# HCD-GNZ77D/GNZ88D

# SERVICE MANUAL

*E Model*

**Ver. 1.3 2007. 08**

(Photo: HCD-GNZ77D)

- HCD-GNZ77D/GNZ88D are the tuner, deck, DVD and amplifier section in MHC-GNZ77D/GNZ88D.

| | | |
|---|---|---|
| DVD Section | Model Name Using Similar Mechanism | HCD-GNZ7D/GNZ8D/GNZ9D |
| | DVD Mechanism Type | CDM74HF-DVBU101//C |
| | Optical Pick-up Name | KHM-310CAB/C2NP |
| Tape Deck Section | Model Name Using Similar Machanism | NEW |

## SPECIFICATIONS

### Amplifier section

**HCD-GNZ88D**

The following measured at AC 120, 127, 220, 240 V, 50/60 Hz

DIN power output (rated)
75 W + 75 W
(4 ohms at 1 kHz, DIN)

Continuous RMS power output (reference)

Front speaker: 100 W + 100 W
(4 ohms at 1 kHz, 10% THD)

Center speaker: 40 W (8 ohms at 1 kHz, 10% THD)

Surround speaker: 40 W + 40 W
(8 ohms at 1 kHz, 10% THD)

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DIN power output (rated)
75 W + 75 W
(4 ohms at 1 kHz, DIN)

Continuous RMS power output (reference)
100 W + 100 W
(4 ohms at 1 kHz, 10% THD)

Inputs

VIDEO INPUT (phono jacks):
VIDEO: 1 Vp-p, 75 ohms
AUDIO L/R: Voltage 250 mV, impedance 47 kilohms

TV/SAT AUDIO IN L/R (phono jack):
Voltage 250 mV/450 mV, impedance 47 kilohms

Outputs

VIDEO OUT (phono jack):
max. output level
1 Vp-p, unbalanced, Sync negative load impedance
75 ohms

COMPONENT VIDEO OUT:
Y: 1 Vp-p, 75 ohms
PB/CB: 0.7 Vp-p, 75 ohms
PR/CR: 0.7 Vp-p, 75 ohms

S-VIDEO OUT (4-pin/mini-DIN jack):
Y: 1 Vp-p, unbalanced, Sync. negative
C: 0.286 Vp-p, load impedance 75 ohms

PHONES (stereo mini jack):
Accepts headphones of 8 ohms or more

FRONT SPEAKER: Use only the supplied speakers

SURROUND SPEAKER (HCD-GNZ88D):
Use only the supplied speakers

CENTER SPEAKER (HCD-GNZ88D):
Use only the supplied speakers

SUB WOOFER OUT (phono jack):
Voltage 250 mV, impedance 1 kilohm

– Continued on next page –

## DVD DECK RECEIVER

**9-887-258-04**
2007H04-1


**Sony Corporation**
**Personal Audio Division**
**Published by Sony Techno Create Corporation**

SONY

# SECTION 3
# TEST MODE

## [PANEL TEST MODE]

- This mode is used to check the fluorescent indicator tube, LEDs, keys, VOLUME jog, model, destination, software version and VACS level.

**Procedure:**

1. Press ■ button, ILLUMINATION button and DISC 2 button simultaneously.
2. All LEDs and segments in fluorescent indicator tube are lighted up. All LEDs are lighted up in red color where the SUB WOOFER ON/OFF LED is lighted up in green color.
3. When you want to enter to the software version dispaly mode, press DISC 1 button. The model information appears on the fluorescent indicator tube. Press DISC 1 button again to view the destination information.
4. Each time DISC 1 button is pressed, the display changes from MC version, SYS version, UI version, DVD version, CDMA version, CDMB version, ST version, TA version, TM version, TC version in this order, and returns to the model version display.
5. When DISC 3 button is pressed while the version numbers are being displayed except model and destination, the date of the software creation appears. When DISC 3 button is pressed again, the display returns to the software version display. When DISC 1 button is pressed while the date of the software creation is being displayed, the date of the software creation is displayed in the same order of software version display.
6. Press DISC 2 button, the key check mode is activated.
7. In the key check mode, the fluorescent indicator tube displays "K 0 V0".
   Turn the OPERATIONAL DIAL clockwise; "K" value increases by one. Turn the OPERATIONAL DIAL counterclockwise; "K" value increases by one. Each time a button is pressed, "K" value increases. Press other keys on main unit to check whether the key is detected. However, once a button has been pressed, it is no longer taken into account.
   "V" value increases in the manner of 0, 1, 2, 3 ... if VOLUME knob is turned clockwise, or it decreases in the manner of 0, 9, 8, 7 ... if VOLUME knob is turned counterclockwise.
8. When DISC 3 button is pressed after all LEDs and segments in fluorescent indicator tube light up, the fluorescent indicator tube displays "VACS A". A is VACS level which is triggered by signal level.
9. When DISC SKIP/EX-CHANGE button is pressed after all LEDs and segments in fluorescent indicator tube light up, alternate segments in fluorescent indicator tube would light up. If you press DISC SKIP/EX-CHANGE button again, another half of alternate segments in fluorescent indicator tube would light up. When DISC SKIP/EX-CHANGE button is pressed again, all segments lights off. Press DISC SKIP/EX-CHANGE button again would cause all segments lights up.
10. To release from this mode, press three buttons in the same manner as step 1, or disconnect the power cord.

## [COMMON TEST MODE]

- This mode is used to check operations of the respective sections of Amplifier and Tape.

**Procedure:**

- To enter Common Test Mode

1. Press ■ button, ILLUMINATION button and DISC 3 button simultaneously.
2. The DVD ring indicators and the line below DVD ring indicator flash synchronously on the fluorescent indicator tube. The function is changed to TV where the function is changed to DVD.

- Check of Amplifier

1. Press EQ BAND/MEMORY button repeatedly until a message "GEQ MAX" appears on the fluorescent indicator tube. GEQ increases to its maximum.
2. Press EQ BAND/MEMORY button repeatedly until a message "GEQ MIN" appears on the fluorescent indicator tube. GEQ decreases to its minimum.
3. Press EQ BAND/MEMORY button repeatedly until a message "GEQ FLAT" appears on the fluorescent indicator tube. GEQ is set to flat.
4. When the VOLUME knob is turned clockwise even slightly, the sound volume increases to its maximum and a message "VOLUME MAX" appears on the fluorescent indicator tube.
5. When the VOLUME knob is turned counterclockwise even slightly, the sound volume decreases to its minimum and a message "VOLUME MIN" appears on the fluorescent indicator tube.

- Tape function

1. When a tape is inserted in Deck B and recording is started, the function is changed to TV automatically. The function is change to DVD automatically when a tape is inserted in Deck B and recording is started. When CD SYNC button is pressed during recording in function, ALC (Automatic Logic Control) is turned on.
2. During recording, press ◀◀ button will stop the recording and the function is changed to TAPE B and rewind the tape in Deck B until the recording start position and playback of the tape in Deck B is started. If the REC PAUSE/START button is pressed for a pause and pressed again to resume recording during recording time, when the tape is rewind, the tape will be rewind until the position where the pause is applied.

- To release from Common Test mode

1. To release from this mode, press I/⏻ button.
2. The cold reset is enforced at the same time.

## [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 I/⏻ button to turn on the system.
2. Press ■ button, ILLUMINATION button, and I/⏻ button simultaneously.
3. The message "COLD RESET" appears on the fluorescent indicator tube. Then, the fluorescent indicator tube becomes blank for a while, and the system is reset.

## [VACS ON/OFF]

- This mode is used to switch on and off the VACS (Variable Attenuation Control System).

**Procedure:**

1. Press I/⏻ button to turn on the system.
2. Press ■ button, DIRECTION button and DISC 1 simultaneously. The message "VACS OFF" or "VACS ON" appears on the fluorescent indicator tube.

## [TUNER STEP CHANGE]

- The step interval of AM channels can be toggled between 9 kHz and 10 kHz. This mode is not available for Saudi Arabia and Russia models.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Press TUNER/BAND button repeatedly to select the “AM”.
3. Press I/⏻ button to turn off the system.
4. Press ILLUMINATION button and I/⏻ button simultaneously. The system will turn on automatically. The message “AM 9K STEP” or “AM 10K STEP” appears on the fluorescent indicator tube and thus the channel step is changed.

### [DVD SHIP MODE (WITH MEMORY CLEAR)]
- This mode moves the optical pick-up to the position durable to vibration and clears all data including preset data stored in the RAM to initial conditions. Use this mode when returning the set to the customer after repair.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press ■ button, DIRECTION button and I/⏻ button simultaneously during “DVD NO DISC” condition. The system will turn off automatically.
4. After the “STANDBY” blinking display finishes, a message “MECHA LOCK” appears on the fluorescent indicator tube and the DVD ship mode is set.

### [DVD SHIP MODE (WITHOUT MEMORY CLEAR)]
- This mode moves the optical pick-up to the position durable to vibration. Use this mode when returning the set to the customer after repair.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press DVD button and I/⏻ button simultaneously during “DVD NO DISC” condition. The system will turn off automatically.
4. After the “STANDBY” blinking display finishes, a message “MECHA LOCK” appears on the fluorescent indicator tube and the DVD ship mode is set.

### [DVD TRAY LOCK MODE]
- This mode let you lock the disc tray. When this mode is activated, the disc tray will not open when OPEN/CLOSE button or DISC SKIP/EX-CHANGE button is pressed. The message “LOCKED” will appears on the fluorescent indicator tube.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press ■ button and OPEN/CLOSE button simultaneously and hold down until “LOCKED” or “UNLOCKED” appears on the fluorescent indicator tube (around 5 seconds).

### [TCM OFFLINE MODE]
- This mode prevents the system from turning off automatically when TCM is not connected. Therefore, measurements can be done even when TCM is not connected during production.

**Procedure:**
1. When the system is turned off, press EQ BAND/MEMORY button, TAPE A/B button and I/⏻ button simultaneously. The system will turn on automatically.
2. The message “TCM OFFLINE” will appears on the fluorescent indicator tube.

- To release from TCM Offline Mode
  To release from this mode, perform “COLD RESET” or turn off the power supply.

### [TV/SAT SWITCHING]
- This mode let you switch from TV to SAT and vice-versa.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Select TV function.
3. Press TV/SAT button and I/⏻ button simultaneously. The function will change to SAT. Press the same buttons again to change from SAT to TV.

### [DVD COLOR SYSTEM]
- This mode let you change the color system of the video output from PAL to NTSC or vice-versa. This mode is not available for Latin American and Russian models.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press I/⏻ button again to turn off the system.
4. Press ❚❚ button and I/⏻ button simultaneously. The system will turn on automatically.
   The message “COLOR PAL” or “COLOR NTSC” appears on the fluorescent indicator tube.

### [REMOTE DISABLE MODE]
- This mode let you disable the remote commander reception. When this mode is activated, the system will not response if the button on the remote commander is pressed. The message “RM DISABLE” appears on the fluorescent indicator tube.
  This mode is essential for conducting test and repairing when no interruption from the other remote commander is expected. This mode is cancelled automatically when the system is turned off.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Press ■ button, DIRECTION button and DISC 3 button simultaneously until “SIRCS ON” or “SIRCS OFF” appears on the fluorescent indicator tube.

### [PROGRESSIVE]
- This mode let you change the format of the video output from the COMPONENT OUT jacks among PROGRESSIVE AUTO, PROGRESSIVE VIDEO and INTERLACE.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Press DVD button and DISPLAY button simultaneously. “P AUTO” or “P VIDEO” or “INTERLACE” appears on the fluorescent indicator tube.

### [MTK FIRMWARE DISPLAY]
- This mode is used to display the MTK firmware version.

**Procedure:**
1. Press I/⏻ button to turn on the system.
2. Press DVD button to switch to DVD function.
3. Press I/⏻ button again to turn off the system.
4. Press ■ button and I/⏻ button. The system turns on automatically.
5. The version of MTK firmware appears on the TV screen.

### [DVD SERVICE MODE]
- This mode let you make diagnosis and adjustment easily by using the remote commander and the TV. The instructions, diagnostic results, etc. are given on the on-screen display.

• TEST DISC LIST

Be sure to use the DVD disc that matches the signal standards of your region.

• CD

YEDS-18 (Part No.: 3-702-101-01)
PATD-012 (Part No.: 4-225-203-01)

• DVD SL (Single Layer)

NTSC : HLX-503 (Part No.: J-6090-069-A)
HLX-504 (Part No.: J-6090-088-A)
PAL : HLX-506 (Part No.: J-6090-077-A)

• DVD DL (Dual Layer)

NTSC : HLX-501 (Part No.: J-6090-071-A)
HLX-505 (Part No.: J-6090-089-A)
PAL : HLX-507 (Part No.: J-6090-078-A)

• Procedure to enter to DVD Service Mode:

1. Press I/⏻ button to turn on the system.
2. Select DVD function.
3. Press ■ button and OPEN/CLOSE button simultaneously and then turn the VOLUME knob clockwise.
4. The message “SERVICE IN” appears on the fluorescent indicator tube and the Top Menu of Remocon Diagnosis Menu appears on the on-screen display on the TV. The model name and revision number is displayed at the bottom of the on-screen display.

```
Remocon Diagnosis Menu

0. External Chip Check
1. Servo Parameter Check
2. Drive Manual Operation
3. Emergency History
4. Version Information


Model Name   : GML6DS_ME
IF-con       : Ver. 01.00 (0000)
Syscon       : Ver. 0.302
```

5. To execute each function, press its number by using numeric button on the remote commander.
6. To release from this mode, press I/⏻ button to turn off the system.

• Execute IOP Measurement

In order to execute IOP measurement, the following standard procedures must be followed.

1. From the Top Menu of Remocon Diagnosis Menu, select “2. Drive Manual Operation” by pressing the 2 button on the remote commander. The following screen appears on the on-screen display.

```
Drive Manual Operation

1. Servo Control
2. Track/Layer Jump
3. Manual Adjustment
4. Mecha test Mode
5. MIRR time Adjust
0. Return to Top Menu
```

2. Select “3. Manual Adjustment” by pressing the 3 button on the remote commander. The following screen appears on the on-screen display.

```
Manual Adjust

1. Track Balance Adjust:
2. Track Gain Adjust:
3. Focus Balance Adjust:
4. Focus Gain Adjust:
5. Eg Boost Adjust:
6. Iop:
7. TRV. Level:
8. S curve(FE) Level:
9. RFL(PI) Level:
0. MIRR Time:

↑↓ Change Value
RETURN Return to previous menu
```

3. Select “6. Iop:” by pressing 6 button on the remote commander.
4. Wait until a hexadecimal number appears in the on-screen display as below:

```
Manual Adjust

1. Track Balance Adjust:
2. Track Gain Adjust:
3. Focus Balance Adjust:
4. Focus Gain Adjust:
5. Eg Boost Adjust:
6. Iop. ED:
7. TRV. Level:
8. S curve(FE) Level:
9. RFL(PI) Level:
0. MIRR Time:

↑↓ Change Value
RETURN Return to previous menu
```

5. Convert data from hexadecimal to decimal by using conversion table.
6. Please find the label on the rear of the BU (Base Unit). The default IOP value is written in the label.
7. Subtract between these two values.
8. If the remainder is smaller than 93 (decimal), then it is OK. However if the value is higher than 93, then the BU is defective and need to be change.
9. Press RETURN button on the remote commander to return to previous menu.
10. Press 0 button on the remote commander to return to the Top Menu of Remocon Diagnosis Menu.
11. Press I/⏻ button to turn off the system.

• Check Emergency History

To check the emergency history, please follow the following procedure.

1. From the Top Menu of Remocon Diagnosis Menu, select “3. Emergency History” by pressing the 3 button on the remote commander. The following screen appears on the on-screen display.

```
                Emg.History Check

Laser Hours          CD      999h        59min
                     DVD     999h        59min

1.  01  05  04  04        00  92  46  00
    00  00  00  00        00  00  23  45
2.  02  02  01  01        00  A9  4B  00
    00  00  00  00        00  00  23  45

[Next] Next Page  [Prev] Prev Page
[O] Return to Top Menu
```

2. You can check the total time when the laser is turned on during playback of DVD and CD from the above menu. The maximum time, which can be displayed are 999h 59min.
3. You can check the error code of latest 10 emergency history from the above menu. To view the previous or next page of emergency history, press [⏮] or [⏭] on the remote commander. The error code consists of

- Error Code

```
                Example of Error code

1. [01] 05  04  04        00  92  46  00
    00  00  00  00        00  00  23  45
```

The meaning of error code is as below:
01: Communication error (No reply from syscon)
02: Syscon hung up
03: Power OFF request when syscon hung up
19: Thermal shutdown
24: MoveSledHome error
25: Mechanical move error (5 Changer)
26: Mechanical move stack error
30: DC motor adjustment error
31: DPD offset adjustment error
32: TE balance adjustment error
33: TE sensor adjustment error
34: TE loop gain adjustment error
35: FE loop gain adjustment error
36: Bad jitter after adjustment
40: Focus NG
42: Focus layer jump NG
52: Open kick spindle error
51: Spindle stop error
60: Focus on error
61: Seek fail error
62: Read Q data/ID error
70: Lead in data read fail
71: TOC read time out (CD)
80: Can't buffering
81: Unknown media type

- Parameter of error code
This is the detail of error code.

```
                Example of Error code

1.  01 [05  04  04        00  92  46  00]
   [00  00  00  00        00  00] 23  45
```

- Time of error code
This is the laser time when an error occurred.

```
                Example of Error code

1.  01  05  04  04        00  92  46  00
    00  00  00  00        00  00 [23  45]
```

### To clear the Laser Hour

Press [DISPLAY] button and then press [CLEAR] button. The data for both CD and DVD data are reset.

```
                Emg.History Check

Laser Hours          CD      0h          0min
                     DVD     0h          0min

1.  01  05  04  04        00  92  46  00
    00  00  00  00        00  00  23  45
2.  02  02  01  01        00  A9  4B  00
    00  00  00  00        00  00  23  45

[Next] Next Page  [Prev] Prev Page
[O] Return to Top Menu
```

### To clear the Emergency History

Press [TOP MENU] button and then press [CLEAR] button. The error code for all emergency history would be reset.

```
                Emg.History Check

Laser Hours          CD      999h        59min
                     DVD     999h        59min

1.  00  00  00  00        00  00  00  00
    00  00  00  00        00  00  00  00
2.  00  00  00  00        00  00  00  00
    00  00  00  00        00  00  00  00

[Next] Next Page  [Prev] Prev Page
[O] Return to Top Menu
```

### To clear the Initialize Setup Data

Press [MENU] button and then press [CLEAR] button on the remote commander.

```
                Emg.History Check

Laser Hours          CD      999h        59min
                     DVD     999h        59min

Initialize setup data...




[Next] Next Page  [Prev] Prev Page
[O] Return to Top Menu
```

### To return to the Top Menu of Remocon Diagnosis Menu

Press [0] button on the remote commander.

- Check Version Information

  To check the version information, please follow the following procedure.

1. From the Top Menu of Remocon Diagnosis Menu, select “4. Version Information” by pressing the [4] button on the remote commander. The following screen appears on the on-screen display.

```
Version information

Firm (Main) :  Ver. xxxxx
Firm (Sub) :  xxxxx
RISC :  xxxxx
8032 :  xxxxx
Audio DSP :  xxxxx
Servo DSP :  xxxxx

[0] Return to Top Menu
```

   To return to the Top Menu of Remocon Diagnosis Menu, press [0] on the remote commander.

### 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.
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 |
|---|---|---|
| FWD | CQ-102C | 3.06 N • m to 6.96 N • m<br>31 to 71 g • cm<br>(0.43 – 0.98 oz • inch) |
| FWD<br>back tension | CQ-102C | 0.19 N • m to 0.58 N • m<br>2 to 6 g • cm<br>(0.02 – 0.08 oz • inch) |
| REV | CQ-102RC | 3.06 N • m to 6.96 N • m<br>31 to 71 g • cm<br>(0.43 – 0.98 oz • inch) |
| REV<br>back tension | CQ-102RC | 0.19 N • m to 0.58 N • m<br>2 to 6 g • cm<br>(0.02 – 0.08 oz • inch) |
| FF/REW | CQ-201B | 6.96 N • m to 14.02 N • m<br>71 to 143 g • cm<br>(0.98 – 1.99 oz • inch) |
| FWD tension | CQ-403A | 9.80 N • m<br>100 g or more<br>(3.53 oz or more) |
| REV tension | CQ-403R | 9.80 N • m<br>100 g or more<br>(3.53 oz or more) |

# SECTION 5
# ELECTRICAL ADJUSTMENTS

## DVD SECTION

When the optical pick-up assy is replaced, perform the "Execute IOP Measurement".

Execute IOP Measurement (See page 21)

### [TEST DISC LIST]

Be sure to use the DVD disc that matches the signal standards of your region.

• CD
- YEDS-18 (Part No.: 3-702-101-01)
- PATD-012 (Part No.: 4-225-203-01)

• DVD SL (Single Layer)
- NTSC : HLX-503 (Part No.: J-6090-069-A)
- HLX-504 (Part No.: J-6090-088-A)
- PAL : HLX-506 (Part No.: J-6090-077-A)

• DVD DL (Dual Layer)
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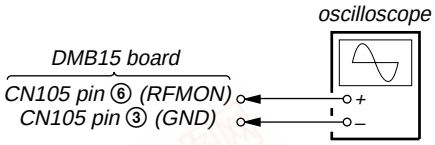
- HLX-505 (Part No.: J-6090-089-A)
- PAL : HLX-507 (Part No.: J-6090-078-A)

### [RFMON Level Check]

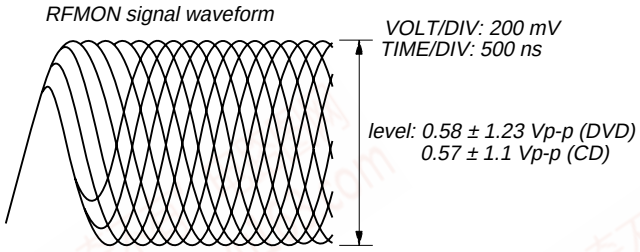
**Connection:**



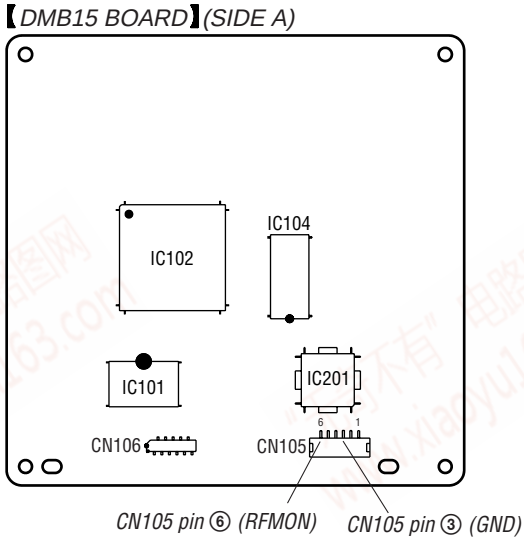

**Procedure:**

1. Connect an oscilloscope to CN105 pin ⑥ (RFMON) and CN105 pin ③ (GND) on the DMB15 board.
2. Turn the power on.
3. Set the test disc (refer to the TEST DISC LIST) on the tray and press ▷ button to playback.
4. Confirm that oscilloscope waveform is clear and check RFMON signal level is correct or not.

**Note:** A clear RFMON signal waveform means that the shape "◊" can be clearly distinguished at the center of the waveform.




**Checking Location:** DMB15 board (Side A)

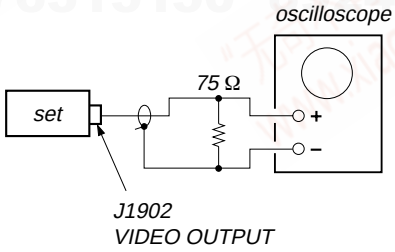



## VIDEO SECTION

### Video Level Check (VIDEO BOARD)

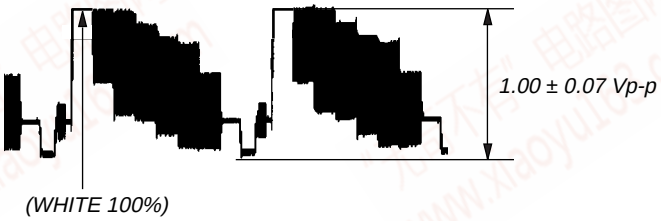
**Purpose**

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.




**Procedure:**

1. Connect oscilloscope to VIDEO output.
2. Load a DVD reference disc playback.
3. Check the video signal level is 1.00±0.07Vp-p.



## DECK SECTION

0 dB=0.775 V

1. Demagnetize the record/playback head with a head demagnetizer.
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.

• Test Tape

| Tape | Signal | Used for |
|---|---|---|
| P-4-A063 | 6.3 kHz, –10 dB | Azimuth Adjustment |

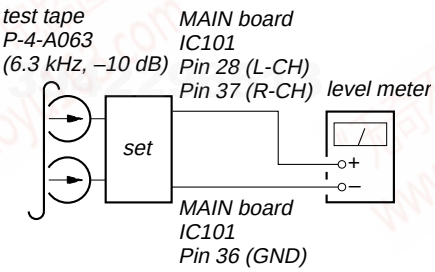
### Record/Playback Head Azimuth Adjustment

**DECK A** **DECK B**

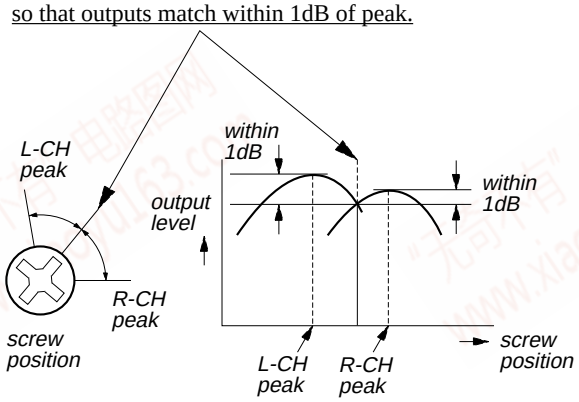
**Note:** Perform this adjustments for both decks

**Procedure:**

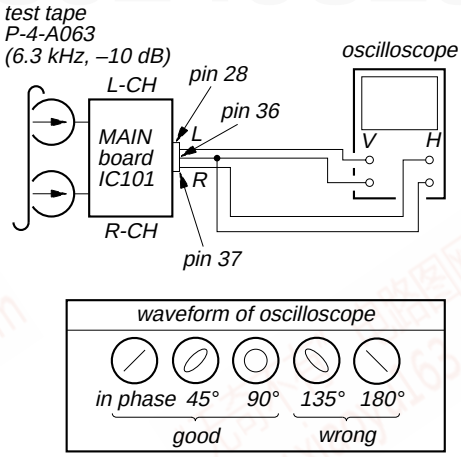
1. Mode: Playback




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.

