HCD-RG110

SERVICE MANUAL

AEP Model
UK Model

Ver 1.0 2003. 04

• HCD-RG110 are the tuner, deck, CD and amplifier section in MHC-RG110.

CD Section	Model Name Using Similar Mechanism	HCD-RL3
	CD Mechanism Type	CDM58F-K6
	Optical Pick-up Name	KSM-213DCP/Z-NP
Tape deck Section	Model Name Using Similar Mechanism	HCD-RL3
	Tape Transport Mechanism Type	CWL43FF48

SPECIFICATIONS

Amplifier section

DIN power output (rated)
50 + 50 watts
(6 ohms at 1 kHz, DIN)
Continuous RMS power output (reference)
60 + 60 watts (6 ohms at 1 kHz, 10% THD)
Music power output (reference)
120 + 120 watts (6 ohms at 1 kHz, 10% THD)

Inputs
AUDIO INPUT (phono jack):
voltage 250 mV, impedance 47 kilohms

Outputs
PHONES (stereo mini jack):
accepts headphones of 8 ohms or more
Front speaker: accepts impedance of 6 to 16 ohms

CD player section

System	Compact disc and digital audio system
Laser	Semiconductor laser (λ=780 nm) Emission duration: continuous
Frequency response	2 Hz – 20 kHz (±0.5 dB)
Wavelength	780 – 790 nm
Signal-to-noise ratio	More than 90 dB
Dynamic range	More than 90 dB

Tape deck section

Recording system	4-track 2-channel stereo
Frequency response	50 – 13,000 Hz (±3 dB), using Sony TYPE I cassette

– Continued on next page –

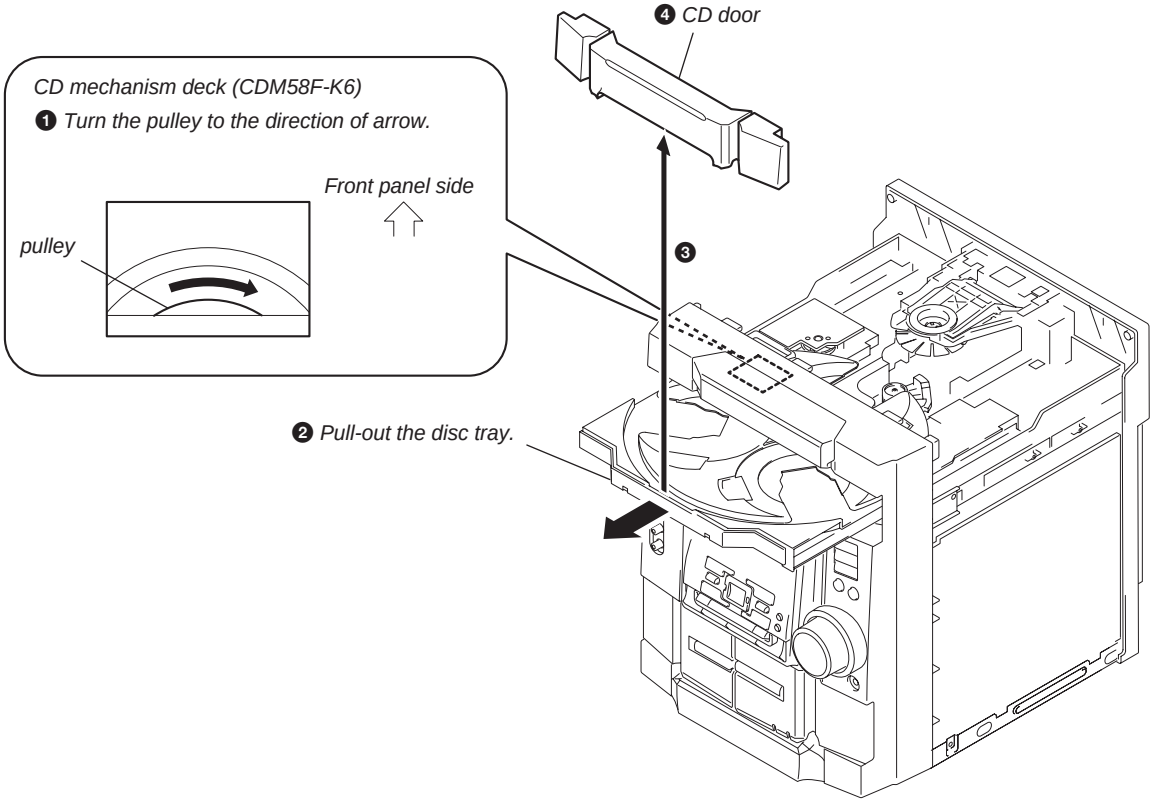
MINI HI-FI COMPONENT SYSTEM

9-877-259-01
2003D0400-1

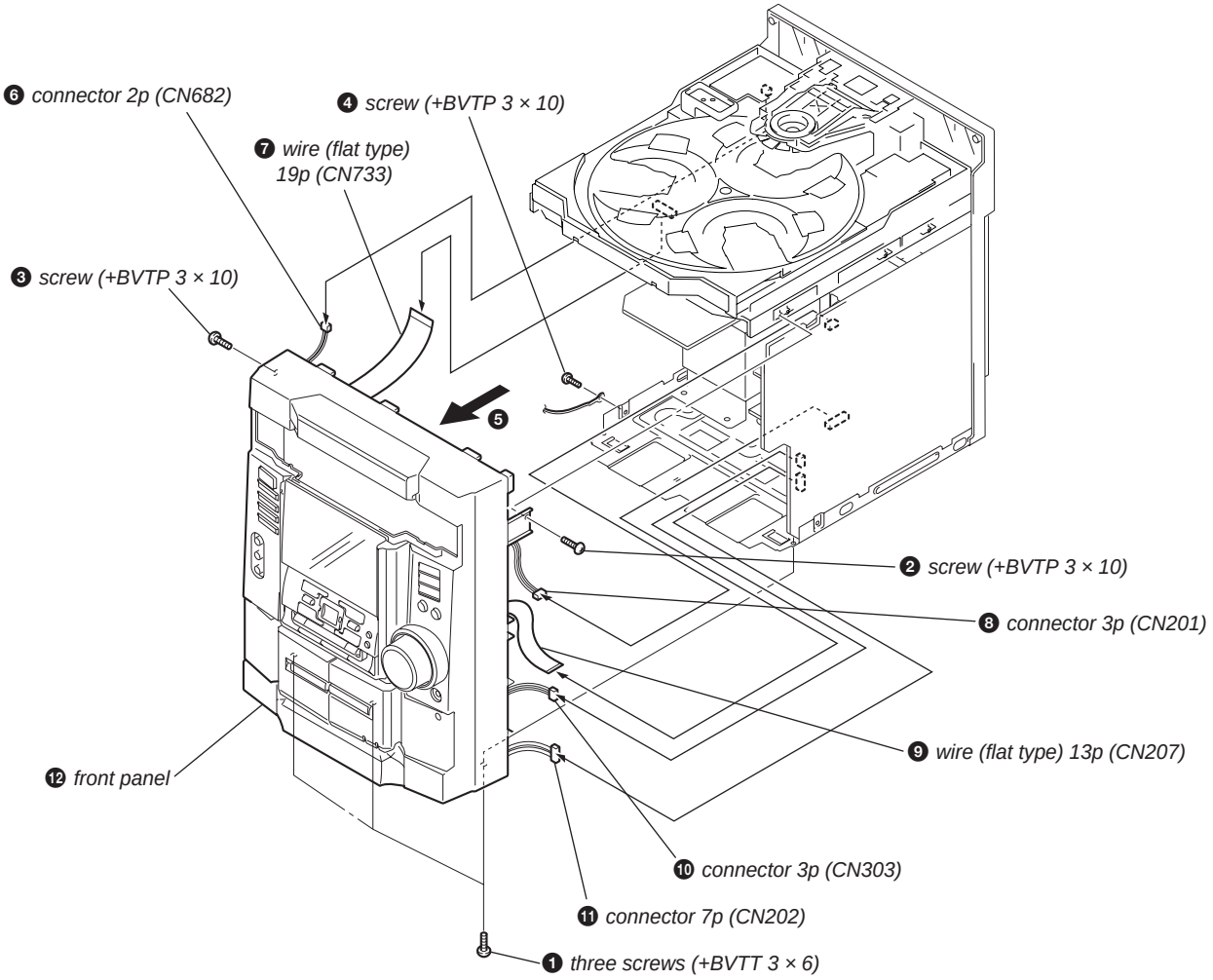
Sony Corporation
Home Audio Company
Published by Sony Engineering Corporation

