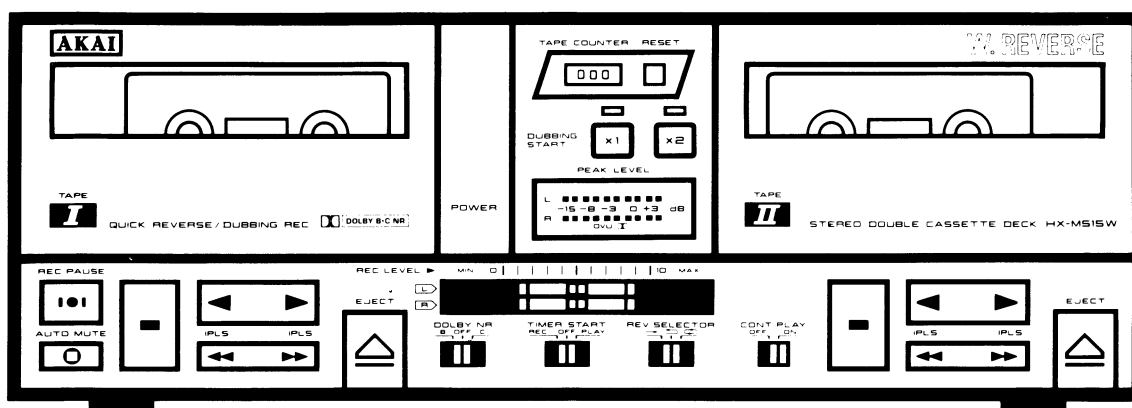


AKAI SERVICE MANUAL



STEREO DOUBLE CASSETTE DECK

MODEL HX-M515W

SPECIFICATIONS

Motors	Electronically speed controlled DC motor for capstan drive × 2 DC motor for reel drive × 2	Dolby B type NR ON: Improves up to 5dB at 1kHz, 10dB above 5kHz
Heads	HD head for recording and play- back × 2 Erase head × 1	Input sensitivity 70mV Impedance 47kohms
Wow & flutter	0.07% WRMS (JIS), 0.12% (DIN)	Output sensitivity 388mV Impedance 2kohms
Distortion	0.7% (Metal)	Power requirements ... 120V, 60Hz for USA & Canada 220V, 50Hz for Europe except UK
Frequency response		240V, 50Hz for UK & Aus- tralia
(-20dB recording)	Normal: 25Hz to 15,000Hz ± 3dB CrO ₂ : 25Hz to 16,000Hz ± 3dB Metal: 25Hz to 17,000Hz ± 3dB	110V/120V/220V/240V, 50Hz / 60Hz convertible for other coun- tries
S/N	58dB (Metal) (Measured via tape with peak recording level)	Dimensions 350(W) × 123(H) × 270(D) mm (13.8 × 4.8 × 10.6 inches)
	Dolby C type NR ON: Improves up to 15 dB at 500 Hz, 20 dB at 1kHz to 10 kHz	Weight 5.3kg (11.7lbs)

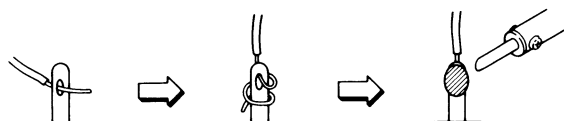
* For improvement purposes, specifications and design are subject to change without notice.

* Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

1. Parts identified by the Δ symbol parts are critical for safety. Replace only with parts number specified.
2. In addition to safety other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
 - 1) Wires covered with PVC tubing.
 - 2) Double insulated wires
 - 3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation Tape
 - 2) PVC tubing
 - 3) Spacers (Insulating Barriers)
 - 4) Insulation sheets for transistors
 - 5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).

7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 Mohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be headphone jacks, line-in-out jacks etc.) more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks, line-in-out jacks etc.)

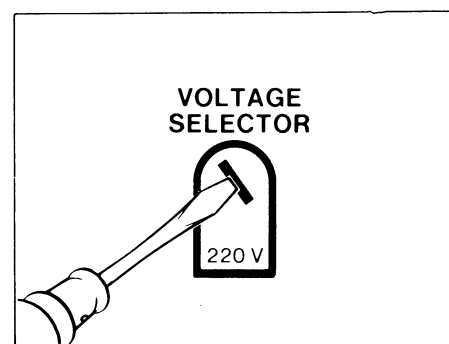
USEFUL INFORMATIONS

PRINCIPAL DESTINATION AND SYMBOLS

Symbols	Principal Destinations
[A]	America
[B]	United Kingdom
[C]	Canada
[E]	Europe
[J]	Japan
[S]	Australia
[V]	West Germany
[U]	Other countries

VOLTAGE CONVERSION ([U] model only)

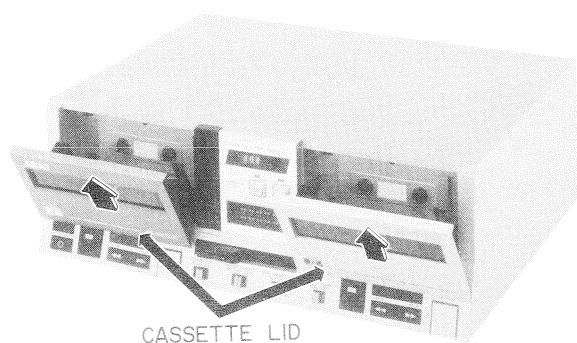
Before connecting the power cord, turn the VOLTAGE SELECTOR located on the Rear panel with a screw-driver until the correct voltage is indicated.



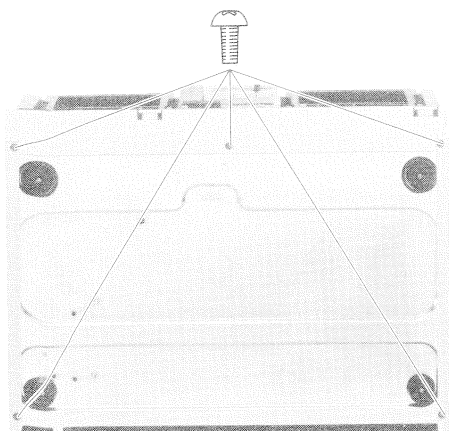
I. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.

1 REMOVAL CASSETTE LIDS

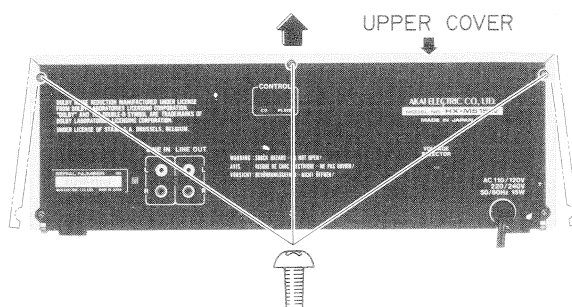


2 REMOVAL UPPER COVER



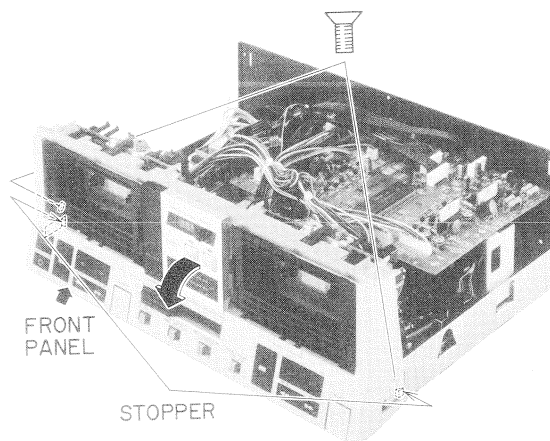
remove the five screws

3



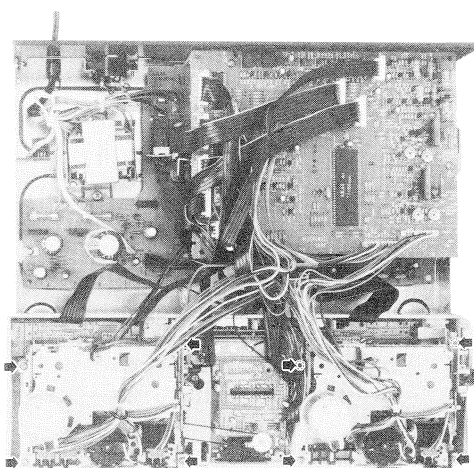
remove the three screws

4 REMOVAL FRONT PANEL



remove the two screws and unfasten the two stoppers

5



when removing MECHA BLK, remove the screws with indicated → (arrow) mark.

II. CONTROLS

POWER button.

Commutateur d'alimentation (POWER).

Cassette holders.

Compartmentiments de cassette.

REC PAUSE button and indicator.

Touche et indicateur d'enregistrement/pause (REC PAUSE).

AUTO MUTE button. To instantly create 4 seconds of blank tape.

Touche de sourdine automatique (AUTO MUTE). Pour créer instantanément 4 secondes de bande vierge.

Tape Transport Buttons. (PLAY, STOP, F.FWD, RWD, IPLS, EJECT.)

Touches de transport de la bande (reproduction (◀ ou ▶), arrêt (■), avance rapide/retour (◀◀ ou ▶▶), IPLS, éjection (EJECT ■■■)).

Dolby NR selector.

Sélecteur Dolby NR.

TAPE COUNTER and COUNTER RESET button for TAPE I only.

Compteur de bande (TAPE COUNTER) et touche de réinitialisation (RESET), uniquement pour la bande 1 (TAPE I).

PEAK LEVEL METER. Shows the recording and playback Peak Levels (L: Left, R: Right).

Indicateur du niveau de crête (PEAK LEVEL). Indique les niveaux de crête de l'enregistrement et de la reproduction (L: gauche, R: droite).

DUBBING indicators.

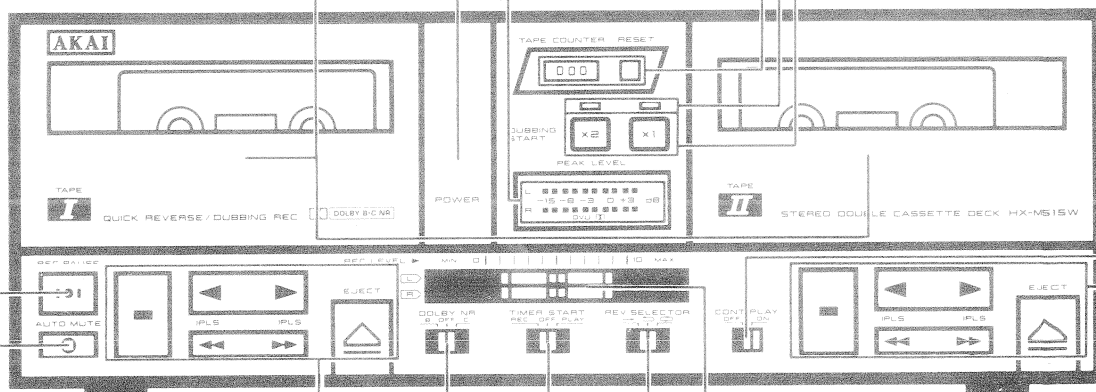
Indicateurs de copie (DUBBING).

DUBBING START ×1, ×2 buttons. For normal and high speed dubbing.

Touche de démarrage de copie (DUBBING START ×1, ×2). Pour la copie à vitesse normale et à vitesse rapide.

CONT PLAY switch. To continuously play back two cassette tapes.

Commutateur de lecture continue (CONT PLAY). Pour reproduire de façon continue deux bandes cassette.



REV SELECTOR. To set the tape reverse mode during recording and playback.

Sélecteur d'inversion (REV SELECTOR). Pour régler le mode d'inversion de la bande durant l'enregistrement et la reproduction.

TIMER START selector.

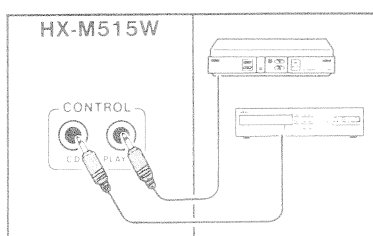
Commutateur de départ minuterie (TIMER START).

Tape Transport Buttons. (PLAY, STOP, F.FWD, RWD, IPLS, EJECT.)

Touches de transport de la bande (reproduction (◀ ou ▶), arrêt (■), avance rapide/retour (◀◀ ou ▶▶), IPLS, éjection (EJECT ■■■)).

Left and Right REC LEVEL control. To set the recording input levels.

Commande de niveau d'enregistrement gauche et droit (REC LEVEL). Pour régler les niveaux d'entrée de l'enregistrement.



CONTROL JACKS on the Rear Panel for the CD-M515 and AP-M313.

III. PRINCIPAL PARTS LOCATION

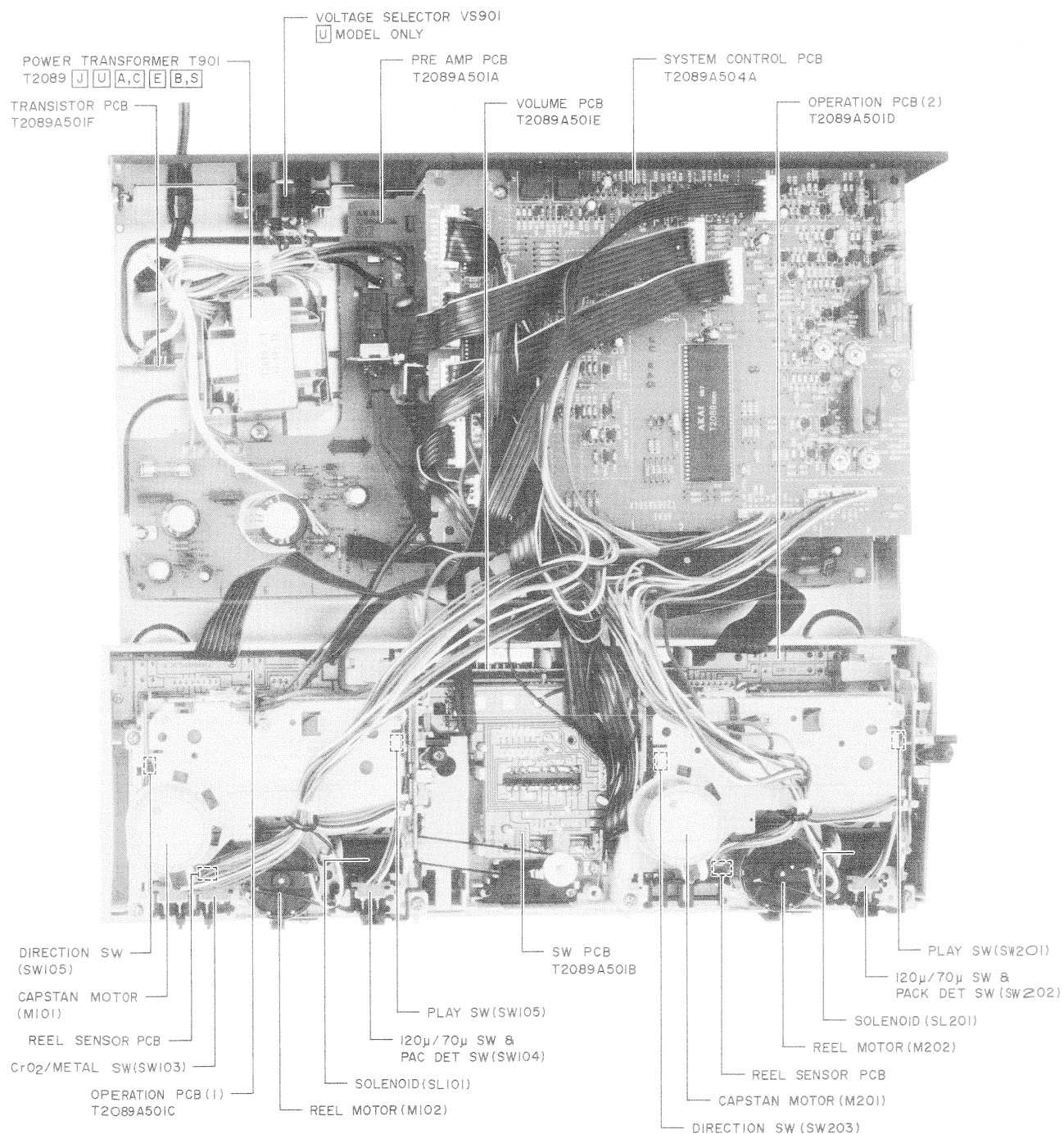


Fig. 3-1

IV. MECHANICAL ADJUSTMENT

4-1 PINCH ROLLER PRESSURE MEASUREMENT

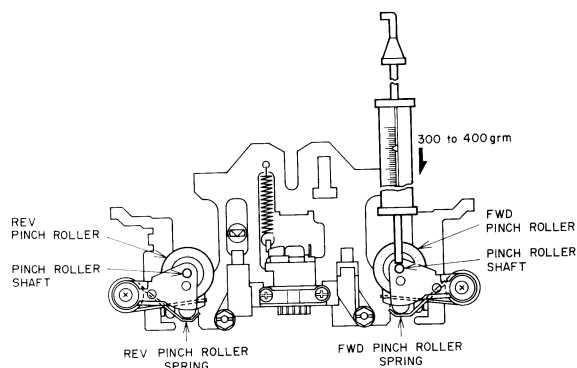


Fig. 4-1

Put in FWD PLAY Mode. Push Pinch roller shaft down with the spring gauge, and push the pinch roller 1 to 2mm away from the capstan and release slowly. Read the spring gauge at the moment the pinch roller touches the capstan and begins to rotate. Specified contact pressure measurement is 300 to 400 grams. If the correct measurement is not obtained, replace the pinch roller spring. Do the same for the reverse side.

