

ADDITIONAL

 **PIONEER**

Service Manual

CASSETTE TAPE DECK

CT-400

MODEL CT-400 COMES IN TWO VERSIONS DISTINGUISHED AS FOLLOWS;

Type	Voltage	Remarks
HE	AC 220V and 240V (Switchable)	Europe model
HB	AC 220V and 240V (Switchable)	United Kingdom model

- This additional service manual is applicable to the CT-400/HE, HB.
- The basic performance of the CT-400/HE, HB types are the same as the CT-F615/KU type. Please refer to the CT-F615/KU type service manual (ART-483) with exception of this supplements.

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1. SPECIFICATIONS

Systems	Compact cassette, 2-channel stereo
Motor	DC servo motor x 1
Heads	"Sendust" recording/playback head x 1 Erasing head x 1
Fast Winding Time	Approximately 100 seconds (C-60 tape)
Wow and Flutter	No more than 0.05% (WRMS) No more than 0.17% (DIN)
Frequency Response	
Standard, LH tapes	20 to 15,000Hz (25 to 14,000Hz ± 3 dB)
Ferrichrome tape	20 to 17,000Hz (25 to 16,000Hz ± 3 dB)
Chromium dioxide tape	20 to 17,000Hz (25 to 16,000Hz ± 3 dB) (0dB recording; 25 to 8,000Hz ± 3 dB)
Matal tape	20 to 18,000Hz (25 to 17,000Hz ± 3 dB) (0dB recording; 25 to 12,500Hz ± 3 dB)
Signal-to-Noise Ratio	
Dolby NR OFF	More than 58dB
Dolby NR ON	More than 68dB (over 5kHz)
Harmonic Distortion	No more than 1.2% (0dB)
Input (Sensitivity/Maximum allowable input/Impedance)	
MIC (L, R)	0.3mV/100mV/10k Ω , 6mm diam. jack (Reference MIC impedance; 250 Ω to 10k Ω)
LINE (INPUT)	50mV/25V/75k Ω , Pin jack
Output (Reference level/Load impedance)	
LINE (OUTPUT)	450mV/50k Ω , Pin jack
Headphones	73mV/8 Ω , 6mm diam. jack

Subfunctions

- Dolby NR system (ON/OFF)
- Stand-by mechanism with unattended recording
- 4 position tape selector (STD/Fe-Cr/CrO₂/METAL)
- IC logic control
- Full automatic stop mechanism
- Air damp eject function
- Fluorescent display level meter (-20 to +8dB)
- REC muting function

Miscellaneous

Power Requirements	AC 220V/240V (switchable) 50/60Hz
Power consumption	36 watts
Dimensions	420(W) x 98(H) x 328(D)mmMax. 16-9/16 x 3-7/8 x 12-15/16in
Weight (without package)	6.5kg (14 lb 5oz)

Furnished Parts

Connection cord with pin plugs	2
Operating instructions	
HB model	1
HE model (English, German/French)	2

NOTE:

Specifications and the design subject to possible modifications without notice due to improvements.

NOTE:

1. Reference Tapes: Standard & LH: DIN 45513/BLATT6 or equiv.
: CrO₂: DIN45513/BLATT7 (CrO₂) or equiv.
2. Reference Recording Level: Meter 0dB indicating level (160 nwb/m magnetic level = Phillips cassette reference level)
3. Reference Signal: 333Hz
4. Wow & Flutter: ● JIS [3kHz, with acoustic compensation (weighted), rms value] ● DIN [3,150Hz, with acoustic compensation (weighted) PEAK value] ; DIN 45507
5. Frequency Response: ● Measured at -20dB level, DOLBY NR OFF, level deviation is ± 6 dB without indication.
6. Signal to Noise Ratio: ● Measured at the third harmonic distortion 3% level, weighted. ● Measured at +4dB level (250nwb/m magnetic level = DIN 45513 specified reference level)
7. Sensitivity: Input level (mV) required for reference recording level with input (REC) controls set to maximum.
8. Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier output waveform becomes clipped.
9. Reference Output Level: Playback output level when meter indicates 0dB.
10. This model doesn't employ with a recording/playback connector (DIN-type).

*Manufactured under license from Dolby Laboratories.

*Dolby and  are trademarks of Dolby Laboratories.

- SWITCHES:**
S1 : REC/PLAYBACK
S2 : DOLBY NR
S3 : TAPE SELECTOR
S4 : TAPE SELECTOR
S5 : REC MUTE
S6 : MIC/LINE SELECTOR

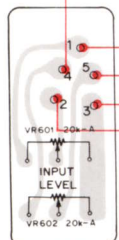
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.



2.2 P.C. BOARD PATTERNS

**MOTHER
Ass'y
(RWX-383)**

Rch
REC/P.B. HEAD
Lch



**VR Ass'y
(RWX-385)**

	Q315	Q317	Q318	Q319	Q320
STOP	0.4V	0.4V	0.4V	2.5mV	4 mV
PLAY	0.8V	—	—	—	—
REC/PAUSE	0.8V	—	0.8V	1.4V	—
F.F	—	0.8V	—	—	—
REW	—	—	0.8V	—	—

	Q303	Q304	Q305
STOP	54mV	77mV	0.6V
PLAY	58mV	87mV	0.6V
REC/PLAY	0.8V	1.4V	40mV
REC/PAUSE	40mV	22mV	40mV

ERASE HEAD

A

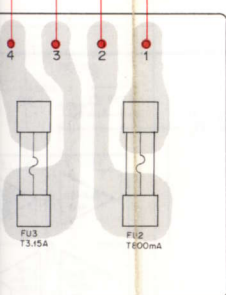
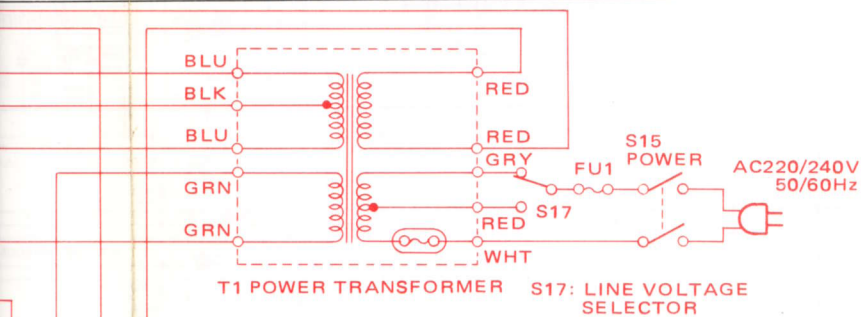
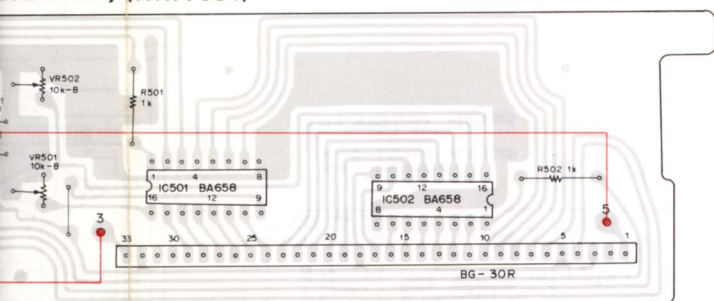
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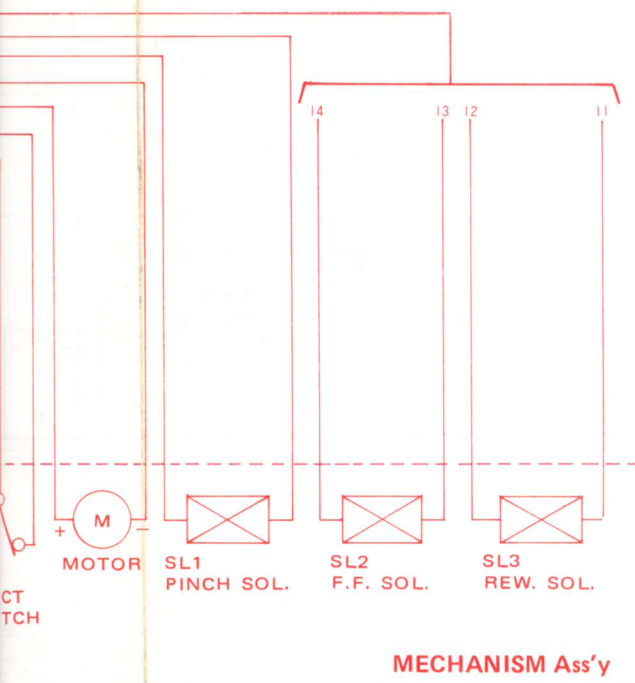
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ETER Ass'y (RWX-384)



