

SERVICE MANUAL

NAD

SERVICE SAFETY PRECAUTIONS (UL)

1. Use exact replacement parts for critical locations marked "⚠"
2. Return lead dress to original position and re-install protective covers.
3. Before returning to customer, test for shock hazard; use either method A or B:
 - A. Leakage test "cold":
 1. Unplug the AC cord; turn power switch ON.
 2. Connect one lead of High Voltage Insulation Tester to both prongs of the AC plug.
 3. Touch other lead to all exposed metal parts.
 4. Impedance measurement must be 0.3-5.0 Megohms.
 - B. Leakage test, "live":
 1. Plug unit directly into the AC outlet: do not use isolation transformer.
 2. Connect one lead of the Leakage Current Tester to earth ground.
 3. Touch other lead to all exposed metal parts.
 4. Leakage measurement must be less than 0.5 milliamps.

614

CASSETTE
DECK

614

CASSETTE
DECK

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Specifications

Description: Full logic and front loading stereo cassette deck with Dolby B/C NR.			
Track system	4-track, 2-channel stereo record/playback		
Power source	120V/60Hz (for the AH version) 230V/50Hz (for the C version)		
Type of head	(Record) hard permalloy HAJCH4605A (Erase) ferrite HAJAB3125A		
Tape speed	4.75cm/sec. (1-7/8 inch/sec.) ±1%		
Wow & flutter	0.05% (JIS WRMS); 0.05% (DIN)		
Input sensitivity/Impedance	40mV±1dB/10K ohm		
Frequency response	Playback	Rec/Play (NR:OFF)	
	40Hz ±3dB	35Hz	+2dB, -3dB
	125Hz ±1.5dB	40Hz	±1.5dB
	12.5kHz ±1.5dB	10kHz	±1.5dB
	14kHz ±3dB	12.5kHz	±3dB
		16kHz	±5dB
Separation (with 1kHz band pass filter)			
Dolby level input at 1kHz record/play	40dB		
Distortion (at dolby level 1kHz)			
Normal (I)	1.0%		
CrO2 (II)	2.2%		
Metal (IV)	1.2%		
Signal to noise ratio			
(Dolby NR:OFF CCIR/ARM weighted/ 20Hz - 20kHz band pass filter)			
Normal (I) no tape	58dB/52dB		
CrO2 (II) no tape	63dB/54dB		
Metal (IV) virgin tape	58dB/53dB		
Power consumption	23W		
Dimensions in mm (W x H x D)	435 x 115 x 285		
Net weight	5kg (11 lbs)		

Top Cover Removal

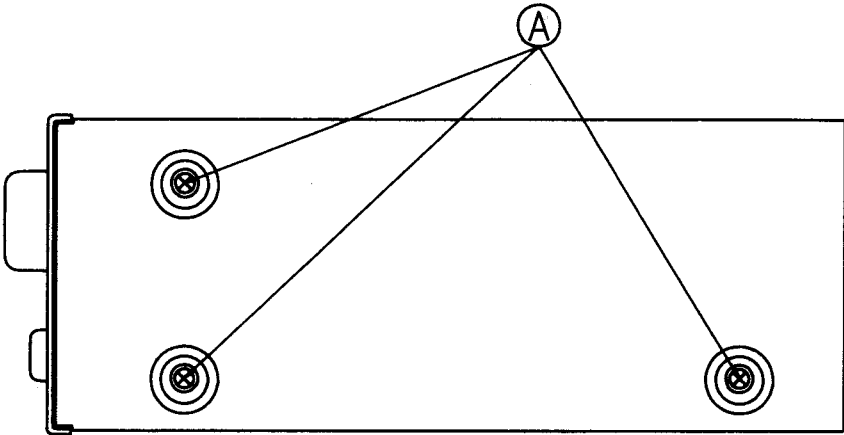


Figure 1

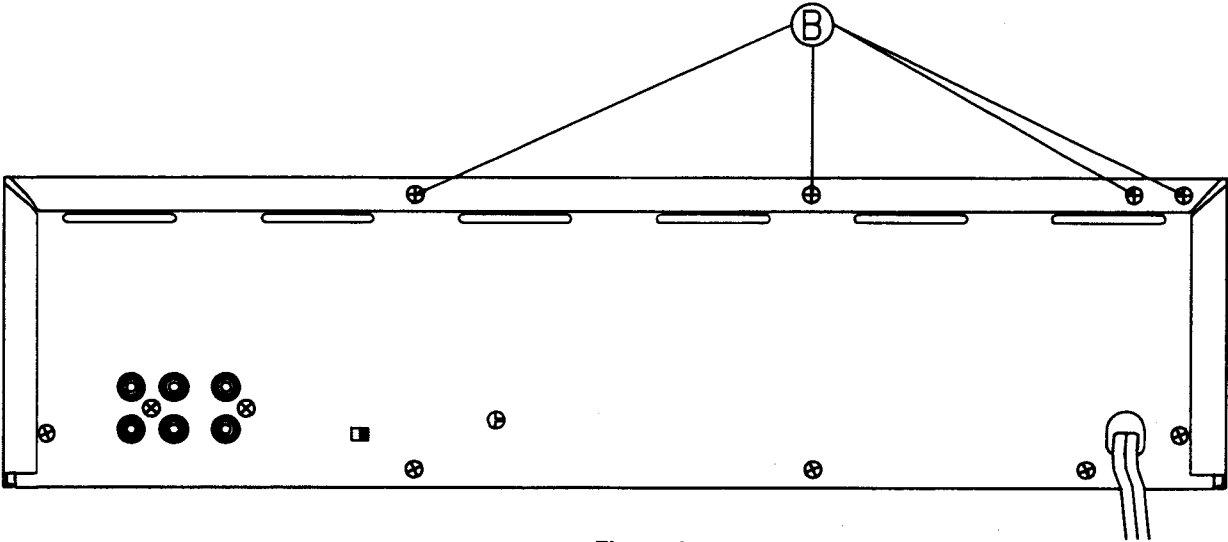


Figure 2

1. Remove 6 screws (A) from the left and right sides of the top cover. (See Figure 1)
2. Remove 4 screws (B) from the back panel. (See Figure 2)
3. Top cover can now be removed.

Location of Controls

WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

REAR PANEL CONNECTIONS

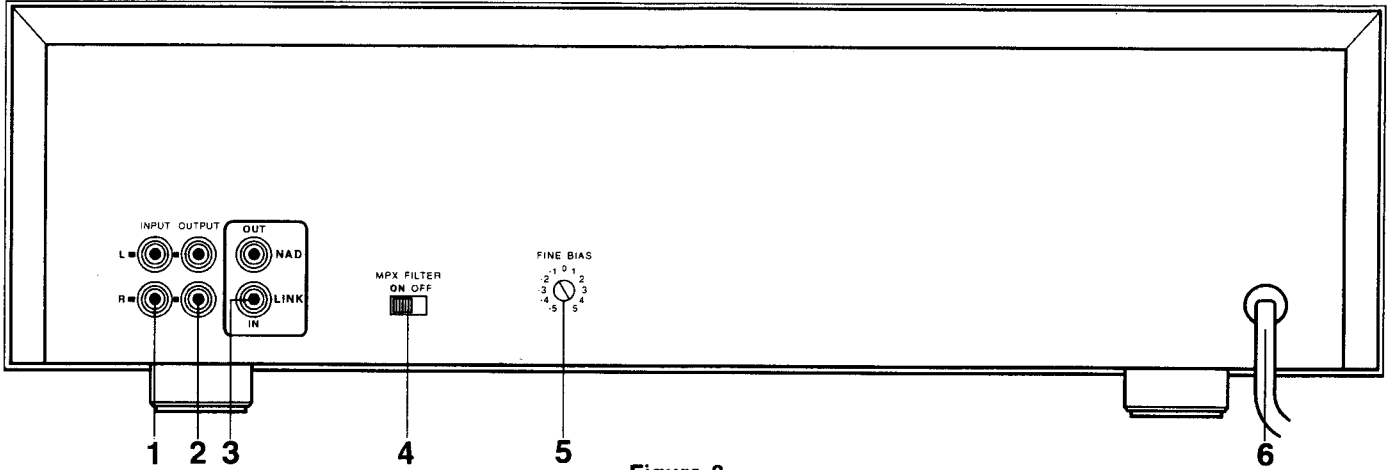


Figure 3

- 1. TAPE INPUT
- 2. TAPE OUTPUT
- 3. NAD LINK IN/OUT

- 4. MPX FILTER
- 5. FINE BIAS
- 6. AC POWER CORD



The lightning flash with arrowhead, within an equilateral triangle is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance

FRONT PANEL CONTROLS

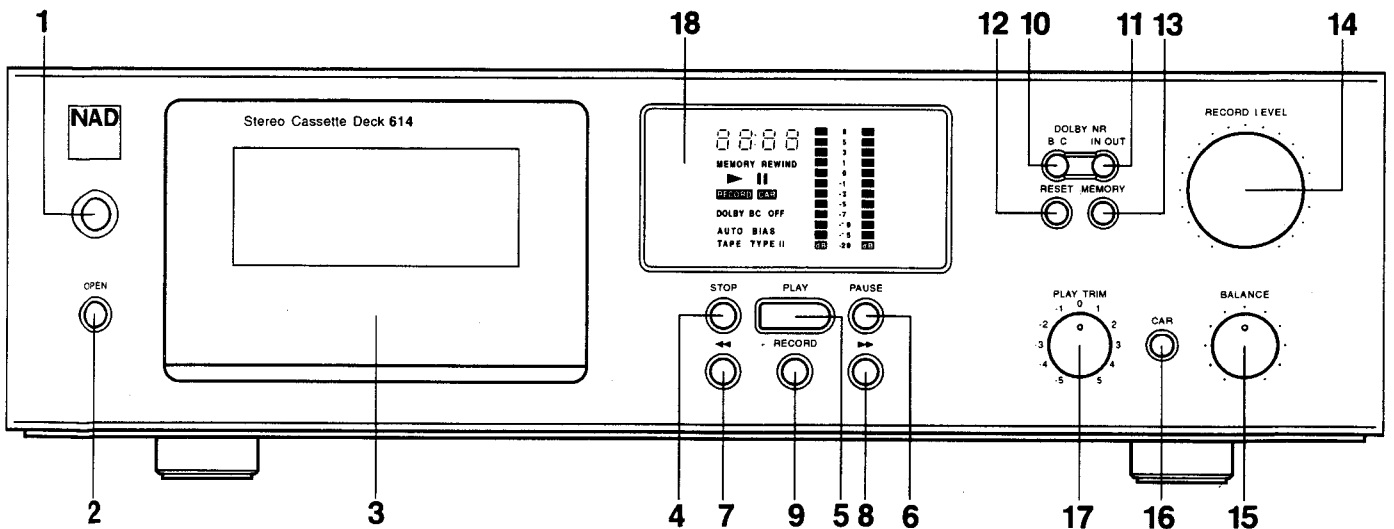


Figure 4

- 1. POWER BUTTON
- 2. OPEN BUTTON
- 3. CASSETTE COMPARTMENT
- 4. STOP BUTTON
- 5. PLAY BUTTON
- 6. PAUSE BUTTON

- 7. REWIND ◀◀ BUTTON
- 8. FAST FORWARD ▶▶ BUTTON
- 9. RECORD BUTTON
- 10. DOLBY NR B/C
- 11. DOLBY NR IN/OUT
- 12. RESET BUTTON

- 13. MEMORY BUTTON
- 14. RECORD LEVEL
- 15. BALANCE
- 16. CAR BUTTON
- 17. PLAY TRIM
- 18. DISPLAY

Alignment Procedure

The tape path (heads, tape guides, capstan, pinch roller) should be cleaned and degaussed before alignment.

