

SHARP SERVICE MANUAL

No. S5733CDC405W/

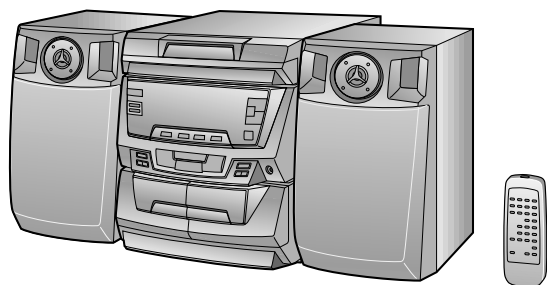


Illustration: CD-C405W/CP-C405

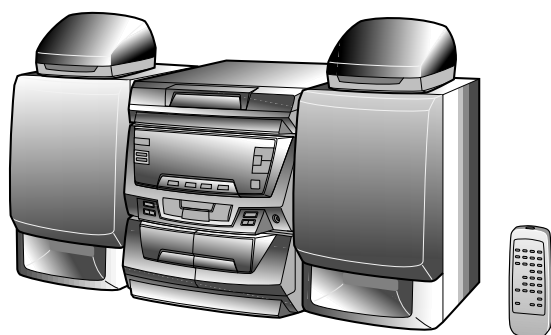


Illustration: CD-C420H/CP-C410/CP-SR421

COMPACT
disc
DIGITAL AUDIO

CD-C405W CD-C420H CP-C405 CP-C410 CP-SR421

CD-C405W and CP-C405 constitute CD-C405W.
CD-C420H and CP-C410 and CP-SR421 constitute CD-C405W.

- In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

CONTENTS

	Page
SPECIFICATIONS	2
VOLTAGE SELECTION (CD-C405W ONLY)	2
NAMES OF PARTS	3
OPERATION MANUAL	5
DISASSEMBLY	6
REMOVING AND REINSTALLING THE MAIN PARTS	9
ADJUSTMENT	10
NOTES ON SCHEMATIC DIAGRAM	12
BLOCK DIAGRAM	13
SCHEMATIC DIAGRAM / WIRING SIDE OF P.W.BOARD	16
WAVEFORMS OF CD CIRCUIT	30
TROUBLESHOOTING (CD CHANGER CONTROL / CD SECTION)	31
FUNCTION TABLE OF IC	35
FL DISPLAY	41
REPLACEMENT PARTS LIST/EXPLODED VIEW	

CD-C405W/CD-C420H/CP-C410/CP-C405/CP-SR421

FOR A COMPLETE DESCRIPTION OF THE OPERATION OF THIS UNIT, PLEASE REFER TO THE OPERATION MANUAL.

SPECIFICATIONS

CD-C405W/CD-C420H

● General

Power source: AC 110/127/220/230 - 240 V, 50/60 Hz
(CD-C405W)
Power source: AC 230 V, 50 Hz
(CD-C420H)
Power consumption: 65 W
Dimensions: Width; 270 mm (10-5/8")
Height; 300 mm (11-13/16")
Depth; 359.5 mm (14-3/16")
Weight: 5.0 kg (11.0 lbs.)

● Amplifier section

Output power: PMPO; 160 W (total)
MPO; 34 W (17 W + 17 W)(10 % T.H.D.)
RMS; 20 W (10 W + 10 W)(10 % T.H.D.)
Output terminals: Speakers; 8 ohms
(CD-C405W) Headphones; 16-50 ohms
(recommended; 32 ohms)
Output terminals: Front speakers; 8 ohms
(CD-C420H) Rear speakers; 16 ohms
Headphones; 16-50 ohms
(recommended; 32 ohms)
Input terminals: Video/Auxiliary (audio signal);
245 mV/47 kohms

● Tuner section

Frequency range: FM; 88 - 108 MHz
(CD-C405W) AM; 531 - 1,602 kHz
Frequency range: FM; 87.5 - 108 MHz
(CD-C420H) AM; 522 - 1,620 kHz

● Compact disc player section

Type: 3-disc multi-play compact disc player
Signal readout: Non-contact, 3-beam semi-con-ductor
laser pickup
D/A Converter: 1-bit D/A converter
Frequency response: 20 - 20,000 Hz
Dynamic range: 90 dB (1 kHz)

● Cassette deck section

Frequency response: 50 - 14,000 Hz (Normal tape)
Signal/noise ratio: 55 dB (TAPE 1, playback)
50 dB (TAPE 2, recording/playback)
Wow and flutter: 0.15 % (WRMS)

CD-C405

● Speaker section

Type: 2-way type [10 cm (4") woofer and super
tweeter]
Maximum input power: 20 W
Impedance: 8 ohms
Dimensions: Width; 180 mm (7-1/8")
Height; 300 mm (11-13/16")
Depth; 214 mm (8-7/16")
Weight: 2.4 kg (5.3 lbs.)/each

CP-C410

● Front speaker section

Frequency response: 100 MM (4") full-range speaker
Maximum input power: 20W
Impedance: 8 ohms
Dimensions: Width; 180 mm (7-1/8")
Height; 300 mm (11-13/16")
Depth; 204 mm (8")
Weight: 2.1 kg (4.6 lbs.)/each

CP-SR421

● Rear speaker section

Type: 100 mm (4") full-range speaker
Maximum input power: 10 W
Impedance: 16 ohms
Dimensions: Width; 170 mm (6-11/16")
Height; 120 mm (4-3/4")
Depth; 175 mm (6-7/8")
Weight: 0.6 kg (1.3 lbs.)/each

Specifications for this model are subject to change without prior notice.

VOLTAGE SELECTION (CD-C405W)

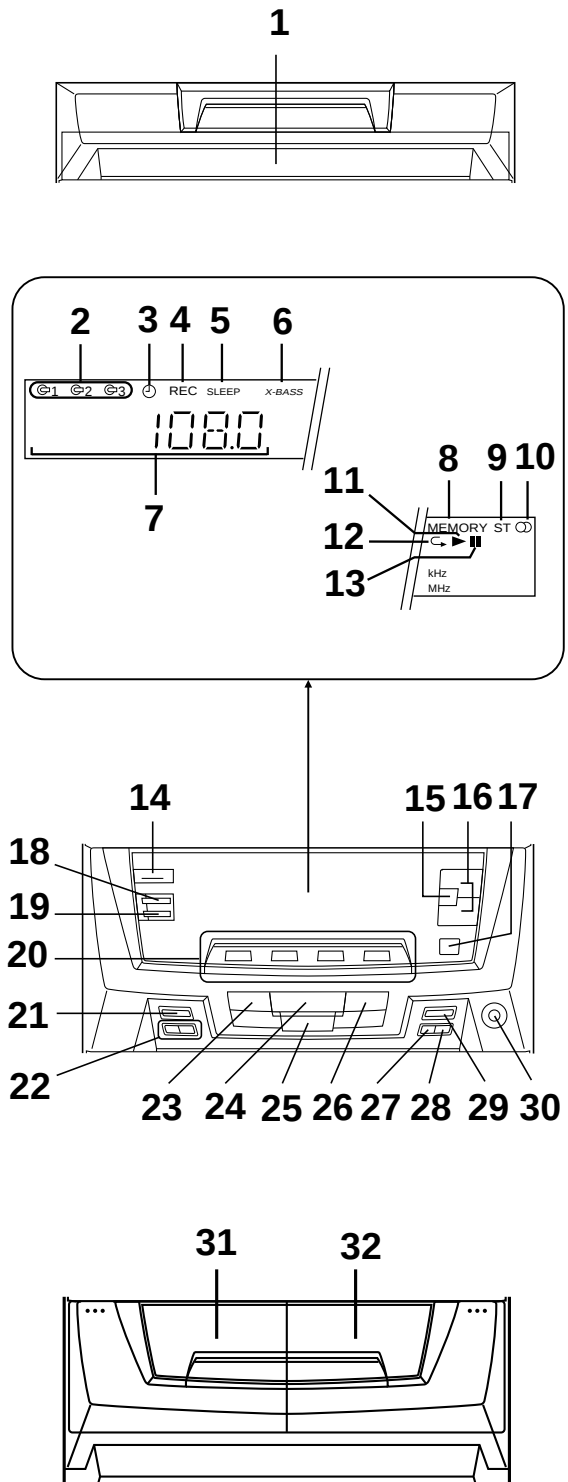
Before operating the unit on mains, check the preset voltage. If the votage is different from your local voltage. Slide the AC power supply socket cover by slightly loosong the screw to the visible indication of the side of your local voltage.

