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**PRELIMINARY SERVICE MANUAL**MODEL **GXC-706D**

DATE May 1978

## I. TECHNICAL DATA

TRACK SYSTEM	4 Track, 2 Channel Stereo System
TAPE	Philips Type Cassette
TAPE SPEED	1-7/8 ips
WOW & FLUTTER	Less than 0.055% WRMS, 0.17% (DIN 45 500, 45 507)
FREQUENCY RESPONSE	35 to 13,000 Hz $\pm 3$ dB using LN tape. 35 to 14,000 Hz $\pm 3$ dB using LH tape 35 to 15,000 Hz $\pm 3$ dB using CrO <sub>2</sub> (SA) tape 35 to 15,000 Hz $\pm 3$ dB using FeCr tape
DISTORTION	Less than 1.3% using LN tape
(1,000 Hz "0" VU)	Less than 1.3% using LH tape Less than 1.5% using CrO <sub>2</sub> (SA) tape Less than 1.5% using FeCr tape
SIGNAL TO NOISE RATIO	Better than 54 dB using LN tape Better than 54 dB using LH tape Better than 56 dB using CrO <sub>2</sub> (SA) tape Better than 56 dB using FeCr tape (measured via tape with peak recording level of +3 VU) Dolby N.R. switch ON: Improves up to 10 dB above 5 kHz
ERASE RATIO	Better than 70 dB
BIAS FREQUENCY	85 kHz
HEADS	(2): One Recording/Playback Head, One Erase Head
MOTORS	(1): Electronically speed controlled DC Motor
F.F. & REWIND TIME	120 sec using a C-60 cassette tape
OUTPUT JACKS	Line(2): 410 mV (0 VU) Required load impedance: more than 20 kohms Phone(1): 100 mV/8 ohms
INPUT JACKS	Microphone(2): 0.25 mV (Input impedance 5 kohms) Required microphone impedance: 600 ohms Line(2): 70 mV (Input impedance 100 kohms)
DIN JACK	Input: 0.25 mV (Input impedance 5 kohms) Output: 410 mV Required load impedance: more than 20 kohms

**AKAI ELECTRIC CO., LTD.**(P.O.BOX 21, Tokyo International Airport, Japan)  
12-14, 2-chome, Higashi-Kojiya, Ohta-ku, Tokyo, Japan  
Printed in Japan

## SEMICONDUCTORS

Transistors: 16

Diodes : 21

FETs : 2

ICs : 3

## DIMENSION

440(W) x 150(H) x 290(D)mm

(17.3 x 5.9 x 11.4")

## WEIGHT

6.5 kg (14.4 lbs)

## POWER REQUIREMENTS

120V/60 Hz for U.S.A. &amp; CANADA

100V 50/60 Hz for JAPAN

220V/50 Hz for European Countries except U.K.