This tape recorder is designed to work well with a variety of tapes however, maximum performance will be obtained with recommended tapes or similar tape formulations.

Recommended tapes For North America For Europe-DIN
Type I Maxell UDS-I, Maxell UD-I BASF TP18, R723DG
Type II Maxell SL-II, Teac MTT-5561
Type IV Maxell MX, TDK AC712

Before adjusting, switch DOLBY NR off, and set PLAY TRIM to center position.

DOLBY NR level $200\text{nWb/m} = 245\text{mV RMS}$ on testpoints TP003 (PLAYBACK and RECORDING) on Main PCB; approximately 530mV at line outputs.

1. TAPE SPEED

Connect one output to Wow and Flutter Meter of Frequency Counter, Play speed test tape TEAC MTT-111=3kHz or TEAC MTT-211=3.15kHz and adjust the semi-variable resistor, for correct reading on Wow and Flutter Meter or Frequency Counter. Tolerance: $\pm 1\%$

2. AZIMUTH

Connect VTVM's and/or Oscilloscope to outputs. Start playing Azimuth tape TEAC MTT-113 or MTT-114. Rotate azimuth screw for maximum output and/or maximum and in-phase on Oscilloscope. Reseal adjustment screw with nail polish or similar (do not use glue).

3. PLAYBACK EQUALIZER

THIS ADJUSTMENT IS NOT NEEDED UNLESS THE HEAD HAS BEEN REPLACED OF REPAIR HAS BEEN DONE IN HEADAMP CIRCUIT.

Play level/azimuth tape TEAC MTT-256 and adjust SVR001 (L) and SVR002 (R) for identical output at 315/6300 Hz (MTT-255) OR 250/6300 Hz (MTT-256). Tolerance: $\pm 0.5\text{dB}$.

4. PLAYBACK HIGH FREQUENCY EQUALIZER

THIS ADJUSTMENT SHOULD BE DONE ONLY WHEN HEAD HAS BEEN REPLACED.

Before adjusting cut out links EJ001 to EJ008. Play the frequency response tape TEAC MTT5561 and check the 14kHz level. Adjust to the 400Hz level adjusting SVR007 (L) and SVR008 (R), if the level is low, link EJ005/EJ008 and/or EJ007/EJ008. Repeat till 400Hz and 14kHz levels are the same. Tolerance: $\pm 1.5\text{dB}/-0.5\text{dB}$

5. PLAYBACK LEVEL

Connect VTVM's to testpoints TP003 on Main PCB. Play Dolby NR level tape TEAC MTT-150 and adjust SVR003 (L) and SVR004 (R) for 245mV RMS . Tolerance: $\pm 2.5\text{mV RMS}$.

output should be approximately 530mV RMS .

6. BIAS TRAP

Insert a blank type IV and start recording. Turn record level all the way down. Connect VTVM's and/or oscilloscope probes to testpoints TP201 and adjust F201 (L) and F202 (R) for minimum. Tolerance: Less than 300mV RMS.

7. BIAS CURRENT ADJUSTMENT

Connect VTVM to TP001 (L), set unit with tape in rec/pause and adjust L301 (L) to 8.5mV. Same for TP002 (R) and adjust L302 (R).

8. RECORD LEVEL

Connect VTVM's to testpoints TP003 on Main PCB. Insert a type I tape. Connect audio oscillator to line inputs, turn record levels to maximum (clockwise). Adjust audio oscillator frequency to 400Hz and output so the VTVM's read 30-40mV. (Use a convenient reference point on the VTVM's).

Reset tape counter to 0 and release pause to start recording.

Record for approximately 5 seconds, rewind to 0 on tape counter and play back while observing the VTVM's. The VTVM's should indicate the same level as when the tape was recorded. Adjust SVR201 (L) and SVR202 (R) if necessary and repeat the record/play procedure until the readings are the same.

Tolerance: +/-0.5dB from record level. Less than 0.5dB difference between channels.

9. BIAS ADJUST TYPE I TAPE (NORMAL)

Leave the connections of the VTVM's as under 7.

Set audio generator to 400Hz, Set level to -20dB. Reset tape counter to 0 and start recording. After 5 seconds change audio generator frequency to 8.3kHz (do not stop the machine or change levels) and continue recording for another 5 seconds stop and rewind to 0 on tape counter. Play back while observing VTVM's There should be no level difference between the 400Hz and the 6.3kHz tone when played back. If 6.3kHz is different in level to 400Hz, adjust SVR305 (L) and SVR306 (R) and repeat the record/play procedure until both frequencies play back at same level. Tolerance: +/-0.5dB Use 10kHz if unable to set REC/PB to give a flat response

WARNING: Greater tolerance will grossly affect the Dolby NR tracking and especially the Dolby C tracking.

Record level (step 7) should be checked and if necessary adjusted.

10. PEAKING CIRCUIT TYPE I TAPE (NORMAL)

Leave the connections of the VTVM's as under 7.

Adjust audio generator to 14kHz while maintaining the same output level. Record and play back the 14kHz tone and adjust SVR207 (L) and SVR208 (R) to the same level as the 400Hz.

Use 16kHz if unable to set REC/PB to give a flat response. Tolerance: +/-1.0dB.

WARNING: If the R/P head is worn, the tape may not have adequate contact with the head resulting in severe drop outs.

A worn head will make this adjustment very difficult or impossible. Do not try to adjust the worn R/P head. Leave SVR207 (L) and SVR208 (R) in the factory preset condition, or if they have already been adjusted, re-adjust them to their approximate midposition.

11. FREQUENCY RESPONSE TYPE II TAPE (CrO2)

Insert a type II tape. Adjust audio generator to 400Hz and 6.3kHz and repeat procedure described in step 8 using SVR304 (R) and SVR303 (L) to adjust both channels simultaneously. After 400Hz and 6.3kHz are adjusted properly, set audio generator to 14kHz and repeat same procedure as described in step 9 while adjusting SVR205 (L) and SVR206 (R) to obtain correct reading.

12. FREQUENCY RESPONSE TYPE IV TAPE (METAL)

Insert a type IV tape. Repeat procedure as in step 8 while adjusting SVR302 (R) and SVR301 (L) for correct 6.3kHz level in both channels. Set audio generator to 14kHz and repeat procedure as in step 8 while adjusting SVR203 (L) and SVR204 (R) for correct 14kHz record level.

13. 19kHz MPX ADJUSTMENT

Connect VTVM to TP003, feed with the audio generator 19kHz, 1V to line input and set unit in rec/play mode. Switch the MPX switch on and adjust F101 (L) and F102 (R) for minimal reading on VTVM. The difference in MPX on and off should be over 30dB.

14. CAR CIRCUIT

Set unit in REC/PAUSE mode, and connect VTVM to TP003. Adjust input signal to give 24mV. Switch car on and adjust SVR101/102 to increase level by 5dB.

Adjustment Locations

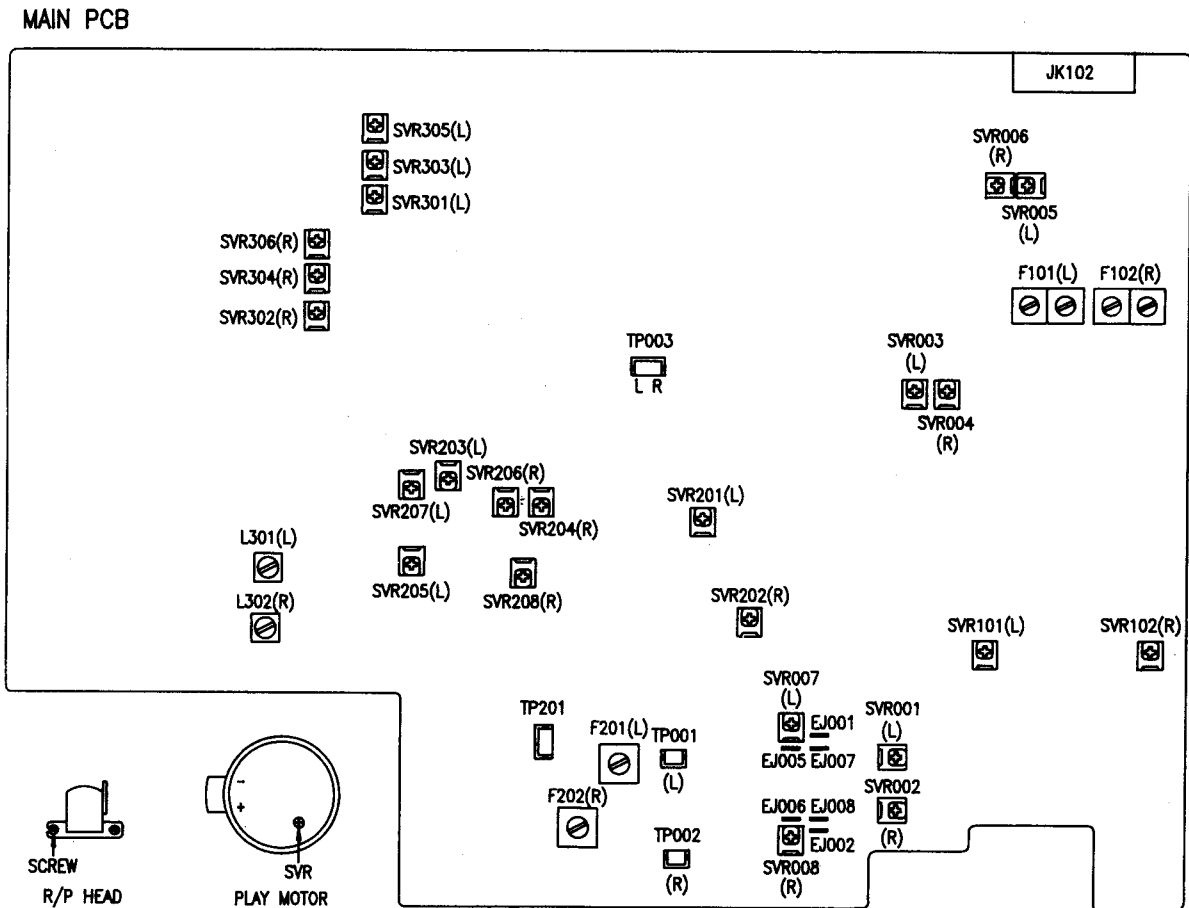


Figure 7

Figure 6

Figure 5

IC/Transistor Voltage Chart

1. IC

IC NO.	PIN NO.																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC001	0	0	0	-11.9	0	0	0	11.9												
IC002	7.3	0	-6.04	0	6.15	0	0	0	0	0	0	0	-6.8	-6.95	0	-6.8	7	0	0	0
IC003	0	0	0	-11.9	0	0	0	11.9												
IC101	0	0	0	-11.9	0	0	0	11.9												
IC102	0	0	0	-11.9	0	0	0	11.9												
IC201	0	0	0	-11.9	0	0	0	11.9												
IC202	0	NC	0	0	0	0	0	0	0	0	0	0	0	0	NC	11.9				
IC301	4.46	2.57	4.44	2.5	2.1	15.1	17.2	17.2	0	1.8	17.2	17.2	15.2	2.1	2.5	4.5	2.6	17.4		
IC302	11.9	NC	11.9	0	0	0	0	0	0	0	0	0	0	0	NC	11.9				
IC303	0	NC	0	0	0	0	0	0	0	0	0	0	0	0	NC	11.9				
IC401	3.53	1.9	4.3	4	0	4.23	0	3.54	0	0	0	4.2	4.3	1.8	0	4.5	3.5	0	4.2	4.2
IC403	0	5.6	7.1	5.7	3.9	0	12	11.2	0.72	0										
IC404	0	0	0	0	4.23	4.23	0	4.24												
IC601	27	0	12																	
IC602	-27	0	-12																	
IC603	20	0	5																	
IC604	20	0	12																	
IC NO.	PIN NO.																			
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
IC002	0	0	0	0	0	-7	-6.8	0	-7	-6.8	0	0	0	0	0	0	0	-7.3	0	0
IC401	4.2	0	0	3.6	0	4.2	4.2	4.2	4.2	0	0	0	0	0	-25.6	-25.6	-25.6	-25.6	-25.6	-25.6
IC NO.	PIN NO.																			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
IC002	0	-7.3																		
IC401	-25	-22.7	-23	-23	-23	-23	-23	-23	-23	-10	-14	-16	-16	-14	-14	-17	-22	-22	-25	-25
IC NO.	PIN NO.																			
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
IC401	-22	-25	-25	-25	-25	-25.6	0	0	0	0	0	0	0	0	0.12	0.12	0.37	0.37	0.37	0.37
RECORD SIGNAL																				
IC NO.	PIN NO.																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
IC302	11.9	NC	11.9	0	0	0	0	0	0	3.9	4.4	4.4	4.4	NC	11.9					
IC303	0.95	NC	0.95	2.6	1.4	0	0	0	0	0	2.4	0.98	0.98	1.4	NC	11.9				

