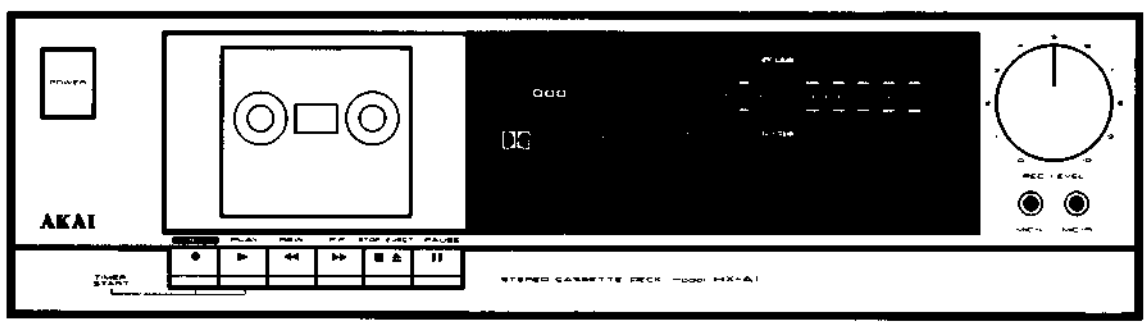
AKAI SERVICE MANUAL

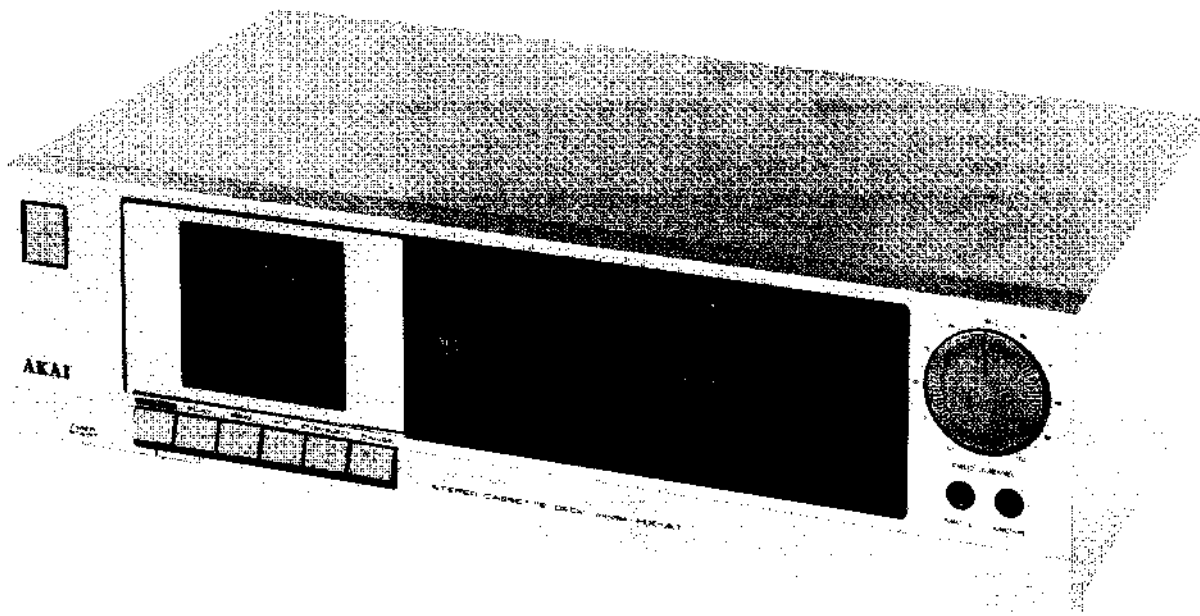


STEREO CASSETTE DECK

MODEL HX-A1

ABBREVIATIONS FOR SERVICE MANUAL
MODEL HX-A1

ABBREVIATION	EXPLANATION
ADJ	ADJust (ADJustment)
DIN	Deutsche Industrie Normen
FREQ.	FREQuency
IND	INDicator
LED	Light Emitting Diode
MIC	MICrophone
MPX	MultiPleX
PCB	Printed Circuit Board
S/N	Signal to Noise (Ratio)
SW	SWitch
TR	TRansistor



STEREO CASSETTE DECK

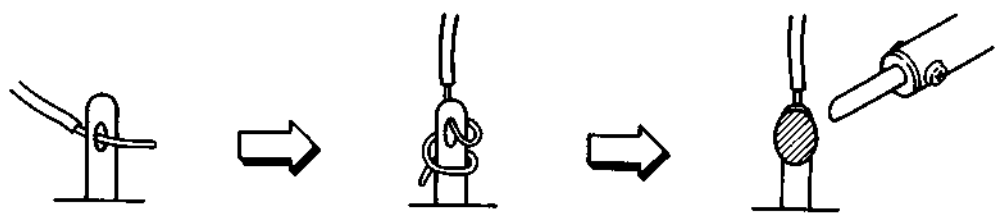
MODEL HX-A1

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 more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks, line-in-out jacks etc.)

PRECAUTIONS DURING SERVICING

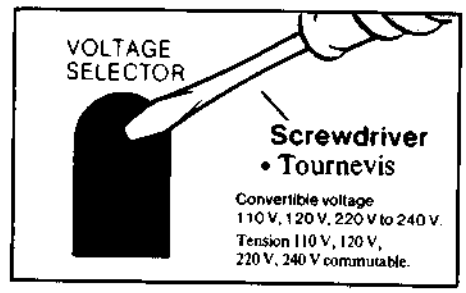
1. Parts identified by the ⚠ symbol parts are critical for safety.
   Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified 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.

VOLTAGE CONVERSION

Models for Canada, USA, Europe, UK and Australia are not equipped with this facility. Each machine is preset at the factory according to destination, but some machines can be set to 110V, 120V, 220V, or 240V as required.
If your machine's voltage can be converted:
Before connecting the power cord, turn the VOLTAGE SELECTOR located on the rear panel with a screwdriver until the correct voltage is indicated.



CYCLE CONVERSION

Cycle Conversion are not necessary since HX-A1 use a DC MOTOR.

SECTION 1

SERVICE MANUAL

TABLE OF CONTENTS

For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

I. SPECIFICATIONS

TRACK SYSTEM	4 Track 2 Channel Stereo System
TAPE	Philips Type Cassette
MOTOR	Electronically speed controlled DC Motor for capstan drive x 1
HEADS	High Density head for recording/playback x 1 Erase head x 1
TAPE WINDING TIME	100 sec. Using a C-60 cassette tape
WOW & FLUTTER	0.05% WRMS, 0.12% WTD (DIN)
DISTORTION	0.7% (Metal)
FREQUENCY RESPONSE	Metal 30Hz to 17,000Hz ± 3dB CrO_2 30Hz to 16,000Hz ± 3dB Normal 30Hz to 15,000Hz ± 3dB
S/N	56dB (Metal Tape) Dolby NR ON: Improves up to 5dB at 1kHz, 10dB above 5kHz
INPUT SENSITIVITY/IMPEDANCE	LINE 70 mV/47 kohms DIN 5 mV/10 kohms (HX-A1-G type) MIC 0.25 mV/5 kohms
OUTPUT SENSITIVITY/IMPEDANCE	LINE 380 mV/1 kohms DIN 380 mV/1 kohms (HX-A1-G type) PHONES 0.3 mW (at 8 ohms)/56 ohms
POWER REQUIREMENTS	120V, 60Hz for USA and Canada 220V, 50Hz for Europe except UK 240V, 50Hz for UK and Australia 110V/120V/220V/240V, 50/60Hz switchable for other countries
DIMENSIONS	440(W) x 115(H) x 258(D) mm (17.3 x 4.5 x 10.2 inches)
WEIGHT	3.3kg (7.3 lbs)

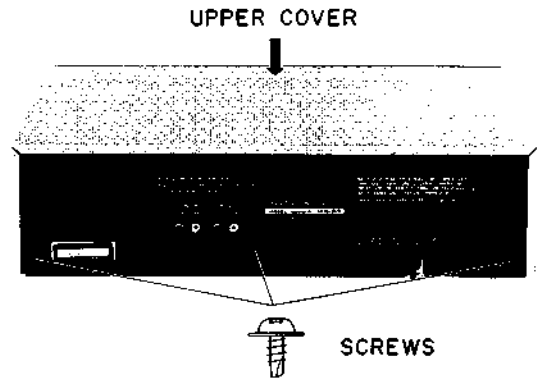
*** For improvement purposes, specifications and design are subject to change without notice.**

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

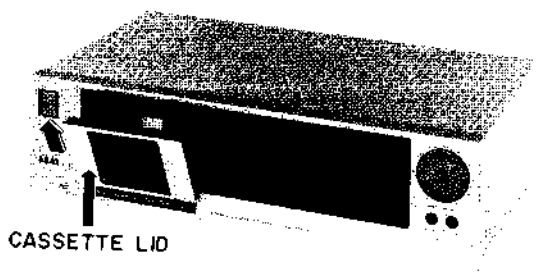
II. DISMANTLING OF UNIT

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

3

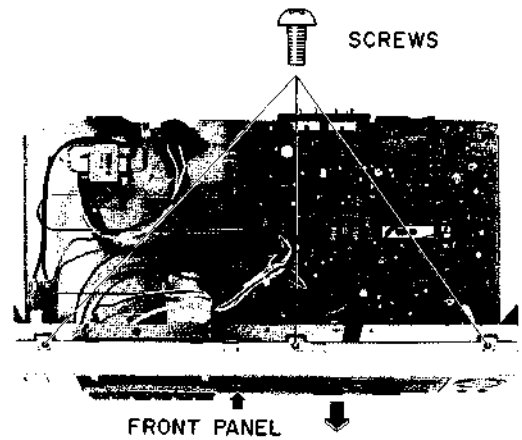


1

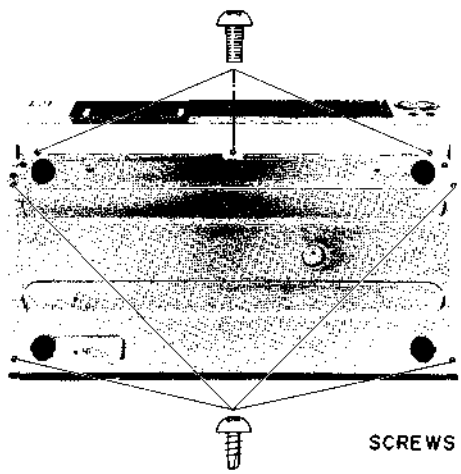


Push EJECT BUTTON and slide LID in direction shown.

