CFD-S35CP

SERVICE MANUAL

AEP Model
UK Model
E Model

Ver. 1.1 2005.05

CD Section	Model Name Using Similar Mechanism	CFD-S350/S350L
	CD Mechanism Type	KSM-213CDP
	Optical Pick-up Name	KSS-213C
TC Section	Model Name Using Similar Mechanism	CFD-S350/S350L
	Tape Transport Mechanism Type	MF-S350

SPECIFICATIONS

CD player section

System
Compact disc digital audio system
Laser diode properties
Material: GaAlAs
Wave length: 780 nm
Emission duration: Continuous
Laser output: Less than 44.6 µW
(This output is the value measured at a distance of about 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.)
Spindle speed
200 r/min (rpm) to 500 r/min (rpm)
(CLV)
Number of channels
2
Frequency response
20 - 20,000 Hz +1/–2 dB
Wow and flutter
Below measurable limit

Radio section

Frequency range

E Model	
FM	87.5 - 108 MHz
AM	MX model: 530 - 1,710 kHz other models: 531 - 1,611 kHz (9 kHz step) 530 - 1,610 kHz (10 kHz step)
AEP, UK Model	
FM	87.5 - 108 MHz
MW	531 - 1,611 kHz (9 kHz step) 530 - 1,610 kHz (10 kHz step)
LW	153 - 279 kHz

Aerials
FM: Telescopic aerials
AM/MW/LW: Built-in ferrite bar aerials

Cassette-corder section

Recording system
4-track 2 channel stereo
Fast winding time
Approx. 120 s (sec.) with Sony cassette C-60
Frequency response
TYPE I (normal): 80 - 10,000 Hz

– Continued on next page –

CD RADIO CASSETTE-CORDER

9-879-598-02
2005E04-1

Sony Corporation
Personal Audio Group
Published by Sony Engineering Corporation

SONY®

General

Speaker
Full range: 10 cm dia., 3.2 Ω, cone type (2)
Outputs
Headphones jack (stereo minijack):
For 16 - 68 Ω impedance headphones
Maximum Power output
MX model: 2.3 W + 2.3 W
(at 3.2 ohms, 10% harmonic distortion)
other models: 5.2 W
Power requirements
For CD radio cassette-corder:
MX model: 120 V AC, 60 Hz
KR model: 220 V AC, 60 Hz
EA model: 220-240 V AC, 50/60 Hz
Other models: 230 V AC, 50 Hz
9 V DC, 6 R20 (size D) batteries
For remote control:
3 V DC, 2 R03 (size AAA) batteries
Power consumption
AC 14 W
Battery life
For CD radio cassette-corder:

FM recording
Sony R20P: approx. 13.5 h
Sony alkaline LR20: approx. 20 h
Tape playback
Sony R20P: approx. 7.5 h
Sony alkaline LR20: approx. 15 h
CD playback
Sony R20P: approx. 2.5 h
Sony alkaline LR20: approx. 7 h

Dimensions
Approx. 420 × 155 × 260 mm (w/h/d)
(incl. projecting parts)
Mass
Approx. 3.7 kg (incl. batteries)
Supplied accessory
Mains lead (1)
Remote control (1)
Conversion plug adaptor (1) (UK model)

Design and specifications are subject to change without notice.

• Abbreviation
EA : Saudi Arabia model
KR : Korean model
MX : Mexican model

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

Flexible Circuit Board Repairing

- Keep the temperature of the 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.

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.

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

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown 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 ⚠ OR DOTTED LINE WITH MARK ⚠ 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.

● UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

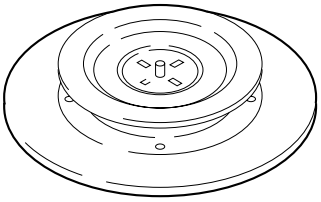
TABLE OF CONTENTS

SECTION 1
SERVICING NOTES

CHUCK PLATE JIG ON REPAIRING

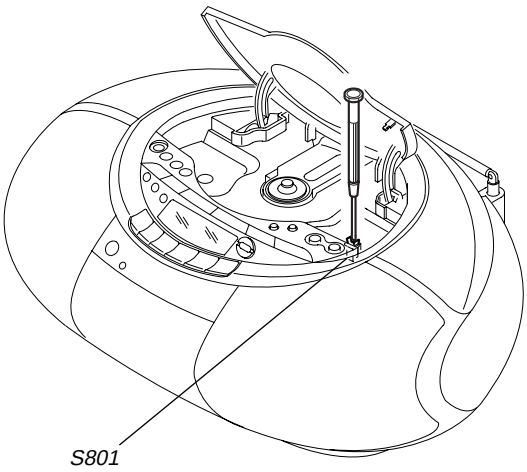
On repairing CD section, playing a disc without the lid (CD), use Chuck Plate Jig.

- Code number of Chuck Plate Jig: X-4918-255-1



LASER DIODE AND FOCUS SEARCH OPERATION CHECK

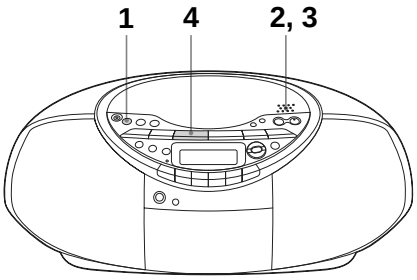
1. Turn ON the [POWER] or [OPERATE] button and press [CD] button to CD position.
2. Open the CD lid.
3. Turn on S801 with screwdriver, etc. as following figure.
4. Press the [►II] (CD) button.
5. Confirm the laser diode emission while observing the objecting lens. When there is no emission, Auto Power Control circuit or Optical Pick-up is broken.
   Objective lens moves up and down three times for focus search.



SECTION 2
GENERAL

This section is extracted from instruction manual.

Playing an audio CD or MP3 files



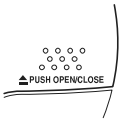
Connect the supplied mains lead (see page 23).

1 CD

Press CD.

(On the remote, press OPERATE (POWER, see page 2) and then press FUNCTION repeatedly until "CD" appears in the display.)

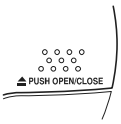
2



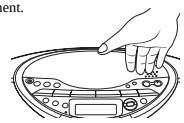
Press ⏏ PUSH OPEN/CLOSE down to open the CD compartment and place the CD on the CD compartment.

With the label side up

3



Close the lid of the CD compartment.



4 ►II

Press ►II (► on the remote).

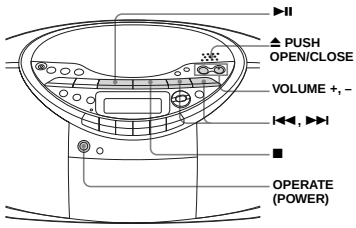
The player plays all the tracks once.

To play a CD with MP3 files, see page 6.

Display

Track number — Playing time

Use these buttons for additional operations



Tip

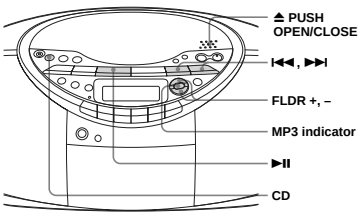
Playback starts from the track you last stopped playing (Resume play). During stop, the track number to be played are displayed.
To cancel the resume play to start play from the beginning of the first track, press ■ in stop mode.

To	Press
adjust the volume	VOLUME +*, – (VOL +*, – on the remote.)
stop playback	■
pause playback	►II* (II on the remote) Press the button again to resume play after pause.
go to the next track	►►I
go back to the previous track	I◄◄
remove the CD	⏏ PUSH OPEN/CLOSE**
turn on/off the player	OPERATE (or POWER, see page 2)

* The button has a tactile dot.
**Once you open the CD compartment, the track to start play will change to the beginning of the first track.

continued

Playing a CD with MP3 files



Note

Before playing a file, this player reads all file and folder information on the CD. Depending on the file structure, it may take more than a minute to read them. During this time, "READING" is displayed.

Tip

You can use the buttons mentioned in the table on page 5 for additional operations in the same way as when playing an audio CD.

1 Press CD.

2 Press ⏏ PUSH OPEN/CLOSE to open the CD compartment and place the CD on the CD compartment (see page 4) .

3 Close the lid of the CD compartment.

4 Press ►II.
The player plays all MP3 files on the CD.
When you play a CD with MP3 files, MP3 indicator lights up.

Track number — After the file name is displayed, the playing time will appear

To select a folder

Press FLDR + to go forward and FLDR – to go backward .
Press FOLDER +, – on the remote.

To select a file

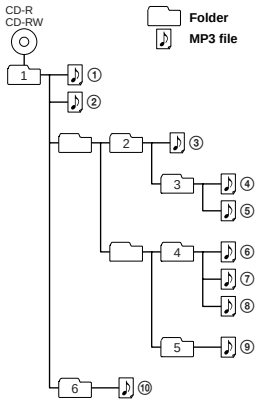
Press ►►I to go forward and I◄◄ to go backward.

Notes

- A folder that does not include an MP3 file is skipped.
- Maximum number of folders: 255
  Maximum number of files: 255
- Folder names and file names can be displayed with up to 64 characters.
- The characters A - Z, a - z, 0 - 9, and _ can be displayed on this player. Other characters are displayed as "*".
- This player conforms to Version 1.1 of the ID3 tag format. If the file has the ID3 tag information, "song title", "artist name" and "album name" can be displayed.

