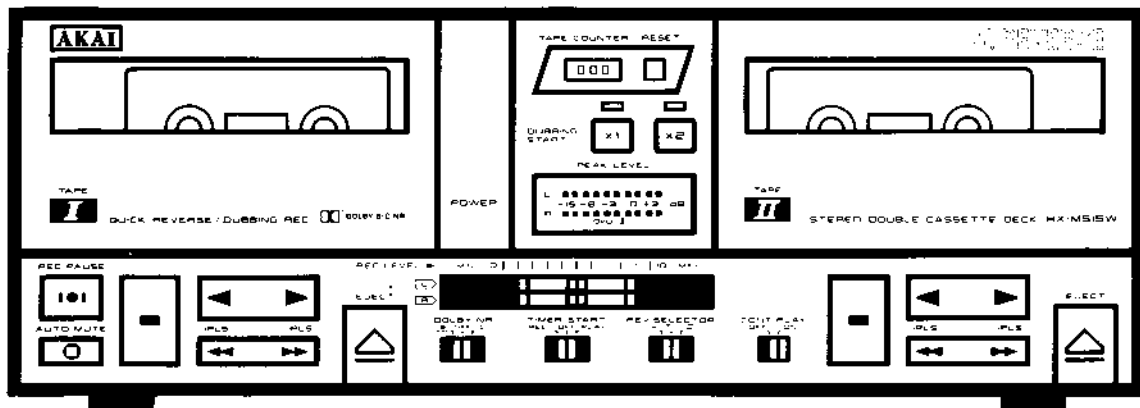


AKAI SERVICE MANUAL



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 (-20dB recording)	Normal: 25Hz to 15,000Hz ± 3dB CrO ₂ : 25Hz to 16,000Hz ± 3dB Metal: 25Hz to 17,000Hz ± 3dB	240V, 50Hz for UK & Aus- tralia 110V/120V/220V/240V, 50Hz/ 60Hz convertible for other coun- tries
S/N	58dB (Metal) (Measured via tape with peak recording level) Dolby C type NR ON: Improves up to 15 dB at 500 Hz, 20 dB at 1kHz to 10 kHz	Dimensions 350(W) × 123(H) × 270(D) mm (13.8 × 4.8 × 10.6 inches)
		Weight 5.3kg (11.7lbs)

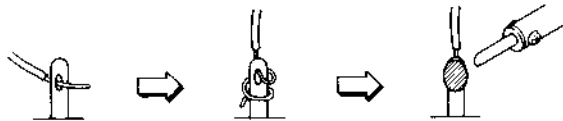
* For improvement purposes, specifications and design are subject to change without notice.

* 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 $\square C$ or $\square A$, 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.)

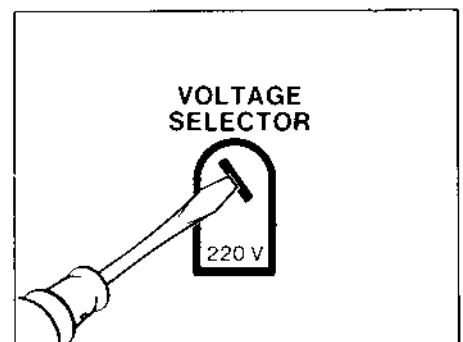
USEFUL INFORMATIONS

PRINCIPAL DESTINATION AND SYMBOLS

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

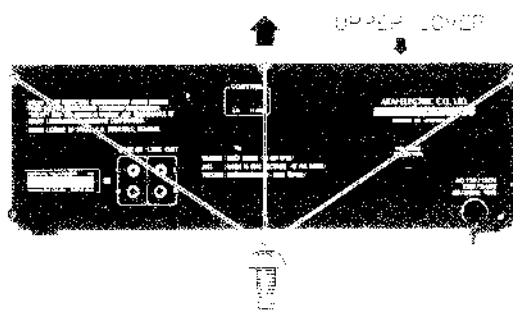
VOLTAGE CONVERSION ($\square U$ model only)

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

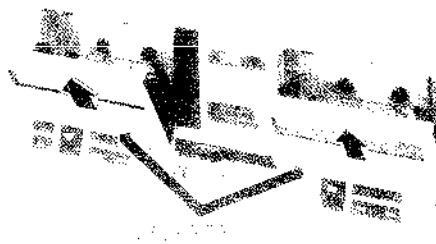


I. DISMANTLING OF UNIT

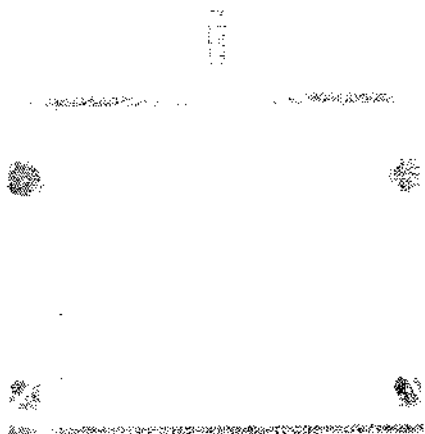
1. Turn the unit upside down. Remove the covers of the unit. Refer to the following diagram for the location of the covers.



1. REMOVAL OF CASE TOP COVER

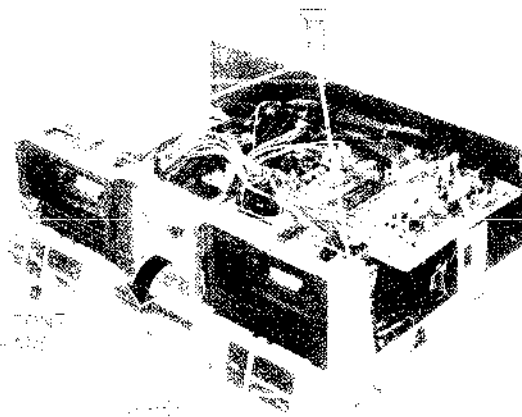


2. REMOVAL OF THE COVER

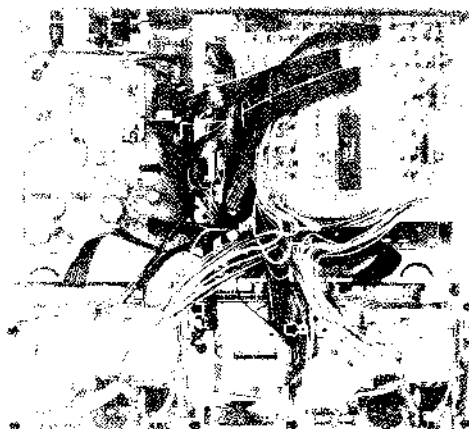


removing the five screws

3. REMOVAL OF THE MECHA. BLK. 4. REMOVAL OF THE MOTOR



5. REMOVAL OF THE MECHA. BLK. FROM THE MOTOR



When removing MECHA. BLK. remove the screws with indication → (arrow) mark.

II CONTROLS

REVERSE

Indicatore de sensibilitate inversa

Tape COUNTER and COUNTER RESET
indicator (OFF/ON)

Indicatore de sensibilitate inversa
si indicator de reset al indicator
de numerare (OFF/ON)

Indicatore inversa

Indicatore de reset al indicator

Cartridge holders

Incadratoarele de casete

PEAK LEVEL indicator for Line
recording and playback (Peak Level)
Left/Right

Indicatore de nivel pentru nivel
LEVEL. Indica nivelul nivelului
de inregistrare si de reproducere
la stanga si la dreapta

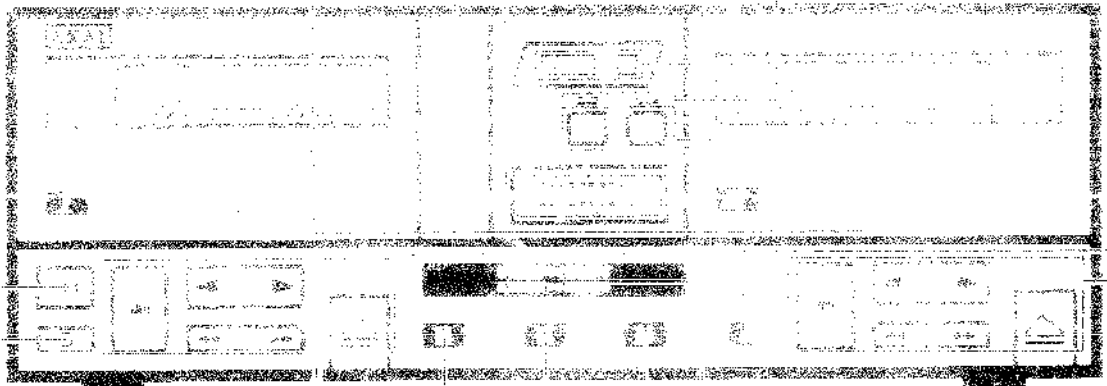
INDICATOR OF PEAK LEVEL
for line recording and playback

Indicatore de nivel pentru
inregistrare si reproducere
la stanga si la dreapta
COUNTER RESET indicator (OFF/ON)

Indicatore de reset al indicator
de numerare (OFF/ON)

Indicatore de reset al indicator
de numerare (OFF/ON)

Indicatore de reset al indicator
de numerare (OFF/ON)



Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

REVERSE selector

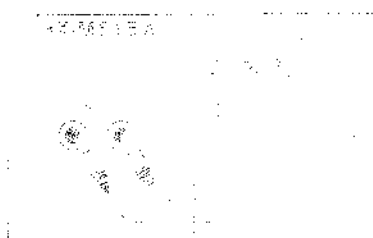
Selecție sensibilitate inversa

Tape STOP

Comandă de oprire a
indicator STOP

Indicatore de nivel pentru nivel
LEVEL

Comandă de nivel de inregistrare
si reproducere (REC LEVEL)
Indicatore de nivel pentru nivel
LEVEL



Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

Indicatore de nivel pentru nivel
LEVEL

IV. MECHANICAL ADJUSTMENT

4-1 PINCH ROLLER PRESSURE MEASUREMENT

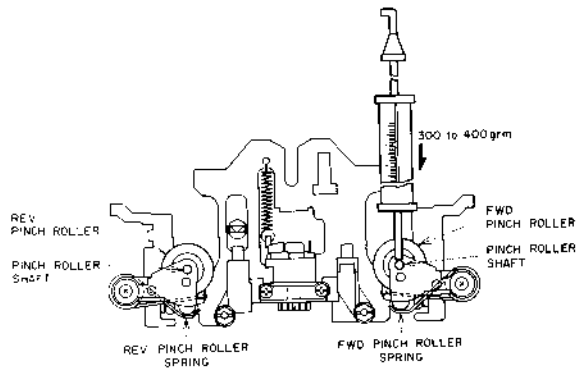


Fig. 4-1

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

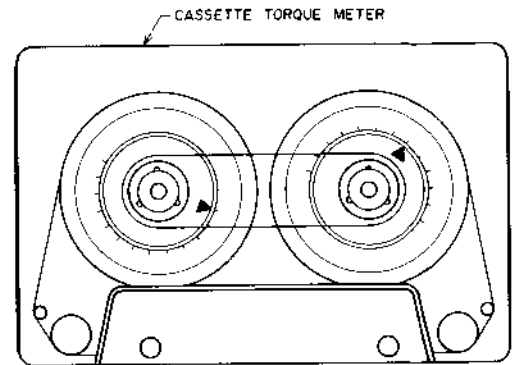


Fig. 4-2

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 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 g-cm (90 to 180g-cm)

V. HEAD ADJUSTMENT

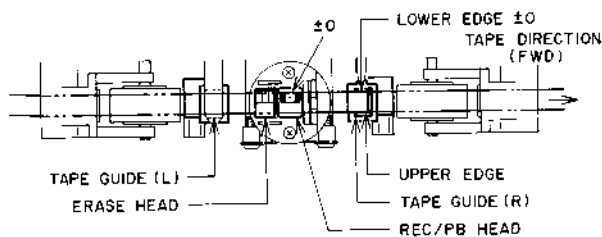
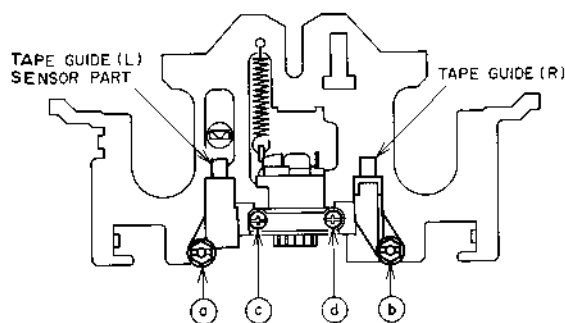