SONY®

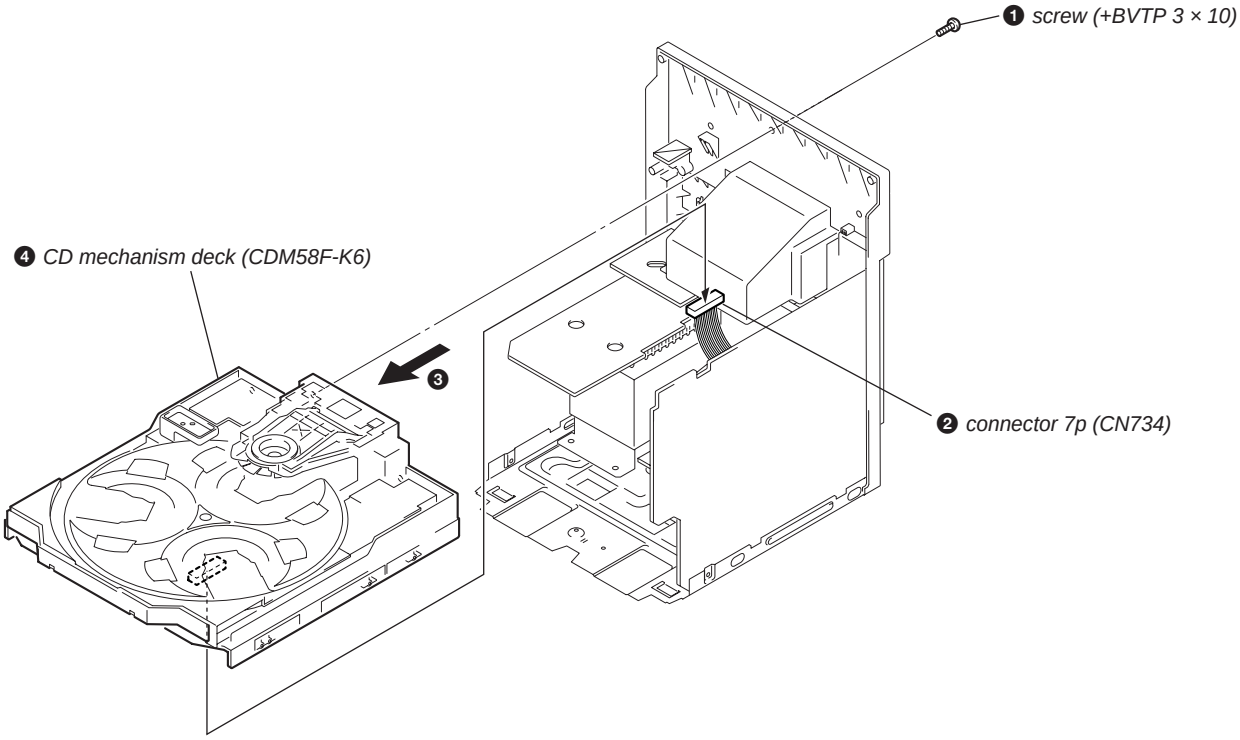
2-2. CD Door



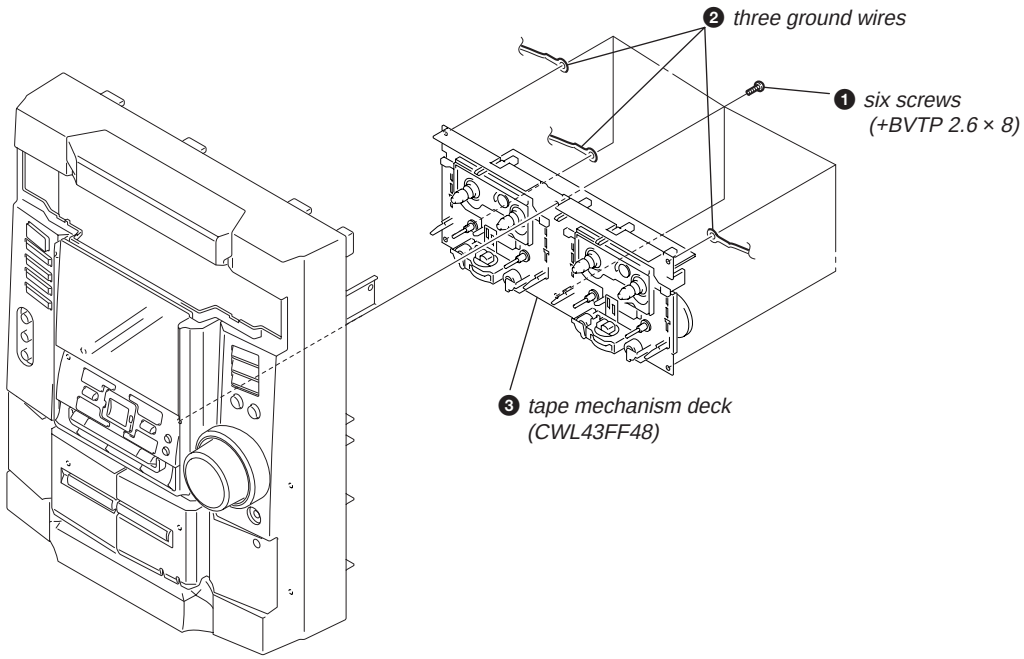
2-3. Front Panel Section



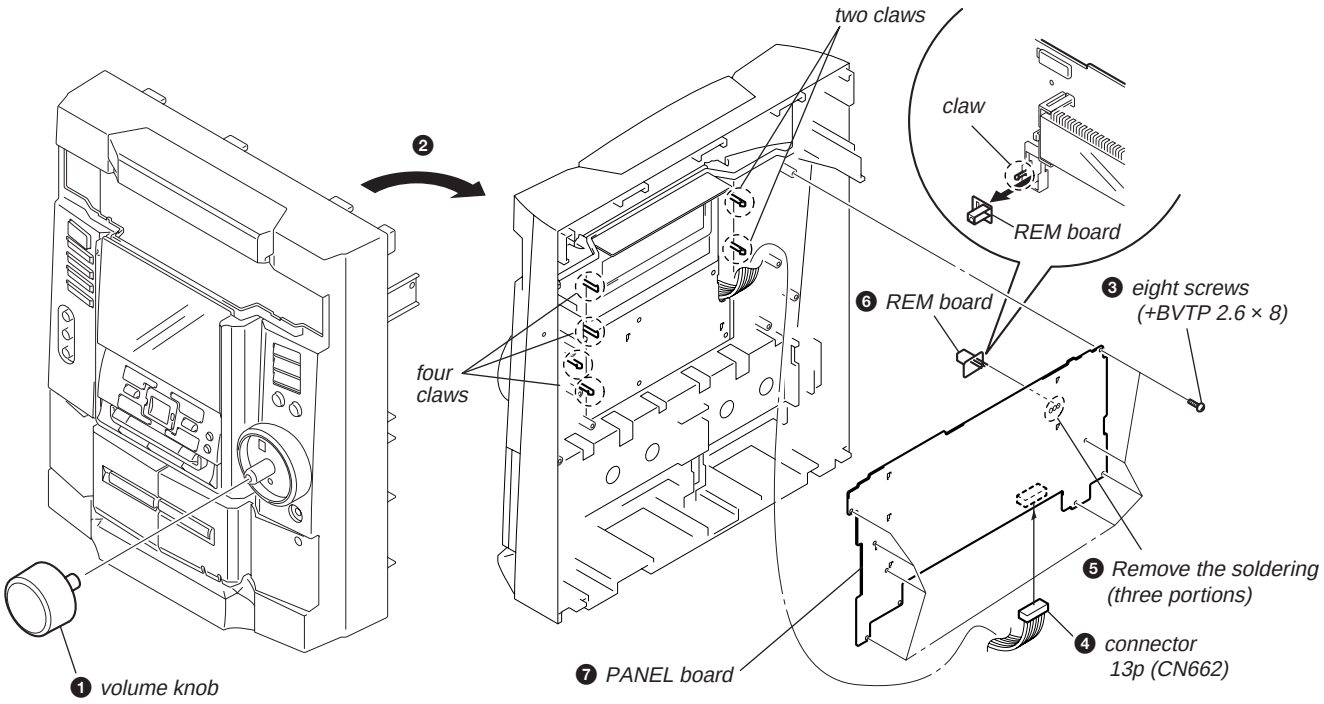
2-4. CD Mechanism Deck (CDM58F-K6)



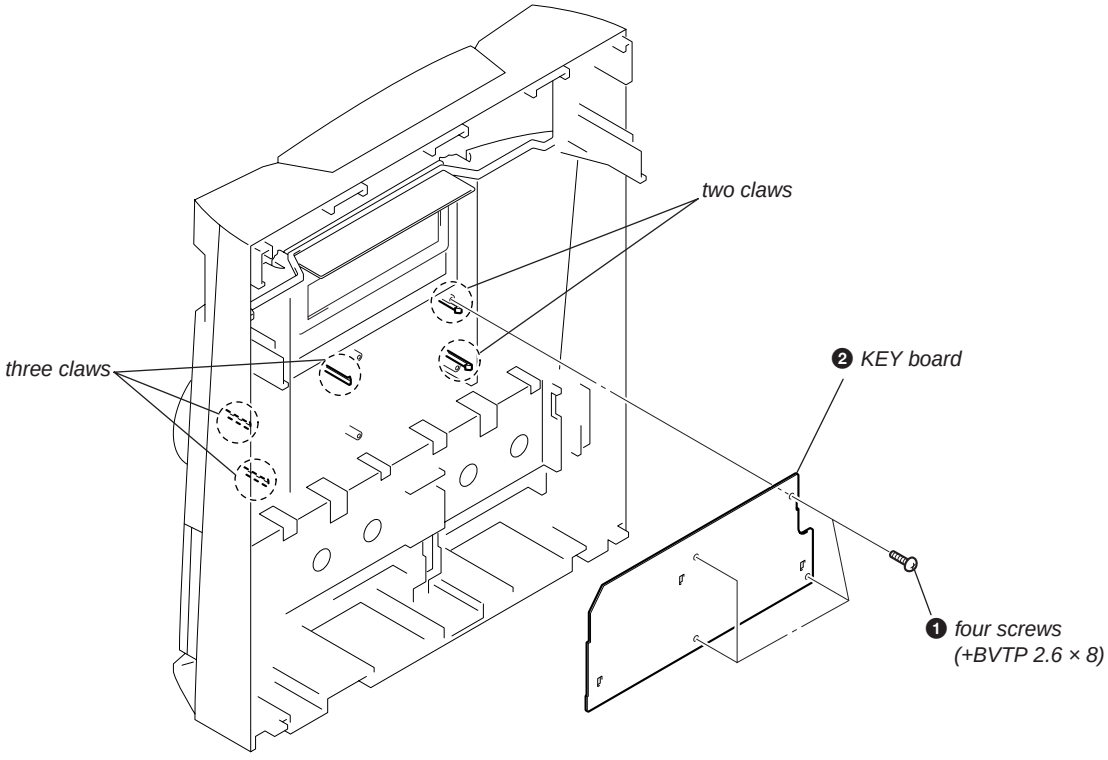
2-5. Tape Mechanism Deck (CWL43FF48)



