

ONKYO SERVICE MANUAL

SERIAL NO. 3249

**STEREO CASSETTE
TAPE DECK
MODEL TA-2120**

UDN, UDC, 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  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.)
Wow and Flutter:	0.08% (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:	Dolby NR off: 58dB (metal position tape) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Line IN: 2 Input sensitivity: 60mV Input impedance: 50 kohms
Output:	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 $\times$ 1; DC motor

Heads: REC/PB: Special Hard Permalloy $\times$ 1;
Erase head: Ferrite $\times$ 1

Power Consumption: 8 watts

Dimensions: 435(W) $\times$ 116(H) $\times$ 264(D)mm
(17-1/8" $\times$ 4-9/16" $\times$ 10-3/8")

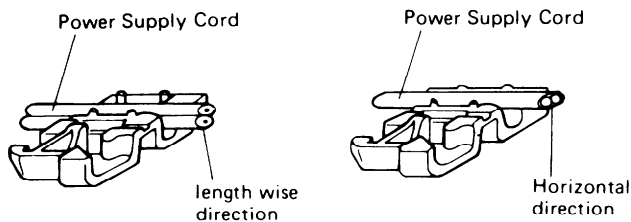
Weight: 3.7 kg. (8.2 lbs.)

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.



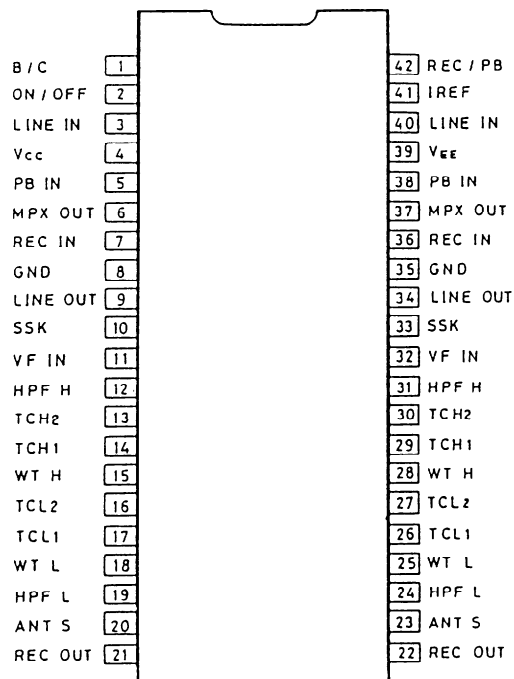
2. Instruction resistance measurement

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

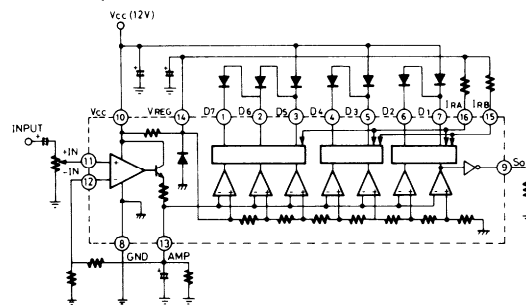
Specifications; 500V more than 10M Ω

IC BLOCK DIAGRAM

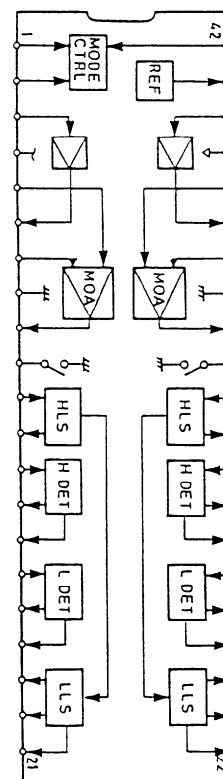
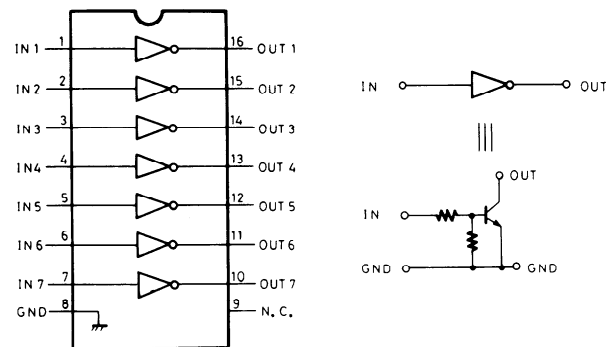
CX20187 (DOLBY N.R)



