HCD-H160/H600

SERVICE MANUAL

HCD-H160 and HCD-H600 are the tuner, deck, CD and amplifier section in FH-B166 and MHC-600 respectively.

PHOTO : HCD-H600

AEP Model

HCD-H160

HCD-H600

UK Model

HCD-H600

COMPACT disc DIGITAL AUDIO

SECTION 5
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab :
   record/playback head　　pinch roller
   erase head　　rubber belt
   capstan　　idler
2. Demagnetize the record/playback head with a head demagnetizer.
   (Head demagnetizer do not approach for the erase head.)
3. Do not use a magnetized screwdriver for the adjustment.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustment should be performed with the rated power supply voltage unless otherwise noted.

• Torque Measurement

Torque	Torque meter	Meter reading
Forward	CQ-102C	30 to 60g•cm (0.42 to 0.83oz•inch)
Forward back tension	CQ-102C	1 to 5g•cm (0.014 to 0.069oz•inch)
Reverse	CQ-102RB	30 to 60g•cm (0.42 to 0.83oz•inch)
Reverse back tension	CQ-102RB	1 to 5g•cm (0.014 to 0.069oz•inch)
Forward, Reverse	CQ-201B	100 to 170g•cm (1.39 to 2.36oz•inch)

SECTION 6
ELECTRICAL ADJUSTMENTS

DECK SECTION

1. The adjustment should be performed in the publication. (Be sure to make playback adjustment at first.)
2. The adjustment and measurement should be performed for both L-CH and R-CH.
   • Switch position
   DOLBY NR switch : OFF

• Test Tape

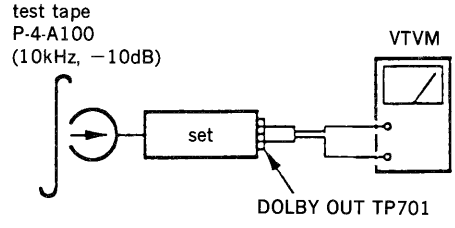
Tape	Contents	Use
P-4-A100	10kHz, −10dB	Head Azimuth Adjustment
P-4-L300	315Hz, 0dB	Level Adjustment
WS-48A	3kHz, 0dB	Tape Speed Adjustment
CS-122	—	Recording bias and Recording level Adjustment

Record/Playback Head Azimuth Adjustment

DECK A **DECK B**

Procedure :

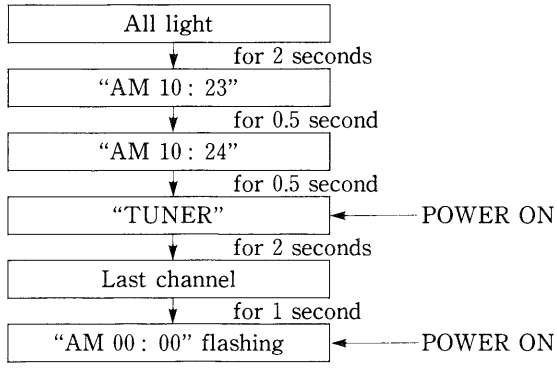
1. Forward Playback Mode



• Timer Test Mode

When BAND, SHIFT and PRESET/TIMER+buttons are pressed at the same time the following time test operation is performed. After the operation, it becoms in the system reset mode. Take care that the frequency preset to the tuner is initialized.

1) POWER OFF
2) Timer set　Clock　AM10 : 23
   Timer ON　AM10 : 24
   Timer OFF　AM10 : 31
   Function　TUNER
3) FL tube display (FLT501)



