INPUT).
- ELECTROLYTIC CAPACITORS (E) ARE IN  $\mu$ F/WV.
- ALL CAPACITORS ARE IN  $\mu$ F/500V UNLESS OTHERWISE NOTED.
- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
- ALL DIODES ARE 1N2473, 1N2076, US1040 OR 1N5133 UNLESS OTHERWISE NOTED.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

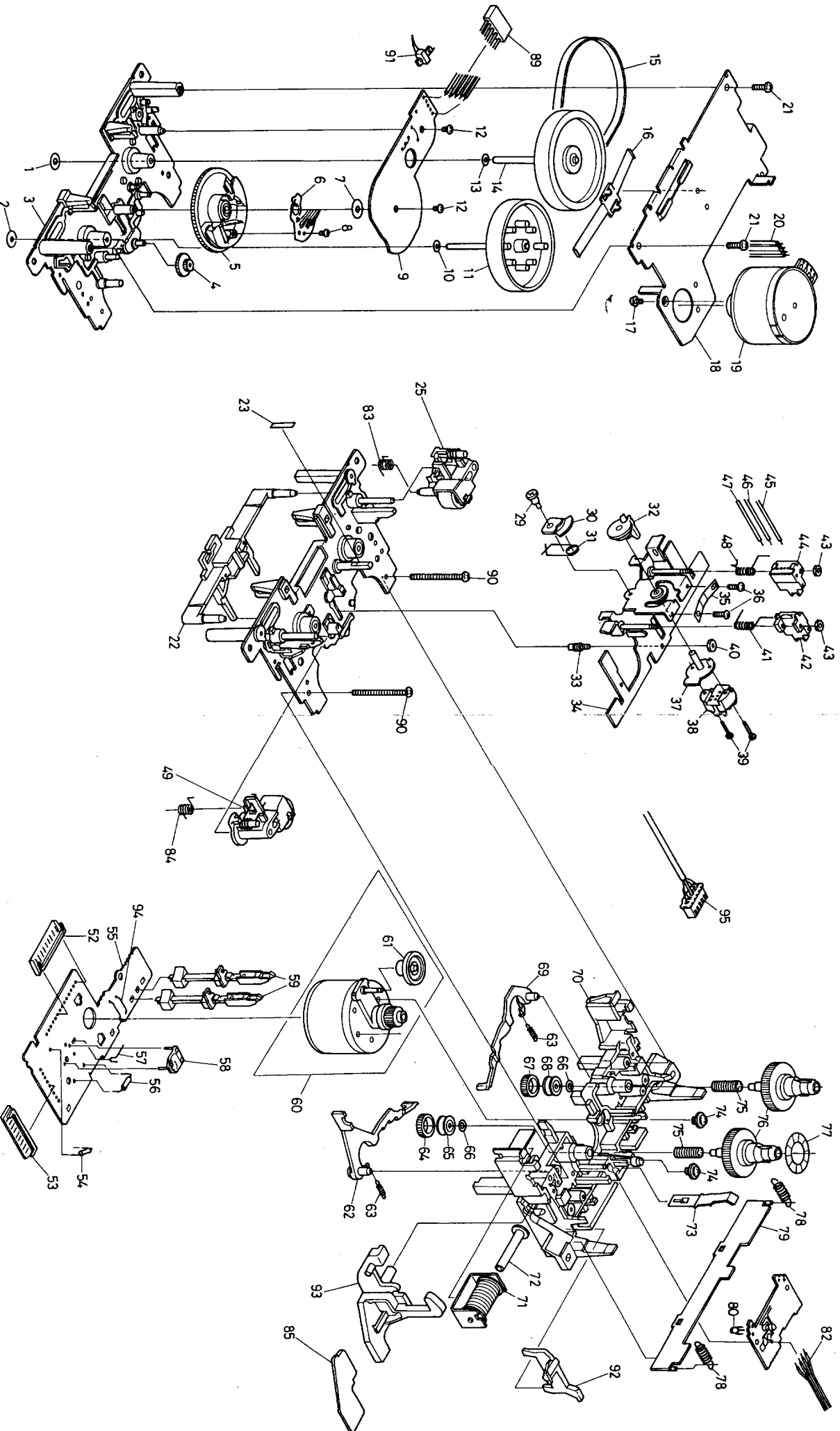
*POWER OFF IS (L)  
Q704 IS P.O.P.  
2909 POWER SUPPLY BOARD 15-18 NDC*

- Q703, Q704, Q705-25A1015 OR JA1015
- Q706, Q711, Q712-25C1815 OR 25C1815
- Q707, Q719, Q720-Q7A114YS
- Q708, Q725, Q726-D7C114YS
- Q721, Q724-25K381 OR 25K246
- Q716, Q718, Q729-D7C144ES