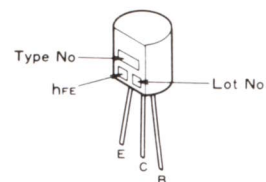
FUSE Ass'y



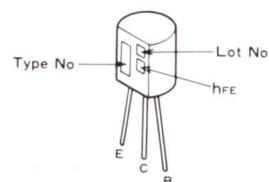
MECHANISM Ass'y

Appearance of Transistors and ICs

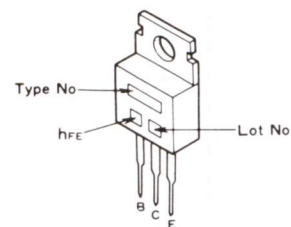
2SA564
2SA825
2SC2634



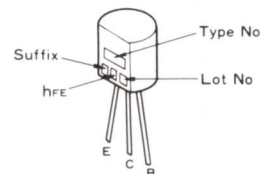
2SA1015
2SC1815
2SC2240



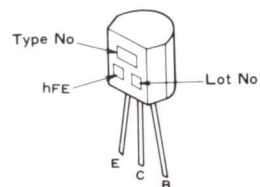
2SC790
2SC1398
2SD837



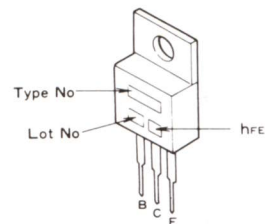
2SC1740LN



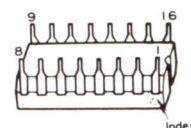
2SC2060



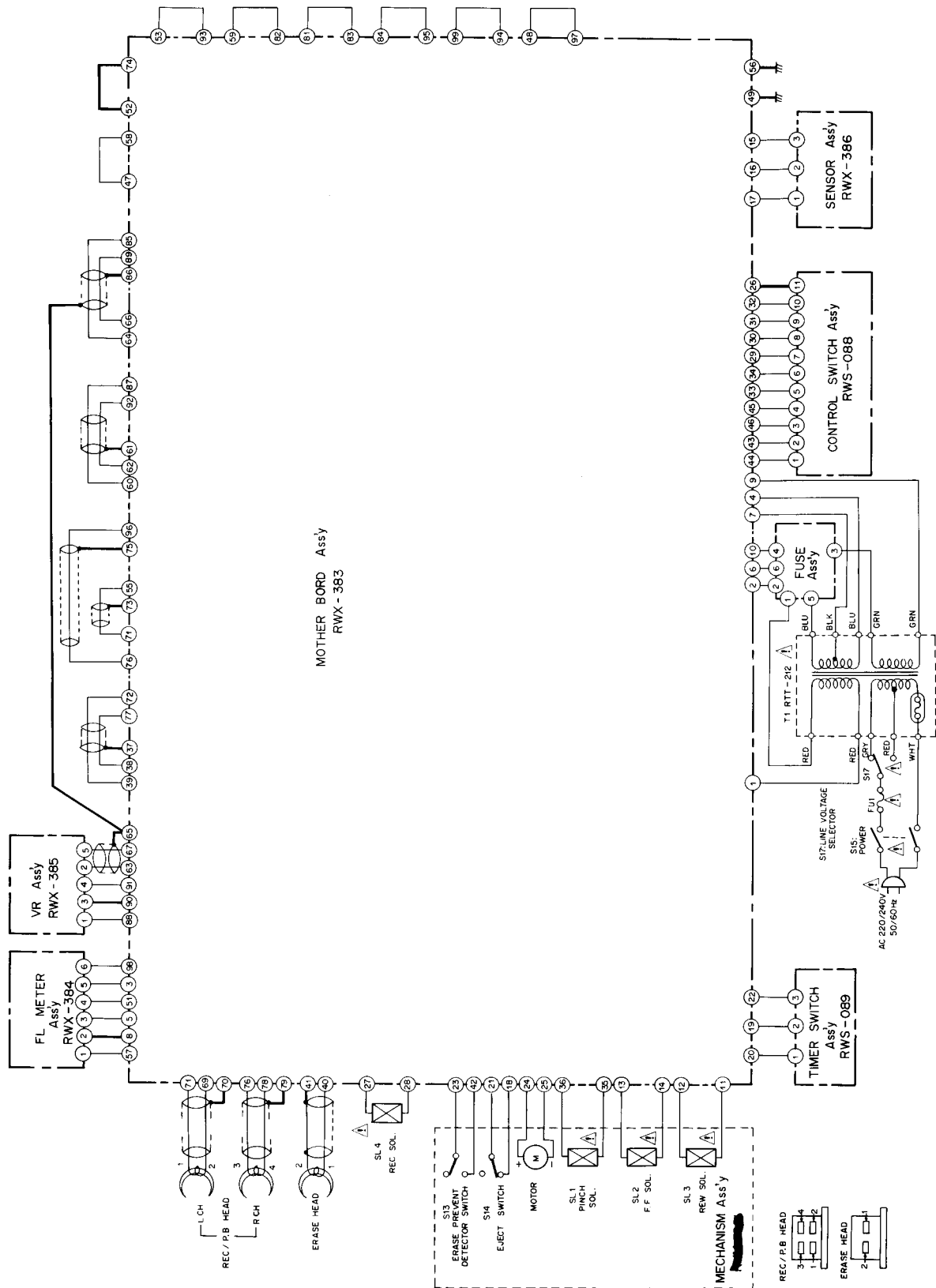
2SD712



BA658
PA4005
BA843



2.3 CONNECTION DIAGRAM



2.4 MISCELLANEA PARTS

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω — 56 × 10¹ — 561 RD¼PS 561 J

