

DENON

Hi-Fi AM-FM Stereo Tuner

SERVICE MANUAL

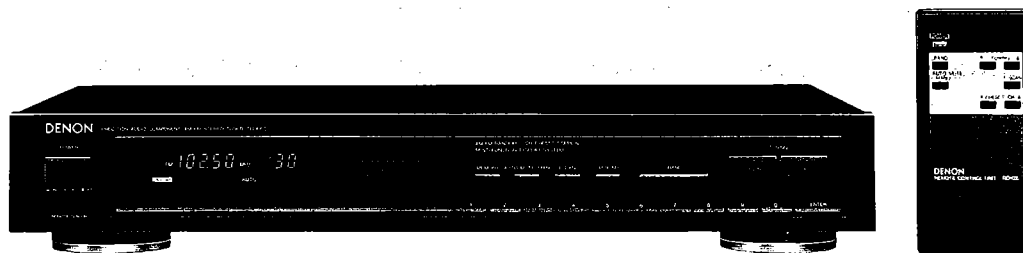
MODEL TU-660/660L

TU-660

2-BAND (AM-FM) STEREO TUNER

TU-660L

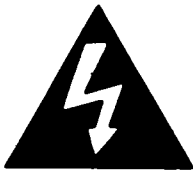
3-BAND (LW-MW-FM) STEREO TUNER



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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 SERVICE-ABLE 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.

CAUTION

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION

POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

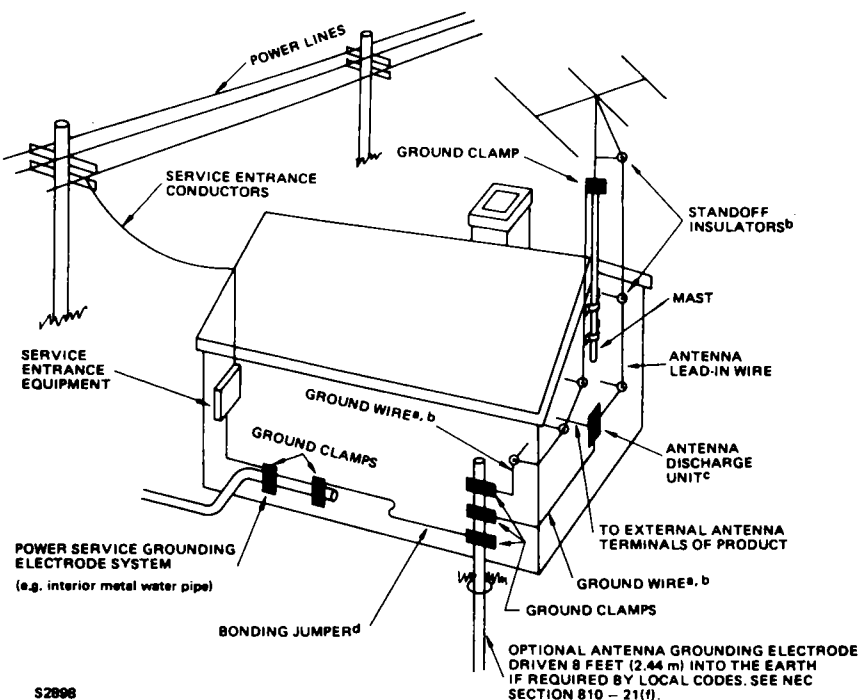
SAFETY INSTRUCTIONS

1. Read Instructions – All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions – The safety and operating instructions should be retained for future reference.
3. Heed Warnings – All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions – All operating and use instructions should be followed.
5. Water and Moisture – The appliance should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands – The appliance should be used only with a cart or stand that is recommended by the manufacturer.
- 6A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
7. Wall or Ceiling Mounting – The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation – The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat – The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.



10. **Power Sources** – The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. **Grounding or Polarization** – The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
12. **Power-Cord Protection** – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. **Protective Attachment Plug** – The appliance is equipped with an attachment plug having overload protection. This is a safety feature. See Instruction Manual for replacement or resetting of protective device. If replacement of the plug is required, be sure the service technician has used a replacement plug specified by the manufacturer that has the same overload protection as the original plug.
14. **Cleaning** – The appliance should be cleaned only as recommended by the manufacturer.
15. **Power Lines** – An outdoor antenna should be located away from power lines.
16. **Outdoor Antenna Grounding** – If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.
17. **Nonuse Periods** – The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
18. **Object and Liquid Entry** – Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
19. **Damage Requiring Service** – The appliance should be serviced by qualified service personnel when:
 - A. The power-supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled into the appliance; or
 - C. The appliance has been exposed to rain; or
 - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - E. The appliance has been dropped, or the enclosure damaged.
20. **Servicing** – The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FIGURE A
EXAMPLE OF ANTENNA GROUNDING ACCORDING
TO NATIONAL ELECTRICAL CODE INSTRUCTIONS
CONTAINED IN ARTICLE 810 – "RADIO AND
TELEVISION EQUIPMENT"



