

ONKYO® SERVICE MANUAL

STEREO CASSETTE TAPE DECK MODEL TA-2047

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:	0.045% (WRMS)
Frequency Response:	20-16,000 Hz (30-15,000 Hz \pm 3dB) (normal position tape) 20-17,000 Hz (30-16,000 Hz \pm 3dB) (high position tape) 20-18,000 Hz (30-17,000 Hz \pm 3dB)
Signal-to-Noise Ratio:	60dB (metal position tape, Dolby NR out) A noise reduction of 10dB above 5KHz and 3dB at 1kHz is possible with Dolby B NR. A noise reduction of 30dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Mic jacks: 2 Input sensitivity: 0.3mV/600 ohm Input impedance: 2.7 kohms Line IN: 2 Input sensitivity: 60mV Input impedance: 50 kohms



Outputs;	Line OUT: 2 Std output level: 500mV (0dB) Optimum load impedance; over 50 kohms Headphone Jack: 1 Optimum load impedance: 8-200 ohm
Motors;	DC servo motor: 1 DC motor: 2
Heads:	Rec/pb head: Special Hard Permalloy Erase head: Ferrite
Power Supply:	AC120V/60Hz
Power Consumption:	33 watts
Dimensions:	435(W) x 112(H) x 371(D)mm (17-1/8" x 4-3/8" x 14-5/8")
Weight:	6.0 kg. (13.2 lbs.)

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

SERVICE PROCEDURES

1. Insulation resistance measurement

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

Specifications; 500V more than 10 M Ω

2. Replacing the lamps

This unit used the lamps listed below.

Circuit No.	Part No.	Description
PL101	210090	150mA, 14V. Lamp
PL701	210183	0.06A, 14V. Lamp

CAUTION: Before replacing the lamps, be sure to unplug the power supply cable.

FEATURES

ACCUBIAS For the Best Performance With Any Tape

The ACCUBIAS system fine tunes the recording bias to obtain optimum performance with any kind of tape (not necessary with metal tapes). By setting precisely the correct bias level, ACCUBIAS guarantees the flattest frequency response and highest signal-to-noise ratio possible with each tape.

Dual Sensor Real Time Tape Counter

The tape counter circuit measures the speed of both tape reels and compares them by microcomputer to provide precise readings of remaining time. This dual sensor technique eliminates small errors in time calculations caused by slight variations in tape thickness between different manufacturers to give the most accurate time indications possible.

2-Motor Tape Transport with Separate Head Assembly Motor

The tape transport system, along with the heads, is the most important factor affecting the basic performance of a cassette deck. To assure extremely stable and accurate

transport, this unit uses a DC servo-controlled capstan motor. This motor is unaffected by fluctuations in the power supply voltage and frequency and instantaneous changes in load. A highly reliable simple drive transmission system and precision vertical cassette holder further enhance overall accuracy and stability. As a result, wow and flutter is under 0.045%. In addition, separate DC motors drive the reel tables and head base and the head assembly is constructed to move silently with no annoying clicks.

Dolby B and C Noise Reduction

Along with standard Dolby B NR, this unit also has the even more effective Dolby C NR system. Dolby C NR reduces tape background noise by 20dB at 5kHz, about 3 times more than Dolby B NR. In addition to its wide band noise reduction, Dolby C NR uses a sliding band technique that varies the band width of noise reduction according to the input level, thereby avoiding noise "pumping." Dolby C NR also has an anti-saturation effect to reduce the chance of tape saturation in the high range. All these features combine to eliminate the adverse effects on tape sound that other noise reduction systems can cause.

Remote Control Unit Connector

With an optional remote control unit (such as the RC-5T), this unit can be controlled even while you are relaxing in your favorite chair. All transport modes are included: record, play, fast forward, rewind, stop and pause.

Sensitive 2-Color 10-Segment LED Peak Level Meter

The left and right peak level meters react instantaneously to signals and the two-color layout assures that you won't miss any potentially harmful input signals when setting the recording level.

Auto Space Rec Mute Button

This button lets you insert unrecorded sections five seconds long with just one quick tap.

Auto Music Control System (A.M.C.S.)

The AMCS automatically locates the beginning of every song on a cassette in either the forward or the reverse direction. When AMCS \ggg is pressed during the play mode, tape is rapidly wound to the beginning of the next song and the first 10 seconds (approximately) is played. Then the tape is rapidly wound forward to the beginning of the next song and about 10 seconds is played. This process continues until the PLAY button is pressed to cancel AMCS operation and return to normal playback. When AMCS \ggg is pressed during the play mode, this process is performed in the reverse direction.

Repeat Playback Modes

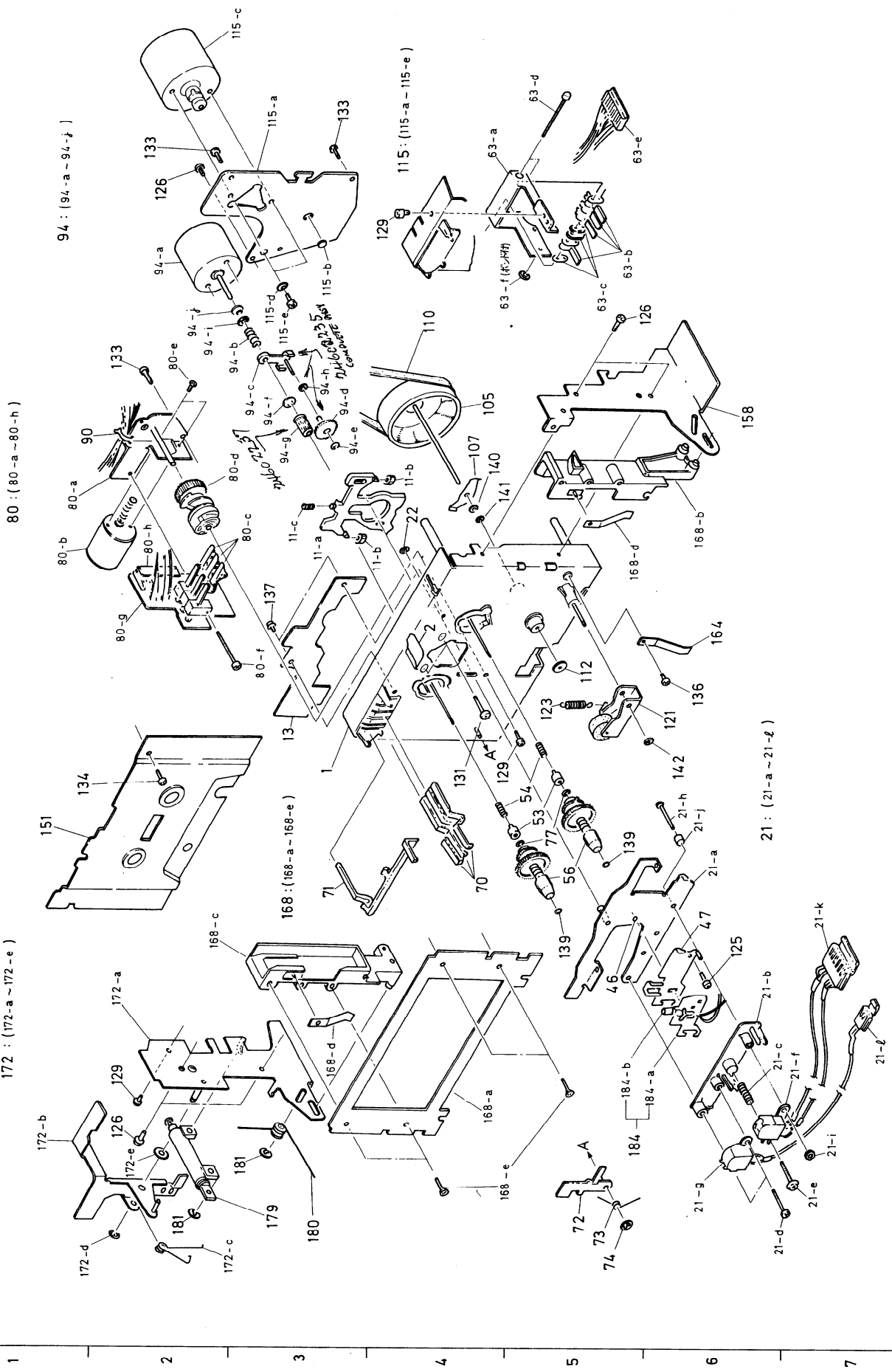
With this deck, you have a choice of two ways to play a tape repeatedly: (1) Single repeat for one song; (2) Full repeat for an entire cassette side.