4-2 WINDING TORQUE MEASUREMENT IN EACH MODE

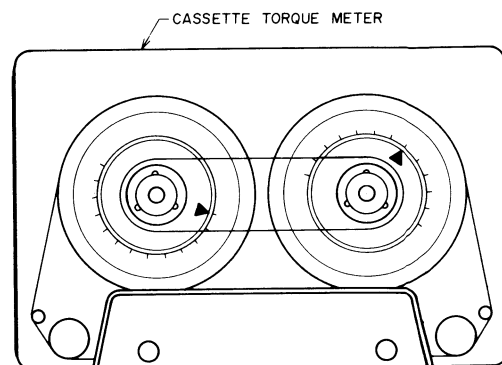


Fig. 4-2

Insert a cassette torque meter (AJ-751179) and measure in each mode, for Fast Forward and Rewind, measure at the end of the tape when the tape has stopped running. Forward or Reverse mode

Take up Torque: 45^{+25}_{-15} g-cm (30 to 70g-cm)
Back Tension Torque: 4 ± 2 g-cm (2 to 6g-cm)

Fast Forward or Rewind mode

Take up Torque: 100^{+80}_{-10} g-cm (90 to 180g-cm)

V. HEAD ADJUSTMENT

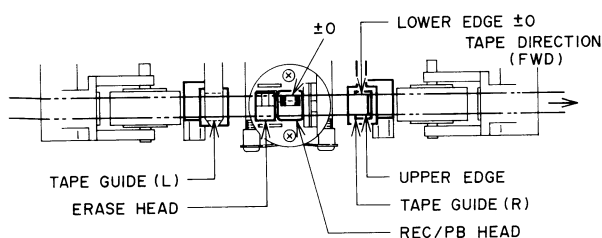


Fig. 5-1

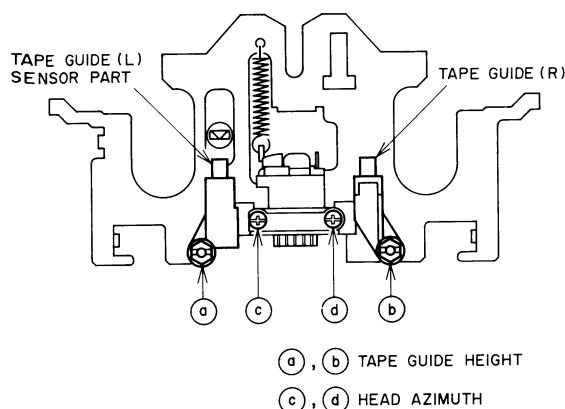


Fig. 5-2

5-1 TAPE GUIDE HEIGHT

ADJUSTMENT

- 1) Use the mirror tape (AJ-751178) and adjust the tape guide height with turning the tape guide height adjustment nuts (a) and (b) so that when in FWD Play mode, the tape edge and the head edge match as in Fig.5-1
- 2) Play back the 315Hz OVU test tape (AT-750773) and adjust the tape guide height adjustments (a) and (b) so that the difference in level between Lch on FWD and Lch on REV is within 0.5 dBm.
- 3) Play back the 1kHz 4 Track test tape (AT-750775) and adjust the tape guide height adjustment nuts (a) and (b) so that the difference in level between this and the 315Hz tape in step 2) is within 2.0 dBm.
- 4) Repeat step 2) and step 3) until the optimum condition is achieved.
- 5) Use the mirror tape and check that the tape runs smoothly (The tape edge should not catch on the tape guide and should not curl.) If the tape edge catches on the tape guide, move the tape guide height adjustment nuts (a) and (b) slowly until the tape runs smoothly.
- 6) After adjustment, check step 2) and step 3) again.
- 7) After adjustment, paint-lock the tape guide height adjustment nuts (a) and (b).

5-2 HEAD HEIGHT ADJUSTMENT

No adjustment is required for the height of the head itself. Follow the tape guide height adjustment procedures when the head is replaced and head height adjustment is required.

5-3 REC/PB HEAD AZIMUTH

ALIGNMENT ADJUSTMENT

Play back the 10kHz test tape (AT-750778) for head azimuth adjustment and adjust screw ㊟ for the FWD direction and screw ㊠ for the REV direction, so that the level on both channels becomes maximum.

- NOTES:
1. Be sure to clean the heads prior to head adjustment.
 2. Be careful not to use a magnetized driver or other magnetized tools in the vicinity of the heads.
 3. Be sure to demagnetize the heads with a head demagnetizer before and after head adjustment.

VI. ELECTRICAL ADJUSTMENT

6-1 SYSCON PC BOARD ADJUSTMENT

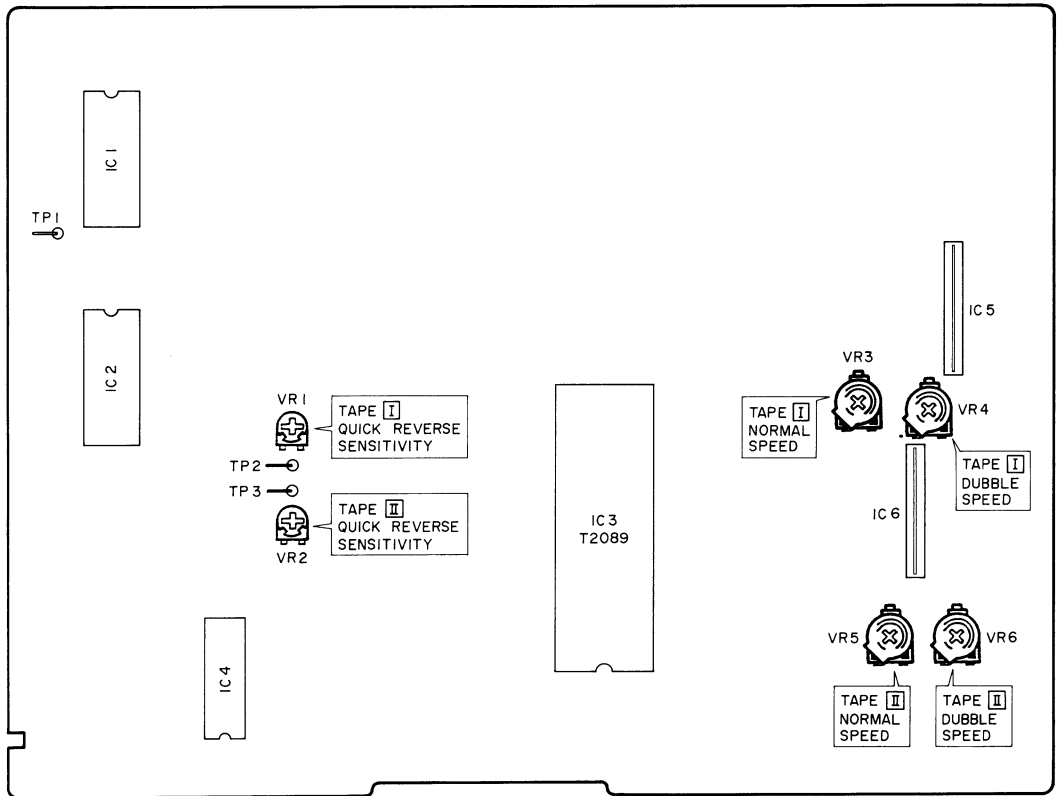


Fig. 6-1 SYSCON PCB. ADJUSTMENT POINTS

- NOTE:
1. Adjust Double speed mode first, then Adjust Normal speed.
 2. The TAPE II speed should be adjust 0.3% faster than the TAPE I speed.
 3. Make a tapeless cassette pack by removing the tape from the white colored test tape for the Quick Reverse sensitivity adjustment.
 4. Clean the reference pole and the Detection tape guide before the Quick Reverse adjustment. refer to Fig.6-2

5. Set the reverse selector to (endless mode)

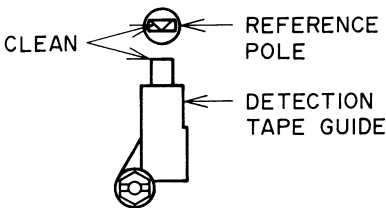


Fig. 6-2

Step	Adjustment Item	Test tape & Input Signal	Mode	Test Point	Adjustment Point	Result & Remarks
1	Tape I Double Speed	3150Hz Test Tape TF-110CT (AT-751263)	FWD PB with Double Speed * see remarks	Line out	VR4	Unit set to Double speed mode (short the circuit TP1 and GND.) connect the Frequency Counter to Line Out and adjust VR4 so that FRQ. Counter reads $6280 \pm 60\text{Hz}$
2	Tape II Double Speed	3150Hz Test Tape TF-110CT (AT-751263)	FWD PB with Double Speed	Line out	VR6	adjust VR6 so that FRQ. Counter reads $6280 \pm 60\text{Hz}$ disconnect short wire after the adjustment.
3	Tape I Normal Speed	3150Hz Test Tape TF-110CT (AT-751263)	FWD PB	Line out	VR3	adjust VR3 so that FRQ. Counter reads $3150 \pm 30\text{Hz}$
4	Tape II Normal Speed	3150Hz Test Tape TF-110CT (AT-751263)	FWD PB	Line out	VR5	adjust VR5 so that FRQ. Counter reads $3150 \pm 30\text{Hz}$
5	Tape I Quick Revers Sensitivity	Tapeless cassette pack * see NOTE3	FWD PB	TP2	VR1	connect Digital Volt Meter to TP2 and adjust VR1 so that meter reads $4.0 \pm 0.1\text{V}$
6	Tape II Quick Revers Sensitivity	Tapeless cassette pack	FWD PB	TP3	VR2	connect Digital Volt Meter to TP3 and adjust VR2 so that meter reads $4.0 \pm 0.1\text{V}$

6-2 PRE AMP PCB ADJUSTMENT

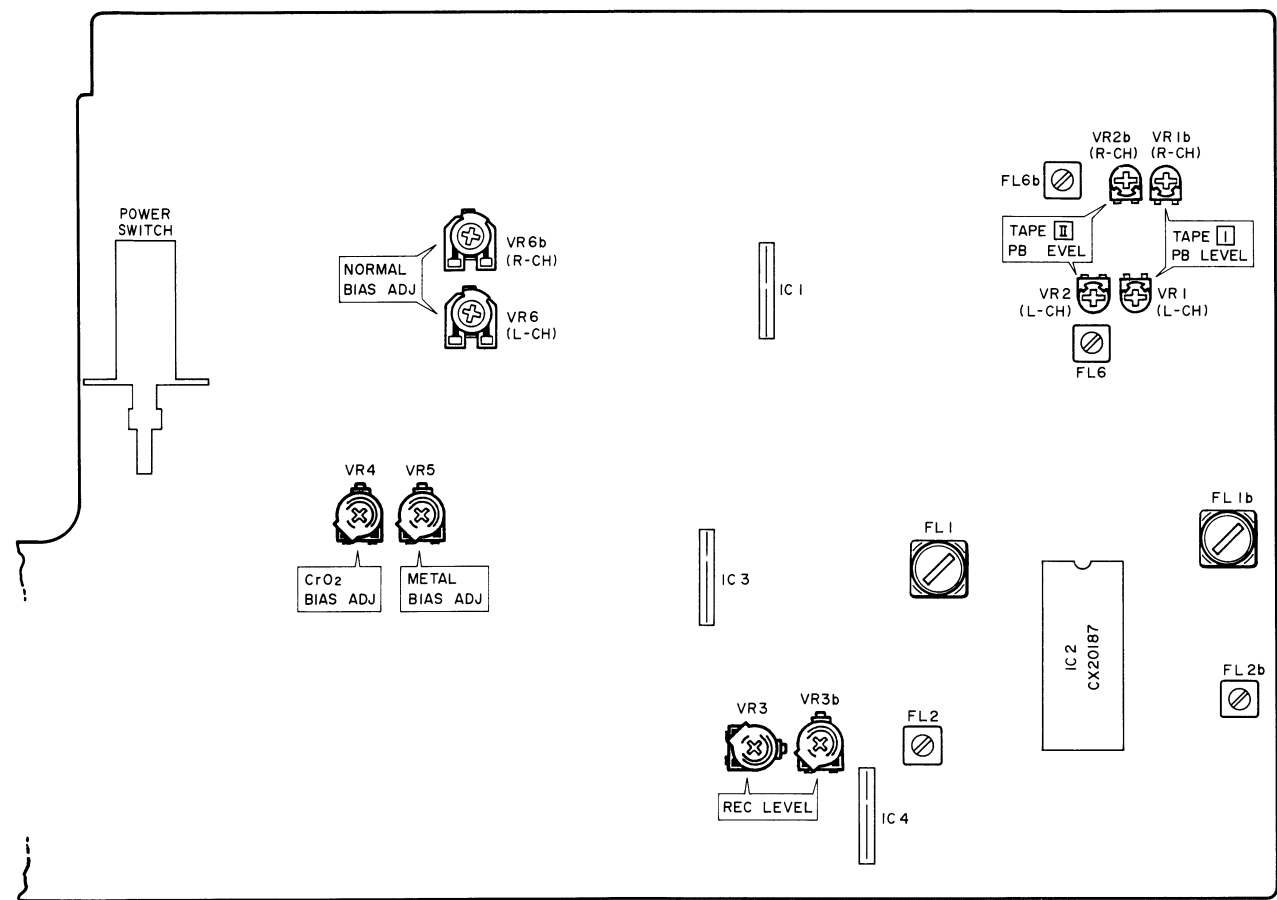


Fig. 6-3 PRE AMP PCB ADJUSTMENT POINTS

- NOTES: 1. Set the DOLBY NR switch to OFF position for all the adjustments.
2. Use the following cassette measuring tapes.
- NOMAL Tape : Maxell UDI C-60
- CrO₂ Tape : TDK SA C-60
- METAL Tape : TDK MA C-60

Step	Adjustment Item	Test tape & Input Signal	Mode	Test Point	Adjustment Point	Result & Remarks
1	Tape I FWD PB Level	315Hz Test Tape TF-101CL (AT-750773)	FWD PB	Line out	VR1b(R-ch) VR1(L-ch)	connect the AC volt meter to the Line out and adj. VR1b(R-ch), VR1(L-ch) so that meter reads $-6.0\pm0.5\text{dBm}$
2	Tape I REV PB Level	315Hz Test Tape TF-101CL (AT-750773)	REV PB	Line out	conformation	$-6.0\pm0.5\text{dBm}$
3	Tape II FWD PB Level	315Hz Test Tape TF-101CL (AT-750773)	FWD PB	Line out	VR2b(R-ch) VR2(L-ch)	$-6.0\pm0.5\text{dBm}$
4	Tape II REV PB Level	315Hz Test Tape TF-101CL (AT-750773)	REV PB	Line out	conformation	$-6.0\pm0.5\text{dBm}$
5	Normal Bias	Normal Blank Tape and Sine wave 1kHz, 10kHz -26dBm from Oscillator	REC/PB	Line out	VR6b(R-ch) VR6(L-ch)	adjust VR6b(R-ch), VR6(L-ch) so that meter reads at 1kHz and 10kHz are flat. $\pm0.5\text{dBm}$
6	CrO ₂ Bias	CrO ₂ Blank Tape and Sine wave 1kHz, 10kHz -26dBm from Oscillator	REC/PB	Line out	VR4	adjust VR4 so that meter reads at 1kHz and 10kHz are flat. $\pm0.5\text{dBm}$
7	Metal Bias	Metal Blank Tape and Sine wave 1kHz, 10kHz -26dBm from Oscillator	REC/PB	Line out	VR5	adjust VR5 so that meter reads at 1kHz and 10kHz are flat. $\pm0.5\text{dBm}$
8	REC Level	Normal Blank Tape and Sine wave 315Hz -6dBm	REC/PB	Line out	VR3b(R-ch) VR3(L-ch)	adjust VR3b(R-ch) VR3(L-ch) so that meter reads $-6.0\pm0.5\text{dBm}$

VII. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering.
If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

b) PC Board

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

A small "x" indicates that this part is not shown in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure.

This number corresponds with the Figure Number.

6. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
6-C1B	EC-350949	C MMY V 223M 250DC [J]
6-C1C	EC-338397	C MMY V 223M 125AC [C,A]
6-X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A]: AAL(U.S.A.) [S]: SAA(Australia)
[B]: BEAB(England) [U]: U/T(Universal Area)
[C]: CSA(Canada) [V]: VDE(W. Germany)
[E]: CEE(Europe) [Y]: Custom Version
[J]: JPN(Japan)

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

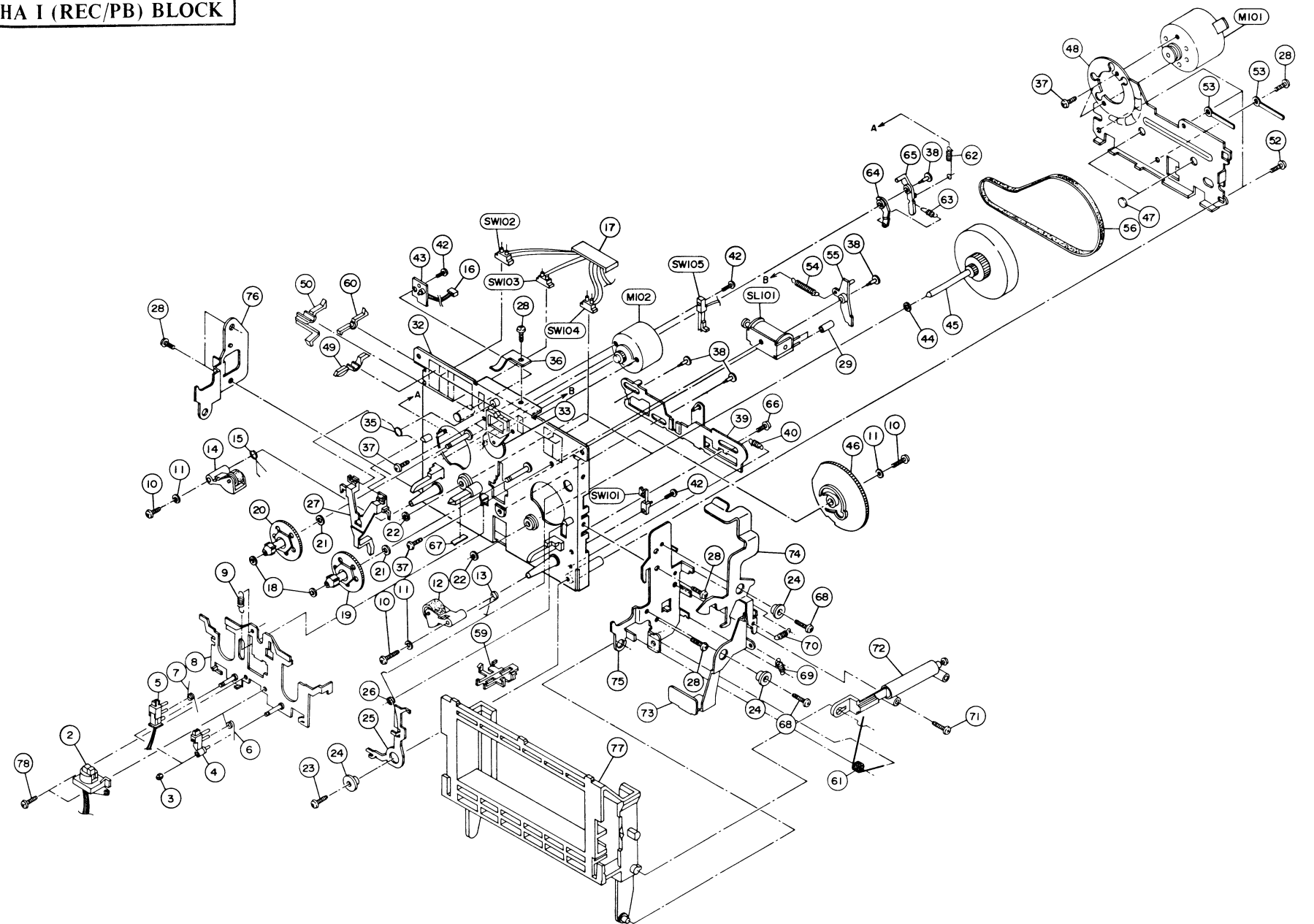
RECOMMENDED SPARE PARTS LIST

We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

REF. NO.	PART NO.	DESCRIPTION
1 N	BF-717852	FLY WHEEL PART
2 N	BM-717859	MOTOR CAPSTAN W/PULLEY MMA-6B2LWF
3 N	BM-717860	MOTOR REEL W/GEAR RF-500T
4 N	BR-717842	REEL PART
5 N	BR-717843	REEL PART
6 N	BT-359967	△ TRANS POWER T2089[U]
7 N	BT-359969	△ TRANS POWER T2089[A,C]
8 N	BT-359971	△ TRANS POWER T2089[B,S]
9 N	BT-359970	△ TRANS POWER T2089[E,V]
10	EC-353388	C EC V CUT 04W 682M 16.0DC
11	ED-330319	△ D SILICON DBA10B 100/1.0A
12 N	ED-359992	D LED AY5608S AMBER
13	ED-347777	D LED BR5628S RED
14 N	ED-359974	D LED GL-103N5 GREEN
15 N	ED-359975	D LED GL-9PR23 RED
16 N	ED-363586	D LED GL-9PR23 RED
17	ED-349662	D SILICON DS135E-FA6 F10 100/1.0A
18	ED-301911	D SILICON H DS448
19	ED-344280	D SILICON H GMA-01-FY2 F05
20	ED-330989	D ZENER H HZ11 B2
21	ED-306320	D ZENER H HZ15 2
22	ED-337776	D ZENER H HZ3 C1
23	ED-305655	D ZENER H HZ4 B3
24	ED-306316	D ZENER H HZ5 C2
25	ED-346603	D ZENER H HZ6 A1
26	ED-319167	D ZENER H HZ6 C3
27	EF-359007	△ FUSE BET T 1.25A 250V[B]
28 N	EF-355385	△ FUSE BET T 310MA 250V[B]
29	EF-602550	△ FUSE SEMKO T 1.25A 250V[E,S]
30	EF-695766	△ FUSE SEMKO T 310MA 250V[E,S]
31	EF-327103	△ FUSE TSC A 250V 0.50A[U,J]
32	EF-311839	△ FUSE TSC A 250V 1.60A[U,J]
33	EF-309390	△ FUSE TSC 125V 0.50A[C,A]
34	EF-308847	△ FUSE TSC 125V 1.60A[C,A]
35	EH-336776	FILTER DB D07003K 100kHz
36	EH-354528	FILTER DB FX-100B
37 N	EH-359984	FILTER DOLBY T2089
38 N	EI-361561	IC BA3402
39	EI-330352	IC BA6109
40 N	EI-359985	IC CX20187
41	EI-349874	IC LB1245
42	EI-337008	IC LC7800
43	EI-357498	IC M51143AL
44	EI-337228	IC M5218L
45 N	EI-359990	IC TMP47C-46N
46	EI-349372	OSC CE CSA4.00MG 4MHz
47 N	EP-717856	SOLENOID PKA16122
48	ES-359606	△ SW SELECTOR 8T-41S0454 01-4
49 N	ES-717849	SW LEAF MSW-0058NBKP
50 N	ES-717844	SW PUSH
51 N	ES-717846	SW PUSH
52	ES-358581	SW PUSH J-U3065 01-1
53	ES-353296	SW SLIDE SSSY12031A 2-02-02N
54	ES-353708	SW SLIDE SSSY12083A 2-02-03N
55	ES-349367	SW TACT SKHHAK003A
56	ES-359988	SW TACT SKHHAN
57	ET-201580	△ TR 2SD894
58 N	ET-717850	PHOTO SENSOR NJL5141 W/PC BOARD
59 N	ET-717830	SENSOR PART
60 N	ET-717874	SENSOR PART NJL5146
61	ET-308472	TR 2SA1115 E,F,G F05
62	ET-355626	TR 2SA992 E,F
63	ET-352334	TR 2SB774 Q,R,S,T
64	ET-347143	TR 2SC1845 E,F
65	ET-308977	TR 2SC2274K F F05
66	ET-349705	TR 2SC2320 E,F,G
67	ET-308141	TR 2SC2603 G F05
68	ET-357845	TR 2SC3242A F,G F05
69	ET-349608	TR 2SC3383 T,U
70	ET-350795	TR 2SC3399 F05
71	ET-349592	TR 2SC3400 F05
72	ET-349366	TR 2SC3402 F05
73	ET-338324	TR 2SD1012-V H F05
74 N	ET-362113	△ TR 2SD1406 Y,GR
75	EV-356582	R S-FIX H RH0615CS4J 3P 473
76 N	EV-356679	R S-FIX H RH0615CW3J 3P 682
77	EV-344109	R S-FIX H RVF8P01 3P 102
78	EV-337995	R S-FIX H RVF8P01 3P 103
79	EV-337993	R S-FIX H RVF8P01 3P 203
80	EV-336785	R S-FIX H TM8KV2-1S 3P 0.50W 104
81 N	EV-359986	VR SLIDE 45P VJ4513 5B-15A503X2
82 N	HR-717826	HEAD COMBO ROTARY HADRH5558A
83 N	HR-717872	HEAD ROTARY HAYRH2407
84	MB-314722	BELT COUNTER
85 N	MB-717858	BELT MAIN
86 N	MI-717845	IDLER BLK
87 N	MP-717837	PINCH ROLLER PART (L)
88 N	MP-717835	PINCH ROLLER PART (R)
89 N	MZ-717853	GEAR CAM (B)

"NOTE" N: New Parts

MECHA I (REC/PB) BLOCK



1. MECHA I (REC/PB) BLOCK

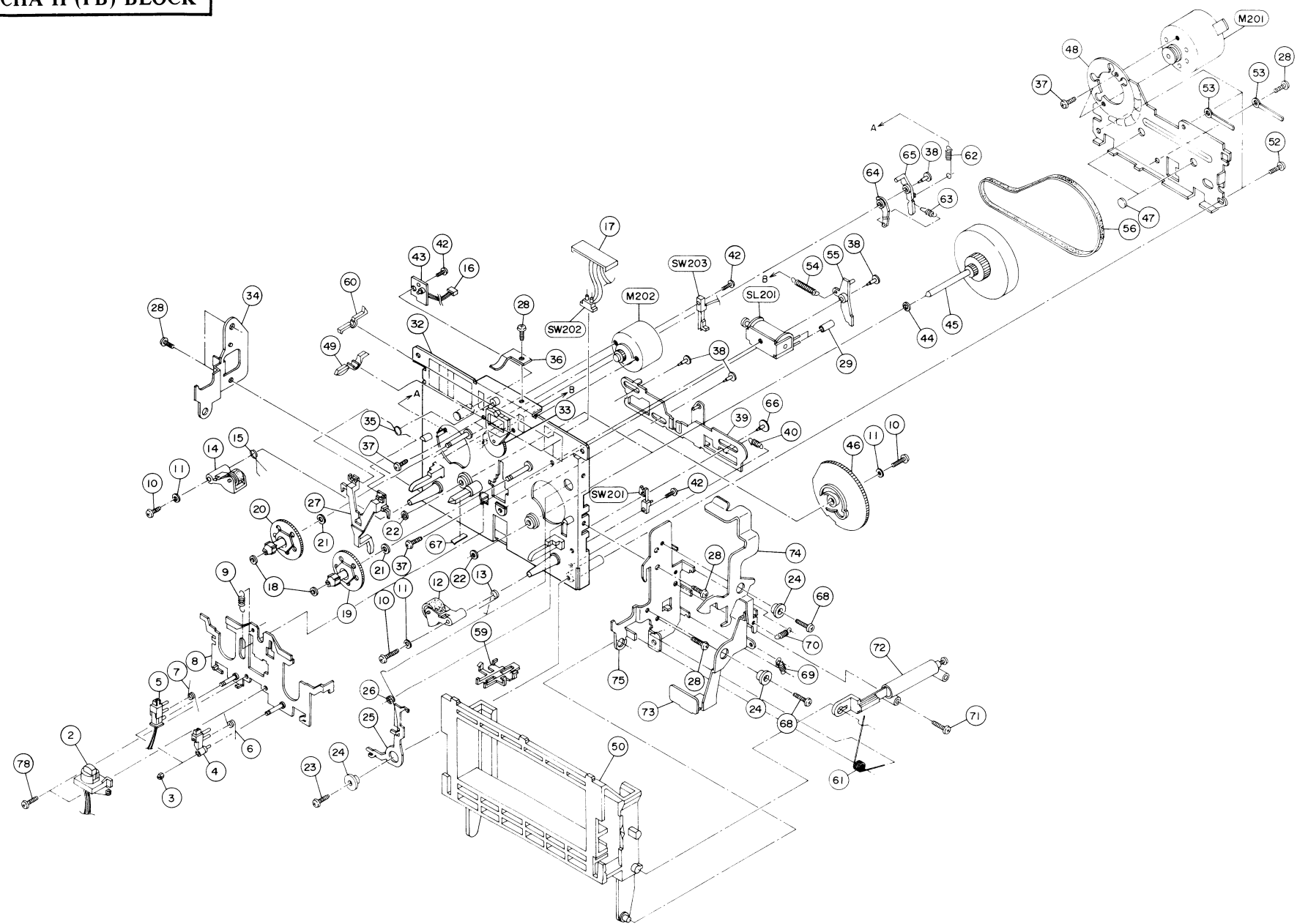
REF. NO.	PART NO.	DESCRIPTION
1-1	BB-359972	MECHA CMAY2Z027A
1-2	HR-717826	HEAD COMBO ROTARY HADRH5558A
1-2	ZW-717828	NUT ADJUSTMENT
1-4	MS-717829	GUIDE TAPE
1-5	ET-717830	SENSOR PART
1-6	ZG-717831	SP ADJUST (R)
1-7	ZG-717832	SP ADJUST (L)
1-9	ZG-717833	SP HEAD BASE
1-10	ZS-717834	SCREW 20×13
1-12	MP-717835	PINCH ROLLER PART (R)
1-13	ZG-717836	SP PINCH ROLLER (R)
1-14	MP-717837	PINCH ROLLER PART (L)
1-15	ZG-717839	SP PINCH ROLLER (L)
1-18	ZW-717841	WASHER PSL
1-19	BR-717842	REEL PART
1-20	BR-717843	REEL PART
1-22	ZW-704947	WASHER OIL SEAL
1-26	ZG-717875	SP ANTI EJECT (R)
1-33	MI-717845	IDLER BLK

REF. NO.	PART NO.	DESCRIPTION
1-35	ZG-717847	SP HOLD
1-36	ZG-717848	SP PLATE CASSETTE HOLDER
1-38	SB-704944	CAP
1-43	ET-717850	PHOTO SENSOR NJL5141 W/PC BOARD
1-45	BF-717852	FLY WHEEL PART
1-46	MZ-717853	GEAR CAM (B)
1-49	ML-717854	LEVER PACK DETECTION
1-50	ML-717855	LEVER METAL DETECTOR
1-55	ML-717857	ARM PALY PART
1-56	MB-717858	BELT MAIN
1-60	ML-717861	LEVER REC DETECTOR
1-61	ZG-717863	SP DOOR
1-62	ZG-717864	SP TURN
1-64	ML-717865	ARM (A)
1-65	ML-717866	ARM (B)
1-66	SB-717867	CAP
1-69	ZG-717868	SP LEVER (A)
1-70	ZG-717869	SP LEVER (B)
1-72	TC-706398	DAMPER ASSY

REF. NO.	PART NO.	DESCRIPTION
1-77	TC-717870	LID CASE
1-78	ZS-717825	SCREEN W/WASHER
1-M101	BM-717859	MOTOR CAPSTAN W/PULLEY MMA-6B2 LWF
1-M102	BM-717860	MOTOR REEL W/GEAR RF-500T
1-SW101	ES-717849	SW LEAF MSW-0058NBKP
1-SW102	ES-717844	SW PUSH
1-SW103	ES-717846	SW PUSH
1-SW104	ES-717846	SW PUSH
1-SW105	ES-717849	SW LEAF MSW-0058NBKP
1-SL101	EP-717856	SOLENOID PKA16122

NOTE
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

MECHA II (PB) BLOCK



2. MECHA II (PB) BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1	BB-359973	MECHA CMAY22028A
2-2	HR-717872	HEAD ROTARY HAYRH2407
2-3	ZW-717828	NUT ADJUSTMENT
2-4	MS-717829	GUIDE TAPE
2-5	ET-717874	SENSOR PART NJL5146
2-6	ZG-717831	SP ADJUST (R)
2-7	ZG-717832	SP ADJUST (L)
2-9	ZG-717833	SP HEAD BASE
2-10	ZS-717834	SCREW 20x13
2-12	MP-717835	PINCH ROLLER PART (R)
2-13	ZG-717836	SP PINCH ROLLER (R)
2-14	MP-717837	PINCH ROLLER PART (L)
2-15	ZG-717839	SP PINCH ROLLER (L)
2-18	ZW-717841	WASHER PSL
2-19	BR-717842	REEL PART
2-20	BR-717843	REEL PART
2-22	ZW-704947	WASHER OIL SEAL
2-26	ZG-717875	SP ANTI EJECT (R)

REF. NO.	PART NO.	DESCRIPTION
2-33	MI-717845	IDLER BLK
2-35	ZG-717847	SP HOLD
2-36	ZG-717848	SP PLATE CASSETTE HOLDER
2-38	SB-704944	CAP
2-43	ET-717850	PHOTO SENSOR NJL5141 W/PC BOARD
2-45	BF-717852	FLY WHEEL PART
2-46	MZ-717853	GEAR CAM (B)
2-49	ML-717871	LEVER PACK DETECTOR
2-50	TC-717870	LID CASE
2-55	ML-717857	ARM PLAY PART
2-56	MB-717858	BELT MAIN
2-60	ML-717861	LEVER REC DETECTOR
2-61	ZG-717863	SP DOOR
2-62	ZG-717864	SP TURN
2-64	ML-717865	ARM (A)
2-65	ML-717866	ARM (B)
2-66	SB-717867	CAP
2-69	ZG-717868	SP LEVER (A)

REF. NO.	PART NO.	DESCRIPTION
2-70	ZG-717869	SP LEVER (B)
2-72	TC-706398	DAMPER ASSY
2-78	ZS-717825	SCREW W/WASHER
2-M201	BM-717859	MOTOR CAPSTAN W/PULLEY MMA-6B2LWF
2-M202	BM-717860	MOTOR REEL W/GEAR RF-520T
2-SW201	ES-717849	SW LEAF MSW-0058NBKP
2-SW202	ES-717844	SW PUSH
2-SW203	ES-717849	SW LEAF MSW-0058NBKP
2-SL201	EP-717856	SOLENOID PKA16122

NOTE
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

3. PC BOARD BLOCK

REF. NO.	PART NO.	DESCRIPTION
3-1	BA-T2089A030A	PC PRE AMP BLK HX-M515W [U,J]
3-1A	BA-T2089A030B	PC PRE AMP BLK HX-M515W [C,A]
3-1B	BA-T2089A030C	PC PRE AMP BLK HX-M515W [E,B,S]
3-2	BA-T2089A040A	PC PRE AMP BLK HX-M515W

NOTE: PC PRE AMP BLK consists of following PC BOARDS.