2. TRANSISTORS

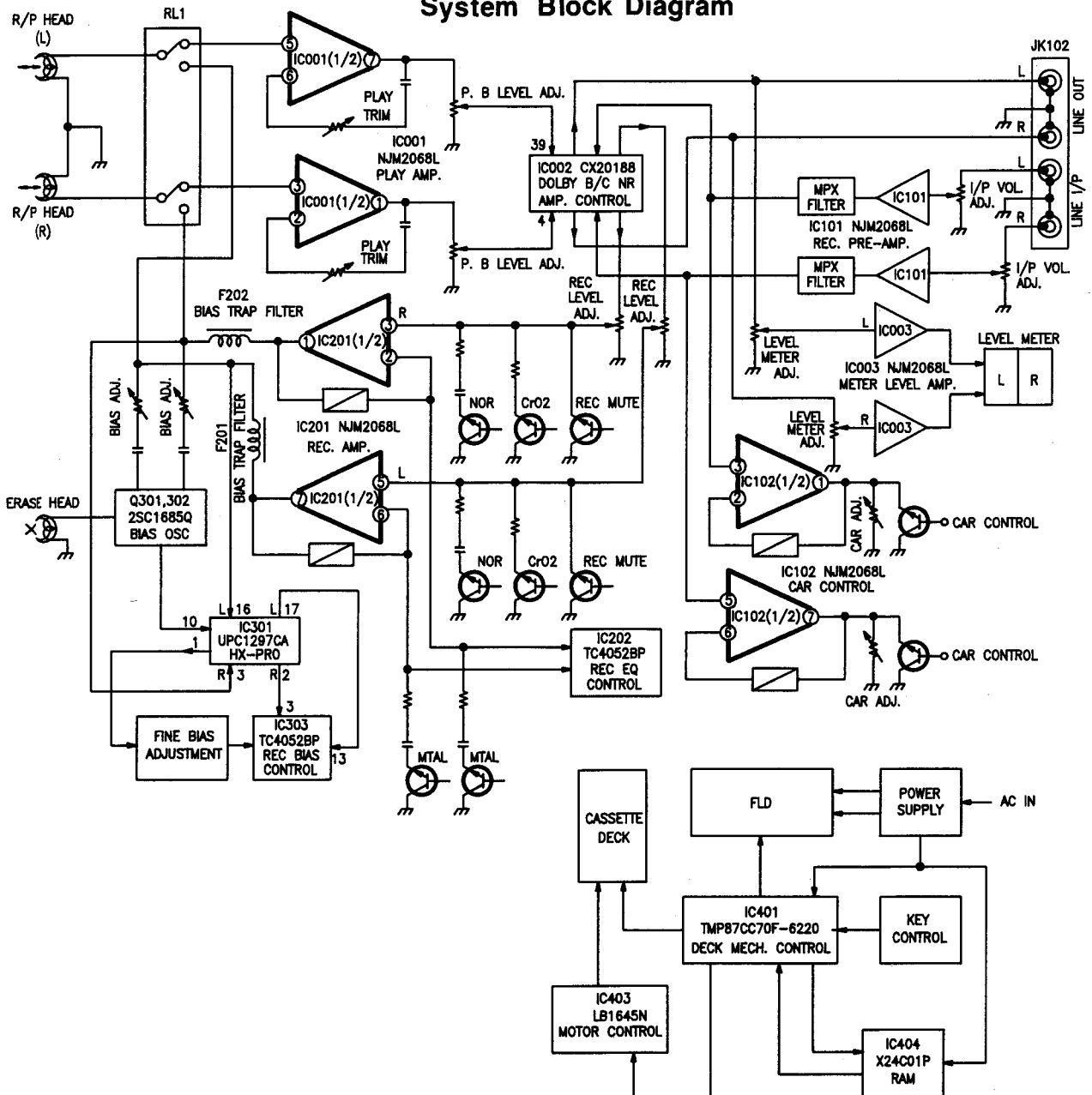
TR NO.	Q001-006	Q003	Q007	Q008	Q010	Q011	Q012	Q013	Q014	Q015	Q101	Q102	Q103	Q104	Q105	Q106	Q109	Q110	Q113
E	0	0	0	0	-7.3	7.3	11.4	0	0	0	-0.65	-0.65	0.6	0.6	0	0	0	0	0
C	0	0	12	6.2	-7.3	-7.3	0	11	0	0	11.9	11.9	-11.9	-11.9	0	0	11.9	11.9	0
B	0	0	0	0	-7.3	7.3	11	0	0	0	0	0	0	0	0	0	0.6	0.6	0
TR NO.	Q114-116	Q201	Q202	Q203	Q204	Q205-208	Q209	Q210	Q211	Q212	Q214	Q215	Q216	Q217	Q301	Q302	Q303	Q304	
E	0	0	0	0	0	0	0	0	0	0	8	-8	0	11.9	0	0	27.5	0	
C	0	0	0	0	0	0	0	0.6	0	0.63	10.3	-10.5	0	11.9	0	0	0.4	0	
B	0	0	0	0.6	0.6	0	0.6	0	0.63	0	7.3	-7.3	3.6	0	0.4	0.4	0	0.7	

TR NO.	Q305	Q401	Q402	Q403	Q404	Q405	Q406	Q407	Q408	Q410	Q411	Q413	Q415	Q416	Q417	Q418	Q419	TR NO.	Q107	Q108
E	0	4.2	0	4.2	0	4.2	0	3.6	4.1	0	0	0	0	12	0	12	12	D	1.3	1.3
C	0.7	1.9	0	4.2	27.3	0	4.5	4.4	0.2	12	0	0	12	0	12	0	0	S	1.3	1.3
B	0	2.5	0.7	3.5	0	4.2	0	4.2	3.6	0	4.2	4.2	4.2	12	0	12	12	G	0	0

RECORD SIGNAL

TR NO.	Q003	Q004	Q007	Q008	Q207	Q208	Q216	Q217	Q301	Q302	Q303	Q304	Q305	Q417	Q418
E	0	0	0	0	0	0	0	11.9	0	0	25	0	0	0	12
C	0	0	0	0	0	0	11.9	-8.3	2.1	2.1	17.3	17.8	0	0	12
B	0.7	0.7	0.7	11.5	0.6	0.6	0	11.9	1.7	1.7	17.9	0	0.6	4.3	0