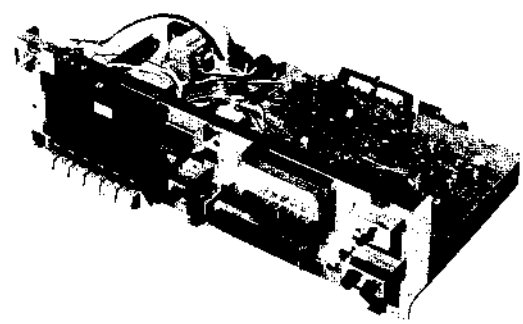
4



2



5



III. CONTROLS

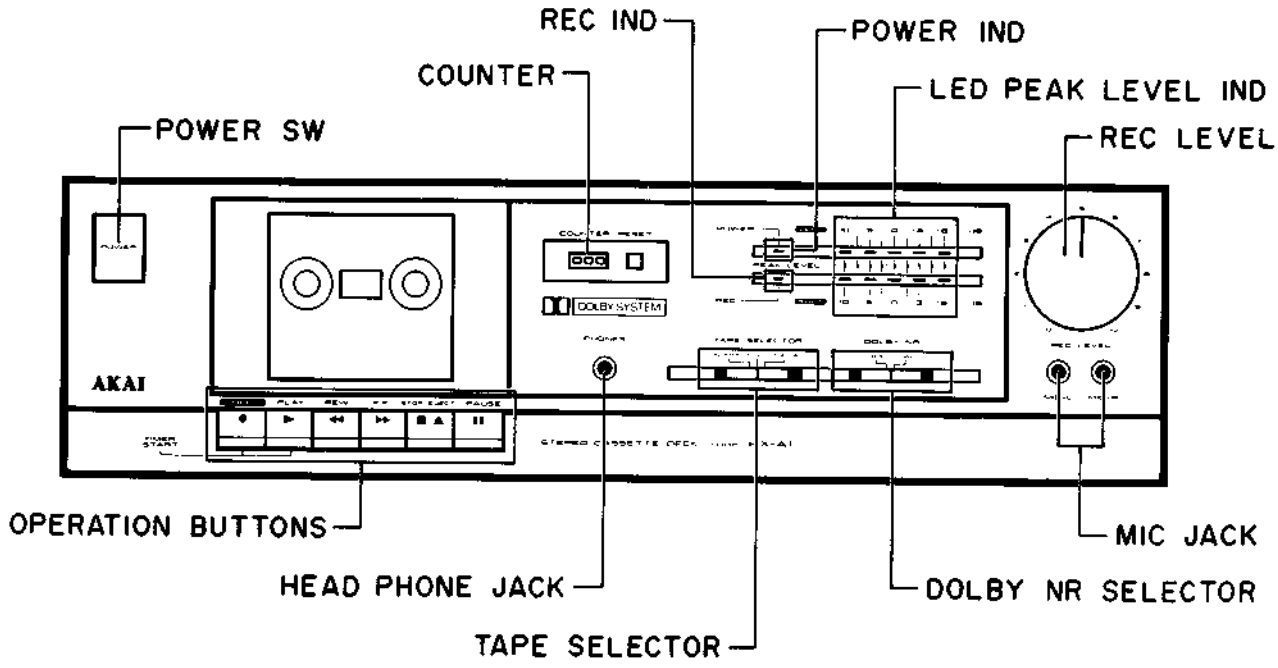


Fig. 3-1

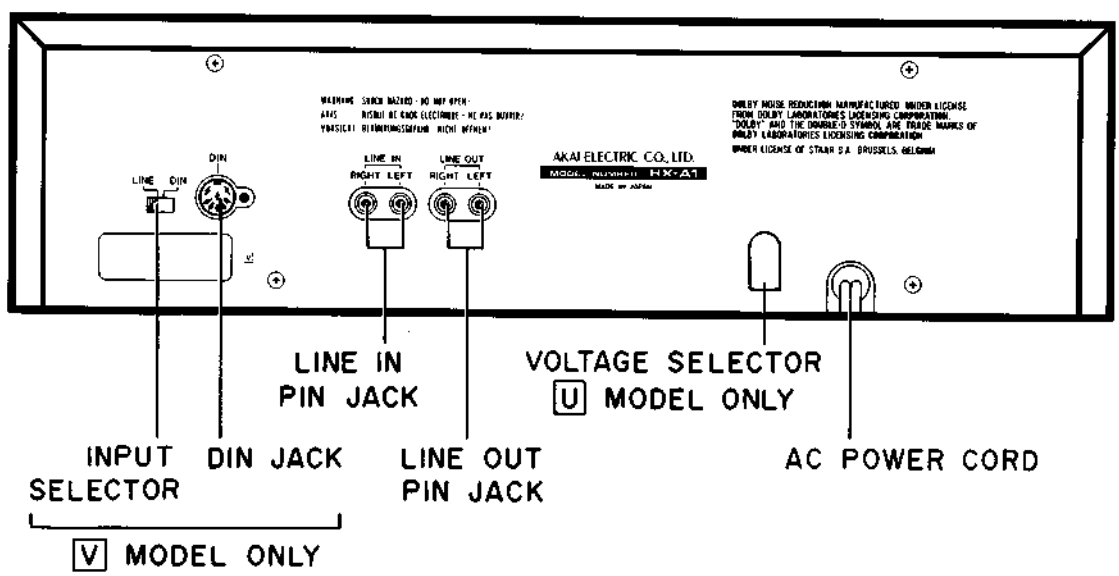


Fig. 3-2

IV. PRINCIPAL PARTS LOCATION

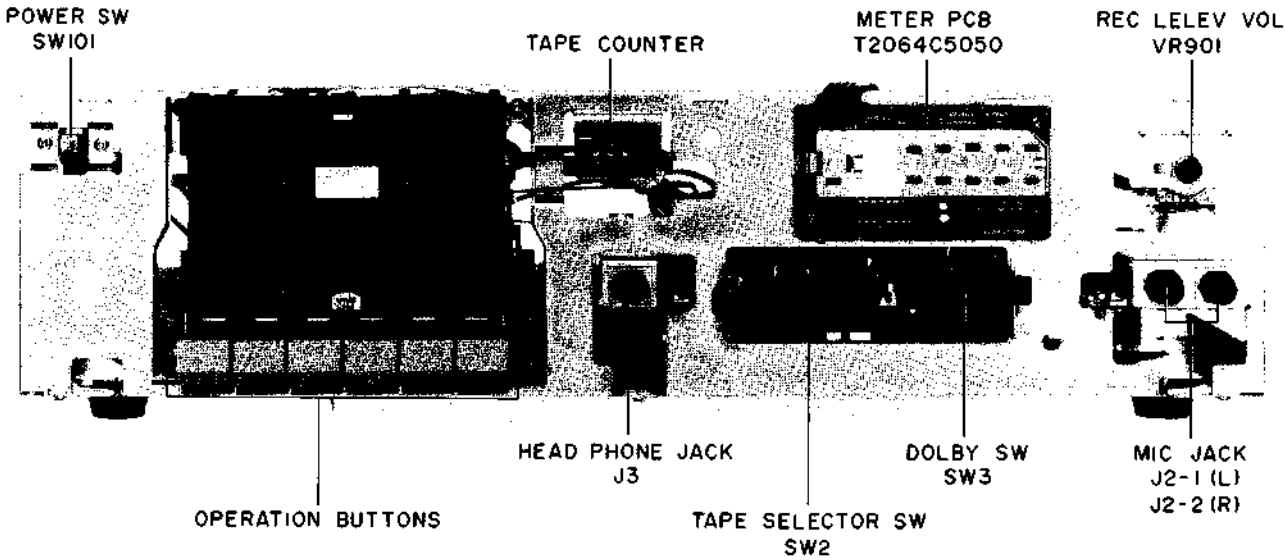


Fig. 4-1 Front View

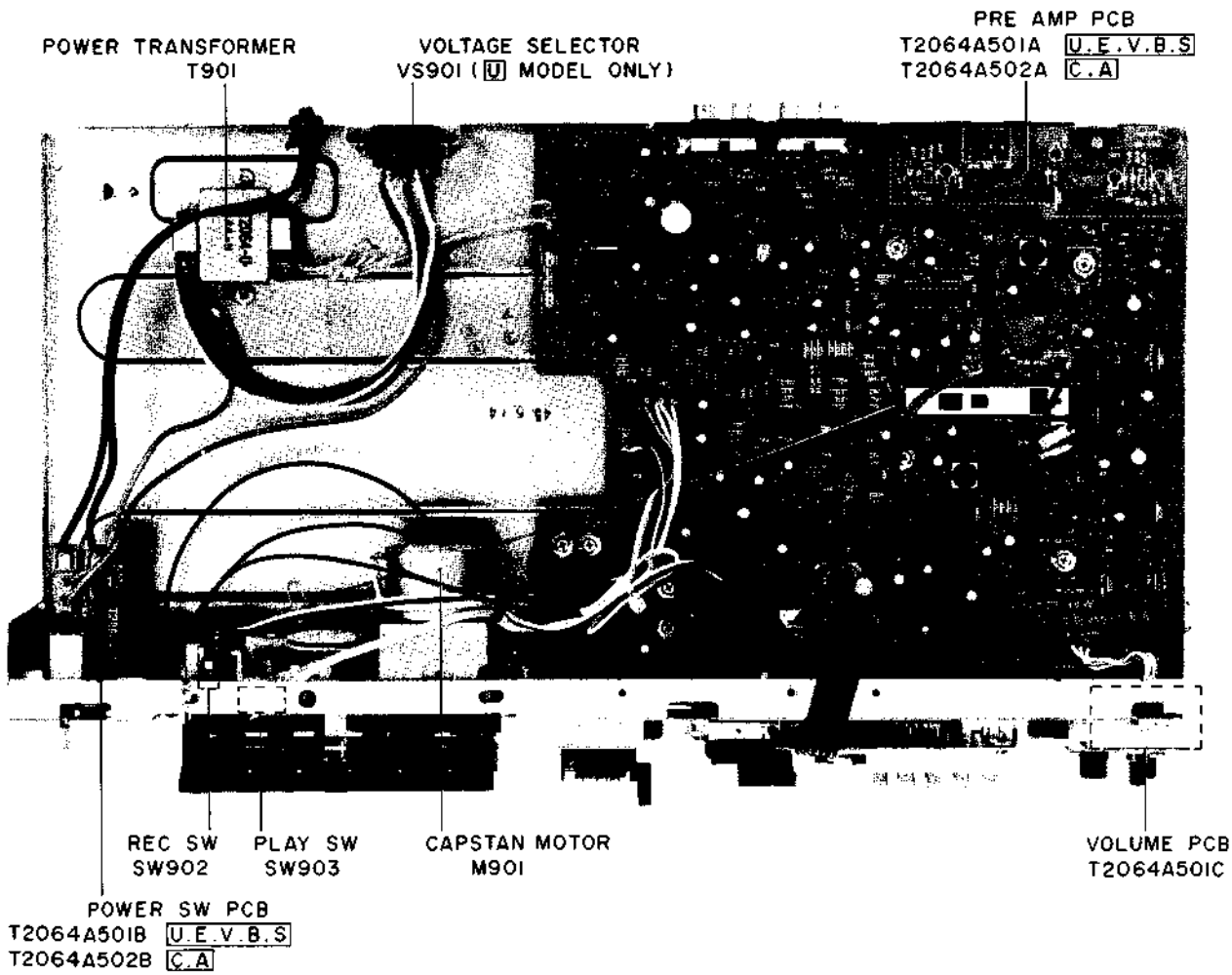


Fig. 4-2 Top View

V. MECHANICAL ADJUSTMENT

5-1 PINCH ROLLER PRESSURE MEASUREMENT (Refer to Fig. 5-1)

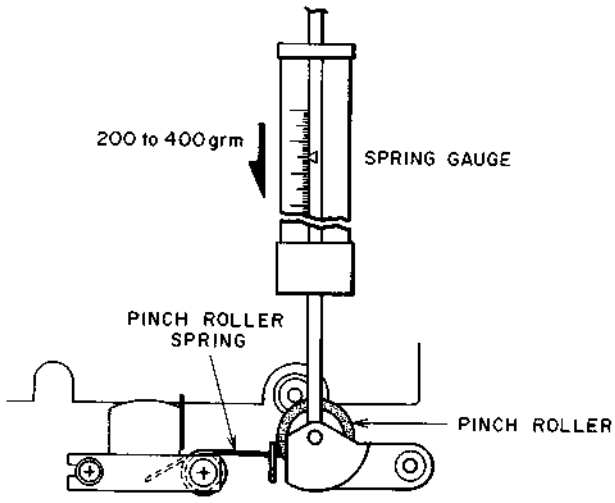


Fig. 5-1

Put in PLAY mode. Push pinch roller arm down with the spring gauge, push the pinch roller 1 to 2 mm 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 of 200 to 400 grm. If there is no measurement obtained, Adjust or Replace the pinch roller spring.