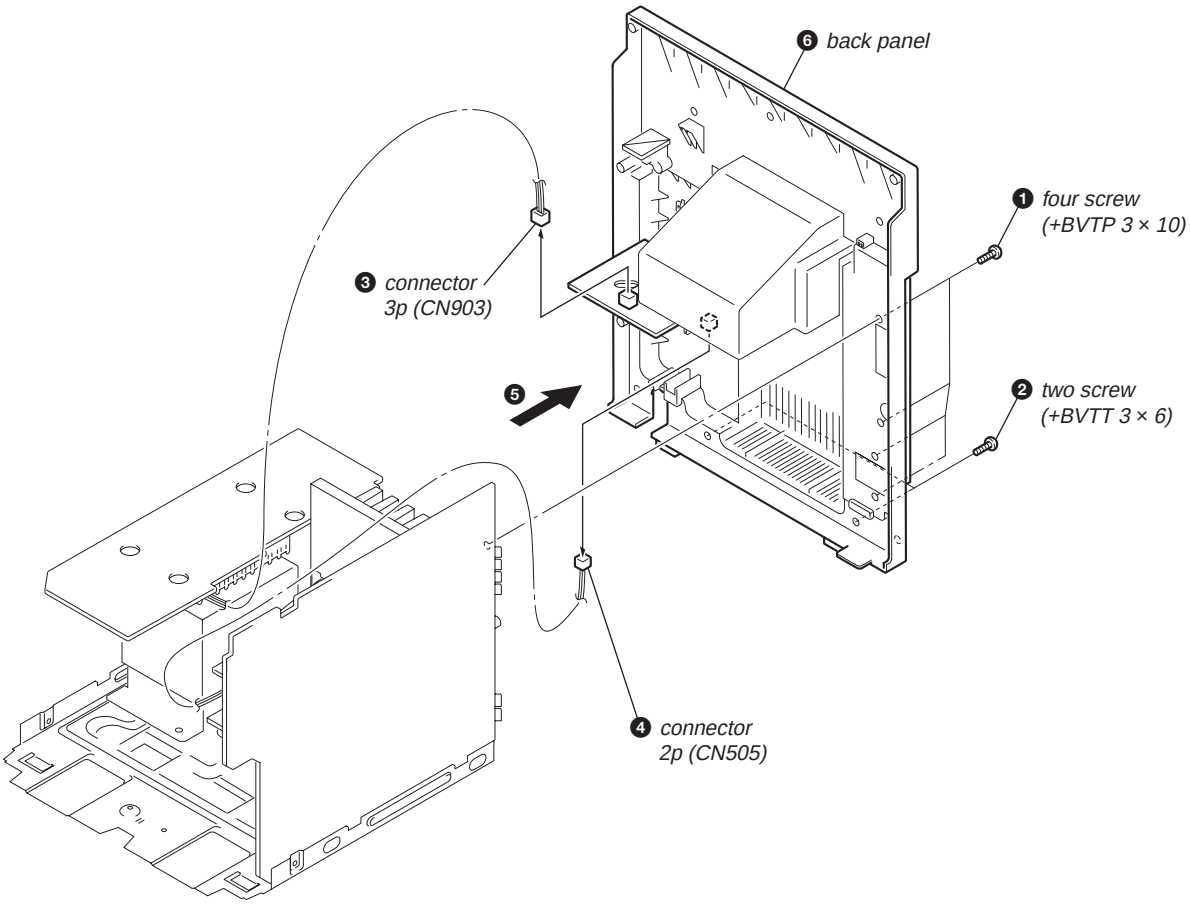
2-6. REM Board and PANEL Board



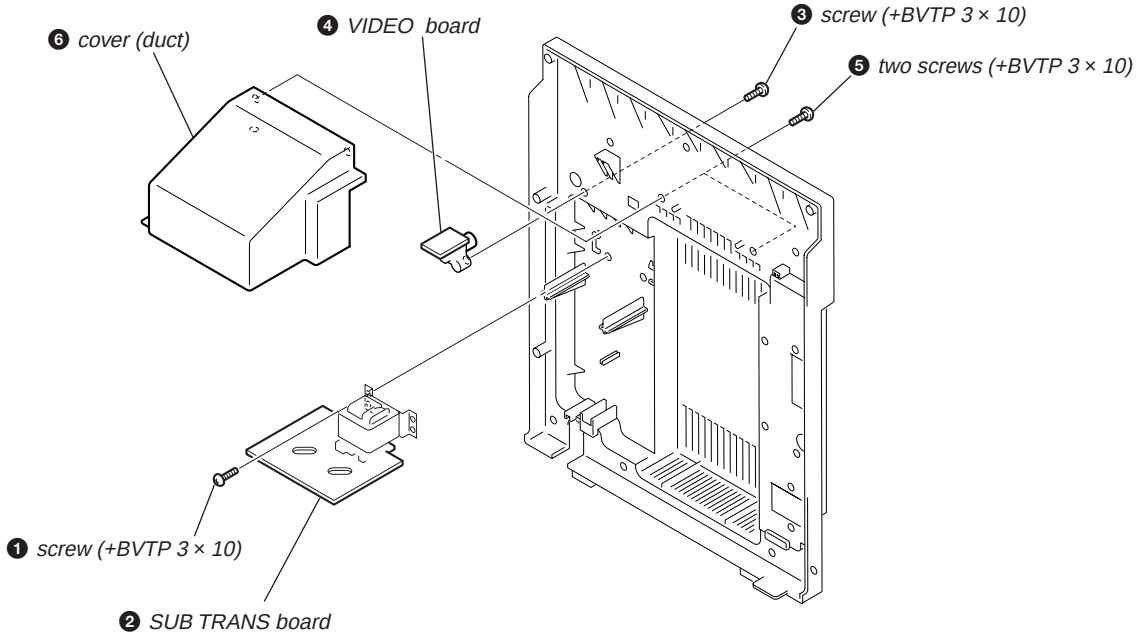
2-7. KEY Board



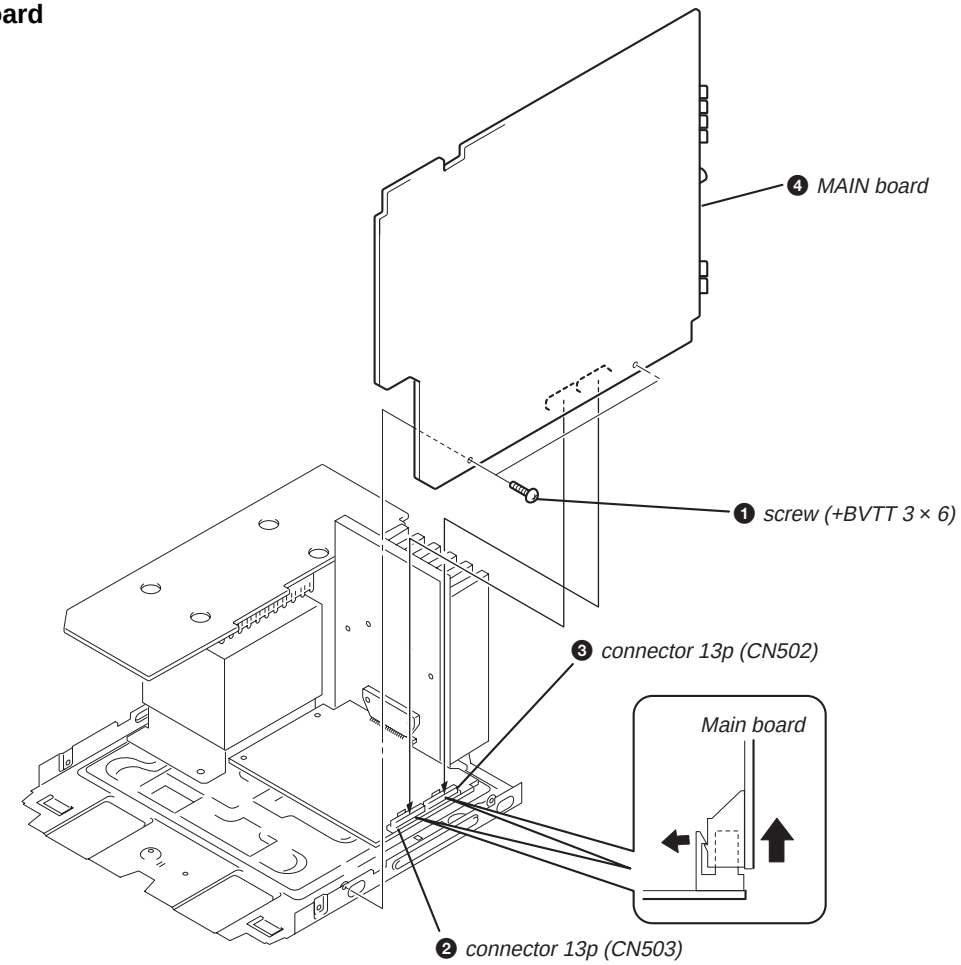
2-8. Back Panel Section



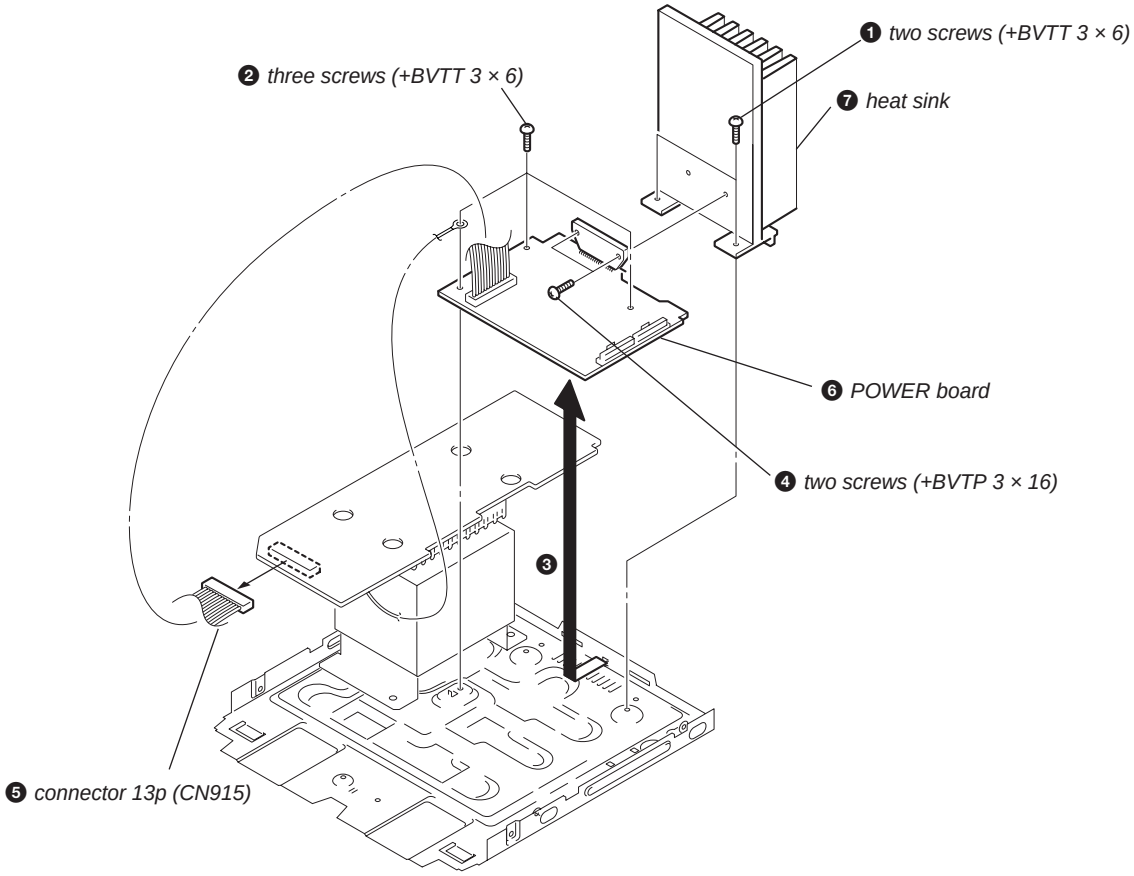
2-9. SUB TRANS Board, VIDEO OUT Board and SENSOR Board



