HCD-XB3K

SERVICE MANUAL

E Model

HCD-XB3K is the tuner, deck, CD and amplifier section in LBT-XB3K.

CD Section	Model Name Using Similar Mechanism	HCD-XB3
	CD Mechanism Type	CDM37L-5BD29AL
	Base Unit Name	BU-5BD29AL
	Optical Pick-up Name	KSS-213D/Q-NP
Tape deck Section	Model Name Using Similar Mechanism	HCD-XB3
	Tape Transport Mechanism Type	TCM-220WR2

SPECIFICATIONS

Amplifier section

Continuous RMS power output	70 + 70 watts (6 ohms at 1 kHz, 10% THD)
Peak music power output	1000 watts
Inputs	
PHONO IN (phono jack):	sensitivity 3 mV, impedance 47 kilohms
VIDEO (AUDIO) IN (phono jack):	sensitivity 250 mV, impedance 47 kilohms
MIX MIC (phono jack):	sensitivity 1 mV, impedance 10 kilohms
Outputs	
PHONES (stereo phone jack):	accepts headphones of 8 ohms or more
SPEAKER:	accepts impeadance of 6 to 16 ohms.

CD player section

System	compact disc and digital audio system
Laser	Semiconductor laser (λ = 780 nm). Emission duration: continuous
Laser output	Max. 44.6μF* *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.
Wavelength	780 –790 nm
Frequency response	2 Hz – 20 kHz (± 0.5 dB)
Signal-to-noise ratio	More than 90 dB
Dynamic range	More than 90 dB

Tape player section

Recording system	4-track 2-channel stereo
Frequency response (DOLBY NR OFF)	60 – 13,000 Hz (± 3 dB), using a Sony TYPE I cassette 60 – 14,000 Hz (± 3 dB), using a Sony TYPE II cassette

– Continued on next page –

COMPACT DISC DECK RECEIVER

MICROFILM

SONY®

SECTION 3
TEST MODE

[MC 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], [ENTER/NEXT], and [DISC 1] simultaneously.
2. The fluorescent indicator tube becomes blank instantaneously, and the set is reset.

[CD Delivery Mode]

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

Procedure:

1. Press [POWER] button to turn the set ON.
2. Press [PLAY MODE] button and [POWER] button simultaneously.
3. A message "LOCK" is displayed on the fluorescent indicator tube, and the CD delivery mode is set.

[MC Hot Reset]

- This mode resets the set with the preset data kept stored in the memory. The hot reset mode functions same as if the power cord is plugged in and out.

Procedure:

1. Press three buttons [GROOVE], [ENTER/NEXT], and [DISC 2] simultaneously.
2. The fluorescent indicator tube becomes blank instantaneously, and the set is reset.

[Sled Servo Mode]

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

Procedure:

1. Select the function "CD".
2. Press three buttons [GROOVE], [ENTER/NEXT], and [FLASH] simultaneously.
3. The Sled Servo mode is selected, if "CD" is blanking on the fluorescent indicator tube.
4. With the CD in stop status, press [▶▶] button in CD section to move the pick-up to outside track, or [◀◀] button to inside track.
5. To exit from this mode, perform as follows:
   1) Move the pick-up to the most inside track.
   2) Press three buttons in the same manner as step 2.

Note:

- Always move the pick-up 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.

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

- A step of AM channels can be changed over between 9kHz and 10kHz.

Procedure:

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

[LED and Fluorescent Indicator Tube All Lit, Key Check Mode]

Procedure:

1. Press three buttons [GROOVE], [ENTER/NEXT], and [DISC 3] simultaneously.
2. LEDs and fluorescent indicator tube are all turned on.
   Press [DISC 2] button, and the key check mode is activated.
3. In the key check mode, the fluorescent indicator tube displays "K 1 V0 J0". Each time a button is pressed, "K"value increases. However, once a button is pressed, it is no longer taken into account.
   "J" value increases like 1, 2, 3 ... if rotating [JOG] knob in "+" direction, or it decreases like 0, 9, 8 ... if rotating in "–" direction.
   "V" value increases like 1, 2, 3 ... if rotating [VOLUME] knob in "+" derection, or it decreases like 0, 9, 8 ... if rotating in "–" direction.
4. To exit from this mode, press three buttons in the same manner as step 1, or disconnect the power cord.

[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.
- If no error occurs:
  The aging operation continues repeatedly.

1. Aging Mode in CD Section

1-1. Operating Method of Aging Mode

1. Set discs in DISC 1 and DISC 3 trays.
2. Select the function "CD".
3. Press three buttons [GROOVE], [ENTER/NEXT], and [DISC 5] simultaneously.
4. The aging mode is activated, if a roulette mark on the fluorescent indicator tube is blinking.
5. In the aging mode, the aging is executed in a sequence given in "1-2. Operation during Aging Mode".
   The aging continues unless an alarm occurred.
6. To exit from the aging mode, press [POWER] button to turn the set OFF.

- If a button other than buttons In CD section is pressed during aging, the aging in the CD section is finished.
- To execute aging to the tape deck section successively, press [▷] button in the deck A.
  "AGING" is displayed on the fluorescent indicator tube. (For the aging in tape deck, see "2. Aging Mode in Tape Deck Section".

1-2. Operation during aging Mode

In the aging mode, the program is executed in the following sequence.

1. The disc tray turns to select a disc. (For a disc selection sequence, see Section 1-3.)
2. TOC of disc is read.
3. The pick-up accesses to the last track.
4. Steps 1 through 3 are repeated.

1-3. Disc Selection Sequence

- During the aging mode, discs are selected in the following sequence:

Disc 1 → Disc 3
↑ ↓
Disc 3 ← Disc 1

2. Aging Mode in Tape Deck Section

2-1. Operating Method of Aging Mode

1. Load a commercially available 10-minute tape into the decks A and B respectively.
   (If a 10-minute tape is not available, another tape may be used but a cycle time will be longer.)
2. Select the function "TAPE".
3. Rewind tapes in advance by pressing [◀◀] button respectively on decks A and B.
4. Press three buttons [GROOVE], [ENTER/NEXT], and [DISC 5] simultaneously.
5. Press [▷] button on deck A. (This button triggers the aging mode.)
6. The aging mode is activated if "AGING A" is displayed on the fluorescent indicator tube.
7. In the aging mode, the aging is executed in a sequence given in "2-2. Operation during Aging Mode".
   The aging continues unless an alarm occurred.
8. To exit from the aging mode, press [POWER] button to turn the set OFF.

2-2. Operation during Aging Mode

In the aging mode, the program is executed in the following sequence.

1. A tape on FWD side is played for one minute.
2. PAUSE STOP is made.
3. Recording is made for 3 minutes. (For the deck not having the record function, the play is executed.)
4. FF is executed up to the end of tape.
5. A tape is reversed, and the tape on REV side is played for one minute.
6. PAUSE STOP is made.
7. Recording is made for 3 minutes. (For the deck not having the record function, the play is executed.)
8. FF is executed up to the end of tape.
9. Steps 1 through 8 are executed for the other deck.
10. Steps 1 through 9 are repeated unless an alarm occurred.

2-3. Deck Selection Sequence

- During the aging mode, decks are selected in the following sequence:

Deck A (FWD) → Deck A (REV)
↑ ↓
Deck B (REV) ← Deck B (FWD)

SECTION 4
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:
   record/playback head, erase head, capstan, pinch roller, rubber belts, 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

Mode	Torque Meter	Meter Reading
Forward	CQ-102C	36 to 61g•cm (0.50 – 0.84 oz•inch)
Forward Back Tension	CQ-102C	2 to 6g•cm (0.026 – 0.082 oz•inch)
Reverse	CQ-102RC	36 to 61g•cm (0.50 – 0.84 oz•inch)
Reverse Back Tension	CQ-102RC	2 to 6g•cm (0.026 – 0.082 oz•inch)
FF, REW	CQ-201B	61 to 143g•cm (0.85 – 1.98 oz•inch)

• Tape Tension Measurement

Mode	Tension Meter	Meter Reading
Forward	CQ-403A	more than 100g (3.52 oz)
Reverse	CQ-403R	more than 100g (3.52 oz)

SECTION 5
ELECTRICAL ADJUSTMENTS

DECK SECTION | 0dB=0.775V

1. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
2. Do not use a magnetized screwdriver for the adjustments.
3. After the adjustments, apply suitable locking compound to the parts adjust.
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.
7. Switches and controls should be set as follows unless otherwise specified.
8. Set to test mode. (Press key switch same time GROOVE ENTER/NEXT and DISC 4 button.)

• Test Tape

Tape	Signal	Used for
P-4-A100	10kHz, –10 dB	Azimuth Adjustment
WS-48B	3kHz, 0dB	Tape Speed Adjustment
P-4-L300	315Hz 0dB	Level Adjustment

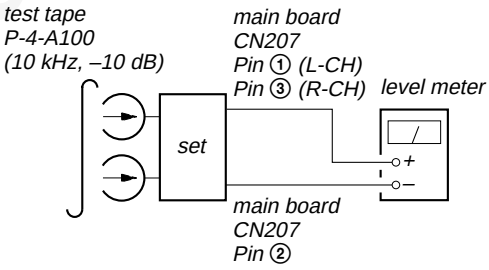
Record/Playback Head Azimuth Adjustment

DECK A | **DECK B**

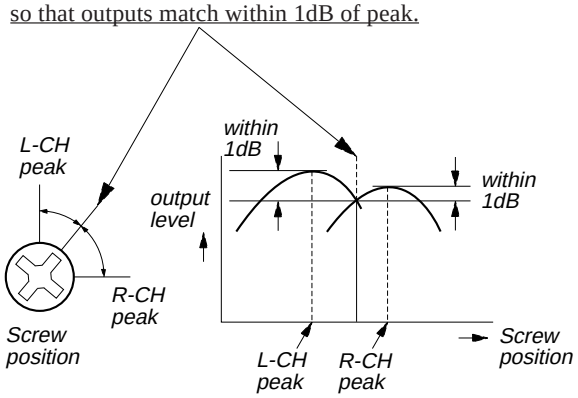
Note: Perform this adjustments for both decks

Procedure:

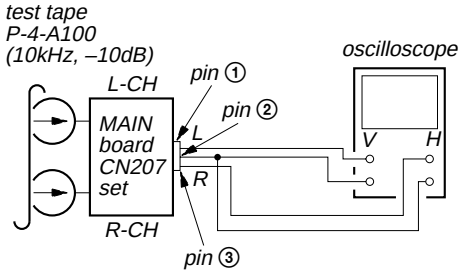
1. Mode: Playback (FWD)

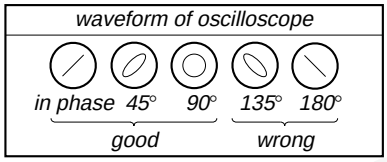


1. Mode: Playback (FWD)
2. Turn the adjustment screw and check output peaks. If the peaks do not match for L-CH and R-CH, turn the adjustment screw so that outputs match within 1dB of peak.



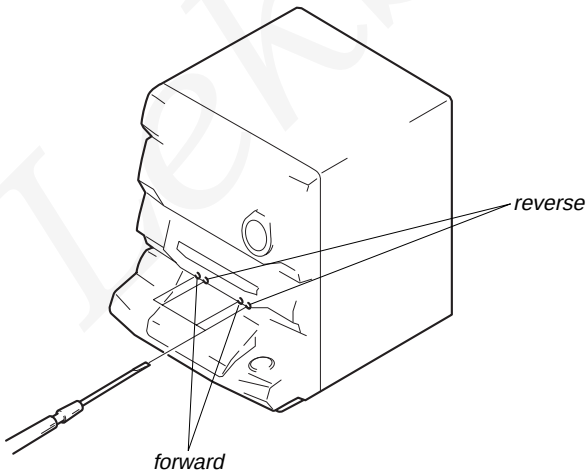
3. Mode: Playback (FWD)





4. Repeat steps 1 to 3 in playback (REV) mode.
5. After the adjustments, apply suitable locking compound to the pats adjusted.

Adjustment Location: Record/Playback Head (Deck A and B) and MAIN board.



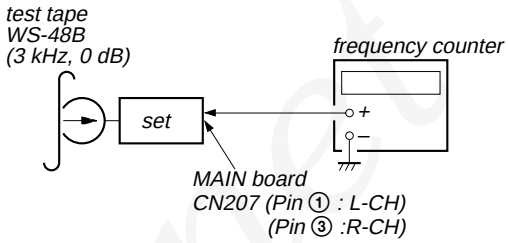
Tape Speed Adjustment DECK A

Note: Start the Tape Speed adjustment as below after setting to the test mode.
In the test mode, the tape speed is high during pressing the H. SPEED DUBB button.

Procedure:

1. Turn the power switch on.
2. Press the SPECTRUM ANALYZER button, ENTER button and EFFECT button simultaneously.
   To exit from the test mode, press the POWER button.

Mode: Playback (FWD)



1. Insert the WS-48B into the deck A and the blank tape into the deck B.
2. Press the REC button and ▷ button on the deck B. Then the deck B is at recording mode.
3. Set the deck A to playback mode.
4. Keep pressing the H. SPEED DUBB button in playback mode. Then at HIGH speed mode.
5. Adjust RV652 on the AUDIO board do that frequency counter reads 6,000 ± 90 Hz.
6. Take off the H. SPEED DUBB button.
   Then at NORMAL speed mode.
7. Adjust RV651 on the AUDIO board so that frequency counter reads 3,000 ± 90 Hz.
8. Frequency difference between deck A and deck B the beginning of the tape should be within ± 1.5%.

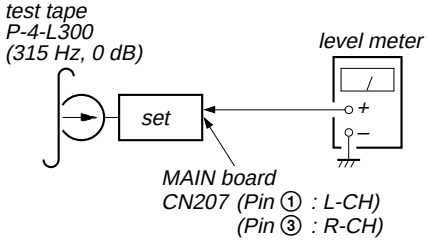
Adjustment Location: AUDIO board

Sample Value of Wow and flutter: 0.3% or less W.RMS (WS-48B)

Playback level Adjustment DECK A DECK B

Procedure:

Mode: Playback (FWD)



Deck A is RV311 (L-CH) and RV411 (R-CH), Deck B is RV301 (L-CH) and RV401 (R-CH) so that adjustment within adjustment level as follows.

Adjustment Level:

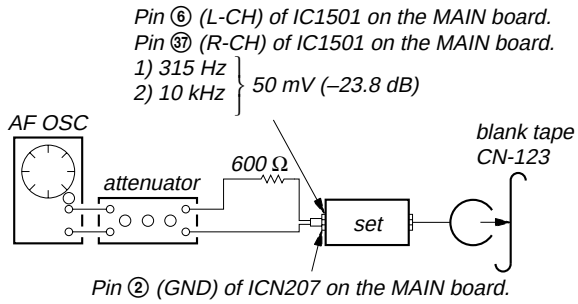
CN207 PB level: 301.5 to 338.3 mV (–8.2 to –7.2 dB) level difference between the channels: within ±0.5 dB

Adjustment Location: AUDIO and MAIN boards

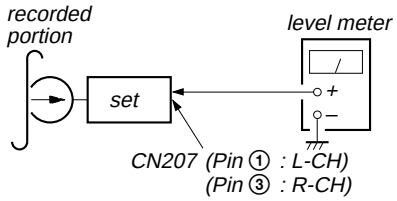
Record bias Current Adjustment DECK B

Procedure:

1. Mode: Record



2. Mode: Playback



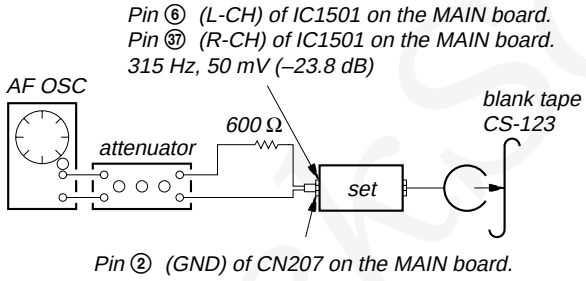
Confirm playback the signal recorded in step 1 become adjustable limits as follows.

If these levels do not adjustable limits, adjustment the RV341 (L-CH) and RV441 (R-CH) on the AUDIO board to repeat steps 1 and 2.

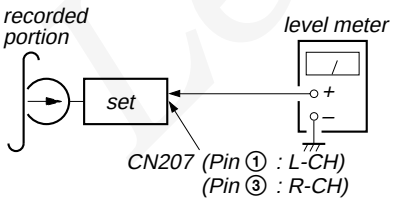
Adjustable limits: Playback output of 315 Hz to playback output of 10kHz: 0±0.5 dB

Adjustment Location: AUDIO and MAIN boards

Record Level Adjustment DECK B



Procedure:



1. Mode: Record
2. Mode: Playback

Confirm playback the signal recorded in step 1 become adjustable limits as follows.

If these levels do not adjustable limits, adjustment the RV1501 (L-CH) and RV1551 (R-CH) on the MAIN board to repeat steps 1 and 2.