Example of folder structure and playing order

The playing order of the folders and files is as follows:



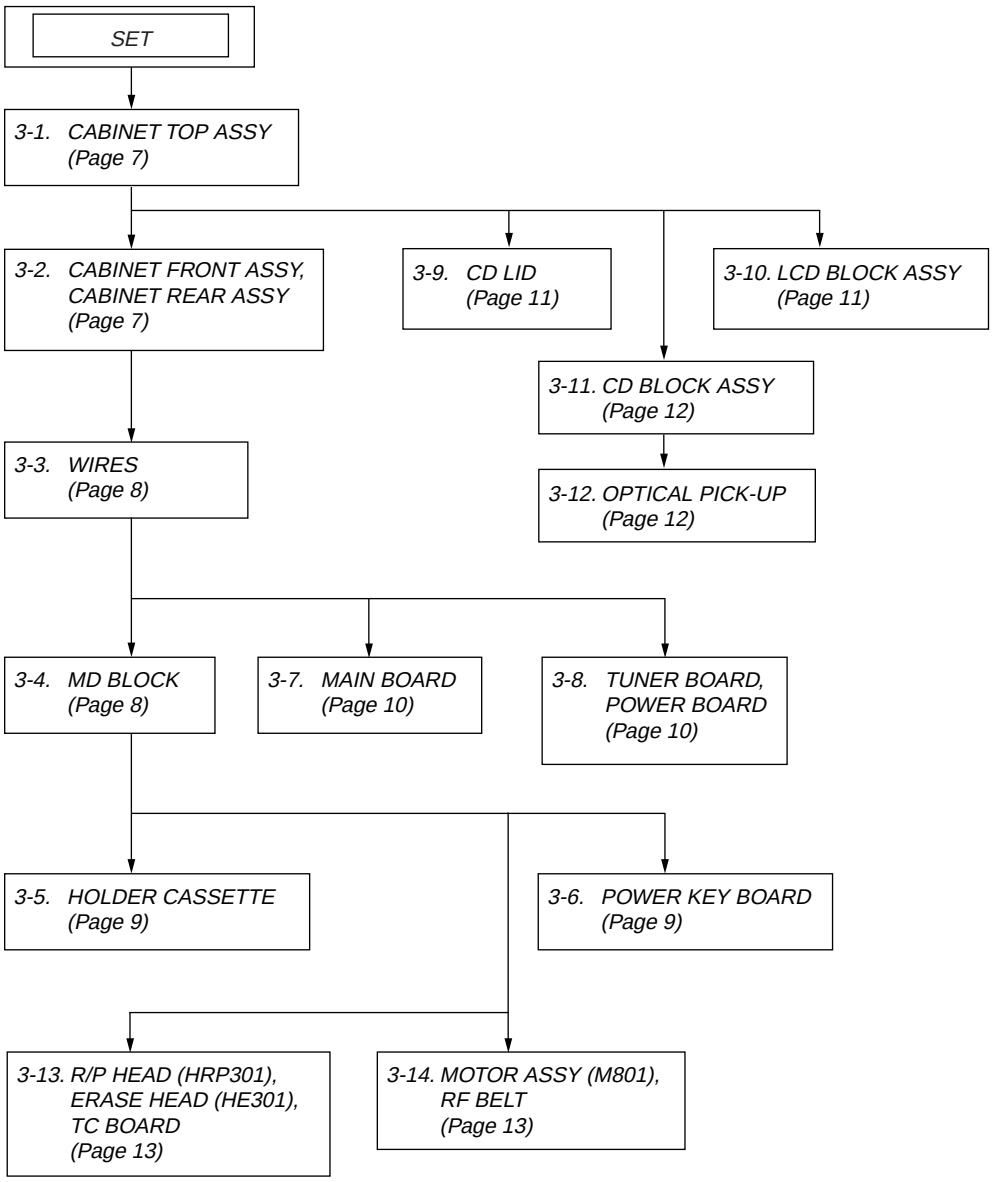
About CD-Rs/CD-RWs and MP3 files

This player can play CD-Rs/CD-RWs recorded in the CD-DA format* and MP3 files recorded in the CD-ROM format, but playback capability may vary depending on the quality of the disc and the condition of the recording device.

* CD-DA is the abbreviation for Compact Disc Digital Audio. It is a recording standard used for Audio CDs.

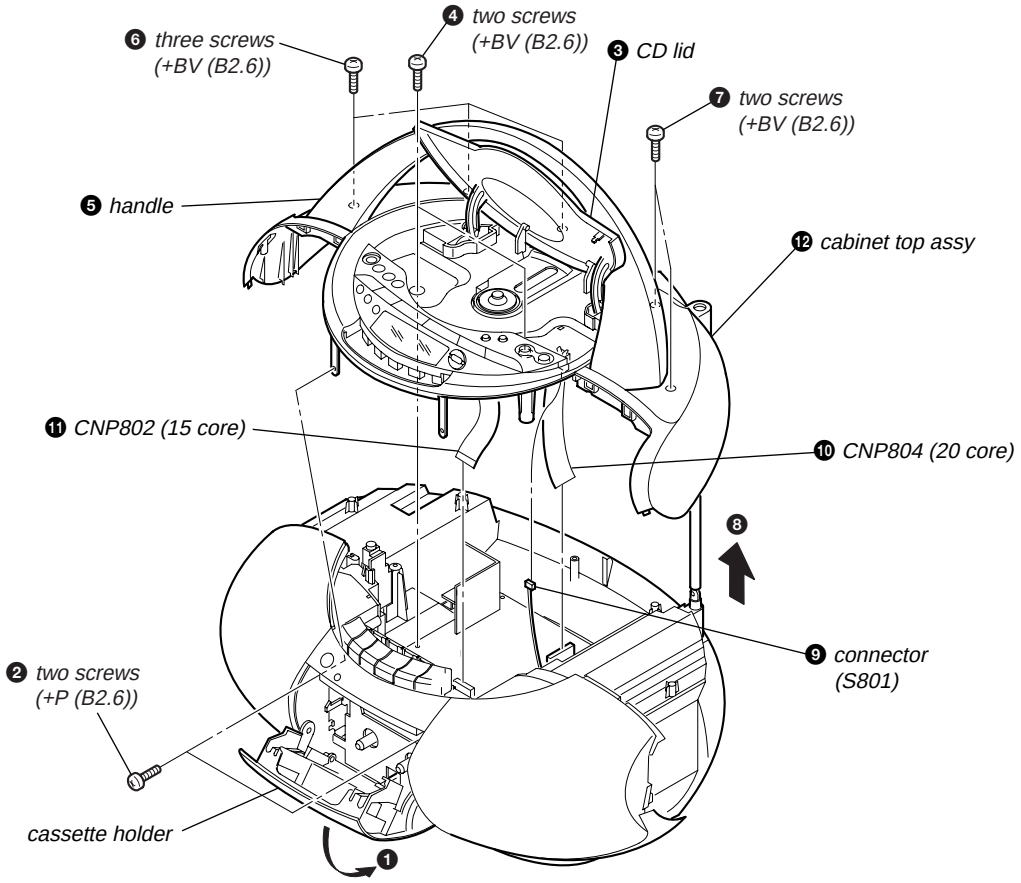
SECTION 3
DISASSEMBLY

• This set can be disassembled in the order shown below.

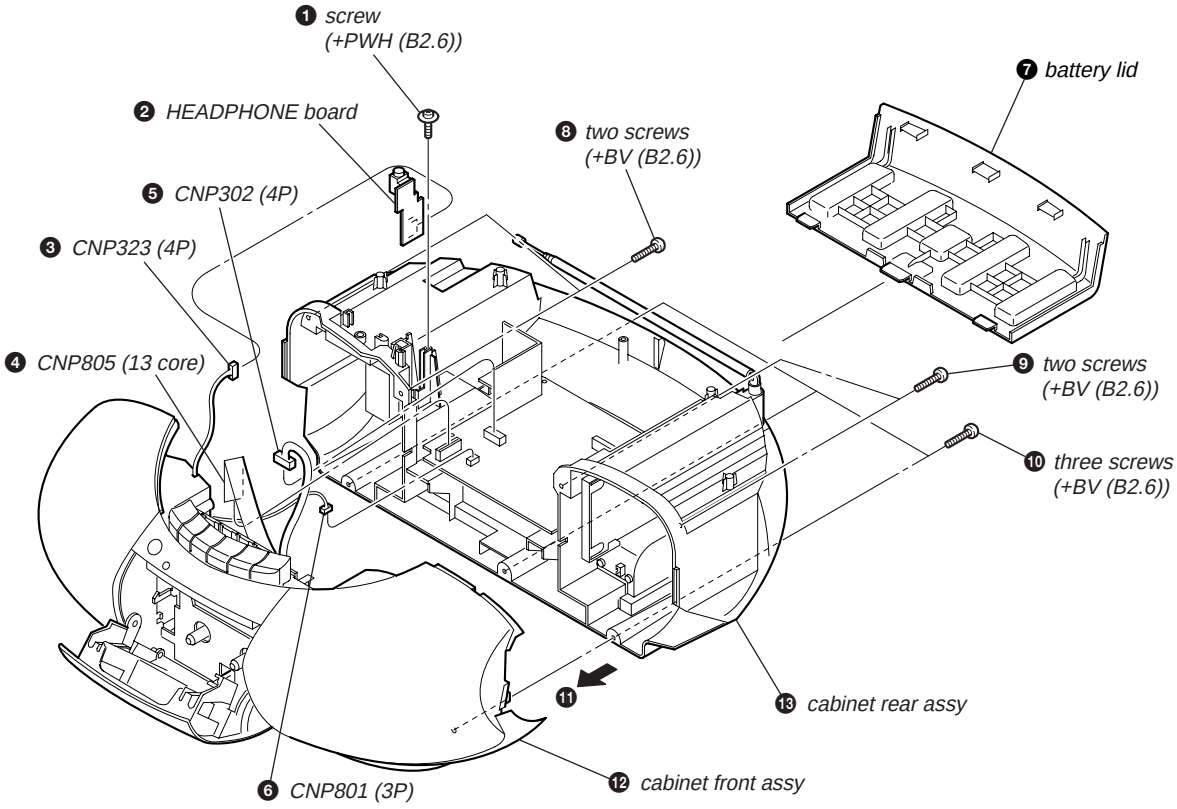


Note: Follow the disassembly procedure in the numerical order given.