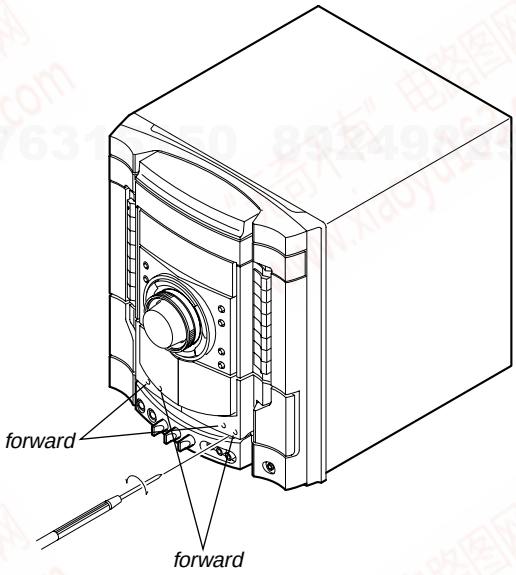



3. Mode: Playback



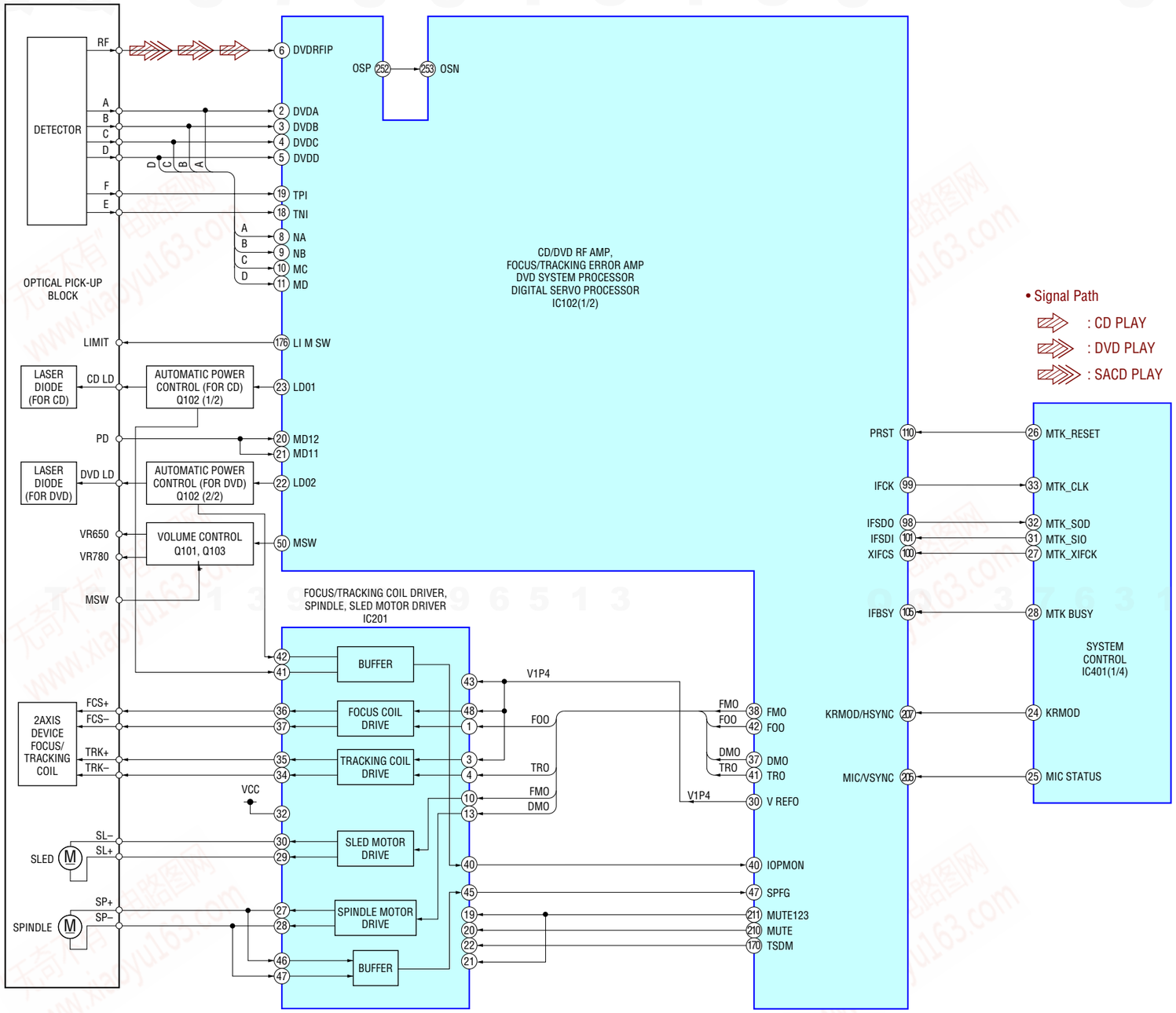

4. After the adjustments, apply suitable locking compound to the pats adjusted.

**Adjustment Location:** Playback Head (Deck A).
Record/Playback/Erase Head (Deck B).

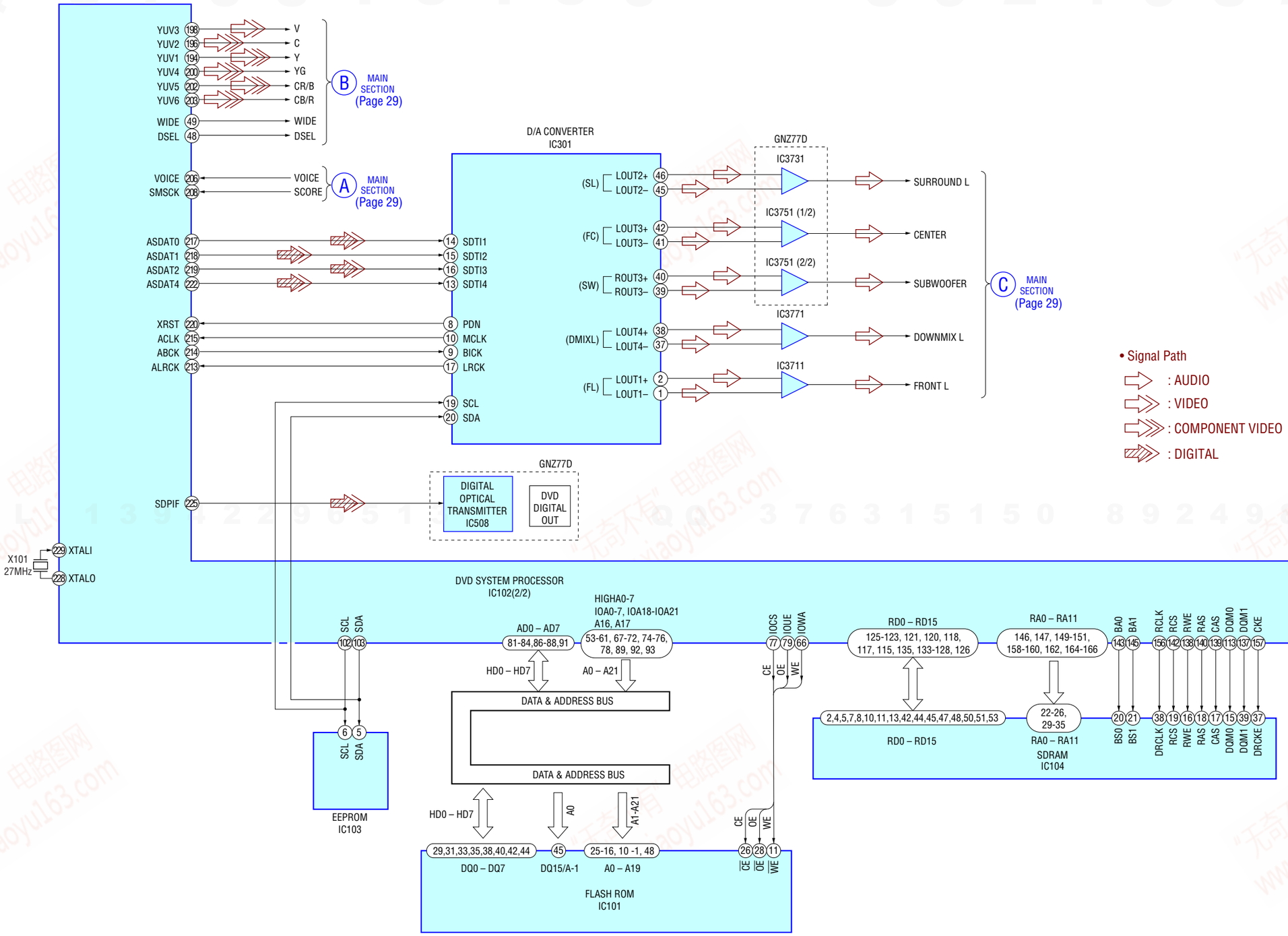


# SECTION 6
# DIAGRAMS

## 6-1. BLOCK DIAGRAM — RF/SERVO SECTION —

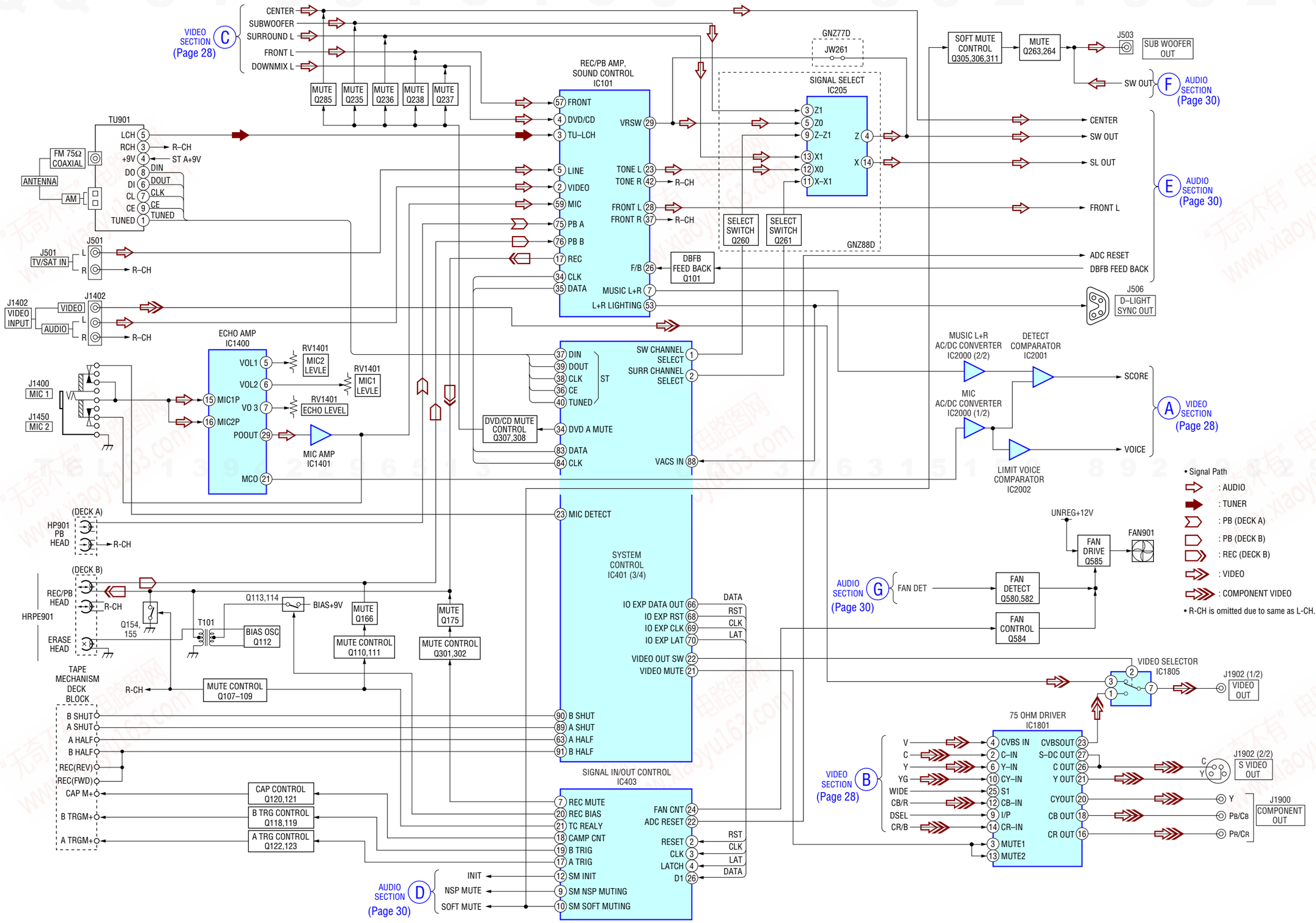


## 6-2. BLOCK DIAGRAM — VIDEO SECTION —

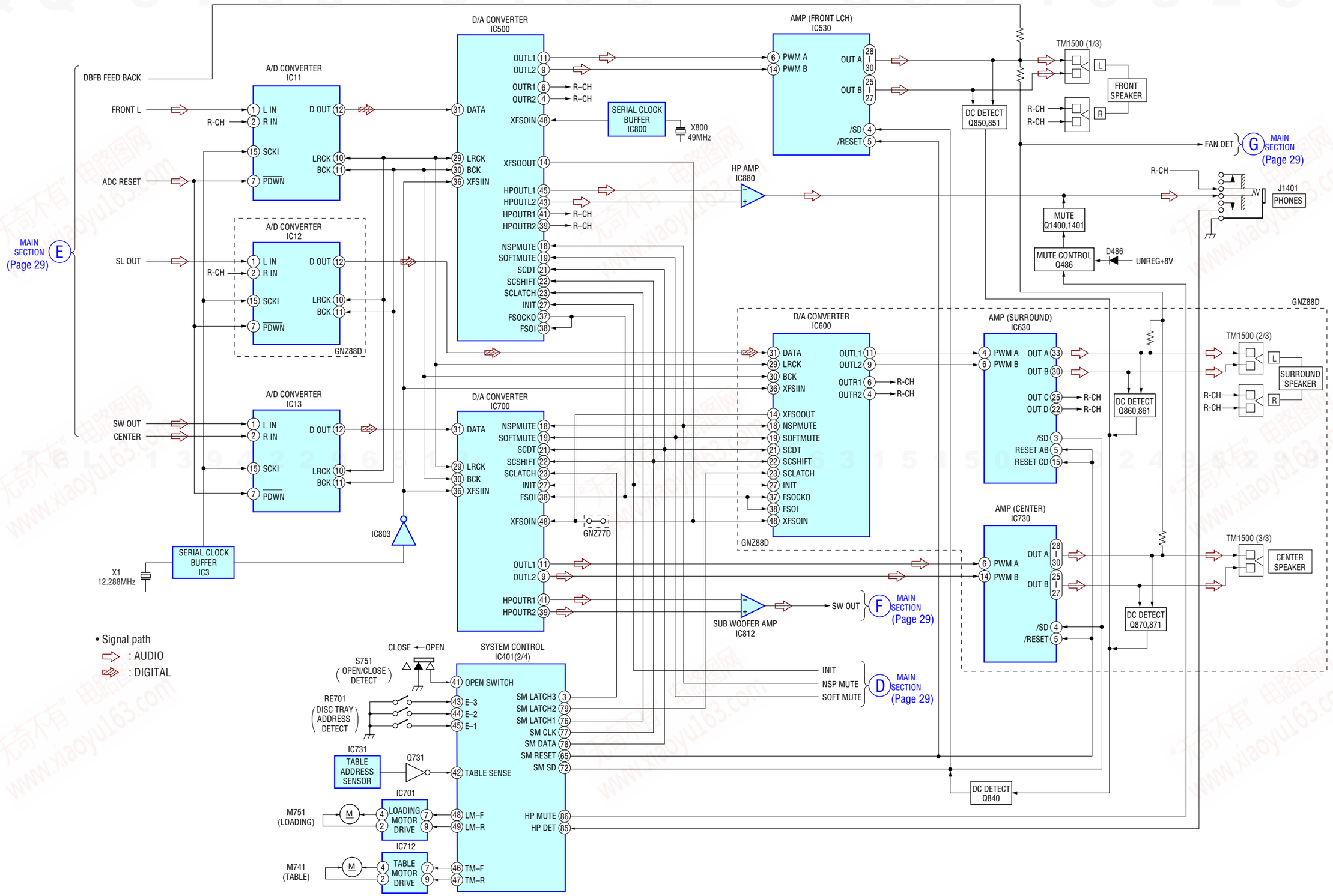



- Signal Path
  - : AUDIO
  - : VIDEO
  - : COMPONENT VIDEO
  - : DIGITAL

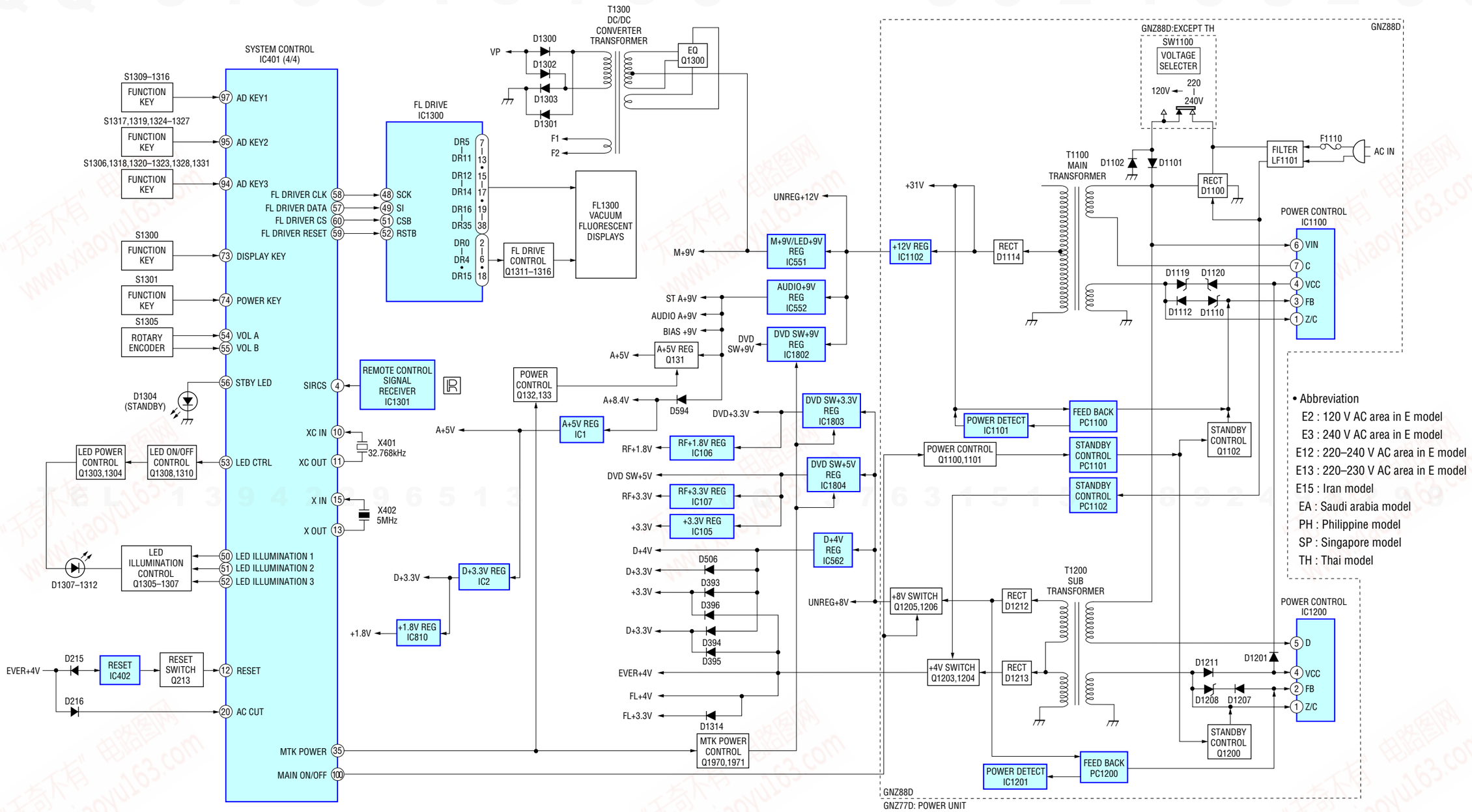
## 6-3. BLOCK DIAGRAM — MAIN SECTION —



## 6-4. BLOCK DIAGRAM — AUDIO SECTION —

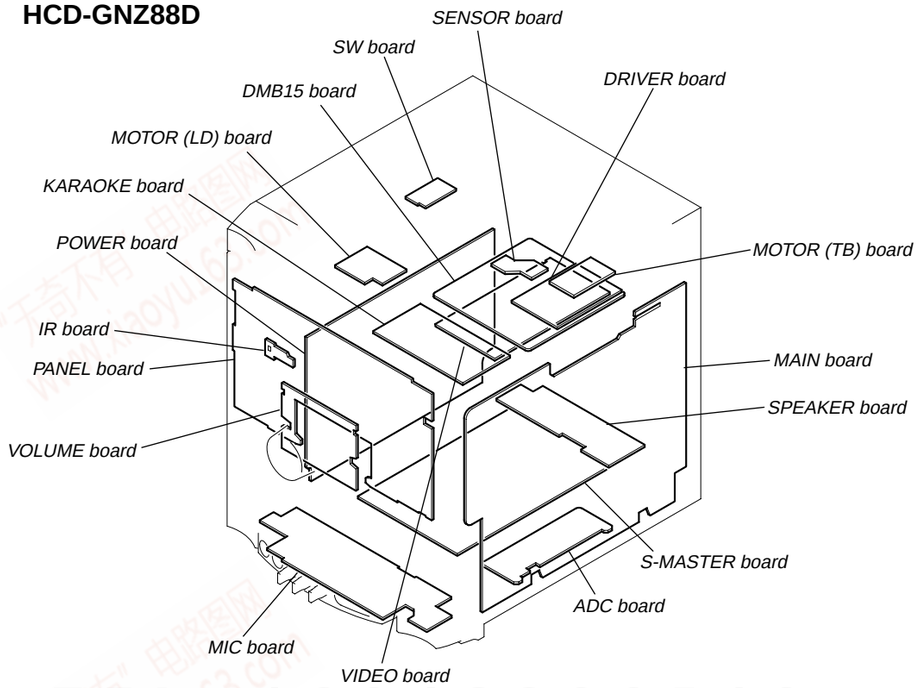


## 6-5. BLOCK DIAGRAM — FUNCTION/POWER SECTION —

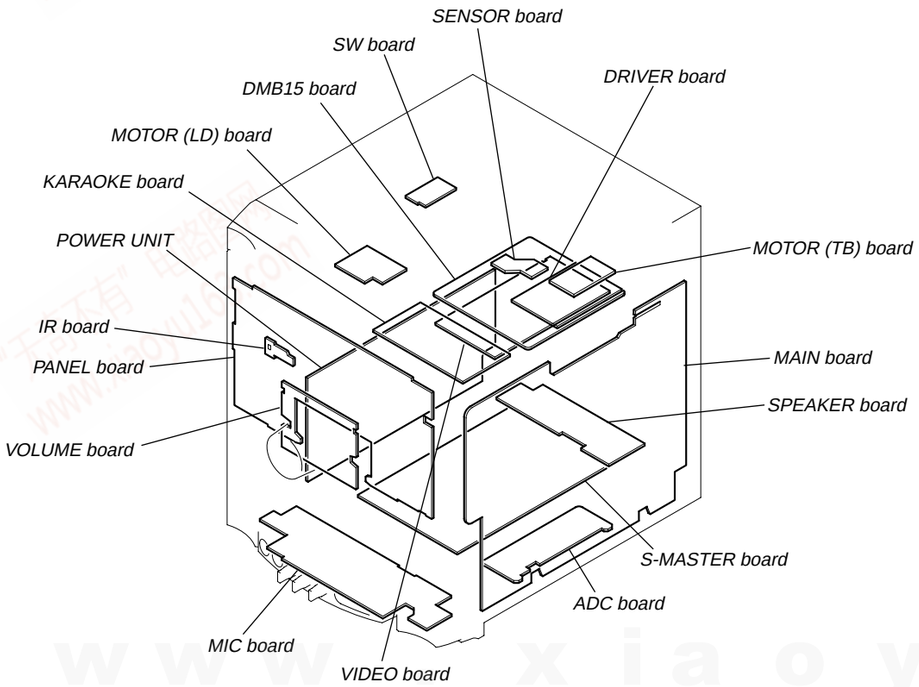


## 6-6. CIRCUIT BOARDS LOCATION

### HCD-GNZ88D




### HCD-GNZ77D



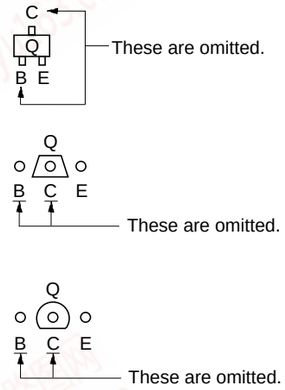

## • Note For Printed Wiring Boards And Schematic Diagrams

**Note on Printed Wiring Board:**

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▬▬ : Pattern from the side which enables seeing.
  (The other layer's 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. |

- Indication of transistor.




**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 viscou-s (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.

**Note on Schematic Diagram:**

- 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.
- : nonflammable resistor.
- : panel designation.