Fully Automatic Tape Selection

This deck senses the type of cassette inserted and automatically sets the correct amount of bias and equalization.

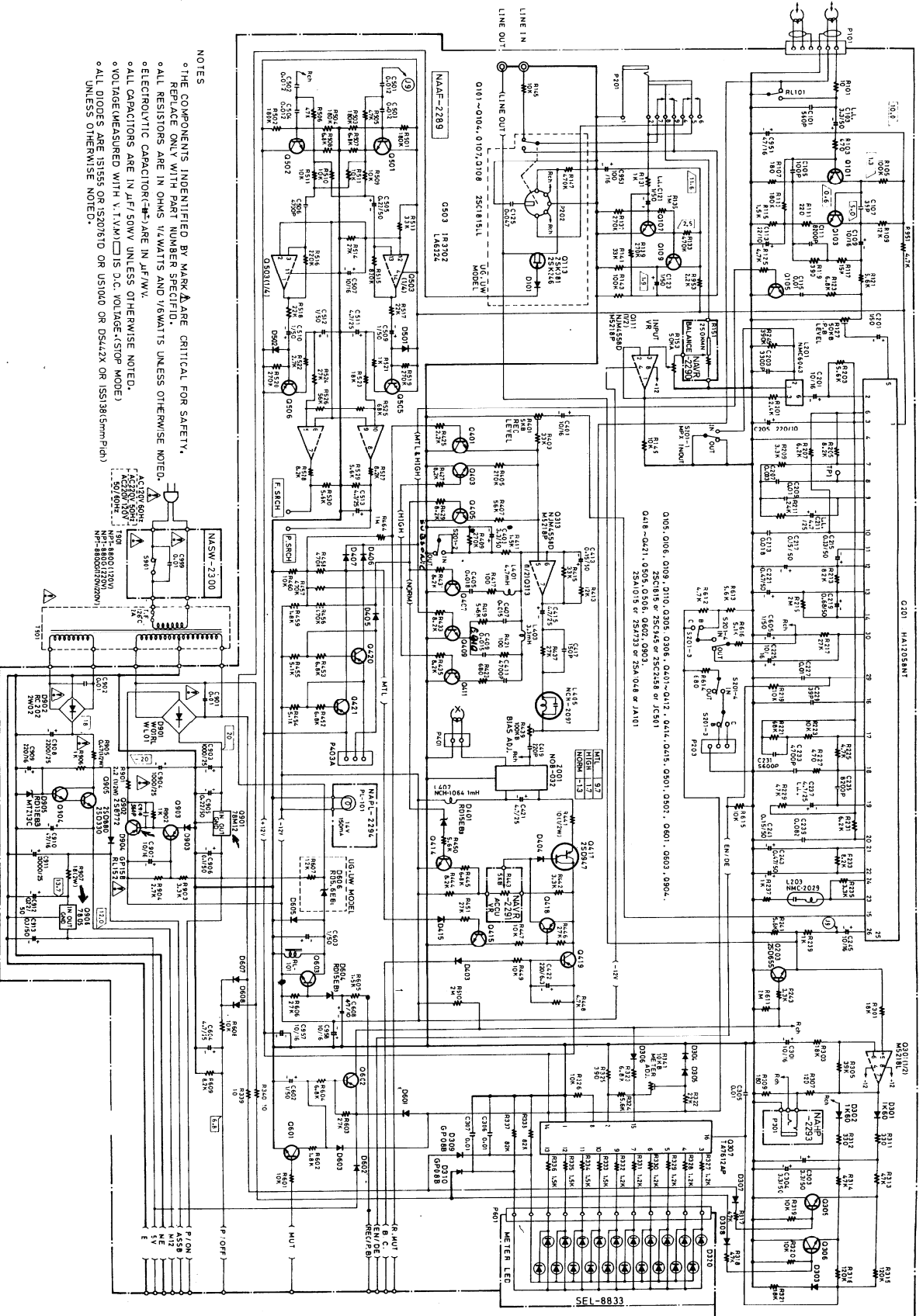
TAPE MECHANISM-EXPLODED VIEW

A B C D E F G H I J



SCHEMATIC DIAGRAM-AMPLIFIER SECTION

A B C D E F G



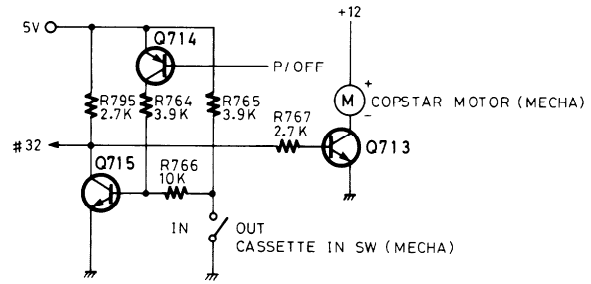
NOTES

- ◊ THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR SAFETY.
- ◊ REPLACE ONLY WITH PART NUMBER SPECIFIED.
- ◊ ALL RESISTORS ARE IN OHMS 1/4 WATTS AND 1/6 WATTS UNLESS OTHERWISE NOTED.
- ◊ ELECTROLYTIC CAPACITOR (C-1) ARE IN JF/WV.
- ◊ ALL CAPACITORS ARE IN µF/50V UNLESS OTHERWISE NOTED.
- ◊ VOLTAGE (MEASURED WITH V.I.V.M.) D.C. VOLTAGE (150P MODE)
- ◊ ALL DIODES ARE 1N555 OR 1N507/61D OR US104D OR DS42X OR 1S1138 (5mm Pin)
- UNLESS OTHERWISE NOTED.

MICRO COMPUTER LM6402H-586 PIN ALLOCATION

1	CLK		CLK	42
2	AMCS REV	V _{DD} (5V)		41
3	AMCS FWD	REC STAND BY (N.C.)		40
4	REW	REPEAT	SINGLE	39
5	FF		FULL	38
6	INT.		OOO IN	37
7	RESET		MODE 3	36
8	AUTO SPACE		MODE 4	35
9	PAUSE	SEARCH	LOW SPEED	34
10	REC	SIGNAL	HIGHSPEED	33
11	PLAY	CASSETTE	IN/OUT	32
12	BIAS CONTROL	REC INH		31
13	MUTE (LINE)		O-PLAY	30
14	REC MUTE	REEL	REV	29
15	LED (FULL)		FWD	28
16	LED (SINGLE)	ASSIST	DOWN	27
17	LED (REC)		UP	26
18	LED (PLAY)			25
19	LED (PAUSE)	MECHANISM POSITION		24
20	TEST			23
21	V _{SS}	REC / P.B.		22

MODE 3	0	0	1	1
MODE 4	0	1	0	1
OPARATION	REC	P.B	P.B	STOP
	TIMER		MEMORY	



3. Mechanical position code

#23	Q-701			Mode
	#24	#25		
H	H	L		—
L	H	L		PLAY
L	L	L		—
H	L	L		PAUSE
H	L	H		—
L	L	H		STOP
L	H	H		FF, REW
H	H	H		—

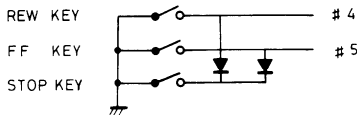
4. Assist up, down, and Reel FWD/RVS signals

	Q701	POWER ON → PLAY → STOP → PLAY (FF)						
Assist motor	#26(UP)	H	H	H	L	H	H	H
	#27(DOWN)	H	L	H	H	H	L	H
Reel motor	#28(FWD)	H		H		L		H
	#29(FEV)	H		L		L		L

As illustrated above, the steady-state (during STOP, FF, RW, and PLAY) control output of the ASSIST motor is at HIGH level, holding the motor under brake applied by the motor control IC (Q704 LB1640N).