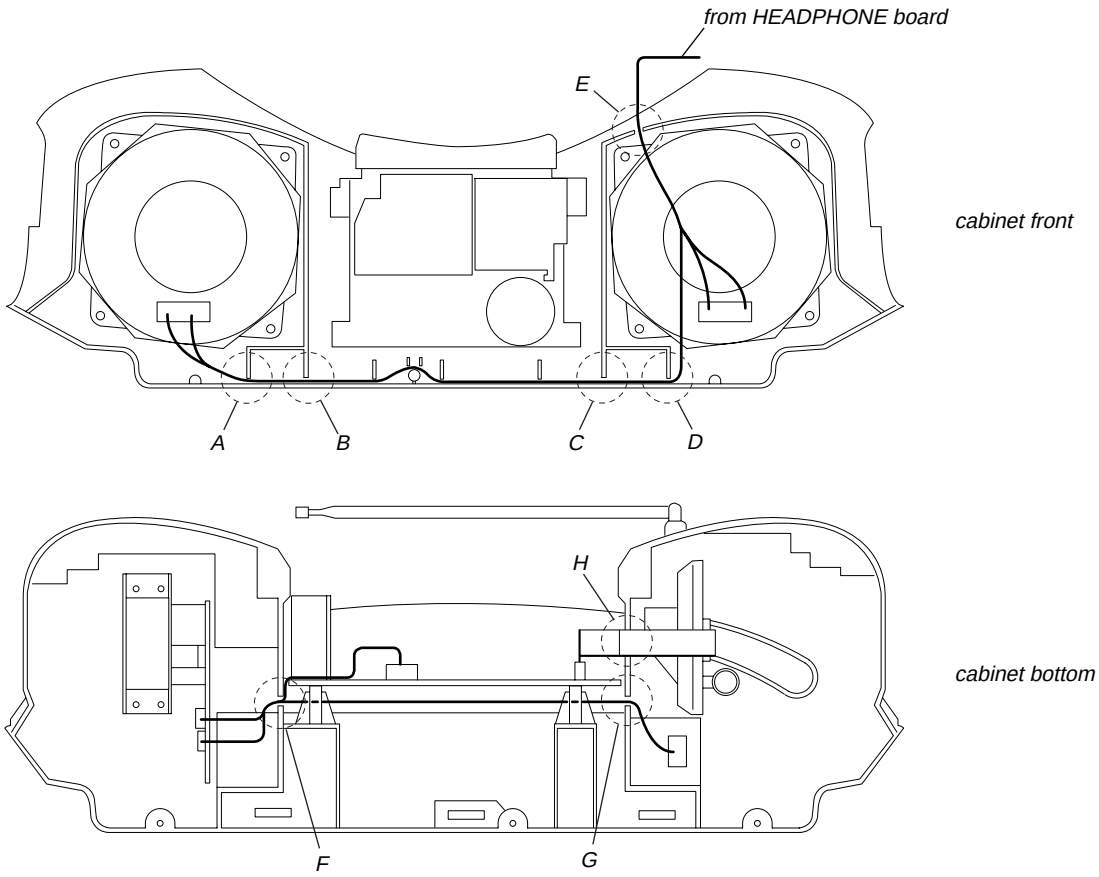
3-1. CABINET TOP ASSY



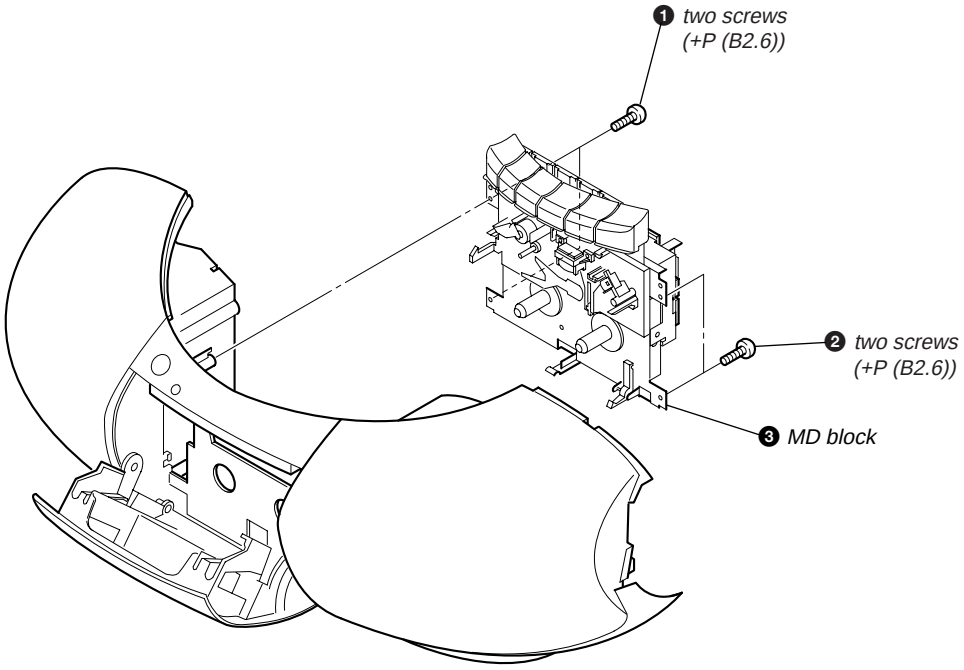
3-2. CABINET FRONT ASSY, CABINET REAR ASSY