240V/50 Hz for U.K. &amp; Australia

110-120/220-240V (Switchable), 50/60 Hz for the  
other countries

## II. PRINCIPAL PARTS LOCATION

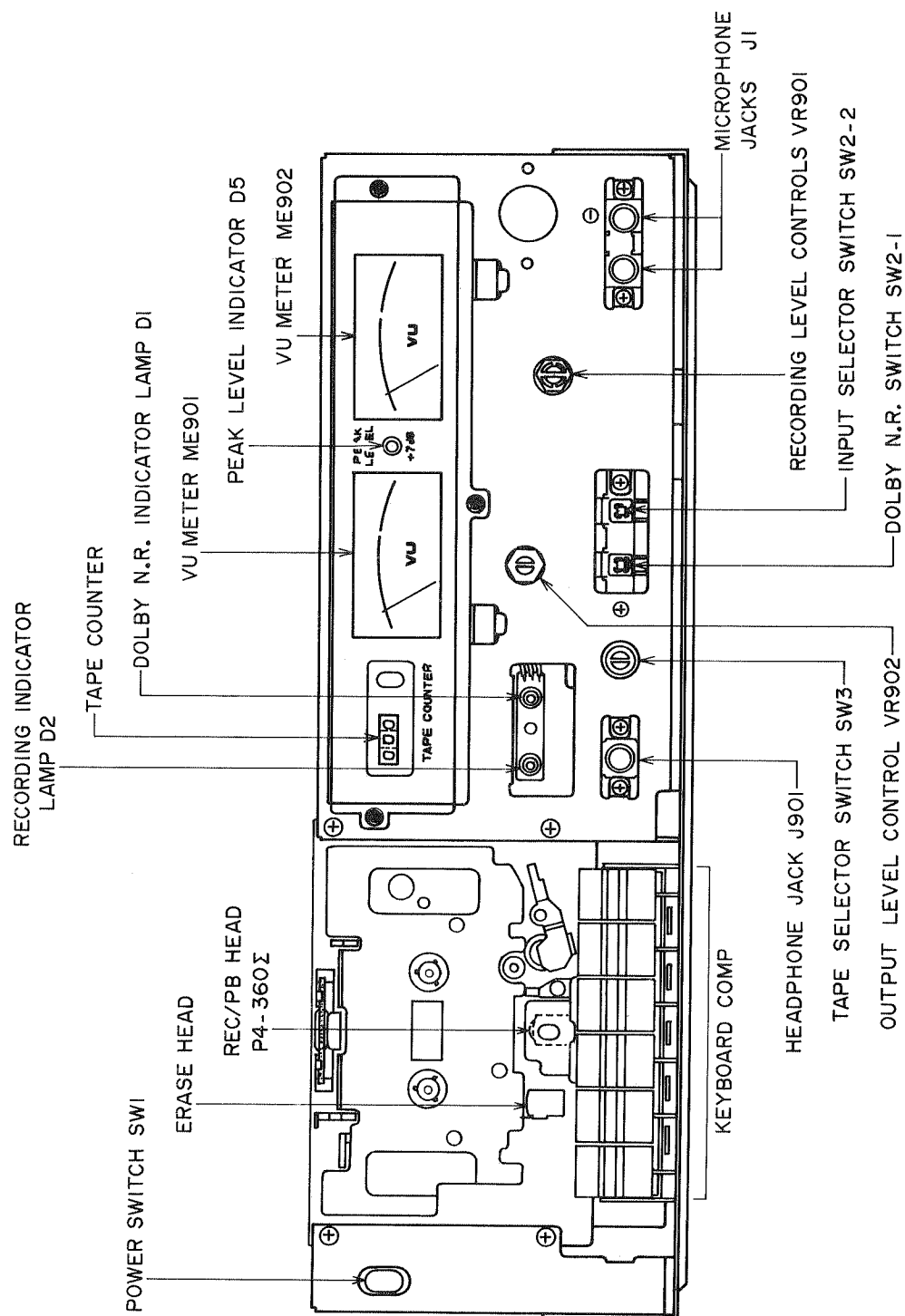


Fig. 1 Front View

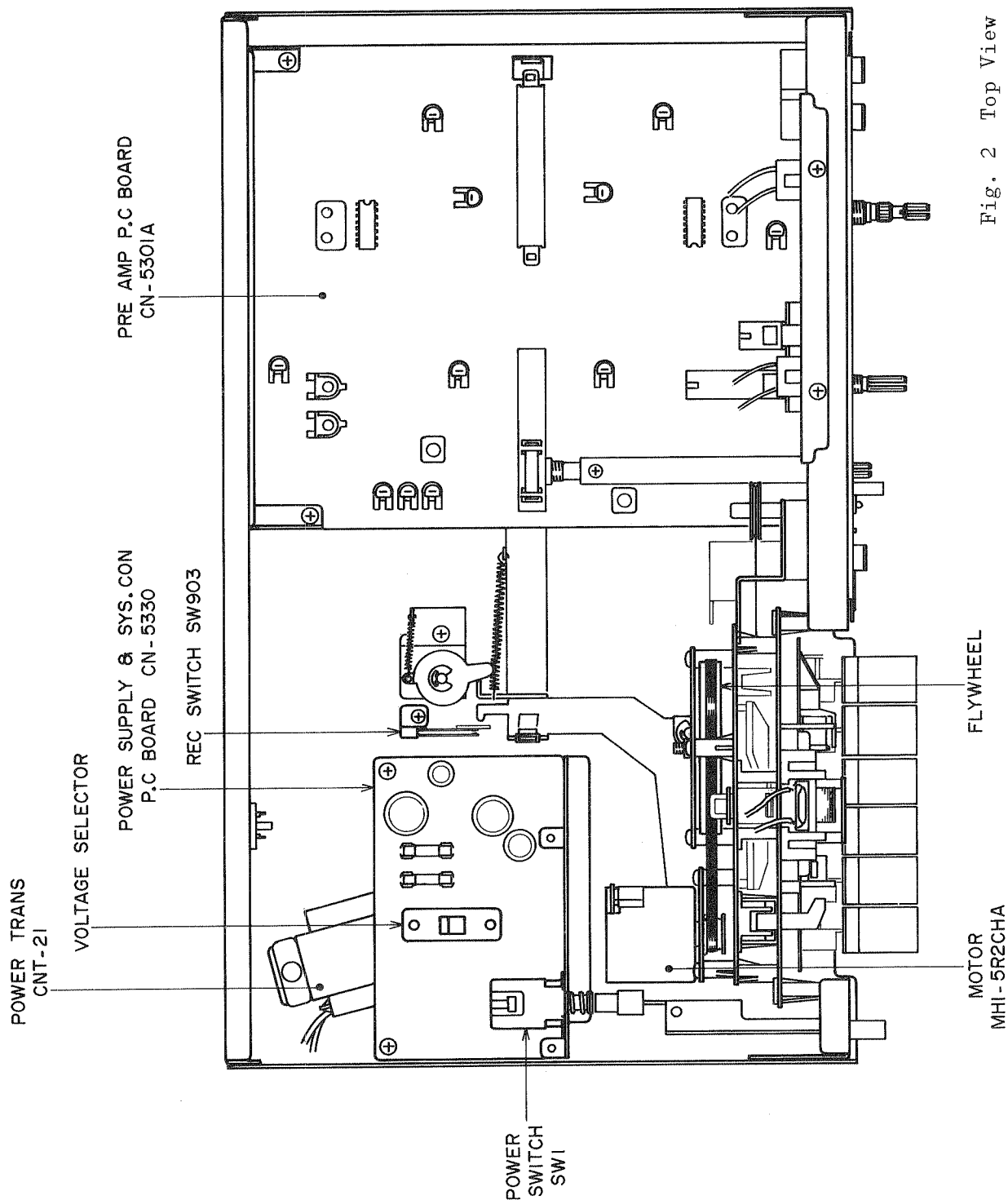


Fig. 2 Top View

## III. MECHANISM ADJUSTMENT

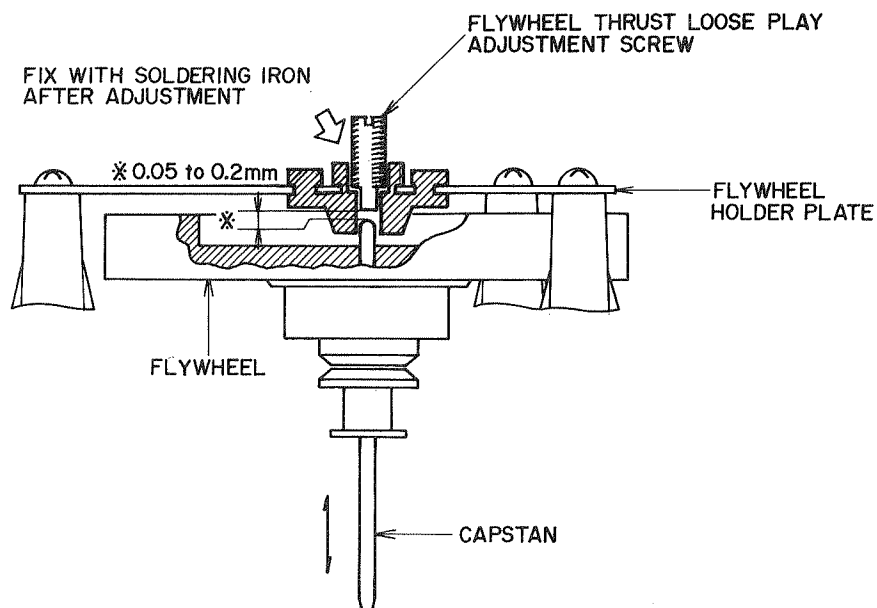


Fig. 3 Flywheel Thrust Loose Play Adjustment

## 1. FLYWHEEL THRUST LOOSE PLAY ADJUSTMENT (Refer to Fig. 3)

Adjust by turning flywheel thrust loose play adjustment screw to obtain a 0.05 to 0.2 mm of loose play when the flywheel is moved as indicated by the arrow mark.

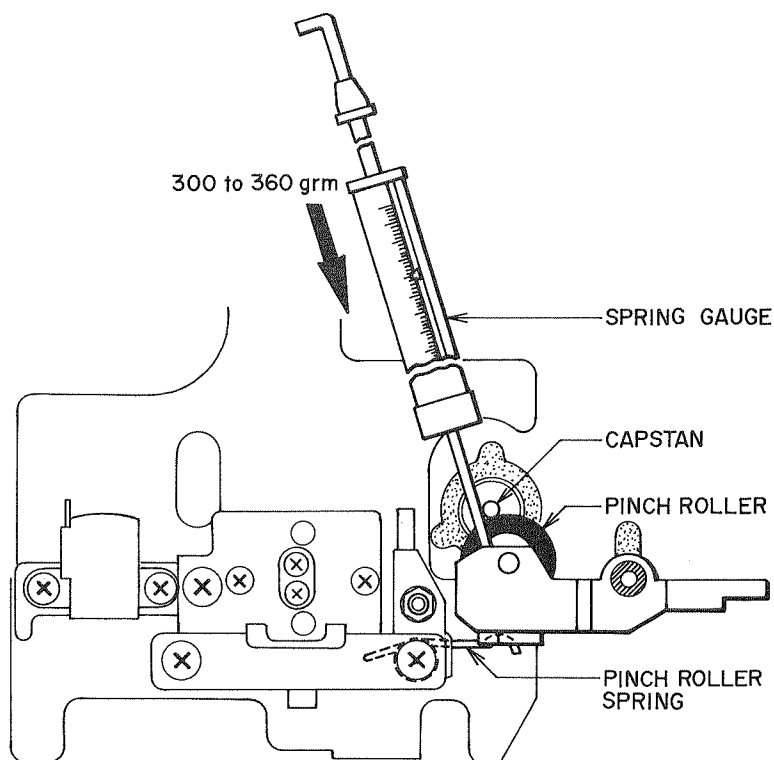


Fig. 4 Pinch Roller Pressure Measurement

## 2. PINCH ROLLER PRESSURE MEASUREMENT (Refer to Fig. 4)

At playback mode, push the pinch roller with a spring gauge until the pinch roller separates from the capstan by about 1 mm to 2 mm and then gently return. Take a reading of the spring gauge indication at the moment the pinch roller touches the capstan and begins to rotate.

Specified Pinch Roller Pressure: 300 to 360 grm

In case specified pressure cannot be attained, replace the pinch roller spring.

## 3. TAKE-UP TORQUE AT VARIOUS MODES

Playback mode: 35 to 55 grm-cm

Fast Forward mode: 70 to 120 grm-cm

Rewind mode: 70 to 120 grm-cm

In case specified take-up torque cannot be attained.

Playback mode: Replace Take-up reel table Block Comp.-G

Fast Forward or

Rewind mode: Replace Middle Lever Part-G.