5-2 WINDING TORQUE MEASUREMENT IN EACH MODE (Refer to Fig. 5-2)

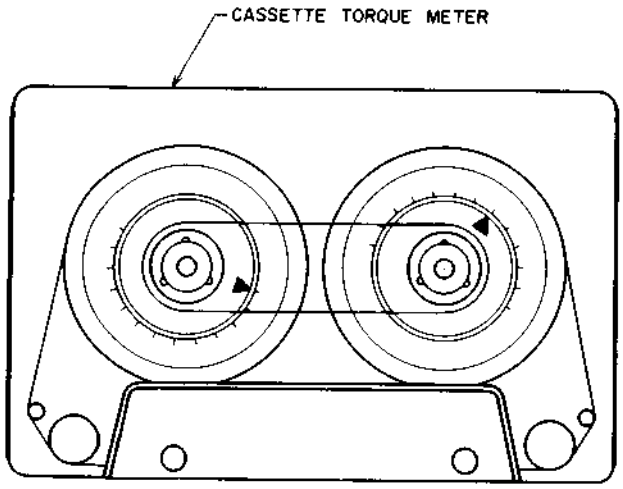


Fig. 5-2

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

PLAY mode

Take up Torque: 35 to 75 grm-cm

Back tension torque: 1 to 6 grm-cm

FAST FORWARD, REWIND mode

Take up Torque: 70 to 160 grm-cm

5-3 TAPE SPEED ADJUSTMENT (Refer to Fig. 5-3)

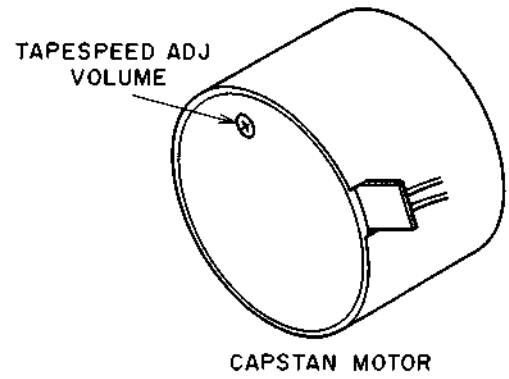


Fig. 5-3

Connect a frequency Counter to Line output terminals. Play Back a 1,000Hz Tape Speed Test Tape(AT-750774) or 3,150Hz Tape Speed Test Tape (AT-750774) and adjust a Tape Speed Adjustment Volume (see Fig. 3-3) to obtain a tape speed of 1,000Hz ± 10Hz, or 3,150 ± 30Hz.

5-4 REC/RB HEAD AZIMUTH ADJUSTMENT (Refer to Fig. 5-4)

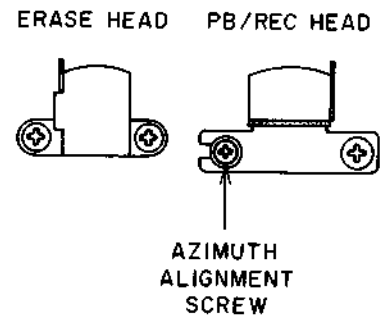


Fig. 5-4

Play Back a 10kHz Azimuth Alignment Tape (AT-750778) and Adjust the Azimuth Alignment Screw, until the output levels of both channels are maximum. After Adjustment, Paintlock the Azimuth Alignment Screw.

5-5 JOINT REC ADJUSTMENT

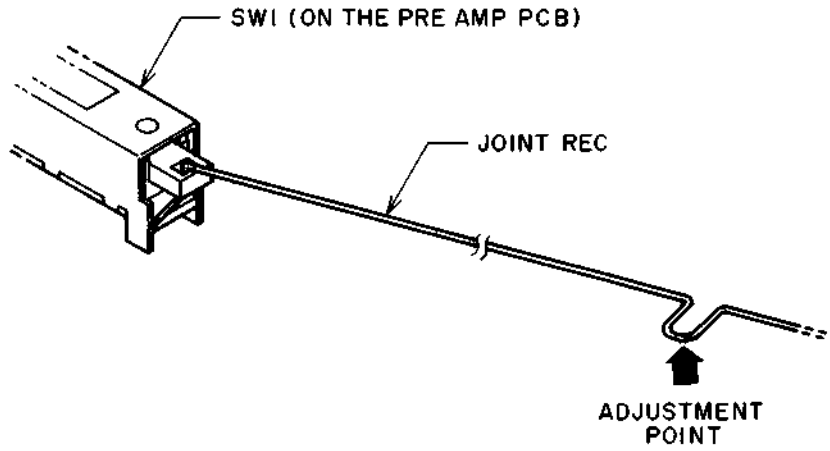


Fig. 5-5

Adjust adjustment point of JOINT REC so that SW1 is pulled completely at REC mode, it is released at PB mode.

VI. AMPLIFIER ADJUSTMENT

6-1 PRE AMP ADJUSTMENT POINT

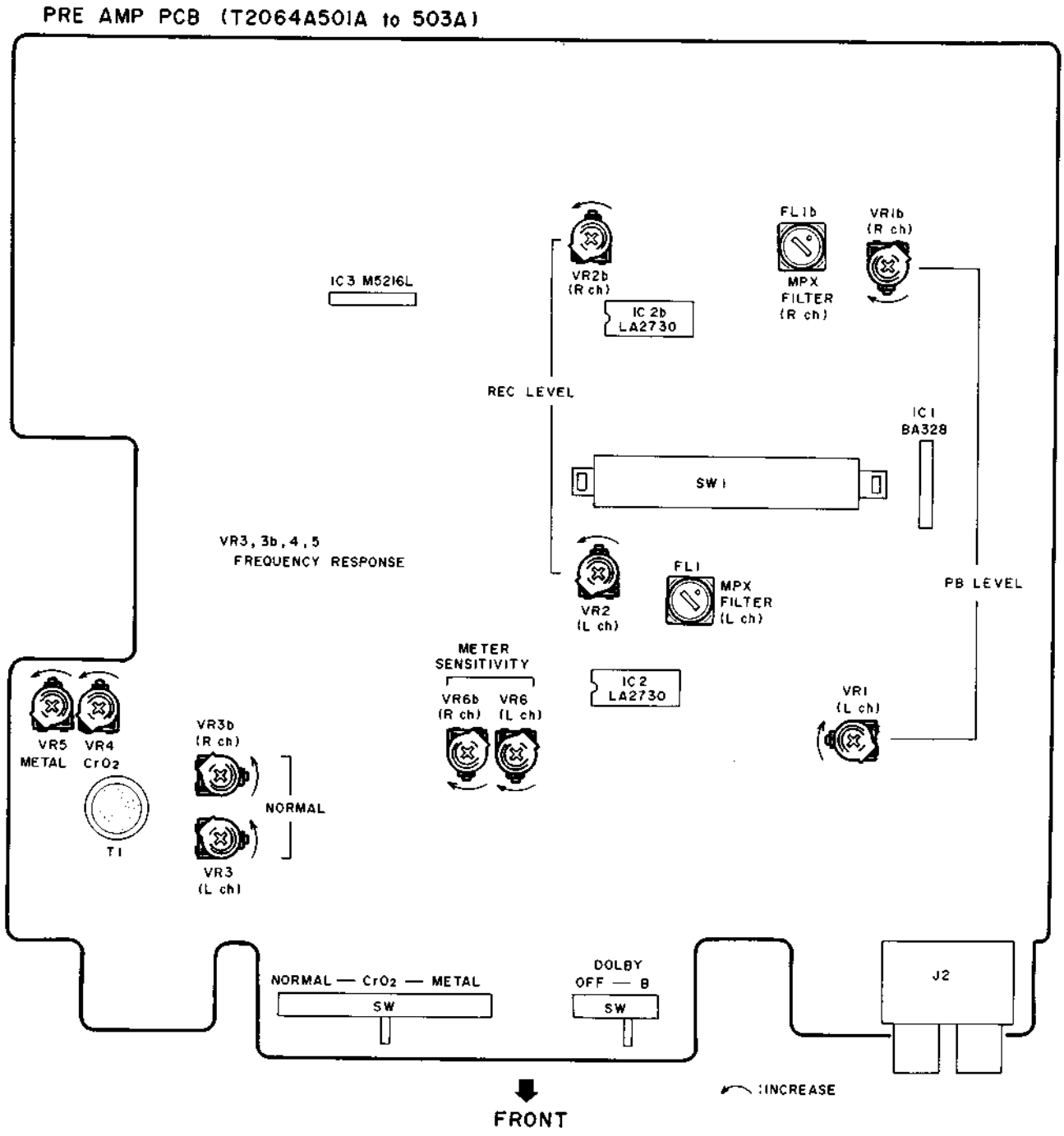


Fig. 6-1

6-2 PRE AMP ADJUSTMENT CHART

Step	Adjustment Item	Test Tape Supply signal	Mode	Adjustment	Result	Remarks
1	PB LEVEL	315Hz or 333Hz	PB	VR 1 (Lch) VR 1b (Rch)	−6.1 ± 0.5 dBm −6.6 ± 0.5 dBm	
2	NORMAL POSITION FREQUENCY RESPONSE	NORMAL Blank Tape 1kHz, 10kHz −26.0dBm	REC/PB	VR 3 (Lch) VR 3b (Rch)	1kHz, 10kHz Flat ± 0.3dBm	
3	CrO_2 POSITION FREQUENCY RESPONSE	CrO_2 Blank Tape 1kHz, 10kHz −26.0dBm	REC/PB	VR 4	1kHz, 10kHz Flat ± 0.8dBm	
4	METAL POSITION FREQUENCY RESPONSE	METAL Blank Tape 1kHz, 10kHz −26.0dBm	REC/PB	VR5	1kHz, 10kHz Flat ± 0.8dBm	
5	REC LEVEL	NORMAL Blank Tape 1kHz, −6.0dBm	REC/PB	VR 2 (Lch) VR 2b (Rch)	−6.0 ± 0.5 dBm	
6	METER SENSITIVITY	1kHz, −2dBm (606mV)	REC	VR 6 (Lch) VR 1b (Rch)	OVU LED BRIGHTLY	OVU = 606mV
7	MPX Filter	19kHz	REC	FL 1 (Lch) FL 1b (Rch)	OUTPUT Minimum	Less than −30dBm

NOTES: 1. All adjustments are without Dolby.