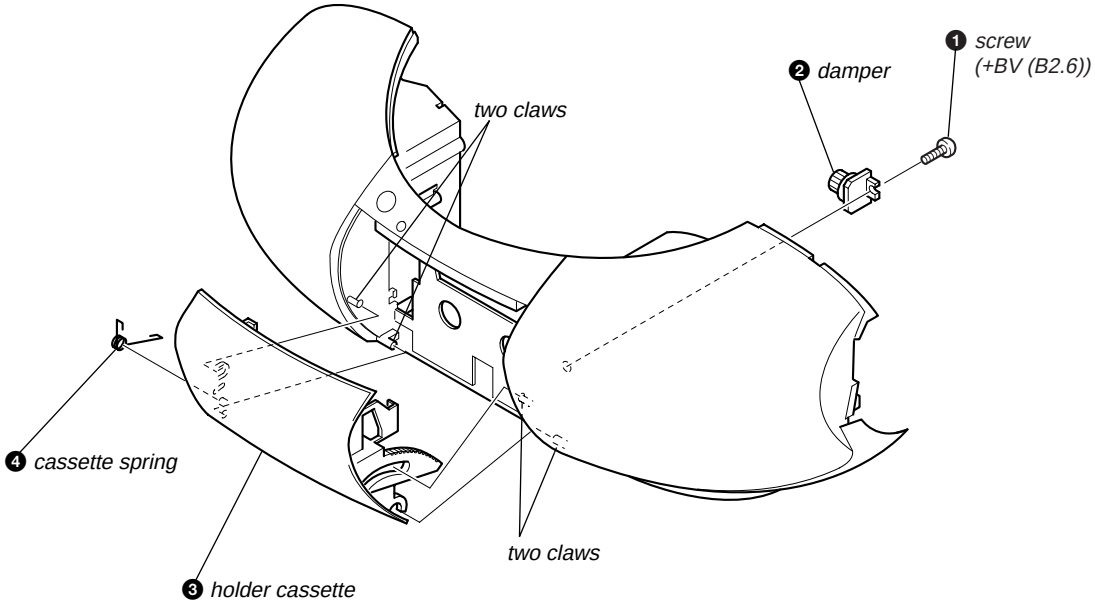
3-3. WIRES



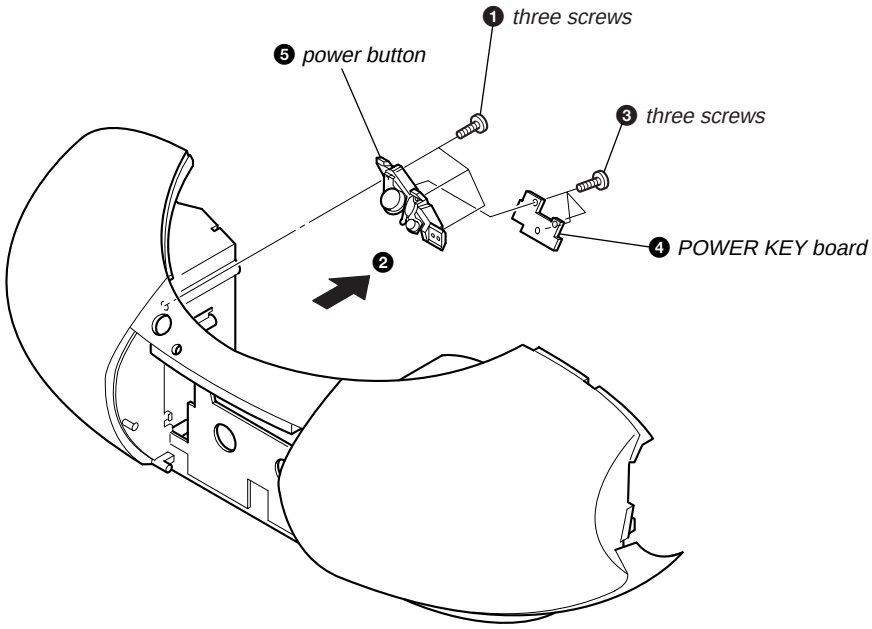
3-4. MD BLOCK



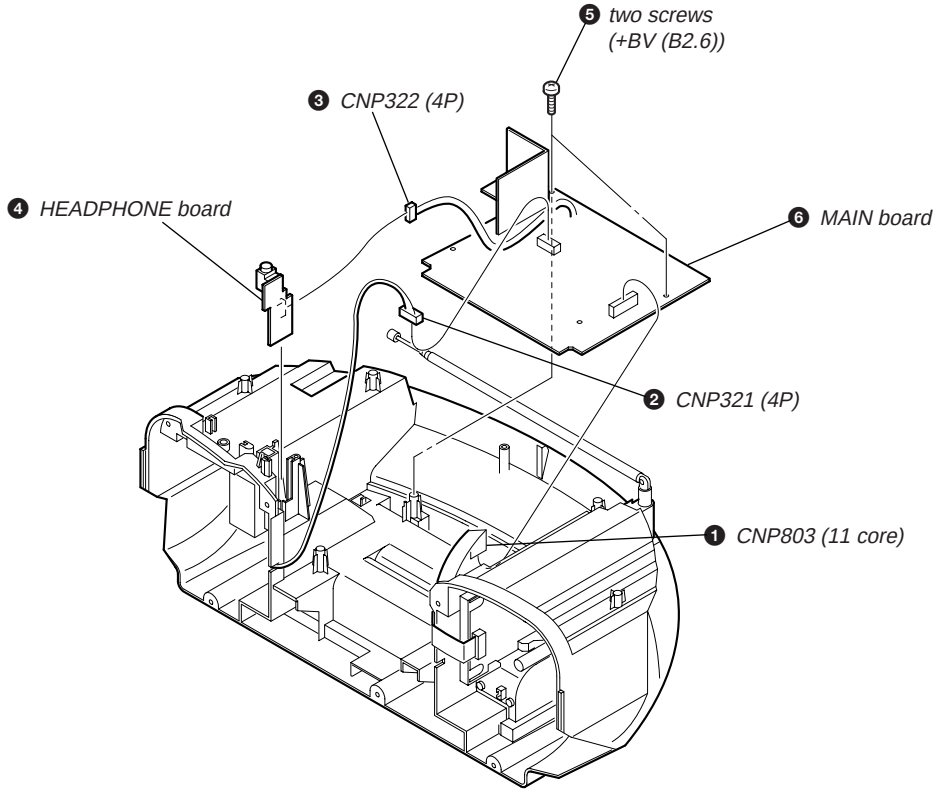
3-5. HOLDER CASSETTE



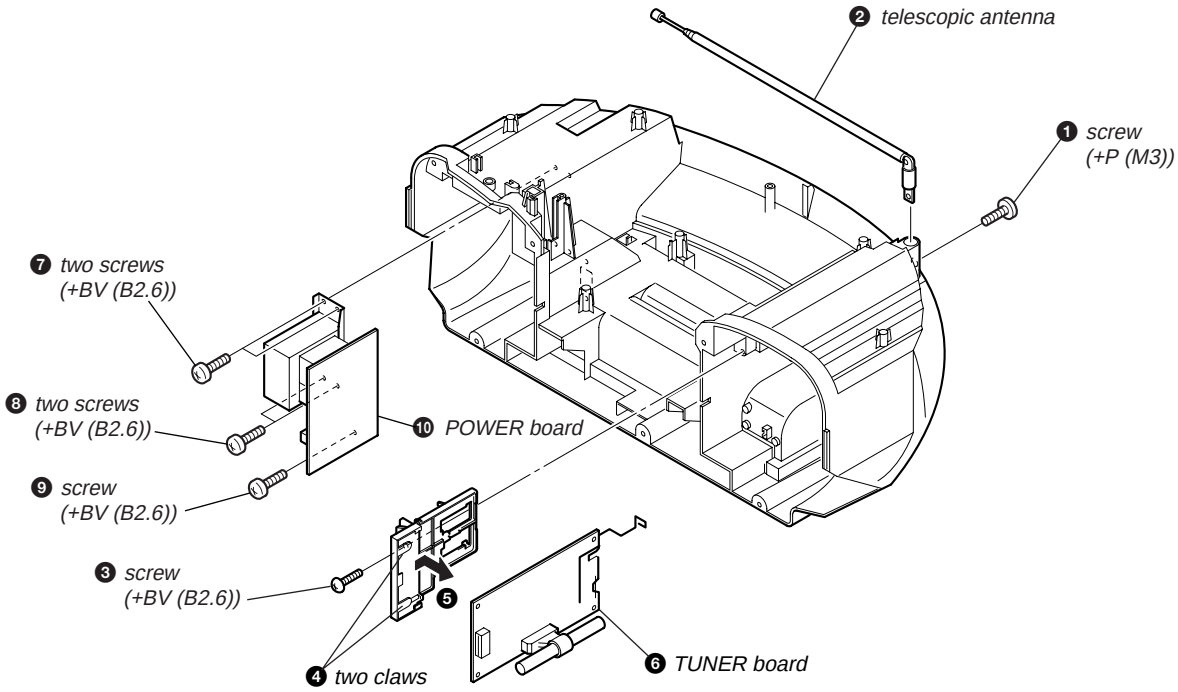
3-6. POWER KEY BOARD



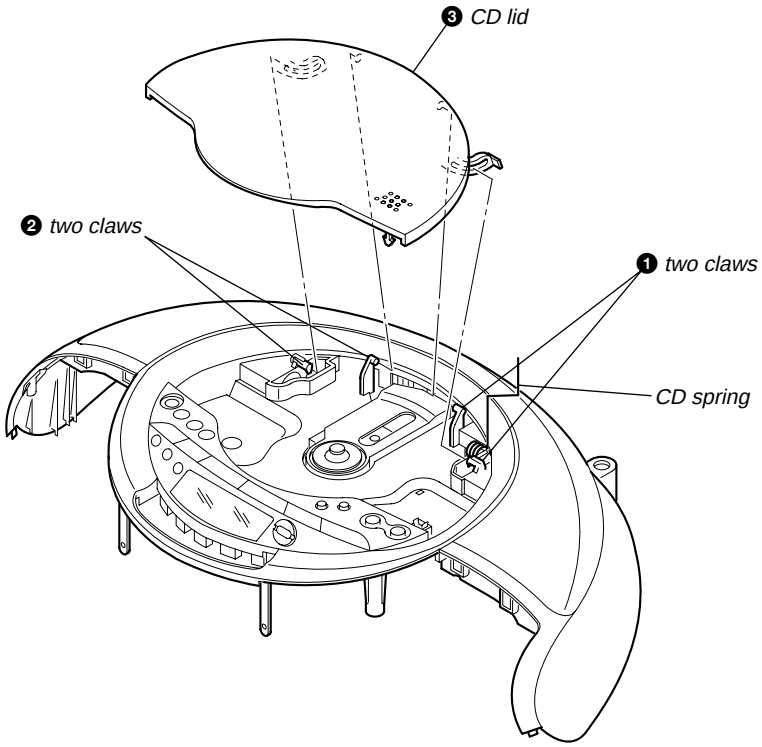
3-7. MAIN BOARD



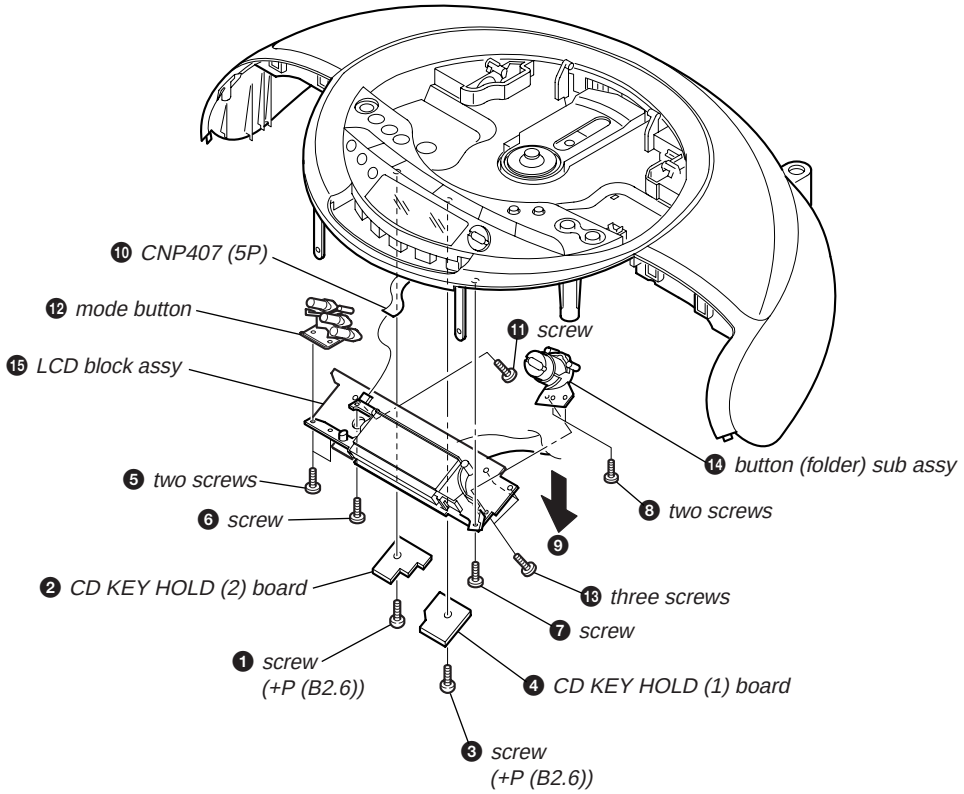
3-8. TUNER BOARD, POWER BOARD



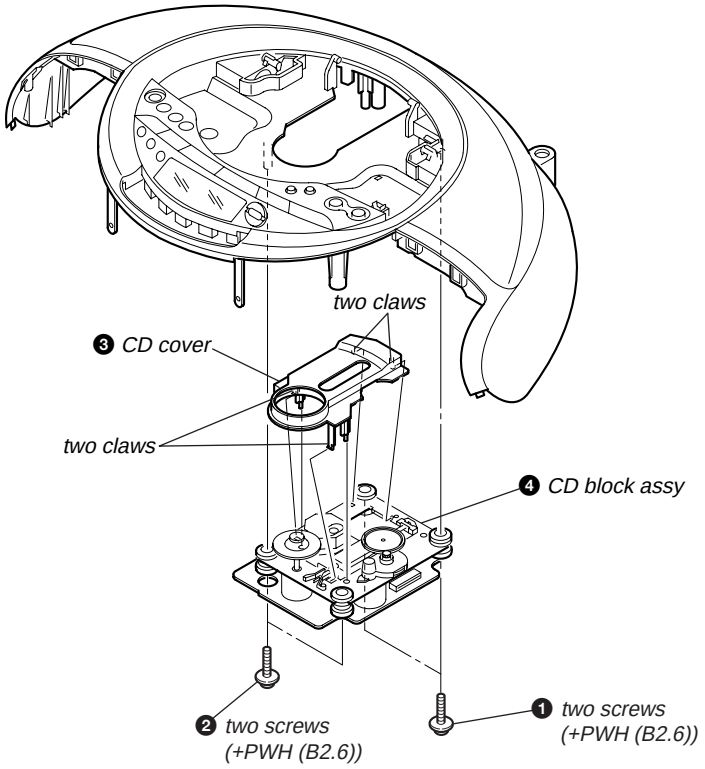
3-9. CD LID



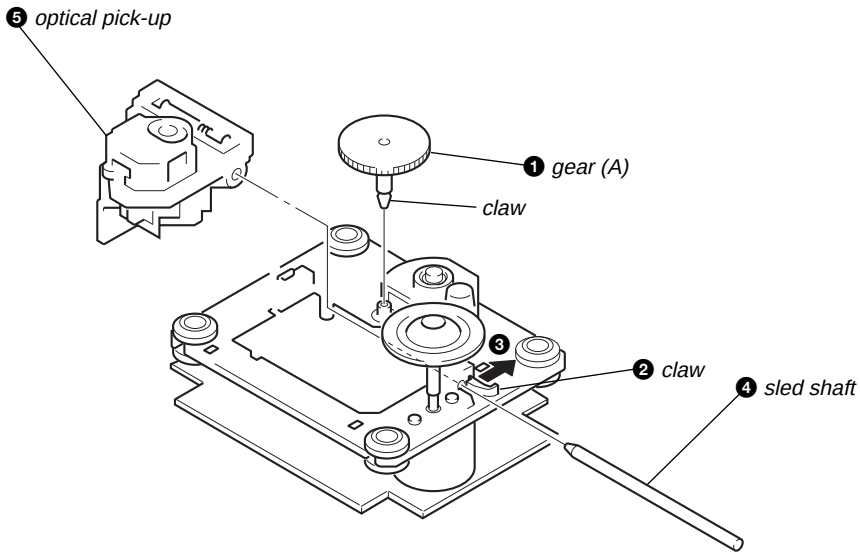
3-10. LCD BLOCK ASSY



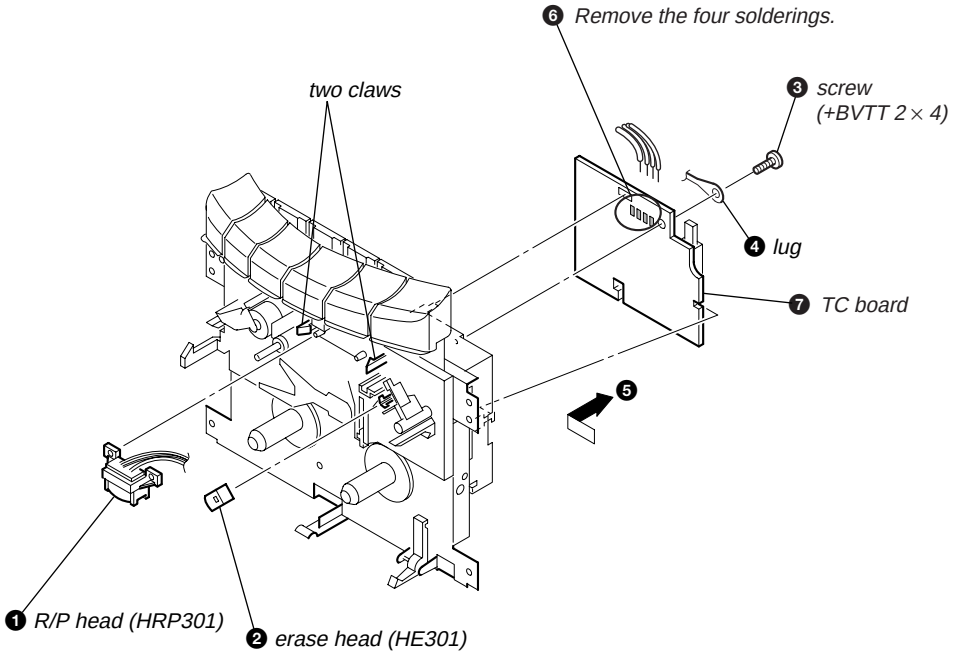
3-11. CD BLOCK ASSY



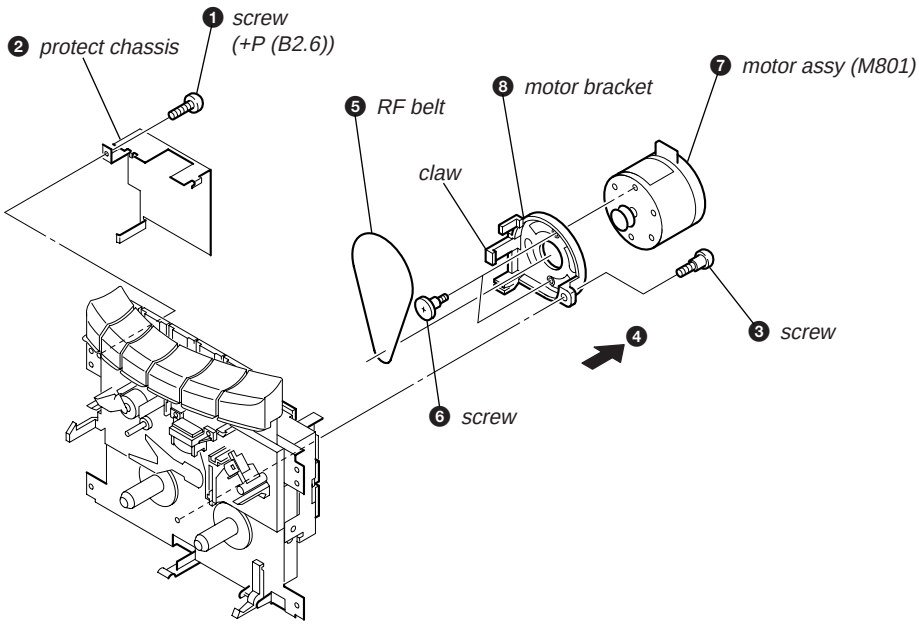
3-12. OPTICAL PICK-UP



3-13. R/P HEAD (HRP301), ERASE HEAD (HE301), TC BOARD



3-14. MOTOR ASSY (M801), RF BELT



SECTION 4
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab:
   record/playback heads, erase head, capstan, pinch rollers, rubber belts, idlers
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head magnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. The adjustments should be performed with the rated power supply voltage (9V) unless otherwise noted.

Torque Measurement

Mode	Torque meter	Meter reading
FWD	CQ-102C	2.95 – 6.86 mN • m (30 – 70 g • cm) (0.42 – 0.97 oz • inch)
FWD back tension	CQ-102C	0.15 – 0.53 mN • m (1.5 – 5.5 g • cm) (0.021 – 0.076 oz • inch)
FF	CQ-201B	more than 5.88 mN • m (more than 60 g • cm) (more than 0.83 oz • inch)