NAMES OF PARTS

CD-C405W/CD-C420H

■ Front Panel

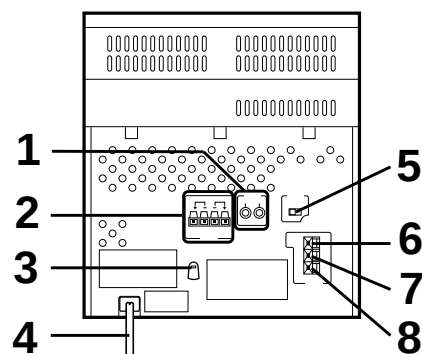
1. Disc Tray
2. Disc Number Indicator
3. Timer Indicator
4. Record Indicator
5. Sleep Indicator
6. Extra Bass Indicator: X-BASS
7. Function/CD Track/CD Counter/Frequency/Preset Channel/Volume/Timer/Sleep Time Indicator
8. Memory Indicator
9. FM Stereo Mode Indicator: ST
10. FM Stereo Indicator: $\odot$
11. CD Play Indicator: $\blacktriangleright$
12. CD Repeat Indicator: $\curvearrowright$
13. CD Pause Indicator: $\parallel$
14. Power Switch
15. Extra Bass/Equalizer Mode Button
16. Volume Up/Down Buttons: ∇/Δ
17. Random/Demo Button
18. Clock Button
19. Timer/Sleep Button
20. Function Selector Buttons
21. Memory/Set Button
22. Tuning and Time Up/Down Buttons: $\vee/\wedge$
23. Track Down/Review/Preset Down Button: $\blacktriangleleft/\blacktriangleleft\blacktriangleleft$
24. Play/Repeat Button: $\blacktriangleright\curvearrowright$
25. Stop Button: $\blacksquare$
26. Track Up/Cue/Preset Up Button: $\blacktriangleright\blacktriangleright/\blacktriangleright\blacktriangleright\blacktriangleright$
27. Disc Skip Button
28. Open/Close Button: $\blacktriangle$
29. Record Pause Button: $\bullet\parallel$
30. Headphone Socket
31. (TAPE 1) Cassette Compartment
32. (TAPE 2) Cassette Compartment



CD-C405W

■ Rear Panel

1. Video/Auxiliary (Audio Signal) Input Sockets
2. Speaker Terminals
3. AC Voltage Selector
4. AC Power Lead
5. Span Selector Switch
6. FM 75 Ohms Aerial Terminal
7. Aerial Earth Terminal
8. AM aerial Terminal

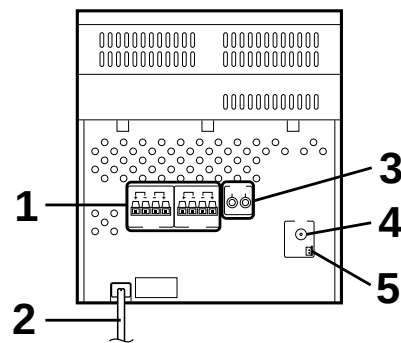


CD-C405W/CD-C420H/CP-C410/CP-C405/CP-SR421

CD-C420H

■ Rear Panel

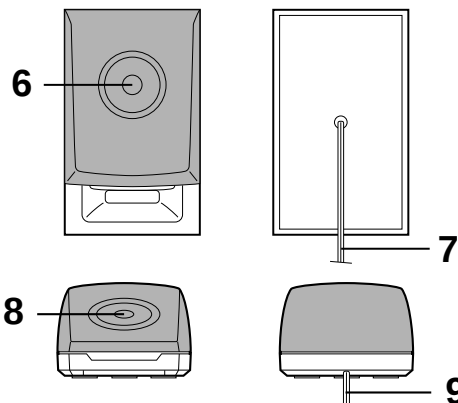
1. Speaker Terminals
2. AC Power Lead
3. Video/Auxiliary (Audio Signal) Input Sockets
4. FM 75 Ohms Aerial Socket
5. AM Loop Aerial Socket



CP-C410

■ Speaker Section

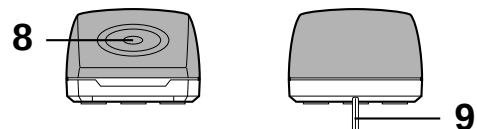
6. Full Range Speaker
7. Speaker Wire



CP-SR421

■ Speaker Section

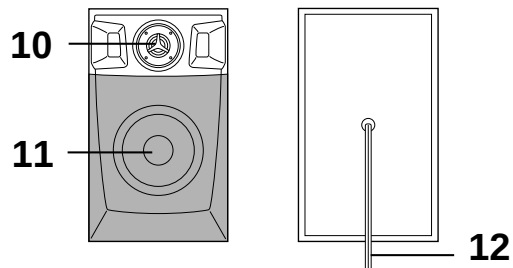
8. Full Range Speaker
9. Speaker Wire



CP-C405

■ Speaker Section

10. Super Tweeter
11. Woofer
12. Speaker Wire



CD-C405W/CD-C420H

■ Remote Control

1. remote Control Transmitter LED

● CD Control section

2. Disc Number Select Buttons
3. Track Down/Review Button: ◀◀/◀◀
4. Track Up/Cue Button: ▶▶/▶▶
5. Disc Skip Button
6. Play/Repeat Button: ▶↺
7. Stop Button: ■
8. Memory Button
9. Clear Button
10. Random Button
11. Pause Button: ||

● Tuner control section

12. Preset Up/Down Buttons: ▽/△

● Tape control section

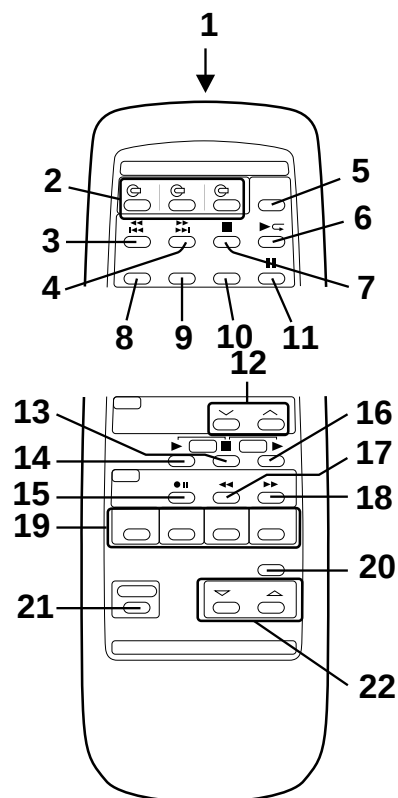
13. (TAPE 1/2) Stop Button: ■
14. (TAPE 1) Play Button: ▶
15. (TAPE 2) Record Pause Button: ●||
16. (TAPE 2) Play Button: ▶
17. (TAPE 2) Rewind Button: ◀◀
18. (TAPE 2) Fast Forward Button: ▶▶

19. Function Selector Buttons

20. Extra Bass/Equalizer Mode Button

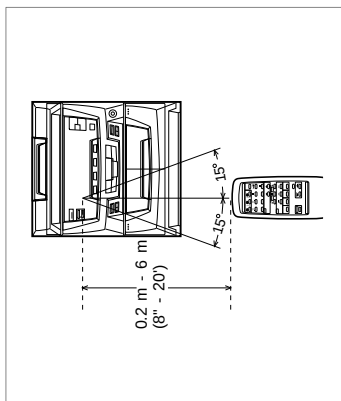
21. Power Button

22. Volume Up/Down Buttons: ▽/△



OPERATION MANUAL

PREPARATION FOR USE



Notes concerning use:

- Replace the batteries if control distance decreases or operation becomes erratic.
- Periodically clean the transmitter LED on the remote control and the sensor on the main unit with a soft cloth.
- Exposing the sensor on the main unit to strong light may interfere with operation. Change the lighting or the direction of the unit.
- Keep the remote control away from moisture, excessive heat, shock, and vibrations.

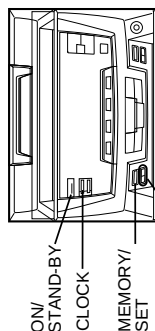
RESETTING THE MICROCOMPUTER

Reset the microcomputer under the following conditions:-

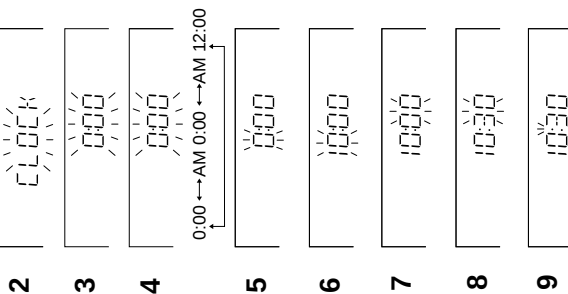
- 1 Press the ON/STAND-BY (POWER) switch to enter the stand-by mode.
 - 2 Press and hold down the VOLUME ∇ button, the $\blacktriangleright\blacktriangleright\blacktriangleright\blacktriangleright\blacktriangleright$ button and the ON/STAND-BY (POWER) switch all at the same time. Hold them for at least 1 second.
- To erase all of the stored memory contents (clock and timer settings, tuner and CD presets).
 - If the display is not correct.
 - If the operation is not correct.

SETTING THE CLOCK

In this example, the clock is set for the 24-hour (0:00) system.



TUNING/TIME
(∇ or $\blacktriangleright$)



- 1 Press the ON/STAND-BY switch to enter the stand-by mode.
- 2 Press the CLOCK button.
- 3 Within 3 seconds, press the MEMORY/SET button.
- 4 Press the TUNING/TIME (∇ or $\blacktriangleright$) button to select the time display.
 - "0:00" → The 24-hour display will appear.
 - "AM 0:00" → The 12-hour display will appear.
 - "AM 12:00" → The 12-hour display will appear.

- 5 Press the MEMORY/SET button.
- 6 Press the TUNING/TIME (∇ or $\blacktriangleright$) button to adjust the hour. Press the TUNING/TIME button once to advance the time by 1 hour. Press for more than 0.5 seconds to advance continuously.
- When the 12-hour display is selected, "AM" will change automatically to "PM".
- 7 Press the MEMORY/SET button.
- 8 Press the TUNING/TIME (∇ or $\blacktriangleright$) button to adjust the minutes. Press the button for at least 0.5 seconds to change the time in 5 minute intervals.
- The hour setting will not advance even if minutes advance from "59" to "00".