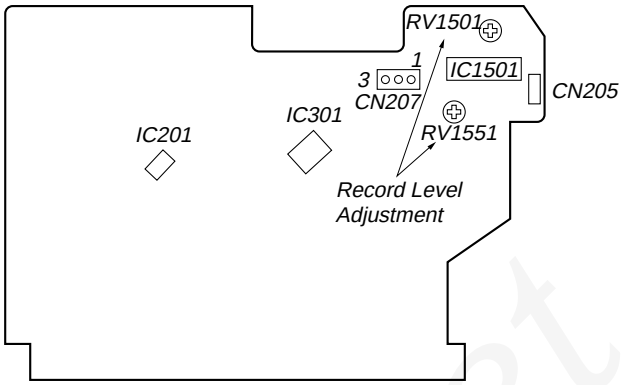
Adjustable limits:

CN207 PB level: 47.3 to 53.1 mV (–24.3 to –23.3 dB)

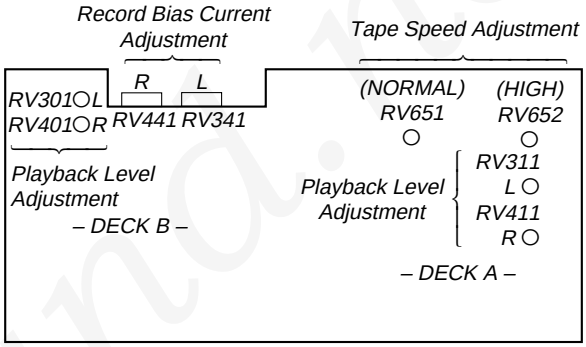
Adjustment Location: MAIN board

Adjustment Location:

[MAIN BOARD] (Component Side)



[AUDIO BOARD] (Conductor Side)

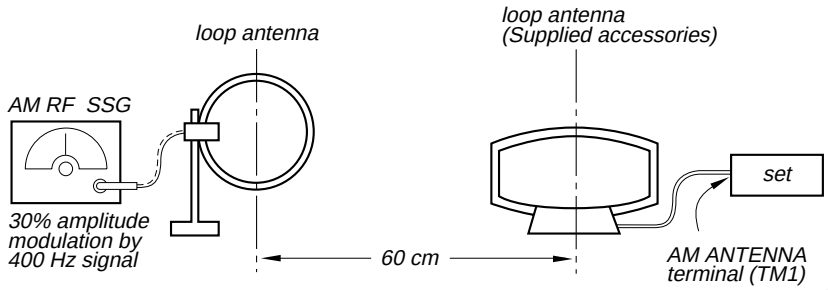


TUNER SECTION | 0dB=1µV

Note: As a front-end (FE1) is difficult to repair if faulty, replace it with new one.

AM Section Adjustment

Setting:



Field strength dB (µV/m) =SSG output level dB (µV/m) –26 dB.

AM Tuned Level Adjustment

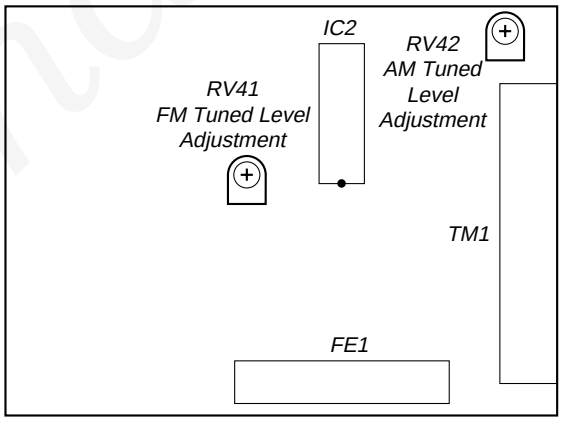
Band: AM

Procedure:

1. Set the output of SSG so that the input level of the set becomes 55 dB.
2. Tune the set to 999 kHz.
3. Adjust RV42 to the point (moment) when the TUNED indicator will change from going off to going on.

Adjustment Location : TCB board

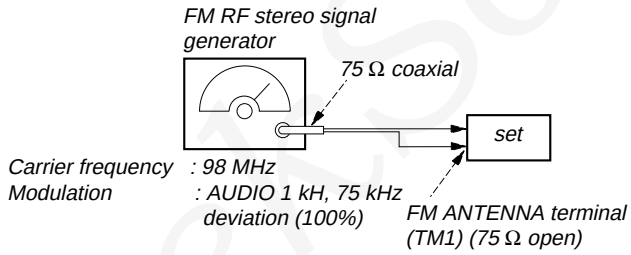
Adjustment Location:
[TCB BOARD] (Component Side)



FM Section Adjustment

Note: This adjustment should be performed after the AM Tuned Level Adjustment due to the same adjustment element.

Setting:



FM Tuned Level Adjustment

Band: FM

Procedure:

1. Supply a 25dBµ 98 MHz signal from the ANTENNA terminal.
2. Tune the set to 98 MHz.
3. If the TUNED indicator does not light, adjust RV41 to the point (moment) when the TUNED indicator will change from going off to going on.

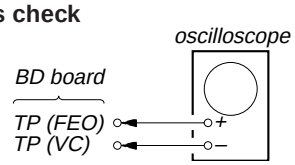
Adjustment Location: TCB board

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 10M 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.

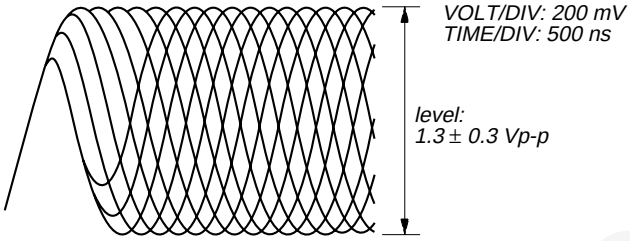
Focus Bias check



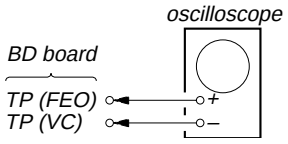
Procedure:

1. Connect oscilloscope to test point TP (RF). (GND terminal : VC)
2. Turned Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that the shape "◇" can be clearly distinguished at the center of the waveform and check the RF signal level.

- **RF signal**



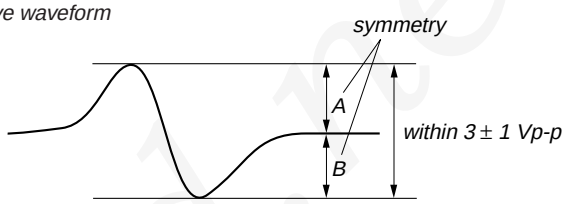
S Curve Check



Procedure:

1. Connect oscilloscope to test point TP (FEO).
2. Connect between test point TP (FOK) and GND by lead wire.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 3±1 Vp-p.

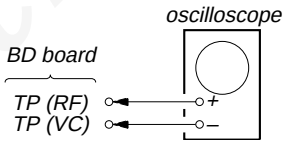
S-curve waveform



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

Note: • Try to measure several times to make sure than 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.

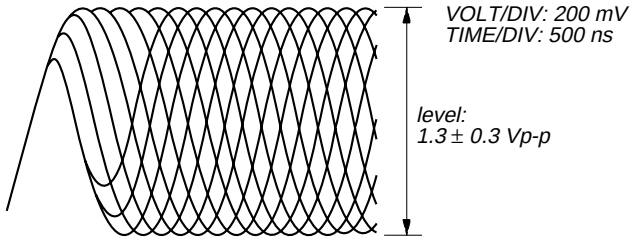
RF Level Check



Procedure:

1. Connect oscilloscope to test point TP (RF) on BD board.
2. 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.

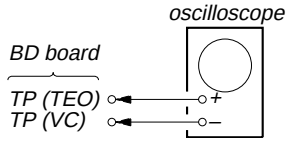
- **RF signal**



Note:

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

E-F Balance (1 Track Jump) check
(Without remote commander)

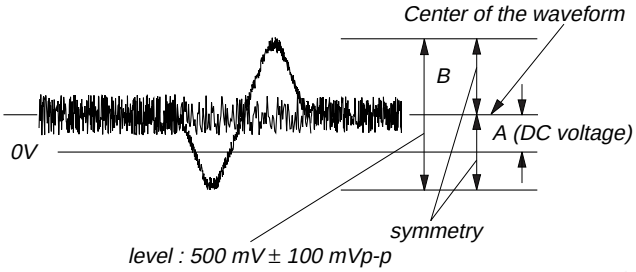


Procedure:

1. Connect oscilloscope to test point TP (TEO) on BD board.
2. Turned Power switch on.
3. Put disc (YEDS-18) in to play the number five track.
4. Press the "▮▮ (Pause)" button. (Becomes the 1 track jump mode)
5. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform. Confirm the following:

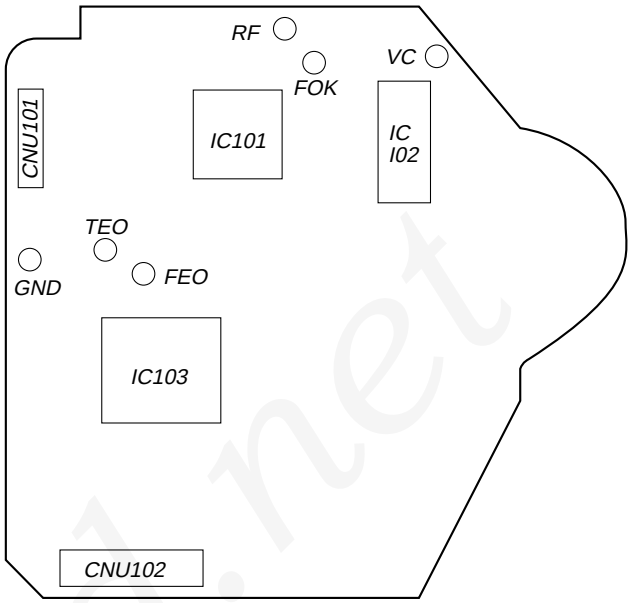
$$\frac{A - B}{2\,(A + B)} \times 100 = \pm 7\ (\%)$$

1 track jump waveform



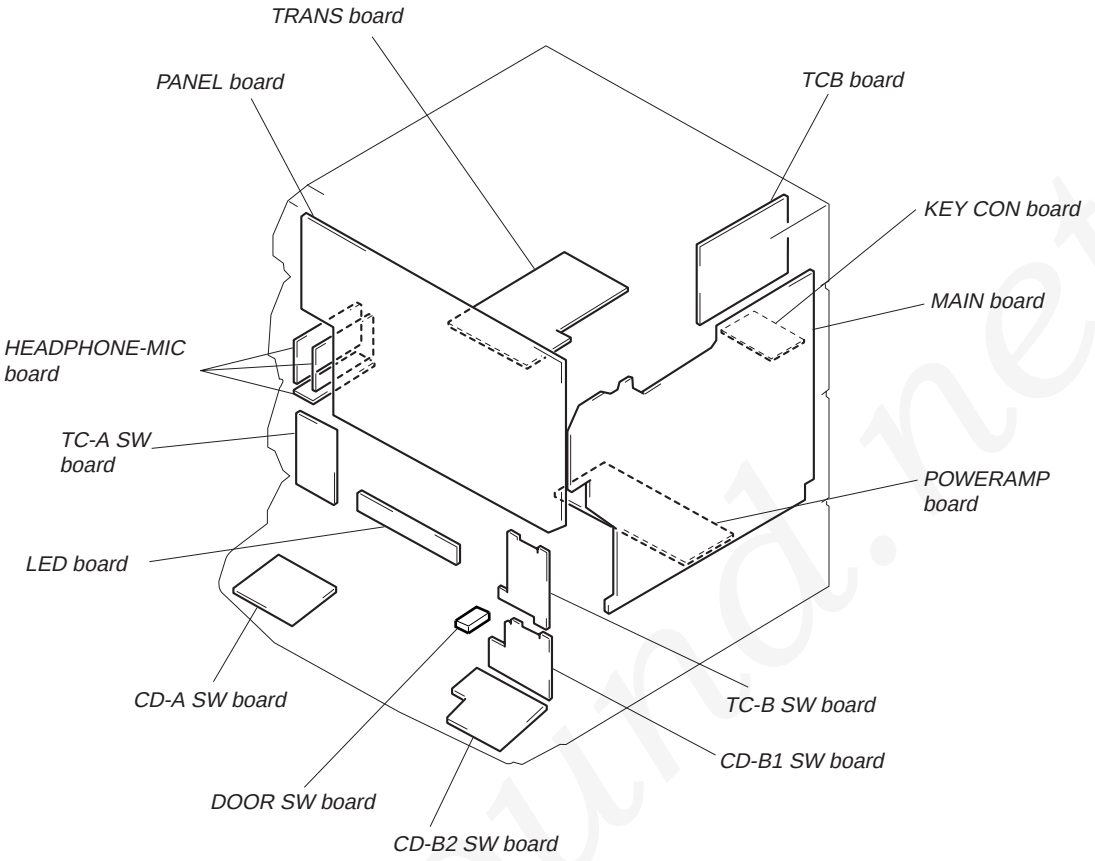
Adjustment Location:

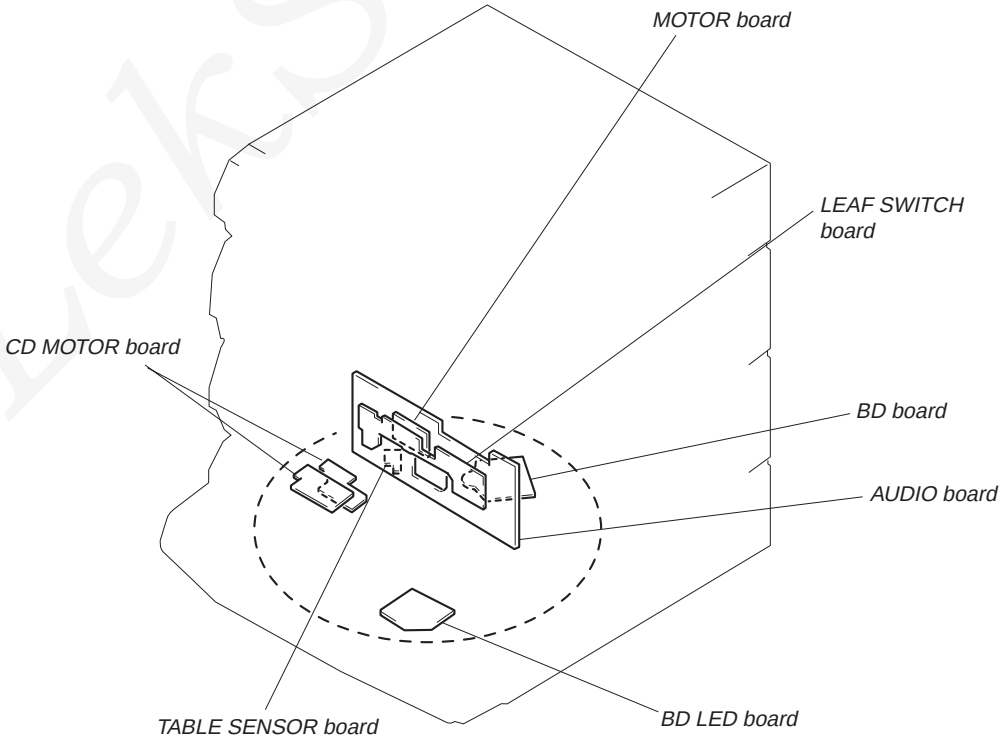
[BD BOARD] (Conductor Side)



SECTION 6
DIAGRAMS

- **Circuit Board Location**

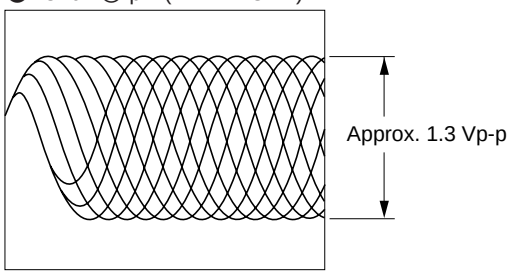




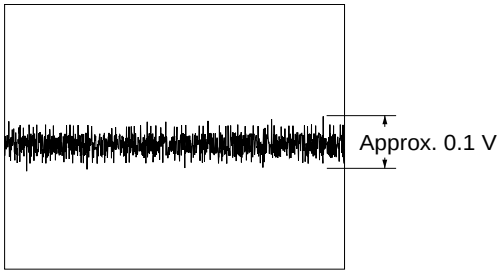
• **Waveforms**

— BD Section—

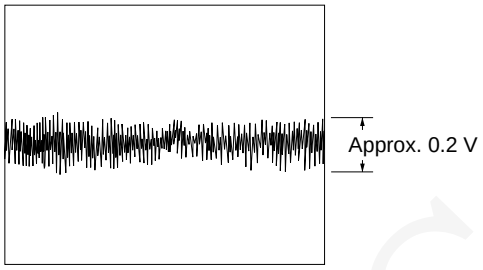
❶ IC101 ㉝ pin (PLAY MODE)



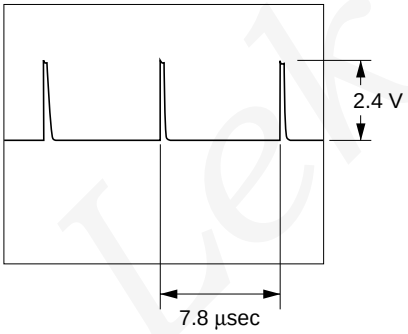
❷ IC101 ② pin (FEI) (PLAY MODE)



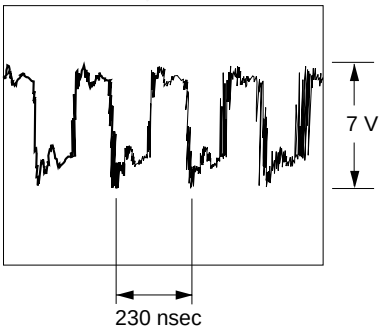
❸ IC101 ㊼ pin (TEI) (PLAY MODE)



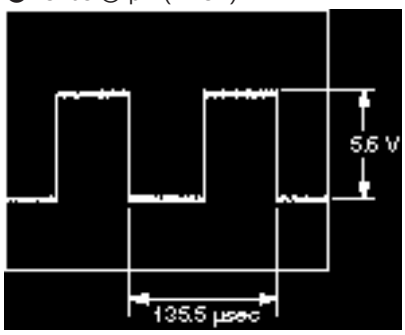
❹ IC103 ㉗ pin (MDP)



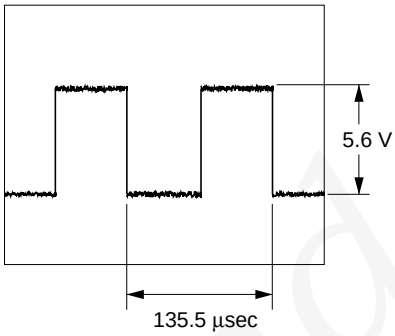
❺ IC103 ㊿ pin (XPCK)