^a Use No. 10 AWG (5.3 mm²) copper, No. 8 AWG (8.4 mm²) aluminum, No. 17 AWG (1.0 mm²) copper-clad steel or bronze wire, or larger, as a ground wire.

^b Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4-6 feet (1.22-1.83 m) apart.

^c Mount antenna discharge unit as close as possible to where lead-in enters house.

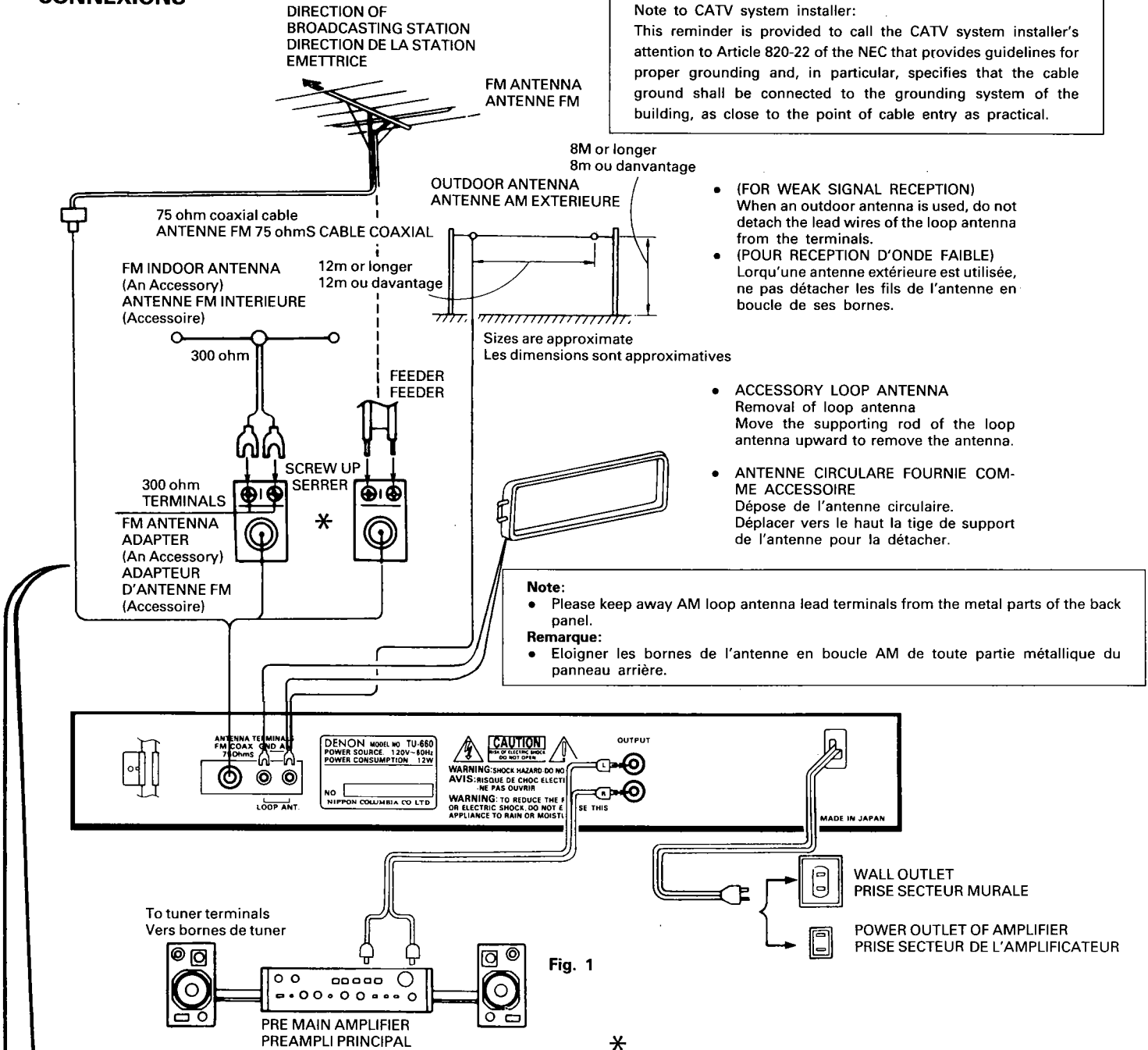
^d Use jumper wire not smaller than No. 6 AWG (13.3 mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).