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

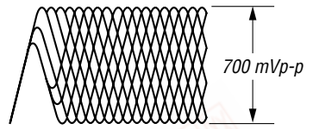
- ▬▬ : B+ Line.
- ▬ ▬ ▬ : B– Line.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ✻ : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : AUDIO
  : TUNER
  : VIDEO (COMPONENT)
  : VIDEO (COMPOSITE)
  : TAPE PLAY (DECK A)
  : TAPE PLAY (DECK B)
  : TAPE REC (DECK B)
  : DVD (AUDIO)
  : DVD (RF)
  : DVD (DIGITAL)
- Abbreviation

| | |
|---|---|
| E2 | : 120 V AC area in E model |
| E3 | : 240 V AC area in E model |
| E12 | : 220-240 V AC area in E model |
| E13 | : 220-230 V AC area in E model |
| E15 | : Iran model |
| EA | : Saudi arabia model |
| PH | : Philippine model |
| SP | : Singapore model |
| TH | : Thai model |

• **Waveforms**

**— DMB15 BOARD —**

① IC102 ⑥ (DVDRFIP)

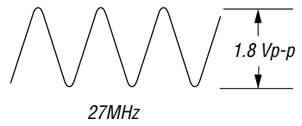



*200 mV/DIV, 100 nsec/DIV*

④ IC102 ⑲④ (YUV1)


*500 mV/DIV, 20 µsec/DIV*

⑦ IC102 ㉙ (XTALI)

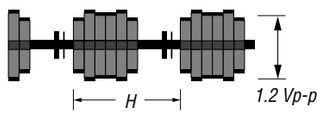



*500 mV/DIV, 20 µsec/DIV*

② IC102 ㉛ (FED)


*100 mV/DIV, 1 msec/DIV*

⑤ IC102 ⑯⑥ (YUV2)

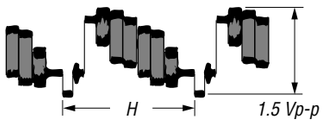



*500 mV/DIV, 20 µsec/DIV*

③ IC102 ㉜ (TEO)


*500 mV/DIV, 1 msec/DIV*

⑥ IC102 ⑲⑥ (YUV3)




*500 mV/DIV, 20 µsec/DIV*

**— S-MASTER BOARD —**

① IC800 ④


*0.2 V/DIV, 0.1 µsec/DIV*

**— ADC BOARD —**

① IC3 ⑥

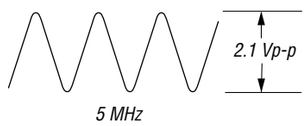

*0.5 V/DIV, 0.1 µsec/DIV*

**— MAIN BOARD —**

① IC401 ⑩ (XC-IN)

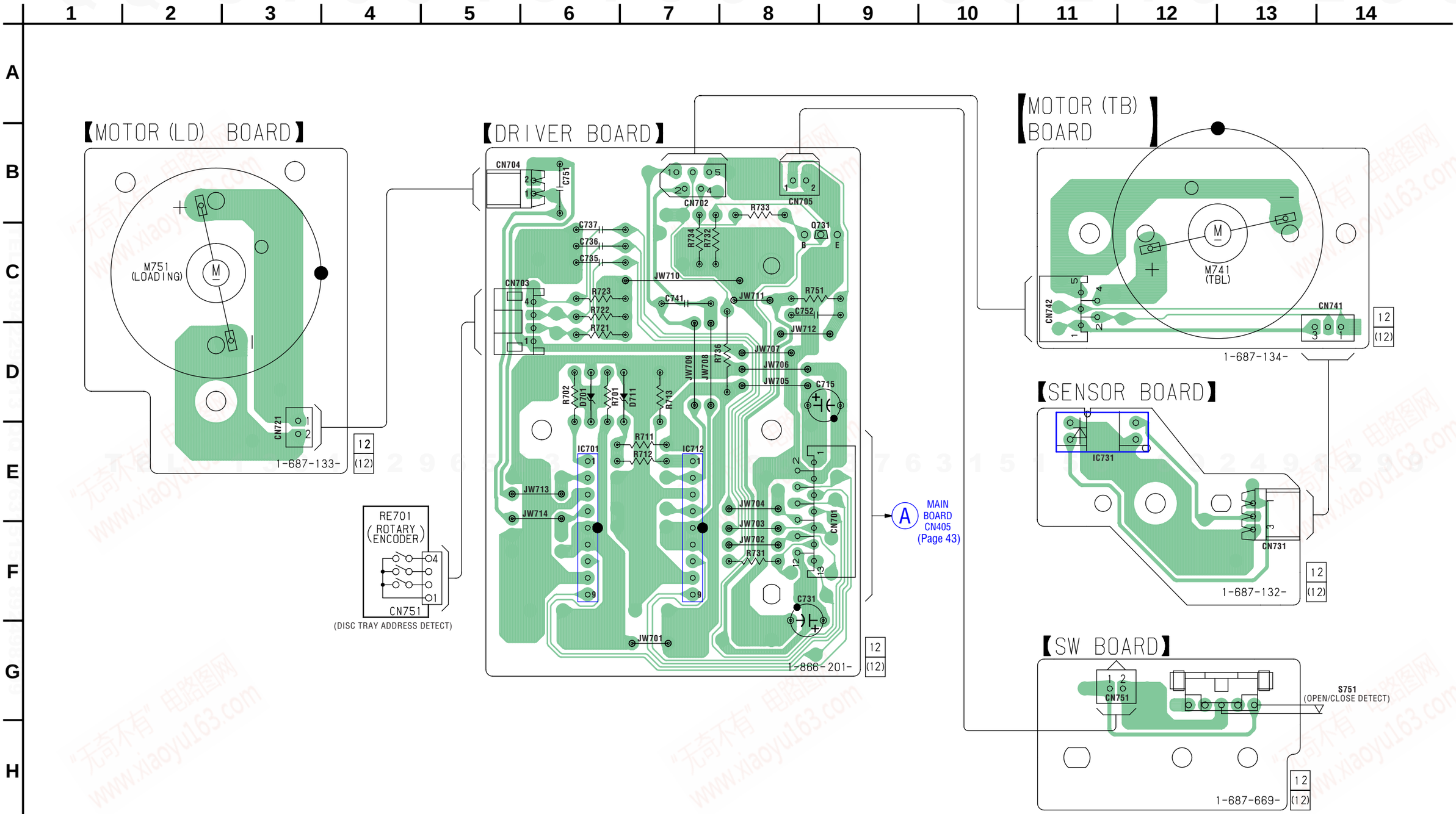

*0.5 V/DIV, 20 µsec/DIV*

② IC401 ⑬ (X OUT)




*1 V/DIV, 0.1 µsec/DIV*

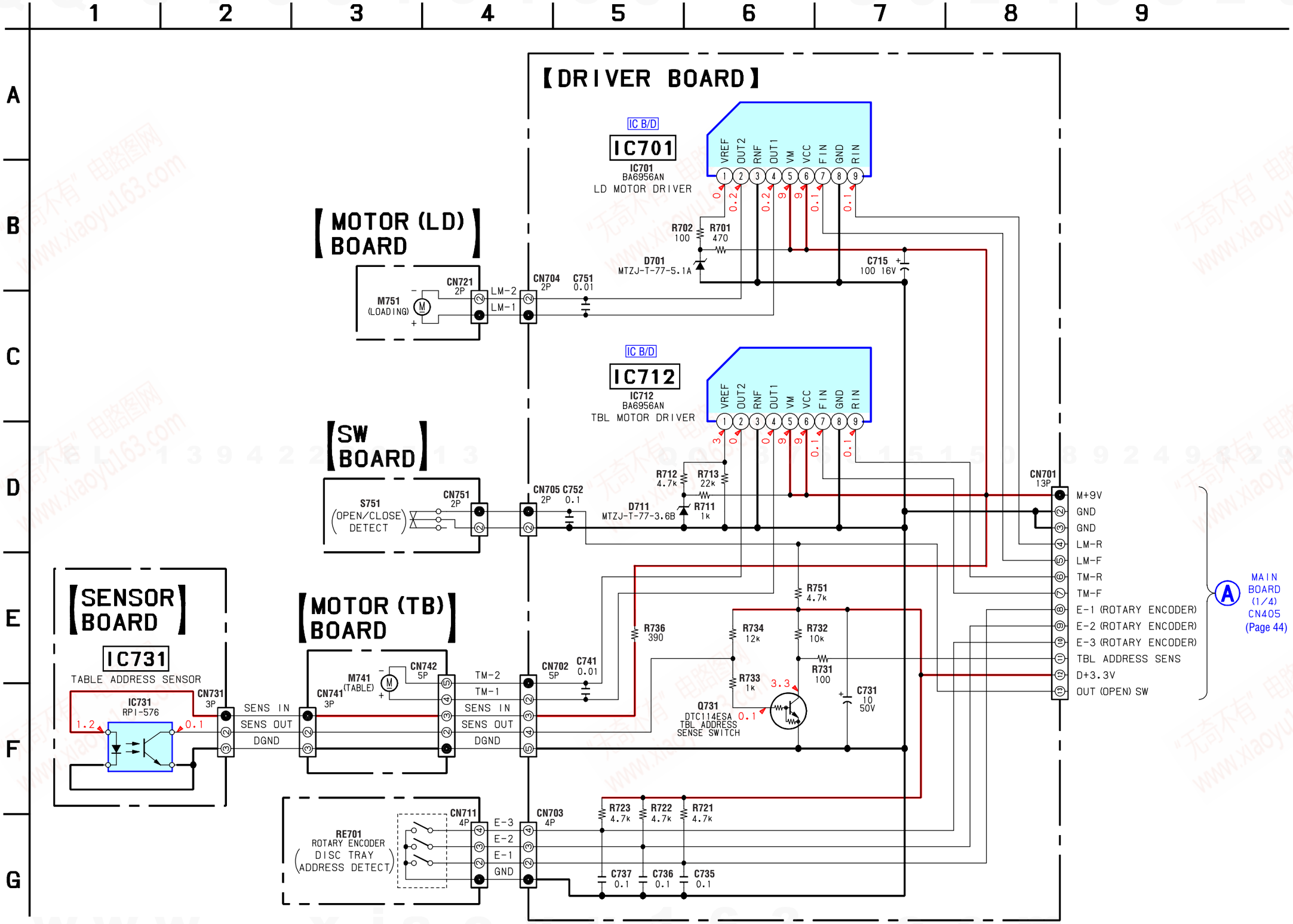
6-7. PRINTED WIRING BOARDS — DRIVER SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.




• **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| D701 | D-6 |
| D711 | D-7 |
| IC701 | E-6 |
| IC712 | E-7 |
| IC731 | E-11 |
| Q731 | B-8 |

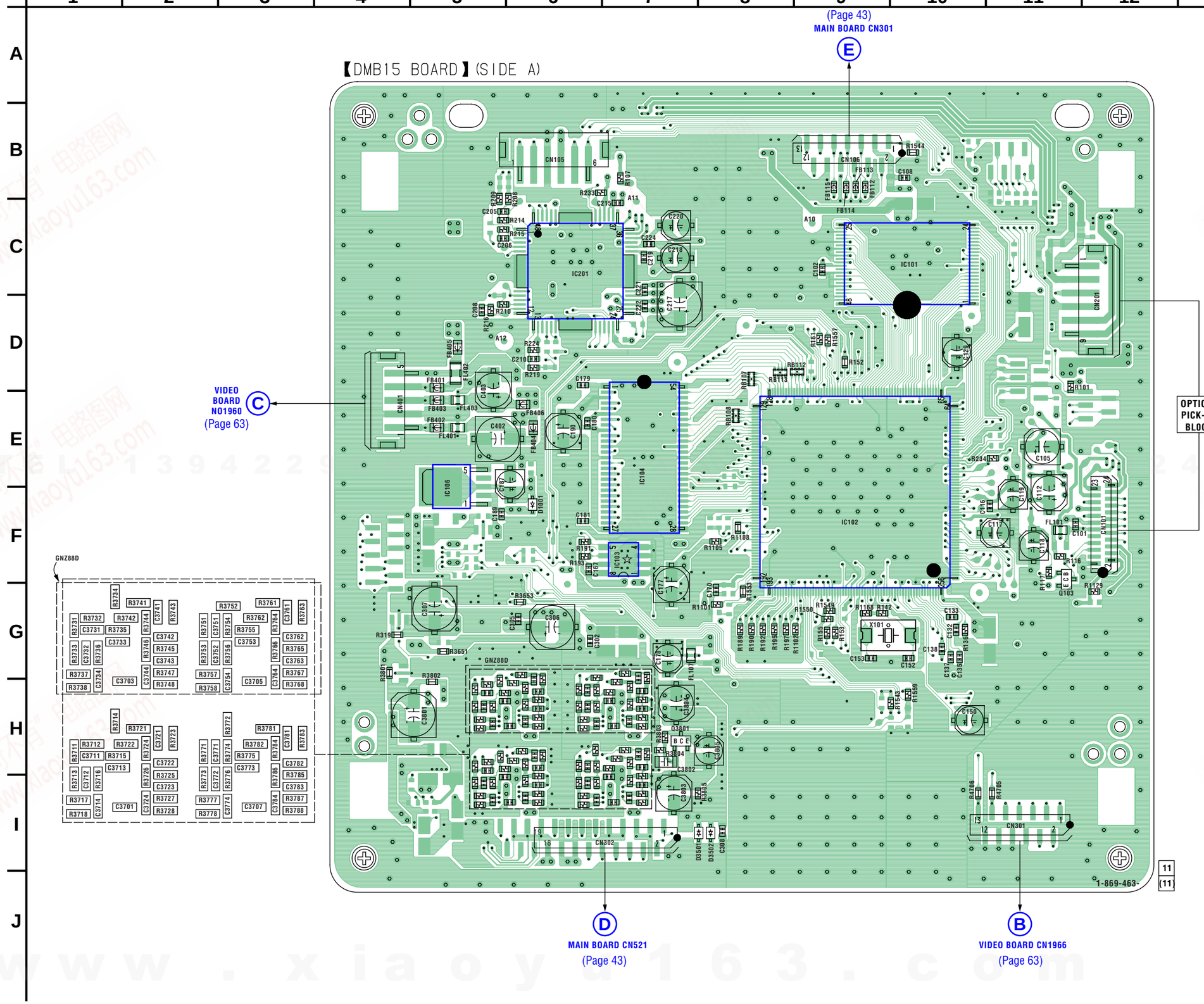
6-8. SCHEMATIC DIAGRAM — DRIVER SECTION — • Refer to page 69 for IC Block Diagrams.



☆ New part of EEPROM (IC103) on the DMB15 board cannot be used. Therefore, if the mounted DMB15 board (A-1167-719-A, etc.) is replaced, exchange new EEPROM (IC103) with that used before the replacement.

## 6-9. PRINTED WIRING BOARD — DMB15 SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

【DMB15 BOARD】(SIDE A)

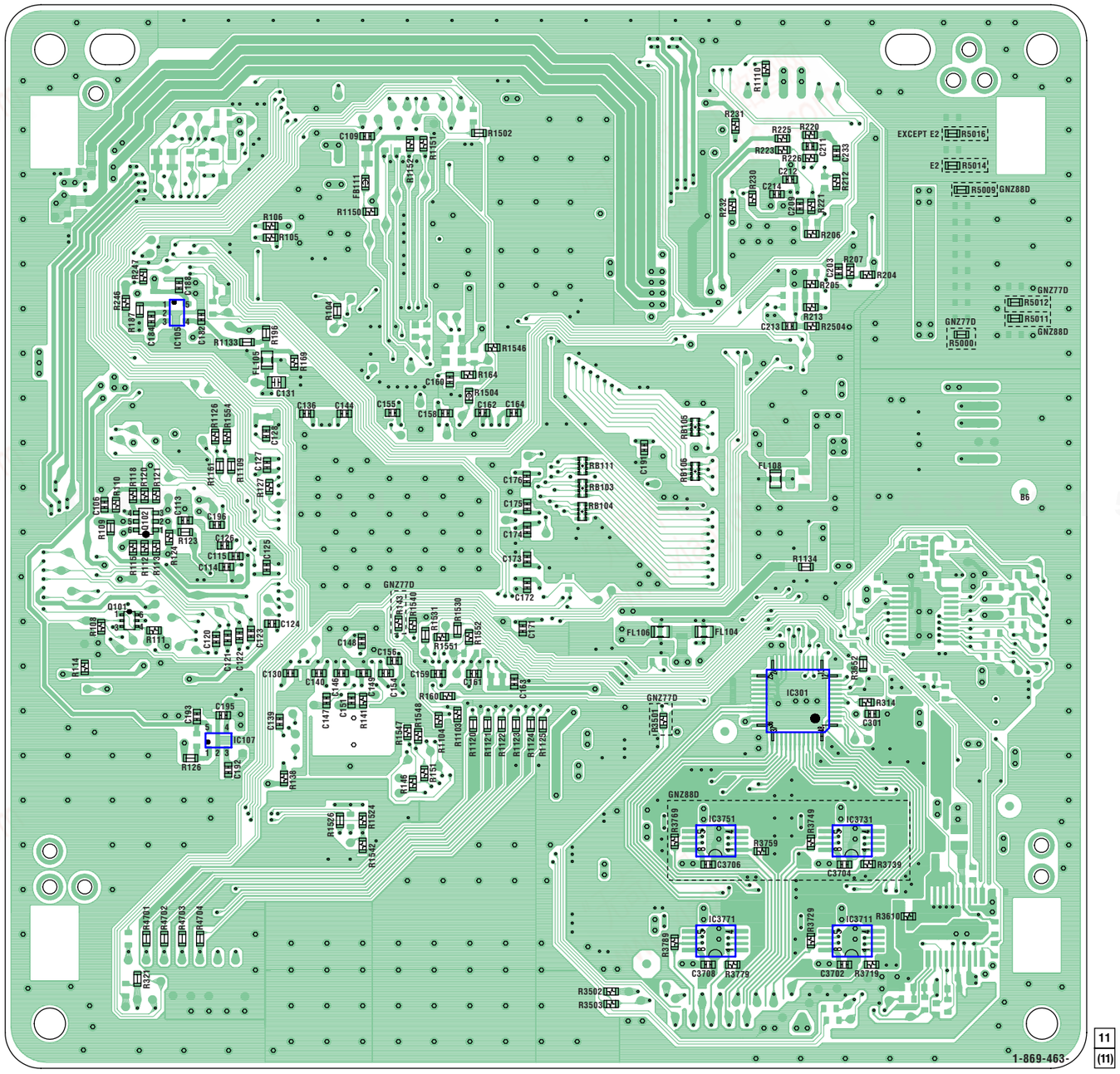



• **Semiconductor Location**

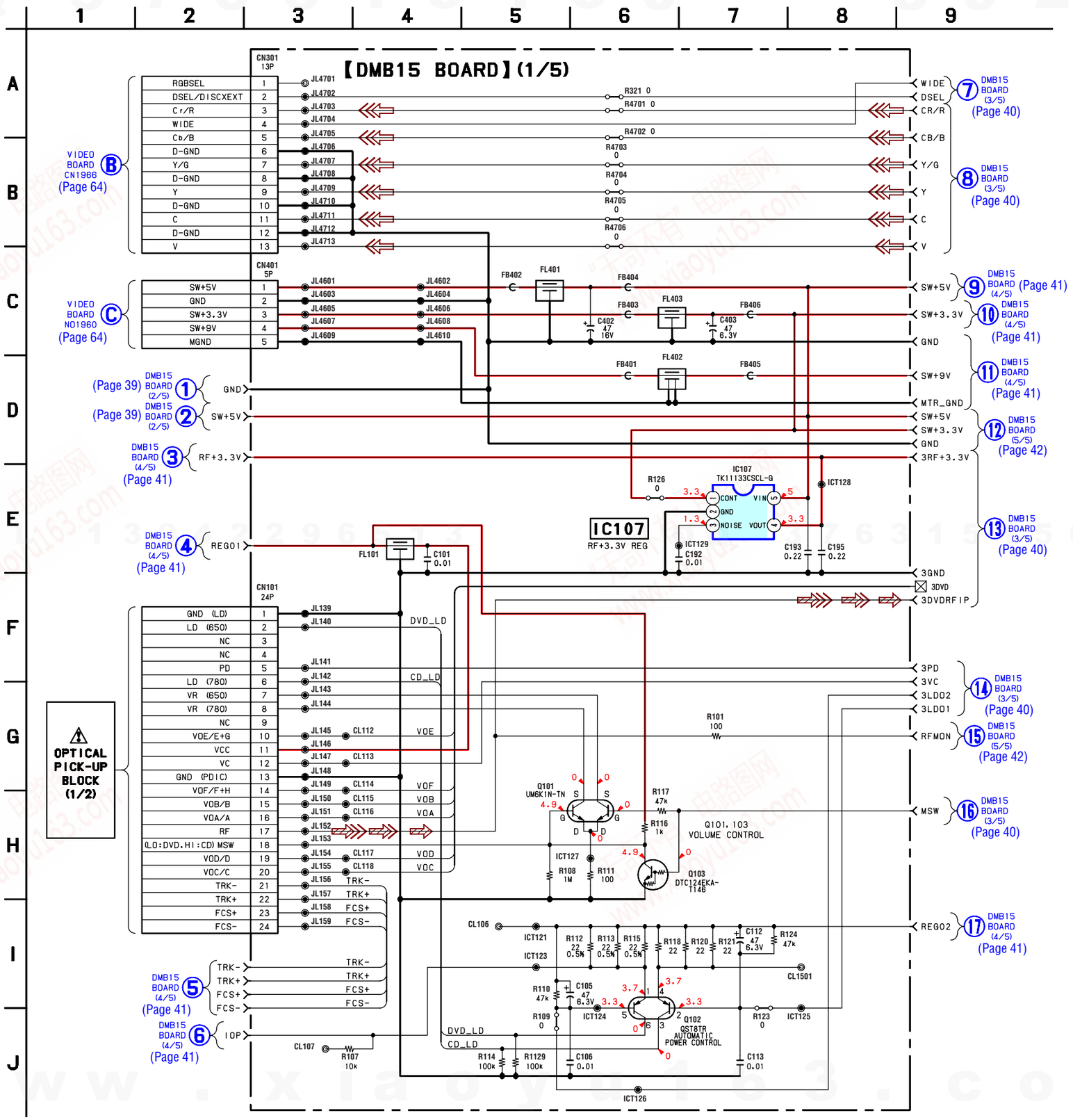
| Ref. No. | Location |
|---|---|
| D1001 | F-6 |
| D3501 | I-7 |
| D3502 | I-8 |
| IC101 | C-10 |
| IC102 | F-9 |
| IC103 | F-7 |
| IC104 | E-7 |
| (IC105) | D-10 |
| IC106 | E-5 |
| (IC107) | G-10 |
| IC201 | C-6 |
| (IC301) | F-6 |
| (IC3711) | H-5 |
| (IC3731) | G-5 |
| (IC3751) | G-6 |
| (IC3771) | H-6 |
| (Q101) | F-11 |
| (Q102) | E-10 |
| Q103 | G-11 |
| Q3801 | H-7 |

( ): SIDE B

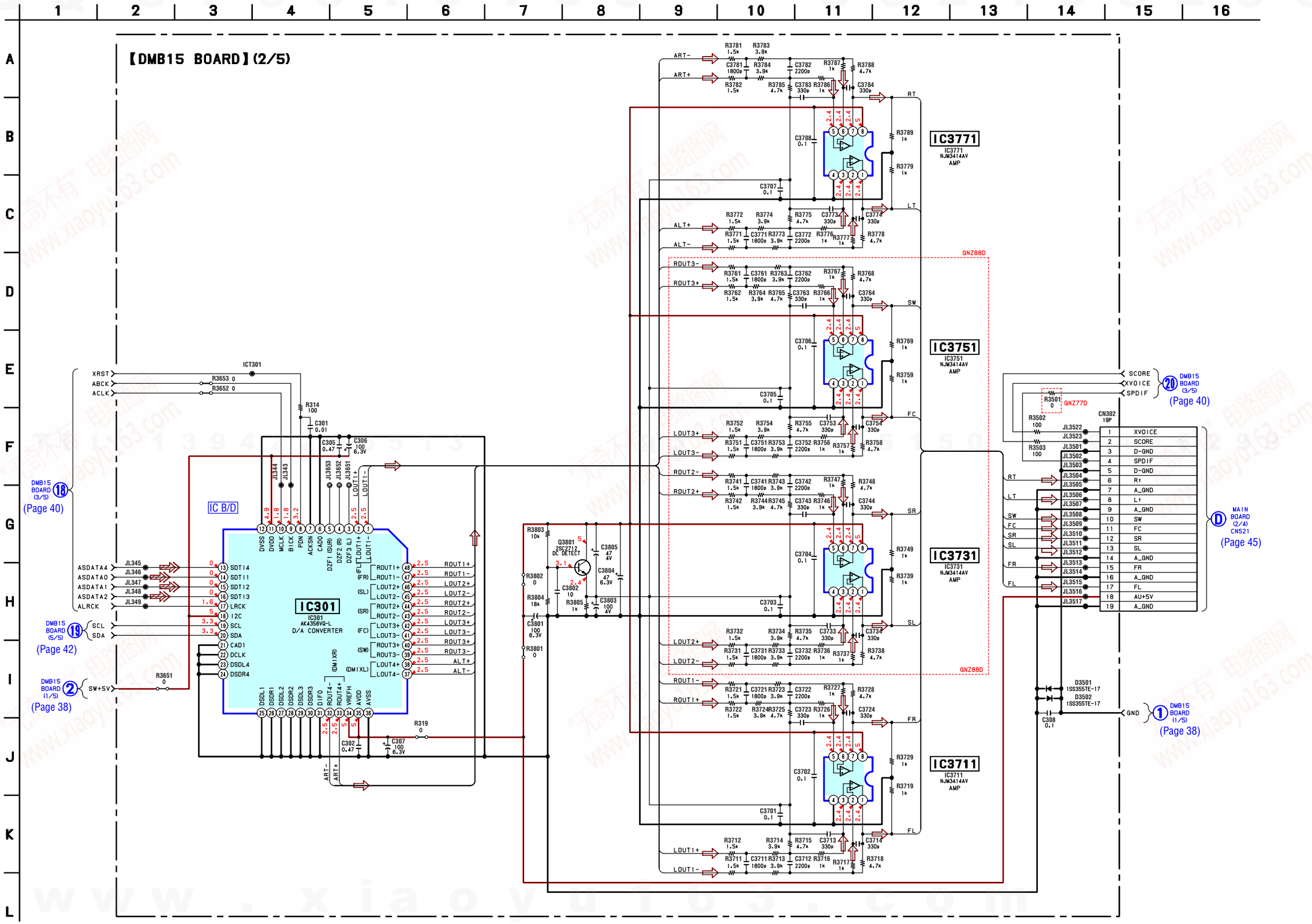
【DMB15 BOARD】(SIDE B)



## 6-10. SCHEMATIC DIAGRAM — DMB15 SECTION (1/5) —

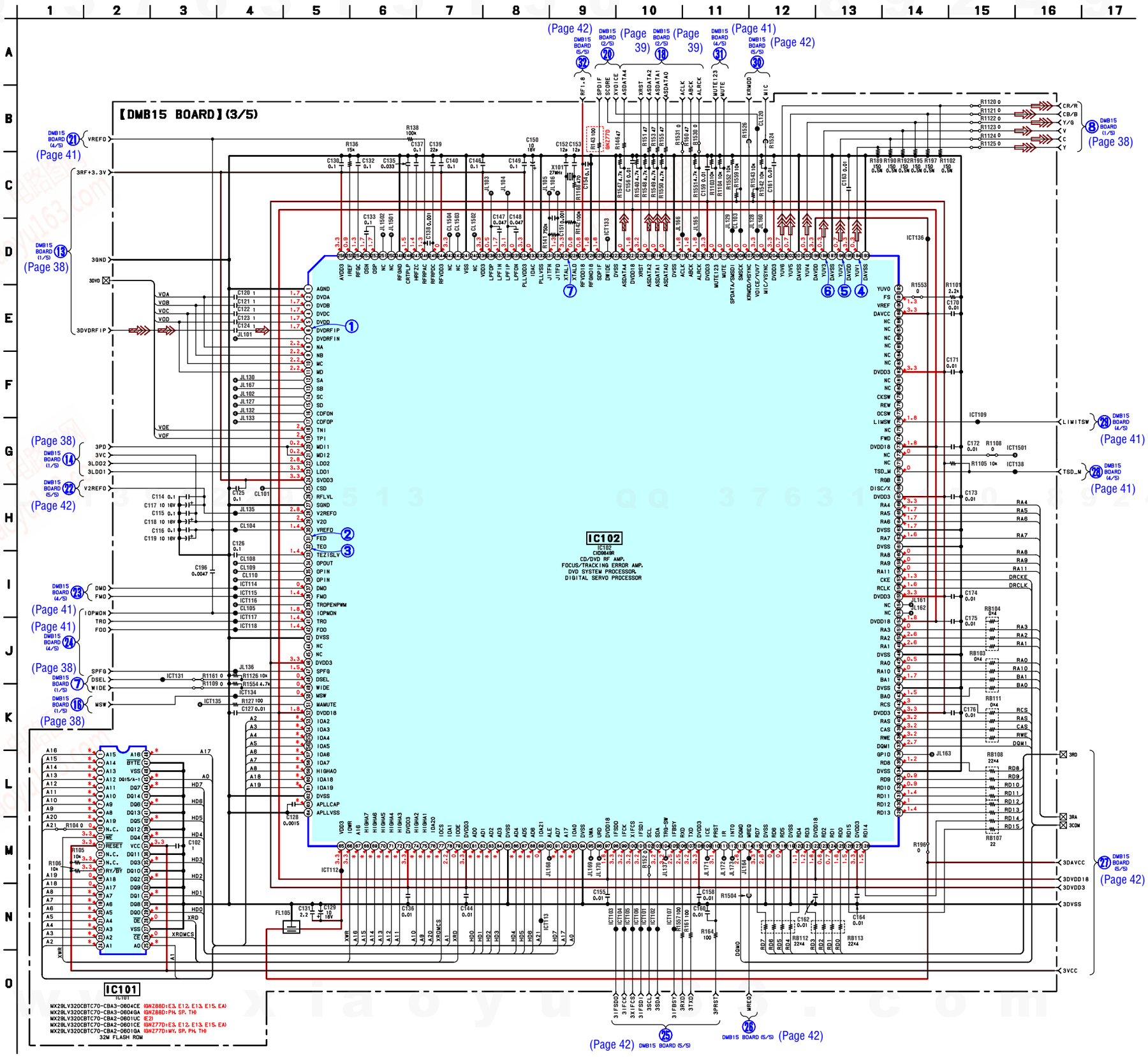


6-11. SCHEMATIC DIAGRAM — DMB15 SECTION (2/5) — • Refer to page 69 for IC Block Diagrams.

