

HCD-G101

SERVICE MANUAL

US Model
Canadian Model



HCD-G101 is the tuner, deck, CD and amplifier section in MHC-G101.

CD SECTION	Model Name Using Similar Mechanism		NEW
	CD Mechanism Type		CX3
	Base Unit Type		KSM-213BCM
	Optical Pick-up Type		KSS-213B/S-N
TAPE DECK SECTION	Model Name Using Similar Mechanism		HCD-H100
	Tape Transport Mechanism Type	DECK-A	TK20FX-SW943-800
		DECK-B	TK20FX-SW943-800

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 8 ohm loads, both channels driven, from 70 – 20,000 Hz; rated 11 watts per channel minimum RMS power, with no more than 0.9% total harmonic distortion from 250 milliwatts to rated output.

Amplifier section

Continuous RMS power output

15 + 15 watts
(8 ohms at 1 kHz,
10% THD)

Music power output (North American model only)

25 + 25 watts

Outputs

PHONES (stereo phone jack): accepts headphones of 8 ohms or more.
SPEAKER: accepts impedance of 8 to 16 ohms.

CD player section

System

Compact disc and digital audio system
Semiconductor laser ($\lambda = 780 - 790 \text{ nm}$)
Emission duration:

Laser

Laser output

continuous
Max. $400\mu\text{W}^*$
^{*}This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.

Frequency response

40 Hz – 16 kHz ($\pm 0.5 \text{ dB}$)

Tape player section

Recording system

4-track 2-channel stereo

Frequency response

60 – 13,000 Hz ($\pm 3 \text{ dB}$), using Sony TYPE I cassette

Tuner section

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range

87.5 – 108.0 MHz

Antenna

FM lead antenna

Antenna terminals

75 ohm unbalanced

Intermediate frequency

10.7 MHz

AM tuner section

Tuning range

530 – 1,710 kHz

Antenna

Bar antenna

Intermediate frequency

450 kHz

General

Power requirements

120 V AC, 60 Hz

Power consumption

90 watts

Dimensions

Approx. $280 \times 320 \times 340 \text{ mm}$ ($11 \frac{1}{8} \times 12 \frac{5}{8} \times 13 \frac{1}{2} \text{ in}$) (w/h/d) incl. projecting parts and controls

Mass

Approx. 5.9 kg (13 lb)

Design and specifications are subject to change without notice.

COMPACT DISC DECK RECEIVER



SONY®

SERVICING NOTE

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION	; INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL	; USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSÅFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	; AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTIINA LASERSÄTELYLLE.
VARNING	; LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URÖPPAD.
ADVARSEL	; USYNLIG LASERSTRÅLING NÄR DEKSEL ÖPNES UNNGÅ EKSPONERING FOR STRÅLEN.

This caution label is located inside the unit.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE \triangle SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer: Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

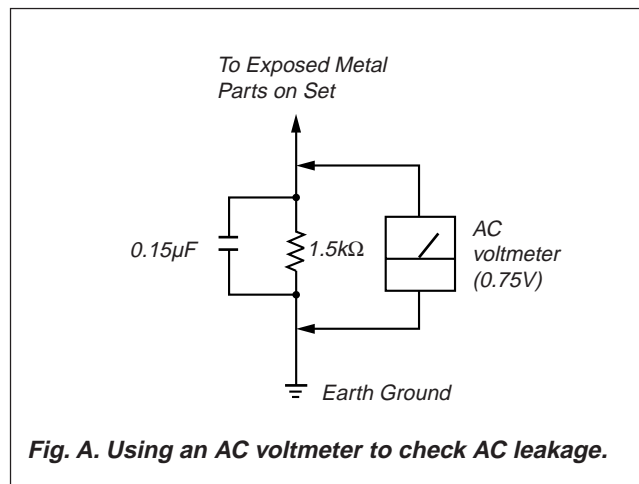
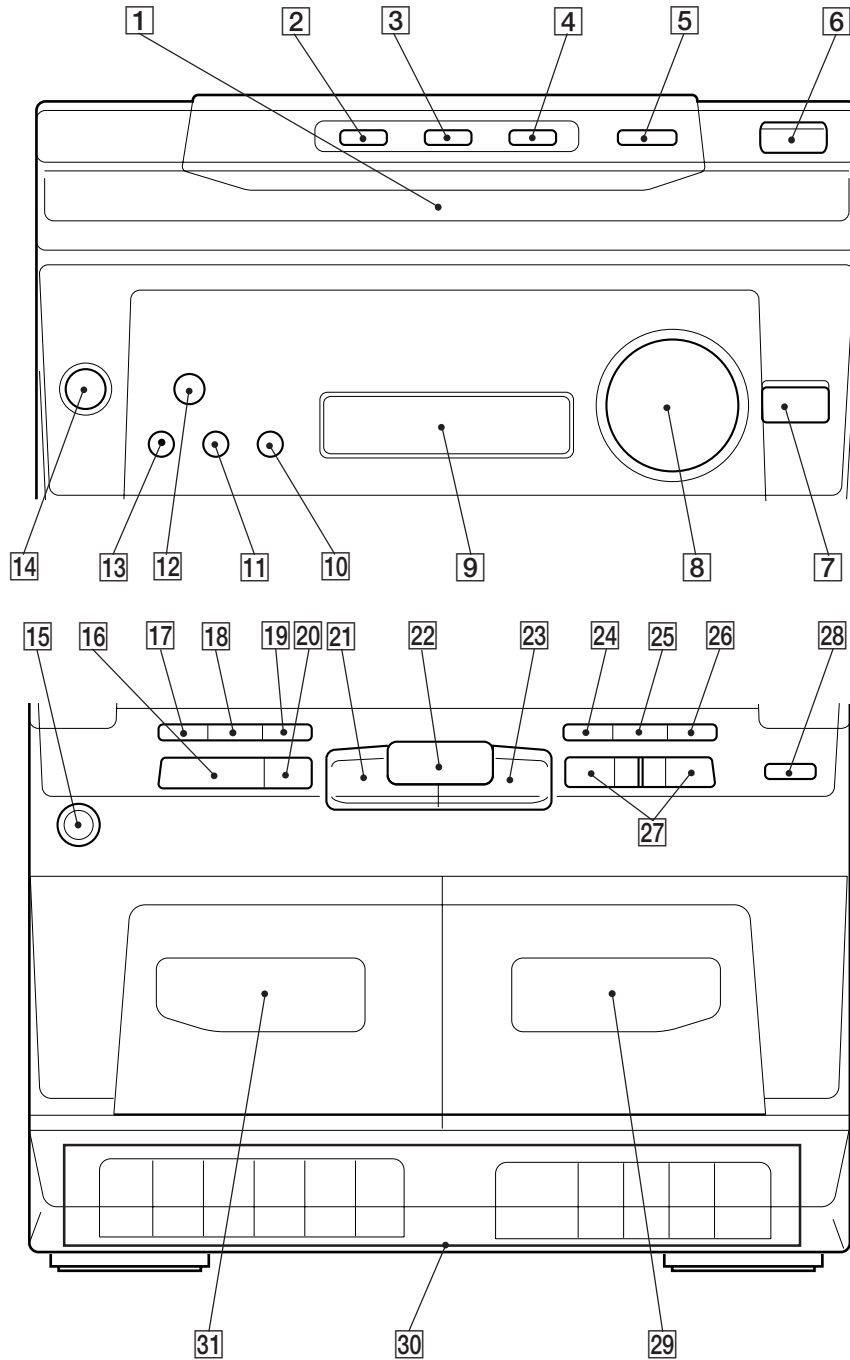


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SECTION 1 GENERAL

Location of Parts and Controls

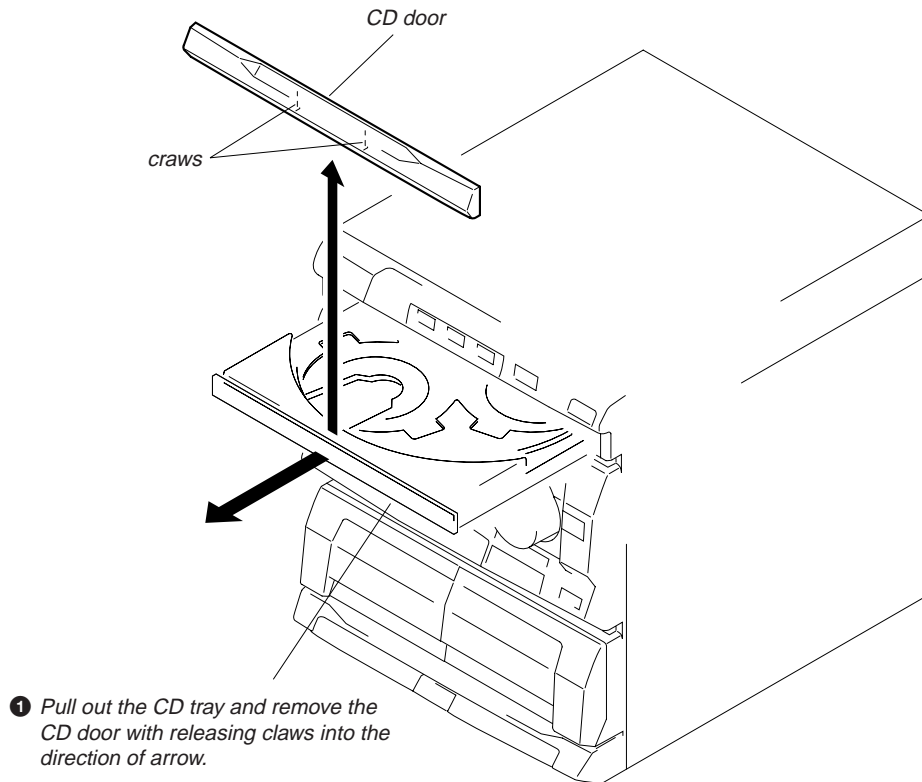


- | | |
|---|----------------------------------|
| 1 Disc tray | 20 ■ (stop) button |
| 2 DISC 1 button | 21 CD button |
| 3 DISC 2 button | 22 TAPE button |
| 4 DISC 3 button | 23 TUNER/BAND button |
| 5 DISC SKIP button | 24 PRESET – button |
| 6 ≡ OPEN/CLOSE button | 25 PRESET + button |
| 7 DBFB button | 26 MEMORY button |
| 8 VOLUME knob | 27 – TUNING +/ ◀◀ ◀◀/ |
| 9 Display window | ▶▶ ▶▶ buttons |
| 10 TIMER SET, CLOCK LIGHT button | 28 PRESET EQ button |
| 11 TIMER MODE button | 29 Deck B |
| 12 Remote sensor | 30 Tape operating buttons |
| 13 CLOCK SET button | ● (recording) (for deck A only) |
| 14 POWER button | ▷ (play) |
| 15 PHONES jack | ◀◀ (fast rewind) |
| 16 ▷ (play/pause) button | ▶▶ (fast forward) |
| 17 SHUFFLE button | ■▲ (stop/eject) |
| 18 PROGRAM button | (pause) |
| 19 REPEAT button | 31 Deck A |