**CONNECTIONS
CONNEXIONS**

USA MODEL ONLY

Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.



Note:

- Please keep away AM loop antenna lead terminals from the metal parts of the back panel.

Remarque:

- Eloigner les bornes de l'antenne en boucle AM de toute partie métallique du panneau arrière.

- (FOR WEAK SIGNAL RECEPTION)
When an outdoor antenna is used, do not detach the lead wires of the loop antenna from the terminals.
- (POUR RECEPTION D'ONDE FAIBLE)
Lorsqu'une antenne extérieure est utilisée, ne pas détacher les fils de l'antenne en boucle de ses bornes.
- ACCESSORY LOOP ANTENNA
Removal of loop antenna
Move the supporting rod of the loop antenna upward to remove the antenna.
- ANTENNE CIRCULAIRE FOURNIE COMME ACCESSOIRE
Dépose de l'antenne circulaire.
Déplacer vers le haut la tige de support de l'antenne pour la détacher.

Fig. 1

75 ohm Coaxial Terminal • Borne coaxiale 75 ohms

1. Cut off the shield and remove the core wire insulation.
Couper le fil blindé et retirer l'isolant du fil de noyau.
2. If the core wire is stranded, solder it.
Si le fil de noyau est torsadé, le souder.
3. Spread out the shield wire with the ring and install the connector.
Etaler le fil blindé avec l'anneau et installer le connecteur.
4. Core Wire Insulation Shield Wire
Isolant de fil de noyau Fil blindé
5. Tighten the ring
Serrer l'anneau
6. Cut off the excess core wire
Couper le fil de noyau en excès.

