

ONKYO® SERVICE MANUAL


STEREO CASSETTE

TAPE DECK

MODEL TA-R33

Silver and Black models

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

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

SPECIFICATIONS

Track System:	4-track, 2-channel stereo
Recording System:	AC bias
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec
Wow and Flutter:	0.05% (WRMS)
Frequency Response:	20–15,000Hz (Normal) (30–14,000Hz ± 3dB) 20–16,000Hz (High) (30–15,000Hz ± 3dB) 20–17,000Hz (Metal) (30–16,000Hz ± 3dB)
S/N Ratio:	Dobly NR out: 60 dB (metal position tape) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with Dolby B. A noise reduction of 20 dB at 5 kHz is possible with Dolby C.
Input Jacks:	Mic Jacks: 2 Input sensitivity: 0.3 mV/600 ohms Input impedance: 2.7 kohms Line IN: 2 Input sensitivity: 60 mV Input impedance: 50 kohms
Outputs:	Line OUT: 2 Std output level: 500mV (0 dB) Opt load impedance: over 50 kohms Headphone Jack: 1 Opt load impedance: 8–200 ohms
Motors:	DC servo: 1 DC motor: 2



ONKYO®
AUDIO COMPONENTS

Heads: Rec/PB head: Special Hard Permalloy
 Erase head: Ferrite
 Semiconductors: TR: 64 Diodes: 34 IC: 13 LED: 17
 Power Supply: AC120V/60 Hz
 Power Consumption: 25 watts
 Dimensions: 418(W) x 112(H) x 270(D) mm
 (16-1/2" x 4-3/8" x 10-5/8")
 Weight: 5.1 kg. (11.2 lbs.)

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

SERVICE PROCEDURES

1. Replacing the lamp

This unit used the lamp listed below.

Circuit No.	Parts No.	Description
PL-901	210090	PL14V 150mA

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

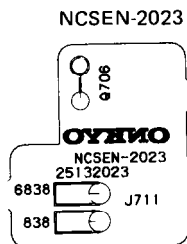
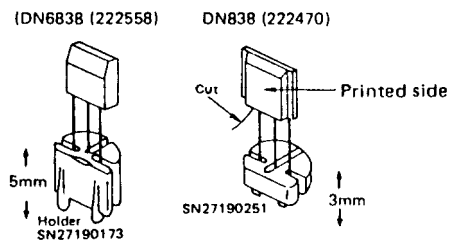
2. Instruction resistance measurement

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

Specifications; 500V more than 10MΩ

3. Replacing the Hall ICs

Cautions: As the position of leg of DN6838 and DN838 differ, use the same Hall IC when replacing.



SPECIAL MODES OF OPERATION

Auto-reverse operation

This unit includes an auto-reverse function that automatically reverses the direction of tape travel in the playback or record modes when the end of the magnetic tape is reached. Tape travel is reversed as soon as a photo sensor detects the presence of the clear leader. In other words, as soon as the sensing light ray passes through the tape, the direction of tape travel is reversed.

The reversal time interval is extremely short so that the silent gap during playback is barely noticeable. If the cassette tape does not have a clear leader section, tape travel is reversed the instant the end of the tape (including leader) is reached.

When defective cassette tapes having pin holes or other damage which allows light to pass through the tape, auto-reverse may be activated at that point. To prevent this from happening, play and record these tapes using the one side tape transport mode in which auto-reverse is not activated under any circumstances.

Notes:

- Because of slight physical differences between cassette halves, cassettes recorded in the forward direction should be played back in the forward direction to obtain the best results.
- When recording, the direction of tape travel only switches from forward to reverse. To keep track of which side is being recorded so that you do not mistakenly use an already recorded side, it is a good idea to always place side A facing outward for recording operations.

Blank skip operation

When the blank skip button 21 is pressed while a tape is being played back, blank (unrecorded) sections of tape of more than 20 seconds in length are automatically skipped over in the fast forward mode. Tape winding stops at the beginning of the next recorded section and playback is automatically resumed.

When playing back a long section of quiet music, press this button again to turn the blank skip function off to prevent mistaken operation.

The Automatic Tape Selection System

This deck automatically detects the type of cassette that has been loaded in cassette holder and sets the bias and equalization to the correct settings. The cassette type is then displayed by the Tape Selector Indicator 7. Tape selection is performed by detecting the presence or absence of identification pits on the back of the cassette shell. Cassettes manufactured before this identification system was adopted and bargain cassettes that do not incorporate these pits can not be used with this deck.

MECHANISM OPERATIONS

1. Tape Transport Mechanism Drive

1-1 Outline

The R33 tape transport uses an assist motor to rotate and raise and lower the head base, the same motor assist method as that used in the TA-R77 and other decks. However, the tape transport position detection method, head position determining method and assist motor braking method are different. Tape transport position detection is performed using

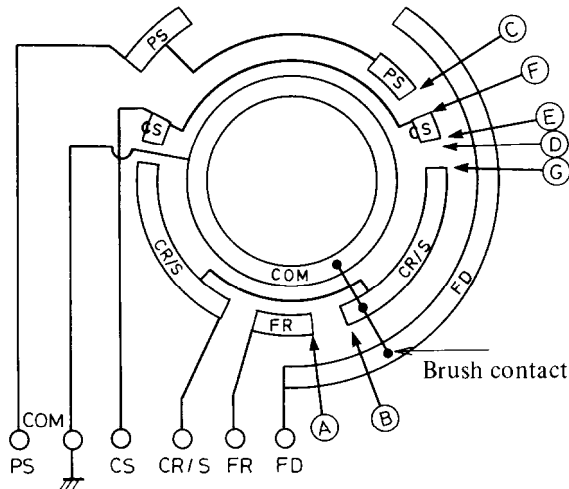


Fig. 1 Rotary Switch Patterns

a rotary switch as shown in figure 1. As in previous decks, it is divided into ranges in which operation is allowed and prohibited. However, instead of allotting each of these two ranges a different code, the edge of each pattern is used as the starting point for operation. These patterns are divided between those for forward and reverse operation. All patterns except the forward one are symmetrical left to right. The forward pattern is used to detect the direction of tape travel; when the transport mechanism is in the forward side, the brush causes contact with COM to set the ground level.

Determination of the head position is done by the stopper when a precise amount of head insertion is required (for PLAY-REC and AMCS). Therefore, the transport is constructed so that the head position does not change even if the assist motor rotates too far. However, there is no head position determining stopper for FF, REW and STOP. In these cases, braking is performed using the motor driver IC which has a brake function and by reversing the assist motor, see section 1-3 for details.

1-2 Transport Mechanism Drive Method

1-2-1 FF and REW: The assist motor is rotated in the direction of the FR pattern (the direction of rotation is reversed for the forward and reverse sides). The FR signal is observed and, when it becomes 0V (when point A is reached), the brake is applied to the assist motor and the reel motor rotates according to the FF or REW command. The method by which the brake is applied to the assist motor is explained in section 1-3.

1-2-2 STOP: when stopping from the FF or REW mode, the CR/S signal is observed and, when it becomes 0V (when point B is reached), the brake is applied to the assist motor. When stopping from the PLAY or REC mode, the assist motor is rotated to point A and then it is rotated in the opposite direction to the STOP position in the same method as when stopping from FF or REW.

1-2-3 PLAY (REC): The PS pattern is used to determine the PLAY position. When the edge of the PS pattern is detected (when point C is reached), the head base has already contacted the stopper so that the assist motor is rotated up to this point. However, the capstan and pinch roller contacted each other at a point in the CS pattern on the side toward the CR/S pattern (point D). Therefore, about 20 msec. after point E is detected 0-PLAY is output to rotate the reel motor to take up the tape. When recording, the BIAS CONT. signal is simultaneously output. When switching from PLAY to STOP, 0-PLAY is switched off to stop the reel motor about 20 msec. after point F is detected.