- Q313, Q314-D7A124ES
- Q753-25C1815 OR 25C945A

POWER OFF

PE MECHA NISM-EXPLODED VIEW (DECK A)



1

2

3

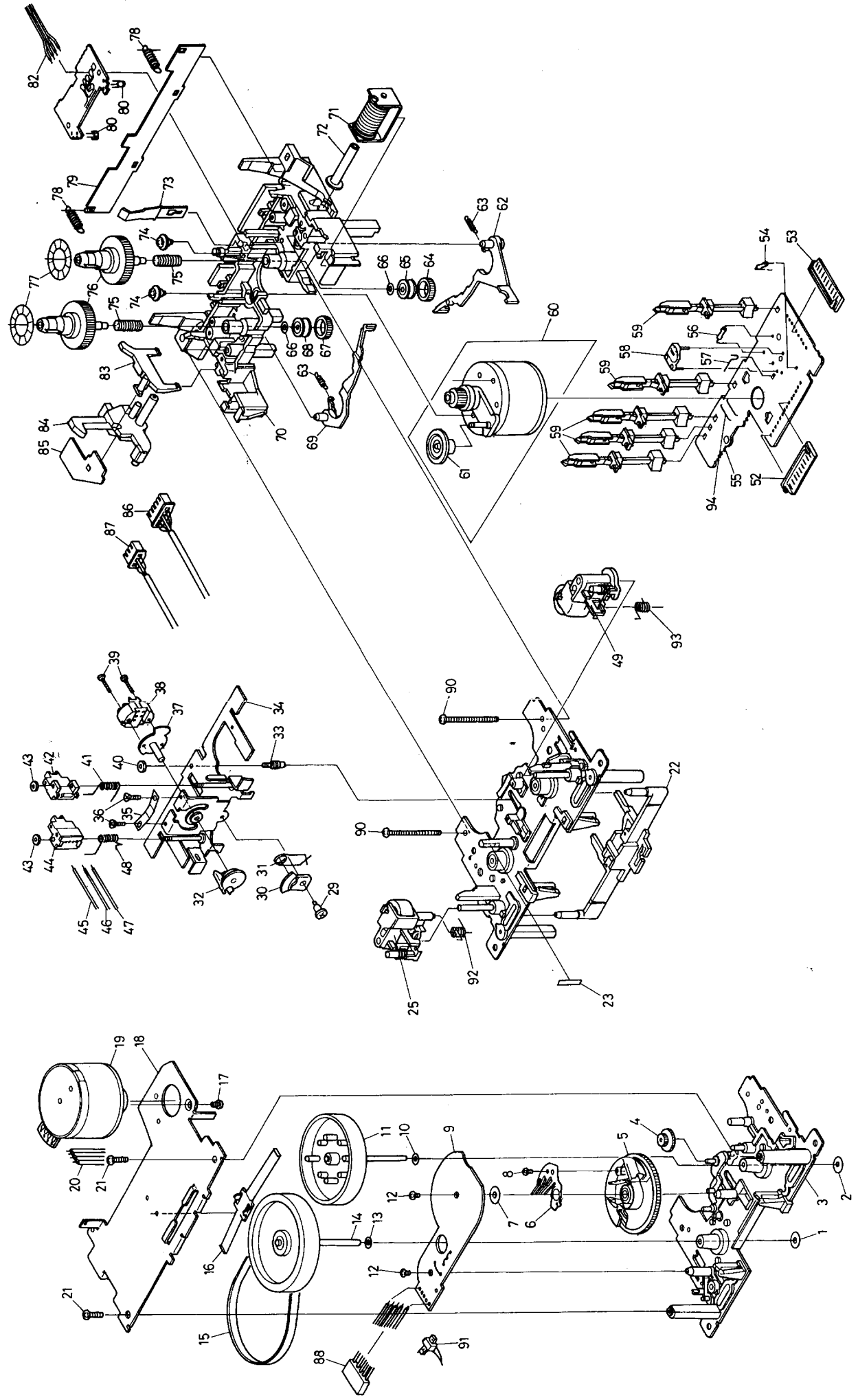
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5