*** Open the cover
Ouvrir le panneau**

SHUT FERMER

CLAMP SERRER

PULL TIRER

ANTENNA ADAPTER 3C-2V
ADAPTEUR D'ANTENNE

CLAMP SERRER

SHUT FERMER

CLAMP SERRER

75 ohm COAXIAL CABLE
CABLE COAXIAL 75 ohms

14mm

19mm

9mm

14mm

5mm

5mm

3C-2V

5C-2V

**FRONT PANEL
PANNEAU AVANT**

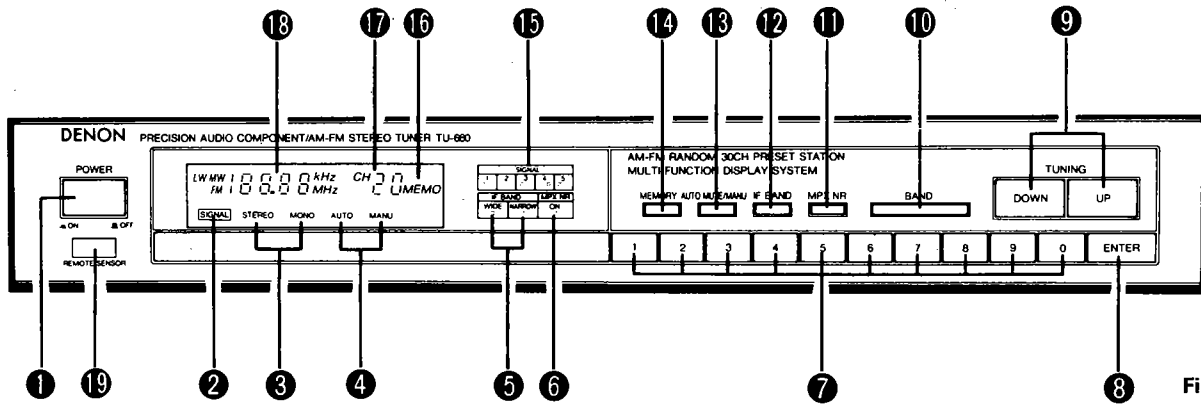


Fig. 2

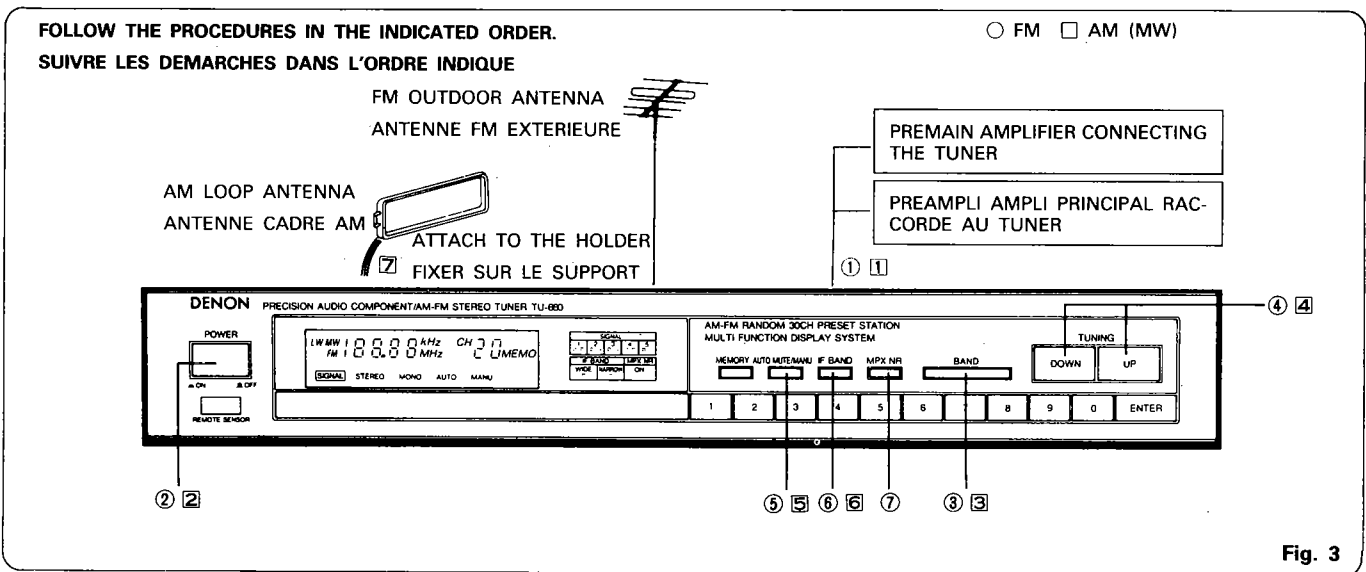


Fig. 3

CAUTION

1. Noise may be generated if a near-by television set is on during AM broadcasting reception. The tuner should be used as far away from a television as possible.
2. Effective period of memory back-up is about a month under normal temperature. If the memorized stations cannot be called back, preset the stations again.

PRECAUTION

1. Il y aura des bruits si un téléviseur situé à proximité est allumé lors de la réception d'émissions AM. Le tuner devrait être utilisé le plus loin possible d'un téléviseur.
2. La période effective de référence en mémoire st d'environ un mois dans les conditions de température normale. Si les stations mises en mémoire ne peuvent pas être captées, recommencer le préréglage.