- PRE AMP PC BOARD
- OPERATION TAPE 1 PC BOARD
- OPERATION TAPE 2 PC BOARD
- SW PC BOARD
- TR PC BOARD

4. PRE AMP PC BOARD

REF. NO.	PART NO.	DESCRIPTION
PRE AMP PC BOARD		
4-IC1	EI-361561	IC BA3402
4-IC2	EI-359985	IC CX20187
4-IC3	EI-337228	IC M5218L
4-IC4	EI-357498	IC M51143AL
4-TR1,2	ET-347143	TR 2SC1845
4-TR3	ET-355626	TR 2SA992 E,F
4-TR4	ET-349608	TR 2SC3383 T,U
4-TR5	ET-349705	TR 2SC2320 E,F,G
4-TR6 to 8	ET-349366	TR 2SC3402 F05
4-TR9	ET-308472	TR 2SA1115 E,F,G F05
4-TR10 to 15	ET-349592	TR 2SC3400 F05
4-TR16	ET-349366	TR 2SC3402 F05
4-TR17 to 24	ET-349608	TR 2SC3383 T,U
4-TR26 to 31	ET-362113	△ TR 2SD1406 Y,GR
4-TR32,33	ET-308977	TR 2SC2274K F F05
4-TR35 to 38	ET-308472	TR 2SA1115 E,F,G F05
4-TR39	ET-349366	TR 2SC3402 F05
4-TR40	ET-357845	△ TR 2SC3242A F,G F05
4-TR43	ET-308472	TR 2SA1115 E,F,G F05
4-TR44	ET-349608	△ TR 2SC3383 T,U
4-D1	ED-337776	D ZENER H HZ3 C1
4-D2	ED-330319	△ D SILICON DBA10B 100/1.0A
4-D3	ED-306320	D ZENER H HZ15 2
4-D4	ED-330319	△ D SILICON DBA10B 100/1.0A
4-D5	ED-349662	△ D SILICON DS135E-FA6 F10 100/1.0A
4-D6	ED-319167	D ZENER H HZ6 C3
4-D7	ED-346603	D ZENER H HZ6 A1
4-D8 to 10	ED-301911	D SILICON H DS448
4-D11	ED-330989	D ZENER H HZ11 B2
4-D12	ED-319167	D ZENER H HZ6 C3
4-SW1	ES-358581	SW PUSH J-U3065 01-1
4-VR1,2	EV-356582	R S-FIX H RH0615 CS4J 3P 473
4-VR3	EV-337993	R S-FIX H RVF8P01 3P 203
4-VR4	EV-337995	R S-FIX H RVF8P01 3P 103
4-VR5	EV-344109	R S-FIX H RVF8P01 3P 102
4-VR6	EV-336785	R S-FIX H TM8KV2-1S 3P 0.50W 104
4-FL1	EH-354528	FILTER DB FX-100B
4-FL2	EH-359984	FILTER DOLBY T2089
4-FL3	EO-356809	COIL FIX 1 100Z-121 100.00KC
4-FL4	EO-360140	COIL FIX 1 L-8 822J
4-FL5	EO-361913	COIL FIX 1 L-8
4-FL6	EH-336776	FILTER DB D07003K 100kHz
4-T1	EO-359575	COIL OSC1 32-5034-12
4-R30	ER-338228	R MF H F10 1/4W 104J
4-R37	ER-338224	R MF H F10 1/4W 392J
4-R38	ER-356247	R MF H F10 1/4W 2701G
4-R96,97	ER-359738	△ R OMF H S15 FS 1W 151J
4-C2	EC-314992	C STY V S05 CQFS 681J 50DC
4-C3	EC-306017	C STY V F05 CQ09S 221J 50DC
4-C4	EC-307494	C STY V F05 CQ09S 331J 50DC
4-C7	EC-361261	C EV V F05 SE 102M 6.3DC
4-C54	EC-347247	C MC V F05 FM 101J 500DC
4-C55	EC-326138	C PP V F10 APH 182J 630DC

REF. NO.	PART NO.	DESCRIPTION
4-C62	EC-352478	C EC V CUT SE 102M 25.0DC
4-C65	EC-362296	C EC V CUT 103M 25.0DC
4-C71	EC-320548	C CE V F 103Z 250AC
4-C71A	EC-338411	C CE V FZ 103P 400AC [E,B,S]
4-J1	EJ-336905	PIN J AJC-035-ACB P 4P

ASSEMBLY BLOCK

4-F1	EF-327103	△ FUSE TSC A 250V 0.50A [U,J]
4-F1A	EF-309390	△ FUSE TSC 125V 0.50A [C,A]
4-F1B	EF-695766	△ FUSE SEMKO T 310MA 250V [E,S]
4-F1C	EF-355385	△ FUSE BET T 310MA 250V [B]
4-F2	EF-311839	△ FUSE TSC A 250V 1.60A [U,J]
4-F2A	EF-308847	△ FUSE TSC 125V 1.60A [C,A]
4-F2B	EF-602550	△ FUSE SEMKO T 1.25A 250V [E,S]
4-F2C	EF-359007	△ FUSE BET T 1.25A 250V [B]

5. SYSCON PC BOARD

REF. NO.	PART NO.	DESCRIPTION
5-IC1,2	EI-337008	IC LC7800
5-IC3	EI-359990	IC TMP47C-46N
5-IC4	EI-349874	IC LB1245
5-IC5,6	EI-330352	IC BA6109
5-TR1	ET-308141	TR 2SC2603 G F05
5-TR2	ET-308472	TR 2SA1115 E,F,G F05
5-TR3,4	ET-308141	TR 2SC2603 G F05
5-TR5	ET-349366	TR 2SC3402 F05
5-TR6	ET-308141	TR 2SC2603 G F05
5-TR7	ET-308472	TR 2SA1115 E,F,G F05
5-TR8,9	ET-308141	TR 2SC2603 G F05
5-TR10	ET-349366	TR 2SC3402 F05
5-TR11	ET-308141	TR 2SC2603 G F05
5-TR12	ET-308472	TR 2SA1115 E,F,G F05
5-TR13	ET-308141	TR 2SC2603 G F05
5-TR14	ET-357845	TR 2SC3242A F,G F05
5-TR15	ET-349366	TR 2SC3402 F05
5-TR16,17	ET-308141	TR 2SC2603 G F05
5-TR18,19	ET-357845	TR 2SC3242A F,G F05
5-TR20	ET-349366	TR 2SC3402 F05
5-TR21	ET-338324	TR 2SD1012-V H F05
5-TR22	ET-349366	TR 2SC3402 F05
5-TR23	ET-308472	TR 2SA1115 E,F,G F05
5-TR24	ET-308141	TR 2SC2603 G F05
5-TR25	ET-308472	TR 2SA1115 E,F,G F05
5-TR26	ET-308141	TR 2SC2603 G F05
5-TR27	ET-357845	TR 2SC3242A F,G F05
5-TR28	ET-349366	TR 2SC3402 F05
5-TR29,30	ET-308141	TR 2SC2603 G F05
5-TR31,32	ET-357845	TR 2SC3242A F,G F05
5-TR33	ET-349366	TR 2SC3402 F05
5-TR34	ET-338324	TR 2SD1012-V H F05
5-TR35	ET-349366	TR 2SC3402 F05
5-TR36	ET-308472	TR 2SA1115 E,F,G F05
5-TR37,38	ET-350795	TR 2SC3399 F05
5-TR39,40	ET-308141	TR 2SC2603 G F05
5-TR41 to 43	ET-350795	TR 2SC3399 F05
5-TR44	ET-352334	TR 2SB774 Q,R,S,T
5-TR45	ET-350795	TR 2SC3399 F05
5-TR46	ET-352334	TR 2SB774 Q,R,S,T
5-TR47	ET-350795	TR 2SC3399 F05
5-TR48,49	ET-308141	TR 2SC2603 G F05
5-D1,2	ED-349662	D SILICON DS135E-FA6 F10 100/1.0A
5-D3	ED-305655	D ZENER H HZ4 B3
5-D4	ED-306316	D ZENER H HZ5 C2
5-D5	ED-305655	D ZENER H HZ4 B3
5-D6	ED-306316	D ZENER H HZ5 C2
5-D7 to 14	ED-344280	D SILICON H GMA-01-FY2 F05
5-D15	ED-301911	D SILICON H DS448
5-VR1,2	EV-356679	R S-FIX H RH0615CW3J 3P 682
5-VR3	EV-337993	R S-FIX H RVF8P01 3P 203
5-VR4	EV-337995	R S-FIX H RVF8P01 3P 103
5-VR5	EV-337993	R S-FIX H RVF8P01 3P 203
5-VR6	EV-337995	R S-FIX H RVF8P01 3P 103
5-X1	EI-349372	OSC CE CSA4.00MG 4MHz
5-R33	ER-321228	R CB H S15 FS RDS 1/2W 471J
5-R40	ER-306805	R CB H S15 FS RDS 1/2W 101J

REF. NO.	PART NO.	DESCRIPTION
5-R41	ER-363986	R OMF H S15 FS 2W 101J
5-R65	ER-321228	R CB H S15 FS RDS 1/2W 471J
5-R72	ER-306805	R CB H S15 FS RDS 1/2W 101J
5-R73	ER-363986	R OMF H S15 FS 2W 101J
5-R115 to 118	ER-361284	R OMF H S15 FS 2W 750J
5-J1,2	EJ-344368	PHONE J 3P HSJ0847-010 3.5

6. METER PC BOARD

REF. NO.	PART NO.	DESCRIPTION
METER PC BOARD		
6-IC101	EI-355388	IC IR2E27
6-TS101	ES-359988	SW TACT SKHHAN
6-TS102	ES-359988	SW TACT SKHHAN
6-VR101	EV-359986	VR SLIDE 45P VJ4513 5B-15A503X2

ASSEMBLY BLOCK

6-D901	ED-359974	D LED GL-103N5 GREEN
6-D902	ED-363586	D LED GL-9PR23 RED
6-D903	ED-363586	D LED GL-9PR23 RED
6-D904	ED-359975	D LED GL-9PR23 RED
6-D905	ED-359975	D LED GL-9PR23 RED

7. OPERATION TAPE 1 PC BOARD

REF. NO.	PART NO.	DESCRIPTION
7-D201	ED-359992	D LED AY5608S AMBER
7-D202	ED-359992	D LED AY5608S AMBER
7-D203	ED-347777	D LED BR5628S RED
7-TS201	ES-349367	SW TACT SKHHAK003A
7-TS202	ES-349367	SW TACT SKHHAK003A
7-TS203	ES-349367	SW TACT SKHHAK003A
7-TS204	ES-349367	SW TACT SKHHAK003A
7-TS205	ES-349367	SW TACT SKHHAK003A
7-TS206	ES-349367	SW TACT SKHHAK003A
7-TS207	ES-349367	SW TACT SKHHAK003A

8. OPERATION TAPE 2 PC BOARD

REF. NO.	PART NO.	DESCRIPTION
8-D301	ED-359992	D LED AY5608S AMBER
8-D302	ED-359992	D LED AY5608S AMBER
8-TS301	ES-349367	SW TACT SKHHAK003A
8-TS302	ES-349367	SW TACT SKHHAK003A
8-TS303	ES-349367	SW TACT SKHHAK003A
8-TS304	ES-349367	SW TACT SKHHAK003A
8-TS305	ES-349367	SW TACT SKHHAK003A

9. SW PC BOARD

REF. NO.	PART NO.	DESCRIPTION
9-SW401	ES-353296	SW SLIDE SSSY12031A 2-02-02N
9-SW402	ES-353708	SW SLIDE SSSY12083A 2-02-03N
9-SW403	ES-353708	SW SLIDE SSSY12083A 2-02-03N
9-SW404	ES-353708	SW SLIDE SSSY12083A 2-02-03N

10. TR PC BOARD

REF. NO.	PART NO.	DESCRIPTION
10-TR501	ET-201580	△ TR 2SD894

11. ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION
ASSEMBLY BLOCK		
11-1	SA-202118	FOOT
11-2	ZS-351186	ST BR30X08STL CMT C080 (FOOT FIX)
11-3	EZ-200473	SILICON RUBBER SHEET TC-30 (FOR TR501)
11-4	ZS-314702	ST BID40X10STL CMT (TRANS POWER FIX)
11-5x	ZW-273914	SW40 (TRANS POWER FIX)
11-6	EW-347604	△ AC CORD 2 CORES VM1165B J [J]
11-6A	EW-347683	△ AC CORD 2 CORES VM0129A,VFF-CB U/T [U]
11-6B	EW-348215	△ AC CORD 2 CORES KP10,SPT1 105CCB UC [C,A]
11-6C	EW-347682	△ AC CORD 2 CORES VM0364,FC3097-CB EV [E]
11-6D	EW-347680	△ AC CORD 2 CORES LCFL2X0.75-CB B [B]
11-6E	EW-347681	△ AC CORD 2 CORES VM0436,FC3093-CB S [S]
11-7	MZ-359935	JOINT POWER
11-8	ZS-352133	ST BR30X10STL CMT [U]
11-9	ZS-350934	PT BR30X08STL BNI
11-10	MC-364134	COUNTER MK-397-032
11-11	ZS-336614	PT PAN26X08STL CMT (COUNTER FIX)
11-12	MB-314722	BELT COUNTER S223M
11-13	SP-359800K	PANEL REAR HX-M515W [J]
11-13A	SP-359800F	PANEL REAR HX-M515W [U]
11-13B	SP-359800G	PANEL REAR HX-M515W [C,A]
11-13C	SP-359800H	PANEL REAR HX-M515W [E,V]
11-13D	SP-359800J	PANEL REAR HX-M515W [B,S]
11-14	ZS-354403	ST BR30X08STL BNI (PANEL REAR FIX)
11-15	ZS-323993	PT BR30X10STL CMT (MECHA BLK FIX)
11-T901	BR-359968	△ TRANS POWER T2089 [J]
11-T901A	BT-359967	△ TRANS POWER T2089 [U]
11-T901B	BT-359969	△ TRANS POWER T2089 [A,C]
11-T901C	BT-359970	△ TRANS POWER T2089 [E,V]
11-T901D	BT-359971	△ TRANS POWER T2089 [B,S]
11-VS901	ES-359606	△ SW SELECTOR 8T-41S0454 01-4 [U]