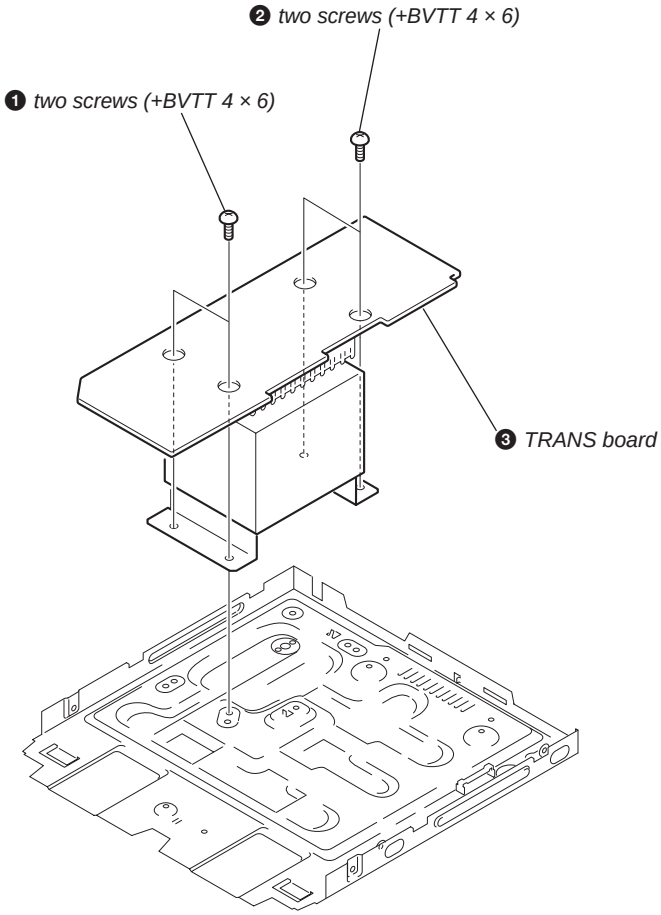
2-10. MAIN Board



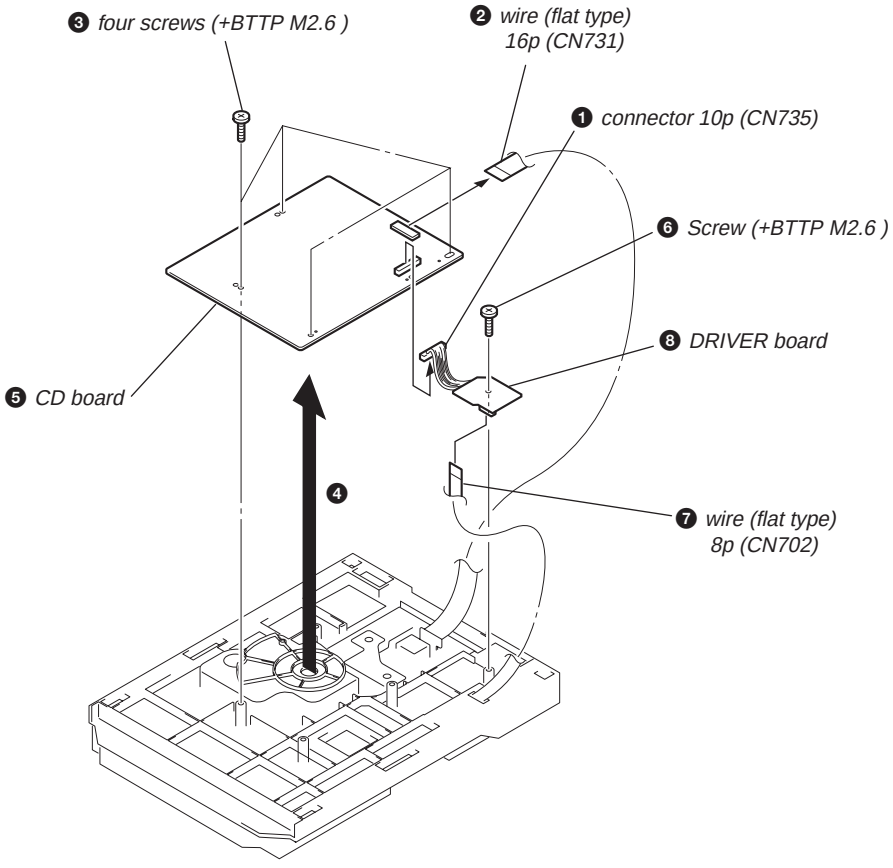
2-11. POWER Board



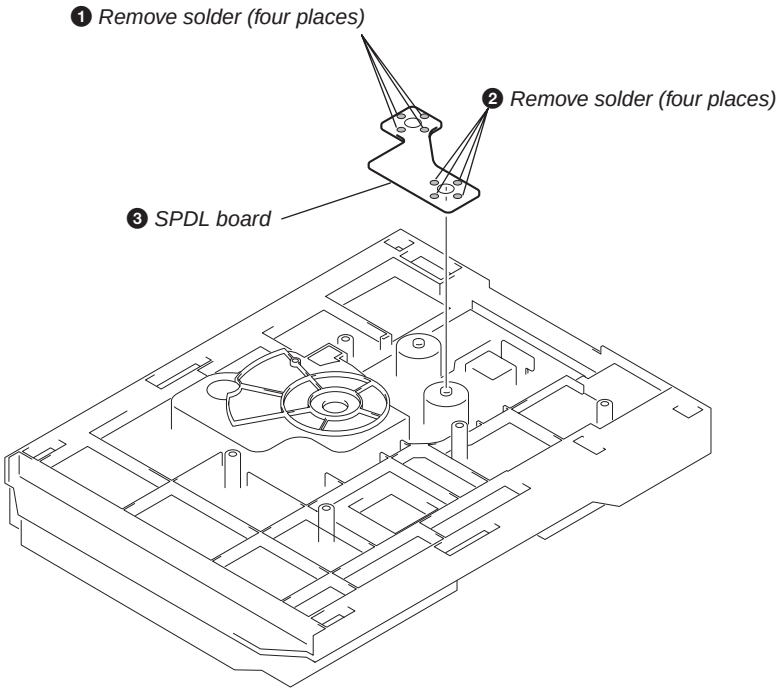
2-12. TRANS Board



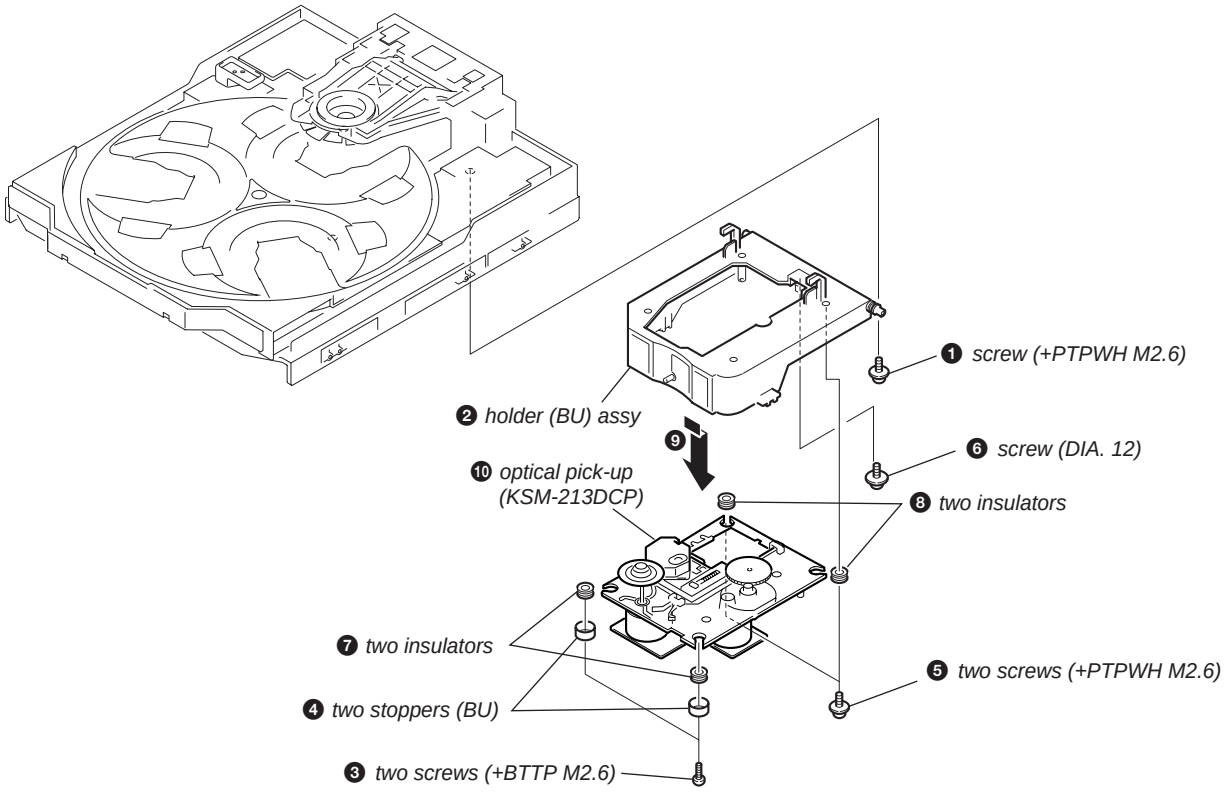
2-13. CD Board and DRIVER Board



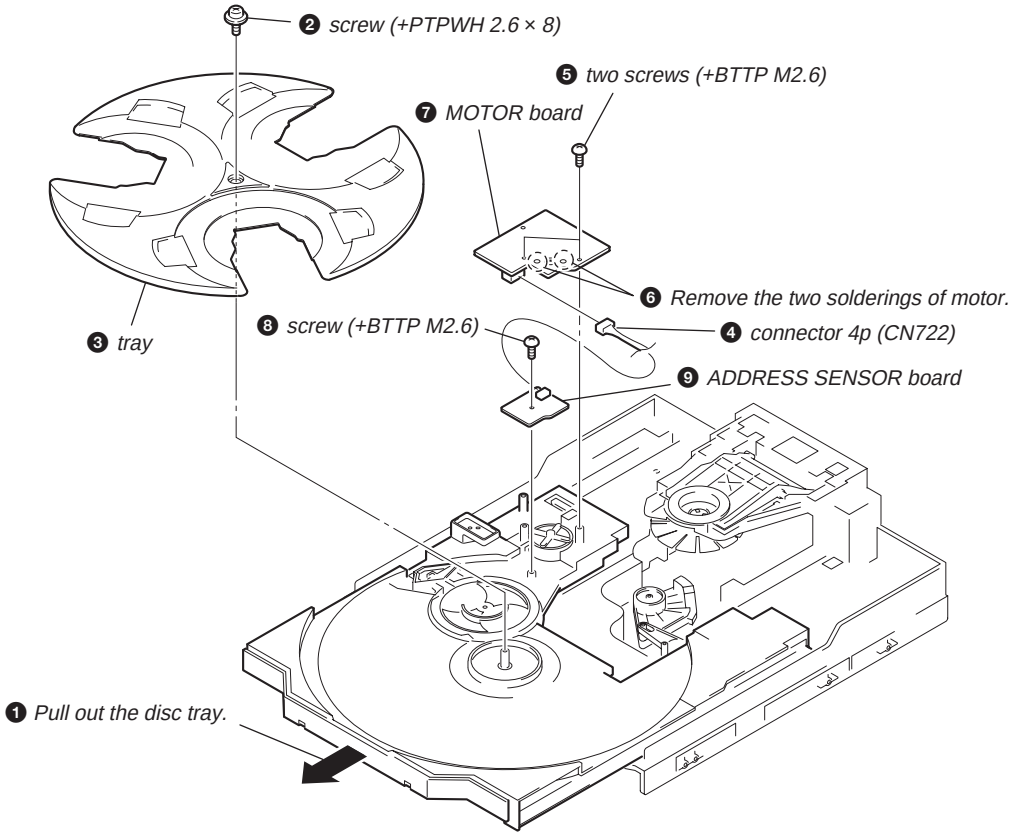
2-14. SPDL Board



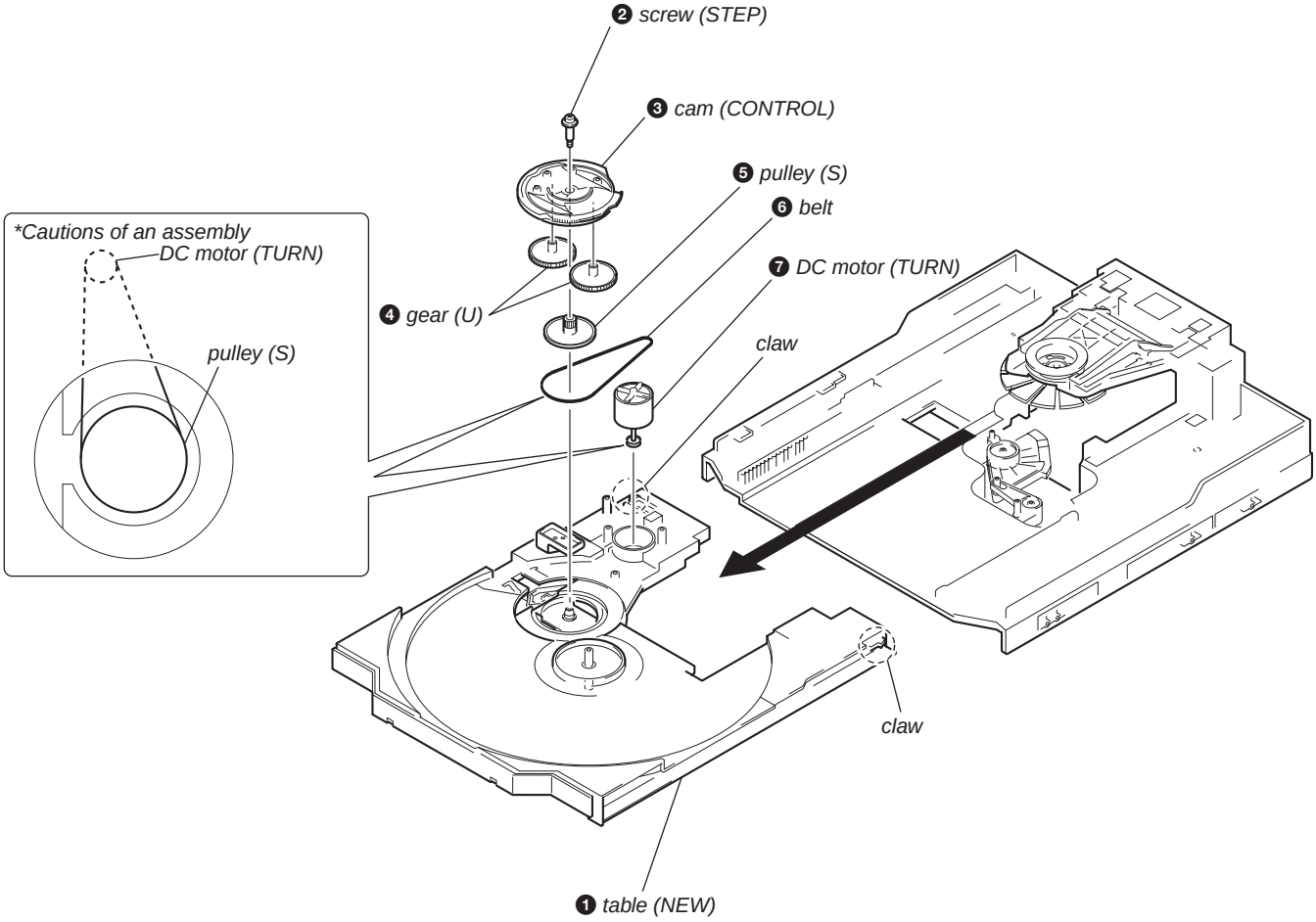
2-15. Optical Pick-up (KSM-213DCP)



2-16. MOTOR Board, ADDRESS SENSOR Board



2-17. Table (New), Cam (Control) and DC Motor



SECTION 3
TEST MODE

[Change-over of AM Tuner Step between 9 kHz and 10 kHz]

- A step of AM channels can be changed over between 9 kHz and 10 kHz. (Except AEP/UK models)

Procedure:

1. Press I/⏻ button to turn the set ON.
2. Select the function "TUNER", and press TUNER/BAND button to select the BAND "AM".
3. Press I/⏻ button to turn the set OFF.
4. Press TUNER/BAND and I/⏻ buttons simultaneously, and the display of fluorescent indicator tube changes to "AM 9 k STEP" or "AM 10 k STEP", and thus the channel step is changed over.

[Cold Reset]

- The cold reset clears all data including preset data stored in the RAM to initial conditions. Execute this mode when returning the set to the customer.

Procedure:

1. Press three buttons ■, GROOVE, and I/⏻ simultaneously.
2. The fluorescent indicator tube displays "COLD RESET" and the set is reset.

[Aging Mode]

This mode can be used for operation check of CD section and tape deck section.

- If an error occurred:
  The aging operation stops and is displayed status.
- If no error occurs:
  The aging operation continues repeatedly.

1. Operating method of Aging Mode

Turn on the main power and select "CD" of the function.

1) Set three discs in tray. Select ALL DISCS, and REPEAT OFF.
2) Load the tapes recording use into both decks.
3) Press three buttons ■, GAME EQ, and DISC SKIP/EX-CHANGE simultaneously.
4) Aging operations of CD and tape are started at the same time.
5) To exit the aging mode, perform [Cold Reset].

2. Aging mode in CD section

1) Operation during aging mode

- In the agining mode ,the program is excuted in the following sequence.

(1) The disc tray opens and closes.
(2) The disc tray turns to select a disc 3.
(3) The pickup accesses to the first track, and plays 3 seconds.
(4) The pickup accesses to the last track, and plays 3 seconds.
(5) The disc tray opens and closes.
(6) The disc tray turns to select a disc 1.
(7) The same operation starts like step (3).
(8) After a disc 1 aging operation, a disc 2 is selected.
(9) When an aging operation of a disc 3 is completed, the display "AGING ****" value increases.
(10) If no error occurs, the aging operation continues repeatedly.

2) Error display

Disc error	
Display	Error
E00D01022	Focus error (No disc)
E00D02022	Sub Q error (Focus is good)
E00D02023	TOC reading error
E00D02014	Access error (Unable within regular time)

Mechanism error	
Display	Error
E00M__E_0	Error during opening tray
E00M__C_2	EX-CHANGE disc error
E00M__D_0	Error during closing tray
E00M__F_3	EX-OPEN error
E00M__D_5	EX-CLOSE error
E00M__C_2	Chuck-up error
E00M__C_3	Unchucking error

3. Aging mode in Tape Deck section

1) Operation during aging mode

- In the agining mode, the program is excuted in the following sequence.

Step	Operation	Display
1	Rewind the TAPE A	TAPE AAG-1
2	Rewind the TAPE B	TAPE BAG-2
3	Play the TAPE A (1 minute)	TAPE AAG-2
4	Stop the TAPE A (1 second)	TAPE AAG-3
5	Play the TAPE A (3 minutes)	TAPE AAG-4
6	Rewind(AMS) the TAPE A	TAPE AAG-5
7	F.F.(AMS) the TAPE A	TAPE AAG-6
8	Play the TAPE B (1 minute)	TAPE BAG-2
9	Stop the TAPE B (1 second)	TAPE BAG-3
10	Record the TAPE B (3 minutes)	TAPE BAG-4
11	Rewind(AMS) the TAPE B	TAPE BAG-5
12	F.F.(AMS) the TAPE B	TAPE BAG-6

2) Error display

- If error occurred, the display remains like "TAPE BAG-2".

4. Exiting from the aging mode

- Be sure to perform Cold Reset to exit from the aging mode.

[GC Test Mode]

- All fluorecent segments and LEDs are tested.