1-2-4 AMCS: To perform song location operation, the stopper must be moved outward to set the head base position. The same construction as that used for the reel motor swing mechanism is employed. By rotating the reel motor, the stopper protrudes on the right and left sides. However, the stopper can move freely only over the vicinity of the edge of the CR/S pattern on the CS side. At all other points, the stopper does not protrude on either side even when the reel motor rotates. Because of this, in the PLAY operation described in 1-2-3, the reel motor is rotated 20 msec. after the CS signal is detected just to be safe. During song location operation, starting the reel motor to move the stopper immediately after the CR/S signal has ended (point G) is too late because the beginning of the song may have already been passed before the head base strikes the stopper. However, since it is not possible to detect the point just before the CR/S signal ends, the assist motor is rotated until point C is detected. Then the assist motor is reversed and stopped when point G is detected. This point is the point just before the CR/S signal ends. From here on, the assist and reel motors are both

driven. The reel motor moves the stopper and the tape; the assist motor rotates until point E is detected.

NOTE: When the unit is repaired, the song location stopper will fall downward when the unit is placed on its side. This may cause the head base to be clamped at the song location position thereby putting the unit in the song location mode.

1-3 Assist Motor Braking

As explained in section 1-2, the stopper moves out to clamp the head position for PLAY (REC) and song location operation. Because of this, no problem is created if the assist motor rotates too far. However, for FF and REW, the direction of tape travel is switched if the assist motor is allowed to rotate beyond the specified point, so the motor must be stopped within a limited range. The assist motor drive IC includes a braking function.

Braking is activated when all input pins are either HIGH or LOW. In this case, both ends of the motor are shorted to apply the brake. That is, when Q1 and Q2 are off, Q3 and Q4 are on. For FF and REW, though, it is still possible for the motor to go too far using this braking method alone. To solve this problem, the assist motor is reversed when braking is applied.

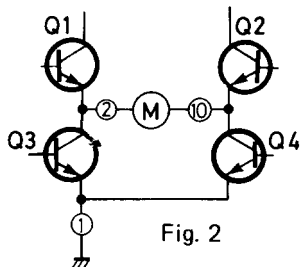


Fig. 2

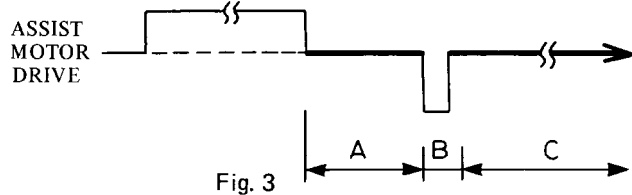
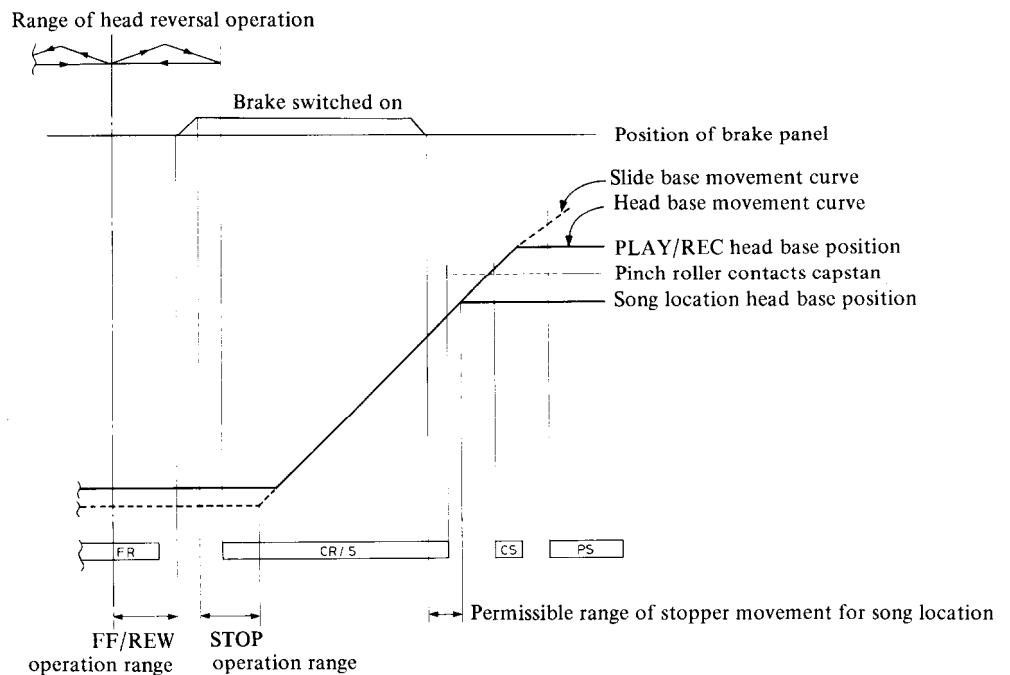


Fig. 3

This procedure is shown in figure 3 which shows that, when the desired location is reached, the brake is applied by the motor drive IC over the 15 msec. of interval A. The remaining rotational force of the motor is used to securely set the head base to the correct position (PLAY-REC). Next, the assist motor is reversed to absorb unnecessary rotational force over interval B. For PLAY and REC, this interval is 2 to 4 msec.; for other modes the interval is 4 to 8 msec.

Interval C is the time until the assist motor is driven according to the next operation command; during this time, the brake is applied by the motor drive IC. In all previous motor assist methods, there has been a 50 msec. interval after the assist motor is driven to permit reconfirmation of the transport position. In this tape transport mechanism, however, the operation positions are all detected by HIGH-LOW (5V to 0V) signal changes instead of codes. Furthermore, these H-L changes are read twice over 4 msec. to permit reading the transport position a second time for reconfirmation.



1-4 Initial Transport Setting When Power is Switched On

Because the transport position detection rotary switch uses the pattern edges as starting points for operation, the assist motor must be rotated each time power is switched on to accurately set it to the STOP position. To do this, the assist motor is rotated until the FR signal becomes 0V. Of course, the motor rotates in the ASSIST DOWN direction for the forward side and in the opposite direction for the reverse side. When the 0V FR signal is confirmed, the assist motor is reversed and rotates until the CR/S signal is detected at which time the brake is applied.

The motor is now in the standard STOP position which is the initial setting for the tape transport mechanism.

1-5 Capstan Motor On/Off Switching

The capstan motor is switched on or off as shown for the operations listed in the following table.

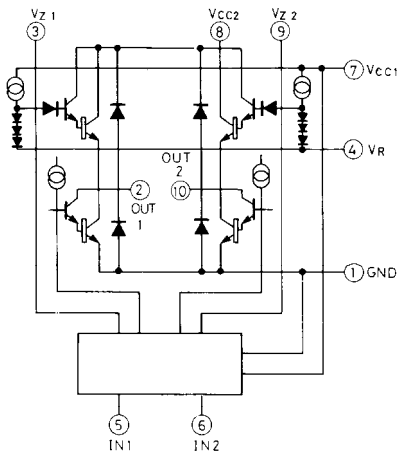
Capstan motor switched on	PLAY, REC
Capstan motor switched off	STOP, FF, REW, AMCS, PAUSE, REC/PAUSE, BLANK SKIP, Direction change
Capstan motor mode not changed	AUTO SPACE

1-6 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.

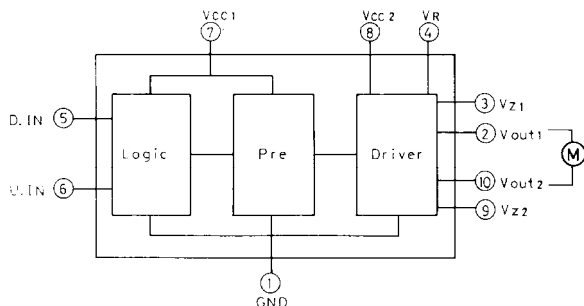
IC BLOCK DIAGRAM

BA6209 (ASSIST MOTOR DRIVER)