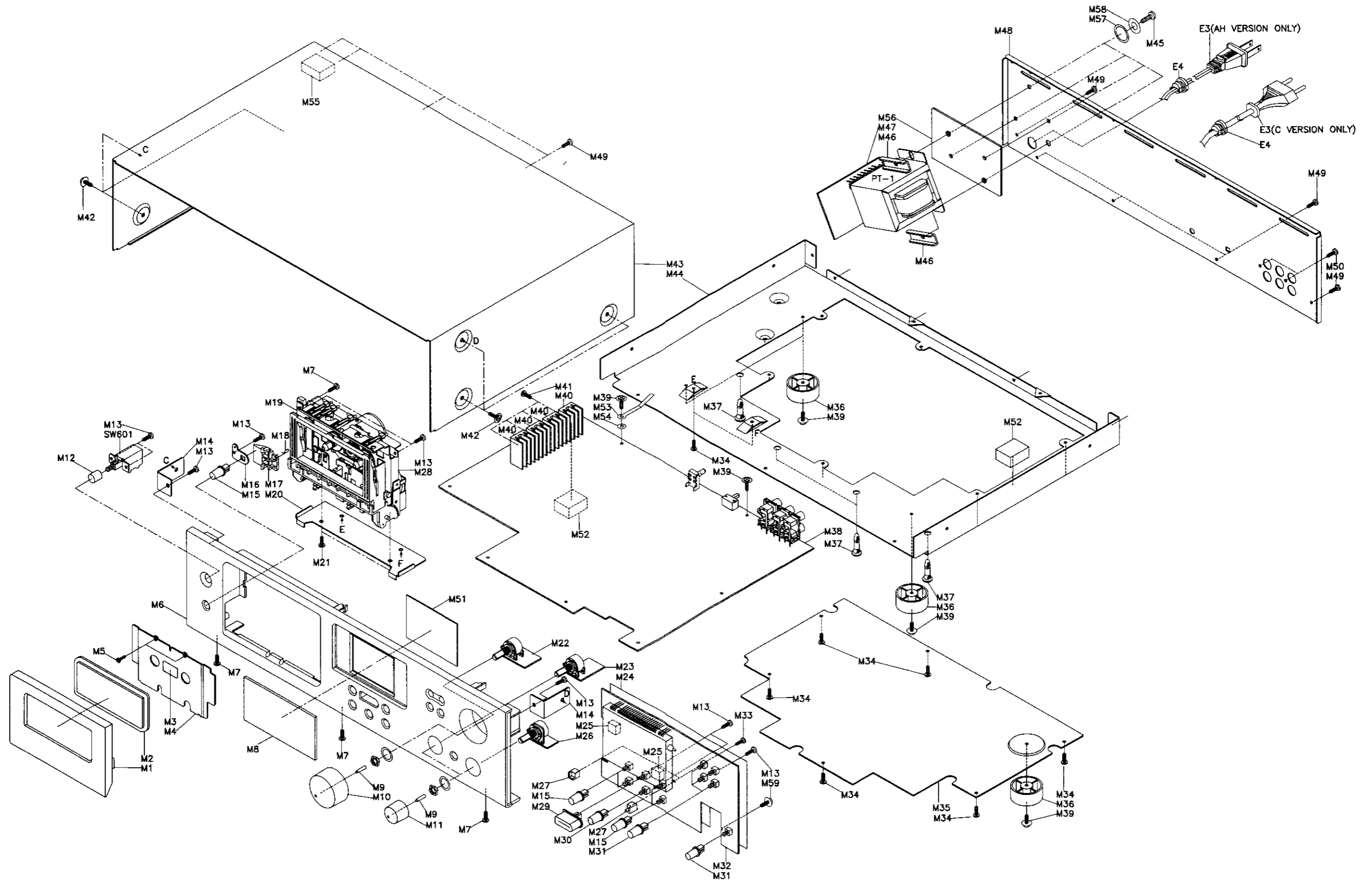
System Block Diagram



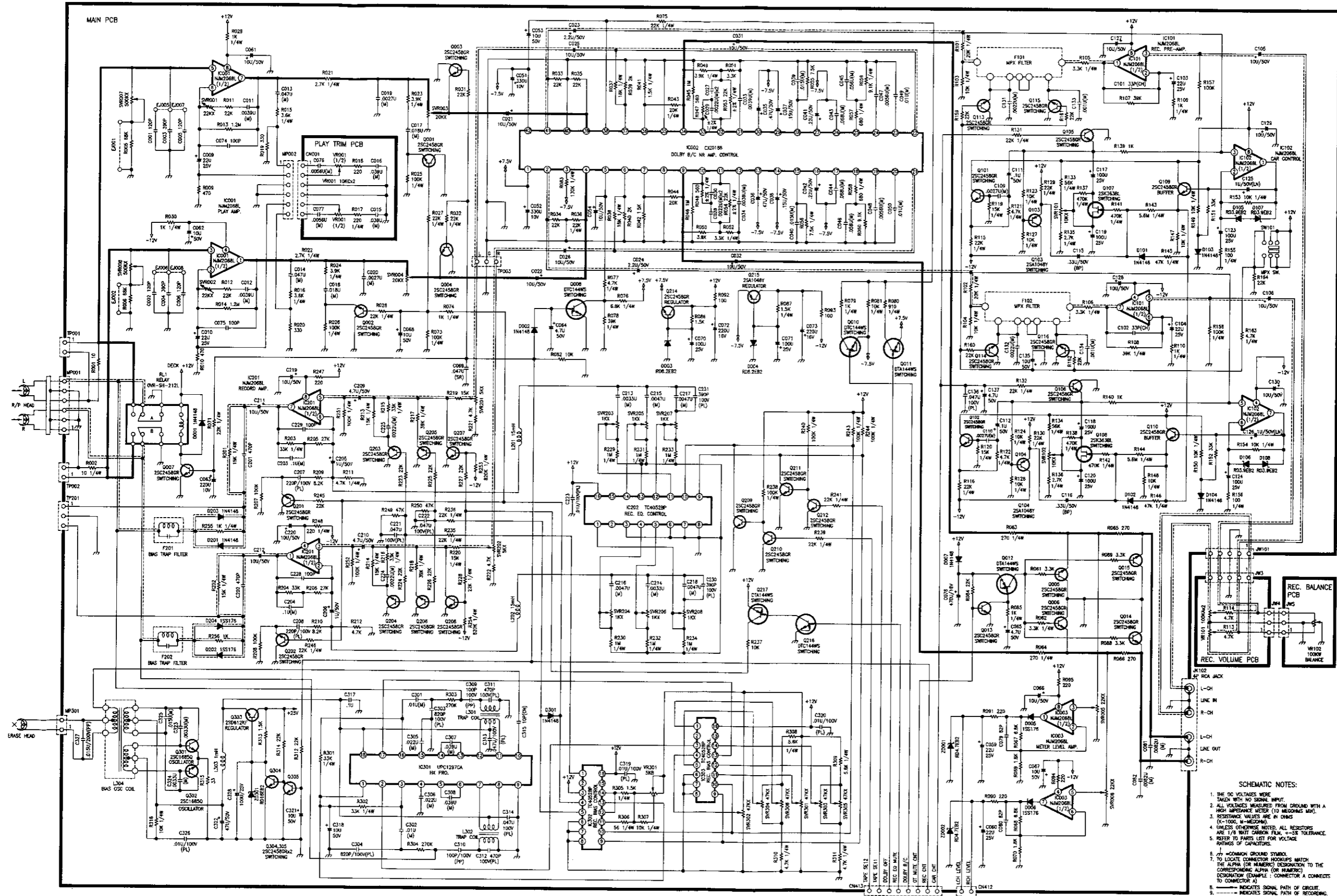
Mechanical Parts List

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
M1	100807D614	Cassette door	M42	8662400800	6 (Taptite-S) CUP4008 ZN3K
M2	100707D614	Door Window			(6 pieces) screws
M3	201407D614	Mirror	M43	100107D614	Top cover
M4	201307D614	Deck shield plate	M44	100407D614	Bottom base
M5	8642260400	6 (Taptite-S) BID2604 ZN3K (2 pieces) screws	M45	8642401000	6 (Taptite-S) BID4010 ZN3K (4 pieces) screws
M6	100507D614	Front panel	M46	2003038401	Transformer washer (2 pieces)
M7	8641300800	6 (Taptite-S) BID3008 ZN3A (4 pieces) screws	M47*AH	C145241620	Transformer PCB assembly
M8	100607D614	Display window	M47*C	C145241621	Transformer PCB assembly
M9	101707D614	W. pointer (3 pieces)	M48*AH	101807D614	Back panel
M10	101307D614	Volume knob	M48*C	100207D614	Back panel
M11	101407D614	B. T. knob (2 pieces)	M49	8642300800	6 (Taptite-S) BID3008 ZN3K (9 pieces) screws
M12	101507D614	Power knob	M50	8742301000	7 (Taptite-P) BID3010 ZN3K (2 pieces) screws
M13	8741300800	7 (Taptite-P) BID3008 ZN3A (10 pieces) screws	M51	201507D614	Filter
M14	200407D614	T. bracket (2 pieces)	M52	201607D614	Cushion (2 pieces)
M15	100907D614	R/F knob (5 pieces)	M53	2000000026	Earth terminal
M16	200807D614	Guide bracket	M54	202007D614	Rubber washer
M17	200207D614	Eject plate	M55	201807D614	Cushion
M18	200607D614	C. spring	M56	201707D614	Trans. spacer
M19	200707D614	M. eject plate	M57	3021220015	W. FLT-A-0015-MS-ZN3K (4 pieces)
M20	200307D614	Deck holder	M58	3022220004	W. spring-A-0004-MS-ZN3K (4 pieces)
M21	8641300400	6 (Taptite-S) BID3004 ZN3A (4 pieces) screws	M59	8761300800	7 (Taptite-P) CUP3008 ZN3A screw
M22	C145241640	Record volume PCB assembly	MISCELLANEOUS		
M23	C145241630	Play trim PCB assembly	SW601	4430102450	Power switch
M24	200507D614	Shield plate	PT-1	420C542229	Power transformer EI-54 UL/CSA
M25	201207D614	LCD cushion (10Lx10Wx6T EVA60) (2 pieces)	E3*AH	463137P070	AC cord UL/CSA 7FT BLK SPT-2
M26	C145241650	Record balance PCB assembly	E3*C	463221P070	AC cord VDE 7FT BLK2
M27	200107D614	FL holder (2 pieces)	E4	4580200002	Cord stopper 4N-4
M28	4380404980	Cassette deck C-90F09D	P C BOARD ASSEMBLY KIT'S		
M29	101007D614	Play knob	K1*AH	K12326D614	Main PCB assembly kit's
M30	101107D614	Record knob	K1*C	K12336D614	Main PCB assembly kit's
M31	101207D614	Dolby knob (5 pieces)	(M22)	C145241640	Record volume PCB assembly
M32	C141241500	Front PCB assembly	(M23)	C145241630	Play trim PCB assembly
M33	8711200500	7 (Taptite-P) PAN2005 ZN3A (2 pieces) screws	(M26)	C145241650	Record balance PCB assembly
M34	8641300600	6 (Taptite-S) BID3006 ZN3A (8 pieces) screws	(M38)	C145241610	Main PCB assembly
M35	100307D614	Base	(M47)*AH	C145241620	Transformer PCB assembly
M36	101607D614	Foot (4 pieces)	(M47)*C	C145241621	Transformer PCB assembly
M37	200907D614	Spacer supporter (SCD-12S) (4 pieces)			
M38	C145241610	Main PCB assembly			
M39	8661300600	6 (Taptite-S) CUP3006 ZN3A (6 pieces) screws			
M40	202304301A	Heat sink H30 (4 pieces)			
M41	8941300800	9 (Taptite-B) BID3008 ZN3A (4 pieces) screws			

Mechanical Exploded View

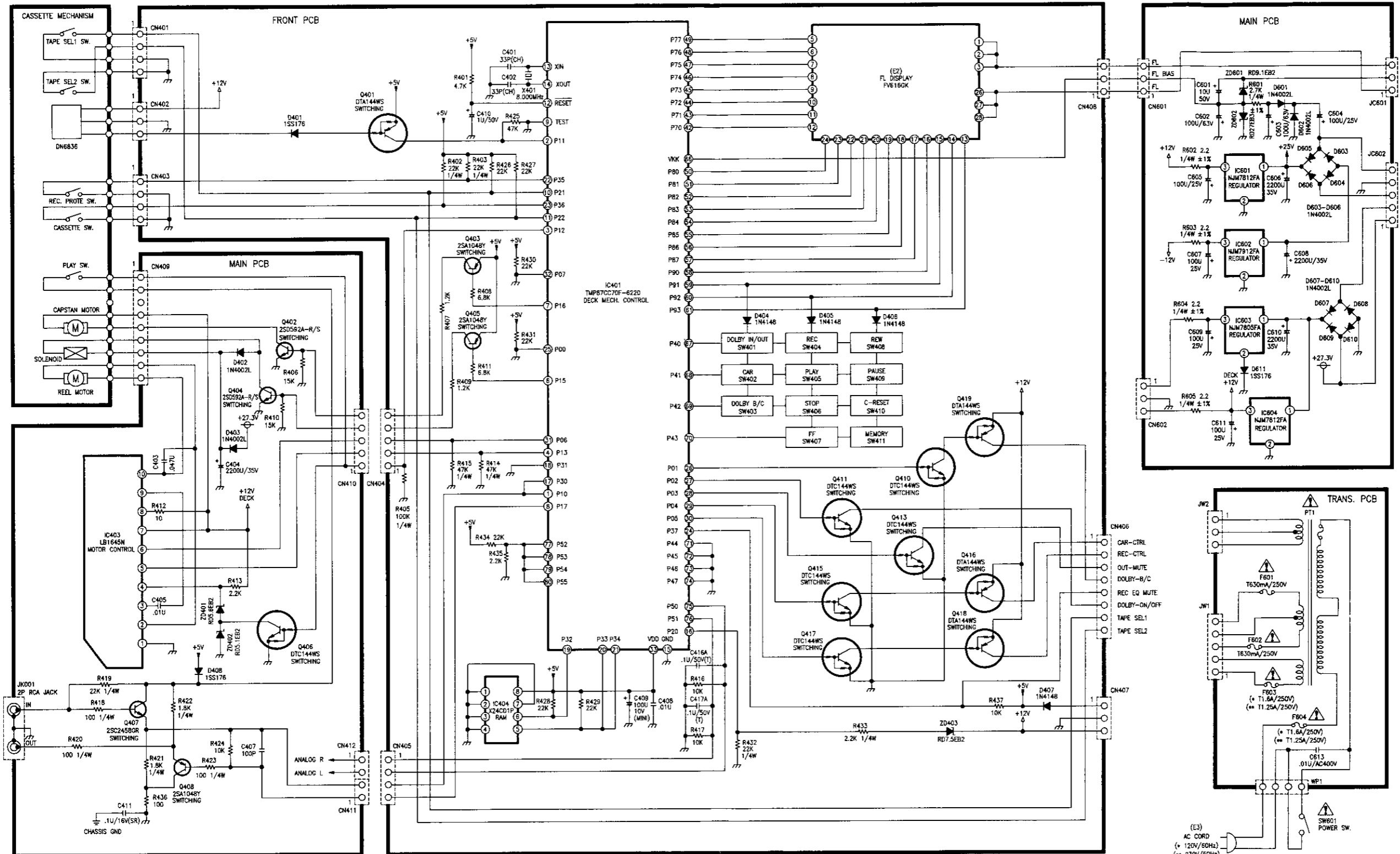


Schematic Diagram—Main



- SCHEMATIC NOTES:**
1. THE DC VOLTAGES WERE TAKEN WITH NO SIGNAL INPUT.
 2. ALL VOLTAGES MEASURED FROM GROUND WITH A HIGH IMPEDANCE METER (10 MEGOHMS MIN).
 3. RESISTANCE VALUES ARE IN OHMS (K=1000, M=MEGOhms).
 4. UNLESS OTHERWISE NOTED, ALL RESISTORS ARE 1/8 WATT CARBON FILM, ±5% TOLERANCE.
 5. REFER TO PARTS LIST FOR VOLTAGE RATINGS OF CAPACITORS.
 6. — COMMON GROUND SYMBOL.
 7. TO LOCATE CONNECTOR HOOKUPS MATCH THE ALPHA (OR NUMERIC) DESIGNATION TO THE CORRESPONDING ALPHA (OR NUMERIC) DESIGNATION (EXAMPLE: CONNECTOR A CONNECTS TO CONNECTOR A).
 8. — INDICATES SIGNAL PATH OF RECORDING.
 9. — INDICATES SIGNAL PATH OF RECORDING.