- Keyboard check.

Procedure:

1. Press I/⏻ button to turn the set ON.
2. To enter the test mode, press the three buttons ■, GAME EQ and DISC 2 simultaneously.
3. All segments and LEDs (without STANDBY LED) are turned on.
4. Press GAME EQ and DISC 2 buttons simultaneously, and the key check mode is activated.
5. The message “KEY 0 0 0 0” is displayed.
   Each time a button is pressed, the key code number is displayed.
6. Press GAME EQ and DISC 2 buttons simultaneously, and the key count mode is activated.
7. The message “KEYCNT 0 1” is displayed.
   Each time a button is pressed, “KEYCNT 0 1” value increased. However, once a button is pressed, it is no longer taken into account.
8. Press GAME EQ and DISC 2 buttons simultaneously, and the head phone detect mode is activated.
9. The message “H_P OFF” is displayed when a headphone jack is not inserted.
   “H_P ON ” is displayed when a headphone jack is inserted.
10. Press GAME EQ and DISC 2 buttons simultaneously, and the volume control detect mode is activated.
11. The message “VOLUME FLAT” is displayed.
    “VOLUME UP” is displayed if rotating VOLUME knob clockwise, or “VOLUME DOWN” is displayed if rotating counterclockwise.
12. To exit from the GC test mode after the volume control detect mode, press GAME EQ and DISC 2 buttons simultaneously.

[Version and Destination Display Mode]

- The version or destination is displayed.

Procedure:

1. Press I/⏻ button to turn the set ON.
2. To enter the test mode, press the three buttons ■, GAME EQ and MOVIE EQ simultaneously.
3. The destination is displayed.
4. Press STOP and GROOVE buttons simultaneously.
5. The version is displayed.
6. To exit from this mode, press I/⏻ button to turn the set OFF.

[CD Service Mode]

- This mode can run the CD sled motor freely. Use this mode, for instance, when cleaning the pickup.

Procedure:

1. Press I/⏻ button to turn the set ON.
2. Select the function “CD”.
3. To enter the test mode, press three buttons ■, GAME EQ, and OPEN/CLOSE simultaneously.
4. The CD service mode is selected.
5. With the CD in stop status, press ⏭ button to move the pickup to outside track, or press ⏮ button to inside track.
6. To exit from this mode, perform as follows:
   1) Move the pickup to the most inside track.
   2) Press I/⏻ button to turn the set OFF.

Note:
- Always move the pickup to most inside track when exiting from this mode. Otherwise, a disc will not be unloaded.
- Do not run the sled motor excessively, otherwise the gear can be chipped.

[MC Test Mode]

- This mode is used to test the function of the equalizer.

Procedure:

1. Press I/⏻ button to turn the set ON.
2. To enter the test mode, press the three buttons ■, GAME EQ and DISC 3 simultaneously.
3. Press the MOVIE EQ button.
   The function of the equalizer is set to “MIN”.
4. Press the MUSIC EQ button.
   The function of the equalizer is set to “MAX”.
5. Press the P.FILE button.
   The function of the equalizer is set to “FLAT”.
6. To exit from this mode, press I/⏻ button to turn the set OFF.

[CD Ship Mode (No Memory Clear)]

- This mode moves the pickup to the position durable to vibration. Use this mode when returning the set to the customer after repair.

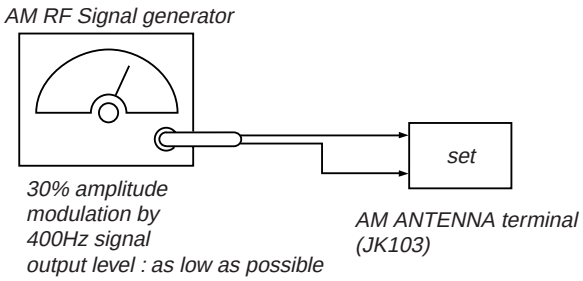
Procedure:

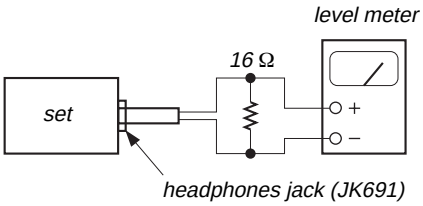
1. Press I/⏻ button to turn the set ON.
2. Select the function “CD”.
3. Press I/⏻ button to turn the set OFF.
4. Press CD button and I/⏻ button simultaneously.
5. The "STANDBY" display blinks instantaneously, and the CD ship mode is set.

SECTION 4
ELECTRICAL ADJUSTMENTS

TUNER SECTION

AM IF Adjustment

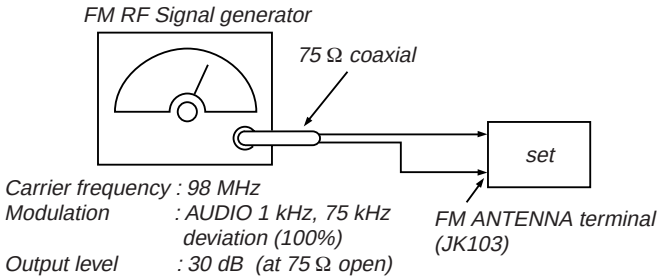




Procedure:

1. Set the frequency of the AM RF signal generator to 1000 kHz (at 10 kHz step) or 999 kHz (at 9 kHz step).
2. Tune the set to AM 1000 kHz (at 10 kHz step) or 999 kHz (at 9 kHz step).
3. Adjust IFT101 so that the reading on level meter becomes in maximum.