47kΩ — 47 × 10³ — 473 RD¼PS 473 J

0.5Ω — 0R5 RN2H 0R5 K

1Ω — 010 RS1P 010 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

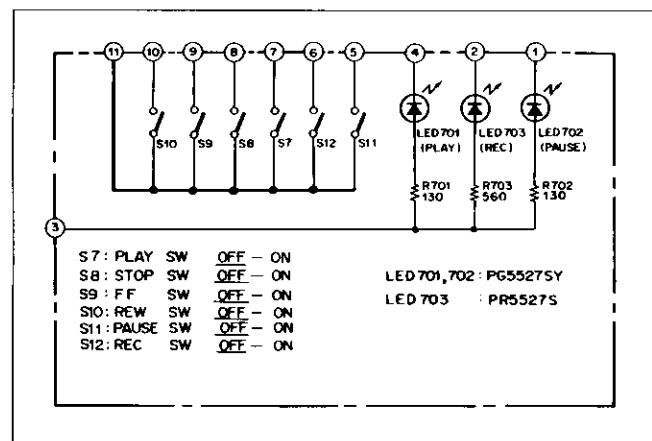
5.62kΩ 562 × 10¹ 5621 RN¼SR 5621 F

- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

Miscellaneous Parts

Part No.	Symbol & Description	
⚠ RTT-212	T1	Power transformer
⚠ RSA-042	S15	Power switch
⚠ RXP-085	SL4	Solenoid
⚠ RDG-027		Power cord (HE)
⚠ RDG-032		Power cord (HB)
⚠ RSX-045	S17	Line voltage selector
RWX-383		Mother assembly
RWX-384		F.L. meter assembly
RWS-088		Function switch assembly
RWX-386		Sensor assembly
RWS-089		Timer switch assembly
RWX-385		Volume assembly
REK-049		Fuse (T500mA)

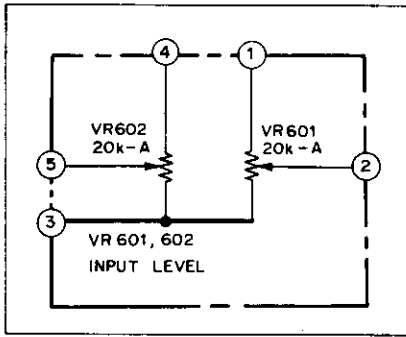
2.5 FUNCTION SWITCH ASSEMBLY (RWS-088)



Parts List

Part No.	Symbol & Description	
RSG-088	S7—S12	Push switch
PG5227SY	LED701, LED702	Light emitting diode (green)
PR5227S	LED703	Light emitting diode (red)
RD¼PM□□□J	R701-R703	

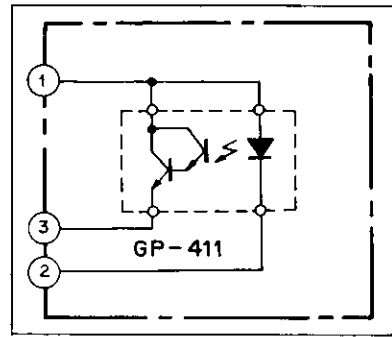
2.6 VOLUME ASSEMBLY (RWX-385)



Part List

Part No.	Symbol & Description
RCV-080	VR601, VR602 Variable resistor

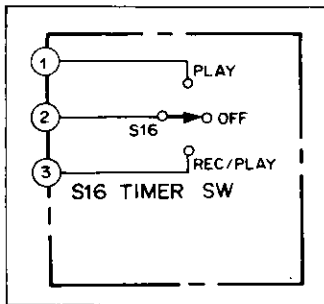
2.7 SENSOR ASSEMBLY (RWX-386)



Part List

Part No.	Symbol & Description
GP411	

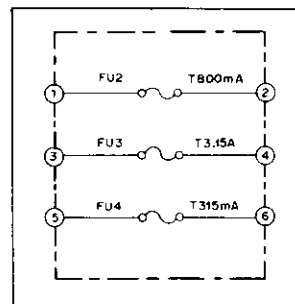
2.8 TIMER SWITCH ASSEMBLY (RWS-089)



Part List

Part No.	Symbol & Description
RSH-051	S16 Slide switch

2.9 FUSE ASSEMBLY



Parts List

Part No.	Symbol & Description
REK-064	FU2 T800mA
REK-047	FU3 T3.15A
REK-052	FU4 T315mA

2.10 MOTHER ASSEMBLY (RWX-383)

Part List

SWITCHES

Part No.	Symbol & Description
RSH-049	S1 Slide switch
RSH-053	S2 Slide switch W
RSK-058	S3 Lever switch A
RSK-059	S4 Lever switch B
RSK-060	S5 Lever switch C
RSK-061	Lever switch W

TRANSFORMER AND COILS

Part No.	Symbol & Description
RTF-040	L101, L201 MPX filter block
RTF-055	L102, L202 Trap coil
RTF-073	L103, L203 Peaking coil
RTF-074	L104, L204 Peaking coil
RTF-057	L301 Line coil
RTD-017	T301 Oscillation transformer

CAPACITORS

Part No.	Symbol & Description
CQMA 102K 50	C101, C201
CEA 471P 50	C326
CEA 470P 50	C325
CEA 010P 50	C135, C148, C235, C248, C312, C346
CEA 2R2P 50	C118, C218
CEA R47P 50	C131, C149, C150, C231, C249, C250, C302
CEA 101P 50	C324
CEA 220P 35	C318
CEA 100P 35	C119, C219, C310
CEA 4R7P 35	C116, C126, C133, C216, C226, C233, C308, C336, C345
CEA 222P 25	C327, C328
CEA 221P 25	C322
CEA 101P 25	C107, C134, C207, C234, C319, C314, C316

Part No.	Symbol & Description
CEA 470P 25	C147, C247
CEA 330P 25	C104, C204
CEA 470P 16	C124, C224, C331, C332
CEA 330P 16	C146, C246, C333
CEA 220P 16	C117, C217, C334
CEA 100P 16	C110, C111, C113, C114, C130, C132, C144, C145, C210, C211, C213, C214, C230, C232, C244, C245, C311
CEA 470P 10	C108, C208, C329, C330
CEA 220P 10	C313, C344
CEANL 100P 16	C103, C203
CEA 100M 16	C335
CEA R22M 50	C320
CEA R33M 50	C122, C222
CEA 010M 50	C123, C223
CEA 4R7M 25NP	C125, C225
CQMA 223K 50	C347
CQMA 563K 50	C138, C142, C238, C242
CQMA 473K 50	C139, C239
CQMA 333K 50	C140, C141, C240, C241, C307
CQMA 273K 50	C137, C143, C237, C243
CQMA 183K 50	C127, C227
CQMA 153K 50	C112, C212
CQMA 123K 50	C120, C220
CQMA 103K 50	C109, C209
CQMA 222K 50	C128, C136, C228, C236
CQSA 272J 250	C305
CQSA 102J 125	C306
CQSA 121K 250	C303, C304
CQSA 561K 50	C102, C202
CKDYF 473Z 50	C301, C317
CKDYF 103Z 50	C309, C315, C321, C323
CKDYF 102Z 50	C337–C343
CCDSL 101K 50	C105, C129, C205, C229
CCDSL 220K 50	C106, C115, C206, C215
CKDYB 471K 50	C121, C221