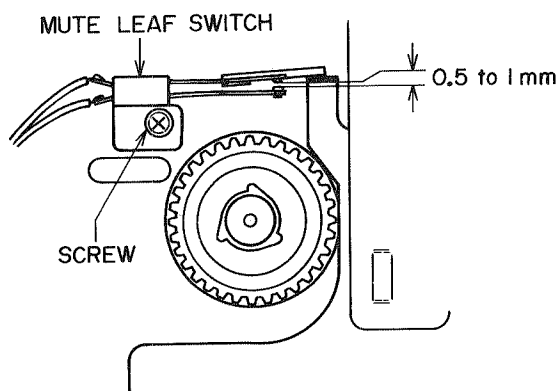


Fig. 5 Mute Switch Adjustment

## 4. MUTE SWITCH ADJUSTMENT (Refer to Fig. 5)

When in the playback mode, the space should be 0.5 mm to 1 mm as in Fig. 5.

To adjust, turn the leaf switch screw.

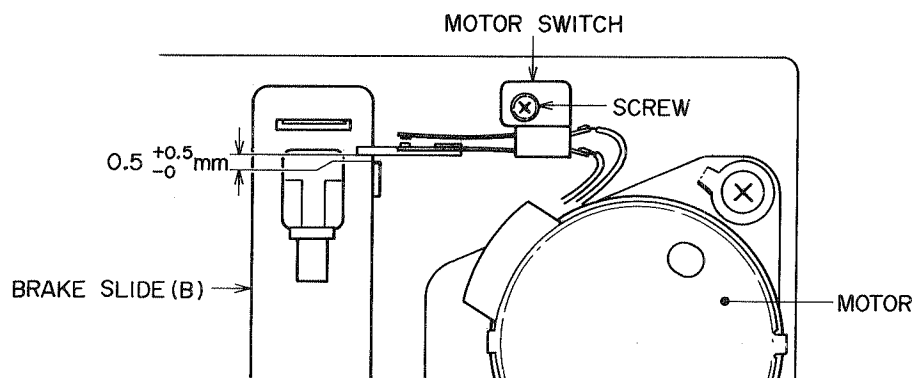


Fig. 6 Motor Switch Adjustment

## 5. MOTOR SWITCH ADJUSTMENT (Refer to Fig. 6)

When in the Stop position, the space between the upper part of the Brake Slide switch and the lower part of the Motor leaf switch should be  $0.5 \text{ mm } ^{+0.5}_{-0} \text{ mm}$ .

To adjust, loosen the leaf switch screw and move the leaf switch.

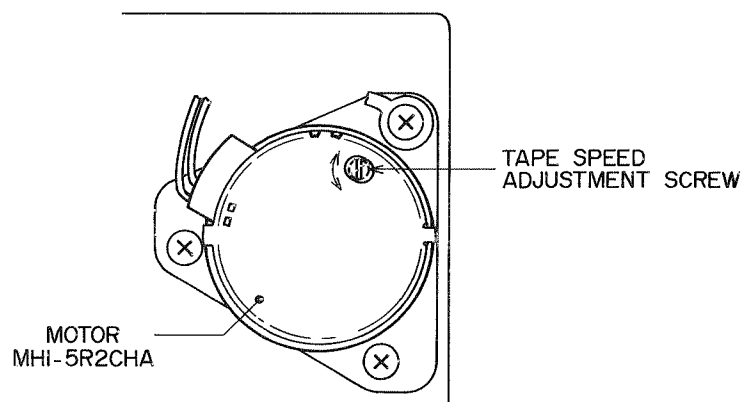


Fig. 7 Tape Speed Adjustment

## 6. TAPE SPEED ADJUSTMENT (Refer to Fig. 7)

Playback a 1,000 Hz pre-recorded test tape and adjust tape speed adjustment screw to obtain a tape speed of  $1,000 \text{ Hz } ^{+2\%}_{-2\%}$ .