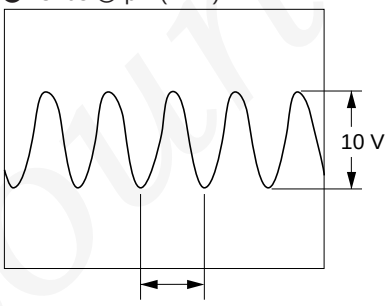
❻ IC103 ㊷ pin (RFCK)



❼ IC103 ㉞ pin (WFCK)

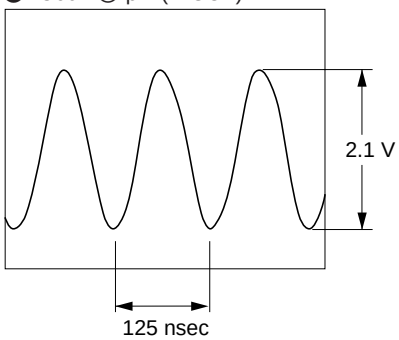


❽ IC103 ㊾ pin (XTAI)



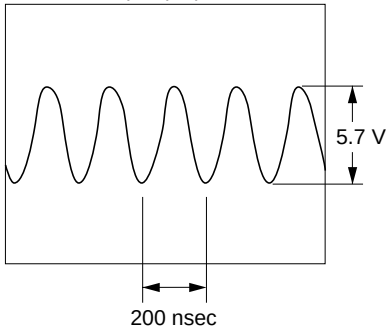
— PANEL Section—

❾ IC601 ⑧ pin (X-OUT)

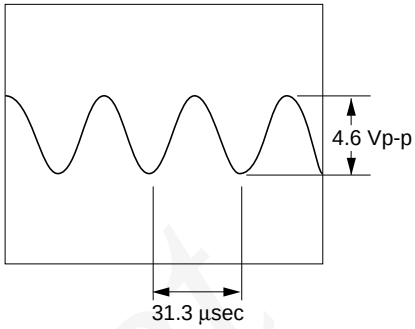


— MAIN Section—

❿ IC301 ⑩ pin (X2)

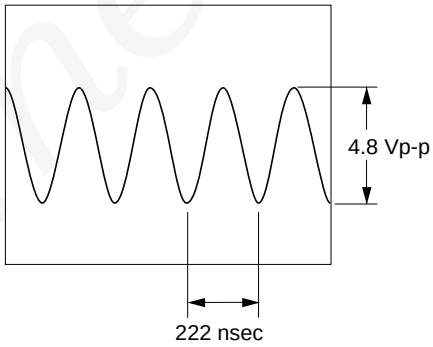


⓫ IC301 ⑬ pin (XT2)

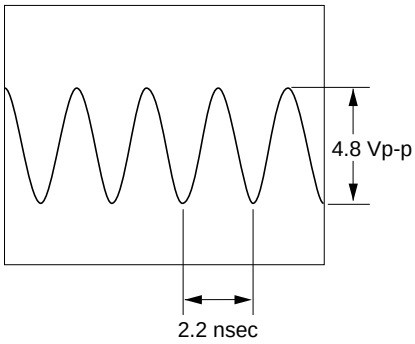


— TUNER Section—

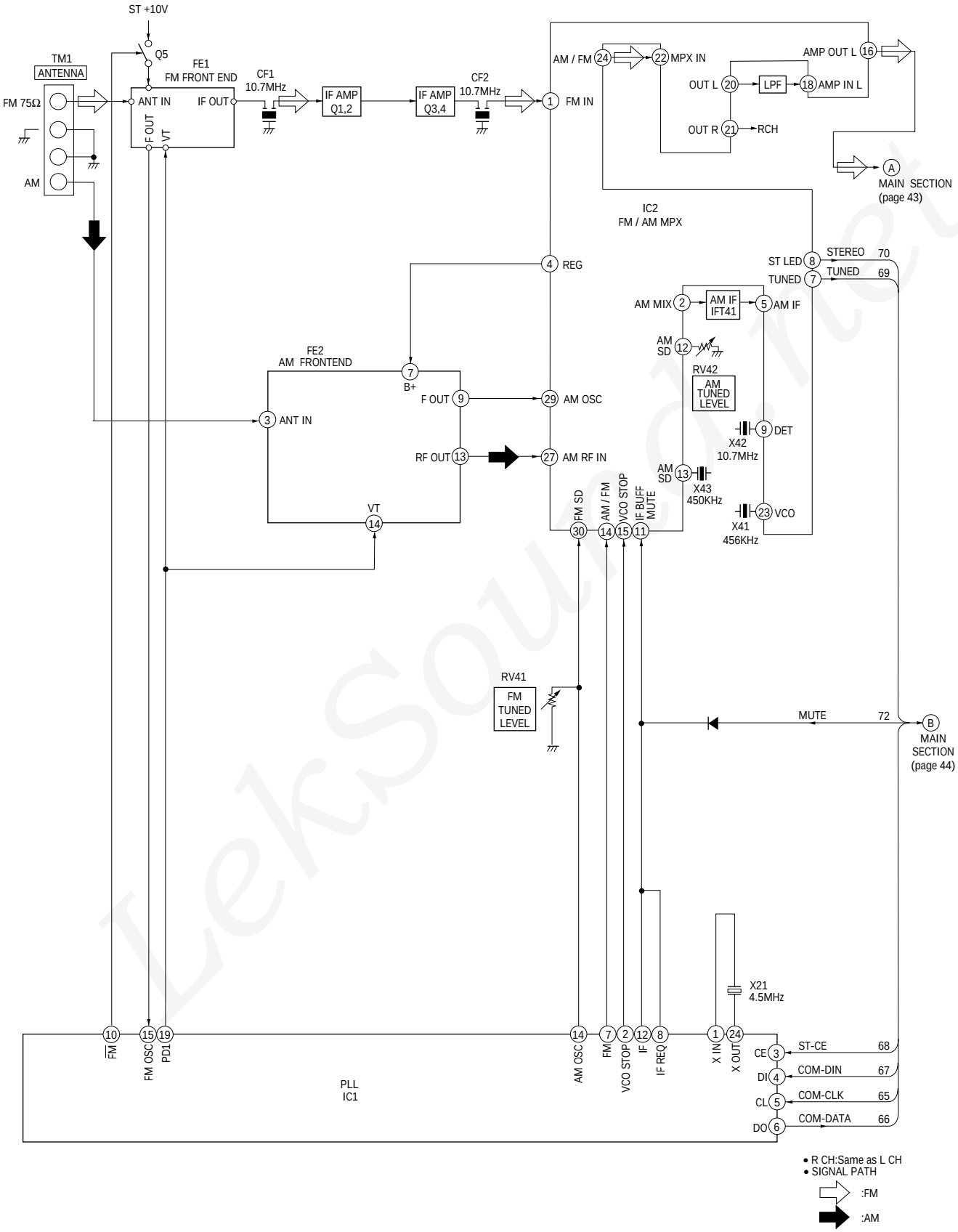
⓬ IC1 ㉔ pin (XOUT)



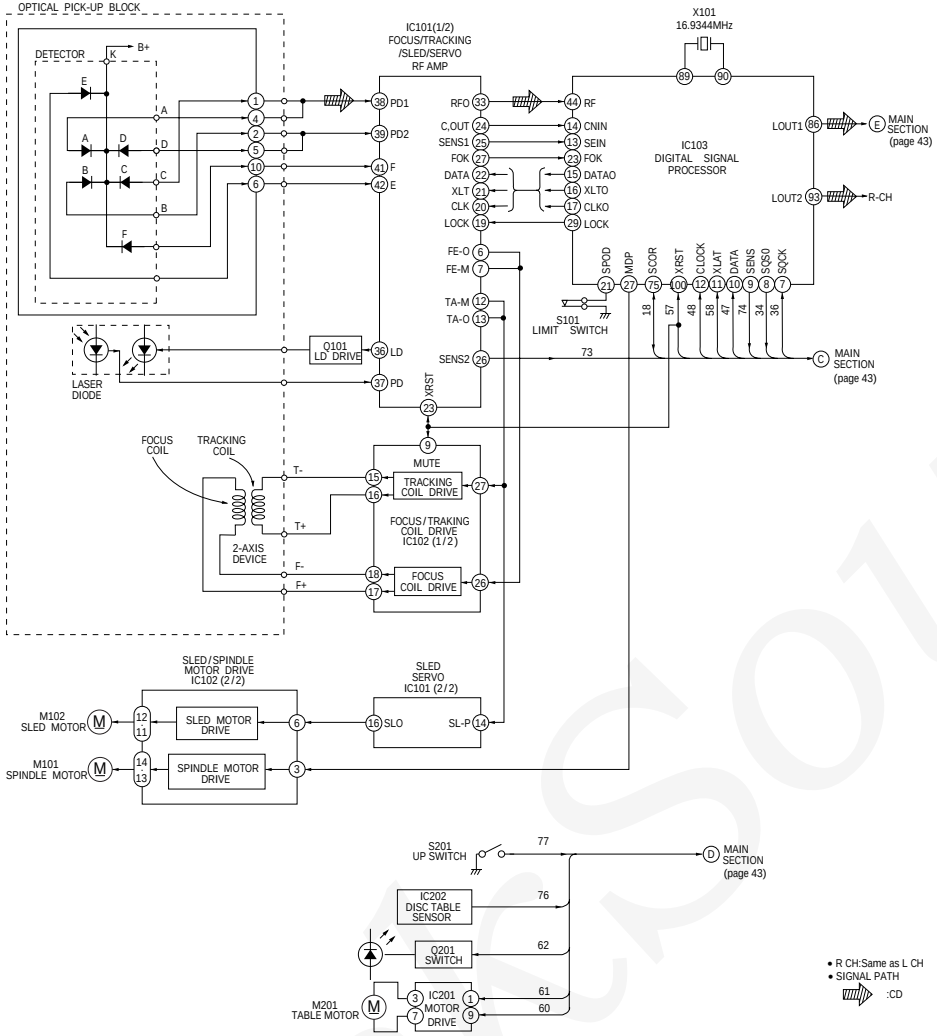
⓭ IC2 ㉓ pin (VCO)