Fig. 5-1



(a), (b) TAPE GUIDE HEIGHT

(c), (d) HEAD AZIMUTH

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

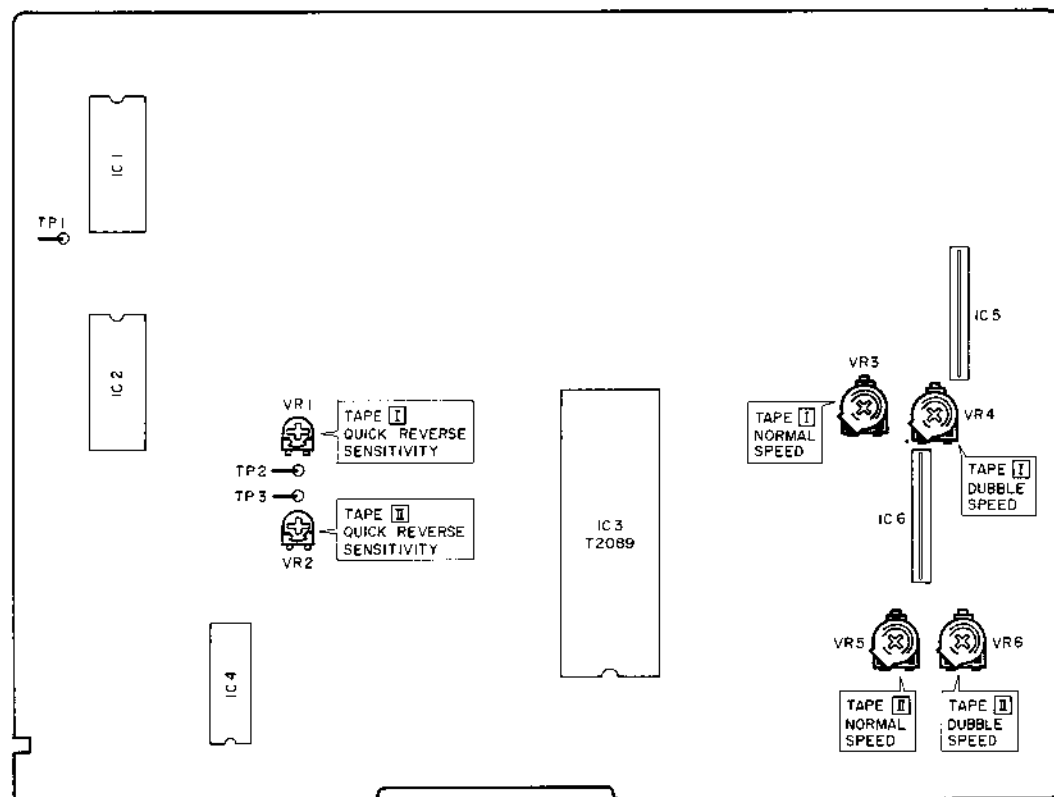


Fig. 6-1 SYSCON PCB. ADJUSTMENT POINTS

- 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)

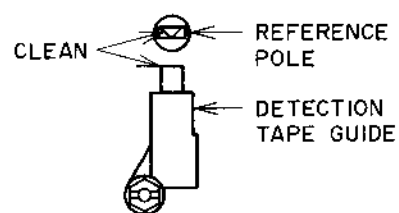


Fig. 6-2

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

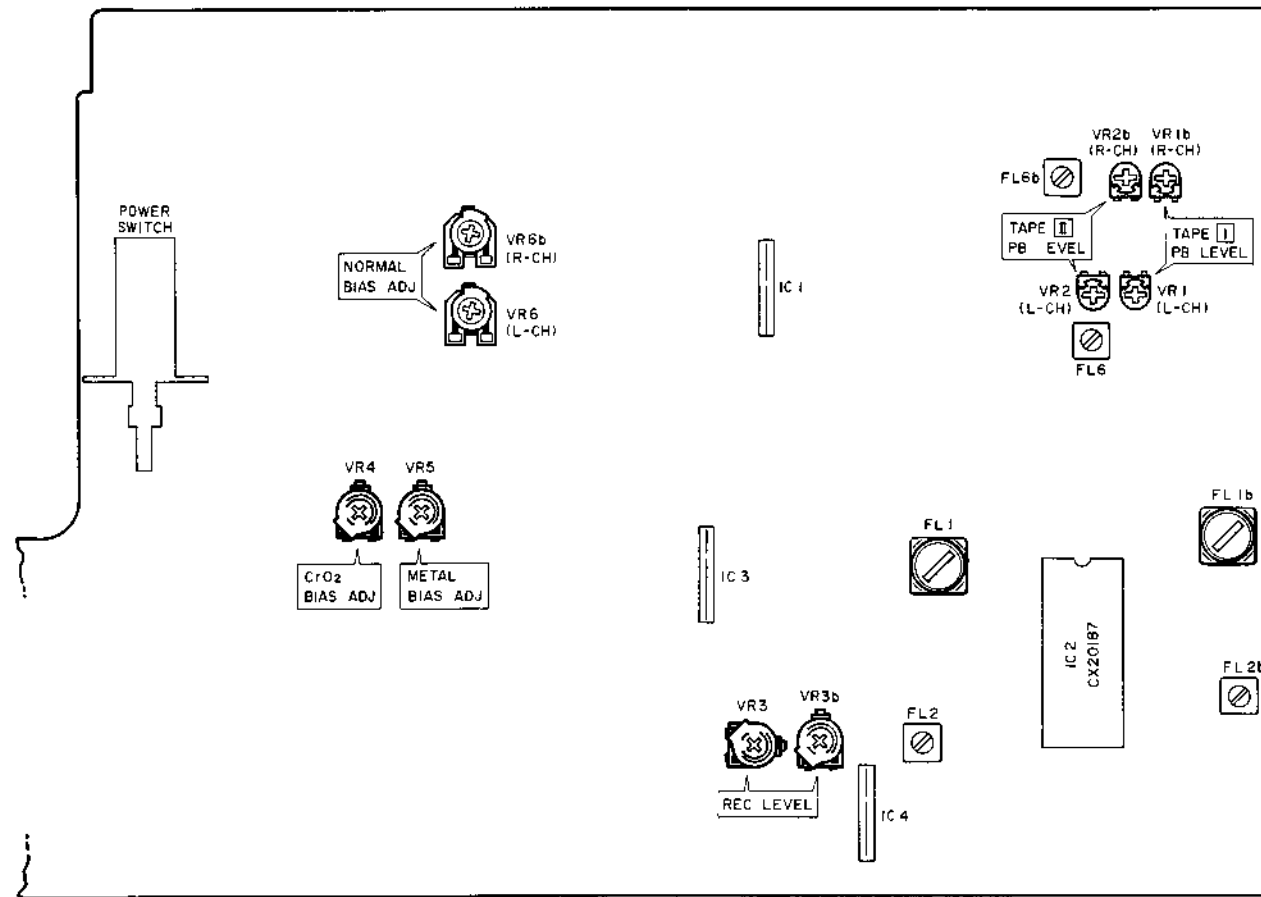


Fig. 6-3 PRE AMP PCB ADJUSTMENT POINTS

- 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 $-6.0 \pm 0.5 \text{dBm}$
2	Tape II REV PB Level	315Hz Test Tape TF-101CL (AT-750773)	REV PB	Line out	conformation	$-6.0 \pm 0.5 \text{dBm}$
3	Tape III FWD PB Level	315Hz Test Tape TF-101CL (AT-750773)	FWD PB	Line out	VR2b(R-ch) VR2(L-ch)	$-6.0 \pm 0.5 \text{dBm}$
4	Tape III REV PB Level	315Hz Test Tape TF-101CL (AT-750773)	REV PB	Line out	conformation	$-6.0 \pm 0.5 \text{dBm}$
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. $\pm 0.5 \text{dBm}$
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. $\pm 0.5 \text{dBm}$
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. $\pm 0.5 \text{dBm}$
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 $-6.0 \pm 0.5 \text{dBm}$

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	PAN20x03STL CMT
2-4	ZS-536488	BID20x08STL 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

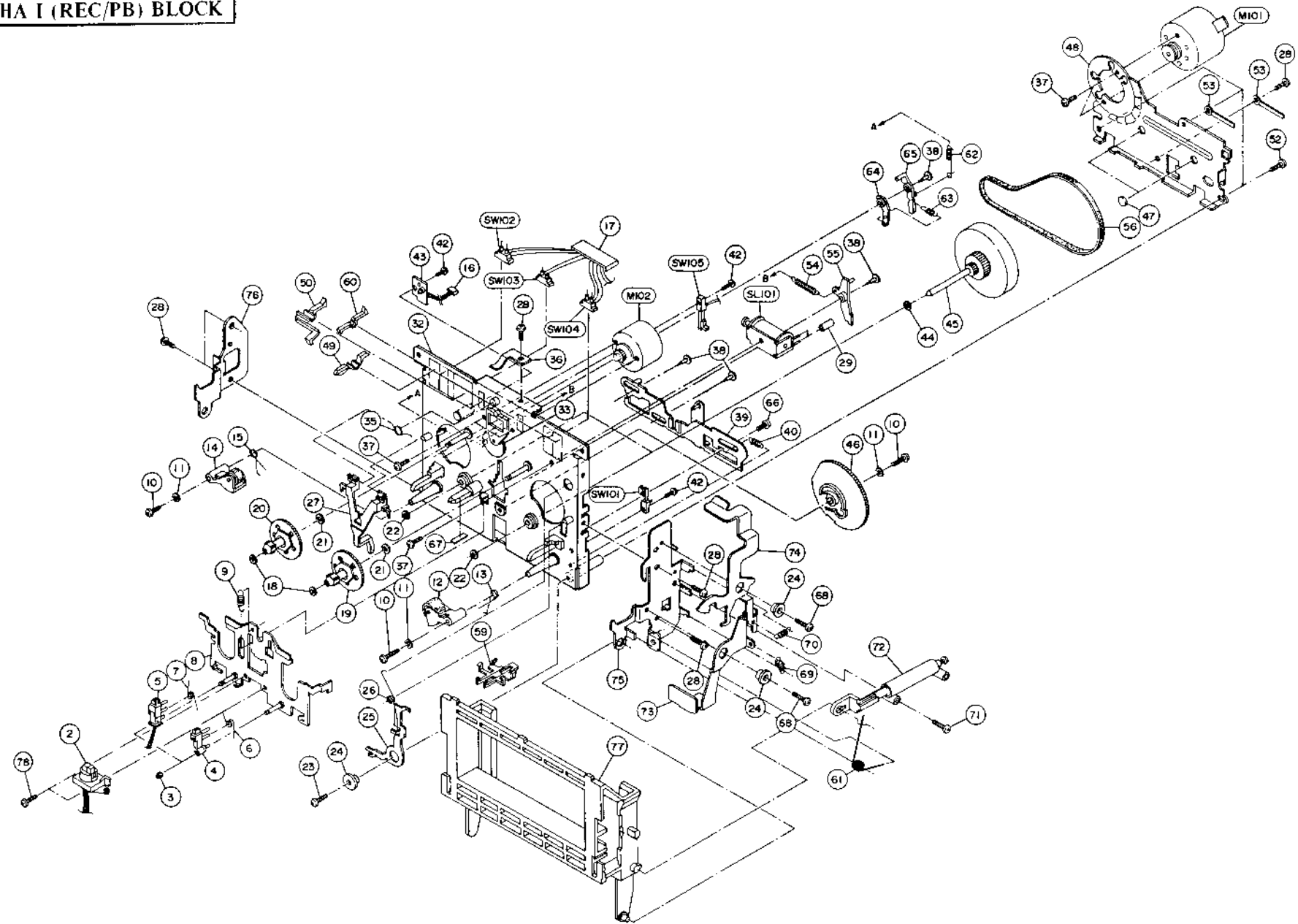
RECOMMENDED SPARE PARTS LIST

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[F.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-359907	△ 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 1B)