The control output of the REEL motor is momentarily held under braking condition only when the power is turned on, then is restored to normal to output the control signals as usual.

1. The STOP key is shown in the following figure with no key entry from the microcomputer.



2. #32 provides the ON/OFF control for the capstan motor and the I/O port for cassette IN/OUT. It is also used for P/OFF (when the power is turned off during play, the capstan motor is stopped to lower the head).

Operation

Power ON → Insert CASSETTE-HALF → CASSETTE IN SW ON → Q715 OFF → #32 HIGH

The above steps are taken at the I/O port.

Then, proceed with the following steps:

#32 → Q713 ON → CAPSTAN MOTOR ON

When the power is turned off, proceed with the following:

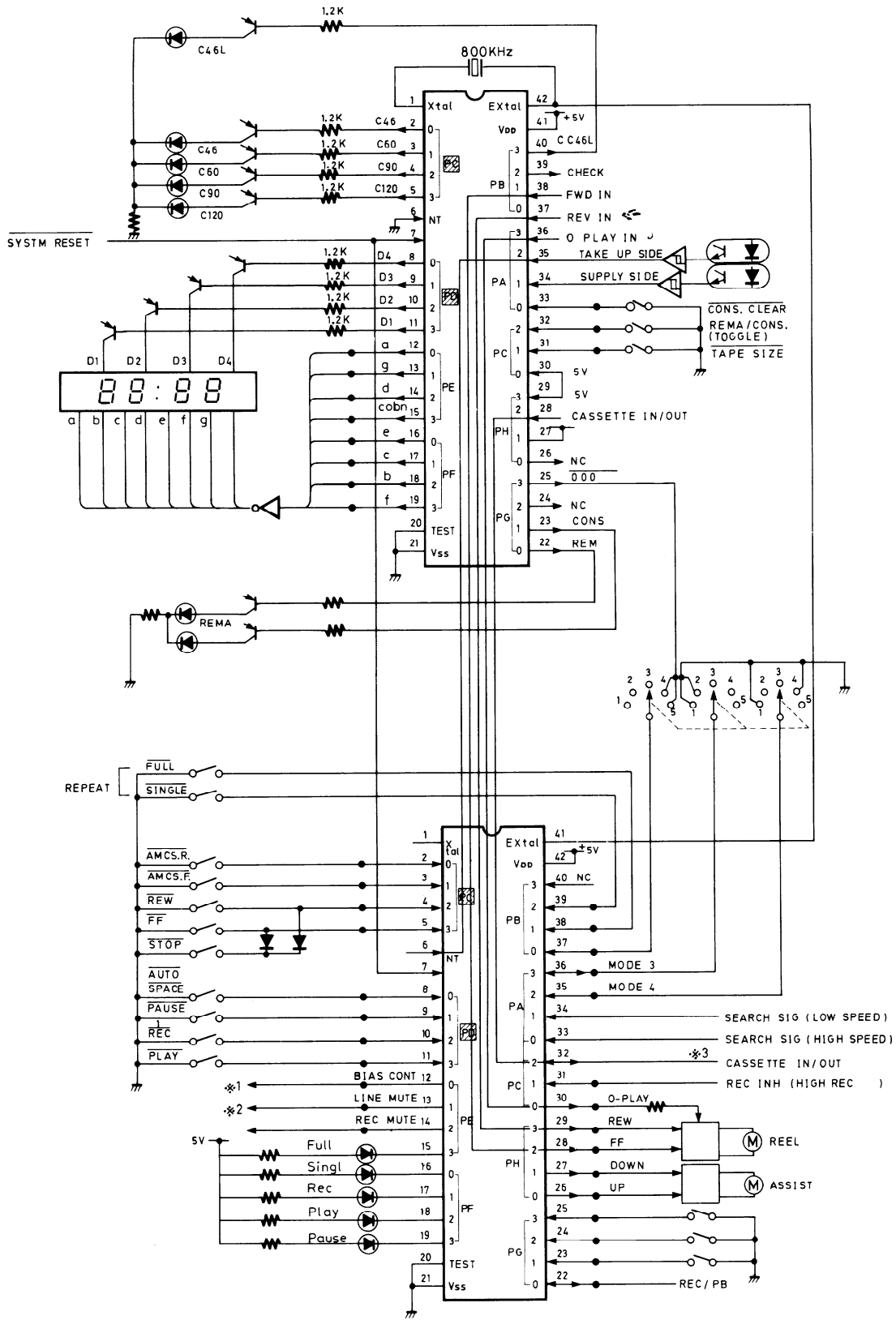
LOW → Q714 ON → Q715 ON → #32 LOW → (assume the half detaches from the holder)

Q713 OFF → CAPSTAN OFF

In line with the step above, DOWN signal is sent to the ASSIST motor.

MICRO COMPUTER

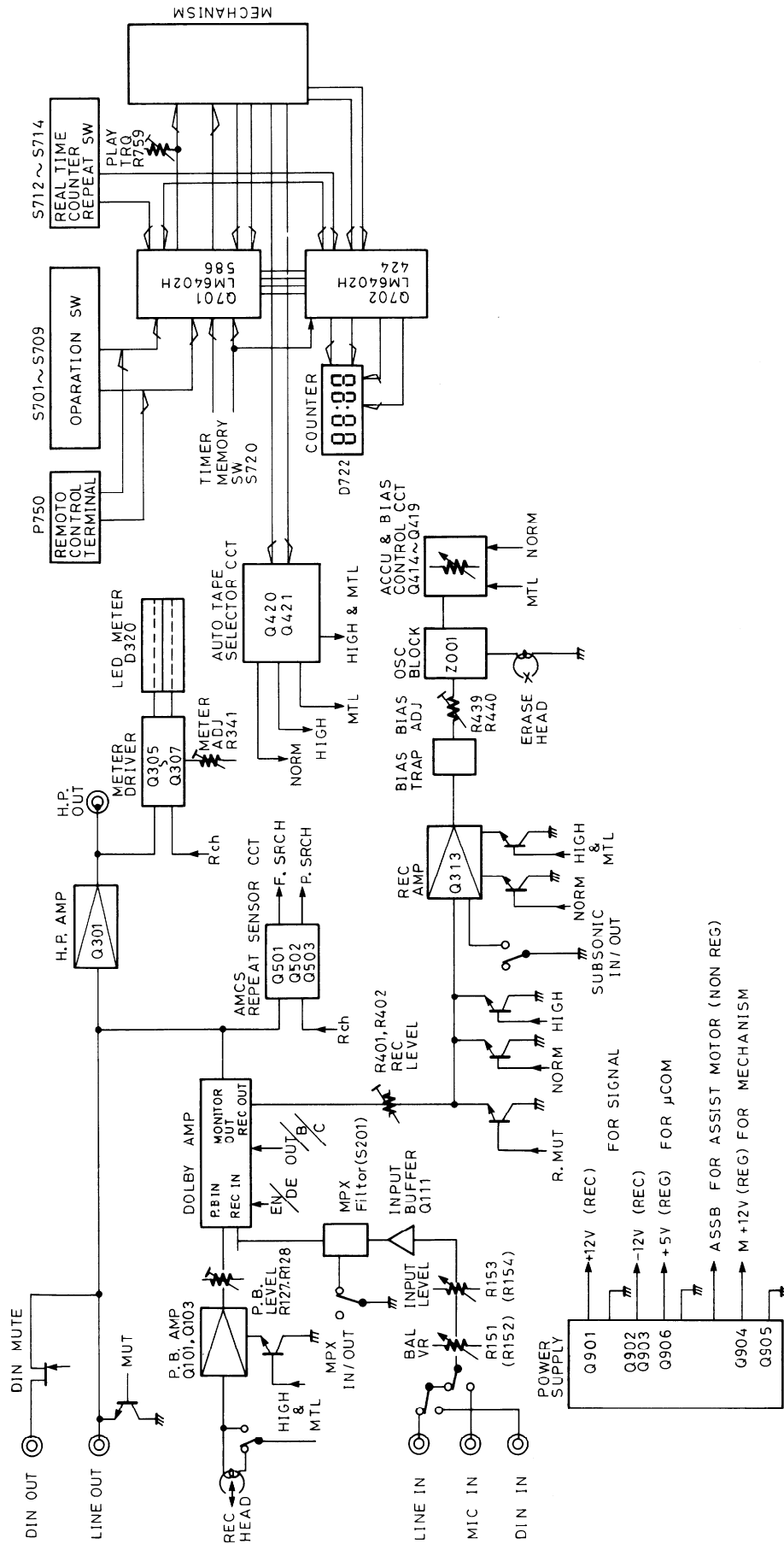
LM-6402H (424)