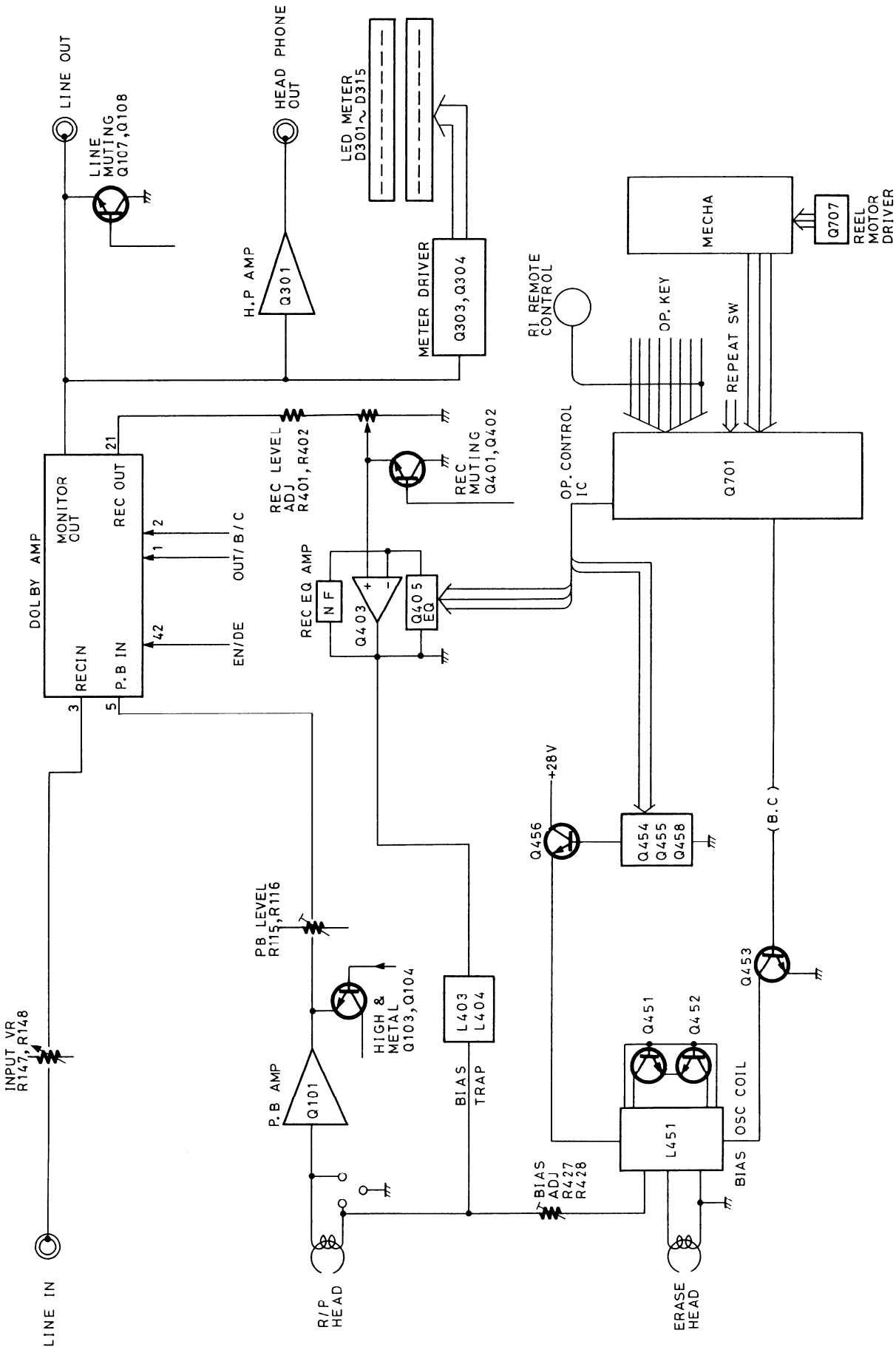
IR2E02 (LEVEL METER DRIDE)



BA6251 (REC AMP. EQ. SW)



