

ATSM381033DCK



Auto Program Search System

MODEL RT-6405



Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

FEATURES

- MICROPROCESSOR/SOLENOID CONTROL
- DOLBY NOISE REDUCTION
- APSS (Auto Program Search System)
- 2-MOTOR DRIVE SYSTEM
- OPTO PEAK LEVEL DISPLAY AND HOLDING SYSTEM
- TIMER-ACTIVED RECORDING
- FM MULTIPLEX FILTER
- TAPE SELECTION

SPECIFICATIONS

Type:	Plunger-solenoid controlled 4-track 2-channel stereo cassette tape recorder/player deck with built-in Dolby noise reduction system and APSS	Frequency range:	
Power source:	AC 120V, 50/60 Hz	Normal tape;	20 — 17,000 Hz
Power consumption:	30W		30 — 15,000 Hz ± 3 dB
Semi-conductors:	1 LSI (Large Scale Integrated circuit)	Fe-Cr tape;	20 — 19,000 Hz
	7 ICs (Integrated Circuits)		30 — 18,000 Hz ± 3 dB
	57 Transistors	MAXELL UDXL II tape;	
	34 Diodes		20 — 18,000 Hz
	4 LEDs (Light Emitting Diodes)		30 — 17,000 Hz ± 3 dB
Dimensions:	Width; 430 mm (17")	Metal tape;	20 — 20,000 Hz
	Height; 95 mm (3-3/4")		30 — 18,000 Hz ± 3 dB
	Depth; 320 mm (12-5/8")	S/N ratio (Use of MAXELL UDXL II tape):	
Weight:	6.0 kg (13.2 lbs.)	Dolby NR off;	57 dB
Tape:	Philips standard compact cassette tape	Dolby NR on;	67 dB (at over 5 kHz)
Tape speed:	4.8 cm/sec. (1-7/8 ips.)	Input sensitivity and input impedance:	
Wow & flutter:	0.038% (WRMS)	Microphones;	0.2 mV (6.8K ohms)
		Line in;	50 mV (50K ohms)
		Output level and load impedance:	
		Headphones;	89 mV ("0" dB), 8 ohms
		Line out;	710 mV ("0" dB), 50K ohms

Specification are subject to change without prior notice.

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Note

Attention should be attracted to the following application and provision concerning model RT-6405 which is designed on the basis of RT-6207 that has been put on sale already:

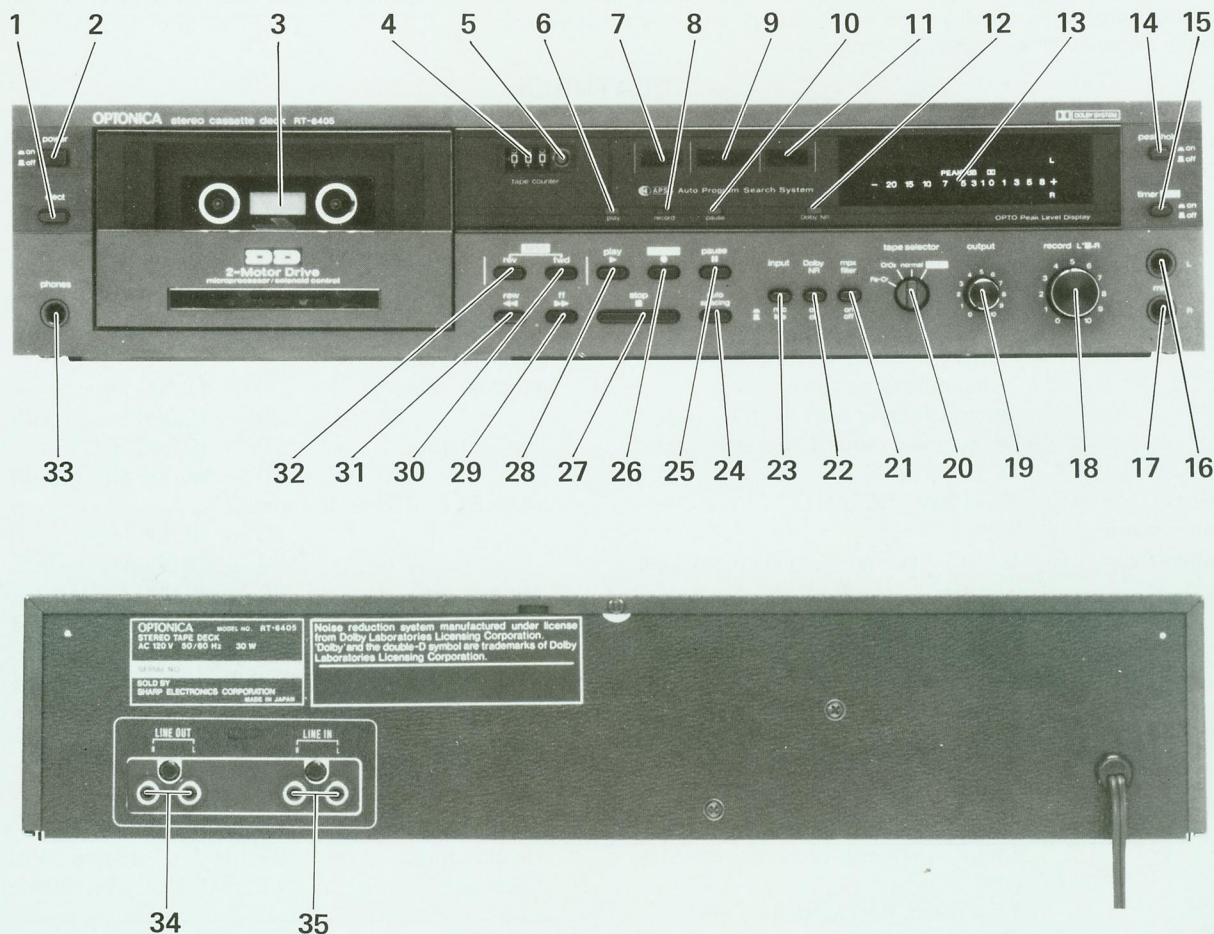
- (1) A direct drive motor is incorporated into the set instead of the capstan motor for the purpose of making better in performance of wow & flutter; and
- (2) Peak hold switch is provided so that the peak level may be easily visible.

As this service manual is based on that of RT-6207 and made out, therefore, the common explanation and the others are omitted from items shown in this manual.

Refer to RT-6207 service manual for items 1 to 9 described below.