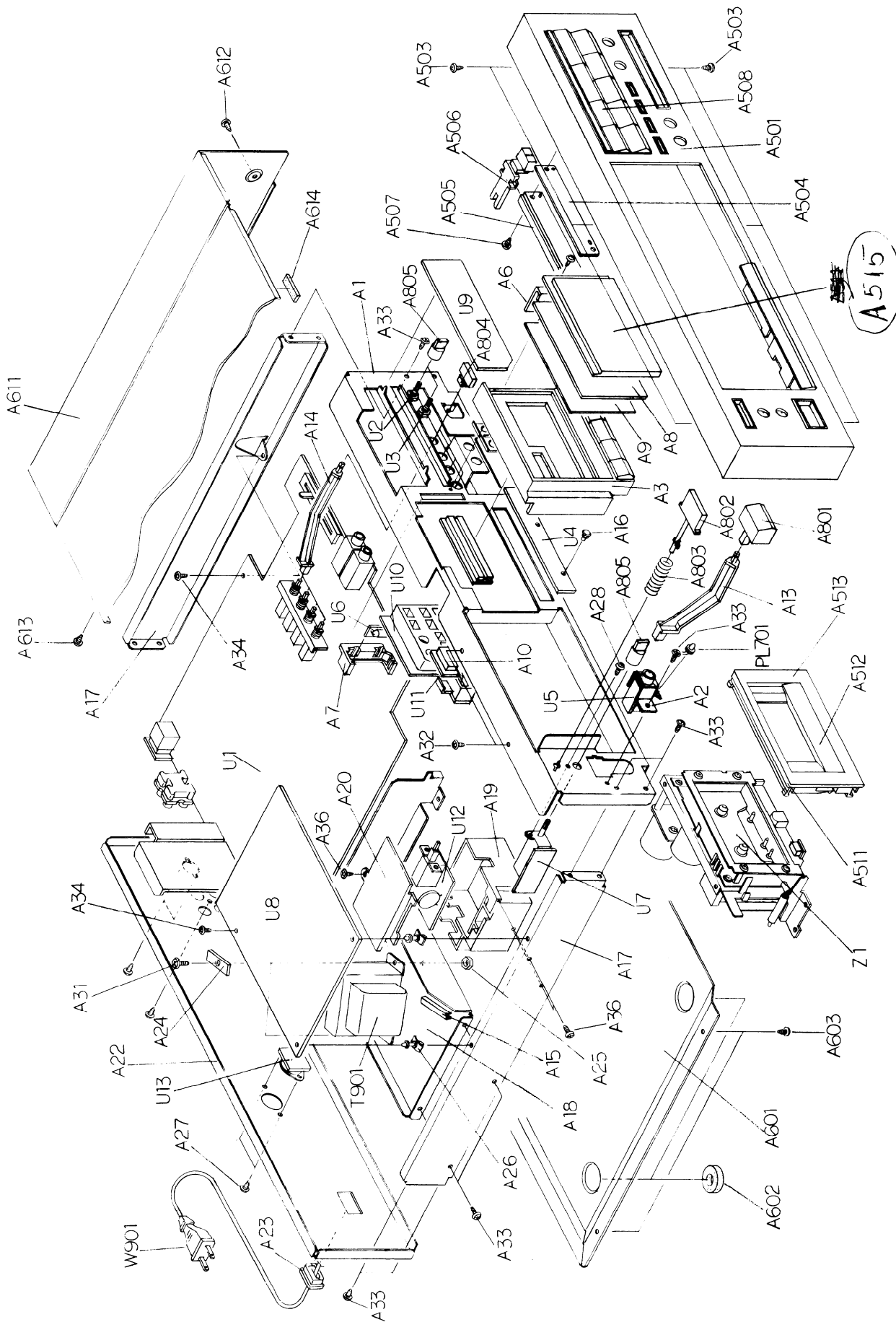
LM-6402H (586)