"NOTE" N: New Parts

MECHA I (REC/PB) BLOCK



1. MECHA I (REC/PB) BLOCK

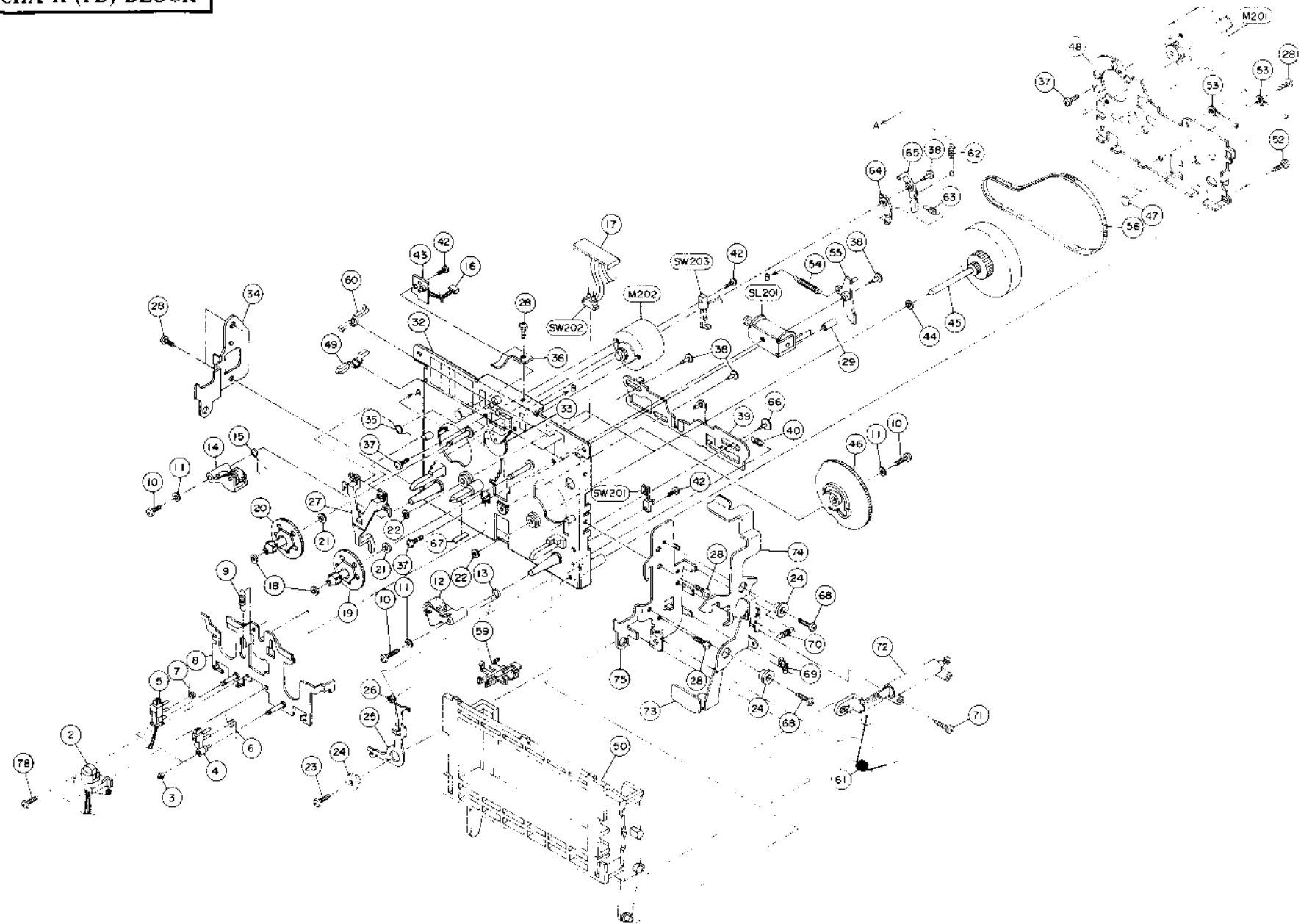
REF. NO.	PART NO.	DESCRIPTION
1-1	BB-359972	MECHA CMAY2Z027A
1-2	HR-717826	HEAD COMBO ROTARY HADRII5558A
1-2	ZW-717828	NUT ADJUSTMENT
1-4	MS-717829	GUIDE TAPE
1-5	ET-717830	SENSOR PART
1-6	ZG-717831	SP ADJUST (R)
1-7	ZG-717832	SP ADJUST (L)
1-9	ZG-717833	SP HEAD BASE
1-10	ZS-717834	SCREW 20x13
1-12	MP-717835	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 II RH0615 CSAJ 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 CQ9S 221J 50DC
4-C4	EC-307494	C STY V F05 CQ9S 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 FC 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 LBI245
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 II 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-R11510118	ER-361284	R OMF H S15 FS 2W 750J
5-J1.2	EJ-344368	PHONE J 3P HJ0847-010 3.5

6. METER PC BOARD

REF. NO.	PART NO.	DESCRIPTION
METER PC BOARD		
6-IC101	ED-353388	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

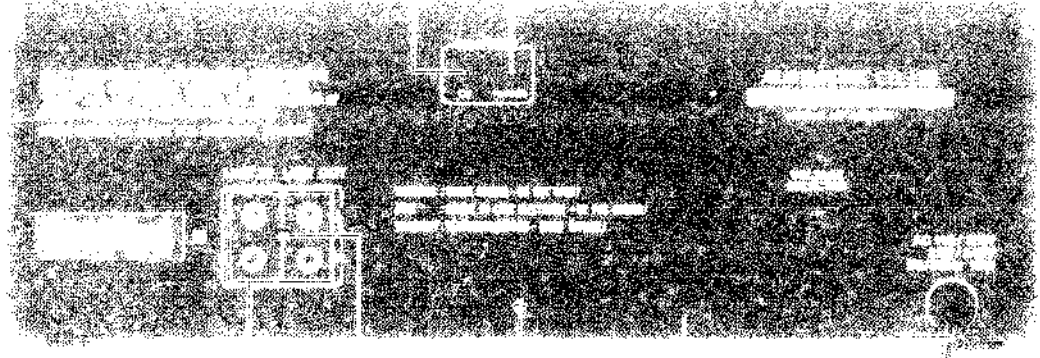
REF. NO.	PART NO.	DESCRIPTION
ASSEMBLY BLOCK		
11-1	SA-202118	FOOT
11-2	ZS-351186	ST BR30X08STL CMT C080 (FOOT FIX)
11-3	EZ-200473	SILICON RUBBER SHEET TC-30 (FOR TR501)
11-4	ZS-314702	ST BID40X10STL CMT (TRANS POWER FIX)
11-5x	ZW-273914	SW40 (TRANS POWER FIX)
11-6	EW-347604	△ AC CORD 2 CORES VM0165B J [J]
11-6A	EW-347683	△ AC CORD 2 CORES VM0129A.VFF-CB U [U]
11-6B	EW-348215	△ AC CORD 2 CORES KP10.SPT105CCB UC [C.A.]
11-6C	EW-347682	△ AC CORD 2 CORES VM0364.FC3097-CB EV [C.]
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 [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
------	-----------	------------------------

SYSCON PC BOARD

5-J1	EJ-344368	PHONE J 3P HJ0847-010 3.50
5-J2	EJ-344368	PHONE J 3P HJ0847-010 3.50



INDEX

PART. NO.	REF. NO.	PART. NO.	REF. NO.	PART. NO.	REF. NO.	PART. NO.	REF. NO.	PART. NO.	REF. NO.
BA-12089A030A	3-1	FI-330352	5-1C6	ET-308141	5-TR24	EV-337993	5-VR3	SZ-359790	12-5
BA-12089A030B	3-1A	ET-337008	5-1C1	ET-308141	5-TR17	EV-337995	4-VR4	SZ-359923	12-4
BA-12089A030C	3-1B	ET-337008	5-1C2	ET-308472	4-TR9	EV-337995	5-VR6	TC-706398	1-72
BA-12089A040A	3-2	FI-337228	4-1C3	ET-308472	4-TR36	EV-337995	5-VR4	TC-706398	2-72
BB-359972	1-1	ET-349372	5-X1	ET-308472	4-TR43	EV-344109	4-VR5	TC-717870	1-77
BB-359973	2-1	ET-349874	5-1C4	ET-308472	4-TR35	EV-356582	4-VR1	TC-717870	2-50
BD-B359802C	12-18	ET-355388	6-1C100	ET-308472	4-TR38	EV-356582	4-VR2	ZG-313186	12-7
BD-B359802D	12-18-B	ET-357498	4-1C4	ET-308472	4-TR37	EV-356679	5-VR1	ZG-717831	1-6
BD-B359803C	12-19	FI-359985	4-1C2	ET-308472	5-TR2	EV-356679	5-VR2	ZG-717831	2-6
BD-B359803D	12-19-B	ET-359990	5-1C3	ET-308472	5-TR23	EV-359986	6-VR101	ZG-717832	1-7
BD-B359803E	12-19A	FI-361561	4-1C1	ET-308472	5-TR36	EW-347604	11-6	ZG-717832	2-7
BD-B359803F	12-19A-B	ET-336905	4-11	ET-308472	5-TR12	EW-347680	11-6D	ZG-717833	1-9
BD-12089A020A	12-1	ET-344368	5-12	ET-308472	5-TR25	EW-347681	11-6E	ZG-717833	2-9
BD-12089A020B	12-1-B	ET-344368	5-11	ET-308472	5-TR7	EW-347682	11-6C	ZG-717836	1-13
BF-717852	1-45	EO-356809	4-FL3	ET-308977	4-TR33	FW-347683	11-6A	ZG-717836	2-13
BF-717852	2-45	EO-359575	4-11	ET-308977	4-TR32	FW-348215	11-6B	ZG-717839	1-15
BM-717859	1-M101	EO-360140	4-FL4	ET-338324	5-TR34	EZ-200473	11-3	ZG-717839	2-15
BM-717859	2-M201	EO-361913	4-FL5	ET-338324	5-TR21	HR-717826	1-2	ZG-717847	1-35
BM-717860	1-M102	EP-717856	1-SL101	ET-347143	4-TR2	HR-717872	2-2	ZG-717847	2-35
BM-717860	2-M202	EP-717856	2-SL201	ET-347143	4-TR1	MB-314722	11-12	ZG-717848	1-36
BR-359968	11-T901	FR-306805	5-R40	ET-349366	4-TR6	MB-717858	1-56	ZG-717848	2-36
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
BR-717843	2-20	ER-338224	4-R37	ET-349366	4-TR39	MI-717845	2-33	ZG-717864	2-62
BT-359967	11-T901A	ER-338228	4-R30	ET-349366	4-TR7	ML-359930	12-23	ZG-717868	1-69
BT-359969	11-T901B	ER-356247	4-R38	ET-349366	5-TR22	ML-717854	1-49	ZG-717868	2-69
BT-359970	11-T901C	ER-359738	4-R96	ET-349366	5-TR10	ML-717855	1-50	ZG-717869	1-70
BT-359971	11-T901D	ER-359738	4-R97	ET-349366	5-TR15	ML-717857	1-55	ZG-717869	2-70
FC-306017	4-C3	ER-361384	5-R116	ET-349366	5-TR33	ML-717857	2-55	ZG-717875	1-26
GC-307494	4-C4	ER-361284	5-R118	ET-349366	5-TR35	ML-717861	1-60	ZG-717875	2-26
EC-314992	4-C2	ER-361284	5-R115	ET-349366	5-TR20	ML-717861	2-60	ZS-314702	11-4
EC-320548	4-C71	ER-361284	5-R117	ET-349366	5-TR28	ML-717865	1-64	ZS-323993	11-15
EC-326138	4-C55	ER-363986	5-R73	ET-349366	5-TR5	ML-717865	2-64	ZS-336614	11-11
EC-338411	4-C71A	ER-363986	5-R41	ET-349592	4-TR10	ML-717866	1-65	ZS-350934	11-9
EC-347247	4-C54	ES-349367	7-TS206	ET-349608	4-TR4	ML-717866	2-65	ZS-351186	11-2
EC-352478	4-C62	ES-349367	7-TS207	ET-349608	4-TR44	ML-717871	2-49	ZS-352133	11-8
EC-361261	4-C7	ES-349367	7-TS205	ET-349608	4-TR17	MP-717835	1-12	ZS-354403	11-14
EC-362296	4-C65	ES-349367	7-TS203	ET-349705	4-TR13	MP-717835	2-12	ZS-717825	1-78
ED-301911	4-D10	ES-349367	7-TS202	ET-349705	4-TR15	MP-717837	1-14	ZS-717825	2-78
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	11-58
ED-305655	5-D3	ES-349367	8-TS305	ET-349705	4-TR20	MZ-359935	11-7	ZW-704947	1-22
ED-305655	5-D5	ES-349367	8-TS301	ET-349705	4-TR29	MZ-717853	1-46	ZW-704947	2-22
ED-306316	5-D4	ES-349367	8-TS303	ET-349705	4-TR31	MZ-717853	2-41	ZW-717828	1-3
ED-306316	5-D6	ES-349367	8-TS302	ET-349705	4-TR12	SA-202118	11-1	ZW-717828	2-3
ED-306320	4-D3	ES-353296	9-SW401	ET-349705	4-TR30	SB-704944	1-38	ZW-717841	1-18
ED-319167	4-D6	ES-353708	9-SW403	ET-349705	4-TR14	SB-704944	2-38	ZW-717841	2-18
ED-319167	4-D12	ES-353708	9-SW402	ET-349705	4-TR28	SB-717867	1-66		
ED-330319	4-D2	ES-353708	9-SW404	ET-349705	4-TR24	SB-717867	2-66		
ED-330319	4-D4	ES-358581	4-SW1	ET-349705	4-TR27	SC-359931A	12-17		
ED-330989	4-D11	ES-359606	11-VS901	ET-349705	4-TR23	SC-359931B	12-17-B		
ED-337776	4-D1	ES-359988	6-TS101	ET-349705	4-TR19	SE-359924	12-22		
ED-344280	5-D14	ES-359988	6-TS102	ET-349705	4-TR21	SK-B359925A	12-10		
ED-344280	5-D9	ES-717844	1-SW102	ET-350795	5-TR45	SK-B364455	12-14		
ED-344280	5-D13	ES-717844	2-SW202	ET-350795	5-TR47	SK-345270	12-16		
ED-344280	5-D11	ES-717846	1-SW103	ET-350795	5-TR37	SK-359797A	12-8		
ED-344280	5-D12	ES-717846	1-SW104	ET-350795	5-TR41	SK-359925B	12-11		
ED-344280	5-D7	ES-717849	1-SW105	ET-350795	5-TR43	SK-359925C	12-11-B		
ED-344280	5-D8	ES-717849	1-SW101	ET-350795	5-TR42	SK-359925D	12-12		
ED-346603	4-D7	ES-717849	2-SW203	ET-350795	5-TR38	SK-359925E	12-12-B		
ED-347777	7-D203	ET-201580	10-TR501	ET-352334	5-TR46	SK-359928A	12-9		
ED-349662	4-D5	ET-308141	5-TR3	ET-352334	5-TR44	SK-359928B	12-9-B		
ED-349662	5-D1	ET-308141	5-TR4	ET-355626	4-TR3	SK-359929A	12-15		
ED-349662	5-D2	ET-308141	5-TR6	ET-357845	4-TR40	SK-359929B	12-15-B		
ED-359974	6-D901	ET-308141	5-TR8	ET-357845	5-TR18	SK-362289A	12-13		
ED-359975	6-D904	ET-308141	5-TR13	ET-357845	5-TR32	SM-361028	12-20		
ED-359975	6-D905	ET-308141	5-TR16	ET-357845	5-TR27	SM-361028B	12-20-B		
				ET-357845	5-TR14	SP-359798A	12-21		
ED-359992	7-D202	ET-308141	5-TR26	ET-357845	5-TR31	SP-359798B	12-21-B		
ED-359992	7-D201	ET-308141	5-TR29	ET-357845	5-TR19	SP-359800F	11-13A		
ED-359992	8-D301	ET-308141	5-TR30	ET-362113	4-TR26	SP-359800G	11-13B		
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		
ET-330352	5-1C5	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

