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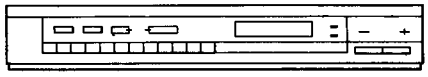
Y072302 113.

# Service Manual



ORDER NO.
ARP 1306

## FM/AM DIGITAL SYNTHESIZER TUNER

# F-X88ZL

MODEL F-X88ZL AND F-X88Z COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

| Type | Applicable model | | Power requirement | Destination |
|---|---|---|---|---|
| | F-X88ZL | F-X88Z | | |
| ZEB | ○ | – | (DC power supply) | European continent and United Kingdom |
| ZEZ | – | ○ | (DC power supply) | West Germany |
| Z | – | ○ | (DC power supply) | General market |
| ZIOX1B | – | ○ | (DC power supply) | Italy |

- **This service manual is applicable to the F-X88ZL/ZEB type.**
- **As to the other types, please refer to the additional service manual.**
- **The AM tuner of the F-X88ZL/ZEB type is a two wave-band tuner with MW (medium wave) and LW (long wave), but the other types are MW only.**
- **Ce manuel d'instruction se refère au mode de réglage en français. (p. 21 - p. 23)**
- **Este manual de servicio trata del método ajuste escrito en español. (p. 24 - p. 26)**

## CONTENTS

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# 1. SPECIFICATIONS

### FM Tuner Section

Frequency range . . . . . .87.5 MHz to 108 MHz
Usable Sensitivity . . . . . 12.7 dBf, IHF (1.2μV/75 ohms)
50 dB Quieting Sensitivity. . . . . Mono: 18 dBf (2.2μV/75 ohms)
Stereo: 38.3 dBf (22.6μV/75 ohms)
Sensitivity (DIN). . . . . Mono 0.9μV/75 ohms
Stereo: 31.5μV/75 ohms
Signal-to-Noise Ratio (IHF, 85 dBf Input)
. . . . . .Mono: 77 dB
Stereo: 73 dB
Signal-to-Noise Ratio (DIN). . . . . .Mono: 62 dB
Stereo: 60 dB
Distortion . . . . . Stereo: 0.5% (1 kHz)
Alternate Channel Selectivity. . . . . 60 dB (400 kHz)
Stereo Separation . . . . . 40 dB (1 kHz)
Frequency Response . . . . . .±1 dB (30 Hz to 15 kHz)
Image Interference Ratio . . . . . .38 dB
IF Interference Ratio. . . . . .110 dB
Antenna Input . . . . . 300 ohm balanced
75 ohm unbalanced
Output Level (FM 100% MOD) . . . . . 650 mV

### MW (AM) Tuner Section

Frequency range
When 10 kHz step . . . . . .530 kHz to 1,600 kHz
When 9 kHz step. . . . . .531 kHz to 1,602 kHz
Sensitivity (IHF, Loop antenna). . . . . 350μV/m
Selectivity . . . . . .20 dB
Signal-to-Noise Ratio . . . . . .45 dB
Image Interference Ratio . . . . . .40 dB
IF Interference Ratio. . . . . .50 dB
Antenna . . . . . Loop Antenna
Output Level (AM 30% MOD) . . . . . .150mV

### LW Tuner Section (For LW-equipped models only)

Frequency range . . . . . .153 kHz to 281 kHz
Sensitivity (IHF, Loop antenna) . . . . . 1500 μV/m
Selectivity . . . . . .20 dB
Signal-to-Noise Ratio . . . . . .45 dB
Image Interference Ratio . . . . . .30 dB
IF Interference Ratio. . . . . .50 dB
Antenna . . . . . Loop Antenna
Output Level (AM 30% MOD) . . . . . 150 mV

### Miscellaneous

Dimensions ..... 360(W) × 56(H) × 215(D) mm
14-3/16(W) ×2-3/16(H) × 8-1/2(D) in
Weight (without packge) ..... 1.8 kg (4 lb)

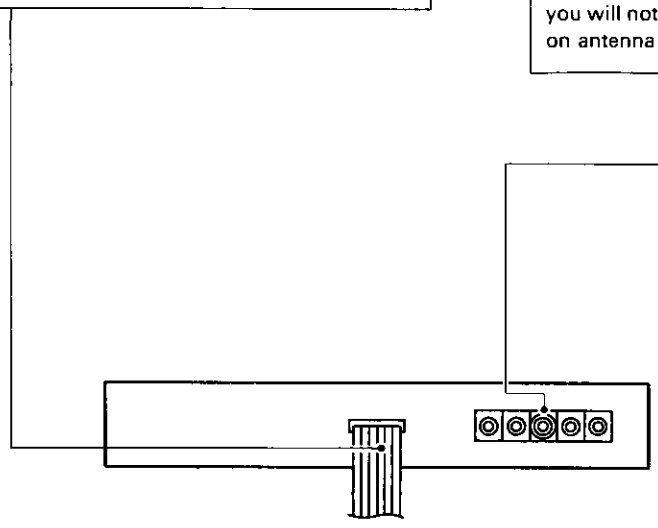
### Furnished Parts

FM T-type antenna ..... 1
AM Loop Antenna ..... 1

# 2. PANEL FACILITIES

**TUNER input/output cord**
Connect to the TUNER jack of the deck amplifier.

**FM/AM antenna terminals**
Antennas must be connected to these terminals; otherwise you will not be able to receive stations. See page 5 for details on antenna connections.



### FM MONO switch/indicator
Normally this is set to the off position (the FM MONO indicator goes off). When noise spoils the reception of an FM program, press the switch to the on position (the FM MONO indicator will now light).
The program of an FM stereo broadcast will be heard in mono.
The setting of the FM MONO switch (on or off) is memorized along with the station's frequency in the STATION CALL switches.
When using the preset tuning feature, reception will be in the mode selected when the station was memorized.
This switch will not function for AM (MW or LW) reception.

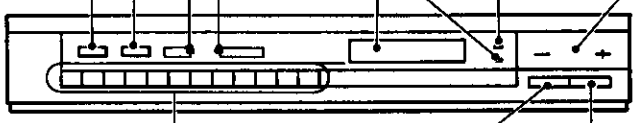
### SELECT (1–12/13–24) switch/indicator
This switch is used to select the STATION CALL switches to Mode 1 (1—12) or Mode 2 (13—24). Mode 2 (13—24) is obtained when the switch is pressed and select indicator is lit.
*NOTE:*
*Changing the position of this switch has no effect on receiver performance itself.*

### FREQUENCY display
Permits reading the received frequency at a glance from the displayed figure. The FM band is indicated by MHz, and the AM (MW or LW) band by kHz.

### TUNING switch
This is used to locate the stations.
Push either side of this switch; the left side "–" to go to a lower, and the right side "+" to go to a higher frequency.

### STEREO indicator
This lights when a stereo program has been picked up during an FM broadcast.

### TUNED indicator
This lights to indicate when the finest tuning of a station has been achieved.



### STATION CALL switches
These are used to recall preset broadcasting stations and to preset the station.

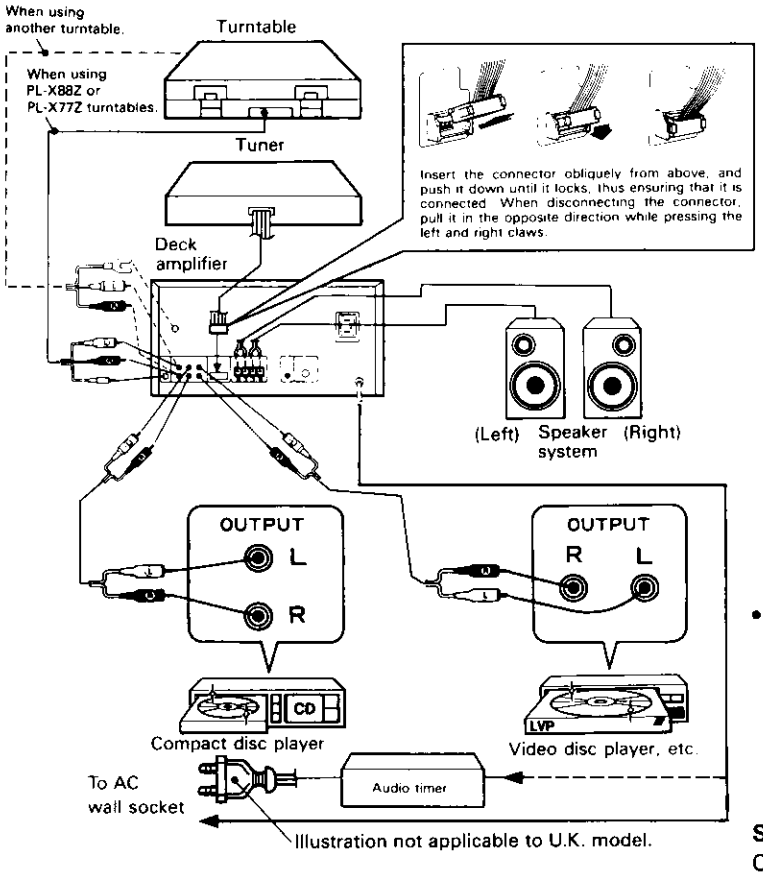
### MEMORY switch
This switch is used to memorize stations. When the switch is pressed, the frequency indicator will flash. To memorize the frequency of any station, press the station call switch while the memory indicator is lit.

### BAND SELECTOR switch
**[For model F-X88Z]**
Each time this switch is pressed, FM or AM reception is selected alternately.
FM and MHz light: FM reception
AM and kHz light: AM reception
**[For model F-X88ZL]**
Each time this switch is pressed, FM, MW or LW reception is selected alternately.
FM and MHz light: FM reception
AM and kHz light: MW or LW reception

**Proceed as follows with the set-up and connections.**

1. Place the tuner on top of the cassette tape deck amplifier.
2. Connect the tuner to cassette tape deck amplifier.
3. Connect the FM antenna and the AM antenna to the tuner's antenna terminals.
   If the model has an AM/FM CHANNEL STEP switch, check whether it is positioned properly.
4. Attach the turntable legs at the left and right of the cassette tape deck amplifier's rear panel.
5. Place the turntable on top of the tuner.
6. Connect the turntable's output cords to the cassette tape deck amplifier's PHONO jacks. If any other stereo component is to be used, connect it in the same way to the CD or VIDEO jacks.
7. Connect the speaker cords to the SPEAKERS terminals.
8. Finally, connect the power cord the the AC wall socket.

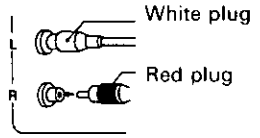
Plug the power cord into the AC wall socket outlet only after all the connections have been completed. Keep the power switch at the OFF position.



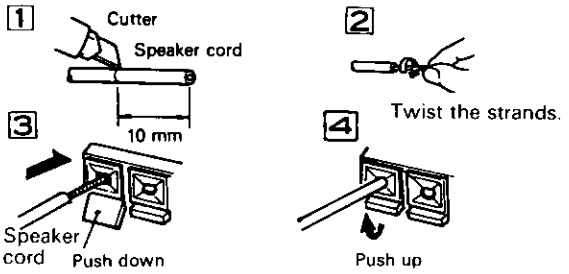

**Connecting the input/output cords**

- Insert the plugs securely into the jacks. Improper connection can lead to sound distortion or malfunctioning.
- The white plug is for the left channel connection and the red plug for the right channel connection.

Be sure to insert the plugs all the way.




## Connecting the speaker cords




- Check that the speaker cords are secure and will nt become disconnected.

*NOTE:*
*Do not allow the conductors of the cords to project beyond the terminals and to come into contact with other conductors. A breakdown or failure may occur when conductors touch one another.*

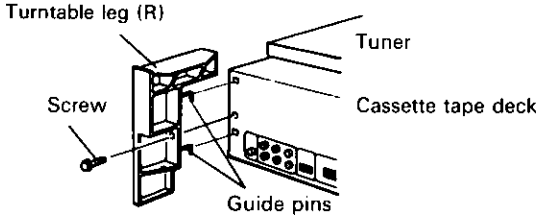
**Speaker impedance**
Connect speaker systems with a nominal impedance of between 6 and 16 ohms.

## Attaching the legs of the turntable

Attach the legs accompanying the turntable to the rear panel of the cassette deck amplifier.

- Be sure to attach the left (L) and right (R) legs to their proper positions.

1. Insert the guide pins on the legs into the holes in the back of the cassette deck amplifier.
2. Fasten the legs in place with the screws provided.
3. After connecting the antenna, mount the turntable securely on top of the legs.



## Radio reception is not possible unless the antenna is properly connected.

The strength of broadcast signals varies from one area to another (signal propagation is especially poor in metropolitan areas, where there are many tall buildings, and in mountainous areas). Proper antenna installation is vital to good reception.

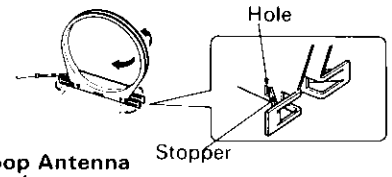
## AM ANTENNA

The AM loop antenna supplied with the tuner should be connected to the AM antenna terminals. The antenna should be placed at a distance from the tuner, and should not be allowed to touch metallic objects. Avoid placing it near CD players, personal computers, television sets, and other devices generating radio frequencies.

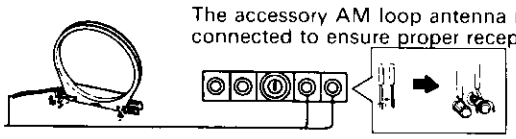
### Setting Up the AM Antenna

- Fold out the supports on the bottom of the antenna. Insert the stopper in the hole in the antenna to lock them in place.
- Place the antenna on a level surface and rotate it to locate the orientation that yields the best reception.

**AM Loop Antenna Set-up**




**AM Loop Antenna Connection**




## External AM antenna

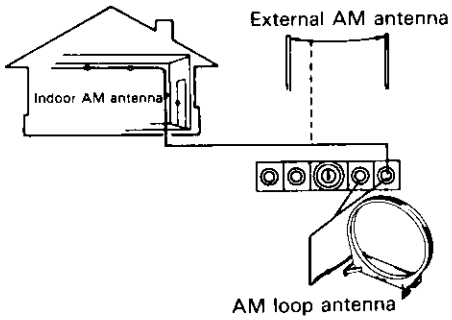
### Indoor AM antenna

Provide a vinyl-coated wire (5 to 6 meters long). Secure one end to the AM terminal and the other end to a wall or other high location.

### External AM antenna

If reception is still poor even when a lead antenna has been stretched out indoors, stretch out a vinyl-coated wire and secure it indoors.

### Connecting the external AM antenna



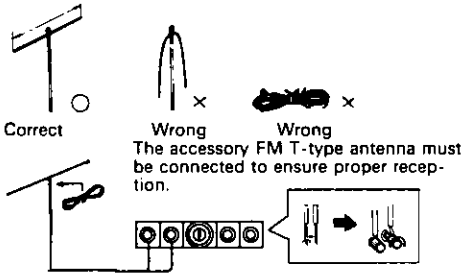

*NOTE:*
*Do not detach the AM loop antenna when using the external AM antenna.*

## FM ANTENNA

### FM T-type Antenna Attachment

Connect the accessory FM T-type antenna to the FM terminals. Stretch the antenna out to its full length, and affix it to a wall, etc.

Stretch out both ends.

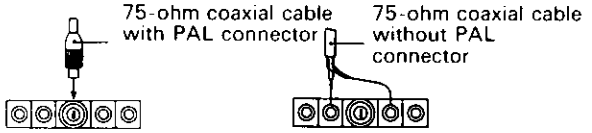



## External FM antenna installation

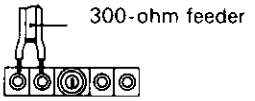
Use an external antenna when the signals from the station are weak and cannot be picked up by the accessory T-type FM antenna, or when the sound heard is accompanied by large amounts of noise. There are two ways of connecting the external FM antenna to the ANTENNA terminals: with 300-ohm feeder wire, or with a 75-ohm coaxial cable.

It is recommended that you use the 75-ohm coaxial cable, so that the effects of extraneous noise are reduced to a minimum.

**When the connecting cable is a 75-ohm coaxial cable**




**When the connecting cable is a 300-ohm feeder wire**




## AM/FM CHANNEL STEP SWITCH (F-X88Z only)

This switch is not provided on models for use in Europe, North America, or Australia. (Provided only on models stamped "Z/E" on packing case.)

The AM/FM channel step switch is located on the rear panel of the digital synthesizer tuner. Before the tuner leaves the factory, this switch is set to the channel allotment plan of the area in which the tuner is sold. When the TUNING switch is given a single push, the frequency display will change in the following units.

| Model destination | CHANNEL STEP switch position | Frequency change | |
|---|---|---|---|
| | | FM mode | AM mode |
| North America and Continental South America | 100 kHz/10 kHz | 100 kHz | 10 kHz |
| Other countries | 50 kHz/9 kHz | 50 kHz | 9 kHz |

*NOTE:*

- *If the switch is set to the wrong position, correct tuning will not be possible.*

Consult your dealer if you are not sure about the channel allotment plan in your area.

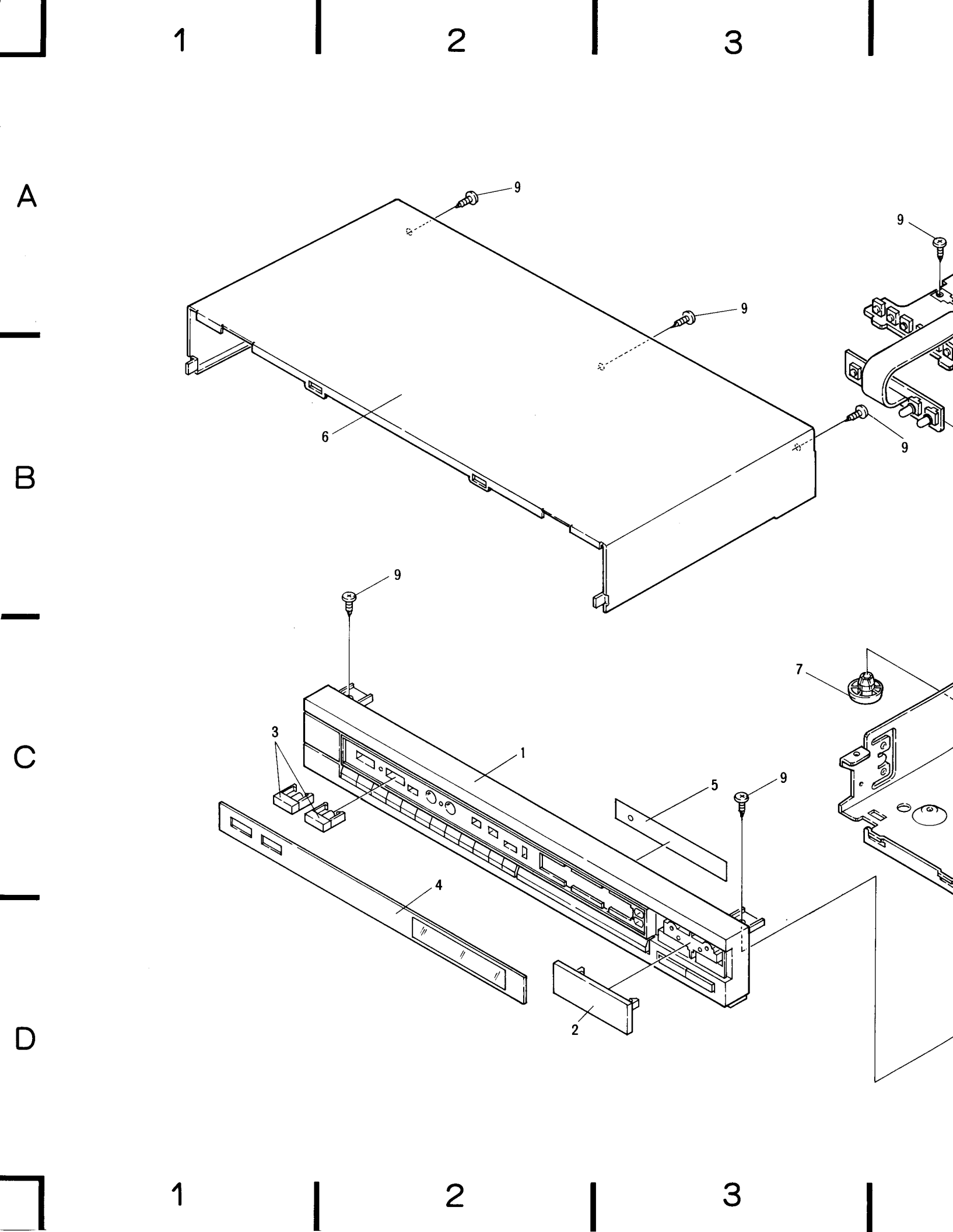
# 3. EXPLODED VIEWS AND PARTS LIST

*NOTES:*

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  *★★ GENERALLY MOVES FASTER THAN ★*
  *This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

## ● Parts List

| Mark | No. | Part No. | Description |
|---|---|---|---|
| | 1. | AMB1146 | Front panel assembly |
| | 2. | AAC1006 | Knob cap |
| | 3. | AAD1107 | Push knob |
| | 4. | AAK1181 | IND. panel |
| | 5. | AAK1189 | FL filter |
| | 6. | ANE1062 | Bonnet case |
| | 7. | AMR1002 | Foot assembly |
| | 8. | ABA-298 | Screw |
| | 9. | ABA1009 | Screw |
| | 10. | AWZ1247 | Tuner assembly |
| | 11. | ADE1024 | Connection cable |
| | 51. | | LED assembly |
| | 52. | | Tuning assembly |
| | 53. | | Chassis |


1
2
3
A
B
C
D
9
9
9
9
6
9
7
3
1
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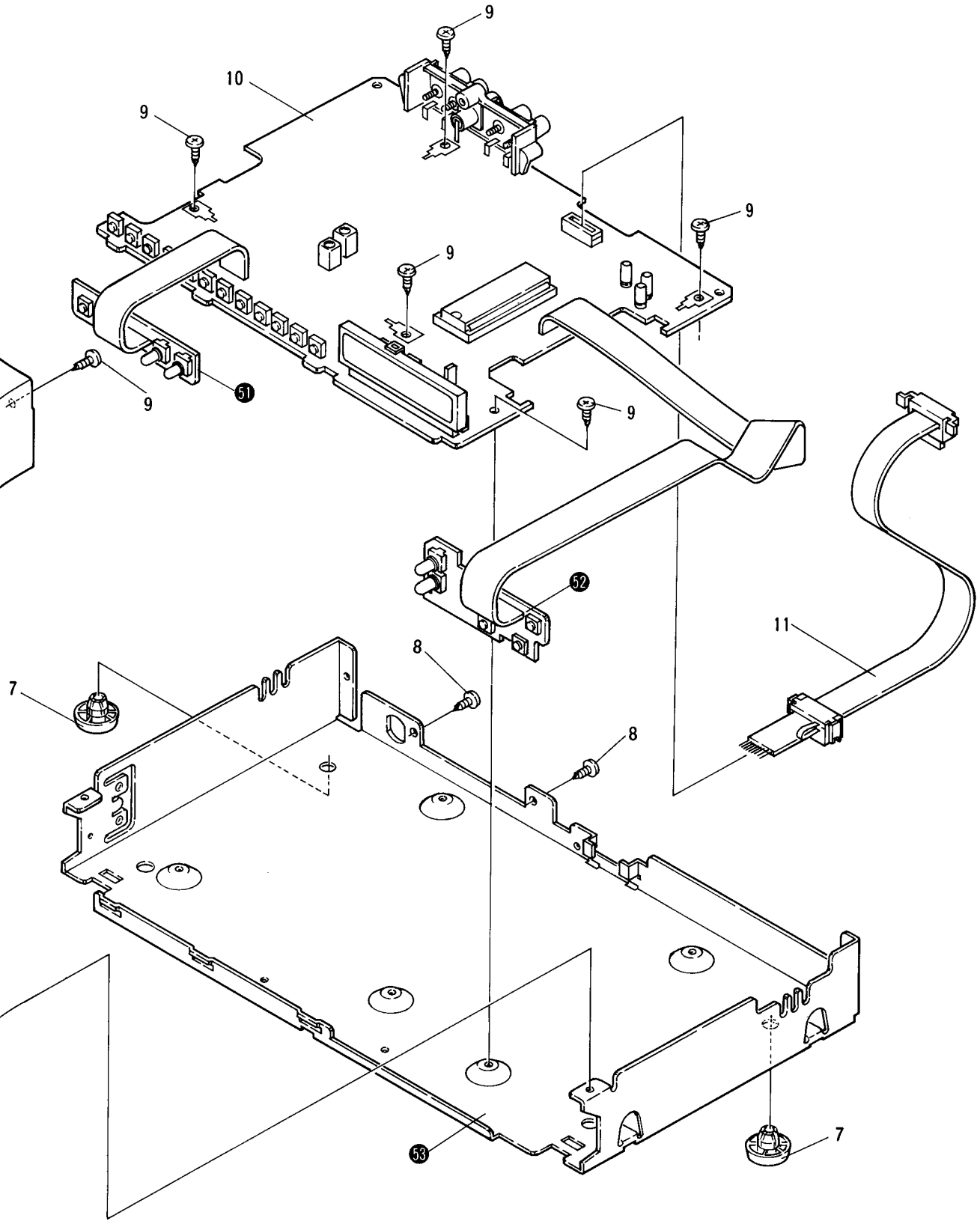
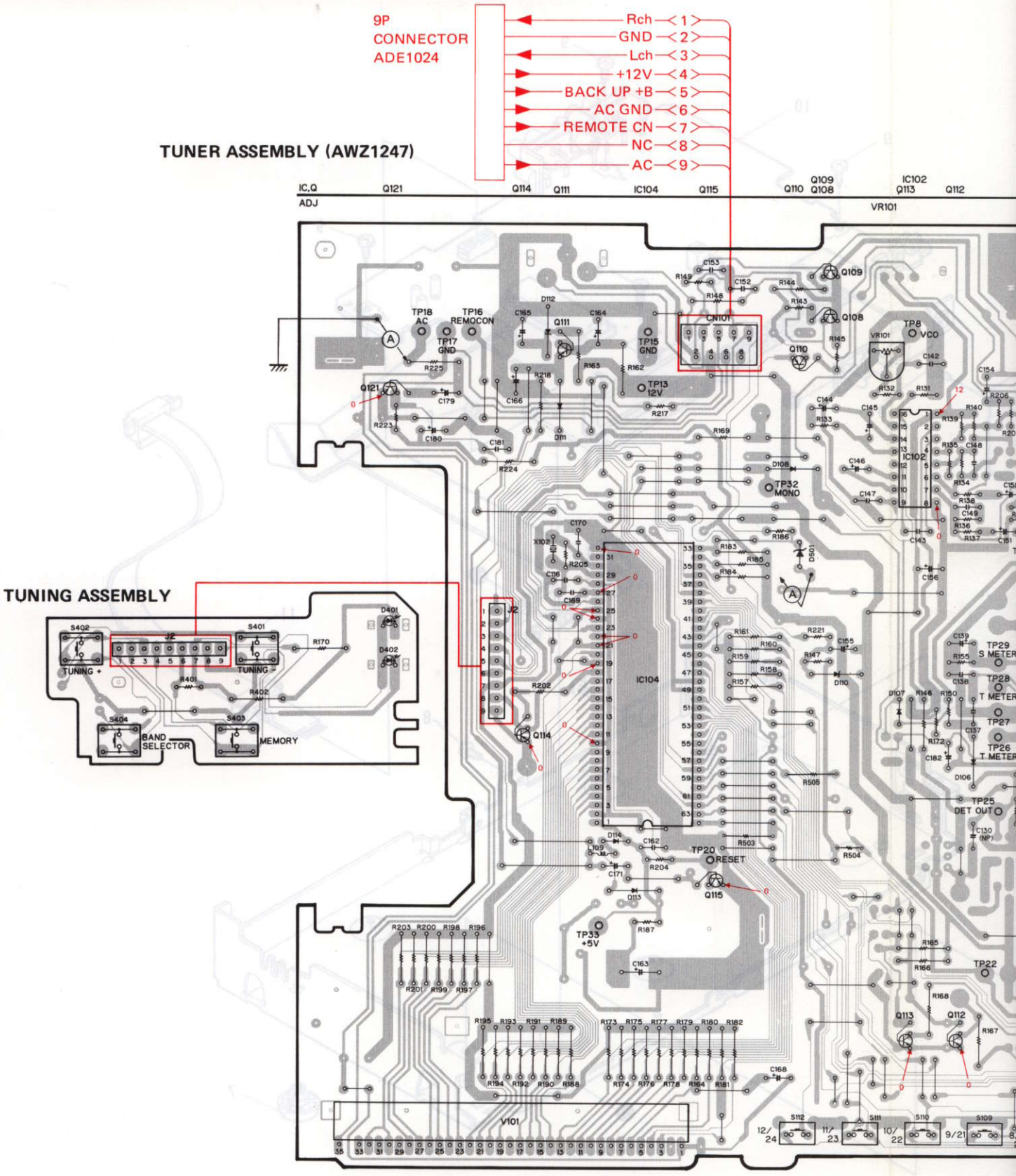
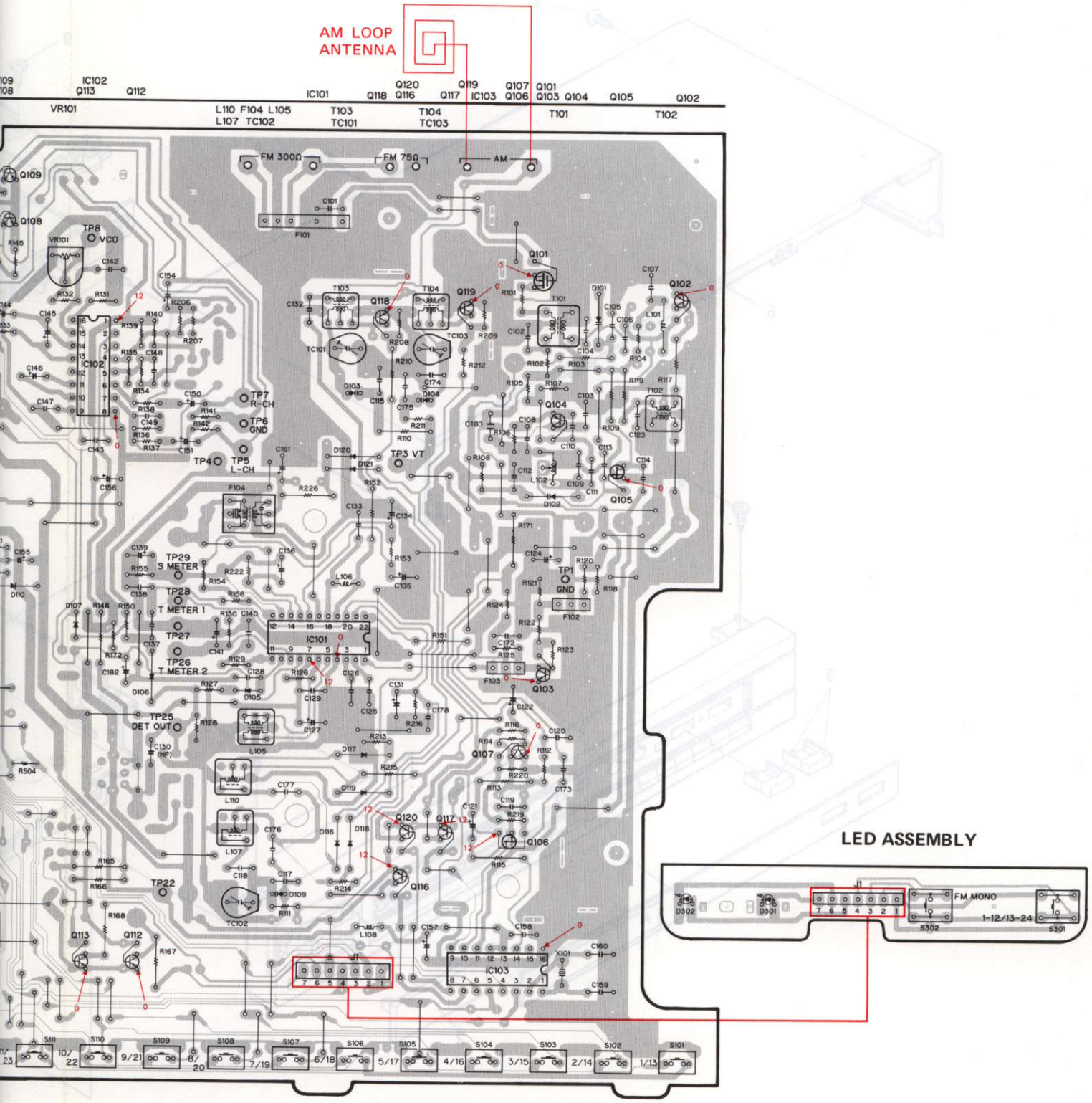
9
4
2



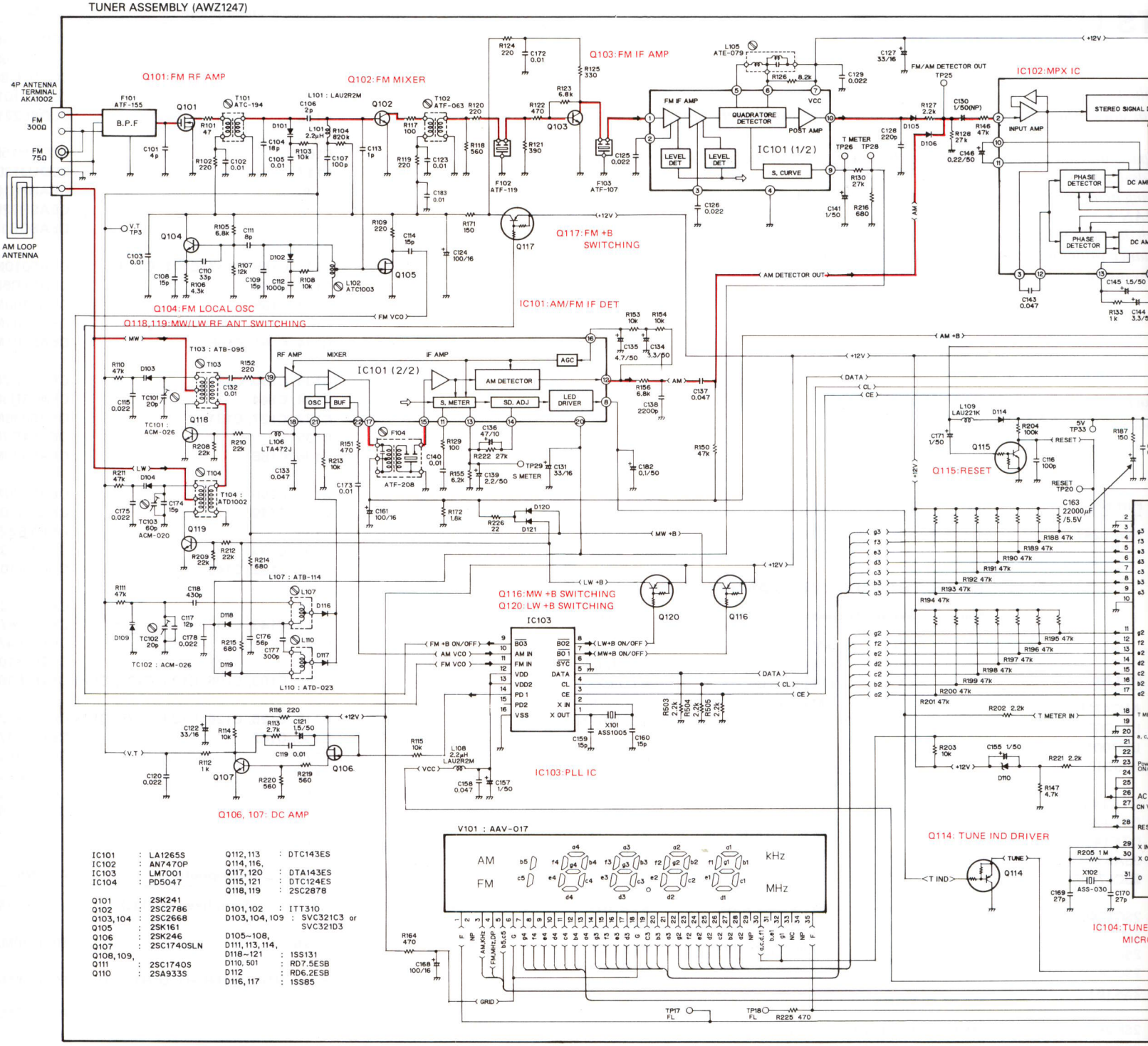

A B C D

# 4. P.C. BOARDS CONNECTION DIAGRAM




AM LOOP ANTENNA
VR101
L110 F104 L105
L107 TC102
T103
TC101
T104
TC103
T101
T102
FM 300Ω
FM 75Ω
AM
TP8 VCO
TP7 R-CH
TP6 GND
TP5 L-CH
TP4
TP3 VT
TP29 S METER
TP28 T METER 1
TP27
TP26 T METER 2
TP25 DET OUT
TP22
TP1 GND
IC101
IC102
IC103
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q109
Q110
Q111
Q112
Q113
Q116
Q117
Q118
Q119
Q120
LED ASSEMBLY
J1
FM MONO
1-12/13-24
S302
S301
S101
S102
S103
S104
S105
S106
S107
S108
S109
S110
S111

## TUNER ASSEMBLY (AWZ1247)




| | | | | | |
|---|---|---|---|---|---|
| IC101 | : LA1265S | Q112, 113 | : DTC143ES | | |
| IC102 | : AN7470P | Q114, 116, | | | |
| IC103 | : LM7001 | Q117, 120 | : DTA143ES | | |
| IC104 | : PD5047 | Q115, 121 | : DTC124ES | | |
| | | Q118, 119 | : 2SC2878 | | |
| Q101 | : 2SK241 | | | | |
| Q102 | : 2SC2786 | D101, 102 | : ITT310 | | |
| Q103, 104 | : 2SC2668 | D103, 104, 109 | : SVC321C3 or SVC321D3 | | |
| Q105 | : 2SK161 | | | | |
| Q106 | : 2SK246 | D105~108, | | | |
| Q107 | : 2SC1740SLN | D111, 113, 114, | | | |
| Q108, 109, | | D118~121 | : 1SS131 | | |
| Q111 | : 2SC1740S | D110, 501 | : RD7.5ESB | | |
| Q110 | : 2SA933S | D112 | : RD6.2ESB | | |
| | | D116, 117 | : 1SS85 | | |

1. RESISTORS:
Indicated in Ω, 1/8W, 1/4W, ±5% tolerance unless otherwise noted
k: kΩ, M: MΩ, (F): ±1%, (G): ±2%,(K): ±10%, (M): ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted
p: pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: DC voltage (V) at no input signal
mA : Signal voltage at FM 400Hz 75kHz DEV.

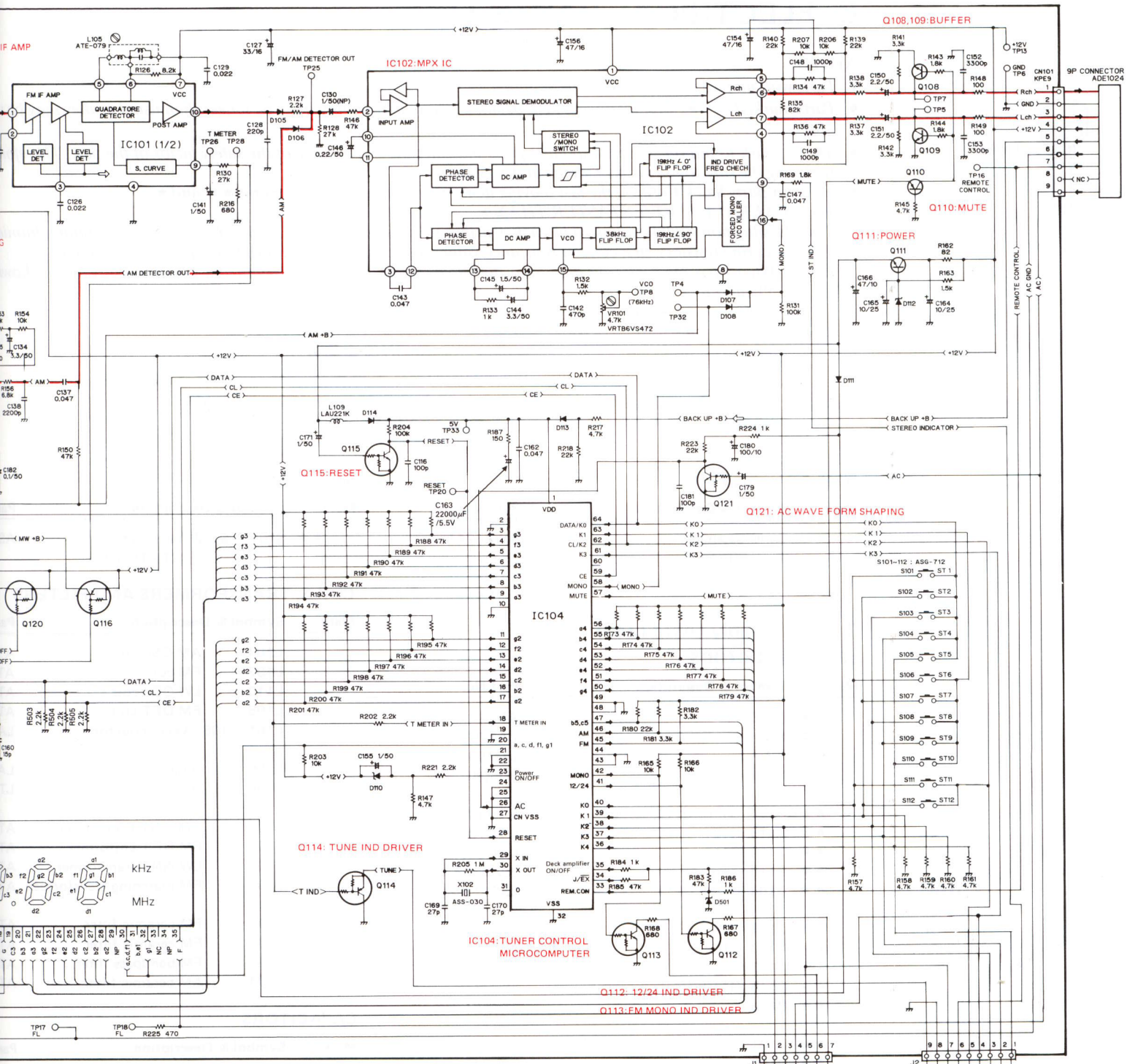
4. OTHERS:
➡ : Signal route.
⦸ : Adjusting point.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
*marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES:

| | | | |
|---|---|---|---|
| S101 | : 1/13 | S301 | : 1-12/13-24 |
| S102 | : 2/14 | S302 | : FM MONO |
| S103 | : 3/15 | | |
| S104 | : 4/16 | S401 | : TUNING - |
| S105 | : 5/17 | S402 | : TUNING + |
| S106 | : 6/18 | S403 | : MEMORY |
| S107 | : 7/19 | S404 | : BAND SELECTOR |
| S108 | : 8/20 | | |
| S109 | : 9/21 | | |
| S110 | : 10/22 | | |
| S111 | : 11/23 | | |
| S112 | : 12/24 | | |

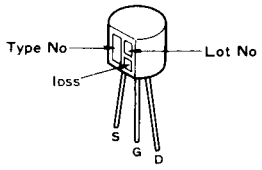



5. SWITCHES :

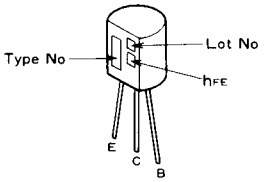
| | | | |
|---|---|---|---|
| S101 | : 1/13 | S301 | : 1-12/13-24 |
| S102 | : 2/14 | S302 | : FM MONO |
| S103 | : 3/15 | | |
| S104 | : 4/16 | S401 | : TUNING - |
| S105 | : 5/17 | S402 | : TUNING + |
| S106 | : 6/18 | S403 | : MEMORY |
| S107 | : 7/19 | S404 | : BAND SELECTOR |
| S108 | : 8/20 | | |
| S109 | : 9/21 | | |
| S110 | : 10/22 | | |
| S111 | : 11/23 | | |
| S112 | : 12/24 | | |

## External Appearances of Transistors and ICs

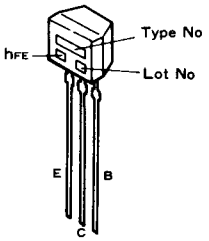
2SK246



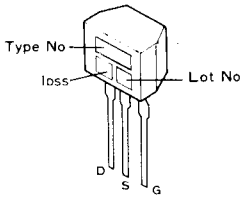

2SC2878



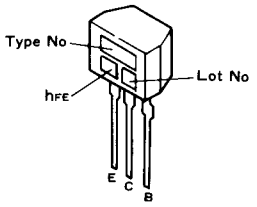

2SC2786



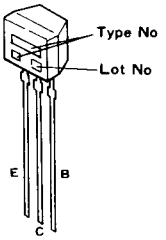

2SK161
2SK241



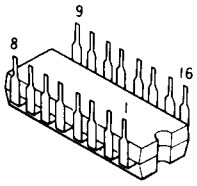

2SA933S
2SC1740S
2SC1740SLN



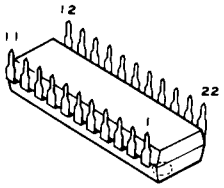

DTA143ES
DTC124ES
DTC143ES



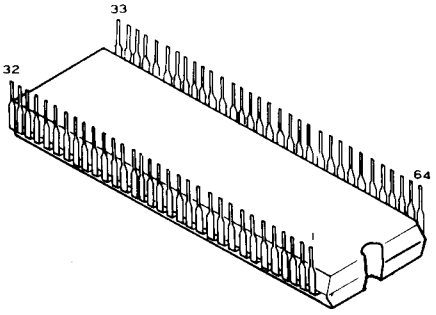

AN7470P
LM7001




LA1265S




PD5047



# 6. ELECTRICAL PARTS LIST

*NOTES:*

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  *★★ GENERALLY MOVES FASTER THAN ★*
  *This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  *Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

| | | | |
|---|---|---|---|
| *560Ω* | *56 × 10¹* | *561* | *RD1/4PS 5 6 1 J* |
| *47kΩ* | *47 × 10³* | *473* | *RD1/4PS 4 7 3 J* |
| *0.5Ω* | *0R5* | | *RN2H 0 R 5 K* |
| *1Ω* | *010* | | *RS1P 0 1 0 K* |

*Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).*

| | | | |
|---|---|---|---|
| *5.62kΩ* | *562 × 10¹* | *5621* | *RN1/4SR 5 6 2 1 F* |

## Miscellaneous Parts

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | Tuner assemboy | AWZ1247 |
| | Tuning assembly | |
| | LED assembly | |

## Tuner Assembly (AWZ1247)

### SEMICONDUCTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| ★★ | IC102 | AN7470P |
| ★★ | IC101 | LA1265S |
| ★★ | IC103 | LM7001 |
| ★★ | IC104 | PD5047 |
| ★★ | Q114, Q116, Q117, Q120 | DTA143ES |
| ★★ | Q115, Q121 | DTC124ES |
| ★★ | Q112, Q113 | DTC143ES |
| ★★ | Q110 | 2SA933S |
| ★★ | Q108, Q109, Q111 | 2SC1740S |
| ★★ | Q107 | 2SC1740SLN |
| ★★ | Q103, Q104 | 2SC2668 |
| ★★ | Q102 | 2SC2786 |
| ★★ | Q118, Q119 | 2SC2878 |
| ★★ | Q105 | 2SK161 |
| ★★ | Q101 | 2SK241 |
| ★★ | Q106 | 2SK246 |
| ★ | D101, D102 | ITT310 |
| ★ | D112 | RD6.2ESB |
| ★ | D110, D501 | RD7.5ESB |
| ★ | D103, D104, D109 | SVC321C3 (SVC321D3) |
| ★ | D105 – D108, D111, D113, D114, D118 – D121 | 1SS131 |
| ★ | D116, D117 | 1SS85 |

### SWITCHES

| Mark | Symbol & Description | Part No. |
|---|---|---|
| ★★ | S101 – S112 Tact switch (STATION) | ASG-712 |

### COILS, TRANSFORMERS AND FILTERS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | L107 AM OSC coil | ATB-114 |
| | L102 FM coil | ATC1003 |
| | L110 LW OSC coil | ATD-023 |
| | L105 FM DET coil | ATE-079 |
| | L101, L108 Axial inductor | LAU2R2M |
| | L109 Axial inductor | LAU221K |
| | L106 Inductor | LTA472J |
| | T103 AM ANT transformer | ATB-095 |
| | T101 FM RF transformer | ATC-194 |
| | T104 LW ANT transformer | ATD1002 |
| | T102 FM matching transformer | ATE-063 |
| | F103 FM ceramic filter | ATF-107 |
| | F102 FM ceramic filter | ATF-119 |
| | F101 FM bandpass filter | ATF-155 |
| | F104 AM ceramic filter | ATF-208 |

### CAPACITORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C163 (22000μF/5.5V) | ACH1023 |
| | TC103 Ceramic trimmer | ACM-020 |
| | TC101, TC102 Ceramic trimmer | ACM-026 |
| | C116, C181 | CCCSL101J50 |
| | C113 | CCDCH010C50 |
| | C106 | CCDCH020C50 |
| | C101 | CCDCH040C50 |
| | C111 | CCDCH080D50 |
| | C108, C114, C159, C160, C174 | CCDCH150J50 |
| | C169, C170 | CCDCH270J50 |

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | C110 | CCDCH330J50 |
| | C176 | CCDCH560J50 |
| | C104 | CCDRH180J50 |
| | C107 | CCDSL101J50 |
| | C128 | CCDSL221J50 |
| | C109 | CCDTH150J50 |
| | C117 | CCDUJ120J50 |
| | C130 | CEANP010M50 |
| | C146 | CEASR22M50 |
| | C182 | CEASOR1M50 |
| | C141, C155, C157, C171, C179 | CEAS010M50 |
| | C121, C145 | CEAS1R5M50 |
| | C164, C165 | CEAS100M25 |
| | C180 | CEAS101M10 |
| | C124, C161, C168 | CEAS101M16 |
| | C139, C150, C151 | CEAS2R2M50 |
| | C134, C144 | CEAS3R3M50 |
| | C122, C127, C131 | CEAS330M16 |
| | C135 | CEAS4R7M50 |
| | C136, C166 | CEAS470M10 |
| | C154, C156 | CEAS470M16 |
| | C148, C149 | CKCYB102K50 |
| | C138 | CKCYB222K50 |
| | C152, C153 | CKCYB332K50 |
| | C119, C132, C140 | CKCYF103Z50 |
| | C120 | CKCYF223Z50 |
| | C133, C143, C147 | CKCYF473Z50 |
| | C137 | CKCYX473M25 |
| | C112 | CKDYB102K50 |
| | C102, C103, C105, C123, C172, C173 | CKDYF103Z50 |
| | C115, C125, C126, C129, C175, C178 | CKDYF223Z50 |
| | C158, C162 | CKDYF473Z50 |
| | C177 | CQSA301J50 |
| | C118 | CQSA431J50 |
| | C142 | CQSA471J50 |
| | C183 | CKDYF103Z50 |

### RESISTORS

| Mark | Symbol & Descriptiofn | | Part No. |
|---|---|---|---|
| ★ | VR101 | Semi-fixed (4.7kΩ) | VRTB6VS472 |
| | R226 | | RD1/2PM220J |
| | R162, R167, R168, R170, R171, R225 | | RD1/4PM□□□J |
| | | Other resistors | RD1/8PM□□□J |

### OTHERS

| Mark | Symbol & Description | | Part No. |
|---|---|---|---|
| | | Antenna terminal (4P) (PAL) | AKA1002 |
| ★ | V101 | Fluorescent tube | AAV-017 |
| ★ | X102 | Ceramic resonator | ASS-030 |
| ★ | X101 | Crystal resonator | ASS1005 |

## Tuning Assembly

### SEMICONDUCTORS

| Mark | Symbol & Description | | Part No. |
|---|---|---|---|
| ★ | D402 | LED assembly | AEL1009 |
| ★ | D401 | LED assembly | AEL1024 |

### SWITCHES

| Mark | Symbol & Description | | Part No. |
|---|---|---|---|
| ★★ | S401 – S404 | Tact switch (TUNING–, TUNING+, MEMORY, BAND) | ASG-711 |

### RESISTORS

| Mark | Symbol & Description | Part No. |
|---|---|---|
| | R401 | RD1/8PM332J |

## LED Assembly

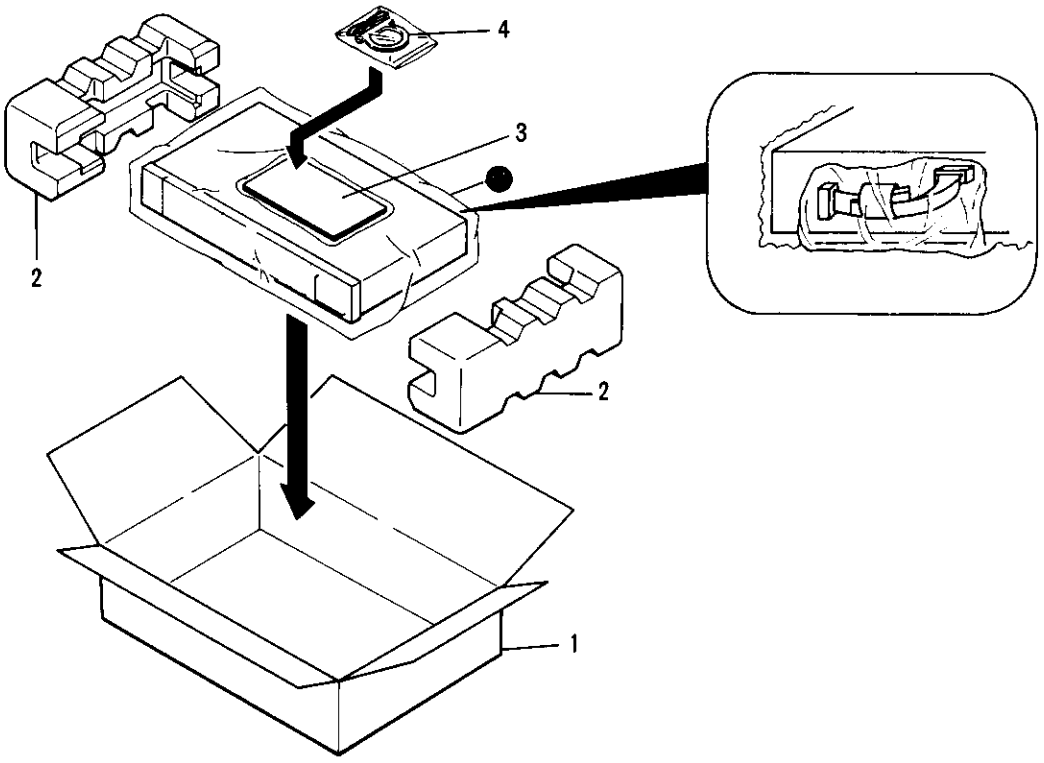
### SEMICONDUCTORS

| Mark | Symbol & Description | | Part No. |
|---|---|---|---|
| ★ | D301, D302 | LED assembly | AEL1024 |

### SWITCHES

| Mark | Symbol & Description | | Part No. |
|---|---|---|---|
| ★★ | S301, S302 | Tact switch (FM MONO, STEREO) | ASG-711 |

# 7. PACKING




● **Parts List of Packing**

| Mark | No. | Part No. | Description |
|---|---|---|---|
| | 1. | AHD1164 | Packing case |
| | 2. | AHA1046 | Side pad |
| | 3. | ARH-051 | Supplementary instructions |
| | 4. | AEA1002 | Antenna set |
| | 51. | | Packing sheet |

# 8. ADJUSTMENT

## PREPARATION

- Connect TP15 (GND) with TP17 (GND).
- Supply DC 12V between TP18 and TP17, and between TP13 and TP15 (see Fig. 8-1).

### FM Tuner Adjustment

- Make the wire connections as shown in Fig. 8-2.
- Set the function to FM.

| Step No. | FM SG (1kHz ± 75kHz dev.) | | F-X88ZL Reception Frequency Display | Adjustment | |
|---|---|---|---|---|---|
| | Frequency (MHz) | Level (dBμ) | | Adjustment Location | Specifications |
| 1 | 98.0 | 60 | 98.0MHz | L105 | Adjust so that DC voltage is 0V ±0.1V for TP28 (TMETER 1) and TP26 (TMETER 2). |
| 2 (*3) | 98.0 | 60 | 98.0MHz | T101, T102 | Adjust the output terminal (TP5: L ch, TP7: Rch) voltage to the maximum. |
| 3 | — | — | 98.0MHz | VR101 | Ground TP25 through the 220μF capacitor, and adjust the frequency of TP8 to 76kHz ±200Hz. |
| 4 | 98.0 *1 (stereo modulation) | 60 | 98.0MHz | T102 | Adjust the output terminal (TP5: Lch, TP7: Rch) distortion to the minimum. |

(*1) Stereo Modulation: Main 1kHz L + R ±68.25Hz dev.
Pilot 19kHz ±6.75kHz dev.

(*3) The method of adjustment in step 2 is different for F-X88Z/ZEZ type. For details, refer to service manual (ARP1341) for type F-X88Z/ZEZ.

### MW Tuner Adjustment

- Make the connections as shown in Fig. 8-3.
- Set the function to MW.

| Step No. | AM SG (400Hz, 30% modulation) | | F-X88ZL Reception Frequency Display | Adjustment | |
|---|---|---|---|---|---|
| | Frequency (kHz) | Level (dBμ) | | Adjustment Location | Specifications |
| 1 | — | — | 531kHz | L107 | Adjust TP3 (VT) to 1.3V ±0.1V. |
| 2 | — | — | 1602kHz | TC102 | Adjust TP3 (VT) to 10V ±0.5V. |
| 3 | 603 | Level at which output is not saturated. | 603kHz | T103 (*2) | Adjust the output terminal (TP5: L ch, TP7: R ch) voltage to the maximum. |
| 4 | 1395 | | 1395kHz | TC101 (*2) | |

(*2) F104 is adjusted for F-X88Z/ZIOX1B type.

### LW Tuner Adjustment

- Make the connections as shown in Fig. 8-3.
- Set the function to LW.
- F-X88ZL/ZEB type only.

| Step No. | AM SG (400Hz, 30% modulation) | | F-X88ZL Reception Frequency Display | Adjustment | |
|---|---|---|---|---|---|
| | Frequency (kHz) | Level (dBμ) | | Adjustment Location | Specifications |
| 1 | — | — | 281kHz | L110 | Adjust TP3 (VT) to 5.2V. |
| 2 | 164 | Level at which output is not saturated. | 164kHz | T104 | Adjust the output terminal (TP5: L ch, TP7: R ch) voltage to the maximum. |
| 3 | 254 | | 254kHz | TC103 | |

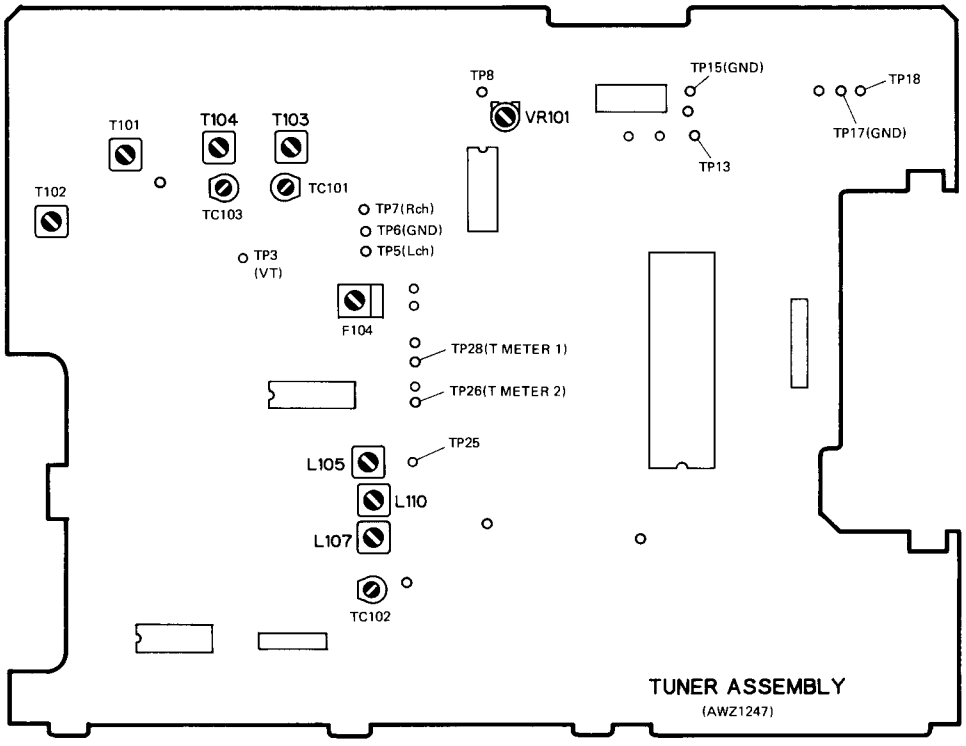



Fig. 8-1 Adjustment point

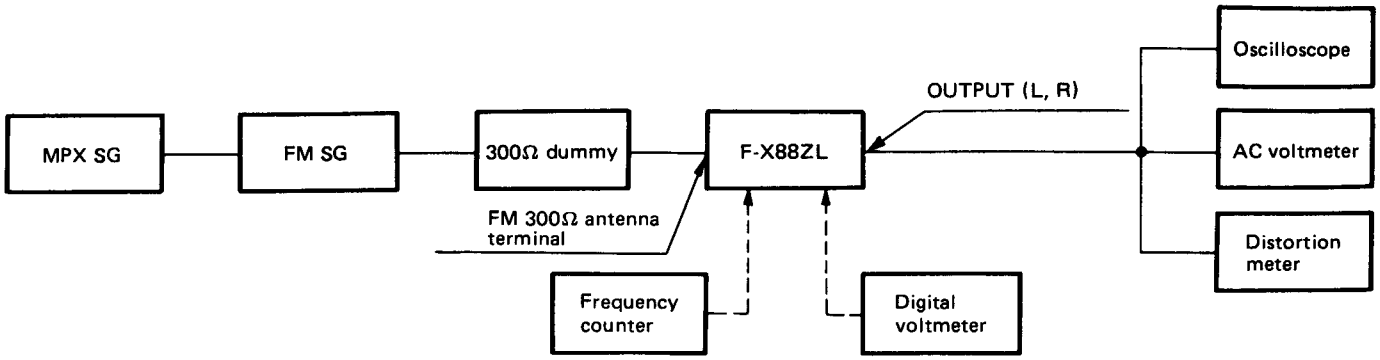



Fig. 8-2 FM Tuner Connection

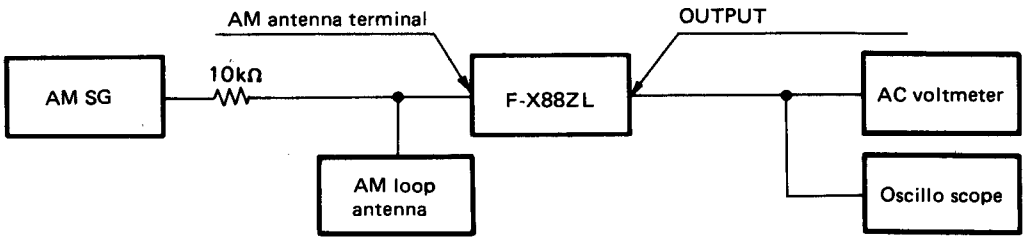



Fig. 8-3 AM Tuner Connection

# 8. RÉGLAGE

## PRÉPARATIFS

- Raccorder TP15 (Terre) à TP17 (Terre).
- Fournir un courant continu de 12 V entre TP18 et TP17, et entre TP13 et TP15 (voir Fig. 8-1).

### Réglage du tuner FM

- Effectuer les connexions des fils de la façon indiquée dans la Fig. 8-2.
- Régler la fonction sur FM.

| Etape N° | FM SG (1kHz ± 75kHz dév.) | | F-X88ZL Affichage de fréquence de réception | Réglage | |
|---|---|---|---|---|---|
| | Fréquence (MHz) | Niveau (dBμ) | | Lieu de réglage | Caractéristiques |
| 1 | 98,0 | 60 | 98,0MHz | L105 | Ajuster de telle façon que la tension CC soit de 0V ±0,1V pour TP28 (TMETER 1) et TP26 (TMETER 2). |
| 2 (*3) | 98,0 | 60 | 98,0MHz | T101, T102 | Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum. |
| 3 | — | — | 98,0MHz | VR101 | Mettre à la terre TP25 en passant par le capaciteur de 220 μF, et ajuster la fréquence de TP8 à 76kHz ±200Hz. |
| 4 | 98,0 *1 (modulation stéréo) | 60 | 98,0MHz | T102 | Ajuster la distortion de la borne de sortie (TP5: canal gauche, TP7: canal droit) au minimum. |

(*1) Modulation stéréo: Déviation principale de 1kHz G + D ±68,25Hz
Déviation pilote de 19kHz ±6,75kHz

(*3) La méthode de réglage à l'étape 2 diffère pour le F-X88Z/ZEZ. Pour de plus amples détails, se reporter au mode d'emploi (ARP1341) du F-X88Z/ZEZ.

### Réglage du tuner MW

- Effectuer les connexions comme indiqué dans la Fig. 8-3.
- Régler la fonction sur MW.

| Etape N° | AM SG (400Hz, 30% modulation) | | F-X88ZL Affichage de fréquence de réception | Réglage | |
|---|---|---|---|---|---|
| | Fréquence (kHz) | Niveau (dBμ) | | Lieu de réglage | Caractéristiques |
| 1 | — | — | 531kHz | L107 | Ajuster TP3 (VT) sur 1,3V ±0,1V. |
| 2 | — | — | 1602kHz | TC102 | Ajuster TP3 (VT) sur 10V ±0,5V. |
| 3 | 603 | Niveau auquel la sortie n'est pas saturée. | 603kHz | T103 (*2) | Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum. |
| 4 | 1395 | | 1395kHz | TC101 (*2) | |

(*2) F104 est réglé pour le type F-X88Z/ZIOX1B.

### Réglage du tuner LW

- Effectuer les connexions comme indiqué dans la Fig. 8-3.
- Régler la fonction sur LW.
- F-X88ZL/ZEB uniquement.

| Etape N° | AM SG (400Hz, 30% modulation) | | F-X88ZL Affichage de fréquence de réception | Réglage | |
|---|---|---|---|---|---|
| | Fréquence (kHz) | Niveau (dBμ) | | Lieu de réglage | Caractéristiques |
| 1 | – | – | 281kHz | L110 | Ajuster TP3 (VT) sur 5,2V |
| 2 | 164 | Niveau auquel la sortie n'est pas saturée. | 164kHz | T104 | Ajuster la tension de la borne de sortie (TP5: canal gauche, TP7: canal droit) au maximum. |
| 3 | 254 | | 254kHz | TC103 | |

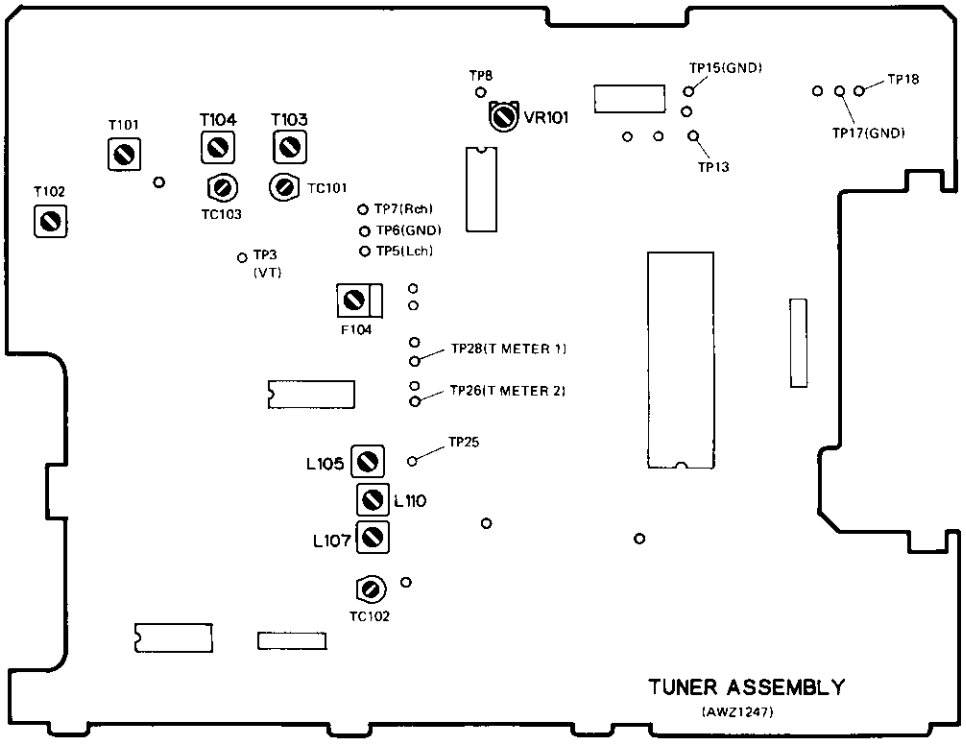



Fig. 8-1 Positions de réglage

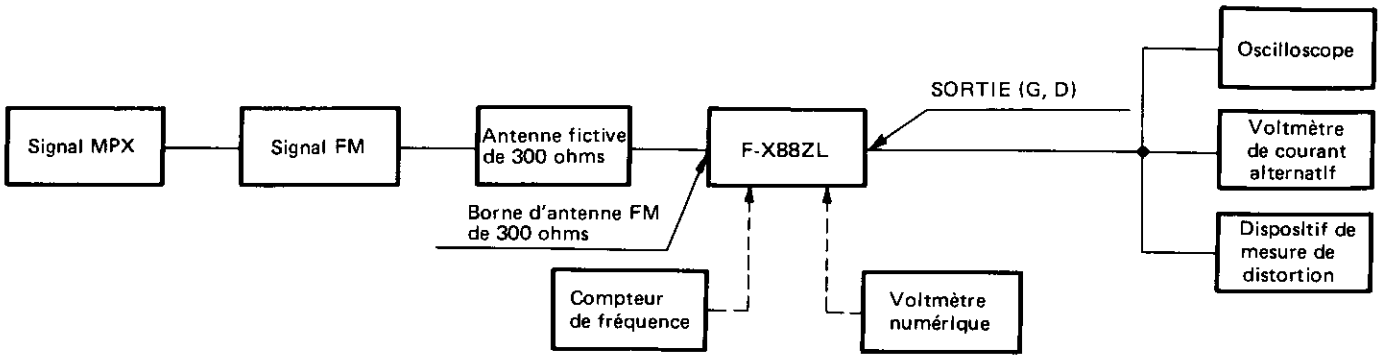



Fig. 8-2 Connexion du tuner FM

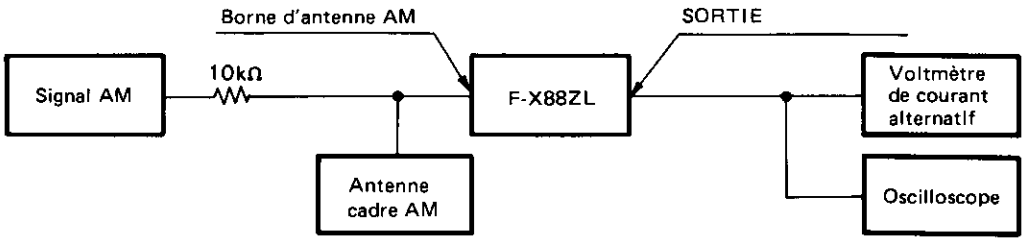



Fig. 8-3 Connexion du tuner AM

# 8. AJUSTE

## PREPARATIVOS

- Conecte TP15 (masa) con TP17 (masa).
- Aplique 12V CC entre TP18 y TP17, y entre TP13 y TP15 (consulte la Fig. 8-1).

### Ajuste del sintonizador de FM

- Realice las conexiones como se muestra en la Fig. 8-2.
- Ponga el selector de función en FM.

| No.de paso | FM SG (1kHz ± 75kHz dev.) | | F-X88ZL Frecuencímetro de recepción | Ajuste | |
|---|---|---|---|---|---|
| | Frecuencia (MHz) | Nivel (dBμ) | | Lugar de ajuste | Especificaciones |
| 1 | 98.0 | 60 | 98,0MHz | L105 | Ajuste de forma que la tensión de CC sea de 0V ±0,1V para TP28 (TMETER 1) y TP26 (TMETER 2). |
| 2 | 98.0 | 60 | 98,0MHz | T101, T102 | Ajuste la tensión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al máximo valor. |
| 3 (*3) | — | — | 98,0MHz | VR101 | Ponga TP25 a masa a través de un capacifor de 220 μF, y ajuste la frecuencia de TP8 a 76kHz ±200Hz. |
| 4 | 98,0 *1 (modulación estéreo) | 60 | 98,0MHz | T102 | Ajuste la distorsión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al mínimo estéreo) |

(*1) Modulación estéreo: Principal 1kHz canal izquierdo + canal derecho ±68,25Hz de desviación
Piloto 19kHz ±6,75kHz de desviación

(*3) El método de ajuste del paso 2 es diferente para el tipo F-X88Z/ZEZ. Con respecto a los detalles, consulte el manual de servicio (ARP1341) para el tipo F-X88Z/ZEZ.

### Ajuste del sintonizador de MW

- Realice las conexiones como se muestra en la Fig. 8-3.
- Ponga el selector de función en MW.

| No.de paso | AM SG (400Hz, 30% modulation) | | F-X88ZL Frecuencímetro de recepción | Ajuste | |
|---|---|---|---|---|---|
| | Frecuencia (kHz) | Nivel (dBμ) | | Lugar de ajuste | Especificaciones |
| 1 | — | — | 531kHz | L107 | Ajuste TP3 (VT) a 1,3V ±0,1V. |
| 2 | — | — | 1602kHz | TC102 | Ajuste TP3 (VT) a 10V ±0,5V. |
| 3 | 603 | Nivel en el que la salida no se satura | 603kHz | T103 (*2) | Ajuste la tensión del terminal de salida (TP5: canal izquierdo, TP7: canal derecho) al máximo valor. |
| 4 | 1395 | | 1395kHz | TC101 (*2) | |

(*2) F104 se ajusta para el tipo F-X88Z/ZIOX1B.

### Ajuste del sintonizador de LW

- Realice las conexiones como se muestra en la Fig. 8-3.
- Ponga el selector de función en LW.
- Tipo F-X88ZL/ZEB solamente.

| No. de paso | AM SG (400Hz, 30% modulation) | | F-X88ZL Frecuencímetro de recepción | Ajuste | |
|---|---|---|---|---|---|
| | Frecuencia (kHz) | Nivel (dBμ) | | Lugar de ajuste | Especificaciones |
| 1 | — | — | 281kHz | L110 | Ajuste TP3 (VT) a 5,2V. |
| 2 | 164 | Nivel en el que la salida no se satura | 164kHz | T104 | Ajuste la tensión del terminal de salida TP5: canal izquierdo, TP7: canal derecho) al máximo valor. |
| 3 | 254 | | 254kHz | TC103 | |

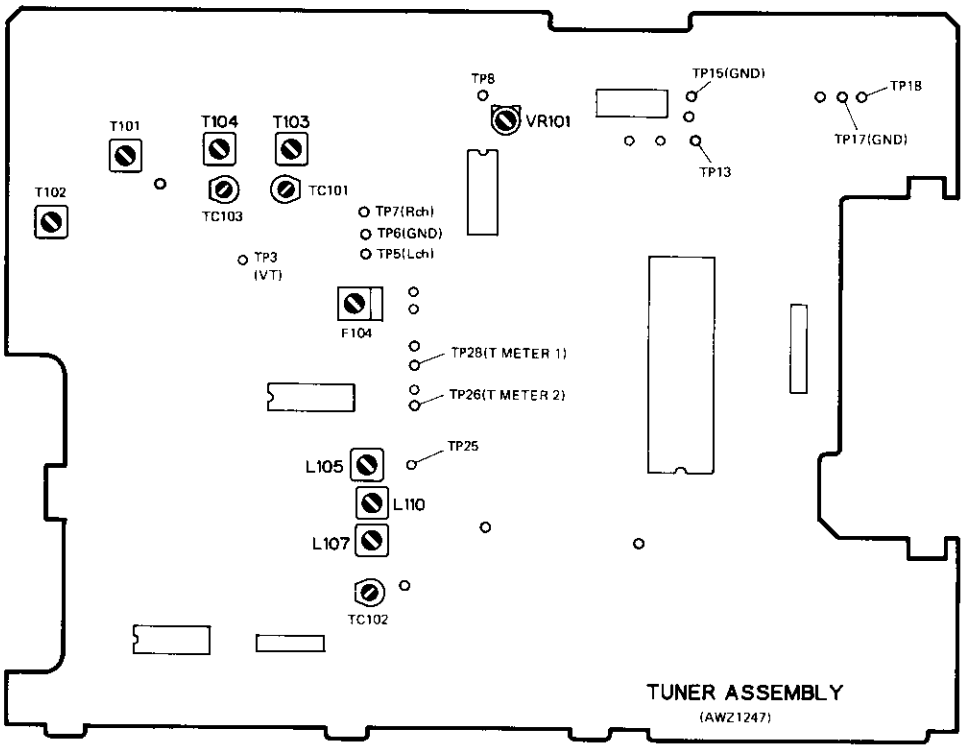



Fig. 8-1 Posiciones de ajuste

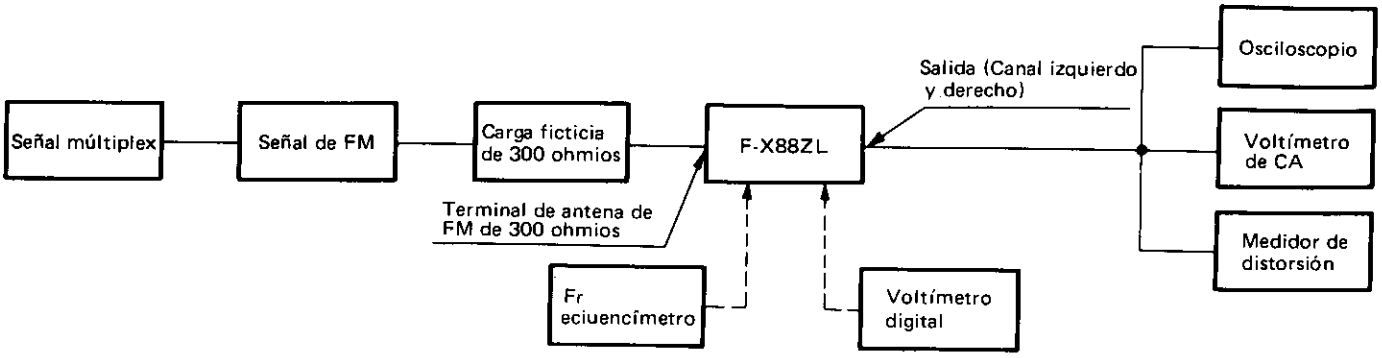



Fig. 8-2 Conexiones del sintonizador de FM

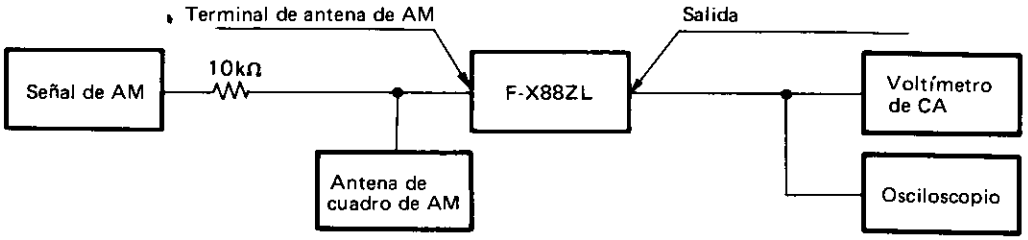



Fig. 8-3 Conexiones del sintonizador de AM

# ADVARSEL

**ADVARSEL!**

Lithiumbatteri. Eksplosionsfare. Udskiftning må kun foretages af en sagkyndig, og som beskrevet i servicemanualen.

Denne advarsel or angivet på produktet eller i brugsvejledningen. Ved udskiftning af lithium batterierne følges nedenstående anveisning. Batterierne må kun udskiftes med batterier af samme type og mærke.

**WARNING!**

Lithium batteries. Danger of explosion. Replacement must be done by qualified personnel and only by following the instructions given in the service manual.

This warning is stated on the product or in the operating instructions. When replacing the lithium batteries, follow the note below. The batteries must be replaced only by batteries of the same type and manufacture.

TL