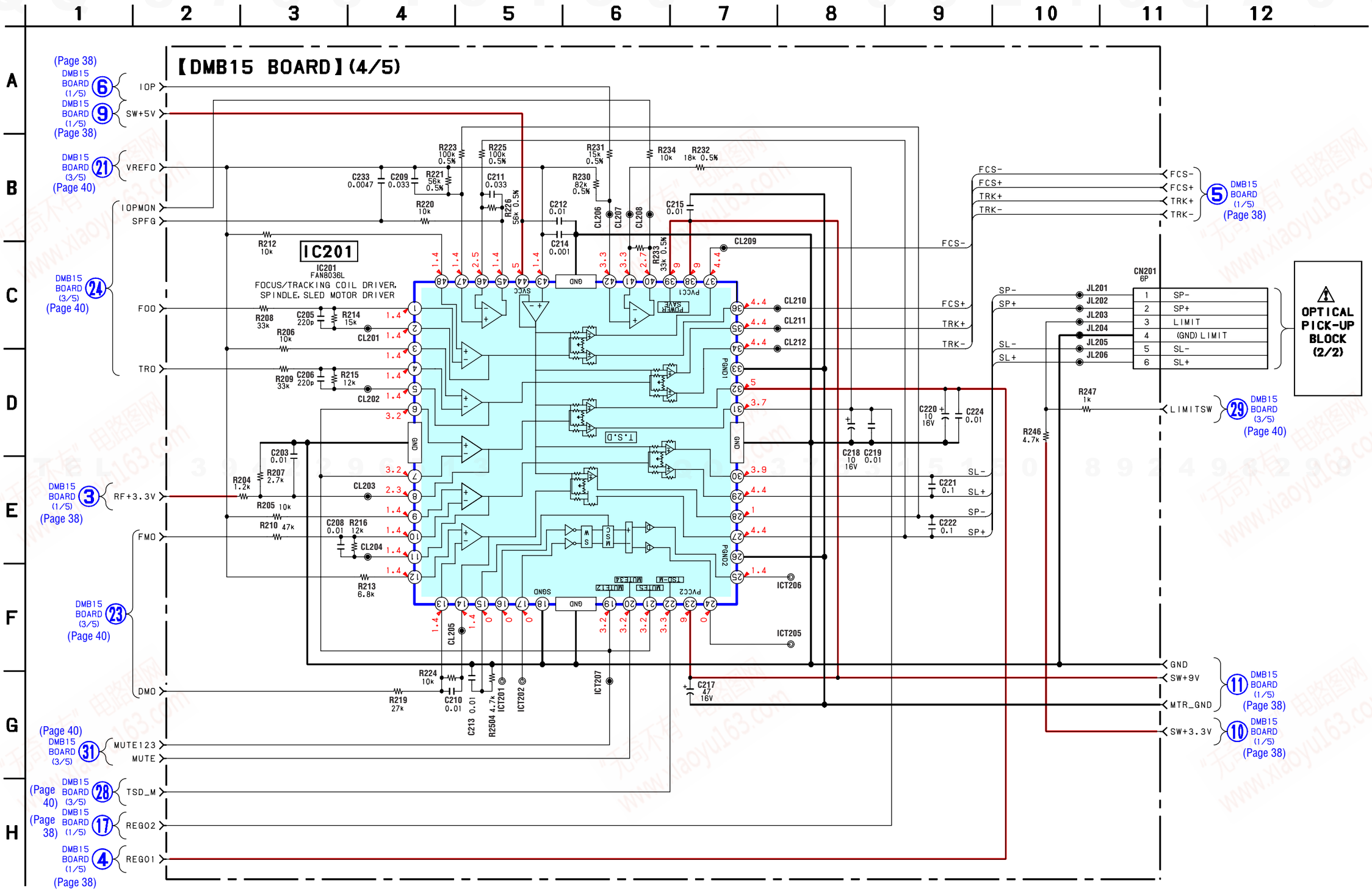


## 6-12. SCHEMATIC DIAGRAM — DMB15 SECTION (3/5) —

• Refer to page 33 for Waveforms.
• Refer to page 70 for IC Pin Description of IC102.

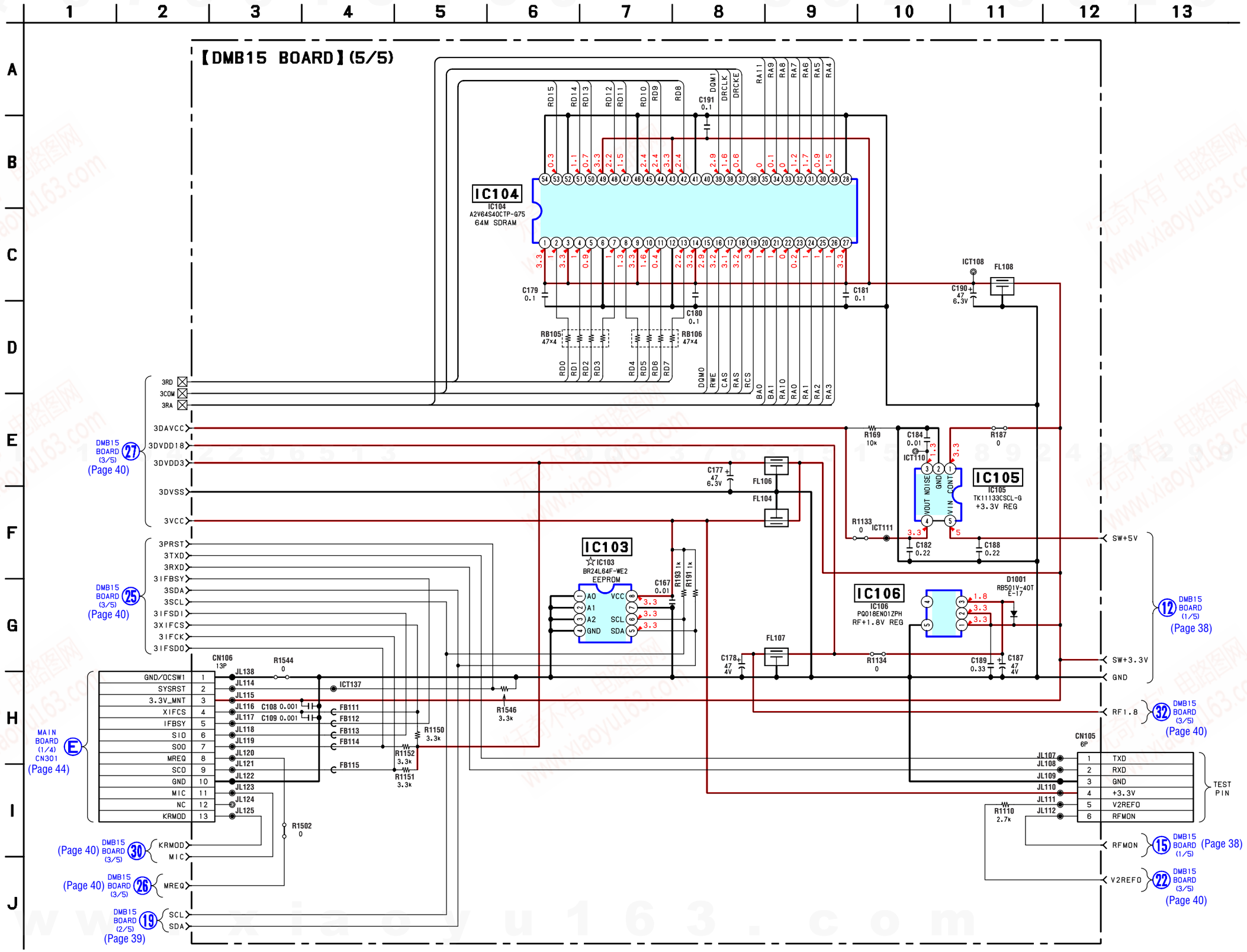


## 6-13. SCHEMATIC DIAGRAM — DMB15 SECTION (4/5) —

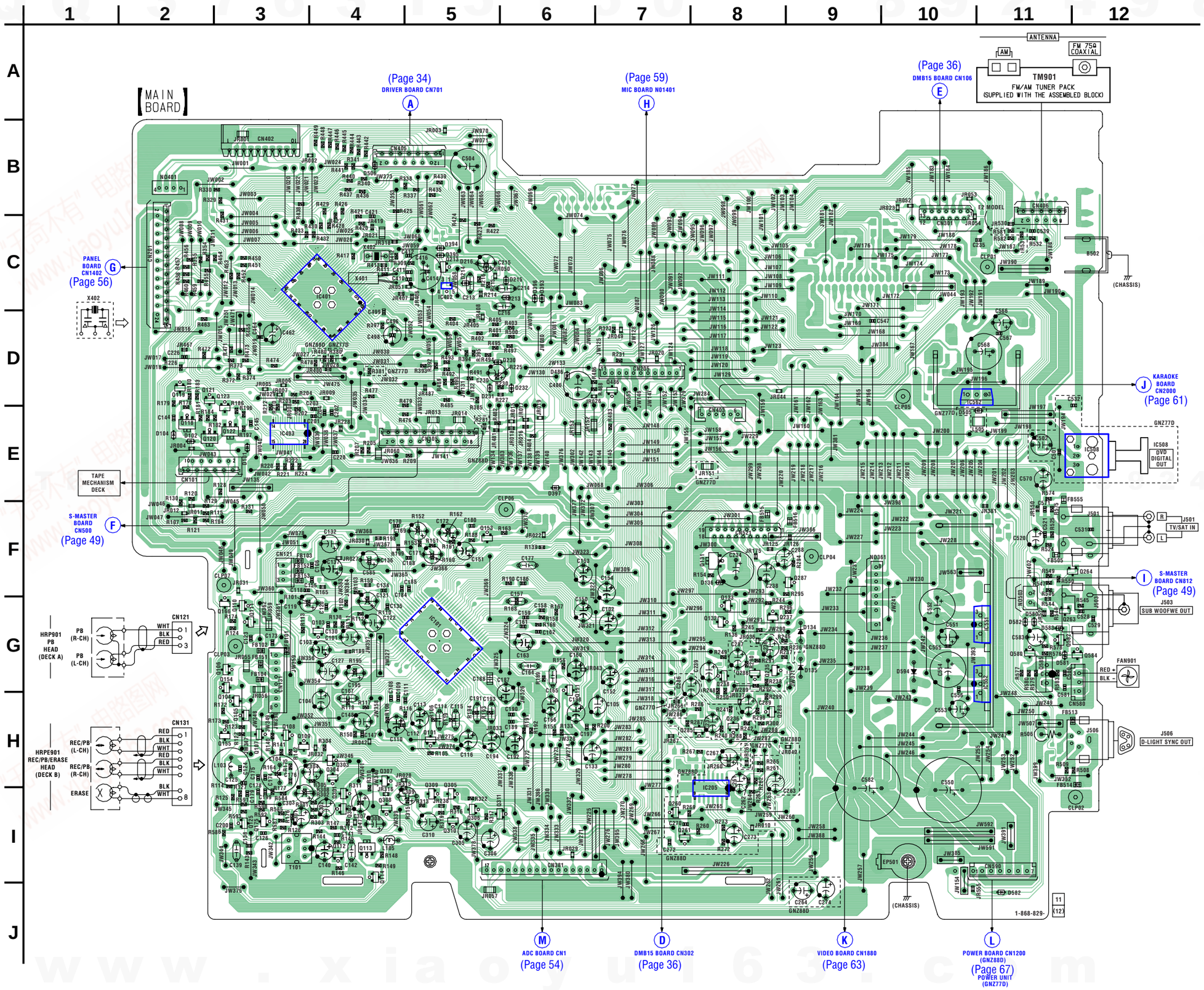


☆ New part of EEPROM (IC103) on the DMB15 board cannot be used. Therefore, if the mounted DMB15 board (A-1167-719-A, etc.) is replaced, exchange new EEPROM (IC103) with that used before the replacement.

## 6-14. SCHEMATIC DIAGRAM — DMB15 SECTION (5/5) —



## 6-15. PRINTED WIRING BOARD — MAIN SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



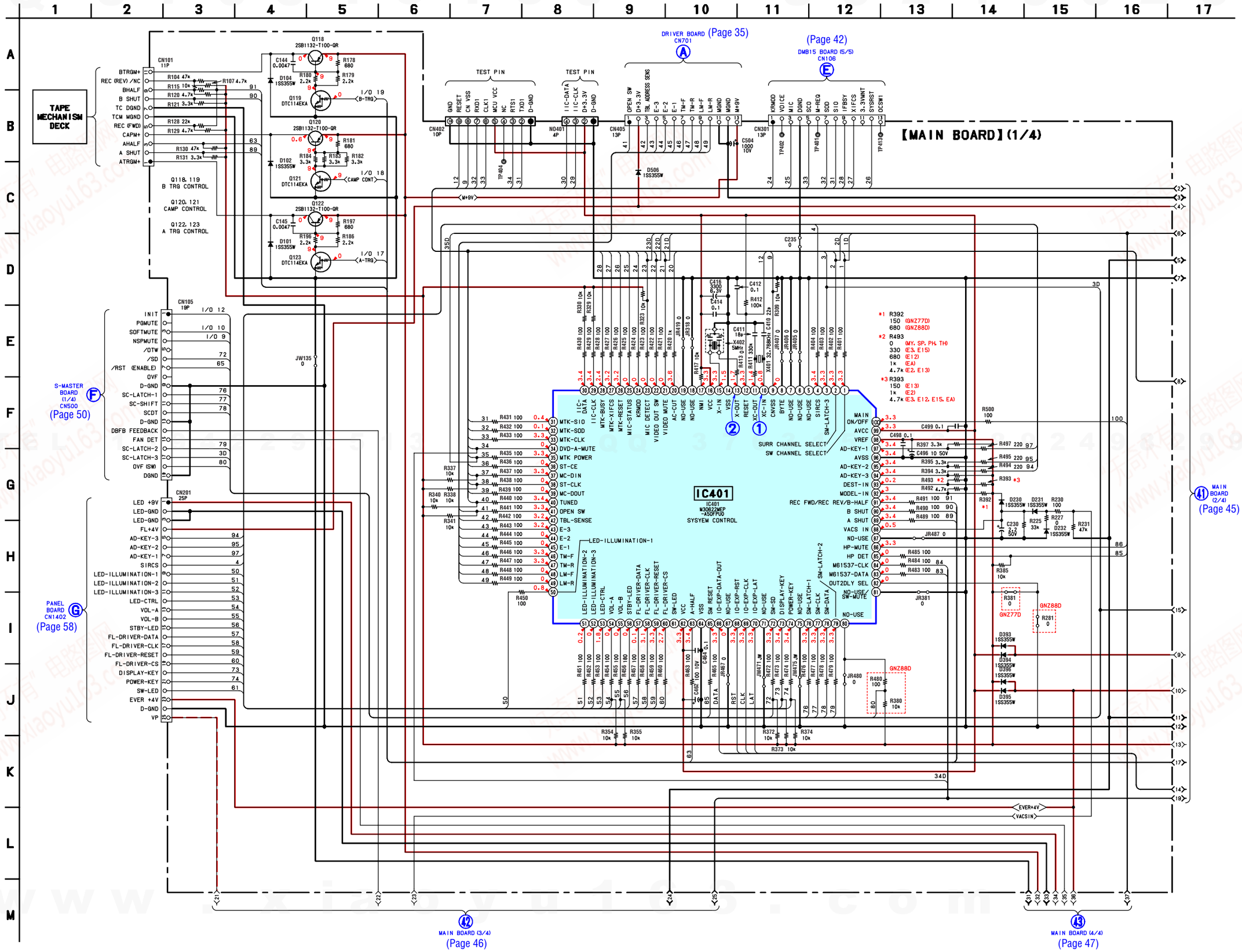

• **Semiconductor Location**

| Ref. No. | Location | Ref. No. | Location |
|---|---|---|---|
| D101 | E-3 | Q112 | I-4 |
| D102 | E-2 | Q113 | I-4 |
| D104 | E-2 | Q114 | I-4 |
| D134 | G-9 | Q118 | E-2 |
| D135 | G-9 | Q119 | D-2 |
| D136 | F-8 | Q120 | E-2 |
| D213 | C-6 | Q121 | D-2 |
| D214 | C-5 | Q122 | E-3 |
| D215 | C-6 | Q123 | E-3 |
| D216 | C-5 | Q125 | I-3 |
| D230 | D-5 | Q131 | F-8 |
| D231 | D-5 | Q132 | G-8 |
| D232 | D-6 | Q133 | G-8 |
| D393 | C-6 | Q151 | G-6 |
| D394 | C-5 | Q153 | F-5 |
| D395 | C-5 | Q154 | G-3 |
| D396 | C-6 | Q155 | H-3 |
| D397 | E-6 | Q166 | G-3 |
| D486 | D-6 | Q175 | I-3 |
| D505 | E-10 | Q213 | C-5 |
| D506 | B-4 | Q235 | G-8 |
| D580 | G-11 | Q236 | H-8 |
| D581 | G-11 | Q237 | G-8 |
| D582 | G-11 | Q238 | G-8 |
| D583 | G-11 | Q260 | I-7 |
| D594 | G-10 | Q261 | I-7 |
| | | Q263 | F-11 |
| IC101 | G-5 | Q264 | F-11 |
| IC205 | H-8 | Q285 | H-8 |
| IC401 | C-4 | Q286 | G-8 |
| IC402 | C-5 | Q287 | F-9 |
| IC403 | E-3 | Q288 | H-8 |
| IC508 | E-12 | Q301 | I-4 |
| IC551 | G-11 | Q302 | I-4 |
| IC552 | G-11 | Q303 | H-4 |
| IC562 | D-10 | Q304 | H-4 |
| | | Q305 | H-5 |
| Q101 | H-5 | Q306 | I-5 |
| Q103 | G-4 | Q307 | H-4 |
| Q104 | H-3 | Q308 | I-4 |
| Q105 | H-3 | Q311 | H-5 |
| Q106 | G-3 | Q486 | D-7 |
| Q107 | H-3 | Q580 | G-11 |
| Q108 | H-3 | Q582 | G-11 |
| Q109 | H-3 | Q584 | G-12 |
| Q110 | G-3 | Q585 | G-11 |
| Q111 | G-3 | | |

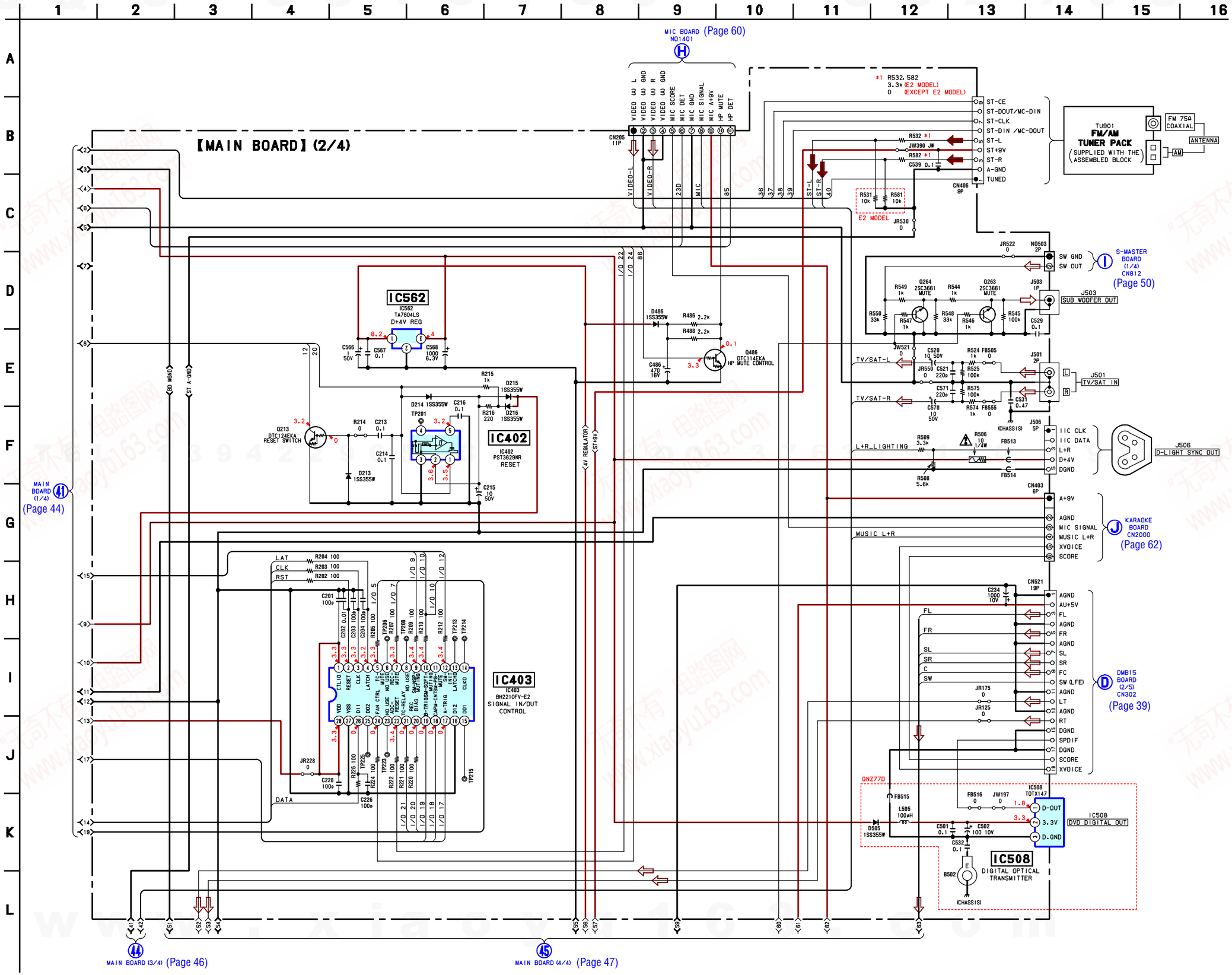
• Refer to page 33 for Waveforms.

## 6-16. SCHEMATIC DIAGRAM — MAIN SECTION (1/4) —

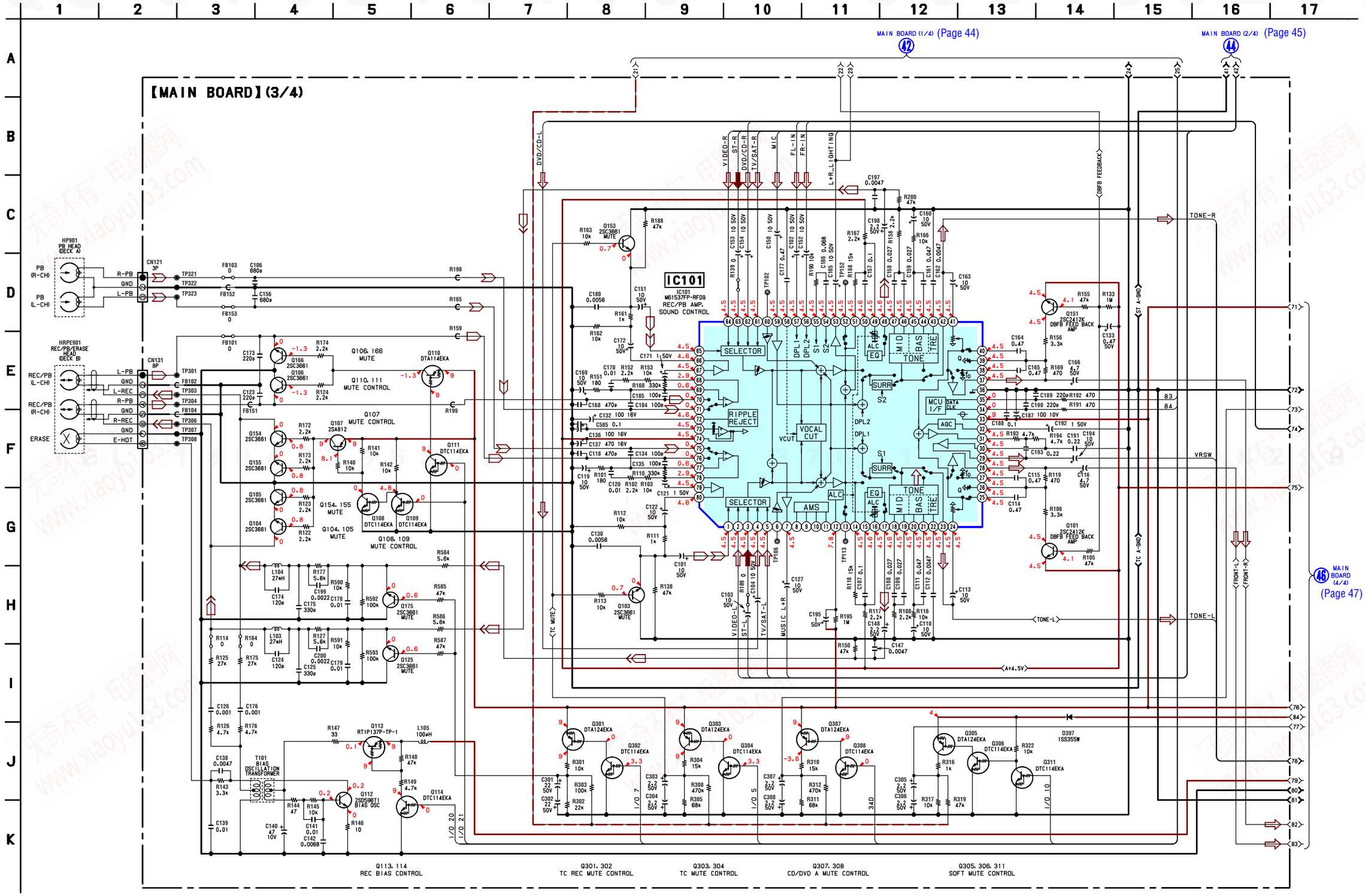
• Refer to page 75 for IC Pin Description of IC401.



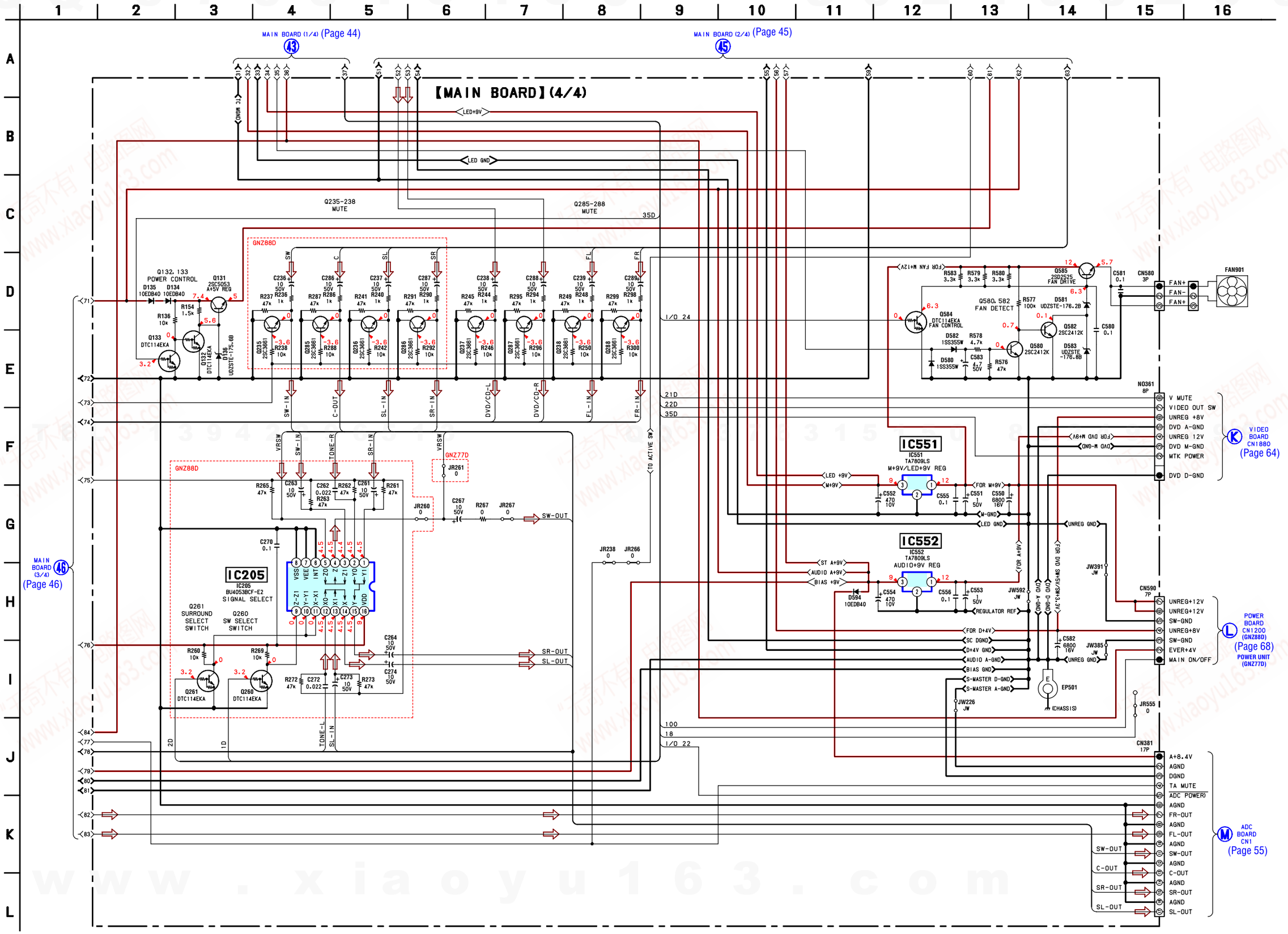
6-17. SCHEMATIC DIAGRAM — MAIN SECTION (2/4) — • Refer to page 78 for IC Pin Description of IC403.