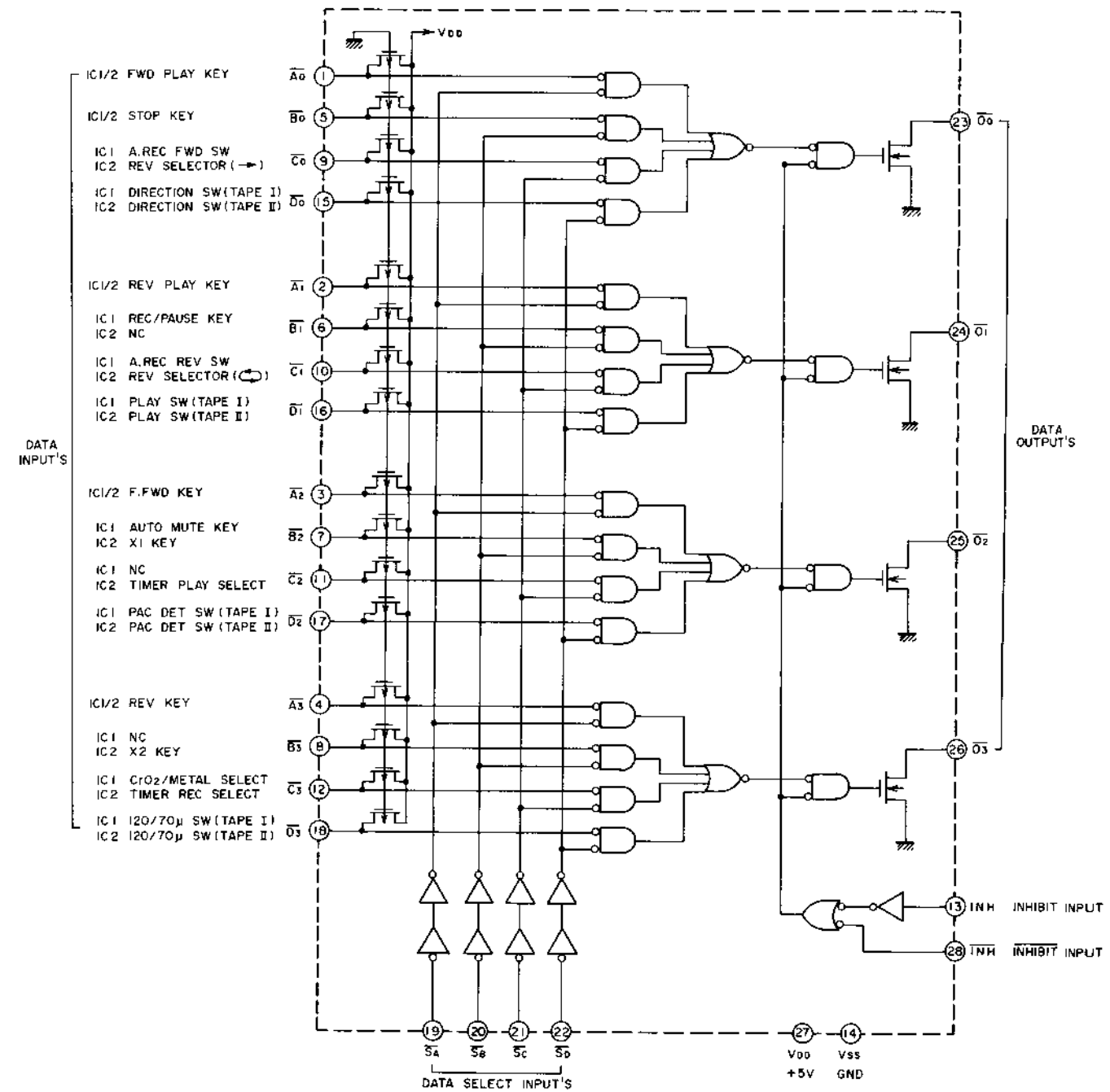
MODEL HX-M515W

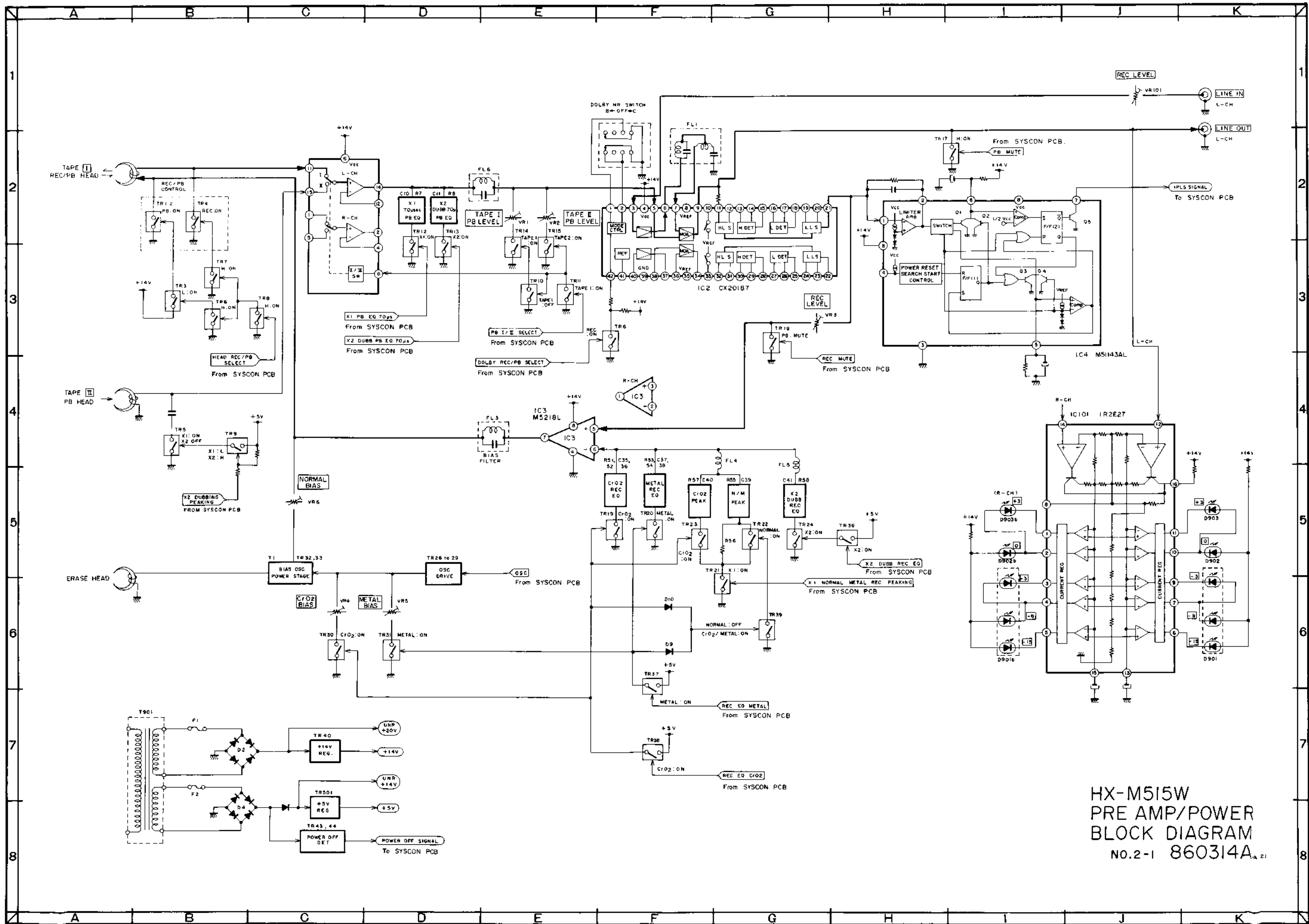
SCHEMATIC DIAGRAM AND PCB BOARDS

TABLE OF CONTENTS

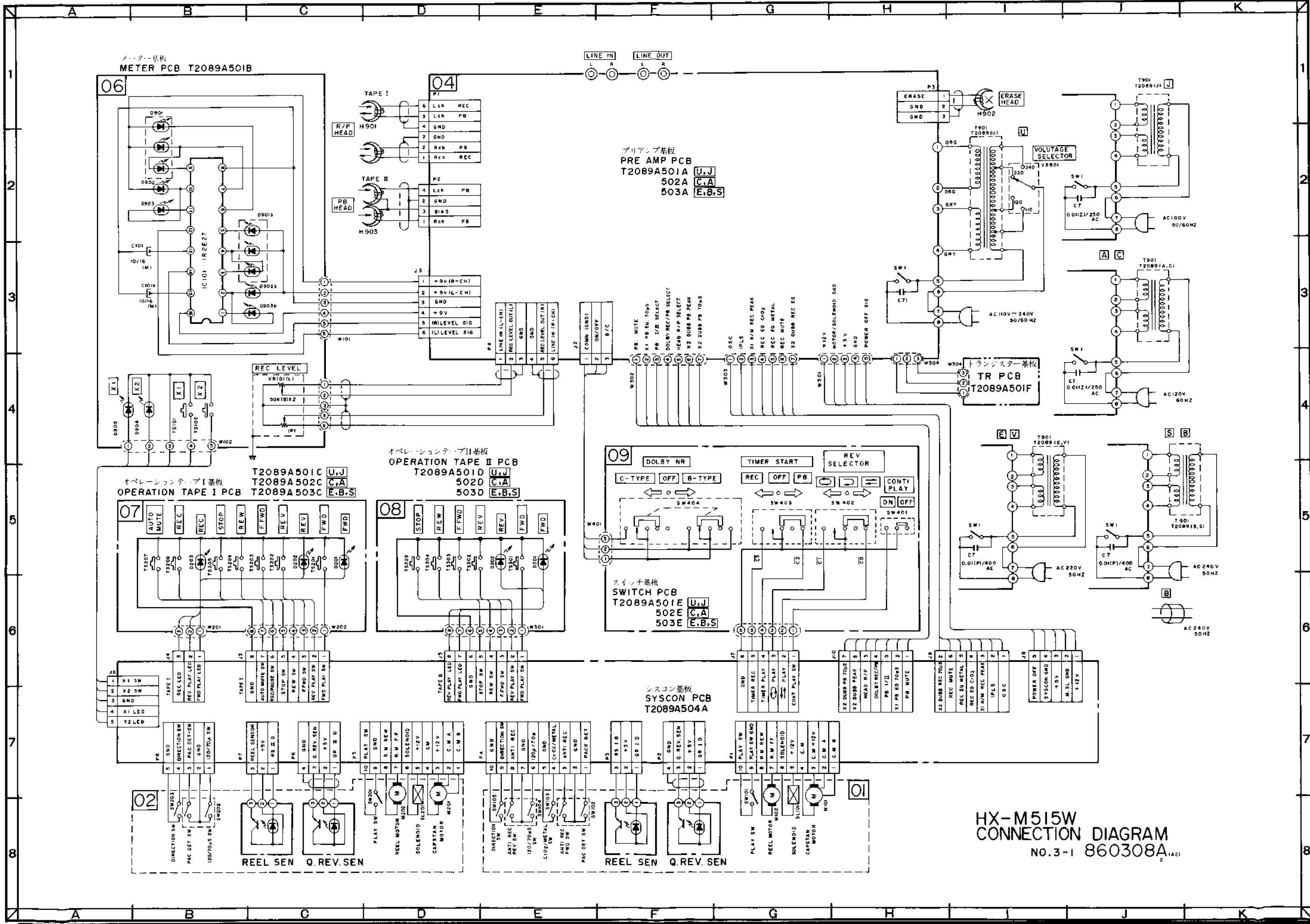
1. BLOCK DIAGRAM OF IC's	1
2. PRE AMP/POWER BLOCK DIAGRAM	2
3. SYSCON BLOCK DIAGRAM	3
4. CONNECTION DIAGRAM	4
5. METER PCB, SWITCH PCB, OPERATION TAPE I PCB, OPERATION TAPE II PCB	5
6. SYSCON PCB	6
7. SYSCON SCHEMATIC DIAGRAM	7
8. PRE AMP SCHEMATIC DIAGRAM	8
9. PRE AMP PCB, TR PCB	9