- 9 Press the MEMORY/SET button.
- The clock starts operating from "0" seconds. (Seconds are not displayed.)

Note:

- In the event of a power failure or when the AC power lead is disconnected, the clock display will go out. When the AC power supply is restored, the clock display will flash on and off to indicate the time when the power failure occurred or when the AC power lead was disconnected. If this happens follow the procedure below to change the clock time.

To change the clock time:

When the ON/STAND-BY switch is set to STAND-BY.

- 1 Press the MEMORY/SET button.
 - 2 Perform steps 6 - 9 above.
- When the ON/STAND-BY switch is set to ON.
- 1 Press the CLOCK button.
 - 2 Within 3 seconds, press the MEMORY/SET button.
 - 3 Perform steps 6 - 9 above.

To see the time display: (When the power is ON)

Press the CLOCK button.

- The time display will appear for about 3 seconds.

To switch the time display mode:

- 1 Press the ON/STAND-BY switch to enter the stand-by mode.
- 2 Press and hold down the VOLUME ∇ button, the $\blacktriangleright\blacktriangleright\blacktriangleright\blacktriangleright\blacktriangleright$ button and the ON/STAND-BY switch all at the same time. Hold them for at least 2 second. (Refer to RESET THE MICROCOMPUTER on page 16.)
- 3 Perform steps 1 - 9 above.

Note:

- The operation explained above will erase all data stored in memory, such as clock and timer settings, tuner and CD presets.

DISASSEMBLY

Caution on Disassembly

Follow the below-mentioned notes when disassembling the unit and reassembling it, to keep it safe and ensure excellent performance:

1. Take cassette tape and compact disc out of the unit.
2. Be sure to remove the power supply plug from the wall outlet before starting to disassemble the unit.
3. Take off nylon bands or wire holders where they need be removed when disassembling the unit. After servicing the unit, be sure to rearrange the leads where they were before disassembling.
4. Take sufficient care on static electricity of integrated circuits and other circuits when servicing.

CD-C405W/CD-C420H

STEP	REMOVAL	PROCEDURE	FIGURE
1	Top Cabinet	1. Screw (A1) x4	6-1
2	Side Panel (Left/right)	1. Screw (B1) x6	6-1
3	CD Player Unit/ CD Tray Cover	1. Turn on the power supply, open the disc tray, take out the CD cover, and close. (Note 1) 2. Hook (C1) x3 3. Hook (C2) x2 4. Socket (C3) x4	6-2
4	Back Board	1. Screw (D1) x5 2. Screw (D2) x1	6-2
5	Main PWB/ Display PWB/ Headphone PWB	1. Screw (E1) x12 2. Socket (E2) x4	7-1
6	Front Panel	1. Screw (F1) x2 2. Hook (F2) x2	7-1
7	Tape Mechanism	1. Open the cassette holder. 2. Screw..... (G1) x6	7-2
8	Turntable	1. Screw (H1) x1 2. Cover (H2) x1	7-3
9	Disc Tray	1. Screw (J1) x2 2. Guide (J2) x2	7-3
10	CD Changer Mechanism	1. Screw (K1) x4	7-4
11	CD Mechanism	1. Screw (L1) x1	7-4

Note 1:

How to open the changer manually. (Fig. 6-3)

1. Insert the tip of fine screwdriver into the hole of CD player base, and press down the worm wheel < A > .
2. Then, turn fully the lock lever in the arrow direction through the hole on the loading chassis bottom in this state.

After that, push forward the CD player base.

CP-C410

STEP	REMOVAL	PROCEDURE	FIGURE
1	Speaker	1. Front panel (A1) x1 2. Screw (A2) x4	7-5 7-6

CP-SR421

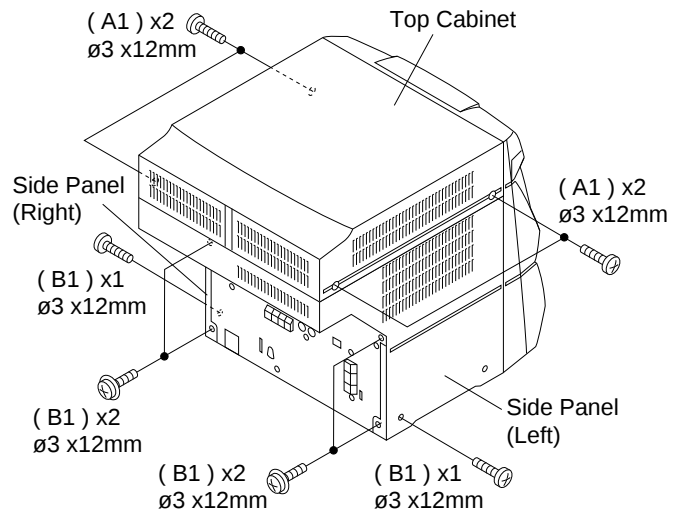
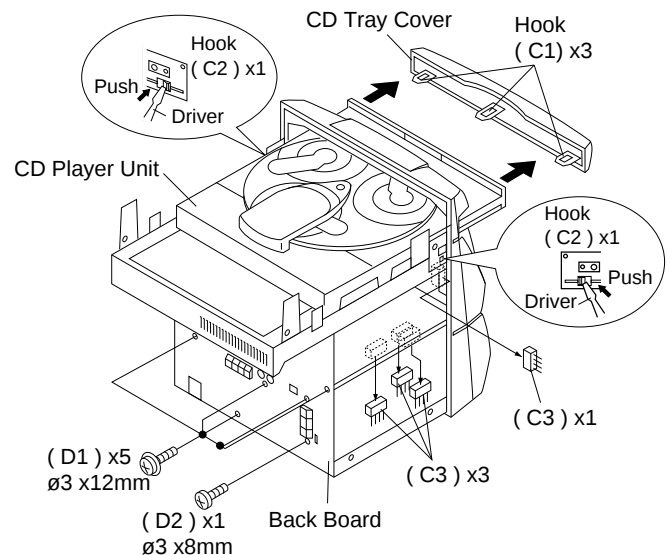
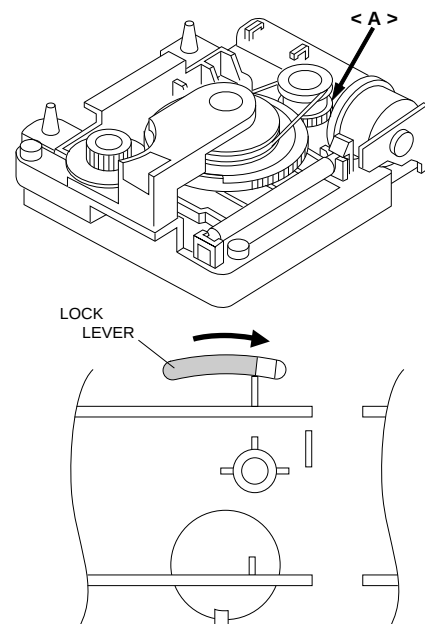
STEP	REMOVAL	PROCEDURE	FIGURE
1	Top cabinet	1. Screw (B1) x6	8-1

CP-C405

STEP	REMOVAL	PROCEDURE	FIGURE
1	Speaker	1. Front panel (C1) x1 2. Screw (C2) x4	8-2 8-3