2. Use the following cassette measuring tapes:

NORMAL TAPE : Maxell UDI C-60
CrO_2 TAPE : TDK SA C-60
METAL TAPE : TDK MA C-60

3. Refer to Fig. 6-1 for the adjustments.

VII. DC RESISTANCE OF HEADS

Description	Name	DC Resistance
PB/REC Head	HY4247199VK	320 ohms ± 20%
Erase Head	HJ213270	3.5 ohms

VIII. PC BOARD TITLES AND IDENTIFICATION NUMBERS

PC Board Title	PC Board Number	Remarks
PRE AMP PC BOARD	T2064A501A	U, E, V, B, S
	T2064A502A	C, A
METER PC BOARD	T2064C5050	
POWER SW PC BOARD	T2064C501B	U, E, V, B, S
	T2064C502B	C, A
VOLUME PC BOARD	T2064A501C	

SECTION 2

PARTS LIST

TABLE OF CONTENTS

Resistors and Capacitors which are not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

ATTENTION

1. When placing an order for parts, be sure to list the parts no. model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Parts List may be partially changed, please use this parts list for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List shows the parts that are considered necessary for repairs. Other parts, such as resistors and capacitors, are shown in the "Common List for Service Parts". Select and order such parts from the "Common List for Service Parts".
2. The Recommended Spare Parts 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 be supplied in principle.
4. How to read list

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK GX-F66R
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	CS ANGLE ADJUST SPRING

SP (Service Parts) Classification

A small "x" indicates the inability to show that particular part in the Photo or Illustration.

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

This number corresponds with the Figure Number

b) P.C Board Block

6. SYS. CON. P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
6-1	BA-T2034A070A	PC SYS CON BLK GX-F44R
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-IC3	EI-331661	IC SN7405N
6-IC4	EI-336725	IC M54527P
6-TR1to4	ET-200985	TR 2SC2603 F,G
6-TR5to28	ET-554657	TR 2SA733A P,Q
6-D1	ED-318292	D SILICON H 1S2473T-77 T26
6-D2to4	ED-308952	D GERMA V 1K34A-LR F07
6-D5to10	ED-318292	D SILICON H 1S2473T-77 T26
6-X1	EI-318384	OSC X'TAL NC-18C 3.579545MHZ

SP (Service Parts) Classification

This reference numbers corresponds with symbol numbers of Schematic Diagrams.

5. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List. It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index.

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 SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

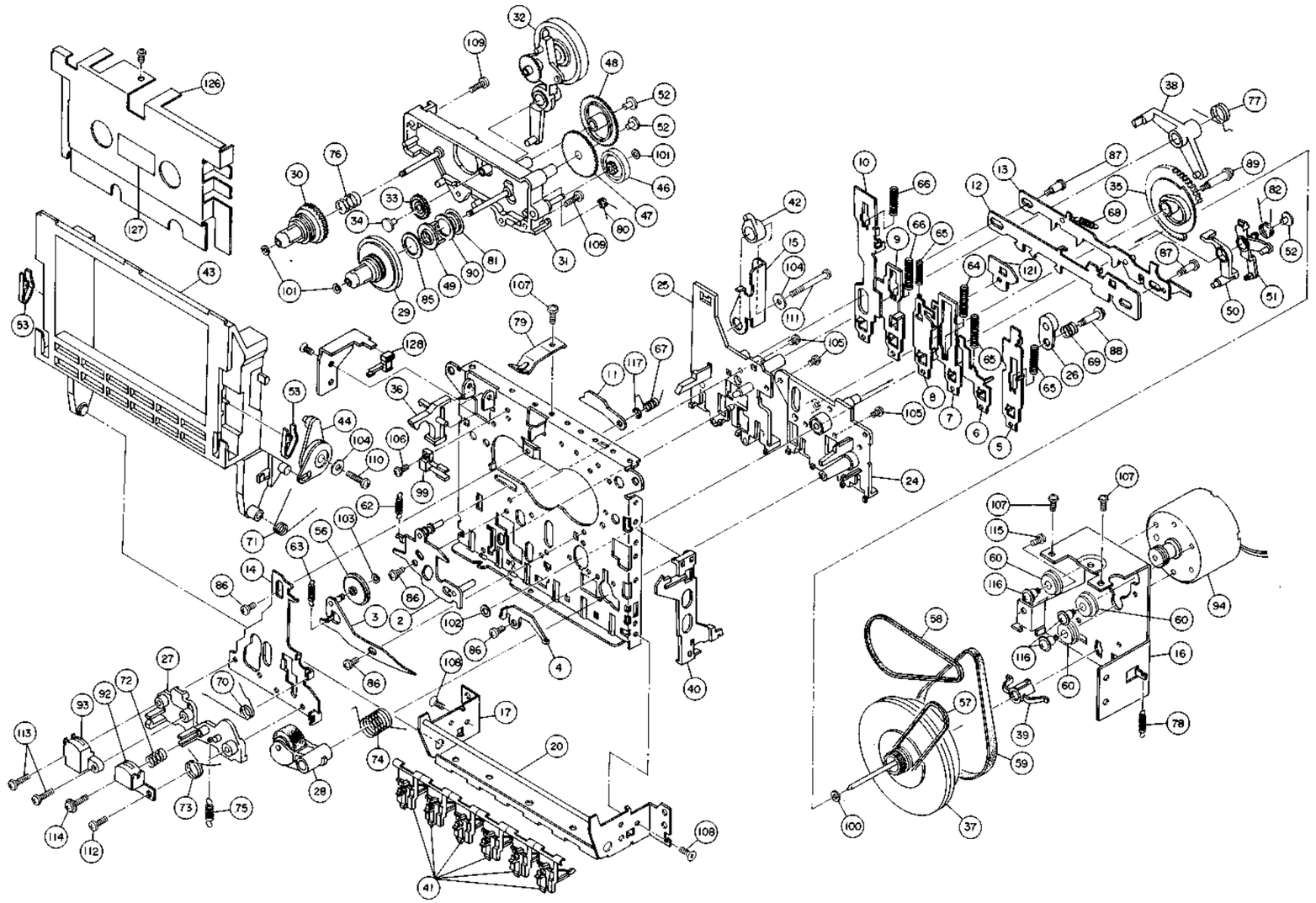
NO.		PARTS NO.	DESCRIPTION
1		BL-712799	PINCH ROLLER ARM ASSY
2		BM-712825	⚠ MOTOR (W/PULLEY) ASSY
3		BR-712802	SUPPLY REEL ASSY
4		BR-712801	TAKE-UP REEL ASSY
5		BT-354051	⚠ TRANS POWER T2064 (A,C)
6		BT-354053	⚠ TRANS POWER T2064 (B,S)
7		BT-354052	⚠ TRANS POWER T2064 (E,V,Y1)
8		BT-354050	⚠ TRANS POWER T2064 (U)
9		ED-353292	D LED GL-9HY24 YELLOW
10		ED-353290	D LED GL-9NG24 GREEN
11		ED-353291	D LED GL-9PR24 RED
12		ED-330319	D SILICON DBA10B 100/1.0A
13		ED-301911	D SILICON H DS448
14	N	ED-338403	D ZENER V HZ11B-1S7
15		ED-348001	D ZENER V HZ2B-1S7
16		EF-258344	⚠ FUSE SEMKO T 250V 0.80A (EXCEPT C,A)
17		EF-309391	⚠ FUSE TSC 125V 0.80A (C,A)
18		EH-354528	FILTER DOLBY FX-100B
19		EI-349590	IC BA3280EC
20		EI-353289	IC IR2E27A
21		EI-349591	IC LA2730
22		EI-353227	IC M5216L
23		ES-337902	⚠ SW PUSH SDLD1P 01-1
24		ES-305733	⚠ SW SELECTOR HXW0131-260 01-4 (U)
25		ES-713178	SW LSA-1120-YN
26		ES-713179	SW LSA-1123-37
27		ES-353296	SW SLIDE SSY322
28		ES-353295	SW SLIDE SSY363
29		ES-353294	SW SLIDE 01420061
30		ET-322598	TR 2SB632K E,F
31		ET-348931	TR 2SB774 R,S,T
32		ET-331279	TR 2SC1843 P,F SNP
33	N	ET-309353	TR 2SC2274K E,F
34		ET-328578	TR 2SC2320 E,F
35		ET-351872	TR 2SC3383 R,S
36		ET-349081	TR 2SC3383 S,T
37		ET-351123	TR 2SC3383 T
38	N	ET-452531	TR 2SD313HP E,F
39		EV-344109	R S-FIX H RVF8P01 3P 102
40		EV-337995	R S-FIX H RVF8P01 3P 103
41		EV-337993	R S-FIX H RVF8P01 3P 203
42		EV-337992	R S-FIX H RVF8P01 3P 502
43		EV-338588	R S-FIX H RVF8P01 3P 503
44		EV-348314	VR ROTARY 16P20×3C A503
45		HE-337047	HEAD E HJ213270 C
46		HP-712824	HEAD R/P HY424528 SVK
47		MB-712818	BELT AUTO
48		MB-712820	BELT DRIVE
49		MB-712819	BELT FR
50		MB-351605	BELT 0.8×D593 CRHS65
51		MC-353312	COUNTER MK395-043 (BLACK)
52		MI-712813	GEAR AUTO
53		MI-711710	GEAR C
54		MI-712814	GEAR CAM AUTO
55		MI-712804	GEAR FF

"NOTE" N : New Parts

SYMBOL FOR DESTINATION

A : AAL (U.S.A)
B : UK (England)
C : CSA (Canada)
E : CEE (Europe)
S : SAA (Australia)
U : U/T (Universal Area)
V : VDE (West Germany)

MECHA AKI-90FMF BLOCK



1. MECHA AKI-90FMF BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
1-1	BB-349568	MECHA BLK AKI-90FMF
1-24	MV-712797	HOLDER LEVER (A) ASSY
1-28	BL-712799	PINCH ROLLER ARM ASSY
1-29	BR-712801	TAKE-UP REEL ASSY
1-30	BR-712802	SUPPLY REEL ASSY
1-32	MI-712803	CLUTCH ARM ASSY
1-33	MI-712804	GEAR FF
1-35	MI-711710	GEAR C
1-36	ML-712806	REC SENSOR
1-37	BF-712807	FLYWHEEL ASSY
1-39	MZ-712808	HOLDER CAPSTAN
1-40	ML-712809	LEVER EJECT
1-43	TC-712810	LID FRAME
1-44	TC-712811	DAMPER ASSY
1-46	MI-712812	PULLEY AUTO
1-47	MI-712813	GEAR AUTO
1-48	MI-712814	GEAR CAM AUTO
1-49	MI-712815	CLUTCH AUTO
1-53	ZG-712816	CLAMP CASSETTE
1-56	MI-712817	IDLER PLAY
1-57	MB-712818	BELT AUTO
1-58	MB-712819	BELT FR
1-59	MB-712820	BELT DRIVE
1-72	ZG-749268	SP HEAD
1-73	ZG-712821	SP PINCH ROLLER
1-79	ZG-712822	SP PACK
1-85	TC-712823	FELT AUTO CLUTCH
1-92	HP-712824	HEAD R/P HY424528 SVK
1-93	HE-337047	HEAD E HJ213270 C
1-94	BM-712825	⚠ MOTOR (W/PULLEY) ASSY
1-99	ES-713178	SW LSA-1120-YN (SW903)
1-112	ZS-536488	BID20×08STL CMT
1-113	ZS-749292	BID20×8.5STL CMT
1-114	ZS-749293	BID20×09STL CMT TW
1-126	TC-349493	DECORATION PLATE
1-127	SZ-645186	REFLECTOR
1-128	ES-713179	SW LSA-1123-37 (SW902)

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.

