TA-RW311

Ref. No. 3504

ONKYO. SERVICE MANUAL

STEREO CASSETTE TAPE DECK

MODEL TA-RW311

Black model

BMD, BMDN	120V AC, 60Hz
BMP	230V 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 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.

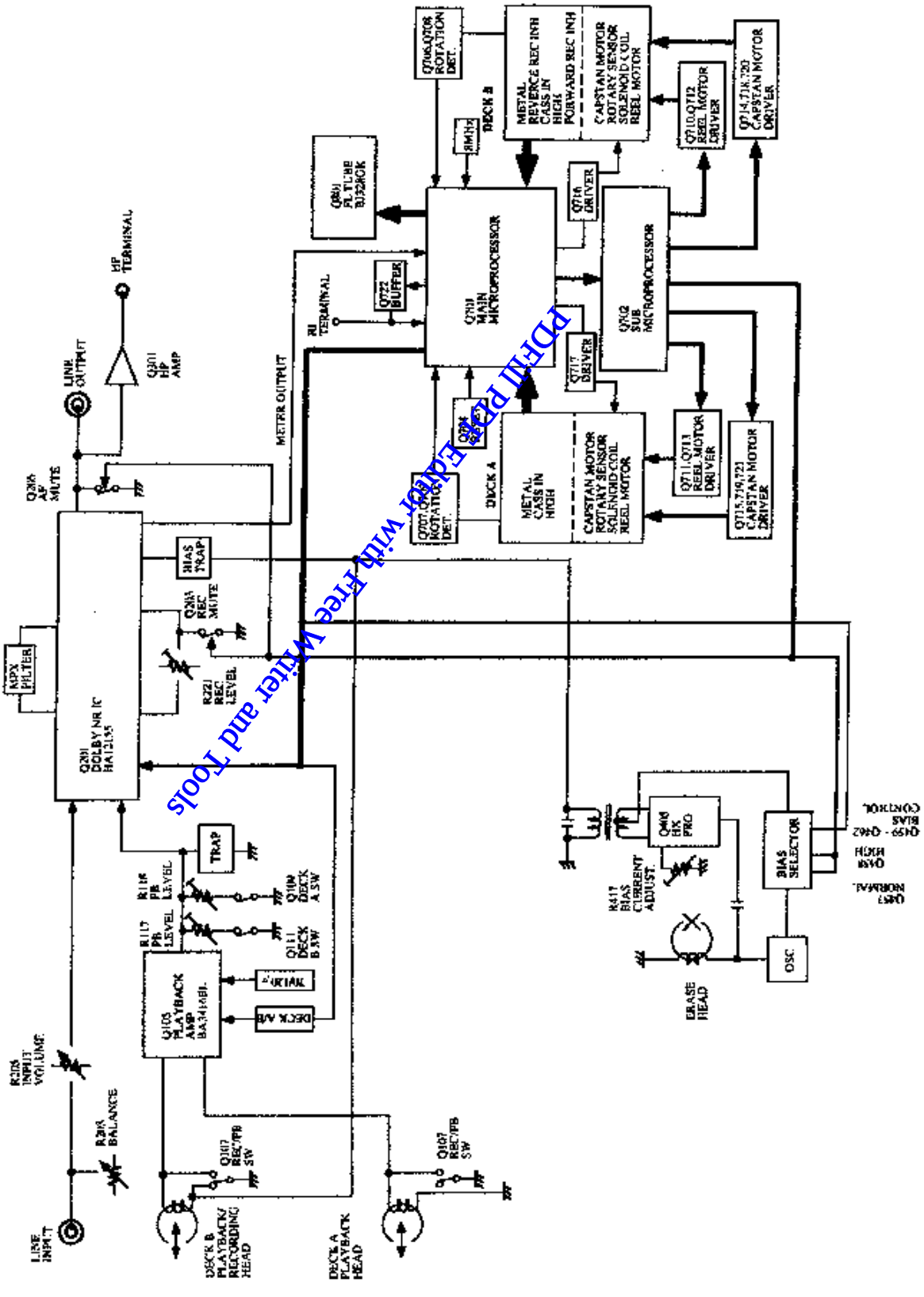
ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Track Format:	4-track, 2-channels
Erasure System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.) 9.6 cm/sec. (3-3/4 i.p.s.) (high-speed dubbing)
Wow and Flutter:	0.07 % (WRMS)
Frequency Response:	20 — 15,000 Hz (Normal) (30 — 14,000 Hz ± 3 dB) 20 — 16,000 Hz (High) (30 — 15,000 Hz ± 3 dB) 20 — 17,000 Hz (Metal) (30 — 16,000 Hz ± 3 dB)
S/N Ratio:	Dolby NR off: 58 dB (metal position tape) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with Dolby B NR. A noise reduction of 20 dB at 5 kHz is possible with Dolby C NR.
Input Jacks:	Line IN: 2 Input sensitivity: 80 mV Input impedance: 50 kohms
Outputs:	Line OUT: 2 Standard output level: 500 mV (0 dB) Optimum load impedance: over 50 kohms
Headphone jack:	1 Optimum load impedance: 8 to 200 ohms
Motors:	DC servo motor × 2, DC motor × 2
Heads:	REC/PB: 1 PB: 1 ERASE: 1
Power Supply:	European and Australian models: AC 230V, 50 Hz U.S.A. and Canadian models: AC 120V, 60 Hz Worldwide model: AC 120V and AC 230V, Switchable 50/60 Hz
Power Consumption:	29 watts
Dimensions:	455(W) × 120(H) × 305(D) mm (17-15/16" × 4-3/4" × 12")
Weight:	5.9 kg. (13.0 lbs.)

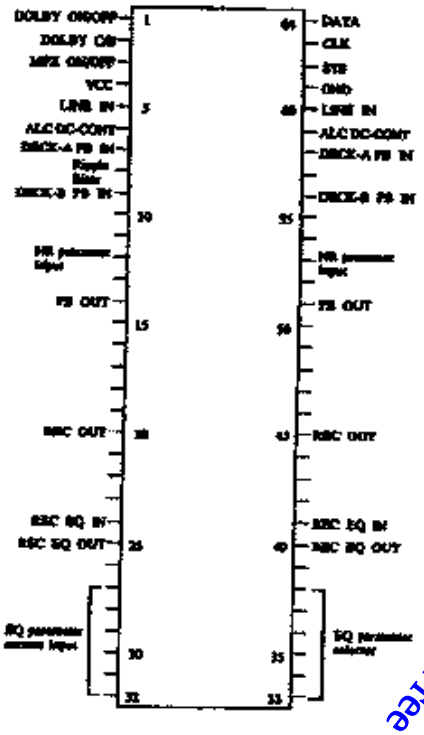
Specifications and external appearance are subject to change without notice because of product improvements.