CD-C405W/CD-C420H

Illustration: CD-C405W

**Figure 6-1****Figure 6-2****Figure 6-3**

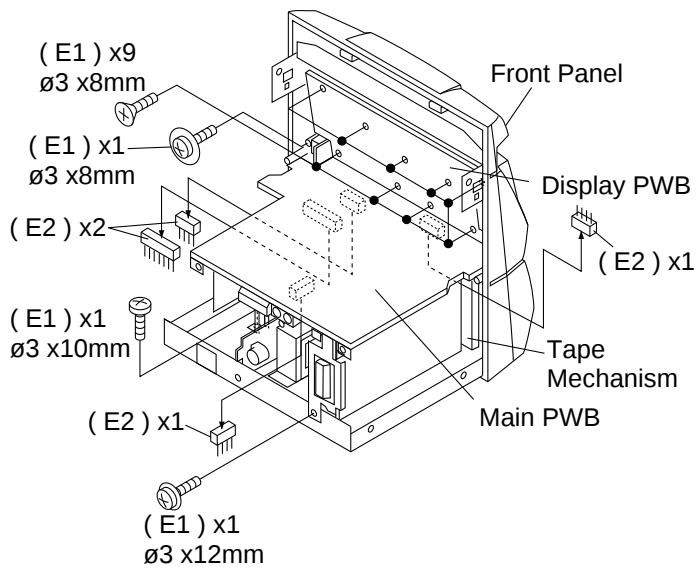


Figure 7-1

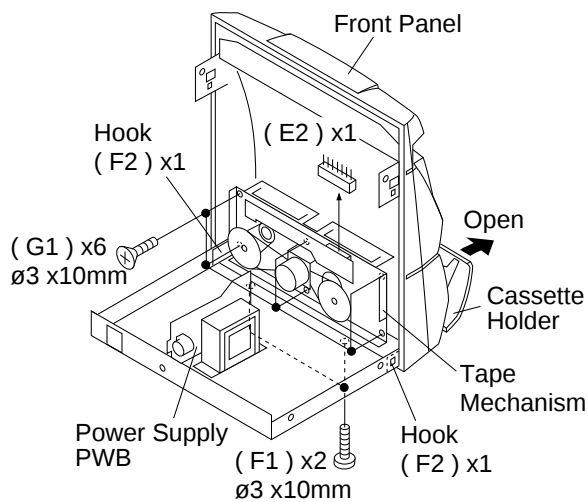


Figure 7-2

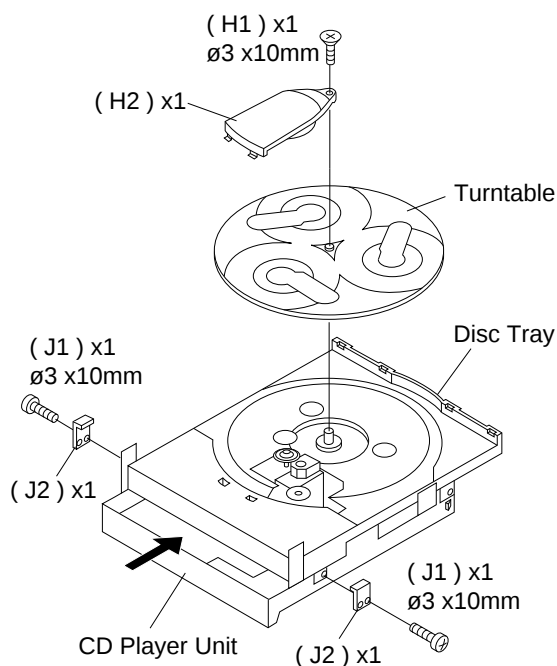
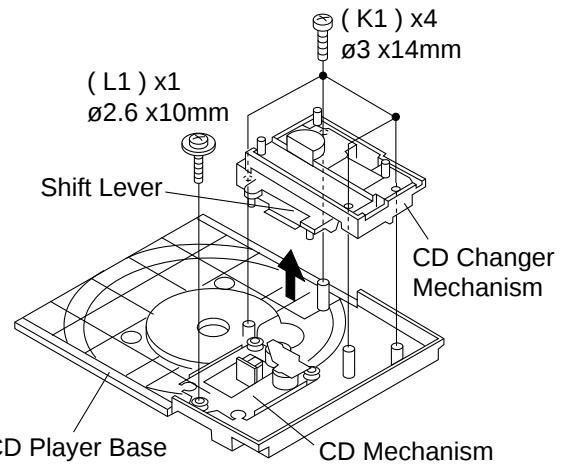


Figure 7-3



Care when installing the CD changer mechanism.
Install the CD changer mechanism on the CD player base after
the shift lever has been set in the highest position.

Figure 7-4

CP-C410

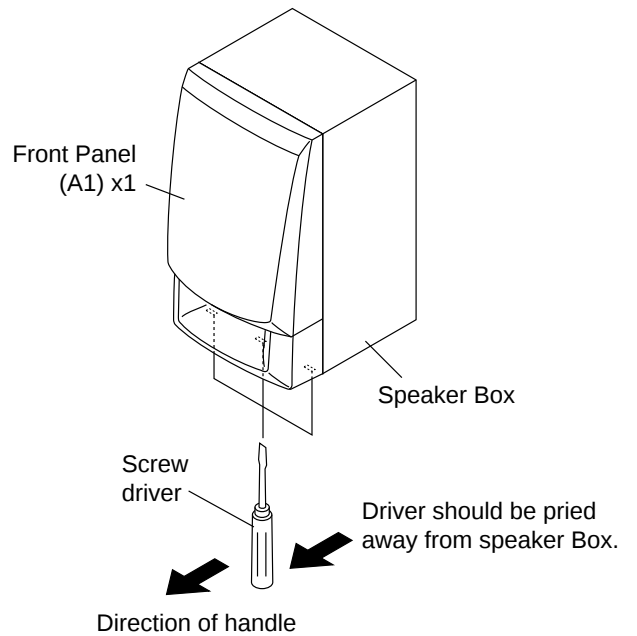


Figure 7-5

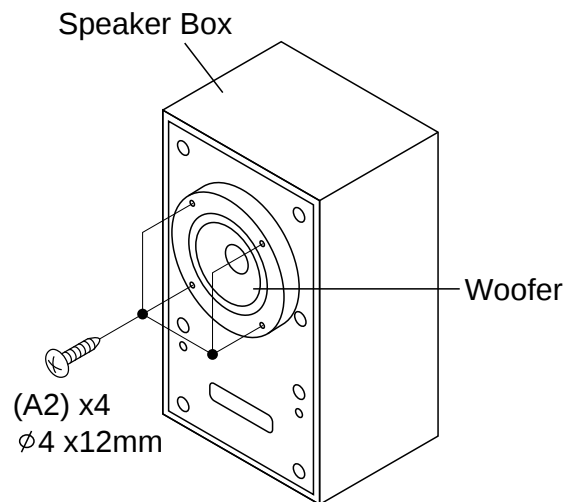


Figure 7-6

CP-SR421

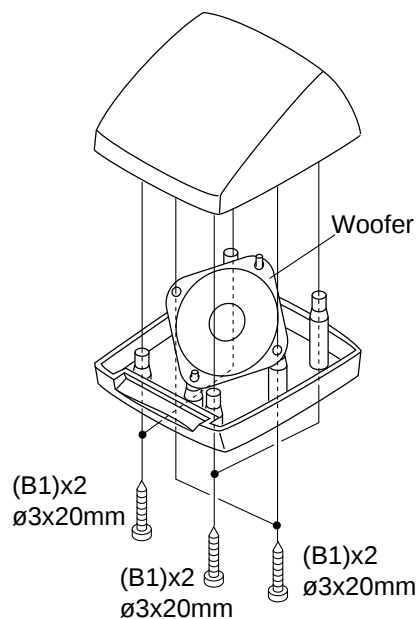


Figure 8-1

CP-C405

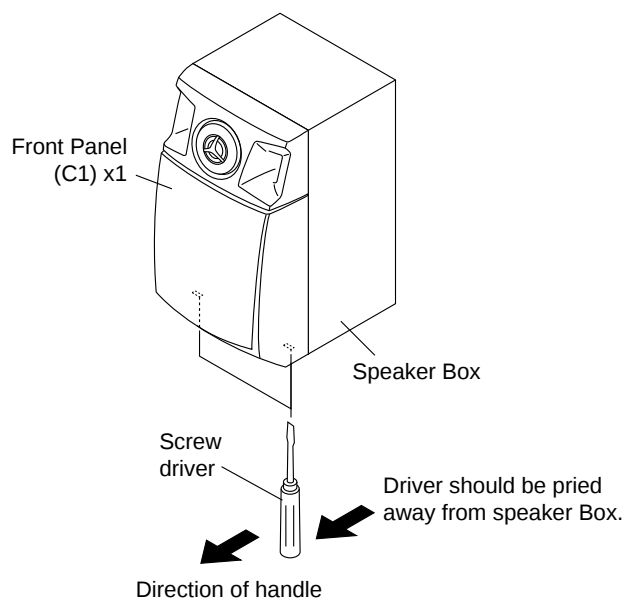


Figure 8-2

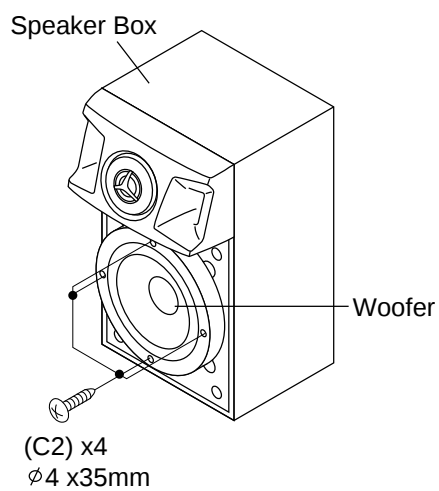


Figure 8-3

REMOVING AND REINSTALLING THE MAIN PARTS

CD MECHANISM SECTION

Perform steps 1, 2, 3, 10 and 11 of the disassembly method to remove the CD mechanism.

How to remove the loading motor (See Fig. 9-1)

1. Remove the screws (A1) x 2 pcs., to remove the loading motor.

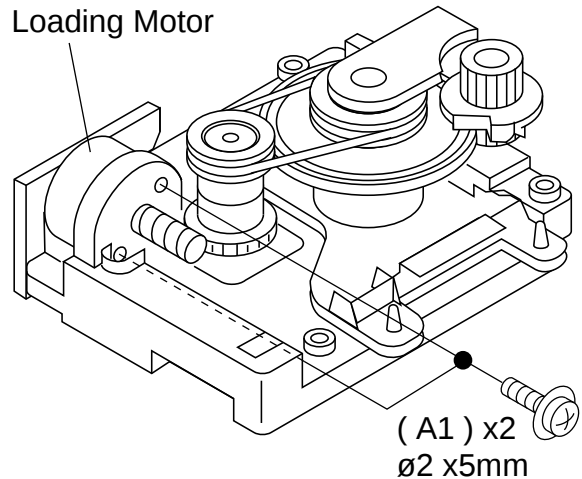


Figure 9-1

How to remove the turntable up/down motor (See Fig. 9-2)

1. Remove the screws (B1) x 2 pcs., to remove the turntable up/down motor.

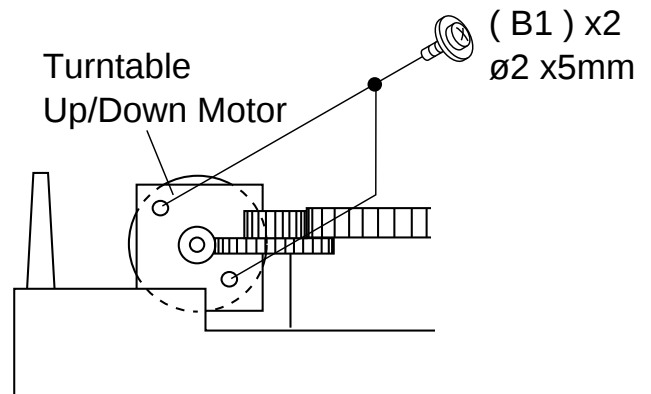


Figure 9-2

How to remove the pickup (See Fig. 9-3)

1. Remove the screws (C1) x 2 pcs., to remove the shaft (C2).
2. Remove the stop washer (C3) x 1 pc., to remove the gear (C4).
3. Remove the pickup.