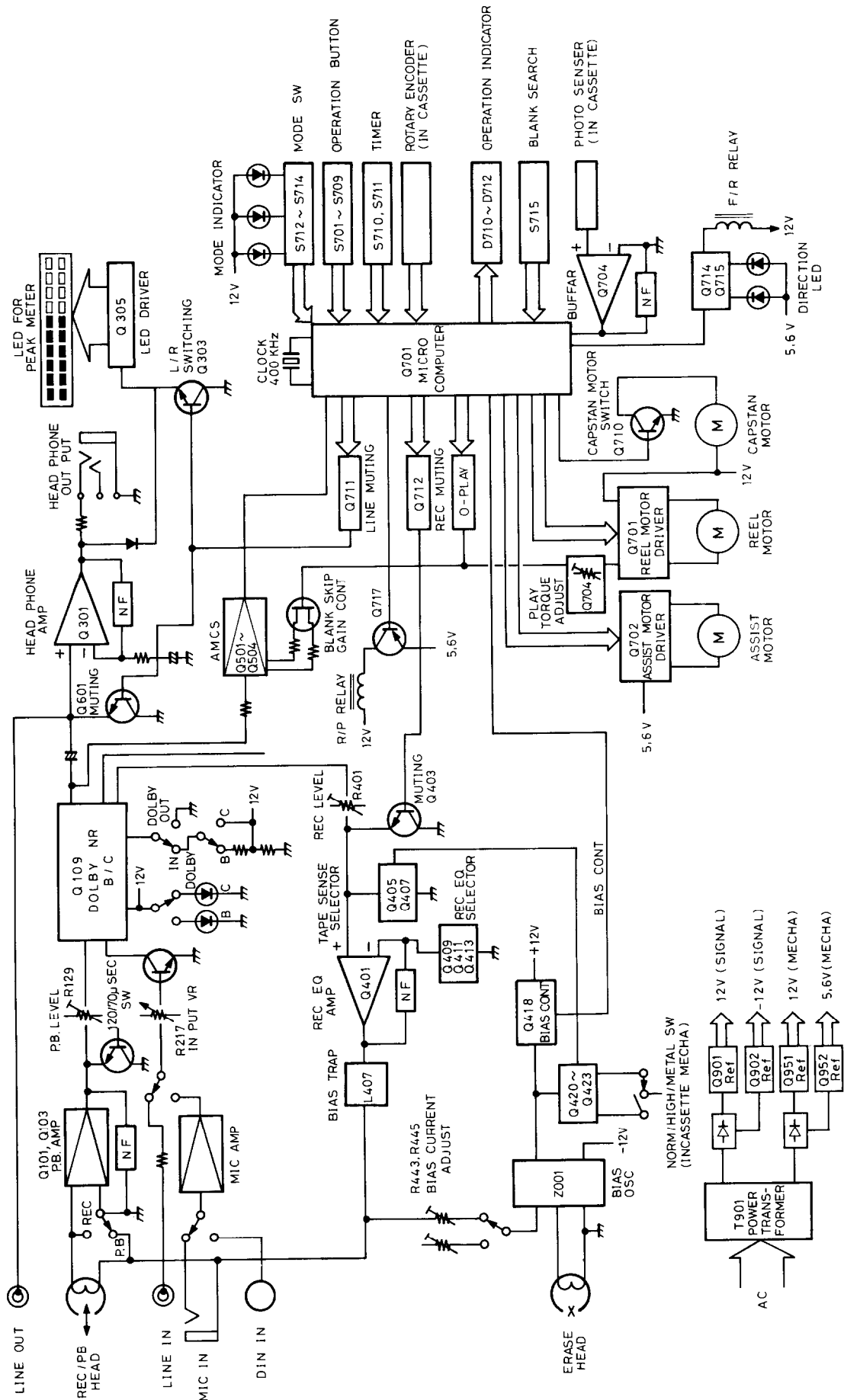
INPUT		OUTPUT		
IN1 (5)	IN2 (6)	OUT1 (2)	OUT2 (10)	
L	L	L	L	STOP
H	L	H	L	REV
L	H	L	H	FOR
H	H	L	L	BRAKE

BA6229 (REEL MOTOR DRIVER)






INPUT		OUTPUT		
D. IN (5)	U. IN (6)	OUT1 (2)	OUT2 (10)	
H	H	L	L	
L	H	L	H	UP
H	L	H	L	DOWN
L	L	L	L	

BLOCK DIAGRAM

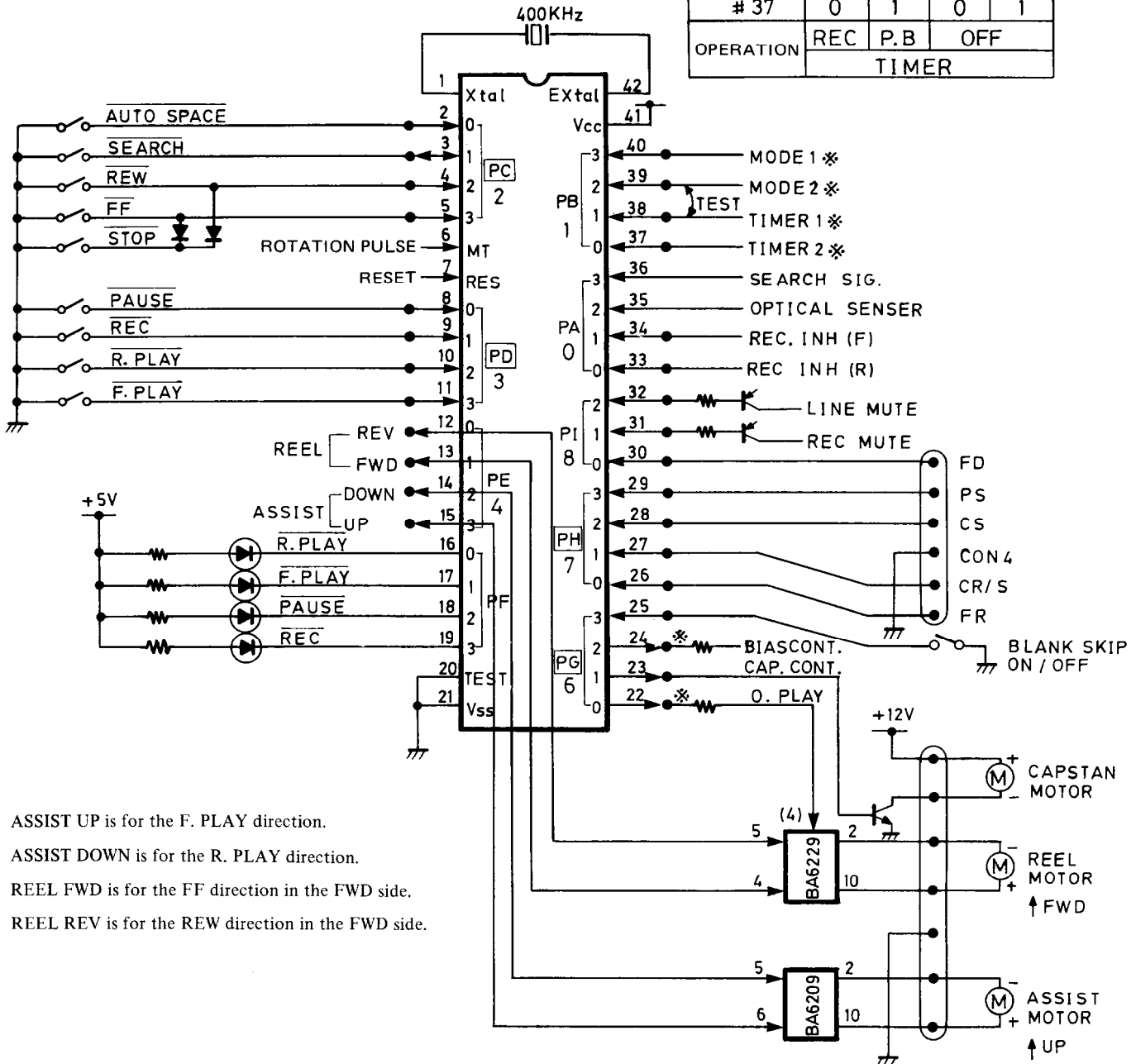


BLOCK DIAGRAM

MICRO COMPUTER (LM6402A-426)