ENGLISH

DESIGNATIONS AND FUNCTIONS OF PANEL CONTROLS

- 1 POWER (Power ON-STANDBY/OFF Switch)**
The unit works 2 to 3 seconds after this switch is turned on.
- 2 SIGNAL (Signal Indicator)**
This lights when a station can be received.
- 3 STEREO/MONO (Stereo/Mono Indicator)**
"STEREO" lights automatically when receiving a stereo broadcast.
"MONO" lights when receiving a monaural broadcast or no broadcast at all.
- 4 TUNING MODE (AUTO/MANUAL)**
Pressing MODE **13** causes "AUTO" and "MANUAL" to light up alternately.
- 5 WIDE/NARROW (IF BAND LED Indicator)**
Pressing "IF BAND" **12** causes WIDE or NARROW to light up alternately.
- 6 MPX NR (MPX NR Indicator)**
This LED indicator lights up when the MPX NR button **11** is pressed and this circuit is operated.
- 7 TEN KEYS (Ten Key Buttons)**
Used to specify numbers for Memory and Preset Call. Channels 1-30 can be specified using these buttons.
Preset Call Setting Method
A station that has already been preset can be fetched by the following method.
Pressing **1**, **2**, **ENTER** in order fetches the station present in memory for channel 12.
- 8 ENTER (Enter Button)**
Used for setting Memory, and Preset Call.
- 9 TUNING (Tuning Buttons)**
Used to change the received frequency to a higher frequency (UP) or a lower frequency (DOWN).
- 10 BAND (Band Button)**
Selects between FM or AM.
- 11 MPX NR (MPX NR Button)**
Switches MPX NR "ON" or "OFF". Lights "ON" LED **6**.
ON: Suppresses noise when a stereo broadcast with a weak signal is being received.
OFF: Does not carry out the above operation.
- 12 IF BAND (IF Bandwidth Selector Button)**
Selects the bandwidth of the FM and AM intermediate frequency amplifier from 2 ranges, "WIDE" and "NARROW".
This LED indicator **5** lights up at this time.
- 13 AUTO MUTE/MANU (Tuning Mode Button)**
This switches between auto and manual tuning.
Auto tuning: When the UP key is pressed, the radio is tuned automatically to a higher frequency. Press the DOWN key 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.
- 14 MEMORY (Memory Button)**
Used to store the frequency of the station currently received.
Pressing **MEMORY**, **1**, **2**, **ENTER** in order stores the station on channel 12 in memory. Up to 30 channels of either FM or AM can be stored in memory.
- 15 SIGNAL (Signal-Strength Indicators)**
The number of LEDs that light increases in correspondence with the strength of the signal being picked up by the antenna.
- 16 MEMORY (Memory Indicator)**
This indicator lights when the MEMORY button **14** is pressed.
- 17 CHANNEL (Channel Indicator)**
This displays the number of the channel at which the station is stored.
- 18 DIGITAL FREQUENCY INDICATOR**
Reception frequencies are digitally indicated with numbers. The FM frequency unit is MHz; the AM (MW) frequency unit is kHz.
- 19 REMOTE SENSOR (Remote Control Photosensitive Window)**
This sensor receives the infrared light transmitted from the wireless remote control unit.
When operating the wireless remote control unit, point it towards this sensor.
The wireless remote control unit included with the DENON AVC-2000, AVC-700 or DAP 2500 can be used to switch the preset channels up or down.

OPERATION INSTRUCTIONS

PREPARATION

CHECKING CONNECTIONS

- Check all the connections by referring to connection diagram (Fig. 1).
- Check that the right (R) and left (L) channels of the speakers are connected to the corresponding right (R) and left (L) plugs, and check that polarities (positive and negative) are correctly matched.
- Check that the right (R) and left (L) pins are correctly inserted to the corresponding jacks.
- Check that all the cords are firmly connected.
* Turn on the power with the POWER switch after checking all the connections.

CHECKING ANTENNA

1. Do not incorrectly connect the loop antenna. If you are not sure how to connect the loop antenna, refer to Fig. 1.
2. Use of loop antenna: Keep the loop antenna away from the main body. If the antenna contacts a metal body, reception sensitivity is degraded, thus resulting in unclear reproduction.

ADVICE FOR USE

- Do not place the set in direct sunlight, in hot areas such as near heating equipment, with high humidity or dust levels. This may cause damage to the unit.
- Check that all parts are connected correctly before turning on the power source.
- When user is absent for long periods, be sure to remove plug from wall socket.
- Do not use insecticide, benzene or thinner near the unit, or the cabinet color will fade. Avoid using polish: use a soft cloth (e.g. silicon cloth).
- It is not recommended to place players, decks and other objects on the this appliance so that the ventilation openings are blocked.
This will cause internal temperature rise and equipment failure. Do not use this appliance in a closed cabinet or container. This will cause internal temperature rise abnormally.

SPECIFICATIONS• **FM SECTION**

Frequency Range:	87.5 MHz~108.0 MHz
Antenna Terminal:	75 ohm Unbalanced
Usable Sensitivity:	1.0 μ V (11.2 dBf)
S/N 50 dB Sensitivity:	Monaural 1.6 μ V (15.3 dBf) Stereo 20 μ V (37.2 dBf) (μ V at 75 ohms, 0 dBf= 10^{-15} W)
Image Interference Ratio:	80 dB
IF Interference Ratio:	100 dB
AM Suppression Ratio:	60 dB
Effective Selectivity:	NARROW 75 dB (\pm 400 kHz) WIDE 50 dB (\pm 400 kHz)
Capture Ratio:	1.3 dB
Frequency Characteristics:	20 Hz~15 kHz +0.5 dB, -1.0 dB
Signal-to-noise Ratio:	Monaural 88 dB Stereo 82 dB
Total Harmonic Distortion:	Mono 1 kHz (at 75 kHz dev.) 0.06% Stereo 1 kHz (at 67.5 kHz dev.) 0.1%
Stereo Separation 1 kHz:	50 dB

• **AM (MW) SECTION
MEDIUM WAVE**

Frequency Range:	520 kHz~1710 kHz
Antenna Terminals:	Terminal Type with Loop Ant.
Usable Sensitivity:	18 μ V
Signal-to-noise Ratio:	53 dB