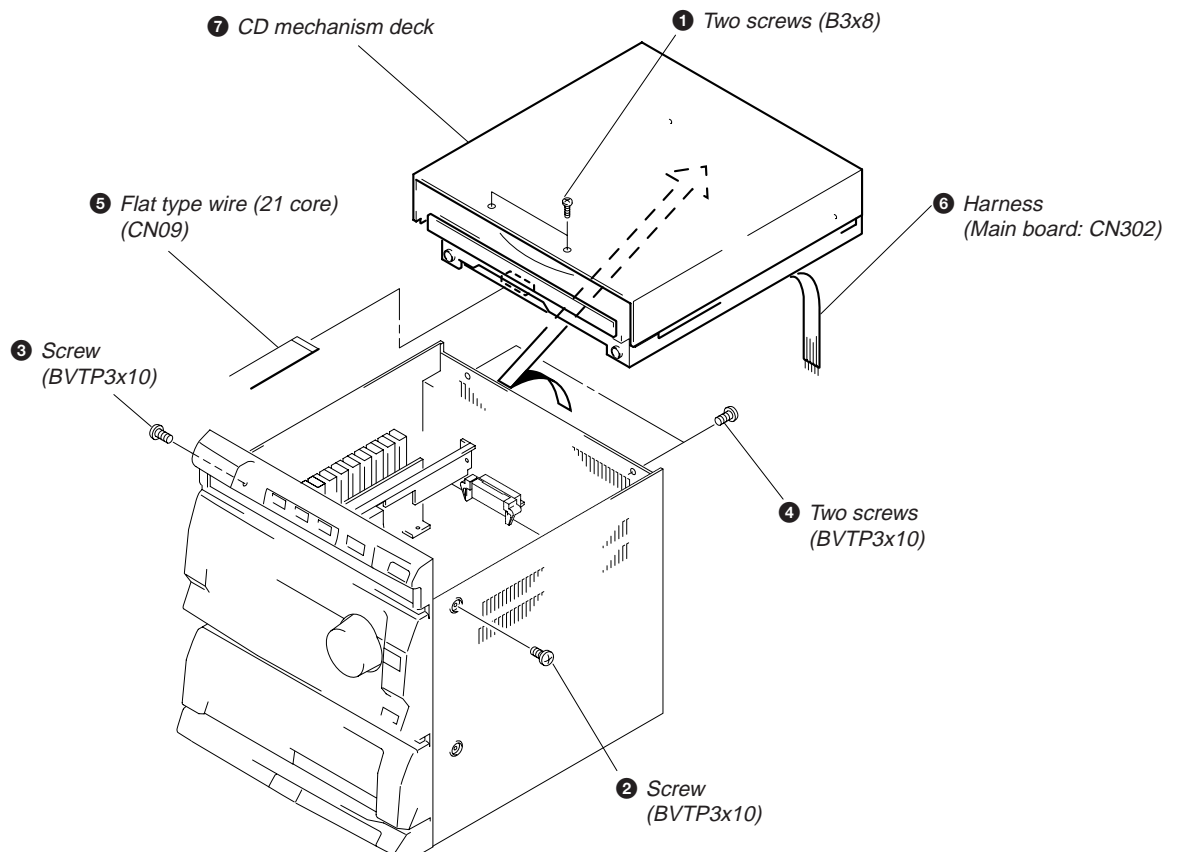
SECTION 2 DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