# 40	0	0	1	1
# 39	0	1	0	1
OPERATION	  			

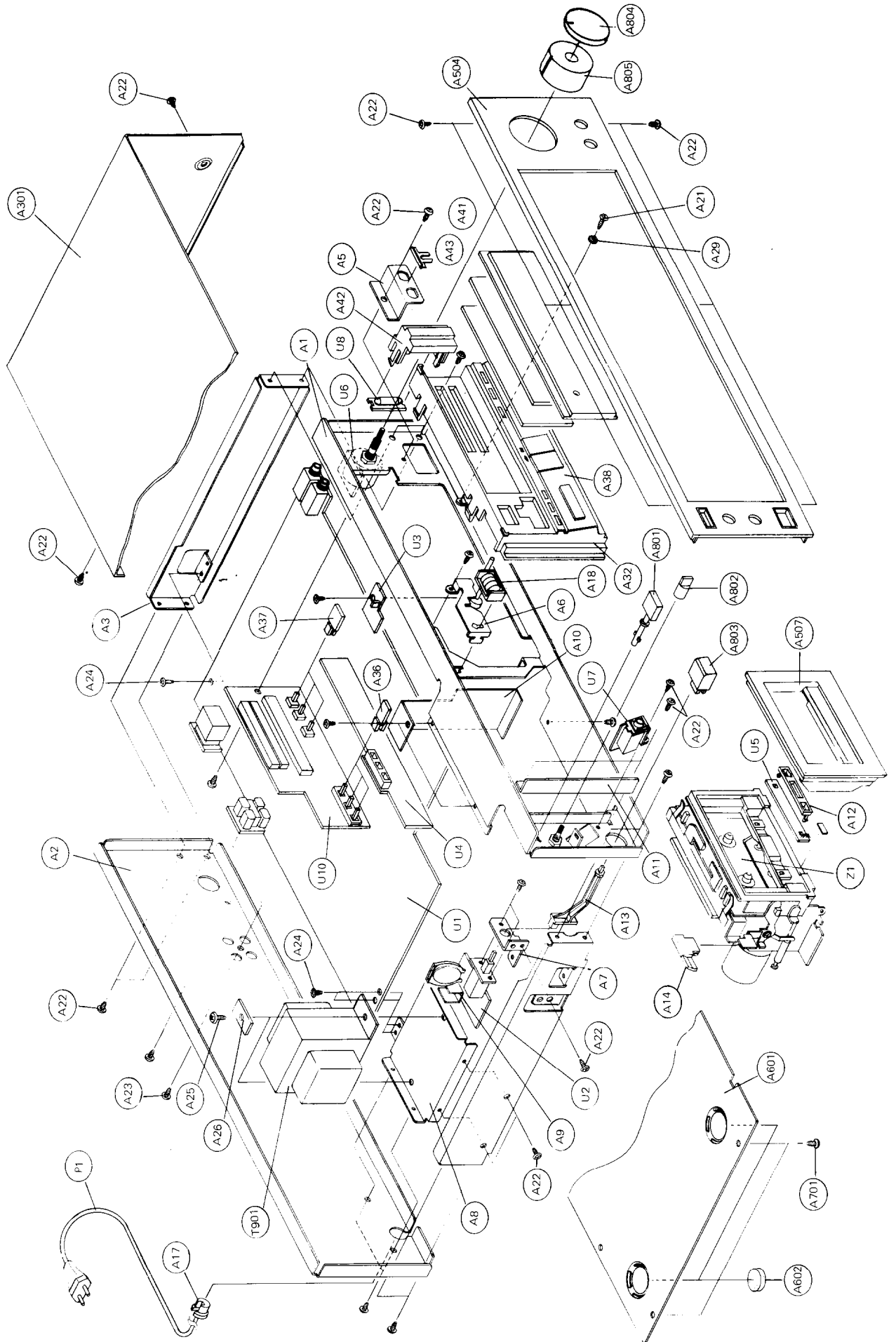
# 38	0	0	1	1
# 37	0	1	0	1
OPERATION	REC	P.B	OFF	
	TIMER			



ASSIST UP is for the F. PLAY direction.
 ASSIST DOWN is for the R. PLAY direction.
 REEL FWD is for the FF direction in the FWD side.
 REEL REV is for the REW direction in the FWD side.

* When H is output, adjust so this port is at least 3V.
 1. LOW for no REC INH tab
 2. LOW for CASSETTE IN

CHASSIS-EXPLODED VIEW



CHASSIS-EXPLODED VIEW-PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
A1	27110220A	Front bracket	A504	28191247B	Clear plate	U6	11268526	NAVR-2026, Input level control pc board ass'y
A2	27120607	Back panel (D)	A507	28400182	Cassette lid ass'y (S)	U7	11268527	NASJ-2027, Headphone terminal pc board ass'y
A3	27120608	Back panel (G)		27262282	Plate	U8	11268528	NAPL-2028, Lamp
A4	27120610	Back panel (W)		28199121	Film	U9	11268529	NASW-2029, Timer switch pc board ass'y
A5	27115130A	Side bracket		28400186	Window	U10	11268530	NADIS-2030, Display pc board ass'y
A6	27140896	Bracket H		28140460	0.5 x 12 x 22 mm, Cushion	Z1	244063	NDM-55, Deck mechanism ass'y
A7	27140896	Bracket M		28400183	Cassette lid ass'y (B)			
A8	27140897	Bracket C		27262282	Plate			
A9	27130356	Bracket, power		28199121	Film			
A10	27130356	Bracket, power transformer		28400187	Window			
A11	28175104	Insulating plate (G)		28140460	0.5 x 12 x 22 mm, Cushion			
A12	28175102	Insulating plate	A601	27170155A	Bottom board			
A13	28400098B	Plate	A602	27175028	Leg			
A14	27190280	Holder, LED	A701	834430068	3TTS+6B (BC), Tapping screw			
A15	2723030B	Joint (L)	A801	28321719	Knob, eject (S)			
A16	27273031A	Joint		28321720	Knob, eject (B)			
A17	28140488	60 x 10 x 13 mm, Cushion	A802	28320797	Knob, selector (S)			
A18	270025	SR-3P4, Strainrelief (D)	A803	28321130	Knob, selector (B)			
A19	270280	SR-4K-4, Strainrelief (G/W)	A804	28320852	Knob, power (S)			
A20	24601163	Tape counter		28321160	Knob, power (B)			
A21	834230108	3TTS+10B (Ni), Tapping screw		28320671	Knob, L (S)			
A22	834430068	3TTS+6B (BC), Tapping screw		28321711	Knob L (B)			
A23	834430108	3TTS+10B (BC), Tapping screw	A805	28320672A	Knob R (S)			
A24	831130088	3TTW+8B, Tapping screw		28321712	Knob R (B)			
A25	838440109	4TTB+10C (BC), Tapping screw	P1	253099B	AS-UC-3, Power supply cord(D)			
A26	870065	Special Washer		253083-1	AS-CEE, Power supply cord (G/W)			
A27	82143006	3P+6FN (BC), Pan head screw	P2	260208	Binder			
A28	87313006	M-3B, Toothed washer	S902		NSS-1258P, Voltage selector switch (W)			
A29	28321551B	Knob ass'y (S)			NPT-842D, Power transformer (D)			
A30	28321552B	Knob ass'y (B)	T901	230808	NPT-842G, Power transformer (G)			
A31	28321563	Knob, repeat (S)			NPT-842G, Power transformer (D)			
A32	28321564	Knob, repeat (B)			NPT-842DG, Power transformer (W)			
A33	28321542	Knob, selector (S)	U1	11268521	NAAF-2021, Rec/pb amplifier pc board ass'y (D)			
A34	28321543	Knob, selector (B)			NAAF-2021a, Rec/pb amplifier pc board ass'y (G/W)			
A35	27262283B	Plate (S)	U2	11268522	NAPS-2022, Power supply circuit pc board ass'y			
A36	27262284B	Plate (B)	U3	11268523	NASEN-2023, Hall IC pc board ass'y			
A37	28199124	Film	U4	11268524	NASW-2024, Tact switch pc board ass'y			
A38	28130215	Dial plate	U5	11268525	NALED-2025, Direction indicator pc board ass'y			
A39	27190276	Holder, lamp						
A40	28133100	Back plate						
A41	28184193	Top cover (S)						
A42	28184192	Top cover (B)						
A43	11268121	Front panel ass'y (S)						
A44	27267216	Guide, eject						
A45	27267215	Guide, power						
A46	11288121	Front panel ass'y (B)						
A47	27267273	Guide, eject						
A48	27267272	Guide, power						