REW	CQ-201B	more than 5.88 mN • m (more than 60 g • cm) (more than 0.83 oz • inch)

Tape Tension Measurement

Mode	Torque meter	Meter reading
FWD	CQ-403A	more than100 g (more than 3.53 oz)

SECTION 5
ELECTRICAL ADJUSTMENTS

TAPE SECTION | 0 dB=0.775V

• Standard Output Level

Output terminal	HP OUT
load impedance	32 Ω
output signal level	0.25 V (–10 dB)

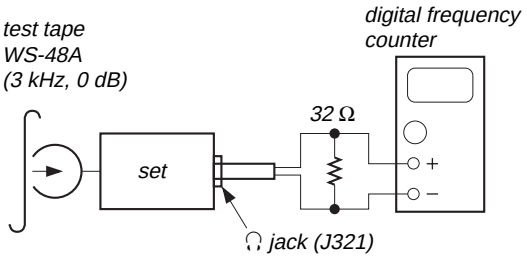
• Test Tape

Type	Signal	Used for
WS-48A	3 kHz, 0 dB	tape speed adjustment

Tape Speed Adjustment

Procedure:

Mode: playback



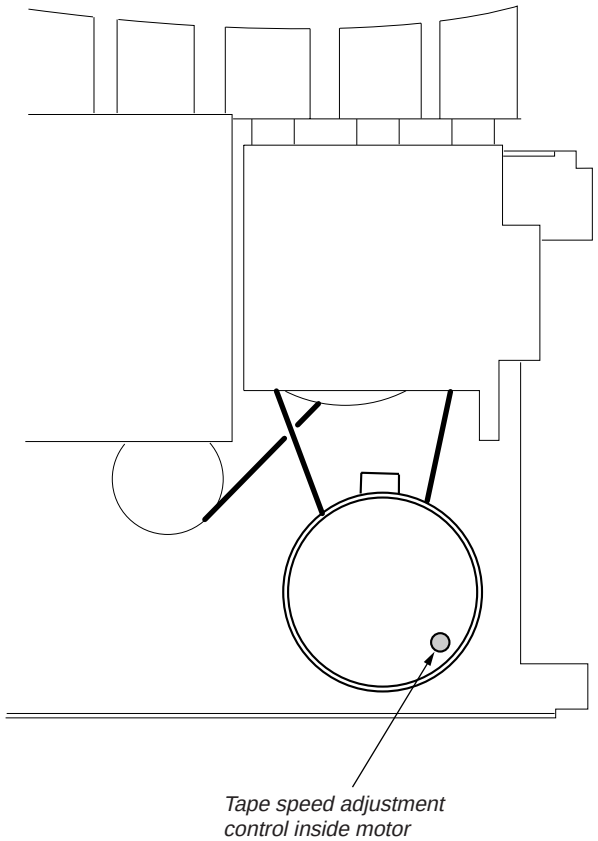
Adjust so that the value on the digital frequency counter is 3,000 Hz.

Specification Value:

Digital frequency counter
2,910 to 3,090 Hz

Adjust so that the frequency at the beginning and that at the end of tape winding are between 2,910 to 3,090 Hz.

Adjustment Location:



TUNER SECTION

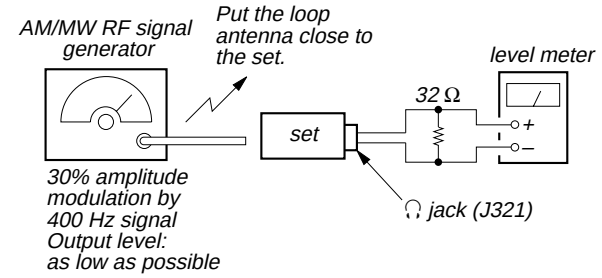
0 dB=1 µV

[AM/MW]

Setting:

Function: RADIO

Band: AM or MW or LW

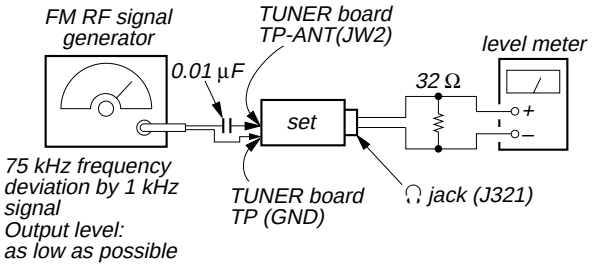


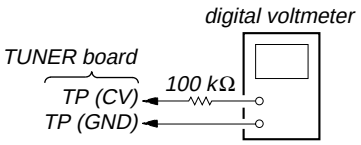
[FM]

Setting:

Function: RADIO

BAND button: FM





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

AM/MW IF ADJUSTMENT	
Adjust for a maximum reading on level meter	
T1	450 kHz

AM FREQUENCY COVERAGE ADJUSTMENT (EA, KR, MX, SP, TH model)		
Adjustment Part	Frequency Display	Reading on Digital Voltmeter
L4	531 kHz	1.0 ± 0.05 V
Confirmation	1,611 kHz	4.8 ± 0.7 V