BLOCK DIAGRAM

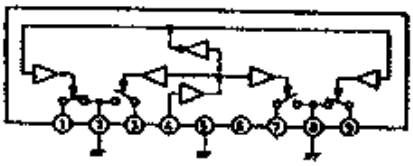


IC BLOCK DIAGRAM

HA12155NT (DOLBY NR)



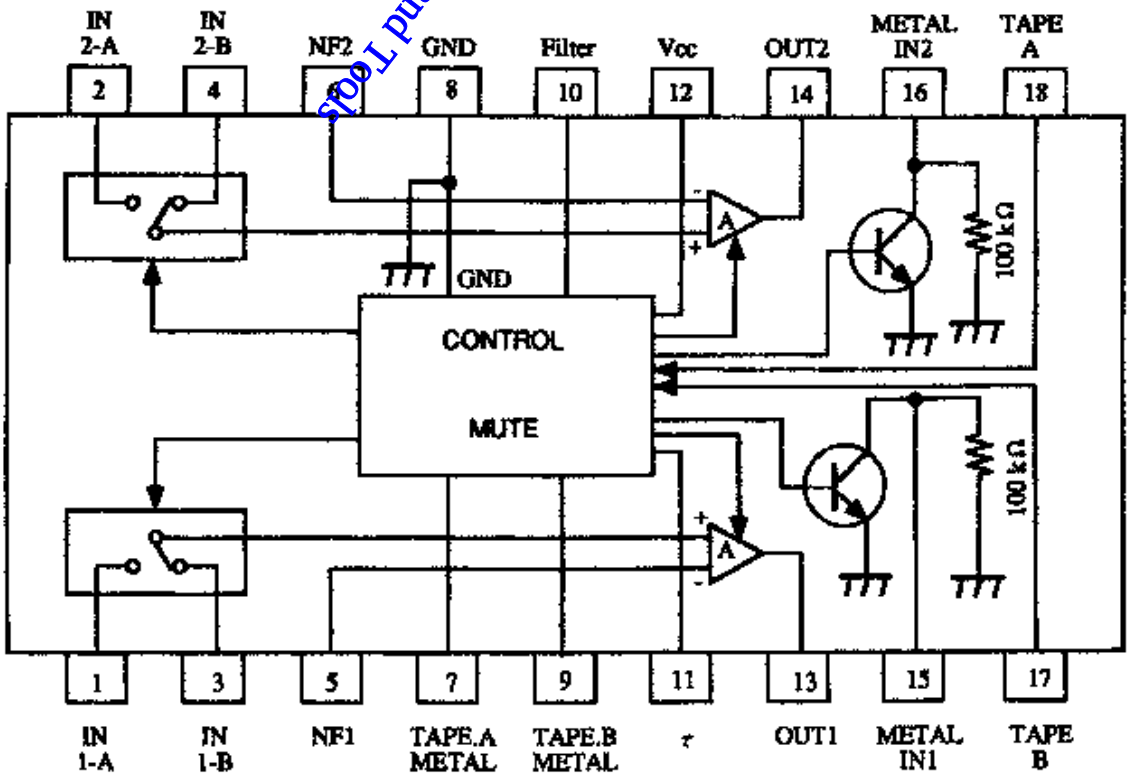
μPC1330HA (REC/PB SW)