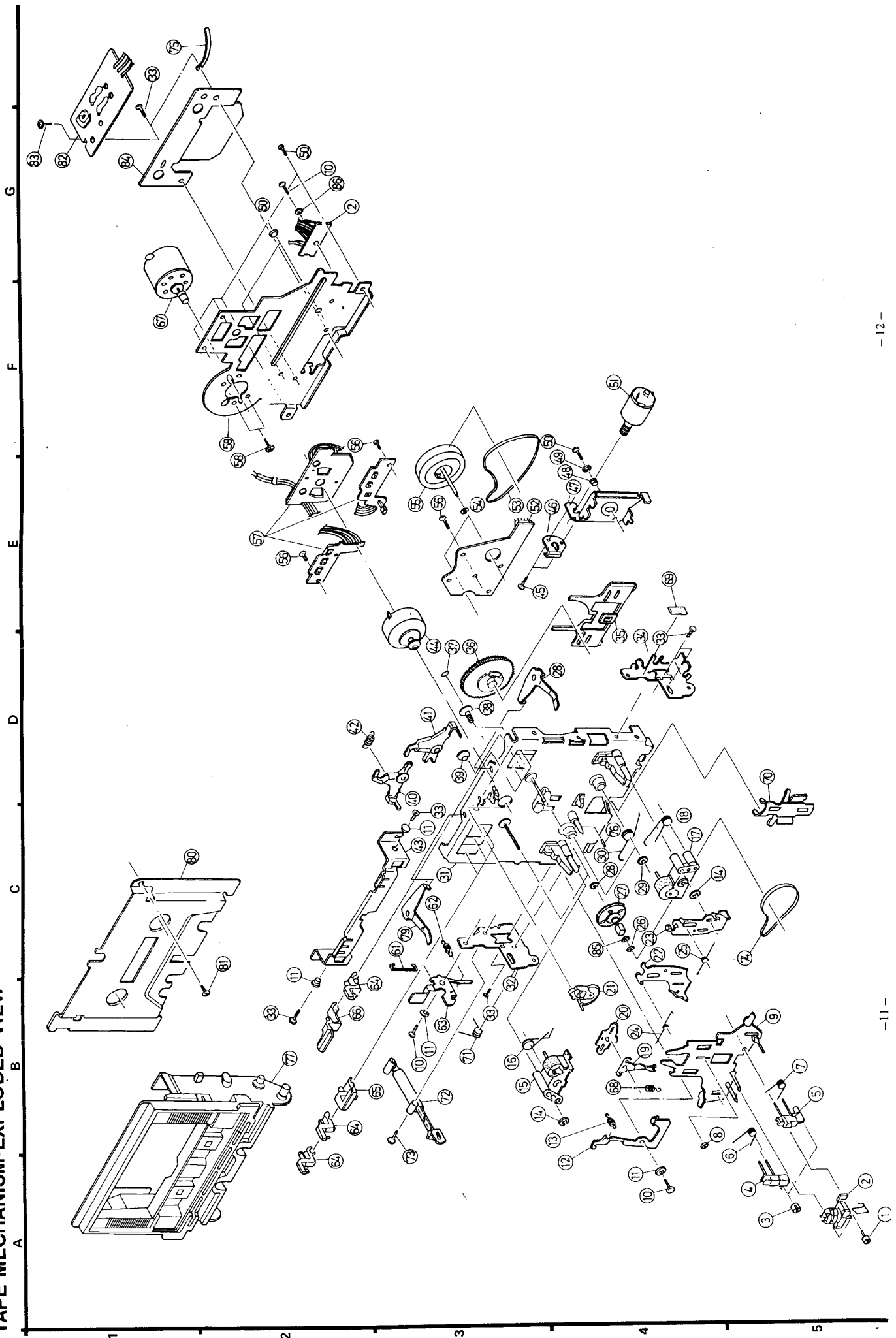
NOTES: (D): Only 120V model
(G): Only 220V model
(W): Only 120/220V model
(B): Only back model
(S): Only silver model

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

TAPE MECHANISM-PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
1	801318	Screw with washer	44	24601165-	Reel motor
2	24600046	Head ass'y	45	801319	2 x 3.5, Screw with washer
3	24611038	Adjustment nut	46	24605493	Thrust holder spring
4	24611020	Sensor ass'y	47	24607032	Assist motor bracket
5	24611021	Tape guide	48	24605494	Bracket, spring
6	24605483	Adjustment spring L	49	8771320605	3.2 x 6 x 0.5, Washer
7	24605458	Adjustment spring R	50	838126080	2.6 x 8, Wave screw
8	24611039	Steelball	51	24601166	Assist motor
9	24611022	Head chassis	52	24606200	Sensor pc board ass'y
10	82113006	3 x 6, Pan head screw	53	24602265	Main belt
11	24604048	Spacer	54	24611041	2.6 x 0.25, Washer
12	24607028	Eject canceller arm L	55	24602266	Flywheel
13	24605485	Eject canceller spring	56	838120060	2 x 6, Wave washer
14	893020	E-2, Circlip	57	24602266	Connector ass'y
15	24602260	Pinch roller ass'y	58	801320	Screw with washer
-16	24605486	Pinch roller spring L	59	24607033	Motor bracket
17	24602258	Pinch roller ass'y	60	24611037	Flywheel holding screw
-18	24605487	Pinch roller spring R	61	24611028	Bar
19	24605488	Holding spring	62	24605495	Eject arm spring
20	24611023	Slide plate	63	24607034	Eject arm L
21	24602259	Idler ass'y	64	24611029	Recording sensor ass'y
22	24611024	Slide base L	65	24611030	Metal sensor ass'y
23	24611025	Slide base R	66	24611031	Packing sensor ass'y
24	24605489	Spring L	67	24601164	Main motor
25	24605490	Spring R	68	24605496	Slider spring
26	24610923	Washer	69	24610950	Cushion
27	24602261	Reel ass'y	70	24611032	Reel holder
28	24611040	2.1 x 7 x 0.13, Washer	71	24605497	Door spring
29	24610926	Washer, oil sheet	72	24610834	Damper ass'y
30	24605491	Spring	73	833120127	2 x 12, Tapping screw
31	24611026	Chassis	74	24602231	Counter belt
32	24607029	Damper bracket L	75	24611033	Terminal
33	82113005	3 x 5, Pan head screw	76	24611034	Reflector plate
34	24607030	Damper bracket	77	24611035	Door frame ass'y
35	24611027	Slider	78	24605498	Cassette holding spring R
36	24602262	Gear saa'y	79	24605499	Cassette holding spring L
37	24610840	Washer	80	24611015	Cassette holder
38	24602263	Worm gear	81	801293	2.6 x 12, Tapping screw
39	24602264	Idler gear	82	24606202	Pc board ass'y
40	24603279	Brake lever L	83	82112004	2 x 4, Pa head screw
41	24603280	Brake lever R	84	24611036	Shielded plate
42	24605492	Brake spring	85	24610924	Washer
43	24607031	Sensor arm	86	87213206	Toothed washer