Schematic Diagram-Front

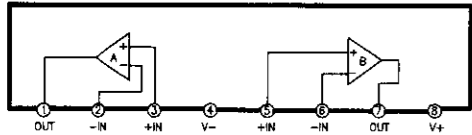


SCHEMATIC NOTES:

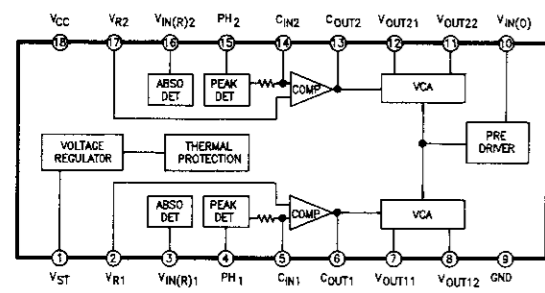
1. THE DC VOLTAGES WERE TAKEN WITH NO SIGNAL INPUT.
2. ALL VOLTAGES MEASURED FROM GROUND WITH A HIGH IMPEDANCE METER (10 MEGOHMS MIN).
3. RESISTANCE VALUES ARE IN OHMS (K=1000, M=MEG OHMS).
4. UNLESS OTHERWISE NOTED, ALL RESISTORS ARE 1/8 WATT CARBON FILM, ±5% TOLERANCE.
5. REFER TO PARTS LIST FOR VOLTAGE RATINGS OF CAPACITORS.
6. ⏏ = COMMON GROUND SYMBOL.
7. TO LOCATE CONNECTOR HOOKUPS MATCH THE ALPHA (OR NUMERIC) DESIGNATION TO THE CORRESPONDING ALPHA (OR NUMERIC) DESIGNATION (EXAMPLE: CONNECTOR A) CONNECTS TO CONNECTOR A).
8. PARTS MARKED WITH THE SYMBOL ⚠ HAVE CRITICAL CHARACTERISTICS. USE ONLY REPLACEMENT PARTS RECOMMENDED BY THE MANUFACTURER.
9. (1) = MULTI-LAYER CERAMIC CAPACITOR.

IC Block Diagram

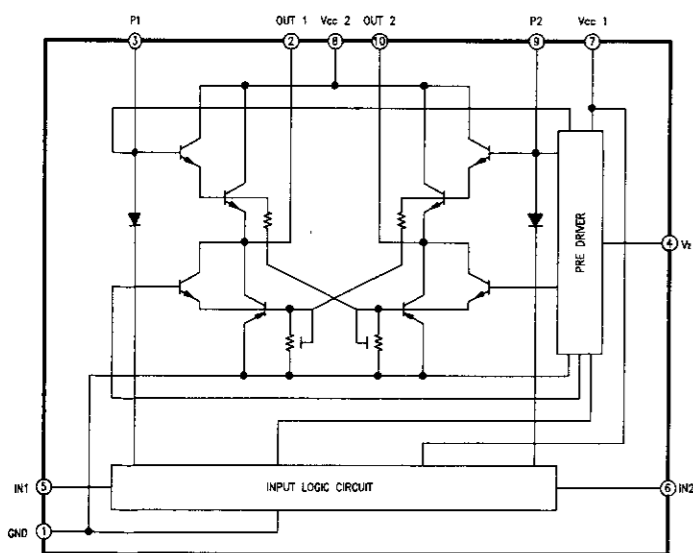
IC001 NJM2068L (PLAY AMP.)
 IC003 NJM2068L (METER LEVEL AMP.)
 IC101 NJM2068L (RECORD PRE-AMP.)
 IC102 NJM2068L (CAR CONTROL)
 IC201 NJM2068L (RECORD AMP.)



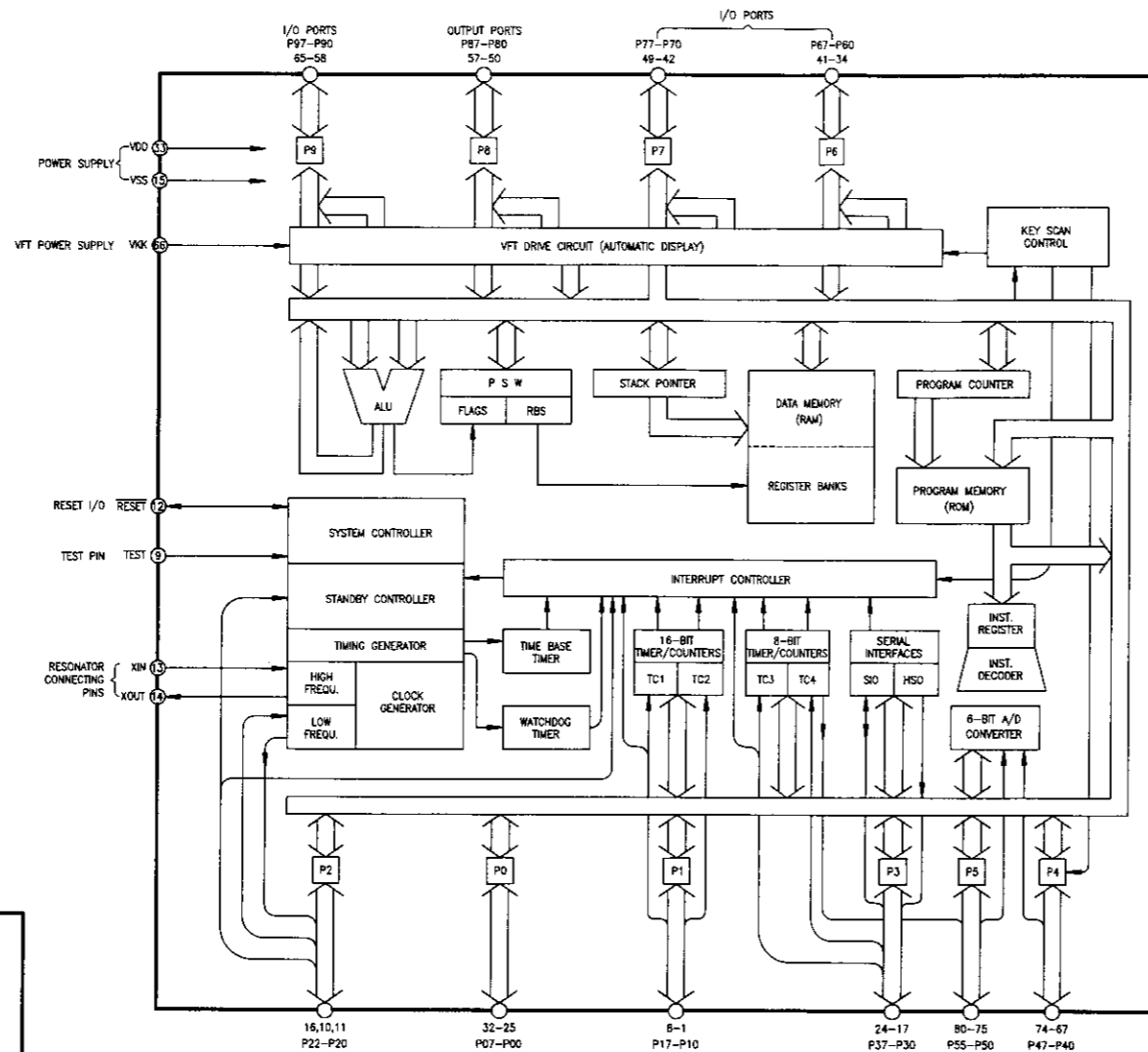
IC301 UPC1297CA (HX PRO.)



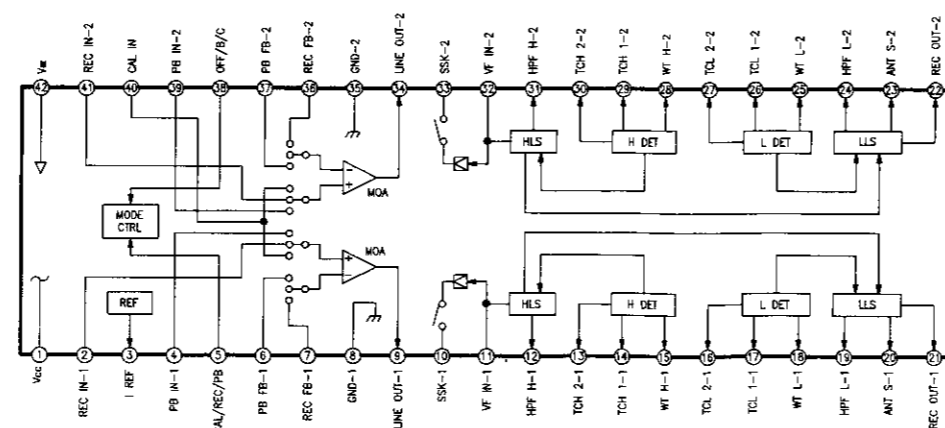
IC403 LB1645N (MOTOR CONTROL)



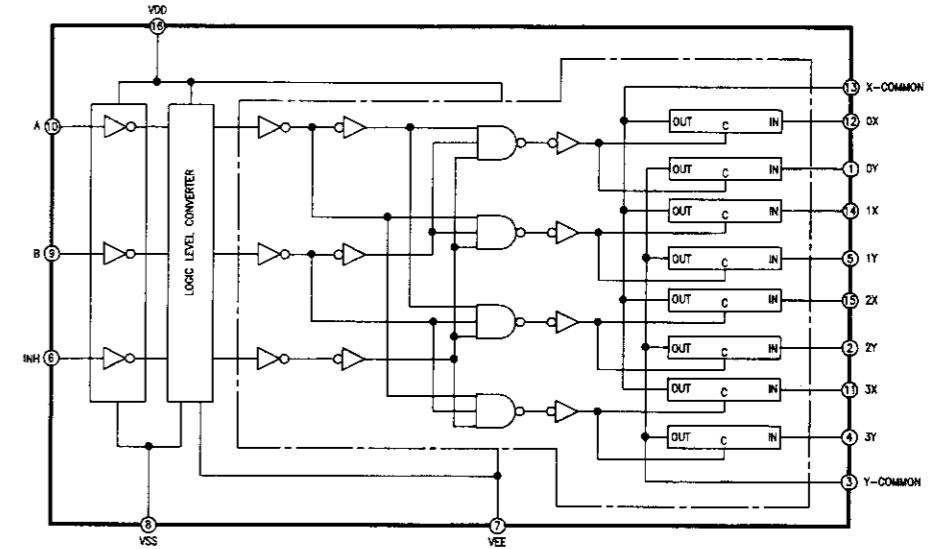
IC401 TMP87CC70F-6220 (DECK MECH. CONTROL)