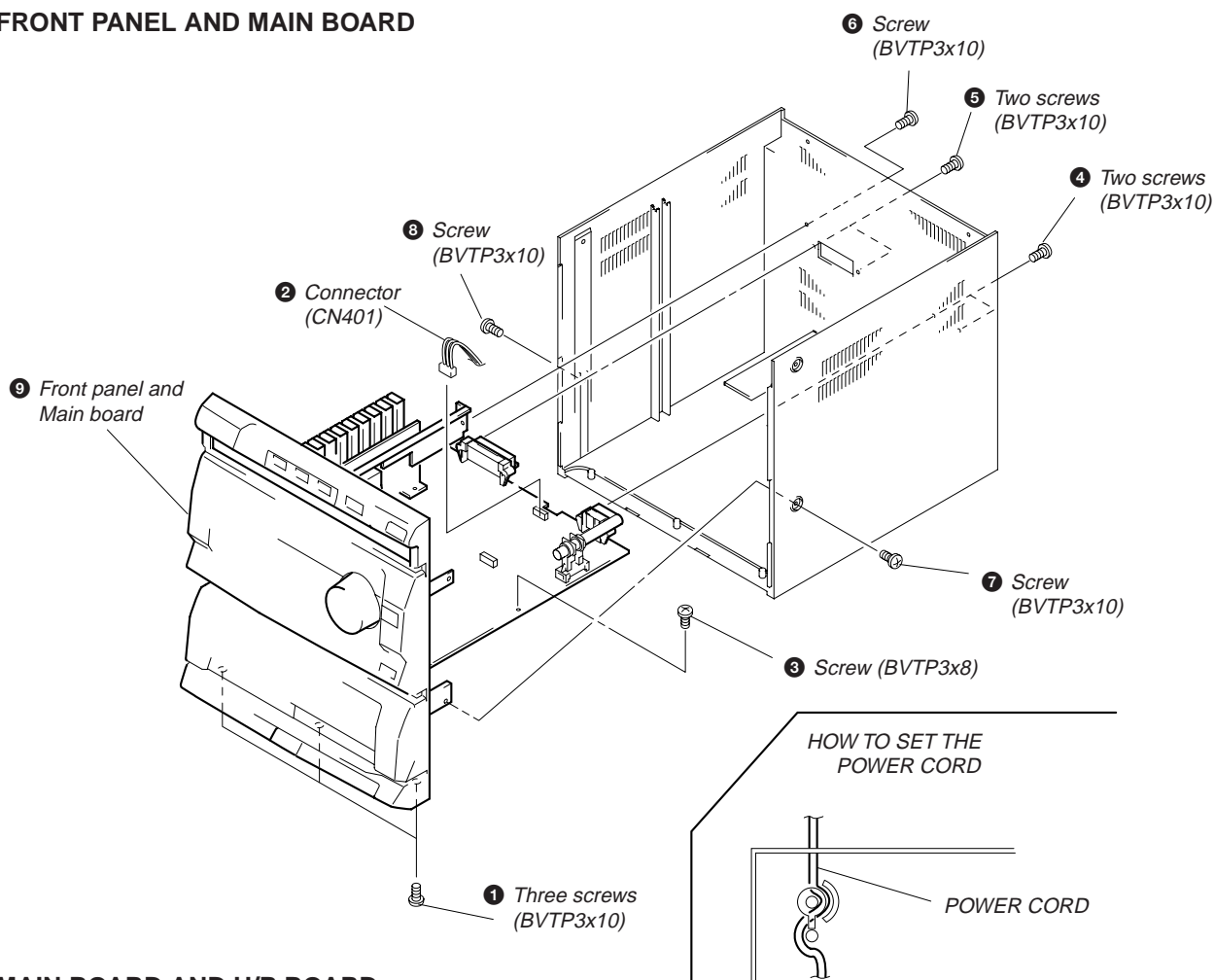
2-1. CD DOOR



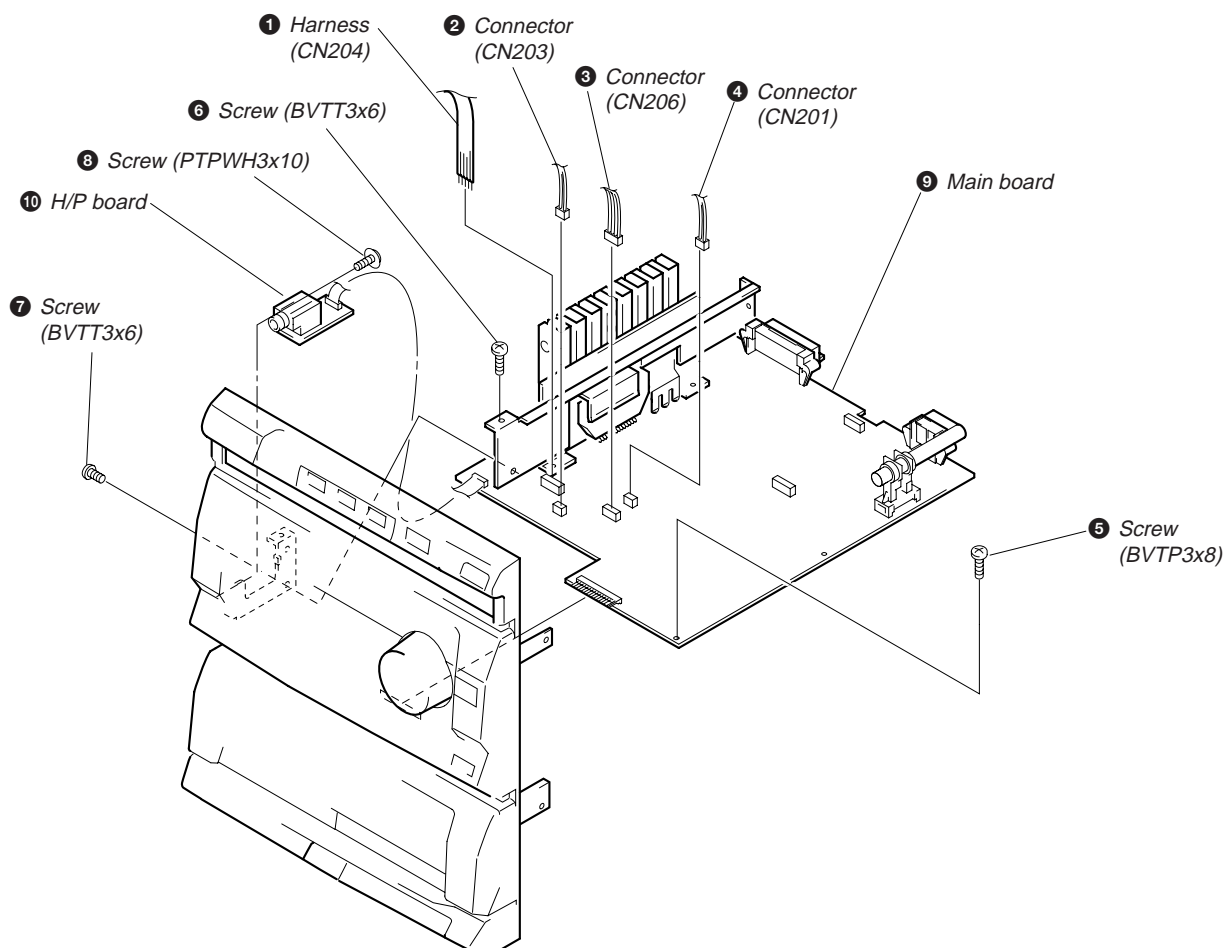
2-2. CD MECHANISM DECK



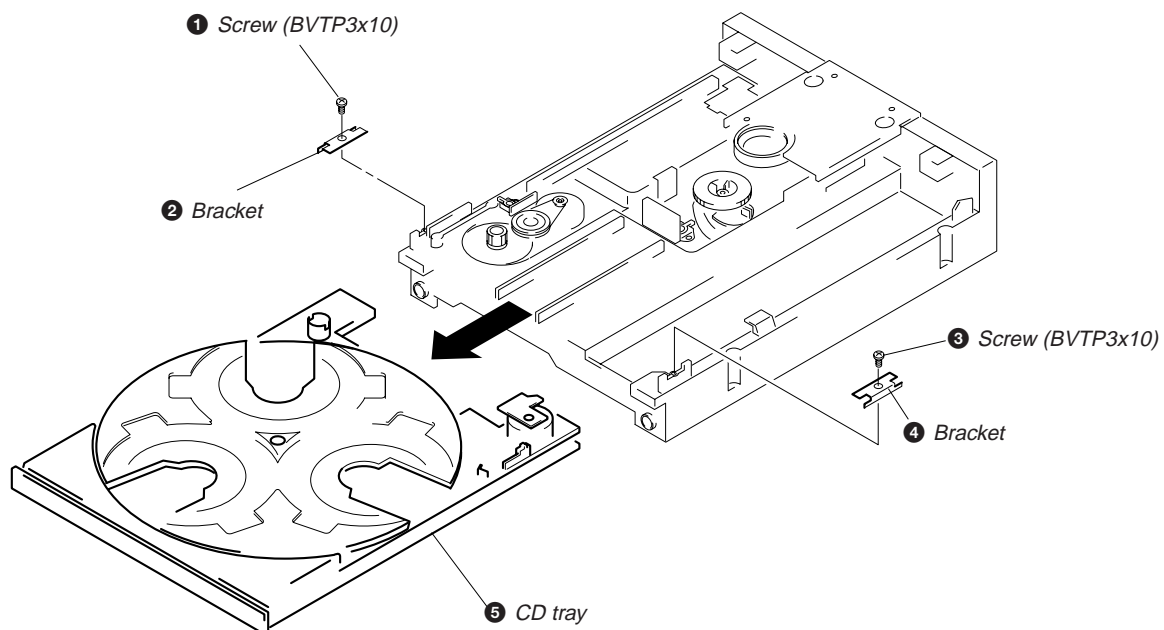
2-3. FRONT PANEL AND MAIN BOARD



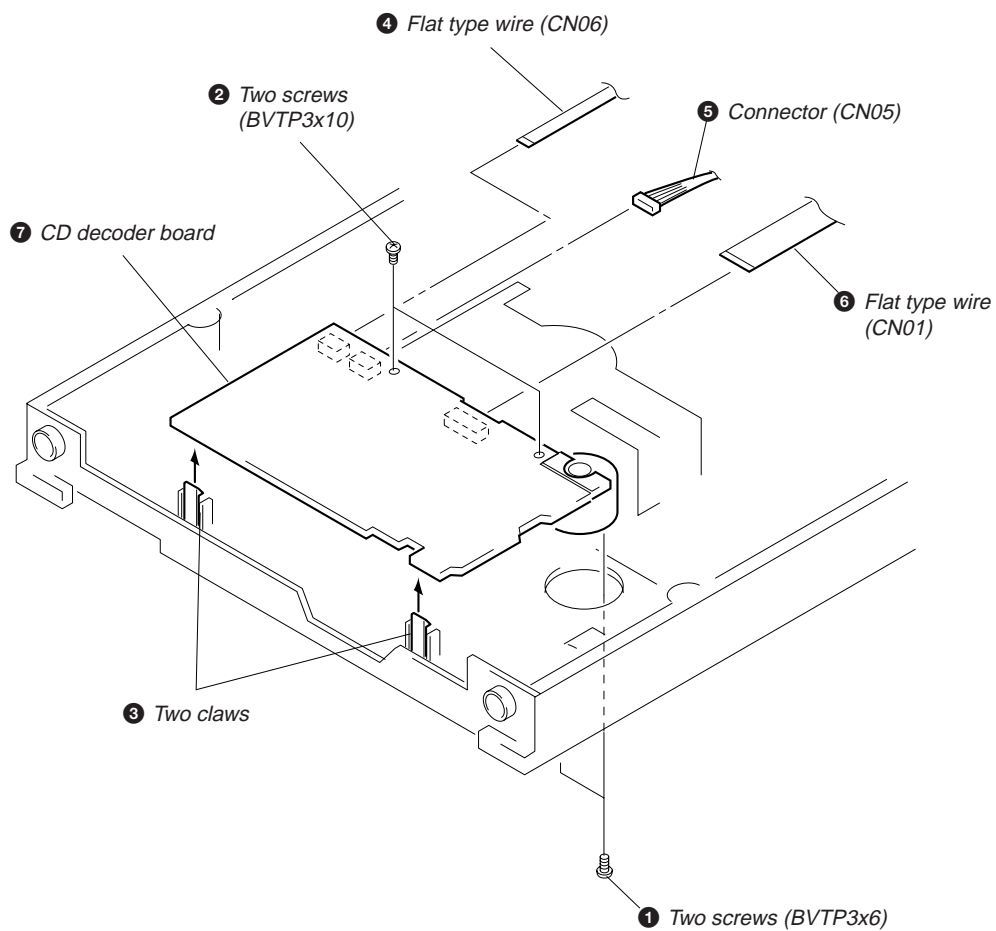
2-4. MAIN BOARD AND H/P BOARD



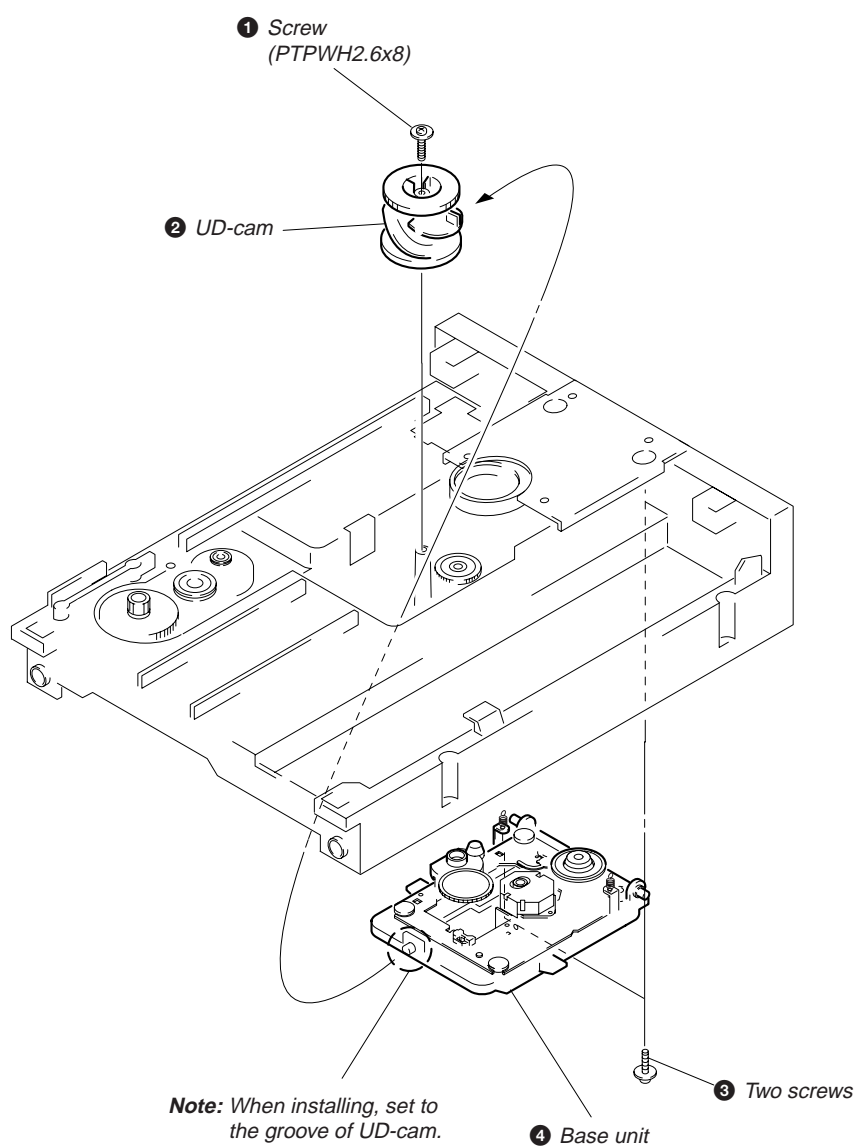
2-5. CD TRAY



2-6. CD DECODER BOARD



2-7. BASE UNIT



SECTION 3 MECHANICAL ADJUSTMENTS

Precaution

1. Clean the following parts with a denatured alcohol-moistened swab:

record/playback heads	pinch rollers
erase head	rubber belts
capstan	idlers
2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Torque meter	Meter reading
FWD	CQ-102C	40 to 70 g • cm (0.56 - 0.97 oz • inch)
FWD back tension	CQ-102C	1 to 5 g • cm (0.01 - 0.07 oz • inch)
FF/REW	CQ-201B	55 to 140 g • cm (0.76 - 1.94 oz • inch)