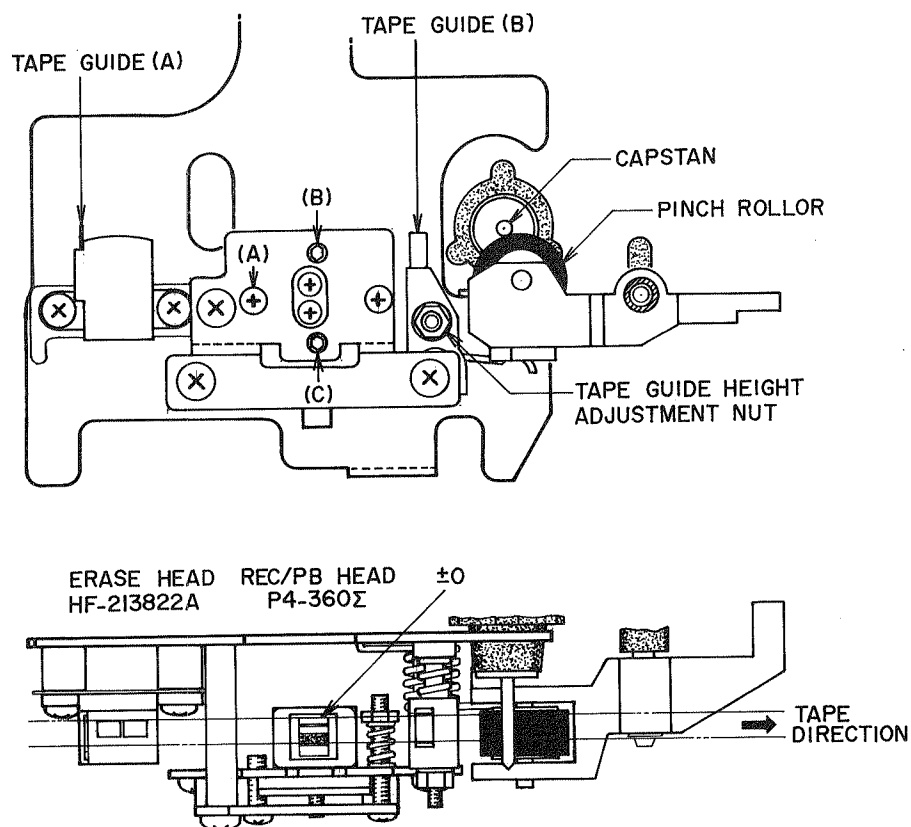


Fig. 8 Head Adjustments

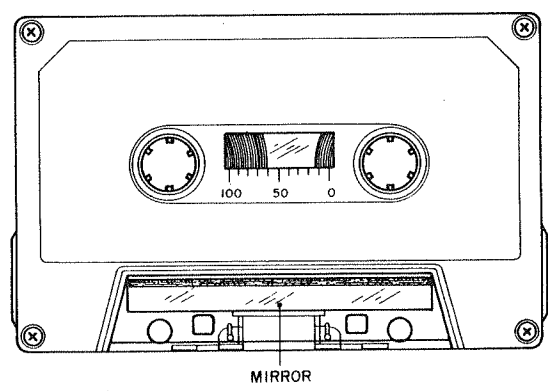


Fig. 9

## IV. HEAD ADJUSTMENT

## 1. TAPE GUIDE HEIGHT ADJUSTMENT (Refer to Figs. 8,9)

- 1) When using an ordinary cassette, the tape guides and heads, etc. are not visible. As shown in Fig. 9 use a cassette tape from which part of the cassette case has been cut out and a mirror installed for easy visibility of the head area when making tape guide height adjustment.
- 2) At playback mode, using the Tape guide (A) shown in Fig. 8 as standard for height, adjust tape guide (B) height with tape guide height adjustment nut so that the tape runs smoothly and does not catch on the tape guides.

## 2. RECORDING/PLAYBACK HEAD HEIGHT ADJUSTMENT (Refer to Figs. 8,9)

- 1) Utilize the cassette tape used in Tape Guide Height Adjustment above, and playback the leader tape part of cassette tape.
- 2) As shown in Fig. 8, adjust head height with screws (A),(B) and (C) until the upper edge of the tape is the same height as the upper edge of the left channel REC/PB head core.
- 3) After completing adjustment step 2, playback the Head Height Adjustment tape (4 track, 1,000 Hz) and adjust Head Height Adjustment screws (A),(B),(C) to put the output power from both channels to maximum.

## 3. RECORDING/PLAYBACK HEAD AZIMUTH ALIGNMENT ADJUSTMENT (Refer to Fig. 8)

- 1) Playback a 10 kHz pre-recorded cassette azimuth alignment test tape and adjust screw (A) shown in Fig. 8 to obtain maximum output on both channels.
- 2) Invert cassette and confirm that the output level does not change from that obtained in Item 3-1) above. If the output level differs, adjust in the same way as in Item 3-1) above until both sides of the test tape display equal output.
- 3) After adjustment, better to check again head height and azimuth alignment.

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.