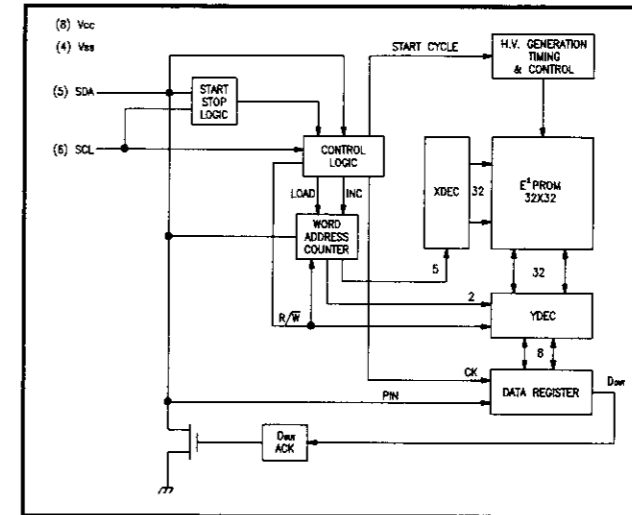
IC002 CX20188 (DOLBY B/C NR AMP. CONTROL)



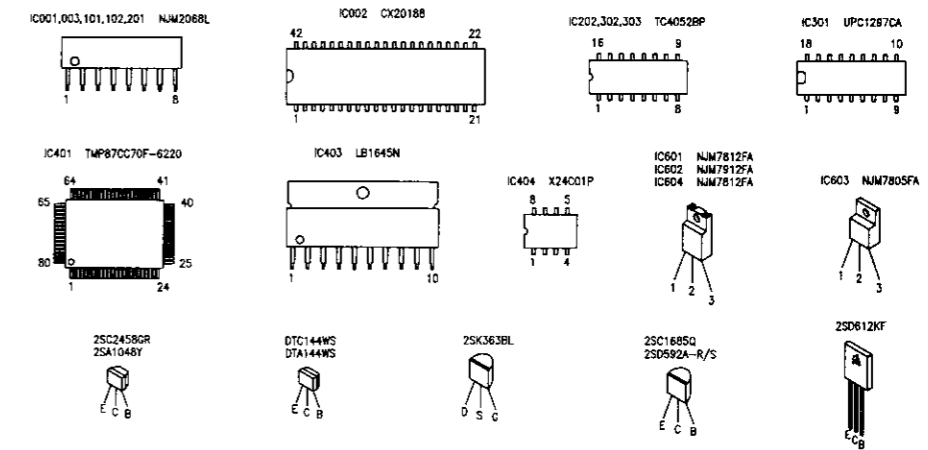
IC202 TC4052BP (RECORD EQUALIZER CONTROL)
 IC302,303 TC4052BP (RECORD BIAS CONTROL)



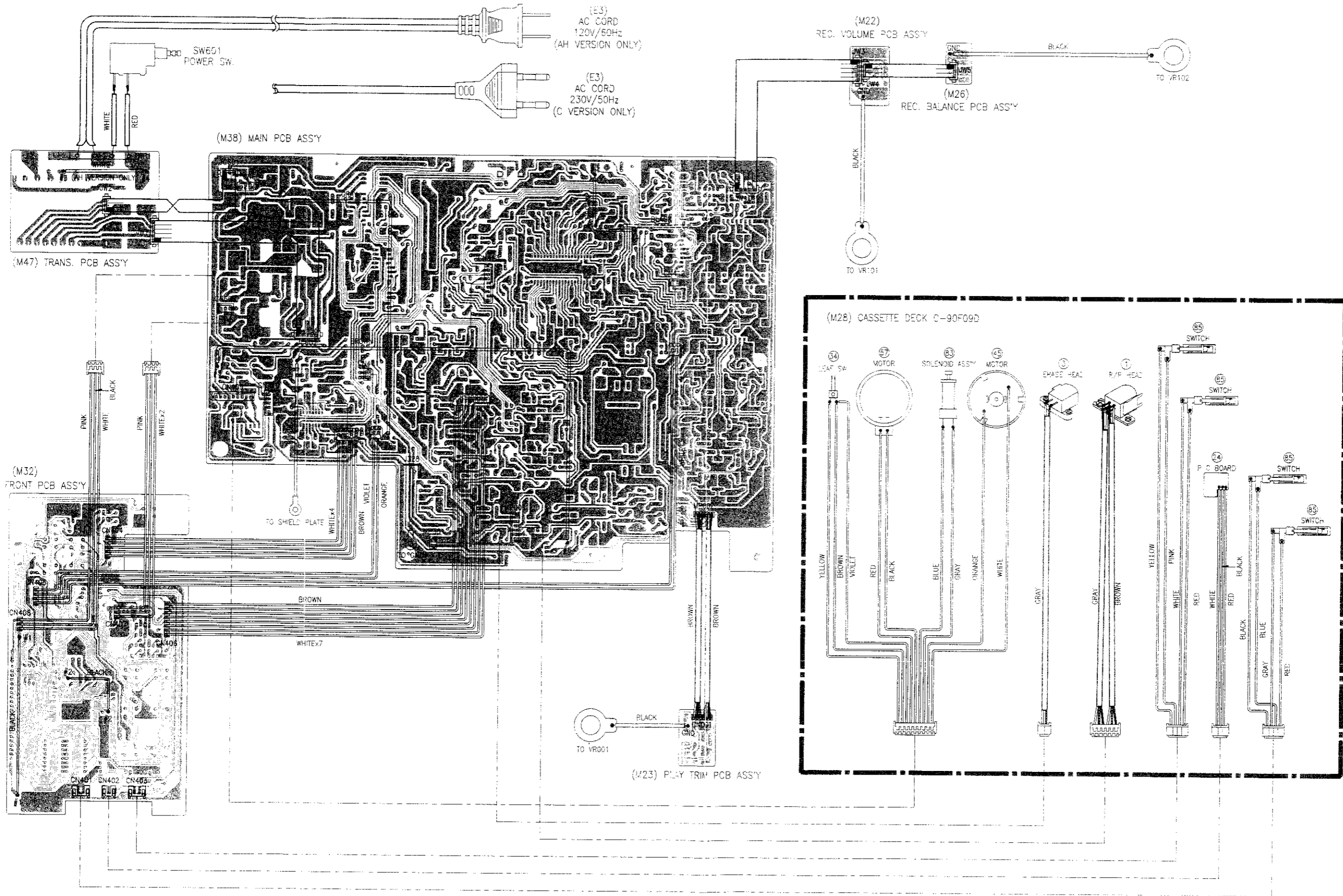
IC404 X24C01P (RAM)



IC/TRANSISTOR CONNECTIONS:



Wiring Diagram-Component Side



Replacement Parts List

Main PCB Assembly

Symbol No.	Ref. No.	Part No.	Description	Symbol No.	Ref. No.	Part No.	Description
P C Board	4145241610 C145241610	4145241610 C145241610	PCB no components PCB assembly	CAPACITORS			
ICs & TRANSISTORS				C009,010 C011,012	5153220225 5116392550	5153220225 5116392550	Ele. 22uF/25V, ±20% Mylar .0039uF/50V, ±5%
IC001 IC002	NJM2068L CX20188	415902068L 415C201880	Play amplifier Dolby B/C NR amplifier control	C013,014 C017,018 C019,020	5116473550 5116183550 5116272550	5116473550 5116183550 5116272550	Mylar .047uF/50V, ±5% Mylar .018uF/50V, ±5% Mylar .0027uF/50V, ±5%
IC003 IC101 IC102 IC201 IC202	NJM2068L NJM2068L NJM2068L NJM2068L TC4052BP	415902068L 415902068L 415902068L 415902068L 4153040522	Meter level amplifier Record pre-amplifier Car control Record amplifier Record equalizer control	C021,022 C023,024 C025,026 C027-030	5153100250 5153229250 5153100250 5116222550	5153100250 5153229250 5153100250 5116222550	Ele. 10uF/50V, ±20% Ele. 2.2uF/50V, ±20% Ele. 10uF/50V, ±20% Mylar .0022uF/50V, ±5%
IC301 IC302,303 IC403 IC601 IC602 IC603 IC604	UPC1297CA TC4052BP LB1645N NJM7812FA NJM7912FA NJM7805FA NJM7812FA	41511297CA 4153040522 415201645N 415978A2FA 415979A2FA 41597805FA 415978A2FA	HX PRO. Record bias control Motor control Regulator Regulator Regulator Regulator	C031,032 C033,034 C035,036 C037,038 C039,040 C041,042 C043,044 C045,046 C047,048	5153100250 5116392550 5153478250 5153158250 5116153550 5153228250 5116683550 5116563550 5116562550	5153100250 5116392550 5153478250 5153158250 5116153550 5153228250 5116683550 5116563550 5116562550	Ele. 10uF/50V, ±20% Mylar .0039uF/50V, ±5% Ele. .47uF/50V, ±20% Ele. .15uF/50V, ±20% Mylar .015uF/50V, ±5% Ele. .22uF/50V, ±20% Mylar .068uF/50V, ±5% Mylar .056uF/50V, ±5% Mylar .0056uF/50V, ±5%
Q001-007 Q013-015 Q101,102 Q105,106 Q113-116 Q201-212 Q304,305 Q407 Q008,010 Q216,406 Q217 Q011,012 Q103,104 Q408 Q107,108 Q109,110	2SC2458GR or 2SC3330T DTC144WS or RN1209 DTA144WS or RN2209 2SA1048Y or 2SA1317 2SK363BL 2SC2458GR or 2SC3330T 2SC2458GR or 2SC3330T 2SA1048Y or 2SA1317 2SC1685Q 2SD612KF 2SD592A-R/S or 2SC3377Q	4105224587 410523330T 41092144WS 4108912090 41091144WS 4108922090 410501048Y 4105013172 4106503632 4105224587 410523330T 4105224587 410523330T 410501048Y 4105013172 410021685Q 4100306122 410530592A 410523377Q	Switching Switching Switching Switching Switching Switching Switching, FET Buffer Buffer Regulator Regulator Regulator Regulator Oscillator Regulator Switching Switching	C049,050 C051,052 C053,054 C059,060 C061,062 C063 C064,065 C066-068 C069 C070,071 C072,073 C078 C081,082	5116103550 5153331210 5153100250 5153220225 5153100250 5153221210 5153479250 5153100250 5105473132 5153101225 5153221216 5153471216 5116822550	5116103550 5153331210 5153100250 5153220225 5153100250 5153221210 5153479250 5153100250 5105473132 5153101225 5153221216 5153471216 5116822550	Mylar .01uF/50V, ±5% Ele. 330uF/10V, ±20% Ele. 10uF/50V, ±20% Ele. 22uF/25V, ±20% Ele. 10uF/50V, ±20% Ele. 220uF/10V, ±20% Ele. 4.7uF/50V, ±20% Ele. 10uF/50V, ±20% SR. .047uF/25V, ±10% Ele. 100uF/25V, ±20% Ele. 220uF/16V, ±20% Ele. 470uF/16V, ±20% Mylar .0082uF/50V, ±5%
Q214 Q215	2SC2458GR or 2SC3330T 2SA1048Y or 2SA1317	4105224587 410523330T 410501048Y 4105013172	Regulator Regulator	C103,104 C105,106 C109,110	5153220225 5153100250 5116272550	5153220225 5153100250 5116272550	Ele. 22uF/25V, ±20% Ele. 10uF/50V, ±20% Mylar .0027uF/50V, ±5%
Q301,302 Q303 Q402,404	2SC1685Q 2SD612KF 2SD592A-R/S or 2SC3377Q	410021685Q 4100306122 410530592A 410523377Q	Oscillator Regulator Switching	C111,112 C115,116	5153108250 5163338250	5153108250 5163338250	Ele. .1uF/50V, ±20% Ele. .33uF/50V, ±20% (BP)
DIODES				C117-120 C123,124 C125,126	5153101225 5153101225 5157109250	5153101225 5153101225 5157109250	Ele. 100uF/25V, ±20% Ele. 100uF/25V, ±20% Ele. 1uF/50V, ±20% (LN)
DIODES				C127-130 C131,132	5153100250 5116222550	5153100250 5116222550	Ele. 10uF/50V, ±20% Mylar .0022uF/50V, ±5%
D001,002 D003,004 D005,006 D007 D101-104 D105-108 D201 D202 D203 D204 D301 D402,403 D408 D601-610 D611 ZD001,002 ZD301 ZD401 ZD402 ZD601 ZD602	1N4148 RD8.2EB2 1SS176 1N4148 1N4148 RD3.9EB2 1N4148 1SS176 1SS176 1N4148 1SS176 1N4148 1N4002L 1SS176 1N4002L 1SS176 RD4.7EB2 RD18EB2 RD5.6EB2 RD5.1EB2 RD9.1EB2 RD27EB3	4121141480 4121520825 4121901760 4121141480 4121141480 4121520395 4121141480 4121901760 4121901760 4121141480 4121901760 4121141480 4138104002 4121901760 4138104002 4121901760 4121520475 4121521805 4121520565 4121520515 4121520915 4121532705	1N4148 Zener, RD8.2EB2 1SS176 1N4148 1N4148 Zener, RD3.9EB2 1N4148 1SS176 1SS176 1N4148 1SS176 1N4148 1N4002L 1SS176 1N4002L 1SS176 Zener, RD4.7EB2 Zener, RD18EB2 Zener, RD5.6EB2 Zener, RD5.1EB2 Zener, RD9.1EB2 Zener, RD27EB3	C133,134 C135 C136 C137 C203,204 C205,206 C207,208 C209,210 C211,212 C213,214	5116102550 5153100250 5091473513 5153479250 5116104550 5153109250 5091221513 5153479250 5153100250 5116332550	5116102550 5153100250 5091473513 5153479250 5116104550 5153109250 5091221513 5153479250 5153100250 5116332550	Mylar .001uF/50V, ±5% Ele. 10uF/50V, ±20% PL. .047uF/100V, ±5% Ele. 4.7uF/50V, ±20% Mylar .1uF/50V, ±5% Ele. 1uF/50V, ±20% PL. 220pF/100V, ±5% Ele. 4.7uF/50V, ±20% Ele. 10uF/50V, ±20% Mylar .0033uF/50V, ±5% Mylar .0047uF/50V, ±5% Ele. 10uF/50V, ±20% 5091473513 5091103513 5116222550 5116222550 PL. 390pF/100V, ±5% Mylar .01uF/50V, ±5% PL. 820pF/100V, ±5% Mylar .022uF/50V, ±5% Mylar .039uF/50V, ±5% PP. 100pF/100V, ±5% PL. 470pF/100V, ±5% PL. .047uF/100V, ±5% Ele. 10uF/50V, ±20% PL. .01uF/100V, ±5% Ele. 10uF/50V, ±20% Ele. 47uF/50V, ±20%
RESISTORS				C215-218 C219,220 C221,222 C223 C224,225 C230,231 C301,302 C303,304 C305,306 C307,308 C309,310 C311,312 C313,314 C318 C319,320 C321 C322	5116472550 5153100250 5091473513 5091103513 5116222550 5091391513 5116103550 5091821513 5116223550 5116393550 5092101513 5091471513 5091473513 5153100250 5091103513 5153100250 5153470250	5116472550 5153100250 5091473513 5091103513 5116222550 5091391513 5116103550 5091821513 5116223550 5116393550 5092101513 5091471513 5091473513 5153100250 5091103513 5153100250 5153470250	560 ohm, 1/4W ±2% Metal (Flame-proof) 22K ohm, 1/4W ±2% Metal (Flame-proof) 2.7K ohm, 1/4W ±1% Metal (Flame-proof) 2.2 ohm, 1/4W ±1% Metal (Flame-proof)