LC7800

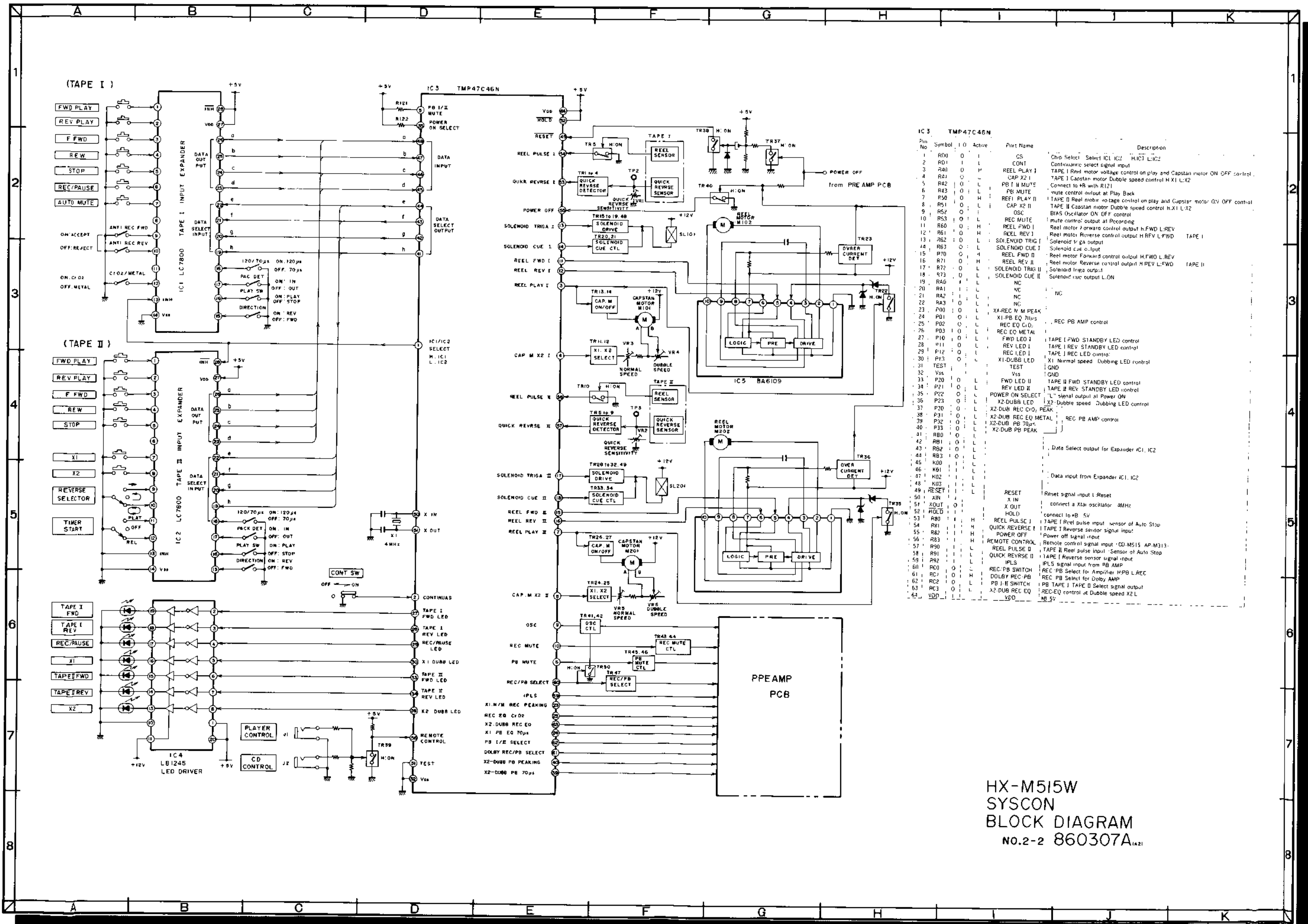




HX-M515W
 PRE AMP/POWER
 BLOCK DIAGRAM
 NO.2-1 860314A.21

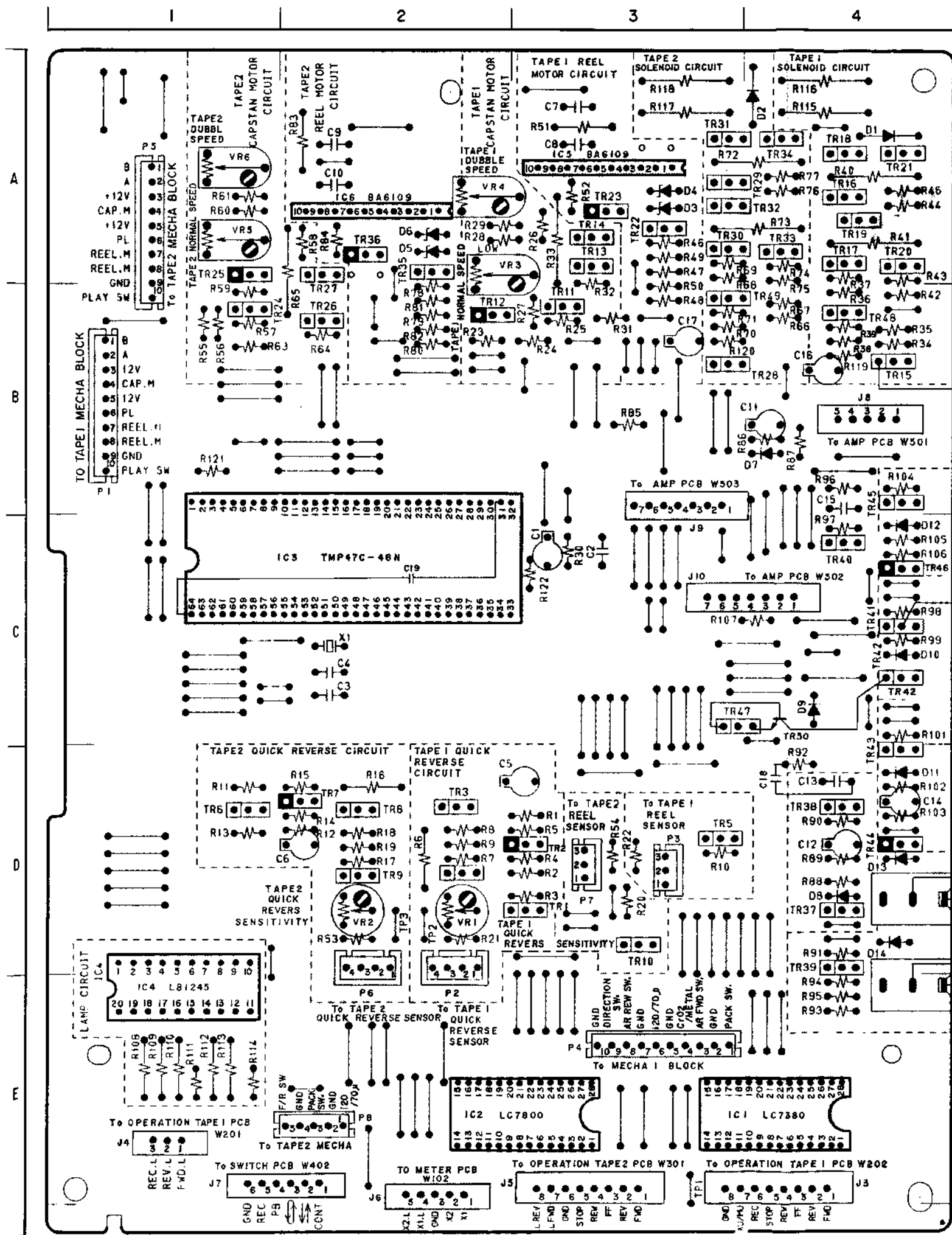


HX-M515W
 CONNECTION DIAGRAM
 NO.3-1 860308A (A2)



Pin No.	Symbol	I	O	Active	Part Name	Description
1	R00	0	I		CS	Chip Select Select IC1 IC2
2	R01	1	L		CONT	Continuing select signal input
3	R01	0	L		REEL PLAY I	TAPE I Reel motor voltage control on play and Capstan motor ON OFF control
4	R21	0	L		CAP X2 I	TAPE I Capstan motor Double speed control H.X1 L.X2
5	R42	0	L		PB I M MUTE	mute control output at Play Back
6	R43	0	L		REEL PLAY II	TAPE II Reel motor voltage control on play and Capstan motor ON OFF control
7	R50	0	H		REEL FWD I	Reel motor Forward control output H.FWD L.REV
8	R51	0	L		CAP X2 II	TAPE II Capstan motor Double speed control H.X1 L.X2
9	R52	0	L		OSC	BIAS Oscillator ON OFF control
10	R53	0	L		REC MUTE	mute control output at Recording
11	R60	0	H		REEL FWD I	Reel motor Forward control output H.FWD L.REV
12	R61	0	H		REEL REV I	Reel motor Reverse control output H.REV L.FWD
13	R62	0	L		SOLENOID TRIG I	Solenoid trigger output
14	R63	0	L		SOLENOID CUE I	Solenoid cue output
15	R70	0	H		REEL FWD II	Reel motor Forward control output H.FWD L.REV
16	R71	0	H		REEL REV II	Reel motor Reverse control output H.REV L.FWD
17	R72	0	L		SOLENOID TRIG II	Solenoid trigger output
18	R73	0	L		SOLENOID CUE II	Solenoid cue output L.ON
19	R40	1	L		NC	
20	R41	1	L		NC	
21	R42	1	L		NC	
22	R43	0	L		NC	
23	P00	0	L		X1-REC N.M PEAK	
24	P01	0	L		X1-PB EQ 70µs	
25	P02	0	L		REC EQ C.D.	REC PB AMP control
26	P03	0	L		REC EQ METAL	
27	P10	0	L		FWD LED I	TAPE I FWD STANDBY LED control
28	P11	0	L		REV LED I	TAPE I REV STANDBY LED control
29	P12	0	L		REC LED I	TAPE I REC LED control
30	P13	0	L		X1-DUBB LED	X1 Normal speed Dubbing LED control
31	TEST				TEST	
32	VSS				GND	
33	VSS				GND	
34	P21	0	L		FWD LED II	TAPE II FWD STANDBY LED control
35	P22	0	L		REV LED II	TAPE II REV STANDBY LED control
36	P23	0	L		POWER ON SELECT	TL signal output at Power ON
37	P30	0	L		X2-DUBB LED	X2 Dubbing LED control
38	P31	0	L		X2-DUB REC EQ PEAK	
39	P32	0	L		X2-DUB PB 70µs	REC PB AMP control
40	P33	0	L		X2-DUB PB PEAK	
41	R80	0	L			
42	R81	0	L			
43	R82	0	L			Data Select output for Expander IC1, IC2
44	R83	0	L			
45	K00					
46	K01					Data input from Expander IC1, IC2
47	K02					
48	K03					
49	RESET				RESET	Reset signal input I-Reset
50	X IN				X IN	connect a Xtal oscillator 4MHz
51	X OUT				X OUT	
52	HOLD				HOLD	connect to +5V
53	R80	0	H		REEL PULSE I	TAPE I Reel pulse input sensor of Auto Stop
54	R81	0	H		QUICK REVERSE I	TAPE I Reverse sensor signal input
55	R82	0	H		POWER OFF	Power off signal input
56	R83	0	H		REMOTE CONTROL	Remote control signal input - CD-M515 AP-M313
57	R90	0	L		REEL PULSE II	TAPE II Reel pulse input - Sensor of Auto Stop
58	R91	0	L		QUICK REVERSE II	TAPE II Reverse sensor signal input
59	R92	0	L		IPLS	IPLS signal input from PB AMP
60	R00	0	C		REC-PB SWITCH	REC-PB Select for Amplifier H-PB L-REC
61	RC1	0	H		DOLBY REC-PB	REC-PB Select for Dolby AMP
62	RC2	0	L		PB TAPE I SWITCH	PB TAPE I Select signal output
63	RC3	0	L		PB TAPE II SWITCH	PB TAPE II Select signal output
64	VDD	1	L		VDD	REC-EQ control at Double speed X2 L PB 3V