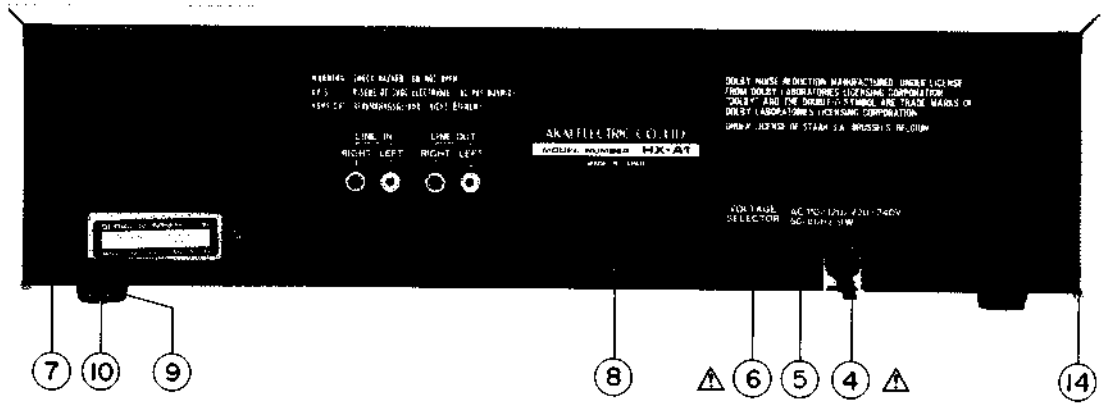
2. PRE AMP PC BOARD BLOCK

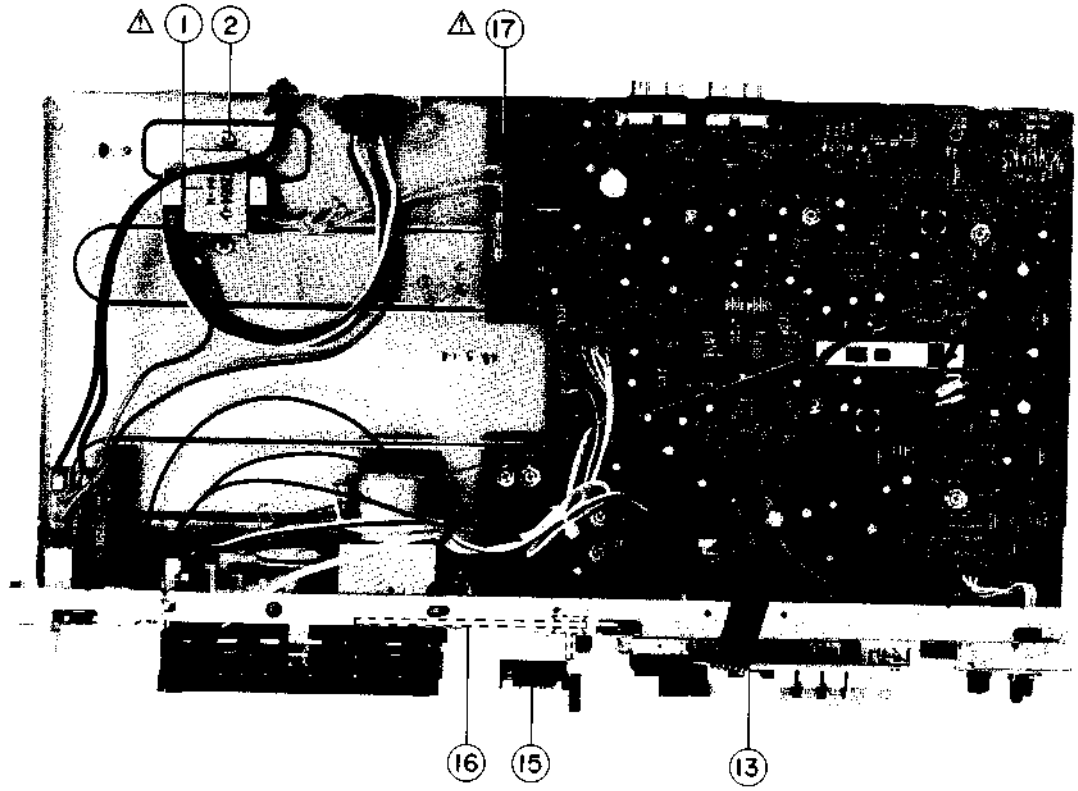
REF. NO.	PARTS NO.	Description
2-1U	BA-T2064A020A	PC PRE AMP BLK HX-A1(U)
2-1C	BA-T2064A020B	PC PRE AMP BLK HX-A1(C,A)
2-1E	BA-T2064A020D	PC PRE AMP BLK HX-A1(E,B,S)
2-1G	BA-T2064A020C	PC PRE AMP BLK HX-A1(V)
	PRE AMP PC BOARD	
2-IC1	EI-349590	IC BA3280EC
2-IC2	EI-349591	IC LA2730
2-IC3	EI-353227	IC M5216L
2-TR1to3	ET-349081	TR 2SC3383 S,T
2-TR4	ET-309353	TR 2SC2274K E,F
2-TR5	ET-309353	TR 2SC2274K E,F
2-TR6	ET-452531	⚠ TR 2SD313HP E,F
2-TR7to10	ET-328578	TR 2SC2320 E,F
2-TR11	ET-348931	TR 2SB774 R,S,T
2-TR12,13	ET-351872	TR 2SC3383 R,S
2-TR100	ET-322598	⚠ TR 2SB632K E,F
2-TR101	ET-351123	⚠ TR 2SC3383 T
2-TR110	ET-331279	TR 2SC1843 P,F SNP (V,Y1)
2-D1,3	ED-301911	D SILICON H DS448
2-D4to6	ED-301911	D SILICON H DS448
2-D7	ED-348001	D ZENER V HZ2B-1S7
2-D100	ED-330319	⚠ D SILICON DBA10B 100/1.0A
2-D101	ED-338403	D ZENER V HZ11B-1S7
2-SW1	ES-353294	SW SLIDE 01420061
2-SW2	ES-353295	SW SLIDE SSY363
2-SW3	ES-353296	SW SLIDE SSY322
2-VR1	EV-338588	R S-FIX H RVF8P01 3P 503
2-VR2	EV-337992	R S-FIX H RVF8P01 3P 502
2-VR3	EV-338588	R S-FIX H RVF8P01 3P 503
2-VR4	EV-337993	R S-FIX H RVF8P01 3P 203
2-VR5	EV-344109	R S-FIX H RVF8P01 3P 102
2-VR6	EV-337995	R S-FIX H RVF8P01 3P 103
2-L1	EO-347162	COIL FIX 1 L-8 103J
2-FL1	EH-354528	FILTER DOLBY FX-100B
2-FL2	EO-315758	COIL TUN 1 100Z-431 100.00KHZ
2-T1	EO-349589	COIL OSC 1 32-5016-12
2-R11	ER-324185	R CB H S10 FS RDS 1/4W 221J
2-R98	ER-353794	R OMF H SNP FS 2W 560J
2-R99	ER-324185	R CB H S10 FS RDS 1/4W 221J
2-R100	ER-324186	R CB H S10 FS RDS 1/4W 681J
2-C1	EC-312012	C STY V F05 CQF09 561J 50DC
2-C3	EC-306017	C STY V F05 CQ09S 221J 50DC
2-C14	EC-314990	C STY V SNP CQFS 101J 50DC
2-C42	EC-334418	C STY V F05 500 122J 50DC
2-C43	EC-347263	C MC V F05 FM 221J 500DC
2-C55	EC-349631	C PP V F10 ECQ-F 182J 630DC
2-J1	EJ-347664	PIN J YKC21-5053 P 4P
2-J2	EJ-347631	PHONE J HLJ0527-3034
2-J3	EJ-343380	PHONE J 3P HLJ0541-040 6.3
2-J5	EJ-698051	DIN J CS707-1-1 P 5P (V,Y1)
	VOLUME PC BOARD	
2-VR901	EV-348314	VR ROTARY 16P20×3C A503
	POWER SW PC BOARD	
2-SW901	ES-337902	⚠ SW PUSH SDLD1P 01-1
2-C901U	EC-320548	⚠ C CE V F 103Z 250AC (U,C,A)
2-C901E	EC-338411	⚠ C CE V FZ 103P 400AC(E,B,S,G)

3. METER PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
3-IC1	EI-353289	IC IR2E27A
3-D1to3	ED-353290	D LED GL-9NG24 GREEN
3-D4to6	ED-353291	D LED GL-9PR24 RED
3-D7	ED-353292	D LED GL-9HY24 YELLOW