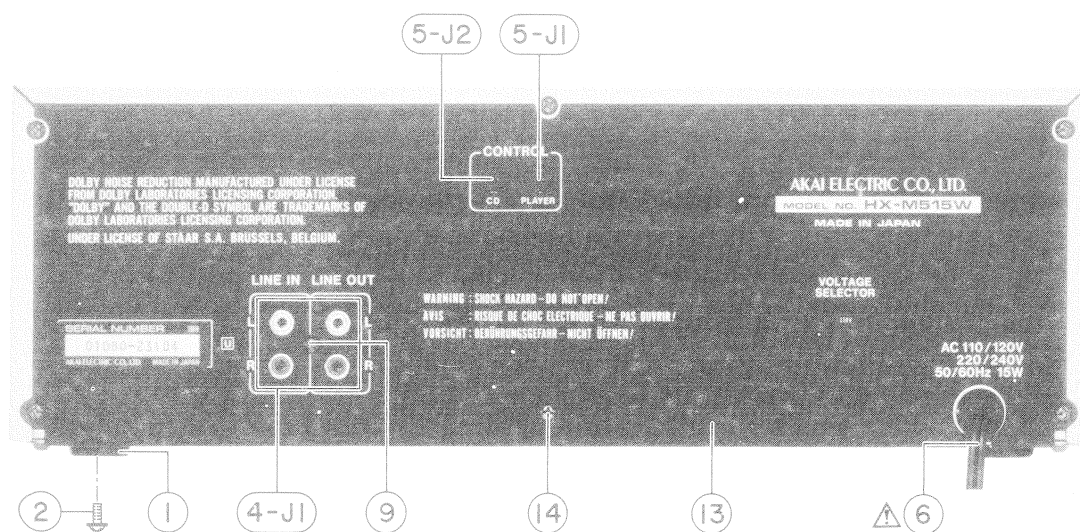
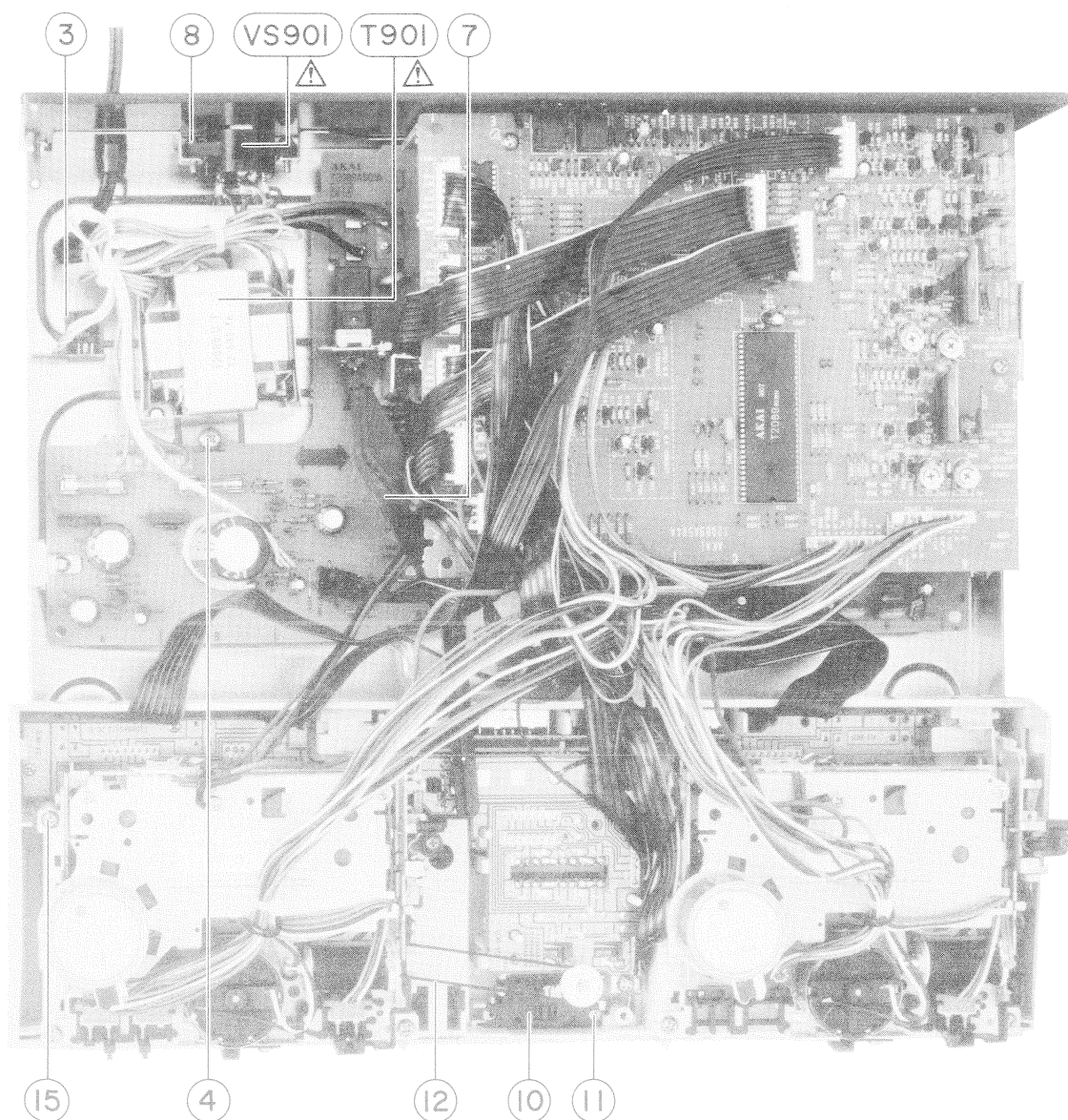
PRE AMP PC BOARD

4-J1	EJ-336905	PIN J AJC-035-ACB P 4P
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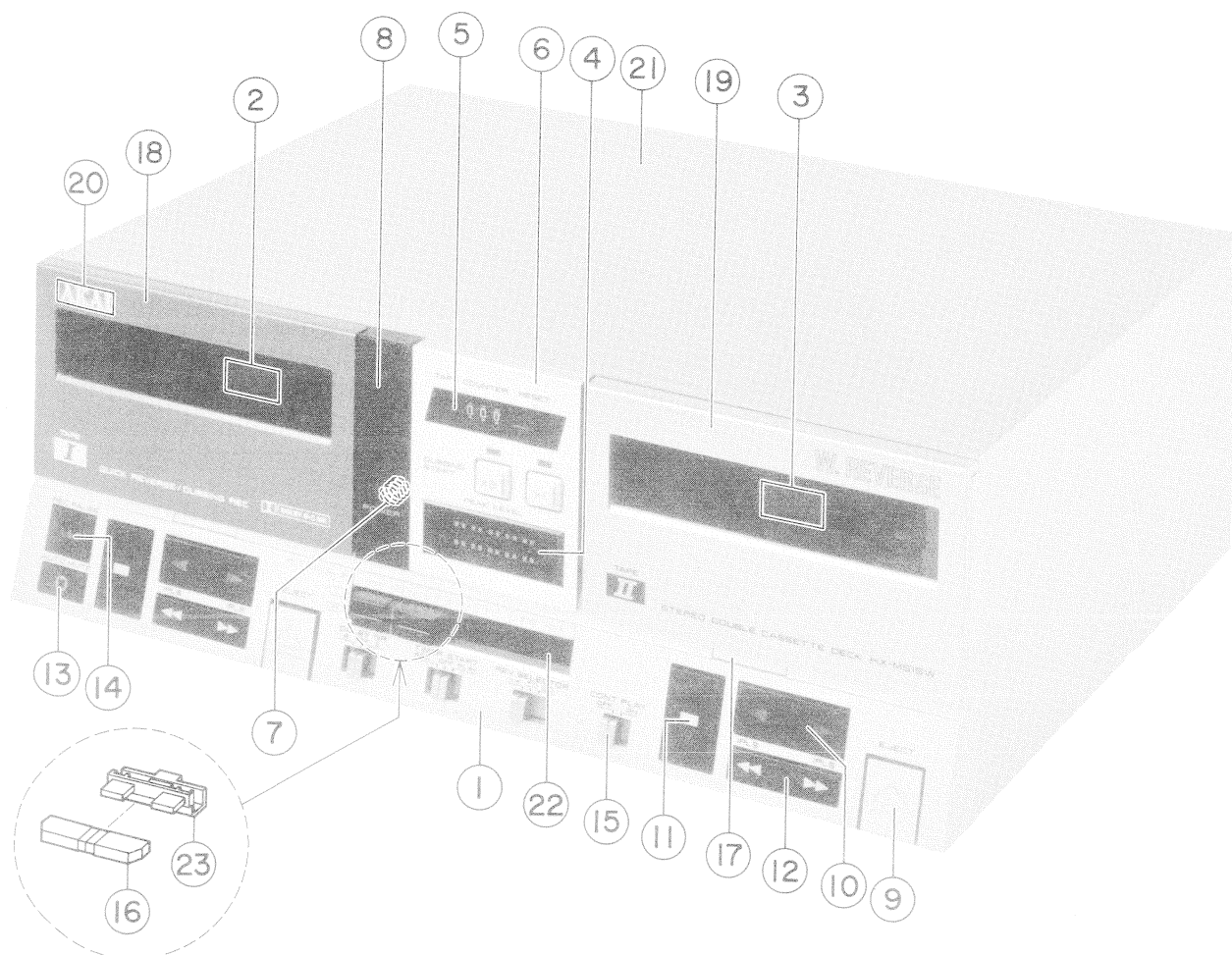
SYSCON PC BOARD

5-J1	EJ-344368	PHONE J 3P HSJ0847-010 3.50
5-J2	EJ-344368	PHONE J 3P HSJ0847-010 3.50

ASSEMBLY BLOCK



FINAL ASSEMBLY BLOCK



12. FINAL ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION
PANEL FRONT BLOCK		
12-1	BD-T2089A020A	PANEL FRONT BLK HX-M515W
12-1-B	BD-T2089A020B	PANEL FRONT BLK HS-M515W-B
12-2	SZ-357722	REFLECTOR
12-3	SZ-359780	REFLECTOR (B)
12-4	SZ-359923	WINDOW METER
12-5	SZ-359790	WINDOW COUNTER
12-6	SP-359927A	PANEL SUB
12-6-B	SP-359927B	PANEL SUB-B
12-7	ZG-313186	SP C-04.5/0.40-31.5 C-033
12-8	SK-359797A	KNOB POWER
12-9	SK-359928A	KNOB EJECT
12-9-B	SK-359928B	KNOB EJECT (B)
12-10	SK-B359925A	KNOB OPERATION PLAY PART
12-11	SK-359925B	KNOB OPERATION STOP
12-11-B	SK-359925C	KNOB OPERATION STOP-B
12-12	SK-359925D	KNOB OPERATION FAST
12-12-B	SK-359925E	KNOB OPERATION FAST-B
12-13	SK-362289A	KNOB OPERATION MUTE
12-14	SK-B364455	KNOB OPERATION REC PART

FINAL ASSEMBLY BLOCK

12-15	SK-359929A	KNOB SLIDE
12-15-B	SK-359929B	KNOB SLIDE-B

REF. NO.	PART NO.	DESCRIPTION
12-16	SK-345270	KNOB REC CAP
12-17	SC-359931A	COVER AZIMUTH
12-17-B	SC-359931B	COVER AZIMUTH-B
12-18	BD-B359802C	LID (1) HX-M515W PART
12-18-B	BD-B359802D	LID (1)-B HX-M515W PART
12-19	BD-B359803C	LID (2) HX-M515W PART [J]
12-19A	BD-B359803E	LID (2) HX-M515W (U) PART [EXCEPT J]
12-19-B	BD-B359803D	LID (2)-B HX-M515W PART [J]
12-19A-B	BD-B359803F	LID (2)-B HX-M515W PART [EXCEPT J]
12-20	SM-361028	NAME PLATE
12-20-B	SM-361028B	NAME PLATE (B)
12-21	SP-359798A	COVER UPPER
12-21-B	SP-359798B	COVER UPPER-B
12-22	SE-359924	ESCUTCHEON VR
12-23	ML-359930	LEVER REC VR

SYMBOL FOR COLOR VARIATION

NON: STANDARD COLOR

-B: BLACK

NOTE : PANEL FRON BLOCK includes 12-2 to 12-14.

INDEX

PART- NO.	REF. NO.	PART- NO.	REF. NO.	PART- NO.	REF. NO.	PART- NO.	REF. NO.	PART- NO.	REF. NO.
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BA-T2089A030B	3-1A	EI-337008	5-IC1	ET-308141	5-TR17	EV-337995	4-VR4	SZ-359923	12-4
BA-T2089A030C	3-1B	EI-337008	5-IC2	ET-308472	4-TR9	EV-337995	5-VR6	TC-706398	1-72
BA-T2089A040A	3-2	EI-337228	4-IC3	ET-308472	4-TR36	EV-337995	5-VR4	TC-706398	2-72
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BD-B359803D	12-19-B	EI-359990	5-IC3	ET-308472	5-TR23	EV-359986	6-VR101	ZG-717832	1-7
BD-B359803E	12-19A	EI-361561	4-IC1	ET-308472	5-TR36	EW-347604	11-6	ZG-717832	2-7
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BF-717852	2-45	EO-359575	4-T1	ET-308977	4-TR32	EW-348215	11-6B	ZG-717839	1-15
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BM-717859	2-M201	EO-361913	4-FL5	ET-338324	5-TR21	HR-717826	1-2	ZG-717847	1-35
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BR-717842	1-19	ER-306805	5-R72	ET-349366	4-TR8	MB-717858	2-56	ZG-717863	1-61
BR-717842	2-19	ER-321228	5-R65	ET-349366	4-TR11	MC-364134	11-10	ZG-717863	2-61
BR-717843	1-20	ER-321228	5-R33	ET-349366	4-TR16	MI-717845	1-33	ZG-717864	1-62
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EC-307494	4-C4	ER-361284	5-R118	ET-349366	5-TR35	ML-717861	1-60	ZG-717875	2-26
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EC-352478	4-C62	ES-349367	7-TS207	ET-349608	4-TR44	ML-717871	2-49	ZS-352133	11-8
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ED-301911	4-D8	ES-349367	7-TS204	ET-349705	4-TR22	MP-717837	2-14	ZS-717834	1-10
ED-301911	4-D9	ES-349367	7-TS201	ET-349705	4-TR5	MS-717829	1-4	ZS-717834	2-10
ED-301911	5-D15	ES-349367	8-TS304	ET-349705	4-TR18	MS-717829	2-4	ZW-273914	11-5x
ED-305655	5-D3	ES-349367	8-TS305	ET-349705	4-TR20	MZ-359935	11-7	ZW-704947	1-22
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ED-344280	5-D10	ES-717849	2-SW203	ET-350795	5-TR38	SK-359925E	12-12-B		
ED-346603	4-D7	ES-717849	2-SW201	ET-352334	5-TR46	SK-359928A	12-9		
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ED-349662	4-D5	ET-308141	5-TR3	ET-355626	4-TR3	SK-359929A	12-15		
ED-349662	5-D1	ET-308141	5-TR4	ET-357845	4-TR40	SK-359929B	12-15-B		
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ED-359992	8-D302	ET-308141	5-TR39	ET-717830	1-5	SP-359800H	11-13C		
ED-363586	6-D903	ET-308141	5-TR48	ET-717850	1-43	SP-359800J	11-13D		
ED-363586	6-D902	ET-308141	5-TR9	ET-717850	2-43	SP-359800K	11-13		
EH-336776	4-FL6	ET-308141	5-TR1	ET-717874	2-5	SP-359927A	12-6		
EH-354528	4-FL1	ET-308141	5-TR49	EV-336785	4-VR6	SP-359927B	12-6-B		
EH-359984	4-FL2	ET-308141	5-TR40	EV-337993	4-VR3	SZ-357722	12-2		
EI-330352	5-IC5	ET-308141	5-TR11	EV-337993	5-VR5	SZ-359780	12-3		

ABBREVIATIONS FOR SERVICE MANUAL (CASSETTE)

Abbreviation	Explanation	Abbreviation	Explanation
AC	Alternating Current	MIN	MINute
A/D	Analog/Digital	MML	Maximum Modulation Level
AF	Auto Fader	MOL	Maximum Output Level
AMP	AMPlifier	MPX	Multi PleX
AR	Anti Recording	NC	Not Connected (No Connection)
AT BIAS	Auto Tuning BIAS	NFB	Negative Feed Back
ATT	ATTenuator	NORM	NORMal
BAL	BALance	NR	Noise Reduction
BEF	Band Elimination Filter	OSC	OSCillator (OSCillation)
BSS	Blank Search System	P	Pulse
CAP M	CAPsTan Motor	PB	Play Back
CH	CHannel	QMSS	Quick Memory Search System
COMP	COMParator	QR	Quick Reverse
CONT	CONTinuance	R CH	Right CHannel
CRLP	Computer Recording Level Process- ing	REC	RECORD (RECORDing)
CS	Chip Select	REV	REVERSE
D/A	Digital/Analog	ROT	ROTation
DC	Direct Current	REW	REWind
DET	DETECTOR	SEC	SECOnd
DISCRI	DISCRIminator	SELE	SELEctor
DUB	DUBbing	SENS	SENSitivity
EQ	EQUALizer	SEPP	Single Ended Push Pull
FF(or F.FWD)	Fast Forward	SIG	SIGNal
FLD	FLUorescent Display	SPECT	SPECTrum
FREQ	FREQUENCY	STD	STANDARD
FWD	FORWARD	SW	SWitch
GND	GROUNd	SYSCON	SYSTEM CONTROL
H	High	TP	Test Point
HPF	High Pass Filter	TRIG	TRIGa
IND	INDicator	VCA	Voltage Control Attenuator
IPLS	Instant Program Location System	VOL	VOLUME
L	Low	VOLT	VOLTage
L CH	Left CHannel	VR	Variable Resistor
LED	Light Emitting Diode	X'TAL	cysTAL
MEMO	MEMOry	X1	Normal speed
MICOM	MicroCOMputer	X2	Dubble speed