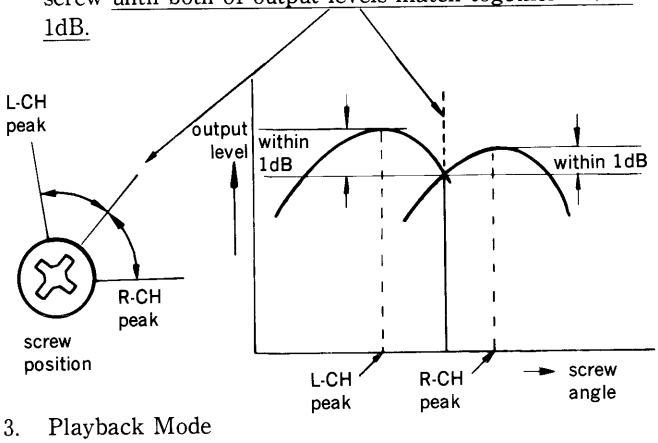
4) Finish

• Preset Frequency in Restting

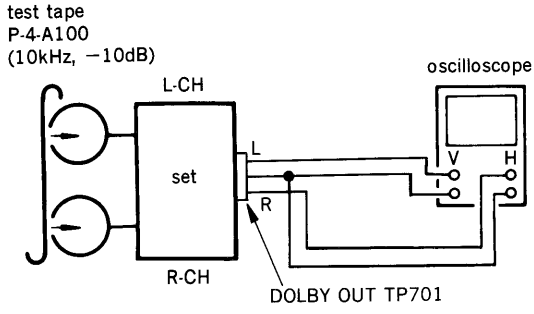
When pressing the system reset button (S702) of the rear side of the unit, the following frequency is preset to the tuner part. When the system reset is performed in repairing, be sure to return to the frequency set by the user.

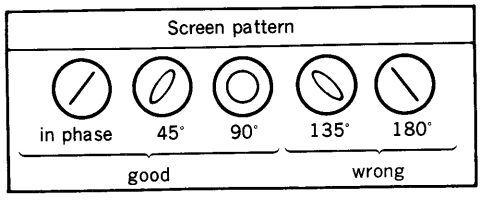
FM		no mark : AEP, Germany, UK model ( ) : Italian model			
		MW		LW	
A1	87.5MHz	A6	531(522)kHz	B1	153(144)kHz
A2	88.0MHz	A7	603(522)kHz	B2	162kHz
A3	98.0MHz	A8	999(522)kHz	B3	216kHz
A4	106.0MHz	A9	1040(522)kHz	B4	270kHz
A5	108.0MHz	A0	1602(1611)kHz	B5	279(288)kHz

2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1dB.



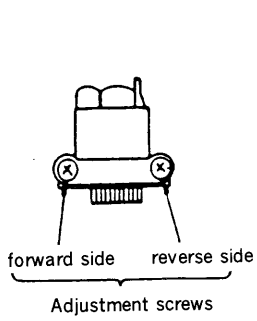
3. Playback Mode

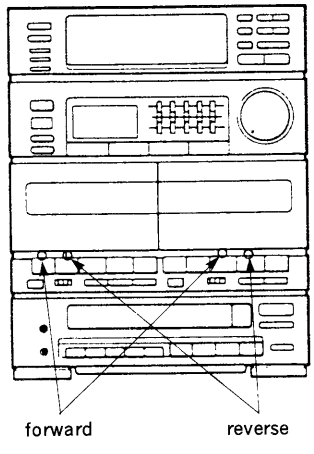




4. Change the reverse playback mode and repeat the steps 1 to 3.
5. After the adjustment, lock the adjustment screw with suitable locking compound.

Adjustment Location :
—record/playback head (deck A and B)



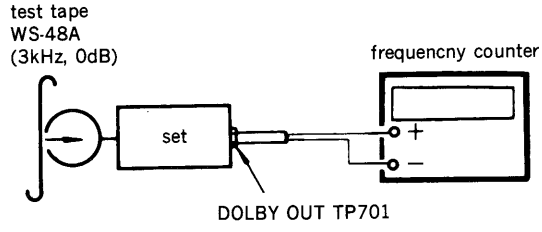


Tape Speed Adjustment DECK A DECK B

Procedure :

- Perform high speed adjustment before normal speed adjustment.

Mode : playback



Speed	Test pin (TP601)	Deck	Adjustment	Frequcency counter
※High	short	A	M1 (H)	5,960 to 6,040Hz
		B	M2 (H)	
Normal	open	A	M1 (L)	2,980 to 3,020Hz
		B	M2 (L)	

※ Continue to press HIGH SPEED DUBBING switch (S312) in playback mode: High speed playback.

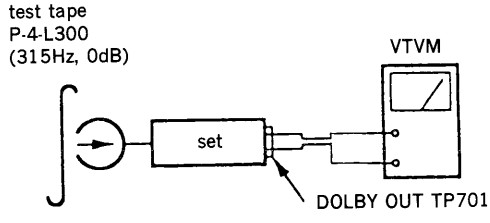
Frequency difference between the begining and the end of the tape should be within ±1.5%.