ASSEMBLY BLOCK

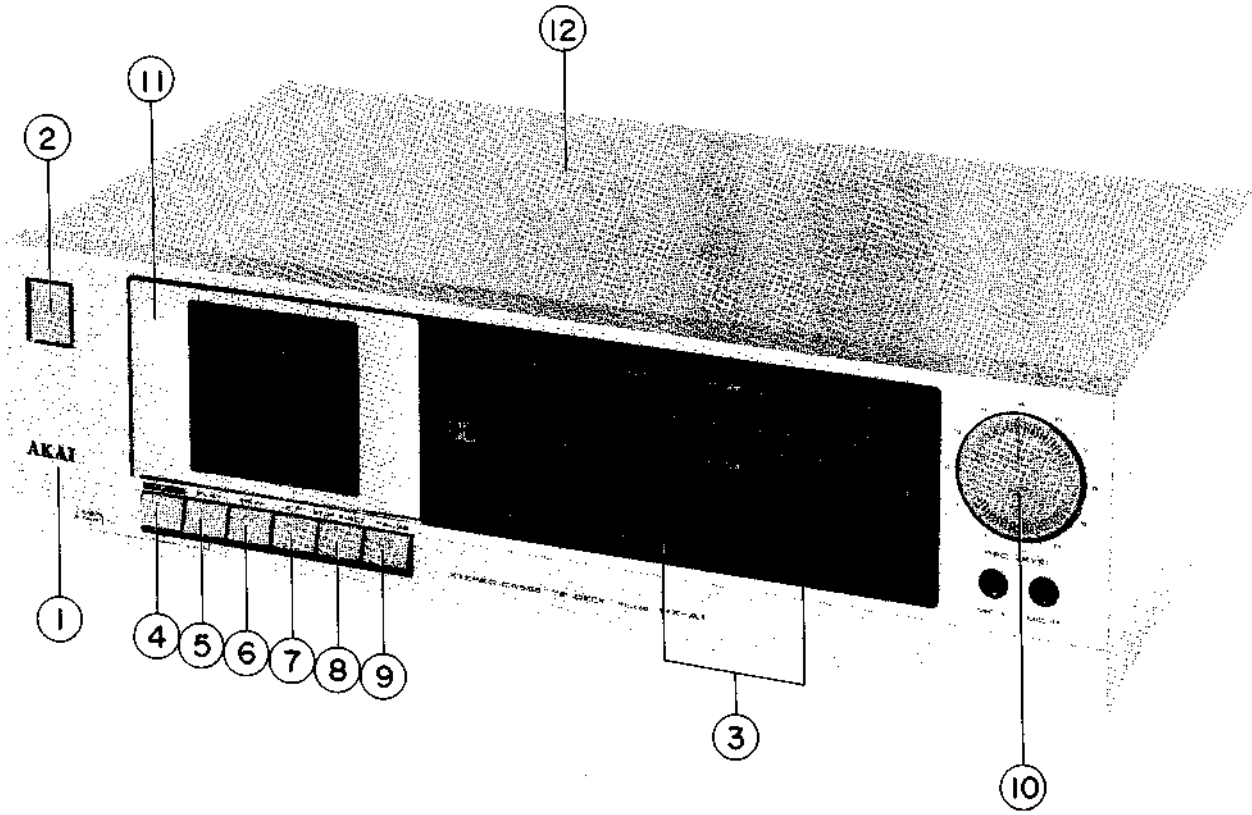




4. ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
4-1U	BT-354050	⚠ TRANS POWER T2064(U)
4-1C	BT-354051	⚠ TRANS POWER T2064(A,C)
4-1E	BT-354052	⚠ TRANS POWER T2064(E,V,Y1)
4-1B	BT-354053	⚠ TRAN SPOWER T2064(B,S)
4-2	ZS-313796	ST BID40x06STL CMT
4-3x	ZW-273914	SW40
4-4U	EW-306428	⚠ AC CORD 1 CORES KP-700A, VFF U/T (U)
4-4C	EW-305691	⚠ AC CORD 2 CORES KP-8, SPT-1 UC (C,A)
4-4E	EW-336923	⚠ AC CORD 2 CORES KP-419C, LTCE-2F EV (E,V,Y1)
4-4B	EW-346249	⚠ AC CORD 2 CORES LCFL2x0.75 B (B)
4-4S	EW-347898	⚠ AC CORD 2 CORES VM-0436, LCFL S (S)
4-5	EZ-631945	STRAIN RELIEF SR-4N-4
4-6	ES-305733	⚠ SW SELECTOR HXW0131-260 01-4 (U)
4-7	ZS-352120	T2BR30x08STL BCM C080 (U)
4-8U	SP-351610A	PANEL REAR HX-A1 (U)
4-8C	SP-351610B	PANEL REAR HX-A1 (C,A)
4-8E	SP-351610C	PANEL REAR HX-A1 (E)
4-8V	SP-351610D	PANEL REAR HX-A1-G (V,Y1)
4-8B	SP-351610E	PANEL REAR HX-A1 (B,S)
4-9	SA-202118	FOOT
4-10	ZS-331567	T2BR30x08STL CMT C080
4-11x	ZW-698308	RV NYL30x055 BL (V,Y1)
4-12x	ZW-305013	RV POP32 (A)
4-13	MZ-353159A	JOINT REC (A)
4-14	ZS-353319	T2BR 30x06STL BCM
4-15	MC-353312	COUNTER MK395-043 (BLACK)
4-16	MB-351605	BELT 0.8xD593 CRHS65
4-17U	EF-258344	⚠ FUSE SEMKO T 250V 0.80A (U,E,V,B,S,Y1)
4-17C	EF-309391	⚠ FUSE TSC 125V 0.80A (C,A)

FINAL ASSEMBLY BLOCK



5. FINAL ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
5-1	BD-351609A	PANEL FRONT HX-A1
5-1P	BD-351609B	PANEL FRONT HX-A1-P (EXCEPT Y1)
5-2	SK-343017C	KNOB POWER (2)
5-2P	SK-343017B	KNOB POWER-P
5-3	SK-351613A	KNOB SLIDE
5-4	SK-349496G	KNOB OPERATION (B) REC
5-4P	SK-349496N	KNOB OPERATION (C) REC
5-5	SK-349496H	KNOB OPERATION (B) PLAY
5-5P	SK-349496P	KNOB OPERATION (C) PLAY
5-6	SK-349496J	KNOB OPERATION (B) REW
5-6P	SK-349496Q	KNOB OPERATION (C) REW
5-7	SK-349496K	KNOB OPERATION (B) FF
5-7P	SK-349496R	KNOB OPERATION (C) FF
5-8	SK-349496L	KNOB OPERATION (B) STOP
5-8P	SK-349496S	KNOB OPERATION (C) STOP
5-9	SK-349496M	KNOB OPERATION (B) PAUSE
5-9P	SK-349496T	KNOB OPERATION (C) PAUSE
5-10	SK-345375H	KNOB VOLUME (F)
5-10P	SK-345375J	KNOB VOLUME (G)
5-11	BD-351612A	LID
5-11P	BD-351612B	LID-P
5-12	SP-351611A	COVER UPPER
5-12P	SP-351611B	COVER UPPER-P

INDEX

AKAI

WERKSTATTHANDBUCH

Da dieses Wartungshandbuch bereits auf Englisch veröffentlicht ist und Einstell- und Zeichnungshinweise auf Deutsch enthält, empfiehlt es sich, diese Ausgabe des Handbuchs zusammen mit der bereits veröffentlichten englischen Ausgabe und den Stromlaufplänen zu verwenden.

STEREOCASSETTENDECK

MODEL HX-A1

I. TECHNISCHE DATEN

I. TECHNISCHE DATEN

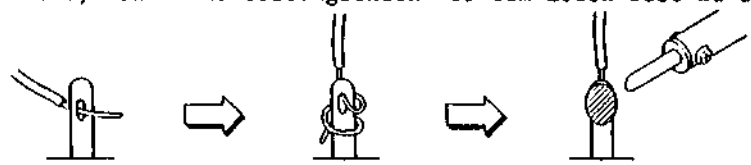
Spursystem	4-Spur 2-Kanal Stereo-System
Cassette	Philips-Kompaktcassette
Motor	Ein Gleichstrommotor mit elektronischer Drehzahlregelung für den Capstan Antrieb
Tonköpfe	Ein hochdichter Aufnahme/Wiedergabe-Kombikopf Ein Löschkopf
spuldauer	100Sek. bei Verwendung einer C-60 Cassette
Gleichlaufschwankungen	0,05% WRMS, WRHS, 0,12% WTD (DIN)
Klirrfaktor	0,7% (Reineisenband)
Frequenzgang	Reineisenband: 30Hz bis 17.000Hz ±3dB CrO_2: 30Hz bis 16.000Hz ±3dB Normal: 30Hz bis 15.000Hz ±3dB
Signal-/Rauschspannungsabstand	56dB (Reineisenband) Dolby B ON: Verbessert um 5dB bei 1kHz, 10dB über 5kHz Dolby C ON: Verbessert um 15dB bei 500Hz, 20dB bei 1kHz bis 10kHz
Eingangsempfindlichkeit/ Impedanz	LINE 70mV/47kOhm DIN 5mV/10kOhm (HX-A2-G Type) MIC 0,25mV/5kOhm
Ausgangsempfindlichkeit/ Impedanz	LINE 380mV/1kOhm DIN 380mV/1kOhm (HX-A2-G Type) PHONES 0,3mV (bei 8 Ohm)/56 Ohm
Spannungsversorgung	120V, 60Hz für USA und Kanada 220V, 50Hz für Europa außer GB 240V, 50Hz für GB und Australien 110V/120V/220V/240V, 50/60Hz umschaltbar für andere Länder
Abmessungen	440(B)x 115(H) x258(T) mm
Gewicht	3,3kg

* Das Rauschenunterdrückungssystem wird unter Lizenz von Dolby Laboratories Licensing Corporation hergestellt. "Dolby" und das Doppel-D-Zeichen sind Warenzeichen von Dolby Laboratories Licensing Corporation.
* Änderungen von Design und technischen Daten zwecks Verbesserung vorbehalten.

II. SICHERHEITSANWEISUNG

SICHERHEITSPRÜFUNG NACH DER REPARATUR
Überprüfen Sie, ob der Isolationswidersatand zwischen den Stiften des Netzsteckers sowie allen äußeren Teilen des Gerätes über 10 MOhm liegt. Bei Geräten mit Anschluß von Außenantenne (Tuner, Empfänger usw.), welche für [C] oder [A] bestimmt sind, muß der Isolationswiderstand über 2,2 MOhom liegen (Masse-Anschlüsse, Mikrofonbuchsen, Kopfhörerbuchsen, line-in/out-Buchsenusw.)
VORSICHTSMASSNAHMEN BEI DER REPARATUR

1. Die mit dem /!\ Symbol bezeichneten Teile sind ausschlaggebend für die Betriebssicherheit. Diese Teile nur gegen Original Ersatzteile austauschen.
2. Zusätzlich werden andere Teile entsprechend den Gesetzen zur Funkentstörung verwendet. Diese dürfen nur gegen die vorgeschriebenen Bauteile ausgetauscht werden.
   Beispiele: HF-Wandler, Tuner-Komponenten, Antennen-Wahlschalter, HF-Kabel, Entstörkondensatoren, Entstörfilter usw.
3. Nur die vorgeschriebene interne Verdrahtung verwenden. Hierbei besonders beachten:
   1) Mit PVC-Umhüllung versehene Leitungen.
   2) Doppelt isolierte Leitungen.
   3) Hochspannungsleitungen
4. Für gefährliche, stromführende Teile die vorgeschriebenen Isoliermaterialien verwenden. Hierbei besonders beachten:
   1) Isolierband
   2) PVC-Umhüllung
   3) Abstandshalter
   4) Isolierscheiben für Transistoren
   5) Plastikschrauben zum Anbringen von Mikroschaltern (speziell bei Plattenspielern)
5. Beim Austausch von Bauteilen auf der Primärseite (Transformatoren, Netzkabel, Entstör Kondensatoren usw.) Sind die Leitungsenden vor dem Löten fest zu umwickeln.

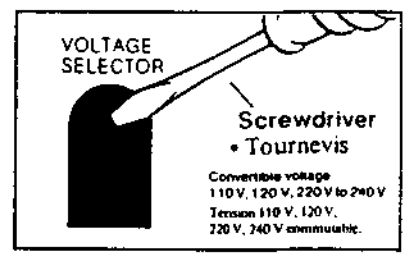


6. Es ist darauf zu achten, daß Leitungen nicht in Kontakt mit Wärme erzeugenden Teilen kommen (Kühlkörper, Oxidmetallschichtwiderstände, Sicherungswiderstände usw.
7. Überprüfen, dass die ausgetauschten Leitungen nicht in Kontakt mit scharfen Kanten oder spitzen Teilen kommen.
8. Desgl. sind die Bereiche in der Umgebung von Stellen, an denen repariert wurde, zu überprüfen.
9. Darauf achten, daß keine Fremdkörper (Schrauben, Lot, usw.) im Gerät verbleiben.