## 6-18. SCHEMATIC DIAGRAM — MAIN SECTION (3/4) —

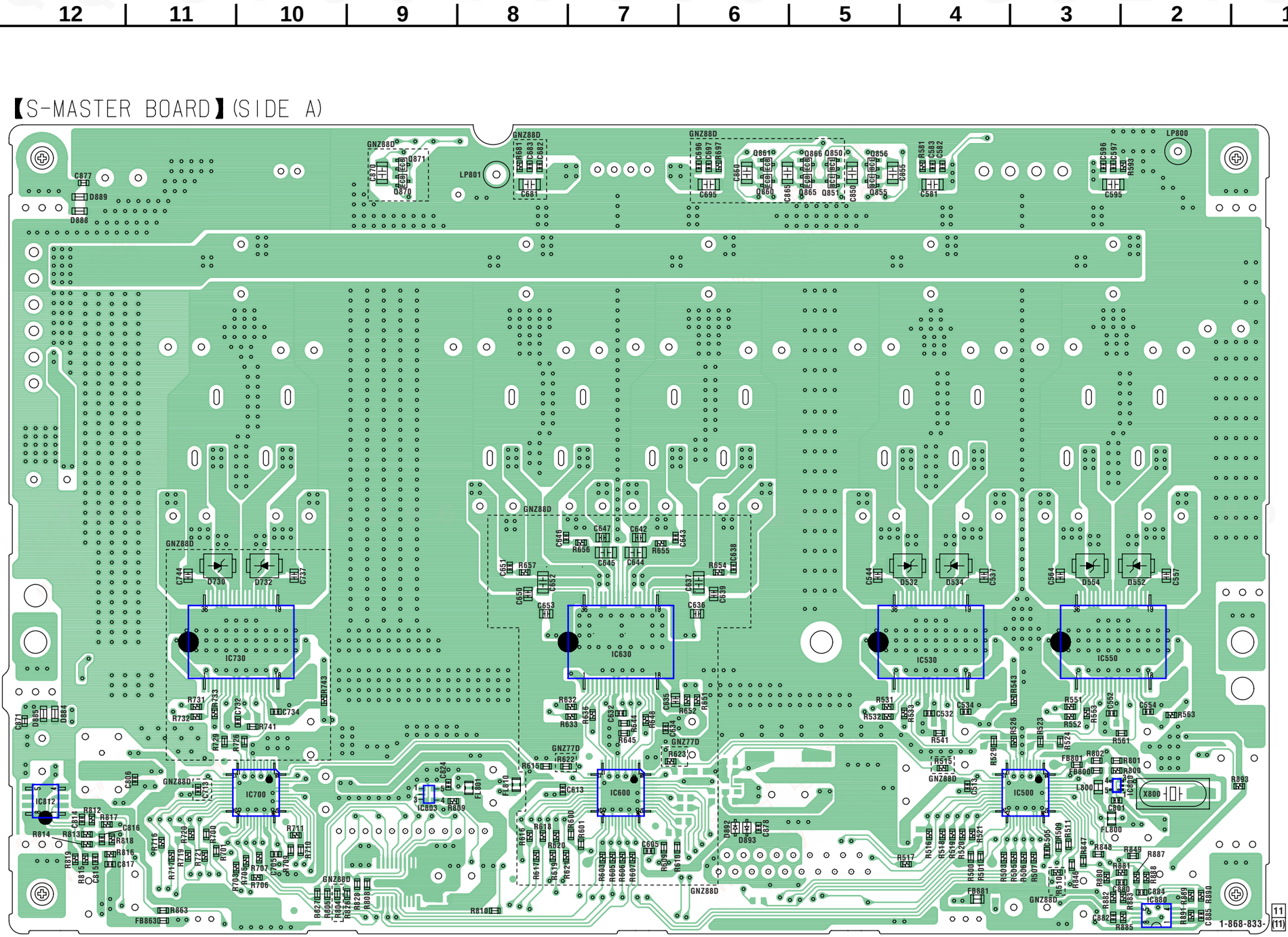


## 6-19. SCHEMATIC DIAGRAM — MAIN SECTION (4/4) —



**6-20. PRINTED WIRING BOARD — S-MASTER SECTION —** • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

【S-MASTER BOARD】(SIDE A)




• **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| D532 | E-4 |
| D534 | E-4 |
| D552 | E-2 |
| D554 | E-3 |
| (D651) | E-7 |
| (D652) | F-7 |
| (D653) | F-7 |
| (D654) | E-7 |
| D730 | E-11 |
| D732 | E-10 |
| (D820) | C-2 |
| (D880) | H-12 |
| (D881) | H-12 |
| (D882) | H-1 |
| (D883) | H-1 |
| D892 | H-6 |
| D893 | H-6 |
| | |
| IC500 | G-3 |
| IC530 | F-4 |
| IC550 | F-3 |
| IC600 | G-7 |
| IC630 | F-7 |
| IC700 | G-10 |
| IC730 | F-10 |
| IC800 | G-3 |
| IC803 | G-9 |
| (IC810) | G-12 |
| IC812 | H-12 |
| IC880 | H-2 |
| | |
| (Q840) | B-8 |
| Q850 | B-5 |
| Q851 | B-5 |
| Q855 | B-5 |
| Q856 | B-5 |
| Q860 | B-6 |
| Q861 | B-6 |
| Q865 | B-5 |
| Q866 | B-5 |
| Q870 | B-9 |
| Q871 | B-9 |

( ): SIDE B

【S-MASTER BOARD (SIDE B)】

(Page 65)
SPEAKER BOARD CN1500
R

(Page 65)
SPEAKER BOARD CN1601
P

(Page 65)
SPEAKER BOARD CN1700
O

S POWER BOARD CN1101 (GNZ88D) (Page 67) POWER UNIT (GNZ77D)

Q MIC BOARD NO1404 (Page 59)

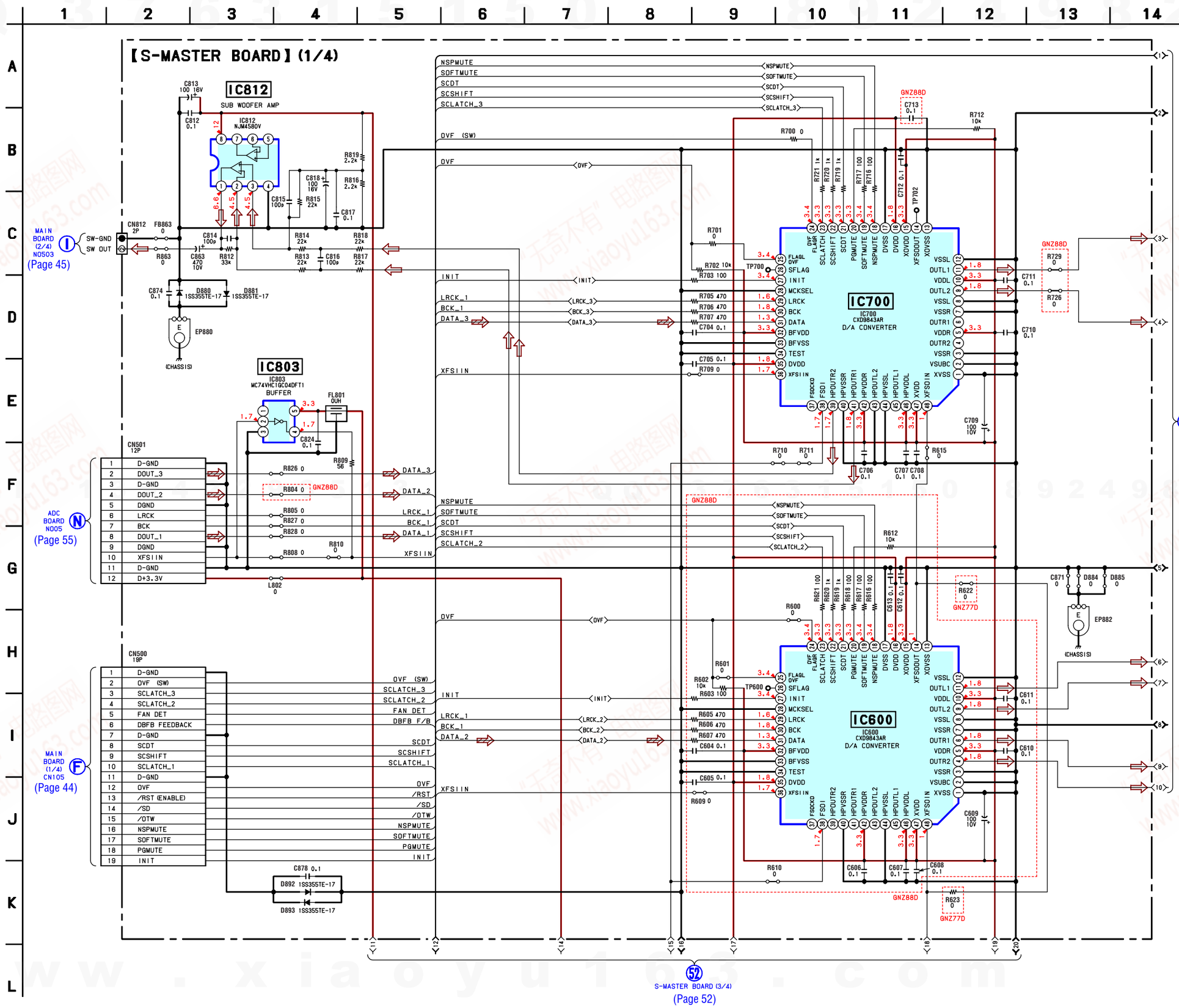
F MAIN BOARD CN105 (Page 43)

N ADC BOARD NO05 (Page 54)

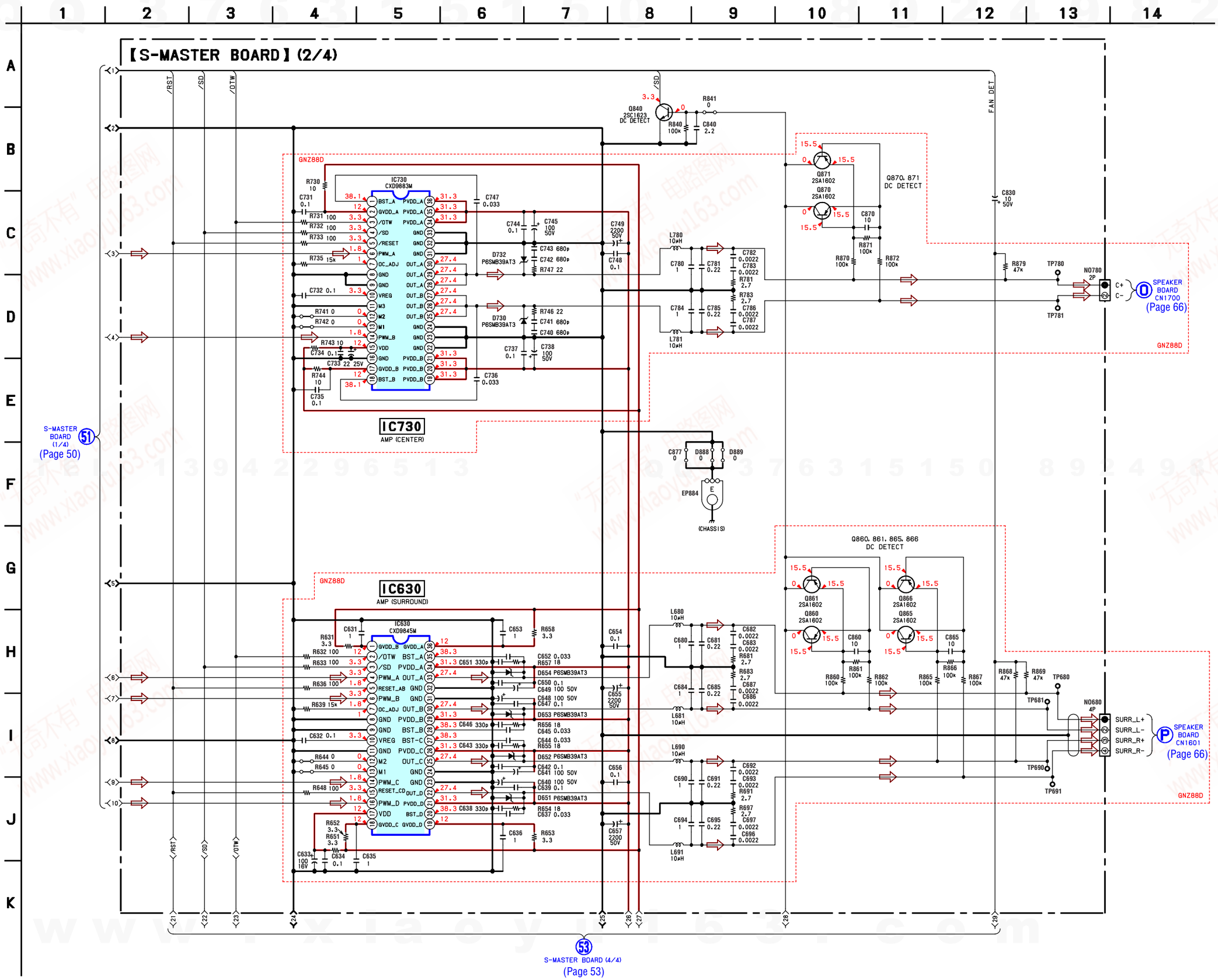
I MAIN BOARD NO503 (Page 43)

1-868-833-

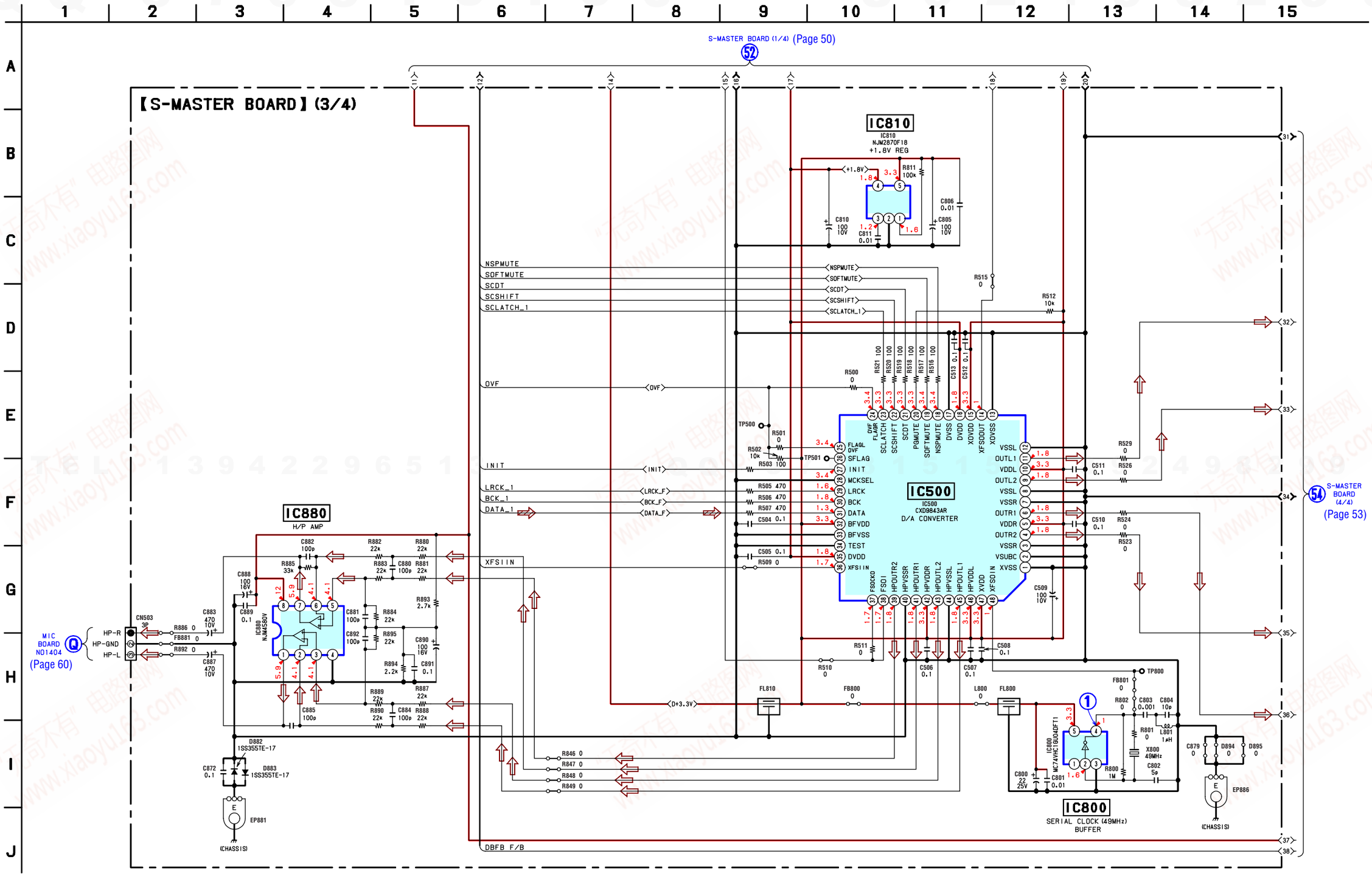
## 6-21. SCHEMATIC DIAGRAM — S-MASTER SECTION (1/4) —



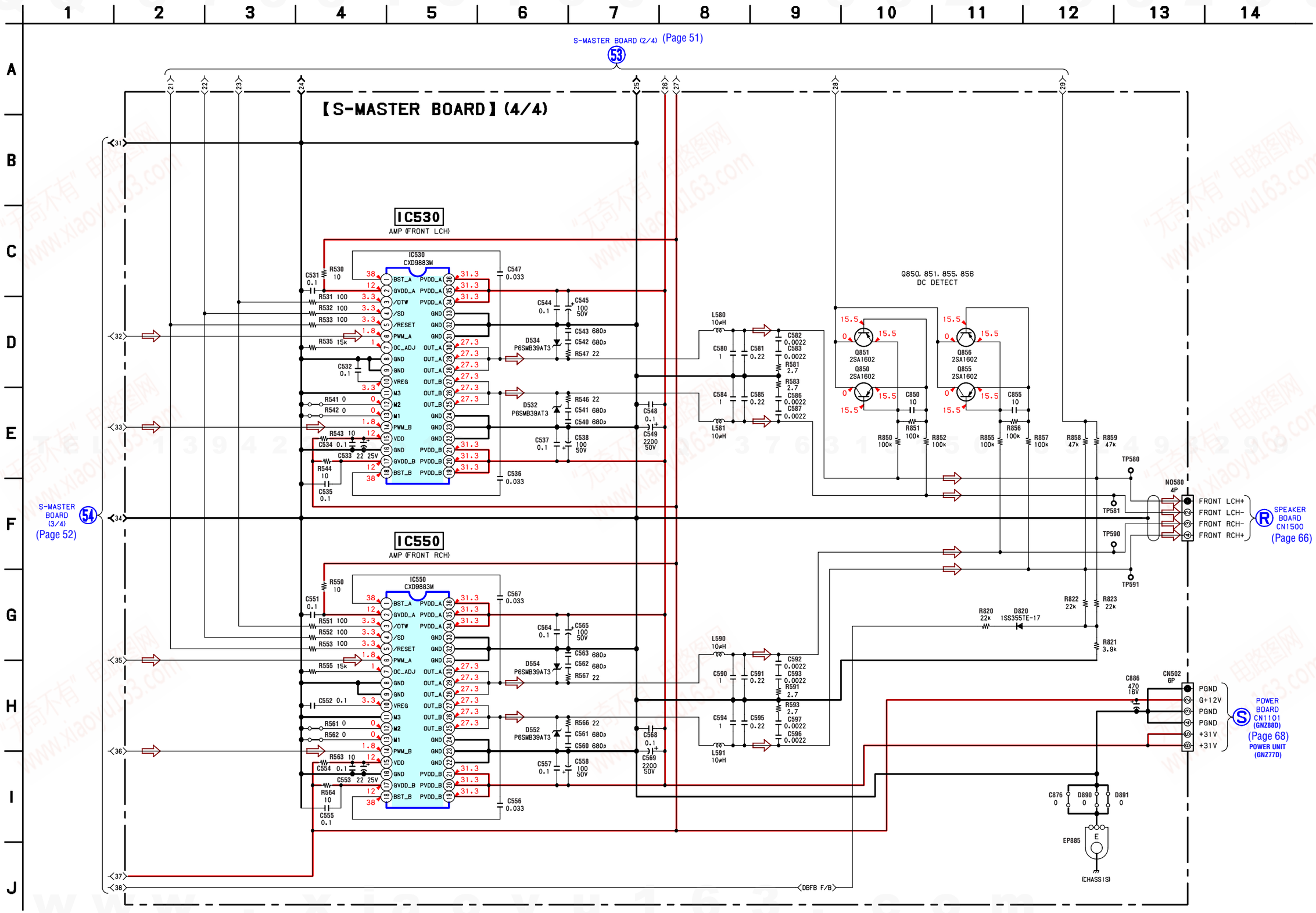
## 6-22. SCHEMATIC DIAGRAM — S-MASTER SECTION (2/4) —



6-23. SCHEMATIC DIAGRAM — S-MASTER SECTION (3/4) — • Refer to page 33 for Waveforms.

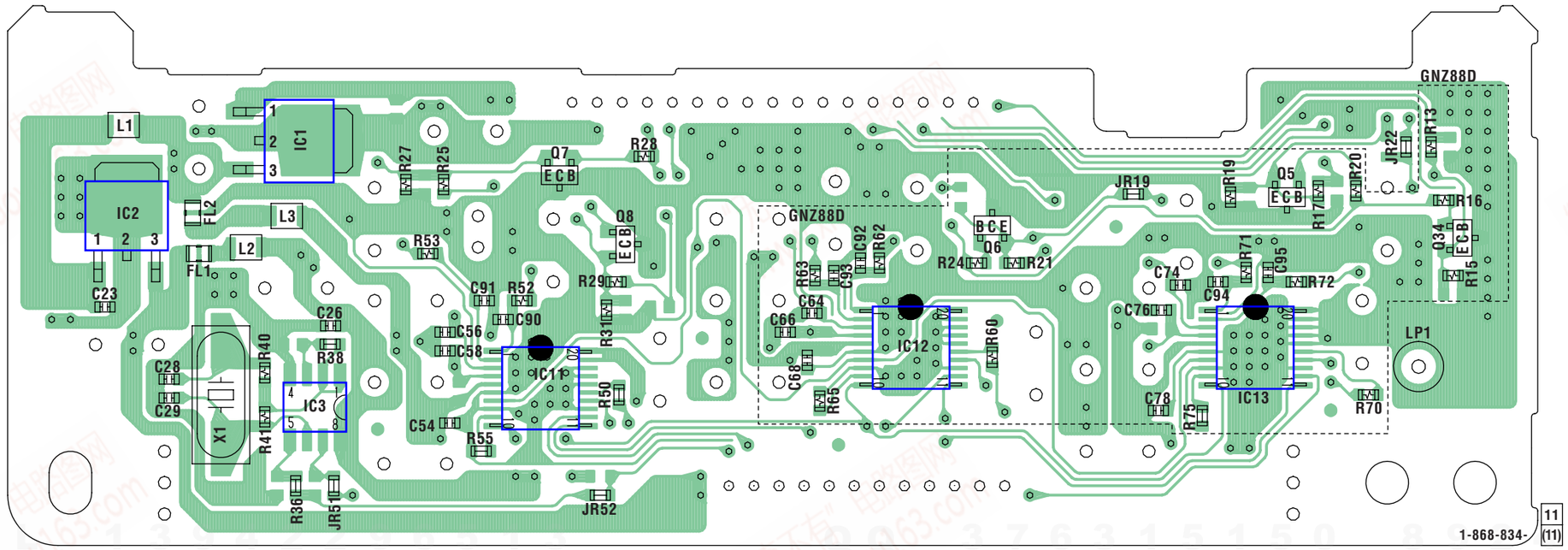


## 6-24. SCHEMATIC DIAGRAM — S-MASTER SECTION (4/4) —



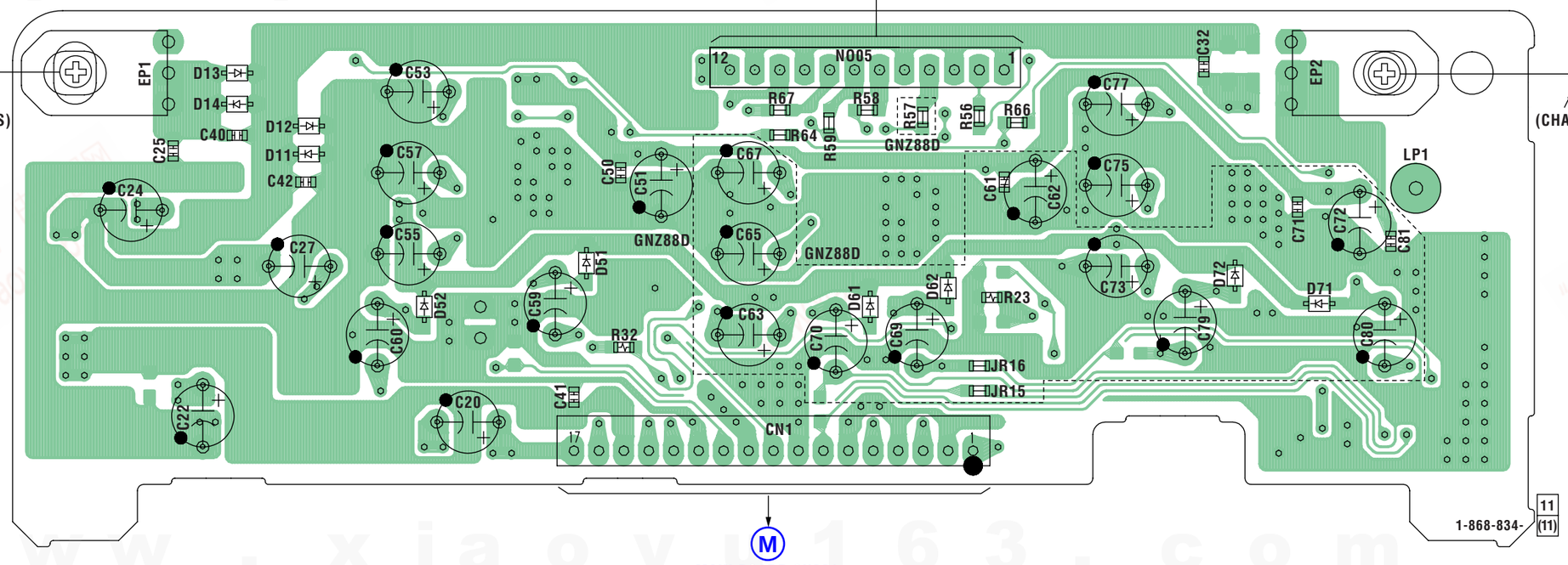
6-25. PRINTED WIRING BOARD — ADC SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

【ADC BOARD】(SIDE A)




(Page 49)
S-MASTER BOARD CN501
N

【ADC BOARD】(SIDE B)