Adjustment Location : motors (M1 (deck A), M2 (deck B))

Playback Level Adjustment DECK A DECK B

Procedure :

Mode : playback



Deck A is RV41A (L-CH) and RV61A (R-CH), deck B is RV41B (L-CH) and RV61B (R-CH) so that adjustment within adjustment level as follows.

Adjustment Level :
LINE OUT level : −6±0.5dB (0.37 to 0.41V)
Level Difference between Channels : within 1dB

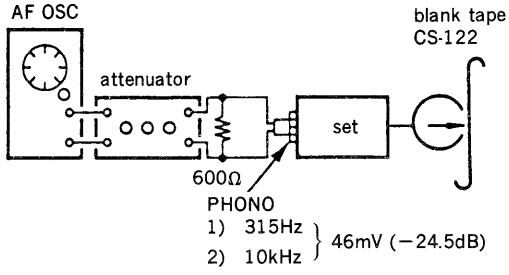
Confirm the DOLBY OUT level does not change in playback mode while changing the mode from playback to stop several times.

Adjustment Location : MD-A and MD-B boards

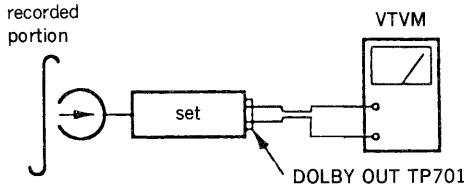
Record Bias Adjustment DECK B

Procedure :

1. record mode



2. playback mode



Confirm playback the signal recorded in step 1 become adjustment level as follows.
If these levels do not adjustment level, adjustment the RV42B (deck A) and RV62B (deck B) to repeat step 1 and 2.

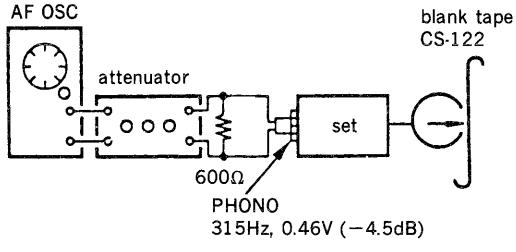
Adjustment level : Playback output of 315Hz to playback output of 10kHz : −0.5dB to 0.5dB

Adjustment Location : MD-B board

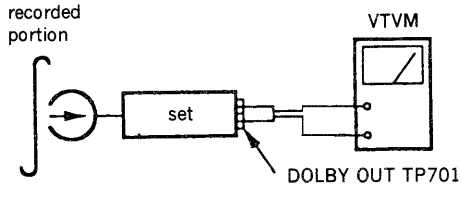
Record Level Adjustment DECK B

Procedure :

1. record mode



2. playback mode



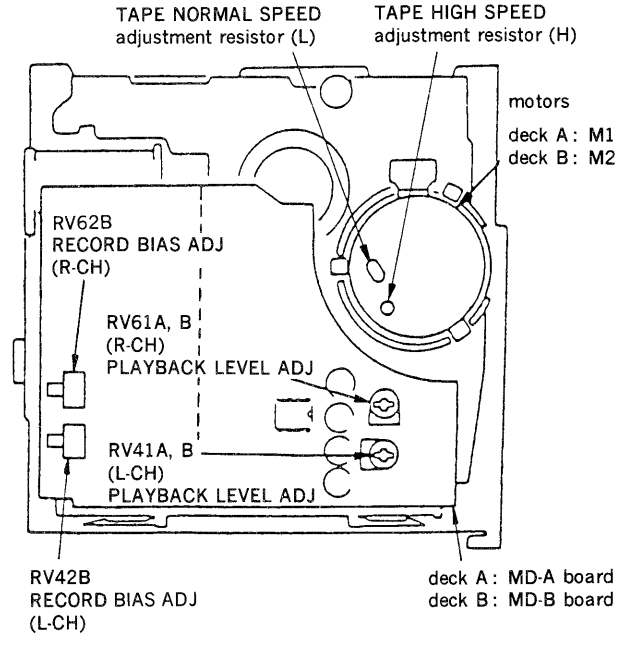
Confirm playback the signal recorded in step become adjustment level as follows.
If these levels do not adjustment level, adjustment the RV701 (deck A) and RV751 (deck B) to repeat step 1 and 2.