4. When a mirror installed cassette test tape as shown in Fig. 9 is required, it can be ordered from AKAI Electric Co.

## V. AMPLIFIER ADJUSTMENT

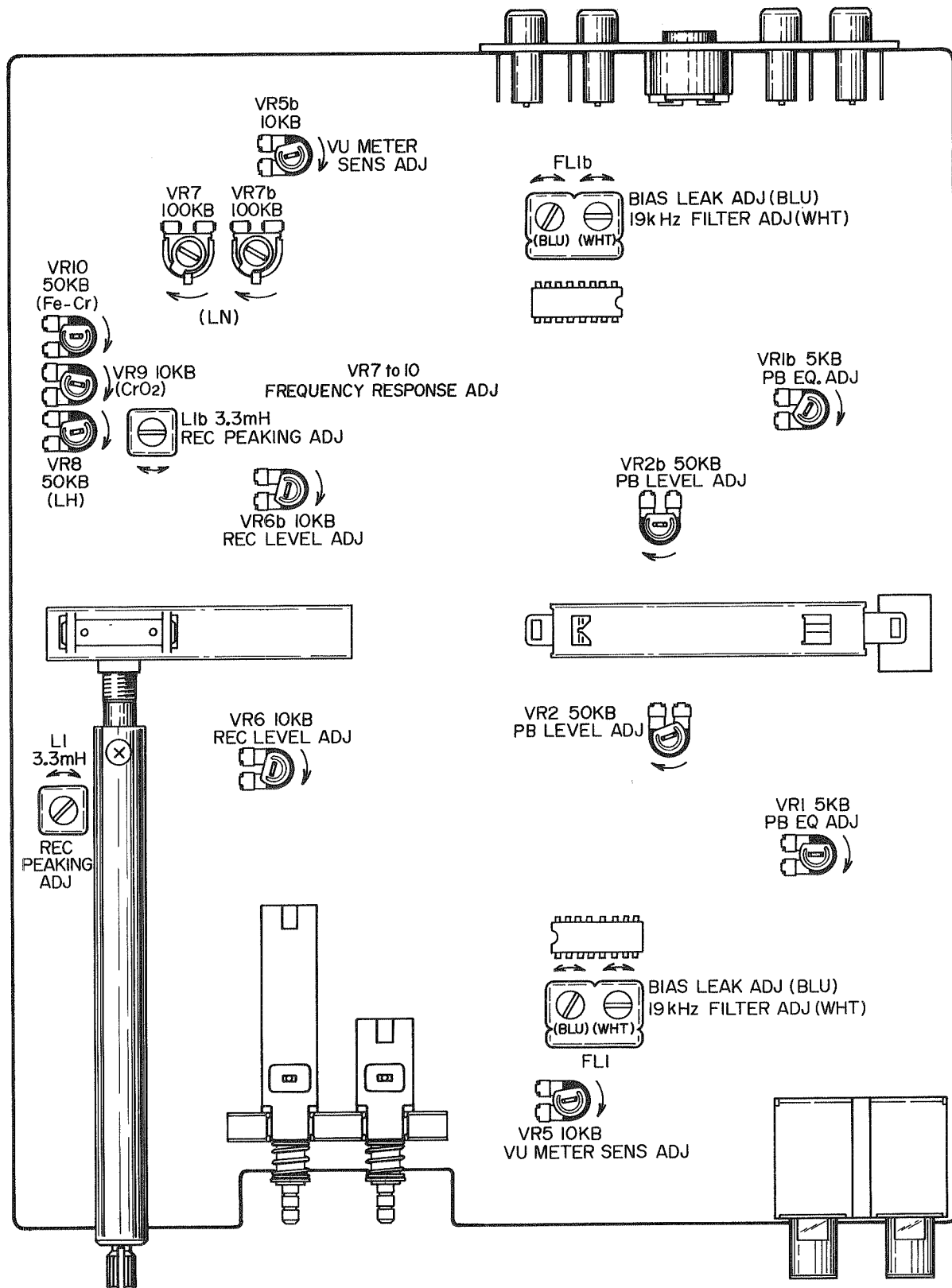


Fig. 10 Pre Amp P.C Board CN-5301A

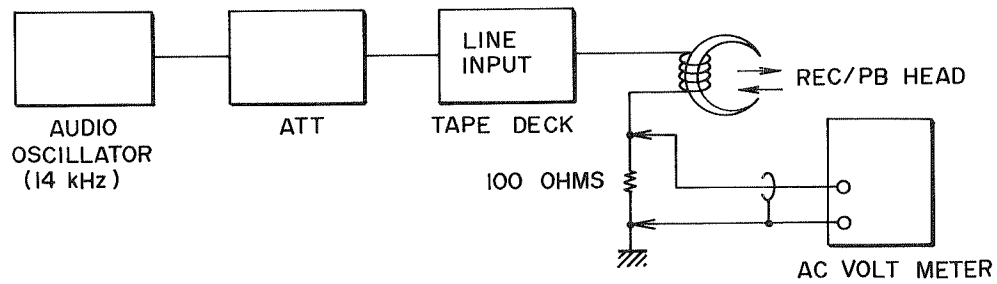


Fig. 11 Instruments Connection

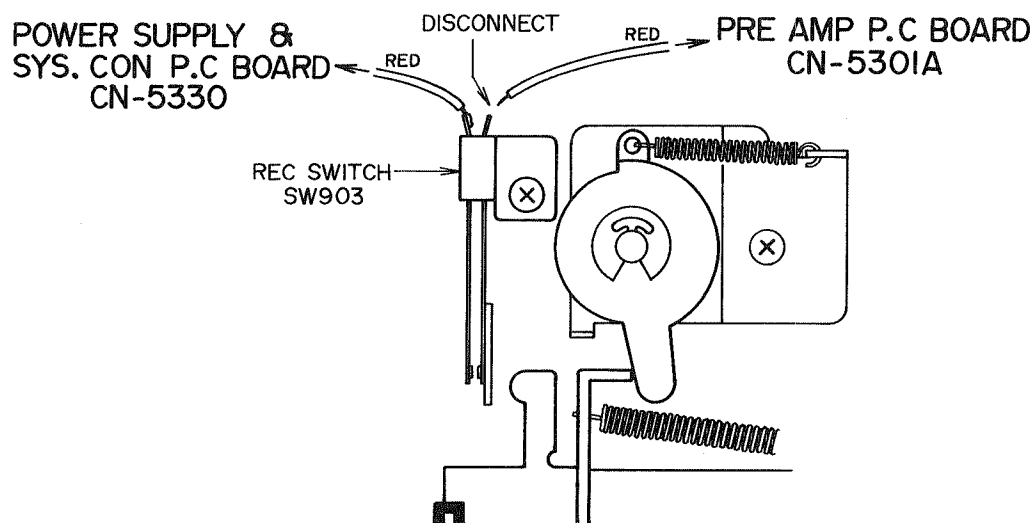
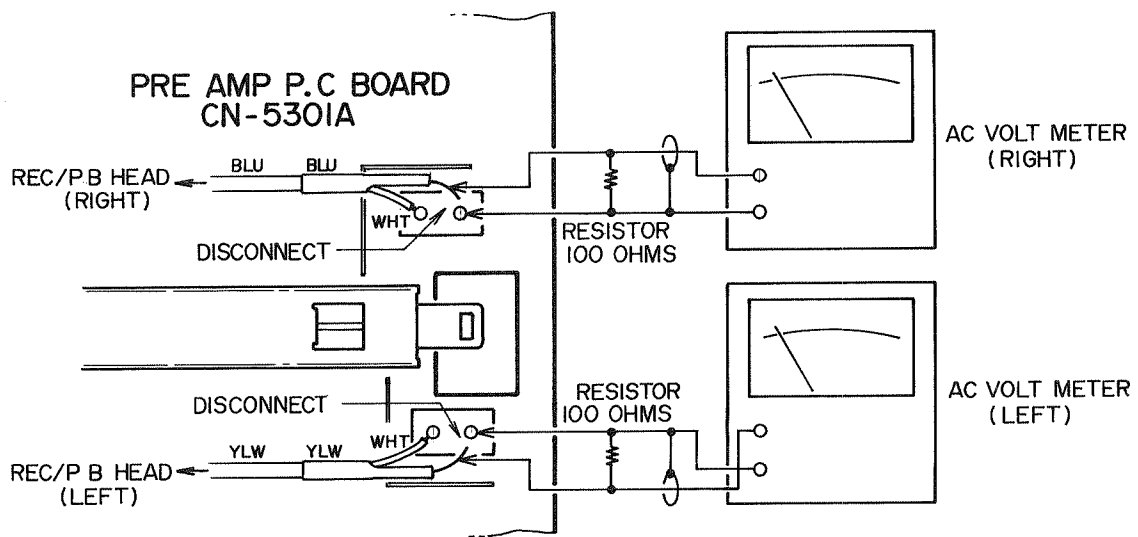