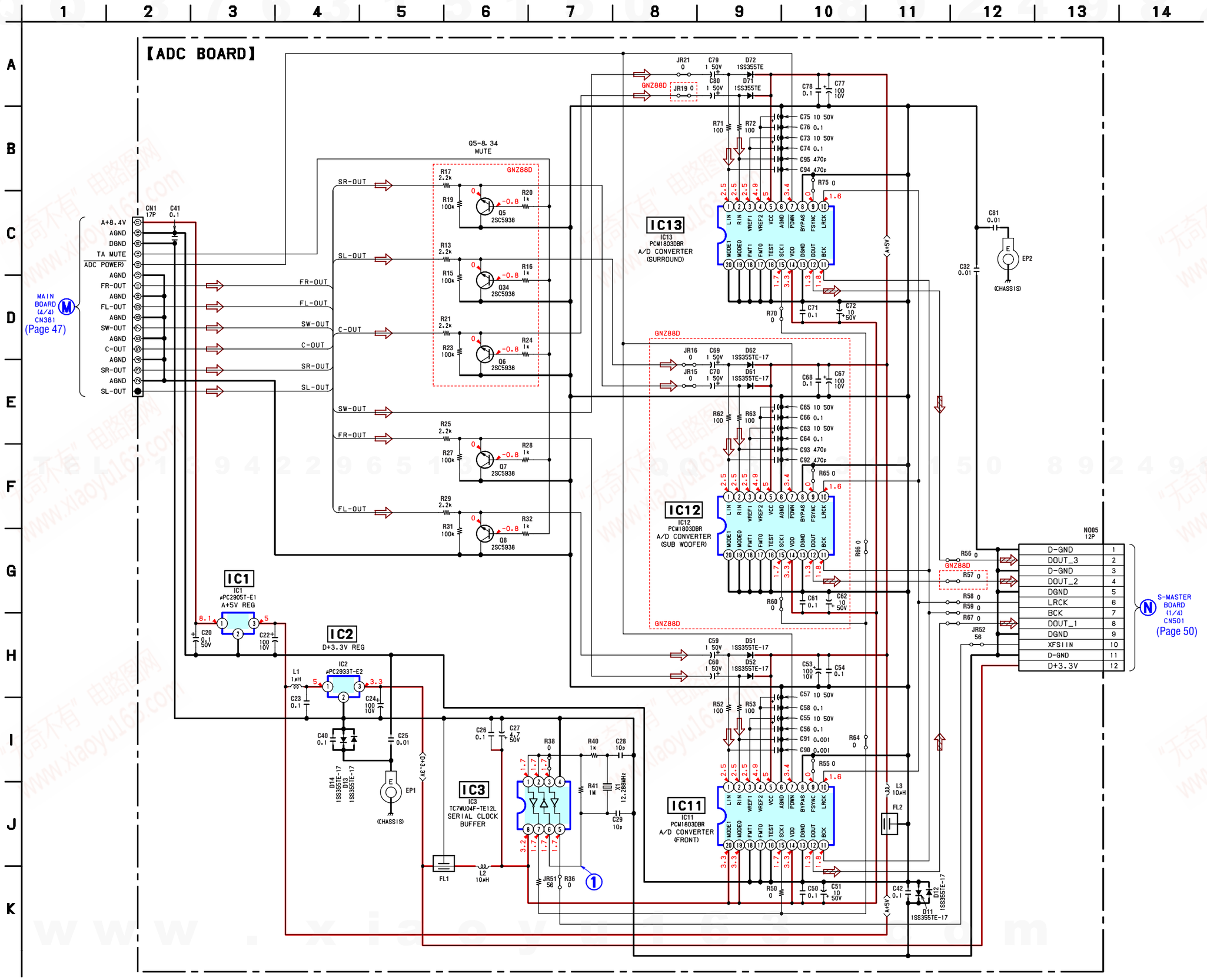



M
MAIN BOARD CN381
(Page 43)

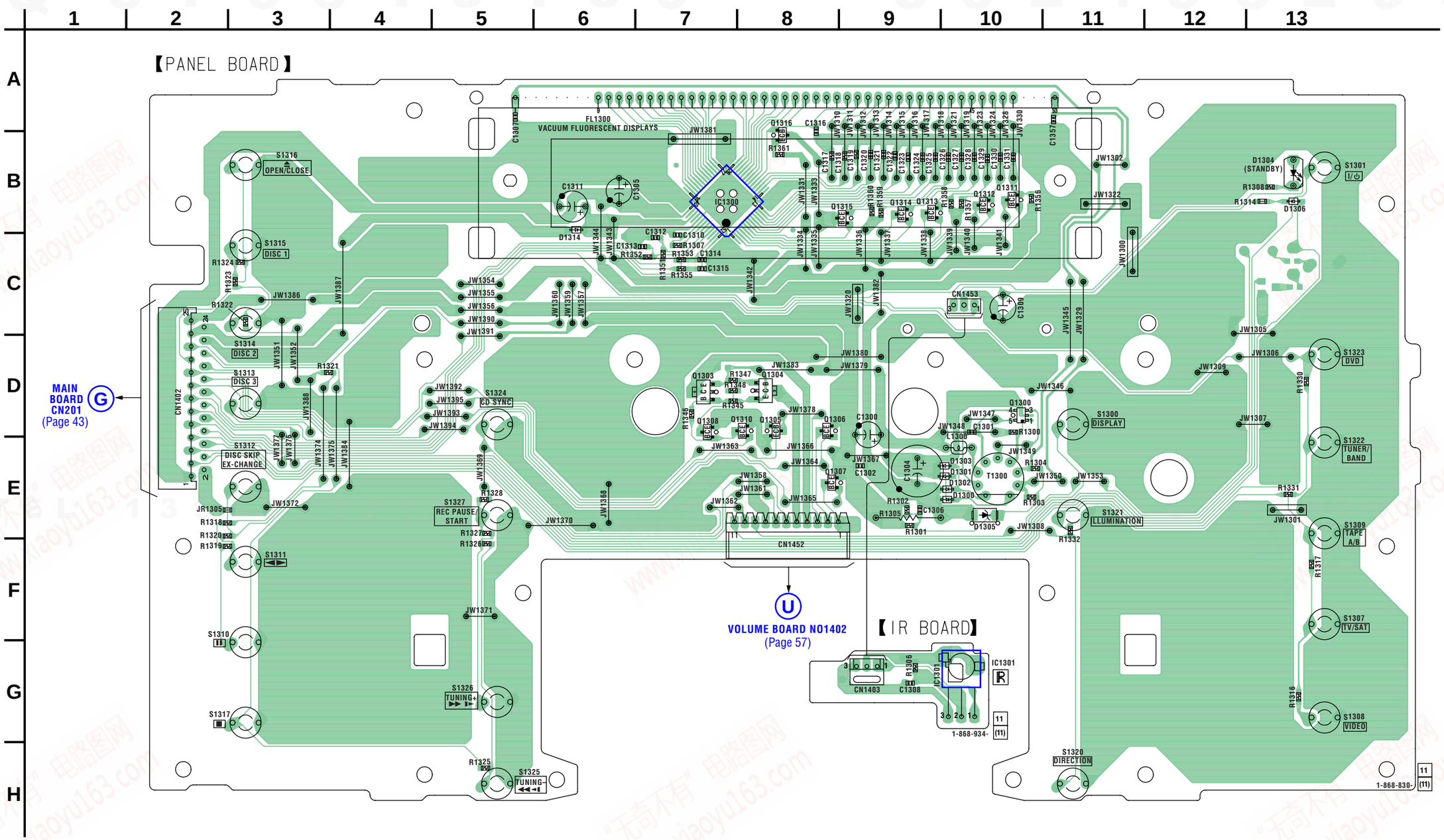
• Semiconductor Location

| Ref. No. | Location |
|---|---|
| D11 | G-3 |
| D12 | G-3 |
| D13 | F-3 |
| D14 | G-3 |
| D51 | H-5 |
| D52 | H-4 |
| D61 | H-7 |
| D62 | H-8 |
| D71 | H-11 |
| D72 | H-10 |
| | |
| IC1 | B-3 |
| IC2 | C-2 |
| IC3 | D-3 |
| IC11 | D-5 |
| IC12 | D-8 |
| IC13 | D-10 |
| | |
| Q5 | B-10 |
| Q6 | C-8 |
| Q7 | B-5 |
| Q8 | C-6 |
| Q34 | C-12 |

## 6-26. SCHEMATIC DIAGRAM — ADC SECTION — • Refer to page 33 for Waveforms.



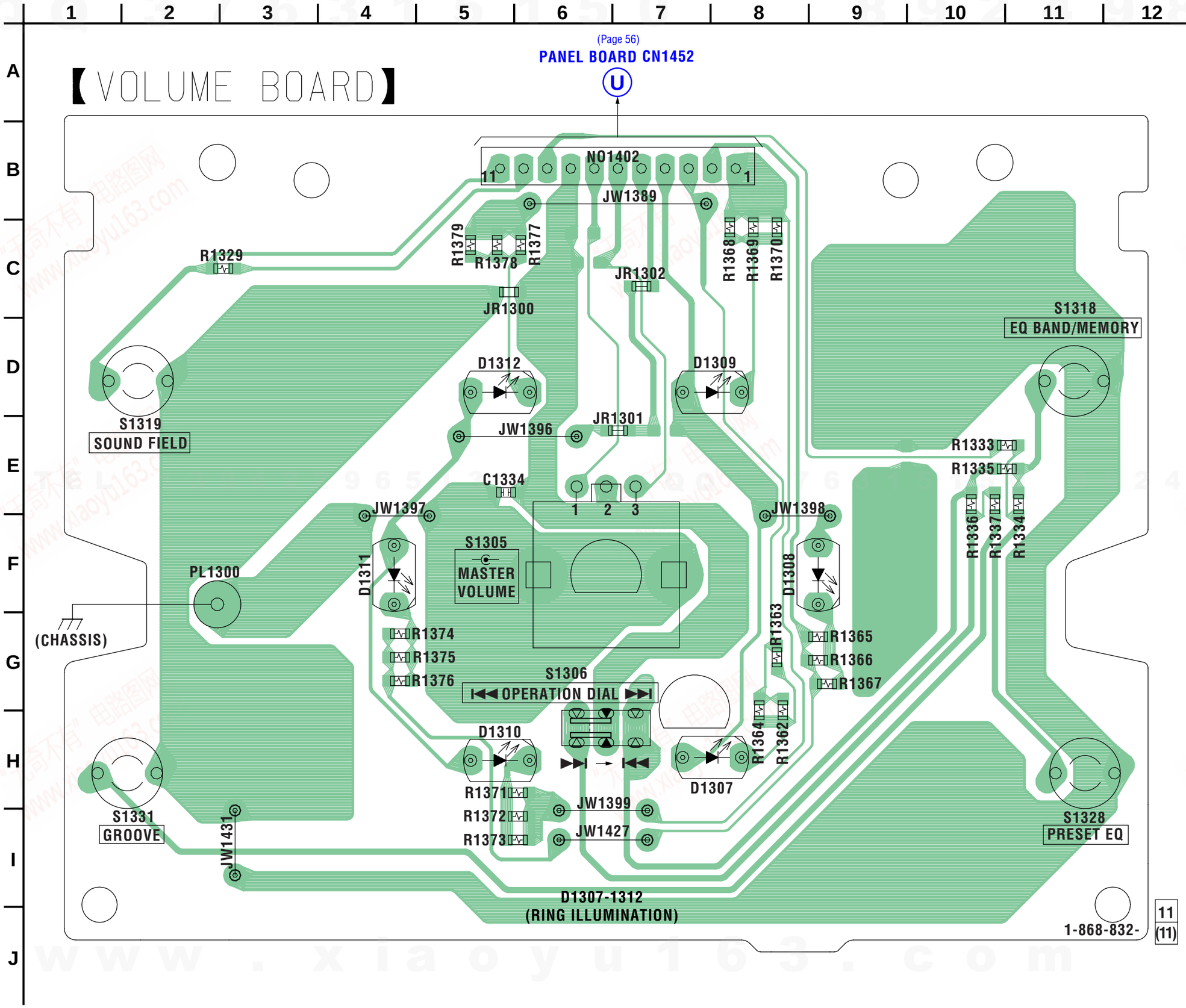
6-27. PRINTED WIRING BOARDS — PANEL SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.




• **Semiconductor Location**

| Ref. No. | Location | Ref. No. | Location |
|---|---|---|---|
| D1300 | E-10 | Q1303 | D-7 |
| D1301 | E-10 | Q1304 | D-8 |
| D1302 | E-10 | Q1305 | D-8 |
| D1303 | E-10 | Q1306 | D-8 |
| D1304 | B-13 | Q1307 | E-8 |
| D1305 | E-10 | Q1308 | D-7 |
| D1306 | B-13 | Q1310 | D-8 |
| D1314 | B-6 | Q1311 | B-10 |
| | | Q1312 | B-10 |
| IC1300 | B-7 | Q1313 | B-9 |
| IC1301 | G-10 | Q1314 | B-9 |
| | | Q1315 | B-9 |
| Q1300 | D-10 | Q1316 | A-8 |

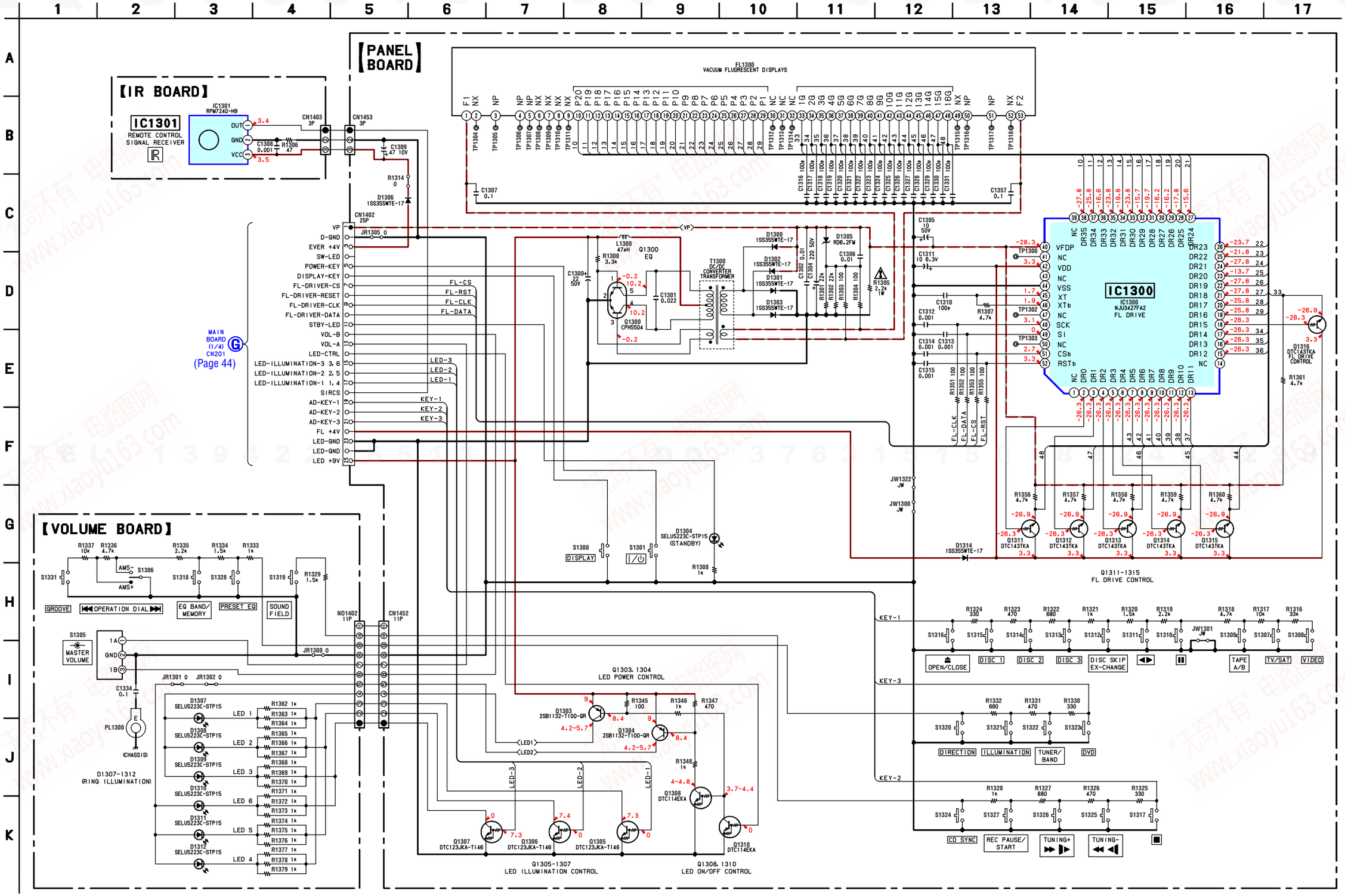
6-28. PRINTED WIRING BOARD — VOLUME SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



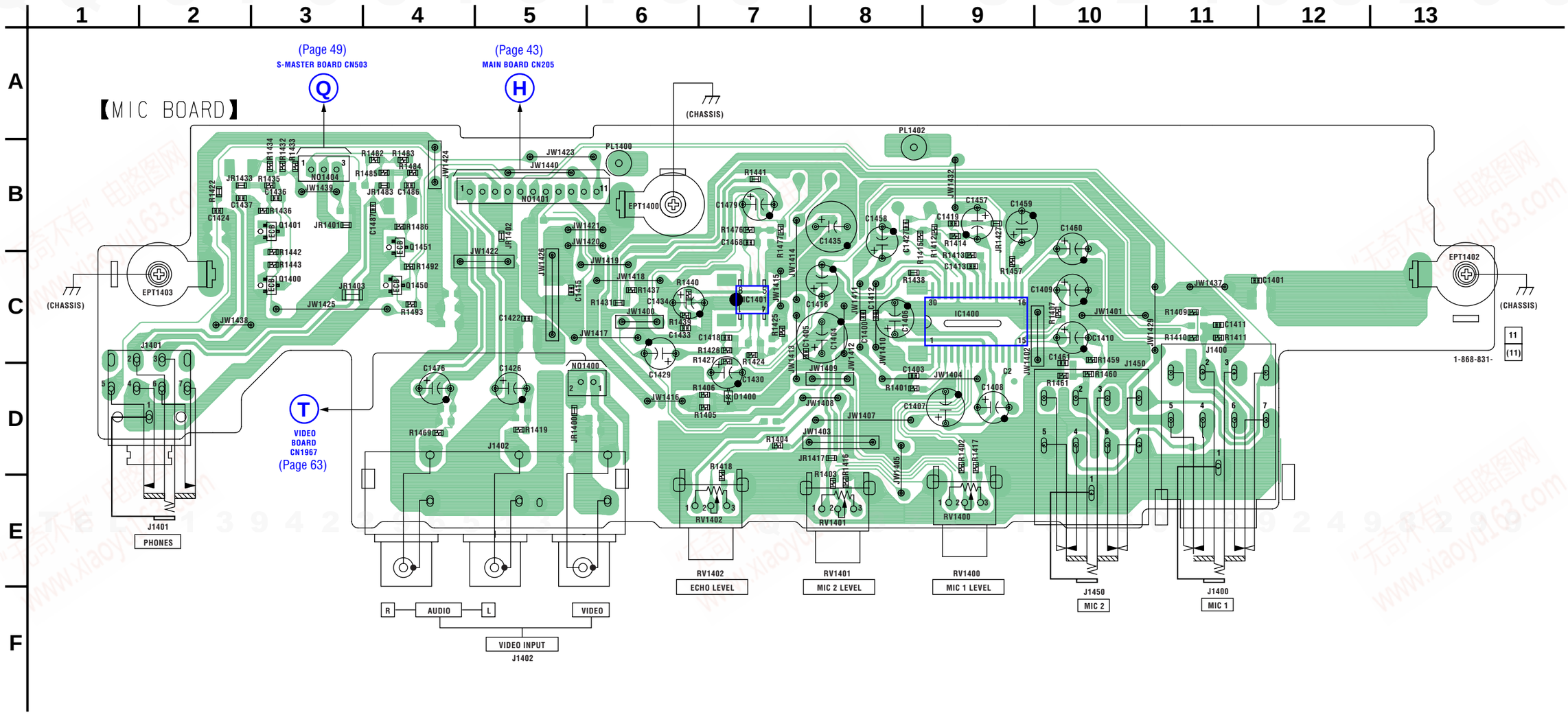

• Semiconductor Location

| Ref. No. | Location |
|---|---|
| D1307 | H-7 |
| D1308 | F-8 |
| D1309 | D-7 |
| D1310 | H-5 |
| D1311 | F-4 |
| D1312 | D-5 |

## 6-29. SCHEMATIC DIAGRAM — PANEL SECTION —



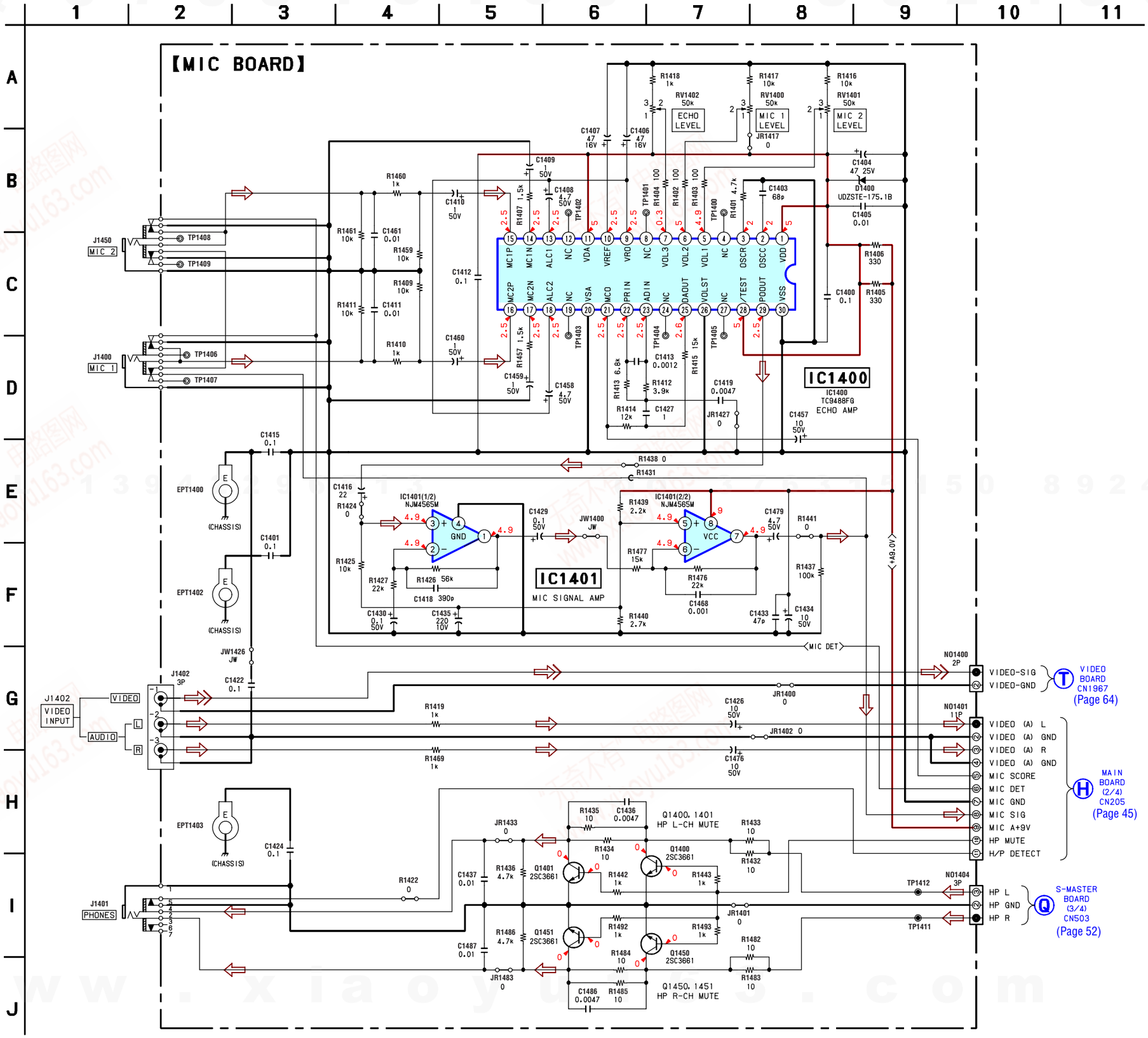
**6-30. PRINTED WIRING BOARD — MIC SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.**




- **Semiconductor Location**

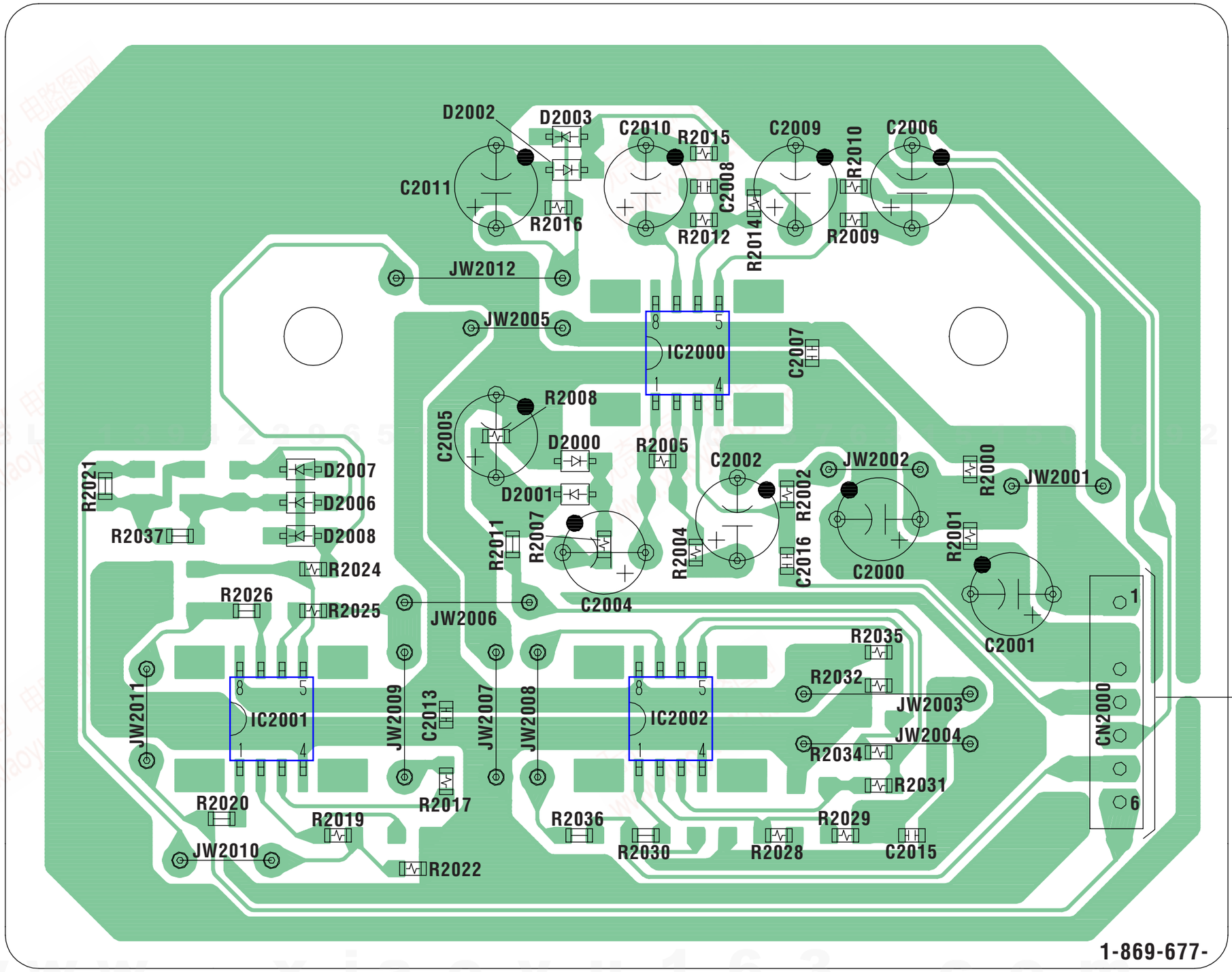
| Ref. No. | Location |
|---|---|
| D1400 | D-7 |
| IC1400 | C-9 |
| IC1401 | C-7 |
| Q1400 | C-3 |
| Q1401 | B-3 |
| Q1450 | C-4 |
| Q1451 | B-4 |

## 6-31. SCHEMATIC DIAGRAM — MIC SECTION —



**6-32. PRINTED WIRING BOARD — KARAOKE SECTION —** • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.

【KARAOKE BOARD】




• **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| D2000 | E-6 |
| D2001 | F-6 |
| D2002 | C-6 |
| D2003 | C-6 |
| D2006 | F-4 |
| D2007 | F-4 |
| D2008 | F-4 |
| IC2000 | E-7 |
| IC2001 | H-3 |
| IC2002 | H-7 |

J MAIN BOARD CN403 (Page 43)