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

RESISTORS

Part No.	Symbol & Description
C92-857	VR101, VR201 Semi-fixed 22k-B
C92-051	VR102, VR202 Semi-fixed 4.7k-B
C81-426	VR103, VR203 Semi-fixed 33k-B
C92-047	VR301, VR302 Semi-fixed 100k-B
C92-048	VR304 Semi-fixed 47k-B
RCP-022	VR303 Semi-fixed 470-B

Part No.	Symbol & Description
RD%PM□□□J	R101–R135, R137–R154, R156–R191, R201–R235, R237–R254, R256–R291, R301–R309, R311, R312, R317–R325, R328, R330–R367, R369, R370
⚠ RS1PF□□□J	R313, R316, R329
RD%PSF□□□J	R314, R315
⚠ RD%PSF□□□J	R155, R255
⚠ RD%PSF□□□J	R327
RD%PM□□□JNL	R107, R207

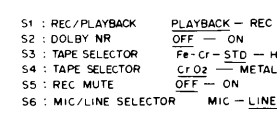
SEMICONDUCTORS

Part No.	Symbol & Description
2SC2240	Q101, Q201
⚠ 2SC1740LN	Q102, Q202, Q303, Q304, Q327
2SC1740LN (2SC2634)	Q103, Q104, Q106, Q107, Q109, Q110, Q113, Q114, Q203, Q204, Q206, Q207, Q209, Q210, Q213, Q214, Q305, Q306, Q310, Q313, Q314, Q316, Q320, Q322–Q326
2SC1815-Y	Q111, Q211
2SA1015-Y	Q112, Q212
2SA825 (2SA564)	Q105, Q108, Q205, Q208, Q307, Q311, Q312, Q321
⚠ 2SC1398NC (2SC790)	Q309
2SD712-D (2SD712-E)	*Q301, Q302
2SC2060	Q315, Q317–Q319
⚠ 2SD837	Q308
PA4005	IC101, IC201
BA843	IC301
1S2473-T	D101, D201, D301–D309, D313–D317, D319–D322, D324, D325, D327, D328, D330, D334–D339
W03B (W03C)	D310
1N34A (1K34A)	D331–D333
⚠ S4VB10	D312
⚠ S1VB10	D311
⚠ BZ-050	ZD301
⚠ WZ-250	ZD302
⚠ WZ-056	ZD303
V06C	D318, D323, D326, D329
*hfe of Q301, Q302 should have the same rank.	

OTHERS

Part No.	Symbol & Description
RKN-059	MIC jack S6
RKN-060	Headphones jack
PKB-014 (RKB-016)	4p mount
RSX-046	Flex wire
RBF-041	Ceramic tube
RBF-042	Ceramic tube

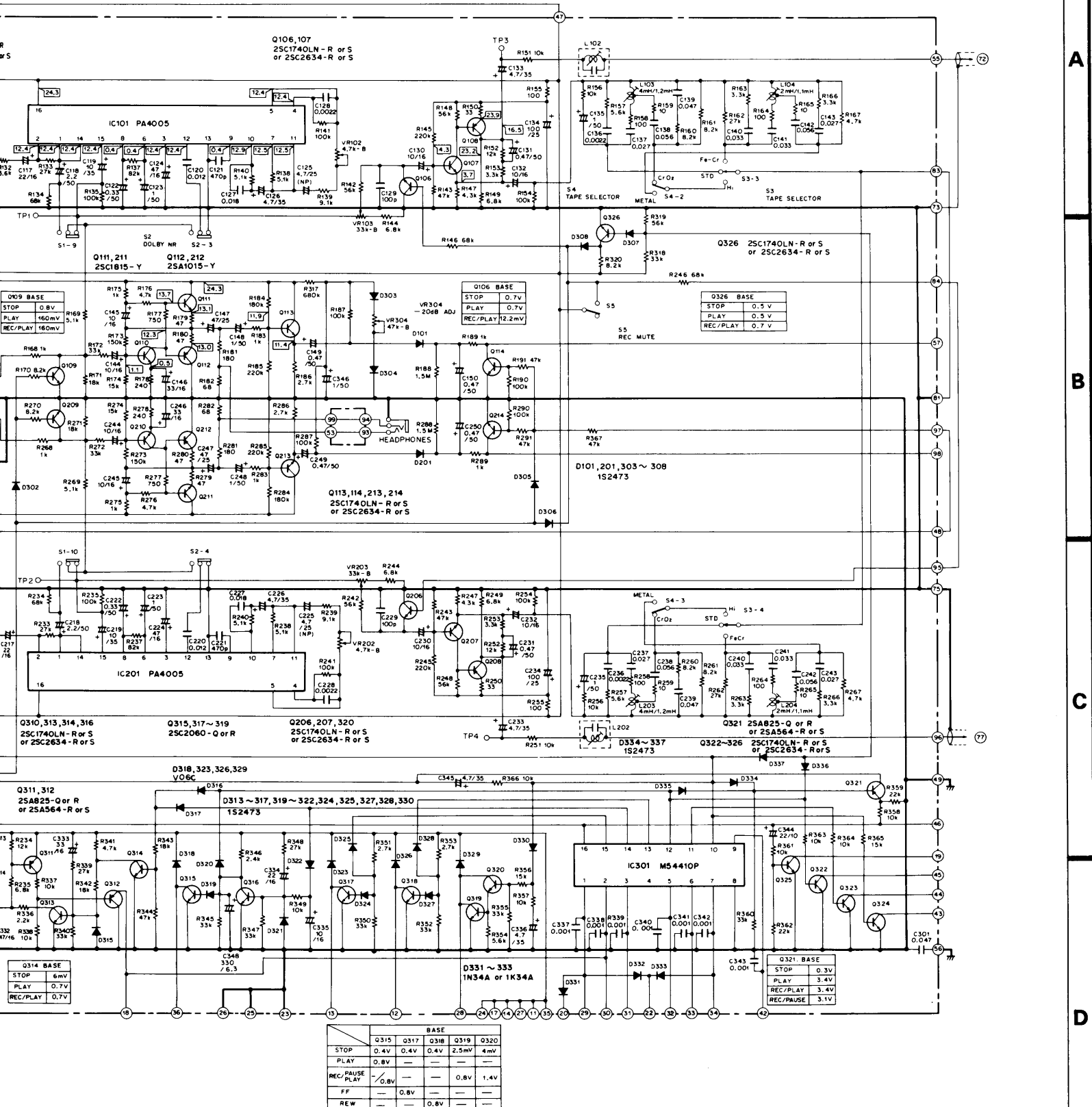
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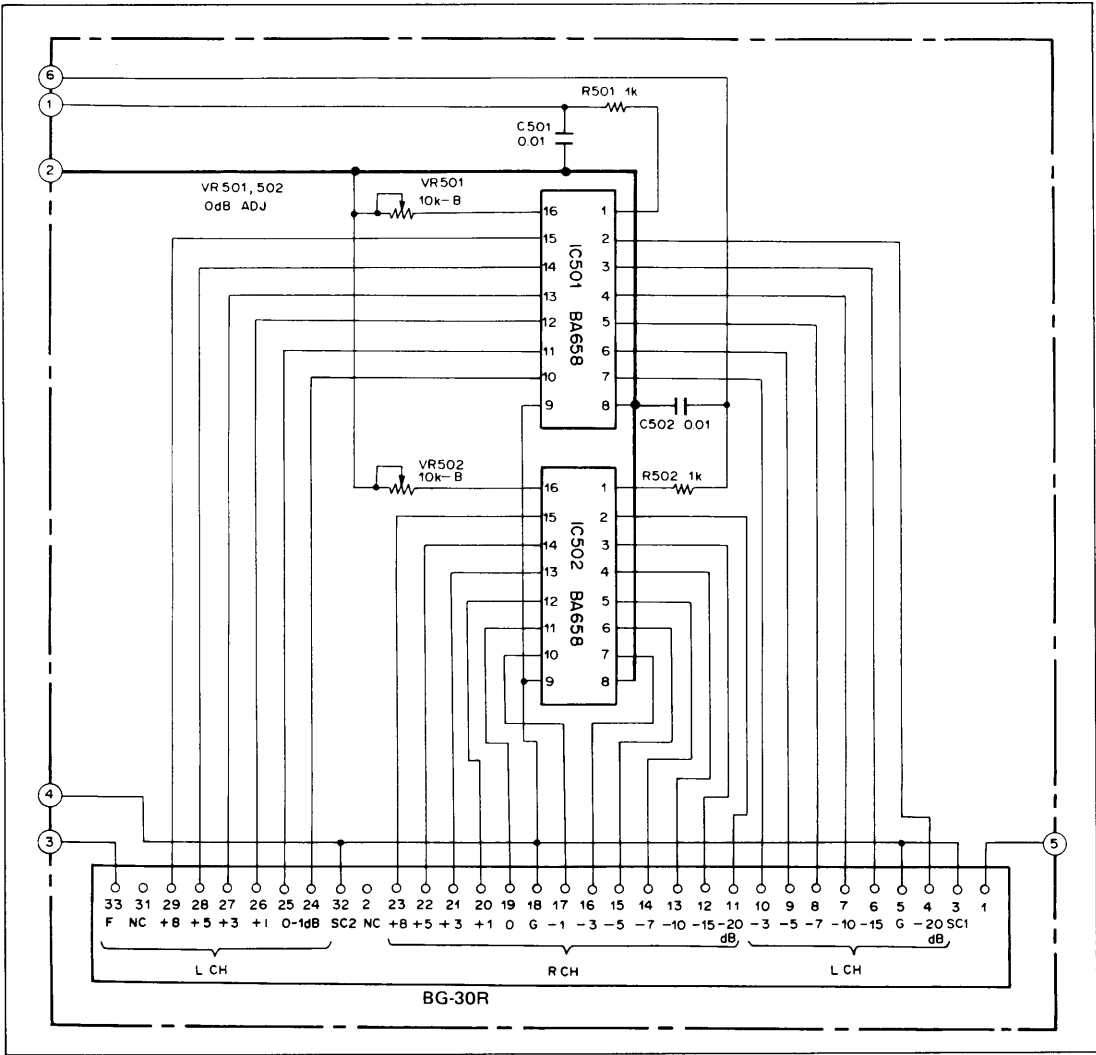


