

ONKYO® SERVICE MANUAL

CASSETTE TAPE DECK MODEL K-501A



UPP	230-240V AC, 50Hz
UDT	120V AC, 60Hz
UGT	220-230V AC, 50/60Hz

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 PART 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.

Wow and flutter

0.1 % (WRMS)

0.2 % (DIN)

Frequency response

Metal position tape

30 to 15,000 Hz $\pm$ 3 dB

High position tape

30 to 14,000 Hz $\pm$ 3 dB

Normal position tape

30 to 13,000 Hz $\pm$ 3 dB

Signal to noise ratio

- 54 dB (metal position tape, Dolby NR off)
- Noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with Dolby B NR.
- Noise reduction of 20 dB at 5 kHz is possible with Dolby C NR.

Input Jacks

LINE IN: 2

Input sensitivity: 500 mV

Input impedance: 50 kohms

Output Jacks

LINE OUT: 2

Standard output level: 500 mV

Output load impedance:

over 50 kohms

Motors

DC servo motor: 1

Heads

REC/PB: Special Hard Permalloy: 1

Erase head: Ferrite: 1

Power supply rating

AC 230-240 V, 50 Hz

AC 220-230 V, 50/60 Hz

AC 120 V, 60 Hz

Power consumption

13 W (230-240 V, 50 Hz)

(220-230 V, 50/60 Hz)

14 W (120 V, 60 Hz)

Dimensions (W x H x D)

155 mm x 94 mm x 303 mm

6-1/8" x 3-11/16" x 11-15/16"

(AC 230-240 V, 50Hz)

(AC 220-230 V, 50/60Hz)

155 mm x 94 mm x 297.5 mm

6-1/8" x 3-11/16" x 11-11/16"

(AC 120 V, 60Hz)

Weight

2.5 kg, 5.5 lbs

Specifications and external appearance are subject to change without notice as a result of product improvement.