AM TRACKING ADJUSTMENT (EA, KR, MX, SP, TH model)	
Adjust for a maximum reading on level meter	
L3	621 kHz
CT3	1,404 kHz

MW FREQUENCY COVERAGE CONFIRMATION (CET, RU model)	
Frequency Display	Reading on Digital Voltmeter
531 kHz	0.9 ± 0.4 V
1,611 kHz	5.2 ± 0.5 V

MW TRACKING ADJUSTMENT (CET, RU model)	
Adjust for a maximum reading on level meter	
L3-1	621 kHz
CT3	1,404 kHz

LW FREQUENCY COVERAGE ADJUSTMENT (CET, RU model)		
Adjustment Part	Frequency Display	Reading on Digital Voltmeter
Confirmation	153 kHz	0.6 ± 0.05 V
L4	279 kHz	5.3 ± 0.5 V

LW TRACKING ADJUSTMENT (CET, RU model)	
Adjust for a maximum reading on level meter	
L3-2	162 kHz
CT5	261 kHz

FM IF ADJUSTMENT	
Adjust for a minimum reading on level meter	
T2	10.7 MHz

FM FREQUENCY COVERAGE ADJUSTMENT		
Adjustment Part	Frequency Display	Reading on Digital Voltmeter
L2	108 MHz	3.0 ± 0.2 V
Confirmation	87.5 MHz	1.3 ± 0.3 V

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter	
L1	87.5 MHz
CT1	108 MHz

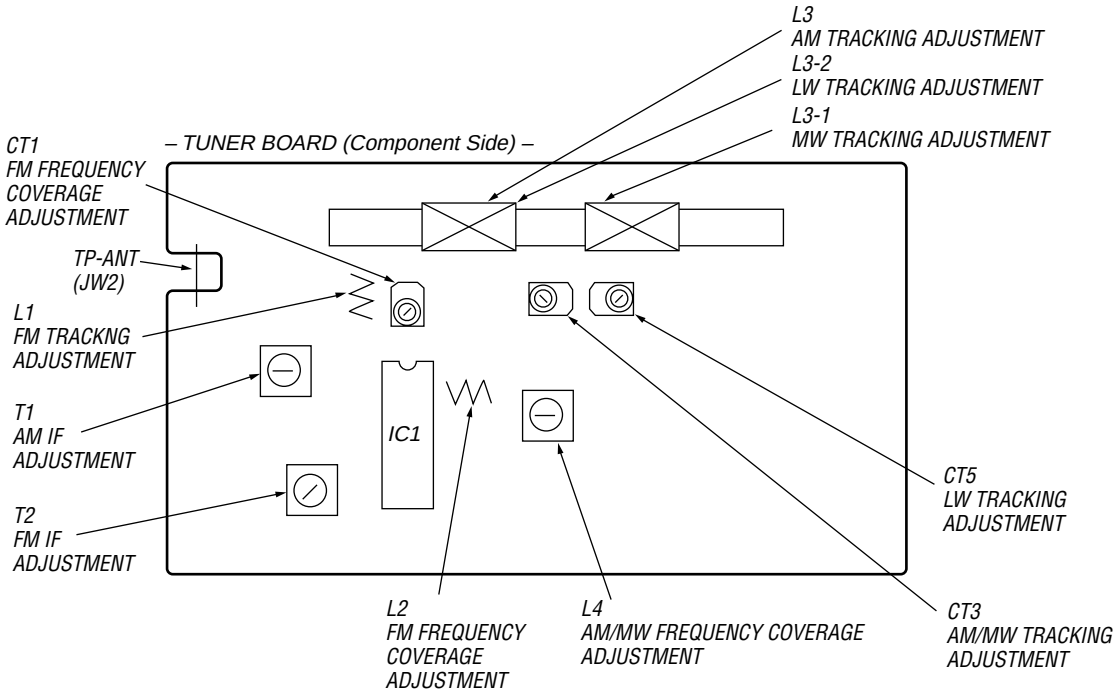
Adjustment and Connecting Location:

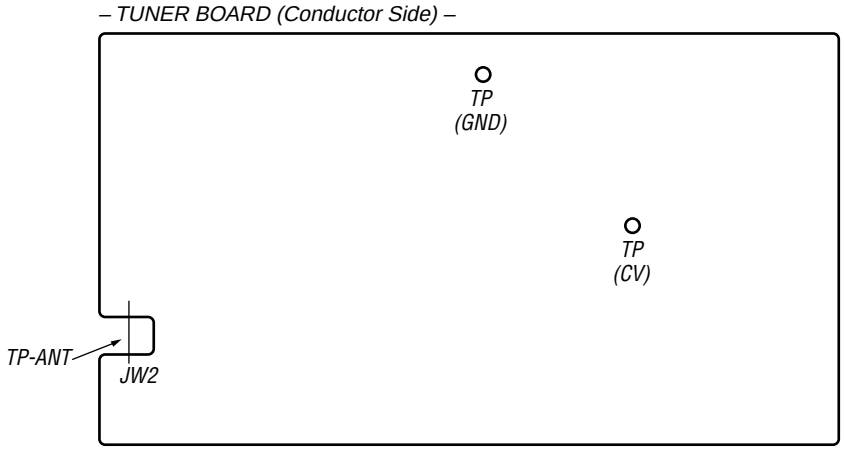
TUNER board (See page 16)

• Abbreviation

CET : East European and CSI model.
EA : Saudi Arabia model.
KR : Korean model.
MX : Mexican model.
RU : Russian model.
SP : Singapore model.
TH : Thai model.

Adjustment and Connecting Location:





CD SECTION

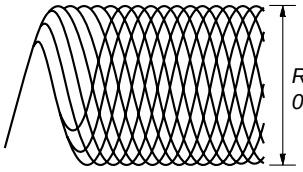
CD section adjustments are done automatically in this set.
In case of operation check, confirm that focus bias.

FOCUS BIAS CHECK

1. Connect the oscilloscope between IC701 pin ④ and pin ⑪ (or TP (RF) and TP (VREF)).
2. Insert the disc (YEDS-18). (Part No. : 3-702-101-01)
3. Press the ►II (CD) button.
4. Confirm that the oscilloscope waveform is as shown in the figure below. (eye pattern)
   A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.

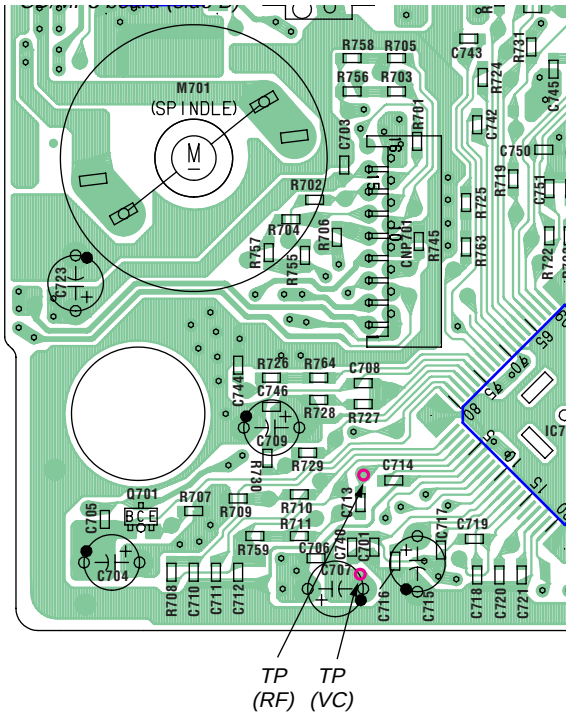
- RF signal reference waveform (eye pattern)

VOLT/DIV : 50 mV (10 : 1 probe in use)
TIME/DIV : 500 nS



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensitivity.