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6

2.11 F.L. METER ASSEMBLY (RWX-384)



Pats List

CAPACITORS

Part No.	Symbol & Description
CKDYF 103Z 50	C501, C502

SEMICONDUCTORS

Part No.	Symbol & Description
BA658 (BA658E)	IC501, IC502

RESISTORS

Part No.	Symbol & Description
C92-049 RD4PS 102J	VR501, VR502 R501, R502.

OTHER

Part No.	Symbol & Description
BG-30R	Fluorescent indicator tube

3. EXPLODED VIEWS AND PARTS LIST

NOTES:

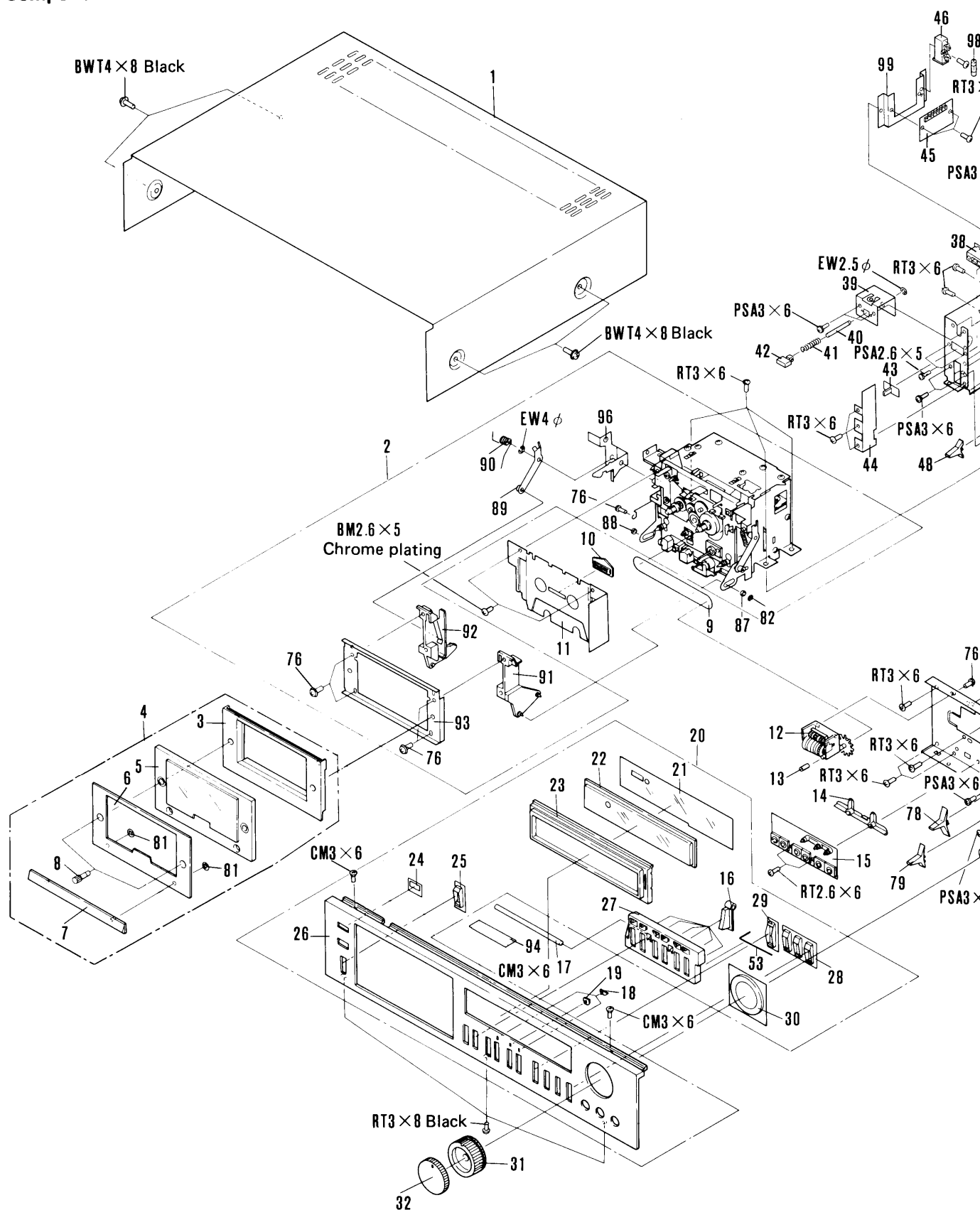
- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