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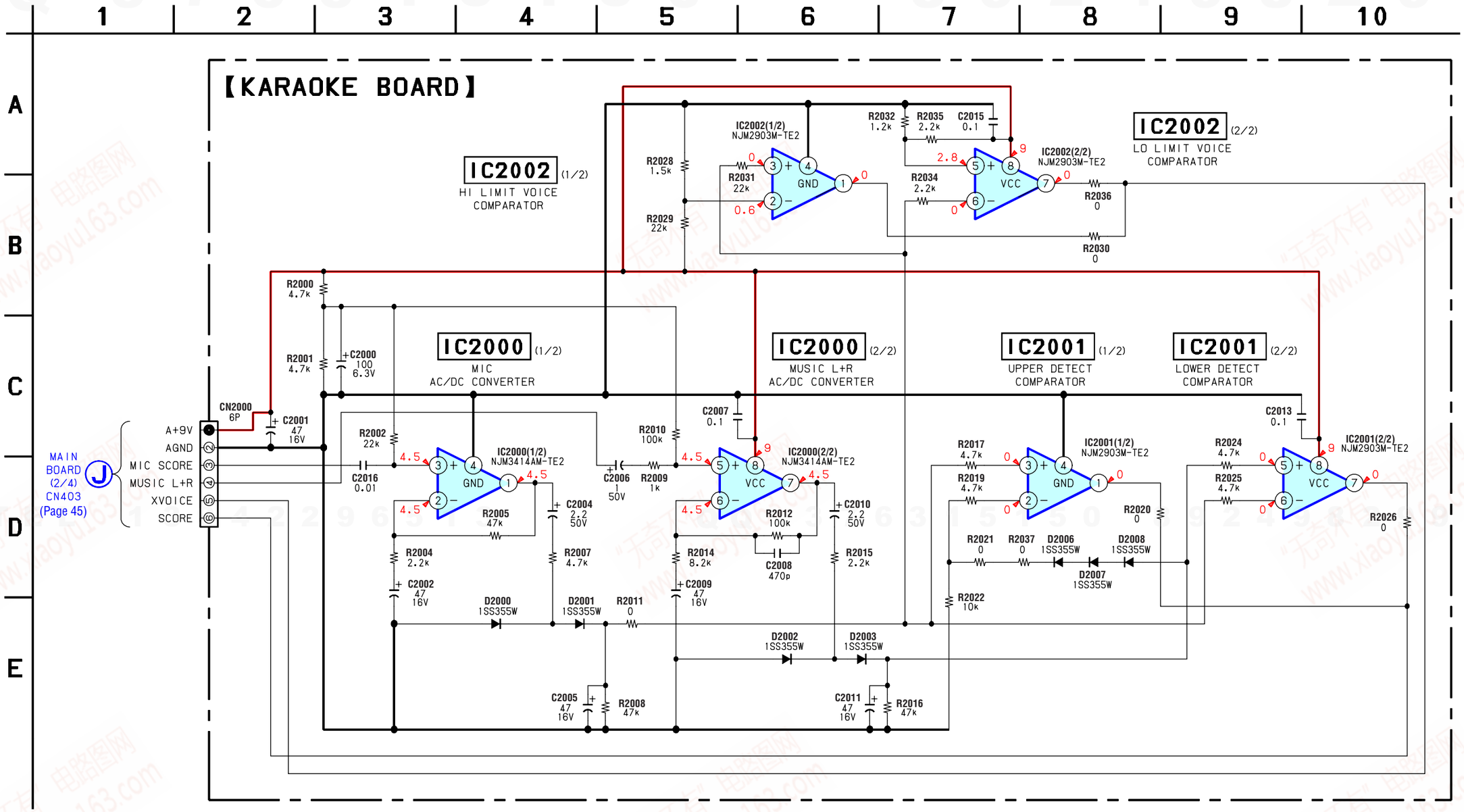
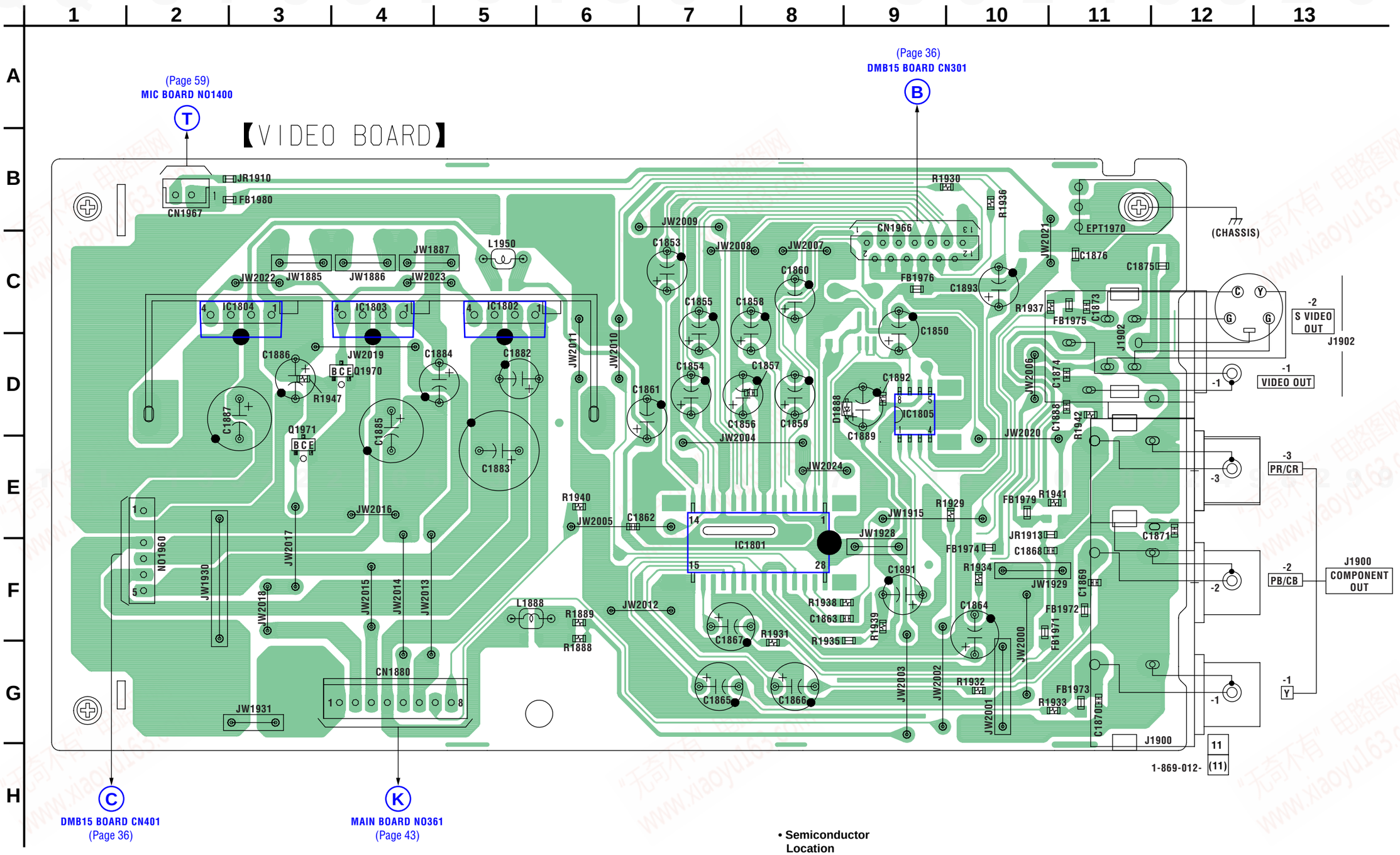
(11)

## 6-33. SCHEMATIC DIAGRAM — KARAOKE SECTION —



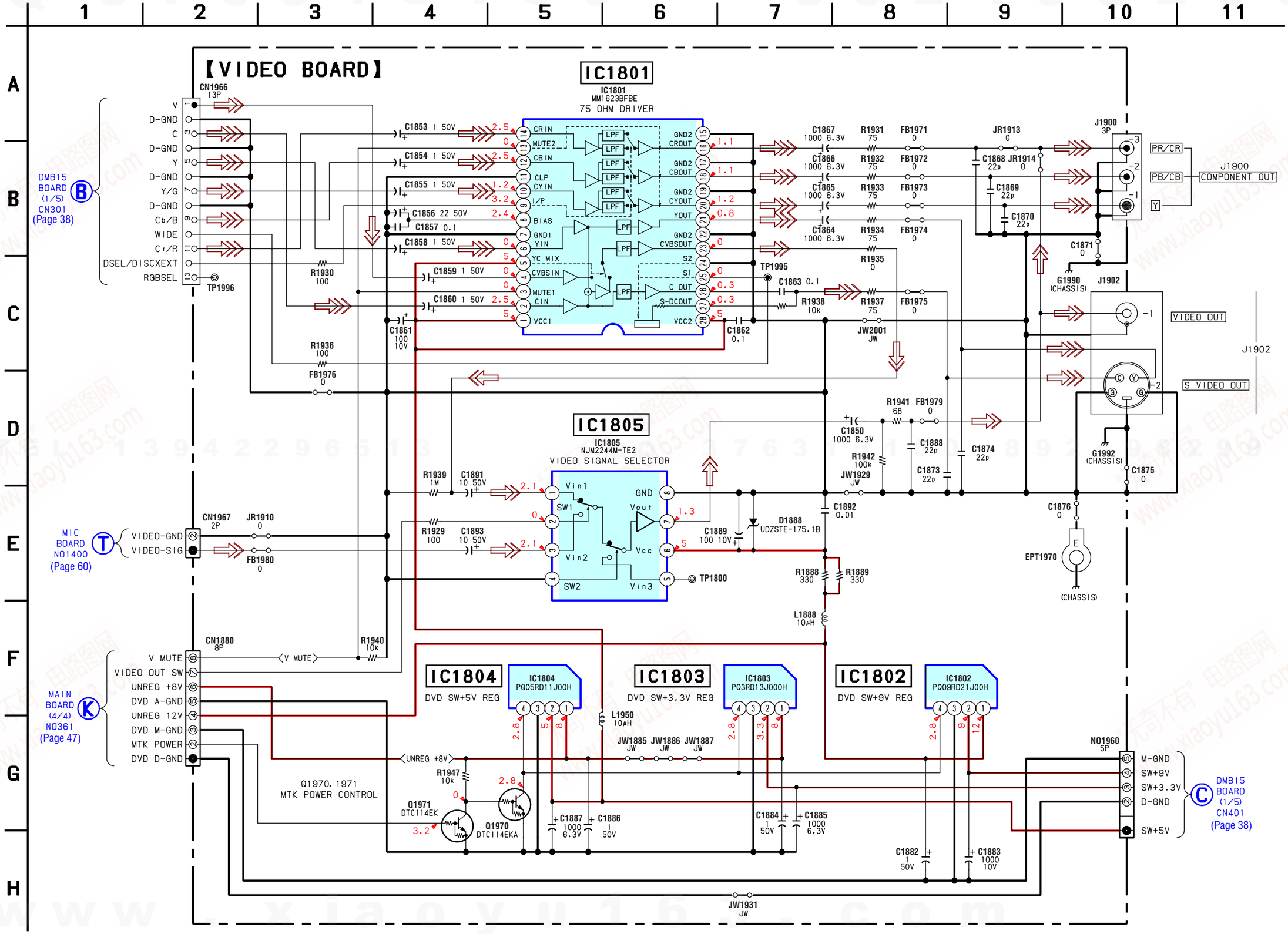
6-34. PRINTED WIRING BOARD — VIDEO SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



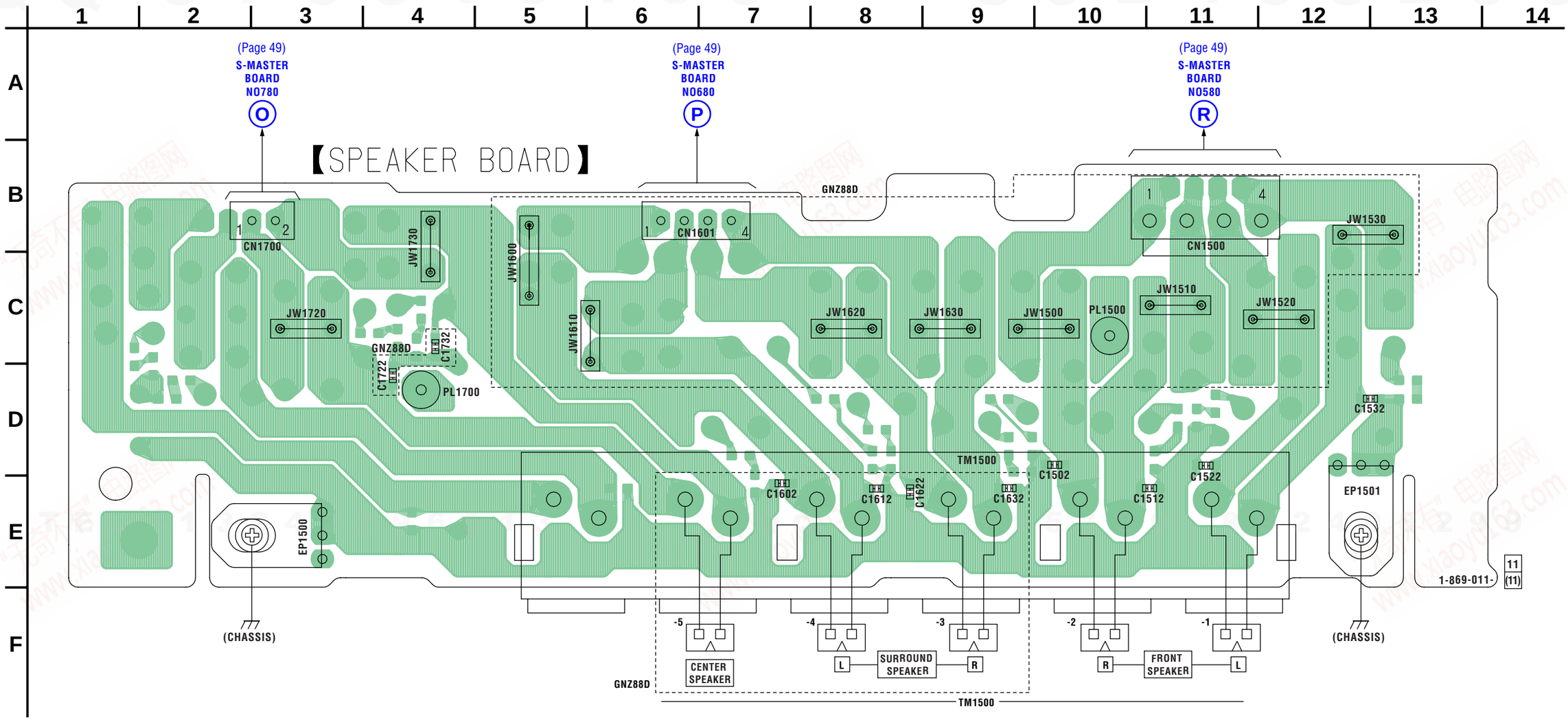

• **Semiconductor Location**

| Ref. No. | Location |
|---|---|
| D1888 | D-9 |
| IC1801 | F-8 |
| IC1802 | C-5 |
| IC1803 | C-4 |
| IC1804 | C-3 |
| IC1805 | D-9 |
| Q1970 | D-4 |
| Q1971 | E-3 |

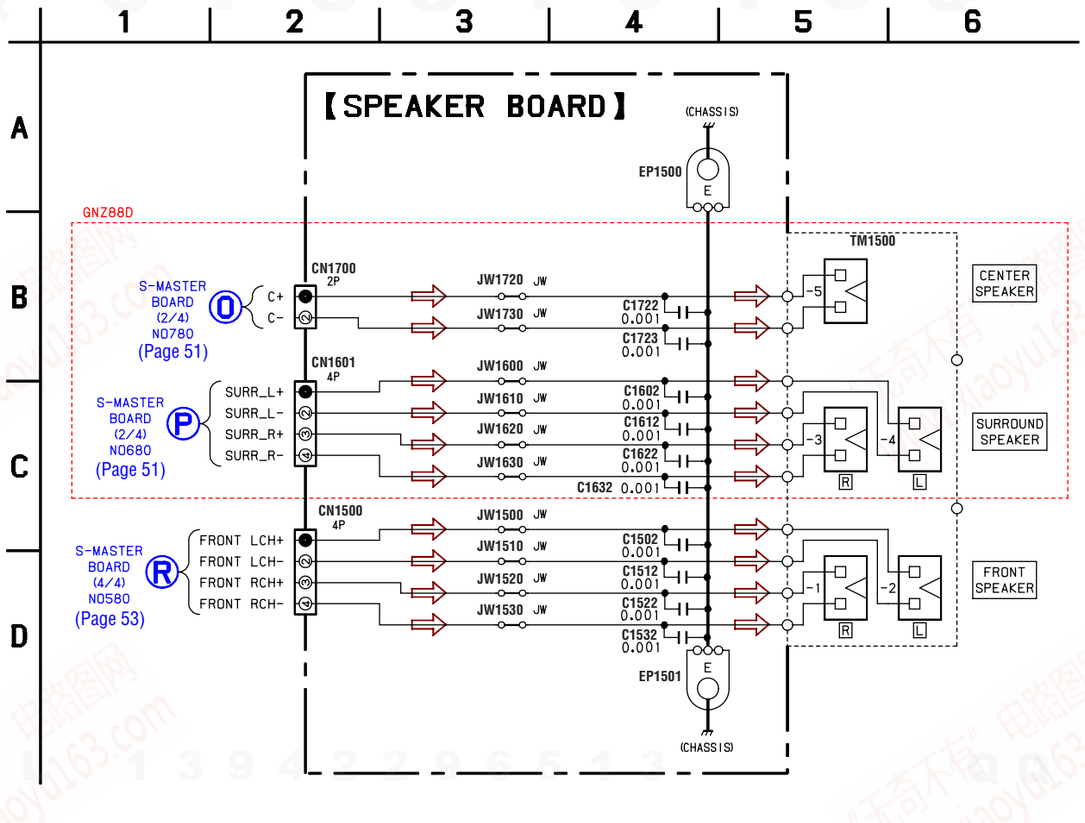
## 6-35. SCHEMATIC DIAGRAM — VIDEO SECTION —



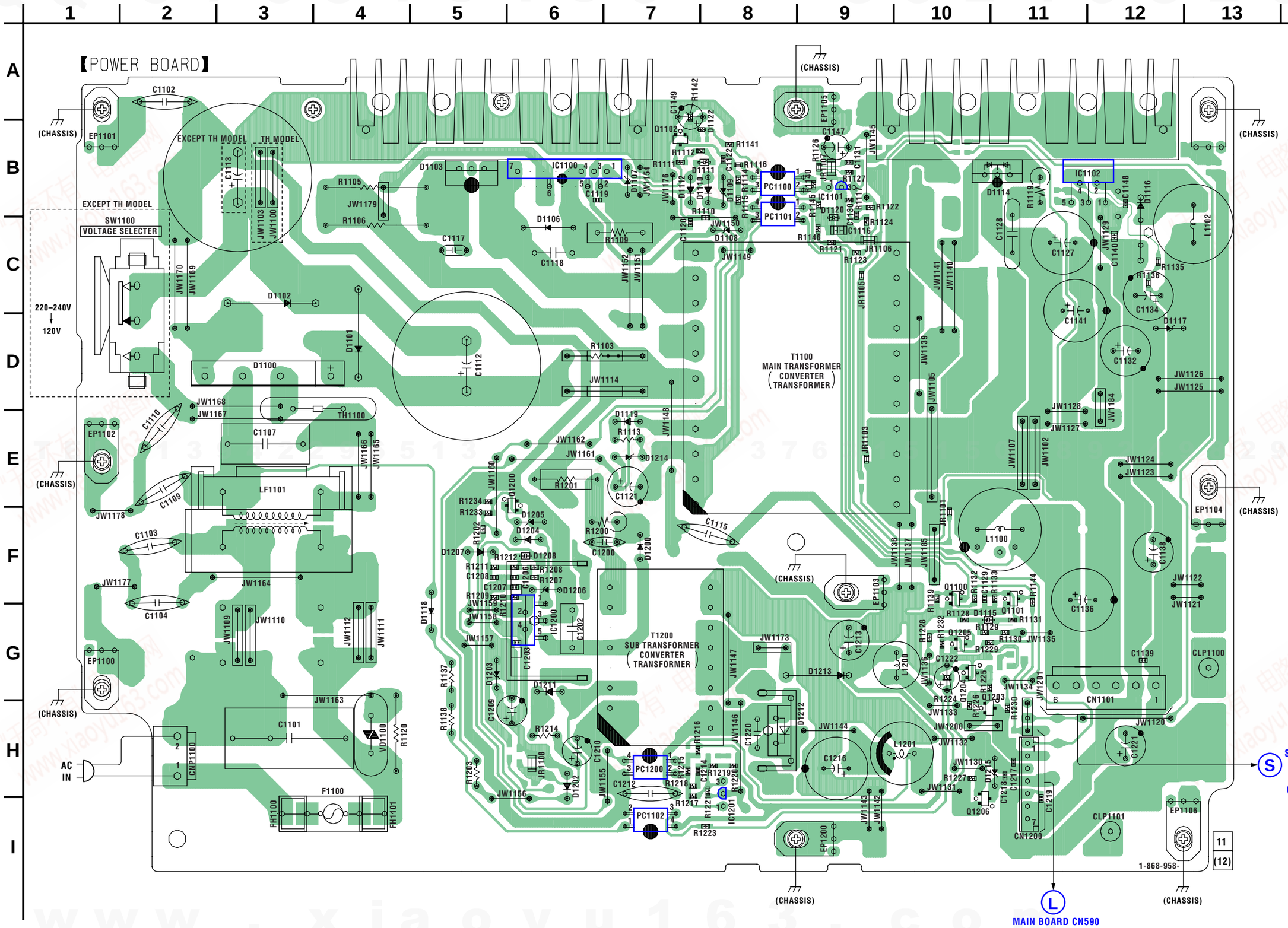
6-36. PRINTED WIRING BOARD — SPEAKER SECTION — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.



## 6-37. SCHEMATIC DIAGRAM — SPEAKER SECTION —



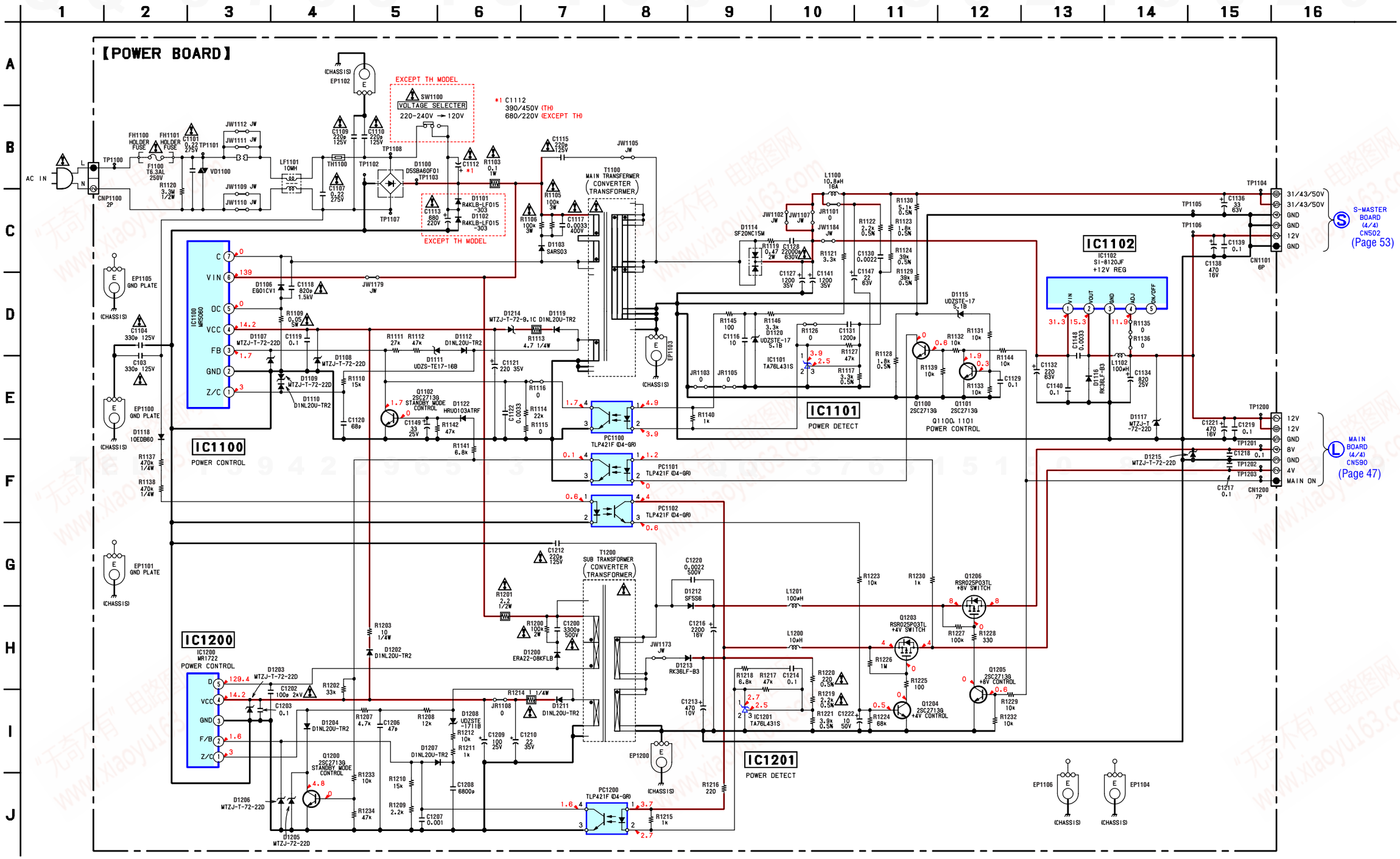
6-38. PRINTED WIRING BOARD — POWER SECTION (HCD-GNZ88D) — • Refer to page 32 for Circuit Boards Location. : Uses unleaded solder.