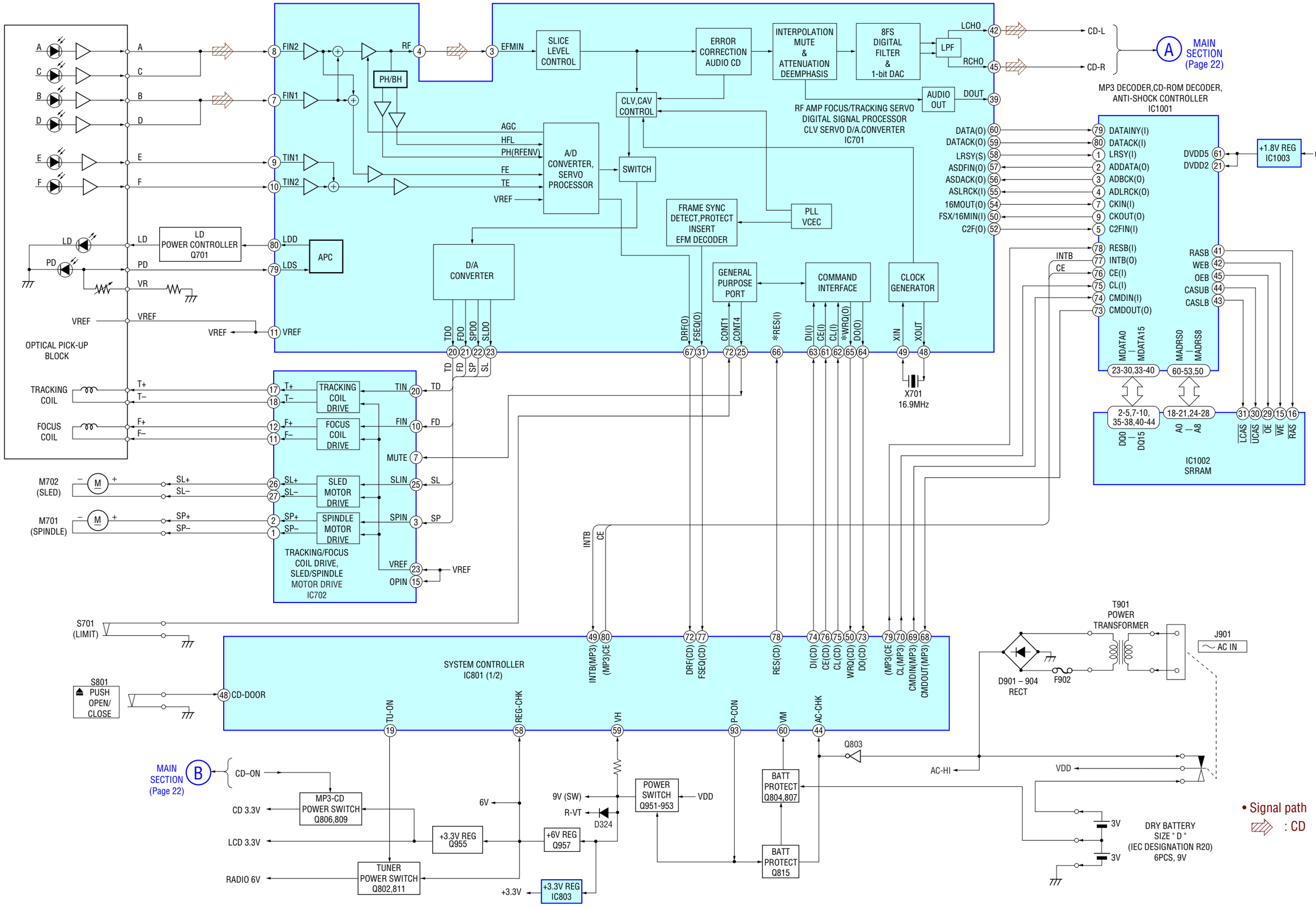
Test Point:
– MP3-CD Board (Side B) –



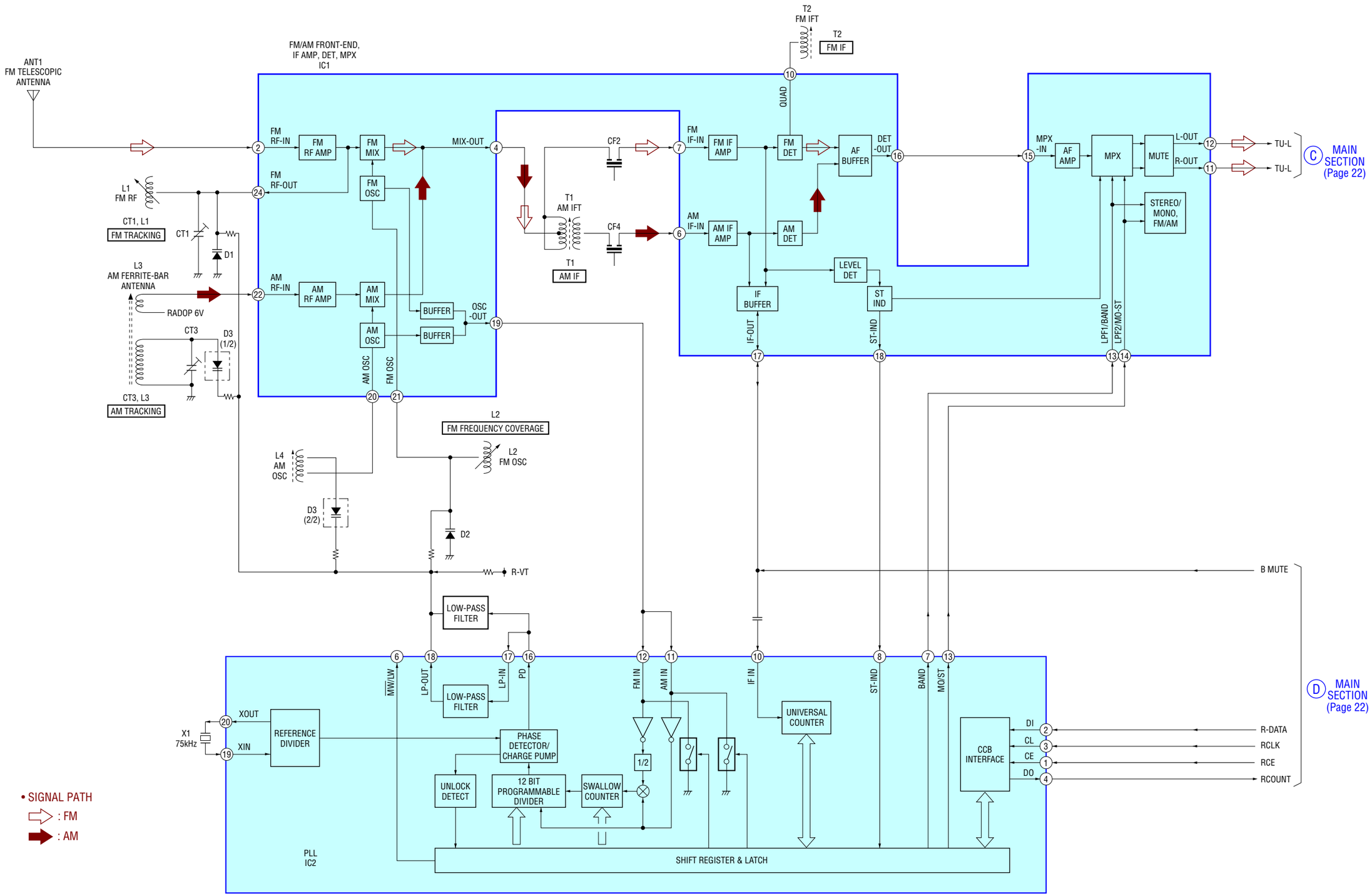
MEMO

SECTION 6
DIAGRAMS

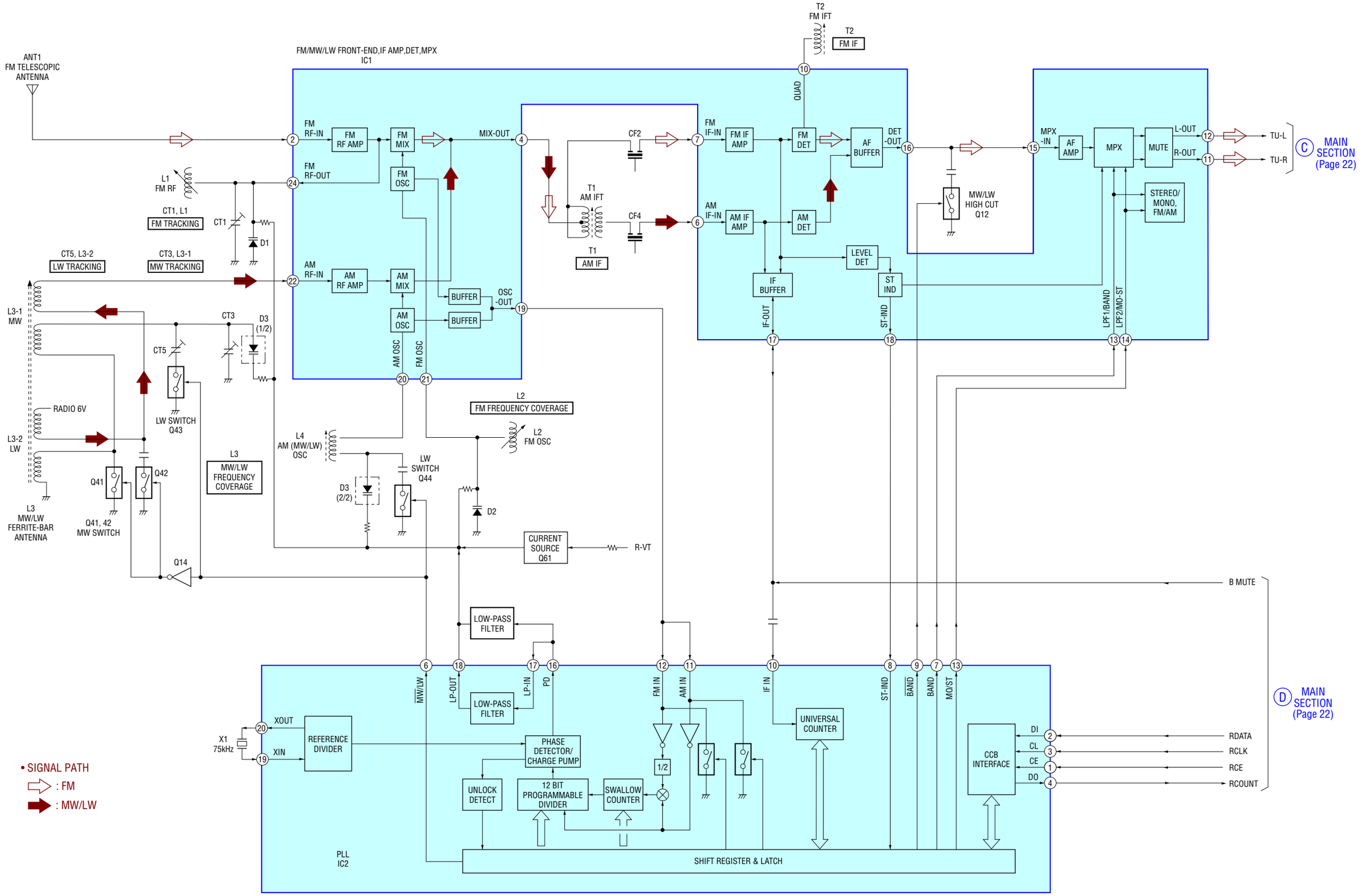
6-1. BLOCK DIAGRAM – CD SECTION –



6-2. BLOCK DIAGRAM – TUNER-2 BAND SECTION –



6-3. BLOCK DIAGRAM – TUNER-3 BAND SECTION –



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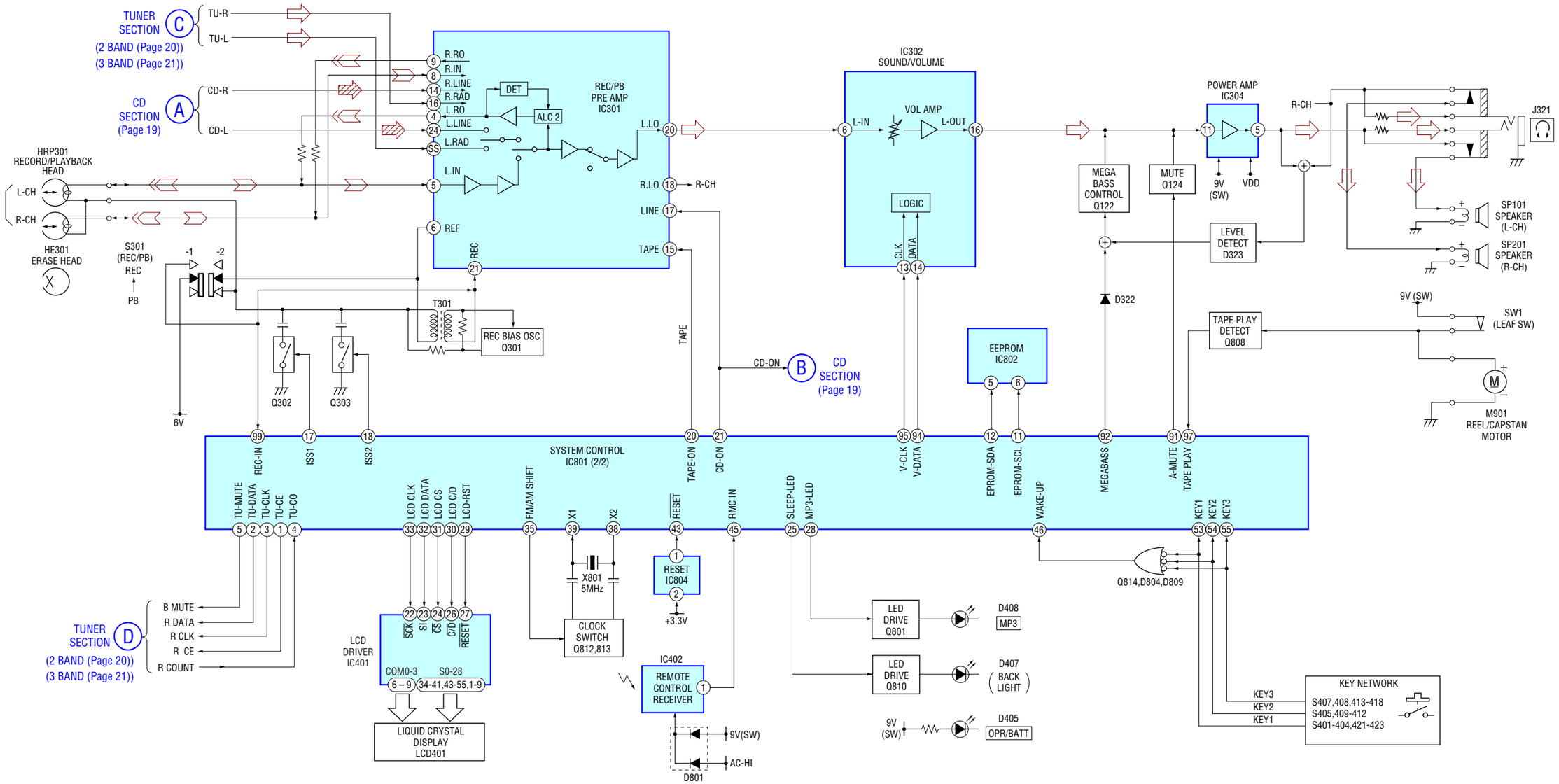
6-4. BLOCK DIAGRAM – MAIN SECTION –



- Signal path
  - : FM
  - : TAPE PLAY
  - : TAPE REC
  - : CD
- R-ch is omitted due to same as L-ch.
- Abbreviation
  CET: East European & CSI model
  RU : Russian model

• NOTE FOR PRINTED WIRING BOARDS AND SCHEMATIC 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 Diagrams:

- All capacitors are in μF unless otherwise noted. (p: pF) 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 tolerance.
- ▭ : panel designation.

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

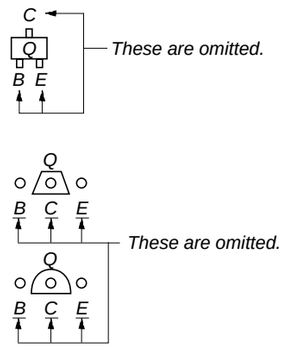
- ▬ : B+ Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  – CD Board –
  no mark : CD PLAY
  – TUNER Board –