SECTION 4 ELECTRICAL ADJUSTMENTS

DECK SECTION

0 dB=0.775V

1. Demagnetize the record/playback head with a head demagnetizer.
2. Do not use a magnetized screwdriver for the adjustments.
3. After the adjustments, apply suitable locking compound to the parts adjusted.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
5. The adjustments should be performed in the order given in this service manual. (As a general rule, playback circuit adjustment should be completed before performing recording circuit adjustment.)
6. The adjustments should be performed for both L-CH and R-CH.

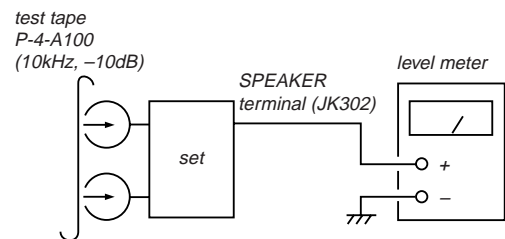
Tape	Signal	Used for
P-4-A100	10 kHz, -10 dB	Azimuth Adjustment
WS-48B	3 kHz, 0 dB	Tape Speed Adjustment

Record/Playback Head Azimuth Adjustment (Deck A, Deck B)

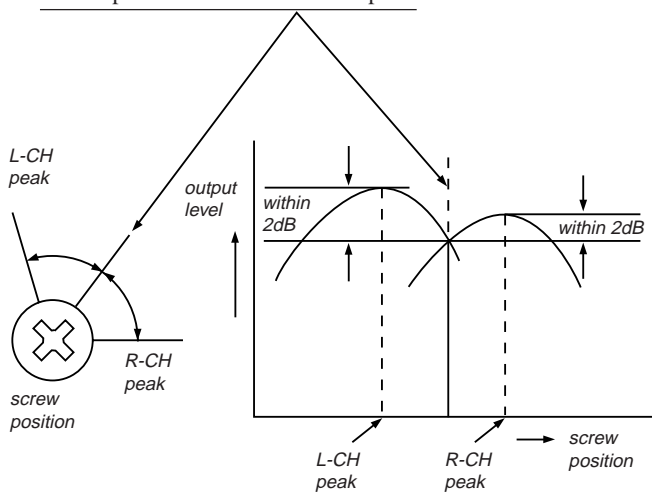
Note: Perform this adjustments for both decks.

Procedure:

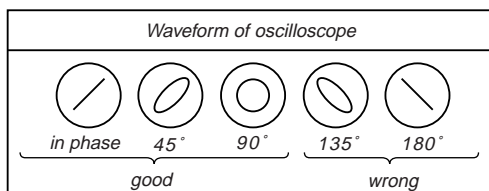
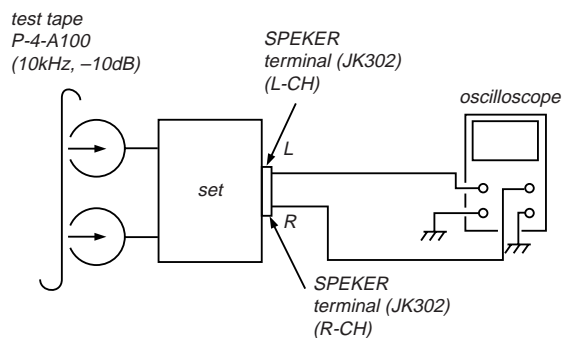
1. Mode : Playback



- Turn the adjustment screw and check output peaks. If the peaks do not match for L-CH and R-CH, turn the adjustment screw so that outputs match within 2 dB of peak.

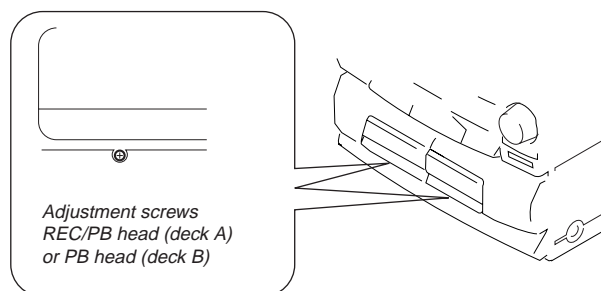


- Mode: Playback



- After the adjustments, apply suitable locking compound to the parts adjusted.

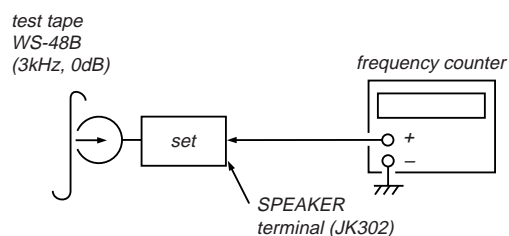
Adjustment Location:



Tape Speed Adjustment (Deck A)

Procedure:

- Mode: Playback



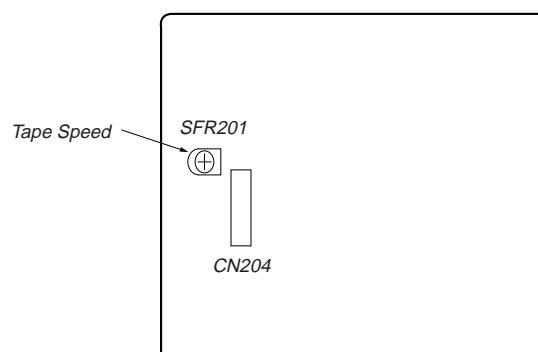
- Adjust the SFR201 so that the frequency counter reads 3,000 Hz \pm 90Hz.

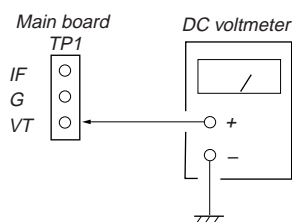
Adjustment Location: MAIN board

Sample Value of Wow and flutter

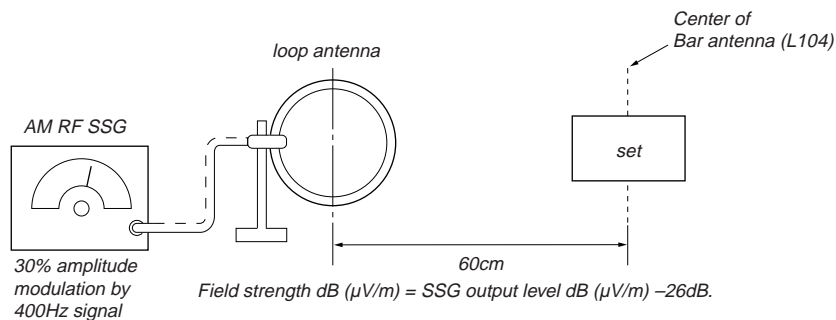
W. RMS (JIS) within 0.3%
(test tape: WS-48B)

[MAIN BOARD] — Component side —



TUNER SECTION**0 dB=1 μ V****AM Tuning Voltage Adjustment****Procedure:**

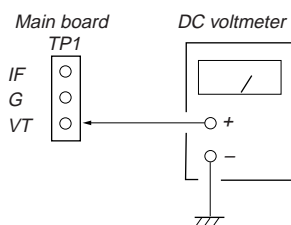
1. Set the reception frequency of the unit to 530 kHz.
2. Adjust L105 for 1.2 ± 0.05 V reading on the DC voltmeter.
3. Set the reception frequency of the unit to 1,710 kHz.
4. Confirm that the voltage reading on the DC voltmeter is within 8.0 ± 0.5 V.

Adjustment Location: MAIN board**AM Tracking Adjustment****Procedure:**

1. Tune the set to 600 kHz.
2. Set the output of AM RF SSG so that the input level of the set will become 60 dB (μ V/m).
3. Adjust L104 so that when the waveform on the oscilloscope is maximum, no noise appears.
4. Tune the set to 1,400 kHz.

5. Adjust TC102 so that when the waveform on the oscilloscope is maximum, no noise appears.

- Repeat the procedures in each adjustment several times, and the tracking adjustment should be finally done by the trimmer capacitors.

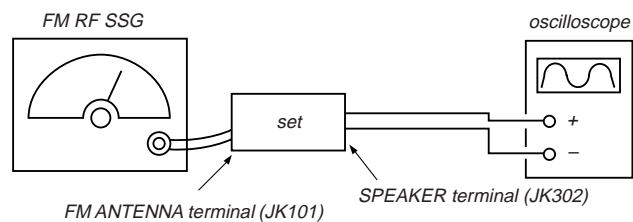
Adjustment Location: MAIN board**FM Tuning Voltage Adjustment****Procedure :**

1. Set the reception frequency of the unit to 87.5 MHz.
2. Adjust L103 for 1.2 ± 0.05 V reading on the DC voltmeter.
3. Set the reception frequency of the unit to 108 MHz.
4. Confirm that the voltage reading on the DC voltmeter is within 7.8 ± 0.5 V.