	1	2	4	5	
MODE 3	0	0	1	1	Pt A (3)
MODE 4	0	1	0	1	Pt A (2)
	REC	PB	PB	STOP	
	TIMER		MEMORY		

BLOCK DIAGRAM



CHASSIS-EXPLODED VIEW



TAPE MECHANISM-PARTS LIST

PLACE	REF. NO	PART NO.	DESCRIPTION	PLACE	REF. NO	PART NO.	DESCRIPTION
E-3	1	24611138	Chassis	G-4	105	24602240	Flywheel
F-4	2	24605468	Cassette holding spring	G-4	107	24605152	Thrust spring
	11	24611043	Brake ass'y	H-4	110	24602269	Flat belt
F-3	11a	24611053	Brake plate	E-5	112	24610673	2.5×7×0.8, Washer
G-4, F-3	11b	24610999	Brake rubber	I-4	115	24611143	Flywheel ass'y
F-3	11c	24605472	Spring	I-3	115a	24610971	Flywheel holder
E-3	13	24606204	Sensor pc board ass'y	H-3	115b	24610671	Thrust holder
	21	24611139	Head base ass'y	J-2	115c	24601184	Capstan motor ass'y
D-6	21a	24610966	Head base	H-3	115d	24611142	2.7×5×0.5, Washer
C-6	21b	24610967	Head stand	H-3	115e	801341	M2.6×3.5, Pan head screw
C-6	21c	24605185	Spring	E-6	121	24602316	Pinch arm ass'y
A-6	21d	82512012	M2×12, Binding screw	E-5	123	24605370	Spring
B-7	21e	801198	M2×14, Pan head screw	C-6	125	833125089	M2.5×8, Pan Head screw
B-7	21f	24600051	Erase head	I-2, H-5, B-2	126	833125059	M2.5×5, Pan head screw
B-6	21g	24600041	Erase head	E-4, B-2	129	801250	M2×4, Pan head screw
D-6	21h	82112016	M2×16, Pan head screw	E-4	131	82512614	M2.6×14, Binding screw
B-7	21i	863130	M2, Nut	I-2, H-2	133	833426105	10×2.6, Tapping screw
D-6	21j	24604060	Spacer	E-1	134	833126055	2.6×5, Tapping screw
D-6	21k		P6, Connector	E-6	136	837120058	M2×5, Truss screw
C-7	21l		P2, Connector	F-3	137	801292	M2×3.2, Truss screw
F-4	22	893030	E3, Ring E	D-5, C-5	139	24610349	1.8×3.2×0.5, Washer
C-5	46	24610943	φ3, Steel ball	G-4	140	24610515	2.6×4.7×0.25, Washer
D-6	47	24610963	Cassette holding plate	G-4	141	24610972	2.6×4.7×0.13, Washer
D-5	53	24610964	Spring holder	E-6	142	24610973	2.7×6×0.5, Washer
D-5	54	24605466	Spring	D-1	151	24610959	Cassette panel
D-5	56	24602267	Reel stand ass'y	G-6	158	24610939	Side bracket R
	63	24606223	Sensor switch ass'y	F-6	164	24605188	Cassette spring
I-4	63a	24611056	Switch holding plate	D-3	168	24610940	Cassette holder ass'y
H-5	63b	24606205	Leaf switch	B-4	168a	24610949	Holding plate
H-5	63c	24611057	Washer	F-6	168b	24610849	Holder R
I-5	63d	82112030	M2×30, Pan head screw	C-2	168c	24610848	Holder L
I-5	63e		P10, Connector	F-5, C-3	168d	24605463	Cassette spring
H-4	63f	24611058	2.9×5×0.5, Washer	B-4	168e	835426082	M2.6×8, Flat head screw
D-4	70	24603281	Switch lever	C-1	172	24611050	Side bracket L ass'y
D-3	71	24603282	Metal switch lever	C-2	172a	24611059	Side bracket
A-5	72	24611049	Lock plate	B-1	172b	24603283	Canceller lever
A-5	73	246005503	Spring	A-3	172c	24605407	Spring
A-5	74	891030	ES-3, Ring CS	A-2	172d	893030	E-3, Ring E
D-5	77	24611140	2.1×4×0.1, Washer	B-2	179	24611051	Dumper unit
F-1	80	24601182	PAD unit ass'y	A-3	179	24611051	Dumper unit
G-1	80a	24610968	Plate, motor	A-3	180	24605456	Spring
F-1	80b	24601103	Motor	B-3, A-2	181	891024	Circlip
F-3	80c	24606182	Leafswitch	B-5	184	24606168	Holder ass'y, lamp
G-2	80d	24602133	Cam gear	B-5	184a	24610498	Holder, lamp
G-2	80e	82112003	M2×3, Pan head screw	B-5	184b	24606173	Lamp
E-3	80f	833125209	M2.5×20, Pan head screw				
F-2	80g	24606181	Pc board				
F-2	80h	24606224	Post with base				
G-1	90		Binder				
H-1	94	24601183	Reel motor ass'y				
H-2	94a	24601054	Reel motor				
G-3	94b	24605467	Spring				
G-3	94c	24602235	Wheel lever				
G-3	94d	24602236	Wheel				
G-3	94e	24610969	1.3×3.4×0.5, Washer				
G-3	94f	24610970	Felt				
G-3	94g	24602237	Motor wheel				
G-3	94h	24611141	1.7×6×0.25, Washer				
H-2	94i	24610374	2.1×7×0.5, Washer				
H-2	94j	24610373	Spring holder				

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 DC voltmeter
 Non-magnetic screw driver

Blank tapes(completely erased)

NORMAL.....NEW UD90
 HIGH.....NEW XL-II 90
 METAL.....NEW MX60

Test tapes

VTT-658 : 10 kHz, -15dB
 MTT-111 : 3 kHz, -10dB
 MTT-150 : Dolby level calibration
 400Hz tone 200nWb/m
 MTT-215C : 315Hz, 10kHz
 TW-2111 : Torque meter
 MC-112C : Mirror tape

Item	Connection of instrument	LINE input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Playback torque		TW-2111	PB	TW-2111	R759	35 to 55gcm	
2	Tape speed		MTT-111	PB	Frequency counter	Semi-fixed on the motor	3,000 to 3,010Hz	
3	Head azimuth		VTT-658	PB	AC voltmeter	Head azimuth screws	Maximum and same phase at channels L and R.	See fig. 1 Set the semi-fixed resistors R127 and R128 to center position.
4	Playback level		MTT-150	PB	AC voltmeter	R127(L) R128(R)	580mV	
5	Bias current	1kHz, -20dB and 12kHz, -20dB	MAXELL UD-1, C90	REC/PB	AC voltmeter	R439(L) R440(R)	Same level at REC/PB	INPUT VOLUME maximum
6	Record level	1kHz	Fig. 2	REC PAUSE	AC voltmeter	Attenuator or AF OSC output	350mV	INPUT VOLUME maximum
				REC/PB	AC voltmeter	R401(L) R402(R)	Same level at REC/PB.	

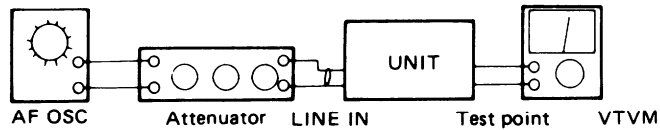
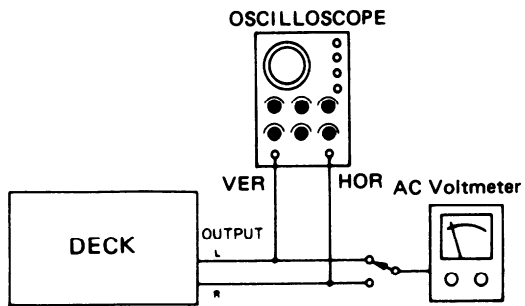
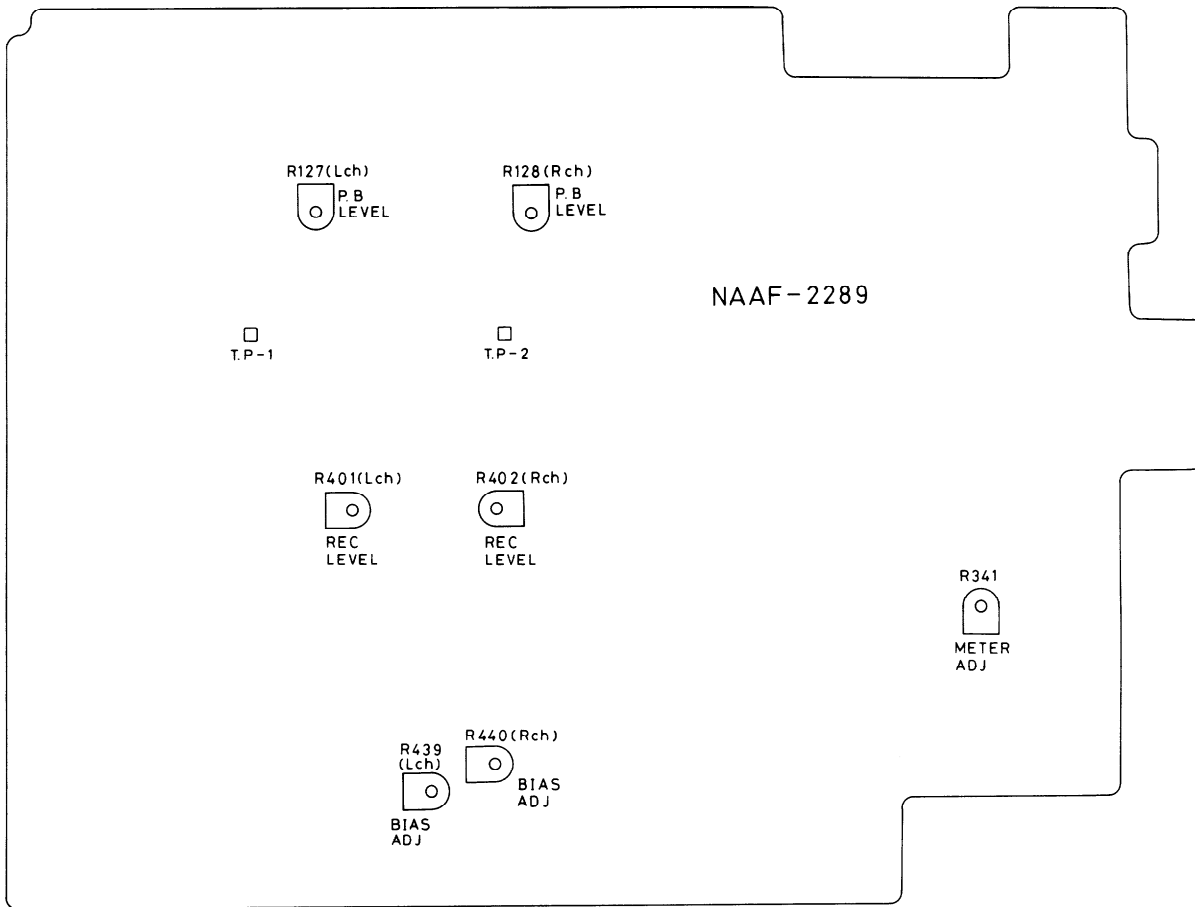
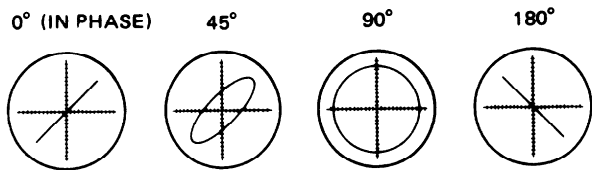