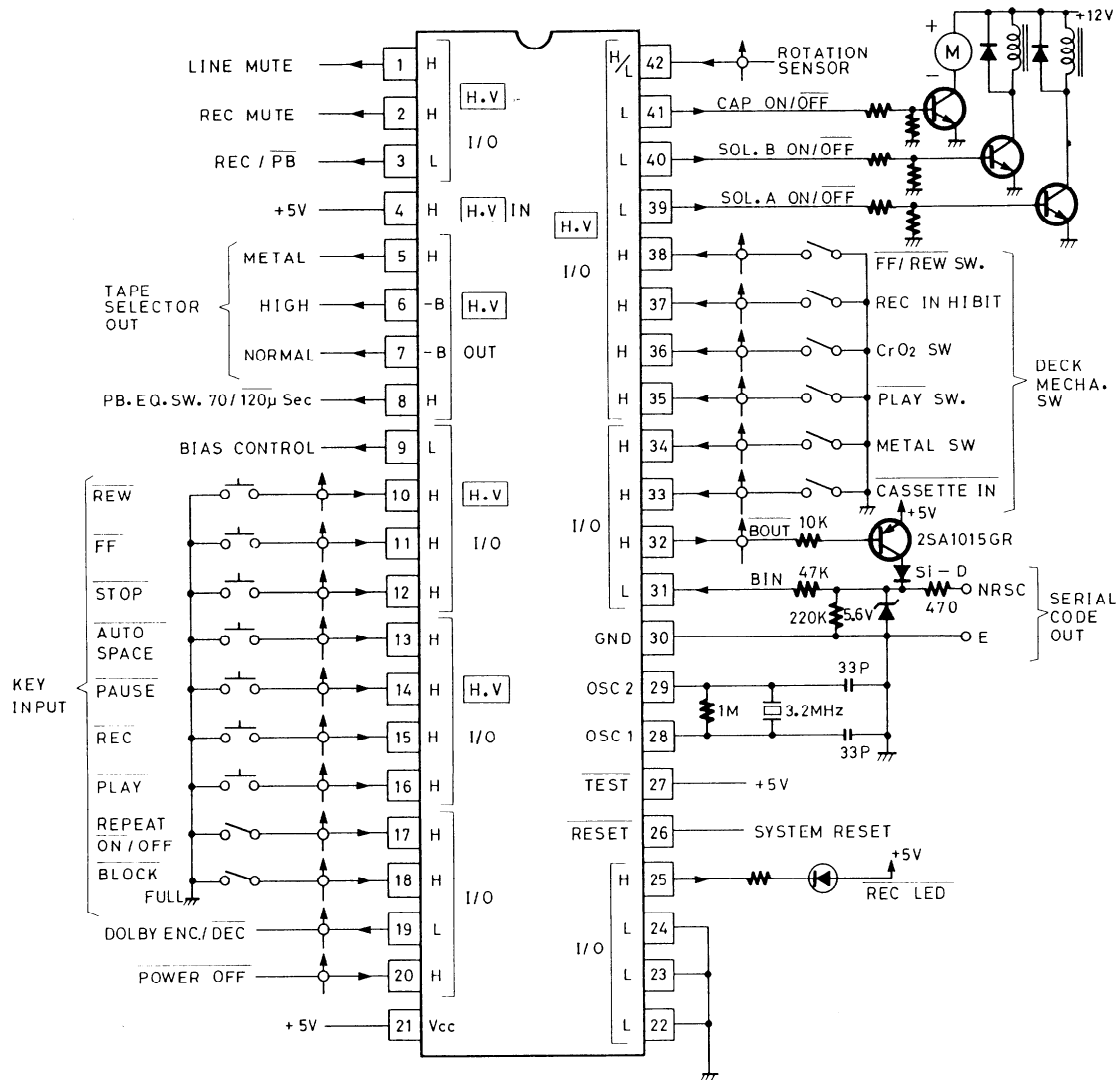
BLOCK DIAGRAM



CIRCUIT DESCRIPTION

1. MICROCOMPUTER (HD614128SA55)

At pins #1~16 and #35~42, +5~-35V can be handled with the high voltage resistant port. The output port is a POMS transistor of open drain construction. The other ports are NMOS open drain type. Because the current flow of the PMOS output port (H.V output terminal in the diagram below) reverses from the IC to the external section, if the port is dropped directly to ground, due to the possibility of damage to the IC, care is required. (In particular, care is necessary with #1~3, #5~9, and #39~41).



Notes)

1. The terminal marking H shows high level, L shows low level, -B shows the -B of the power supply voltage; the deck condition is POWER ON, STOP, no cassette half.
2. The symbol $\uparrow$ shows the pull up resistor (3.9K Ω).
3. The symbol $\rightarrow$ shows the signal flow direction (input, output).
4. In TA2120(B), terminals 22, 23, and 24 are not used (connected to ground).
5. REC LED blinking operation: 500msec (POWER ON, AUTO SPACE), 250msec (at time of mechanism error).

2. Terminal Name and Function

	Name	Function
1	LINE MUTE	Line muting output: With logic level 1, muting is ON
2	REC MUTE	Record muting output: With logic level 1, muting is ON
3	REC/PB	Record/playback selector output: Record with level 1, playback with level 0
4	LED SW.	For PAUSE, PLAY LED use, pull down with 10k Ω . TA-2120
5	METAL	Tape selector output: Level 1 for metal tape
6	HIGH	Tape selector output: Level 1 for high tape
7	NORMAL	Tape selector output: Level 1 for normal tape
8	70/120 μ sec	Playback amplifier equalizer selector output: Level 1 for metal and high tape
9	BIAS CONTROL	Recording bias oscillator control output: Oscillator ON with level 1
10	REW	REW key input
11	FF	FF key input
12	STOP	STOP key input: Stops all operations
13	AUTO SPACE	AUTO SPACE key input: Can accept only at time of REC-PAUSE and recording
14	PAUSE	PAUSE input: Can accept only at time of recording play back, and AUTO SPACE
15	REC	REC input
16	PLAY	PLAY input
17	REPEAT ON/OFF	Repeat operation ON/OFF SW input: ON with level 1
18	BLOCK/FULL	Repeat operation block repeat/full repeat selector input: block with level 0
19	DOLBY ENC/DEC	Dolby IC ENCODE/DECODE selector output: Encode with level 1
20	POWER OFF	Power off detection input: Power OFF with level 0
21	Vcc	Microcomputer power supply (+5V)
22	O-PLAY	Level is 1 when this shows that the mechanism is in the enable condition for recording and playback
23	PLAY LED	Play indicator LED output: LED lights with level 0
24	PAUSE LED	Pause indicator LED output: LED lights with level 0
25	REC LED	Recording indicator LED output: LED lights with level 0
26	RESET	Microcomputer system reset
27	TEST	Microcomputer internal test port, normally connected to Vcc(+5V)
28 29	OSC1, OSC2	Microcomputer clock oscillator terminal
30	GND	Microcomputer power supply (ground)
35	PLAY SW.	Mechanism play operation detection input: Level 0 at time of PLAY operation
36	CrO2 SW.	High position tape detection input: Level 0 with normal tape
37	REC INHIBIT	Erroneous erase prevention input: Record inhibit with level 1
38	FF/REC SW.	Mechanism FF/REW operation detection input: Level 0 with FF/REW operation
39	SOL A ON/OFF	PLAY operation time solenoid drive output: Level 1 for 40msec and 60msec intervals
40	SOL B ON/OFF	FF/REW operation time solenoid drive output: Level 1 for 40. 60. and 320msec intervals
41	CAPSTAN ON/OFF	Capstan motor control output: Motor turns with level 1
42	ROTATION SENSOR	Tape end detection and block repeat time pulse count input