1. Disassembly P. 3
2. Outline of Mechanism P. 4
(Modification: Capstan Motor → D.D.Motor)
3. Circuit Around Microprocessor P. 7
4. Circuit Adjustment PP. 8 — 10
5. Mechanical Adjustment PP. 11 — 13
No need of Flywheel Clearance Adjustment as the result of the application of D.D.Motor. An additional item is D.D.Motor Tape Speed Adjustment — See RT-6405 service manual P. 3.
6. Mechanism Mode Selection Table P. 14
7. Troubleshooting PP. 15 — 18
8. Equivalent Circuit of IC PP. 29 — 30
9. Replacement Parts List PP. 35 — 41
(See this together with the Parts List P. 16)

PARTS LAYOUT



- | | | |
|---------------------------------|--|----------------------------|
| 1. Cassette eject button | 13. Fluorescent display peak level meter | 25. Pause button |
| 2. Power switch | 14. Peak-hold switch | 26. Record button |
| 3. Cassette Compartment | 15. Timer recording standby switch | 27. Stop button |
| 4. Digital tape counter | 16. Microphone jack (Left) | 28. Play button |
| 5. Tape counter zero-set button | 17. Microphone jack (Right) | 29. Fast forward button |
| 6. Play indicator | 18. Record level control | 30. APSS forward button |
| 7. APSS reverse indicator | 19. Output level control | 31. Rewind button |
| 8. Record indicator | 20. Tape selector | 32. APSS reverse button |
| 9. APSS indicator | 21. FM multiplex filter switch | 33. Stereo headphones jack |
| 10. Pause indicator | 22. Dolby NR switch | 34. Line output jacks |
| 11. APSS forward indicator | 23. Input selector | 35. Line input jacks |
| 12. Dolby NR indicator | 24. Auto-spacing button | |

OUTLINE OF MECHANISM

In the mechanism of this set adopted is a newly developed P.A.D. (Power Assist Drive) system which shows much difference from conventional mechanism.

This mechanism is driven by a wind motor (M2), capstan DD (Direct Drive) motor (M1), wind solenoid (SOL2) and P.A.D. solenoid (SOL1) and has three built-in switches (SW7: erase protection switch, SW9: timing switch, and SW8: cassette detector switch). The microprocessor (IC1) detects the states of these switches to control the mechanism.

1. Capstan D.D. motor (M1)

This is a D.D. (Direct Drive) motor of brushless-and-coreless multipolar tachogenerator system. The adoption of this motor keeps wow and flutter below 0.038%.

2. Wind motor (M2)

This is an electronic control governor motor which works in high and low speed and in regular and reverse rotation. This motor turns the turntable and shifts the subchassis on which the record/playback head and erase head are mounted.

The motor works in high speed for 500 milliseconds just after the power switch is turned on.

3. P.A.D. solenoid (SOL1)

When the subchassis is pushed up by the wind motor, the solenoid interlocked with it is so designed as to make the record/playback head or erase head gently touch the tape.

4. Wind solenoid (SOL2)

Works in any modes except in the play mode.

5. Cassette detector switch (SW8)

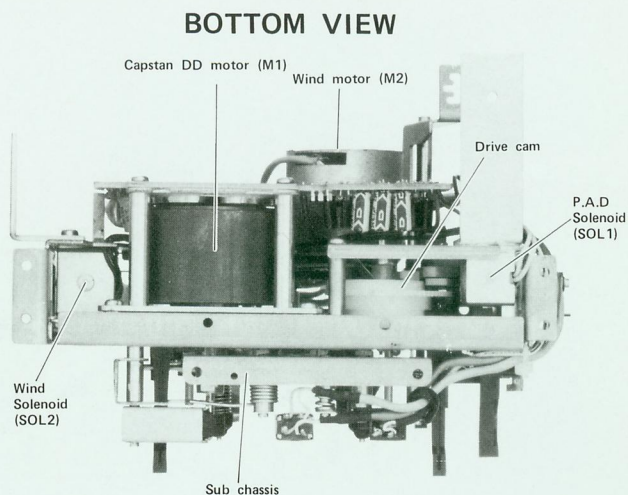
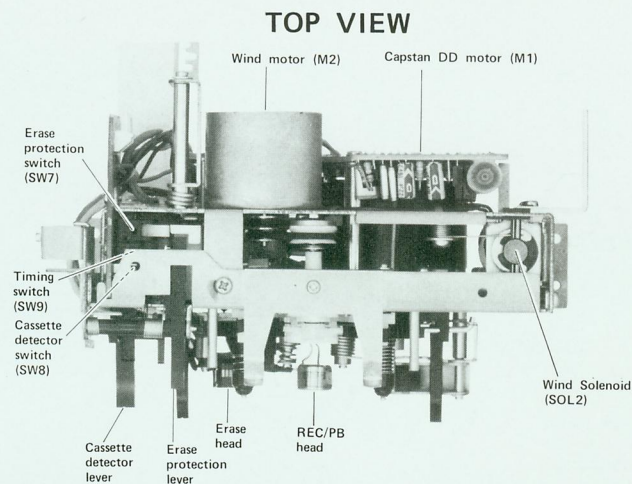
Is turned on when the cassette tape is loaded and the cassette holder is closed, and is turned off when the eject button is pushed down to open the cassette holder. When this switch is turned off, all the functions of the mechanism stop.

6. Timing switch (SW9)

Is interlocked with the mechanism. The microprocessor (IC1) detects that this switch is turned on and off for determining what state the mechanism is in, and figures out the timing for the next process. This switch is off in the stop mode; and it is turned on when the P.A.D. solenoid is turned on and the wind motor starts rotating in the regular direction to lift the subchassis; but, it is turned off again when the subchassis has moved up to its required position.

7. Erase protection switch (SW7)

If a tape whose erase protection tab is broken is loaded and the set is put in record mode, the erase protection lever rises up to prevent the erase protection switch from turning on, thus the recording being impossible. And if a tape whose erase protection tab is not broken is loaded and the set is put in record mode the lever now falls down to permit the switch to turn on, thus the recording being enabled.



TAPE SPEED ADJUSTMENT

(Refer to Figure 3-1)

1. Connect a frequency counter, across a 50k ohm dummy resistor, to the line output socket. (SO102, SO202)
2. Use a test tape (MTT-111, 3 kHz), to be played back (at the midpoint but not at the running start or end point).
3. Use a bladed screwdriver to adjust, through the adjusting hole at the P.W. Board of D.D. motor the semi-variable resistor so that the reproduced frequency becomes 2990 to 3010 Hz.

Note:

Prior to the adjustment, check that there is no stain and no other impurities on the D.D. motor Rotor and take-up turntable.