fig-2



Confirming phase relationship

fig-1

PRINTED CIRCUIT BOARD PARTS LIST

CONTROL CIRCUIT PC BOARD (NACOC-2296)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q701	222866	LM6402H-586
Q702	222776	LM6402H-424
Q703, 704	222862	LB1640N
Q705	222865	BA12004
Q706	222840692	4069BP
	Transistors	
Q710	2201074 or 2201385	2SD880 (Y) or 2SD330 (E)
Q711	2201540	2SD947
Q712, Q715	2211254,	2SC1815 (Y),
Q716, Q719	2212114, 2210747 or 2212485	2SC2458 (Y), 2SC945A (P) or JC501 (Q)
	Transistors	
Q713	2211704 or 2211706	2SD655 (E) or 2SD655 (F)
Q714, Q717	2211454,	2SA1015 (Y),
Q718	2212124,	2SA1015 (Y),
Q724-Q730	2210804 or 2212494	2SA733A (Q) or JA101 (P)
Q720-Q722	2211706	2SD755 (F)
Q723	2211706	2SD655 (F)
Q731	2211544	2SC1959 (Y)
	Diodes	
D701-704	223155	ISS138
D705	2239571 or 2243201	RD9. 1EB1 or MTZ9.1A
	Capacitors	
C701	352750479	4.7 μ F, 25V, Elect.
C703	352741009	10 μ F, 16V, Elect.
C707	392880107	1 μ F, 50V, LL
C708	352781599	0.15 μ F, 50V, Elect.
C709	352780109	1 μ F, 50V, Elect.
C718	352732219	220 μ F, 16V, Elect.
	Ceramic oscillator	
X701	3010092	CSB800K
	Resistors	
R701-R711	49163392411	3.9k Ω ×11, 1/10W, Network
R712-R722	49163392411	3.9k Ω ×11, 1/10W, Network
R723-R728	49121392406	3.9k Ω ×6, 1/8W, Network
R729-R740	49163392412	3.9k Ω ×12, 1/10W, Network
R741-R744	49121392404	3.9k Ω ×4, 1/0W, Network
R759	5215045 or 5215021	N08HR10KBC, Semi-fixed
R760	441722704	27 Ω , 2W, Metal oxide film
	Plugs	
P403	25055133	NPLG-3P-117
P702	25055140	NPLG-10P-124
P703	25055136	NPLG-6P-120
P704	25055135	NPLG-5P-119
	Socket	
P701a	2000447	NSAS-20P-406
	Lamp	
PL701	210183	PL14V0.06AW-2.0

PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD (NAAF-2289/A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q111	222465 or	NJM4558D or
Q413	222808	M5218P
Q201, Q202	222729	HA12058NT
Q301	222652	M5218L
Q307	222507	TA7612AP
Q503	222681 or 222695	IR2702 or LA6324
Q901	222780122	78M12
Q906	222780050	7805
	Transistors	
Q101-Q104	2211896,	2SC1815L (B),
Q107, Q108	2212256 or 2211406	2SC2458 (LL) or 2SC2240 (BL)
Q105, Q106	2211255,	2SC1815 (GR),
Q109, Q110	2212115,	2SC2458 (GR),
Q305, Q306	2210746 or	2SC945A ((P) or
Q401-Q402	2212485	JC501 (Q)
Q113, Q114	2212304, 2212305, 2211945 or 2211946	2SK381 (D), 2SK381 (E), 2SK246 (GR) or 2SK246 (BL) (G/W)
Q203, Q204	2211705 or 2211706	2SD665 (E) or 2SD755 (F)
Q414, Q415	2211254,	2SC1815 (Y),
Q601	2212114,	2SC2458 (Y),
Q904	2210746 or 2212485	2SC945A (P) or JC501 (Q)
Q417	2201540	2SD947
Q418-Q421	2211455,	2SA1015 (GR),
Q602, Q903	2212125, 2210803 or 2212494	2SA1048 (GR), 2SA733A ((P) or JA101 (P)
Q501, Q502	2211255,	2SC1815 (GR),
Q603	2212115, 2210746 or 2212485	2SC2458 (GR), 2SC945A (P) or JC501 (Q)
Q505, Q506	2211454, 2212124, 2210804 or 2212494	2SA1051 (Y), 2SA1048 (Y), 2SA733A (Q) or JA101 (P)
Q902	2201274 or 2201276	2SB772 (Q) or 2SB772 (P)
Q905	2201074 or 2201385	2SD880 (Y) or 2SD330 (E)
	Diodes	
D101, D102	223145, 223150, 223105 or 223133	1S2076TD, US1040, 1S1555 or DS442X (G/W)
D301, D302	223132	1K60
D303-D308	223145,	1S2076TD,
D601-D603	223150,	US1040,
D605, D607	223105 or	1S1555 or
D608, D903	223133	DS442X
D309, D310	223848	GP08B
D401	2239673, 2242922 or 2243253	RD15EB3, EQA-02-14B or MTZ15C
D402-D407	223155	1SS138
D501, D502	223155	1SS138
D604	2239673, 2242922 or 2243253	RD15EB3, EQA02-14B or MTZ14C