HX-M515W
 SYSCON
 BLOCK DIAGRAM
 NO.2-2 860307A_{1A21}



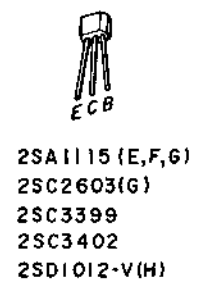
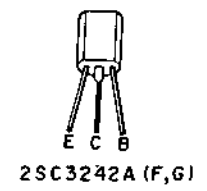
B
 = PNP TRANSISTOR
 = NPN TRANSISTOR

LOCATION OF COMPONENTS

- TR's
 TR1---03
 TR2---03
 TR3---02
 TR4---02
 TR5---03
 TR6---01
 TR7---02
 TR8---02
 TR9---02
 TR10---03
 TR11---83
 TR12---82
 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

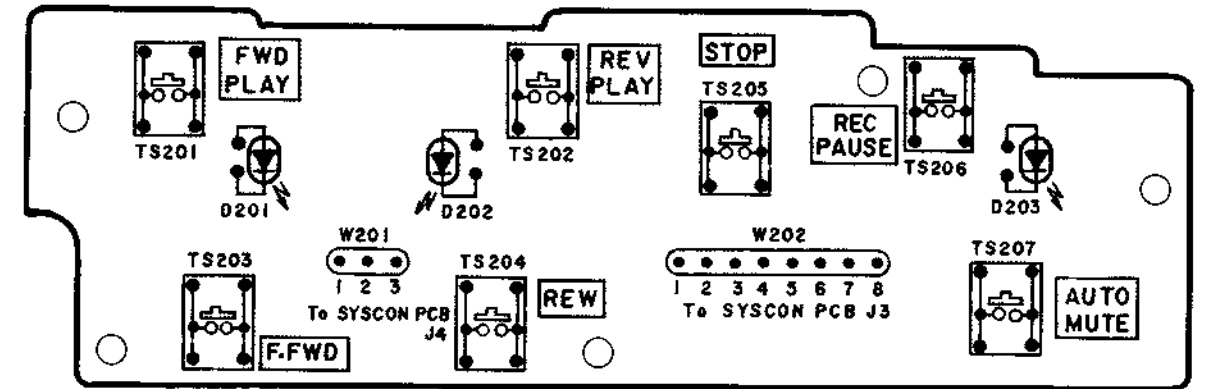
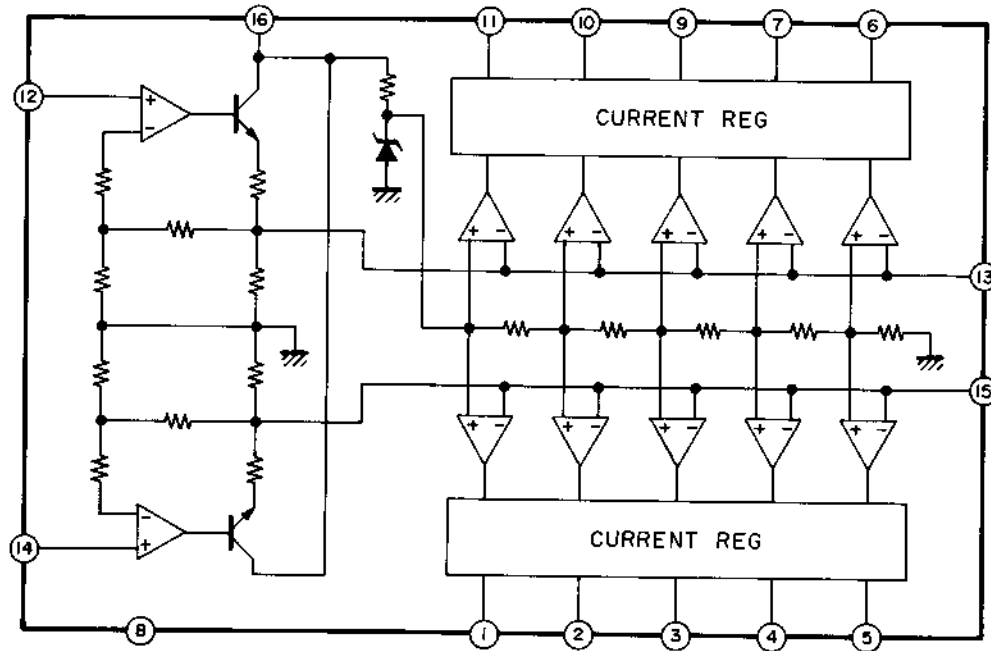
CONNECTORS



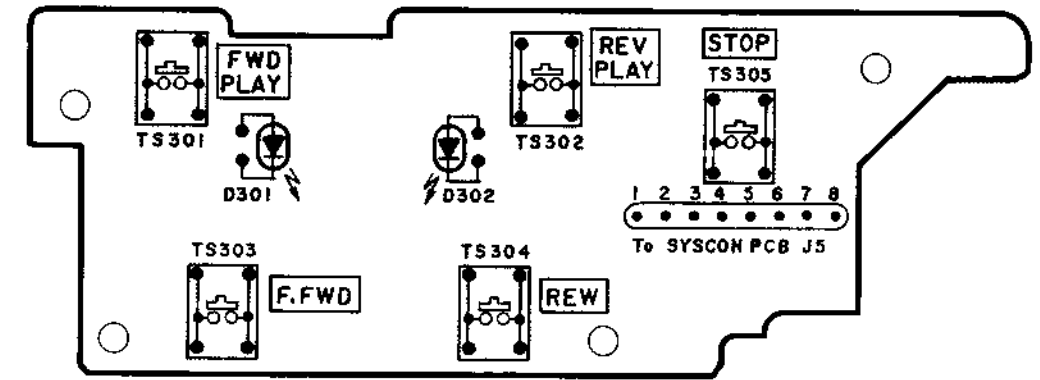
VR. NO.	LOCATION	ADJUSTMENT'S ITEM
VR1	D2	TAPE I QUICK REVERSE SENSITIVITY テープIクイックリバース感度
VR2	D2	TAPE II QUICK REVERSE SENSITIVITY テープIIクイックリバース感度
VR3	A2	TAPE I NORMAL SPEED テープI標準テープスピード
VR4	A2	TAPE I DOUBLE SPEED テープI倍速テープスピード
VR5	A1	TAPE II NORMAL SPEED テープII標準テープスピード
VR6	A1	TAPE II DOUBLE SPEED 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-----2SC3402A(F,G)
 TR21,34-----2SD1012-V(H)
 TR37,38,41,42,43,45,47-----2SC3399
 TR44,46-----2SB774(Q,R,S,T)

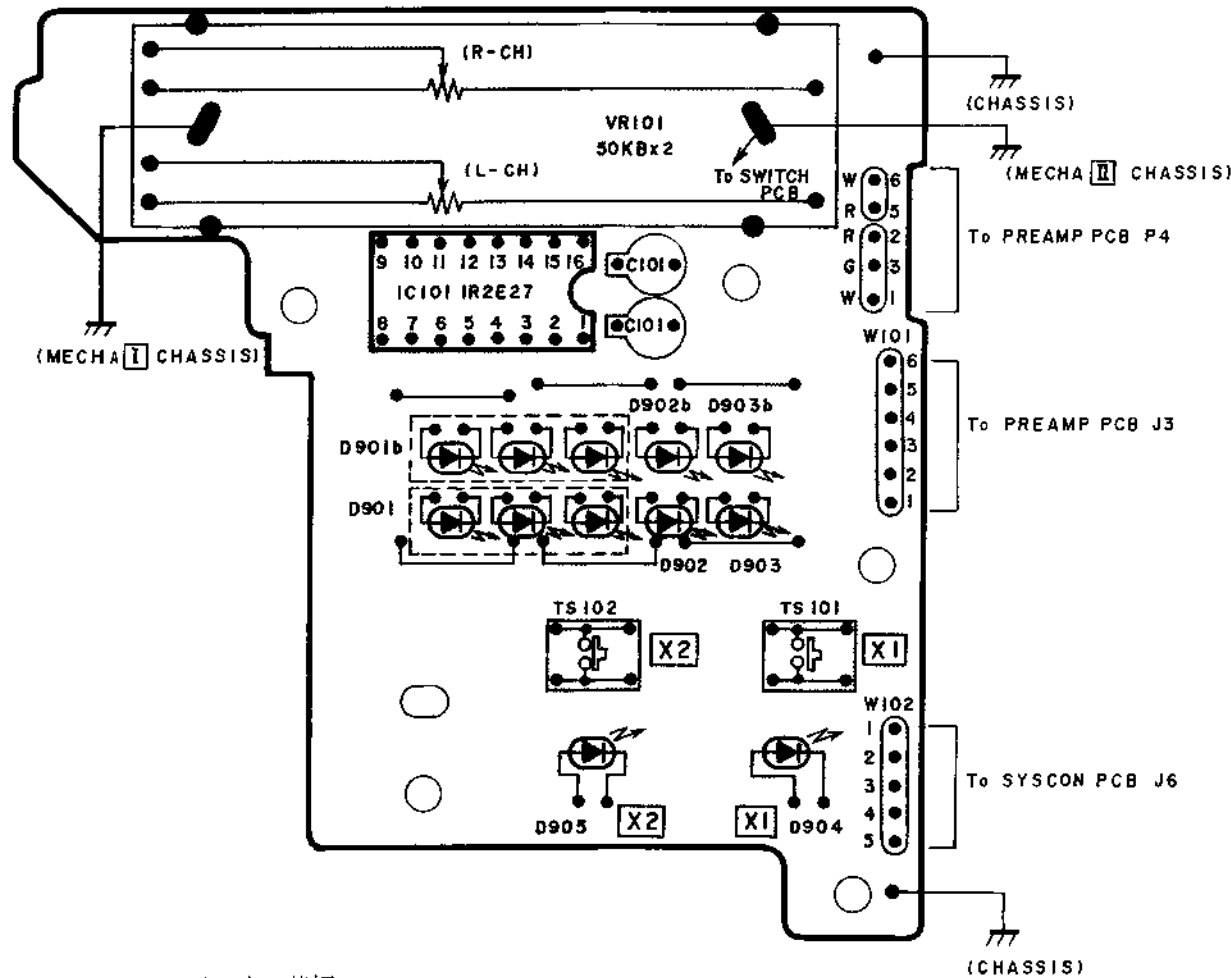
IR2E27A



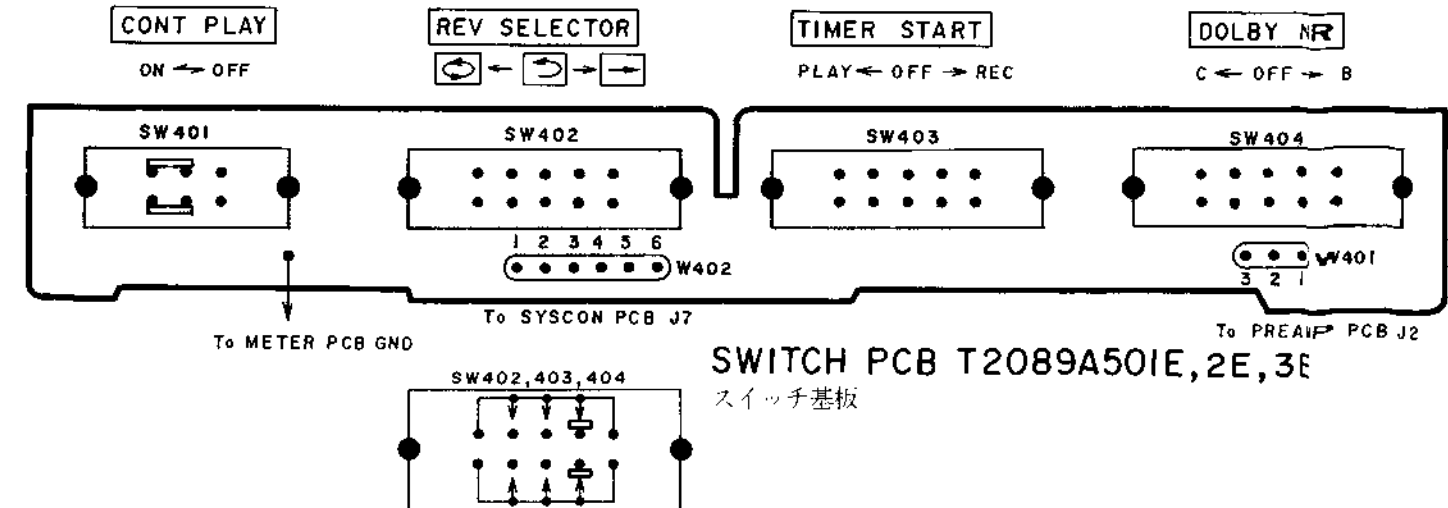
OPERATION TAPE I PCB T2089A50IC,2C,3C
オペレーションテープI基板