SERVICE PROCEDURES

CIRCUIT NO.	PART NO.	DESCRIPTION
F901	252074	2A-SE-EAK, Fuse <PP,GT>

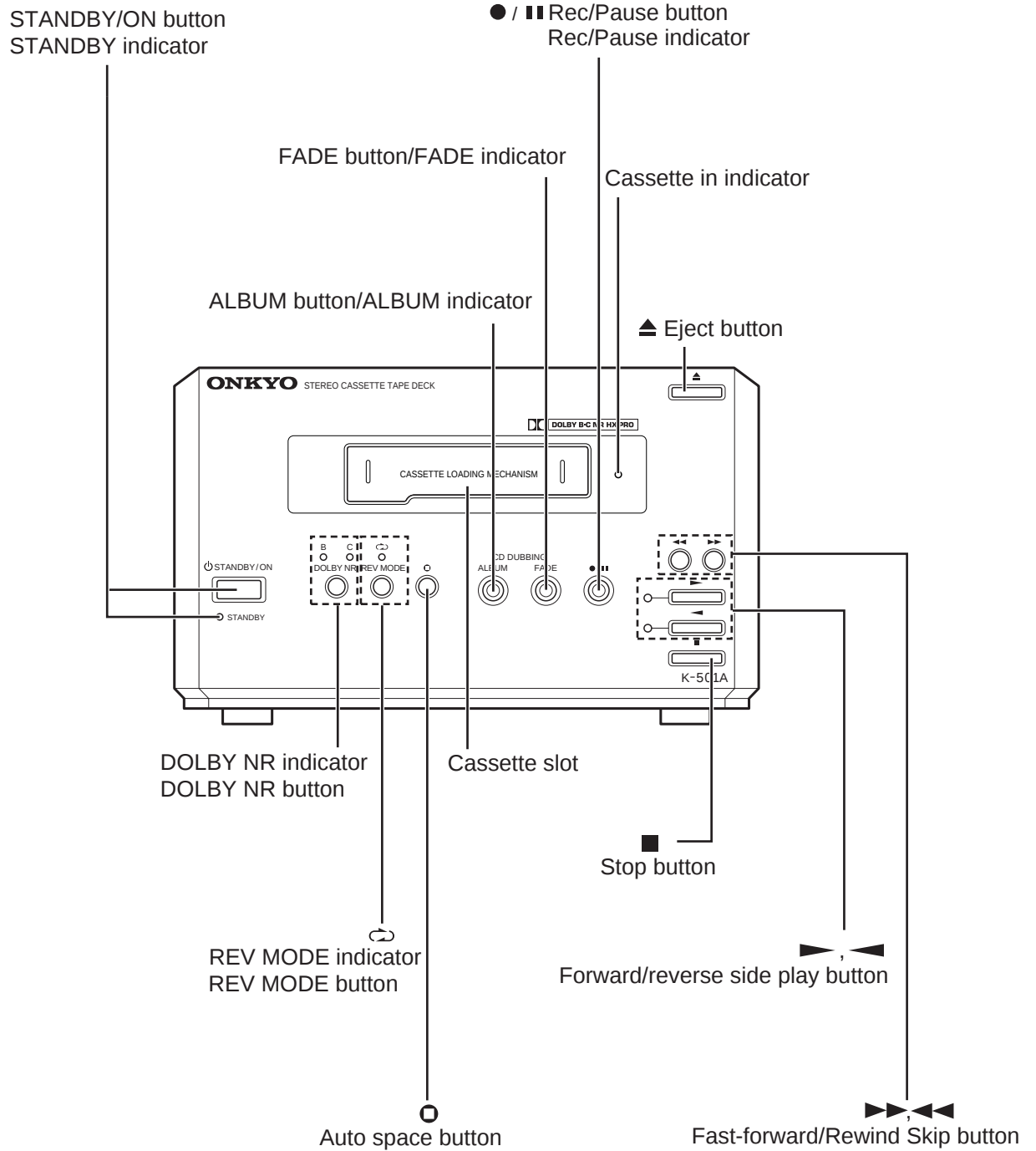
<PP>...European model only

<DT>...120V model only

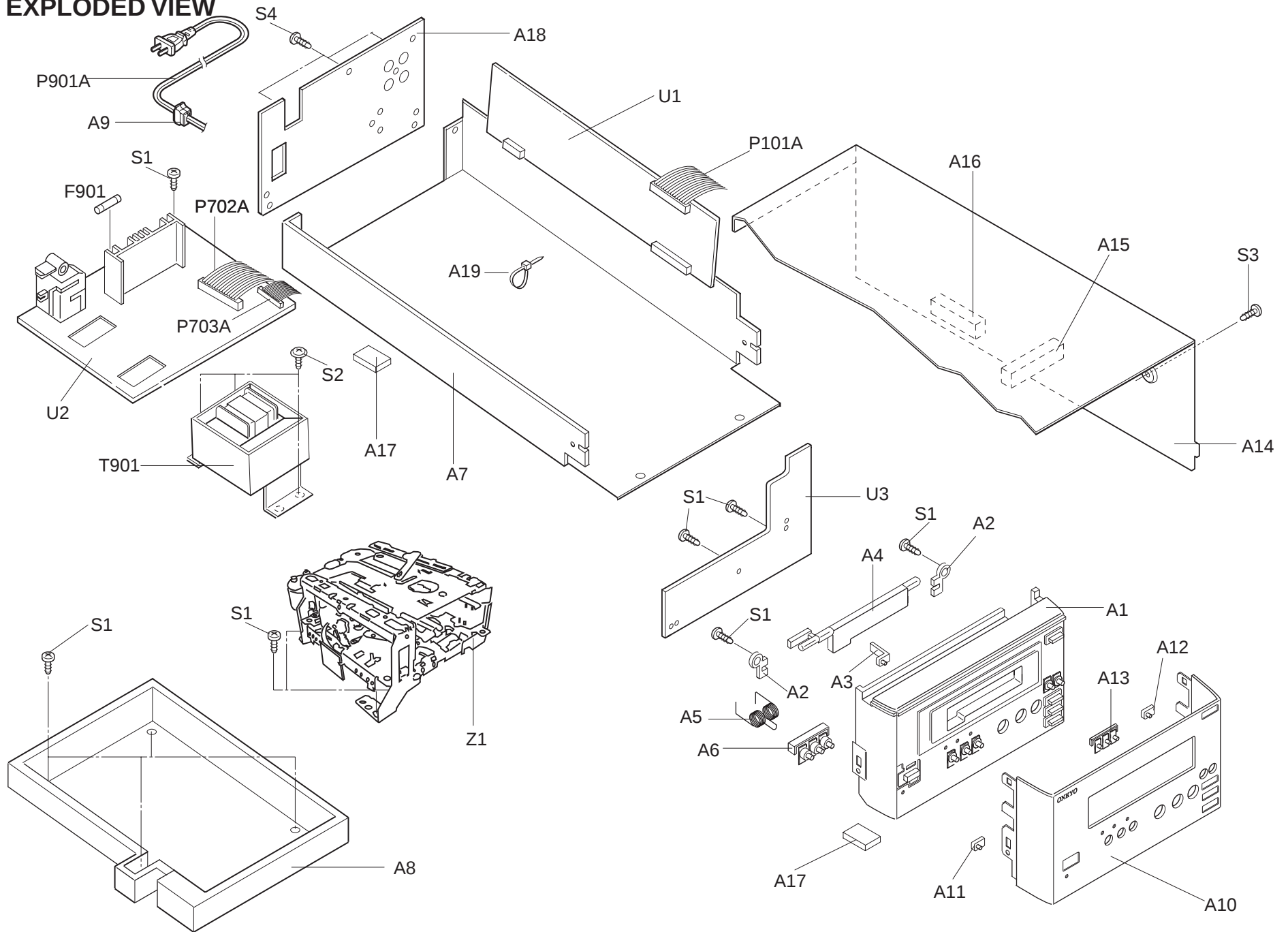
<GT>...220-230V model only

PANEL VIEW

FRONT PANEL



EXPLODED VIEW



PARTS LIST

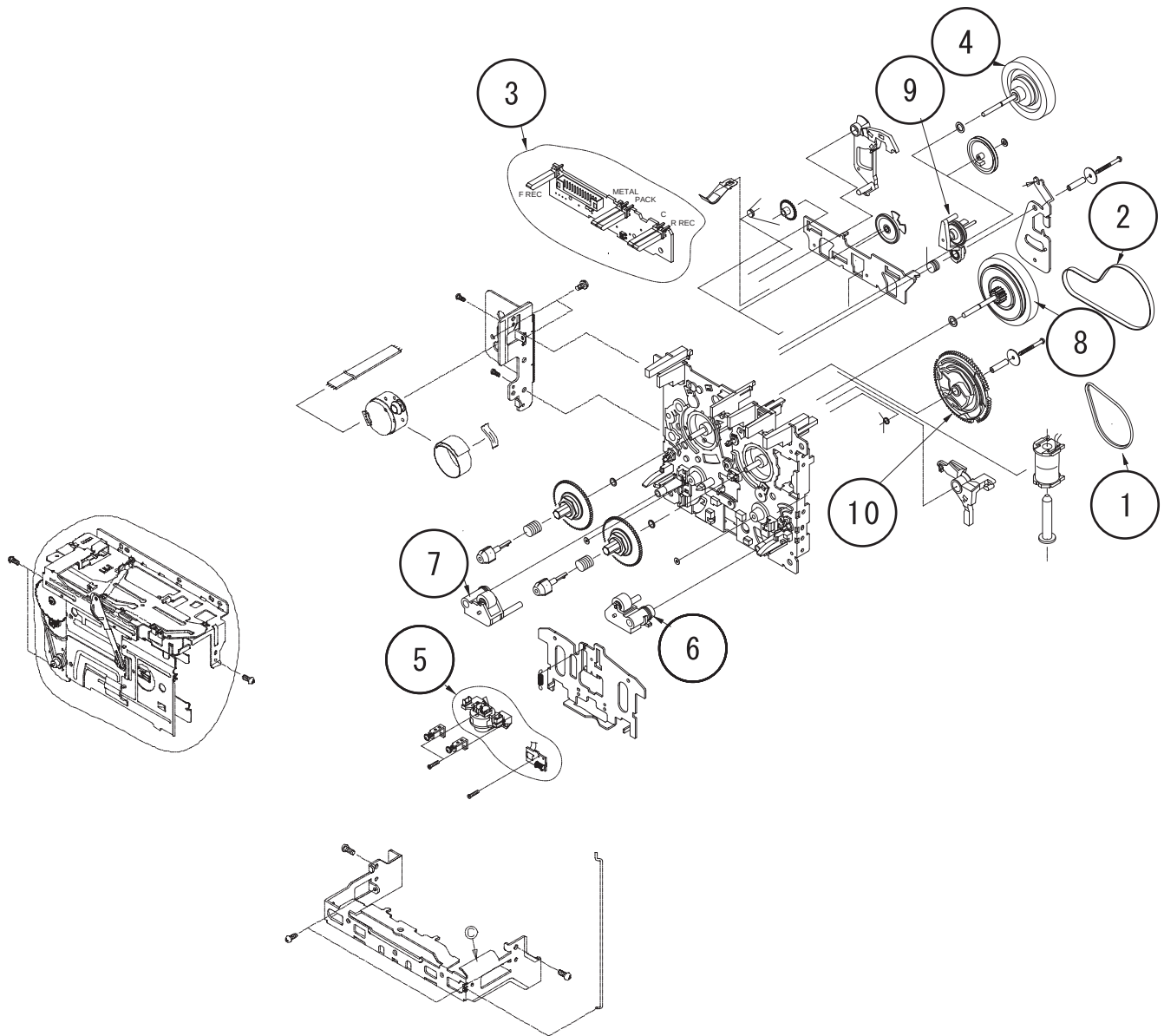
EXPLODED VIEW

REF. NO.	PART NO.	DESCRIPTION
A1	27111266	Front bracket
A2	27191165	Holder (Door)
A3	28198948	Facet(IN)
A4	28148505	Door
A5	27180583	Spring
A6	28325983	Recording button ass'y
A7	27100415	Chassis
A8	27191164	Holder (Mechanism)
A9	27300750	 #2271, Bushing
A10	27212366	Front panel
A11	28198939	Facet(S)
A12	28198946	Facet(PLAY)
A13	28198947	Facet(NR)
A14	28184832	Cover
A15	28140079	Cushion
A16	28141492	Cushion
A17	28141489	Cushion
A18	27122947A	Rear panel <DT>
	27122948A	Rear panel <GT>
	27122949A	Rear panel <PP>
A19	260208	Binder
F901	252074	 2A-SE-EAK, Fuse <PP,GT>
P101A	2009990714	NSAS-14P0999, Socket ass'y
P702A	20022392618	NSAS-26P0998, Socket ass'y
P703A	20022391010	NSAS-10P0997, Socket ass'y
P901A	253334HRK	 AS-CEE, Power supply cord <PP,GT>
	253331HDK or	 AS-UC-2, Power supply cord <DT>
	253330MIL	 AS-UC-2, Power supply cord <DT>
T901	2301571	 NPT-1434D, Power Transformer <DT>
	2301572	 NPT-1434G, Power Transformer <GT>
	2301573	 NPT-1434P, Power Transformer <PP>
U1	1N283583-1B	NAAF-7383-1B, Main circuit PC board <DT>
	1N283583-1C	NAAF-7383-1C, Main circuit PC board <GT>
	1N283583-1D	NAAF-7383-1D, Main circuit PC board <PP>
U2	1N283584-1B	NAPS-7384-1B, Power supply PC board <DT>
	1N283584-1C	NAPS-7384-1C, Power supply PC board <GT>
	1N283584-1D	NAPS-7384-1D, Power supply PC board <PP>
U3	1N283585-1B	NADIS-7385-1B, Display circuit PC board <DT>
	1N283585-1C	NADIS-7385-1C, Display circuit PC board <GT>
	1N283585-1D	NADIS-7385-1D, Display circuit PC board <PP>
Z1	244248A	CMAL2Z815A, Cassette Mechanism
S1	838130088	3TTB+8B, Self tapping screw
S2	830440089	4TTC+8C(BC), Self tapping screw
S3	838930088	3TTB+8B(UN), Self tapping screw
S4	838430088	3TTB+8B(BC), Self tapping screw

Note
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 <DT>...120V model only
 <GT>...220-230V model only

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 CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK.
 REPLACE ONLY WITH PART NUMBER SPECIFIED.

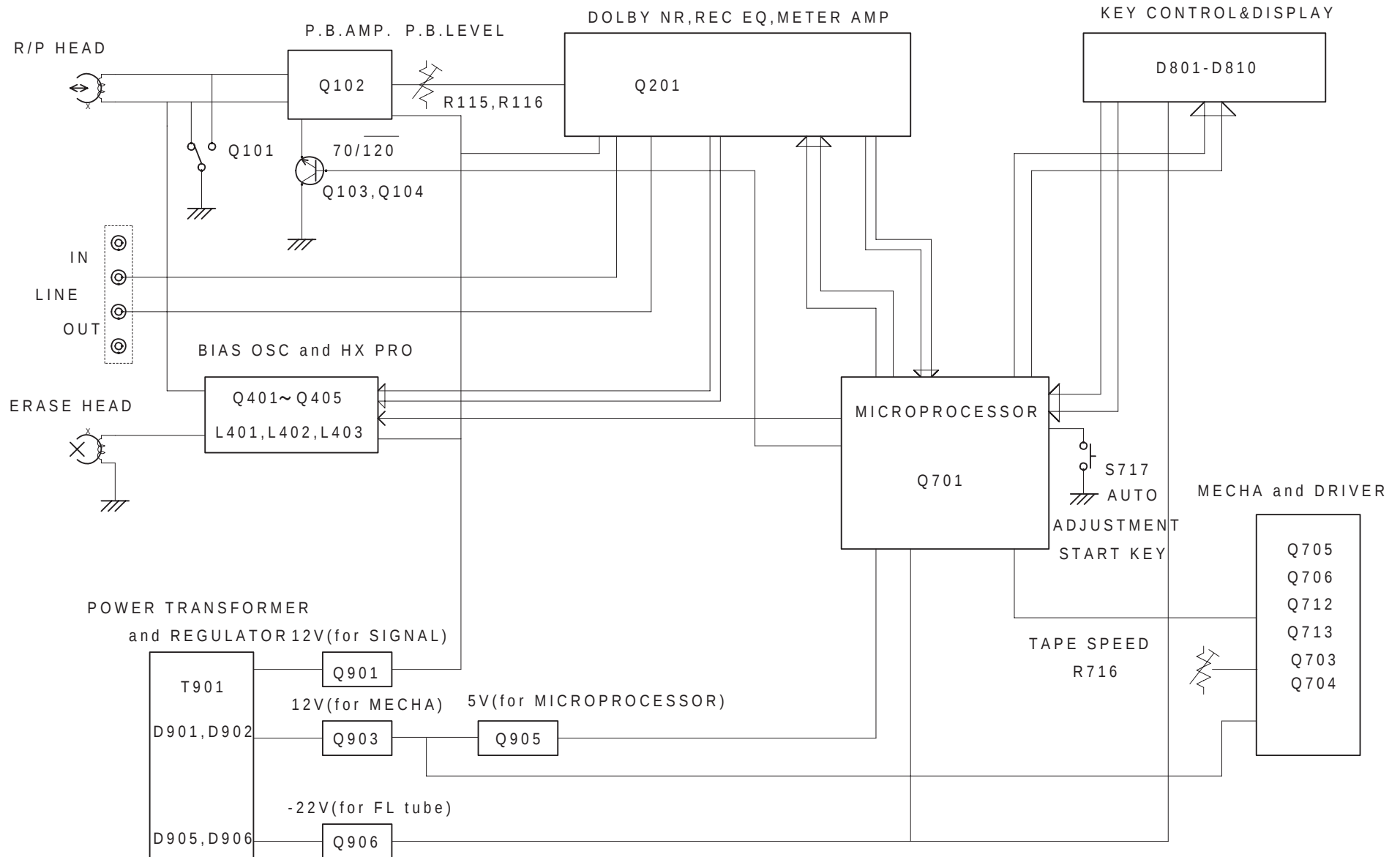
EXPLODED VIEW CASSETTE MECHANISM



PARTS LIST

REF.NO	PART NO.	DESCRIPTION
1	FF18W-	F/R belt
2	FF19Y-	Main belt
3	F567-626	Switch PC board ass'y
4	FF26K-	Flywheel ass'y
5	F513-891	Recording/Play head ass'y
6	F514-129	Pinch roller R
7	F514-130	Pinch roller L
8	F522-064	Clutch
9	F522-052	Clutch
10	FD52Y-	Master cam