Adjustment Level :
LINE OUT level : −6±0.5dB (0.37 to 0.41V)

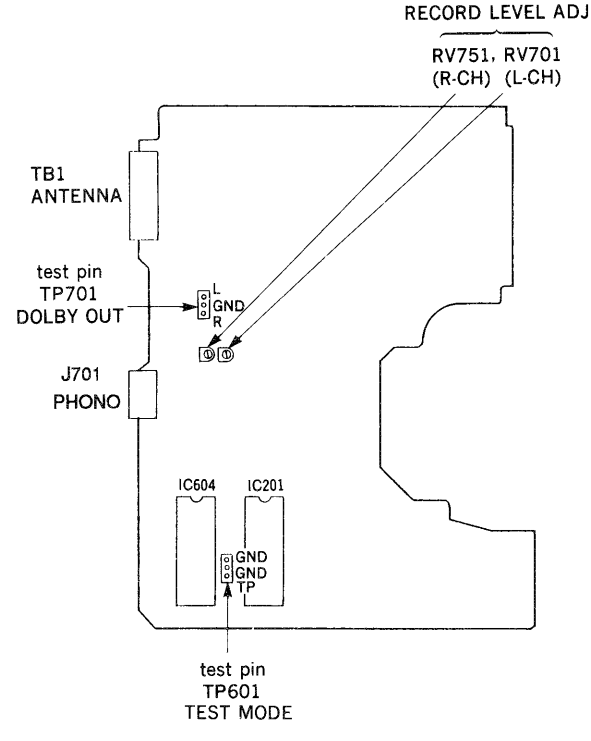
Adjustment Location : main board

Adjustment Location :

mechanism deck—rear side—



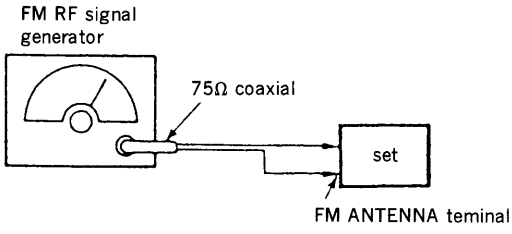
main board —component side—



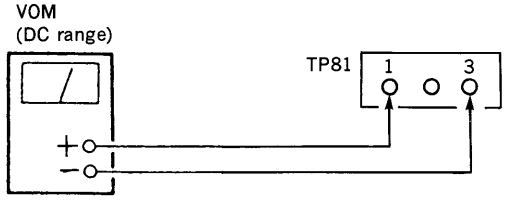
TUNER SECTION

FM SECTION ADJUSTMENTS

Setting :



Carrier frequency : 98MHz
Modulation : 1kHz, 40kHz deviation
Output level : as low as possible



FM Discriminator Alignment (NULL Check)

Band : FM

Procedure :

1. Supply a 1mV (60dBμ) 98MHz signal from the ANTENNA terminal.
2. Tune the to 98MHz.
3. Adjust IFT82 for 0V reading on the VOM.

Note : FM tuned indication lighting level adjustment should be made after FM discriminator alignment.

FM Tuned Indication Lighting Level Adjustment

Band : FM

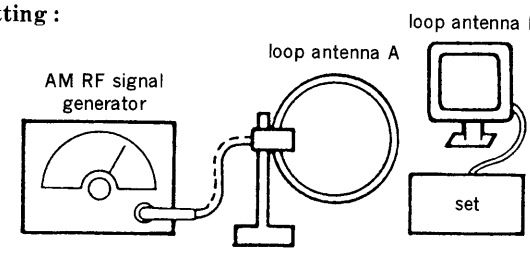
Procedure :

1. Supply a 32μV (30dBμ) 98 MHz signal from the ANTENNA terminal.
2. Tune the set to 98MHz.
3. Adjust RV81 so that the TUNED light up.