FM Tuned Level Adjustment

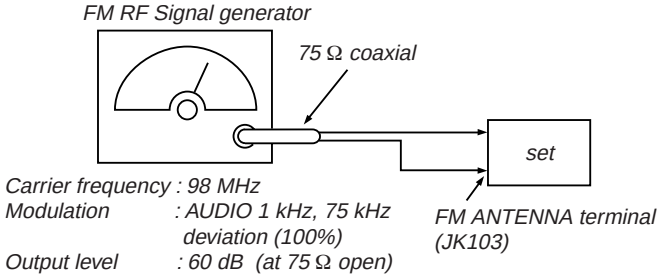


Procedure:

1. Supply a 98 MHz signal at 28 dB from the ANTENNA terminal.
2. Tune the set to 98 MHz.
3. Adjust RV101 to the point (moment) when the TUNED indicator will change from going off to going on.

Adjustment Location: MAIN board

Null Adjustment

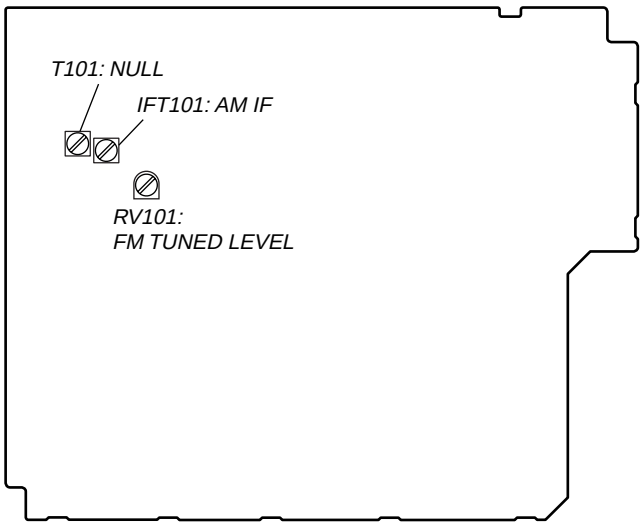


Procedure:

1. Supply a 98 MHz signal at 60 dB from the ANTENNA terminal.
2. Tune the set to 98 MHz.
3. Measure voltage between pin 21 and pin 23 of IC 101. Adjust T101 until the voltage becomes 0 V.

Adjustment Location: MAIN board

[MAIN BOARD] Component side

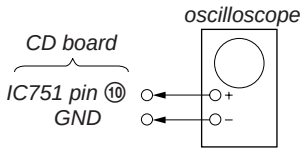


CD SECTION

Note :

1. CD Block is basically designed 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 10MΩ 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.

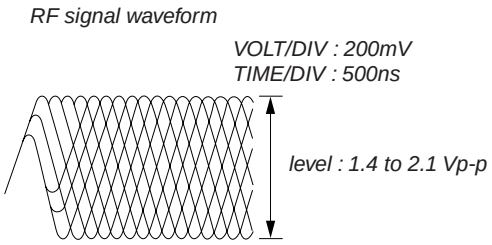
RF Level Check



Procedure :

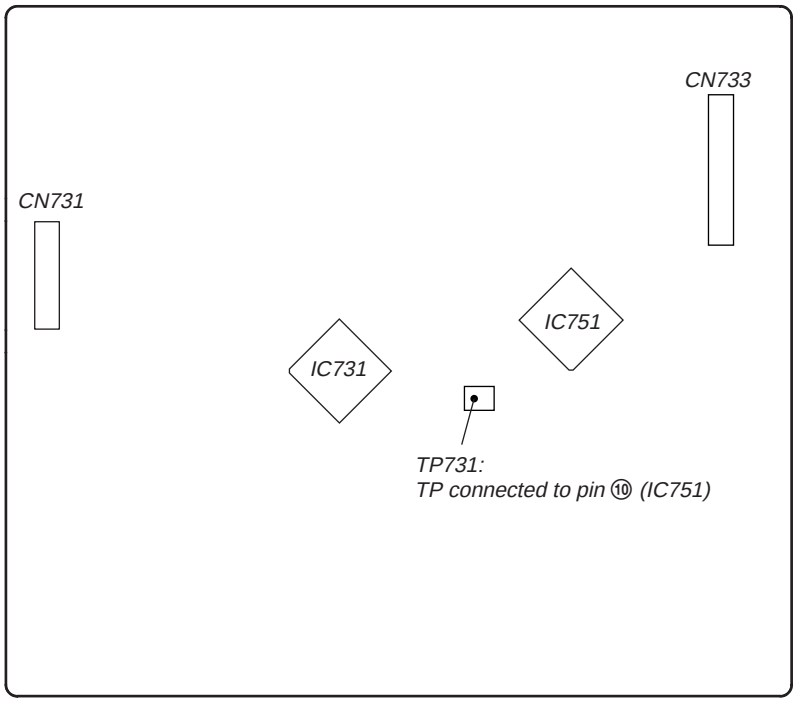
1. Connect oscilloscope to pin ⑩ (IC751).
2. Turned Power switch on.
3. Load a disc (YEDS-18) and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note : Clear RF signal waveform means that the shape " ◊ " can be clearly distinguished at the center of the waveform.



Adjustment Location: CD board

[CD BOARD] (Component Side)



SECTION 5
DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

Note on Schematic Diagram:

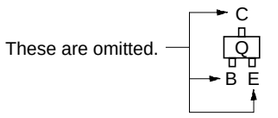
- All capacitors are in µF unless otherwise noted. pF: µµF
  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.

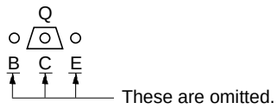
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- ▬▬ : B+ Line.
- ▬ ▬ ▬ : B– Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
  no mark : FM
  < > : CD
  [ ] : TAPE
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : FM
  : PB (DECK A)
  : PB (DECK B)
  : REC (DECK B)
  : CD

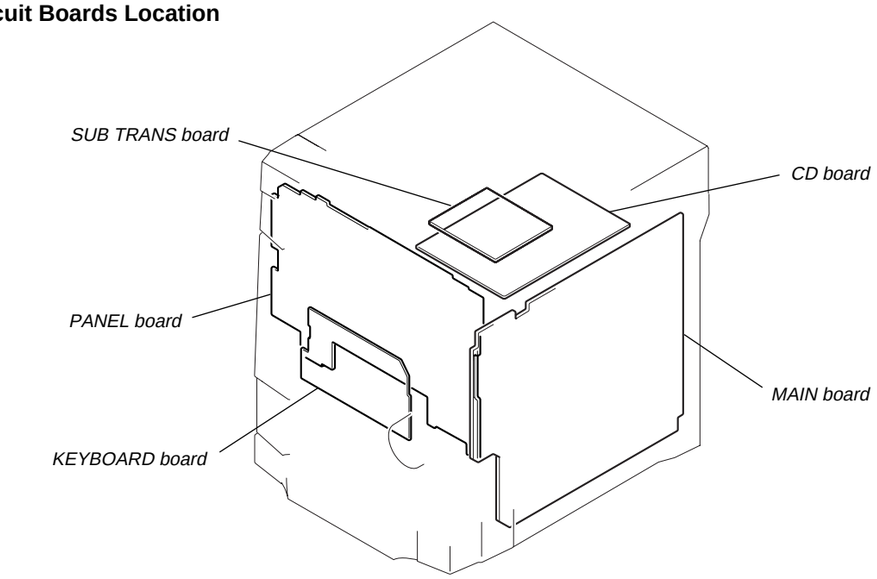
Note on Printed Wiring Boards:

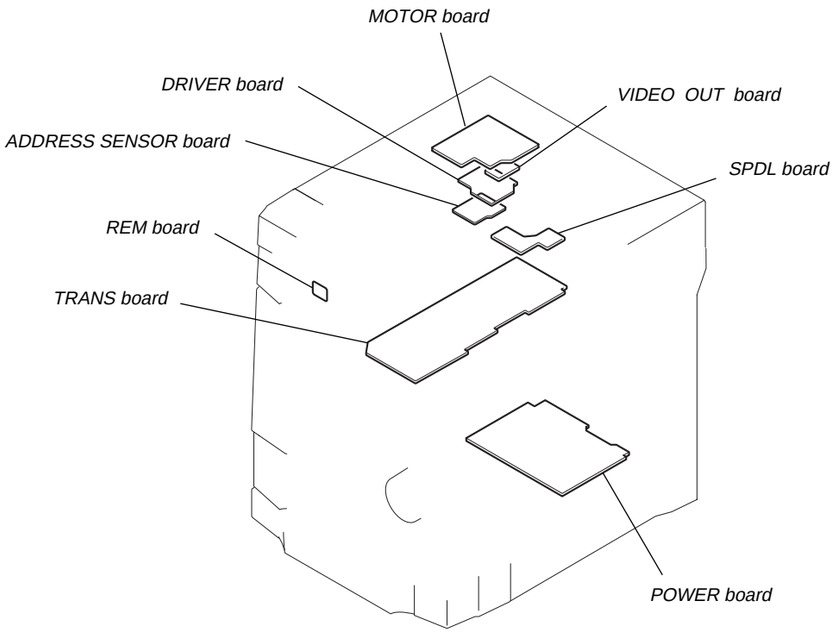
- o——— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.
- Indication of transistor.