BLOCK DIAGRAM



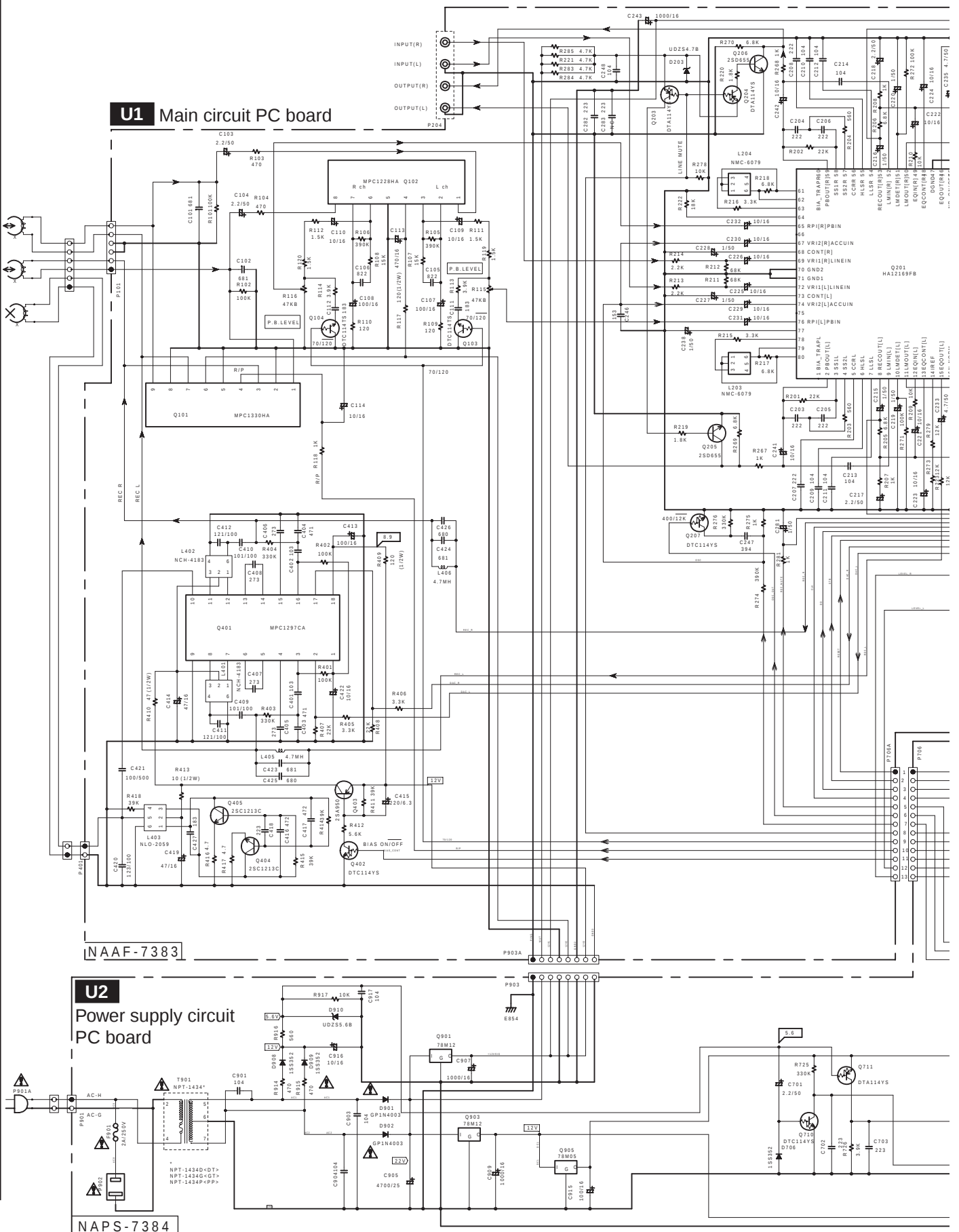
SCHEMATIC DIAGRAM 1

U1 Main circuit PC board

NAAF-7383

U2 Power supply circuit PC board

NAPS-7384



NC: No used

SCHEMATIC DIAGRAM 2

U1 Main circuit PC board

NOTE

- THE COMPONENT IDENTIFIED BY MARK Δ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBERS SPECIFIED.
- VOLTAGE (MEASURED WITH VOLT METER) IS DC VOLTAGE (NO INPUT SIGNAL).
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (E) ARE IN μ F/VV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
- EX) 030-6pF 330-60pF 331-830pF 333M-033 μ F
- ALL RESISTORS ARE IN OHMS 1/10WATT UNLESS OTHERWISE NOTED.
- THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
- EX) PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

NC: Not used

U3 Display circuit PC board

U2 Power supply circuit PC board

NADIS-7385

TO MECHANISM

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SCHEMATIC DIAGRAM

1

U1 Main circuit PC board

2

3

4

5

Power supply circuit PC board

U2 NAPS-7384

NAAF-7383

NOTE

- THE COMPONENT IDENTIFIED BY MARK  ARE CRITICAL FOR SAFETY. REPLACEMENT PARTS MUST BE IDENTICAL TO THE ORIGINAL PARTS SPECIFIED.
- VOLTAGE MEASURED WITH VOLTMETER.  IS DC VOLTAGE (NO INPUT SIGNAL).
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS  ARE IN μ F/VV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
- EX) 030-89F 330-839F 331-8309F 3330-0339F
- ALL RESISTORS ARE IN OHMS/1/4Watts UNLESS OTHERWISE NOTED.
- THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
- EX)  PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