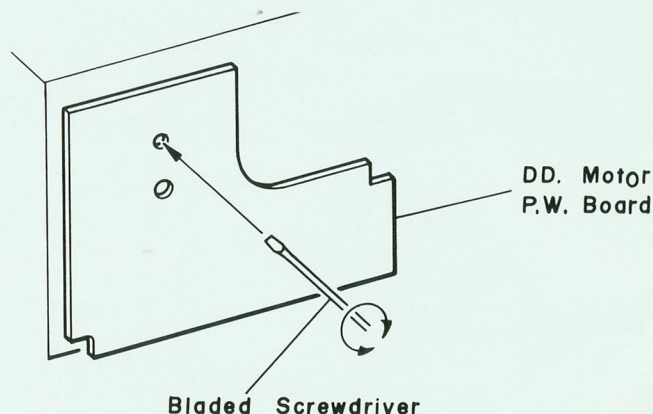
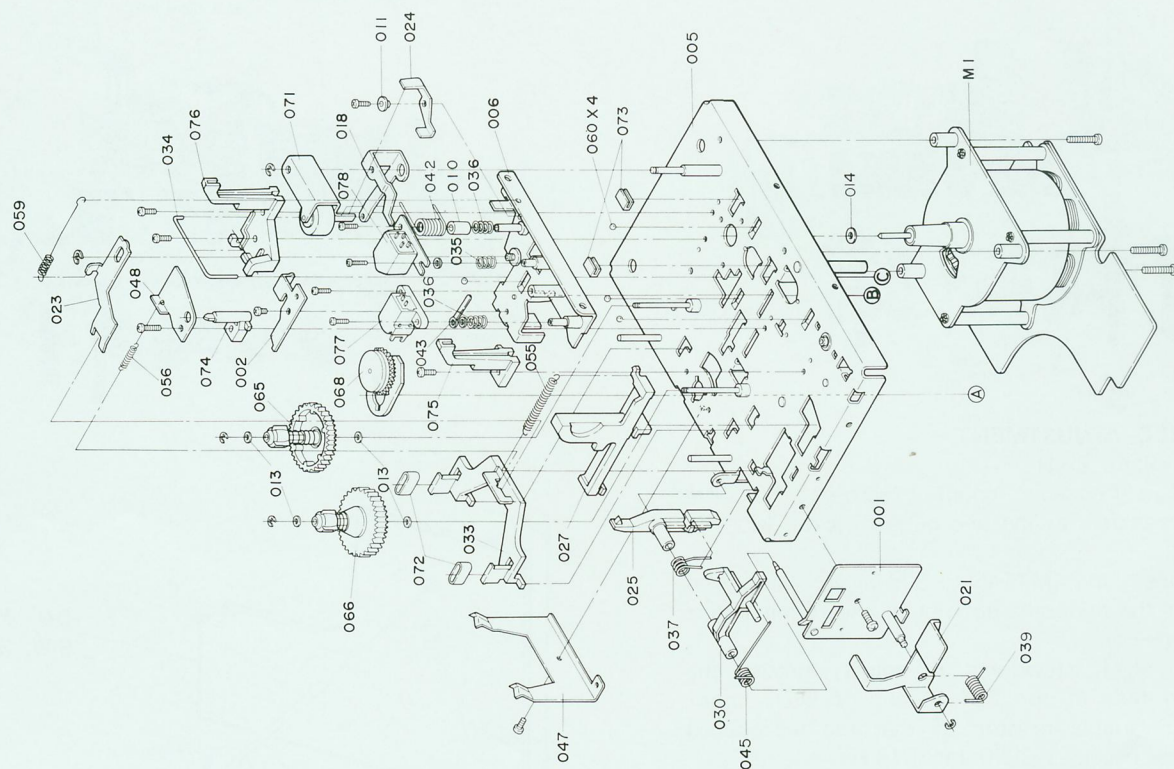
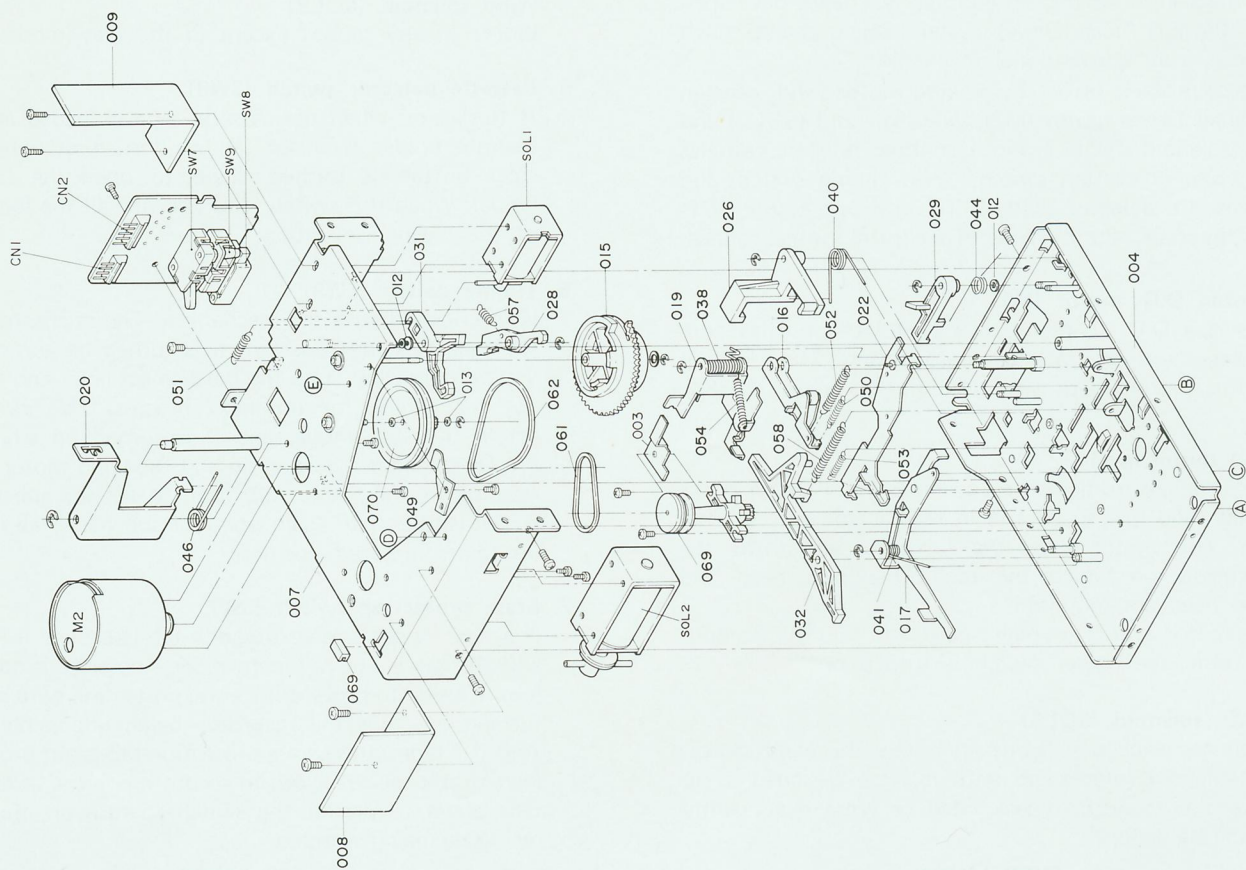