Adjustment Location : main board

AM SECTION ADJUSTMENTS

Setting :



30% amplitude
modulation by 400Hz signal
Output level : as low as possible

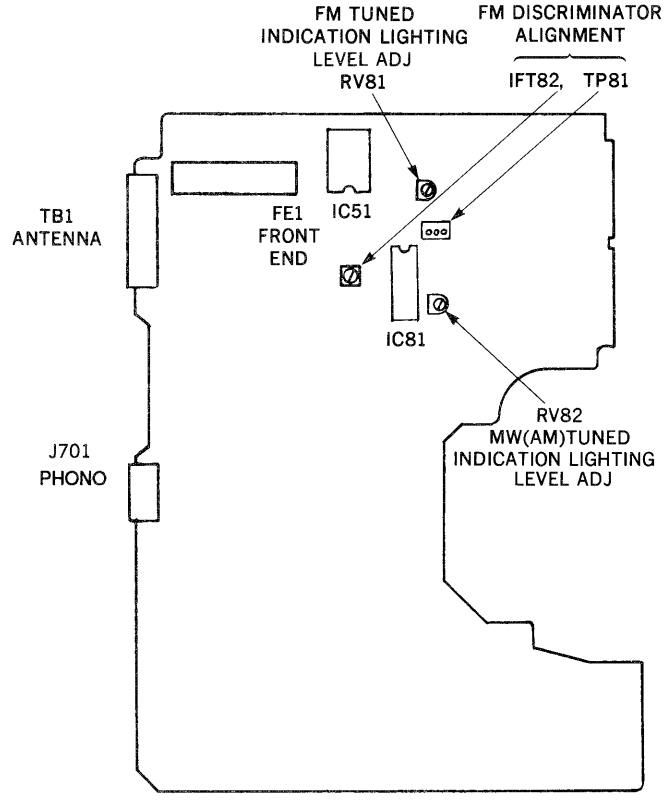
MW Tuned Indication Lighting Level Adjustment

Band : MW

Procedure :

1. Set loop antenna A so that the loop antenna, B input level becomes 0.45mV (53dBμ)
2. Tune the set to 1,404kHz.
3. Adjust the RV82 so that the TUNED light up.

Adjustment Location : main board —component side—

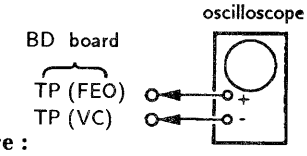


CD SECTION

Note :

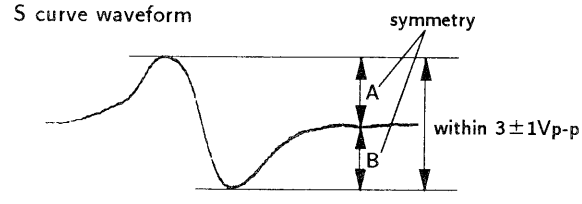
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than 10MΩ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal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

S Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FEO) on BD board.
2. Connect between test point TP (FES) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus serch. (actuate the focus serch when disc table is moving in and out.)
4. Check the oscilloscope waveform (S curve) is symmetrical between A and B. And confirm peak to peak level within 3±1Vp-p.

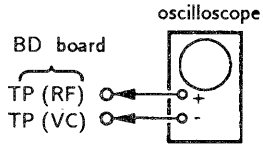


5. After check, remove the lead wire connected in step 2.

Note : • Try to mesure several times to make sure that the ratio of A : B or B : A is more than 10 : 7.

• Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check

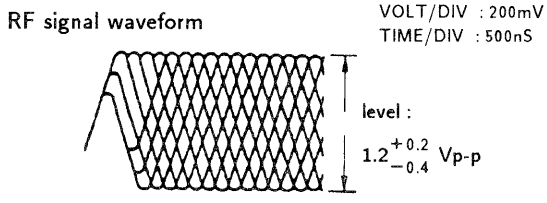


Procedure :

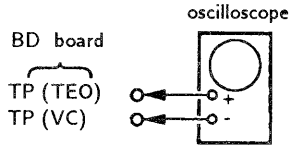
1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note :

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

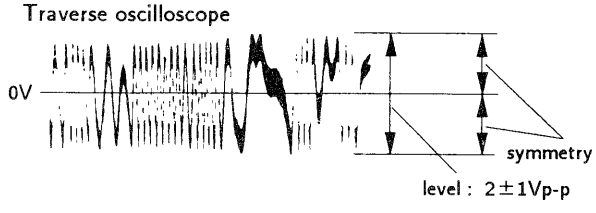


E-F Balance Check



Procedure :

1. Connect test point TP (ADJ) to ground and TP (TES) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TEO) on BD board.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and playback.
5. Confirm that the osilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

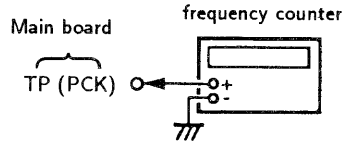


6. Remove the lead wire connected in step 1.

RF PLL Free-run Frequency Check

Procedure :

1. Connect frequency counter to test point (PCK) with lead wire.



2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4. 3218MHz.