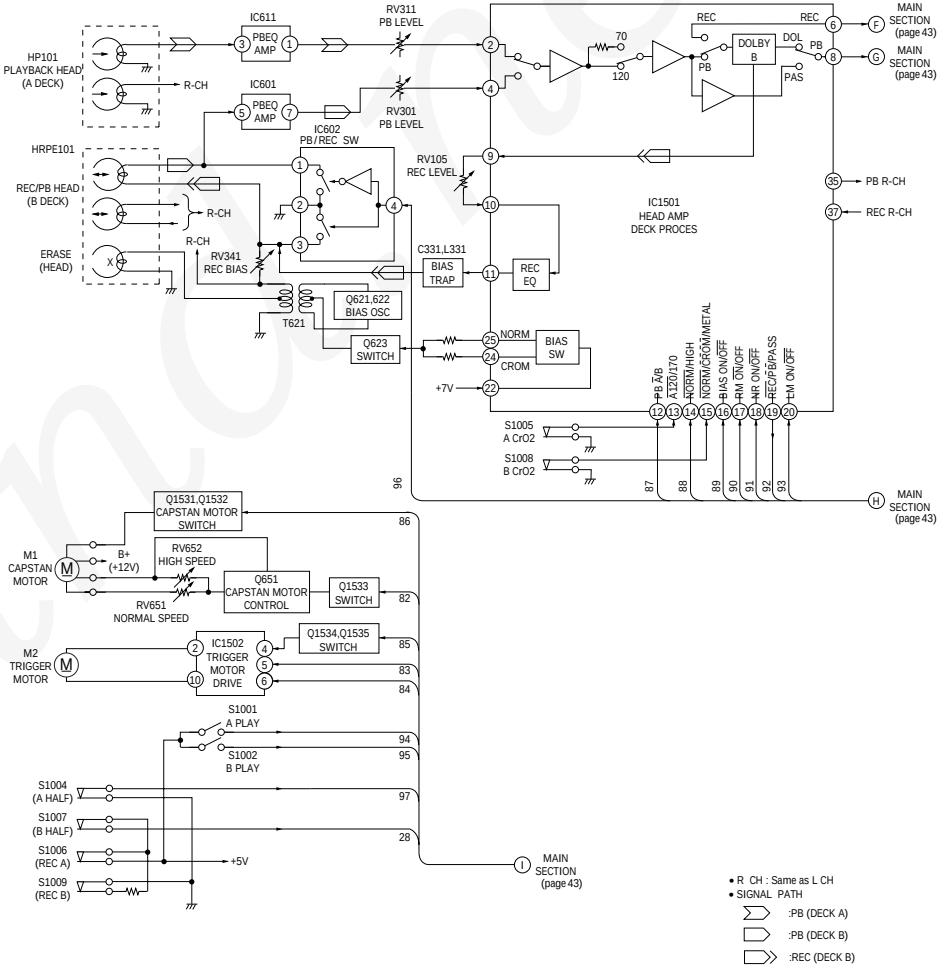
6-1. BLOCK DIAGRAMS
– TUNER SECTION –



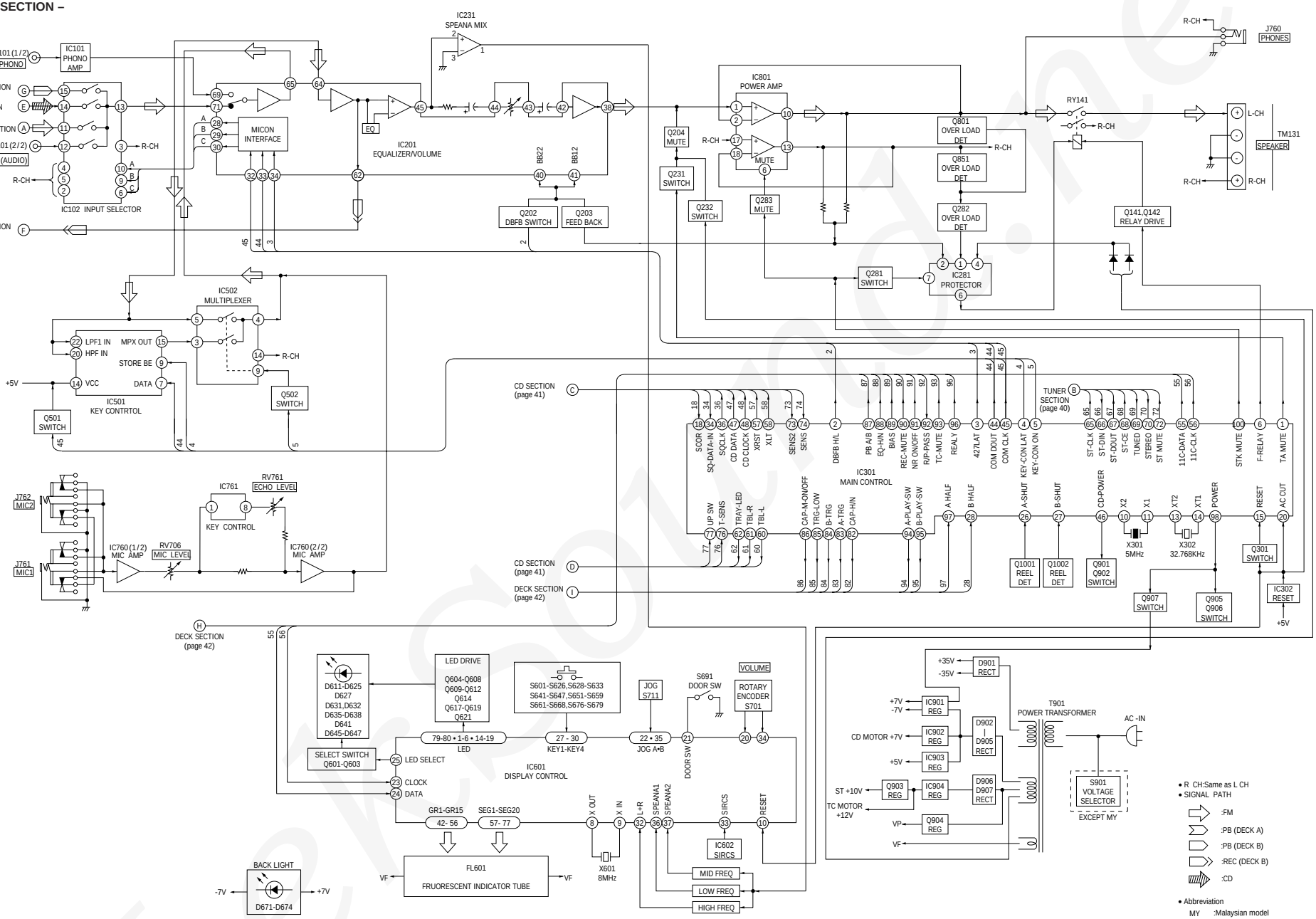
– CD SECTION –



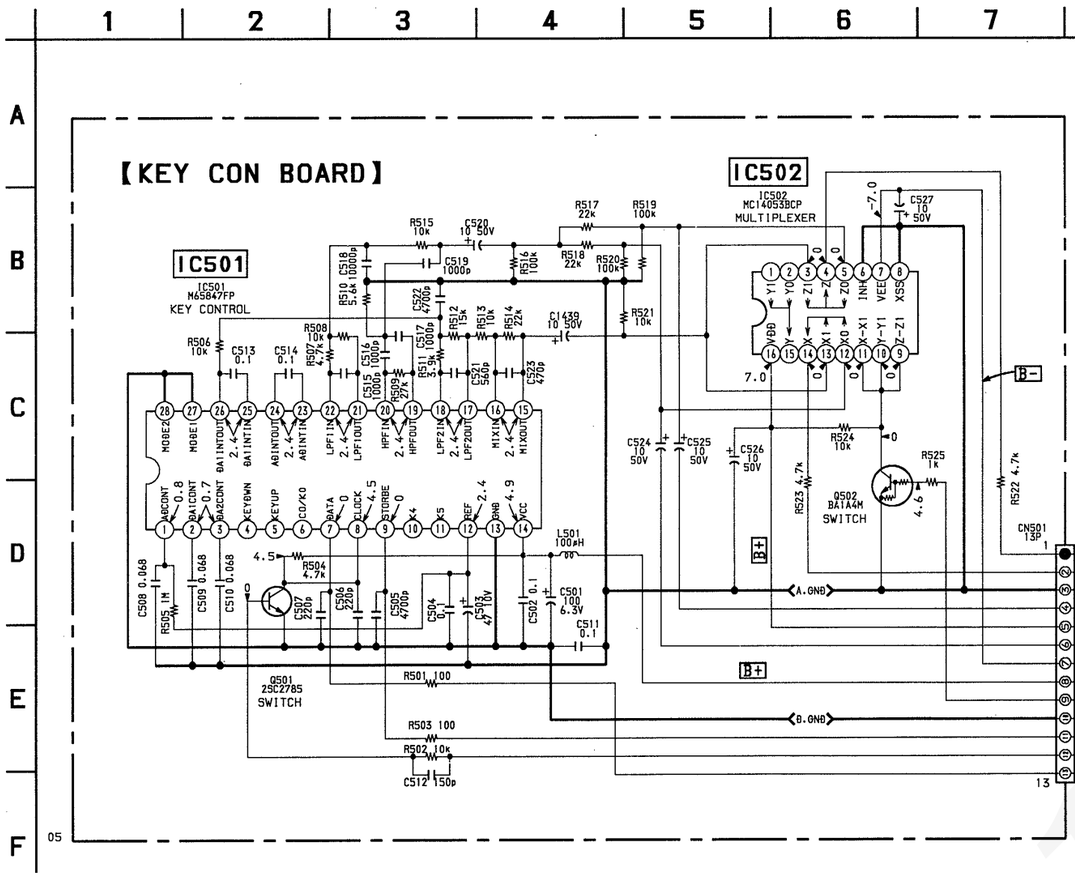
– DECK SECTION –



– MAIN SECTION –



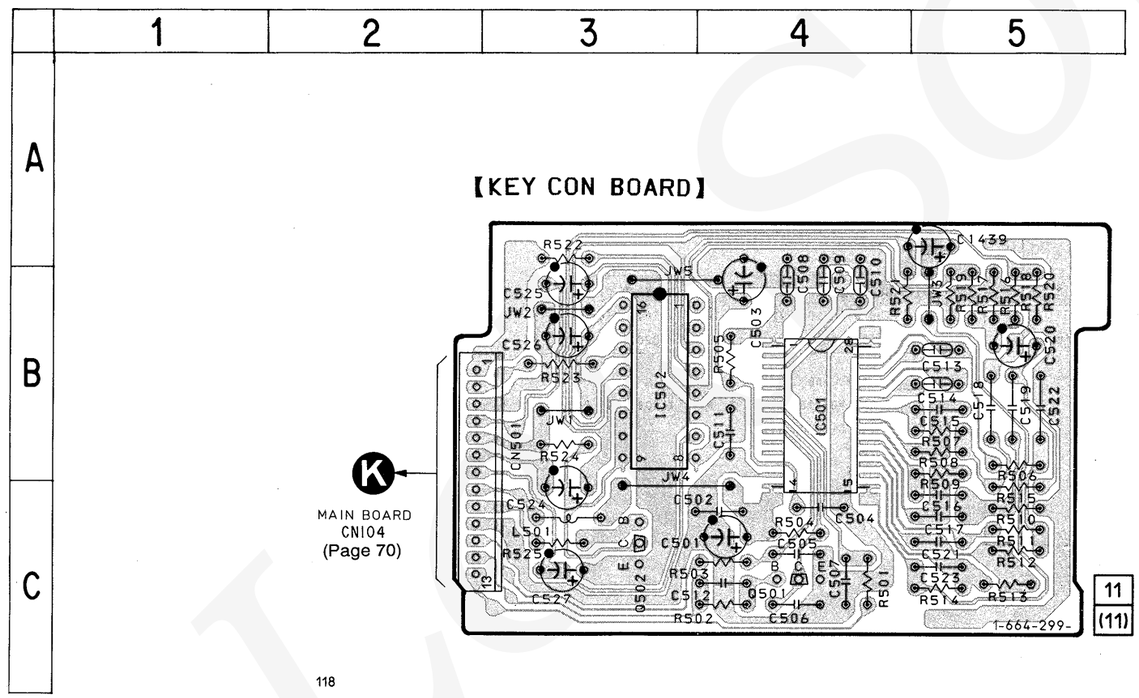
6-2. SCHEMATIC DIAGRAM – KEY CONTROL Section –



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.
- B+ :B+ Line.
- B- :B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark:FM
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

6-3. PRINTED WIRING BOARD –KEY CONTROL Section – • See page 38 for Circuit Boards Location.

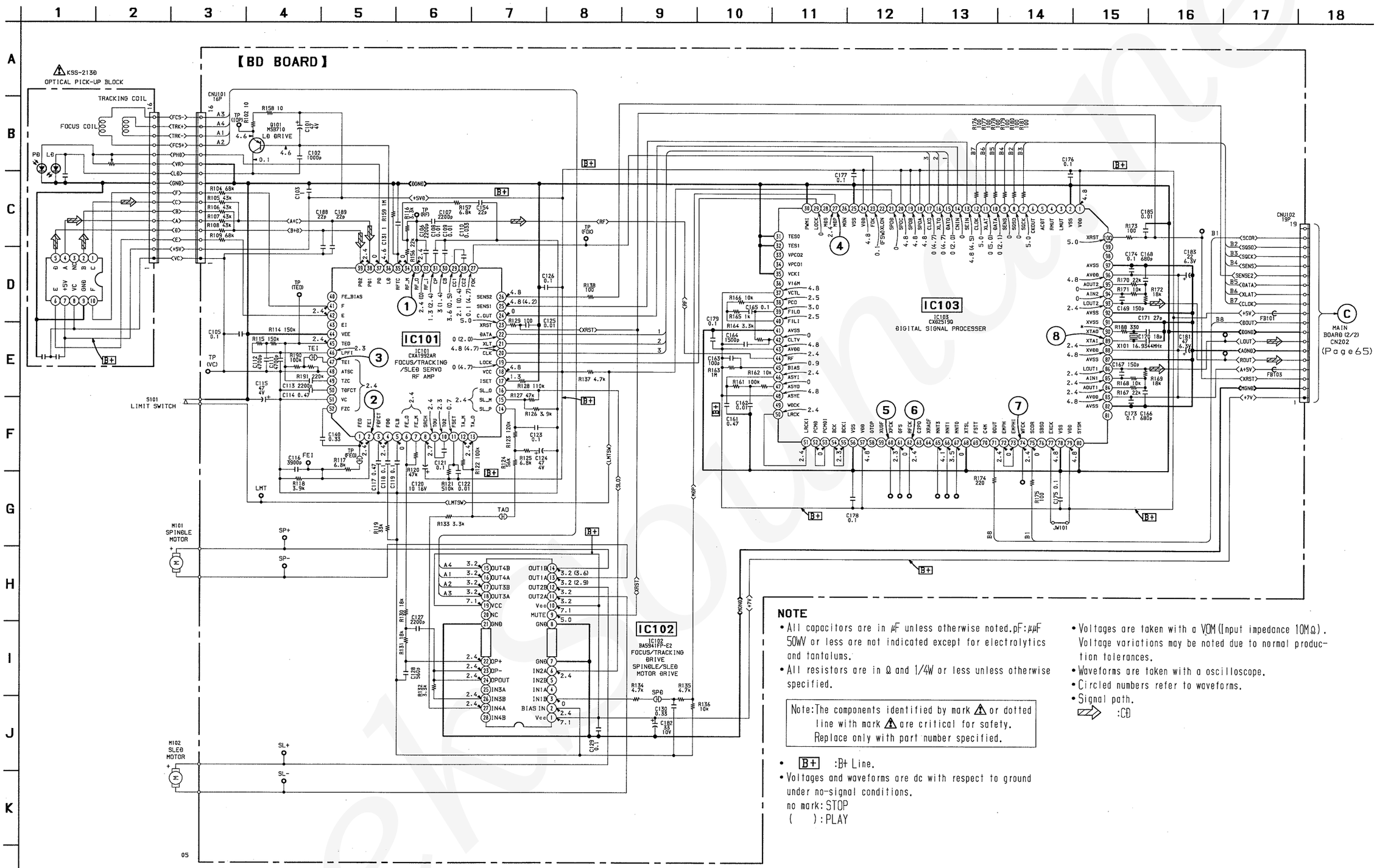


Note

- ○—— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.

6-4. SCHEMATIC DIAGRAM – BD Section –

• See page 39 for Waveforms. • See page 83 for IC Block Diagrams.



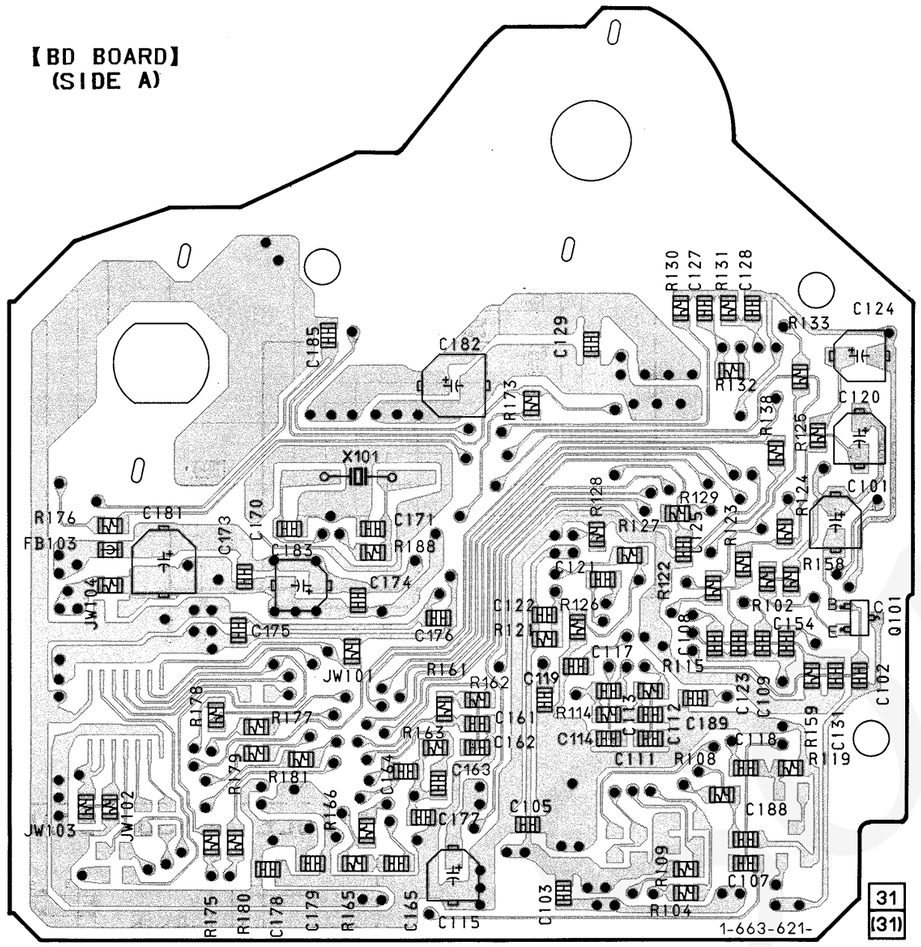
NOTE

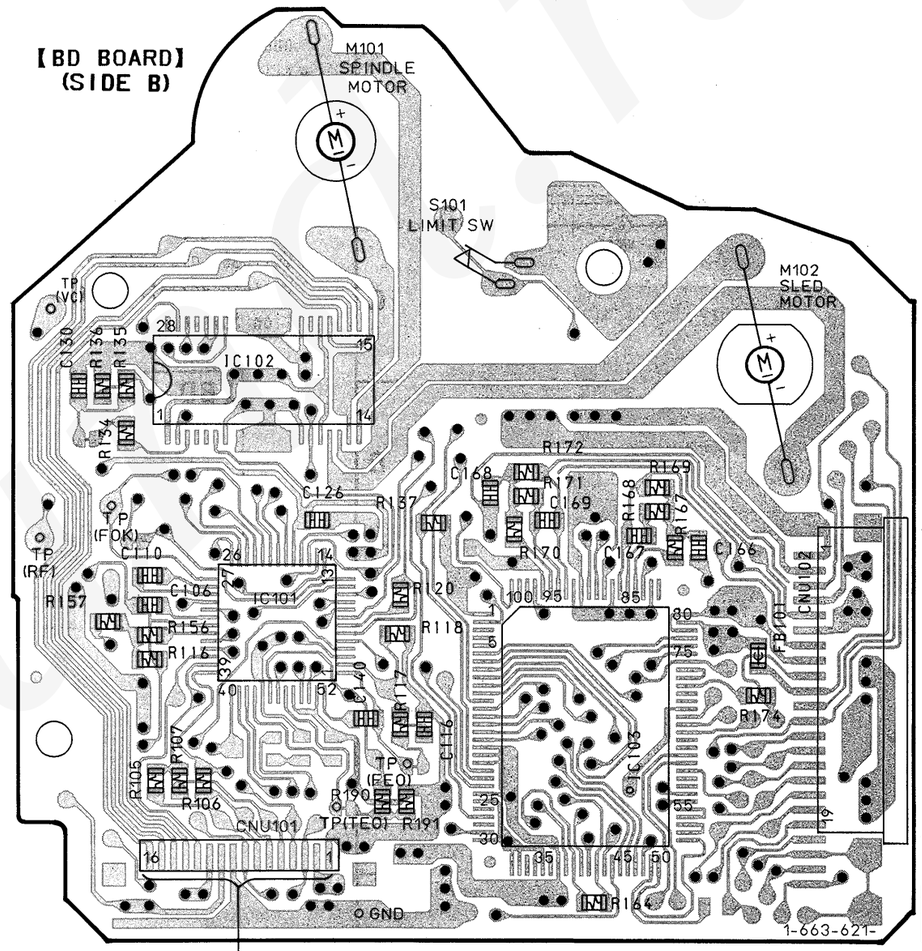
- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.

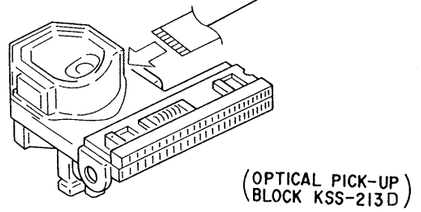
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ :B+ Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP
  ( ): PLAY
- 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.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :CD

6-5. PRINTED WIRING BOARD – BD Section – • See page 38 for Circuit Boards Location.







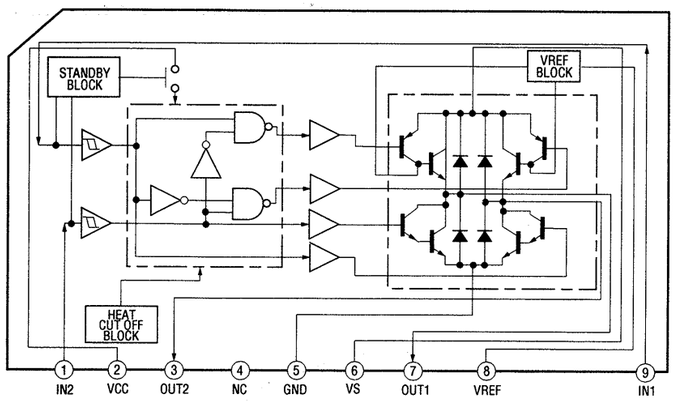
• **Semiconductor Location**

Ref. No.	Location
IC101	D-7
IC102	C-7
IC103	E-9
Q101	D-5

Note:
- ○——— : parts extracted from the component side.
- ● : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