Adjustment Location: MAIN board

FM Tracking Adjustment

Procedure:



Carrier frequency : 90 MHz, 106 MHz
 Modulation : AUDIO 1kHz, 75kHz deviation (100%)
 Output level : 20 dB (at 75 Ω open)

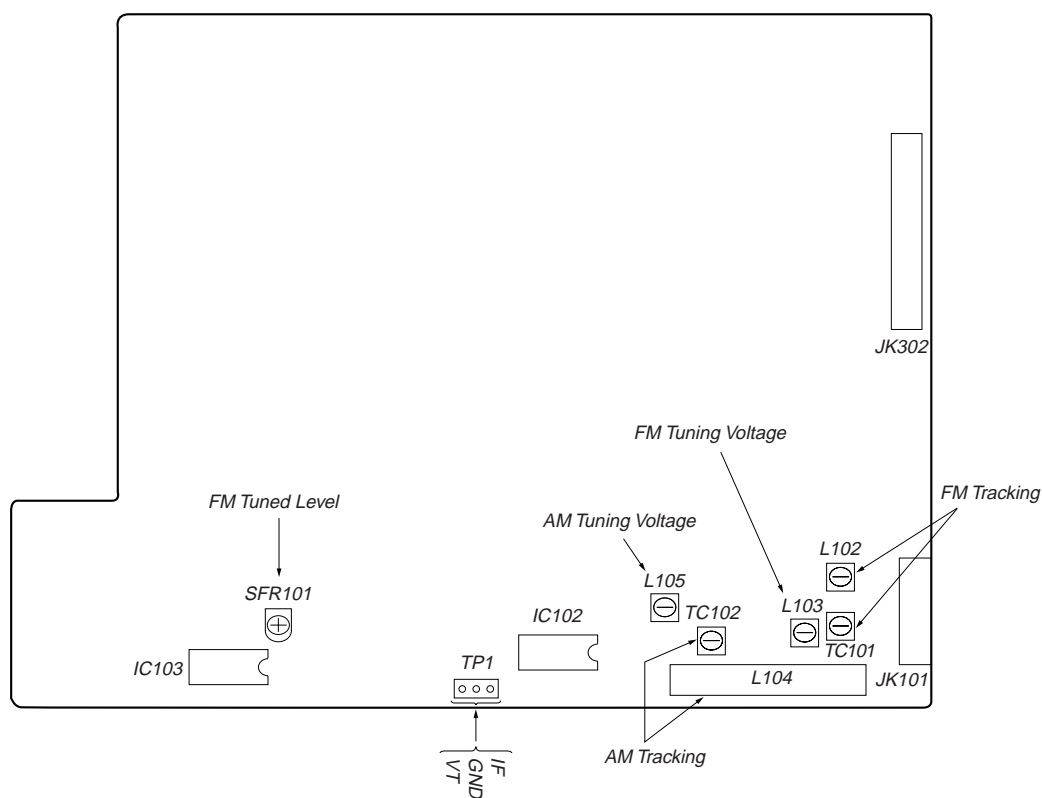
1. Tune the set to 90 MHz.
2. Adjust L102 so that when the waveform on the oscilloscope is maximum, no noise appears.
3. Tune the set to 106 MHz.
4. Adjust TC101 so that when the waveform on the oscilloscope is maximum, no noise appears.

- Repeat the procedures in each adjustment several times, and the tracking adjustment should be finally done by the trimmer capacitors.

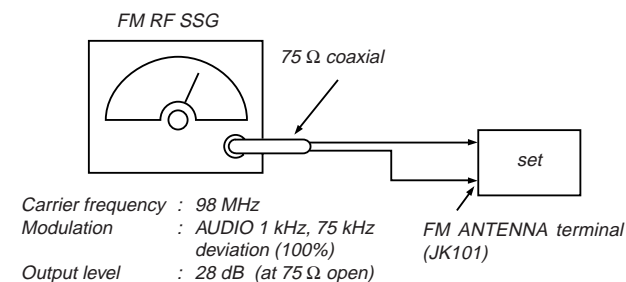
Adjustment Location: MAIN board

Adjustment Location

[MAIN BOARD] — Component side —



FM Tuned Level Adjustment



Procedure:

1. Supply a 28 dB 98 MHz signal from the ANTENNA terminal.
2. Tune the set to 98 MHz.
3. Adjust SFR101 to the point (moment) when the TUNED indicator will change from going off to going on.

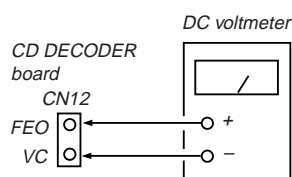
Adjustment Location: MAIN board

CD SECTION

Note:

1. CD Block is basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than $10M\Omega$ impedance.
4. Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.
5. Adjust the focus bias adjustment when optical block is replaced.

Focus Bias Adjustment



Procedure:

1. Connect DC voltmeter to test point CN12 (FEO), (VC) on CD DECODER board.
2. Turned Power switch on.
3. Put disc (YEDS-18) in and stop.
4. Adjust VR01 so that the DC voltmeter reading is 0 ± 20 mV.

Adjustment Location: CD DECODER board

Focus Gain Adjustment (VR02)

This gain has a margin, so even if it is slightly off.

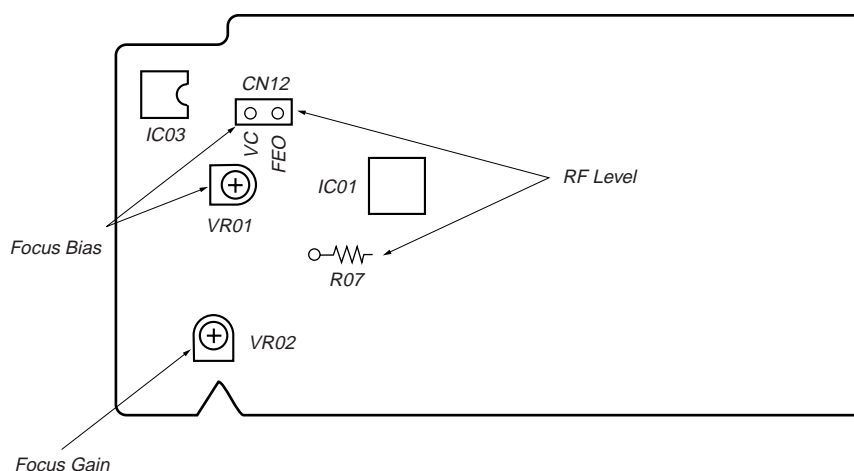
There is no problem.

Therefore, do not perform this adjustment.

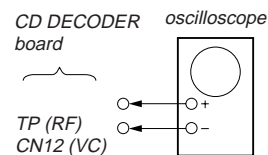
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

Adjustment Location

[CD DECODER BOARD] — Component side —



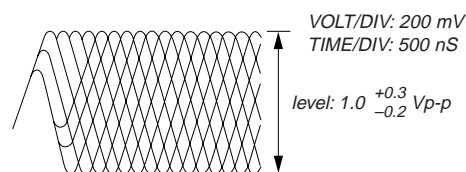
RF Level Check



Procedure :

1. Connect oscilloscope to test point TP (RF) on CD DECODER board.
2. Turned Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

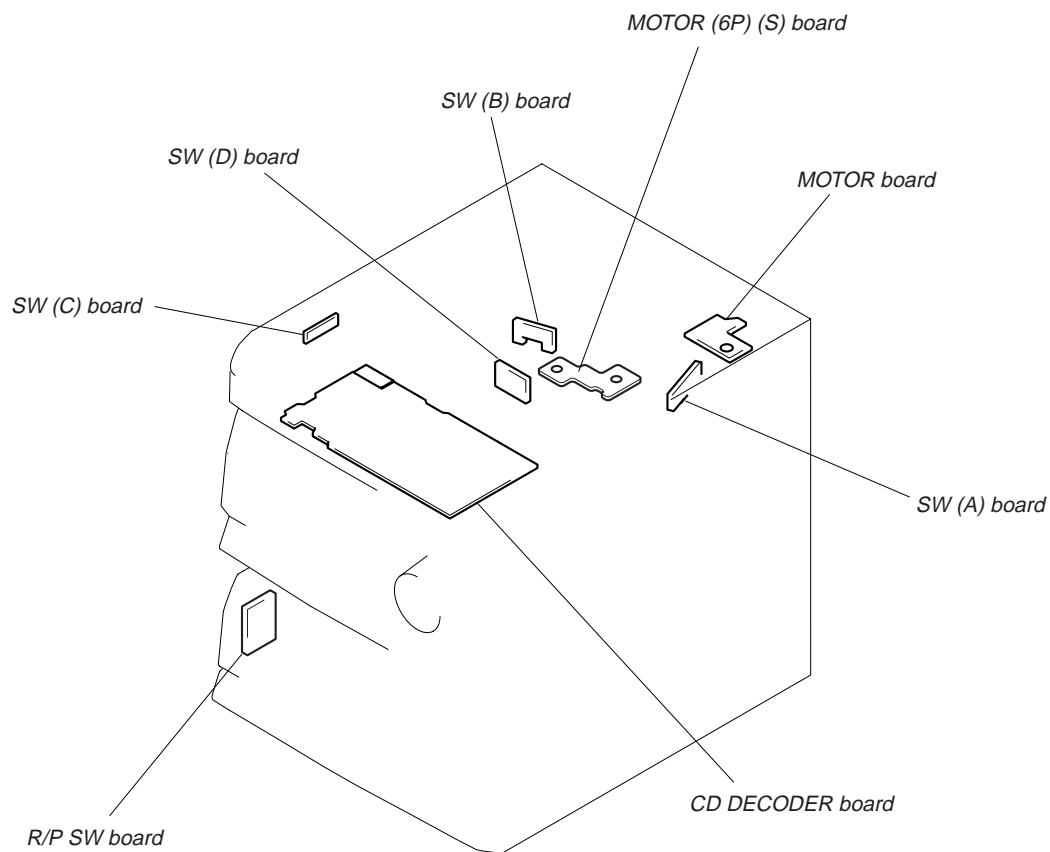
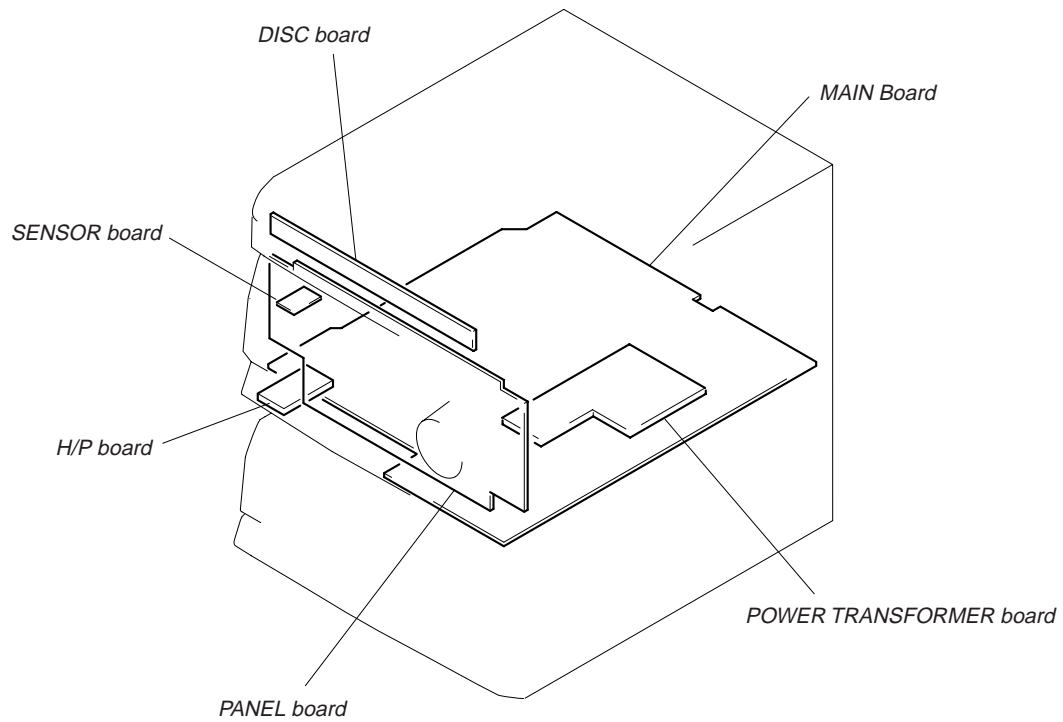
Note: Clear RF signal waveform means that the shape “ \diamond ” can be clearly distinguished at the center of the waveform.