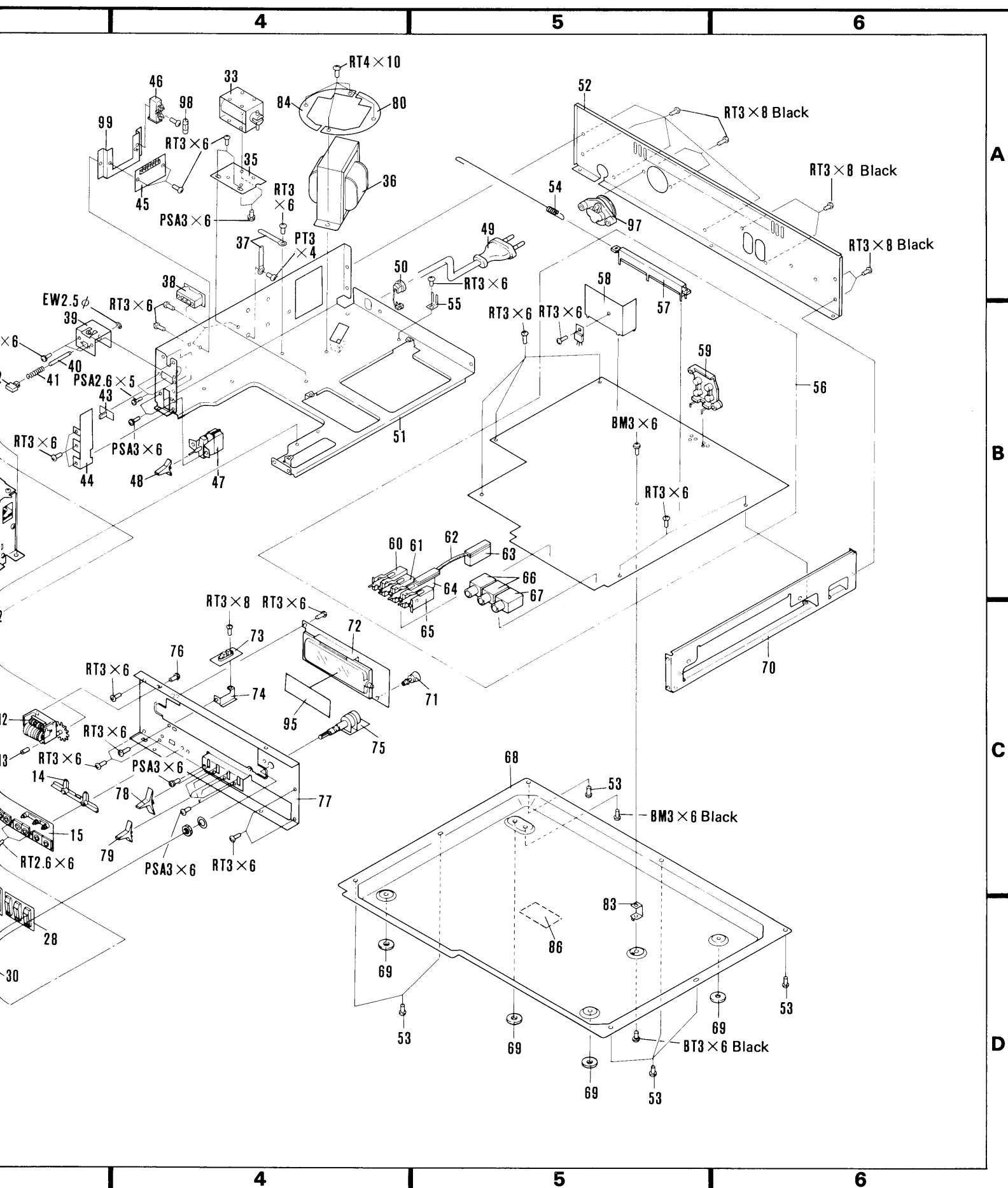
3.1 EXTERIOR COMPONENT

Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
1.	RNA-497	Bonnet	51.		Chassis
2.		Mechanism assembly	52.		Rear panel
3.		Frame cover	53.	RBH-700	Spring (GND)
4.	RXX-289	Pocket door assembly	54.	RBH-664	REC spring
5.		Pocket door	55.		2P terminal (GND)
6.		Door panel	56.	RWX-383	Mother assembly
7.		Door emblem	57.	RSH-049	Slide switch
8.	RLB-213	Door fastener	58.		Heat sink
9.	REB-240	Sensing belt	59.	RKB-014 (RKB-016)	4P mount pin jack
10.	RNK-866	Indicator lens	60.	RSK-058	Lever switch A
11.	RAH-325	Cassette plate	61.	RSK-059	Lever switch B
12.	RAW-134	Counter	62.	RSX-046	Flex wire
13.	RAC-129	Counter cap	63.	RSH-053	Slide switch W
14.		Stud	64.	RSK-061	Lever switch W
15.	RWS-088	Function switch assembly	65.	RSK-060	Lever switch C
16.	RAC-126	Control knob	66.	RKN-059	MIC jack
17.		Knob shaft	67.	RKN-060	Headphones jack
18.		LED cap G	68.		Bottom plate
19.		LED cap R	69.	REC-291	Stopper
20.	RXX-288	Front panel sub assembly	70.		Slide frame
21.		Meter lens	71.		T type rivet
22.	RNK-902	Front cover	72.	RWX-384	F.L. meter assembly
23.		Escutcheon	73.	RWX-386	Sensor assembly
24.		Eject knob guide	74.		Sensor bracket
25.		Knob escutcheon B	75.	RWX-385	VR assembly
26.		Front panel	76.		TP screw 2.6 X 6
27.		Control knob holder	77.		Panel stay
28.		Escutcheon A	78.	RAC-125	Lever knob B
29.		Escutcheon B	79.	RAC-124	Lever knob A
30.		VR plate	80.		Transformer plate R
31.	RAA-319	Knob B	81.		CS type stopper ring 2φ
32.	RAA-318	Knob A	82.		CS type stopper ring 3φ
⚠ 33.	RXP-085 (RXP-091)	Solenoid	83.		P.C.B holder
34.			84.		Transformer plate L
35.		Solenoid plate	85.		
⚠ 36.	RTT-212	Power transformer	86.	RRW-105	Caution label
37.		UL cord clamber	87.		Collar
38.	RWS-089	Timer switch assembly	88.		Collar
39.		Eject bracket	89.		Door arm (II) assembly
40.		Eject rod	90.	RBH-660	Spring
41.	RBH-665	Eject spring	91.	RXB-277	Cassette holder R assembly
42.	RAC-128	Eject knob.	92.	RXB-276	Cassette holder L assembly
43.	RAC-127	Stand-by knob	93.	RNA-456	Pocket frame
44.		Plate	94.	REB-394	Cover cushion H
45.		Fuse assembly	95.	REB-397	Cover cushion M
46.	RKR-021	Fuse holder	96.		Eject lever
⚠ 47.	RSA-042	Power switch	97.	RSX-045	Line voltage selector
48.	RAC-124	Lever knob A	98.	REK-049	Fuse T500mA
⚠ 49.	RDG-027	Power cord (HE)	99.		Fuse bracket
	RDG-032	Power cord (HB)			
⚠ 50.	REC-272	Strain relief			