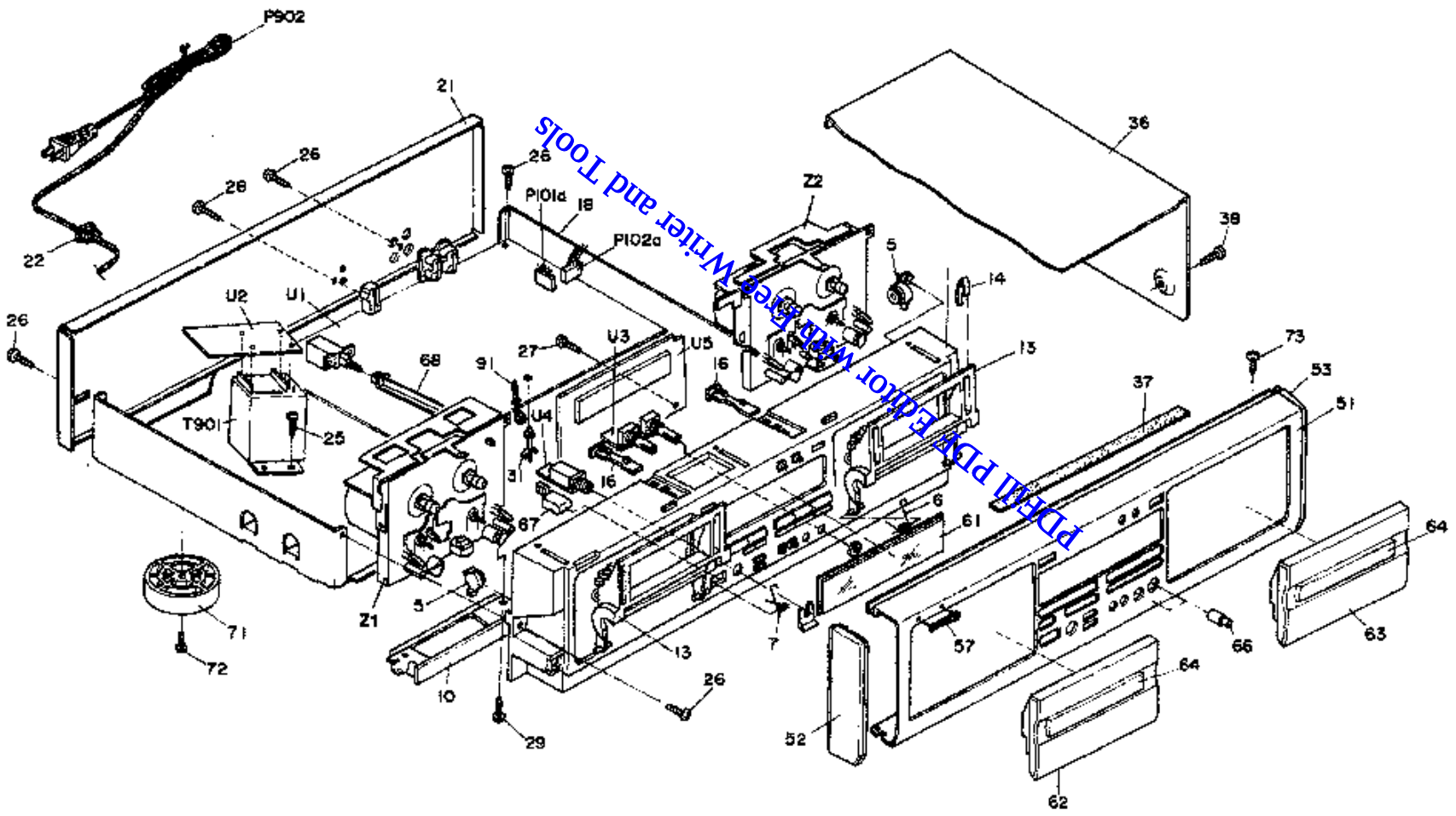
μPC1330HA

Pin No.	Function
1, 9	PB. signal
2	GND
3, 7	REC signal
4	REC/PB SW control
5	GND
6	+B
8	GND

BA3416BL (Dual Playback Preamplifier)



CHASSIS-EXPLODED VIEW



PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
1	27110879Y	Front bracket ass'y
5	28400282	Damper
6	27180476A	Spring B
7	27180477A	Spring A
10	27130741Y	Bracket F
13	27301792AY	Cassette frame
14	27180435	Spring
16	28324943Y	Knob,eject
18	27100280AY	Chassis
21	27121982Y	Rear panel <D>
	27122109Y	Rear panel <P>
22	27300750	⚠ Cord bushing
25	830440089	4TTC+8C(BC),Self-tapping screw
26	838130088	3TTB+8B,Self-tapping screw
27	833430080	3TTP+8P(BC),Self-tapping screw
29	838130088	3TTB+8B,Self-tapping screw
31	27190480-1Y	PCB-8L,Holder
36	28184479AY	Top cover
37	28140837	Cushion
38	838430088	3TTB+8B(BC),Self-tapping screw
51	1N206121Y	Front panel ass'y
52	28125248-6Y	End cap L
53	28125249-6Y	End cap R
57	28135199	Badge
61	28191696Y	Clear plate
62	27301853Y	Cassette lid A
63	27301853-1Y	Cassette lid B
64	28400625Y	Window
66	28323671A	Knob, Volume
67	28325053Y	Knob, Power
68	27273135BY	Joint
71	27175292	Leg
72	838130088	3TTB+8B,Self-tapping screw
73	833430080	3TTP+8P(BC),Self-tapping screw
91	260208	Wire tie

REF. NO.	PART NO.	DESCRIPTION
P101a	2009990350ULY	NSAS-6P0487,Socket for deck A
P102a	2009990315ULY	NSAS-14P0449,Socket for deck B
P902	253192HIT	⚠ AS-UC-6#18,Power supply cord <D>
	253193HIT	⚠ AS-CEE,Power supply cord <P>
T901	2301049Y	⚠ NPT-1223D,Power transformer <D>
	2301050Y	⚠ NPT-1223P,Power transformer <P>
U1	1N206586-2Y	NAAR-5086-2,Main circuit pc board ass'y
U2	1N206587-2Y	NAPS-5087-2,Power supply pc board ass'y
U3	1N206588-2Y	NAETC-5088-2,Input level volume pc board ass'y
U4	1N206589-2Y	NAETC-5089-2,Headphone terminal pc board ass'y
U5	1N206593-2Y	NADIS-5093-2,Display circuit pc board ass'y
W701	2047291512Y	NCFC-291512,Flat cable
Z1	244190Y	NDM-181,Deck mechanism ass'y
Z2	244191Y	NDM-182,Deck mechanism ass'y

NOTE: <D>: 120V model only
<P>: 230V model only

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

ADJUSTMENT PROCEDURES

PRECAUTIONS

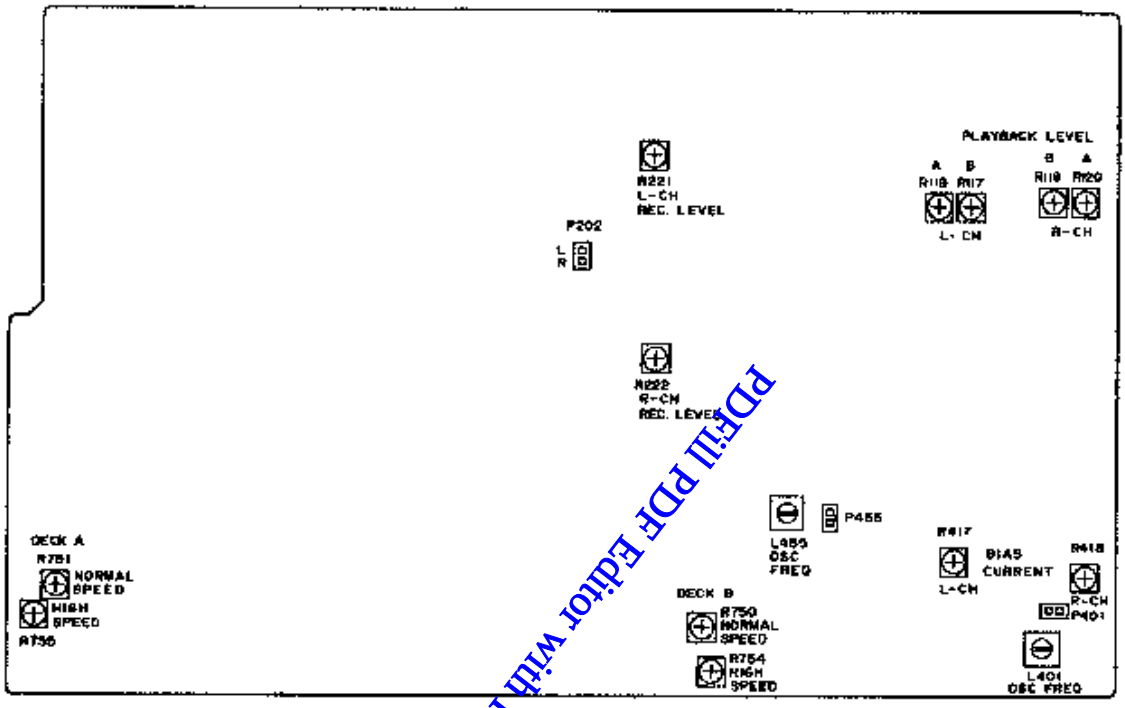
1. ***Before adjustment, clean the following parts with an alchol moistend swab.***
   - ***record/playback head*** ***erase head***
   - ***pinch roller*** ***capstan***
2. ***Do not use magnetized screwdriver for adjustments.***
3. ***Demagnetize record/playback head with a head demagnetizer.***