CHASSIS-EXPLODED VIEW PART LIST

REF.NO.	PART NO.	DESCRIPTION
A 1	27110402	FRONT BRACKET AS (S)
A 4	27110403	FRONT BRACKET AS (B)
A 5	27273095	JOINT (EJECT)
A 9	27180399	SPRING (EJ)
A 10	28400282	DAMPER
A 18	27180395-1	SPRING (T2)
A 20	27100157	CHASSIS
	27121076	BACK PANEL (D)
	27121077	BACK PANEL (G)
	27121079	BACK PANEL (W)
	27121155	BACK PANEL (O)
	27121155	BACK PANEL (QB)
A 21	27300750	BUSHING (CORD)
A 22	86414010	FLANGE NUT FWN4×10FN
A 23	27190524	HOLDER
A 24	28140865	CUSHION
A 26	27273069A	JOINT (POW)
A 31	24601234	TAPE COUNTER
A 34	833430080	TAP-TIGHT SCREW 3TTP+8PBC
A 35	834430088	TAP-TIGHT SCREW 3TTW+8BBC
A 36	831130088	TAP-TIGHT SCREW 3TTS+8B
A 37	830440089	TAP-TIGHT SCREW 4TTC+8CBC
A 53	834230108	TAP-TIGHT SCREW 3TTS+10BN
A 54	831430100	TAP-TIGHT SCREW 3TTS+10PBC
A 301	28184387	TOP COVER (S)
	28184388	TOP COVER (B)
A 311	28191459B	CLEAR PLATE
A 501	1N035121	FRONT PANEL (S)
	1N036121	FRONT PANEL (B)
A 502	28400380A	CASSETTE LID AS
A 502-1	28400379	CASSETTE LID
A 502-2	27180272	SPRING (CA)
A 502-3	28400381A	WINDOW
A 631	27195028	LEG
A 801	28323282	KNOB (EJECT)(S)
	28323287	KNOB (EJECT)(B)
A 810	28323249	KNOB (POW) (S)
	28323241	KNOB (POW) (B)
A 811	28323295	KNOB (PUSH)
A 831	27265166	RING (VOL) (S)
	27265167	RING (VOL) (B)
A 833	28133195	BACK PLATE
A 834	28323296	KNOB (VOL) (S)
	28323297	KNOB (VOL) (B)

△ P901

AS-UC-3, POWER SUPPLY CORD (D)
AS-CEE, POWER SUPPLY CORD (G/W)
AS-SAA, POWER SUPPLY CORD (Q)

253099C
253129A
253118

△ T901

C2, 5BS2 POWER SUPPLY CORD (QB)
NPT-998D, POWER TRANSFORMER (D)
NPT-998G, POWER TRANSFORMER (G)
NPT-998DG, POWER TRANSFORMER (W)
NPT-998Q, POWER TRANSFORMER (Q)

253104
230031
2300317
2300318
2300319

△ S902

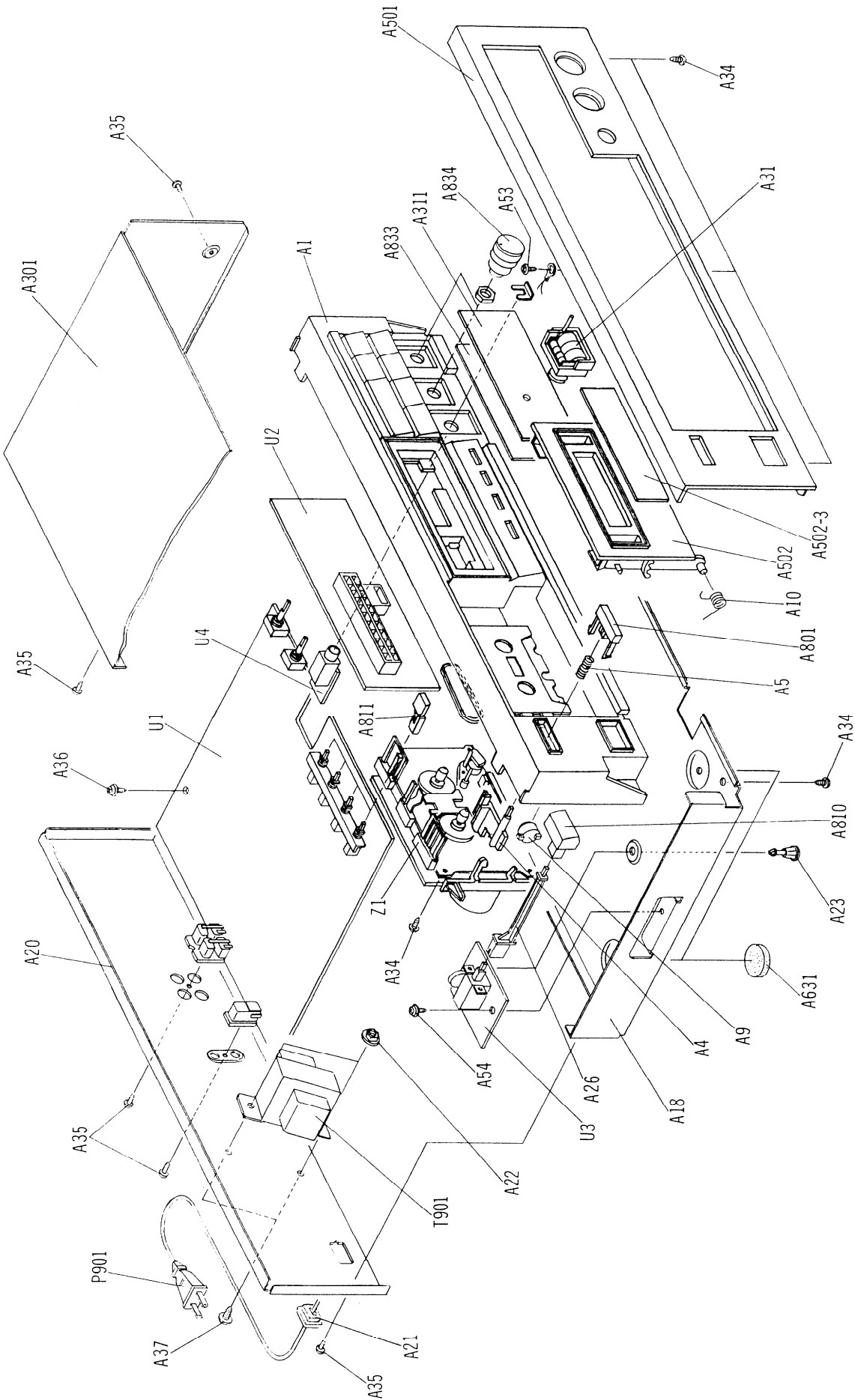
NSS-1258P, SWITCH (W)
NAAF-3239-1
NADIS-3240-1
NASW-3241-1
NAETC-3242-1
NDM-105, CASSETTE DECK MECHANISM