Focus/Tracking Gain

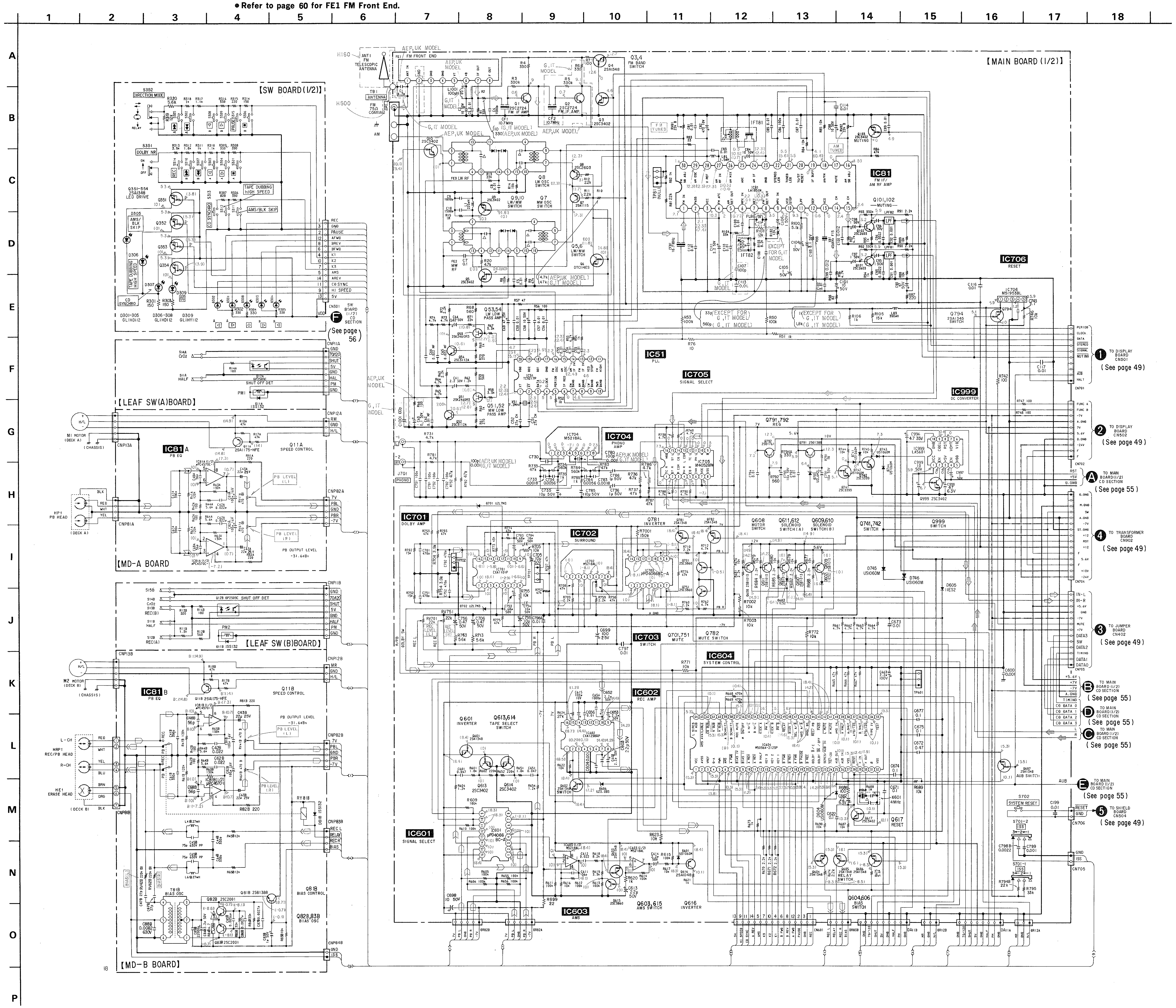
This gain has a margin, so even if it is slightly off. There is no problem.

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.