6

7

TAPE MECHANISM-EXPLODED VIEW (DECK B)



## TAPE MECHANISM-PART-LIST

## DECK A

REF.NO.	PART NO.	DESCRIPTION
1	24610673	WASHER
2	24611295	WASHER 2.2×7×0.8
3	24611325	MECHANISM CHASSIS
4	24602432	ASSIST GEAR
5	24602433	CAM
6	<del>24606282</del>	CONTACT
7	24611337	WASHER 7×8×.5
8	82112003	PAN-HEAD SCREW M2×3
9	<del>24606283</del>	CONTROL P.C.B.
10	24611294	WASHER 2.3×4.7×0.5
11	24602446	FLYWHEEL AS
12	82112003	PAN-HEAD SCREW M2×3
13	24611148	WASHER 2.3×4.7×0.5
14	24602435	FLYWHEEL
15	24602436	BELT
16	24611326	THRUST SPRING
17	82112603	PAN-HEAD SCREW M2.6×3
18	24611327	BRACKET (MOTOR)
19	24601231	→CAPSTAN MOTOR AS
21	833126082	TAPPING SCREW M2.6×8
22	24603349	LEVER (SLIDE)
23	24611336	REFLECTOR
25	24602437	PINCH ROLLER AS (L)
29	24609010	SPECIAL SCREW M2×3
30	24602440	GEAR
31	24605668	SPRING
32	24602441	GEAR (HEAD)
33	24604089	SHAFT (HEAD BASE)
34	24611328	HEAD BASE AS
35	24605669	SPRING
36	801337	ADJUSTING SCREW
37	24611329	BRACKET AS (HEAD)
38	24600078	HEAD
39	82111406	PAN HEAD SCREW M1.4×6
40	863125	NUT M2.5
41	24605670	SPRING
42	24611330	TAPE GUIDE
43	863120	NUT M2
44	24606289	SENSOR
48	24605671	SPRING
49	24602438	PINCH ROLLER AS (R)
55	24606284	P.C.B.
59	24606285	LEAF SWITCH
60	24601230	REEL MOTOR AS
62	24603350	ASSIST LEVER (A)
63	24605673	SPRING
65	24602443	BRAKE PULLEY
66	24610952	WASHER 2.6×5.5×0.13
67	24611331	BRAKE RUBBER
68	24602444	BRAKE PULLEY
69	24603351	ASSIST LEVER (B)
70	24611333	SUB CHASSIS
71	24606286	YOKE AS
72	24606287	CORE
73	24605674	SPRING
74	24609011	SPECIAL SCREW M2.6×1.6
75	24605675	SPRING
76	<del>24602445</del>	REEL
77	<del>24611334</del>	REFLECTOR (5P)
78	24605677	SPRING
79	24611335	HOLDER (CASSETTE)
80	<del>24606288</del>	SENSOR
83	24605678	PINCH SPRING (L)
84	24605679	PINCH SPRING (R)
85	24603352	EJECT LEVER
90	82112630	PAN HEAD SCREW M2.6×30

## DECK B

REF.NO.	PART NO.	DESCRIPTION
1	24610673	WASHER
2	24611295	WASHER 2.2×7×0.8
3	24611325	MECHANISM CHASSIS
4	24602432	ASSIST GEAR
5	24602433	CAM
6	24606282	CONTACT
7	24611337	WASHER 7×8×.5
8	82112003	PAN-HEAD SCREW M2×3
9	<del>24606283</del>	CONTROL P.C.B.
10	24611294	WASHER 2.3×4.7×0.5
11	24602446	FLYWHEEL AS
12	82112003	PAN-HEAD SCREW M2×3
13	24611148	WASHER 2.3×4.7×0.5
14	24602435	FLYWHEEL
15	24602436	BELT
16	24611326	THRUST SPRING
17	82112603	PAN-HEAD SCREW M2.6×3
18	24611327	BRACKET (MOTOR)
19	→24601231 CDo34	→CAPSTAN MOTOR AS
21	833126082	TAPPING SCREW M2.6×8
22	24603349	LEVER (SLIDE)
23	24611336	REFLECTOR
25	24602437	PINCH ROLLER AS (L)
29	24609010	SPECIAL SCREW M2×3
30	24602440	GEAR
31	24605668	SPRING
32	24602441	GEAR (HEAD)
33	24604089	SHAFT (HEAD BASE)
34	24611328	HEAD BASE AS
35	24605669	SPRING
36	801337	ADJUSTING SCREW
37	24611329	BRACKET AS (HEAD)
38	24600074	HEAD
39	82111406	PAN HEAD SCREW M1.4×6
40	863125	NUT M2.5
41	24605670	SPRING
42	24611330	TAPE GUIDE
43	863120	NUT M2
44	24606289	SENSOR
48	24605671	SPRING
49	24602438	PINCH ROLLER AS (R)
55	24606284	P.C.B.
59	24606285	LEAF SWITCH
60	24601230	REEL MOTOR AS
62	24603350	ASSIST LEVER (A)
63	24605673	SPRING
65	24602443	BRAKE PULLEY
66	24610952	WASHER 2.6×5.5×0.13
67	24611331	BRAKE RUBBER
68	24602444	BRAKE PULLEY
69	24603351	ASSIST LEVER (B)
70	24611333	SUB CHASSIS
71	24606286	YOKE AS
72	24606287	CORE
73	24605674	SPRING
74	24609011	SPECIAL SCREW M2.6×1.6
75	24605675	SPRING
76	24602445	REEL
77	24611334	REFLECTOR (5P)
78	24605677	SPRING
79	24611335	HOLDER (CASSETTE)
80	24606288	SENSOR
83	24603355	LEVER
84	24603356	EJECT LEVER (L)
85	24603352	EJECT LEVER
90	82112630	PAN HEAD SCREW M2.6×30