Figure 3-1



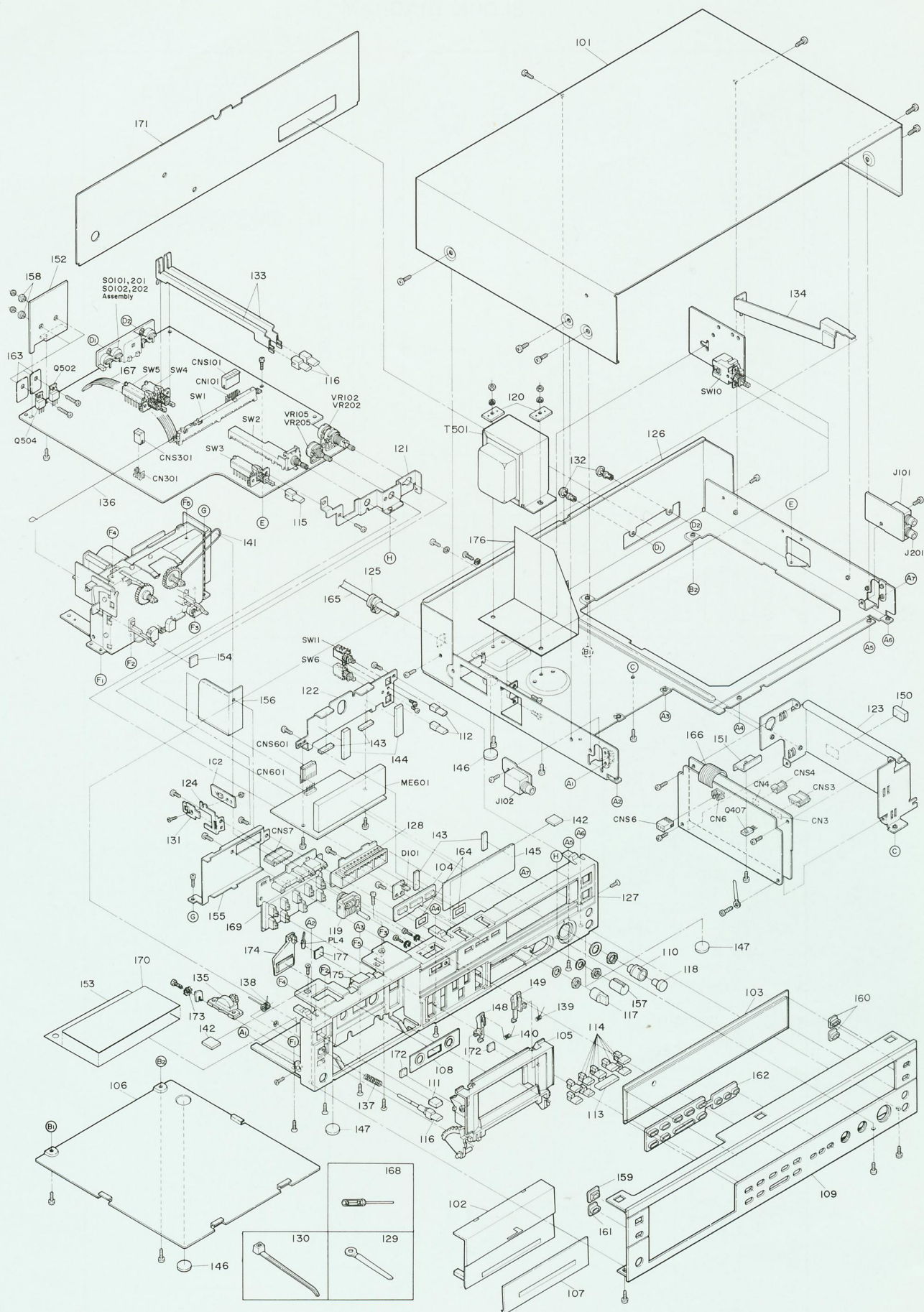
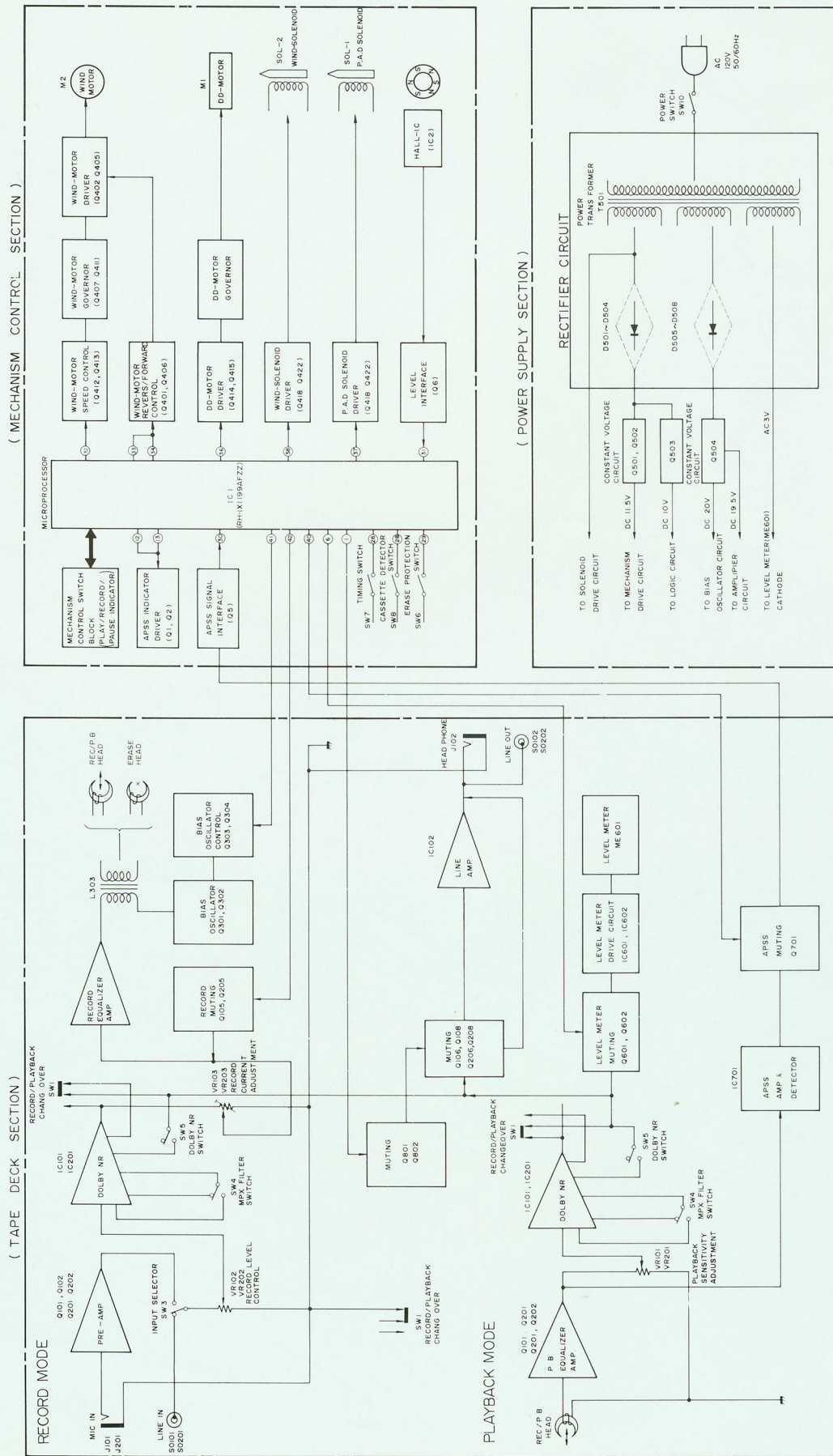
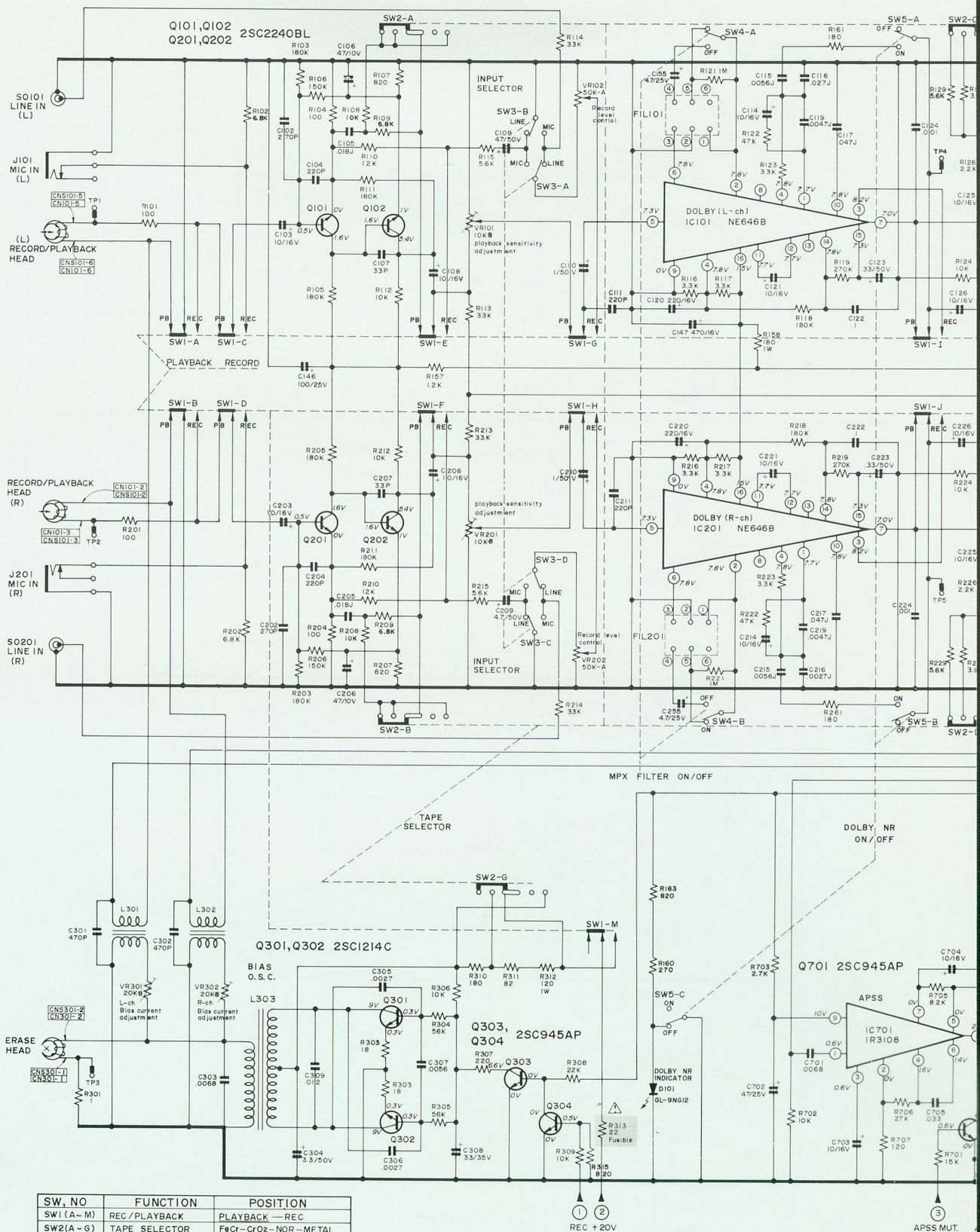