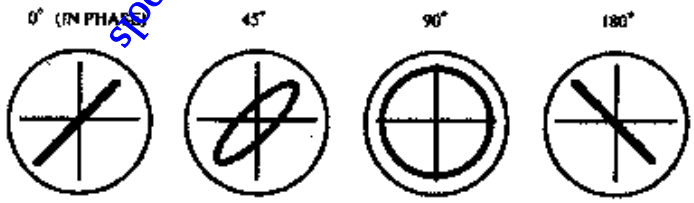
TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter
Oscilloscope
Attenuator
AC voltmeter
Non-magnetic screwdriver
Test tapes
TCC-151 ***:10kHz, −10dB***
MTT-111 ***:8kHz, −10dB***
MTT-150 ***:Dolby level calibration 400Hz, tone 300nWb/m***

Tape speed adjustment
Connect the digital frequency counter to the line output terminal.
Load the test tape MTT-111 into the cassette holder.
Connect the test point J285 to the ground to be unit to the adjustment mode.
Press the forward play button twice to be unit to the high speed.
Adjust the trim resistors R755(Deck A) and R754(Deck B) so that the frequency counter reading becomes 6000Hz to 6020Hz.
Press the forward play button to be unit to the normal speed.
Adjust the trim resistors R751(Deck A) and R750(Deck B) so that the frequency counter reading becomes 3000Hz to 3010Hz.

Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust for	Remarks
Head azimuth	AC voltmeter and oscilloscope to output terminal		TCC-151	Playback	AC voltmeter and Oscilloscope	Head azimuth screw Foward:Left side Reverse:Right side	Maximum and same separation at left and right channels.	Figure 1
Playback level	AC voltmeter to test point P202		MTT-150	Playback	AC voltmeter	Deck A R119(Left channel) R120(Right channel) Deck B R117(Left channel) R118(Right channel)	300mV	
Oscillator block	Frequency counter to test point P401		Metal tape XS-C90	Stop	Frequency counter	L401	107±2kHz	Test mode When you press the stop key, deck becomes recording mode of metal position. Test mode
Bias current	Figure 2	1kHz, -23dB and 12kHz, -23dB	UD-I C-90	Recording/ playback	AC voltmeter	R417(Left channel) R418(Right channel)	Diffrence of 1kHz and 12kHz become less than 1dB.	When you press the AUTO SPACE key, recording of deck starts. Next when you press the AUTO SPACE key, rewind to recording start point and starts to playback.
Recording level	Figure 2	1kHz 350mV	UD-I C-90	Recording	AC voltmeter	Attenuator	350mV	When you press the AUTO SPACE key, recording of deck starts. Next when you press the AUTO SPACE key, rewind to recording start point and starts to playback.
				Recording/ playback	AC voltmeter	R221(Left channel) R222(Right channel)	Signals of recording and playback become same level	





Confirming phase relationship

Fig.1

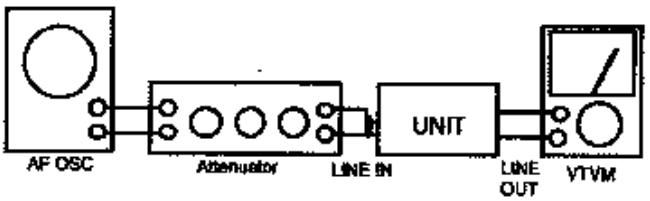


Fig. 2

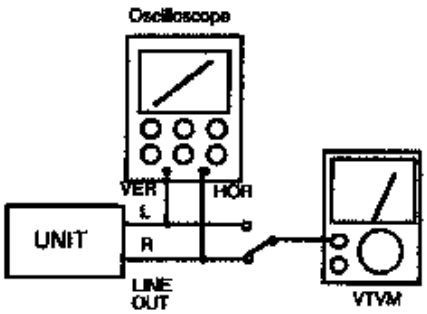
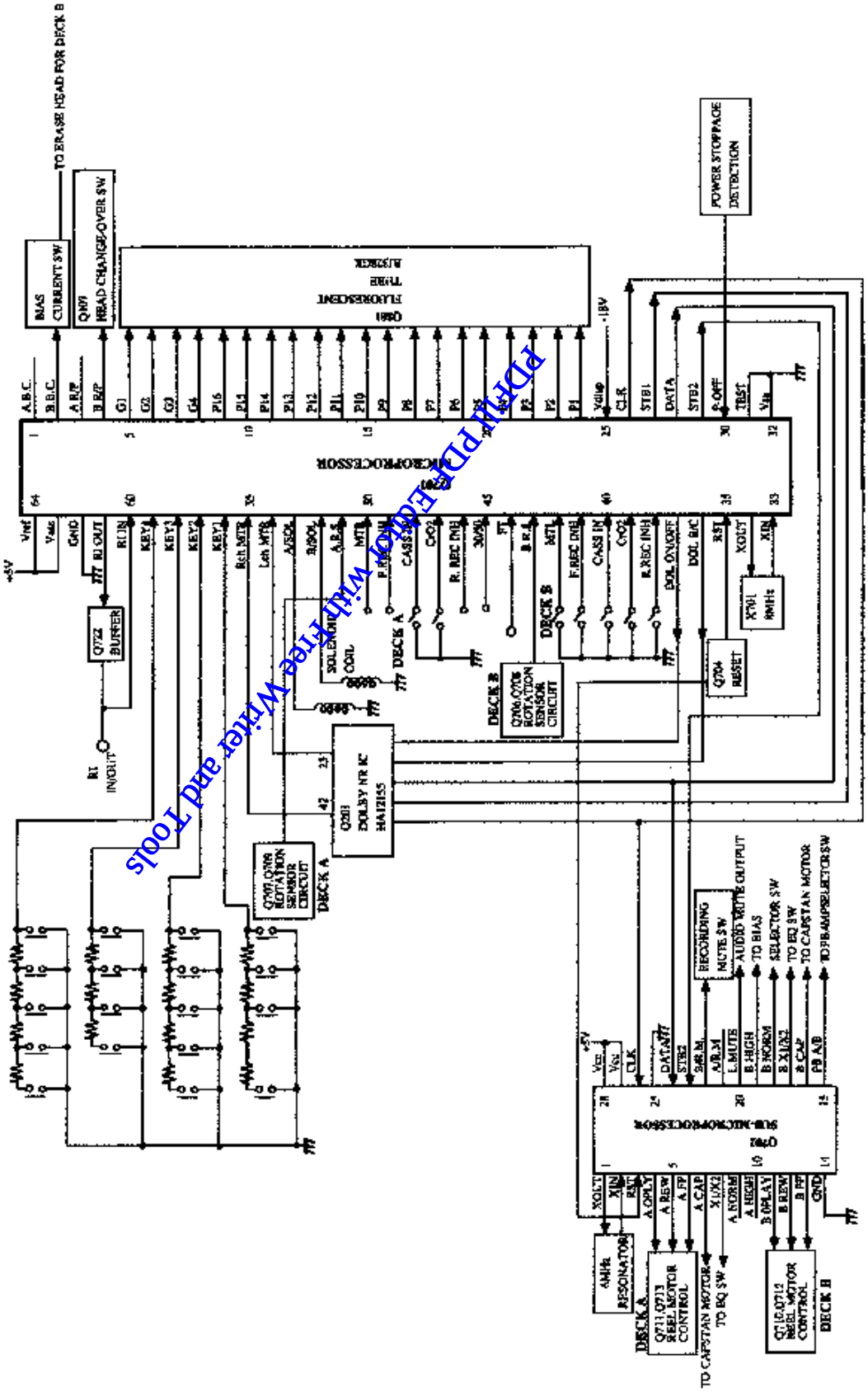