Fig. 12 Rec Peaking Adjustment

Step	Adjustment Item	Test Tape Supply Signal	Mode	Adjustment Point	Result	Remarks
1	Playback level adjustment	333 Hz, 0 VU Test Tape	PLAY	VR2 50 k $\Omega$	-5.5 $\pm$ 0.5 dBm (410 mV)	
2	VU Meter sensitivity adjustment	1,000Hz, 0VU from an oscillator	REC	VR9 5 k $\Omega$	0 VU indication	
3	Playback equalizer adjustment	10 kHz Test Tape	PLAY	VR1 10 k $\Omega$	-20.0 $\pm$ 0.5dBm	
4	Rec peaking adjustment	14 kHz from an oscillator	REC	L1 3.3 mH	Maximum AC volt meter indication	(Refer to NOTE 5 and Figs.11,12.)
5	LN Position frequency response adjustment	Low Noise Blank tape, 1,000 Hz, 10,000 Hz, -20 VU recording	REC/ PLAY	VR7 100 k $\Omega$	1,000 Hz to 10,000 Hz flat response	
6	LH Position frequency response adjustment	LH Blank tape, 1,000Hz, 10,000 Hz, -20 VU recording	REC/ PLAY	VR8 50 k $\Omega$	1,000 Hz to 10,000 Hz flat response	Set tape selector to LH. (Refer to NOTE 6)
7	CrO <sub>2</sub> Position frequency response adjustment	CrO <sub>2</sub> Blank tape, 1,000 Hz, 10,000 Hz, -20 VU recording	REC/ PLAY	VR9 20 k $\Omega$	1,000 Hz to 10,000 Hz flat response	Set tape selector to CrO <sub>2</sub> . (Refer to NOTE 6)
8	Fe-Cr Position frequency response adjustment	Fe-Cr Blank tape, 1,000 Hz, 10,000 Hz, -20 VU recording	REC/ PLAY	VR10 50 k $\Omega$	1,000 Hz to 10,000 Hz flat response	Set tape selector to Fe-Cr. (Refer to NOTE 6)
9	Recording level adjustment	Low Noise Blank tape, 1,000Hz 0VU recording	REC/ PLAY	VR6 10 k $\Omega$	-5.5 $\pm$ 0.5dBm (410 mV)	
10	Distortion Factor Confirmation	1,000 Hz 0 VU recording	REC/ PLAY		LN: Less than 1.3% LH: Less than 1.3% (Refer to NOTE 7) CrO <sub>2</sub> : Less than 1.5% Fe-Cr: Less than 1.5%	
11	Bias Leak adjustment	No signal Input	REC	FL1 FB2000B (BLU)	Minimum AC voltmeter indication	Recording volume to maximum.
12	19 kHz filter adjustment	19 kHz from an oscillator	REC	FL1 FB2000B (WHT)	Minimum AC voltmeter indication	DOLBY N.R. Switch to ON. (Refer to NOTE 8)

- NOTES:
1. Output Level Control should be at maximum.
  2. Except for Steps 6 thru 8, set tape selector to Low Noise position.
  3. Except for Step 11, set DOLBY N.R. switch to OFF position.
  4. Use the following cassette measuring tape:

LN Tape:	Fuji FL C-60
LH Tape:	Maxell UD C-60
CrO <sub>2</sub> Tape:	TDK SA C-60
Fe-Cr Tape:	SONY Duad C-60
  5. Stop recording bias oscillator while making Rec Peaking Adjustment (Refer to Figs. 11,12).
  6. If a flat characteristic cannot be obtained from 1,000 Hz to 10,000 Hz at LH, CrO<sub>2</sub>, or Fe-Cr positions, fine adjust at VR8(LH), VR9 (CrO<sub>2</sub>), or VR10 (Fe-Cr) respectively.
  7. If it does not comply with the specifications, repeat Steps 5 to 9 and re-adjust.
  8. Unless the core is moved intentionally this adjustment is not necessary.
  9. Because each of these adjustments are vital to perfect Dolby N.R. circuit operation, be sure that they are carried out with as little error as possible.