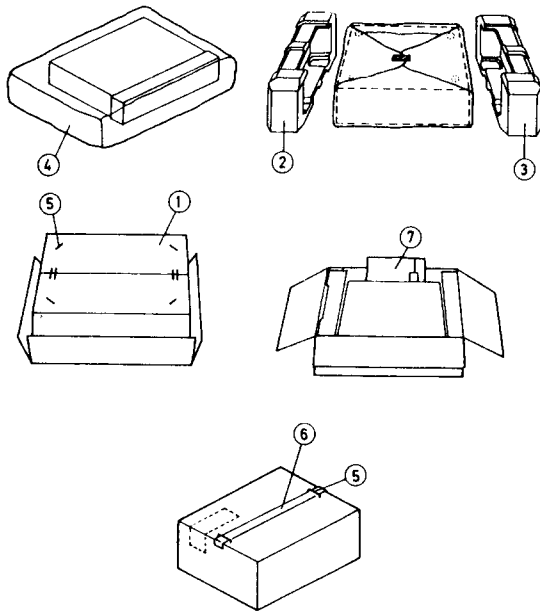
DECK A

REF.NO.	PARTS NO.	DESCRIPTION
92	24603353	LEVER (R)
93	24603354	EJECT LEVER (R)

DECK B

REF.NO.	PARTS NO.	DESCRIPTION
92	24605678	PINCH SPRING (L)
93	24605679	PINCH SPRING (R)

PACKING VIEW



D Model

REF. NO.	PART NO.	DESCRIPTION
1	29051720	Master carton box
2	29091204	Pad(L)
3	29091205	Pad(R)
4	290311A	620 X 550 Poly bag
5	282301	Sealing hook
6	260012	Dampion tape
7	<b>Accessory bag ass'y</b>	
	29341283	Instruction manual
	2010098A	Connection cable
	29358002F	Service station list (N)
	29100006A	350 X 250 Poly bag
	29365019	Waranty card (N)

G/W Model

REF. NO.	PART NO.	DESCRIPTION
1	29051720	Master carton box
2	29091204	Pad(L)
3	29091205	Pad(R)
4	290311A	620 X 550 Poly bag
5	282301	Sealing hook
6	260012	Dampion tape
7	<b>Accessory bag ass'y</b>	
	29341284	Instruction manual
	29341285	Instruction manual(I)
	2010098A	Connection cable
	25055018	Conversion plug (CV-K-I) (W)
	29100006A	350 X 250 Poly bag
	29365022	Waranty card (QB)

NOTE

- (N): Only U.S.A. model
- (W): Only worldwide model
- (I): Only Italian model
- (QB): Only U.K. model

**ONKYO CORPORATION**

International Division: No. 24 Mori Bldg., 23-5, Nishi-Shimbashi 3-chome, Minato-ku,  
 TOKYO 105. JAPAN Telex: 242-3551 ONKYO J. Tel. 03-432-6981  
**ONKYO U.S.A CORPORATION**  
 200 Williams Drive, Ramsey, N.J. 07446 Telex: 25-710-988-1033 Tel. 201-825-7950