TAPE MECHANISM-EXPLODED VIEW



PRINTED CIRCUIT BOARD PARTS LIST

Rec./pb. amplifier pc board (NAAF-2021/a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION	CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs		D705	2239452,	RD5.1EB2,
Q109, Q110	222729	HA12058NT		2242837 or	EQA02-05D or
Q301, Q302	222652	M5218L		2243142	MTZ5.1B
Q305	222507	TA7612AP	D708, D709	223155	1SS138
Q401, Q402	222465 or	NJM4558D or	D716	2239471,	RD5.6EB1,
	222808	M5218P		2242839 or	EQA02-05F or
Q501-Q504	222681 or	IR3702 or		2243151	MTZ5.6A
	222659	LA6324	D901	223862	WL01
Q701	222778	LM6402A-426	D902, D903	2239651,	RD13EB1,
Q702	222774	BA6209		2242901 or	EQA02-12A or
Q703	222775	BA6229		2243241	MTZ13A
Q704, Q705	222465 or	NJM4558D or	D951	223868	2W02
	222808	M5218P	D952	223842	GP-15B
Q951	222780120	NJM7812A	D953	223105,	1S1555,
Q952	222780050	NJM7805A		223133,	DS442X,
Q101-Q104	2211406,	2SC2240 (BL),		223145 or	1S2076TD or
Q201-Q204	2211896 or	2SC1815 (LL) or		223150	US1040
	2212256	2SC2458 (LL)	X701	X'tal	
Q107, Q108	2211255,	2SC1815 (GR),		3010078	CSB400P
Q111, Q112	2212115,	2SC2458 (GR),	L101, L102	Coils	
Q303, Q304	2210746 or	2SC945A (P) or	L103, L104	233313	NMC-6048
Q403-Q414	2212485	JC501Q	L401, L402	233245	NMC-2029
Q205, Q206	2212304 or	2SK381 (D) or		24606072 or	NCH-1010 or
	2211945	2SK246 (GR) (G/W)		231040	NCH-2080
Q417	2201060	2SD549	L403, L4040	24606080 or	NCH-1022 or
Q418, Q422	2211454,	2SA1015 (Y),		231038	NCH-2078
Q423, Q506	2212124,	2SA1048 (Y),	L405, L406	24606076 or	NCH-2099 or
Q603, Q718	2210804 or	2SA733A (Q)		231037	NCH-2077
Q711-Q713	2212494	JA101P	L407, L408	233315	NCH-2099
Q419-Q421	2211255,	2SC1815 (GR),	L409, L410	231025	NCH-1064
Q507, Q604	2212115,	2SC2458 (GR),		Ocs. block	
Q605	2210746 or	2SC945A (P) or	Z001	24606197	NOB-028
	2212485	JC501Q		Capacitors	
Q505	2212304 or	2SK381 (D) or	C103, C104	392881007	10 μ F, 50V, LL
	2211945	2SK246 (GR)	C109, C110	352741009	10 μ F, 16V, Elect.
Q601, Q602	2211706	2SD655 (F)	C111, C112	352742209	22 μ F, 16V, Elect.
Q707-Q709	2211255,	2SC1815 (GR),	C121, C122	352740109	1 μ F, 16V, Elect.
Q714-Q717	2212115,	2SC2458 (GR),	C123, C124	352741019	100 μ F, 16V, Elect.
	2210746 or	2SC945A (P) or	C127, C128	352741009	10 μ F, 16V, Elect.
	2212485	JC501Q	C131, C132	352741009	10 μ F, 16V, Elect.
Q719	2211255,	2SC1815 (GR),	C133, C134	352732219	220 μ F, 10V, Elect.
	2212115,	2SC2458 (GR),	C135	352734709	47 μ F, 10V, Elect.
	2210746 or	2SC945A (P) or	C139, C140	392850477	4.7 μ F, 25V, LL
	2212485	JC501Q (G/W)	C145, C146	352781599	0.15 μ F, 50V, Elect.
Q710	2211706	2SD655 (F)	C147, C148	352783399	0.33 μ F, 50V, Elect.
Q901	2202074 or	2SD880 (Y) or	C149, C150	352784799	0.47 μ F, 50V, Elect.
	2201385	2SD330 (E)	C151, C152	352786899	0.68 μ F, 50V, Elect.
Q902	2201244	2SB834 (Y)	C161, C162	392859477	4.7 μ F, 25V, LL
Q903	2211683	2SD468 (C)	C165, C166	352781599	0.15 μ F, 50V, Elect.
	Diodes		C167, C168	352784799	0.47 μ F, 50V, Elect.
D201, D202	223105,	1S1555,	C169-C172	352741009	10 μ F, 16V, Elect.
	223133,	DS442X,	C173, C174	352734709	47 μ F, 10V, Elect.
	223145 or	1S2076TD or	C201, C202	352780109	1 μ F, 50V, Elect.
	223150	US1040 (G/W)	C203	352724719	470 μ F, 6.3V, Elect.
D301, D302	223132	1K60	C205, C206	352780109	1 μ F, 50V, Elect.
D303-D312	223155	1SS138	C207	352741009	10 μ F, 16V, Elect.
D401	223155	1SS138	C301-C304	352741009	10 μ F, 16V, Elect.
D402, D403	2239671 or	RD15EB1 or	C305, C306	352780339	3.3 μ F, 50V, Elect.
	2242912	EQA02-13B	C413, C414	352782299	0.22 μ F, 50V, Elect.
D404-D407	223155	1SS138	C415, C416	352750479	4.7 μ F, 25V, Elect.
D501	223155	1SS138	C419	352750479	4.7 μ F, 25V, Elect.
D701	223132	1K60	C420	352732219	220 μ F, 10V, Elect.
D702-D704	223155	1SS138	C503	352741009	10 μ F, 16V, Elect.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C504, C505	352780109	1 μ F, 50V, Elect.
C601	352780229	2.2 μ F, 50V, Elect.
C704	352781099	0.1 μ F, 50V, Elect.
C709	352780109	1 μ F, 50V, Elect.
C710	352741009	10 μ F, 16V, Elect.
C711–C714	325280109	1 μ F, 50V, Elect.
C715	352741009	10 μ F, 16V, Elect.
C716	352780109	1 μ F, 50V, Elect.
C718	352732209	22 μ F, 10V, Elect.
C904, C905	352751029	1,000 μ F, 25V, Elect.
C906, C907	352741019	100 μ F, 16V, Elect.
C910	352741019	100 μ F, 16V, Elect.
C953	352751029	1,000 μ F, 25V, Elect.
C954, C956	352783399	0.33 μ F, 50V, Elect.
C955, C957	352781099	0.1 μ F, 50V, Elect.
C960	3504168	13,000 μ F, 25V, Elect.
	Resistors	
R129, R130	5215046 or 5215023	N08HR50KBC, Semi-fixed
R401, R402	5215044 or 5215020	N08HR5KBC, Semi-fixed
R443–R446	5215047 or 5215024	N08HR100KBC, Semi-fixed
R447	441521004	10 Ω , 1/2W, Metal oxide film
R702–R715	49163392414	3.9k Ω x 14, 1/10W, Network
R716–R719	49163392404	3.9k Ω x 4, 1/10W, Network
R720–R732	49163392413	3.9k Ω x 13, 1/10W, Network
R744	441722704	27 Ω , 2W, Metal oxide film
R745	5215045 or 5215021	N08HR1KBC, Semi-fixed
R901	441521004	10 Ω , 1/2W, Metal oxide film
R903	441521504	15 Ω , 1/2W, Metal oxide film
R951	441520224	2.2 Ω , 1/2W, Metal oxide film
R952	441520564	5.6 Ω , 1/2W, Metal oxide film
	Terminals	
P201	25050064	NSCT-5P18, DIN (G/W)
P102	25045120	NPJ-4PDBL49, Input/output
P203, P204	25045134	HLJ-4337-01-010, Microphone
	Rlaies	
RL101, RL701	25065174	NRL-2P1A-DC12-09
	Plugs	
P101	25055103	NPLG-6P-87
P401	25055100	NPLG-3P-84
P709	25055100	NPLG-3P-84
P301	25055142	NPLG-12P-126
P702	25055140	NPLG-10P-124
P712	25055133	NPLG-3P-117
P707	25055134	NPLG-4P-118
	Sockets	
J704	2000227	NSAS-12P-131
J705	2000313	NSAS-12P-272
J706	2000314	NSAS-4P-273
J708	2000266A	NSAS-14P-204
J710	2000316	NSAS-8P-275
J402	2000345	NSAS-8P-304

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Radiators	
	27160029	RD-07
	27160029-1	RD-07B
	27160145	RAD-05

Power supply circuit pc board (NAPS–2022)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C901	3500065A	DE7150FZ103PAC400V, Capacita IS
C901a	27300601	Cover for C901
S901	25035375	NPS-111-L339, Power switch

Hall IC pc board (NATD–2023)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
Q709	222558 or 222470	DN6838 or DN838K
	27190173	Holder for DN6838
	27190251	Spacer for DN838K

Tact switch pc board (NASW–2024)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D710, D711	225126	GL-3PR1, LED
D712	225127	GL-3PG1, LED
S701–S709	25035389	NPS-111-S353, Switch
	27190278	Holder

Direction indicator pc board (NALED–2025)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D717, D718	225150	SEL-308E, LED
D712	2000348	NSAS-3P-307, Socket

Input level control pc board (NAVR–2026)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
R217, R218	5104132	N16RKF50KA45F, Variable resist

Stereo headphone terminal pc board (NAHP–2027)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
SJ301	25045139	HLJ-0540-01-010, Headphone terminal

Edge light pc board (NAPL–2028)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL901	210090	PL14V, 150mA, Lamp

Timer switch pc board (NASW–2029)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S710, S711	25030231	NRS-123-25-SBM, Rotary switch

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-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
- 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	R745	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 R129 and R130 to center position.
4	Playback level		MTT-150	PB	AC voltmeter	R129(L) R130(R)	580mV	
5	Bias current	1kHz, -20dB and 12kHz, -20dB	MAXELL UD-1, C90	REC/PB	AC voltmeter	FWD R445(L) R446(R) REV R443(L) R444(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.	