NC: No used

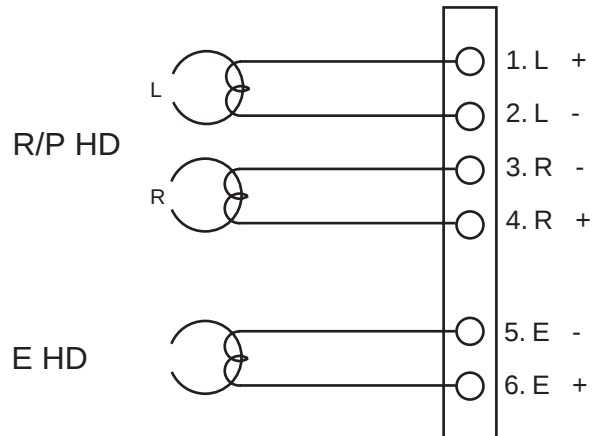
U3 Display circuit PC board

NADIS-7385

SCHEMATIC DIAGRAM

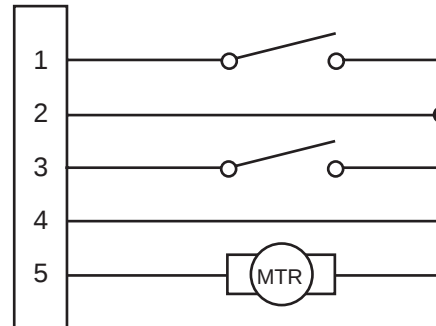
MECHANISM SECTION

Rec/Play/Erase Head



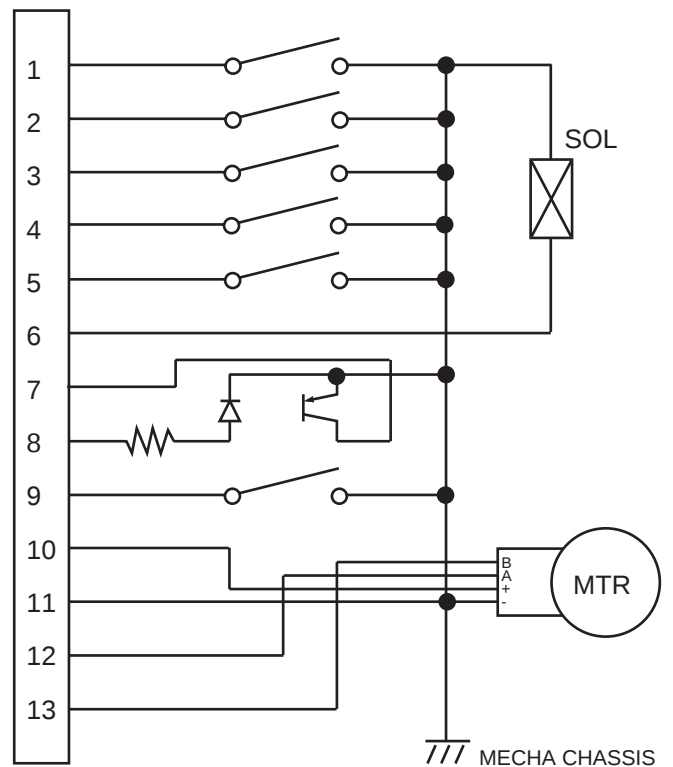
Control circuit PC board

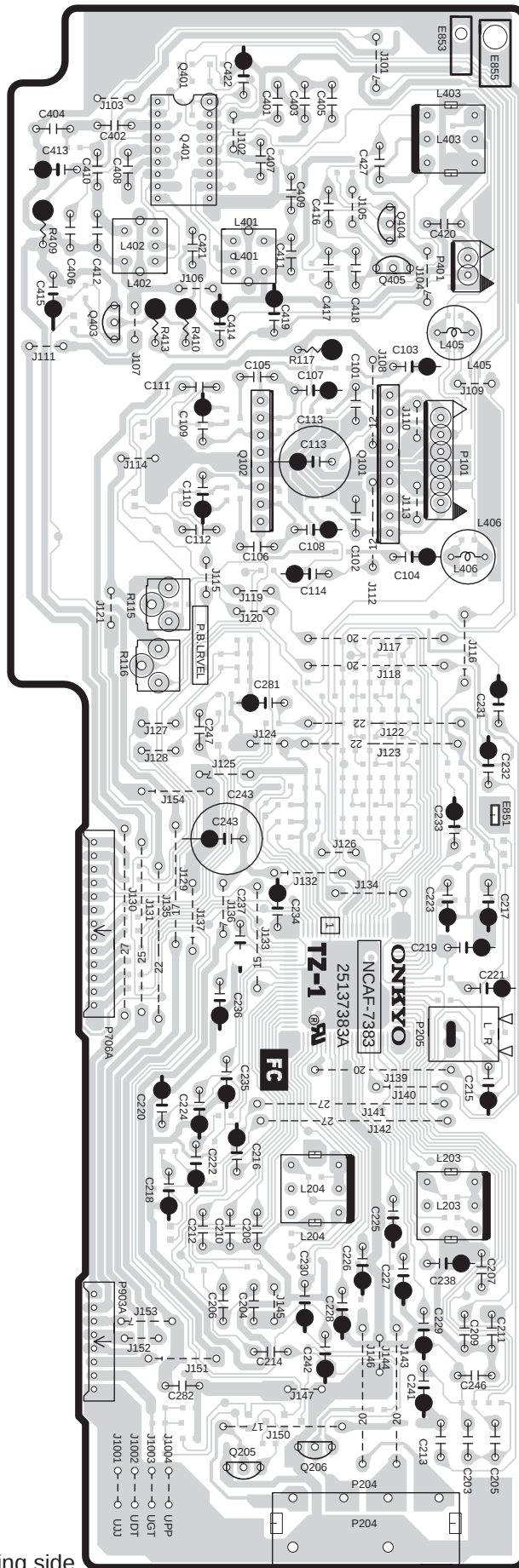
UNLOAD SW
COM
LOAD SW
MTR-(CW)(UNLOAD)
MTR+(CCW)(LOAD)