• IC Block Diagrams

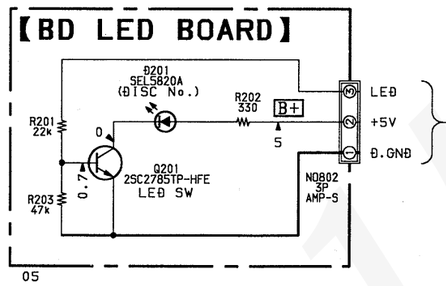
IC201 TA8409S

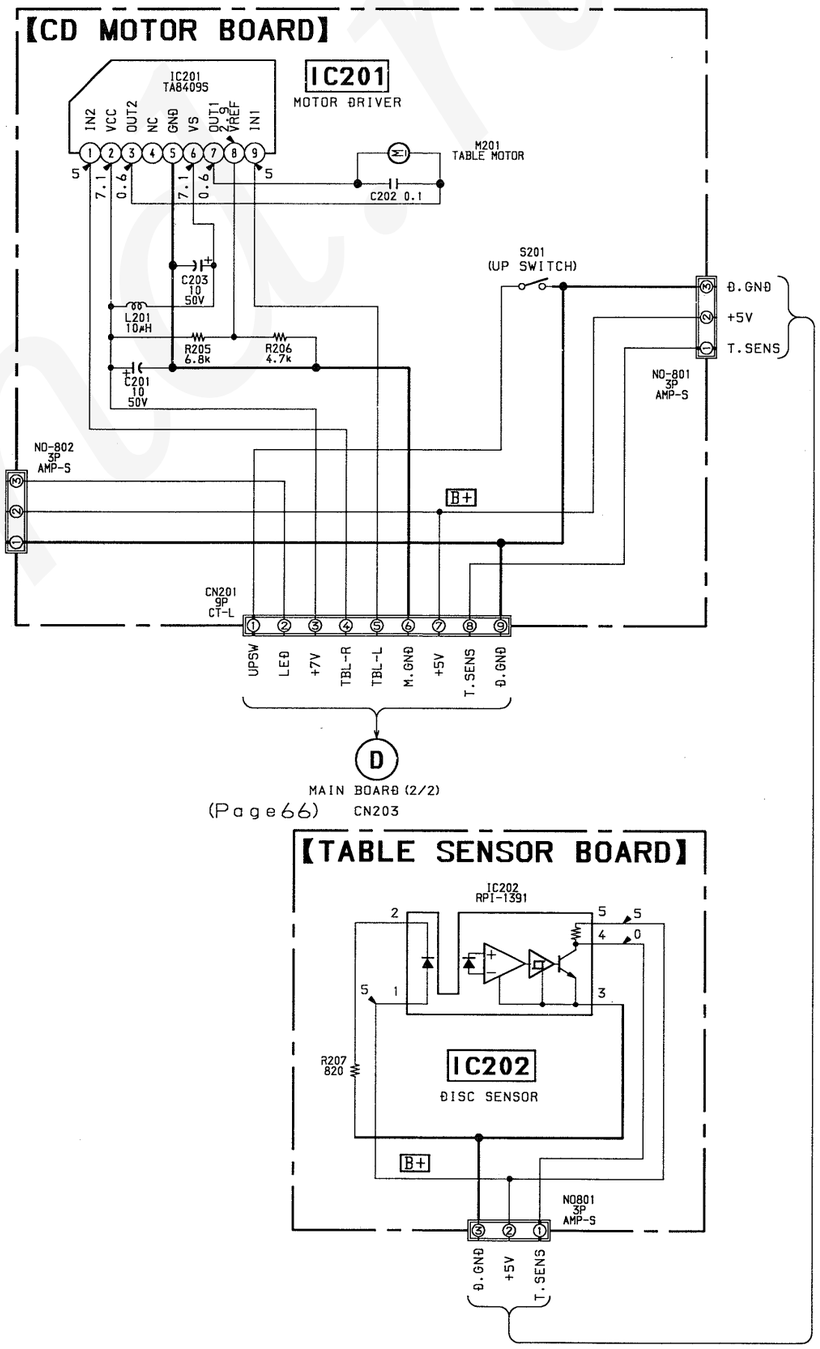


6-6. SCHEMATIC DIAGRAM – CD MOTOR Section –

NOTE

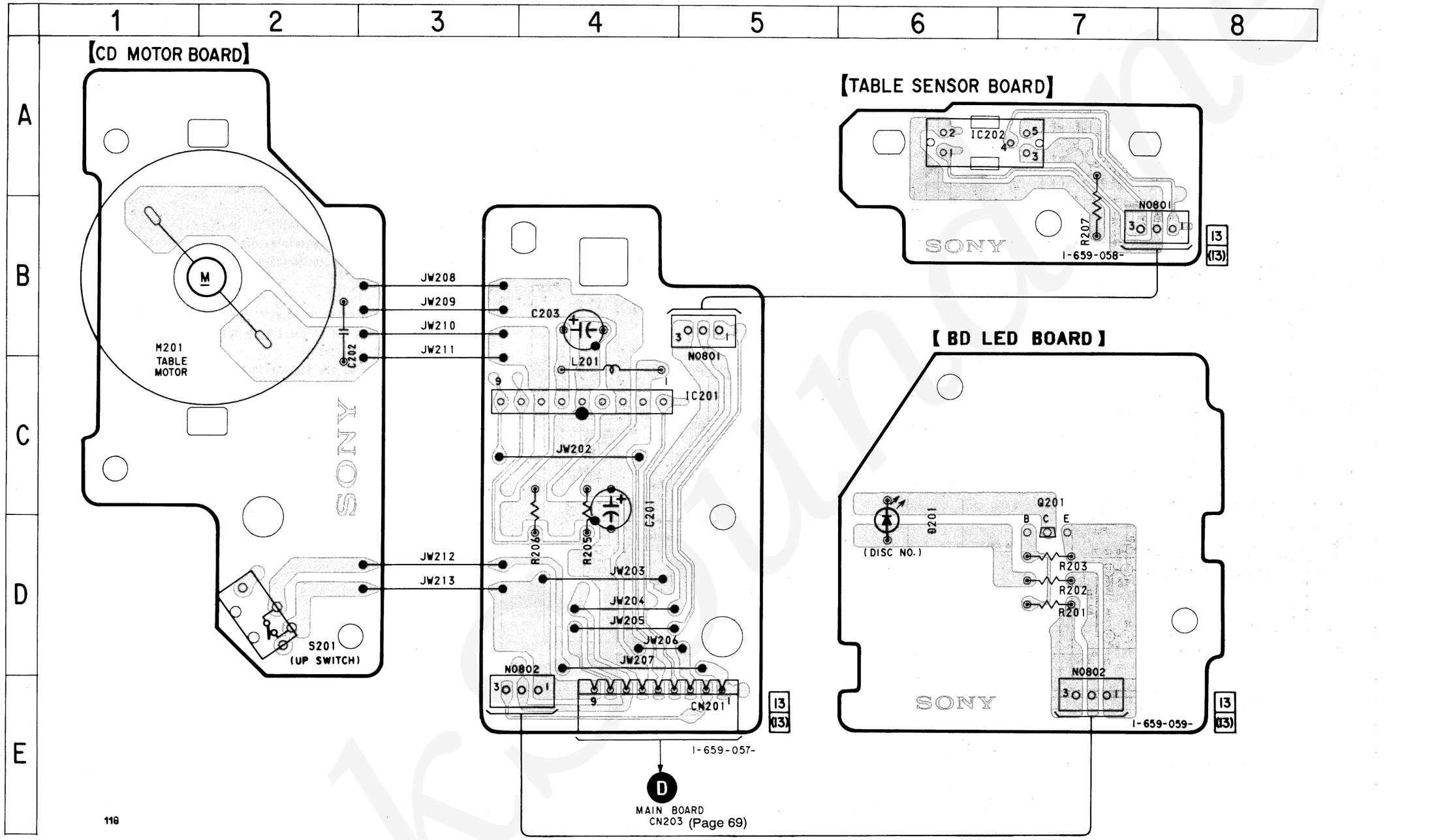
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- B+ :B+ Line.
- Voltages are dc with respect to ground under no-signal conditions. no mark: STOP
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.





6-7. PRINTED WIRING BOARDS – CD MOTOR Section –

• See page 38 for Circuit Boards Location.

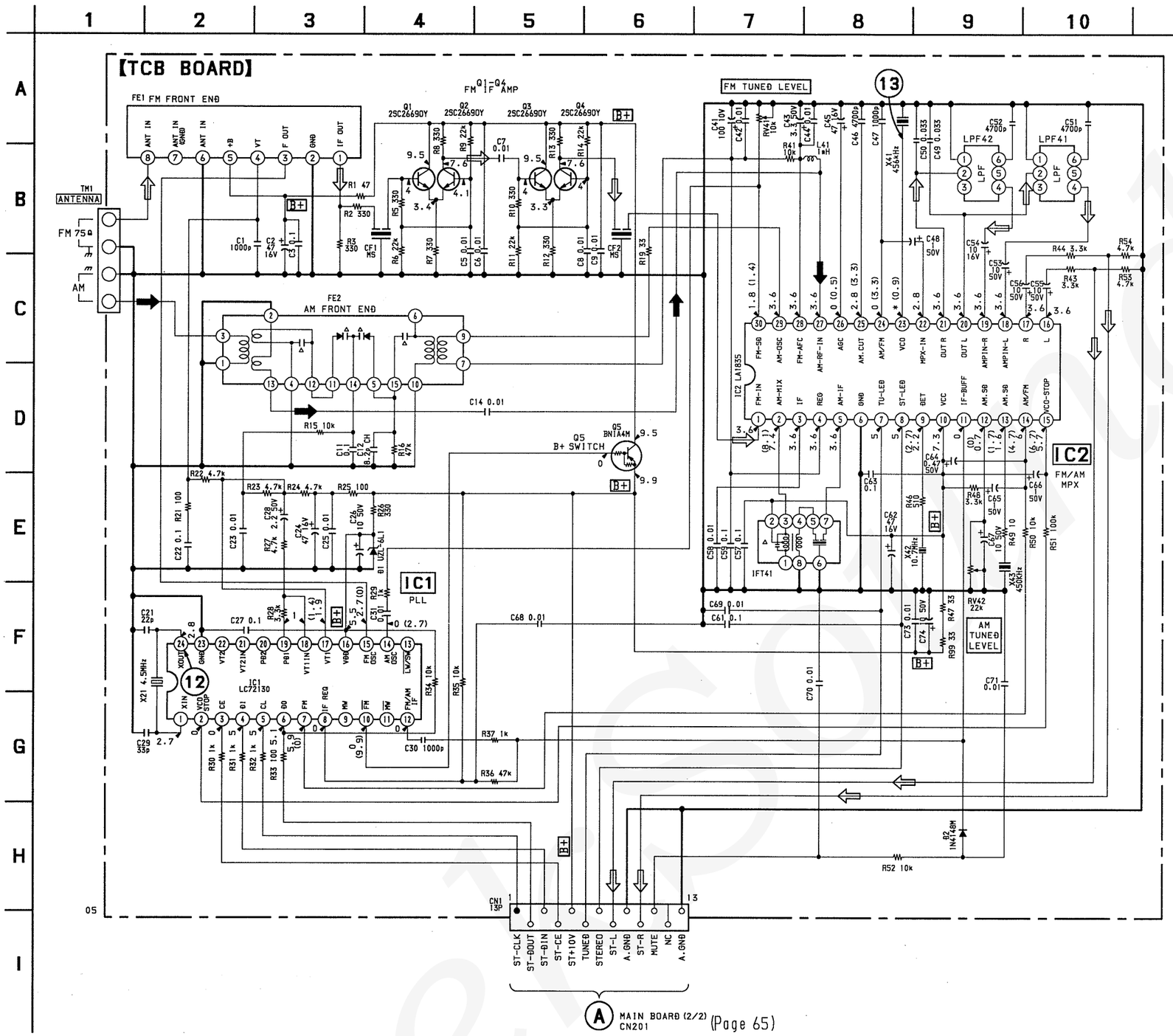


Note:

- ○—— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.

6-8. SCHEMATIC DIAGRAM – TUNER Section –

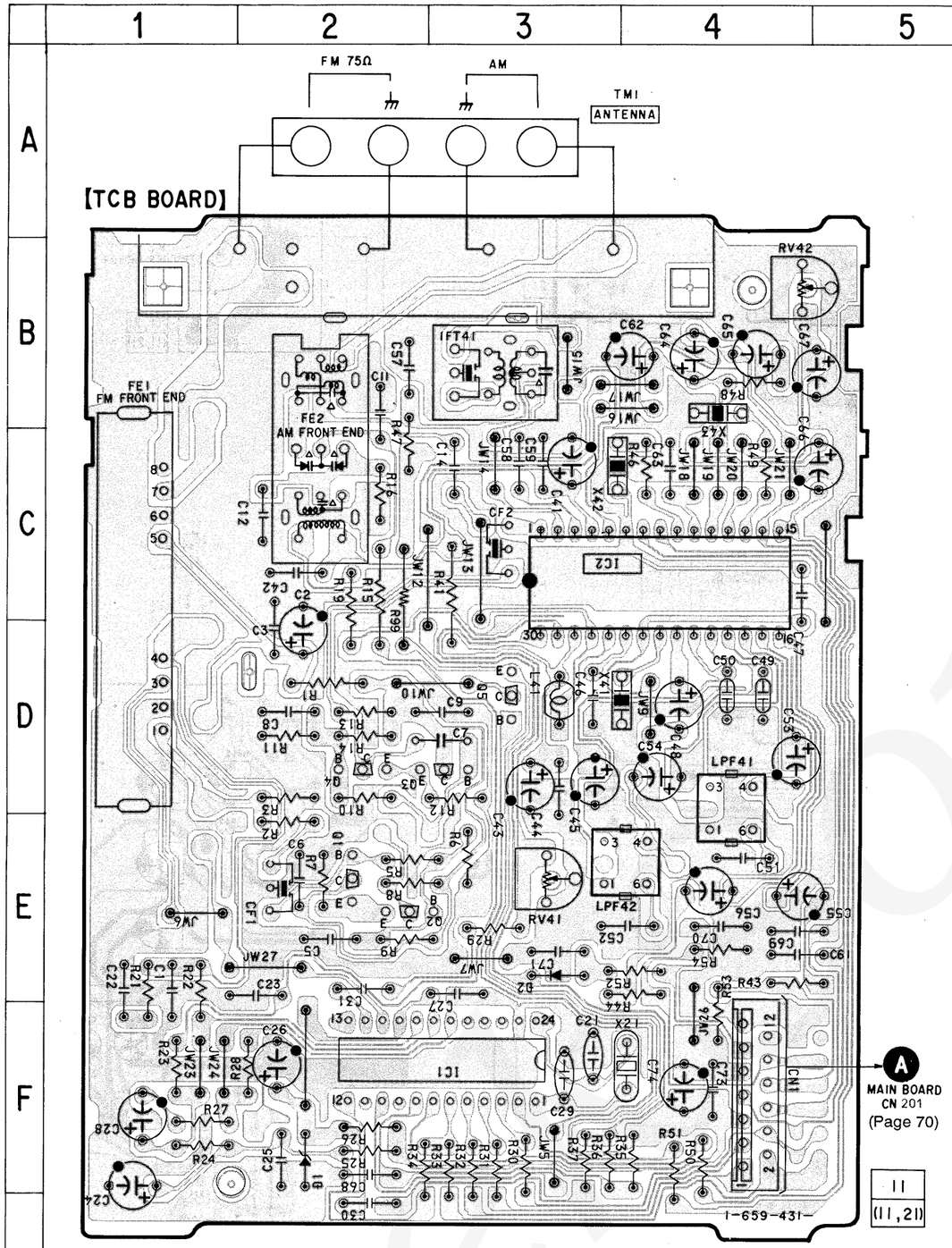
• See page 39 for Waveforms. • See page 85 for IC Block Diagrams.



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.
- ▭ : panel designation.
- B+ : B+ Line.
- ▬ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark: FM
  ( ): AM
- 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.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
  ➡ : AM

6-9. PRINTED WIRING BOARD – TUNER Section – • See page 38 for Circuit Boards Location.



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• **Semiconductor Location**

Ref. No.	Location
D1	F-2
D2	E-3
IC1	F-3
IC2	C-4
Q1	E-2
Q2	E-2
Q3	D-3
Q4	D-2
Q5	D-3

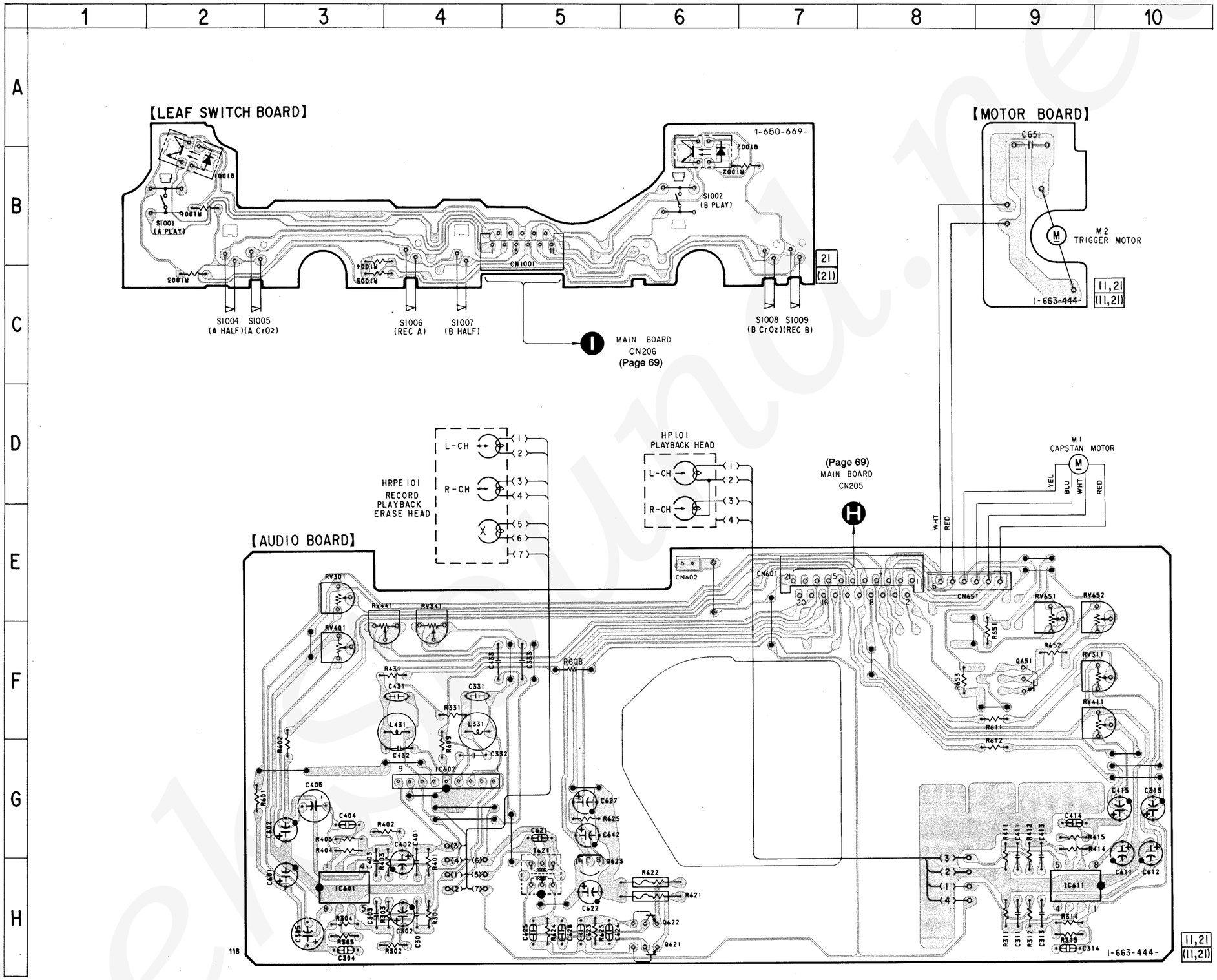
Note:

- ○——— : parts extracted from the component side.
- △ : internal component.
- ▒▒▒ : Pattern from the side which enables seeing.