7-4. SCHEMATIC DIAGRAM—Tuner/Deck Section—

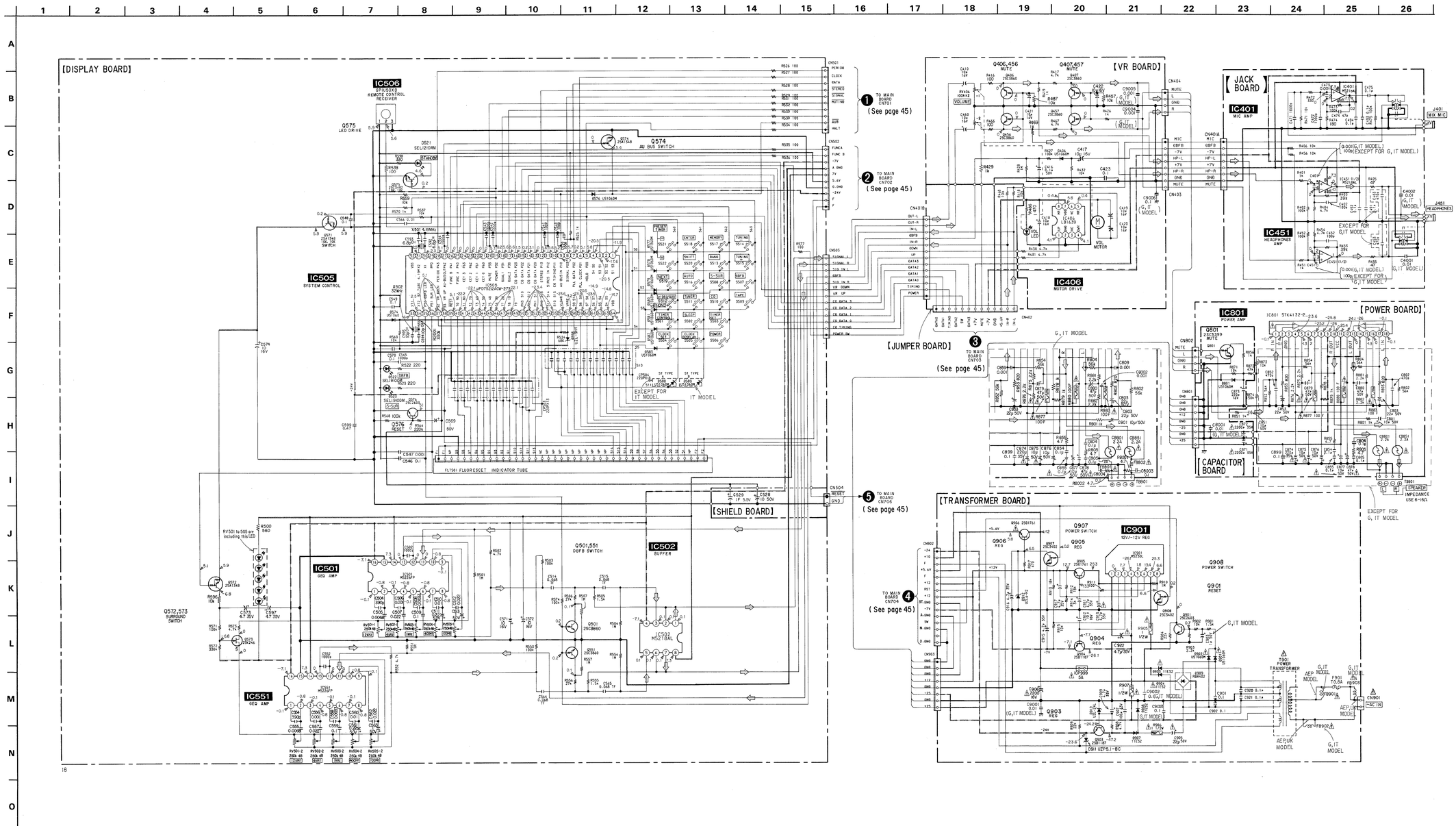
- Refer to page 57 for IC Block Diagrams.
- Refer to page 60 for FE1 FM Front End.



Note:
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¹/₄W or less unless otherwise specified.
- △ : internal component.
- [fusible resistor symbol] : fusible resistor.