III. GERÄT VERBLEIBEN

3-1 SPANNUNGSUMSTELLUNG

Die für Kanada, USA, Europa, GB und Australien bestimmten Geräte sind nicht mit dieser Vorrichtung ausgestattet. Jede Maschine wird bereits im Werk entsprechend dem Bestimmungsland eingestellt. Einige Geräte jedoch können je nach Anforderung auf 110V, 120V, 220V, oder 240V umgeschaltet werden.
Falls ihr Gerät umgestellt werden kann:
Vor dem Anschließen des Netzkabels den SPANNUNGSWÄHLER (VOLTAGE SELECTOR) an der Rückseite des Geräts mit Hilfe eines Shraubenziehers drehen, bis die korrekte Spannung angezeigt wird.



3-1-1 FREQUENZUMSTELLUNG

Da der HX-A1 mit einem GLEICHSTROM-MOTOR ausgerüstet ist, erübrigt sich die Frequenzumstellung.

V. MECHANISCHE EINSTELLUNG

5-1 MESSUNG DES ANDRUCKES DER ANDRUCKROLLE (Siehe Abb. 5-1)

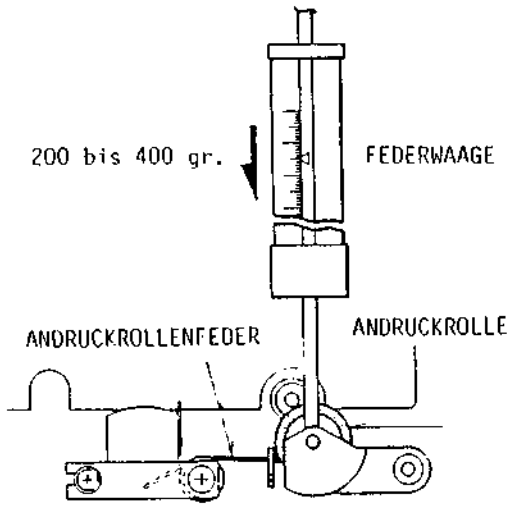


Abb. 5-1

Das Gerät auf Wiedergabebetrieb (PLAY) schalten. Den Andruckrollenhebel mit der Federwaage nach unten drücken und die Andruckrolle 1 bis 2 mm von der Tonwelle wegschieben und langsam freigeben. In dem Augenblick, in dem die Andruckrolle die Tonwelle berührt und sich zu drehen beginnt, den Meßwert auf der Federwaage ablesen. Die Andruckkraft sollte zwischen 200 und 400 gr liegen. Falls der Meßwert nicht in diesem Bereich liegt, muß die Andruckrollenfeder eingestellt oder ausgetauscht werden.

5-2 MESSUNG DES BANDZUGES IN ALLEN BETRIEBSARTEN (Siehe Abb. 5-2)

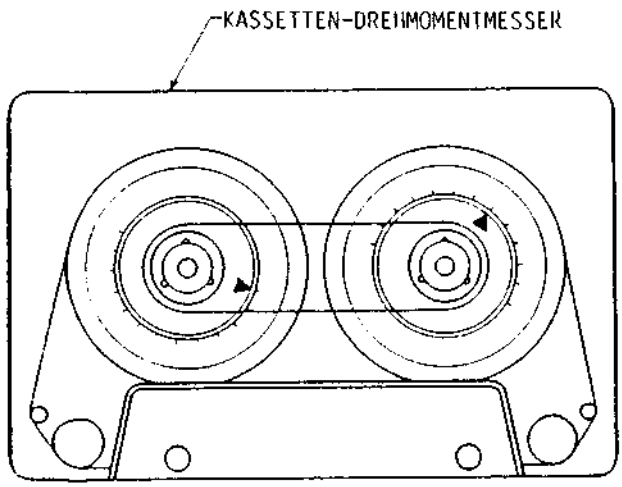


Abb. 5-2

Einen Kassetten-Drehmomentmesser (AJ-7511?9) einlegen und die Messung in allen Betriebsarten vornehmen. Beim Schnellvorlauf und -rücklauf die Messung nach dem Stoppen des Bandes am Bandende vornehmen.

Wiedergabebetriebsart (PLAY)
Aufwickelzug: 35 bis 75 Gr-cm
Abwickelzug: 1 bis 6 Gr-cm
Schnellvor/rücklauf-Betriebsart (FAST FORWARD, REWIND)
Wickelzug: 70 bis 160 Gr-cm

5-3 EINSTELLUNG DER BANDGESCHWINDEGKEIT (Siehe Abb. 5-3)

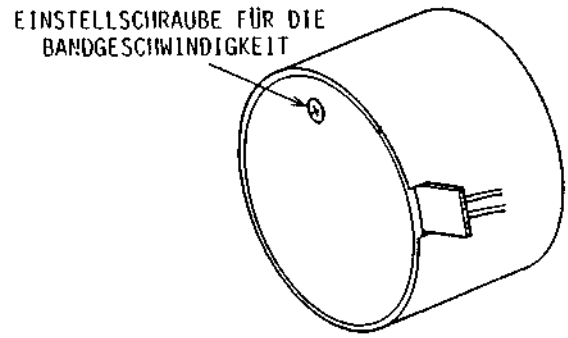


Abb. 5-3

Einen Frequenzzähler an den Ausgangsanschlüssen anschließen. Ein 10001lz oder ein 3150llz Bandgeschwindigkeits-Testband (AT-750774) abspielen und mit Hilfe der Einstellschraube die Bandgeschwindigkeit so regulieren, daß ein Ausgangswert von 10001lz ± 10llz bzw.3150Hz ± 10llz erreicht wird.

5-4 AZIMUTHEINSTELLUNG DES AUFNAHME/WIEDERGABEKOPFES (Siehe Abb. 5-4)

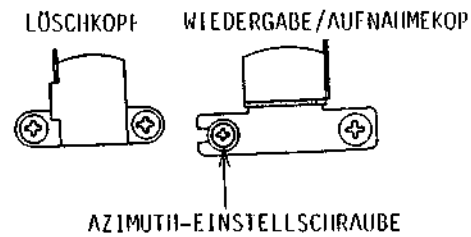


Abb. 5-4

Ein 10kllz Azimuth-Eichband (AT-750778) abspielen und die Azimuth-Einstellschraube so einstellen, daß beide Kanäle Maxiamlpegel abgeben. Nach der Einstellung die Schraube mit Lack fixieren.

5-5 AUFNAHMESCHALTERZUG

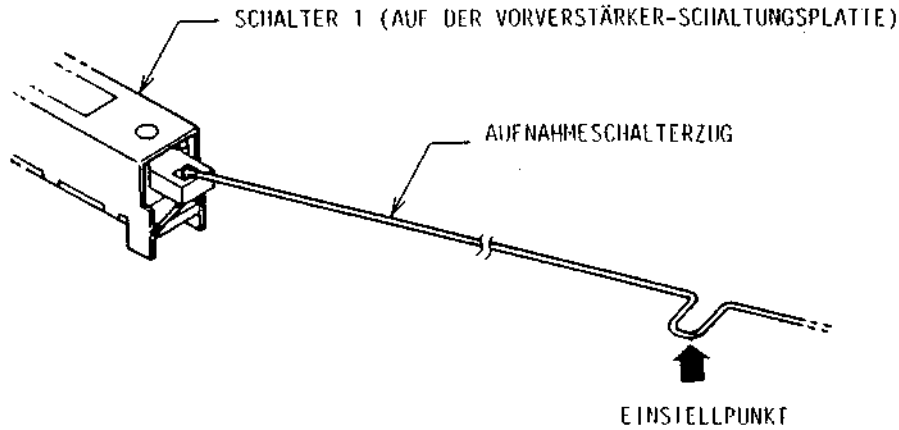


Abb. 5-5

Den Einstellpunkt des AUFNAHMESCHALTER-ZUGS so einstellen, daß Schalter 1 in der Aufnahmebetriebsart (REC) vollständig herausgezogen wird bzw. in der Wiedergabebetriebsart (PB) vollkommen freigegeben wird.