Symbol No.	Ref. No.	Part No.	Description	Symbol No.	Ref. No.	Part No.	Description
C323,324	5116332550	5116332550	Mylar .0033uF/50V, ±5%	Q401,416	DTA144WS	41091144WS	Switching
C325	5116153550	5116153550	Mylar .015uF/50V, ±5%	Q418,419	or RN2209	4108922090	Switching
C326	5091103513	5091103513	PL. .01uF/100V, ±5%	Q410,411	DTC144WS	41092144WS	Switching
C327	5092153521	5092153521	PP. .015uF/200V, ±5%	Q413,415	or RN1209	4108912090	Switching
C328	5153101225	5153101225	Ele. 100uF/25V, ±20%	Q417			
C404	5154222235	5154222235	Ele. 2200uF/35V, ±20%	Q403,405	2SA1048Y	410501048Y	Switching
C411	5105104142	5105104142	SR. .1uF/16V, ±10%	X401	8.000MHZ	4100908MHZ	Crystal
C601	5153100250	5153100250	Ele. 10uF/50V, ±20%	DIODES			
C602,603	5153101263	5153101263	Ele. 100uF/63V, ±20%	D401	1SS176	4121901760	1SS176
C604,605	5153101225	5153101225	Ele. 100uF/25V, ±20%	D404-407	1N4148	4121141480	1N4148
C606	5154222235	5154222235	Ele. 2200uF/35V, ±20%	ZD403	RD7.5EB2	4121520755	Zener, RD7.5EB2
C607	5153101225	5153101225	Ele. 100uF/25V, ±20%	CAPACITORS			
C608	5154222235	5154222235	Ele. 2200uF/35V, ±20%	C409	5150101210	5150101210	Ele. 100uF/10V, ±20% (MINI)
C609	5153101225	5153101225	Ele. 100uF/25V, ±20%	C410	5153109250	5153109250	Ele. 1uF/50V, ±20%
C610	5154222235	5154222235	Ele. 2200uF/35V, ±20%	C416A,417A	7306610441	7306610441	Mul. .1uF/50V, +80/-20%
C611	5153101225	5153101225	Ele. 100uF/25V, ±20%	SWITCHES			
VARIABLE RESISTORS & SWITCH				SW401	SKHHCW054A	4400000209	Dolby IN/OUT SWITCH
SVR001,002	22KX	5226223177	Semi-fixed resistor	SW402	SKHHCW054A	4400000209	Car switch
SVR003,004	20KX	5226203177	Semi-fixed resistor	SW403	SKHHCW054A	4400000209	Dolby B/C switch
SVR005,006	22KX	5226223177	Semi-fixed resistor	SW404	SKHHCW054A	4400000209	Record switch
SVR007,008	500KX	5226504177	Semi-fixed resistor	SW405	SKHHCW054A	4400000209	Play switch
SVR101,102	10KX	5226103177	Semi-fixed resistor	SW406	SKHHCW054A	4400000209	Stop switch
SVR201,202	5KX	5226502177	Semi-fixed resistor	SW407	SKHHCW054A	4400000209	Fast forward switch
SVR203-208	1KX	5226102177	Semi-fixed resistor	SW408	SKHHCW054A	4400000209	Rewind switch
SVR301-306	47KX	5226473177	Semi-fixed resistor	SW409	SKHHCW054A	4400000209	Pause switch
VR301	5KB	5020153281	Variable resistor	SW410	SKHHCW054A	4400000209	C-Reset switch
SW101	SSSF 12511A	4410202186	MPX switch	SW411	SKHHCW054A	4400000209	Memory switch
JACKS & RELAY				MISCELLANEOUS			
JK001	4500800277	4500800277	2P RCA JACK	CN401	EH 4P	4490401003	Side base
JK102	4500800250	4500800250	RJ-1020-050	CN402	EH 3P	4490301003	Side base
RL1	OVR-SH-212L	4390000046	4P RCA JACK	CN403	EH 4P	4490401003	Side base
			Relay	E2	FV616GK	4110540225	FL. display
FILTERS & COILS				Transformer PCB Assembly			
F101,102	184025	4160614260	MPX filter	P C Board	4145241620	4145241620	PCB no components
F201,202	184014	4160614262	Bias trap filter		C145241620	C145241620	PCB assembly
L201,202	15mH	4329215311	Inductor coil		C145241621	C145241621	PCB assembly (For the AH version)
L301,302	184027	4360400860	Trap(hxpro) coil				PCB assembly (For the C version)
L303	1mH	4329210211	Motor choke coil	CAPACITORS			
L304	190027	4330802030	Bias oscillator coil	C613	5106103141	5106103141	Spark .01uF/AC400V "M"
MISCELLANEOUS				FUSES			
TPO01,002	EH 2P	4490201002	Top base	F601,602*AH	T630mA/250V	5266063064	Fuse UL/CSA
TPO03	EH 3P	4490301002	Top base	F601,602*C	T630mA/250V	5267063L60	Fuse semko
TP201	EH 3P	4490301002	Top base	F603,604*AH	T1.6A/250V	5266160064	Fuse UL/CSA
MP001	EH 6P	4490601002	Top base	F603,604*C	T1.25A/250V	5267125L60	Fuse semko
MP301	EH 2P	4490201002	Top base	MISCELLANEOUS			
CN409	B9B-EH-A	4490901002	Top base	JW1	5P25	4490500268	Wire holder
CN410	EH 5P	4490501002	Top base	JW2	3P25	4490300268	Wire holder
CN411,412	EH 2P	4490201002	Top base	WP1	4490400276	4490400276	4P pin header (P10)
CN413	EH 8P	4490801002	Top base	E1	PFC5000-0202T	4692000034	Fuse holder
CN601,602	EH 3P	4490301002	Top base	Front PCB Assembly			
JC601	3P25	4490300268	Wire holder	PC Board	4141241500	4141241500	PCB no components
JC602	5P25	4490500268	Wire holder		C141241500	C141241500	PCB assembly
JW101	5P25	4490500268	Wire holder	ICS & TRANSISTORS			
IC401	TMP87CC70F-6220	415387CC70	Deck mechanism control	IC401	TMP87C70F	415387C70F	Deck mechanism control
	or TMP87C70F	415387C70F	Deck mechanism control	IC404	X24C01P	415924C01P	RAM