## VI. DC RESISTANCE OF VARIOUS COILS

Parts	Designation	DC Resistance
Recording/Playback Head	P4-360Σ	370 ohms
Erase Head	HF213822A	4.5 ohms

Chart-2

## VII. BASIC PARTS LIST

Because the parts number and the parts unit supply listed in the Basic Parts List may partially change in the process of comprising the regular manual, please order parts based on the regular service manual after the regular manual is made available.

This basic parts list does not include those parts used for various domestic safety standards.

Parts No.	Description	Note
BC305744	Upper Cover (A)	
BD305862	Front Panel Block Comp. GXC-706D(U/T)	
BF305887	Flywheel Part GXC-706D	
BK305797	Keyboard Comp. (A) CN-2	
BK305798	Keyboard Comp. (B) CN-2(BL)	
BL300249	Pinch Roller Block Comp. GXC-709D	
BL282508	Take-up Lever Part-G	
BL282510	Middle Lever Part-G	
BM305865	Motor Block Comp. GXC-706D	
BR282475	Take-up Reel Table Block Comp.-G	
BR282497	Supply Reel Table Block Comp.-G	
BT305600	▲ Power Trans. CNT-21	T901
BZ280337	Flywheel Holder Plate Part-G	
BZ282881	Auto Stop Comp.	
ED624903	Silicon Diode 1S2473	
ED306109	Silicon Diode W03B	
ED306110	Silicon Diode B1P1	
ED219464	Germanium Diode 1N34A	
ED498150	Zener Diode WZ-192	
ED249377	LED GL-3AR1	
ED283138	LED GL-3PG1	
EI605013	IC NE545B	IC1
EI306141	IC LA4170	IC2
EL283184	Lamp (L/T) 8V 100 MA	IND901
EM305634	VU Meter S11ADR68B	ME901,902
EM306132	VU Meter S11ADR68C	ME901,902 (BL)
ES301747	Leaf SW. BSW-1F TX-2	SW903
ES283151	Leaf SW. BSW-31(PL)	SW904
ES283173	Leaf SW. BUW-31PLC	SW901

Parts No.	Description	Note
ES665807	△ Push SW. SDG-5P 5A/80A 250V	SW1
ES306134	△ Slide SW. TSS-012164	SW2 (U/T)
ES305724	Slide SW. CL212K	SW1
ES305727	Push SW. SUF-24	SW2
ES305723	Rotary Slide SW. SRZ-L084	SW3
ET639437	Transistor 2SC945L(Q)(P)	
ET520266	Transistor 2SC1211(E)	
ET301154	Transistor 2SC1162(C)(D)	
ET603257	Transistor 2SC1312S(G)(H)	
ET303697	FET 2SK117(G)(R)	
EV305631	Double axial 2 throw Vol. DM20R-50kAx2	VR901
EV305630	Single axial 2 throw Vol. GM70R-10kAx2	VR902
EV464207	Semi-fixed/Vol. V8K4-1 5k(B)	VR1
EV464220	Semi-fixed/Vol. V8K4-1 50k(B)	VR2,8,10
EV520806	Semi-fixed/Vol. V8K4-1 10k(B)	VR5,6,9
EV550023	Semi-fixed/Vol. V10K8-4-2 100k(B)	VR7
HE266466	Erase Head HF213822A	
HP300795	REC/PB HEAD P4-360Σ	
MB282093	Capstan Belt	
MB283421	AS Belt	
MB305617	Counter Belt	
MC305717	Counter	
SK305669	Double Knob (Lower) GXC-706D	
SK306104	Double Knob (Lower-BL) GXC-706D	
SK305668	Double Knob (Upper) GXC-706D	
SK306103	Double Knob (Upper-BL) GXC-706D	
SK305670	Output Knob GXC-706D	
SK306105	Output Knob (BL) GXC-706D	
SK305671	Selector Knob	
SK305672	Selector Knob (BL)	
TC286007	Tape Guide (B)	
TC305728	Oil Clutch Comp. (E) GXC-706D	
ZG305736	Pinch Roller Spring	



## VIII. LIST OF INTERCHANGEABLE SEMICONDUCTORS

If, while servicing, the original parts cannot be obtained, the interchangeable parts listed below can be substituted.

Original Parts			Interchangeable Parts	
Description	Parts No.	Utilizing P.C Board	Description	Parts No.
2SC945L(P)	ET638504	CN-5301A	2SC1641(Q)(R)(S)(E)	ET603843
2SC945L(Q)	ET399846	CN-5301A	2SC536(E)(F)(G)(H)	ET246846
2SC945L(Q)(P)	ET639437	CN-5301A	2SC536(F)(G)(H)	ET632215
			2SC711(E)(F)(G)(H)	ET619727
2SC1162(C)(D)	ET301154	CN-5330		
2SC1211(E)	ET520266	CN-5301A	2SC1175(E)(F)	ET622080
2SC1312S(G)(H)	ET603257	CN-5301A	2SC458LG(C)	ET234854
			2SC693U(F)	ET315472
2SK117(G)(R)	ET303697	CN-5301A		
1N34A	ED219464	CN-5301A	1S188AM	ED562386
			1N60	ED428264
1S2473	ED624903	CN-5301A	1S1588	ED557447
W03B	ED306109	CN-5330		
WZ-192	ED498150	CN-5330		
GL-3AR1	ED249377	CN-5304		
GL-3PG1	ED283138	CN-5304		
B1P1	ED306110	CN-5330		