• Semiconductor Location

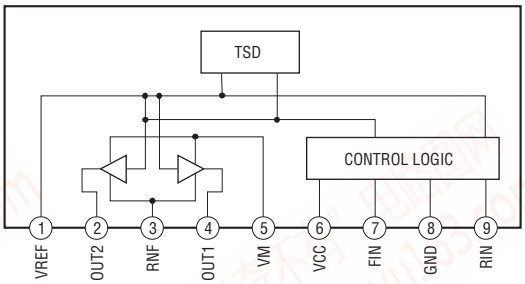
| Ref. No. | Location |
|---|---|
| D1100 | D-3 |
| D1101 | D-4 |
| D1102 | C-3 |
| D1103 | B-5 |
| D1106 | C-6 |
| D1107 | B-7 |
| D1108 | C-8 |
| D1109 | B-8 |
| D1110 | B-8 |
| D1111 | B-8 |
| D1112 | B-7 |
| D1114 | B-11 |
| D1115 | G-10 |
| D1116 | B-12 |
| D1117 | D-12 |
| D1118 | G-5 |
| D1119 | E-7 |
| D1120 | B-9 |
| D1122 | B-8 |
| D1200 | F-7 |
| D1202 | H-6 |
| D1203 | G-5 |
| D1204 | F-6 |
| D1205 | F-6 |
| D1206 | F-6 |
| D1207 | F-5 |
| D1208 | F-6 |
| D1211 | G-6 |
| D1212 | H-8 |
| D1213 | G-9 |
| D1214 | E-7 |
| D1215 | H-11 |
| IC1100 | B-6 |
| IC1101 | B-9 |
| IC1102 | B-11 |
| IC1200 | G-6 |
| IC1201 | I-8 |
| PC1100 | B-8 |
| PC1101 | B-8 |
| PC1102 | I-7 |
| PC1200 | H-7 |
| Q1100 | F-10 |
| Q1101 | G-11 |
| Q1102 | B-7 |
| Q1200 | E-6 |
| Q1203 | H-10 |
| Q1204 | G-10 |
| Q1205 | G-10 |
| Q1206 | I-10 |

## 6-39. SCHEMATIC DIAGRAM — POWER SECTION (HCD-GNZ88D) —

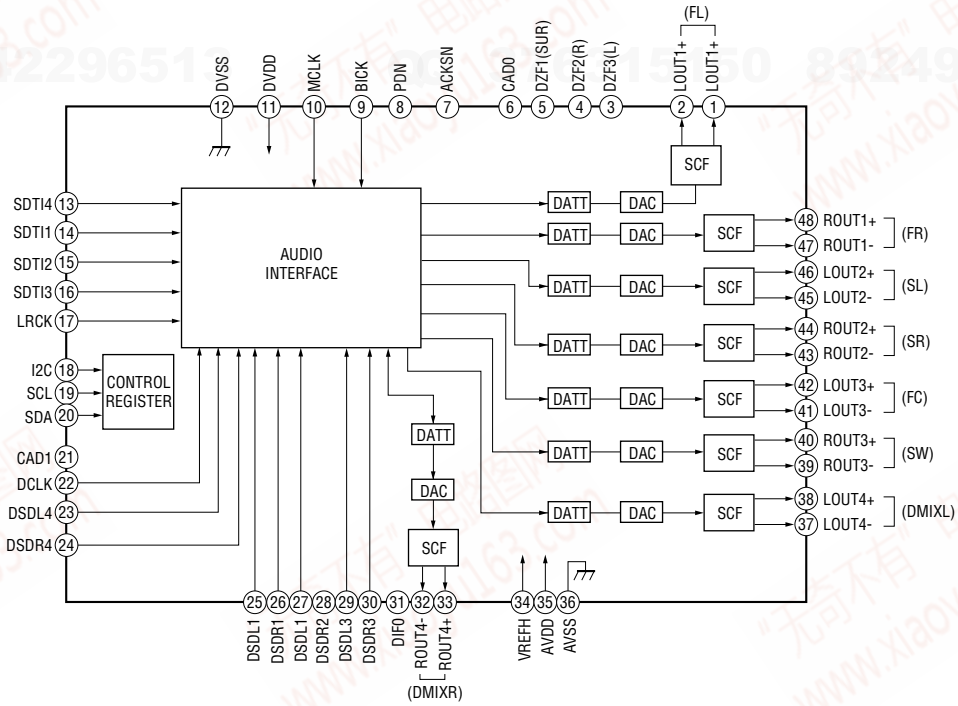


## • IC Block Diagrams

### IC701 BA6956AN (DRIVER Board)
### IC712 BA6956AN (DRIVER Board)




### IC301 AK4358VQ-L (DMB15 Board)



## • IC Pin Descriptions

### IC102 CXD9849R (CD/DVD RF AMP, FOCUS/TRACKING ERROR AMP, DVD SYSTEM PROCESSOR, DIGITAL SERVO PROCESSOR) (DMB15 BOARD (3/5))

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 1 | AGND | — | Ground pin |
| 2 | DVDA | I | AC coupled input path A |
| 3 | DVDB | I | AC coupled input path B |
| 4 | DVDC | I | AC coupled input path C |
| 5 | DVDD | I | AC coupled input path D |
| 6 | DVDRFIP | I | AC coupled DVD RF signal input RFIP |
| 7 | DVDRFIN | I | AC coupled DVD RF signal input RFIN Not used in this set. (Open) |
| 8 | NA | I | DC coupled main-beam RF signal input A |
| 9 | NB | I | DC coupled main-beam RF signal input B |
| 10 | MC | I | DC coupled main-beam RF signal input C |
| 11 | MD | I | DC coupled main-beam RF signal input D |
| 12 | SA | I | DC coupled sub-beam RF signal input A Not used in this set. (Open) |
| 13 | SB | I | DC coupled sub-beam RF signal input B Not used in this set. (Open) |
| 14 | SC | I | DC coupled sub-beam RF signal input C Not used in this set. (Open) |
| 15 | SD | I | DC coupled sub-beam RF signal input D Not used in this set. (Open) |
| 16 | CDFON | I | CD focusing error negative input Not used in this set. (Open) |
| 17 | CDFOP | I | CD focusing error positive input Not used in this set. (Open) |
| 18 | TNI | I | 3 beam satellite PD signal negative input |
| 19 | TPI | I | 3 beam satellite PD signal positive input |
| 20 | MDI1 | I | Laser power PD monitor signal input |
| 21 | MDI2 | I | Laser power PD monitor signal input |
| 22 | LDO2 | O | Laser drive signal output |
| 23 | LDO1 | O | Laser drive signal output |
| 24 | SVDD3 | — | Power Supply pin (+3.3 V) |
| 25 | CSD | O | Central servo, Positive main beam summing signal output<br>Not used in this set. (Open) |
| 26 | RFLVL | O | RFRP low pass, or Positive main beam summing signal output<br>Not used in this set. (Open) |
| 27 | SGND | — | Ground pin |
| 28 | V2REFO | O | Reference voltage 2.8 V |
| 29 | V2O | O | Reference voltage 2.0 V |
| 30 | VREFO | O | Reference voltage 1.4 V |
| 31 | FEO | O | Focus error monitor signal output Not used in this set. (Open) |
| 32 | TEO | O | Tracking error monitor signal output Not used in this set. (Open) |
| 33 | TEZISLY | O | TE Slicing Level Not used in this set. |
| 34 | OPOUT | O | Op amp output Not used in this set. (Open) |
| 35 | OPIN | I | Op amp negative input Not used in this set. (Open) |
| 36 | OPIN | I | Op amp positive input Not used in this set. (Open) |
| 37 | DMO | O | Disk motor control signal output. PWM signal output |
| 38 | FMO | O | Feed motor signal control. PWM signal output |
| 39 | TROPENPWM | O | Tray PWM output/Tray open signal output. |
| 40 | IOPMON | I | General PWM signal input |
| 41 | TRO | O | Tracking servo signal output |
| 42 | FOO | O | Focus servo signal output |
| 43 | DVSS | — | Ground pin |
| 44 | NC | — | Not used. (Open) |
| 45 | NC | — | Not used. (Open) |
| 46 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 47 | SPFG | I | Motor Hall sensor signal input |
| 48 | DSEL | O | Select signal output |

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 49 | WIDE | I | Wide signal output |
| 50 | MSW | O | Volume control signal output |
| 51 | MAMUTE | O | MAMUTE signal output to System Controller Not used in this set. (Open) |
| 52 | DVDD18 | — | Power Supply pin (+1.8 V) |
| 53 to 58 | IOA 2 to 7 | O | Address bus 2 to 7 output to PROM |
| 59 | HIGHA0 | O | Address bus 8 output to PROM |
| 60, 61 | IOA18, 19 | O | Address bus 18, 19 output to PROM |
| 62 | DVSS | — | Ground pin |
| 63 | APLLCAP | I | APLL External Capacitance connection |
| 64 | APLLVSS | — | Ground pin |
| 65 | VDD3 | — | Power Supply pin (+3.3 V) |
| 66 | IOWA | O | WE signal output to PROM |
| 67 | A16 | O | Address bus 16 output to PROM |
| 68 to 72 | HIGHA 7 to 3 | O | Address bus 15 to 11 output to PROM |
| 73 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 74, 75 | HIGHA 2, 1 | O | Address bus 10, 9 output to PROM |
| 76 | IOA20 | O | Address bus 20 output to PROM |
| 77 | IOCS | O | CE signal output to PROM |
| 78 | IOA1 | O | Address bus 1 output to PROM |
| 79 | IOOE | O | OE signal output to PROM |
| 80 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 81 to 84 | AD 0 to 3 | I | Data bus 0 to 3 input from PROM |
| 85 | DVSS | — | Ground pin |
| 86 to 88 | AD 4 to 6 | I | Data bus 4 to 6 input from PROM |
| 89 | IOA21 | O | Address bus 21 output to PROM |
| 90 | ALE | O | Address latch enable Not used in this set. (Open) |
| 91 | AD7 | I | Data bus 7 input from PROM |
| 92 | A17 | O | Address bus 17 output to PROM |
| 93 | IOA0 | O | Address bus 0 output to PROM |
| 94 | DVSS | — | Ground pin |
| 95 | UWA | I | System Controller write strobe Not used in this set. (Open) |
| 96 | URB | I | System Controller read strobe Not used in this set. (Open) |
| 97 | DVDD18 | — | Power Supply pin (+1.8 V) |
| 98 | IFSDO | I | DVD SOD signal input from System Controller |
| 99 | IFCK | O | DVD SCO signal output to System Controller |
| 100 | XIFCS | I | DVD XIFCS signal input from System Controller |
| 101 | IFSDI | I | VIFBUSY signal output from System Controller |
| 102 | SCL | O | SCL signal output to EEPROM |
| 103 | SDA | O | SDA signal output to EEPROM |
| 104 | TRG-SW | O | RS232 RXD signal output Not used in this set. (Open) |
| 105 | IFBSY | I | RS232 TXD signal input from System Controller |
| 106 | RXD | I | RD232 RXD clock |
| 107 | TXD | I | RD232 TXD data |
| 108 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 109 | ICE | I | ICE mode enable Not used in this set. (Open) |
| 110 | PRST | I | MTRST signal input from System Controller |
| 111 | IR | I | IR control signal input Not used in this set. (Open) |
| 112 | INT0 | I | External interrupt0 Not used in this set. (Open) |
| 113 | DQMO | O | DQM0 signal output to SD-RAM |
| 114 | MREQ | I | DQM signal input |
| 115 | RD7 | I | Data bus 7 from SD-RAM |
| 116 | DVSS | — | Ground pin |
| 117, 118 | RD 6, 5 | I | Data bus 6, 5 from SD-RAM |

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 119 | DVSS | — | Ground pin |
| 120, 121 | RD 4, 3 | I | Data bus 4, 3 from SD-RAM |
| 122 | DVDD18 | — | Power Supply pin (+1.8 V) |
| 123 to 125 | RD 2 to 0 | I | Data bus 2 to 0 from SD-RAM |
| 126 | RD15 | I | Data bus 15 from SD-RAM |
| 127 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 128 | RD 14 | I | Data bus 14 from SD-RAM |
| 129 to 133 | RD 13 to 9 | I | Data bus 13 to 9 from SD-RAM |
| 134 | DVSS | — | Ground pin |
| 135 | RD8 | I | Data bus 8 from SD-RAM |
| 136 | GPI0 | — | Not used in this set. (Open) |
| 137 | DQM1 | O | DQM1 signal output to SD-RAM |
| 138 | REW | O | WE signal output to SD-RAM |
| 139 | CAS | O | CAS signal output to SD-RAM |
| 140 | RAS | O | RAS signal output to SD-RAM |
| 141 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 142 | RCS | O | RCS signal output to SD-RAM |
| 143 | BAO | O | BAO signal output to SD-RAM |
| 144 | DVSS | — | Ground pin |
| 145 | BA1 | O | BA1 signal output to SD-RAM |
| 146 | RA10 | O | Address bus 10 output to SD-RAM |
| 147 | RA0 | O | Address bus 0 output to SD-RAM |
| 148 | DVSS | — | Ground pin |
| 149 to 151 | RA 1 to 3 | O | Address bus 1 to 3 output to SD-RAM |
| 152 | DVDD18 | — | Power Supply pin (+1.8 V) |
| 153 | NC | — | Not used. (Open) |
| 154 | NC | — | Not used. (Open) |
| 155 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 156 | RCLK | O | CLK signal output to SD-RAM |
| 157 | CKE | O | CKE signal output to SD-RAM |
| 158 to 160 | RA 11 to 8 | O | Address bus 11 to 8 output to SD-RAM |
| 161 | DVSS | — | Ground pin |
| 162 | RA7 | O | Address bus 7 output to SD-RAM |
| 163 | DVSS | — | Ground pin |
| 164 to 166 | RA 6 to 4 | O | Address bus 6 to 4 output to SD-RAM |
| 167 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 168 | DISC/X | — | Not used in this set. (Open) |
| 169 | RGB | O | RGB control signal output Not used in this set. (Open) |
| 170 | TSD M | O | TSDM signal output |
| 171 | NC | — | Not used in this set. (Open) |
| 172 | NC | — | Not used in this set. (Open) |
| 173 | DVDD18 | — | Power Supply pin (+1.8 V) |
| 174 | FWD | — | Not used in this set. (Open) |
| 175 | NC | — | Not used. (Open) |
| 176 | LIMSW | O | LIMSW signal output to Optical pick-up |
| 177 | OCSW | I | SEN signal input from System Controller/OCSW signal input Not used. (Open) |
| 178 | REW | — | Not used in this set. (Open) |
| 179 | CKSW | I | CKSW signal input Not used in this set. (Open) |
| 180 | NC | — | Not used in this set. (Open) |
| 181 | NC | — | Not used in this set. (Open) |
| 182 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 183 | NC | — | Not used in this set. (Open) |
| 184 | NC | — | Not used in this set. (Open) |

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 185 | NC | — | Not used in this set. (Open) |
| 186 | NC | — | Not used in this set. (Open) |
| 187 | NC | — | Not used in this set. (Open) |
| 188 | NC | — | Not used in this set. (Open) |
| 189 | DAVCC | — | Power Supply pin (+3.3 V) |
| 190 | VREF | I | Bandgap reference voltage Not used in this set. (Open) |
| 191 | FS | O | Full scale adjustment (pull down) |
| 192 | YUV0 | — | Not used in this set. (Open) |
| 193 | DAVSS | — | Ground pin |
| 194 | YUV1 | O | Y signal output to VIDEO AMP |
| 195 | DAVDD | — | Power Supply pin (+3.3 V) |
| 196 | YUV2 | O | CHROMA signal output to VIDEO AMP |
| 197 | DAVSS | — | Ground pin |
| 198 | YUV3 | O | VIDEO signal output to VIDEO AMP |
| 199 | DAVDD | — | Power Supply pin (+3.3 V) |
| 200 | YUV4 | O | G signal output to VIDEO AMP |
| 201 | DAVSS | — | Ground pin |
| 202 | YUV5 | O | B signal output to VIDEO AMP |
| 203 | YUV6 | O | R signal output to VIDEO AMP |
| 204 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 205 | MIC/VSYNC | I | Microphone status signal input |
| 206 | VOICE/YUV7 | I | Karaoke voice signal input |
| 207 | KRMOB/HSYNC | O | Karaoke mode detection signal output |
| 208 | SMSCK | I | Karaoke score signal input |
| 209 | SPDATA/SMSDI | I | Audio data of SPDIF input |
| 210 | MUTE | O | Mute signal output |
| 211 | MUTE123 | O | Mute signal output |
| 212 | DVDD3 | — | Power Supply pin (+3.3 V) |
| 213 | ALRCK | I | Audio left/right channel clock signal input |
| 214 | ABCK | O | Audio bit clock signal output |
| 215 | ACLK | I | Audio DAC master clock signal input |
| 216 | DVSS | — | Ground pin |
| 217 | ASDATA0 | O | Auio serial data signal output |
| 218 | ASDATA1 | O | Auio serial data signal output |
| 219 | ASDATA2 | O | Auio serial data signal output |
| 220 | XRST | O | Reset signal output |
| 221 | DVDD18 | — | Power Supply pin (+1.8 V) |
| 222 | ASDATA4 | O | Auio serial data signal output |
| 223 | DVSS | — | Ground pin |
| 224 | DWIDE | — | Not used in this set. (Open) |
| 225 | SDPIF | O | SPDIF signal output |
| 226 | RFGND18 | — | Ground pin |
| 227 | RFVDD18 | — | Power Supply pin (+1.8 V) |
| 228 | ZTALO | O | Oscillator signal output (27 MHz) |
| 229 | ZTALI | I | Oscillator signal input (27 MHz) |
| 230 | JITFO | O | RF jitter meter output |
| 231 | JITFN | I | Negative input of operation amplifier for RF jigger meter |
| 232 | PLLVSS | — | Ground pin |
| 233 | IDAC | — | Not Used. |
| 234 | PLLVDD3 | — | Power Supply pin (+3.3 V) |
| 235 | LPFON | O | Negative output of loop filter amplifier |
| 236 | LPFIP | I | Positive input of loop filter amplifier |
| 237 | LPFIN | I | Negative input of loop filter amplifier |

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 238 | LPFOP | O | Positive output of loop filter amplifier |
| 239 | VDD3 | I | Power Supply pin (+3.3 V) |
| 240 | NC | — | Not used. (Open) |
| 241 | VSS | — | Ground pin |
| 242 | NC | — | Not used. (Open) |
| 243 | NC | — | Not used. (Open) |
| 244 | RFVDD3 | — | Power Supply pin (+3.3 V) |
| 245 | RFRPDC | I | RFRP signal input |
| 246 | RFRPAC | I | RFRP signal input |
| 247 | HRFZC | I | High frequency RF ripple zero crossing |
| 248 | CRTPLP | O | Defect level filter capacitor connecting |
| 249 | RFGND | — | Ground pin |
| 250 | NC | — | Not used. (Open) |
| 251 | NC | — | Not used. (Open) |
| 252 | OSP | O | RF offset cancellation capacitor connecting |
| 253 | OSN | I | RF offset cancellation capacitor connecting |
| 254 | RFGC | O | RF offset loop capacitor connecting for DVD-ROM |
| 255 | IREF | I | Current reference input |
| 256 | AVDD3 | — | Power Supply pin (+3.3 V) |

**IC401 M30622MEP-A50FPU0 (SYSTEM CONTROL) (MAIN BOARD (1/4))**

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 1 | SW CHANNEL SELECT | O | Signal path selection signal for sub woofer channel<br>“L”: LFE, “H”: Subwoofer out from M61537 |
| 2 | SURR CHANNEL SELECT | O | Signal path selection signal for surround channel<br>“L”: SL/FR (MTK), “H”: Tone out from M61537 |
| 3 | SM LATCH 3 | O | Serial data latch pulse output to the S-Master Processor |
| 4 | SIRCS | I | Remote control signal input |
| 5 | NO USE | I | Not used. (Open) |
| 6 | NO USE | I | Not used. (Open) |
| 7 | NO USE | I | Not used. (Open) |
| 8 | BYTE | — | Ground pin |
| 9 | CNVSS | — | Ground pin |
| 10 | XC IN | I | Sub system clock input (32.768 kHz) |
| 11 | XC OUT | O | Sub system clock output (32.768 kHz) |
| 12 | RESET | I | System reset signal input from the reset signal IC “L”: reset After the power supply rises, “L” is input for several hundreds msec and then change to “H”. |
| 13 | X OUT | O | Main system clock output (5 MHz) |
| 14 | VSS | — | Ground pin |
| 15 | X IN | I | Main system clock input (5 MHz) |
| 16 | VCC | — | Power supply pin (+3.3 V) |
| 17 | NMI | I | Non-maskable interrupt input |
| 18 | NO USE | I | Not used. (Connect to ground.) |
| 19 | NO USE | I | Not used. (Open) |
| 20 | AC CUT | I | AC off detection signal input from the reset signal IC “L”: AC Cut detected |
| 21 | VIDEO MUTE | O | Video muting on/off control signal output “L”: muting on |
| 22 | VIDEO OUT SW | O | Composite video output switching output control<br>“L”: DVD VIDEO output, “H”: VIDEO VIDEO input |
| 23 | MIC DETECT | I | Microphone connection detection signal input “L”: headphone connected |
| 24 | KRMOD | I | Karaoke Mode detection signal input |
| 25 | MIC STATUS | O | Microphone status output to DVD Motherboard<br>“L”: Microphone is not connected, “H”: Microphone is connected |
| 26 | MTK RESET | O | Reset signal output to DVD Motherboard “L”: reset |
| 27 | MTK XIFCS | I | Communication Initialization Request Acknowledgement Signal from DVD Motherboard |
| 28 | MTK BUSY | O | Communication Initialization Request Signal to DVD Motherboard |
| 29 | IIC CLK | I/O | Clock signal for IIC communication between the microcomputer and the IIC checker |
| 30 | IIC DATA | I/O | Data signal for IIC communication between the microcomputer and the IIC checker |
| 31 | MTK SIO | O | Serial data output signal to DVD Motherboard |
| 32 | MTK SOD | I | Serial data input signal from DVD Motherboard |
| 33 | MTK CLK | I | Serial data clock signal to DVD Motherboard |
| 34 | DVD A MUTE | O | DVD analog signal muting on/off control signal output “H”: muting on |
| 35 | MTK POWER | O | Power supply control signal to DVD Motherboard “H”: Power supply on |
| 36 | ST CE | O | PLL chip enable signal output to the tuner unit |
| 37 | MC DIN | I | PLL serial data input from the tuner unit |
| 38 | ST CLK | O | PLL serial data transfer clock signal output to the tuner unit |
| 39 | ST DIN/MC DOUT | O | PLL serial data output to the tuner unit |
| 40 | TUNED | I | Tuning detection signal input from the tuner unit “L”: tuned |
| 41 | OPEN SW | I | Eject detection signal input from CDM |
| 42 | TBL SENSE | I | Disc tray position detection signal input from CDM |
| 43 | E3 | I | Disc tray status detection signal input from CDM |
| 44 | E2 | I | Disc tray status detection signal input from CDM |
| 45 | E1 | I | Disc tray status detection signal input from CDM |
| 46 | TM F | O | CDM turning motor control signal output |

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 47 | TM R | O | CDM turning motor control signal output |
| 48 | LM F | O | CDM loading motor control signal output |
| 49 | LM R | O | CDM loading motor control signal output |
| 50 | LED ILLUMINATION 1 | O | Dynamic LED drive signal output to the ILLUMINATION 1st indicator and 2nd indicator "H": LED on |
| 51 | LED ILLUMINATION 2 | O | Dynamic LED drive signal output to the ILLUMINATION 3rd indicator and 4th indicator "H": LED on |
| 52 | LED ILLUMINATION 3 | O | Dynamic LED drive signal output to the ILLUMINATION 5th indicator and 6th indicator "H": LED on |
| 53 | LED CTRL | O | Dynamic LED drive select signal output |
| 54 | VOL A | I | Jog dial pulse input from the VOLUME rotary encoder (A phase input) |
| 55 | VOL B | I | Jog dial pulse input from the VOLUME rotary encoder (B phase input) |
| 56 | STBY LED | O | LED drive signal output of POWER indicator "H": LED is turned on |
| 57 | FL DRIVER DATA | O | Serial data output signal to FL Driver, NJU3427 |
| 58 | FL DRIVER CLK | O | Serial data clock signal to FL Driver, NJU3427 |
| 59 | FL DRIVER RESET | O | Serial data reset signal to FL Driver, NJU3427 |
| 60 | FL DRIVER CS | O | Serial data chip select signal to FL Driver, NJU3427 |
| 61 | SW LED | O | LED drive signal output of SUB WOOFER ON indicator "H": LED ON |
| 62 | VCC | — | Power supply pin (+3.3 V) |
| 63 | A HALF | I | Deck A cassette detection signal input "H": cassette detected |
| 64 | VSS | — | Ground pin |
| 65 | SM RESET | O | Reset signal output to the S-Master Power IC |
| 66 | IO EXP DATA OUT | O | Serial data output signal to I/O expander, BH2210V |
| 67 | NO USE | I | Not used. (Connect to ground.) |
| 68 | IO EXP RST | O | Reset signal output to the I/O expander, BH2210V |
| 69 | IO EXP CLK | O | Serial data latch signal to I/O expander, BH2210V |
| 70 | IO EXP LAT | O | Serial data clock signal to I/O expander, BH2210V |
| 71 | NO USE | I | Not used. (Connect to ground.) |
| 72 | SM SD | I | Shutdown (protector) detection signal from the S-Master power IC |
| 73 | DISPLAY KEY | I | DISPLAY key press detection signal (Interrupt input) |
| 74 | POWER KEY | I | POWER key press detection signal (Interrupt input) |
| 75 | NO USE | I | Not used. (Connect to ground.) |
| 76 | SM LATCH 1 | O | Serial data latch pulse output to the S-Master Processor |
| 77 | SM CLK | O | Serial data transfer clock signal to the S-Master Processor IC (CXD9843) |
| 78 | SM DATA | O | Serial data output signal to the S-Master Processor IC (CXD9843) |
| 79 | SM LATCH 2 | O | Serial data latch pulse output to the S-Master Processor |
| 80 | NO USE | I | Not used. (Connect to ground.) |
| 81 | NO USE/SW MUTE | O | GNZ88D: Not used. (Connect to ground.), GNZ77D: Subwoofer mute signal output |
| 82 | OUT2DLY SEL | I | PWM Mode selection signal "L": PWM Mode 3, "H": PWM Mode 4 |
| 83 | M61537 DATA | O | Serial data output to audio signal processor, M61537FP |
| 84 | M61537 CLK | O | Serial data transfer clock signal output to audio signal processor, M61537FP |
| 85 | HP DET | I | Headphone connection detection signal input "H": headphone connected |
| 86 | HP MUTE | O | Headphone muting on/off control signal "H": muting on |
| 87 | NO USE | I | Not used. (Connect to ground.) |
| 88 | VACS IN | I | VACS level detection signal |
| 89 | A SHUT | I | Shut off detection signal input from deck A side reel pulse detector (A/D input) |
| 90 | B SHUT | I | Shut off detection signal input from deck B side reel pulse detector (A/D input) |
| 91 | B HALF | I | Deck B cassette detection and forward side recording tab detection signal input (A/D input) |
| 92 | MODEL IN | I | Model setting (A/D input) |
| 93 | DEST IN | I | Destination setting (A/D input) |
| 94 | AD KEY 3 | I | Key signal input (A/D input) |
| 95 | AD KEY 2 | I | Key signal input (A/D input) |

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 96 | AVSS | — | Ground pin |
| 97 | AD KEY 1 | I | Key signal input (A/D input) |
| 98 | VREF | I | A/D Converter reference voltage input (+3.3 V) |
| 99 | AVCC | — | Power supply pin (+3.3 V) (for A/D conversion) |
| 100 | MAIN ON/OFF | O | Main power on/off control signal output “H”: power on |

**IC403 BH2210FV-E2 (SIGNAL IN/OUT CONTROL) (MAIN BOARD (2/4))**

| Pin No. | Pin Name | I/O | Pin Description |
|---|---|---|---|
| 1 | CTLIO | I | IN/OUT control port (Fixed at “H” in this set.) |
| 2 | RESET | I | Reset signal input |
| 3 | CLK | I | Serial data clock signal input |
| 4 | LATCH | I | Serial data latch signal input |
| 5 | TC-MUTE | O | Tape playback muting on/off control signal output “H”: muting on |
| 6 | NO USE | O | Not used. (Open) |
| 7 | REC MUTE | O | Recording muting on/off control signal output “L”: muting on |
| 8 | NO USE | O | Not used. (Open) |
| 9 | SM-NSP-MUTING | O | S master processor IC PWM 50% duty muting on/off control signal output “L”: muting on |
| 10 | SM-SOFT-MUTING | O | S master processor IC soft muting on/off control signal output “L”: muting on |
| 11 | SM-PG-MUTE | O | S master processor IC PWM muting on/off control signal output “L”: muting on |
| 12 | SM-INIT | O | Initialization signal to the S master processor IC |
| 13 | LATCHO | O | Serial data latch output signal Not used. (Open) |
| 14 | CLKO | O | Serial data clock signal output Not used. (Open) |
| 15 | DO1 | O | Serial data signal output 1 Not used. (Open) |
| 16 | DI2 | I | Serial data signal input 2 Not used. (Connect to ground.) |
| 17 | A-TRIG | O | Deck A side trigger plunger drive signal output “H”: plunger on |
| 18 | CAMP-CNT | O | Capstan motor drive signal output |
| 19 | B-TRIG | O | Deck B side trigger plunger drive signal output “H”: plunger on |
| 20 | REC BIAS | O | Recording bias on/off control signal output “H”: bias on |
| 21 | TC RELAY | O | Recording/playback selection signal output “H”: recording, “L”: playback |
| 22 | ADC RESET | O | Power down control signal to analog to digital converter “L”: power down |
| 23 | NO USE | O | Not used. (Open) |
| 24 | FAN CTRL | O | Fan driving signal output “L”: fan on |
| 25 | DO2 | O | Not used. (Open) |
| 26 | DI1 | I | Serial data signal input |
| 27 | VSS | — | Ground pin |
| 28 | VDD | — | Power supply pin (+3 V) |