Main circuit PC board

R.REC SW
METAL SW
F.REC SW
PACK SW
HIGH SW
+ SOL
SENSOR OUT
+5V SENSOR
PLAY SW
+ MTR
- COM
MTR SPEED A
MTR SPEED B



PRINTED CIRCUIT
BOARD VIEW 1**U1**Main circuit PC board
NAAF-7383

Component side from soldering side

A

B

C

D

**PRINTED CIRCUIT
BOARD VIEW 2**

1

U1

Main circuit PC board
NAAF-7383

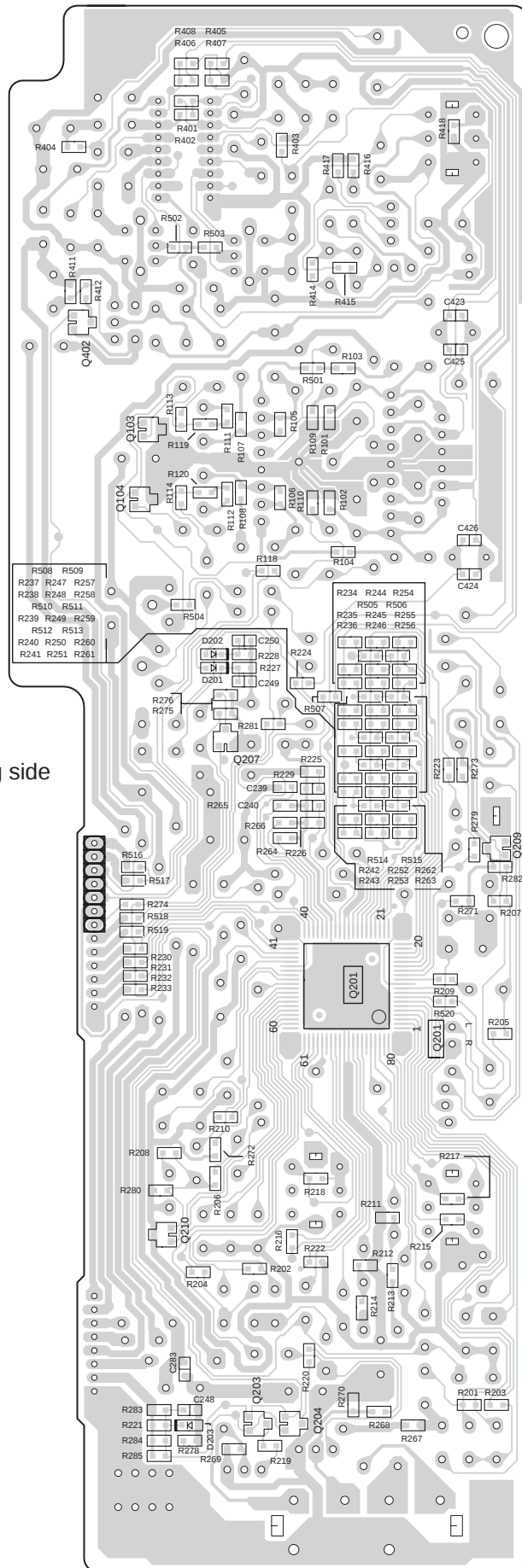
2

3

Soldering side

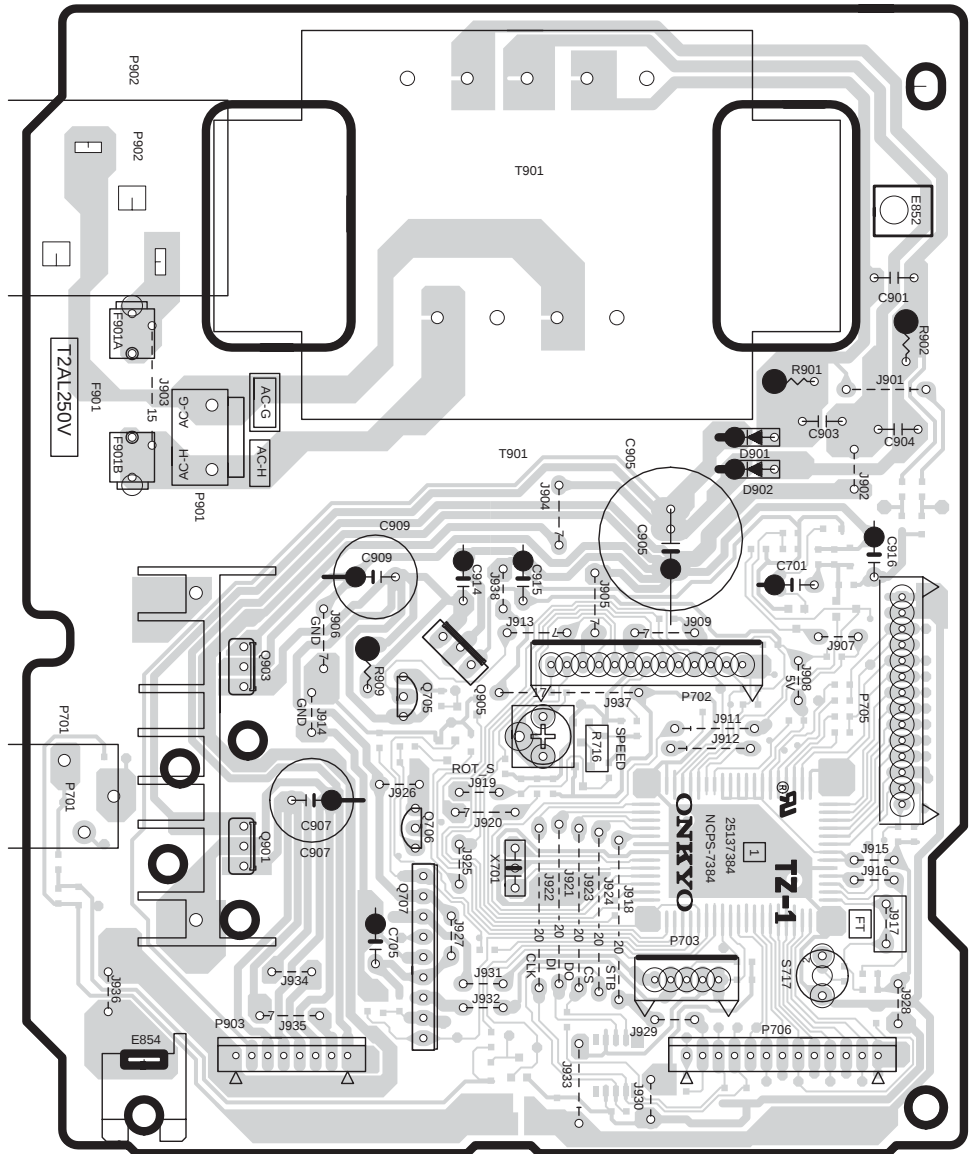
4

5



PRINTED CIRCUIT BOARD VIEW 3

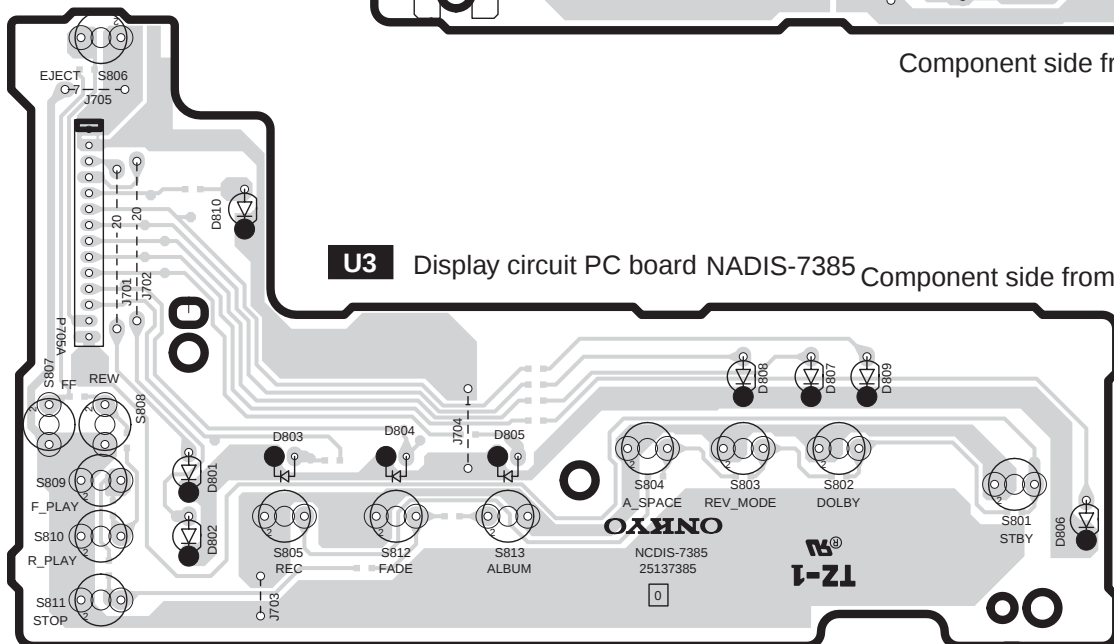
U2 Power supply PC board NAPS-7384

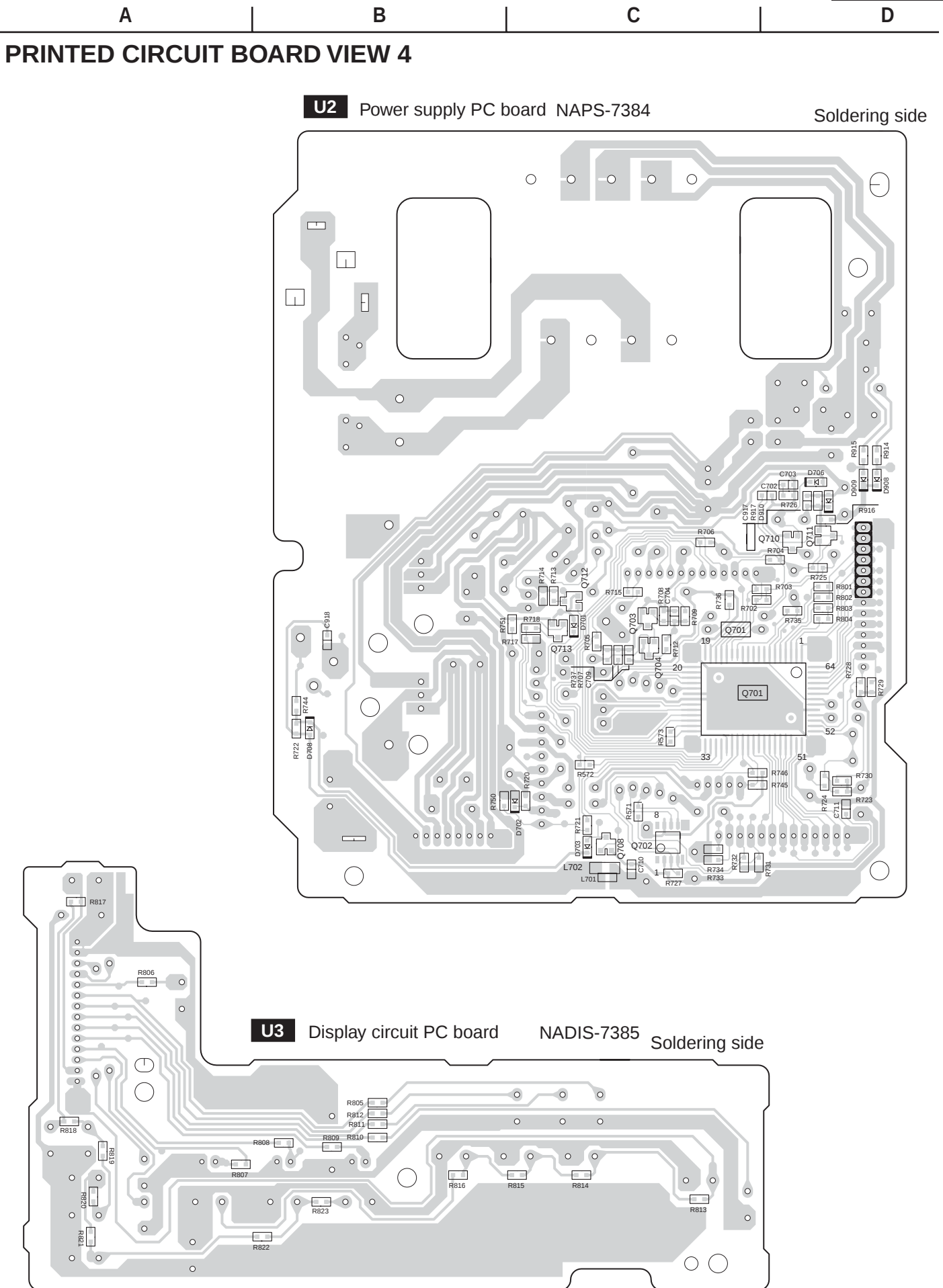


Component side from soldering side

U3 Display circuit PC board NADIS-7385

Component side from soldering side





PARTS LIST

CIRCUIT PARTS 1

REF. NO.	PART NO.	DESCRIPTION
ICs		
Q101	22240147	MPC1330HA
Q102	222905	MPC1228HA
Q201	22241144R3HI	HA12169FB
Q401	222959	MPC1297CA
Q701	22241751R3	TMP87CH14F-3JJ5
Q702	22241609R2	BR93LC46F-WE2
Q707	22240239	TA7291S
Q901,Q903	222780125NEC or 222780125JRC	MPC78M12HF NJM78M12FA
Q905	222780055	78M05HF
Transistors		
Q103,Q104	2216680R2	RN1411
Q203,Q204	2216360R2	RN2407
Q708,Q711	2216480R2	DTA114YKA
Q205,Q206	2211705 or 2211706	2SD655-E 2SD655-F
Q207,Q402	2216260R2	RN1407
Q704,Q710 Q712,Q713	2216470R2	DTC114YKA
Q209,Q210	2216670R2	DTC114TKA
Q403	2211504	2SA950-Y
Q404,Q405	2201883	2SC1213-C
Q703	2214640R2	2SA1037K
Q705,Q706	2212853 or 2212855	2SB1068-K 2SB1068-U
Diodes		
D901,D902	22380035 or 22380260	 GP104003E  RL1N4003
D201,D202	223234R2 or 223269R2	1SS352 1SS355
D701,D703	223234R2 or 223269R2	1SS352 1SS355
D706,D908	223234R2 or 223269R2	1SS352 1SS355
D909	223234R2 or 223269R2	1SS352 1SS355
D203	224550470R2	UDZS4.7B
D702	224550750R2	UDZS7.5B
D708,D910	224550560R2	UDZS5.6B
LEDs		
D801,D802	225390	SEL2910A-TP6
D803	225322	SEL6210S
D804,D805	225324D	SEL6910A-D
D806	225404	SEL2210R TP6
D807-D810	225390	SEL2910A-TP6

Note
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<GT>...220-230V model only
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PARTS LIST

CIRCUIT PARTS 2

REF. NO.	PART NO.	DESCRIPTION
	Coils	
L401,L402	231127	NCH-4183
L405,L406	231085	NCH-2133
L203,L204	233407	NMC-6079
L403	231215	NLO-2059
L701	230955R2	BK1608HS102-T
	Oscillator	
X701	3010341	CSTLS8M00G56
	Capacitors	
C243,C907 C909	354741029	1000uF,16V,Elect
C107,C108 C413,C705 C915	354741019	100uF,16V,Elect
C109,C110 C221-C226 C229-C232 C241,C242 C422,C916 C114	354741009	10uF,16V,Elect
C113	354744719	470uF,16V,Elect
C414,C419	354744709	47uF,16V,Elect
C215,C216 C219,C220 C227,C228 C238,C281	354780109	1uF,50V,Elect
C217,C218 C701	354780229	2.2uF,50V,Elect
C233-C237 C415	354780479	4.7uF,50V,Elect
C101,C102	354722219	220uF,6.3V,Elect
C105,C106 C111,C112 C203-C208 C209-C214 C247 C901,C903 C904	374726814	ECQ-B50V-681J
	374728224	ECQ-B50V-822J
	374721834	ECQ-B50V-183J
	374722224	ECQ-B50V-222J
	374721044	ECQ-V50V-104J
	374723944	ECQ-V50V-394J
	374721044	ECQ-V50V-104J
C409,C410 C411,C412 C420 C103,C104 C905	370131014	APS100V-101J
	370131214	APS100V-121J
	370131234	APS100V-123J
	391980227	2.2uF,50V,Elect
	391963327	3300uF,35V,Elect