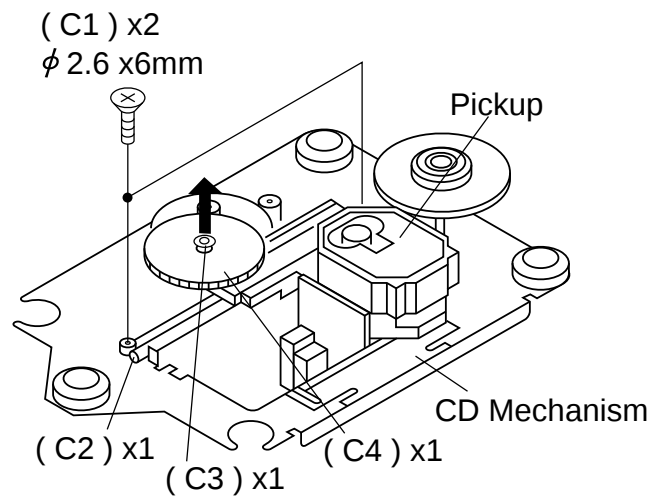


Figure 9-3

ADJUSTMENT

MECHANISM SECTION

• Driving Force Check

Torque Meter	Specified Value
Play: TW-2412	Tape 1: Over 80 g Tape 2: Over 80 g

• Torque Check

Torque Meter	Specified Value	
	Tape 1	Tape 2
Play: TW-2111	30 to 60 g. cm	30 to 60 g.cm
Fast forward: TW-2231	—	60 to 120 g.cm
Rewind: TW-2231	—	60 to 120 g.cm

• Tape Speed

	Test Tape	Adjusting Point	Specified Value	Instrument Connection
Tape speed	MTT-111	Volume in motor.	3,000 ± 30 Hz	Speaker terminal (Load resistance: 8 ohms)

TAPE MECHANISM

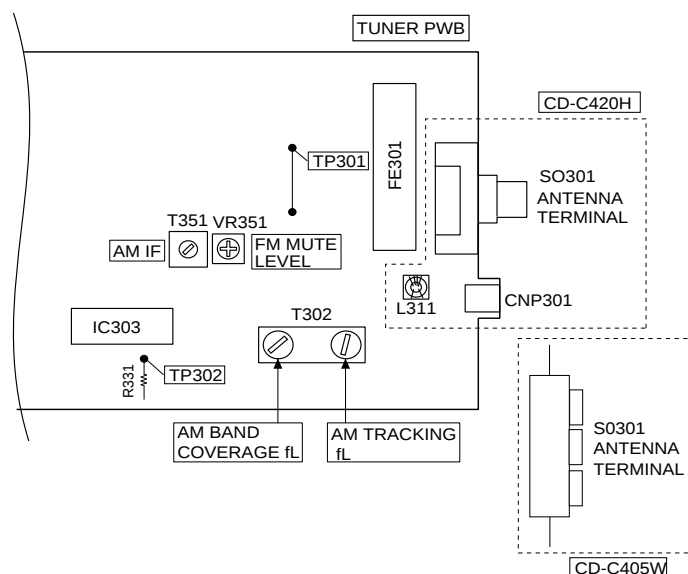
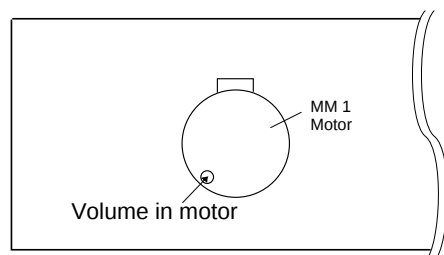


Figure 10-1 ADJUSTMENT POINTS

TUNER SECTION

fL: Low-range frequency

fH: High-range frequency

• AM IF/RF (CD-C405W)

Signal generator: 400 Hz, 30%, AM modulated

Test Stage	Frequency	Frequency Display	Setting/ Adjusting Parts	Instrument Connection
IF	450 kHz	1,602 kHz	T351	*1
Band Coverage	—	531 kHz	(fL): T302 1.1 ± 0.1 V	*2
Tracking	990 kHz	990 kHz	(fL): T302	*1

*1. Input: Antenna, Output: TP302

*2. Input: Input is not connected, Output: TP301

• AM IF/RF (CD-C420H)

Signal generator: 400 Hz, 30%, AM modulated

Test Stage	Frequency	Frequency Display	Setting/ Adjusting Parts	Instrument Connection
IF	450 kHz	1,620 kHz	T351	*1
Band Coverage	—	522 kHz	(fL): T302 1.1 ± 0.1 V	*2
Tracking	990 kHz	990 kHz	(fL): T302	*1

*1. Input: Antenna, Output: TP302

*2. Input: Input is not connected, Output: TP301

• Setting the Test Mode

Keeping the TUNING (DOWN) button and MEMORY button pressed, turn on POWER. Then, the frequency is initially set in the memory as shown in Table. Call it with the PRESET button to use it for adjustment and check of tuner circuit.

Preset No.	FM	Preset No.	AM
1	87.50 MHz	6	522 kHz
2	108.00 MHz	7	1,620 kHz
3	90.00 MHz	8	603 kHz
4	106.00 MHz	9	1,404 kHz
5	98.00 MHz	10	990 kHz
11 ~ 40	—		

• FM Mute Level

Signal generator: 1 kHz, 40 kHz dev. FM modulated.

Frequency	Frequency Display	Adjusting Parts	Instrument Connection
98.00 MHz (25 dBμV)	98.00 MHz	VR351 *1	Input: SO301 Output: Speaker Terminal

*1. Adjust so that an output signal appears

TEST MODE

• Setting the test mode

Any one of test mode can be set by pressing several keys as follows.

<REC. PAUSE> + <DISC. SKIP> + <POWER> TEST: CD operation test

• TEST mode

Function — CD test mode

Setting of TEST mode

Indication of CD TST mode (Fig. 11-1)

OPEN/CLOSE operation is manual operation.

The pickup can be moved by using the (▶▶) or (◀◀) key.

IL is not performed.

<MEMORY> LASER ON — <MEMORY> Tracking on the spot. SERVO OFF PLAY — <MEMORY> Tracking on the spot. SERVO ON PLAY — <STOP> STOP

<PLAY> key input — TOC. IL is performed, and the ordinary PLAY is performed. — Press <STOP> key. — Stop
If the following key is pressed during PLAY, it is possible to specify directly any Track No.
<Disc Number 1> key: Track 4
<Disc Number 2> key: Track 9
<Disc Number 3> key: Track 15

Note:

Only in STOP state it is possible to slide the pickup with the (▶▶) or (◀◀) key.

VOL. --- Last memory

BAL. --- CENTER

R.GEQ. --- FLAT

X-BAS --- OFF

Canceling method - POWER OFF

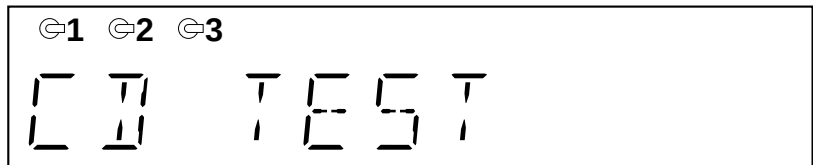


Figure 11-1

CD SECTION

Since this CD system incorporates the following automatic adjustment function, when the pickup is replaced, it is not necessary to readjust it.

Since this CD unit does not need adjustment, the combination of PWB and laser pickup unit is not restricted.

• Automatic adjustment item

1. Focus offset (Fig. 11-2)
2. Tracking offset (Fig. 11-3)
3. E/F balance (tracking error balance) (Fig. 11-4)
4. RF level AGC function (HF level: constant)
5. RF level automatic follow-up of the tracking gain

This automatic adjustment is performed each time a disc is changed. Therefore, each disc is played back using the optimal settings.