Fig.3

MICROPROCESSOR-CONNECTION DIAGRAM



MICROPROCESSOR-TERMINAL DESCRIPTIONS

MAIN MICROPROCESSOR

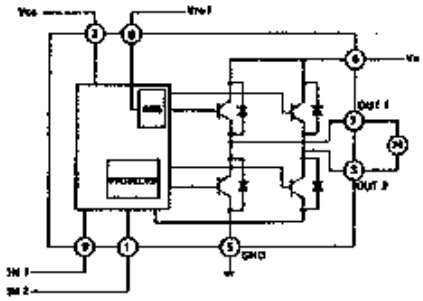
Pin No.	Terminal	Description
1	A B.C.	Bias current change-over control output pin for Deck A
2	B B.C.	Bias current change-over control output pin for Deck B
3	A R/P	Recording/playback head change-over output pin for Deck A
4	B R/P	Recording/playback head change-over output pin for Deck B
5	G1	Grid output pin
6	G2	Grid output pin
7	G3	Grid output pin
8	G4	Grid output pin
9	P16	Segment output pin
10	P15	Segment output pin
11	P14	Segment output pin
12	P13	Segment output pin
13	P12	Segment output pin
14	P11	Segment output pin
15	P10	Segment output pin
16	P9	Segment output pin
17	P8	Segment output pin
18	P7	Segment output pin
19	P6	Segment output pin
20	P5	Segment output pin
21	P4	Segment output pin
22	P3	Segment output pin
23	P2	Segment output pin
24	P1	Segment output pin
25	Vdisp	
26	CLK	Clock output pin
27	STB1	Strobe output pin
28	DATA	Data output pin
29	STB2	Strobe output pin
30	P-OFF	Detection input pin for stoppage of electric current
31	TEST	Test pin
32	Vss	Power supply terminal

Pin No.	Terminal	Description
33	XIN	Ceramic resonator connection pin
34	XOUT	Ceramic resonator connection pin
35	RST	Reset input
36	DOL B/C	Dolby B/C change-over output pin
37	DOL ON/OFF	Dolby change-over output pin
38	R.REC INH	Recording inhibiting detection input pin for reverse side of Deck B
39	QQ2	Hitch position detection input pin for reverse side of Deck B
40	CASS IN	Cassette tape detection input pin for reverse side of Deck B
41	F.REC INH	Recording inhibiting detection input pin for forward side of Deck B
42	MTL	Metal position detection input pin for reverse side of Deck B
43	B R.S.	Rotation detection input pin for reel stand of Deck B
44	FT	Adjustment mode input pin
45	20/50	Initializing input
46	R.REC INH	Recording inhibiting detection input pin for reverse side of Deck A
47	QQ1	High position detection input pin for reverse side of Deck A
48	CASS IN	Cassette tape detection input pin for reverse side of Deck A
49	F.REC INH	Recording inhibiting detection input pin for forward side of Deck A
50	MTL	Metal position detection input pin for reverse side of Deck A
51	A.R.S.	Rotation detection input pin for reel stand of Deck A
52	B.SOL	Solenoid coil drive output pin of Deck B
53	A.SOL	Solenoid coil drive output pin of Deck A
54	[illegible]	Input pin for level meter of left channel
55	[illegible]	Input pin for level meter of right channel
56	KEY1	Operation key connection pin
57	KEY2	Operation key connection pin
58	KEY3	Operation key connection pin
59	KEY4	Operation key connection pin
60	RI IN	Bus signal input pin
61	RI OUT	Bus signal output pin
62	GND	Ground terminal
63	Vass	Power supply pin
64	Vref	Power supply pin