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PARTS LIST

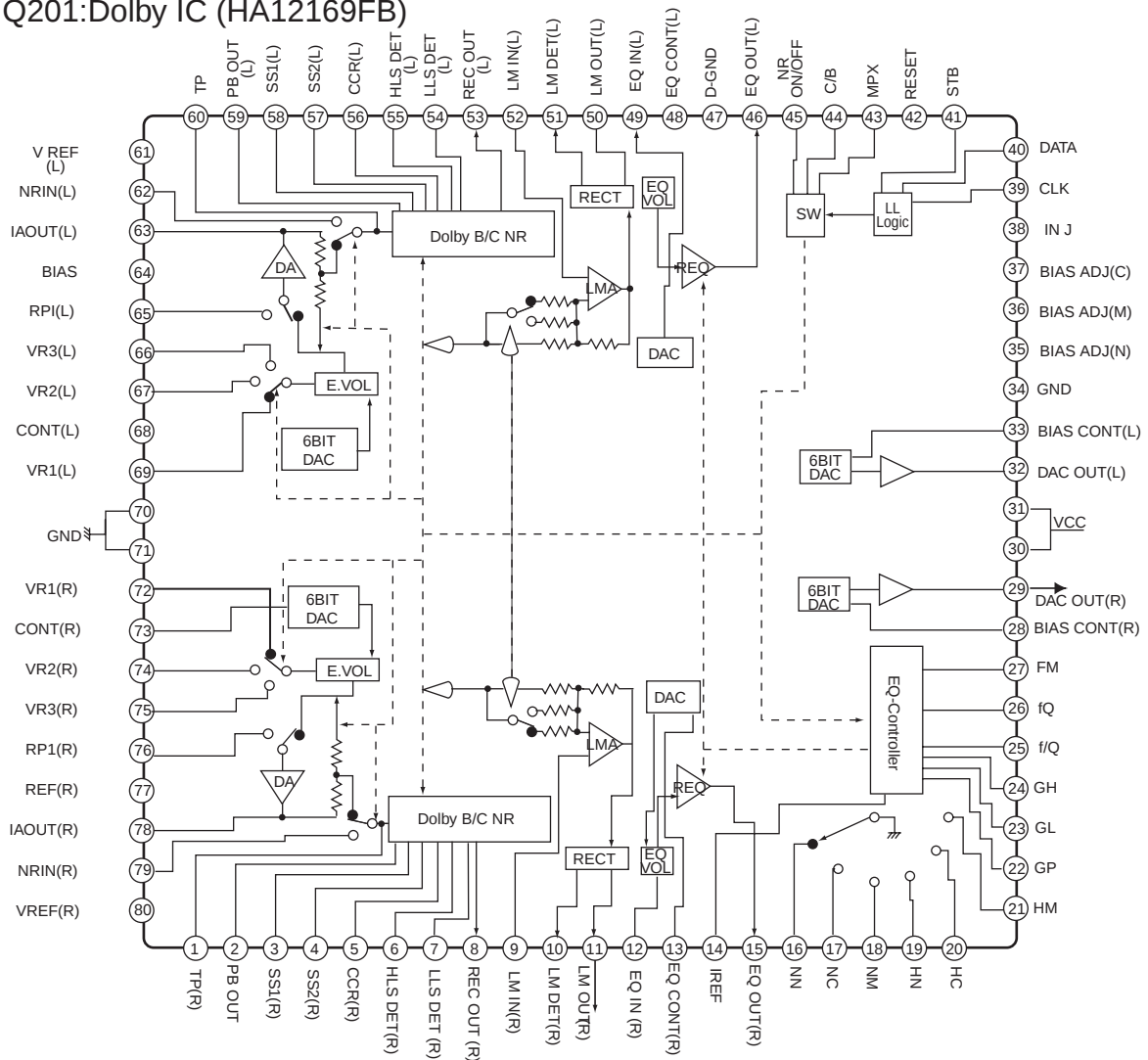
CIRCUIT PARTS 3

REF. NO.	PART NO.	DESCRIPTION
R117,R409	443521214	120ohm +/-5% 1/2W,Metal oxide
R410	443524704	47ohm +/-5% 1/2W,Metal oxide
R413	443521004	10ohm +/-5% 1/2W,Metal oxide
R115,R116	5210296	N06HR47KBE,Trimming
R716	5210261	N06HR5KBC,Trimming
Switches		
S717	25035699	NPS-111-S662
S801-S813		
Heat sink		
Q901A	27160391	HEAT SINK
Fuse holders		
F901A,F901B	25052133	 NSCT-1P2031 <GT,PP>
Jacks		
P204	25045305	NPJ-4PDBL164
P701	25045330	NPJ-2PDBL184
Plugs		
P101	25055136	NPLG-6P120
P205	25055689	NPLG-2P645
P401	25055132	NPLG-2P116
P702	25055157	NPLG-13P141
P703	25055149	NPLG-5P133
P705	25055158	NPLG-14P142
P706	25055709	NPLG-13P665
P901	25055675	NPLG-2P631
P903	25055704	NPLG-8P660
Sockets		
P706A	25051238	NSCT-13P1028
P902	25051990	 NSCT-2P1777 <DT>
	25051637	 NSCT-2P1424 <GT>
	25051637	 NSCT-2P1424<PP>
P903A	25051233	NSCT-8P1023
P705A	2002E392825	NSAS-28P1000
Holder		
E852	27190608-1	(CRAMP) UA-0 V0
Retainer		
E854	27141059	
Clamp		
E851	260224	CP-1S
Screws		
Q901A,Q903B	82143010	3P+10FN(BC),Pan head screw

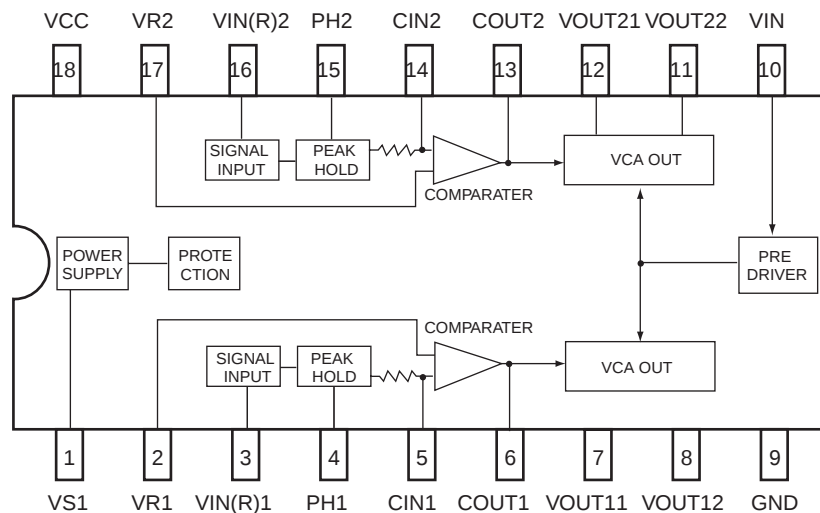
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IC BLOCK DIAGRAM 1

Q201:Dolby IC (HA12169FB)

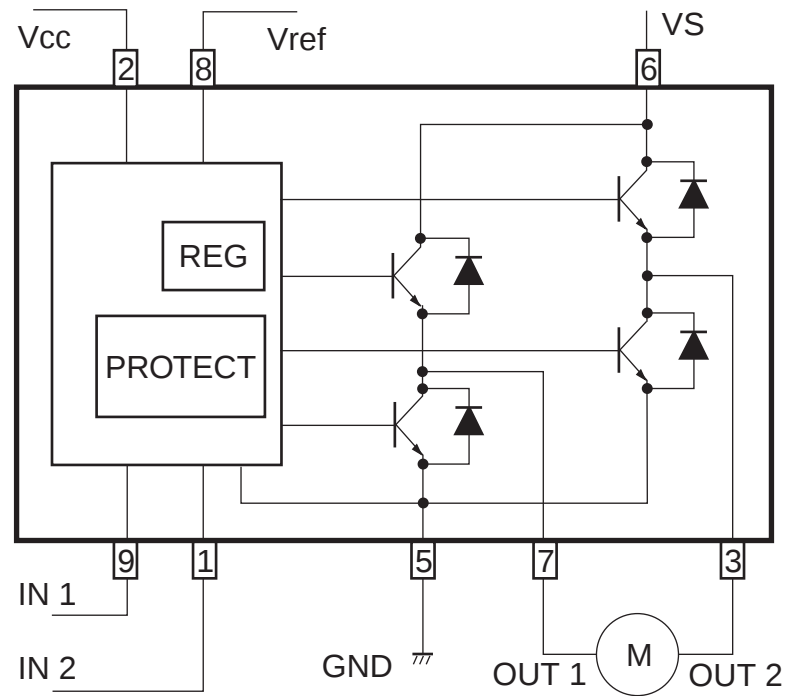


Q101:Recording amplifier IC(MPC1297CA)