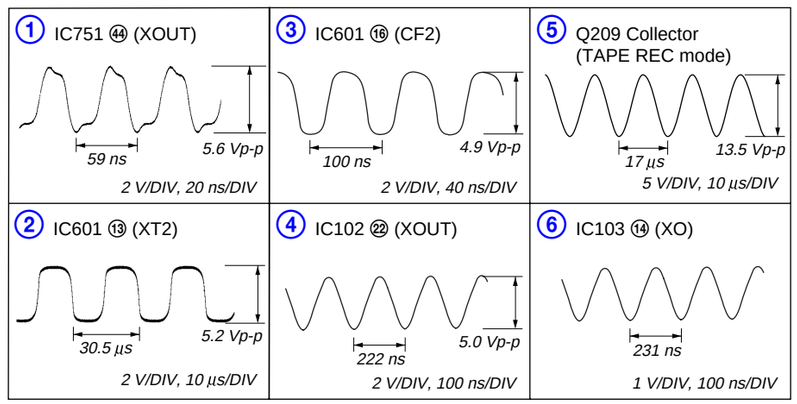


5-1. Circuit Boards Location





• Waveforms



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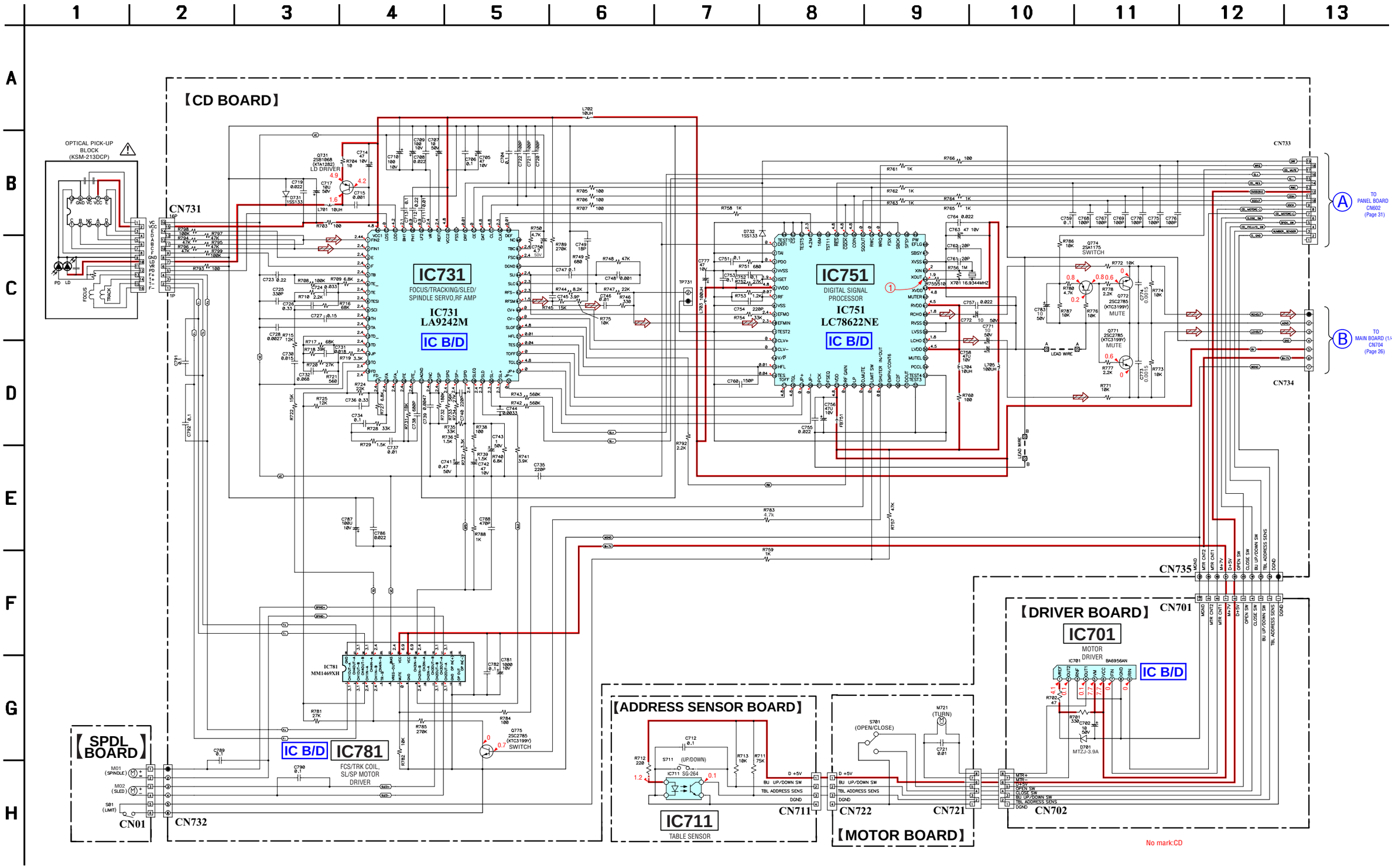
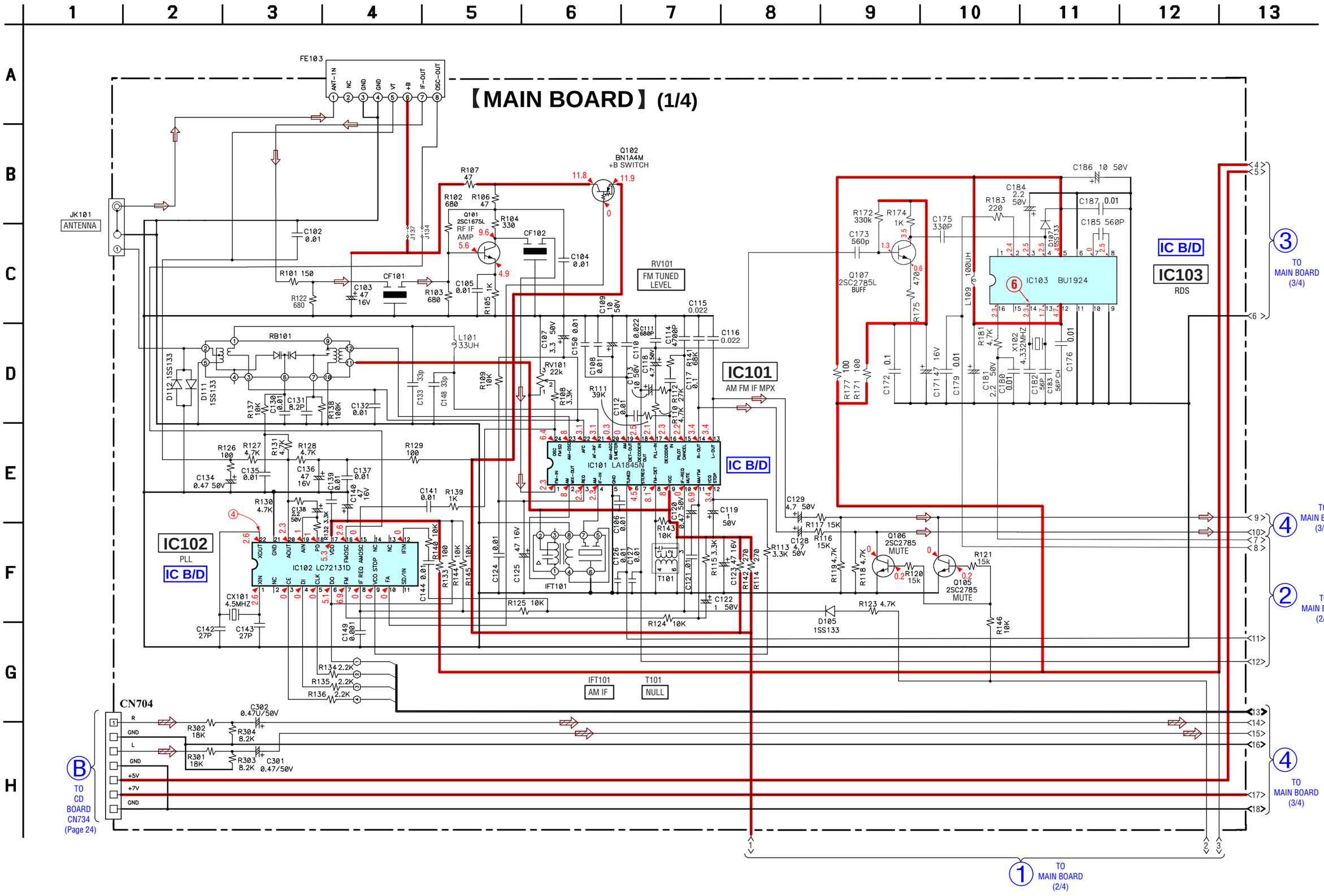
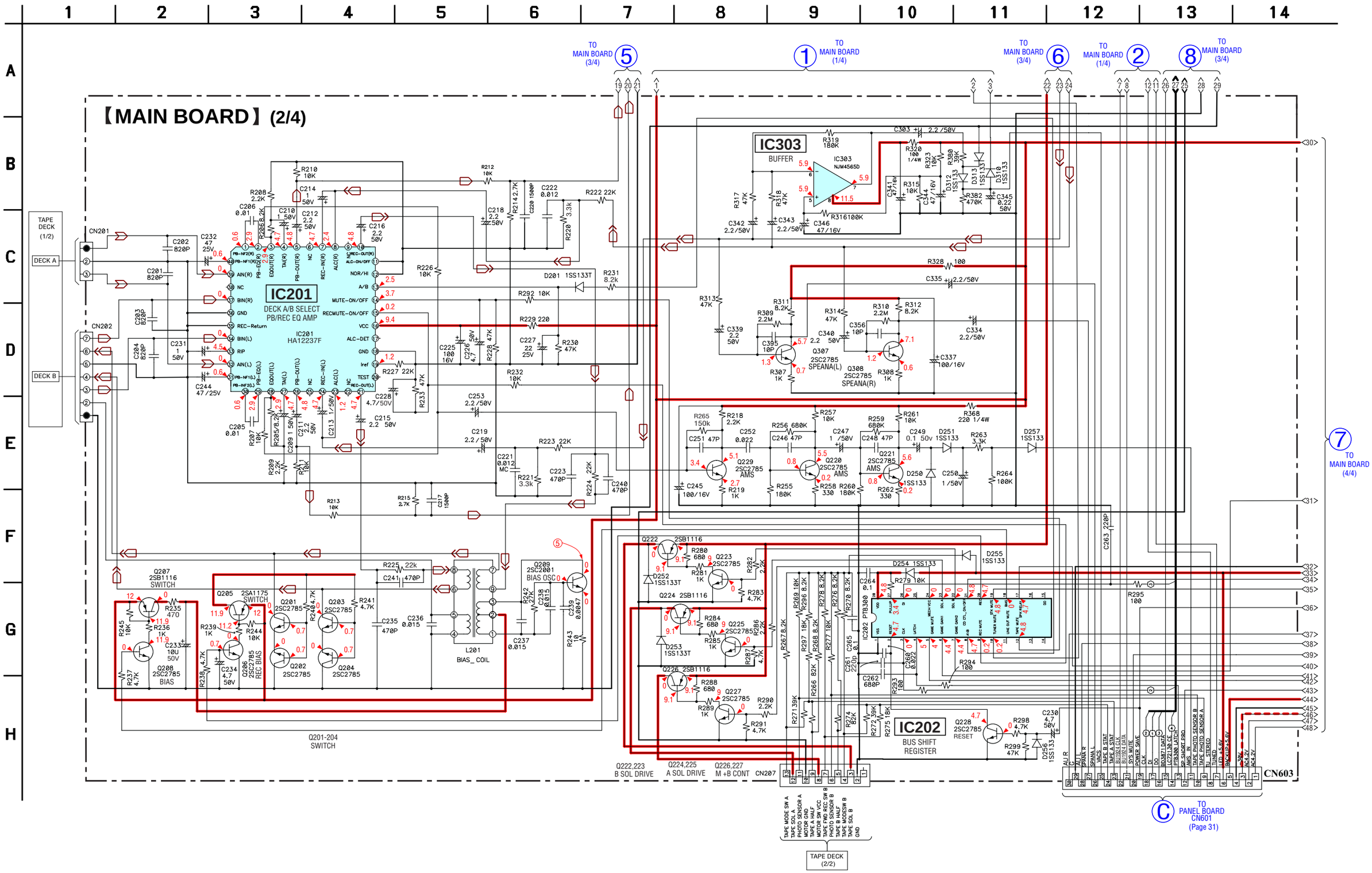
5-5. Schematic Diagram – CD Section – • See page 34,35 for IC Block Diagrams. • See page 19 for Waveforms.