Play Trim PCB Assembly

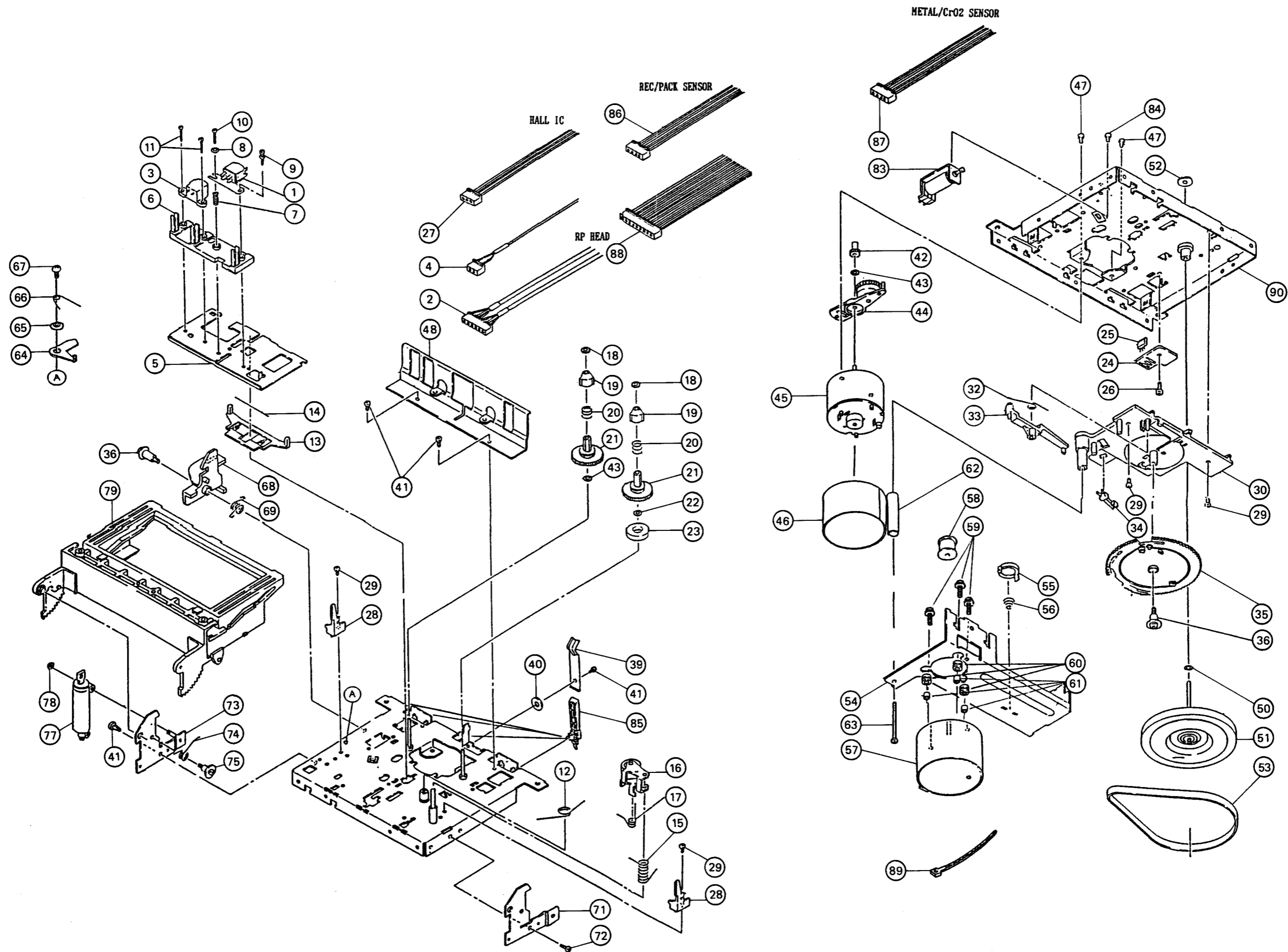
REC. Balance PCB Assembly

Symbol No.	Ref. No.	Part No.	Description	Symbol No.	Ref. No.	Part No.	Description
PC Board	4145241630 C145241630	4145241630 C145241630	PCB no components PCB assembly	PC Board	4145241650 C145241650	4145241650 C145241650	PCB no components PCB assembly
CAPACITORS				VARIABLE RESISTOR			
C015,016 C076,077	5116393550 5116562550	5116393550 5116562550	Mylar .039uF/50V, ±5% Mylar .0056uF/50V, ±5%	VR102	100KW	5020115280	Variable resistor
VARIABLE RESISTOR				MISCELLANEOUS			
VR001	10Kx2	5020214276	Variable resistor	JW5	3P25	4490300268	Wire holder
REC. Volume PCB Assembly				P C BOARD (BLANK) KIT'S			
PC Board	4145241640 C145241640	4145241640 C145241640	PCB no components PCB assembly	A1	4145241610	4145241610	Main PCB (Blank) kit's
VARIABLE RESISTOR				(A)	4145241610	4145241610	Main PCB (Blank)
				(B)	4145241630	4145241630	Play trim PCB (Blank)
				(C)	4145241640	4145241640	Record volume PCB (Blank)
				(D)	4145241650	4145241650	Record balance PCB (Blank)
VR101	10Kax2	5020214279	Variable resistor				
MISCELLANEOUS							
JW3 JW4	5P25 3P25	4490500268 4490300268	Wire holder Wire holder				

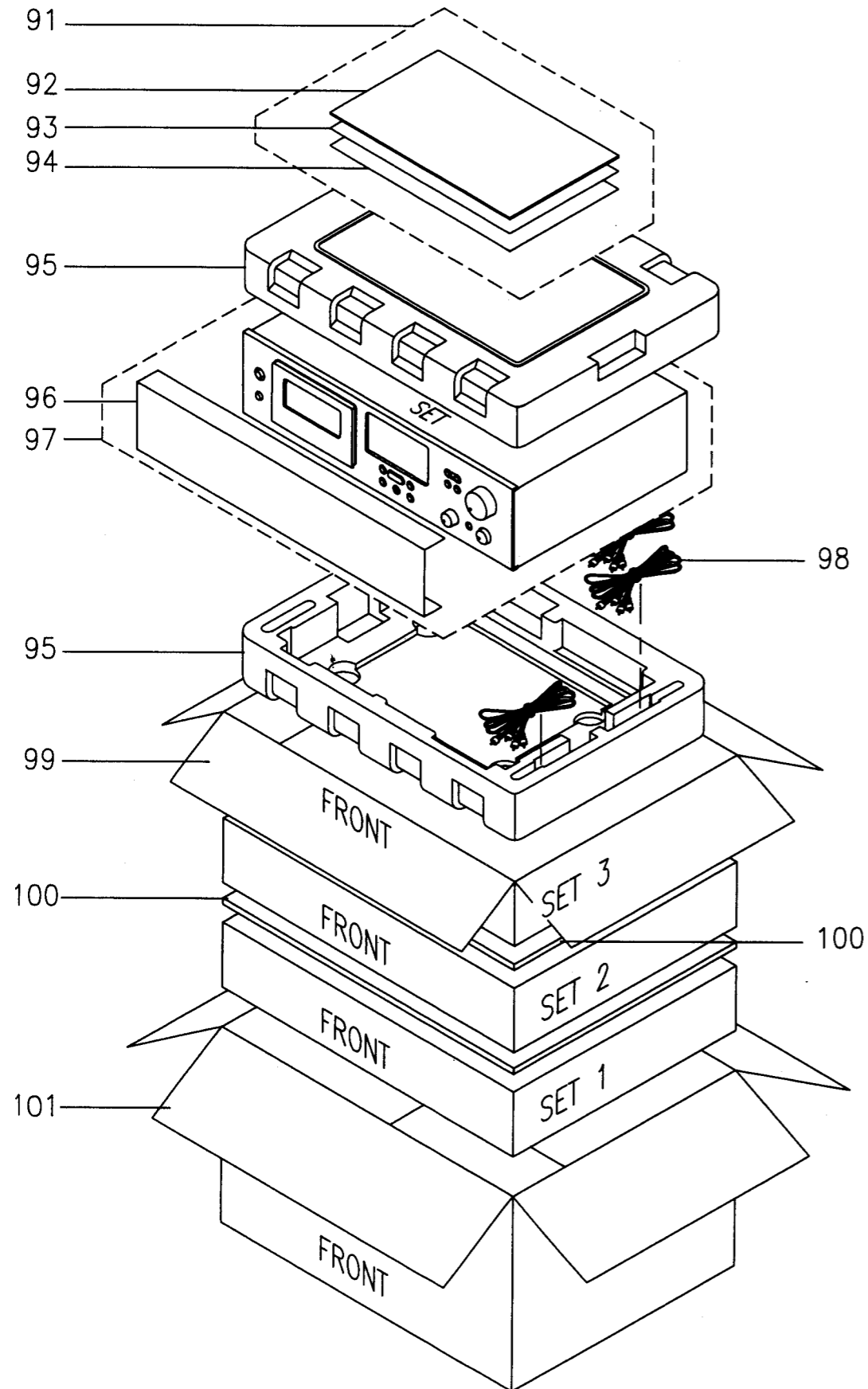
Cassette Deck Parts List

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	0000HAJCH4	RP head HAJCH4605A	44	0000A01950	RF assembly 90A
2	0000E09760	Connector assembly 25C-06F-05	45	0000M00640	Motor RF510T-081200N
3	0000HAJAB3	HAB3125A	46	0000Y08320	Shield plate 30x17
4	0000E09770	Connector assembly 25C-02F-04	47	0000230370	Pan head screw 2.6x2.5
5	0000K06460	Head panel assembly 90A	48	0000Y09330	Switch cover 90B
6	0000U06510	Head base 90A	50	0000322020	PSW 2.1x4x0.25
7	0000Q06370	Spring, head 9FA	51	0000F00510	Flywheel 90B
8	0000301200	Flat washer 2.2x6x0.4	52	0000430170	Nylon washer 1.9x7.0
9	0000190920	Pan head screw 2x11 SW	53	0000U05070	Flat belt 58.5x3.5x0.4
10	0000230420	Bind screw ±2x10	54	0000Y09120	Motor bracket
11	0000080920	Bind screw 2x11	55	0000U03960	Capstan support 9B
12	0000Q07740	Spring, head panel 90A	56	0000Q06210	Spring, capstan support 8RA
13	0000U06470	Brake arm 90A	57	0000M00690	Motor EG530AD-2B
14	0000Q07730	Spring, brake arm 90A	58	0000U05080	Motor pulley 2x9.2
15	0000Q07770	Spring, pinch roller assist	59	0000201480	Screw 2.6x7 w/washer
16	0000T01340	Pinch roller assembly 90A	60	0000U00340	Rubber cushion
17	0000Q07760	Spring, pinch roller	61	0000V02910	Coller motor cushion
18	0000430160	PSW 1.6x3.2x0.4 CUT	62	0000400010	Spacer M2.6x20 ZMC
19	0000U04990	Hub driver 9FA	63	0000230630	Tapping screw 2.6x23.5
20	0000Q07840	Spring, back tension	64	0000Y09080	Safety arm 90A
21	0000U04980	Reel plate 9FA	65	0000W02380	Coller, safty arm 90A
22	0000322050	PSW 2.1x4x0.5	66	0000Q07810	Spring, safty arm 90A
23	0000E02960	Magnet 15x7.2x3 - 12	67	0000230740	Truss tapping screw 2.6x6
24	0000E02950	PCB, IC-20	68	0000U06582	Case lock lever 90A
25	0000E02650	Hall IC (DN-6838)	69	0000Q07880	Spring, case lock lever 90B
26	0000170860	Pan head tapping screw 2x5	71	0000Y09100	Case holder 90A - R
27	0000E09780	Connector assembly 3P	72	0000171470	Tapping screw 2.6x6
28	0000U06480	Cassette guide 90A	73	0000K06470	Case holder assembly 90A - L
29	0000230700	Bind tapping screw 2x4	74	0000Q07870	Spring, cassette case 90B
30	0000U06440	Gear base 90A	75	0000230720	Shoulder screw 2.6x5
32	0000Q07720	Spring, trigger lever 90A	77	0000A00960	Soft damp assembly 3B
33	0000U06450	Trigger lever 90A	78	0000430150	PSW 2.1x4x0.4 CUT
34	0000S01320	Leaf switch LSA-1119R	79	0000U06600	Cassette case 90A
35	0000UV0004	Drive gear 90C	83	0000P01030	Solenoid assembly
36	0000230620	Shoulder screw 2.6x9	84	0000190850	Pan head screw 2x4 w/washer
39	0000Y09010	Spring plate 90A	85	0000S01280	Switch LSA1132FAU
40	0000301260	Flat washer 2.8x7.5x0.5	86	0000E09800	Connector assembly 4P
41	0000171450	Tapping screw 2.6x4	87	0000EV0080	Connector assembly 4P
42	0000U06670	RF pulley gear 90A	88	0000E09790	Connector assembly 9P
43	0000322050	Polyslider washer	90	0000K06450	Chassis assembly

Cassette Deck Exploded View



Packing Diagram



Packing Parts List

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
91	9902304041	Poly bag 23x40 (1/B)	96	9004038401	Soft sheet
92	9080021810	Instruction book (7L)	97	9906006041	Poly bag 60x60 (SET)
93	9120004890	Safety sheet (for the AH version)	98	5620100051	Patch cord BLK-1M (3 pieces)
94	9030005890	Warranty card (for the AH version)	99	900207D614	Gift box
95	900607D614	Snow box (2 pieces)	100	900507D614	Carton sheet (2 pieces/3set)
			101	900107D614	Master carton (3set/carton)