AKAI

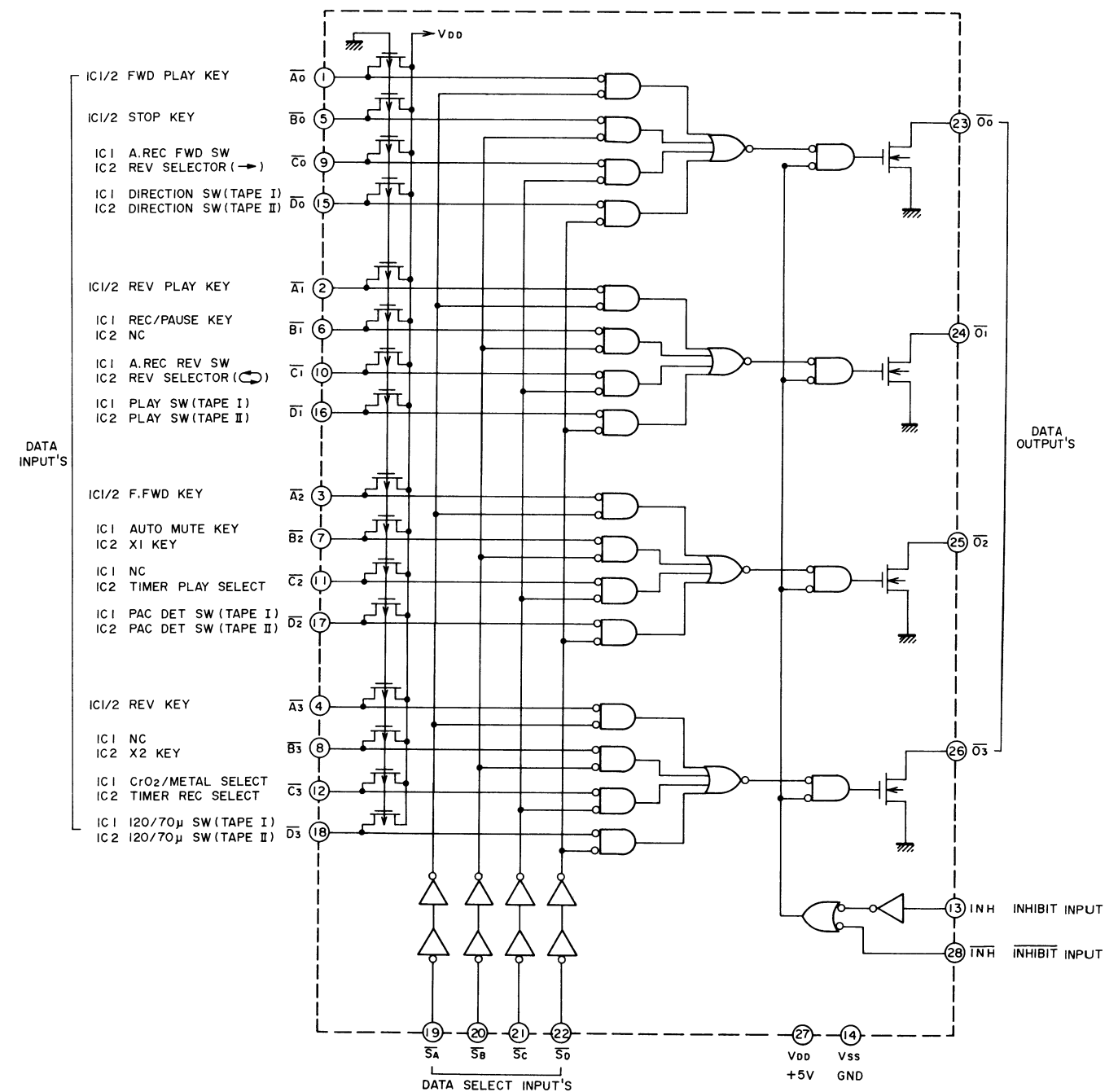
MODEL HX-M515W

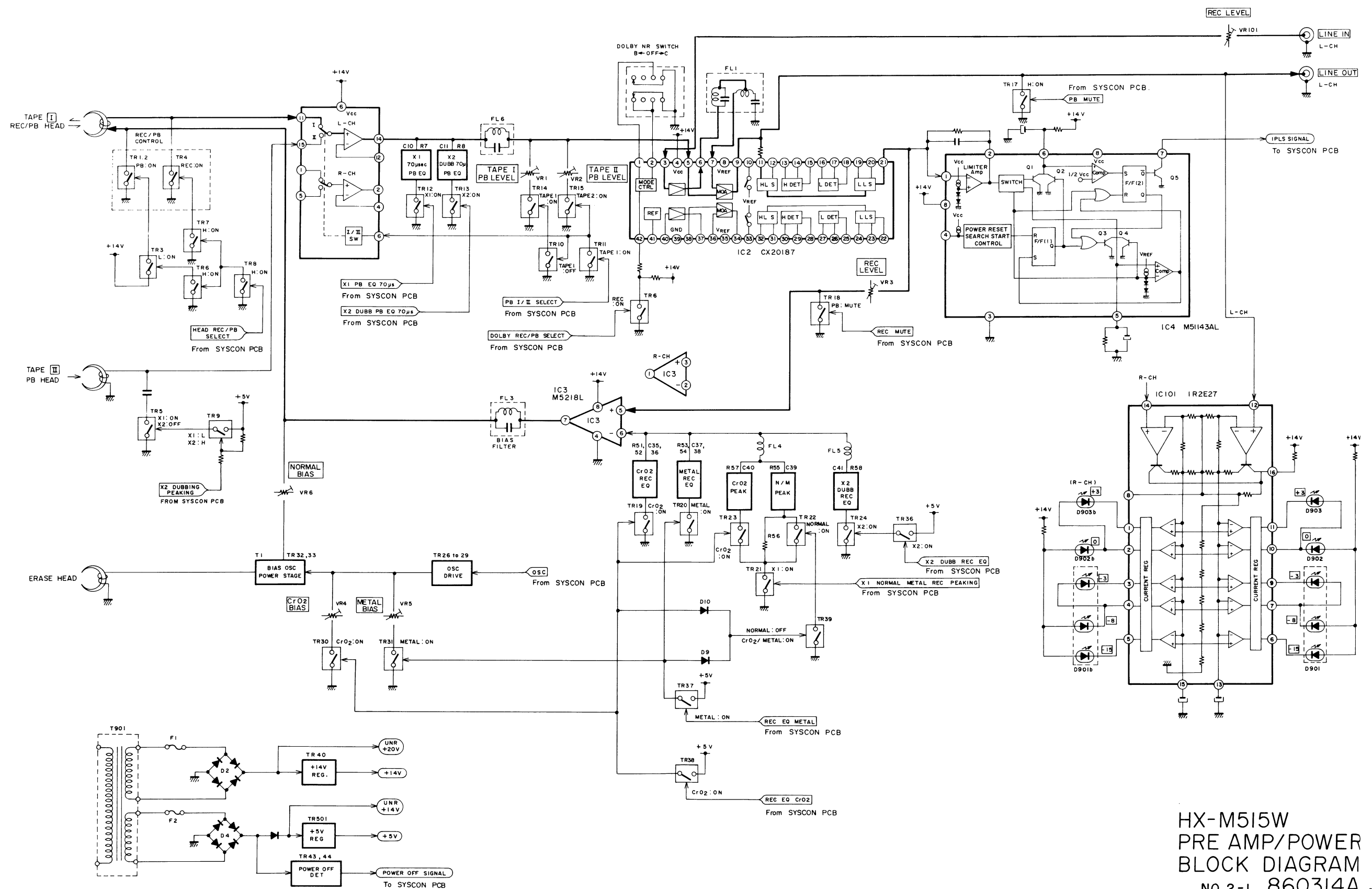
SCHEMATIC DIAGRAM AND PC BOARDS

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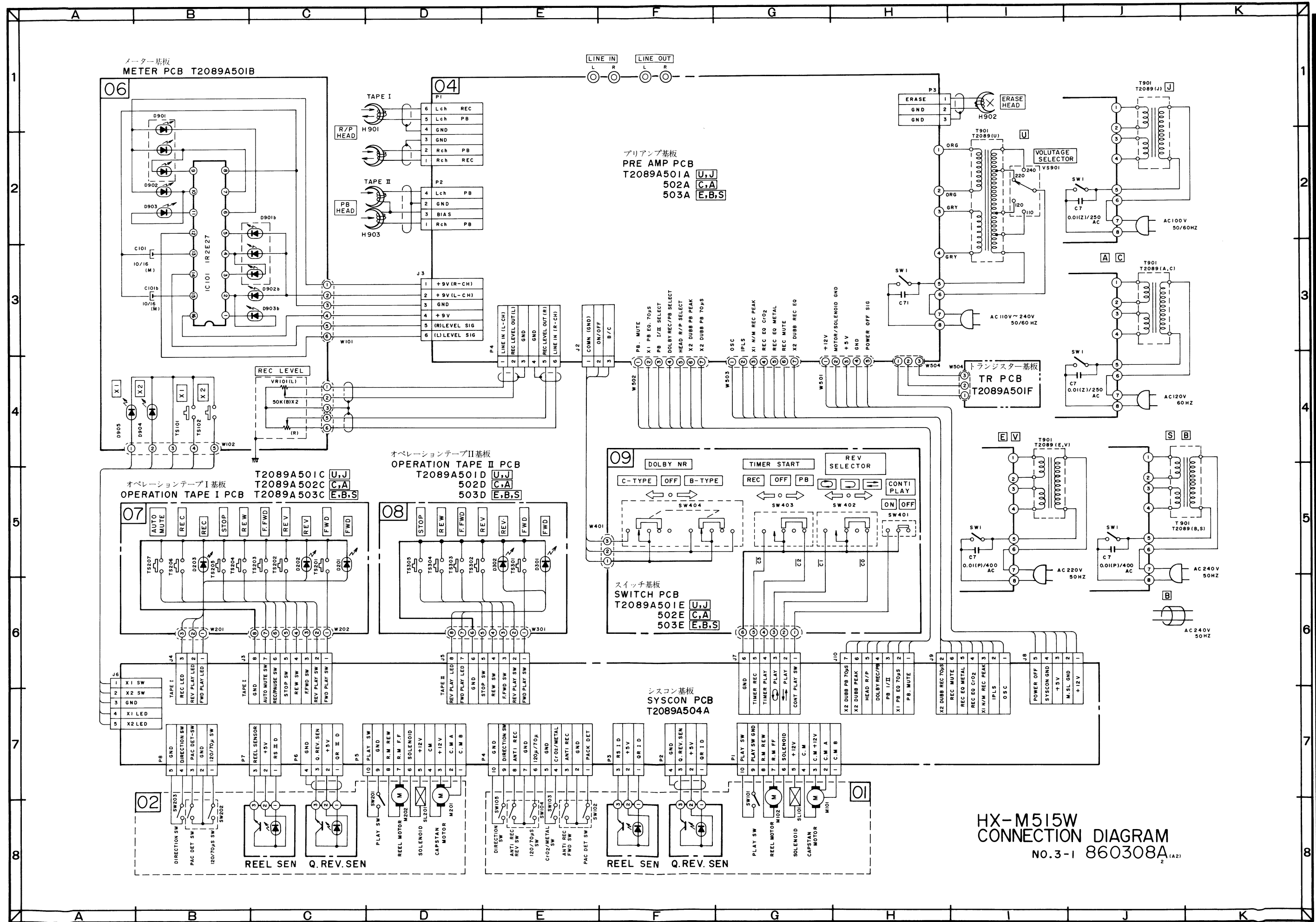
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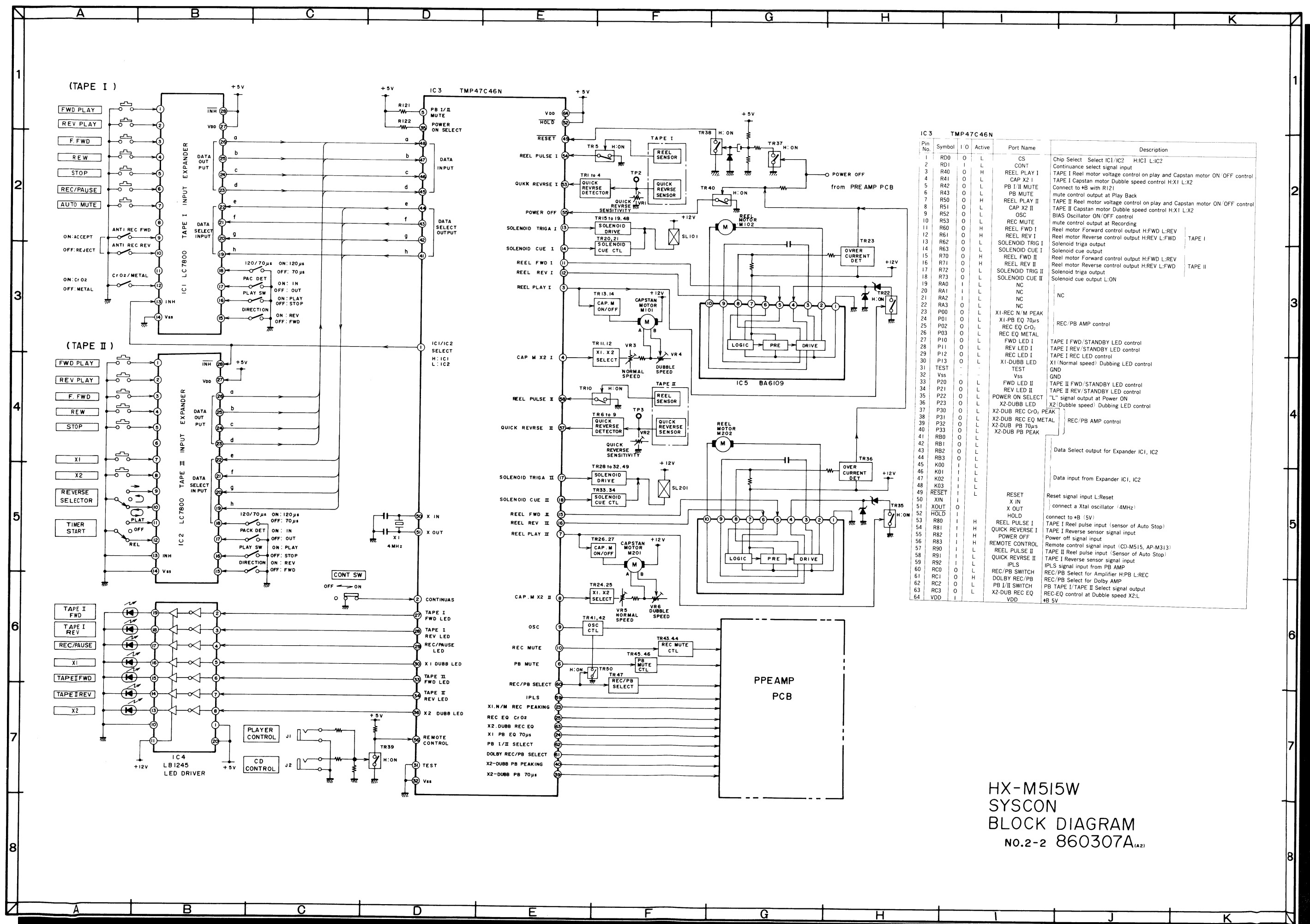
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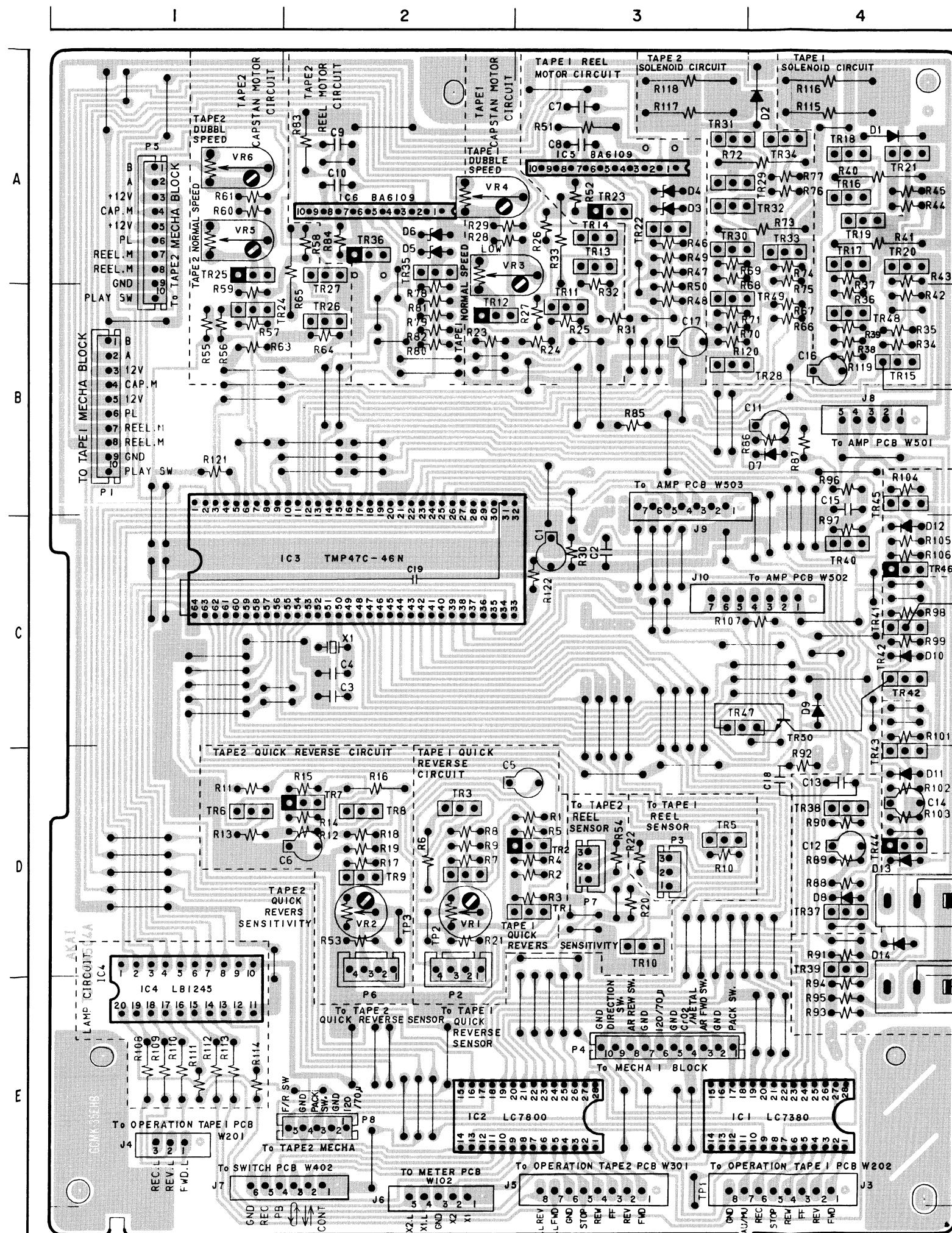
HX-M515W
PRE AMP/POWER
BLOCK DIAGRAM
NO.2-1 860314A₂₁