6-10. PRINTED WIRING BOARDS – DECK Section – • See page 38 for Circuit Boards Location.

• Semiconductor Location

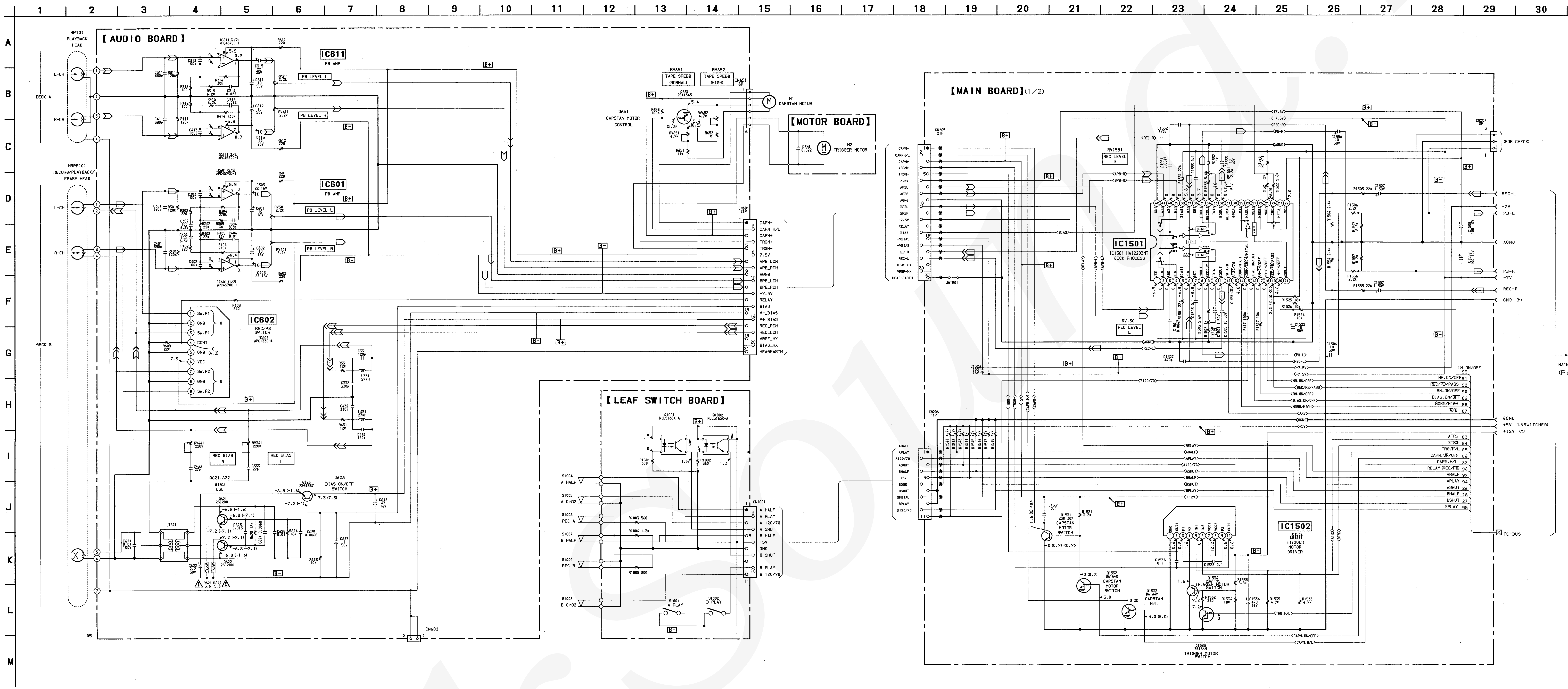
Ref. No.	Location
IC601	H-3
IC602	G-4
IC611	H-9
Q621	H-6
Q622	H-6
Q623	H-5
Q651	F-9
Q1001	B-2
Q1002	B-6



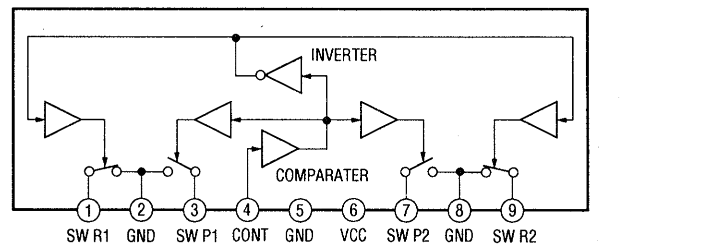
Note:
- ○—— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.

6-11. SCHEMATIC DIAGRAM – DECK Section –

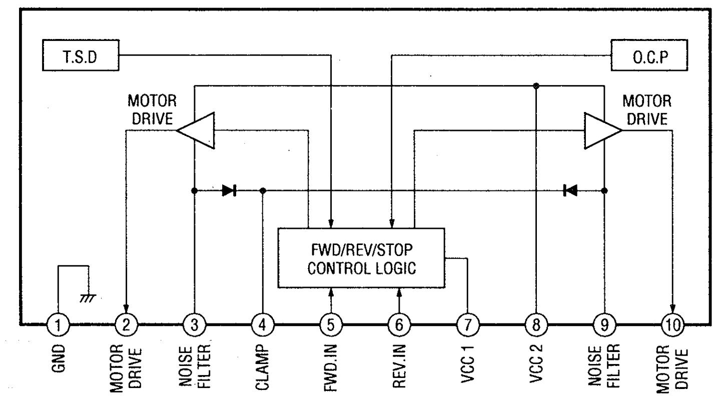
• See page 69 for Printed Wiring Board. (MAIN BOARD).



• IC Block Diagram
IC602 μPC1330HA



IC1502 LB1641



NOTE

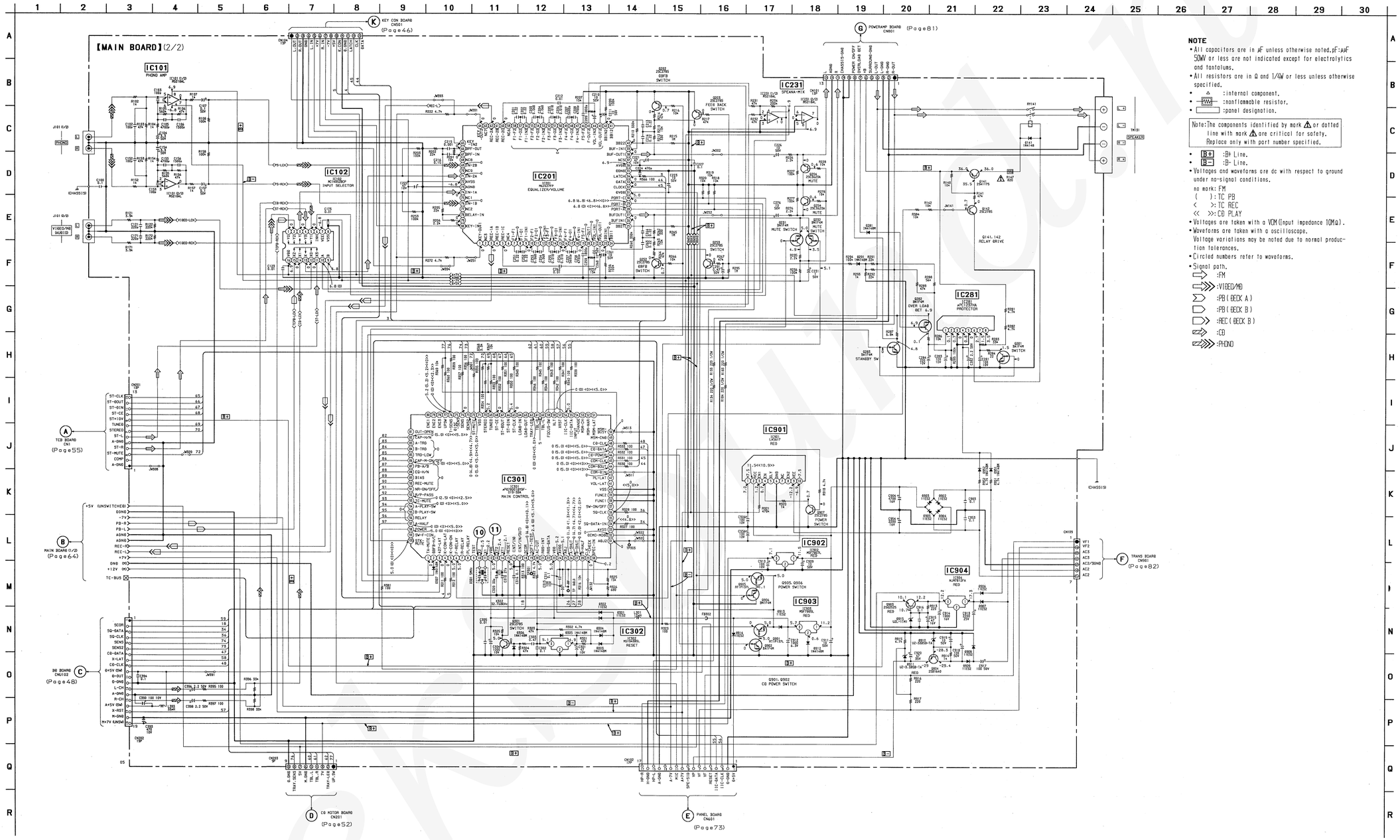
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.
- (fusible resistor symbol) : fusible resistor.

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

- B+ : B+ Line.
- B– : B– Line.
- ▭ : adjustment for repair.
- Voltages are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  ( ) : REC
  * : can not be measured.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  - :PB (DECK A)
  - :PB (DECK B)
  - :REC (DECK B)

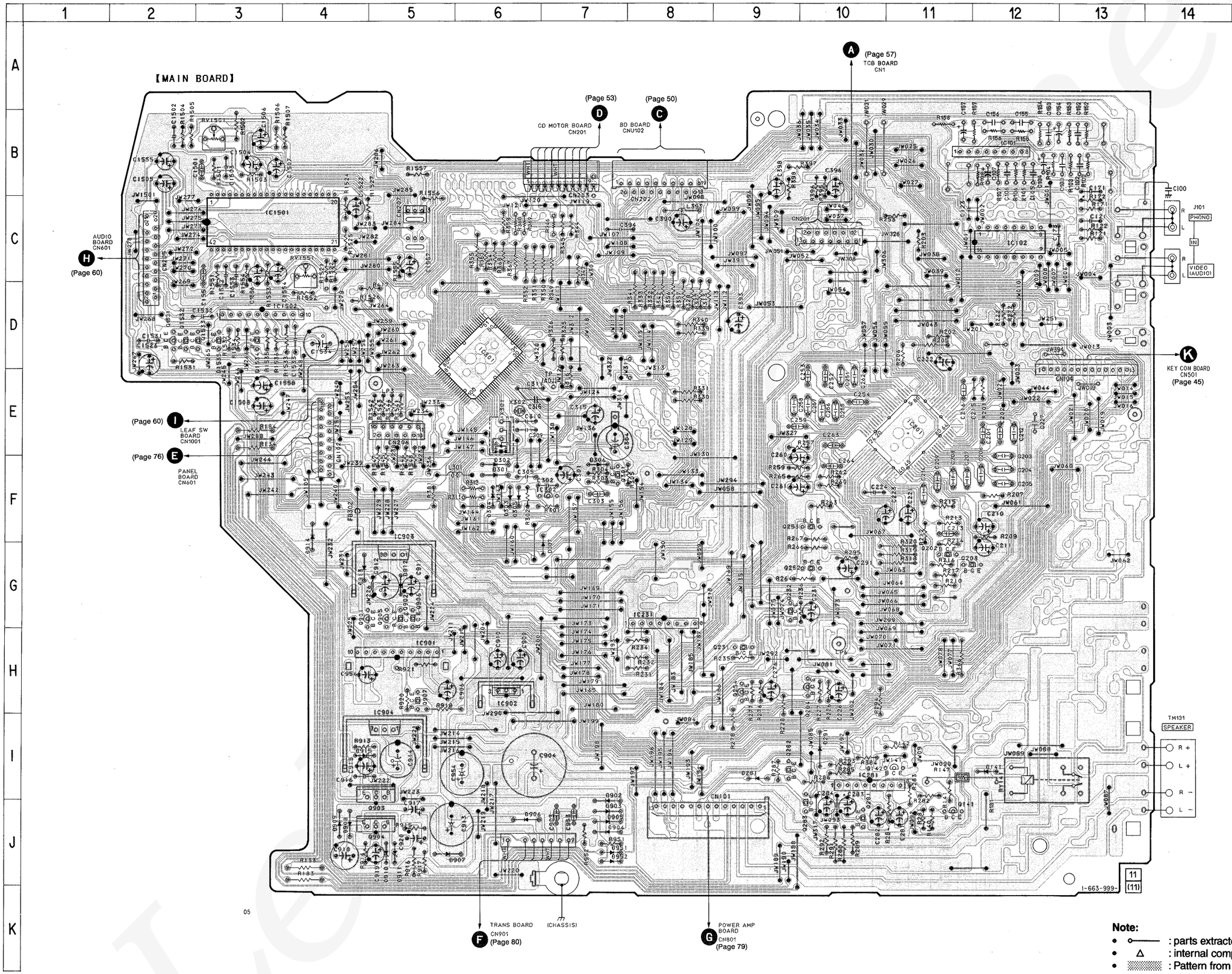
6-12. SCHEMATIC DIAGRAM – MAIN Section –

• See page 78 for IC Block Diagrams. • See page 86 to 88 for IC Pin Function Description.



6-13. PRINTED WIRING BOARD – MAIN Section –

• See page 38 for Circuit Boards Location.



• Semiconductor Location

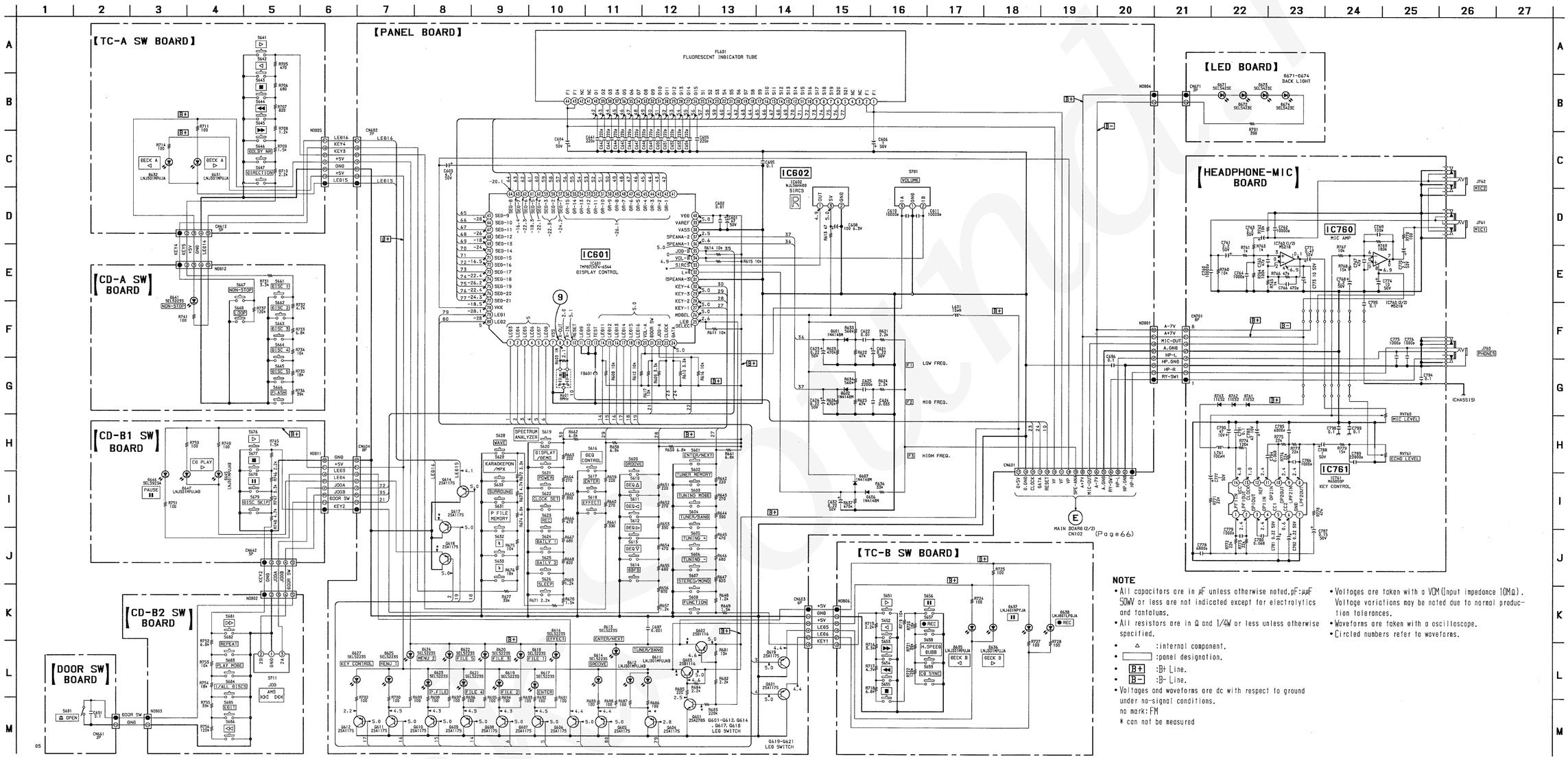
Ref. No.	Location
D141	I-12
D281	I-9
D291	I-10
D301	F-6
D302	F-6
D303	F-6
D304	F-6
D305	F-6
D306	F-7
D307	G-7
D309	G-6
D902	J-7
D903	J-7
D904	J-7
D905	J-7
D906	J-6
D907	J-5
D908	J-4
D909	J-4
D910	J-5
D911	J-5
D912	G-5
D913	G-4
D914	G-4
D915	I-4
D951	J-7
D952	J-7
IC101	B-12
IC102	C-12
IC201	E-11
IC231	G-8
IC281	I-10
IC301	D-6
IC302	F-7
IC901	H-5
IC902	H-6
IC903	G-5
IC904	I-5
IC1501	C-3
IC1502	D-3
Q141	J-11
Q142	I-11
Q201	G-11
Q202	G-11
Q203	G-11
Q204	H-10
Q231	H-9
Q232	G-9
Q251	G-10
Q252	G-10
Q253	F-10
Q254	H-9
Q281	J-10
Q282	I-9
Q283	J-10
Q301	F-7
Q901	H-5
Q902	G-5
Q903	J-5
Q904	J-5
Q905	G-5
Q906	G-5
Q907	H-5
Q1531	D-2
Q1532	D-2
Q1533	D-3
Q1534	D-3
Q1535	D-3

Note:

- ○——— : parts extracted from the component side.
- △ : internal component.
- ▒▒▒ : Pattern from the side which enables seeing.