OPERATION TAPE II PCB T2089A50ID,2D,3D
オペレーションテープII基板



メーター基板
METER PCB T2089A50IB, 2B, 3B



SWITCH PCB T2089A50IE, 2E, 3E
スイッチ基板

A B C D E F

1

2

3

4

5

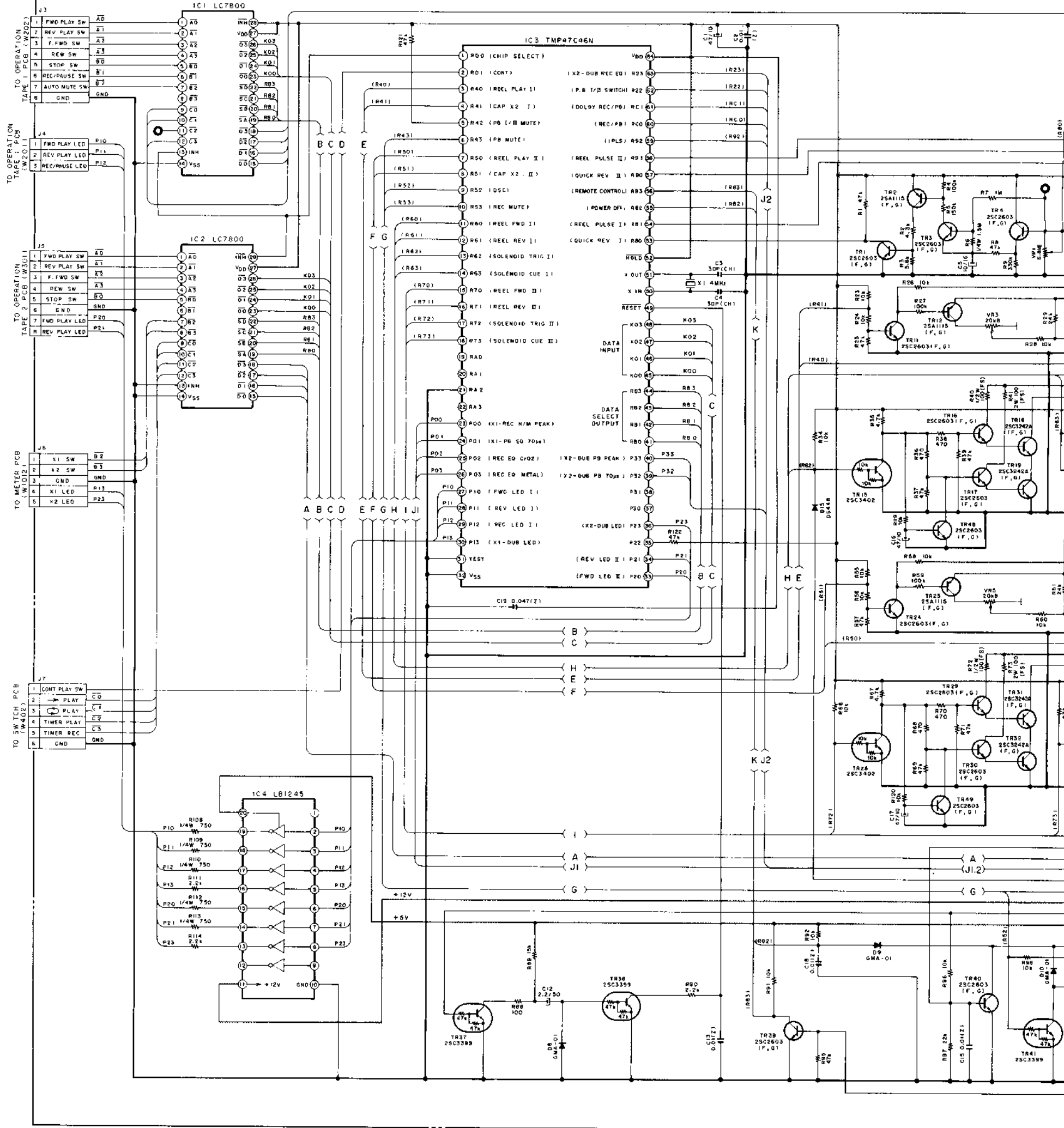
6

7




8

A B C D E F

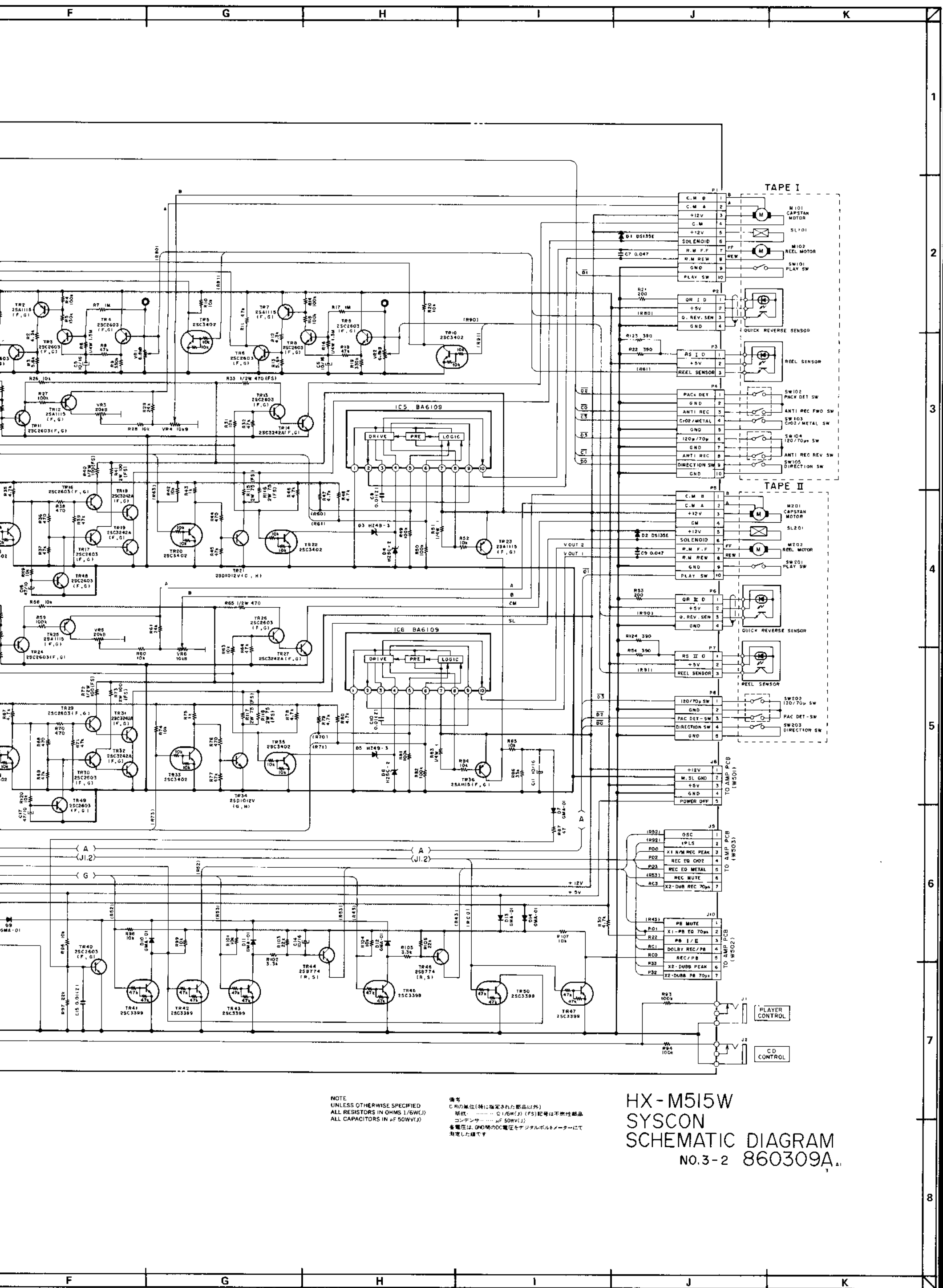
05



SYSCON PCB T2089A504A

-  25C3242A(F, G)
-  25B77410, R, S, T, I
-  25A1115(E, F, G)
- 25C2603(G)
- 25C3399
- 25C3402
- 25D1012-V(H)

8 電源 B (POWER SUPPLY) LINE



NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μ F 50V(V)

備考
Cの単位(特に指定された部品以外)
抵抗値 Ω / 1/6W(J) (FS)記号は不燃性部品
コンデンサ μ F 50V(V)
各電圧は、GND側のDC電圧をデジタルポルトメーターにて
測定した値です

HX-M515W SYSCON SCHEMATIC DIAGRAM NO.3-2 860309A

1
2
3
4
5
6
7
8

HX-M515W

04

TAPE I

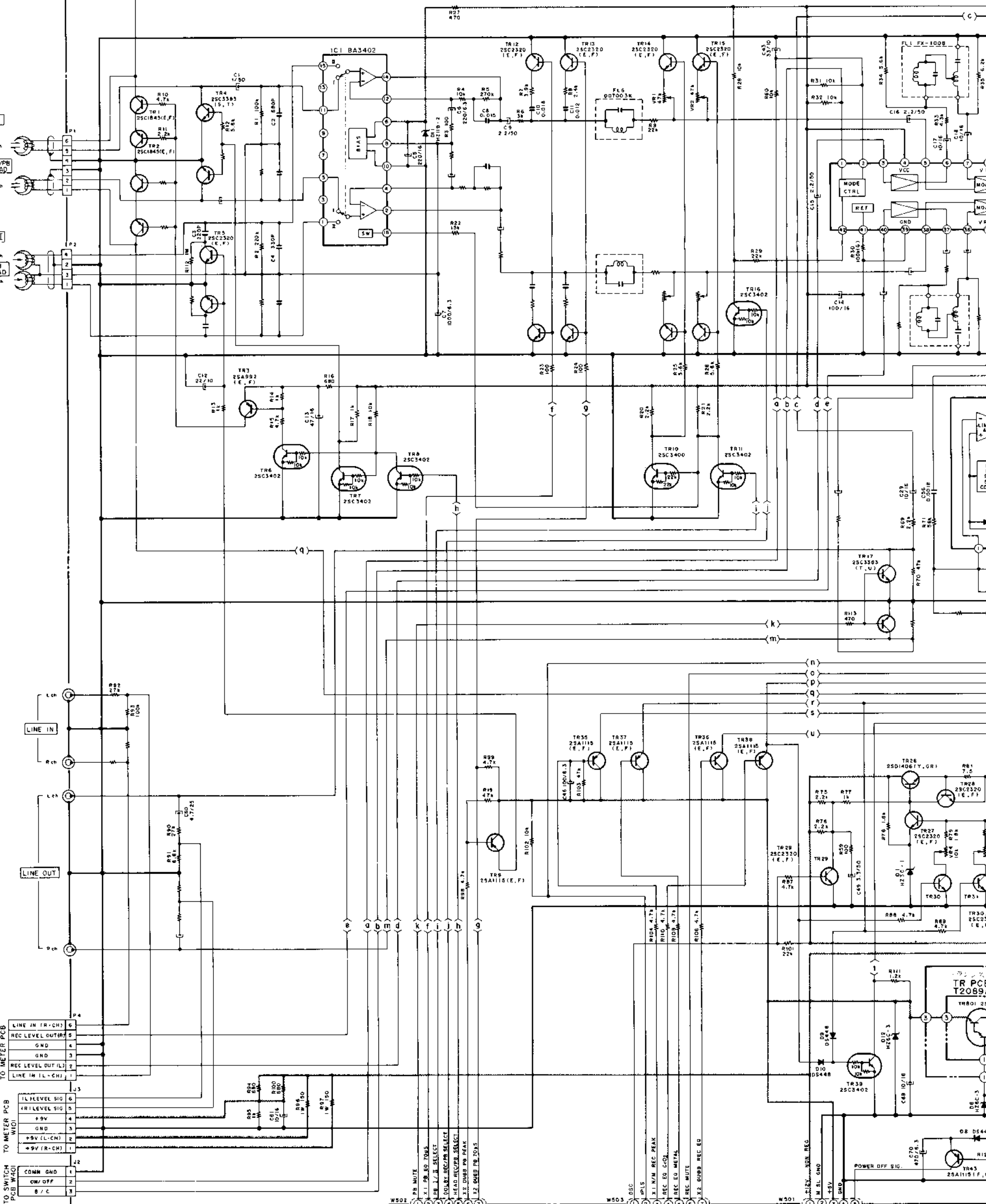
REC/PB HEAD

RCH

TAPE II

PB HEAD

RCH



TO METER PCB (W101)