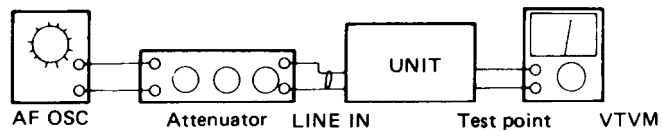
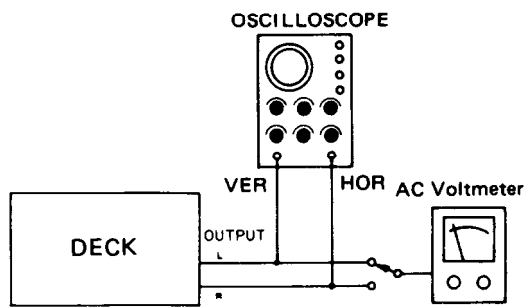
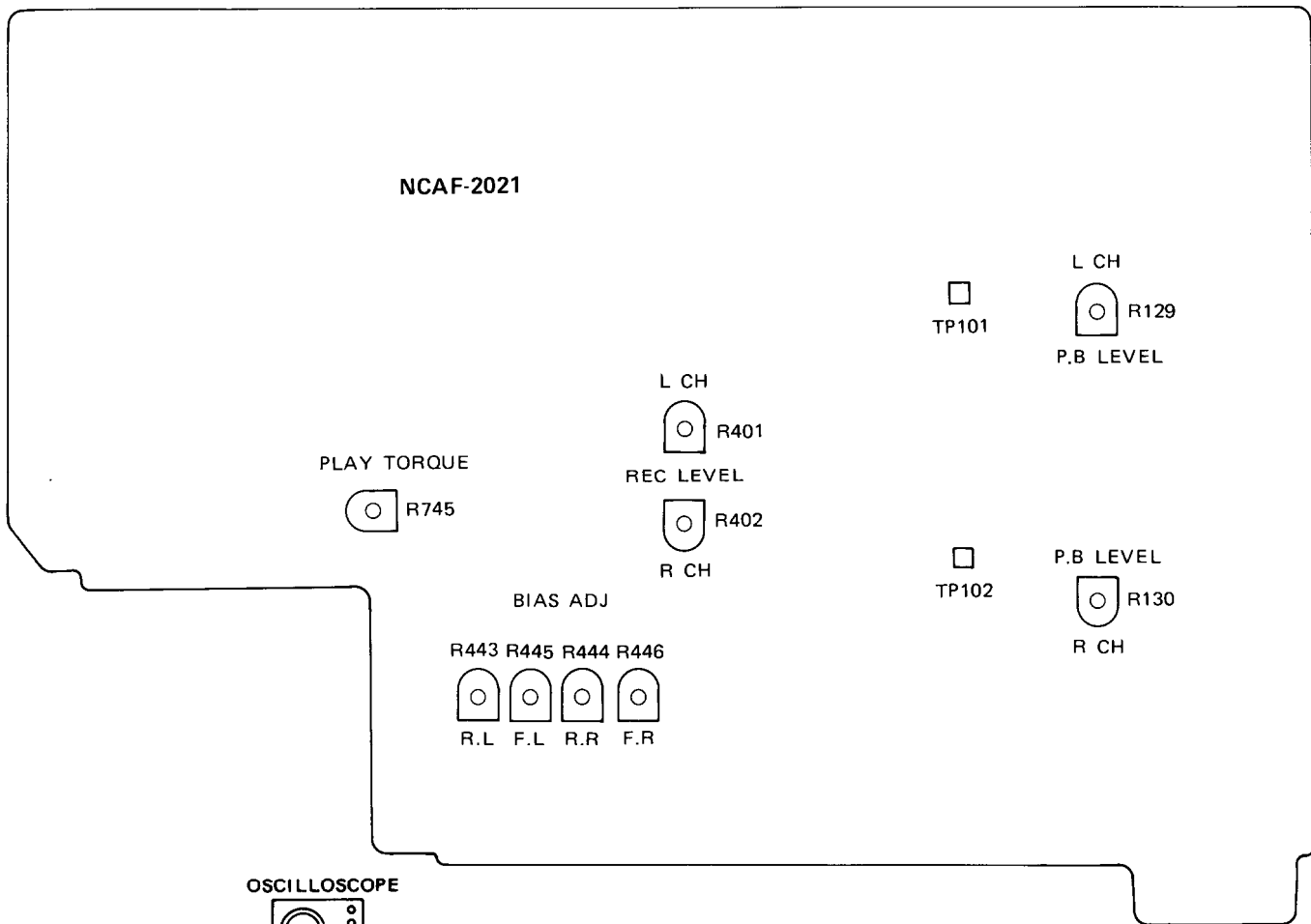


fig-2

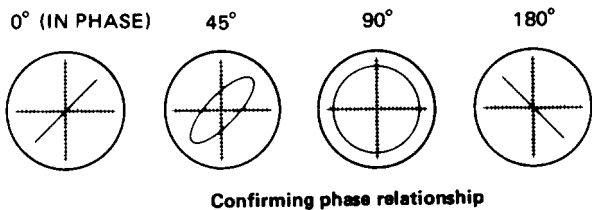
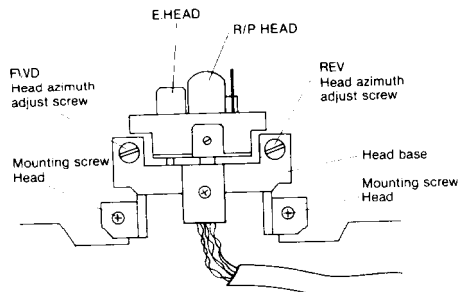
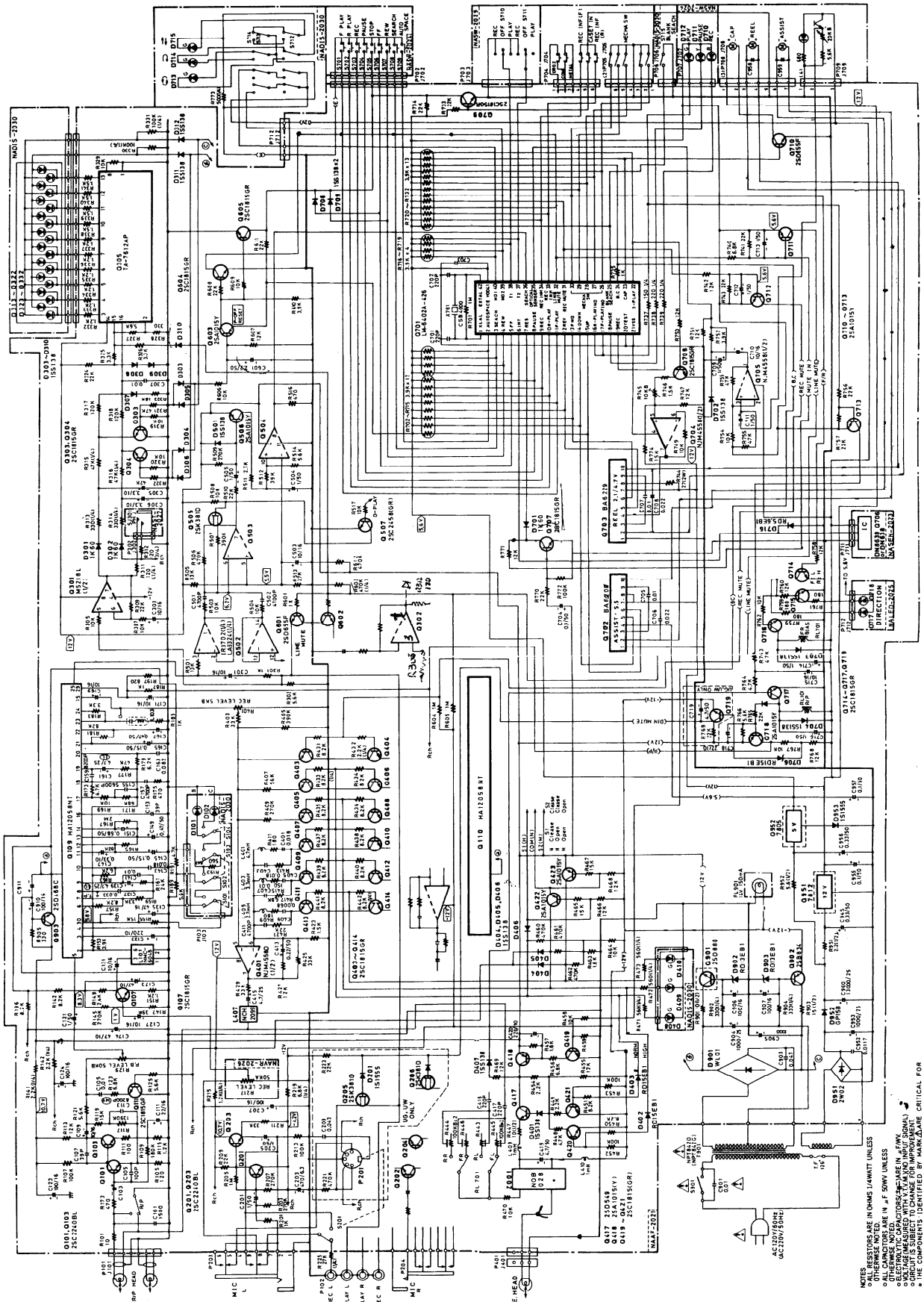