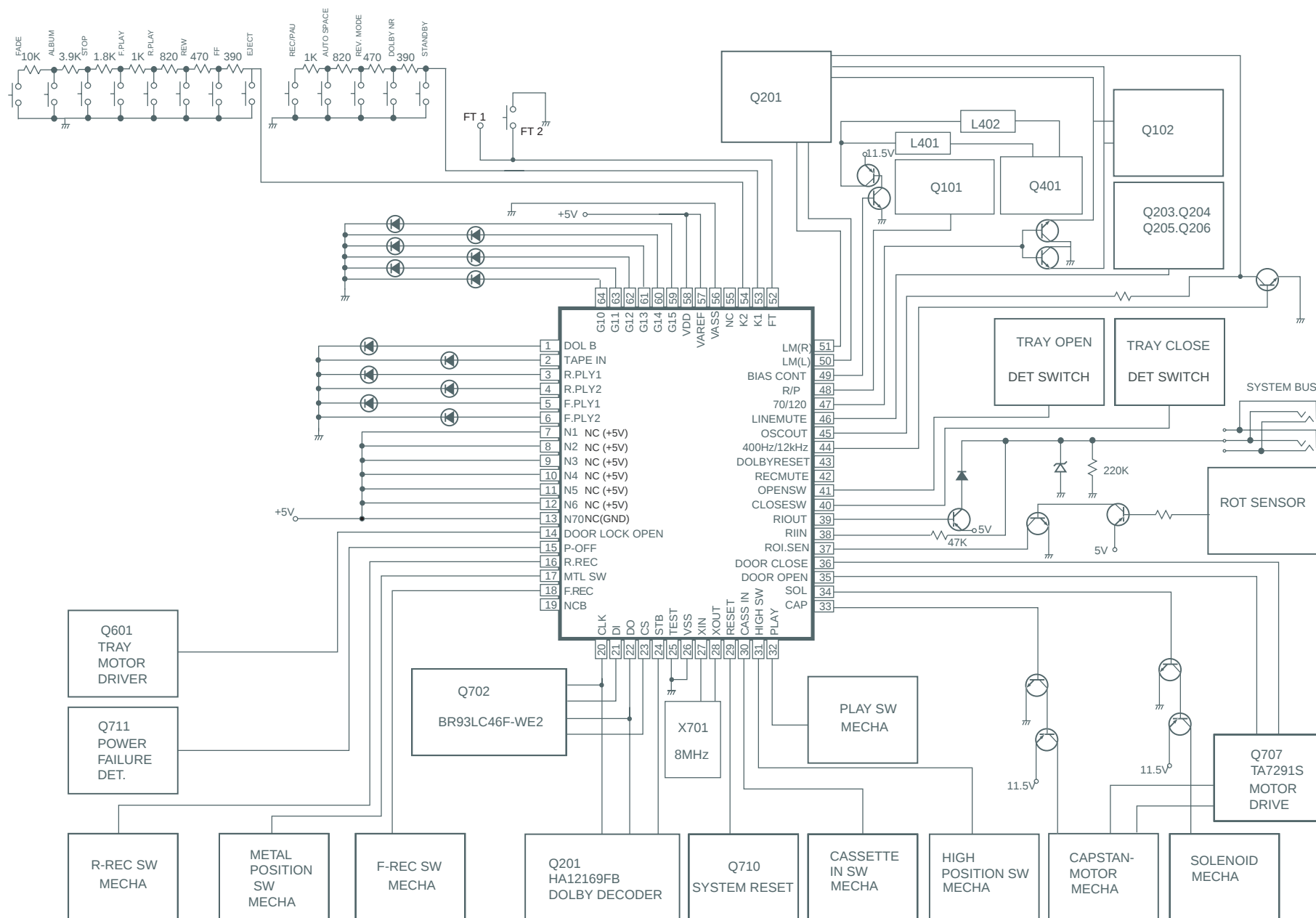
IC BLOCK DIAGRAM 2

Q707 : TA7291S(Motor drive)



OPERATION	INPUT		OUTPUT	
	IN 1	IN 2	OUT 1	OUT 2
STOP	0	0	∞	∞
FORWARD	1	0	H	L
REVERSE	0	1	L	H
BRAKE	1	1	L	L

Q701:TMP87CH14F



MICROPROCESSOR TERMINAL DESCRIPTIONS

Pin NO.	Terminal	I/O	DESCRIPTION
1	DOLBYBLED	O	Dolby B indicator control output pin
2	TAPEINLED	O	Cassette tape detection indicator control output pin
3	REVLED1	O	Reverse direction indicator control output pin
4	REVLED2	O	Reverse direction indicator control output pin
5	FWDLED1	O	Forward direction indicator control output pin
6	FWDLED2	O	Forward direction indicator control output pin
7	NOT USED		Not used.
8	NOT USED		Not used.
9	NOT USED		Not used.
10	NOT USED		Not used.
11	NOT USED		Not used.
12	NOT USED		Not used.
13	MODEL MODE	I	Model judgement input pin
14	DCHECK	I	Load detection input pin when a door closes.
15	POFF	I	Power failure detection input pin
16	PRECINHSW	I	Prohibition against reversal recording input pin
17	METALSW	I	Metal switch detection input pin
18	FRECINHSW	I	Prohibition against forward recording input pin
19	VKK		Not used.
20	CLOCK	I	Control for EEPROM
21	SIN	I	Data input for EEPROM
22	SOUT	I	Data output for EEPROM
23	CS	O	Chip select for EEPROM
24	STB	O	Standby port
25	TEST		Connect to GND
26	VSS		Connect to GND
27	XIN		Clock OSC(8MHz)
28	XOUT		Clock OSC(8MHz)
29	RESET	I	System reset
30	PACKSW	I	Cassette detect switch
31	HIGHSW	I	High switch detect
32	PLAYSW	I	Play switch detect
33	CAPSTAN	O	Capstan control
34	SOLENOID	O	Solenoid control
35	OPEN	O	Door control
36	CLOSE	O	Door control
37	SENSOR	I	Rotate sensor
38	RIIN	I	System code input pin
39	RIOUT	O	System code output pin
40	CLOSESW	I	Door close detect
41	OPENS	I	Door open detect
42	RECMUTE	O	Recording mute control
43	DOLBYRESET	O	Dolby IC reset
44	400Hz/12kHz	O	Switched 400Hz/12kHz
45	OSCOUT	O	OSC output 400Hz/12kHz
46	LINEMUTE	O	Line mute control
47	70/120	O	Tape select port
48	REC/PB	O	Mode select port
49	BIAS	O	Bias select
50	LEVELLCH	I	A/D Control for input level(Lch)
51	LEVELRCH	I	A/D Control for input level(Rch)
52	KEYIN4	I	A/D Control
53	KEYIN3	I	A/D Control
54	KEYIN2	I	A/D Control
55	KEYIN1	I	A/D Control
56	VASS		Ref. Voltage for A/D comparator +5V
57	VAREF		Ref. Voltage for A/D comparator GND
58	VDD		+5V
59	RECLD	O	REC indicator control output pin
60	FADELED	O	FADE indicator control output pin
61	ALBUMLED	O	ALBUM indicator control output pin
62	STBYLED	O	STANBY/ON indicator control output pin
63	DOLBYCLED	O	Dolby C indicator control output pin
64	REVERSELED	O	Reverse mode LED indicator control output pin

ADJUSTMENT PROCEDURES

PRECAUTIONS

- Before adjustment, clean the following parts with an alcohol moistened swab.
 *recording/playback head *erase head
 *pinch roller *capstan
- Do not use magnetized screwdriver for adjustment.
- Demagnetize recording/playback head with a head demagnetizer.

TEST EQUIPMENT/TOOL REQUIRED

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

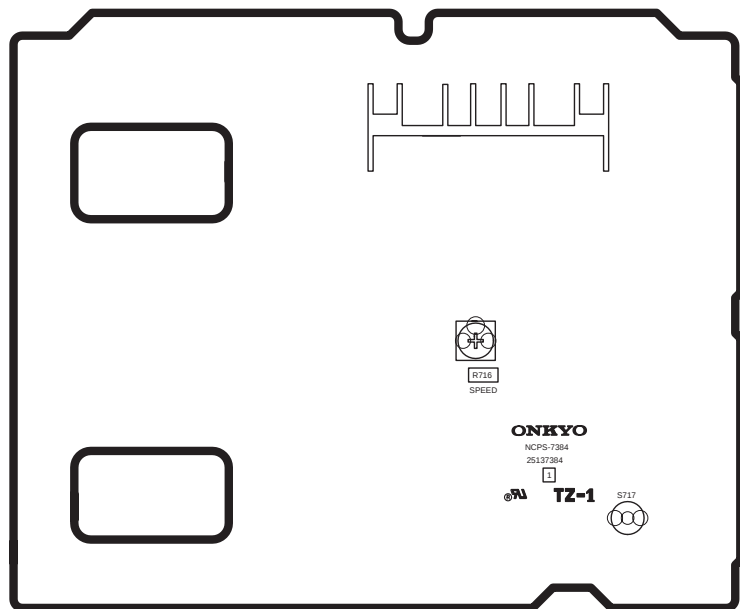
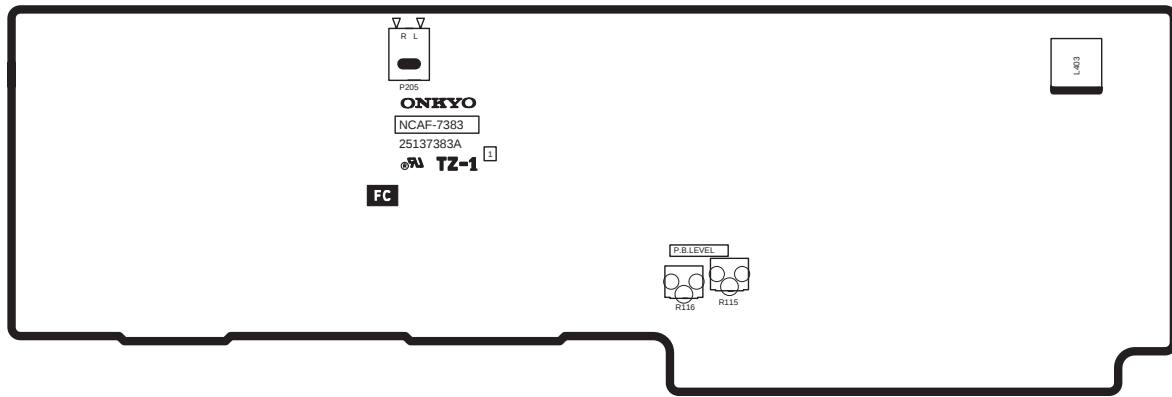
	Item	Connection of instrument	Line output level/freq.	Test tape	Mode	Output indicator	Adjustment point	Adjustment	Remarks
1	Tape speed	Frequency counter to P205 or LINE OUT terminal.		MTT-111N	PB	Frequency counter	R716	3010Hz	
2	Head azimuth	AC voltmeter & oscilloscope to P205		TCC-153	PB	AC voltmeter	Fig.1	Maximum level & same phase at channels L & R	Refer to Fig.2.
3	Playback level	AC voltmeter to P205		MTT-150	PB	AC voltmeter	R115 (L ch.) R116 (R ch.)	300mV	
4	Bias frequency	Frequency counter to lead wire of erase head		Normal tape	REC	Frequency counter	L403	85kHz	
5	Auto Rec, level adjustment			Normal tape	REC/PB			Auto(S717)	Push a auto-adjust button(S717)