• **OTHERS**

Power Supply:	AC 120V 60Hz
Power Consumption:	12W
Dimensions:	434(17-3/32")(W) \times 74(2-29/32")(H) \times 287(11-19/64")(D)mm
Net Weight:	3.1 kg (6 lbs 13 oz)

SPECIFICATIONS• **SECTION FM**

Plage de fréquence d'accord:	87,5 MHz ~ 108,0 MHz
Bornes d'antenne:	75 ohms non équilibrées
Sensibilité utilisable:	1,0 μ V (11,2 dBf)
Rapport S/B 50 dB sensibilité:	Monaural 1,6 μ V (15,3 dBf) Stéréo 20 μ V (37,2 dBf) (à 75 ohms, 0 dBf = 10^{-15} W)
Réjection image:	80 dB
Réjection FI:	100 dB
Suppression AM:	60 dB
Sélectivité effective:	NARROW 75 dB (\pm 400 kHz) LARGE 50 dB (\pm 400 kHz)
Taux de capture:	1,3 dB
Réponse en fréquence:	20 Hz ~ 15 kHz +0,5 dB, -1,0 dB
Rapport signal / bruit:	Monaural 88 dB Stéréo 82 dB
Distorsion harmonique totale:	Mono 1 kHz (à 75 kHz dev.) 0,06% Stéréo 1 kHz (à 67,5 kHz dev.) 0,1%
Séparation stéréo 1 kHz:	50 dB

• **SECTION AM (MW)
ONDES MOYENNES**

Plage de fréquence d'accord:	520 kHz ~ 1710 kHz
Bornes d'antenne:	Borne de type antenne-cadre
Sensibilité utilisable:	18 μ V
Rapport signal / bruit:	53 dB

• **GENERALITES**

Alimentation:	Secteur 120 V 60 Hz,
Puissance absorbée:	12 W
Dimensions:	434(17-3/32")(L) \times 74(2-29/32")(H) \times 287(11-19/64")(P)mm
Poids net:	3,1 kg (6 livres 13 onces)

Design and Specifications are subject to change without prior notice.
Conception et Spécifications sujettes à modifications sans préavis.

● FOR UNITED KINGDOM MODEL ONLY

WARNING:

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

● FÜR DEUTSCHE MODELL NUR

Die Deutsche Bundespost informiert

Sehr geehrter Rundfunkteilnehmer,

Dieses Gerät ist von der Deutschen Bundespost als Ton- bzw. Fernseh-Rundfunkempfänger bzw. als Komponente einer solchen Anlage (Tuner, Verstärker, aktive Lautsprecherbox, Fernseh-Monitor u. dgl.) zugelassen. Es entspricht den zur Zeit geltenden Technischen Vorschriften und ist zum Nachweis dafür mit dem Zulassungszeichen der Deutschen Bundespost gekennzeichnet. Bitte überzeugen Sie sich selbst. Dieses Gerät darf im Rahmen der "Allgemeingenehmigung für das Errichten und Betreiben von Ton- und Fernseh-Rundfunkempfängern" in der Bundesrepublik Deutschland betrieben werden. Beachten Sie aber bitte, daß aufgrund dieser Genehmigung nur für die Allgemeinheit bestimmte Sendungen und solche, für die ebenfalls eine Allgemeine Empfangsgenehmigung erteilt worden ist*), empfangen und wiedergegeben werden dürfen. Wer unbefugt andere Sendungen (z. B. des Polizeifunks, des Mobilfunks) empfängt und wiedergibt, verstößt gegen die Genehmigungsaufgaben und macht sich daher nach § 15, Absatz 2a des Gesetzes über Fernmeldeanlagen strafbar. Die Kennzeichnung mit dem Zulassungszeichen bietet Ihnen die Gewähr, daß dieses Gerät keine anderen ordnungsgemäß errichteten und betriebenen elektrischen Anlagen stört. Der Zusatzbuchstabe S**) beim Zulassungszeichen besagt außerdem, daß das Gerät gegen störende Beeinflussungen durch andere ordnungsgemäß errichtete und betriebene elektrische Anlagen weitgehend unempfindlich ist, Geräte ohne den Zusatz S sind nicht besonders sicher gegen Beeinflussungen. Sollten bei Geräten mit dem Zusatz S ausnahmsweise trotzdem Beeinflussungen auftreten, oder wenn Sie Fragen haben, so wenden Sie sich bitte an die örtlich zuständige Funkstörungsmeßstelle.