fig-1



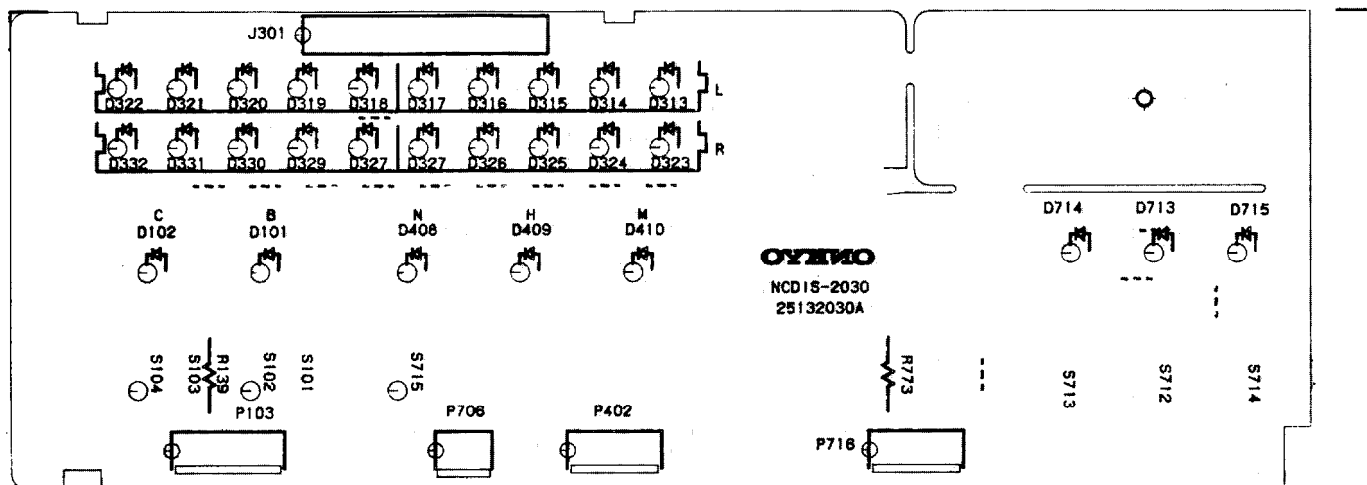
SCHEMATIC DIAGRAM

A B C D E F G



NOTES:
 1. ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
 2. ALL CAPACITORS ARE IN P.F. UNLESS OTHERWISE NOTED.
 3. VOLTAGE MEASURED WITH NO INPUT SIGNAL.
 4. THE COMPONENTS IDENTIFIED BY MARKINGS CRITICAL FOR SAFETY REPAIR USE ONLY WITH PART NUMBER SPECIFIED.
 5. ***** MODEL ONLY.

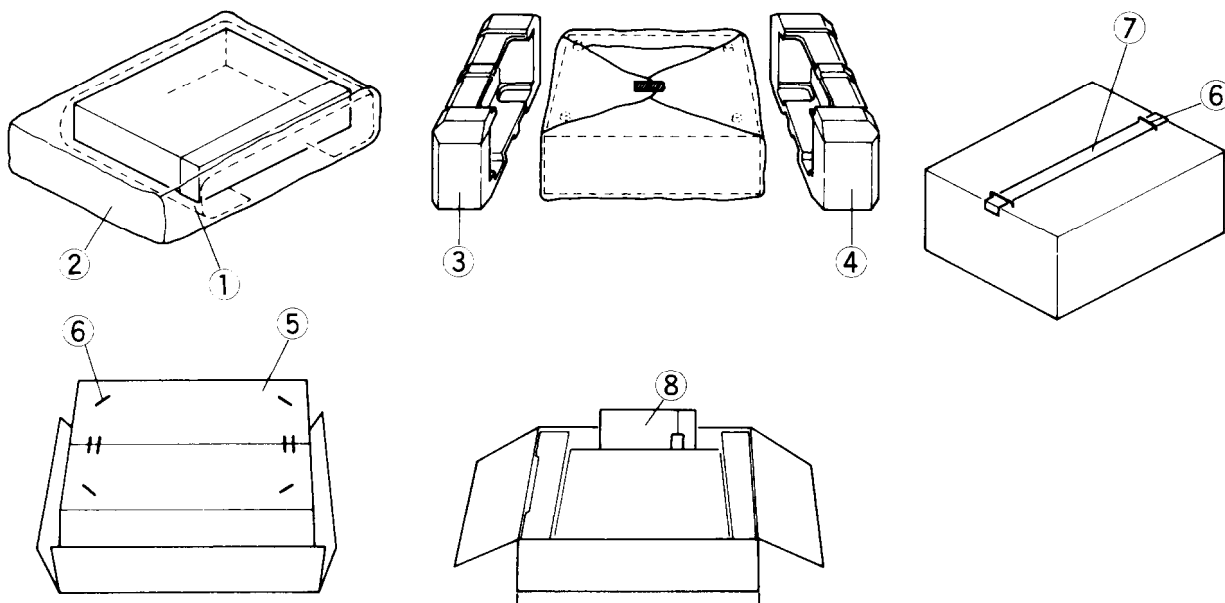
PC BOARD VIEW FROM BOTTOM SIDE



Display pc board (NADIS-2030)

CIRCUIT NO.	PARTS NO.	DESCRIPTION	CIRCUIT NO.	PARTS NO.	DESCRIPTION
	L. E. Ds		S712 - S714	25035411	NPS-342-300-L375, Push
D313-D318	225160	SEL9520BG, Array		Socket	
D319-D322	225161	SEL9520MB01, Array	J301	2000320	NSAS-24P-279
D323-D328	225160	SEL9520BG, Array		Plugs	
D329-D332	225161	SEL9520MB01, Array	P706	25055132	NPLG-2P-116
D101, D102	225142	SFL-2913K	P710, P402	25055134	NPLG-4P-118
D408-D410	225137	SEL-2413E	P103	25055135	NPLG-5P-119
D713-D715	225137	SEL-2413E		Holder	
S101-S104	25035399	NPS-122-L364, Push		27190277	LED-5
S715				27190281A	LED-3

PACKING VIEW



D Model

REF NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500 x 800 Protection sheet (B)
2	29100063	500 x 750 Poly bag
3	29090746	Pad (L)
4	29090747	Pad (R)
5	29050956	Master carton box
	29050957	Master carton box (B)
6	282301	Sealing hook
7	260012	Damplon tape
8		Accessory bag ass'y
	29340786	Instruction manual
	2010095	Connection cable
	29365006-5	Waranty card (N)
	29358002A	Service station list (N)
	29100005	220 x 330 Poly bag

G/W Model

REF NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500 x 800 Protection sheet (B)
2	29100063	500 x 750 Poly bag
3	29090746	Pad (L)
4	29090747	Pad (R)
5	29050956	Master carton box
	29050957	Master carton box (B)
6	282301	Sealing hook
7	260012	Damplon tape
8		Accessory bag ass'y
	29340787	Instruction manual (G)
	2010095	Connection cable
	25055040	Conversion plug CV-K-2 (G)
	29100005	220 x 330 Poly bag

NOTE

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

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