25065123
1N03539-1
1N03540-1
1N03541-1
1N03542-1
244113
U1
U2
U3
U4
Z1

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

NOTE: (B): Only Black model
(S): Only Silver model
(D): Only 120V model
(G): Only 220V model
(W): Only 120V/220V model
(Q): Only 240V model
(QB): Only U.K. model

CHASSIS-EXPLODED VIEW



ADJUSTMENT PROCEDURES

PRECAUTIONS

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

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

2. Do not use magnetized screwdriver for adjustments.

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

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator

Digital frequency counter

Oscilloscope

Attenuator

AC voltmeter

Non-magnetic screw driver

Blank tapes (completely erased)

NORMAL NEW UD90

HIGH NEW XL-II90

METAL NEW MX60

Test tapes

VTT-658 : 10 KHz, -15dB

MTT-111 : 3 kHz, -10dB

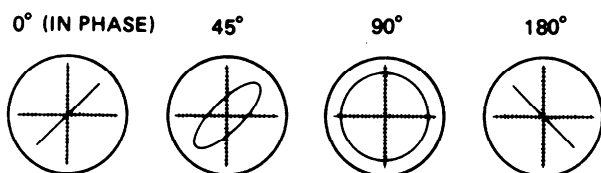
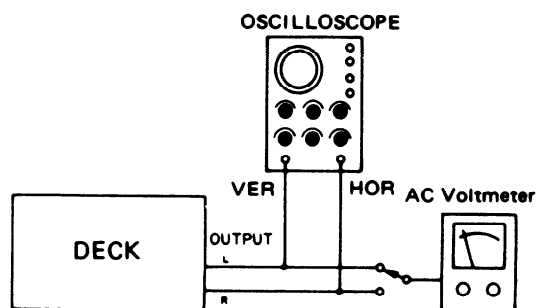
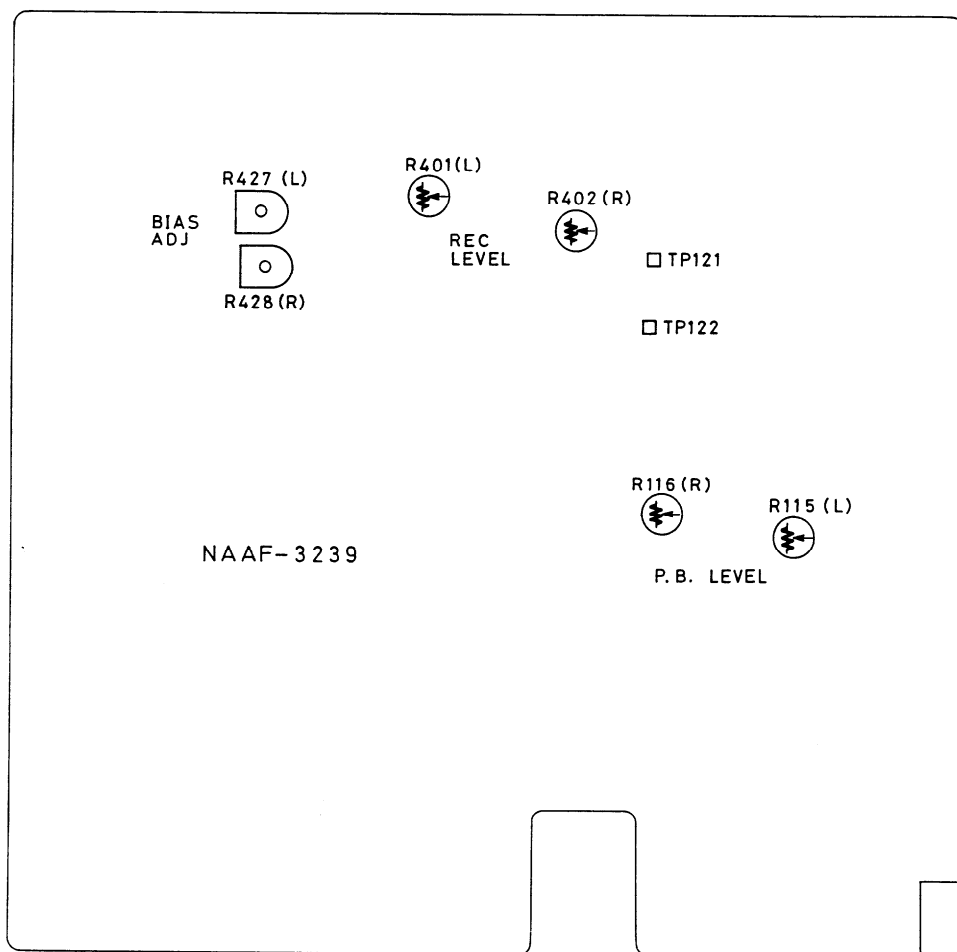
MTT-150 : Dolby level calibration
400Hz, tone 200nWb/m

Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1 Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the motor	3,000 to 3,010 Hz	
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	See fig. 1
3 Playback level	AC voltmeter to terminals TP-121 and TP-122		MTT-150	PB	AC voltmeter	R-115 (Ch.L) R-116 (Ch.R)	245mV	
4 Bias current	Fig. 2	1kHz, -20dB and 12kHz, -20dB	UD-1 C-90	REC/PB	AC voltmeter	R-427 (Ch.L) R-428 (Ch.R)	Same level at REC/PB	Input VR maximum
5 Record level	Fig. 2	1kHz		REC PAUSE	AC voltmeter	Attenuator or AF OSC output	350mV	Input VR maximum
				REC/PB	AC voltmeter	R-401 (Ch.L) R-402 (Ch.R)	Same level at REC/PB	

PLAY torque. 35~75g/cm

FF. REW torque. 70~16g/cm

Back tension. 1.5~8g/cm



Confirming phase relationship

fig-1

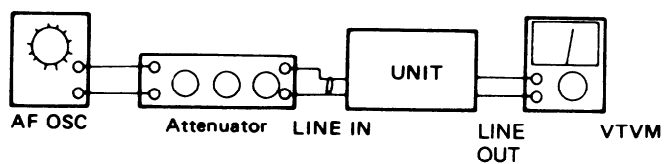


fig-2

TAPE MECHANISM-PART LIST

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
1	24611339	MECHANISM CHASSIS	83	24609012	SCREW (A)
2	24611359	HEAD CHASSIS (C)	84	24611351	MIRROR TAPE
3	24603358	LEVER (FR)	87	24611350	CORD CLAMPER
4	24607081	ARM AS (T R) P	88	24611361	SK BINDER OP-80
5	24607082	ARM AS (SHIFT)	90	8721266	WASHER 2.6
6	24611341	MOTOR HOLDER (R)	91	24611229	PLASTIC WASHER 1.6X3.5X.5
7	24611342	HOLDER (EJECT) L	92	24611355	NYLON WASHER 2.4X5X.5
8	24607083	ARM (EJECT LOCK) L	93	24611352	PLASTIC WASHER 2.1X4X.25
9	24605680	SPRING	94	24611353	PLASTIC WASHER 2.2X4.5X.25
12	24604090	COLLAR (PL ARM)	95	24611362	WASHER 1.7X3.5X.25
16	24611343	BASE AS (MECHANISM)	96	24611363	WASHER 2.1X6.8X.25
17	24607084	ARM AS (F R)	97	833120047	TAP-TIGHT SCREW M2X4
18	24602447	GEAR (FR)	98	833120057	TAP-TIGHT SCREW M2X5
19	24602448	GEAR (REW)	99	833120082	TAPPING SCREW M2X8
20	24602449	GEAR (FR CAM)	100	838120047	TAP-TIGHT SCREW M2X4
21	24602464	SUPPLY REEL AS	101	82512009	SCREW 2X9
22	24602450	REEL AS (B)	102	24609013	SCREW 2X9.5
23	24602451	CAP (REEL) B	103	838120122	TAPPING SCREW 2X12
24	24607085	ARM (BRAKE)	104	838120082	TAPPING SCREW 2STBX8BQ
25	24602452	CLUTCH AS	105	838120062	TAPPING SCREW 2X6
26	24607093	SELECT ARM (B)	106	82112003	PAN-HEAD SCREW M2X3
27	24602453	GEAR (PL CAM)	107	82112603	PAN-HEAD SCREW 2.6PX3
28	24607087	ARM (PLAY GEAR)			
29	24602454	GEAR (PLAY)			
30	24611344	GUIDE (CASSETTE)			
31	24611360	HEAD BASE (B)			
32	24602455	PINCH ROLLER AS (R)			
33	24602457	GEAR (FLYWHEEL) B			
35	24611347	PROTECTOR (SW)			
36	24603363	LEVER (EJECT)			
37	24604093	SPACER (CAPSTAN)			
38	24607089	ARM (SW)			
41	24602466	DRIVE BELT (K)			
42	24602460	CLUTCH BELT (K)			
43	24602467	BELT (COUNTER) B			
44	24607094	SHIFT ARM AS (FR) B			
45	24611348	HOUSING (R)			
46	24607091	ARM (TRIGGER) FR-B			
47	24602461	FLYWHEEL (RD)			
50	24605681	SPRING			
51	24605682	SPRING			
52	24605703	SPRING			
53	24605684	SPRING			
54	24605686	SPRING			
55	24605687	SPRING			
56	24605688	SPRING			
57	24605689	SPRING			
58	24605690	SPRING			
59	24605692	SPRING			
60	24605701	SPRING (C)			
61	24605702	SPRING (P) C			
62	24605695	SPRING			
63	24605697	SPRING			
64	24605698	SPRING			
67	24606296	SOLENOID COIL AS			
68	24606297	SWITCH (REC)			
69	24606298	P. C. B. AS (MECHANISM)			
74	24606299	SENSOR (REFLECTIVE)			
78	24606302	LEAF SWITCH			
79	24606303	LEAF SWITCH			
80	24601235	MOTOR AS (AB)			
81	24600051	R/P (HEAD)			
82	24600041	E HEAD			