SUB-MICROPROCESSOR

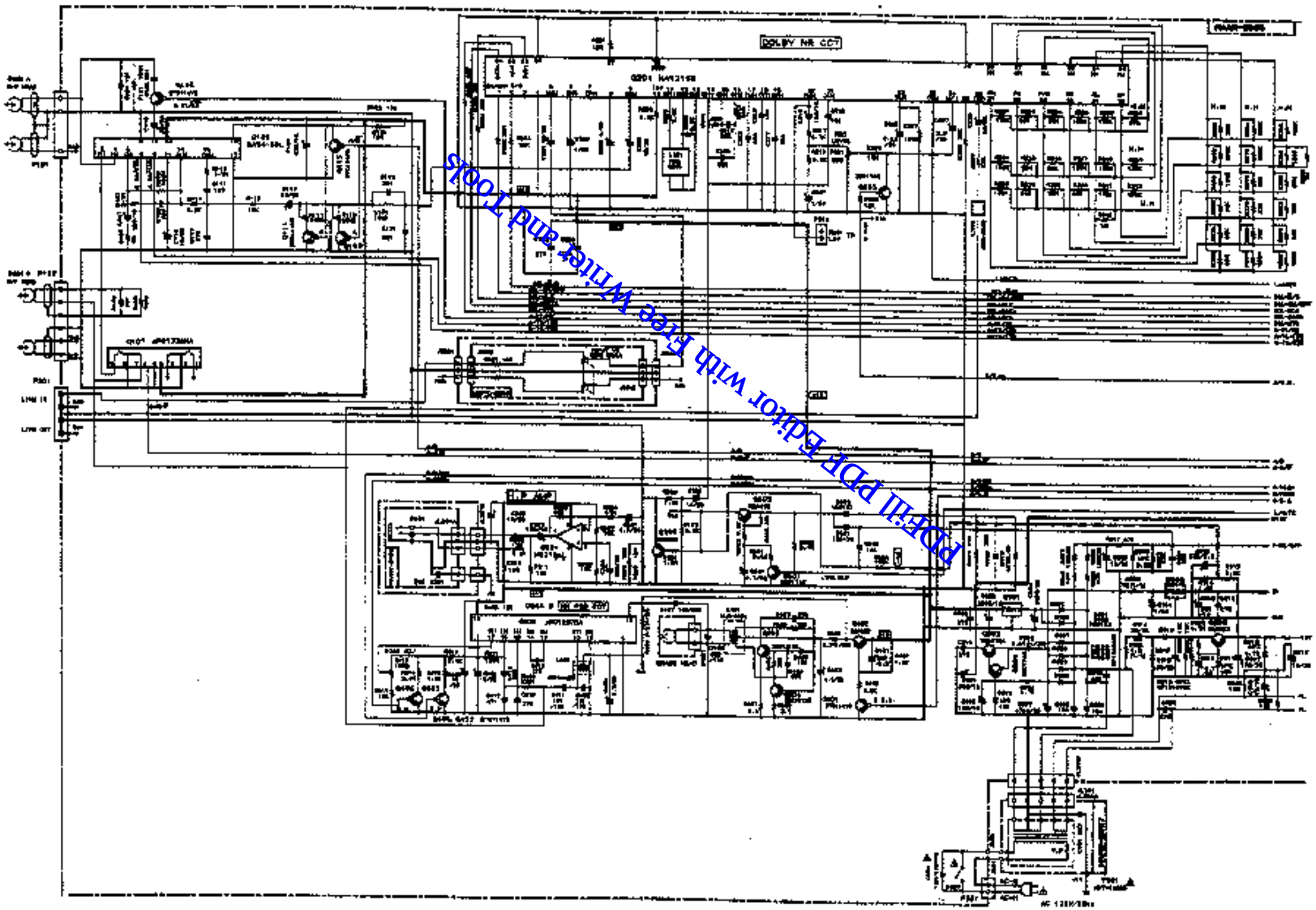
Pin No.	Function	Description
1	XOUT	Ceramic resonator connection pins
2	XIN	Connect the 6.94MHz ceramic resonator
3	RST	System reset input pin
4	A CPLY	Reel motor control output pin for Deck A
5	A REW	Rewind control output pin for Deck A
6	A FP	Fast forward control output pin for Deck A
7	A CAP	Capstan motor control output pin for Deck A
8	A X1/X2	Capstan motor rotation speed control output for deck A
9	A NORM	Recording equalizer and bias current selector output pin for deck A
10	A HIGH	Recording equalizer and bias current selector output pin for deck A
11	B CPLY	Reel motor control output pin for Deck B
12	B REW	Rewind control output pin for Deck B
13	B FP	Fast forward control output pin for Deck B
14	GND	Ground pin
15	PB A/B	Playback amplifier selector pin
16	B CAP	Capstan motor control output pin for Deck B
17	B X1/X2	Capstan motor rotating speed control output for deck B
18	B NORM	Recording equalizer and bias current selector output pin for deck B
19	B HIGH	Recording equalizer and bias current selector output pin for deck B
20	L.MUTE	Audio muting control output pin
21	A/R.M.A.	Recording muting control pin for deck A
22	B/R.M.	Recording muting control pin for deck B
23	STB2	Strobe input pin
24	DATA	Data input pin
25		
26	CLK	Clock input pin
27	Vss	Power supply pin
28	Vcc	Power supply pin

TA-7291S (MOTOR DRIVE)