  no mark : FM
  ( ) : AM (MW)
  < > : LW
  – Other Boards –
  no mark : FM
  ( ) : PB
  < > : REC
  [ ] : CD PLAY
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
  ➡ : AM (MW/LW)
  : PB
  : REC
  : CD PLAY
- Abbreviation
  CET : East European and CSI model.
  EA : Saudi Arabia model.
  KR : Korean model.
  MX : Mexican model.
  RU : Russian model.
  SP : Singapore model.
  TH : Thai model.

Note on Printed Wiring Boards:

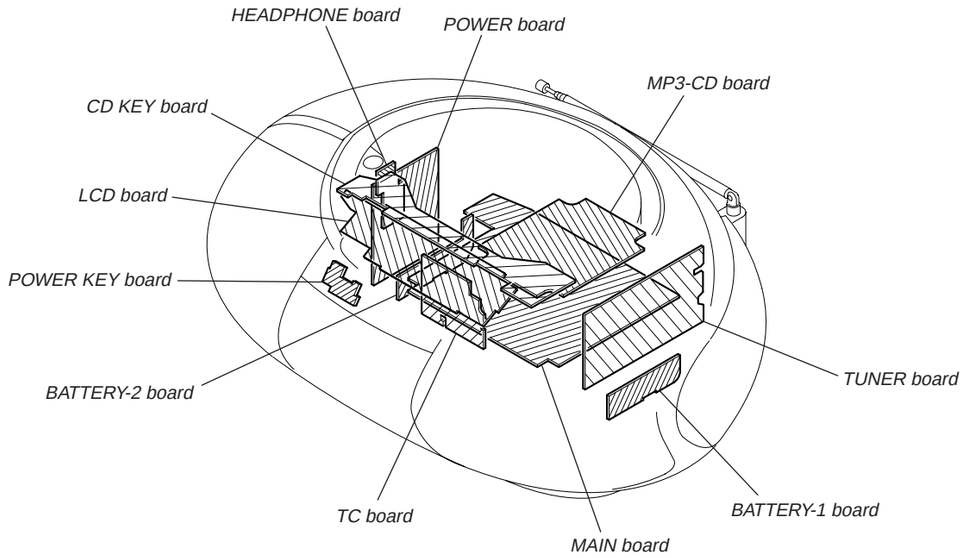
- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ⊡← : indicates side identified with part number.
- △ : internal component.
- ▬ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:
Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side) Parts on the parts face side seen from the parts face are indicated.

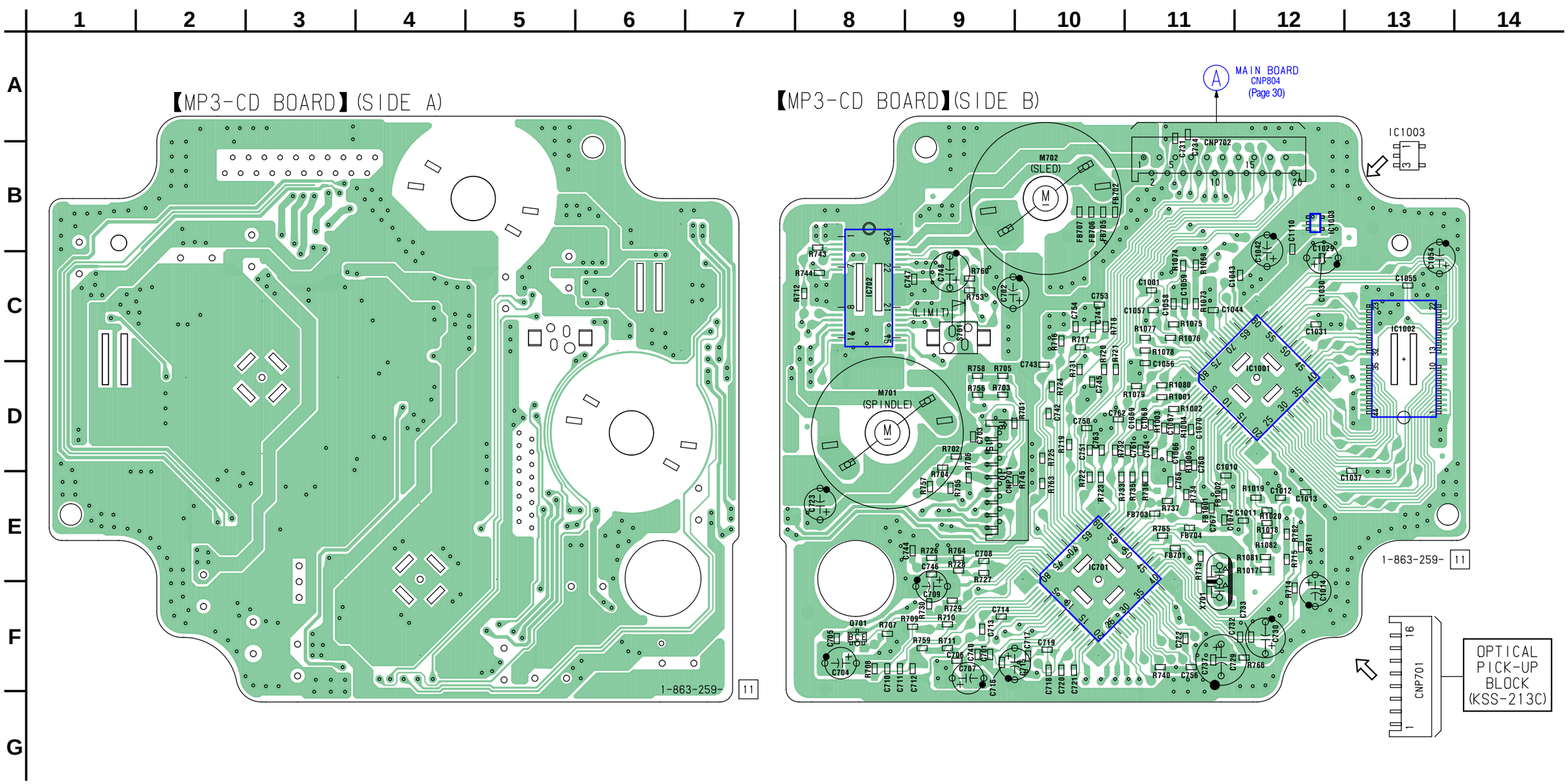


- **Circuit Boards Location**



6-5. PRINTED WIRING BOARD – MP3-CD SECTION –

• See page 23 for Circuit Boards Location. :Uses unleaded solder.



- **Semiconductor Location**

Ref. No.	Location
IC701	E-10
IC702	C-8
IC1001	D-12
IC1002	C-13
IC1003	B-12
Q701	F-8