Figure 5 CABINET EXPLODED VIEW

BLOCK DIAGRAM





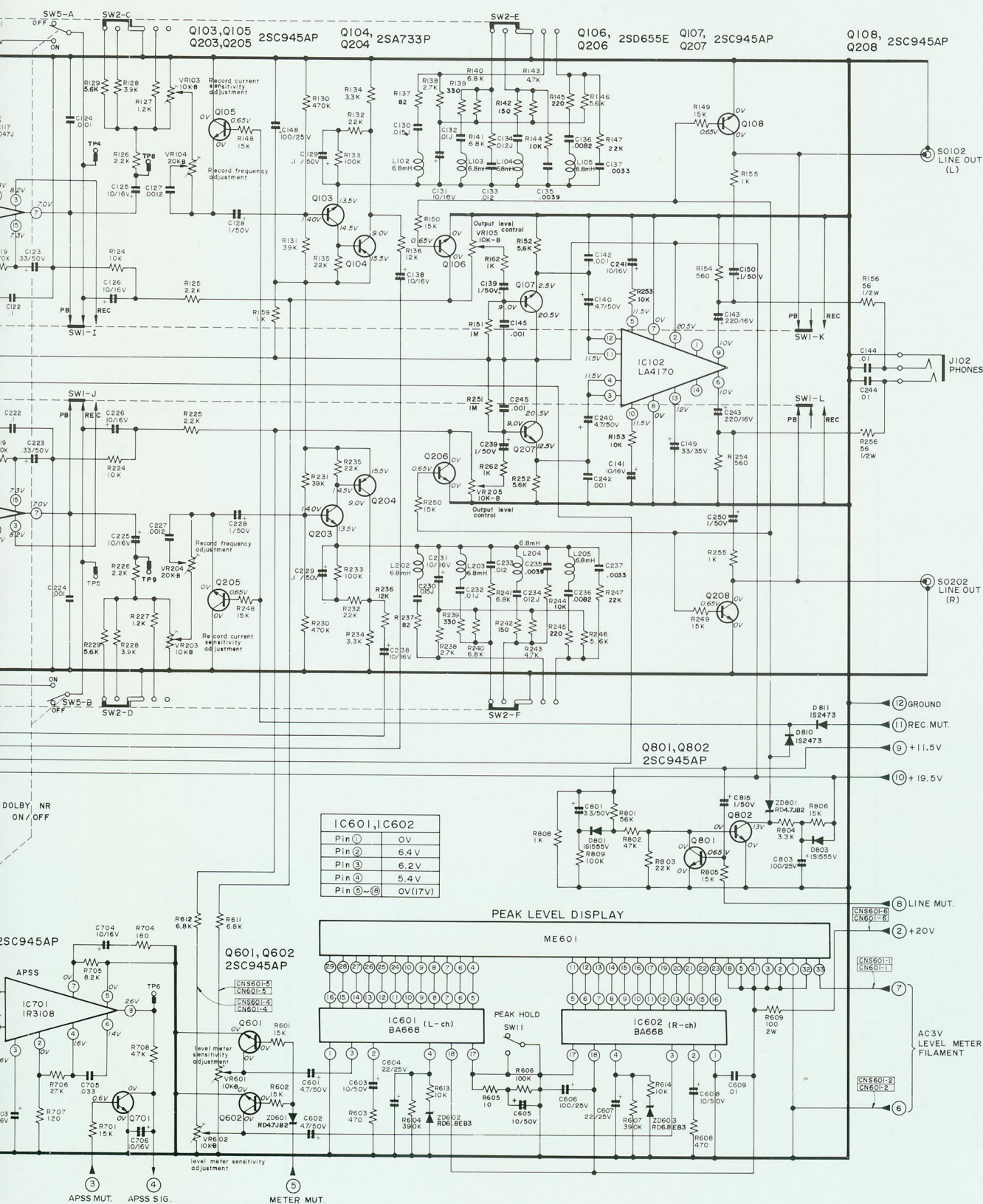
SW, NO	FUNCTION	POSITION
SW1 (A-M)	REC / PLAYBACK	PLAYBACK — REC
SW2 (A-G)	TAPE SELECTOR	FeCr — CrO2 — NOR — METAL
SW3 (A-D)	INPUT SELECTOR	LINE — MIC
SW4 (A, B)	MPX FILTER ON/OFF	ON — OFF
SW5 (A-C)	DOLBY NR	ON — OFF
SW6	TIMER START	ON — OFF
SW7	ERASE PROTECTION	ON — OFF