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.
- Voltage is dc with respect to ground under no-signal (detuned) conditions.
  - no mark : FM
  - ( ) : Playback
  - (( )) : MW
  - < > : LW
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  - ⇨ : FM
  - ⇨ : PB (DECK A)
  - ⇨ : CD
  - ⇨ : PB (DECK B)
  - ⇨ : REC
- G : Germany model
  IT : Italian model



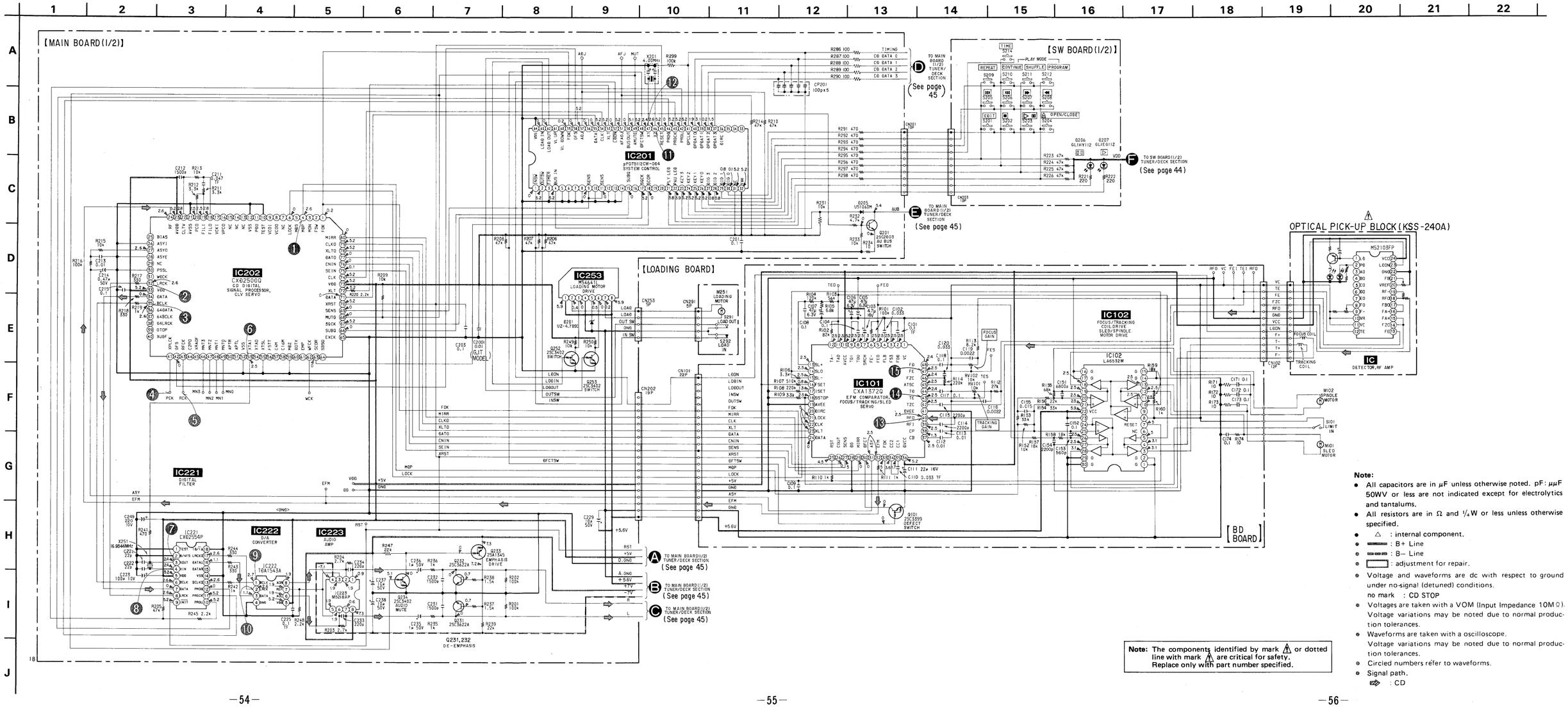
Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantaliums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- : fusible resistor.

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
- Voltage is dc with respect to ground under no-signal (detuned) conditions.
  no mark : POWER ON
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM
- G : Germany model
  IT : Italian model

7-7. SCHEMATIC DIAGRAM—CD Section— • Refer to page 53 for Waveforms.



Note:
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- ▬▬ : B+ Line
- ▬▬ : B− Line
- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : CD STOP
- Voltages are taken with a VOM (Input Impedance 10MΩ). 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.
  ⇨ : CD

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