CIRCUIT NO.	PART NO.	DESCRIPTION
D606	2239471, 2242839 or 2243151	RD5.6EB1, EQA02-05F or MTZ5.6A (G/W)
D901	223862 or 223890	WL01 or W01RL
D902	223868 or 223889	2W02 or RC202
	Diodes	
D904	223891 or 223842	RL152 or TP-15B
D905	2239653 or 2243243	RD13EB3 or MTZ13C
	Coils	
L201, L202	233306	NMC-6043
L203, L204	233245	NMC-2029
L401, L402	24606072 or 231040	NCH-1010 or NCH-2080
L403, L404	24606080 or 231038	NCH-1022 or NCH-2078
L405, L406	233314	NCH-2097
L407	231025	NCH-1064
	Osc. block	
Z001	24606214	NOB-032
	Capacitors	
C103, C104	392880337	3.3 μ F, 50V, LL
C109, C110	352741009	10 μ F, 16V, Elect.
C113, C114	352732209	22 μ F, 10V, Elect.
C121, C122	392880107	1 μ F, 50V, LL
C123, C124	352780109	1 μ F, 50V, Elect.
C201, C202	352780109	1 μ F, 50V, Elect.
C205, C206	352741009	10 μ F, 16V, Elect.
C207, C208	352732219	220 μ F, 10V, Elect.
C213, C214	392850477	4.7 μ F, 24V, LL
C217, C218	352783399	0.33 μ F, 25V, Elect.
C219, C220	352781599	0.15 μ F, 40V, Elect.
C221, C222	352784799	0.47 μ F, 50V, Elect.
C223, C224	352786899	0.68 μ F, 50V, Elect.
C225, C226	352741009	10 μ F, 16V, Elect.
C237, C238	392850477	4.7 μ F, 25V, LL
C241, C252	352781599	0.15 μ F, 50V, Elect.
C243, C244	352784799	0.47 μ F, 50V, Elect.
C245, C246	352741009	10 μ F, 16V, Elect.
C301, C302	352741009	10 μ F, 16V, Elect.
C303, C304	352780339	3.3 μ F, 50V, Elect.
C401, C402	352741009	10 μ F, 16V, Elect.
C403, C404	352780339	3.3 μ F, 50V, Elect.
C413, C414	352781599	0.15 μ F, 50V, Elect.
C415, C416	352750479	4.7 μ F, 25V, Elect.
C421	352750479	4.7 μ F, 24V, Elect.
C422	352722219	220 μ F, 6.3V, Elect.
C505	352782299	0.22 μ F, 50V, Elect.
C507	352741009	10 μ F, 16V, Elect.
C509, C510	452780109	1 μ F, 50V, Elect.
C511	352750479	4.7 μ F, 25V, Elect.
C512	352780109	1 μ F, 50V, Elect.
C513	352750479	4.7 μ F, 25V, Elect.
C602	352780109	1 μ F, 50V, Elect.
C603	352741019	100 μ F, 16V, Elect.
C604	352750479	4.7 μ F, 25V, Elect.
C605	352784799	0.47 μ F, 50V, Elect.
C608	352734709	47 μ F, 10V, Elect.
C903, C904	352741029	1,000 μ F, 24V, Elect.
C905	352782299	0.22 μ F, 50V, Elect.
C906	352781099	0.1 μ F, 50V, Elect.
C907	352741009	10 μ F, 16V, Elect.

PRINTED CIRCUIT BOARD PARTS LIST

CONTROL CIRCUIT PC BOARD (NACOC-2296)

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q701	222866	LM6402H-586
Q702	222776	LM6402H-424
Q703, 704	222862	LB1640N
Q705	222865	BA12004
Q706	222840692	4069BP
Transistors		
Q710	2201074 or 2201385	2SD880 (Y) or 2SD330 (E)
Q711	2201540	2SD947
Q712, Q715	2211254,	2SC1815 (Y),
Q716, Q719	2212114, 2210747 or 2212485	2SC2458 (Y), 2SC945A (P) or JC501 (Q)
Transistors		
Q713	2211704 or 2211706	2SD655 (E) or 2SD655 (F)
Q714, Q717	2211454,	2SA1015 (Y),
Q718	2212124,	2SA1015 (Y),
Q724-Q730	2210804 or 2212494	2SA733A (Q) or JA101 (P)
Q720-Q722	2211706	2SD755 (F)
Q723	2211706	2SD655 (F)
Q731	2211544	2SC1959 (Y)
Diodes		
D701-704	223155	ISS138
D705	2239571 or 2243201	RD9. 1EB1 or MTZ9.1A
Capacitors		
C701	352750479	4.7 μ F, 25V, Elect.
C703	352741009	10 μ F, 16V, Elect.
C707	392880107	1 μ F, 50V, LL
C708	352781599	0.15 μ F, 50V, Elect.
C709	352780109	1 μ F, 50V, Elect.
C718	352732219	220 μ F, 16V, Elect.
Ceramic oscillator		
X701	3010092	CSB800K
Resistors		
R701-R711	49163392411	3.9k Ω \times 11, 1/10W, Network
R712-R722	49163392411	3.9k Ω \times 11, 1/10W, Network
R723-R728	49121392406	3.9k Ω \times 6, 1/8W, Network
R729-R740	49163392412	3.9k Ω \times 12, 1/10W, Network
R741-R744	49121392404	3.9k Ω \times 4, 1/0W, Network
R759	5215045 or 5215021	N08HR10KBC, Semi-fixed
R760	441722704	27 Ω , 2W, Metal oxide film
Plugs		
P403	25055133	NPLG-3P-117
P702	25055140	NPLG-10P-124
P703	25055136	NPLG-6P-120
P704	25055135	NPLG-5P-119
Socket		
P701a	2000447	NSAS-20P-406
Lamp		
PL701	210183	PL14V0.06AW-2.0

CIRCUIT NO.	PART NO.	DESCRIPTON
C908	352752229	0.22 μ F, 50V, Elect.
C909	352742219	220 μ F, 16V, Elect.
C910	352744709	47 μ F, 16V, Elect.
C911	3504168	13,000 μ F, 24V, Elect.
C912	352782299	0.22 μ F, 50V, Elect.
C913	352781099	0.1 μ F, 50V, Elect.
C951, C952	352744709	47 μ F, 16V, Elect.
C953	352741019	100 μ F, 16V, Elect.
C957, C958	352741009	10 μ F, 16V, Elect.
Resistors		
R127, R128	5215046 or 5215023	N08HR50KBC, Semi-fixed
R153, R154	6142042	N60LGL50KA15Z, Input level slide
R341	5215045 or 5215021	N08HR10KBC, Semi-fixed
Resistors		
R401, R402	5215044 or 5215020	N08HR5KBC, Semi-fixed
R439, R440	5215047 or 5215024	N08HR100KBC, Semi-fixed
R441	441521004	10 Ω , 1/2W, Metal oxide film
R901	441520224	2.2 Ω , 1/2W, Metal oxide film
R905	441524794	0.47 Ω , 1/2W, Metal oxide film
R907	441721804	18 Ω , 2W, Metal oxide film
Relay		
RL101	25065174	NRL-2P1A-DC12-09
Plugs		
P101	25055037	NPLG-6P-28
P203	25055133	NPLG-3P0117
P401	25055038	NPLG-2P-29
P601	25055142	NPLG-12P-126
Terminals		
P103	25045120	NPJ-4PDBL49, Input/output
P201	25045134	HLJ4337-01-010, Microphone
P202	25050064	NSCT5P18, DIN (G/W)
Socket		
P403a	2000396	NSAS-6P-355
Switch		
S201	25035473	NPS-422-L435, Push

BALANCE VOLUME PC BOARD (NAVR-2290)

CIRCUIT NO.	PART NO.	DESCRIPTON
R151, R152	5148098	N16RGLC250KMN20, Variable resistor

ACCU. BIAS VOLUME PC BOARD (NAVR-2291)

CIRCUIT NO.	PART NO.	DESCRIPTON
R443	5146047	N16RLC5KB20, Variable resistor

COUNTER/REPEAT SWITCH PC BOARD (NASW-2292)

CIRCUIT NO.	PART NO.	DESCRIPTION
S710-S714	25035389	NPS-111-S353, Push switch
P703	2000445	NASA-6P-404, Socket

HEADPHONE TERMINAL PC BOARD (NAHP-2293)

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	25045139	NLJ0540-01-010, Headphone terminal