Exterior Component





1 2 3

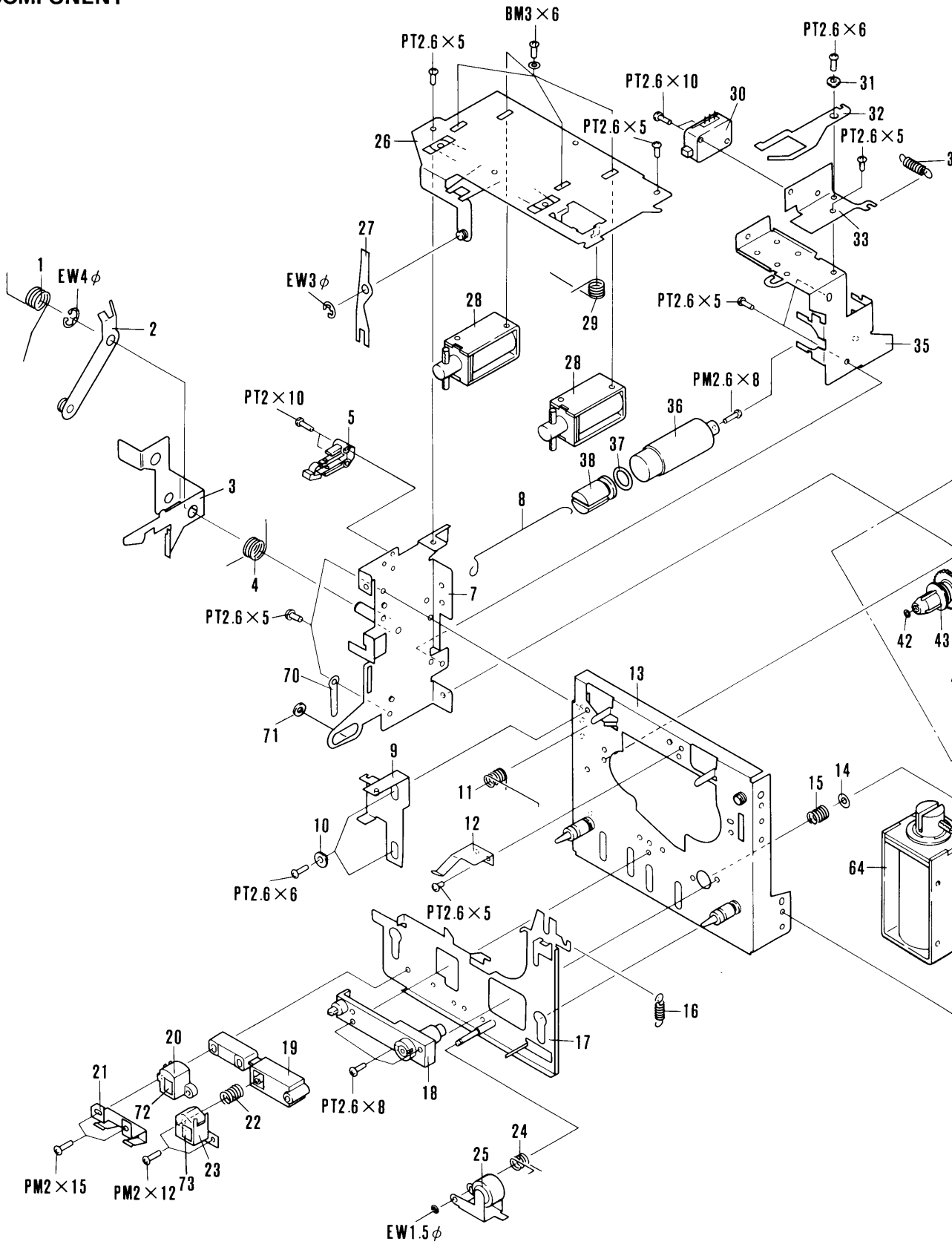
3.2 INTERIOR COMPONENT

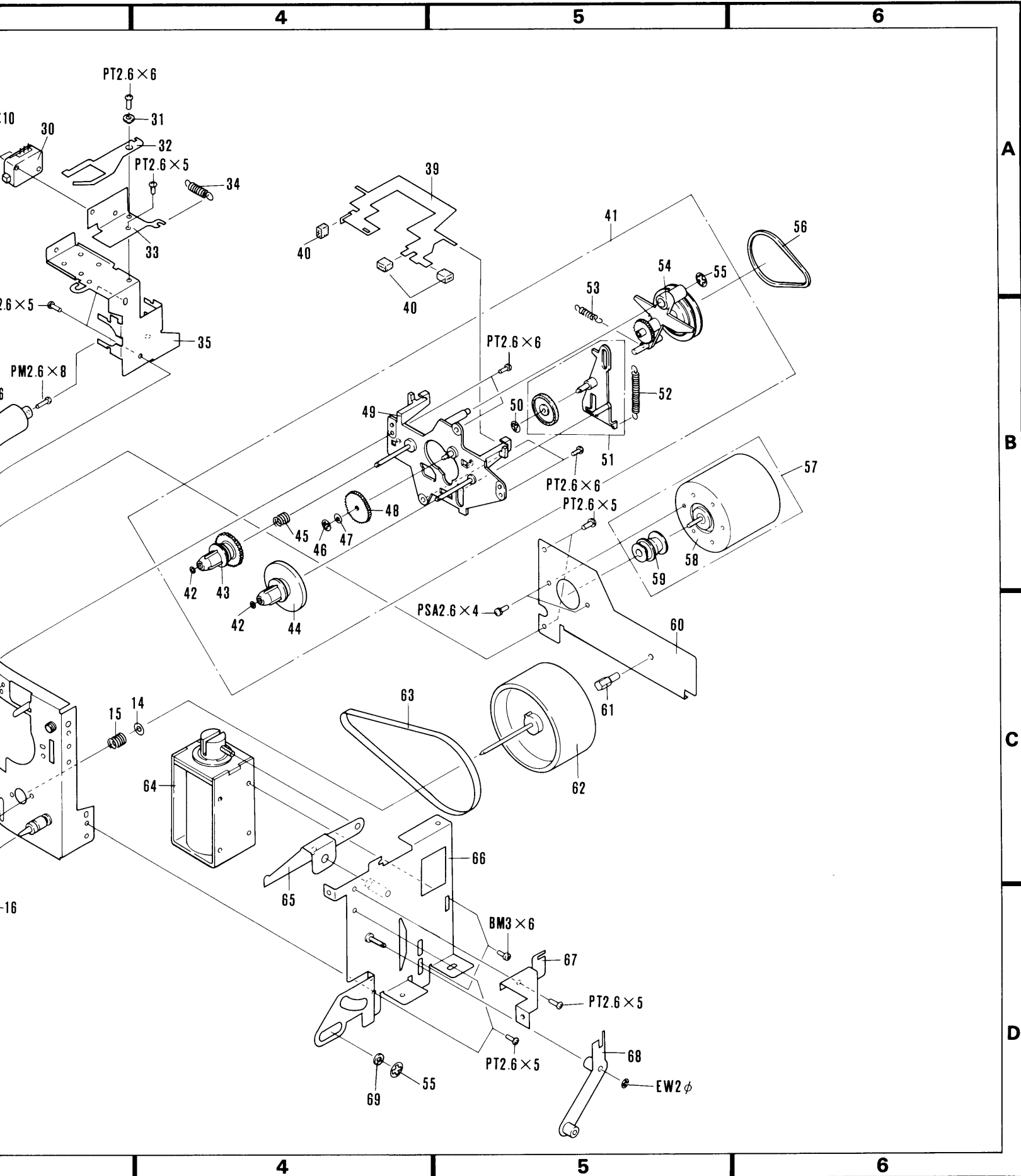
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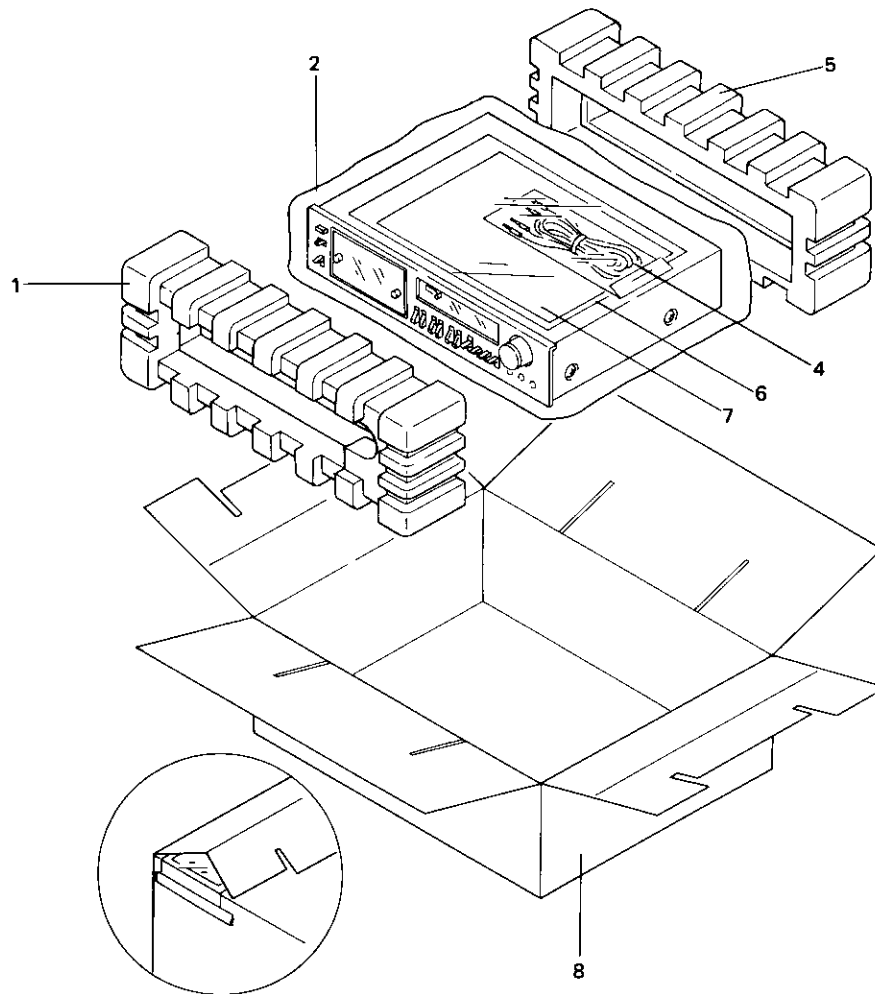


Parts List

Key No.	Part No.	Description	Key No.	Part No.	Description
1.	RBH-660	Coil spring	51.	RXB-273	Idler arm assembly
2.		Door arm (II) assembly	52.	RBH-655	Tension coil spring
3.		Eject lever	53.	RBH-661	Tension coil spring
4.	RBH-653	Coil spring	54.	RXB-274	Drive arm assembly
5.	RSN-029	Switch	55.		CS type stopper
6.			56.	REB-378	Belt
7.		Side plate L assembly	57.	* RXB-279	Motor assembly
8.	RBH-662	Joint bar	58.		Motor
9.		REC plate assembly	59.		Motor pulley
10.		Pause lever collar B	60.		Motor holder
11.	RBH-657	Tension coil spring	61.		Thrust screw
12.	RBK-154	Cassette holder	62.	RNG-243	Fly wheel
13.		Main chassis assembly	63.	REB-377	Belt
14.			64.	RXP-083	Solenoid
15.	RBH-659	Tension coil spring	65.		Play lever
16.	RBH-652	Tension coil spring	66.		Side plate R assembly
17.		Head chassis assembly	67.		Mount plate A
18.	RXB-262	Bearing assembly	68.		Door arm (I) assembly
19.	RNK-884	Head plate	69.		Collar
20.	PPB-056	Erase head	70.		UL cord clasper