Blank tapes

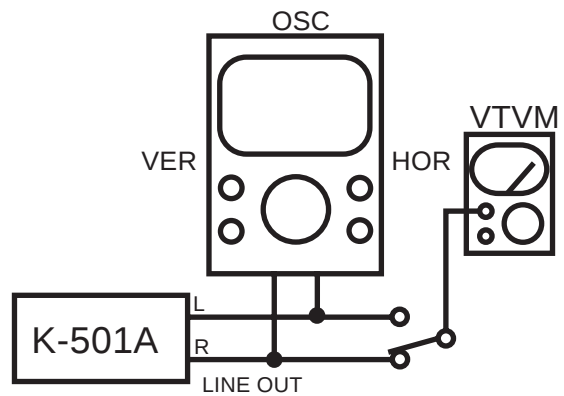
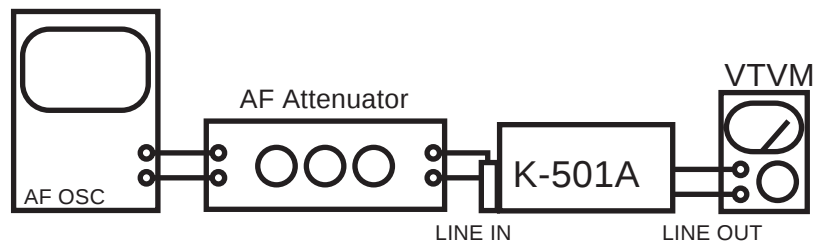
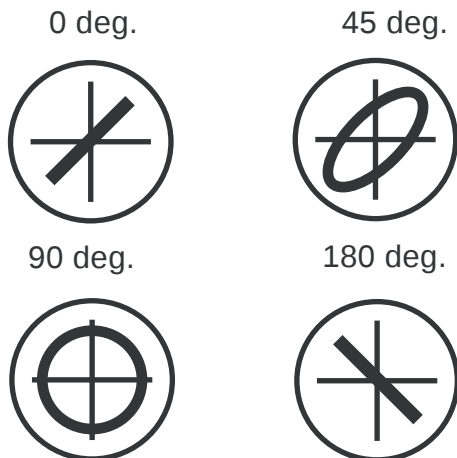
Normal UD- I C-90
 High UD- II C-90
 Metal XS C-60

PLAY torque 30 ~ 70g/cm (Use the test tape TW-2231.)
 FF/REW torque 80 ~ 180g/cm (Use the test tape TW-2111.)
 Back tension 2 ~ 6g/cm (Use the test tape TW-2111.)

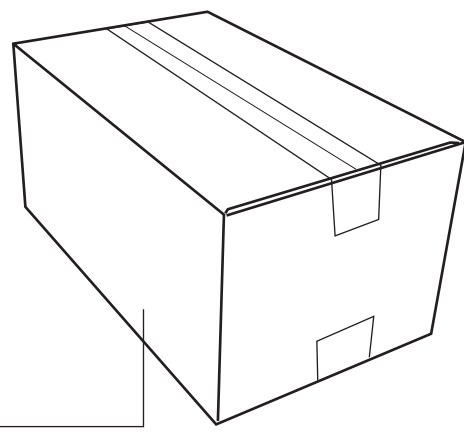
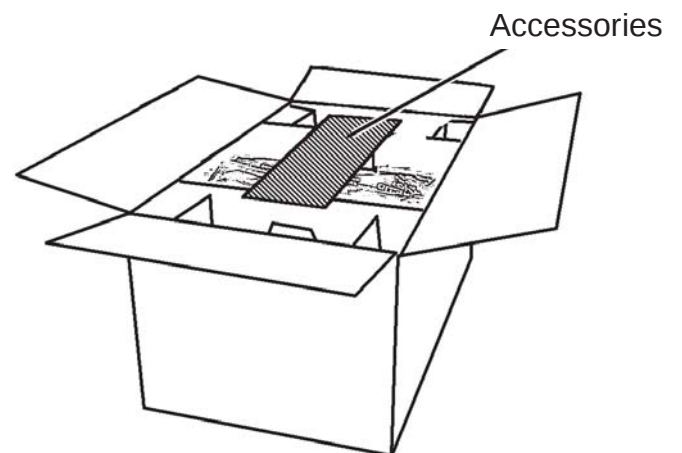
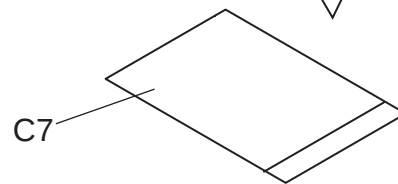
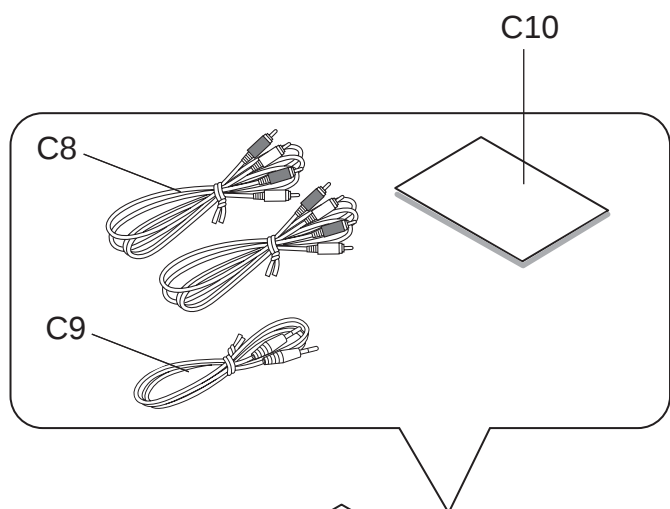
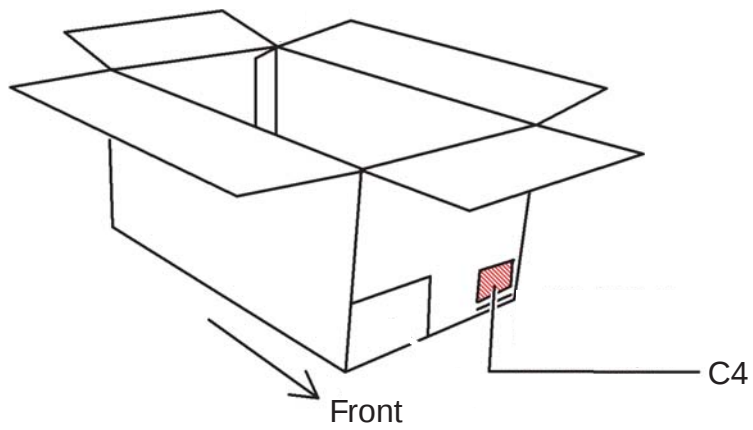
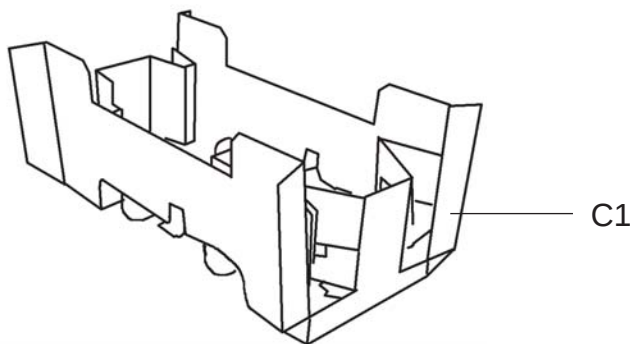
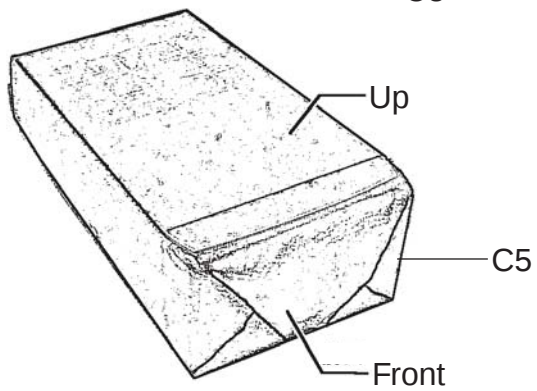
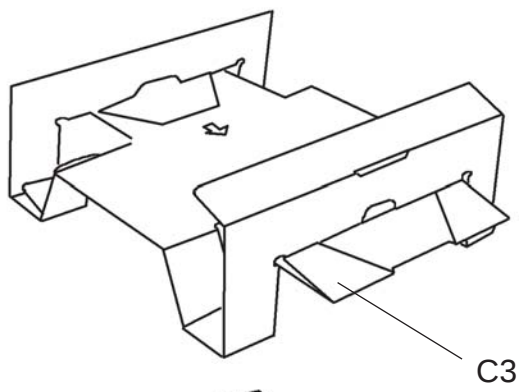
ADJUSTMENT POINT



PHASE CHART



PACKING VIEW



PARTS LIST
PACKING VIEW

REF. NO.	PART NO.	DESCRIPTION
C1	29092028A	Pad
C2	29053865	Carton
C3	29092029	Pad (S)
C4	29363044	EAN Label
C5	29095835	0.515x650x550,Sheet
C7	29100097-1A	350x250,Polybag
C8	2010376	Cord ass'y
C9	2010375	3.5-MINI PLUG,Cord ass'y
C10	29343267	Instruction manual E
	29343268	Instruction manual CT <GT,DT>
	29343269	Instruction manual U3GSWD <PP>
	29343270	Instruction manual U3FSI <PP>

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