SW8	CASSETTE DETECTOR	ON — OFF
SW9	TIMING SWITCH	ON — OFF
SW10	POWER SWITCH	ON — OFF

NOTES ON SCHEMATIC DIAGRAM

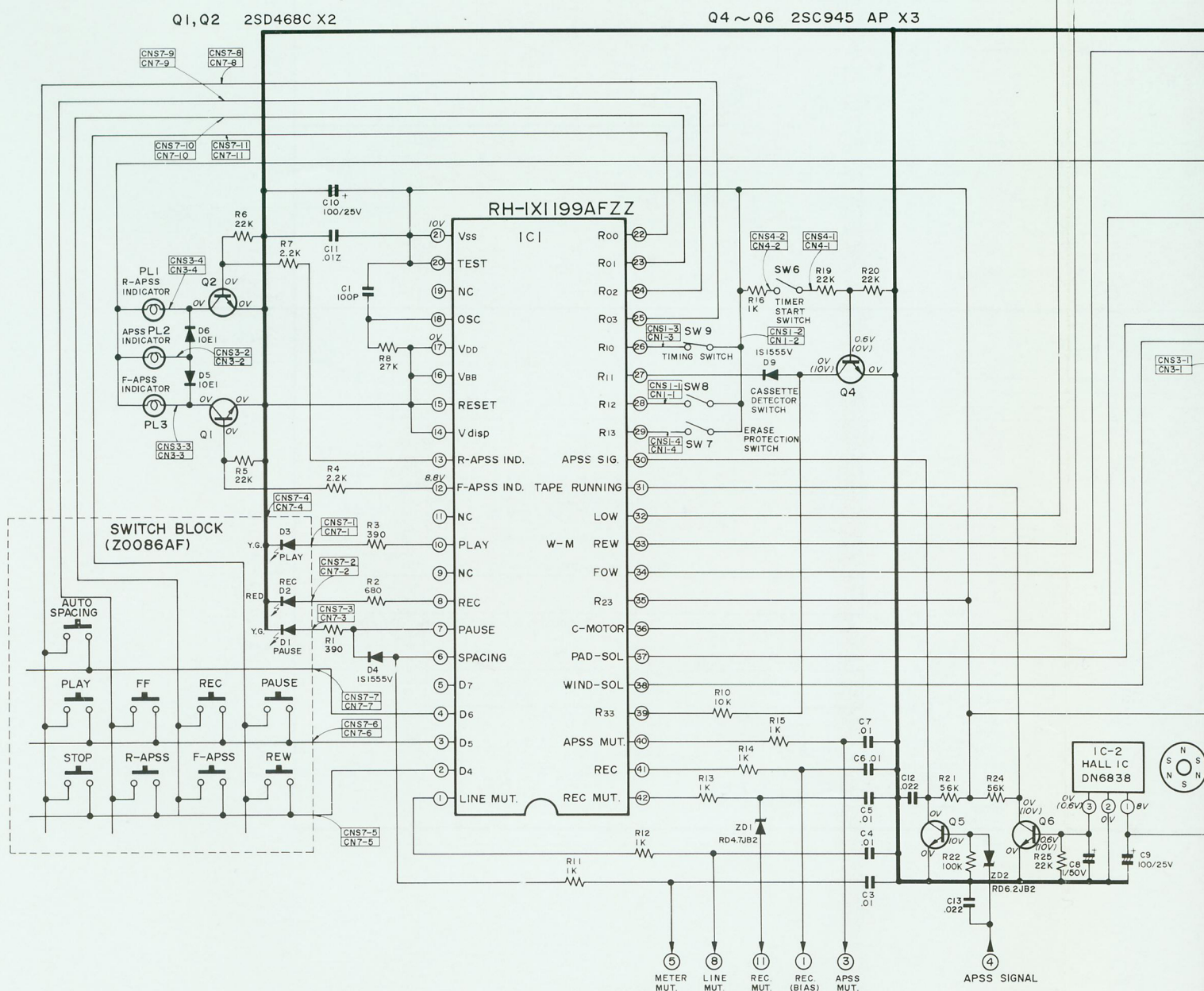
- Capacitance value are in MFD. P = MMFD.
- Resistance value are in ohm K = 1000, M = 1000K.
- Voltage readings are measure with VTVM under no signal input. → Playback mode.
- Specifications of wiring diagram of this model are subject to change for improvement without prior notice.