VI. VERSTÄRKEREINSTELLUNG

6-1 VORVERSTÄRKER-ABGLEICHPUNKTE

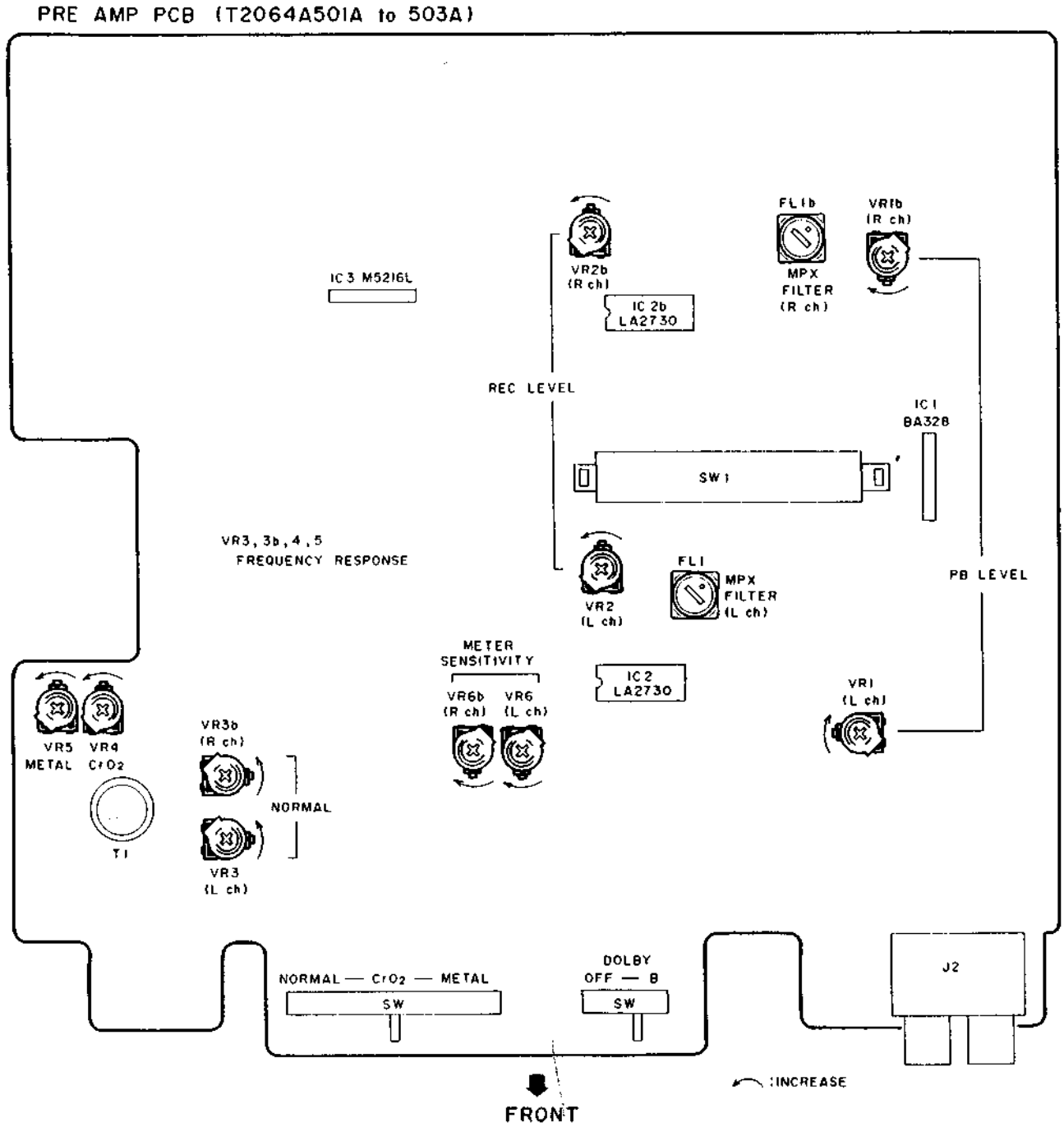


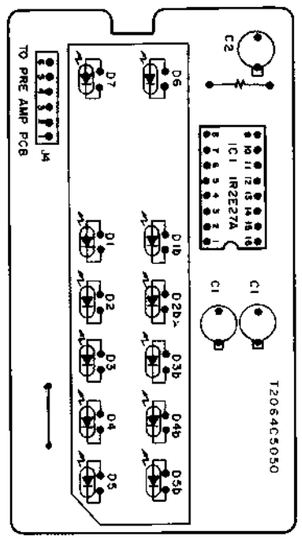
Abb. 6-1

6-2 VERSTÄRKER-ABGLEICHTABELLE

Schritt	Abgleichgegenstand	Testcassetten-Signal	Betriebsart	Abgleich	Ergebnis	Bemerkungen
1	PB LEVEL	315Hz oder 333Hz	PB	VR1 (Lch) VR1b (Rch)	-6,1 ± 0.5dBm -6,6 ± 0.5dBm	
2	NORMAL POSITION FREQUENCY RESPONSE	NORMAL Leercassette 1kHz, 10kHz -26,0dBm	REC/PB	VR3 (Lch) VR3b (Rch)	1kHz, 10kHz linear ±0,3dBm	
3	CrO_2 POSITION FREQUENCY RESPONSE	CrO_2 Leercassette 1kHz, 10kHz -26,0dBm	REC/PB	VR4	1kHz, 10kHz linear ±0,8dBm	
4	METAL POSITION FREQUENCY RESPONSE	METAL Leercassette 1kHz, 10kHz -26,0dBm	REC/PB	VR5	1kHz, 10kHz linear ±0,8dBm	
5	REC LEVEL	NORMAL Leercassette 1kHz, -6,0dBm	REC/PB	VR2 (Lch) VR2b (Rch)	-6,0 ± 0,5dBm	
6	METER SENSITIVITY	1kHz, -2dBm (606mV)	REC	VR6 (Lch) VR1b (Rch)	OVU LED hell	OVU = 606mV
7	MPX Filter	19kHz	REC	FL1 (Lch) FL1b (Rch)	Ausgang Minimum	Weniger als -30dBm

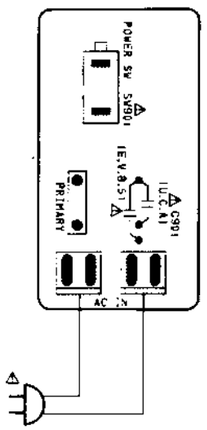
HINWEIS: 1. Alle Abgleiche werden ohne Dolby ausgeführt.
2. Die folgenden Messcassetten verwenden:
NORMALBAND: Maxell UDI C-60
CrO_2-BAND: TDK SA C-60
REINEISENBAND: TDK MA C-60
3. Bezüglich Abgleich siehe Abb. 6-1

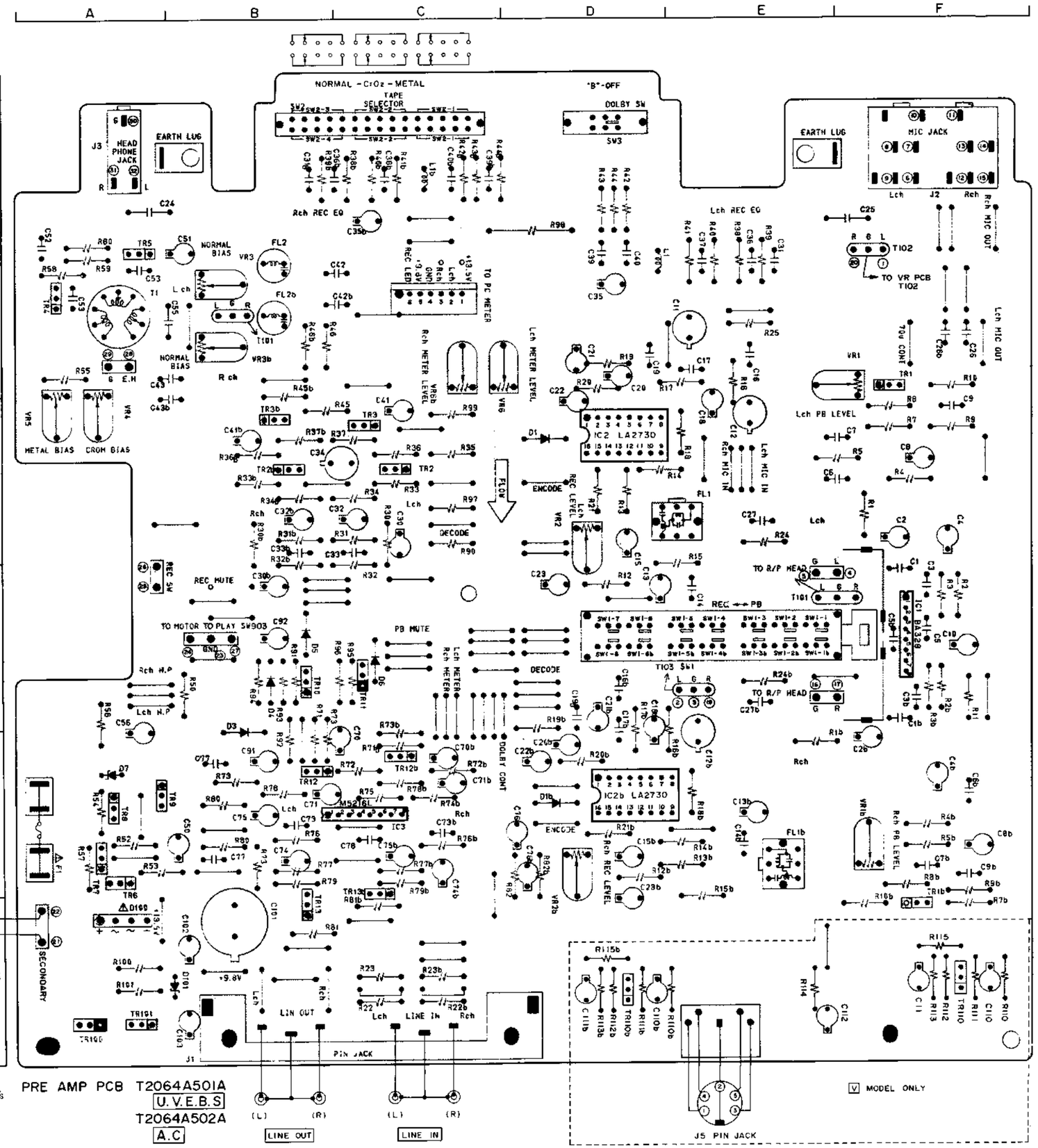
AKAI MODEL HX-A1 PC BOARD SCHEMATIC DIAGRAM



METER PCB
T2064C5050

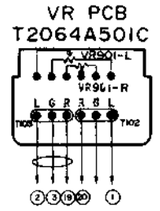
POWER SW PCB
T2064A501B U.C.A
T2064A502B E.V.B.S





PRE AMP PCB T2064A501A
U.V.E.B.S
T2064A502A
A.C

VR PCB
T2064A501C



PARTS ROCATION

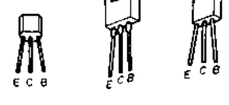
TRANSISTOR

TR1 ---------- F2	IC1 ---------- F4
TR1b -------- F6	IC2 ---------- D3
TR2 ---------- C3	IC2b --------- D5
TR2b -------- B2	IC3 ---------- C5
TR3 ---------- C2	
TR3b -------- B2	
TR4 ---------- A2	
TR5 ---------- A2	
TR6 ---------- A5	
TR7 ---------- A6	
TR8 ---------- A5	
TR9 ---------- A5	
TR10 --------- B4	
TR11 --------- C4	
TR12 --------- B5	
TR12b -------- C5	
TR13 --------- B6	
TR13b -------- C5	
TR100 -------- A6	
TR101 -------- A6	
TR110 -------- F6	
TR110b ------- D6	

PNP TRANSISTOR
B

NPN TRANSISTOR
B

TR 1, 1b, 2, 2b, 3, 3b (2, 12b, 13, 13b, 101 ------- 2SC3383
TR4, 5 ---------- 2SC2274
TR6 ---------- 2SD313
TR7, 8, 9, 10 ---------- 2SC2320
TR11 ---------- 2SB774
TR100 ---------- 2SB632
TR110, 110b ---------- 2SC1843



2SC1843
2SC2320
2SC3383
2SC2274
2SB774

2SB632

2SD313

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 SÉCURITÉ POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

HX-A1 PRE AMP SCHEMATIC DIAGRAM NO. 840703A

VR PCB 1/2 T2064A501C

VR PCB 2/2 T2064A501C

METER PCB T2064C5050

POWER SW PCB T2064A501B [U]

POWER SW PCB [C,A] T2064A5028

POWER SW PCB T2064A5018 [S,B]

POWER SW PCB [E,V] T2064A5018

PRE AMP PCB T2064A501A [U,E,V,B,S]
502A [C,A]

VOLTAGES INDICATED ARE MEASURED AT STOP MODE AND DOLBY NR OFF

REC SIGNAL LINE
PB SIGNAL LINE
B(POWER SUPPLY) LINE

VOLTAGE AT REC MODE

		NORMAL	CrO2	METAL
TR4	E	0V	0.1V	0.1V
	C	3.0V	4.3V	7.1V
	B	0.2V	0V	+0.6V
TR5	E	0V	0.1V	0.1V
	C	3.0V	4.3V	7.2V
	B	0.8V	0V	-0.4V

		NORMAL	CrO2	METAL
TR8	E	2.4V	2.5V	2.3V
	C	3.7V	5.1V	6.3V
	B	3.0V	3.0V	2.9V
TR9	E	3.2V	4.8V	7.6V
	C	12.6V	13.0V	14.6V
	B	3.7V	5.2V	8.2V

2SC1843 2SC2274 2SC2330 2SC3383 2SB774

2SB632

2SD313

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT ACCORDING TO AREA

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 SECURITE POUR MAINTENIR LE DEGRE DE SECURITE QUI L'APPAREIL NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT