# DENON

Hi-Fi Component

For Europe and U.K. Models

# SERVICE MANUAL

# MODEL TU-215RD

## 2-BAND AM-FM STEREO TUNER


— TABLE OF CONTENTS —




NIPPON COLUMBIA CO., LTD.

**CAUTION**

**RISK OF ELECTRIC SHOCK**

**DO NOT OPEN**

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

**• NUR FÜR EUROPÄISCHE MODELLE**

**Konformitätserklärung**

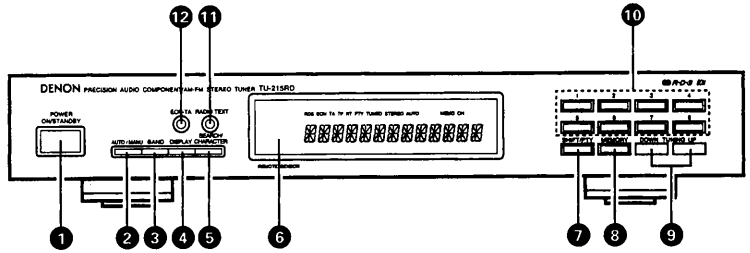
Die DENON Electronic GmbH
Halskestraße 32
40880 Ratingen

Erklärt als Hersteller/Importeur, daß das in dieser Bedienungsanleitung beschriebene Gerät den Technischen Vorschriften für Ton- und Fernseh-Rundfunkempfänger nach der Amtsblattverfügung 868/1989 (Amtsblatt des Bundesministers für Post und Telekommunikation vom 31. 8. 1989) entspricht.



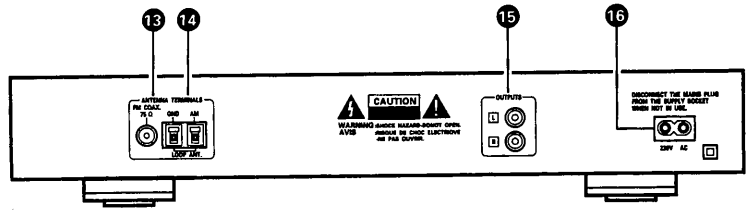
**FRONT PANEL**
**FRONTPLATTE**
**PANNEAU AVANT**
**PANNELLO FRONTALE**

**TABLERO FRONTAL**
**VOORPANEEL**
**FRONT PANELEN**
**PAINEL FRONTAL**

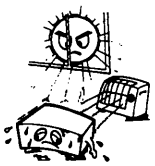



**REAR PANEL**
**RÜCKWAND**
**PANNEAU ARRIERE**
**IL PANNELLO POSTERIORE**

**PANEL TRASERO**
**ACHTERPANEEL**
**BAKSIDAN**
**PAINEL TRAZEIRO**



## NOTE ON USE/HINWEISE ZUM GEBRAUCH/OBSERVATIONS RELATIVES A L'UTILISATION NOTE SULL'USO/NOTAS SOBRE EL USO/ALVORENS TE GEBRUIKEN/OBSERVERA OBSERVAÇÕES QUANTO AO USO



- Avoid high temperatures
  Allow for sufficient heat dispersion when installed on a rack.
- Vermeiden Sie hohe Temperaturen
  Beachten Sie, daß eine ausreichend Luftzirkulation gewährleistet wird, wenn das Gerät auf ein Regal gestellt wird.
- Eviter des températures élevées
  Tenir compte d'une dispersion de chaleur suffisante lors de l'installation sur une étagère.
- Evitate di esporre l'unità a temperature alte.
  Assicuratevi che ci sia un'adeguata dispersione del calore quando installate l'unità in un mobile per componenti audio.
- Evite altas temperaturas
  Permite la suficiente dispersión del calor cuando está instalado en la consola.
- Vermijd hoge temperaturen.
  Zorg voor een degelijk hitteafvoer indien het apparaat op een rek wordt geplaatst.
- Undvik höga temperaturer.
  Se till att det finns möjlighet till god värmeavledning vid montering i ett rack.
- Evite temperaturas altas
  Conceda suficiente dispersão de calor quando o equipamento for instalado numa prateleira.

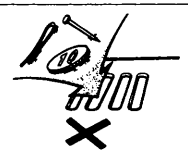
- Handle the power cord carefully.
  Hold the plug when unplugging the cord.
- Gehen Sie vorsichtig mit dem Netzkabel um.
  Halten Sie das Kabel am Stecker, wenn Sie den Stecker herausziehen.
- Manipuler le cordon d'alimentation avec précaution.
  Tenir la prise lors du débranchement du cordon.
- Manneggiate il filo di alimentazione con cura.
  Agite per la spina quando scollegate il cavo dalla presa.
- Maneje el cordón de energía con cuidado.
  Sostenga el enchufe cuando desconecte el cordón de energía.
- Hanteer het netsnoer voorzichtig.
  Houd het snoer bij de stekker vast wanneer deze moet worden aan- of losgekoppeld.
- Hantera nätkabeln varsamt.
  Håll i kabeln när den kopplas från eluttaget.
- Manuseie com cuidado o fio condutor de energia.
  Segure a tomada ao desconectar o fio.

- Keep the set free from moisture, water, and dust.
- Halten Sie das Gerät von Feuchtigkeit, Wasser und Staub fern.
- Protéger l'appareil contre l'humidité, l'eau et la poussière.
- Tenete l'unità lontana dall'umidità, dall'acqua e dalla polvere.
- Mantenga el equipo libre de humedad, agua y polvo.
- Laat geen vochtigheid, water of stof in het apparaat binnendringen.
- Utsätt inte apparaten för fukt, vatten och damm.
- Mantenha o aparelho livre de qualquer umidade, água ou poeira.

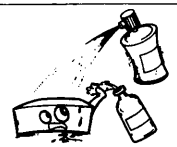
- Unplug the power cord when not using the set for long periods of time.
- Wenn das Gerät eine längere Zeit nicht verwendet werden soll, trennen Sie das Netzkabel vom Netzstecker.
- Débrancher le cordon d'alimentation lorsque l'appareil n'est pas utilisé pendant de longues périodes.
- Disinnestate il filo di alimentazione quando avete l'intenzione di non usare il filo di alimentazione per un lungo periodo di tempo.
- Desconecte el cordón de energía cuando no utilice el equipo por mucho tiempo.
- Neem altijd het netsnoer uit het stopkontakt wanneer het apparaat gedurende een lange periode niet wordt gebruikt.
- Koppla ur nätkabeln om apparaten inte kommer att användas i lång tid.
- Desligue o fio condutor de força quando o aparelho não tiver que ser usado por um longo período.

*(For sets with ventilation holes)

- Do not obstruct the ventilation holes.
- Die Belüftungsöffnungen dürfen nicht verdeckt werden.
- Ne pas obstruer les trous d'aération.
- Non coprite i fori di ventilazione.
- No obstruya los orificios de ventilación.
- De ventilatieopeningen mogen niet worden beblokkeerd.
- Täpp inte till ventilationsöppningarna.
- Não obstrua os orificios de ventilação.



- Do not let foreign objects in the set.
- Keine fremden Gegenstände in das Gerät kommen lassen.
- Ne pas laisser des objets étrangers dans l'appareil.
- E' importante che nessun oggetto è inserito all'interno dell'unità.
- No deje objetos extraños dentro del equipo.
- Laat geen vreemde voorwerpen in dit apparaat vallen.
- Se till att främmande föremål inte tränger in i apparaten.
- Não deixe objetos estranhos no aparelho.



- Do not let insecticides, benzene, and thinner come in contact with the set.
- Lassen Sie das Gerät nicht mit Insektiziden, Benzin oder Verdünnungsmitteln in Berührung kommen.
- Ne pas mettre en contact des insecticides, du benzène et un diluant avec l'appareil.
- Assicuratevvi che l'unità non venga in contatto con insetticidi, benzolo o solventi.
- No permita el contacto de insecticidas, gasolina y diluyentes con el equipo.
- Laat geen insektenverdelgende middelen, benzine of verfverdunner met dit apparaat in kontakt komen.
- Se till att inte insektsmedel på spraybruk, bensen och thinner kommer i kontakt med apparatens hölje.
- Não permita que inseticidas, benzina e dissolvente entrem em contacto com o aparelho.

- Never disassemble or modify the set in any way.
- Versuchen Sie niemals das Gerät auseinander zu nehmen oder auf jegliche Art zu verändern.
- Ne jamais démonter ou modifier l'appareil d'une maniére ou d'une autre.
- Non smontate mai, nè modificate l'unità in nessun modo.
- Nunca desarme o modifique el equipo de ninguna manera.
- Nooit dit apparaat demonteren of op andere wijze modifiëren.
- Ta inte isär apparaten och försök inte bygga om den.
- Nunca desmonte ou modifique o aparelho de alguma forma.





**ENGLISH**

**Please check to make sure the following items are included with the main unit in the carton:**

| | | |
|---|---|---|
| (1) | Operating Instructions | 1 |
| (2) | Connecting Cord | 1 |
| (3) | AM Loop Antenna | 1 |
| (4) | FM Indoor Antenna | 1 |
| (5) | AC Cord | 1 |

**DEUTSCH**

**Bitte überprüfen Sie, ob die folgenden Teile vollständig in der Verpackung enthalten sind:**

| | | |
|---|---|---|
| (1) | Bedienungsanleitung | 1 |
| (2) | Anschlußkabel | 1 |
| (3) | MW-Rahmenantenne | 1 |
| (4) | UKW-Zimmerantenne | 1 |
| (5) | Netzkabel | 1 |

**FRANCAIS**

**Veuillez contrôler que les articles suivants sont bien joints à l'appareil principal dans le carton:**

| | | |
|---|---|---|
| (1) | Mode d'emploi | 1 |
| (2) | Cordon de connexion | 1 |
| (3) | Antenne Cadre AM | 1 |
| (4) | Antenne FM Interieure | 1 |
| (5) | Cordon Secteur | 1 |

**ITALIANO**

**Controllare che le parti seguenti si trovino imballate con l'apparecchio nella scatola di spedizione.**

| | | |
|---|---|---|
| (1) | Istruzioni per l'uso | 1 |
| (2) | Cavo di connessione | 1 |
| (3) | Antenna AM a Quadro | 1 |
| (4) | Antenna FM Interna | 1 |
| (5) | Cavo CA | 1 |

**ESPAÑOL**

**Por favor verifique asegurandose de que los siguientes articulos son empacados en la caja pero separados de la unidad principal.**

| | | |
|---|---|---|
| (1) | Instrucciones de operación | 1 |
| (2) | Cordón de concección | 1 |
| (3) | Antena AM de Cuadro | 1 |
| (4) | Antena FM Interior | 1 |
| (5) | Cable de alimentacion | 1 |

**NEDERLANDS**

**Kontroleer of de volgende accessoires bij het hoofdtoestel in de doos zijn verpakt:**

| | | |
|---|---|---|
| (1) | Gebruiksaanwijzing | 1 |
| (2) | Aansluitsnoer | 1 |
| (3) | AM-Raamantenne | 1 |
| (4) | FM-Binnenantenne | 1 |
| (5) | Netkabel | 1 |

**SVENSKA**

**Kontrollera att följande, förutom huvudapparaten, finns med i kartongen.**

| | | |
|---|---|---|
| (1) | Bruksanvisning | 1 |
| (2) | Anslutningskabel | 1st |
| (3) | AM-Ramantenn | 1st |
| (4) | FM-Inomhusantenn | 1st |
| (5) | Nätsladd | 1 |

**PORTUGUÊS**

**Certifique-se de que as seguintes peças estão incluídas na embalagem fora da unidade principal:**

| | | |
|---|---|---|
| (1) | Instruções de operação | 1 |
| (2) | Cabo de ligação | 1 |
| (3) | Antena de quadro AM | 1 |
| (4) | Antena de interior FM | 1 |
| (5) | Cabo de ligação de corrente | 1 |

**Table of characters**
The characters are input in the order shown below. Use the TUNING buttons ❶ to select the desired characters.

**Zeichentabelle**
Die Zeichen werden in der unten angegebenen Reihenfolge eingegeben. Benutzen Sie die Abstimmtasten (TUNING) ❶ um die gewünschten Zeichen auszuwählen.

**Table des caractères**
Les caractères sont introduits dans l'ordre indiqué ci-dessous. Utiliser les touches de syntonisation (TUNING) ❶ pour sélectionner les caractères désirés.

**Tabella dei caratteri**
I caratteri vengono immessi nell'ordine visualizzato qui sotto. Usate i tasti di sintonizzazione (TUNING) ❶ per selezionare i caratteri desiderati.

**Tabla de caracteres**
Los caracteres se ingresan en el orden que se indica abajo. Use los botones de sintonización (TUNING) ❶ para seleccionar los caracteres deseados.

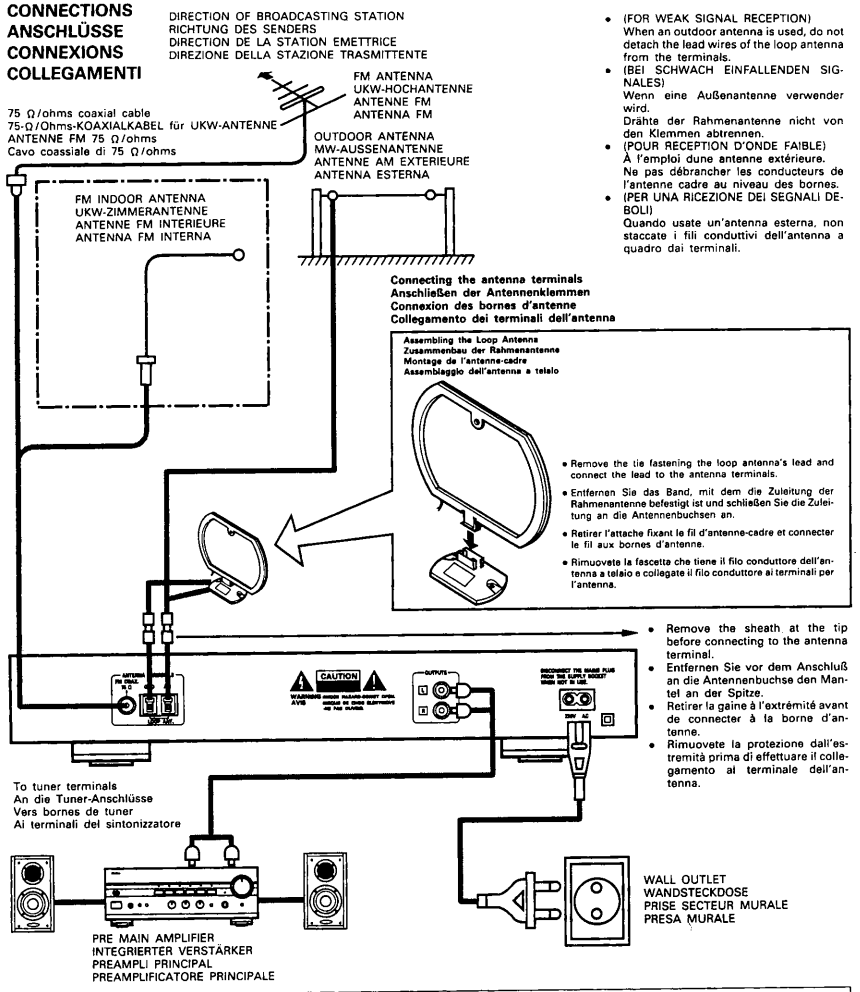
**Lettertabel**
De letters worden in de hieronder getoonde volgorde ingevoerd. Gebruik de afstemtoetsen (TUNING) ❶ om de gewenste letters te kiezen.

**Teckentabell**
Tecken kan matas in enligt ordningen nedan. Använd avstämningstangenterna (TUNING) ❶ för att välja önskat tecken.

**Tabela de caracteres**
Os caracteres são entrados pela ordem que se mostra embaixo. Utilize os botões de sintonizar (TUNING) ❶ para seleccionar os caracteres desejados.

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789C\J-%'():*+,-./=
```

## CONNECTIONS
## ANSCHLÜSSE
## CONNEXIONS
## COLLEGAMENTI




- (FOR WEAK SIGNAL RECEPTION)
  When an outdoor antenna is used, do not detach the lead wires of the loop antenna from the terminals.
- (BEI SCHWACH EINFALLENDEN SIGNALES)
  Wenn eine Außenantenne verwender wird.
  Drähte der Rahmenantenne nicht von den Klemmen abtrennen.
- (POUR RECEPTION D'ONDE FAIBLE)
  À l'emploi dune antenne extérieure.
  Ne pas débrancher les conducteurs de l'antenne cadre au niveau des bornes.
- (PER UNA RICEZIONE DEI SEGNALI DEBOLI)
  Quando usate un'antenna esterna, non staccate i fili conduttivi dell'antenna a quadro dai terminali.

**Note:**
•Please keep away AM loop antenna from the metal parts of the back panel.

**Hinweis:**
•Die MW-Rahmenantenne (AM) draf die Metalliteile der Geräte-Rückseite nicht berühren.

**Remarque:**
•Eloigner l'antenne en boucle AM de toute partie métallique du panneau arrière.

**Nota:**
•Tenete lontana antenna AM a quadro dalle parti metalliche del pannello posteriore.



## DESIGNATIONS AND FUNCTIONS OF PANEL CONTROLS (Refer to Page 3.)

### FRONT PANEL

**❶ POWER (Power ON/STANDBY button)**
The unit works 2-3 seconds after this switch is turned on.
Whenever the power switch is in th STANDBY state, the apparatus is still connected on AC line voltage.
Please be sure to unplug the cord when you leave home for, say, a vacation.

**❷ AUTO MANU (Tuning Mode Button)**
This switches between auto and manual tuning.
Auto tuning: When the UP button is pressed, the radio is tuned automatically to a higher frequency. Press the DOWN button to tune to a lower frequency. Use this position to eliminate noise when no signals or weak signals are being received.
Manual tuning: In this position, the radio can be tuned manually. Reception is automatically monaural when in the manual mode.

**❸ BAND (Band Button)**
Selects FM or MW(AM).

**❹ DISPLAY (Display mode selector button)**
This button is used to select the display mode.
The mode changes as follows each time the button is pressed:
- Tuning frequency
- Input character
- Programme service name (PS)
- Programme type (PTY)
- Clock time (CT)

The following may be displayed if the signals are weak or no RDS service is available. This is not a malfunction.
"NO PS"
"NO PTY"
"NO TIME DATA"
**NOTE:** The programme type, programme service name and clock time are not displayed in the MW (AM) band.
"NO TIME DATA" may be displayed within the first minute after a station is tuned in, but this is not a malfunction. If time data is being broadcast, the time can be displayed after one minute has passed.

**❺ SEARCH/CHARACTER button**
This button is used for the RDS search (refer to page 10), PTY search (refer to page 10) and TP search (refer to page 11) operations, and to input the station name (refer to page 10).

**❻ REMOTE SENSOR (Remote control sensor)**
This sensor receives the infrared light transmitted from the wireless remote control unit.
For remote control, point the wireless remote control unit at the sensor.
Some of the functions can be operated with the remote control units included with DENON pre-main amplifiers and AV surround amplifiers.

**❼ SHIFT/PTY button**
Use this button to select the memory blocks, A (1 to 8), B (9 to 16), C (17 to 24), D (25 to 32), or E (33 to 40).
For PTY search and EON PTY, use this button to select the program type. When writing station names, use this button to set the writing position.

**❽ MEMORY (Memory button)**
Frequencies and station names can be stored in the memory. When this button is pressed, the "MEMO" indicator on the display flashes for 10 seconds. Use the SHIFT button and the channel buttons during this time to designate the desired preset channel.

**❾ TUNING (Tuning buttons)**
Use these to change the received frequency to a higher frequency (UP) or a lower frequency (DOWN).
When writing station names, use these buttons to select the letters. (Refer to Page 5.)

**❿ PRESET CHANNEL (Station button)**
Use these when presetting and recalling stations. Also use these with the SHIFT/PTY button to use a total of 40 preset channels, A (1~8), B (1~8), ... E (1~8).

**⓫ RADIO TEXT button**
This button is used for displaying radio text messages. When this button is pressed while the station currently tuned in is offering a radio text message service, the message scrolls on the display.
This mode turns on and off each time the button is pressed.

**⓬ EON-TA button**
When a traffic announcement begins on a station in the same network as the station currently tuned in, that network station is automatically tuned in, and the previous station is tuned back in once the traffic announcement is over.
This button is used to turn this mode on and off.
If the station switches from the current station to the network station when this mode is on but the network station cannot be received properly due to weak signals, the previous station is immediately tuned back in. (Refer to Page 11.)

**CAUTION:**
1. Whenever the power switch is in the STANDBY position, the unit is still connected on AC line voltage.
   Please be sure to unplug the cord when you leave home for, say, a vacation.
2. Noise may be generated if a near-by television set is on during MW (AM), FM broadcasting reception. The tuner should be used as far away from a television as possible.
3. Effective period of memory back-up is about a month under normal temperature.

## REAR PANEL

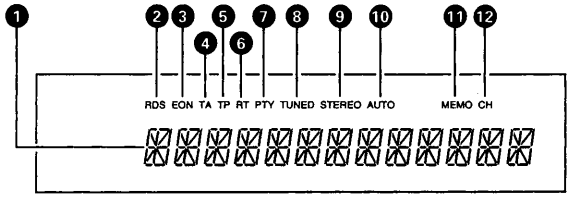
⓭ **FM ANT (FM antenna terminals)**
75-Ω/ohms coaxial cables can be connected to these terminals. For the connection procedure, see the section "CONNECTIONS". (Refer to Page 6)

⓮ **AM ANT (AM antenna terminals)**
Connect the included AM loop antenna. (Refer to page 6 for connections.)
Connect this terminal when a medium wave outdoor antenna is used.

⓯ **OUTPUTS (Output terminals)**
Connect these to the TUNER input terminals on the pre-main amplifier.

⓰ **AC INLET**
Connect the included AC cord here.

## DISPLAY




❶ **16-segment display**
This displays the frequency, station name, program type, etc.

❷ **RDS indicator**
This lights when receiving RDS broadcasts, and flashes during the RDS search.

❸ **EON indicator**
This lights when receiving EON information.

❹ **TA indicator**
This lights when the EON-TA button is pressed and when a traffic announcement is being received.

❺ **TP indicator**
This lights when receiving a station broadcasting traffic announcements and flashes during the TP search operation.

❻ **RT indicator**
This lights when the RADIO TEXT button is pressed.

❼ **PTY indicator**
This flashes during the PTY search operation.

❽ **TUNED indicator**
This lights when a station is properly tuned in.

❾ **STEREO indicator**
This lights when receiving stereo broadcasts. It remains off when receiving AM broadcasts.

❿ **AUTO indicator**
This indicates the tuning mode. It lights in the auto mode, and remains off in the manual mode.

⓫ **MEMO indicator**
This flashes for 10 seconds when the MEMORY button ❽ is pressed, and flashes during the auto preset memory operation.

⓬ **CH indicator**
This lights when the preset channel number is displayed, and flashes during the auto preset memory operation.



## Using the Various Functions

**1. Using the auto preset memory function**
This function automatically stores the FM stations which can be received in the area in which the set is being used in the preset memory. Use this function so that the RDS functions can be used more effectively. Also note that the channel memories can be changed at will even after the preset stations have been stored with this function.

**Operation**
1. Connect the FM antenna and set it so that FM stations can be received.
2. Press the POWER button to turn on the power while holding in the MEMORY button.
3. Searching begins automatically, and stations are stored in the preset memory in order, beginning from channel A1. (The operation automatically stops once 40 stations have been set in the memory.)

**2. Storing new stations at the preset channels**
The reception frequency, RDS service information, Tuning mode and input characters can be stored at the different channel memories.
When this operation is performed, the station already stored in that channel memory using the auto preset memory function is cleared.

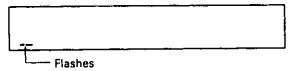
**Operation**
1. Press the MEMORY button. (The MEMO indicator flashes.)
2. Use the SHIFT/PTY button to select the block, A to E.
3. Use buttons 1 to 8 to select the channel at which the station is to be stored.

**3. Recalling preset channels**
Use the following operation to recall preset channels:

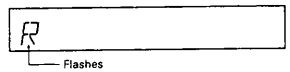
**Operation**
1. Use the SHIFT/PTY button to select the block, A to E.
2. Use buttons 1 to 8 to select the channel at which to store the station.

**4. Inputting characters**
Any characters can be input (up to 8 characters).
The input characters can be stored at the preset channels.

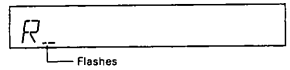
**Operation**
1. Press the SEARCH/CHARACTER button four times.
(The cursor flashes at the first place.)



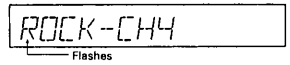

2. Use the UP or DOWN button to select the character for the first place.
(The selected character flashes.)




3. Press the SHIFT/PTY button to move the cursor to the next place.
(The cursor flashes at the second place.)




4. Repeat steps 2 and 3 above to input up to 8 characters.



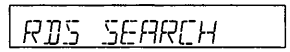

5. The characters are set five seconds after the input procedure is finished. The input characters can be stored in the memory.
To keep the input characters, be sure to store them in a channel memory.

6. Clearing characters
   1. Recall the character you want to clear.
   2. Press the SEARCH/CHARACTER button 4 times until the character at the first place flashes.
   3. Then press the SHIFT/PTY button for at least 2 seconds. The current character will then be cleared.

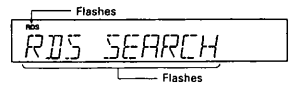
## Using the RDS Functions (for FM only)

**1. RDS Search**
Use this to automatically search and stop at stations offering RDS services.

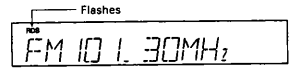
**Operation**
1. Press the SEARCH/CHARACTER button once.




2. Press the UP or DOWN button.
(Searching begins.)



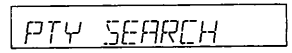

3. Searching begins again if the UP or DOWN button is pressed while the RDS indicator is flashing.



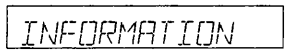

4. If no other RDS station is found when all the frequencies are searched, "NO RDS" is displayed.

**2. PTY Search**
Use this to automatically search and stop at stations broadcasting the specified programme type (PTY).

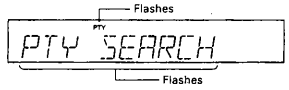
**Operation**
1. Press the SEARCH/CHARACTER button twice.



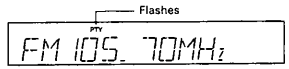
2. Use the SHIFT/PTY button to select the programme type.




3. Press the UP or DOWN button.
(Searching begins.)




4. Searching begins again if the UP or DOWN button is pressed while the PTY indicator is flashing.




5. If no other station broadcasting the designated programme type is found when all the frequencies are searched, "NO PROGRAMME" is displayed.

List of PTY (Programme Type) Displays

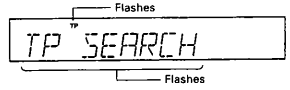
| | |
|---|---|
| 1. NEWS | 9. VARIED |
| 2. AFFAIRS | 10. POP MUSIC |
| 3. INFORMATION | 11. ROCK MUSIC |
| 4. SPORT | 12. M.O.R. MUSIC |
| 5. EDUCATION | 13. L-CLASSICS (Light classics) |
| 6. DRAMA | 14. S-CLASSICS (Serious classics) |
| 7. CULTURE | 15. OTHER MUSIC |
| 8. SCIENCE | 31. ALARM |

NOTE: ALARM cannot be selected during the PTY search operation.

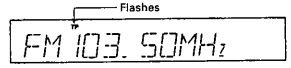
**3. TP Search**
Use this to automatically search and stop at stations which broadcast traffic announcements (even if the station is not currently broadcasting a traffic announcement.)

**Operation**
1. Press the SEARCH/CHARACTER button three times.


2. Press the UP or DOWN button.
(Searching begins.)

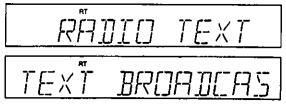



3. Searching begins again if the UP or DOWN button is pressed while the TP indicator is flashing.




4. If no other TP station is found when all the frequencies are searched, "NO PROGRAMME" is displayed.

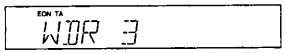
**4. RADIO TEXT**
When this button is pressed while the station currently tuned in is offering a radio text message service, the message scrolls on the display.
(The RT indicator lights when the RADIO TEXT button is pressed.)




("NO TEXT DATA" is displayed if no radio text message is being broadcast.)

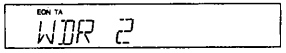
**5. EON-TA**
When an RDS station is broadcasting RDS information on other stations within the same network and a traffic announcement begins on another station in the same network based on this information (EON = Enhanced Other Network), that network station is automatically tuned in. The previous station is tuned back in once the traffic announcement is over.

**Operation**
1. Press the EON-TA button.
(The TA indicator lights.)



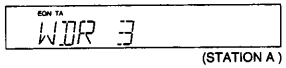

(STATION A)

(When a traffic announcement starts, that station is automatically tuned in.)




(STATION B)

(When the traffic announcement is over, the previous station is tuned back in.)




(STATION A)

NOTE:
1. Be sure to turn the EON-TA mode off when recording programmes.
2. In the EON-TA mode, if the station is switched from the current station to another station in the network but the signals of that network station are weak and it cannot be tuned in properly, "WEAK SIGNAL" is displayed and the original station is immediately tuned back in.
3. In the EON-TA mode, the station does not switch to another station in the network if the current station is broadcasting a traffic announcement.
4. Since the RDS services offered differ from station to station, some RDS functions may not operate for some stations, but this is not a malfunction.



| Technical Data (typical value) | Technische Daten (typische Werte) |
|---|---|
| **• FM SECTION** | |
| Frequency Range | 87.5 MHz~108.0 MHz |
| Antenna Terminals | 75 Ω / ohms Unbalanced |
| Usable Sensitivity | 0.9 µV (10.3dBf) |
| | 1.2 µV (IHF) |
| S/N 50 dB Sensitivity | |
| Monaural | 1.6 µV (15.3 dBf) |
| Stereo | 50 µV (45.2 dBf) |
| (µV is at 75 Ω/ohms | |
| 0 dBf=$10^{-15}$W) | |
| Image Interference Ratio | 80 dB |
| IF Interference Ratio | 100 dB |
| AM Suppression Ratio | 50 dB |
| Effective Selectivity | 70 dB (±400 kHz) |
| Capture Ratio | 1.5 dB |
| Frequency Characteristics | 20 Hz~15kHz $\pm\frac{0.5}{2.0}$ dB |
| Signal-to-noise Ratio | |
| Monaural | 82 dB (IHF) 78 dB (DIN) |
| Stereo | 78 dB (IHF) 74 dB (DIN) |
| Total Harmonic Distortion | |
| Mono 1 kHz | 0.5% |
| (at 75 kHz dev.) | |
| Stereo 1 kHz | 0.6% |
| (at 67.5 kHz dev.) | |
| Stereo Separation 1 kHz | 40 dB |
| **• AM (MW) SECTION** | |
| Frequency Range | 522 kHz~1611 kHz |
| Antenna Terminals | Terminal Type with Loop Ant. |
| Usable Sensitivity | 18 µV |
| Signal-to-noise Ratio | 53 dB |
| **• OTHERS** | |
| Power Supply | AC 230 V 50 Hz |
| Power Consumption | 9 W |
| Dimensions (W)×(H)×(D) | 434 x 75 x 238 mm |
| Net Weight | 2.5 kg |

• Design and specifications are subject to change without prior notice.

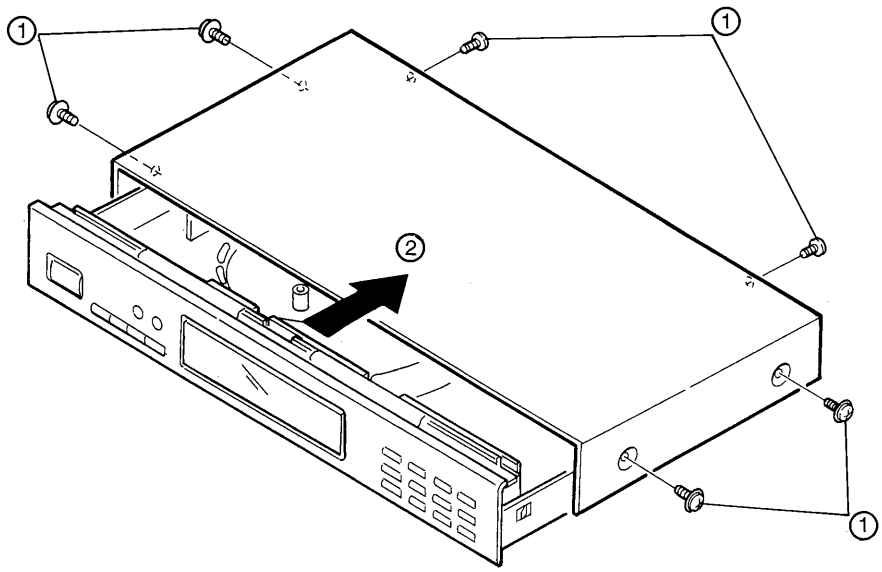
# REMOVAL OF EACH SECTION

(To assemble, follow these procedures in reverse order.)

## ● Removing the Top Cover

① Removing the six top cover fixing screws (four on the sides and two on the back).

② Slide the top cover to the back and remove it.

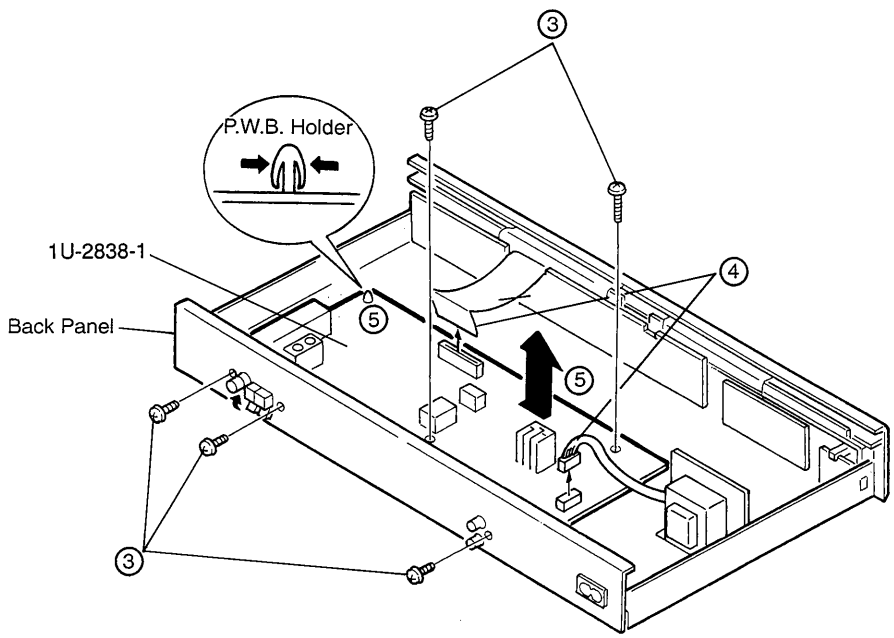



## ● Removing the Tuner Unit P.W. Board (1U-2838-1)

③ Remove the three screws and two screws fixing P.W.board.

④ Disconnect the two connectors.

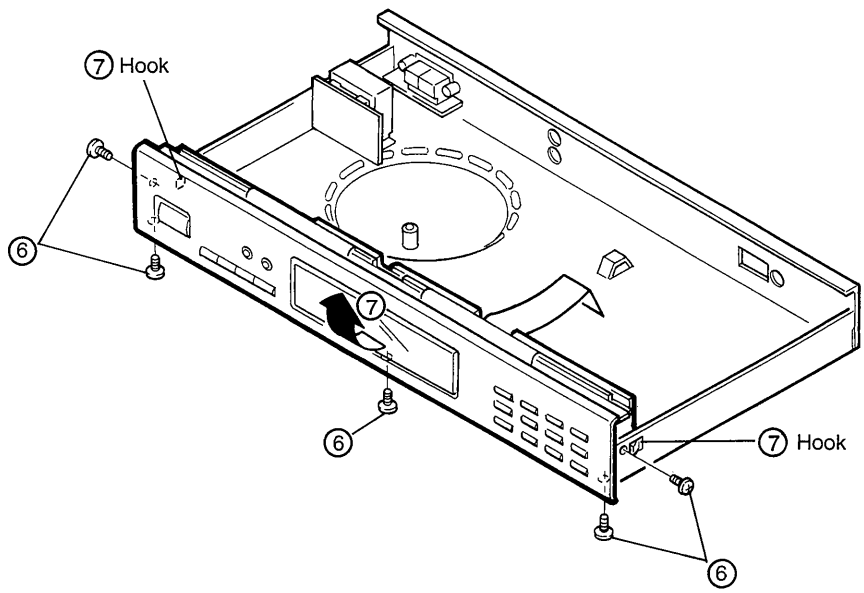
⑤ Using radio pliers, grasp the two P.W. board holders and remove, and lift the P.W.board to arrow direction.



## ● Removing the Front Panel

⑥ Remove the five front panel fixing screws (two on the sides and three on the bottom).

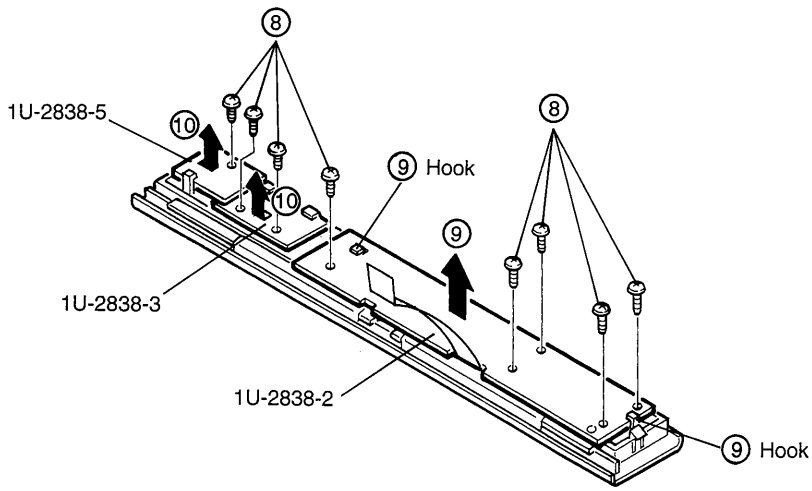
⑦ Release the two hooks (on the lift and right sides of the chassis) and detach the front panel to arrow direction.



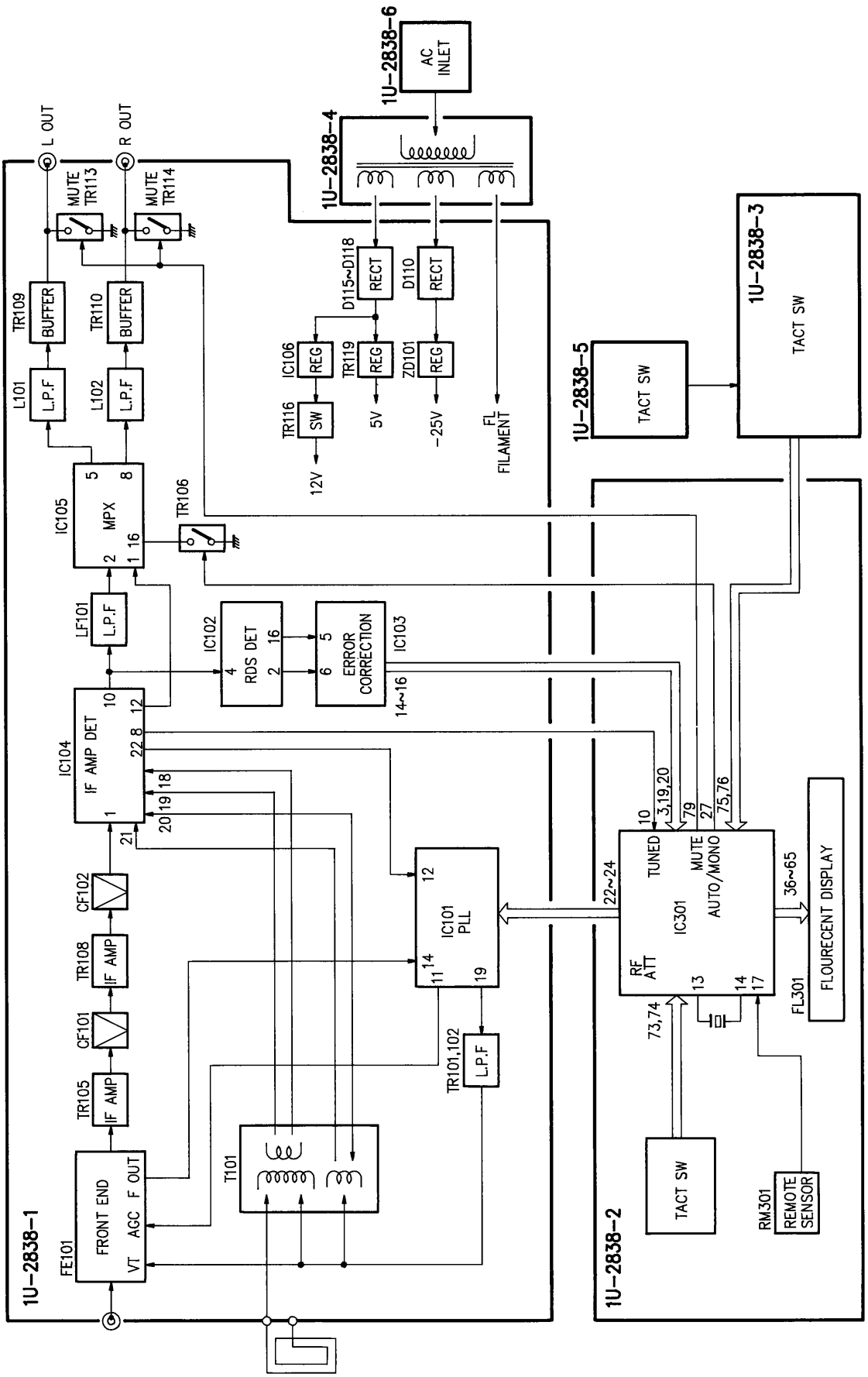

⑧ Remove the eight screw fixing the P.W. boards.

⑨ Release the two hooks and lift the P.W. board (1U-2838-2) to arrow direction.

⑩ Lift the P.W. boards (1U-2838-3, 1U-2838-5) up and off.



# BLOCK DIAGRAM

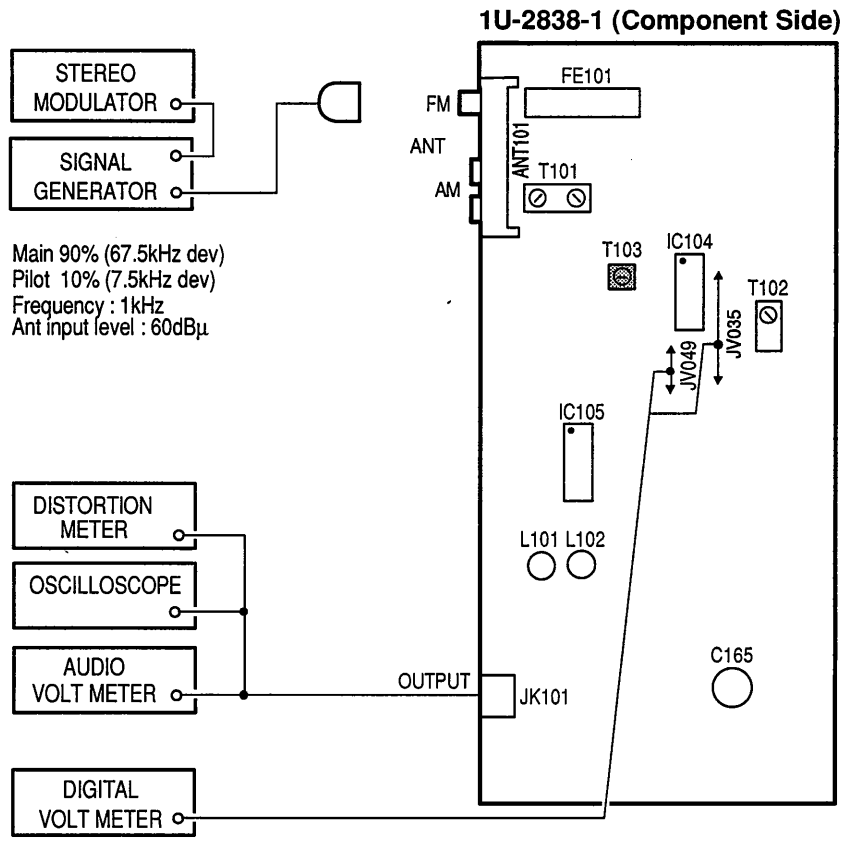


# METHOD OF ADJUSTMENT

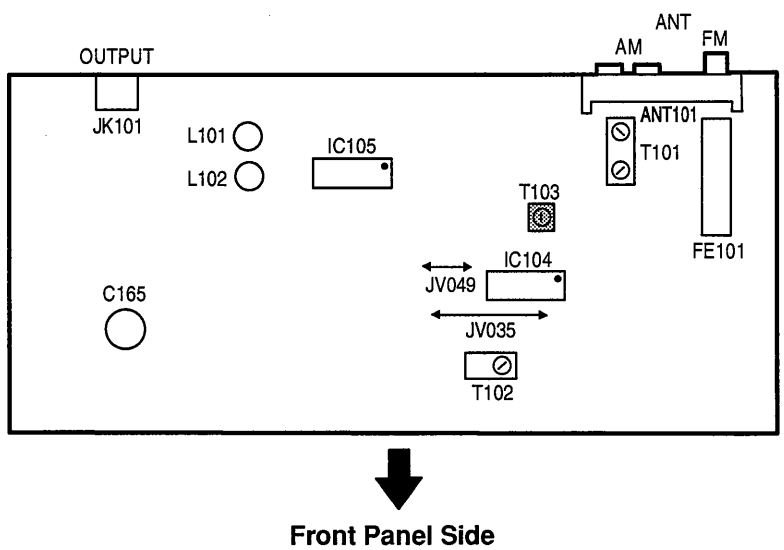
## CONNECTION DIAGRAM OF MEASURING INSTRUMENTS

When making adjustments, be sure the power supply is at the rated voltage and the room air is on normal conditions with respect to temperature and humidity.

● **FM**




**1U-2838-1 TUNER UNIT FM Alignment Points (Component Side)**




**Front Panel Side**

## FM ALIGNMENT

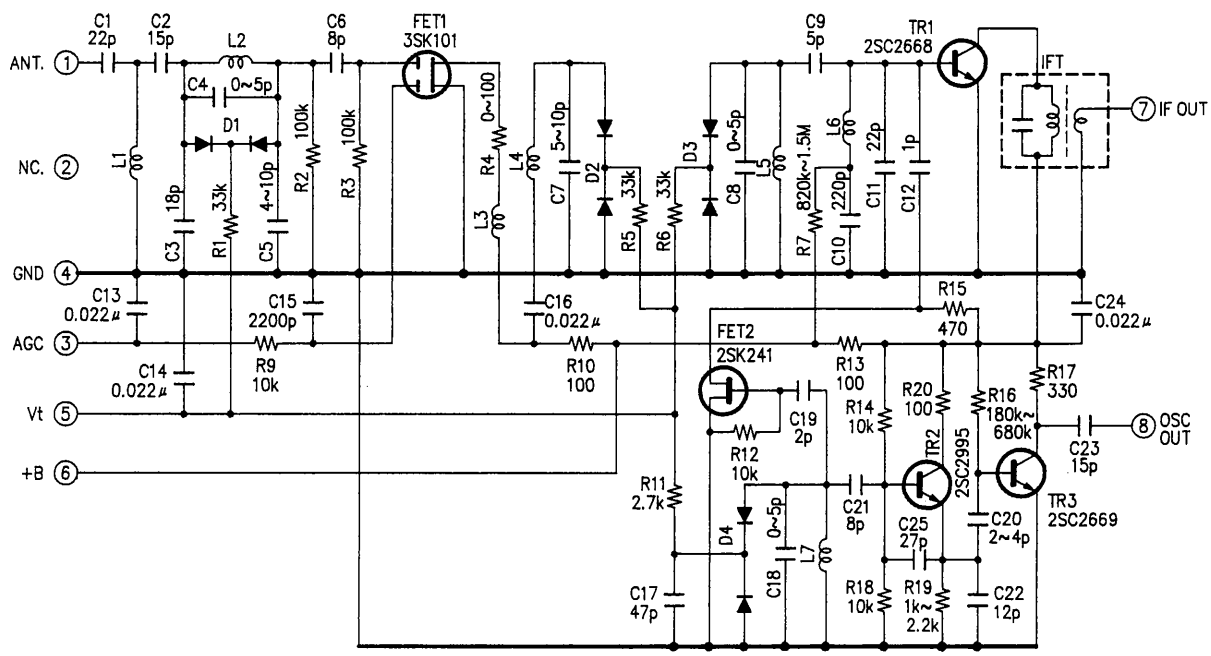
| Item | Alignment Item | Tuning Frequency Setting | Input | | | | | Output | | Adjustment | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Type | Frequency | Input Level | Modulation | Coupling | Type | Connect to | Points | Adjust to |
| 1 | Center Adjustment | 98 MHz | FMSSG | 98 MHz | 60 dBμ | Mono 1 kHz 100% | Antenna Terminal | Digital Voltmeter | JV039 JV049 | T103 Primary | ± 50 mV |
| 2 | Distortion | 98 MHz | FMSSG | 98 MHz | 60 dBμ | Stereo (L) 1 kHz 100% | Antenna Terminal | Distortion Meter | Output Terminal (L) | FRONT END IFT | Minimum Distortion |

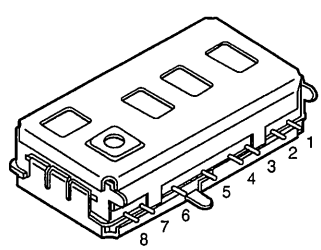
### Initializing (Memory clearing) Method

To clear memory contents of microcomputer and restore to the state of shipment at the factory, take the following step.

● While pressing the Keys 1 and 7 of the front panel insert power cord into the AC outlet.

## FRONT END (Europe, U.K.)




EXTERNAL TERMINALS

1. ANT
2. NC
3. AGC
4. GND
5. Vt
6. +B
7. IF OUT
8. OSC OUT

**NOTE FOR PARTS LIST**

- Part indicated with the mark " ◉ " are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

**WARNING:**

Parts marked with this symbol ⚠ ▒▒ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

## ● Resistors

Ex.: RN (Type) 14K (Shape and performance) 2E (Power) 182 (Resistance) G (Allowable error) FR (Others)

| | | | |
|---|---|---|---|
| RD : Carbon | 2B : 1/8W | F : ±1% | P : Pulse-resistant type |
| RC : Composition | 2E : 1/4W | G : ±2% | NL : Low noise type |
| RS : Metal oxide film | 2H : 1/2W | J : ±5% | NB : Non-burning type |
| RW : Winding | 3A : 1W | K : ±10% | FR : Fuse-resistor |
| RN : Metal film | 3D : 2W | M : ±20% | F : Lead wire forming |
| RK : Metal mixture | 3F : 3W | | |
| | 3H : 5W | | |

* **Resistance**

1 8 2 ⇒ 1800 ohm = 1.8 kohm
Indicates number of zeros after effective number.
2-digit effective number.
• Units: ohm

1 R 2 ⇒ 1.2 ohm
1-digit effective number.
2-digit effective number, decimal point indicated by R.
• Units: ohm

## ● Capacitors

Ex.: CE (Type) 04W (Shape and performance) 1H (Dielectric strength) 2R2 (Capacity) M (Allowable error) BP (Others)

| | | | |
|---|---|---|---|
| CE : Aluminum foil electrolytic | 0J : 6.3V | F : ±1% | HS : High stability type |
| CA : Aluminum solid electrolytic | 1A : 10V | G : ±2% | BP : Non-polar type |
| CS : Tantalum electrolytic | 1C : 16V | J : ±5% | HR : Ripple-resistant type |
| CQ : Film | 1E : 25V | K : ±10% | DL : For charge and discharge |
| CK : Ceramic | 1V : 35V | M : ±20% | HF : For assuring high frequency |
| CC : Ceramic | 1H : 50V | Z : +80% −20% | U : UL part |
| CP : Oil | 2A : 100V | P : +100% −0% | C : CSA part |
| CM : Mica | 2B : 125V | C : ±0.25pF | W : UL-CSA type |
| CF : Metallized | 2C : 160V | D : ±0.5pF | F : Lead wire forming |
| CH : Metallized | 2D : 200V | = : Others | |
| | 2E : 250V | | |
| | 2H : 500V | | |
| | 2J : 630V | | |

* **Capacity (electrolyte only)**

2 2 2 ⇒ 2200μF
Indicates number of zeros after effective number.
2-digit effective number.
• Units: μF.

2 R 2 ⇒ 2.2μF
1-digit effective number.
2-digit effective number, decimal point indicated by R.
• Units: μF.

* **Capacity (except electrolyte)**

2 2 2 ⇒ 2200pF = 0.0022μF
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number.
• Units: μF.

2 2 1 ⇒ 220pF
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.
• Units: pF.

• When the dielectric strength is indicated in AC, "AC" is included after the dieelectric strength value.

# PRINTED WIRING BOARD PARTS LIST

## 1U-2838 MAIN UNIT

| Ref. No. | Part No. | Part Name | Remaks |
|---|---|---|---|
| **SEMICONDUCTORS GROUP** | | | |
| IC101 | 263 0791 907 | IC LM7001M | |
| IC102 | 262 1701 906 | IC :SAA6579 | |
| IC103 | 262 1929 908 | IC LC7074NM-TE-R | |
| IC105 | 263 0439 007 | IC LA3401 | |
| IC104 | 263 0891 001 | IC LA1265(S) | |
| IC106 | 263 1004 004 | IC BA178M12 | |
| IC301 | 262 1960 006 | IC TMP78CM71F | |

| Ref. No. | Part No. | Part Name | Remaks |
|---|---|---|---|
| TR101 | 273 0403 904 | Transistor 2SC2712-Y/GR | |
| TR102 | 275 0075 901 | Transistor 2SK209-Y/GR | |
| TR103,104 | 269 0083 901 | Transistor DTA114EK | Built in resistor |
| TR105 | 275 0074 902 | Transistor 2SK211-Y/GR | |
| TR106,107 | 269 0054 901 | Transistor DTC144EK | Built in resistor |
| TR108 | 273 0411 909 | Transistor 2SC2996-Y | |
| TR109,110 | 273 0403 904 | Transistor 2SC2712-Y/GR | |
| TR111 | 269 0086 908 | Transistor DTA114TK | Built in resistor |

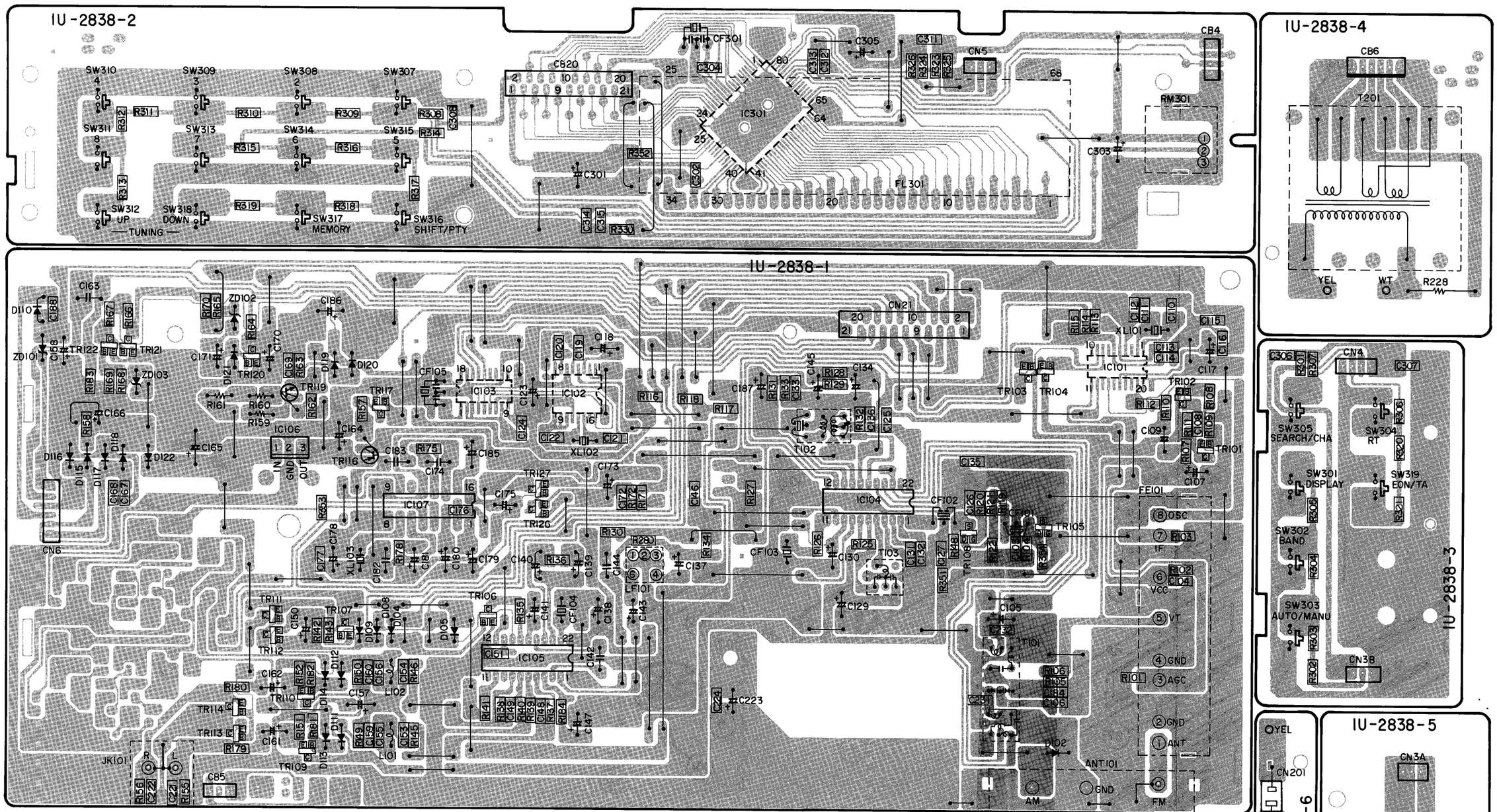
| Ref. No. | Part No. | Part Name | Remaks |
|---|---|---|---|
| TR112 | 269 0088 906 | Transistor DTC114TK | Built in resistor |
| TR113,114 | 269 0104 903 | Transistor DTC343TK | Built in resistor |
| TR116 | 271 0102 937 | Transistor 2SC1015(GR/Y) | |
| TR117 | 269 0054 901 | Transistor DTC144EK | Built in resistor |
| TR119 | 273 0198 947 | Transistor 2SC1815(Y/GR) | |
| TR120 | 269 0054 901 | Transistor DTC144EK | Built in resistor |
| TR121 | 269 0088 906 | Transistor DTC114TK | Built in resistor |
| TR122 | 273 0403 904 | Transistor 2SC2712-Y/GR | |
| | | | |
| D102 | 276 0616 907 | Diode 1SS252T | |
| D108,109 | 276 0616 907 | Diode 1SS252T | |
| D110 | 276 0553 905 | Diode 1SR35-200A | |
| D115~120 | 276 0553 905 | Diode 1SR35-200A | |
| D121 | 276 0616 907 | Diode 1SS252T | |
| D122 | 276 0553 905 | Diode 1SR35-200A | |
| | | | |
| ZD101 | 276 0636 903 | Zener diode MTZJ8.2B | |
| ZD102 | 276 0634 905 | Zener diode MTZJ3.3A | |
| ZD103 | 276 0633 906 | Zener diode MTZJ6.8C | |
| | | | |
| **RESISRORS GROUP (not included carbon film ±5% 1/4W type)** | | | |
| R101 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |
| R102 | 247 0010 929 | Chip 15kohm 1/10W | RM73B--153J |
| R103 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R104 | 247 0006 920 | Chip 330ohm 1/10W | RM73B--331J |
| R105 | 247 0012 927 | Chip 100kohm 1/10W | RM73B--104J |
| R106 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |
| R107 | 247 0005 905 | Chip 100ohm 1/10W | RM73B--101J |
| R108 | 247 0006 946 | Chip 390ohm 1/10W | RM73B--391J |
| R109 | 247 0005 947 | Chip 150ohm 1/10W | RM73B--151J |
| R110 | 247 0008 986 | Chip 3.9kohm 1/10W | RM73B--392J |
| R111 | 247 0009 969 | Chip 8.2kohm 1/10W | RM73B--822J |
| R112~115 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |
| R116 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R117 | 247 0009 927 | Chip 5.6kohm 1/10W | RM73B--562J |
| R118 | 247 0009 901 | Chip 4.7kohm 1/10W | RM73B--472J |
| R119 | 247 0006 920 | Chip 330ohm 1/10W | RM73B--331J |
| R120 | 247 0008 902 | Chip 1.8kohm 1/10W | RM73B--182J |
| R121 | 247 0005 989 | Chip 220ohm 1/10W | RM73B--221J |
| R122 | 247 0009 901 | Chip 4.7kohm 1/10W | RM73B--472J |
| R125 | 247 0009 930 | Chip 6.2kohm 1/10W | RM73B--622J |
| R126 | 247 0005 921 | Chip 120ohm 1/10W | RM73B--121J |
| R127 | 247 0011 928 | Chip 39kohm 1/10W | RM73B--393J |
| R128,129 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |
| R130 | 247 0008 960 | Chip 3.3kohm 1/10W | RM73B--332J |
| R131 | 247 0009 927 | Chip 5.6kohm 1/10W | RM73B--562J |
| R132 | 247 0011 986 | Chip 68kohm 1/10W | RM73B--683J |
| R133 | 247 0009 943 | Chip 6.8kohm 1/10W | RM73B--682J |
| R134 | 247 0008 944 | Chip 2.7kohm 1/10W | RM73B--272J |
| R135 | 247 0012 927 | Chip 100kohm 1/10W | RM73B--104J |

| Ref. No. | Part No. | Part Name | Remaks |
|---|---|---|---|
| R136 | 247 0009 927 | Chip 5.6kohm 1/10W | RM73B--562J |
| R137,138 | 247 0012 969 | Chip 150kohm 1/10W | RM73B--154J |
| R139,140 | 247 0012 998 | Chip 200kohm 1/10W | RM73B--204J |
| R141 | 247 0011 915 | Chip 36kohm 1/10W | RM73B--363J |
| R142 | 247 0012 985 | Chip 180kohm 1/10W | RM73B--184J |
| R143 | 247 0010 961 | Chip 22kohm 1/10W | RM73B--223J |
| R145,146 | 247 0008 960 | Chip 3.3kohm 1/10W | RM73B--332J |
| R148 | 247 0006 920 | Chip 330ohm 1/10W | RM73B--331J |
| R149,150 | 247 0010 916 | Chip 13kohm 1/10W | RM73B--133J |
| R151,152 | 247 0007 990 | Chip 1.6kohm 1/10W | RM73B--162J |
| R155,156 | 247 0012 927 | Chip 100kohm 1/10W | RM73B--104J |
| R157 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R158 | 247 0011 928 | Chip 39kohm 1/10W | RM73B--393J |
| ⚠R159~161 | 244 2055 970 | Metal oxide film 56ohm 1W | RD14B3A560JNBS(S) |
| R162 | 247 0008 944 | Chip 2.7kohm 1/10W | RM73B--272J |
| R163 | 247 0008 960 | Chip 3.3kohm 1/10W | RM73B--332J |
| R165,166 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R167 | 247 0009 901 | Chip 4.7kohm 1/10W | RM73B--472J |
| R168 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |
| R169 | 247 0010 958 | Chip 20kohm 1/10W | RM73B--203J |
| R170 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |
| R179,180 | 247 0006 946 | Chip 390ohm 1/10W | RM73B--391J |
| R181,182 | 247 0011 986 | Chip 68kohm 1/10W | RM73B--683J |
| R183 | 247 0009 901 | Chip 4.7kohm 1/10W | RM73B--472J |
| R184 | 247 0010 958 | Chip 20kohm 1/10W | RM73B--203J |
| | | | |
| R301 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R302 | 247 0005 976 | Chip 200ohm 1/10W | RM73B--201J |
| R303 | 247 0006 917 | Chip 300ohm 1/10W | RM73B--301J |
| R304 | 247 0006 975 | Chip 510ohm 1/10W | RM73B--511J |
| R305 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R306 | 247 0005 976 | Chip 200ohm 1/10W | RM73B--201J |
| R307,308 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R309 | 247 0005 976 | Chip 200ohm 1/10W | RM73B--201J |
| R310 | 247 0006 917 | Chip 300ohm 1/10W | RM73B--301J |
| R311 | 247 0006 975 | Chip 510ohm 1/10W | RM73B--511J |
| R312 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R313 | 247 0008 957 | Chip 3kohm 1/10W | RM73B--302J |
| R314 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R315 | 247 0005 976 | Chip 200ohm 1/10W | RM73B--201J |
| R316 | 247 0006 917 | Chip 300ohm 1/10W | RM73B--301J |
| R317 | 247 0006 975 | Chip 510ohm 1/10W | RM73B--511J |
| R318 | 247 0007 945 | Chip 1kohm 1/10W | RM73B--102J |
| R319 | 247 0008 957 | Chip 3kohm 1/10W | RM73B--302J |
| R320 | 247 0006 917 | Chip 300ohm 1/10W | RM73B--301J |
| R321 | 247 0006 975 | Chip 510ohm 1/10W | RM73B--511J |
| R323 | 247 0018 905 | Chip 0ohm 1/10W | RM73B--0R0K |
| R325 | 247 0018 905 | Chip 0ohm 1/10W | RM73B--0R0K |
| R351 | 247 0002 966 | Chip 10ohm 1/10W | RM73B--100J |
| R352 | 247 0009 985 | Chip 10kohm 1/10W | RM73B--103J |

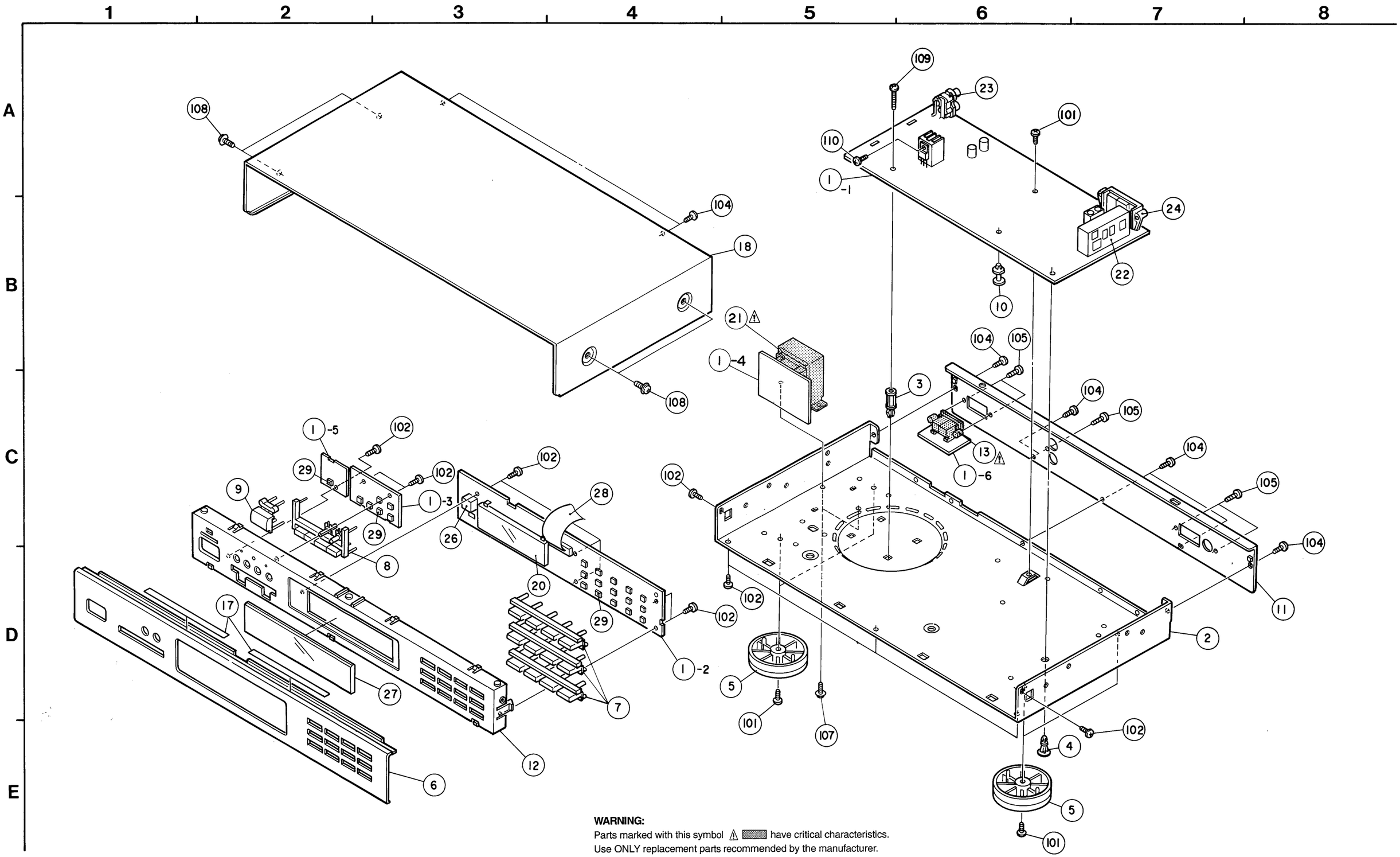
| Ref. No. | Part No. | Part Name | Remaks |
|---|---|---|---|
| **CAPACITORS GROUP** | | | |
| C103,104 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C105 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C106 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C107 | 254 4260 906 | Electrolytic 0.1μF/50V | CE04W1H0R1M |
| C108 | 257 0012 982 | Chip(Ceramic) 0.022μF/50V | CK73F1H223Z |
| C109 | 254 3056 917 | Electrolytic 1μF/50V | CE04D1H010MBP |
| C110,111 | 257 0002 989 | Chip(Ceramic) 18pF/50V | CC73SL1H180J |
| C112~115 | 257 0004 961 | Chip(Ceramic) 100pF/50V | CC73SL1H101J |
| C116 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C117 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C118 | 254 4260 951 | Electrolytic 2.2μF/50V | CE04W1H2R2M |
| C119 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C120 | 257 0006 943 | Chip(Ceramic) 560pF/50V | CC73SL1H561J |
| C121,122 | 257 0016 962 | Chip(Ceramic) 27pF/50V | CC73CH1H270J |
| C123 | 254 4250 916 | Electrolytic 47μF/6.3V | CE04W0J470M |
| C124~127 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C129 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C130 | 254 4260 922 | Electrolytic 0.33μF/50V | CE04W1HR33M |
| C131,132 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C133 | 257 0012 982 | Chip(Ceramic) 0.022μF/50V | CK73F1H223Z |
| C134 | 254 4260 935 | Electrolytic 0.47μF/50V | CE04W1HR47M |
| C135 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C136 | 257 0004 961 | Chip(Ceramic) 100pF/50V | CC73SL1H101J |
| C137 | 254 4254 912 | Electrolytic 22μF/16V | CE04W1C220M |
| C138 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C139 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C140 | 254 4260 919 | Electrolytic 0.22μF/50V | CE04W1HR22M |
| C141 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C142 | 256 1034 937 | Metallized 0.047μF/50V | CF93A1H473J |
| C143 | 254 4254 912 | Electrolytic 22μF/16V | CE04W1C220M |
| C144 | 256 1034 940 | Metallized 0.056μF/50V | CF93A1H563J |
| C145 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C146 | 257 0004 961 | Chip(Ceramic) 100pF/50V | CC73SL1H101J |
| C147 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C148,149 | 257 0005 986 | Chip(Ceramic) 330pF/50V | CC73SL1H331J |
| C150 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C151 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C153,154 | 257 0009 937 | Chip(Ceramic) 2700pF/50V | CK73B1H272K |
| C155,156 | 257 0009 911 | Chip(Ceramic) 1800pF/50V | CK73B1H182K |
| C157 | 254 4254 938 | Electrolytic 47μF/16V | CE04W1C470M |
| C158 | 254 4261 921 | Electrolytic 100μF/50V | CE04W1H101M |
| C159,160 | 257 0008 996 | Chip(Ceramic) 1200pF/50V | CK73B1H122K |
| C161,162 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C163 | 256 1034 979 | Metallized 0.1μF/50V | CF93A1H104J |
| C164 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C165 | 254 4259 700 | Electrolytic 2200μF/35V | CE04W1V222MC |
| C166 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C167~169 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C170 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C171 | 254 4258 905 | Electrolytic 4.7μF/35V | CE04W1V4R7M |
| C184 | 257 0002 989 | Chip(Ceramic) 18pF/50V | CC73SL1H180J |
| C186 | 254 4250 767 | Electrolytic 1000μF/6.3V | CE04W0J102MC |
| C187 | 254 4260 948 | Electrolytic 1μF/50V | CE04W1H010M |
| C221,222 | 257 0009 953 | Chip(Ceramic) 3900pF/50V | CK73B1H392K |
| C231 | 257 0002 989 | Chip(Ceramic) 18pF/50V | CC73SL1H180J |
| C232 | 257 0012 982 | Chip(Ceramic) 0.022μF/50V | CK73F1H223Z |
| C301 | 254 4250 929 | Electrolytic 100μF/6.3V | CE04W0J101M |
| C302 | 257 0004 961 | Chip(Ceramic) 100pF/50V | CC73SL1H101J |
| C303 | 254 4254 909 | Electrolytic 10μF/16V | CE04W1C100M |
| C304 | 257 0004 961 | Chip(Ceramic) 100pF/50V | CC73SL1H101J |
| C305 | 254 4260 993 | Electrolytic 22μF/50V | CE04W1H220M |
| C306~308 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| C311~315 | 257 0012 966 | Chip(Ceramic) 0.01μF/50V | CK73F1H103Z |
| **OTHER PARTS** | | | |
| CF101,102 | 261 0146 006 | Ceramic filter | FMCFSK107M2-A |
| CF103 | 261 0144 008 | Ceramic filter | CMU1-450A01 |
| CF104 | 261 0103 007 | :Resonator | CSB456F11 |
| CF105 | 399 0261 901 | Crystal resonator | DCRHTP4.00M |
| CF301 | 399 0261 901 | Crystal resonator | DCRHTP4.00M |
| ⚠CN201 | 203 2349 009 | 2P AC Inlet | |
| FE101 | 216 0079 005 | FM frontend (U) | |
| FL301 | 393 4155 002 | FL tube | FIP14AM7R |
| JK101 | 205 0274 004 | 2P connector base | |
| L101,102 | 235 0110 907 | Inductor (393) | |
| LF101 | 232 9010 009 | Anti birdie filter | |
| RM301 | 499 0150 008 | Remote sensor | SBX1610-52 |
| SW301~319 | 212 5604 910 | Tact switch | |
| T101 | 231 1913 004 | MW ANT-OSC coil | |
| T102 | 231 3034 004 | AM IFT | |
| T103 | 231 2099 008 | FM DTF trans | |
| XL101 | 399 0075 003 | Crystal | 7.2MHz |
| XL102 | 399 0178 007 | Crystal | 4.332MHz |
| | 203 0619 003 | 1P SIN cord ass'y | |
| | 203 0619 016 | 1P SIN cord ass'y | |
| | 203 4749 018 | 3P DA-DA connector cord | |
| | 203 6369 014 | 4P KR-DA connector cord | |
| | 204 0265 065 | 6P KR-DA connector cord | |
| | 205 0274 004 | 2P connector base | |
| | 205 0343 045 | 4P connector base (KR-PH) | |
| | 205 0343 061 | 6P connector base (KR-PH) | |
| | 205 0549 056 | 21P FFC connector base | |
| | 205 0847 004 | 3P antenna terminal(PAL/F) | |
| ⚠ | 233 6164 003 | Power transformer | |

## PRINTED WIRING BOARD PATTERNS (Pattern Side)

1U-2838A MAIN UNIT ASS'Y



## EXPLODED VIEW



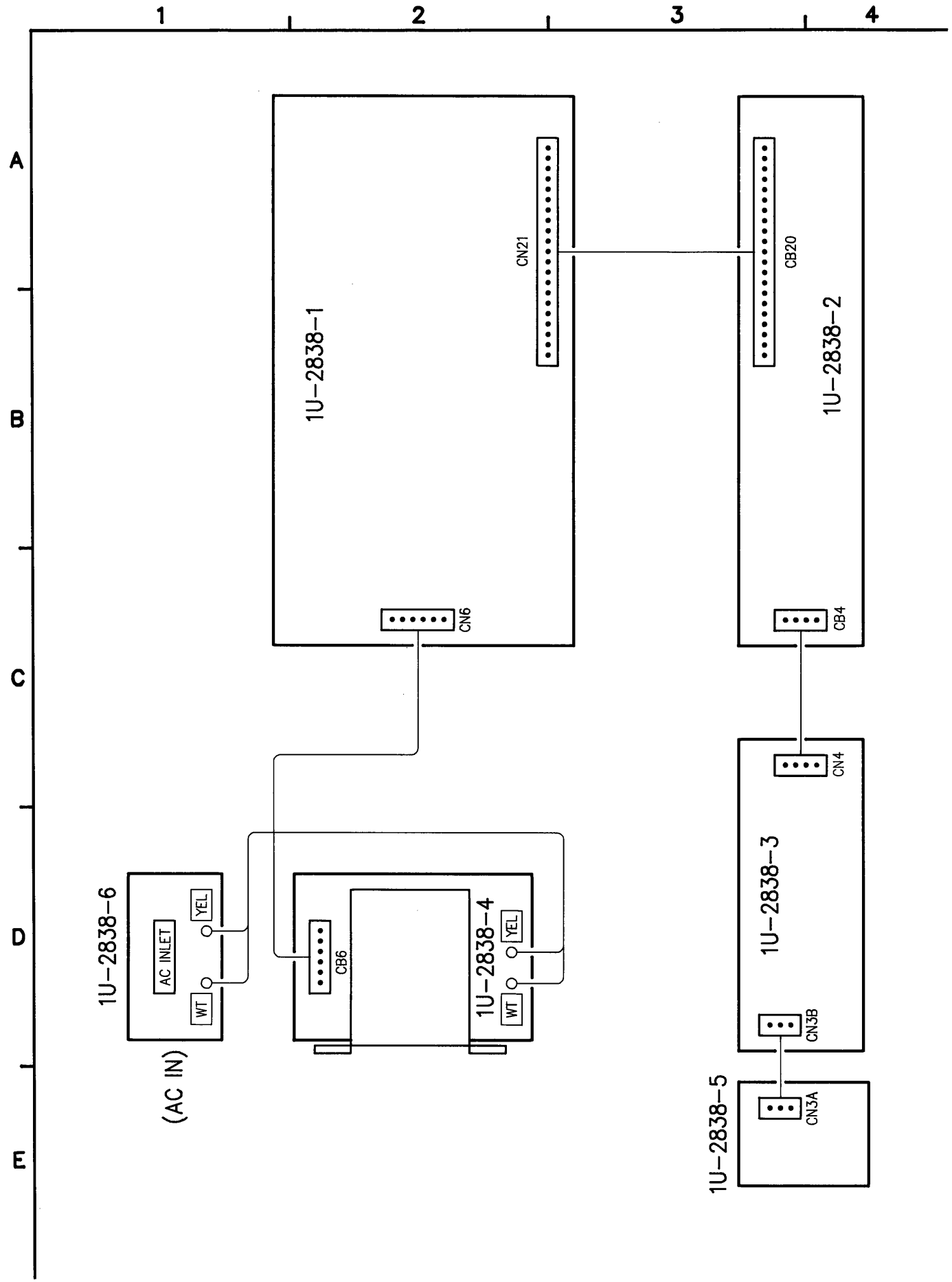

**WARNING:**
Parts marked with this symbol ⚠ ▒▒ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

# PARTS LIST OF EXPLODED VIEW

| Ref. No. | Part No. | Part Name | Remaks | Q'ty |
|---|---|---|---|---|
| ◉ 1 | 1U- 2838 A | Main unit Ass'y | | 1 |
| 1-1 | — | Tuner unit | | |
| 1-2 | — | Display unit | | |
| 1-3 | — | Tact Switch unit | | |
| 1-4 | — | Power trans unit | | |
| 1-5 | — | Power switch unit | | |
| 1-6 | — | AC inlet unit | | |
| ◉ 2 | 411 0942 504 | :*Chassis | | 1 |
| ◉ 3 | 412 2762 002 | P.W.B.holder | | 1 |
| ◉ 4 | 412 2741 007 | P.W.B.holder(H=8) | | 1 |
| 5 | 104 0208 308 | Foot Ass'y | | 4 |
| ◉ 6 | 144 2366 039 | Front panel | Black model | 1 |
| ◉ 6 | 144 2366 042 | Front panel | Gold model | 1 |
| 7 | 113 1740 005 | :Button | Black model | 3 |
| 7 | 113 1740 018 | :Button | Gold bodel | 3 |
| 8 | 113 1741 004 | :Button | Black model | 1 |
| 8 | 113 1741 017 | :Button | Gold model | 1 |
| 9 | 113 1744 001 | :Power button | Black model | 1 |
| 9 | 113 1744 014 | :Power button | Gold model | 1 |
| 10 | 412 2814 002 | Card spacer (L=8) | | 1 |
| ◉ 11 | 105 1115 053 | :Rear panel | | 1 |
| ◉ 12 | 146 1484 002 | :Inner panel | Black model | 1 |
| ◉ 12 | 146 1484 015 | :Inner panel | Gold mdel | 1 |
| ⚠ 13 | 203 2349 009 | 2P Inlet | | 1 |
| ◉ 17 | 461 0577 000 | Rubber sheet | | 2 |
| ◉ 18 | 102 0413 223 | :*Top cover | Black model | 1 |
| ◉ 18 | 102 0413 236 | :*Top cover | Gold model | 1 |
| 20 | 393 4155 002 | FL tube | FIP14AM7R | 1 |
| ⚠ 21 | 233 6164 003 | Power transformer | | 1 |
| 22 | 216 0079 005 | FM frontend | | 1 |
| 23 | 205 0274 004 | 2P connector base | | 1 |
| 24 | 205 0847 004 | 3P antnna terminal | | 1 |
| 26 | 499 0150 008 | Remote sensor | SBX1610-52 | 1 |
| 27 | 143 0877 213 | Window | | 1 |
| 28 | 009 0113 004 | 21P FFC cable | | 1 |
| 29 | 212 5604 910 | Tact switch | | 19 |
| **SCREW** | | | | |
| 101 | 473 7002 018 | Tapping screw 3 x 8 Black | | 5 |
| 102 | 473 7508 017 | Tapping screw 3 x 10 Black | | 13 |
| 104 | 473 7015 018 | Tapping screw 3 x 8 Black | | 7 |
| 105 | 473 8057 004 | Tapping screw 3 x 10 Black | | 5 |
| 107 | 473 8007 025 | Cup screw 3 x 8 | | 2 |
| 108 | 477 0263 005 | 3P swelling screw | Black model | 4 |
| 108 | 477 1263 018 | 3P swelling screw | Gold model | 4 |
| 109 | 473 7501 030 | Tapping screw 3 x 20 Black | | 1 |
| 110 | 471 3304 015 | Screw 3 x 8 CBS-Z | | 1 |

| Ref. No. | Part No. | Part Name | Remaks | Q'ty |
|---|---|---|---|---|
| **PACKING & ACCESSORIES** | | | | |
| ◉ | | | | |
| | 505 8006 019 | Envelope | | 1 |
| ◉ | 511 2769 001 | :Operating instruction | | 1 |
| | 203 2360 004 | 2P pin cord | | 1 |
| | 231 1914 003 | Loop antenna | | 1 |
| | 395 0023 008 | :*FM antenna Ass'y | | 1 |
| ⚠ | 206 2108 003 | :AC cordWith plug | Europe model | 1 |
| ⚠ | 206 2113 001 | :AC cordWith plug | U.K. model | 1 |
| ◉ | 505 0131 050 | Cabinet cover | | 1 |
| ◉ | 503 0902 005 | Cushion | | 2 |
| | 502 0741 085 | :Pad | U.K. model onry | 1 |
| | 505 9125 009 | :Poly cover | U.K. model onry | 1 |
| ◉ | 501 1775 031 | Carton case | Europe model | 1 |
| | 501 1775 044 | Carton case | U.K. model | 1 |

## WIRING DIAGRAM



# SCHEMATIC DIAGRAM

1 2 3 4 5 6

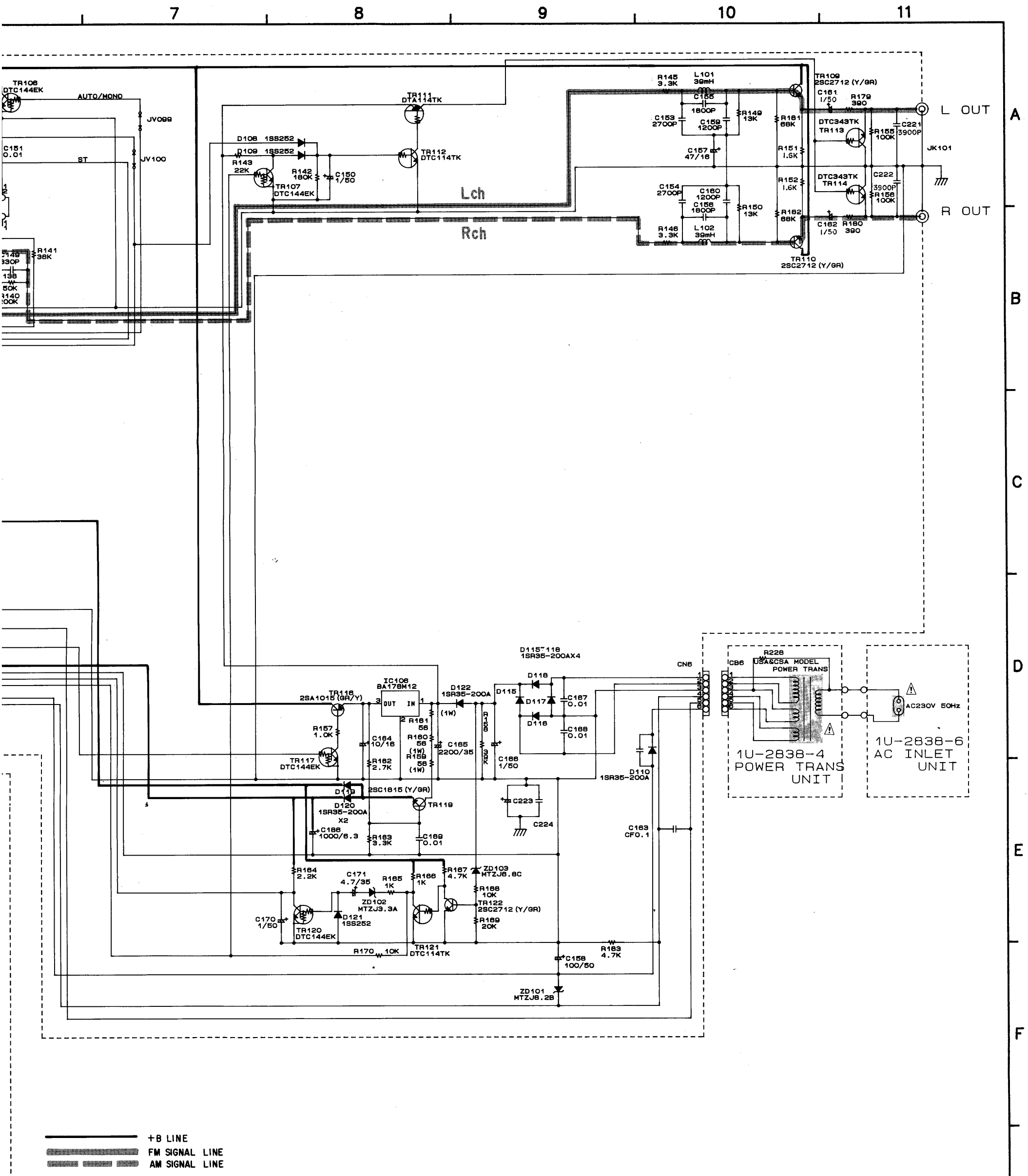
1U-2838-1
TUNER UNIT

FM
FE101
FRONT-END
ANT
GND
IF
GND
AGC
VCC
VCC
R103 1K
R104 330
R122 4.7K
R148 330
CF101 FMCFSK107M2-A
CF102 FMCFSK107M2-A
R121 220
TR108 2SC2998
R119 330
C126 0.01
C103 0.01
R120 1.8K
C127 0.01
R101 10K
R102 15K
C104 0.01
TR105 2SK211 (Y/GR)
R351 10
T103 FM IF DET TRANS
C129 10/16
CF103 CF.CMU1-450A01
R125 6.2K
R126 120
C131 0.01
C132 0.01
C130 0.33/50
IC104 LA1265S
R127 39K
R128 10K
R129 10K
R130 3.3K
C134 0.47/50
C135 1/50
C133 0.022
R131 5.6K
C145 10/16
R133 6.8K
C136 100P
AM
T101
MW ANT OSC. COIL
AM IFT (SF)
T102
R132 68K
C146 100P
C138 10/16
R135 100K
TR106 DTC144EK
C139 1/50
R136 5.6K
CO.CSB456F11
CF104
C140 0.22/50
C151 0.01
R134 2.7K
C137 22/16
CFO.047
C142
IC105 LA3401
C143 22/16
C144
CFO.056
LF101
ANTI BIRDIE FILTER
C149 330P
R141 36K
C148 330P
R137 150K
R138 150K
R139 200K
R140 200K
R184 20K
C147 10/16
D102 1SS252
C106 0.01
C231 5P
10K
R106
C184 18P
R105 100K
C105 10/16
C232 0.022
R111 8.2K
C109 1/50
R110 3.9K
C108 0.022
TR102 2SK209 (GR)
R107 100
TR101 2SC2712 (Y/GR)
C107 0.1/50
R108 390
R109 150
R112 10K
XL101 7.2M
C110 18P
C111 18P
C112 100P
R113 10K
R114 10K
R115 10K
C113 100P
C114 100P
C115 100P
C116 0.01
C117 1/50
C118 2.2/50
C119 0.01Z
DTA114EK
TR103
TR104 DTA114EK
C125 0.01
IC101 LM7001M
C121 CH27P
C122 CH27P
XL102 4.332M
C123 47/6.3
CLK
IC102 SAA6579
C120 560P
CF105 CO.DCRHT P4.00M
IC109 LC7074
RDS-ST
RDS-DATA
RDS-CK
C124 0.01Z
R116 1K
R117 5.6K
R118 4.7K
CB21
CN21
C331 0.01
R330
CF301 CO.DCRHTP4.00M
C304 100P
R323 0
R325 0
C308 0.01
C315 0.01
C314 0.01
C312 0.01
C313 0.01
C305 22/50
C306 100/6.3
R352 10K
C301
C302 100P
C303 10/16
RM301 SBX1616-52
IC301 TMP87CM71F-8271
AUTO/MONO
POWER
VDD
MUTE
P51
P50
P47
P46
VKK
S15(S)
R306 1K
SW307 1
R314 1K
SW313 7
R309 200
SW308 2
R315 200
SW314 6
R310 300
SW309 3
R316 300
SW315 5
R311 510
SW310 4
R317 510
SW316 SHIFT /PTY
R312 1K
SW311 8
R318 1K
SW317 MEMORY
R313 3K
SW312 UP
R319 3K
SW318 DOWN
FL301 FLD
1U-2838-2
DISPLAY UNIT

1U-2838-3
TACT SW UNIT
CN4
C307 0.01
R301 1K
R307 1K
C308 0.01
SW305 SEARCH/ CHARACTER
R303 300
SW303 AUTO/ MANU
R306 200
SW304 RT
R302 200
R304 510
SW302 BAND
R320 300
R305 1K
SW301 DISPLAY
R321 510
SW319 EON TA
CN3B

1U-2838-5
POWER SW
UNIT
SW306 POWER
CN3A

**NOTES**
ALL RESISTANCE VALUES IN OHM. k=1,00
ALL CAPACITANCE VALUES IN MICRO FAR
EACH VOLTAGE AND CURRENT ARE MEA
CIRCUIT AND PARTS ARE SUBJECT TO CH




+B LINE
FM SIGNAL LINE
AM SIGNAL LINE

ALUES IN OHM. k=1,000 OHM, M=1,000,000 OHM
VALUES IN MICRO FARAD. P=MICRO-MICRO FARAD
D CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
S ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

**WARNING:**
Parts marked with this symbol ⚠ ▒ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

**CAUTION:**
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 kohms, the unit is defective.

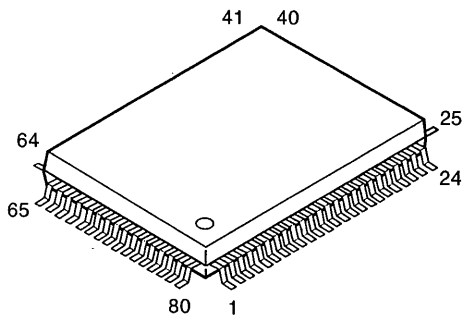
**WARNING:**
DO NOT return the unit to the customer until the problem is located and corrected.

**NOTES:**
Circuit and parts are subject to change without prior notice.

# SEMICONDUCTORS

## ● IC's

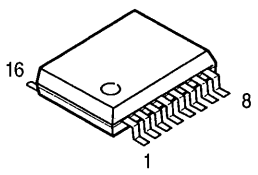
### TMP87CM71F




### TMP87CM71F Terminal Function

| Pin No. | Symbol | I/O | Logic | Initial Setting | Function |
|---|---|---|---|---|---|
| 1 | STOP | I | L | — | Power down detection ("L" = at power down). |
| 2 | GND | I | — | — | Not used. |
| 3 | RDS ST | I | Serial | — | RDS data (start) input. |
| 4 | RES | O | L | H | LC7074 reset output. |
| 5 ~ 8 | GND | I | — | — | Not used. |
| 9 | GND | I | — | — | Connect to GND. |
| 10 | TUNED | I | L | — | Tuned signal input ("L" = at tuned in). |
| 11 | GND | I | — | — | Not used. |
| 12 | RESET | I | L | — | Reset input. |
| 13 | XIN | I | — | — | Oscillation circuit (4MHz). |
| 14 | XOUT | I | — | — | Oscillation circuit (4MHz). |
| 15 | Vss | PW | — | — | GND |
| 16 | GND | I | — | — | Not used. |
| 17 | REM | I | L | — | Remote control signal input. |
| 18 | STEREO | I | L | — | Stereo signal input ("L" = at stereo). |
| 19 | RDS CK | I | Serial | — | RDS data (clock) input. |
| 20 | RDS DATA | I | Serial | — | RDS data (data) input. |
| 21 | GND | I | — | — | Not used. |
| 22 | PLL CK | O | Serial | L | LM7001 control output for PLL-CK. |
| 23 | PLL DATA | O | Serial | L | LM7001 control output for PLL-DATA. |
| 24 | PLL STB | O | H | L | LM7001 control output for PLL-STB. |
| 25 | NC | O | — | — | Not used. |
| 26 | NC | O | — | | Not used. |
| 27 | AUTO/ MONO | O | L | L | AUTO/MANUAL control signal ("L" = AUTO). |
| 28 | GND | I | — | — | Not used. |
| 29 | POWER | O | H | L | Power supply switch control output ("H" = ON). |
| 30 | GND | I | — | — | Not used. |
| 31 | GND | I | — | — | Not used. |
| 32 | GND | I | — | — | Not used. |
| 33 | VDD | PW | — | — | +5V |
| 34 | NC | I | — | — | Not used. |
| 35 | NC | I | — | — | Not used. |
| 36 | 1G | O | — | — | FL tube control output for 1G. |
| 37 | 2G | O | — | — | FL tube control output for 2G. |
| 38 | 3G | O | — | — | FL tube control output for 3G. |
| 39 | 4G | O | — | — | FL tube control output for 4G. |
| 40 | 5G | O | — | — | FL tube control output for 5G. |
| 41 | 6G | O | — | — | FL Tube control output for 6G. |
| 42 | 7G | O | — | — | FL Tube control output for 7G. |
| 43 | 8G | O | — | — | FL Tube control output for 8G. |
| 44 | 9G | O | — | — | FL Tube control output for 9G. |
| 45 | 10G | O | — | — | FL Tube control output for 10G. |
| 46 | 11G | O | — | — | FL Tube control output for 11G. |
| 47 | 12G | O | — | — | FL Tube control output for 12G. |
| 48 | 13G | O | — | — | FL Tube control output for 13G. |
| 49 | 14G | O | — | — | FL Tube control output for 14G. |
| 50 | S0 (a) | O | — | — | FL Tube control output for P(a). |
| 51 | S1 (b) | O | — | — | FL Tube control output for P(b). |
| 52 | S2 (c) | O | — | — | FL Tube control output for P(c). |
| 53 | S3 (d) | O | — | — | FL Tube control output for P(d). |
| 54 | S4 (e) | O | — | — | FL Tube control output for P(e). |
| 55 | S5 (f) | O | — | — | FL Tube control output for P(f). |
| 56 | S6 (g) | O | — | — | FL Tube control output for P(g). |
| 57 | S7 (h) | O | — | — | FL Tube control output for P(h). |
| 58 | S8 (j) | O | — | — | FL Tube control output for P(j). |
| 59 | S9 (k) | O | — | — | FL Tube control output for P(k). |
| 60 | S10 (m) | O | — | — | FL Tube control output for P(m). |
| 61 | S11 (n) | O | — | — | FL Tube control output for p(n). |
| 62 | S12 (p) | O | — | — | FL Tube control output for P(p). |
| 63 | S13 (q) | O | — | — | FL Tube control output for P(q). |
| 64 | S14 (r) | O | — | — | FL Tube control output for P(r). |
| 65 | S15 (s) | O | — | — | FL Tube control output for P(s). |
| 66 | Vkk | PW | — | — | –25V |
| 67 ~ 72 | GND | I | — | — | Not used. |
| 73 | KEY1 | I | — | — | Key input (A/D conversion input). |
| 74 | KEY2 | I | — | — | Key input (A/D conversion input). |
| 75 | KEY3 | I | — | — | Key input (A/D conversion input). |
| 76 | KEY4 | I | — | — | Key input (A/D conversion input). |
| 77 | VER | I | — | — | Forwarding country setting. (5V: Europe, U.K. GND: USA, Canada) |
| 78 | VER | I | — | — | Specification setting. |
| 79 | MUTE | O | H | H | MUTE output ("H" = MUTE). |
| 80 | GND | I | — | — | Not used. |

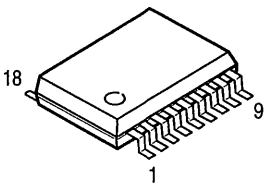
### SAA6579T

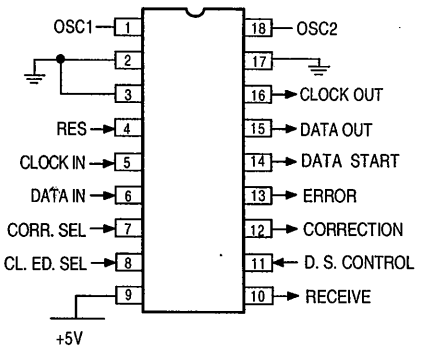



### SAA6579T Terminal Function

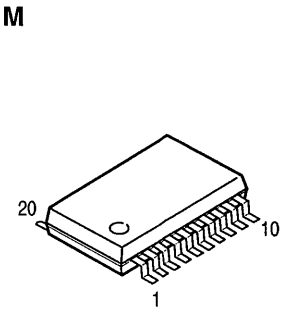
| Pin No. | Symbol | Description |
|---|---|---|
| 1 | QUAL | Quality indication output. |
| 2 | RDDA | RDS data output. |
| 3 | $V_{ref}$ | Reference voltage output (0.5 $V_{DDA}$). |
| 4 | MUX | Multiplex signal input. |
| 5 | $V_{DDA}$ | +5 V supply voltage for analog part. |
| 6 | $V_{SSA}$ | Ground for analog part (0 V). |
| 7 | CIN | Subcarrier input to comparator. |
| 8 | SCOUT | Subcarrier output of reconstruction filter. |
| 9 | TSTLD | Test control. |
| 10 | TEST | Test enable. |
| 11 | $V_{SSD}$ | Ground for digital part (0 V). |
| 12 | $V_{DDD}$ | +5 V supply voltage for digital part. |
| 13 | OSCI | Oscillator input. |
| 14 | OSCO | Oscillator output. |
| 15 | T57 | 57 kHz clock signal output. |
| 16 | RDCL | RDS clock output. |

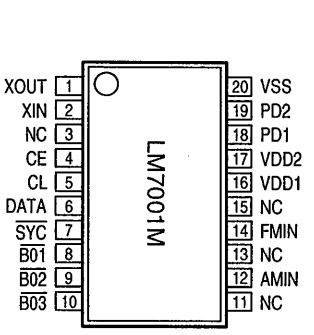
### LC7074M



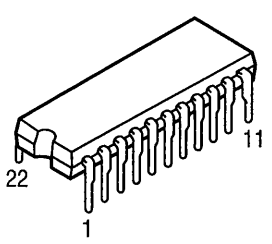




### LM7001M

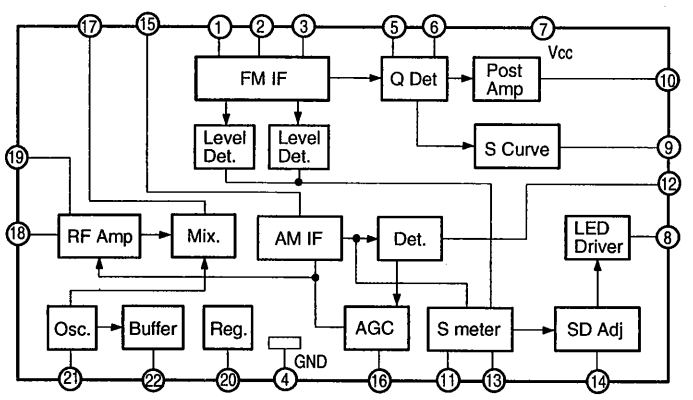


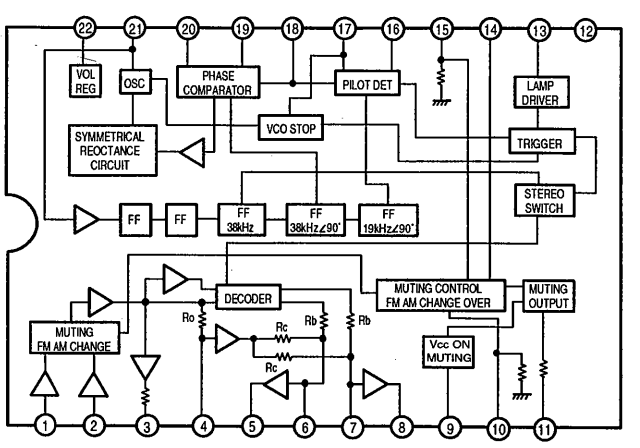

### LA1265 (S)
### LA3401



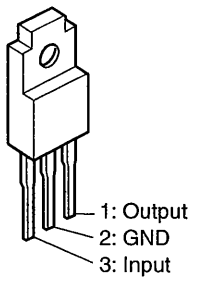

### LA1265 (S)

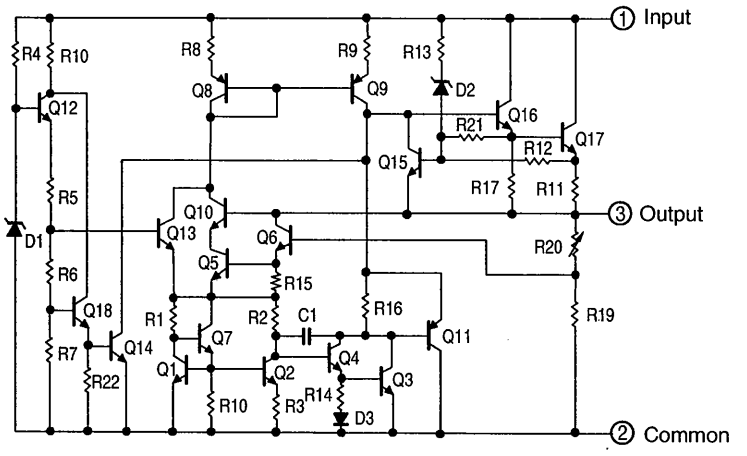



### LA3401



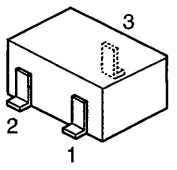
**BA178M12T**



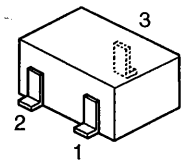

## ● TRANSISTORS

**2SK209**



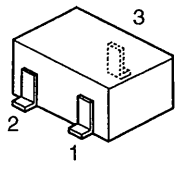

1: Drain
2: Source
3: Gate

**2SK211**



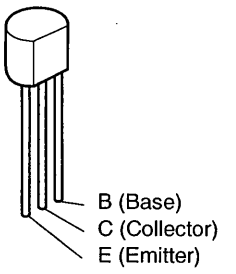

1: Gate
2: Drain
3: Source

**2SC2712**
**2SC2996**

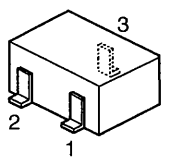



1: Emitter
2: Base
3: Collector

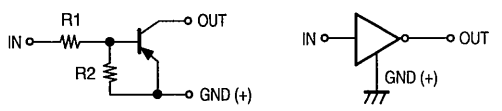
**2SA1015**
**2SC1815**



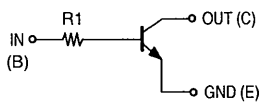

**DTA114TK**
**DTC114TK**
**DTC144EK**
**DTC144TK**
**DTC323TK**



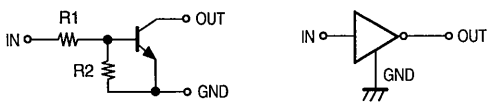

1: GND/Emitter
2: In/Base
3: Out/Collector




| | R1 | R2 |
|---|---|---|
| DTA114TK | 10 Kohm | 10 Kohm |



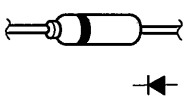

| | R1 |
|---|---|
| DTC114TK | 10 Kohm |
| DTC144TK | 47 Kohm |
| DTC343TS | 4.7 Kohm |



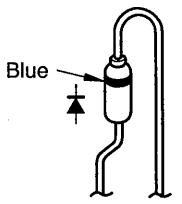

| | R1 | R2 |
|---|---|---|
| DTC144EK | 47Kohm | 47Kohm |

## ● DIODES

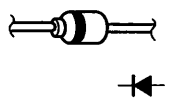
**1SS252**



**1SR35-200A**

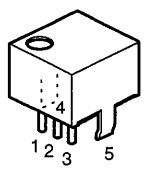



**MTZJ6.8C**
**MTZJ3.3A**
**MTZJ8.2B**

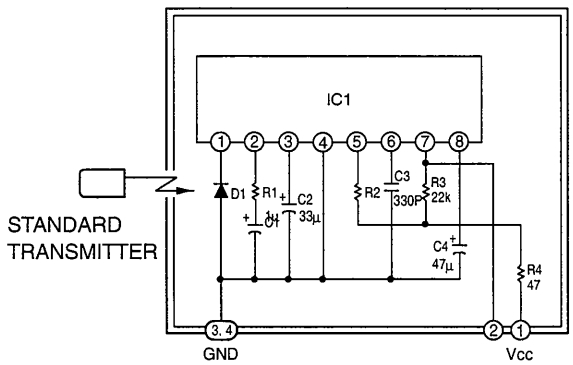


## ● REMOTE SENSOR

**(SBX1610-52)**

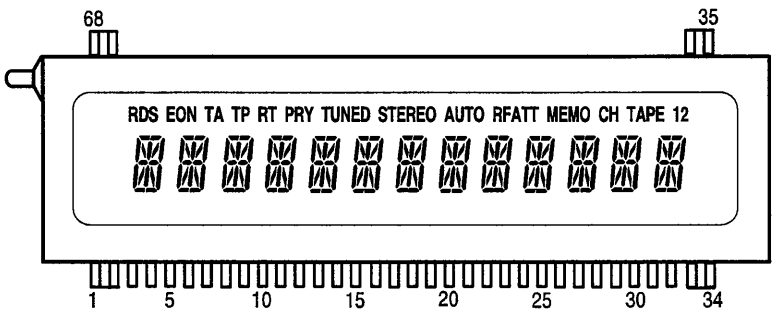


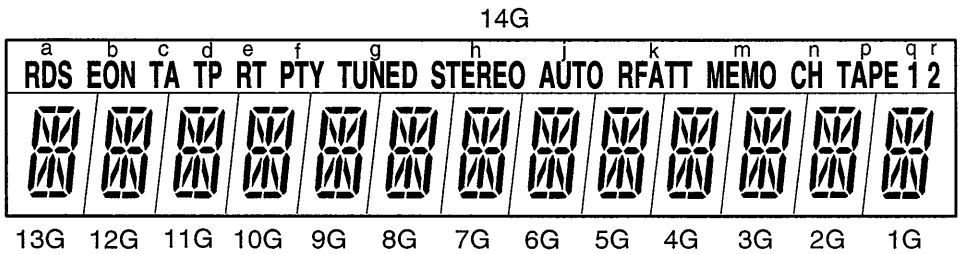

1. Vcc
2. Output
3. GND
4. Case Fin
5. Case Fin

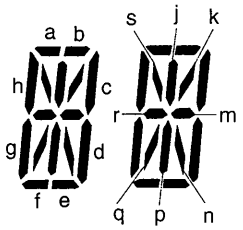



| | |
|---|---|
| IC1 | : CX20106A Chip |
| D1 | : PIN Photo Diode Chip |
| C1, C2, C4 | : Aluminum Electrolytic Capacitor |
| C3 | : SL Characteristic ±5% |
| R1 | : Gain Adjuster |
| R2 | : fo Adjust ±1% USE |
| R3, R4 | : ± 5% |

## ● FLD (FIP14AM7R)




### TERMINAL CONNECTION

(UPPER)

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TERMINAL NO. | 68 | 67 | 66 | 65 | 64 | 63 | 62 | 61 | 60 | 59 | 58 | 57 | 56 | 55 | 54 | 53 | 52 | | | | |
| ELECTRODE | F1 | F1 | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | | | | |
| TERMINAL NO. | | | | 51 | 50 | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | |
| ELECTRODE | | | | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | F2 | F2 | |

(LOWER)

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TERMINAL NO. | | | | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | |
| ELECTRODE | | | | P a | 14G | 13G | 12G | 11G | 10G | 9G | 8G | 7G | 6G | 5G | 4G | 3G | 2G | 1G | F2 | F2 | |
| TERMINAL NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | | | |
| ELECTRODE | F1 | F1 | P s | P r | P q | P p | P n | P m | P k | P j | P h | P g | P f | P e | P d | P c | P b | | | | |

Notes : F : Filament NP : No. Pin
G : Grid
P : Anode

DENON

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