21.		Wire holder	71.		Collar
22.	RBH-650	Compression coil spring	72.	RRW-081	E head label
23.	RPB-070	REC/P.B. head	73.	PRW-109	R/P head label
24.	RBH-651	Tension coil spring			
25.	RXB-264	Pinch arm assembly			
26.		Solenoid chassis assembly			
27.		FR lever			
28.	RXP-084	Solenoid			
29.	RBH-658	Tension coil spring			
30.	RSH-054	Slide switch			
31.	RLB-210	Collar			
32.		Lock lever			
33.		Switch mount plate			
34.	RBH-663	Tension coil spring			
35.		Mount plate B			
36.	RNK-897	Cylinder			
37.	REB-379	O ring			
38.	RNK-898	Piston			
39.		Brake plate			
40.	REB-380	Brake rubber			
41.	RXB-269	Reel assembly			
42.					
43.	RXB-271	S reel base assembly			
44.	RXB-272	T reel base assembly			
45.	RBH-654	S brake spring			
46.		CS ring			
47.		Washer			
48.	RNK-887	Idler gear			
49.		Reel base assembly			
50.		CS ring			

* Motor pulley can not be removed from the motor. The motor and motor pulley can be supplied as motor assembly.

4. PACKING



Parts List

Key No.	Part No.	Description
1.	RHA-199	Front pad
2.	RHL-050	Vinyl bag
3.		
4.	RDE-032	Connection cord assembly
5.	RHA-200	Rear pad
6.	RHL-018	Vinyl bag (for operating instruction)
7.	RRB-133	Operating
	RRD-044	(German/French) (HE)
8.	RHG-355	Packing case