PRINTED CIRCUIT BOARD-PARTS LIST

N AAF-3239-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ics	
Q101	222905	μPC-1228HA
Q105	222999	CX-20187
Q301	222652	M5218L
Q403	222808 or 22240111	M5218P or BA15218
Q405	222918	BA6251
Q601	22240147	μPC1330HA
Q701	22240141	HD614128SA55
Q902	222780053	78L05
	Transistors	
Q103, Q104	2211255, 2210746 or 2212485	2SC1815GR, 2SC945AP or JA501Q
Q107, Q108	2212794 or 2212795	2SD1468R or 2SD1468S
Q401, Q402	2211255, 2210746 or 2212485	2SC1815GR, 2SC945AP or JC501Q
Q451, Q452	2201883	2SC1213-C
Q453	2211706	2SD655F
Q454, Q455	221281	DTC114YS
Q456	2201540	2SC947
Q458	2211255, 2210746 or 2212485	2SC1815GR, 2SC945AP or JC501Q
Q602	221281	DTC114YS
Q702-Q704	2211454 or 2212494	2SA1015-Y or JA101P
Q705-Q707	2211706	2SD655F
Q708	2211255, 2210746 or 2212485	2SC1815GR, 2SC945AP or JC501Q
Q901	2201074 or 2201385	2SD880-Y or 2SD330-E
Q903	2211945 or 2212304	2SK246-GR or 2SK381-D
	Diodes	
D401, D402	223163	1SS133
D451	223163	1SS133
D701-D707	223163	1SS133
D708	224650561, 224450561 or 224150561	HZ-5.6E-B1, MTZ5.6A or 05AZ5.6X
D709, D710	223163	1SS133
D901-D905	223894	1N4002F
D906, D907	223163	1SS133
D908	224651302, 224451302 or 224151302	HZ-13EB2, MTZ13B or 05AZ13Y
	Coils	
L121, L122	233313	NMC6048
L123, L124	233382	NMC2058
L401, L402	231085 or 24606072	NCH2133 or NCH1010
L403, L404	233344A or 233314	NCH2114 or NCH2097
L451	231144A	NLO2048
X701	3010139	CSA3.20MG

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C103, C104	354780109T	1μF, 50V, Elect.
C107, C108	354721019T	100μF, 6.3V, Elect.
C113, C114	354780109T	1μF, 50V, Elect.
C121	354780109T	1μF, 50V, Elect.
C123-C126	354780229T	2.2μF, 50V, Elect.
C127-C130	354780479T	4.7μF, 50V, Elect.
C131, C132	354722219T	220μF, 6.3V, Elect.
C135, C136	354780479T	4.7μF, 50V, Elect.
C139, C140	354784799T	0.47μF, 50V, Elect.
C141, C142	354781599T	0.15μF, 50V, Elect.
C145, C146	354782299T	0.22μF, 50V, Elect.
C155, C156	354780479T	4.7μF, 50V, Elect.
C301-C304	354780479T	4.7μF, 50V, Elect.
C401, C402	354780479T	4.7μF, 50V, Elect.
C403, C404	354741009T	10μF, 16V, Elect.
C413, C414	354783399T	0.33μF, 50V, Elect.
C415, C416	354780479T	4.7μF, 50V, Elect.
C451	370131234	0.012μF, 100V, APS.
C456	354781009T	10μF, 50V, Elect.
C458	354744709T	47μF, 16V, Elect.
C459	354741019T	100μF, 16V, Elect.
C601	354741009T	10μF, 16V, Elect.
C701	354780109T	1μF, 50V, Elect.
C702	354741009T	10μF, 16V, Elect.
C704, C705	354780229T	2.2μF, 50V, Elect.
C709	354780229S	2.2μF, 50V, Elect.
C904	354761029S	1000μF, 35V, Elect.
C905, C906	354744709T	47μF, 16V, Elect.
C907	354744729S	4700μF, 16V, Elect.
C909	354781599T	0.15μF, 50V, Elect.
C912	354742219T	220μF, 16V, Elect.
C914	354741009T	10μF, 16V, Elect.
	Resistors	
R115, R116	5210066	N06HR22KBD
R147, R148	5104226	N11RL50kA17, VR
R401, R402	5210068	N06HR47KBD
R427, R428	5215047 or 5215024	N08HR100KBC N08HR100KBC
R701	49163392410	3.9kΩX10, 1/10W, Network
R718	49163392408	3.9kΩX8, 1/10W, Network
R901, R910	441520104	RS1/2WBJ 1.0
	Plugs, Socket	
P101	25055136	NPLG-6P120
P102	25045165	NPJ-4PDBL59
P401	25055132	NPLG-2P116
P701	25045172	HSJ-1003-01-020
P702A	2000637	NSAS-18P593
P703A	2000728	NSAS-16P684
P704A	2000824	NSAS-18P780
	Switches	
S708-S711	25035587	NPS-422-S549