Pin No.	Symbol	I/O	Active	Port Name	Description
1	R00	O	L	CS	Chip Select Select IC1/IC2 H:IC1 L:IC2
2	R01	I	L	CONT	Continuance select signal input
3	R40	O	H	REEL PLAY I	TAPE I Reel motor voltage control on play and Capstan motor ON/OFF control
4	R41	O	L	CAP X2 I	TAPE I Capstan motor Double speed control H:X1 L:X2
5	R42	O	L	PB I/II MUTE	Connect to #B with R121
6	R43	O	L	PB MUTE	Mute control output at Play Back
7	R50	O	H	REEL PLAY II	TAPE II Reel motor voltage control on play and Capstan motor ON/OFF control
8	R51	O	L	CAP X2 II	TAPE II Capstan motor Double speed control H:X1 L:X2
9	R52	O	L	OSC	BIAS Oscillator ON/OFF control
10	R53	O	L	REC MUTE	Mute control output at Recording
11	R60	O	H	REEL FWD I	Reel motor Forward control output H:FWD L:REV
12	R61	O	H	REEL REV I	Reel motor Reverse control output H:REV L:FWD
13	R62	O	L	SOLENOID TRIG I	SOLENOID TRIGA output
14	R63	O	L	SOLENOID CUE I	SOLENOID CUE output
15	R70	O	H	REEL FWD II	Reel motor Forward control output H:FWD L:REV
16	R71	O	H	REEL REV II	Reel motor Reverse control output H:REV L:FWD
17	R72	O	L	SOLENOID TRIG II	SOLENOID TRIGA output
18	R73	O	L	SOLENOID CUE II	SOLENOID CUE output
19	RA0	I	L	NC	
20	RA1	I	L	NC	
21	RA2	I	L	NC	
22	RA3	I	L	NC	
23	P00	O	L	X1-REC N/M PEAK	REC/PB AMP control
24	P01	O	L	X1-PB EQ 70µs	
25	P02	O	L	REC EQ CR02	
26	P03	O	L	REC EQ METAL	
27	P10	O	L	FWD LED I	TAPE I FWD/STANDBY LED control
28	P11	O	L	REV LED I	TAPE I REV/STANDBY LED control
29	P12	O	L	REC LED I	TAPE I REC LED control
30	P13	O	L	X1-DUBB LED	X1(Normal speed) Dubbing LED control
31	TEST	-	-	TEST	
32	VSS	-	-	GND	
33	P20	O	L	FWD LED II	TAPE II FWD/STANDBY LED control
34	P21	O	L	REV LED II	TAPE II REV/STANDBY LED control
35	P22	O	L	POWER ON SELECT	"L" signal output at Power ON
36	P23	O	L	X2-DUBB LED	X2(Dubbing speed) Dubbing LED control
37	P30	O	L	X2-DUBB REC CR02 PEAK	REC/PB AMP control
38	P31	O	L	X2-DUBB REC EQ METAL	
39	P32	O	L	X2-DUBB PB 70µs	
40	P33	O	L	X2-DUBB PB PEAK	
41	R80	O	L	NC	
42	R81	O	L	NC	
43	R82	O	L	NC	
44	R83	O	L	NC	
45	K00	I	L	NC	
46	K01	I	L	NC	
47	K02	I	L	NC	
48	K03	I	L	NC	
49	RESET	I	L	RESET	Reset signal input L:Reset
50	XIN	I	L	X IN	connect a Xtal oscillator (4MHz)
51	XOUT	O	L	X OUT	connect to #B (5V)
52	HOLD	I	L	HOLD	
53	R80	I	H	REEL PULSE I	TAPE I Reel pulse input (sensor of Auto Stop)
54	R81	I	H	QUICK REVERSE I	TAPE I Reverse sensor signal input
55	R82	I	H	POWER OFF	Power off signal input
56	R83	I	H	REMOTE CONTROL	Remote control signal input (CD-M515, AP-M313)
57	R90	I	L	REEL PULSE II	TAPE II Reel pulse input (Sensor of Auto Stop)
58	R91	I	L	QUICK REVERSE II	TAPE II Reverse sensor signal input
59	R92	I	L	IPLS	IPLS signal input from PB AMP
60	RC0	O	L	REC/PB SWITCH	REC/PB Select for Amplifier H:PB L:REC
61	RC1	O	H	DOLBY REC/PB	REC/PB Select for Dolby AMP
62	RC2	O	L	PB I/II SWITCH	PB TAPE I/TAPE II Select signal output
63	RC3	O	L	X2-DUBB REC EQ	REC-EQ control at Dubbing speed X2:L
64	VDD	I	L	VDD	#B 5V

HX-M515W
SYSCON
BLOCK DIAGRAM
No.2-2 860307A (A2)



B
 = PNP TRANSISTOR
 = NPN TRANSISTOR

2SC3242A (F,G)

2SB774 (Q,R,S,T)

2SA1115 (E,F,G)
 2SC2603(G)
 2SC3399
 2SC3402
 2SD1012-V(H)

J2
 CD CONTROL JACK

J1
 PLAYER CONTROL JACK

LOCATION OF COMPONENTS

TR's
 TR1---D3
 TR2---D3
 TR3---D2
 TR4---D2
 TR5---D3
 TR6---D1
 TR7---D2
 TR8---D2
 TR9---D2
 TR10---D3
 TR11---B3
 TR12---B2
 TR13---A3
 TR14---A3
 TR15---B4
 TR16---A4
 TR17---A4
 TR18---A4
 TR19---A4
 TR20---A4
 TR21---A4
 TR22---A3
 TR23---A3
 TR24---B1
 TR25---A1
 TR26---B1
 TR27---A2
 TR28---B3
 TR29---A3
 TR30---A3
 TR31---A3
 TR32---A3
 TR33---A4
 TR34---A4
 TR35---A2
 TR36---A2
 TR37---D4
 TR38---D4
 TR39---D4
 TR40---C4
 TR41---C4
 TR42---C4
 TR43---D4
 TR44---D4
 TR45---B4
 TR46---C4
 TR47---C3
 TR48---B4
 TR49---B3

IC's
 IC1---E4
 IC2---E3
 IC3---C2
 IC4---E1
 IC5---A3
 IC6---A2

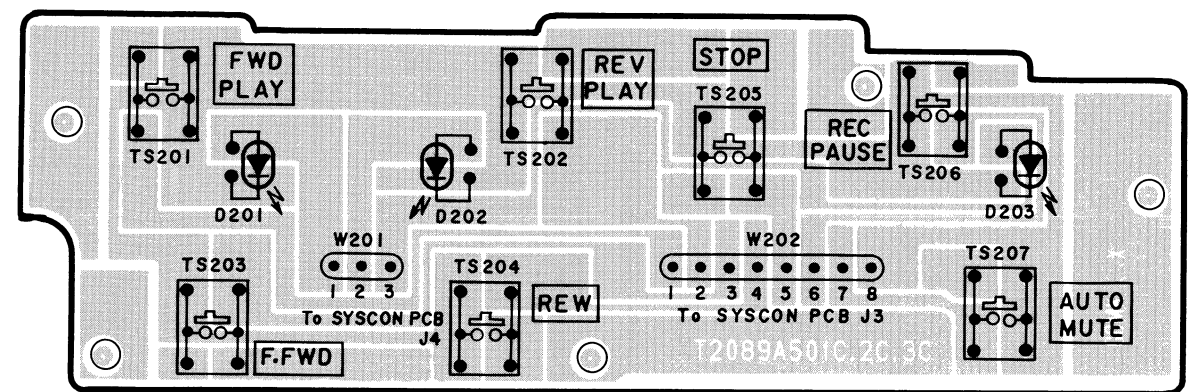
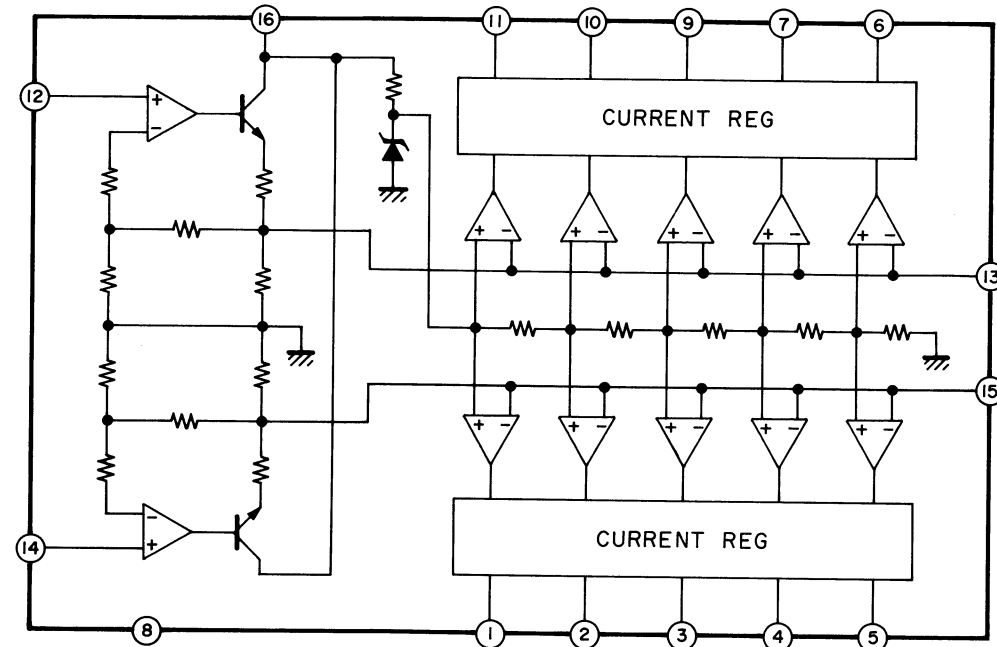
CONNECTORS

J3---E4
 J4---E1
 J5---E3
 J6---E2
 J7---E2
 J8---B4
 J9---B3
 J10---C4
 P1---B1
 P2---D2
 P3---D3
 P4---E3
 P5---A1
 P6---D2
 P7---D3
 P8---E2

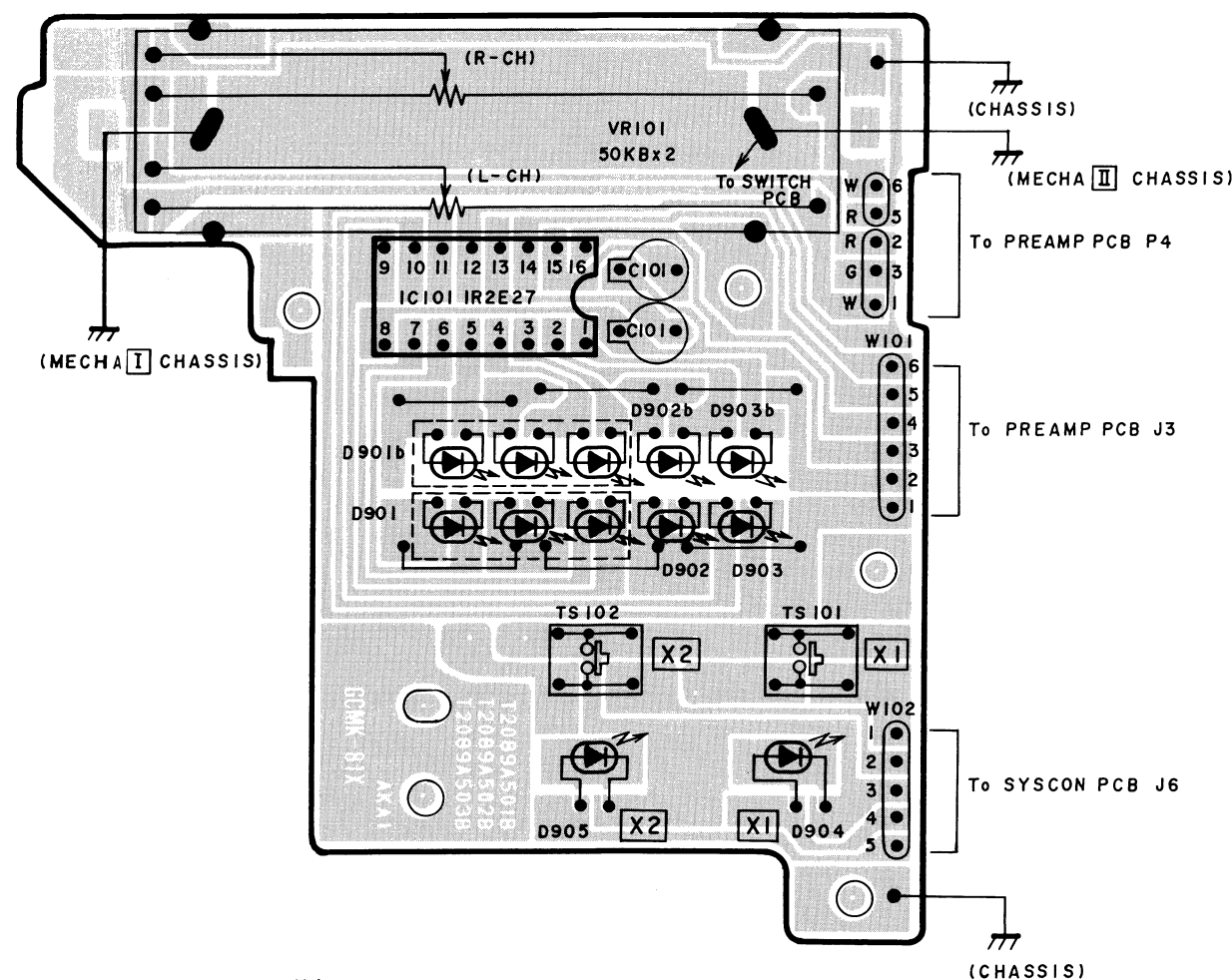
VR.NO.	LOCATION	ADJUSTMENT'S ITEM
VR1	D2	TAPE I QUICK REVERSE SENSITIVITY テープIクイックリバース感度
VR2	D2	TAPE II QUICK REVERSE SENSITIVITY テープIIクイックリバース感度
VR3	A2	TAPE I NORMAL SPEED テープI標準テープスピード
VR4	A2	TAPE I DUBBLE SPEED テープI倍速テープスピード
VR5	A1	TAPE II NORMAL SPEED テープII標準テープスピード
VR6	A1	TAPE II DUBBLE SPEED テープII倍速テープスピード

TR1,3,4,6,8,9,11,13,16,17,24,26,29,30
 39,40,48,49---2SC2103(G)
 TR2,7,12,23,25,36---2SA1115(E,F,G)
 TR5,10,15,20,22,28,33,35---2SC3399
 TR14,18,19,27,31,32---2SC3242A(F,G)
 TR21,34---2SD1012-V(H)
 TR37,38,41,42,43,45,47---2SC3399
 TR44,46---2SB774(Q,R,S,T)

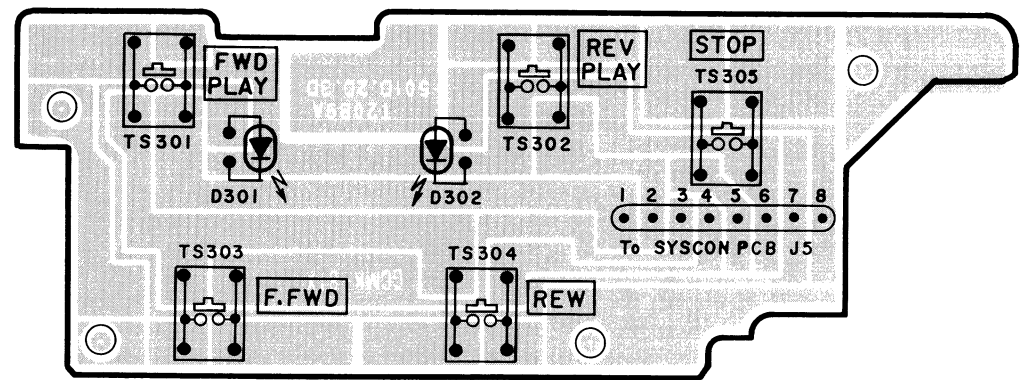
IR2E27A



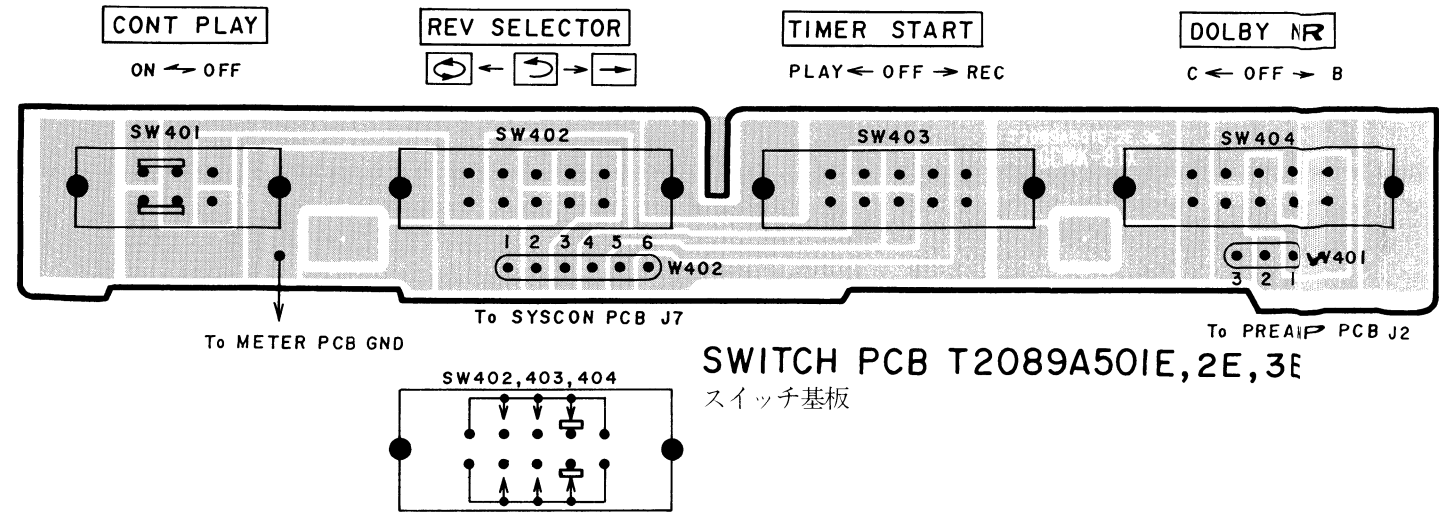
OPERATION TAPE I PCB T2089A501C, 2C, 3C
オペレーションテープI 基板