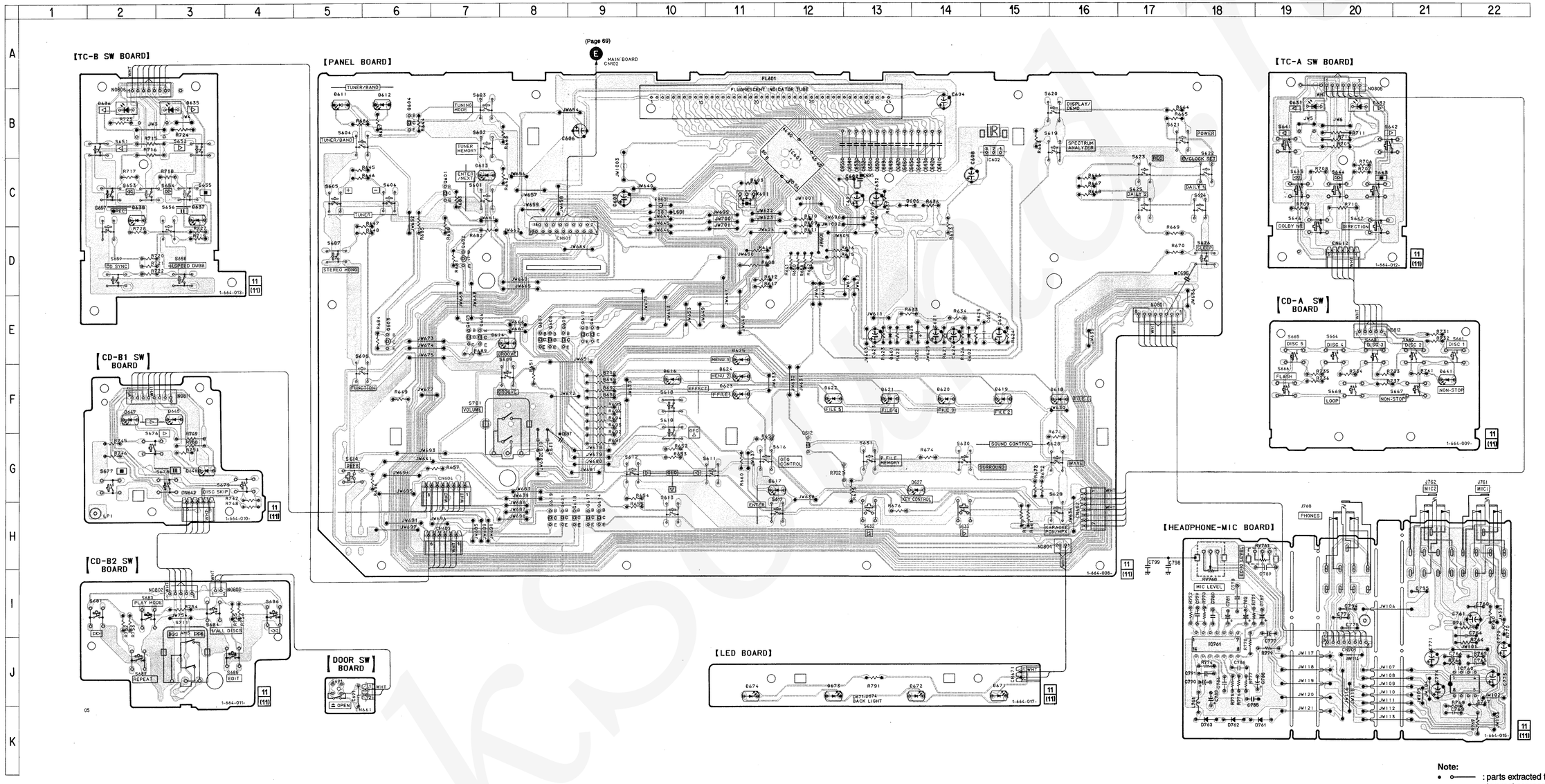
6-14. SCHEMATIC DIAGRAM – PANEL Section –

• See page 39 for Waveforms. • See page 85 for IC Block Diagrams. • See page 89 for IC Pin Function Description.



6-15. PRINTED WIRING BOARDS – PANEL Section –

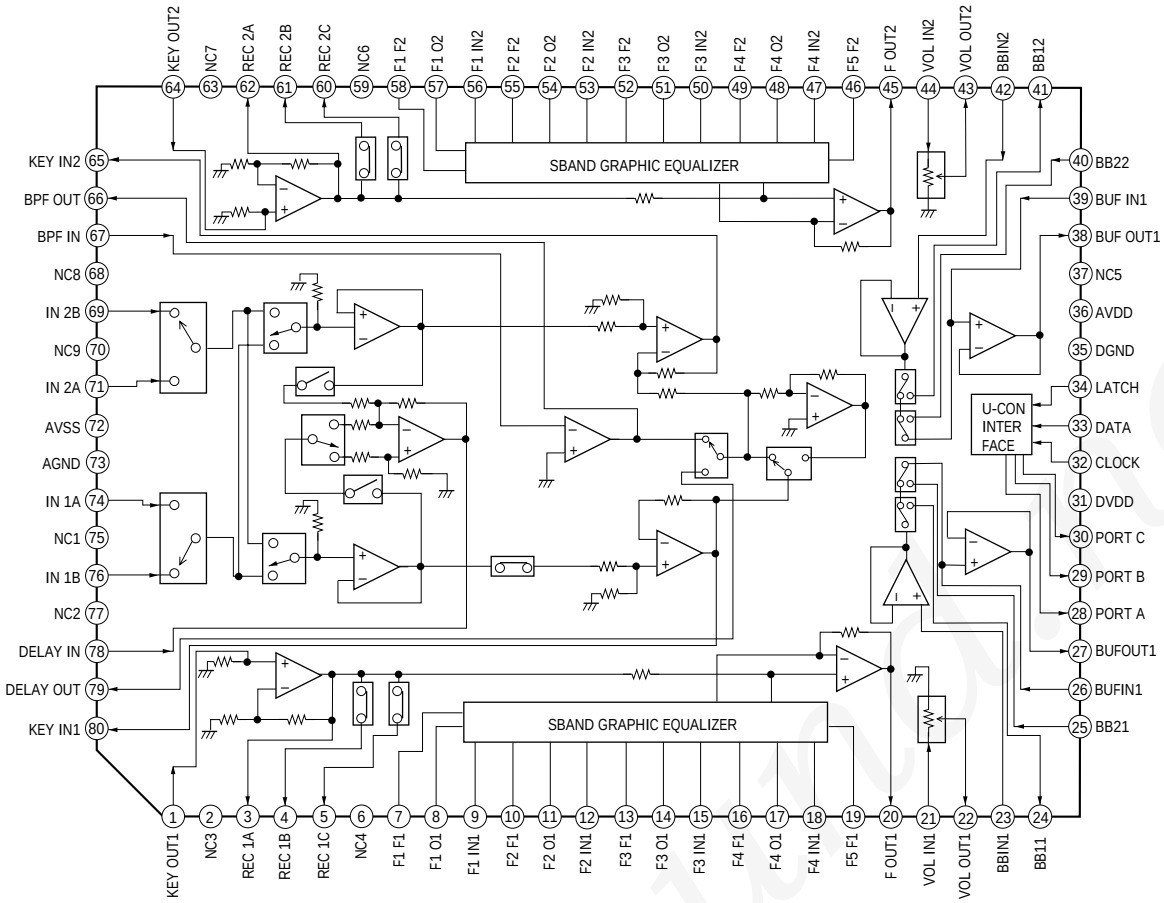
• See page 38 for Circuit Boards Location.



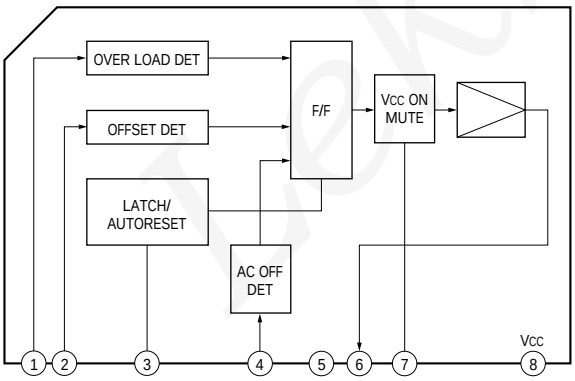
Note:
- ○—— : parts extracted from the component side.
- △ : internal component.
- ▒▒ : Pattern from the side which enables seeing.

• IC Block Diagram – MAIN Section –

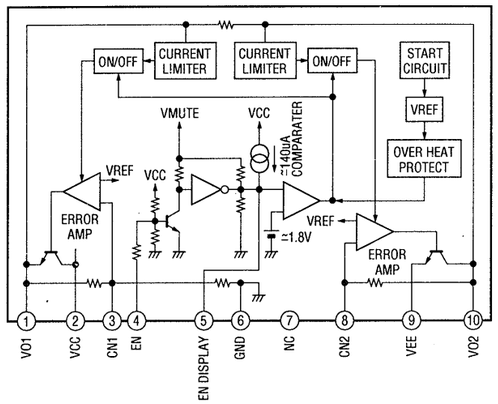
IC201 M62427FP



IC281 µPC1237HA

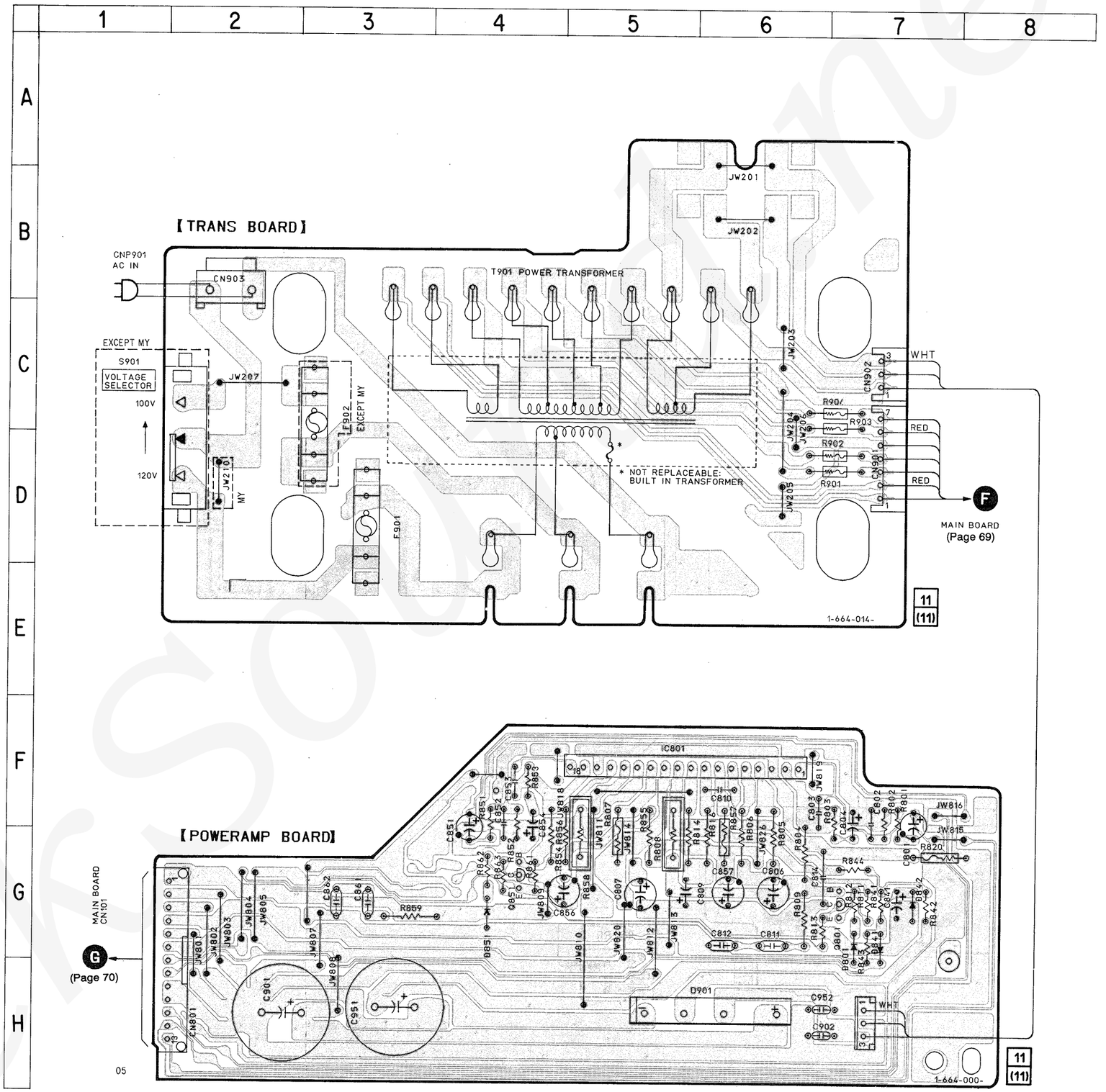


IC901 LA5617



6-16. PRINTED WIRING BOARDS – POWER Section –

• See page 38 for Circuit Boards Location.



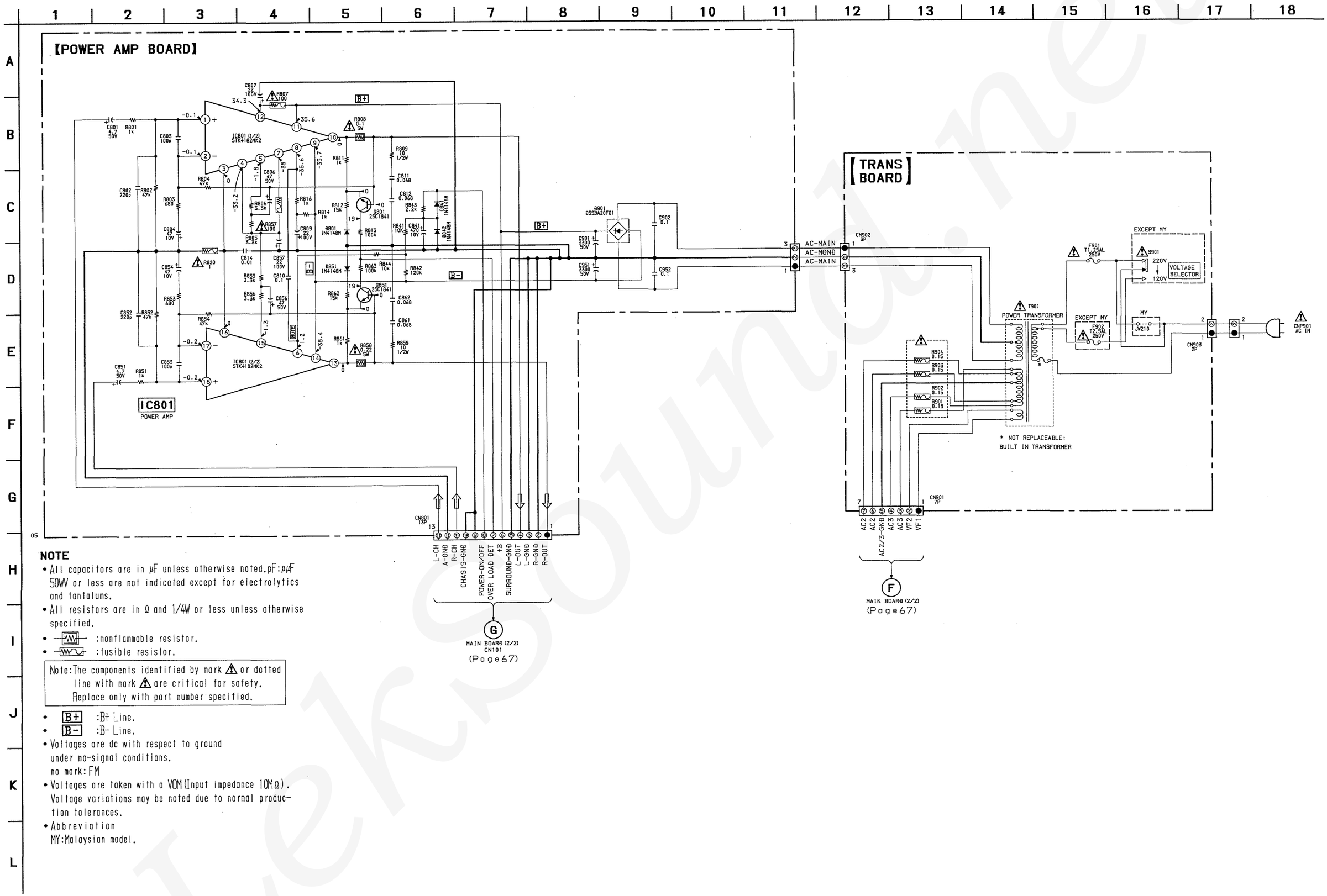
• **Semiconductor Location**

Ref. No.	Location
D801	G-7
D841	G-7
D842	G-7
D851	G-4
D901	H-6
IC801	F-5
Q801	G-7
Q851	G-4