N ADIS-3240-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ic	
Q303, Q704	222623	1R2E02

CIRCUIT NO.	PART NO.	DESCRIPTION
LED		
D301-D308	225137CG or	SEL2413E-CG or
	225137DG	SEL2413E-DG
D309-D315	225141	SEL2213C
Capacitors		
C305, C306	354780479T	4.7 μ F, 50V, Elect.
C307, C308	354780109T	1 μ F, 50V, Elect.
Switch		
S701-S707	25035548	NPS-111S510
Holders		
	27190613A	HOLDER(LED)

N A SW-3241-1

CIRCUIT NO.	PART NO.	DESCRIPTION
C901	3500065A	0.01 μ F, AC 400V, IS
S901	25035558	NPS-111-L520P, Power switch

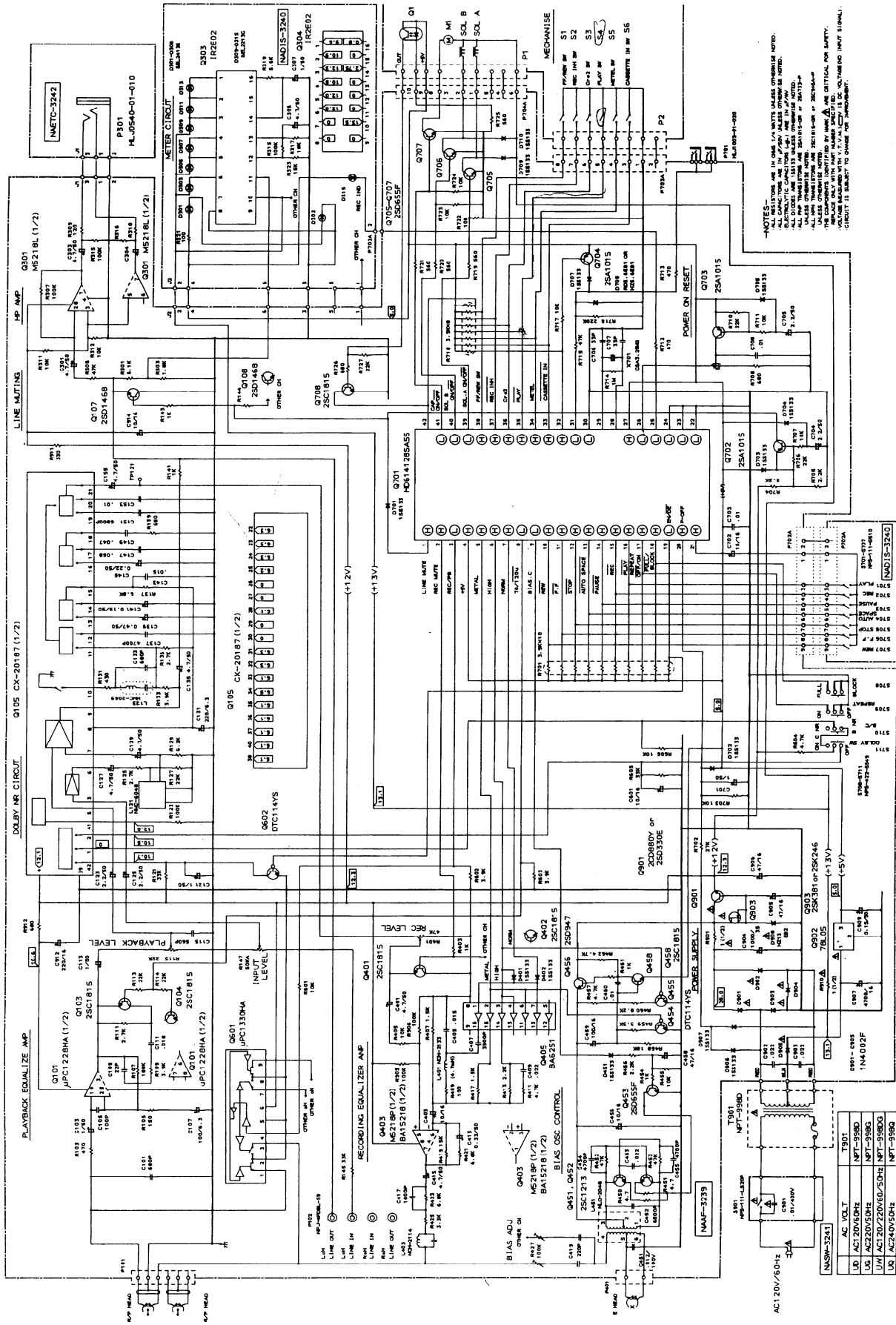
NAETC-3242-1

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	25045139	HLJ0540-01-010

ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, Nishi Shimbashi 3-chome, Minato-ku,
TOKYO 105, JAPAN Tel: 03-432-6987 Fax: 03-436-6979 TLX: 242-3551 ONKYO J
ONKYO U.S.A. CORPORATION
200 Williams Drive, Ramsey, N.J. 07446, U.S.A. Tel: 201-825-7950 Fax: 201-825-8150

SCHEMATIC DIAGRAM



TAPE MECHANISM-EXPLODED VIEW