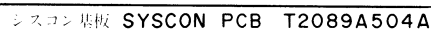
メーター基板
METER PCB T2089A501B, 2B, 3B



OPERATION TAPE II PCB T2089A501D, 2D, 3D
オペレーションテープII 基板



SWITCH PCB T2089A501E, 2E, 3E
スイッチ基板





HX-M515W

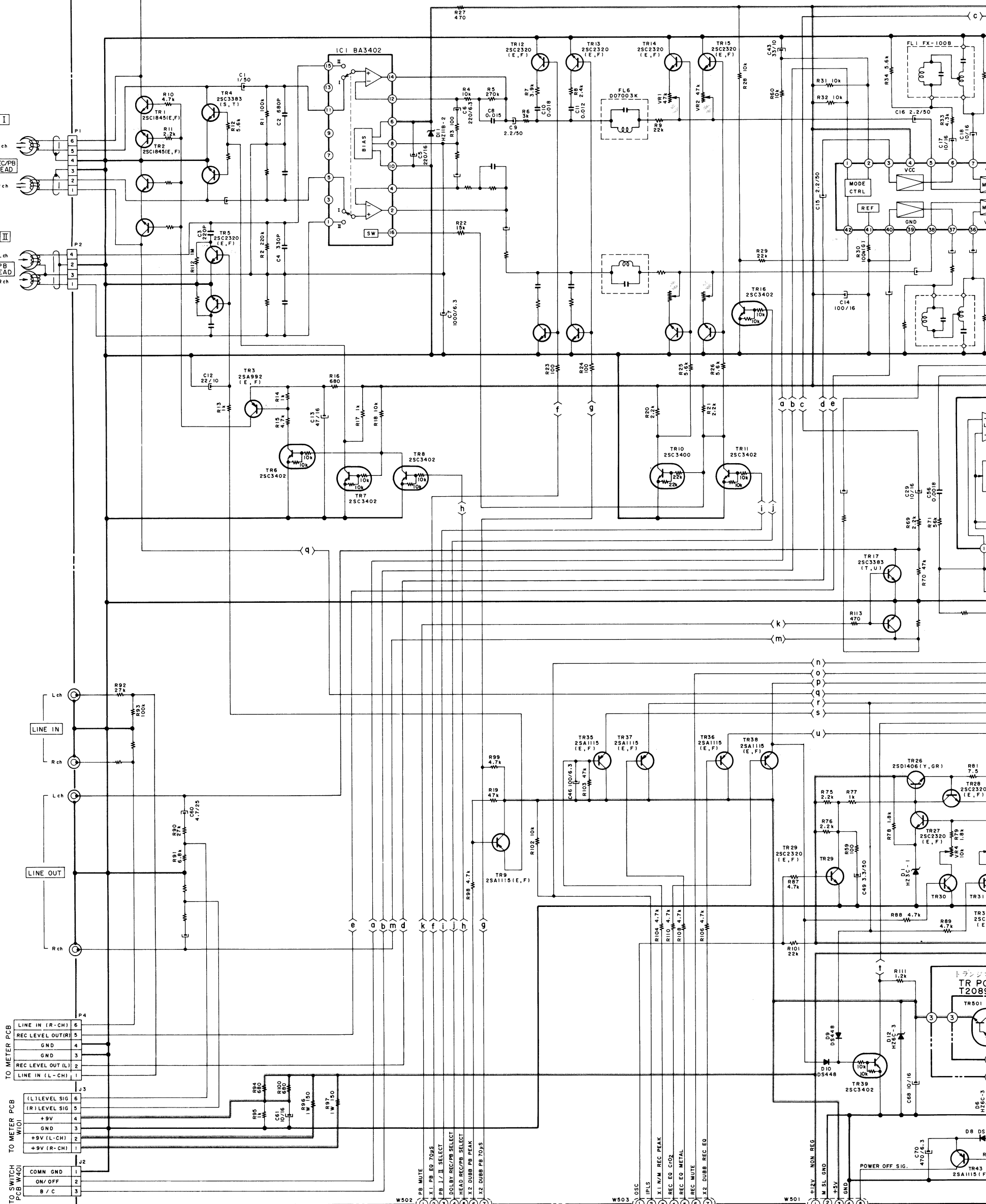
04

TAPE I

REC/PB HEAD

TAPE II

PB HEAD



プリアンプ基板 PRE AMP PCB T2089A501A

TO SYSCON PCB (J10)

TO SYSCON PCB (J9)

TO SYSCON PCB (J8)

トランジスタ
TR PCB
T2089A

TR501 2SD

TR502 2SD

TR503 2SD

TR504 2SD

TR505 2SD

TR506 2SD

TR507 2SD

TR508 2SD

TR509 2SD

TR510 2SD

TR511 2SD

TR512 2SD

TR513 2SD

TR514 2SD

TR515 2SD

TR516 2SD

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TR531 2SD

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TR718 2SD

TR719 2SD

TR720 2SD

TR721 2SD

TR722 2SD

TR723 2SD

TR724 2SD

TR725 2SD

TR726 2SD

TR727 2SD

TR728 2SD

TR729 2SD

TR730 2SD

TR731 2SD

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TR733 2SD

TR734 2SD

TR735 2SD

TR736 2SD

TR737 2SD

TR738 2SD

TR739 2SD

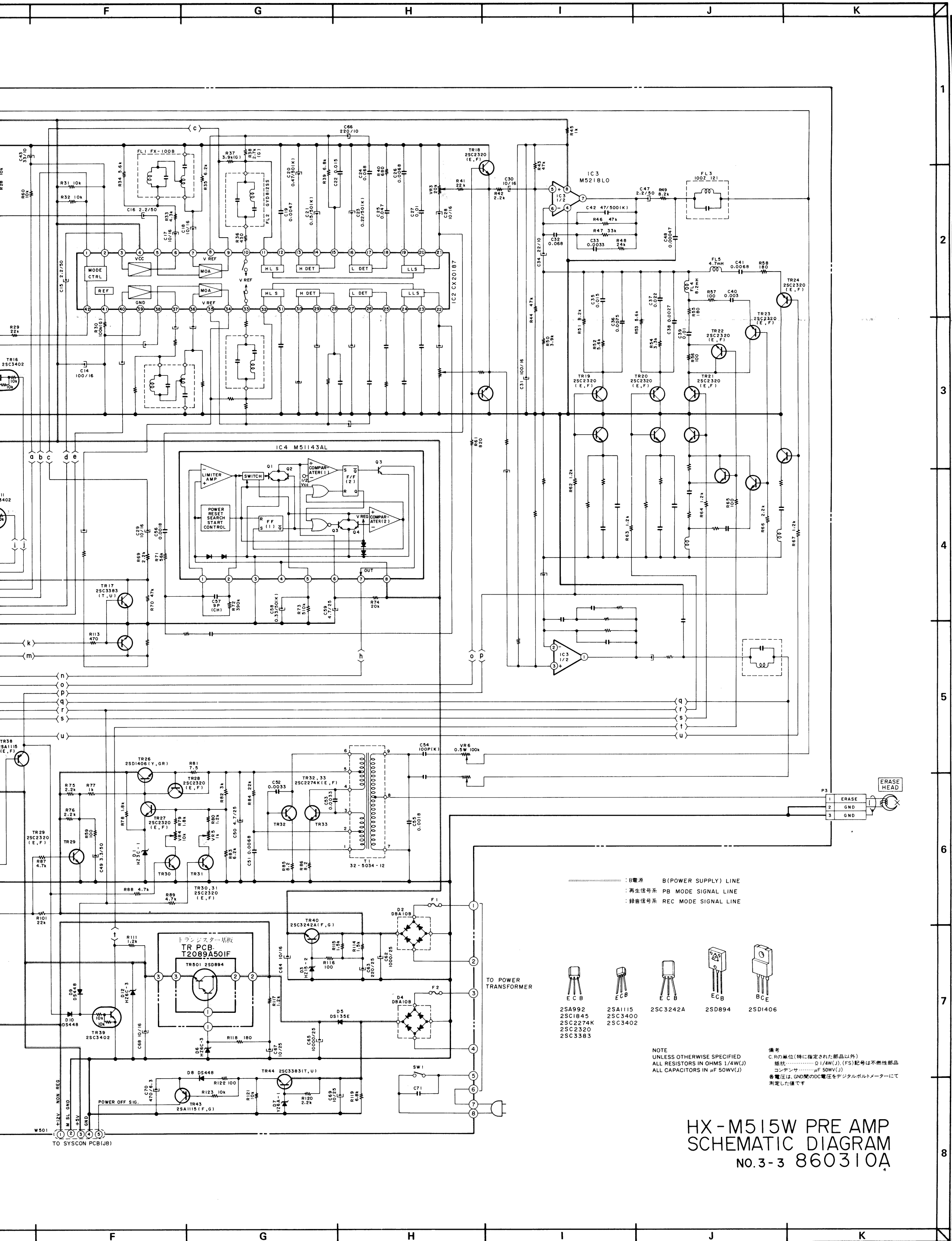
TR740 2SD

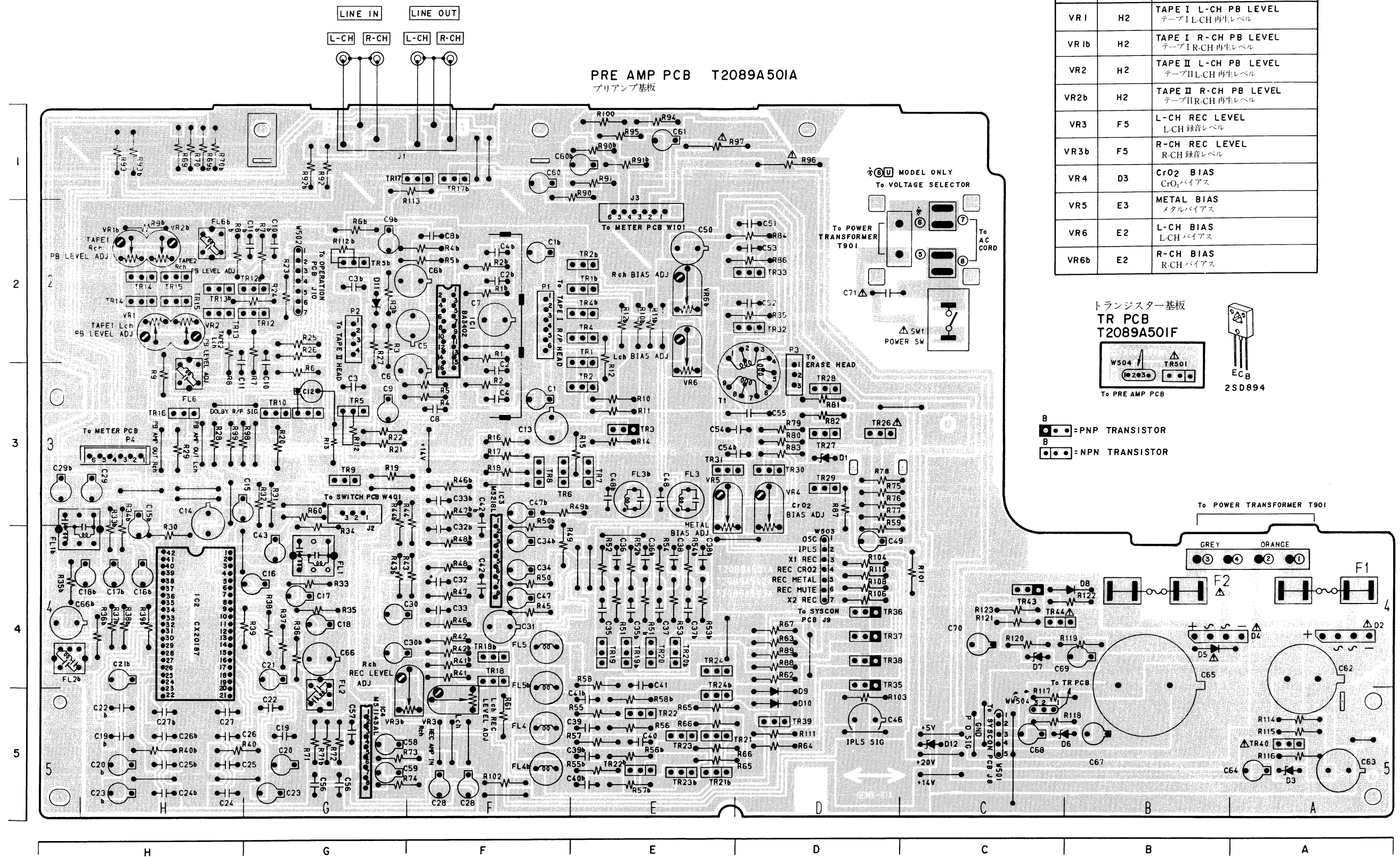
TR741 2SD

TR742 2SD

TR743 2SD

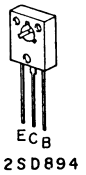
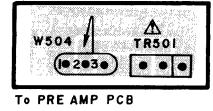
TR744 2SD





VR.NO.	LOCATION	ADJUSTMENT'S ITEM
VR1	H2	TAPE I L-CH PB LEVEL テープI L-CH 再生レベル
VR1b	H2	TAPE I R-CH PB LEVEL テープI R-CH 再生レベル
VR2	H2	TAPE II L-CH PB LEVEL テープII L-CH 再生レベル
VR2b	H2	TAPE II R-CH PB LEVEL テープII R-CH 再生レベル
VR3	F5	L-CH REC LEVEL L-CH 録音レベル
VR3b	F5	R-CH REC LEVEL R-CH 録音レベル
VR4	D3	CrO ₂ BIAS CrO ₂ バイアス
VR5	E3	METAL BIAS メタルバイアス
VR6	E2	L-CH BIAS L-CH バイアス
VR6b	E2	R-CH BIAS R-CH バイアス

トランジスター基板
TR PCB
T2089A501F



B = PNP TRANSISTOR
 B = NPN TRANSISTOR

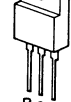
LOCATION OF COMPONENTS					CONNECTOR'S	
IC's	TR's				P1---F2	
IC1---F2	TR1---E2	TR10---G3	TR18---F4	TR24b---E5	P2---G2	
IC2---H4	TR1b---E2	TR11---G3	TR18b---F4	TR26---D3	P3---D3	
IC3---F4	TR2---E3	TR12---G2	TR19---E4	TR27---D3	P4---H3	
IC4---G5	TR2b---E2	TR12b---G2	TR19b---E4	TR28---D3	J2---G3	
	TR3---E3	TR13---H2	TR20---E4	TR29---D3	J3---E2	
	TR4---E2	TR13b---H2	TR20b---E4	TR30---D3	W501---C5	
	TR4b---E2	TR14---H2	TR21---E5	TR31---E3	W502---G2	
	TR5---G3	TR14b---H2	TR21b---E5	TR32---D2	W503---D4	
	TR5b---G2	TR15---H2	TR22---E5	TR33---D2	W504---C5	
	TR6---F3	TR15b---H2	TR22b---E5	TR35---D4		
	TR7---E3	TR16---H3	TR23---E5	TR36---D4		
	TR8---F3	TR17---F1	TR23b---E5	TR37---D4		
	TR9---G3	TR17b---F1	TR24---E4	TR38---D4		

TR1,2-----2SC1845(E,F)
 TR3-----2SA992(E,F)
 TR4,17,44-----2SC3383(T,U)
 TR5,12 to 15
 18 to 24
 27 to 31-----2SC2320(E,F,G)
 TR6 to 8,11,16,39-----2SC3402
 TR9,35 to 38,43-----2SA1115(E,F,G)
 TR10-----2SC3400
 TR26-----2SD1406(Y,G)
 TR32,33-----2SC2274K(F)
 TR40-----2SC3242A(F,G)



2SA992
2SC1845
2SC2274K
2SC2320
2SC3383

2SA1115
2SC3400
2SC3402



2SC3242A

2SD1406

= PNP TRANSISTOR
 = NPN TRANSISTOR

注意: △の付された部品は、安全上重要部品です。交換の際は、指定部品以外は使用しないこと。
 WARNING: △ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.
 Avertissement: △ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÛRETÉ. POUR MAINTENIR LE DEGRÉ DE SÛRETÉ DE L'APPAREIL, NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SÛRETÉ QUE PAR DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.