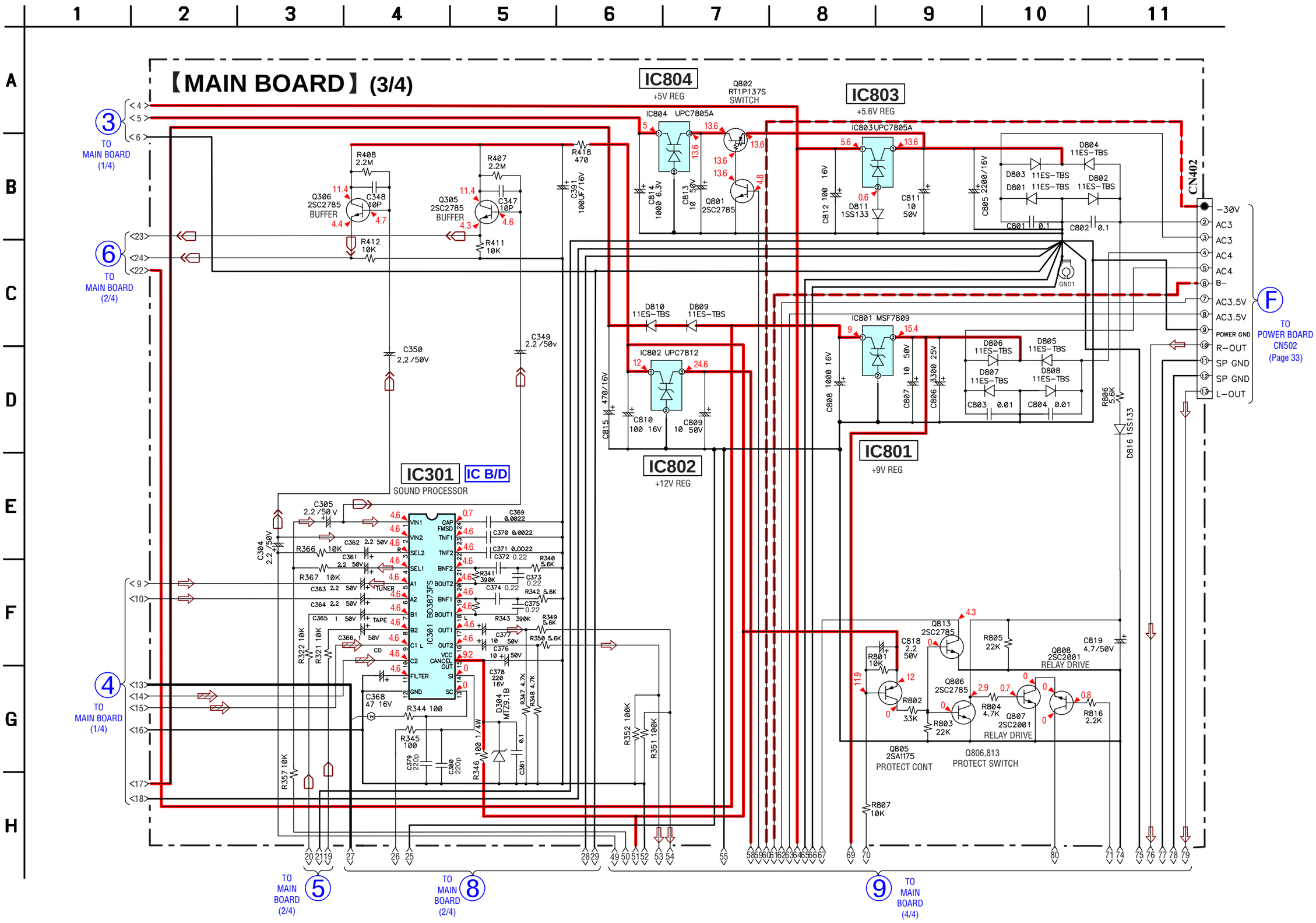
5-7. Schematic Diagram – MAIN Board (1/4) – • See page 34 for IC Block Diagrams. • See page 19 for Waveforms.



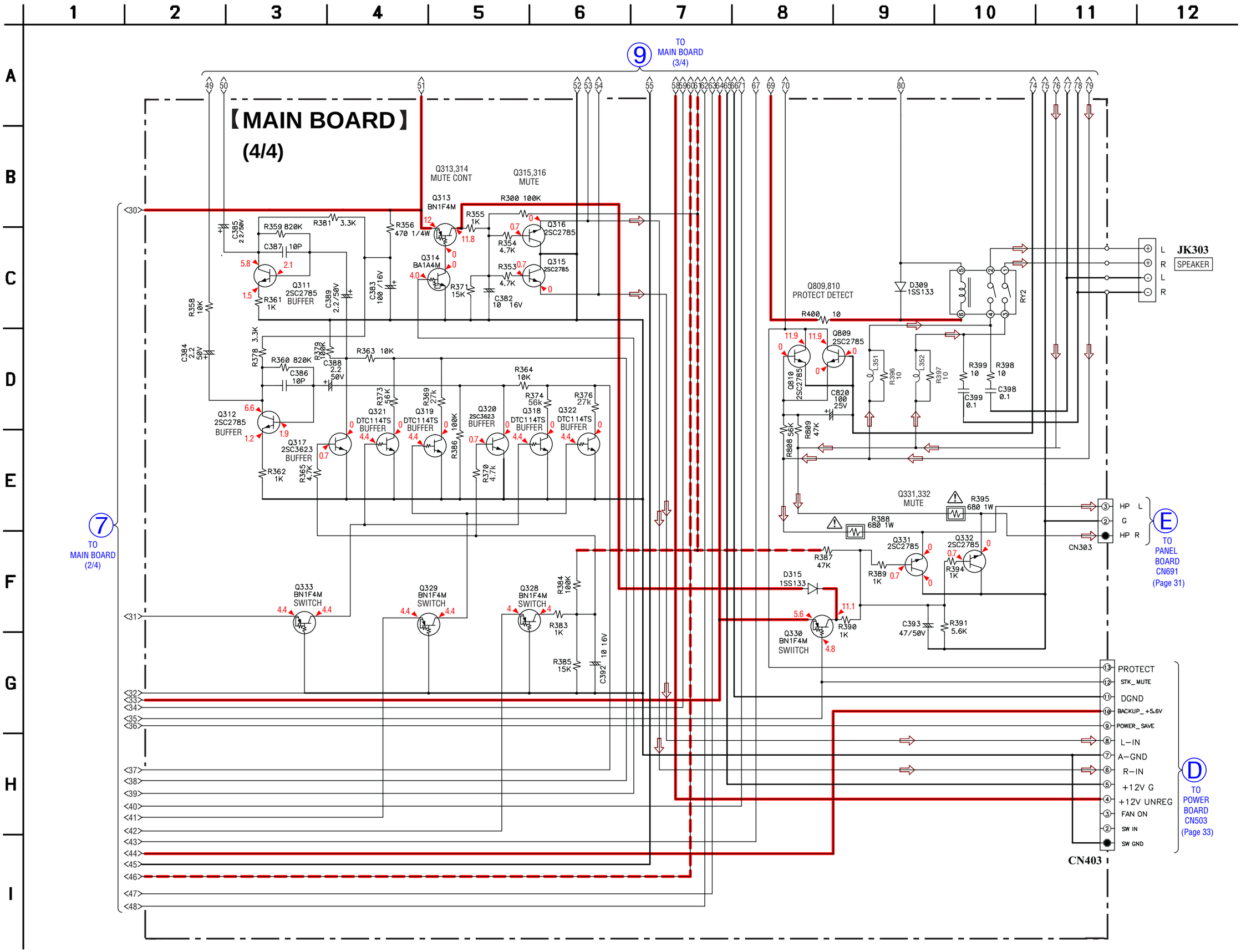
5-8. Schematic Diagram – MAIN Board (2/4) – • See page 19 for Waveforms.



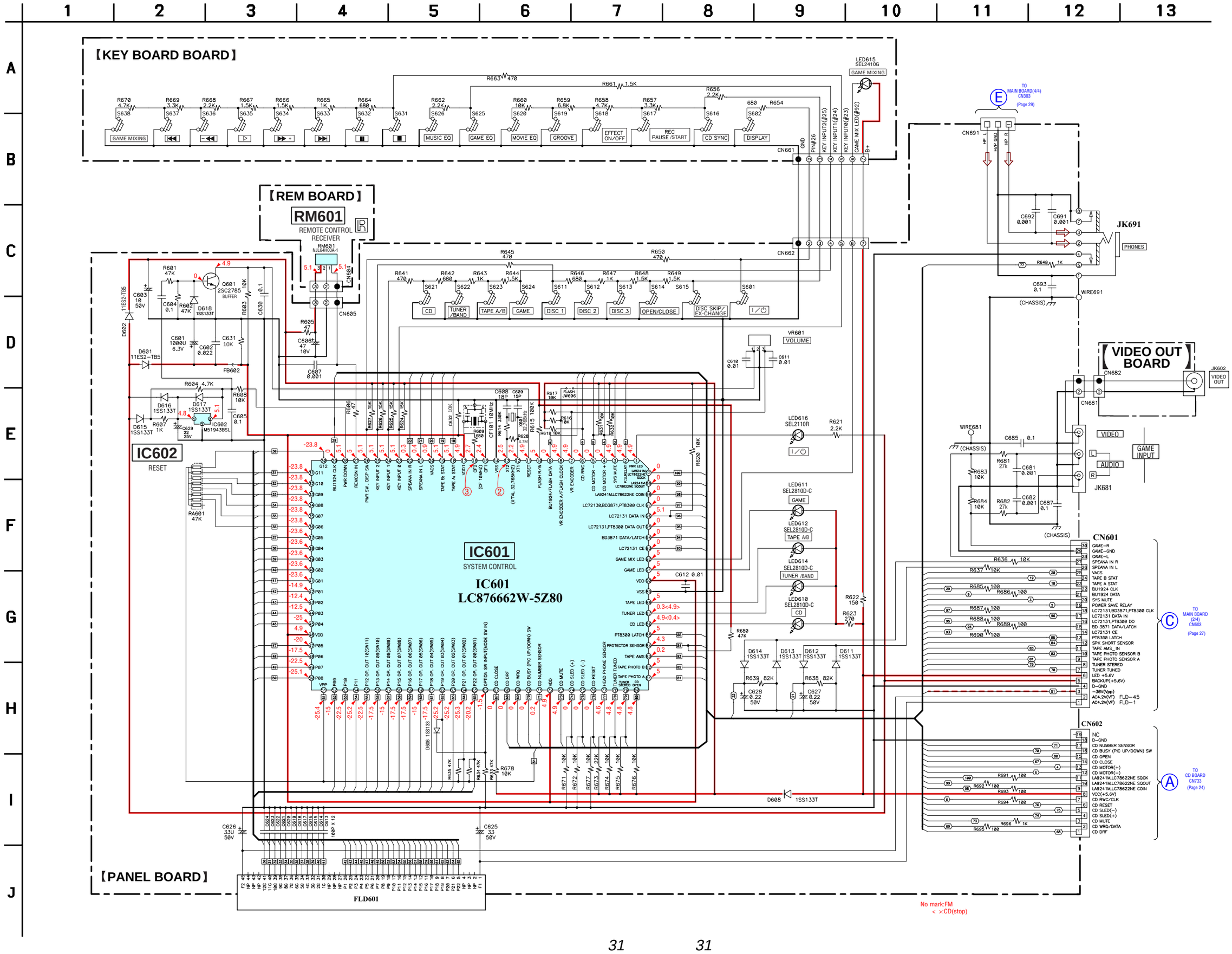
5-9. Schematic Diagram – MAIN Board (3/4) – • See page 34 for IC Block Diagrams.



5-10. Schematic Diagram – MAIN Board (4/4) –



5-12. Schematic Diagram – PANEL Section – • See page 36 for IC Pin Function Description. • See page 19 for Waveforms.



5-14. Schematic Diagram – POWER/TRANS Section –