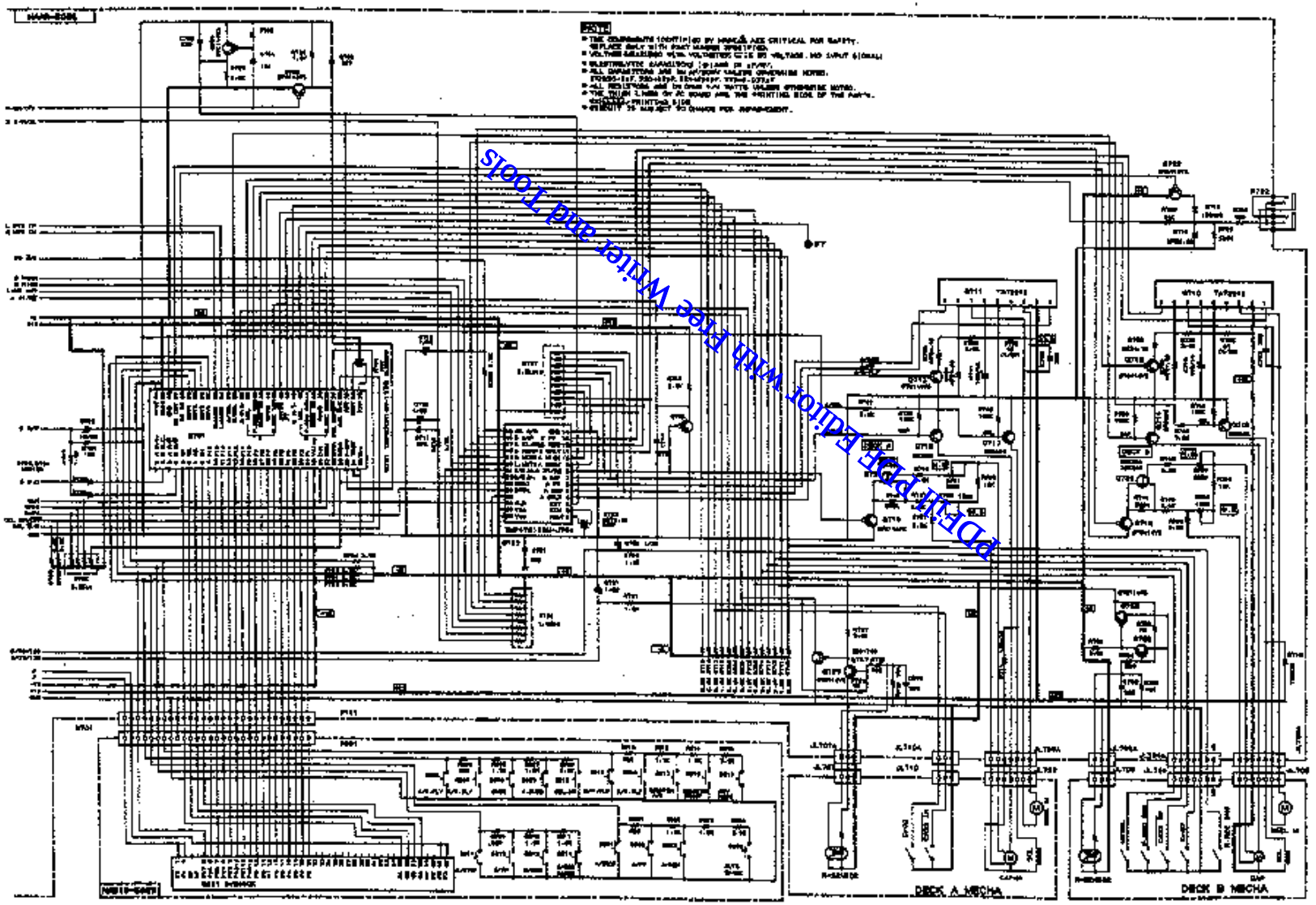


INPUT		OUTPUT		MODE
IN 1	IN 2	OUT 1	OUT 2	
H	H	OPEN	OPEN	STOP
L	H	H	L	CW/CCW
H	L	L	H	CCW/CW
L	L	L	L	BRAKE

SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



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PRINTED CIRCUIT BOARD-PARTS LIST

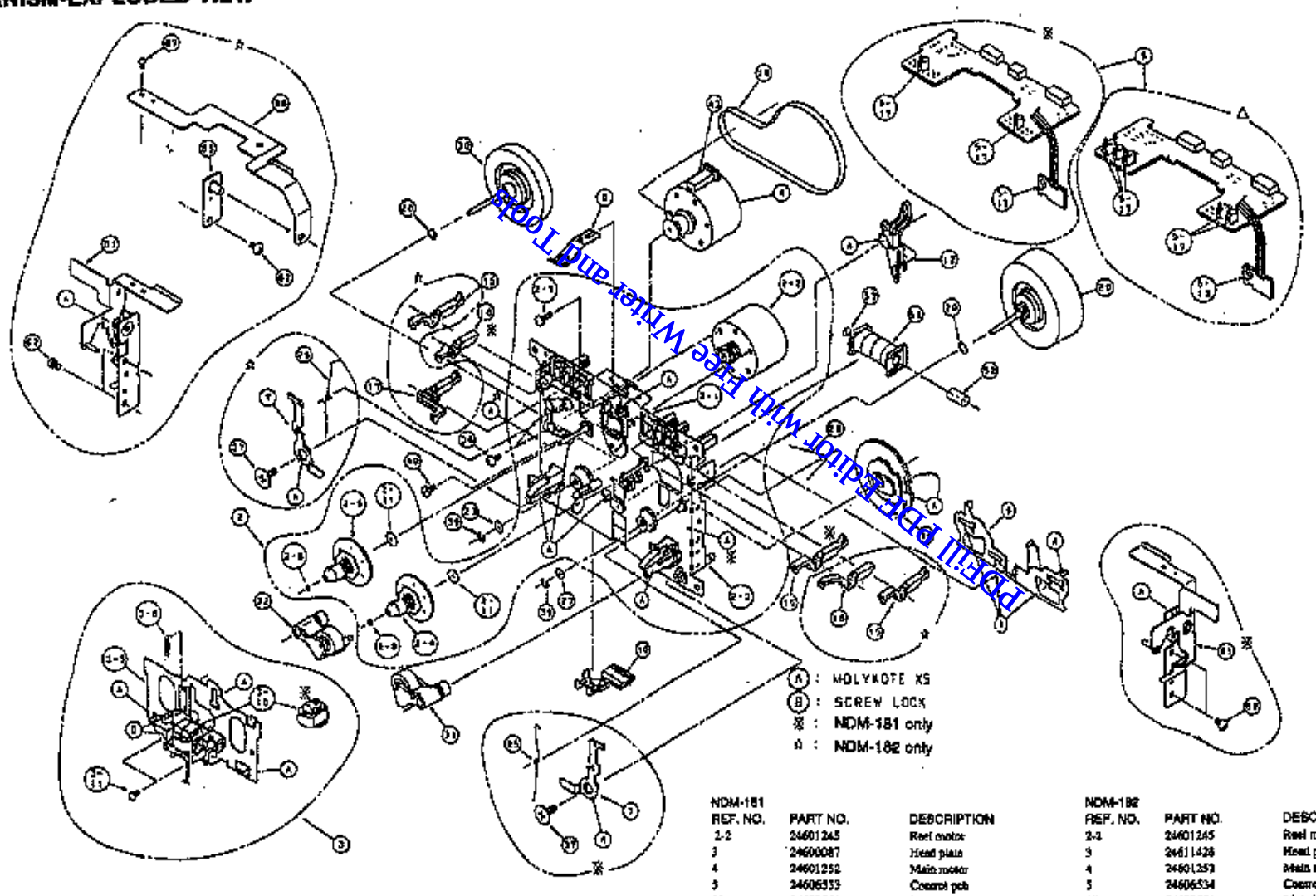
MAIN CIRCUIT PC BOARD (HAAR-8086-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q105	22240767	BA3416BL
Q107	22240147	É PC1330HA
Q201	22240544	HA12155NT
Q301	22240369	M5218AP
Q405	222959	É PC1297CA
Q701	22240822	TMP87CH14N-1139
Q702	22240823	TMP47C103N-J794
Q710,Q711	22240239	TA7291S
Q901	222780125NEC	78M12
Q902	222780055NEC	78M05HF
	Transistors	
Q103,Q104	221281	DTC114YS
Q109-Q113	221281	DTC114YS
Q203,Q204	2213284 or	2SC1740S-R or
	2213285	2SC1740S-S
Q205,Q206	2211705 or	2SD655-E or
	2211706	2SD655-F
Q401	221281	DTC114YS
Q402	2211504	2SA950-Y
Q403,Q404	2201883	2SC1213-C
Q406,Q407	221281	DTC114YS
Q601	2213284 or	2SC1740S-R or
Q706,Q707	2213285	2SC1740S-S
Q602,Q905	2213334 or	2SA933S-R or
	2213355	2SA933S-S
Q703,Q722	2213090	DTA114YS
Q704	221281	DTC114YS
Q708,Q709	221281	DTC114YS
Q712,Q713	221281	DTC114YS
Q714-Q717	2211705 or	2SD655-E or
	2211706	2SD655-F
Q718,Q719	221281	DTC114YS
Q720,Q721	2211945 or	2SK246-GR or
	2212304	2SK381-D
Q723	221281	DTC114YS
Q903	2202705 or	2SD2394-E
	2202706	2SD2394-F
Q904	2213285 or	2SC1740S-S or
	2213284	2SC1740S-R
	Diodes	
D601,D603	223163	1SS133
D701	223163	1SS133
D704,D705	223163	1SS133
D706,D707	224450752	MTZ7.5B, Zener
D708,D709	224450472	MTZ4.7B, Zener
D710-D712	223163	1SS133
D713	224450562	MTZ5.6B, Zener
D901,D902	2238003I	HER152
D907-D910	22380085	GP10400SE
D911	224451303	MTZ13C, Zener
D912,D913	22380035	GP10400SE
	Diodes	
D914	224451803	MTZ18C, Zener
D915	224470683	MTZ6.8C, Zener
D916,D917	223163	1SS133
D918,D919	224450562	MTZ5.6B, Zener
	Coils	
L101,L102	231089	NCH-2137, CHOKE
L201,L202	233436	NMS-6081, MPX
L203,L204	231221	NTR-6907, TRAP
L401	231223Y	NLO-2007, OSC
L403,L404	231218	NCH-4453, CHOKE
	Resonators	
X701	3010190	CST8.00MTW, Ceramic
X702	3010149	CST6.00MGW, Ceramic
	Capacitors	
C103,C104	374725614	560pF±5%,50V,Plastic
C105,C106	374726814	680pF±5%,50V,Plastic
C107,C108	354742219	220µ F,16V,Elect.
C109,C110	374723334	0.033µ F±5%,50V,Plastic
C111,C112	374721834	0.018µ F±5%,50V,Plastic
C115	354762209	22µ F,35V,Elect.
C116-C118	354761009	10µ F,35V,Elect.
C123	354744719	470µ F,16V,Elect.
C201-C204	354761009	10µ F,35V,Elect.
C205-C207	354780109	1µ F,50V,Elect.
C209-C214	374722224	2200pF±5%,50V,Plastic
C215-C218	374721044	0.1µ F±5%,50V,Plastic
C219,C220	354741019	100µ F,16V,Elect.
C221,C222	354780109	1µ F,50V,Elect.
C223,C224	374721044	0.1µ F±5%,50V,Plastic
C225,C226	354782299	0.22µ F,50V,Elect.
C227,C228	354780229	2.2µ F,50V,Elect.
C229,C230	354761009	10µ F,35V,Elect.
C231	354742219	220µ F,16V,Elect.
C232	374722734	0.027µ F±5%,50V,Plastic
C233,C234	354761009	10µ F,35V,Elect.
C301,C302	354780479	4.7µ F,50V,Elect.
C303,C304	354741019	100µ F,16V,Elect.
C305	354761009	10µ F,35V,Elect.
C306	354741019	100µ F,16V,Elect.
C401	354722219	220µ F,6.3V,Elect.
C402	354780479	4.7µ F,50V,Elect.
C403,C404	374723324	3300pF±5%,50V,Plastic
C405	374721034	0.01É FÅ}5%,50V,Plastic
C406,C478	370138224	8200pF±5%,100V,Plastic
C408	354780479	4.7µ F,50V,Elect.
C409,C410	370131514	150pF±5%,100V,Plastic
C411,C412	370131014	100pF±5%,100V,Plastic
C413-C416	374722734	0.027µ F±5%,50V,Plastic
C417,C418	374724734	470pF±5%,50V,Plastic
C419,C420	374721034	0.01µ F±5%,50V,Plastic
C421,C422	354761009	10µ F,35V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION

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

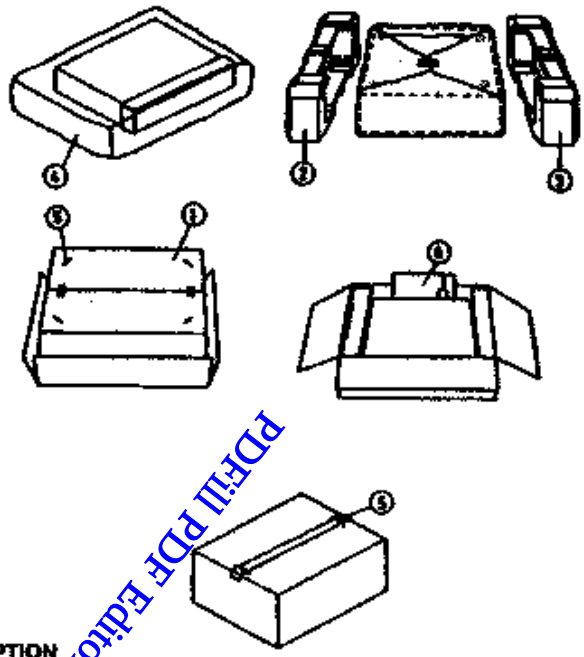
MECHANISM-EXPLODED VIEW



NDM-181 REF. NO.	PART NO.	DESCRIPTION
2-2	24601245	Reel motor
3	24600087	Head plate
4	24601252	Main motor
5	24606533	Control pcb
18	24602551	Main belt
31	24602541	Pinch roller R
32	24602589	Pinch roller L

NDM-182 REF. NO.	PART NO.	DESCRIPTION
2-2	24601245	Reel motor
3	24611428	Head plate
4	24601252	Main motor
5	24606534	Control pcb
18	24602551	Main belt
31	24602541	Pinch roller R
32	24602589	Pinch roller L

PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29052818Y	Carton box
2	29091636-1BY	Pad L
3	29091637-1BY	Pad R
4	29100034-1Y	650×850mm, Styren bag
5	282301	Staple
6	Accessary bag ass'y	
	29342035Y	Instruction manual, English
	29342147Y	Instruction manual U6 <P>
	29342117Y	Instruction manual U3 <C>
	2010244Y	Connection cord
	29100097-1Y	350×250mm, Styren bag
	29365019B	Warranty card <N>
	29358002	Service station list <N>
	29361773Y	Label UPC <N>
	29361759Y	Label CUL <N/C>

NOTE: <P>: 230V model only
<N>: U.S.A. model only
<C>: Canadian model only

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