*) Zur Zeit für den Empfang der Aussendungen von Amateurfunkstellen und der Normalfrequenz- und Zeitzeichensendungen.

**) Weitere Zusätze haben in Bezug auf die Störfestigkeit keine Bedeutung, Sie geben bei Empfängern vielmehr Aufschluß über Empfangsmöglichkeiten.

Allgemeine Genehmigung für Ton- und Fernseh-Rundfunkempfänger

Die Allgemeine Ton- und Fernseh-Rundfunkgenehmigung vom 11.12.1970 (veröffentlicht im Bundesanzeiger Nr. 234 vom 16.12.1970) wird unter Bezug auf Abschnitt III der Genehmigung durch folgende Fassung der Allgemeinen Genehmigung für Ton- und Fernseh-Rundfunkempfänger gemäß den §§ 1 und 2 des Gesetzes über Fernmeldeanlagen ersetzt.

Genehmigung für Ton- und Fernseh-Rundfunkempfänger

1 Die Errichtung und der Betrieb von Ton- und Fernseh-Rundfunkempfängern werden nach §§ 1 und 2 des Gesetzes über Fernmeldeanlagen in der Fassung der Bekanntmachung vom 17.3.1977 (BGBl. I, S. 459) allgemein genehmigt.

2 Ton- und Fernseh-Rundfunkempfänger im Sinne dieser Genehmigung sind Funkanlagen gemäß § 1 Abs. 1 des Gesetzes über Fernmeldeanlagen, die ausschließlich für den Rundfunkempfang zugelassenen Frequenzabstimmbereiche*) aufweisen und zum Aufnehmen und gleichzeitigen Hör- oder Sichtbarmachen von Ton- oder Fernseh-Rundfunksendungen bestimmt sind. Zum Empfänger gehören auch eingebaute oder mit ihm fest verbundene Antennen sowie bei Unterteilung in mehrere Geräte die funktionsmäßig zugehörigen Geräte. Außer für den Empfang von Rundfunksendungen dürfen Ton- und Fernseh-Rundfunkempfänger nur mit besonderer Genehmigung der Deutschen Bundespost für andere Fernmeldezwecke zusätzlich benutzt werden.

In dem Empfänger eingebaute oder sonst mit ihm verbundene Zusatzgeräte (z.B. Ultraschallfernmeldeanlagen, Infrarotfernmeldeanlagen) werden von dieser Genehmigung nicht erfaßt (ausgenommen die Einrichtungen zum Empfang des Verkehrs-Rundfunks). Desgleichen sind andere technische Empfängereigenschaften, die über den eigentlichen Zweck eines Rundfunkempfängers hinausgehen (z.B. zum Empfang anderer Funkdienste, für die Wiedergabe im Rahmen von Textübertragungsverfahren) hierdurch nicht genehmigt. Hierfür gelten besondere Regelungen.

II

Diese Genehmigung wird unter nachstehenden Auflagen erteilt.

1 Ton- und Fernseh-Rundfunkempfänger müssen den jeweils geltenden Technischen Vorschriften für Ton- und Fernseh-Rundfunkempfänger entsprechen. Eingebaute Zusatzgeräte müssen den für sie geltenden Bestimmungen und technischen Vorschriften genügen.

Änderungen der Technischen Vorschriften, die im Amtsblatt des Bundesministers für das Post- und Fernmeldewesen veröffentlicht werden, muß bei schon errichteten und in Betrieb genommenen Ton- und Fernseh-Rundfunkempfängern nachgekommen werden, wenn durch den Betrieb dieser Rundfunkempfänger andere elektrische Anlagen gestört werden.

Senenmäßig hergestellte Ton- und Fernseh-Rundfunkempfänger müssen zum Nachweis dafür, daß sie den

*) Siehe Technische Vorschriften für Ton- und Fernseh-Rundfunkempfänger, veröffentlicht im Amtsblatt des Bundesministers für das Post- und Fernmeldewesen.

**) Für ausnahmsweise noch nicht gekennzeichnete, vor dem 1.7.1979 errichtete und in Betrieb genommene Ton-Rundfunkempfänger wird die Kennzeichnung nicht verlangt.

Technischen Vorschriften entsprechen, mit einer DBP-Prüfnummer gekennzeichnet sein.**) Die DBP-Prüfnummer sagt über die elektrische und mechanische Sicherheit und die Einhaltung der Strahlenschutzbestimmungen nichts aus.