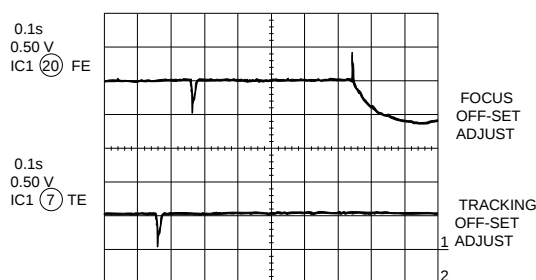


Figure 11-2

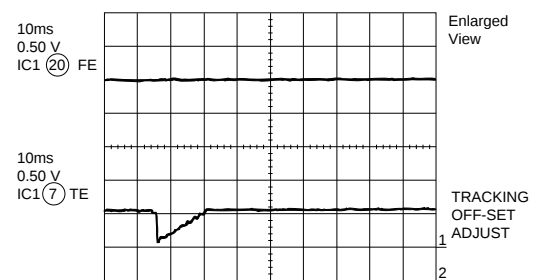


Figure 11-3

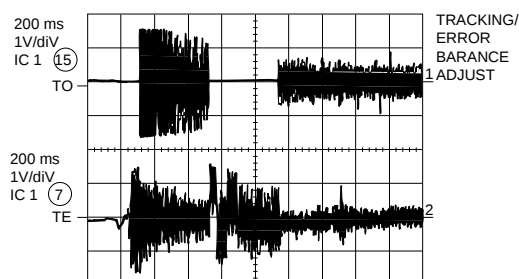


Figure 11-4

NOTES ON SCHEMATIC DIAGRAM

- **Resistor:**
To differentiate the units of resistors, such symbol as K and M are used: the symbol K means 1000 ohm and the symbol M means 1000 kohm and the resistor without any symbol is ohm-type resistor. Besides, the one with "Fusible" is a fuse type.
- **Capacitor:**
To indicate the unit of capacitor, a symbol P is used: this symbol P means micro-micro-farad and the unit of the capacitor without such a symbol is microfarad. As to electrolytic capacitor, the expression "capacitance/withstand voltage" is used.
(CH), (TH), (RH), (UJ): Temperature compensation
(ML): Mylar type
(P.P.): Polypropylene type
- Schematic diagram and Wiring Side of P.W.Board for this model are subject to change for improvement without prior notice.
- The indicated voltage in each section is the one measured by Digital Multimeter between such a section and the chassis with no signal given.
 1. In the tuner section,
() indicates AM
< > indicates FM stereo
 2. In the main section, a tape is being played back.
 3. In the deck section, a tape is being played back.
() indicates the record state.
 4. In the power section, a tape is being played back.
 5. In the CD section, the CD is stopped.
- Parts marked with "△" (□ = = □) are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

REF. NO	DESCRIPTION	POSITION
SW1	OPEN/CLOSE	ON—OFF
SW2	MECHA UP	ON—OFF
SW3	DISC NUMBER	ON—OFF
SW4	PICKUP IN	ON—OFF
SW301	SPAN SELECTOR [CD-C405W ONLY]	50/9-100/10
SW701	RANDOM/DEMO	ON—OFF
SW702	VOLUME DOWN	ON—OFF
SW703	X-BASS	ON—OFF
SW704	VOLUME UP	ON—OFF
SW705	OPEN/CLOSE	ON—OFF
SW706	DISC SKIP	ON—OFF
SW709	REC./PAUSE	ON—OFF
SW710	UP	ON—OFF
SW711	STOP	ON—OFF
SW712	PLAY	ON—OFF
SW713	DOWN	ON—OFF

REF. NO	DESCRIPTION	POSITION
SW714	TUNING UP	ON—OFF
SW715	TUNING DOWN	ON—OFF
SW717	POWER	ON—OFF
SW718	CLOCK	ON—OFF
SW719	TIMER/SLEEP	ON—OFF
SW721	MEMORY/SET	ON—OFF
SW722	CD	ON—OFF
SW723	TUNER	ON—OFF
SW724	TAPE	ON—OFF
SW725	AUX	ON—OFF
SW961	AC VOLTAGE SELECTOR [CD-C405W ONLY]	110—127— 220—230-240
SWM 1	T1 CrO ₂ [CD-C405W ONLY]	ON—OFF
SWM 3	FOOL PROOF	ON—OFF
SWM 4	F.A.S.	ON—OFF
SWM 5	CAM	ON—OFF

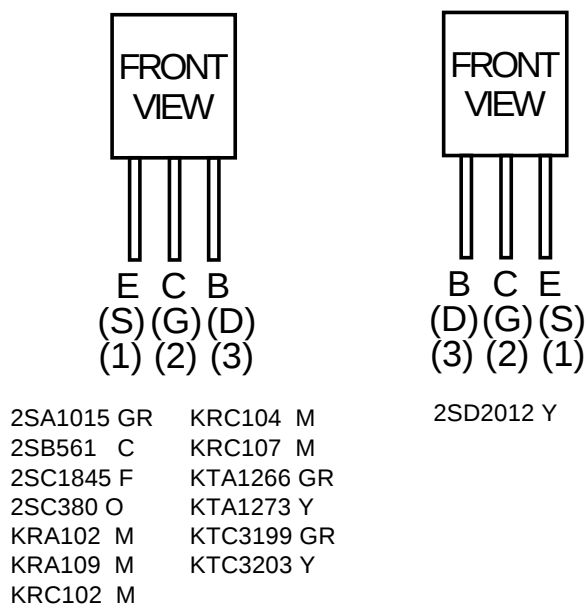


Figure 12 TYPES OF TRANSISTOR

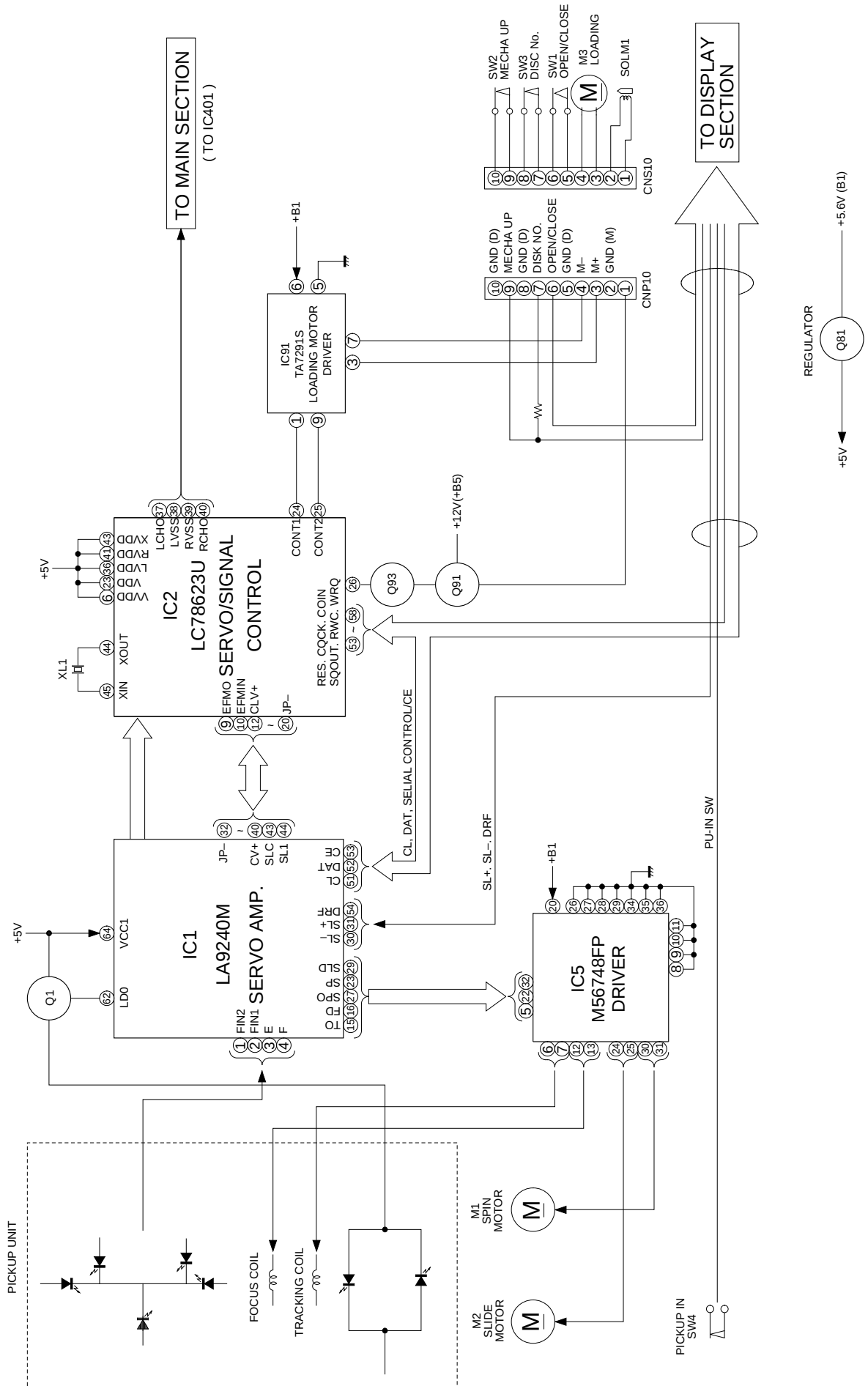


Figure 13 BLOCK DIAGRAM (1/3)