LINE IN (R-CH) 6
 REC LEVEL OUT (R) 5
 GND 4
 GND 3
 REC LEVEL OUT (L) 2
 LINE IN (L-CH) 1

TO METER PCB (W101)

IL LEVEL SIG 6
 RL LEVEL SIG 5
 +9V 4
 GND 3
 +9V (L-CH) 2
 +9V (R-CH) 1

TO SWITCH PCB (W101)

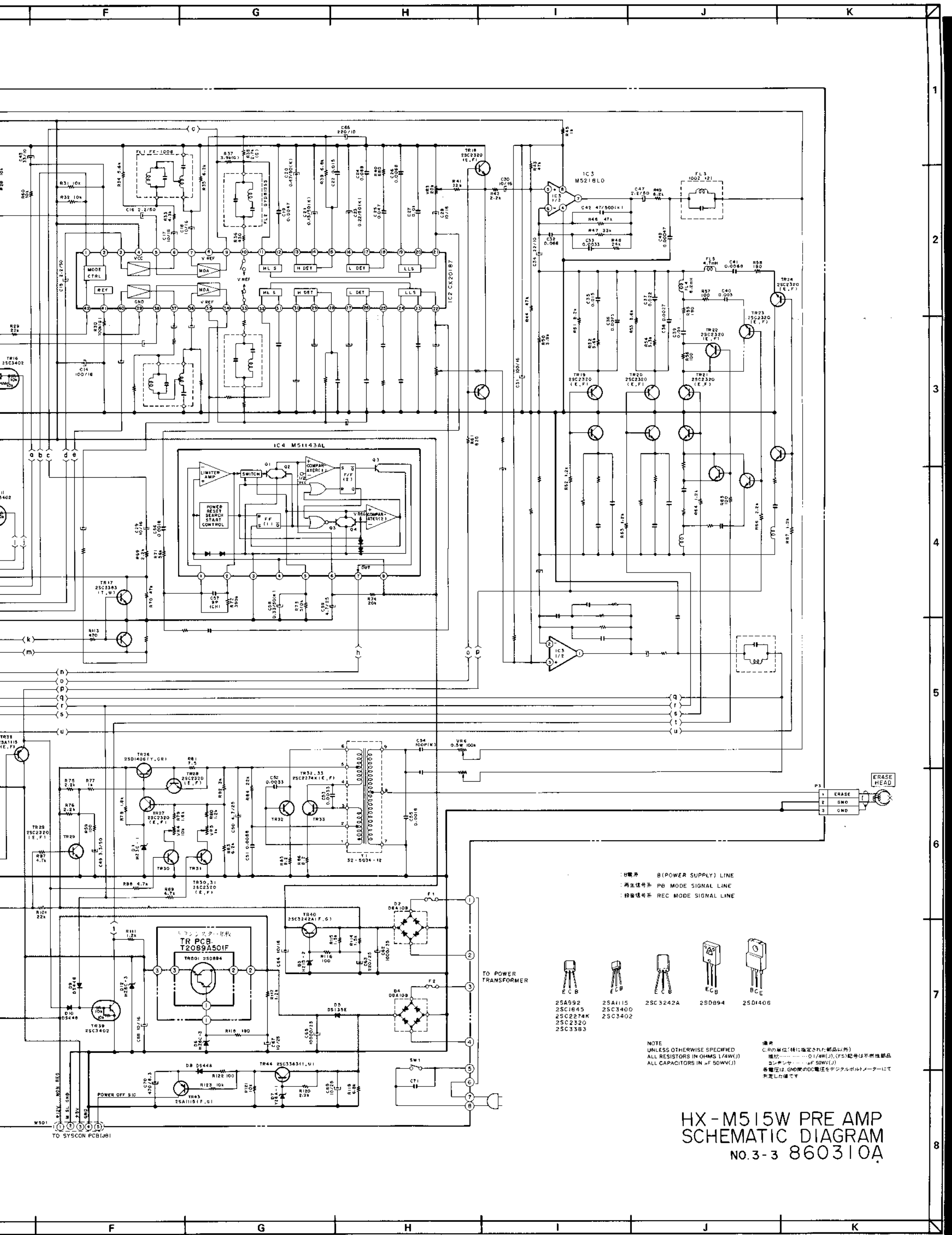
COMM GND 1
 ON/OFF 2
 B/C 3

PRE AMP PCB T2089A501A

TO SYSCON PCB (J10)

TO SYSCON PCB (J9)

TO SYSCON PCB (J8)



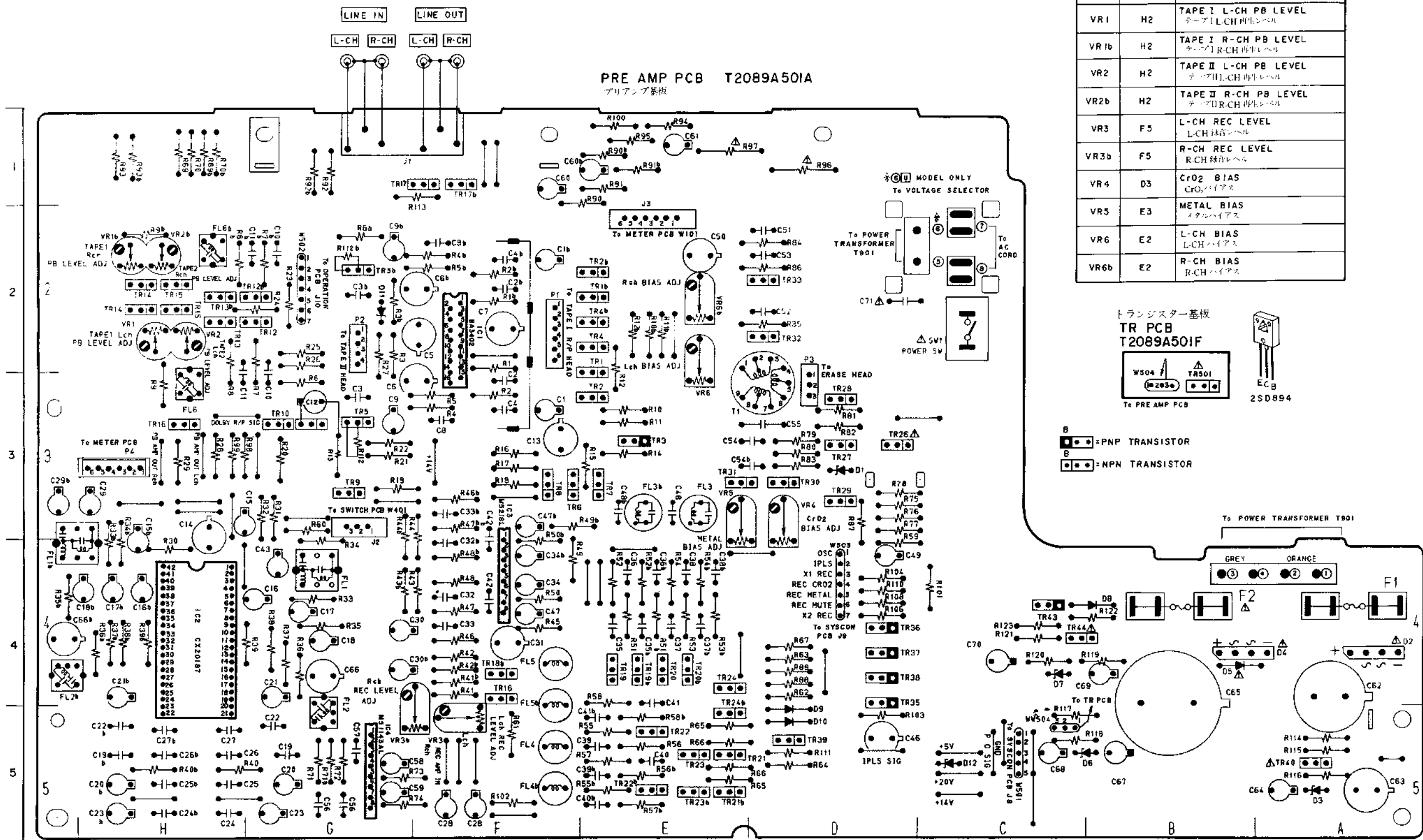
B電源 B (POWER SUPPLY) LINE
 再生信号線 PB MODE SIGNAL LINE
 録音信号線 REC MODE SIGNAL LINE

- | | | | | |
|----------|---------|----------|--------|---------|
| | | | | |
| 25A992 | 25A115 | 25C3242A | 25D894 | 25D1406 |
| 25C1845 | 25C3400 | | | |
| 25C2274K | 25C3402 | | | |
| 25C2320 | | | | |
| 25C3383 | | | | |

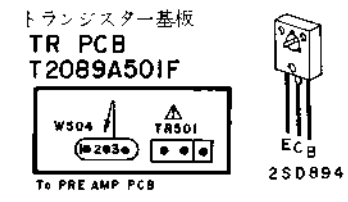
NOTE
 UNLESS OTHERWISE SPECIFIED
 ALL RESISTORS IN OHMS 1/4W(J)
 ALL CAPACITORS IN μF 50WV(J)

備考
 C.Rの単位(特に指定された部品以外)
 抵抗.....Ω(1/4W(J)), (F5)記号は不燃性部品
 コンデンサ.....μF 50WV(J)
 各電圧は、GND線のDC電圧をデジタルポルトメーターにて
 測定した値です

HX-M515W PRE AMP
SCHEMATIC DIAGRAM
 NO.3-3 860310A



VR.NO.	LOCATION	ADJUSTMENT'S ITEM
VR1	H2	TAPE I L-CH PB LEVEL テープI LCH再生レベル
VR1b	H2	TAPE I R-CH PB LEVEL テープI RCH再生レベル
VR2	H2	TAPE II L-CH PB LEVEL テープII LCH再生レベル
VR2b	H2	TAPE II R-CH PB LEVEL テープII RCH再生レベル
VR3	F5	L-CH REC LEVEL LCH録音レベル
VR3b	F5	R-CH REC LEVEL RCH録音レベル
VR4	D3	CrO2 BIAS CrO2バイアス
VR5	E3	METAL BIAS メタルバイアス
VR6	E2	L-CH BIAS LCHバイアス
VR6b	E2	R-CH BIAS RCHバイアス

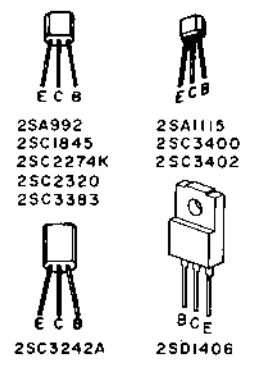


= PNP TRANSISTOR
 = NPN TRANSISTOR

LOCATION OF COMPONENTS

IC's	TR's	CONNECTOR'S
IC1--F2	TR1--E2	TR10--G3
IC2--H4	TR1b--E2	TR11--G3
IC3--F4	TR2--E3	TR12--G2
IC4--G5	TR2b--E2	TR13--H2
	TR3--E3	TR14--H2
	TR4--E2	TR15--H2
	TR4b--E2	TR16--H3
	TR5--G3	TR17--F1
	TR5b--G2	TR17b--F1
	TR6--F3	TR18--F4
	TR7--E3	TR18b--F4
	TR8--F3	TR19--E4
	TR9--G3	TR19b--E4
		TR20--E4
		TR20b--E4
		TR21--E5
		TR21b--E5
		TR22--E5
		TR23--E5
		TR23b--E5
		TR24--E4
		TR24b--E5
		TR25--D3
		TR26--D3
		TR27--D3
		TR28--D3
		TR29--D3
		TR30--D3
		TR31--E3
		TR32--D2
		TR33--D2
		TR35--D4
		TR36--D4
		TR37--D4
		TR38--D4
		TR39--D5
		TR40--A5
		TR43--C4
		TR44--C4
		P1--F2
		P2--G2
		P3--D3
		P4--H3
		J2--G3
		J3--E2
		W501--C5
		W502--G2
		W503--D4
		W504--C5

- 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, GR)
- TR32, 33 -----2SC2274K (F)
- TR40 -----2SC3242A (F, G)



= PNP TRANSISTOR
 = NPN TRANSISTOR

注意 △印は安全上重要な部品で、交換の際は指定品を使用してください。
 WARNING: △ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.
 Remarque: △印の部品は安全上重要な部品で、交換の際は指定品を使用してください。
 ATTENTION: △印の部品は安全上重要な部品で、交換の際は指定品を使用してください。