Note:

- ——o : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.
- Abbreviation
  MY : Malaysian model

6-17. SCHEMATIC DIAGRAM – POWER Section –



NOTE

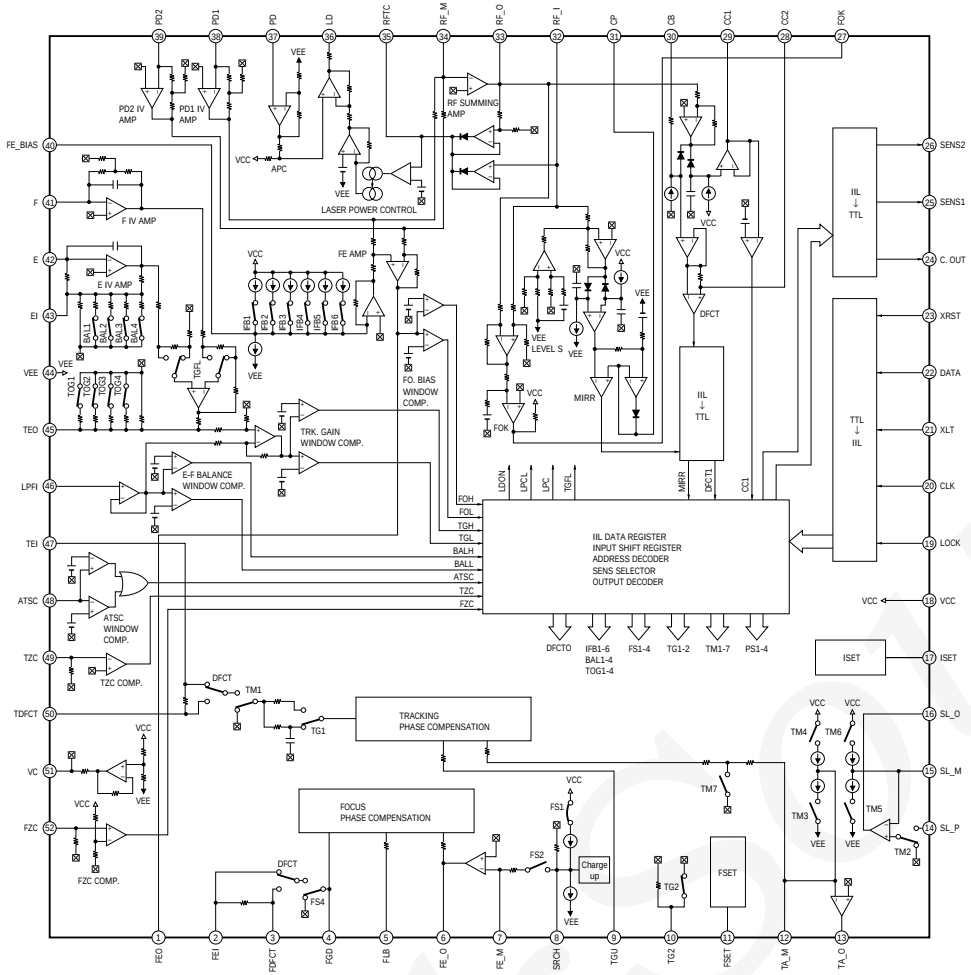
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ⚠ :nonflammable resistor.
- ⚠ :fusible resistor.

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

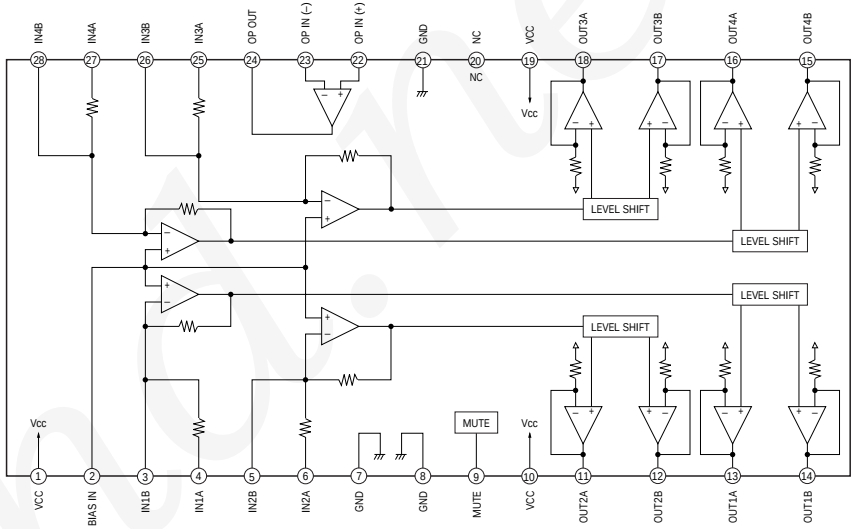
- B+ :B+ Line.
- B- :B- Line.
- Voltages are dc with respect to ground under no-signal conditions. no mark: FM
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Abbreviation MY: Malaysian model.

• **IC Block Diagram**

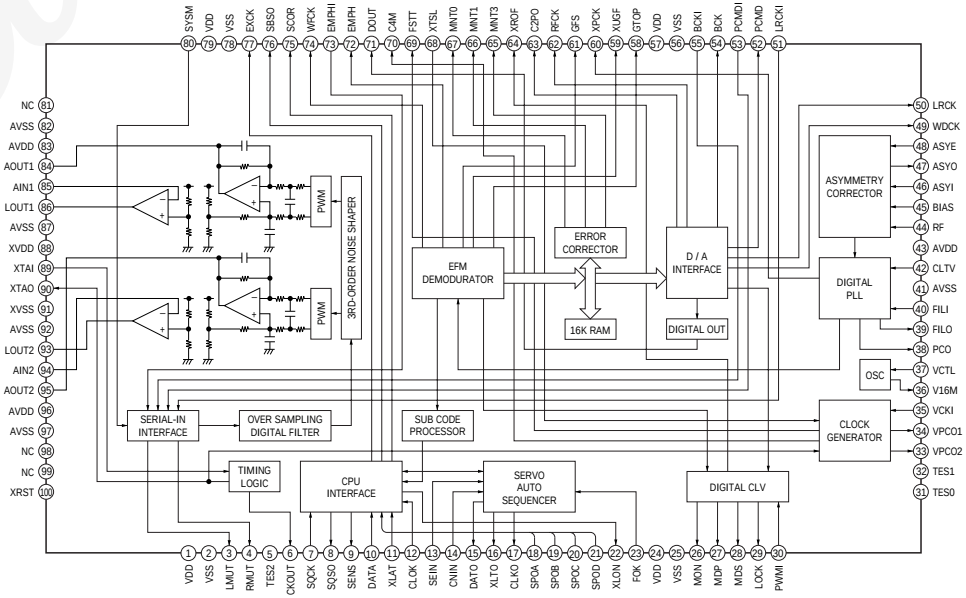
IC101 CXA1992AR



IC102 BA5941FP

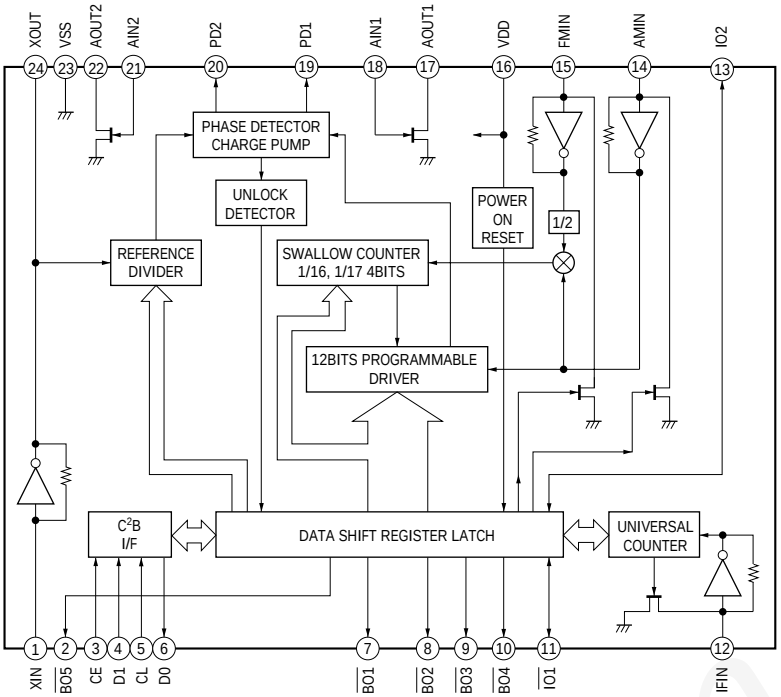


IC103 CXD2519Q



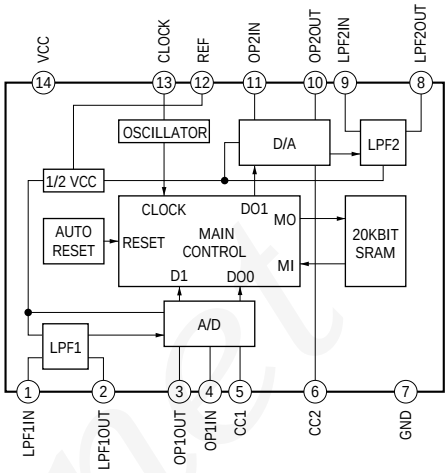
– TUNER Section –

IC1 LC72130

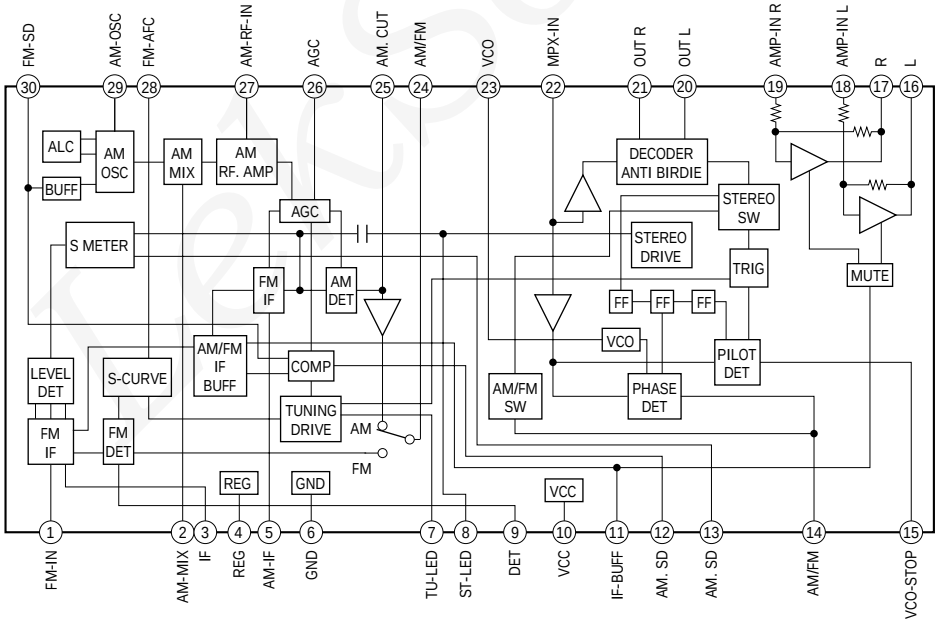


– PANEL Section –

IC761 M65850P



IC2 LA1835



6-18. IC PIN FUNCTION DESCRIPTION

MAIN BOARD IC301 µPD780018Y (MAIN CONTROL)

Pin No.	Pin Name	I/O	Function
1	TA-MUTE	O	Line mute signal output
2	DBFB-H/L	O	DBFB H/L select signal output
3	427-LT	O	Latch signal output for IC201 (62427)
4	KCON-LT	O	Latch signal output for IC501 (Key Control)
5	KCON-ON/OFF	O	Key control ON/OFF signal output
6	F-RELAY	O	Front speaker relay control output
7	R-RELAY	O	Not used
8	PL-RELAY	O	
9	TEST	I	Connected ground
10	X2	O	X'tal (5MHz)
11	X1	I	
12	VDD	–	Power supply (+5V)
13	XT2	O	X'tal (32.768 KHz)
14	XT1	I	
15	RESET	I	Reset signal input
16	INT/IN	I	Connected ground
17	INT/IN/OUT	I	
18	SCOR	O	Subcode data request signal output
19	SOFT-TEST	O	Software test port
20	AC-CUT	I	Back up signal input
21	RDS-INT	I	Not used
22	RDS-DATA	I	
23	VDD	–	Power supply (+5V)
24	AVDD	I	Analog reference voltage input
25	ADJ	I	CD adjust point port
26	A-SHUT	I	A Deck reel pulse detector
27	B-SHUT	I	B Deck reel pulse detector
28	B-HALF	I	Half detector signal input
29	CLK-CHECK	I	Connected ground
30	SPEC-IN	I	Version select signal input
31	ADJ 2	I	Connected ground
32	DEMO-MODE	I	Connected ground
33	AVss	–	Ground
34	SQ-DATA-IN	I	Subcode Q data input
35	—	–	Not used
36	SQ-CLK	I	Subcode Q data clock input
37	SW-ON/OFF	O	Not used
38, 39	FUNC 1, 2	I	Connected ground
40	Vss	–	Ground
41	VOL-LAT	O	Not used
42	PL-LAT	O	
43	COM-DIN	I	Connected ground
44	COM-DOUT	O	Common serial data output

Pin No.	Pin Name	I/O	Function
45	COM-CLK	O	Common serial clock output
46	CD-POWER	O	CD power on signal output
47	CD-DATA	O	CD data output
48	CD-CLOK	O	CD clock output
49	MSM-CMD	O	Not used
50	MSM-BUSY	I	Connected ground
51	MSM-LT	O	Not used
52	MSM-NAR	I	
53	MSM-CH	O	
54	INPUT-CHANGE	O	Not used
55	11C-DATA	O	Data output for IC601
56	11C-CLK	O	Clock output for IC601
57	XRST	O	CD reset signal output
58	XLT	O	CD latch signal output
59	FOUCUS-SW	O	Not used
60	TBL-L	O	Table motor control output
61	TBL-R	O	
62	TRAY-LED	O	CD tray LED ON/OFF output
63	LOAD-OUT	O	Not used
64	LOAD-IN	O	
65	ST-CLK	O	Tuner clock output
66	ST-DIN	I	Tuner data input
67	ST-DOUT	O	Tuner data output
68	ST-CE	O	Tuner chip enable output
69	TUNED	I	Tuned detection for tuner
70	STEREO	I	Stereo detection for tuner
71	Vss	–	Ground
72	ST-MUTE	O	Tuner mute signal output
73	SENS2	I	BD Condition signal input
74	SENS	I	
75	DISC-SENS	I	Not used
76	T-SENS	I	CD table detection signal input
77	UP-SW	I	Up SW (S201) signal input
78	ENC 3	I	Not used
79	ENC 2	I	
80	ENC 1	I	
81	OUT-OPEN	I	Not used
82	CAP-M-H/N	O	Capstan motor H/N speed select signal output
83	B-TRG	O	Trigger motor control output
84	A-TRG	O	Trigger motor control output
85	TRG-LOW	O	Trigger motor control output
86	CAP-M-ON/OFF	O	Capstan motor ON/OFF signal output
87	PB-A/B	O	PB Deck A/Deck B select output

Pin No.	Pin Name	I/O	Function
88	EQ-H/N	O	Equalizer H/N select output
89	BIAS	O	Bias ON/OFF signal output
90	REC-MUTE	O	REC mute ON/OFF selection output
91	NR-ON/OFF	O	NR ON/OFF signal output
92	R/P-PASS	O	REC/PB/PASS selection output
93	TC-MUTE	O	TC mute ON/OFF selection output
94	A-PLAY-SW	I	Deck A play detect
95	B-PLAY-SW	I	Deck B play detect
96	TC-RELAY	O	REC/PB head selection output for IC602
97	A-HALF	I	Deck A cassette detect
98	POWER	O	POWER ON/OFF signal output
99	SW-F-CHG	O	Super woofer mode signal output
100	STK-MUTE	O	Power amp ON/OFF signal output

PANEL BOARD IC601 TMP87CH74 (DISPLAY CONTROL)

Pin No.	Pin Name	I/O	Function
1-6	LED3-LED8	O	LED driver output
7	VSS	–	Ground
8	X-OUT	O	X'tall (8MHz)
9	X-IN	I	
10	RESET	I	Reset signal input from main controller
11	LED 9	O	Connected ground
12	LED10	O	
13	TEST	I	
14-19	LED11-LED19	O	LED driver output
20	VOL-A	I	Rotary encoder (S701 VOLUME) pulse input
21	DOOR SW	I	DOOR SW (S651) ON/OFF signal input
22	JOG-A	I	Rotaly encoder (S711 AMS) pulse input
23	CLOCK	I	Serial clock input from main controller
24	DATA	I	Serial data input from main controller
25	LED SELECT	O	LED select signal output
26	MODEL	I	Version select signal input
27-30	KEY1-KEY4	I	Key input
31	SPEANA-3	I	Connected ground
32	L + R	I	Spectrum analyzer (high frequency) input
33	SIRCS	I	Remote commander signal input
34	VOL-B	I	Rotary encoder (S701 VOLUME) pulse input
35	JOG-B	I	Rotary encoder (S711 AMS) pulse input
36	SPEANA-1	I	Spectrum analyzer (Low frequency) input
37	SPEANA-2	I	Spectrum analyzer (Middle frequency) input
38	VASS	–	Ground
39	VAREF	I	Analog reference voltage input
40	VDD	–	Power supply (+5V)
41	—	–	Not used
42-56	GR1-GR15	O	FL gride signal output
57-77	SEG1-SEG77	O	FL segment signal output
78	VKK	–	–30V driving power for FL
79, 80	LED1-LED2	O	LED driver output

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