EDGE LIGTH PC BOARD (NAPL-2294)

CIRCUIT NO.	PART NO.	DESCRIPTION
PL101	210090	PL14V, 150mA, Lamp

TIMER/MEMORY SWITCH PC BOARD (NASW-2295)

CIRCUIT NO.	PART NO.	DESCRIPTION
S720	25030267	NRS-145-20SS, Rotary switch
P704	2000444	NSAS-5P-403, Socket

OPERATION SWITCH PC BOARD (NASW-2297)

CIRCUIT NO.	PART NO.	DESCRIPTION
S701-709	25035389	NPS-111-S353, Push switch

DIAPLAY PC BOARD (NADIS-2298)

CIRCUIT NO.	PART NO.	DESCRIPTION
D201, D202	225178	GL3HY27, LED
D713, D714	225178	GL3HY27, LED
D715-D721	225179	GL3NG28, LED
D710, D712	225177	GL3PR28, LED
D711	225179	GL3NG28, LED
P203a	2000442	NSAS-3P-401, Socket
	27190352	Holder, LED

L.E.D. PC BOARD (NALED-2299)

CIRCUIT NO.	PART NO.	DESCRIPTON
D722	225176	GL3N412, LED

POWER SWITCH PC BOARD (NASW-2300)

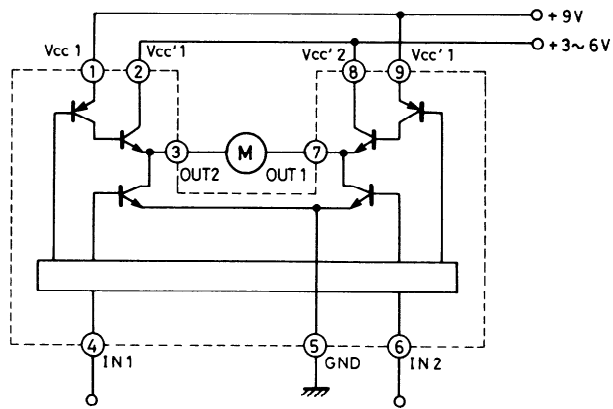
CIRCUIT NO.	PART NO.	DESCRIPTON
C999	3500065A	DE7150FZ103P400VAC,
Capacitor IS		
S901	25035375	NPS-111-L339P, Power switch
	25060092	NTM-1S33, Terminal

REMOTE CONTROL TERMINAL PC BOARD (NARM-2301)

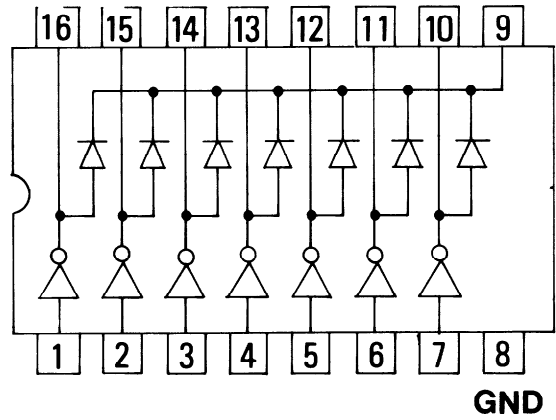
CIRCUIT NO.	PART NO.	DESCRIPTON
P750	25050070	NSCT-7P20, Terminal

IC BLOCK DIAGRAM

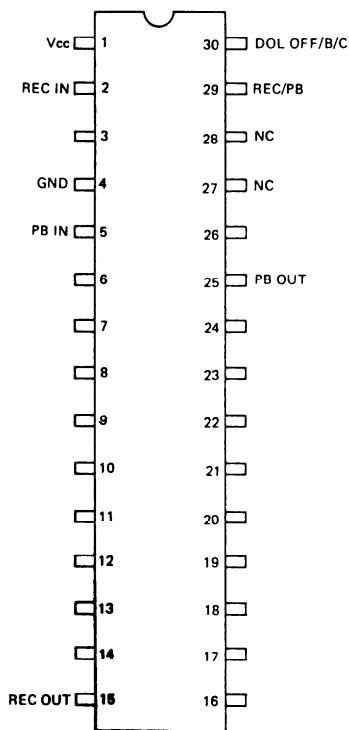
LB-1640N (MOTOR DRIVE)



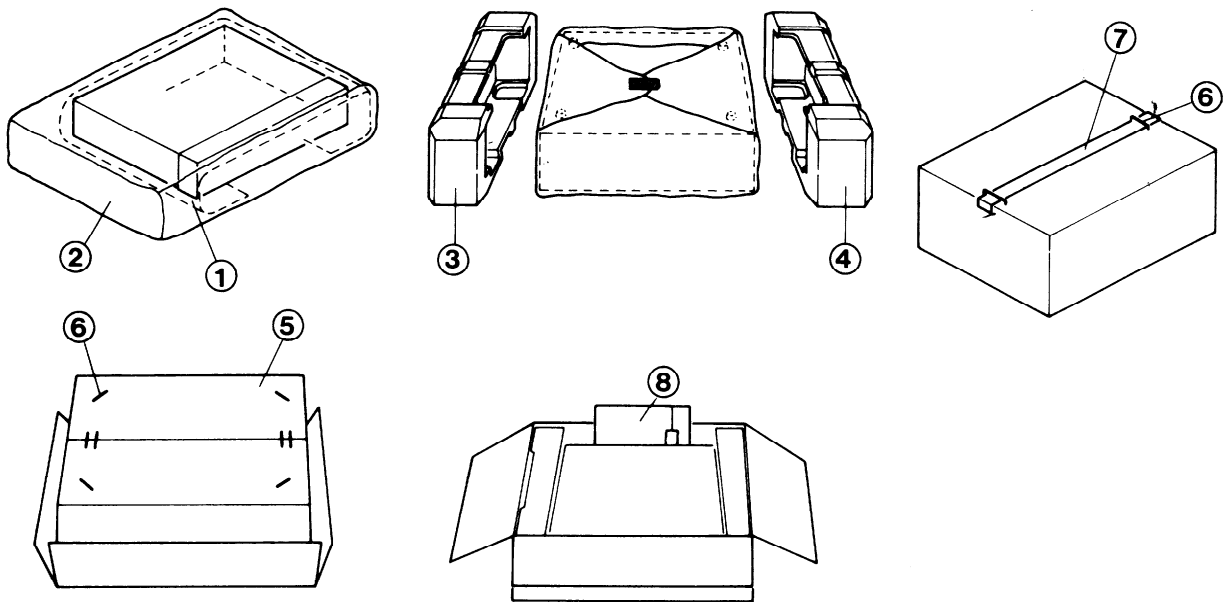
BA-12004 (LED DRIVER)



HA-12058NT (DOLBY-NR)



PACKING VIEW



D model

REF. NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500×800 Protection sheet
2	290311A	620×550 Poly bag
3	29090770A	Pad (L)
4	29090769B	Pad (R)
5	29051067	Master carton box
	29051068	Master carton box (B)
6	282301	Sealing hook
7	260012	Damplon tape
8	Accessory bag ass'y	
	29340848	Instruction manual
	2010095	Connection cable
	29365006-7	Waranty card (N)
	29358002B	Service station list (N)
	29100005	220×330 Poly bag

G/W Model

REF. NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500×800 Protection sheet
2	290311A	500×750 Poly bag
3	29090770A	Pad (L)
4	29090769A	Pad (R)
5	29051067	Master carton box
	29051068	Master carton box (B)
6	282301	Sealing hook
7	260012	Damplon tape
8	Accessory bag ass'y	
	29340849	Instruction manual (G)
	2010095	Connection cable
	25055040	Conversion plug CV-K-2 (W)
	29100005	220×330 Poly bag

NOTE:

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

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