Adjustment Location: CD DECODER board

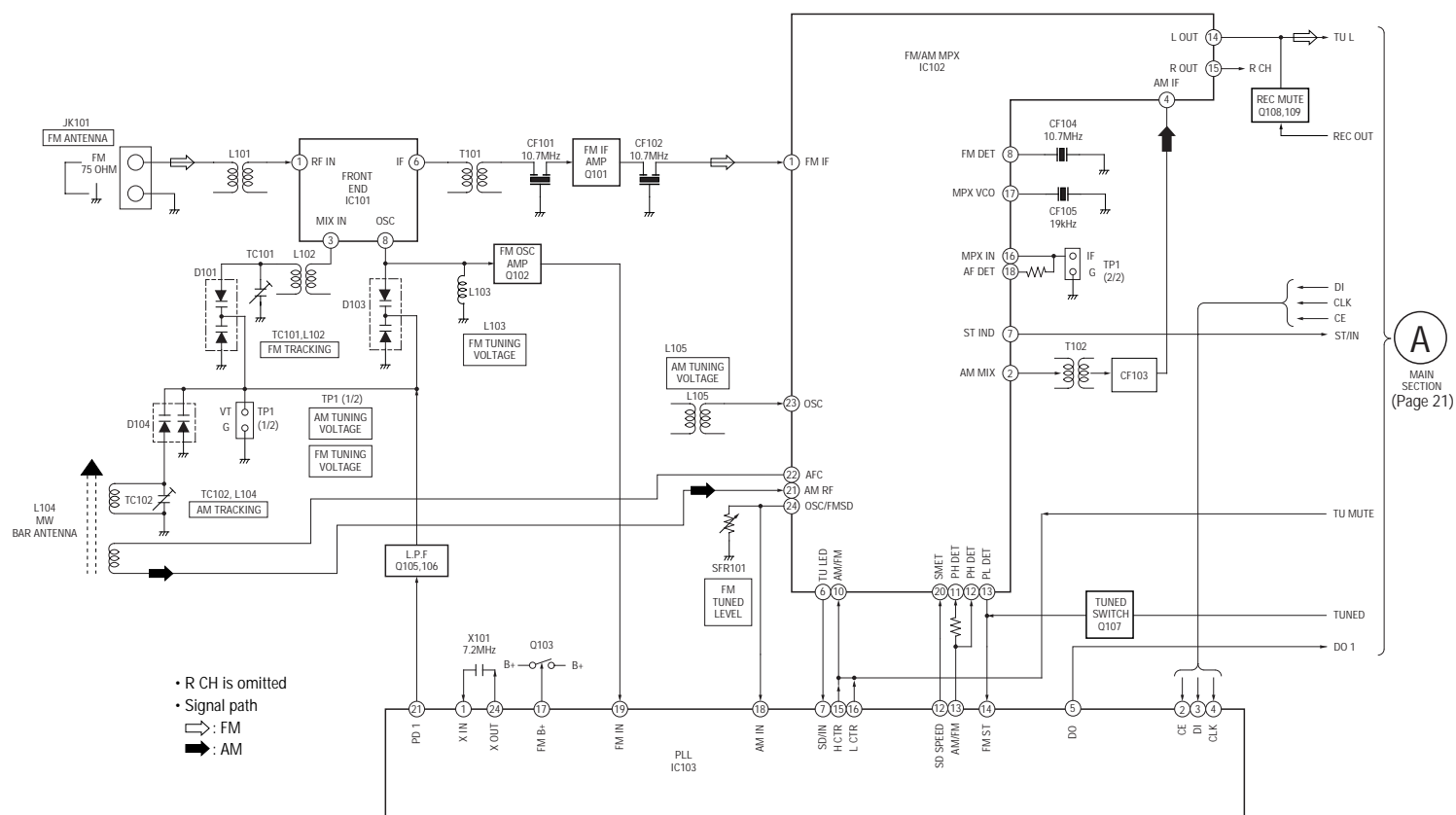
SECTION 5 DIAGRAMS

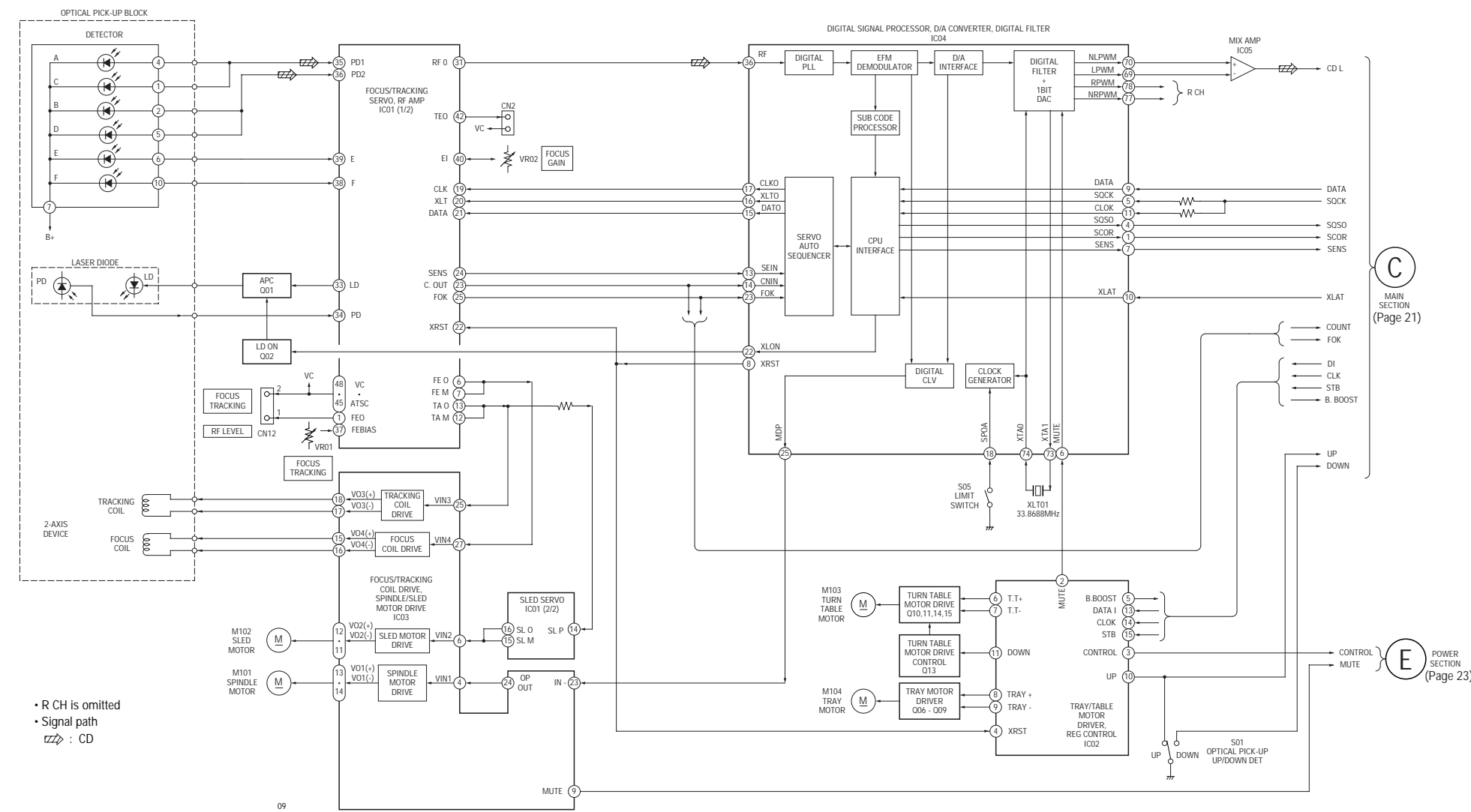
5-1. CIRCUIT BOARDS LOCATION



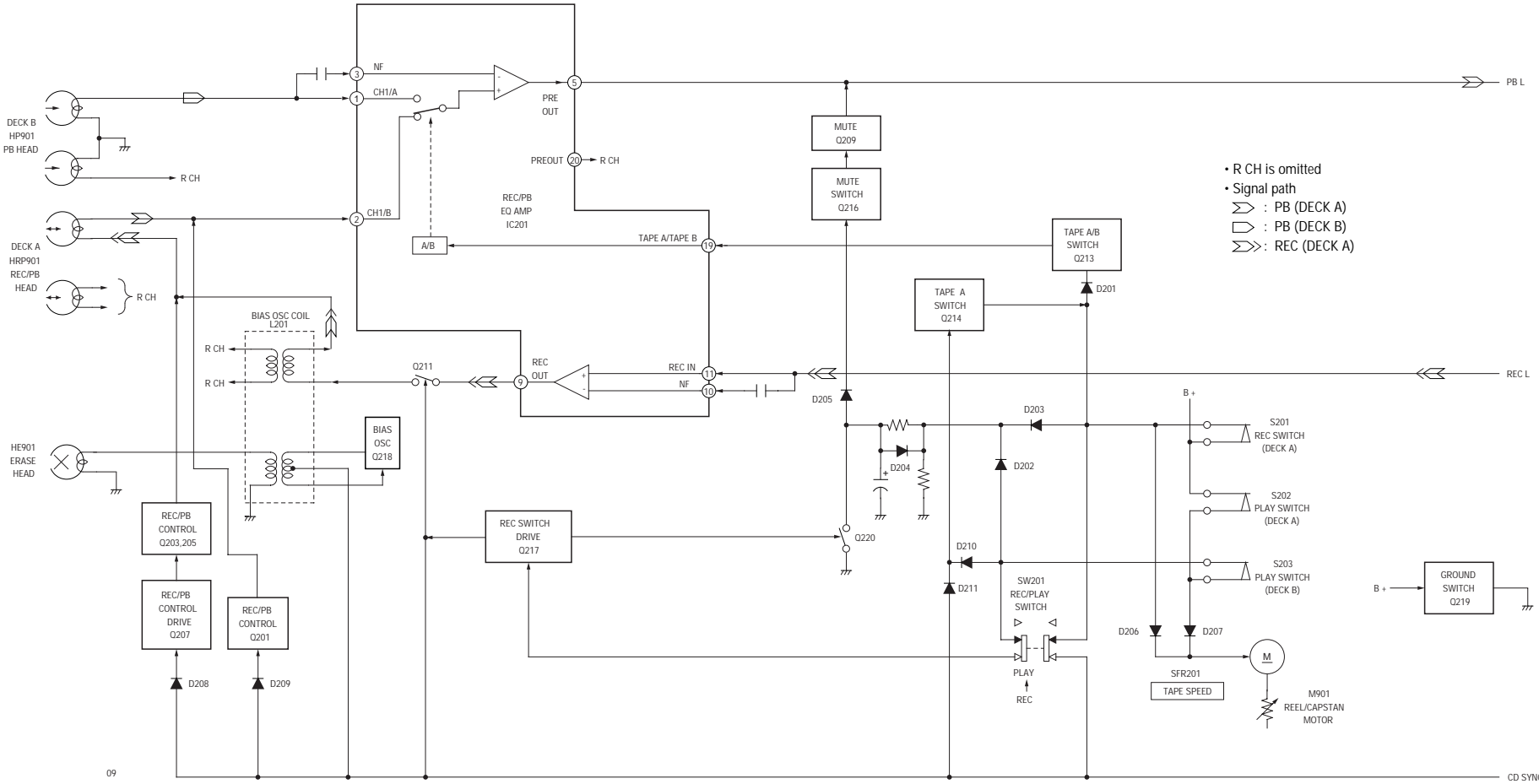
5-2. BLOCK DIAGRAMS

—TUNER SECTION—

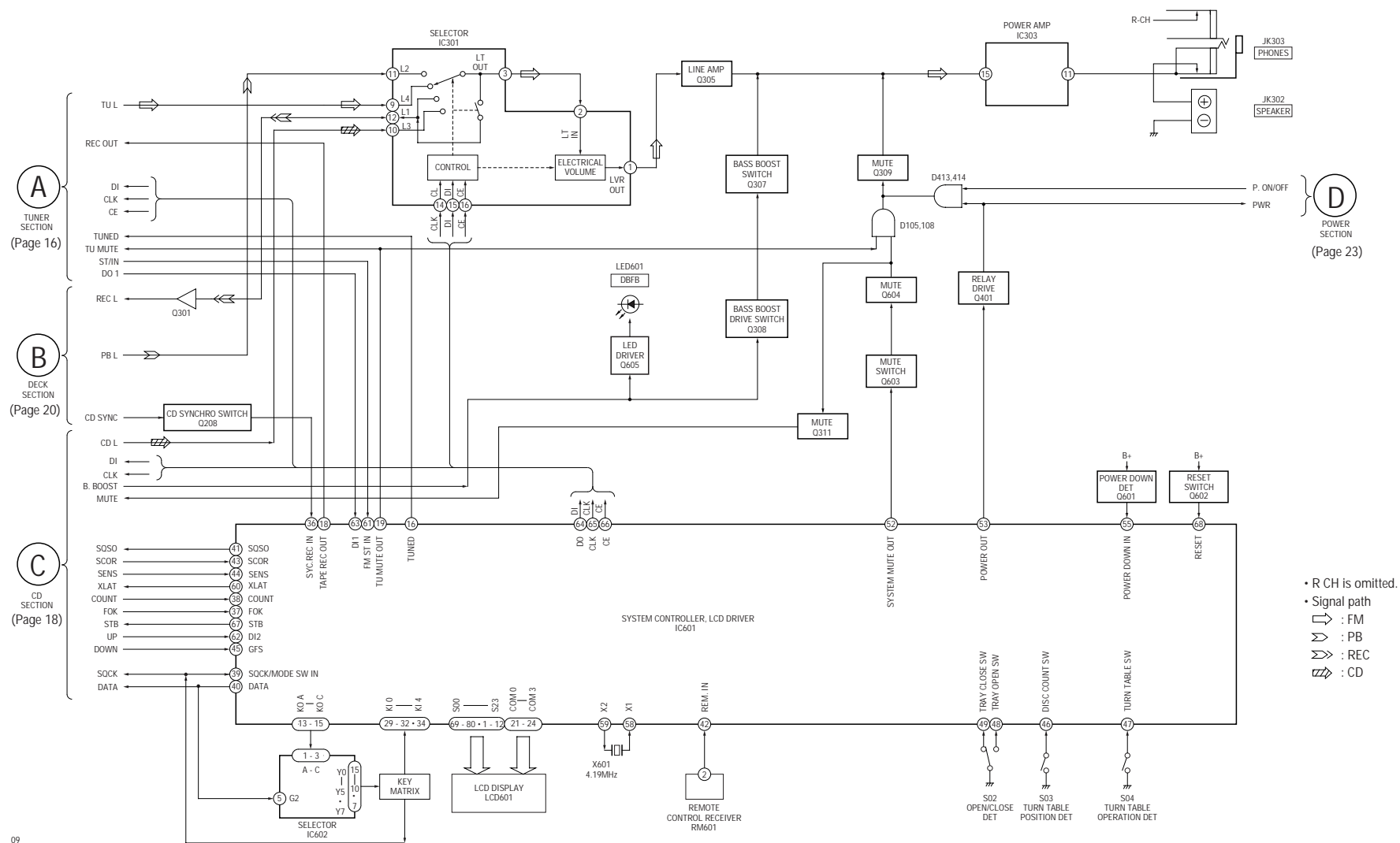




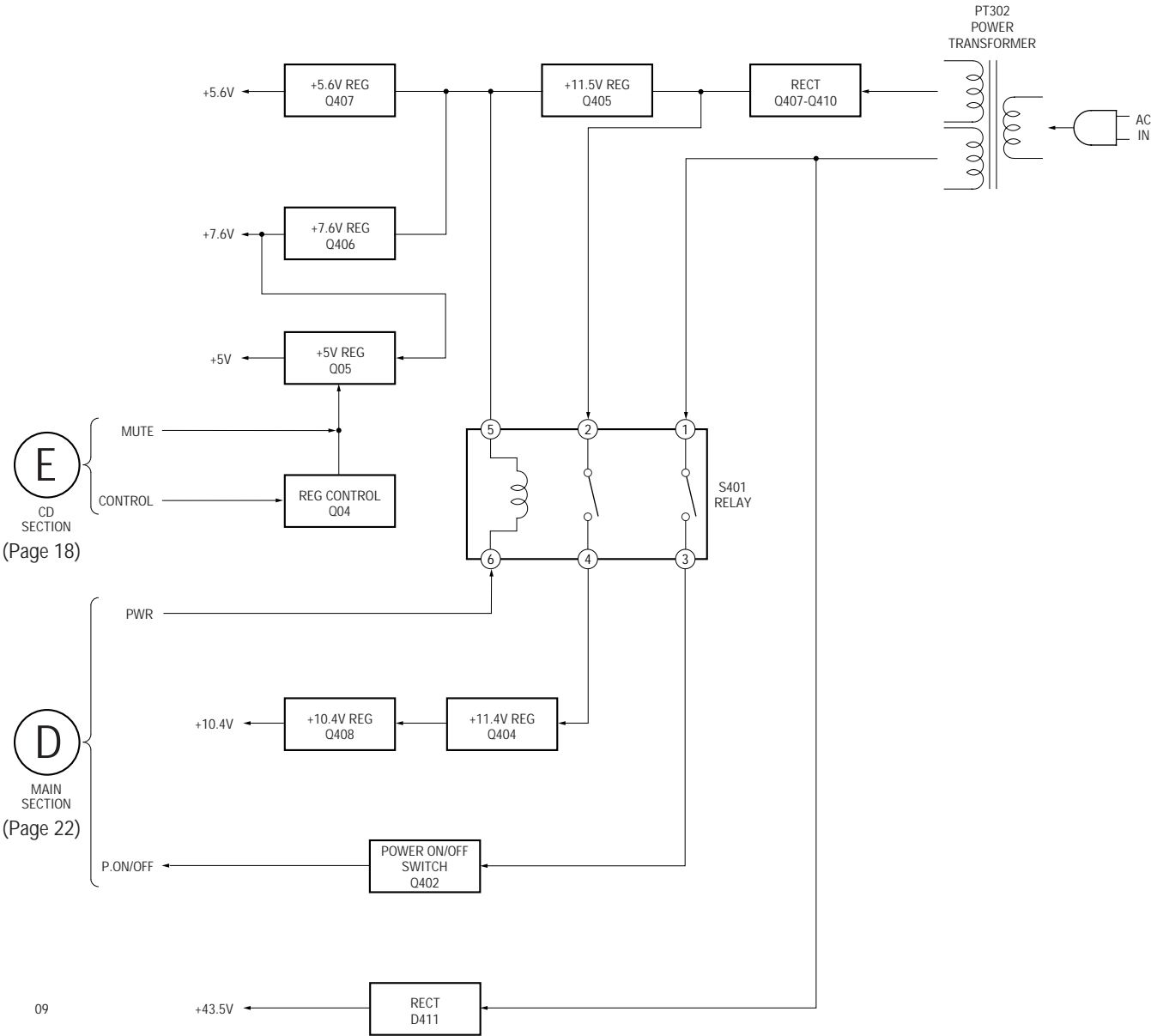
— DECK SECTION —



B
MAIN
SECTION
(Page 21)



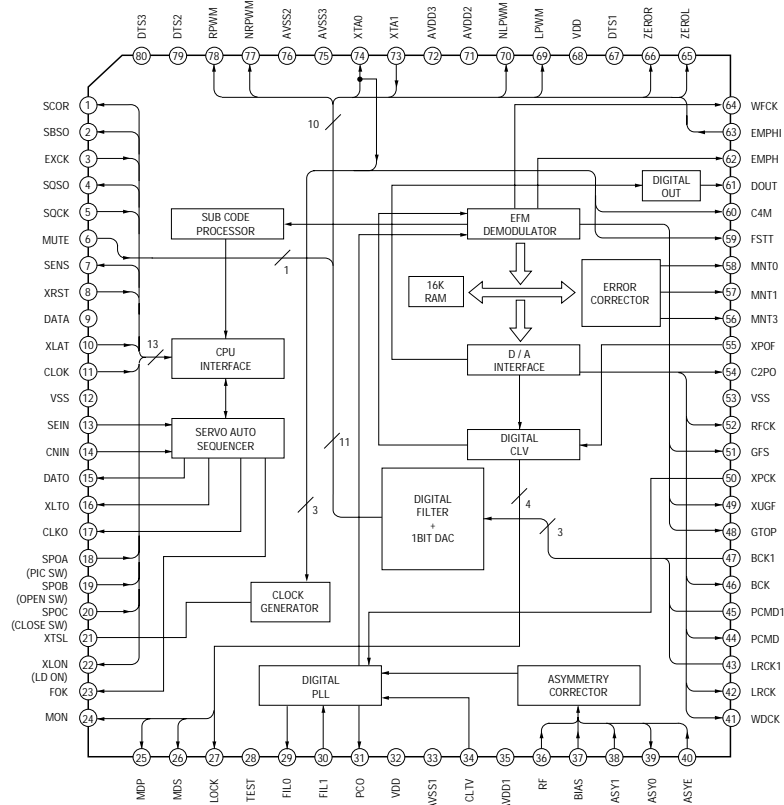
— POWER SECTION —



— CD SECTION —

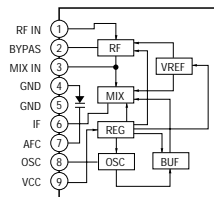
The block diagram illustrates the internal architecture of the ADXL045 digital accelerometer. On