CD-C405W/CD-C420H/CP-C410/CP-C405/CP-SR421

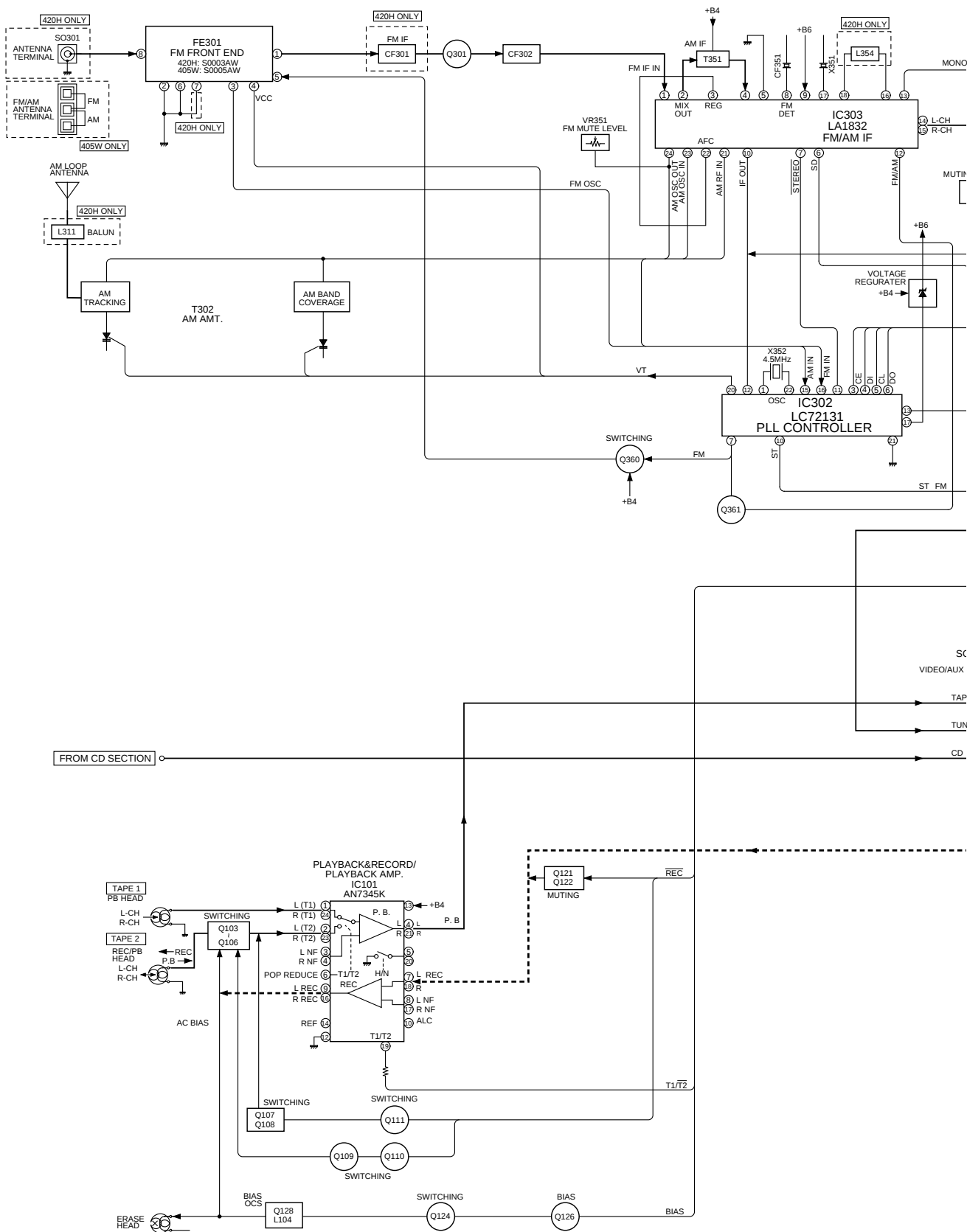
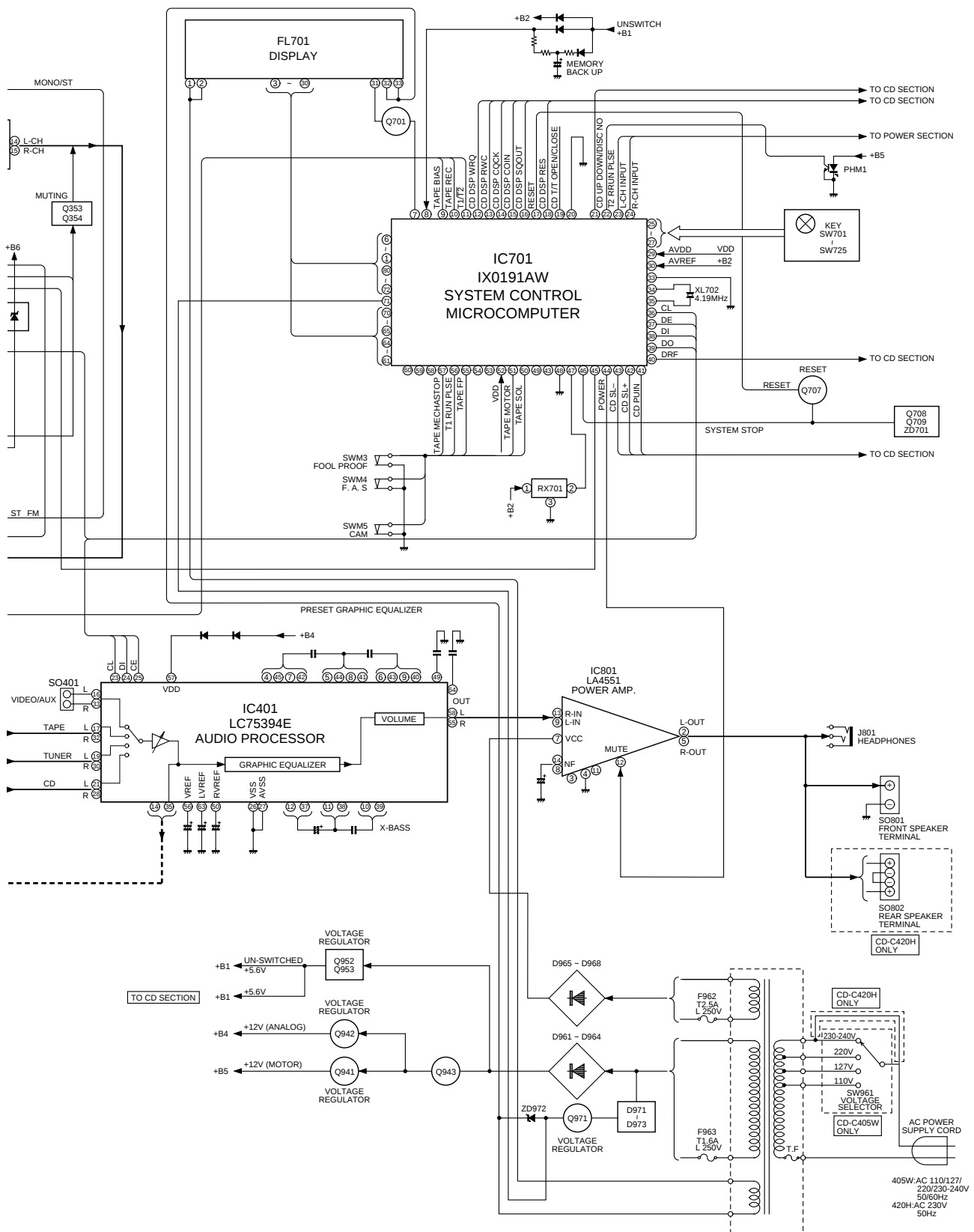
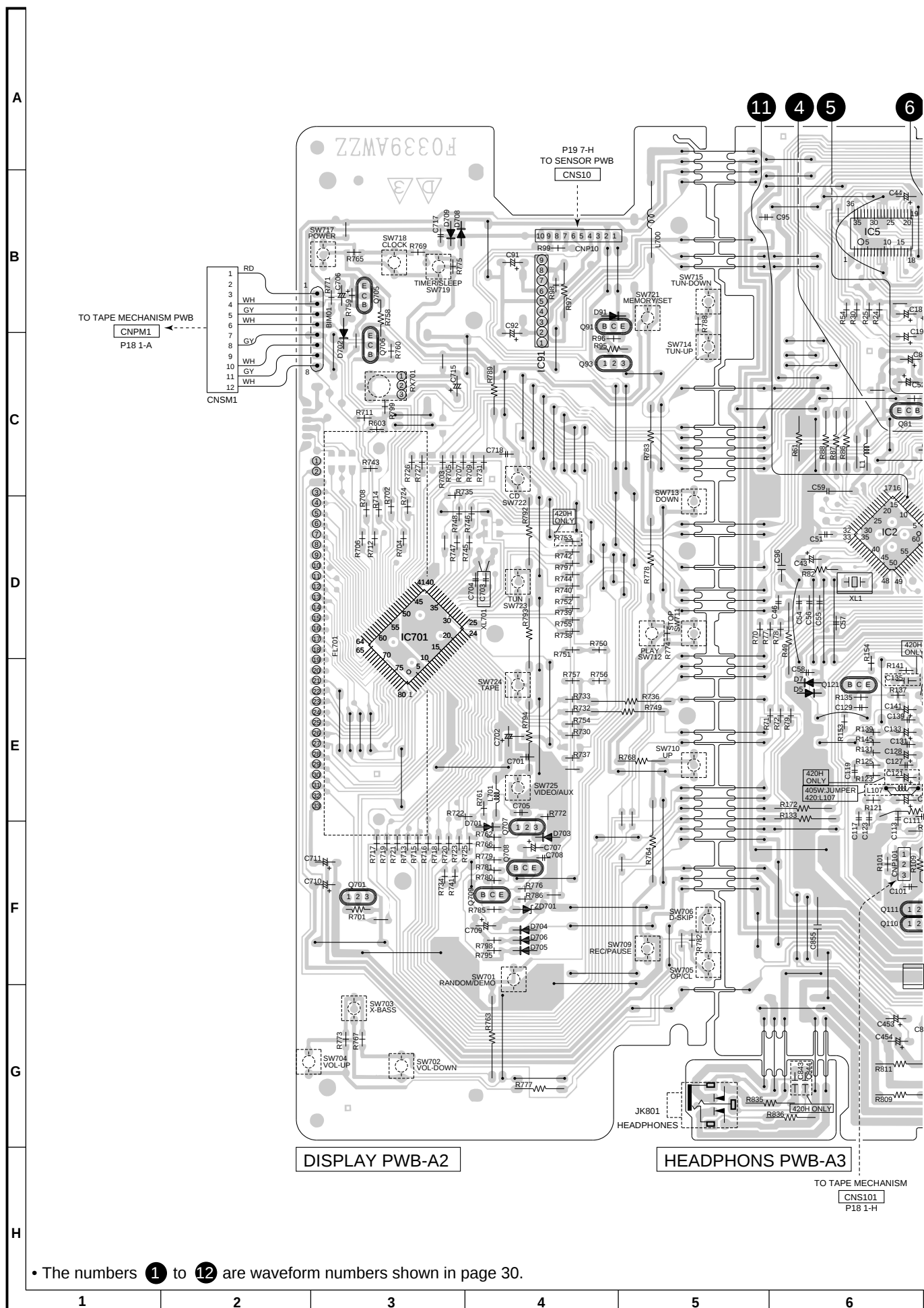