Figure 7 SCHEMATIC DI



Parts marked with "△" () are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

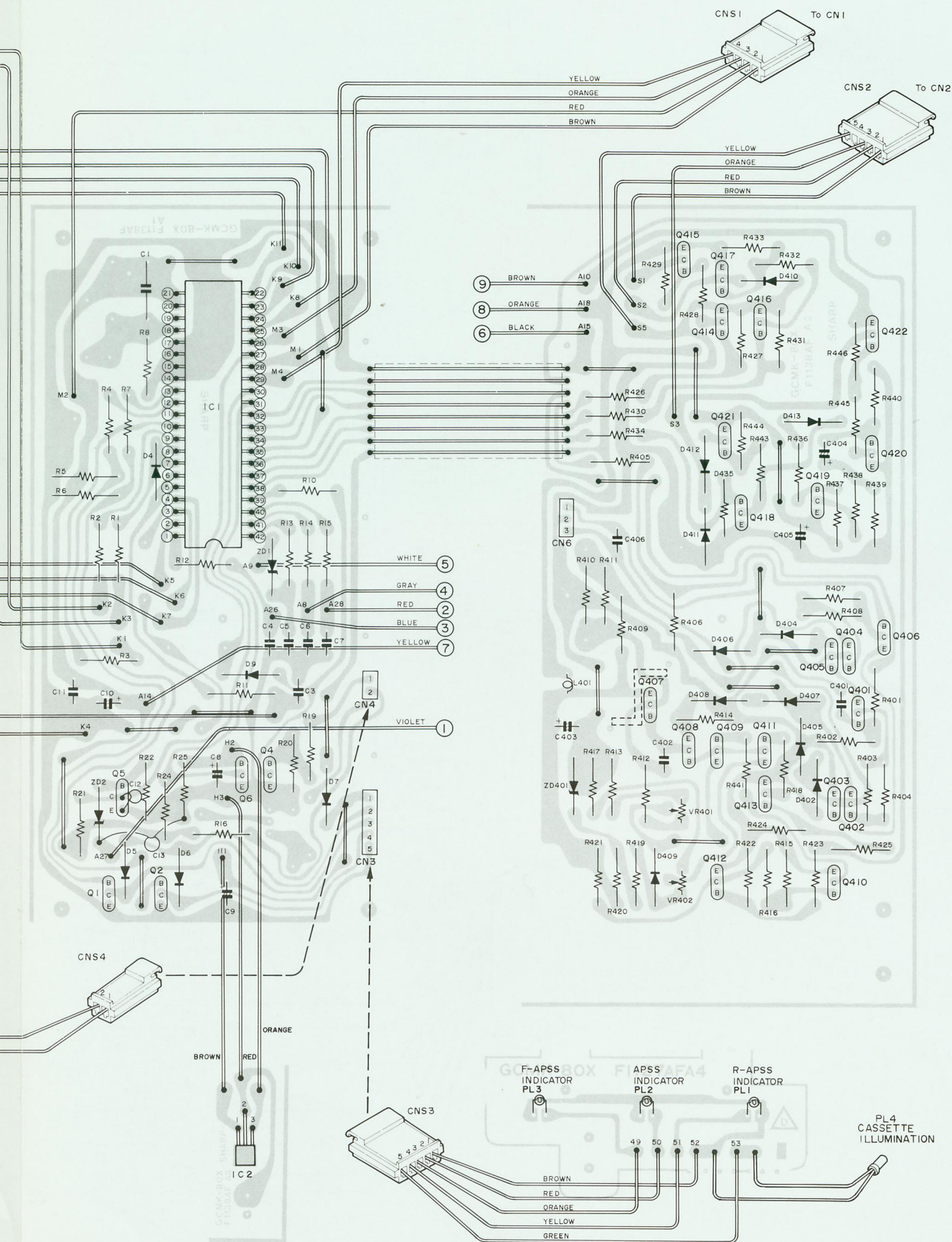
Q401, Q406, Q410	} 2SC945 AP X9
Q412 ~ Q414	
Q416, Q418, Q420	
Q402, Q404, Q415	2SB562 C X3
Q403, Q405	2SD468 C X2
Q407	2SA715WCPX1
Q417, Q421, Q422	2SB744 Q X3
Q408	2SC945 AQX1
Q409, Q411, Q419	2SA733 P X3



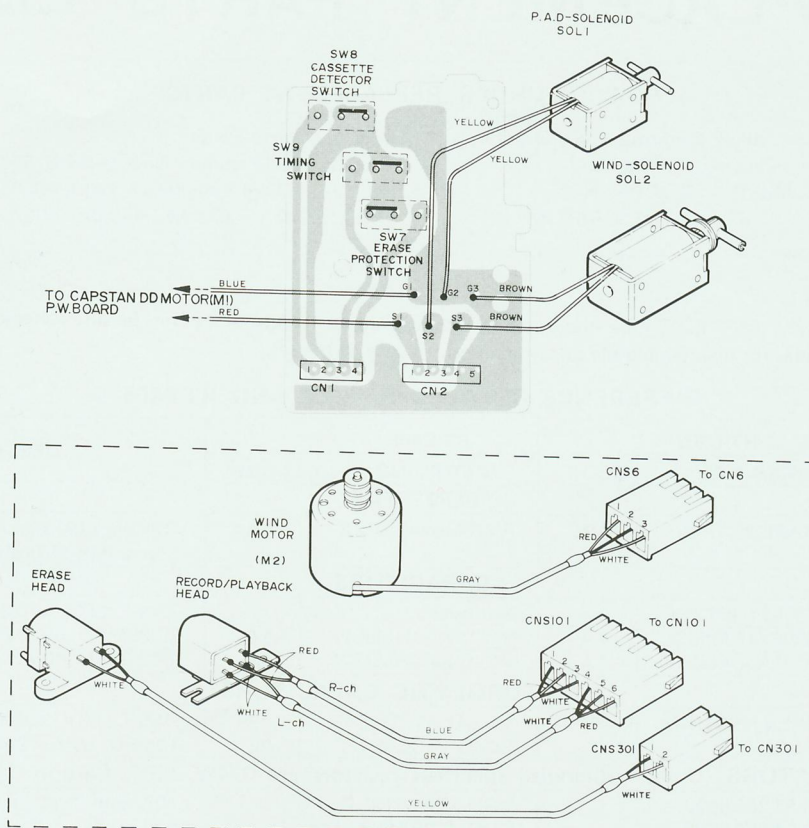
Parts marked with "△" () are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

Figure 9 SCHEMATIC DIAGRAM (CONTRO





RD (CONTROL/LEVEL METER SECTION)



For RT-6207 Service Manual, information for wiring connection of Record/Playback head and Erase head and Wind

motor, which can not be get in this manual, is the same as for RT-6405.

Figure 15-1 WIRING SIDE OF P.W.B (MECHANISM P.W.B)

TECHNICAL INFORMATION

Attention should be drawn to DOLBY NR CIRCUIT CHECK item 1 shown on RT-6207 Service Manual page 9 because of the following misprint: "TP4, TP5" described as the test

point for connection of VTVM. Correct are TP8 and TP9. Please take correction of the point (shown) into consideration in service.

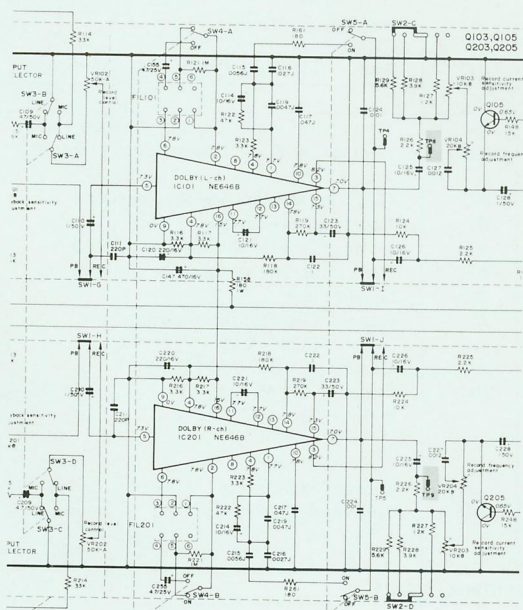


Figure 15-2

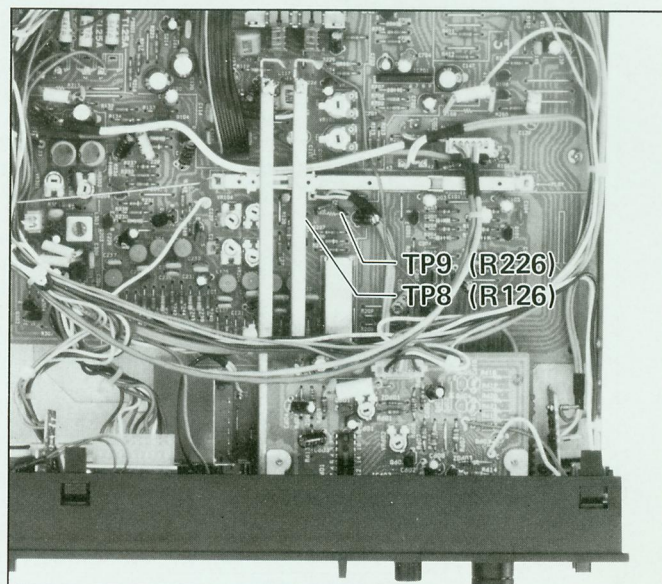


Figure 15-3

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly,
please furnish the following information.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

Order to : Parts Center

P.O. Box 664 Paramus, New Jersey 07652 (201) 262-9000

P.O. Box 20394 Long Beach, Calif. 90801 (213) 637-9488

P.O. Box 10 La Grange, Illinois 60525 (312) 482-9292

NOTES:

Parts marked with "△" (□) are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

DIFFERENCE BETWEEN RT-6207 AND RT-6405

REF. NO.	RT-6207		RT-6405		DESCRIPTION	
	PARTS NO.	CODE	PARTS NO.	CODE		
VR103, 203	CONTROLS					
	RVR-M0325AFZZ	AB	RVR-M0248AFZZ	AB	10K ohm (B) Record Current Sensitivity Adjustment	
	CAPACITORS					
	VCKYAT1HB221K	AA	Not used		220PF, 50V, ±10%, Ceramic	
C101, 201	VCQYKV1HM562K	AA	VCQYKU1HM392K	AA	.0039MFD, 50V, ±10%, Mylar	
C135, 235	VCQYKA1HM392K	AA	VCQYKA1HM332K	AA	.0033MFD, 50V, ±10%, Mylar	
C137, 237						
C129, 229	ELECTROLYTIC CAPACITORS					
	VCEALV1HW154M	AB	VCEALA1HW104M	AB	.1MFD, 50V, ±20%	
	Not used		RC-EZV106AF1H	AB	10MFD, 50V, ±20%	
C605	RESISTORS (Unless otherwise specified resistors are 1/4W, ±5%, Carbon Type.)					
R108, 208	VRD-ST2EE682J	AA	VRD-ST2EE103J	AA	10K ohm	
R109, 209	VRD-ST2EE562J		VRD-ST2EE682J		6.8K ohm	
R137, 237	VRD-ST2EE123J		VRD-ST2EE820J		82 ohm	
R139, 239	VRD-ST2EE221J		VRD-ST2EE331J		330 ohm	
R142, 242	VRD-ST2EE820J		VRD-ST2EE151J		150 ohm	
R144, 244	VRD-ST2EE153J		VRD-ST2EE103J		10K ohm	
R145, 245	VRD-ST2EE680J		VRD-ST2EE221J		220 ohm	
R147, 247	VRD-ST2EE123J		VRD-ST2EE223J		22K ohm	
R153, 253	VRD-ST2EE273J		VRD-ST2EE103J		10K ohm	
R316	VRD-SU2EE101J		Not used			100 ohm
R605	Not used		VRD-ST2EE100J		10 ohm	
R606	Not used		VRD-ST2EE104J		100K ohm	
004	MECHANICAL PARTS					
	LANGT0949AFZZ	AC	Not used		Bracket, Flywheel	
	LX-BZ0214AFZZ	AB	Not used		Screw, Flywheel Thrust Adjuster	
	013	LX-WZ5018AGZZ	AA	Not used	Washer	
	014	XWHJZ19-05050	AA	LX-WZ9051AFZZ	AA	Washer, Oil Cut
	063	NBLTH0073AFZZ	AC	Not used		Belt, Drive
	064	NBRGC0071AFZZ	AG	Not used		Bearing, Capstan
	067	NFLYC0087AFZZ	AN	Not used		Flywheel
078	RHEDH0093AFZZ	AT	RHEDH0079AFZZ	BA	Record/Playback Head	
107	MISCELLANEOUS					
	HDECB0153AFSC	AM	HDECB0162AFSA	AL	Decoration Plate, Cassette Compartment	
	108	HDECB0143AFSB	AH	HDECB0142AFSA	AD	Decoration Plate, Cassette Illumination
	109	HPNLC3467AFSA		HPNLC3468AFSA		Front Panel
	150	PGUMS0083AF00		PCUSG0083AF00	AC	Cushion, Microprocessor Bracket
	171	TSPC-0713AFZZ	AF	TSPC-0714AFZZ	AF	Label, Specification
	174	Not used		GCOVA1220AFSA	AF	Cover, Cassette Illumination Lamp
	175	Not used		PSHEK0057AFZZ	AB	Reflection Sheet, Cassette Illumination
	176	Not used		PSLDC3116AFZZ	AD	Shield Plate
	177	Not used		PSPA10166AFZZ	AA	Spacer, Cassette Illumination
	SW11	Not used		QSW-P0219AFZZ	AE	Switch, Peak Hold
	PL4	Not used		RLMPM0123AFZZ	AE	Cassette Illumination Lamp
	M1	RMOTV0088AFZZ	AV	RMOTP0058AFZZ	BN	Capstan DD Motor
	CN3	QCNCM438EAFZZ		QCNCM101EAFZZ		5 Pin Plug
	CN4	QCNCM431BAFZZ		QCNCM316BAFZZ		2 Pin Plug
		SPAKC1654AFZZ		SPAKC1655AFZZ		Packing Case
		TINSE0706AFZZ		TINSE0707AFZZ		Owners Manual
		TMAPC0738AFZZ		TMAPC0739AFZZ	AM	Schematic Diagram
	P.W.B ASSEMBLY (Not Replacement Item)					
		DUNTU0054AF09		DUNTU0054AF12		Main P.W.Board
	DUNTZ0430AF01		DUNTZ0412AF01		Level Meter P.W.Board	