the left, pins 1 through 8 are connected to various control and status signals: GND (1), MUTE (2), CONTROL (3), X_RST (4), T.T.(M) (5), POS1.1 (6), POS1.2 (7), and T.T.SW (8). These signals are processed by a large 'DRIVER' block. The output of this driver is connected to two 'LATCH' blocks. The top 'LATCH' block is connected to the 'SERIAL I/O CONTROL' block, which has pins 9 through 16. The bottom 'LATCH' block is connected to the 'DRIVER' block on the right, which has pins 9 through 16. The 'SERIAL I/O CONTROL' block has pins 9 (SENSOR), 10 (LOADING M+), 11 (LOADING M-), 12 (DATA 0), 13 (DATA 1), 14 (CLOCK), 15 (STB), and 16 (VDD). The 'DRIVER' block on the right has pins 9 (SENSOR), 10 (LOADING M+), 11 (LOADING M-), 12 (DATA 0), 13 (DATA 1), 14 (CLOCK), 15 (STB), and 16 (VDD).

IC04 CXD2508Q

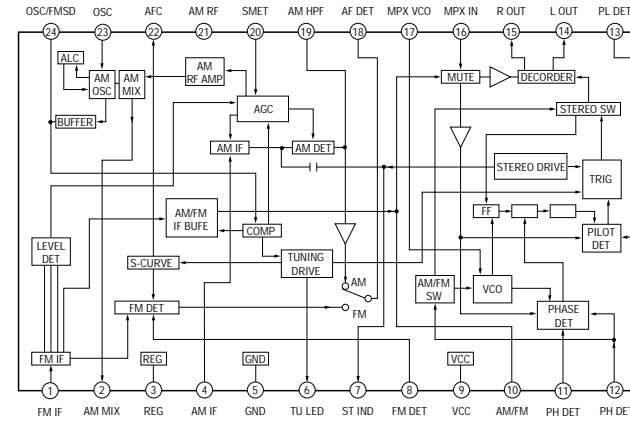


— MAIN SECTION —

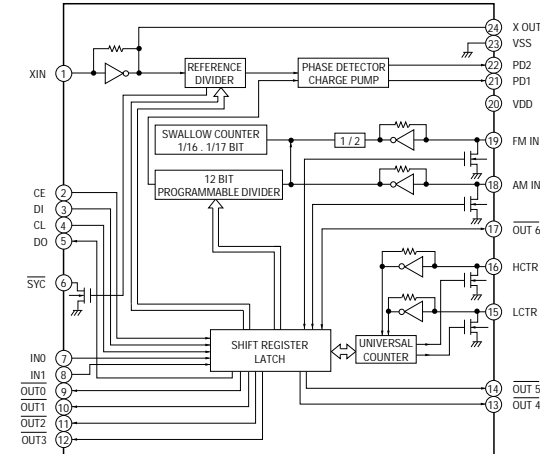
IC101 LA1186N



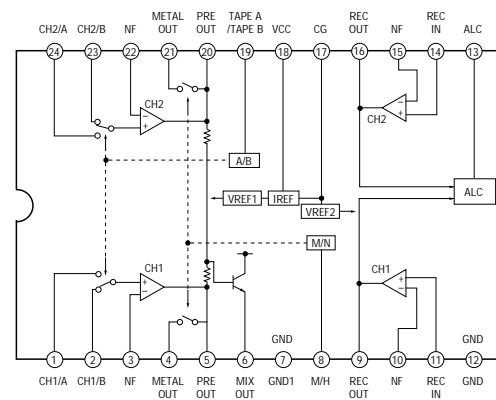
IC102 LA1831

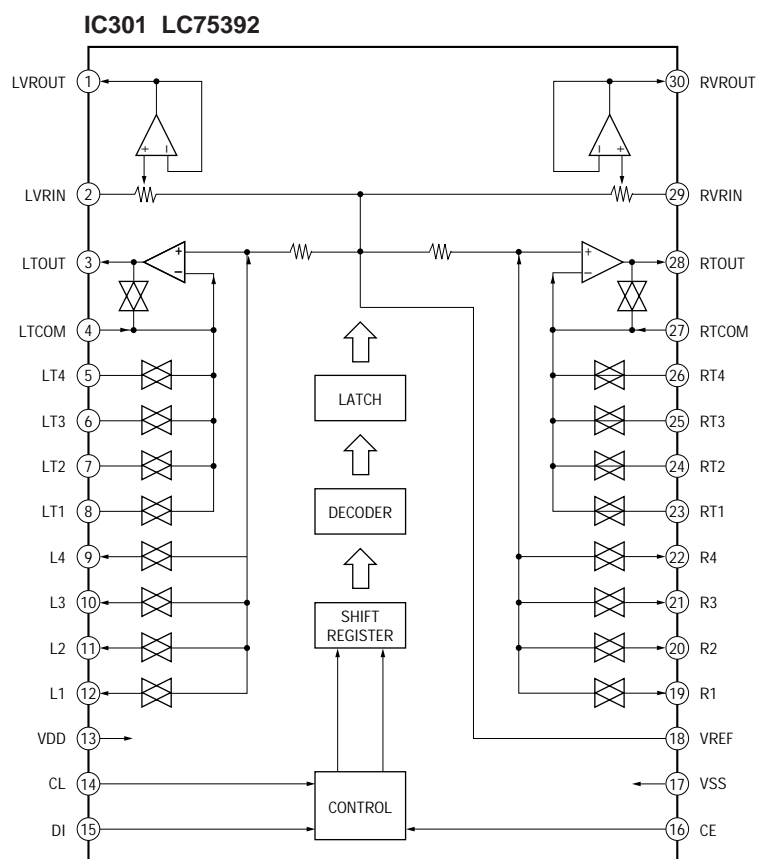


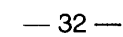
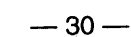
IC103 LC7218




IC201 TA8189N







Note:

-  : parts extracted from the component side.