Figure 14 BLOCK DIAGRAM (2/3)





• The numbers ① to ⑫ are waveform numbers shown in page 30.

Figure 16 WIRING SIDE OF P.W.BOARD (1/4)

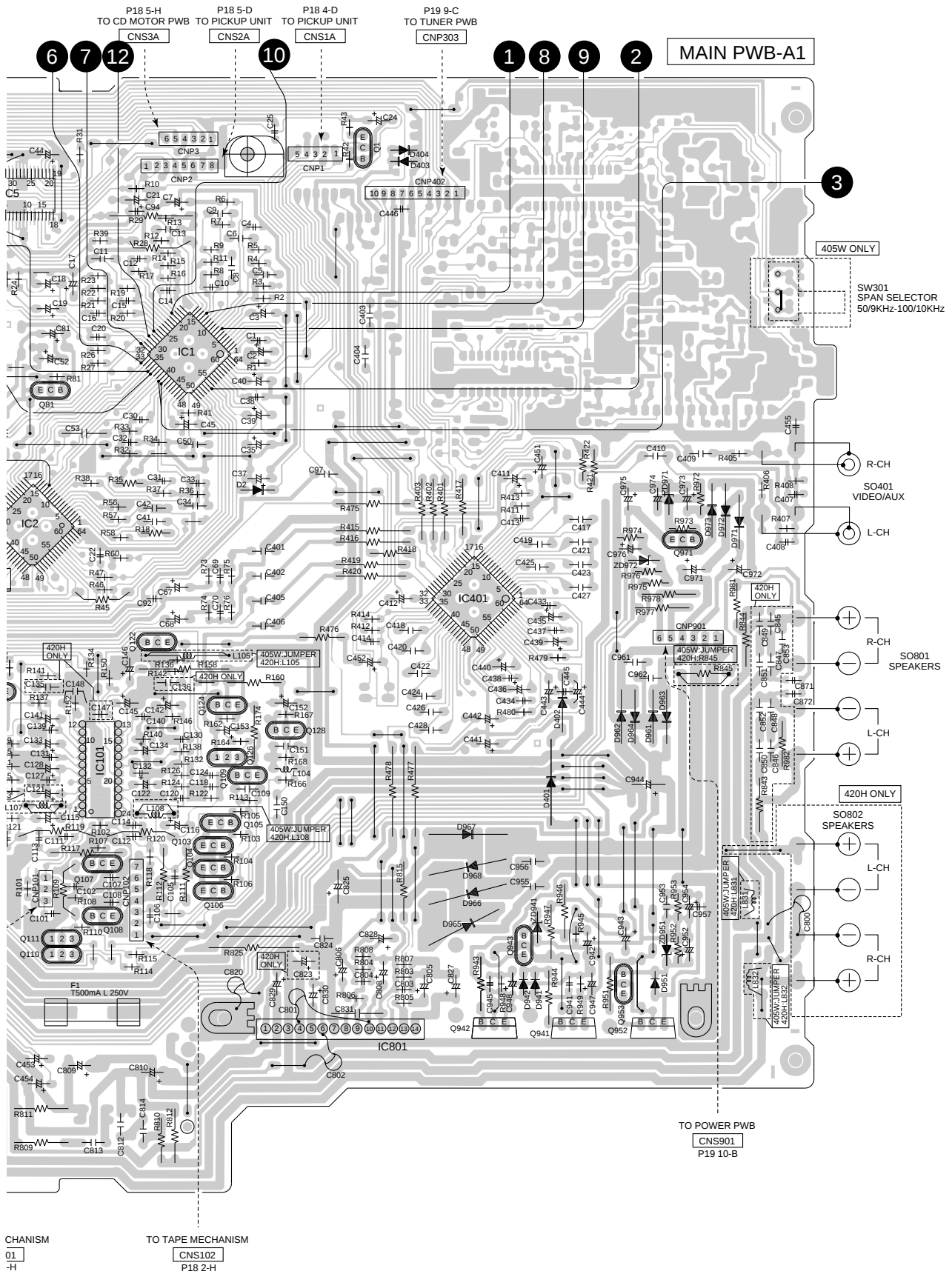


Figure 17 WIRING SIDE OF P.W.BOARD (2/4)

- 18 -

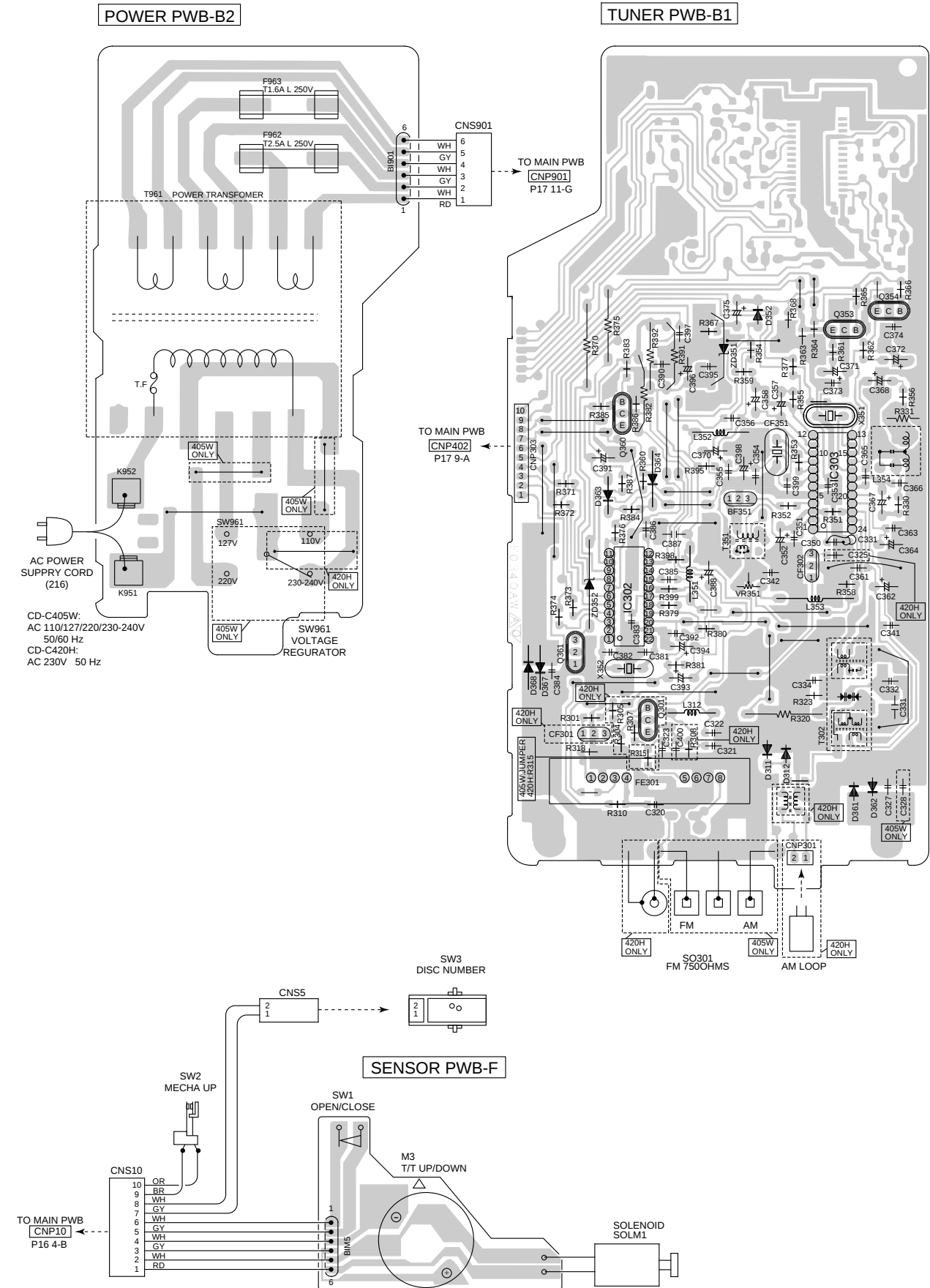


Figure 19 WIRING SIDE OF P.W.BOARD (4/4)