2 Ton- und Fernseh-Rundfunkempfänger dürfen an ortsfesten oder nichtortsfesten Rundfunk-Empfangsantennenanlagen, Verteilanlagen oder Kabelfernsehanlagen betrieben und im Rahmen der Bestimmungen über private Drahtfernmeldeanlagen mit Drahtfernmeldeanlagen verbunden werden.

Auf demselben Grundstück oder innerhalb eines Fahrzeuges dürfen Ton- und Fernseh-Rundfunkempfänger mit anderen Geräten oder sonstigen Gegenständen (z.B. Plattenspieler, Magnetlaufzeichnungs- und -Wiedergabegeräte, Antennen) verbunden werden, sofern diese Geräte von der Deutschen Bundespost genehmigt sind oder keiner Genehmigung bedürfen.

Die räumliche Kombination von Funkanlagen mit Ton- oder Fernseh-Rundfunkempfängern ist nur dann zulässig, wenn die betreffenden Funkanlagen je für sich genehmigt sind.

3 Mit Ton- oder Fernseh-Rundfunkempfängern dürfen aufgrund dieser Genehmigung nur Sendungen des Rundfunks empfangen werden, also übertragene Tonsignale (Musik, Sprache) und Fernsehsignale (nur Bildinformationen). Andere Sendungen (z.B. des Polizeifunks, der öffentlichen beweglichen Landfunkdienste, Datenübertragungen) dürfen nicht aufgenommen werden, werden sie jedoch unbeabsichtigt empfangen, so dürfen sie weder aufgezeichnet, noch anderen mitgeteilt, noch für irgendwelche Zwecke ausgewertet werden. Das Vorhandensein solcher Sendungen darf auch nicht anderen zur Kenntnis gebracht werden.

4 Durch Ton- oder Fernseh-Rundfunkempfänger darf der Betrieb anderer elektrischer Anlagen nicht gestört werden.

5 Änderungen der Ton- oder Fernseh-Rundfunkempfänger, die die zulässigen Frequenzabstimmbereiche der Empfänger erweitern, gehen über den Umfang dieser Genehmigung hinaus und bedürfen vor ihrer Ausführung einer besonderen Genehmigung der Deutschen Bundespost.

Wer aufgrund dieser Genehmigung einen Ton- oder Fernseh-Rundfunkempfänger betreibt, hat bei einer Änderung der kennzeichnenden Merkmale von Ton- oder Fernseh-Rundfunksendem (insbesondere bei Änderung des Sendeverfahrens oder bei Frequenzwechsel) die ggf. notwendig werdenden Änderungen an den Rundfunkempfängern auf seine Kosten vornehmen zu lassen.

6 Die Deutsche Bundespost ist berechtigt, Rundfunkempfänger und mit ihnen verbundene Geräte darauf zu prüfen, ob die Auflagen der Genehmigung und die Technischen Vorschriften eingehalten werden. Den Beauftragten der Deutschen Bundespost ist das Betreten der Grundstücke oder Räume, in denen sich Ton- oder Fernseh-Rundfunkempfänger befinden, zu den verkehrsüblichen Zeiten zu gestatten. Befinden sich die Rundfunkempfänger oder mit ihnen verbundene Geräte nicht im Verfügungsbereich desjenigen, der die Empfänger betreibt, so hat er den Beauftragten der Deutschen Bundespost Zutritt zu diesen Teilen zu ermöglichen.

III

Bei Funkstörungen die nicht durch Mangel der Rundfunkempfänger oder der mit ihnen verbundenen Geräte verursacht werden, können die Funkmedien der Deutschen Bundespost zur Feststellung der Störung in Anspruch genommen werden.

IV

1 Diese Genehmigung kann allgemein oder durch die örtlich zuständige Oberpostdirektion einem einzelnen Betreiber gegenüber für einen bestimmten Rundfunkempfänger widerrufen werden. Ein Widerruf ist insbesondere zulässig, wenn die unter Abschnitt II aufgeführten Auflagen nicht erfüllt werden.

Anstatt die Genehmigung zu widerrufen, kann die Deutsche Bundespost anordnen, daß bei einem Verstoß gegen eine Auflage ein Ton- oder Fernseh-Rundfunkempfänger außer Betrieb zu setzen ist und erst bei Einhaltung der Auflagen wieder betrieben werden darf.

Die Auflagen dieser Genehmigung können jederzeit ergänzt oder geändert werden.

2 Diese Genehmigung ersetzt die Allgemeine Ton- und Fernseh-Rundfunkgenehmigung vom 11.12.1970, sie gilt ab 1.7.1979.

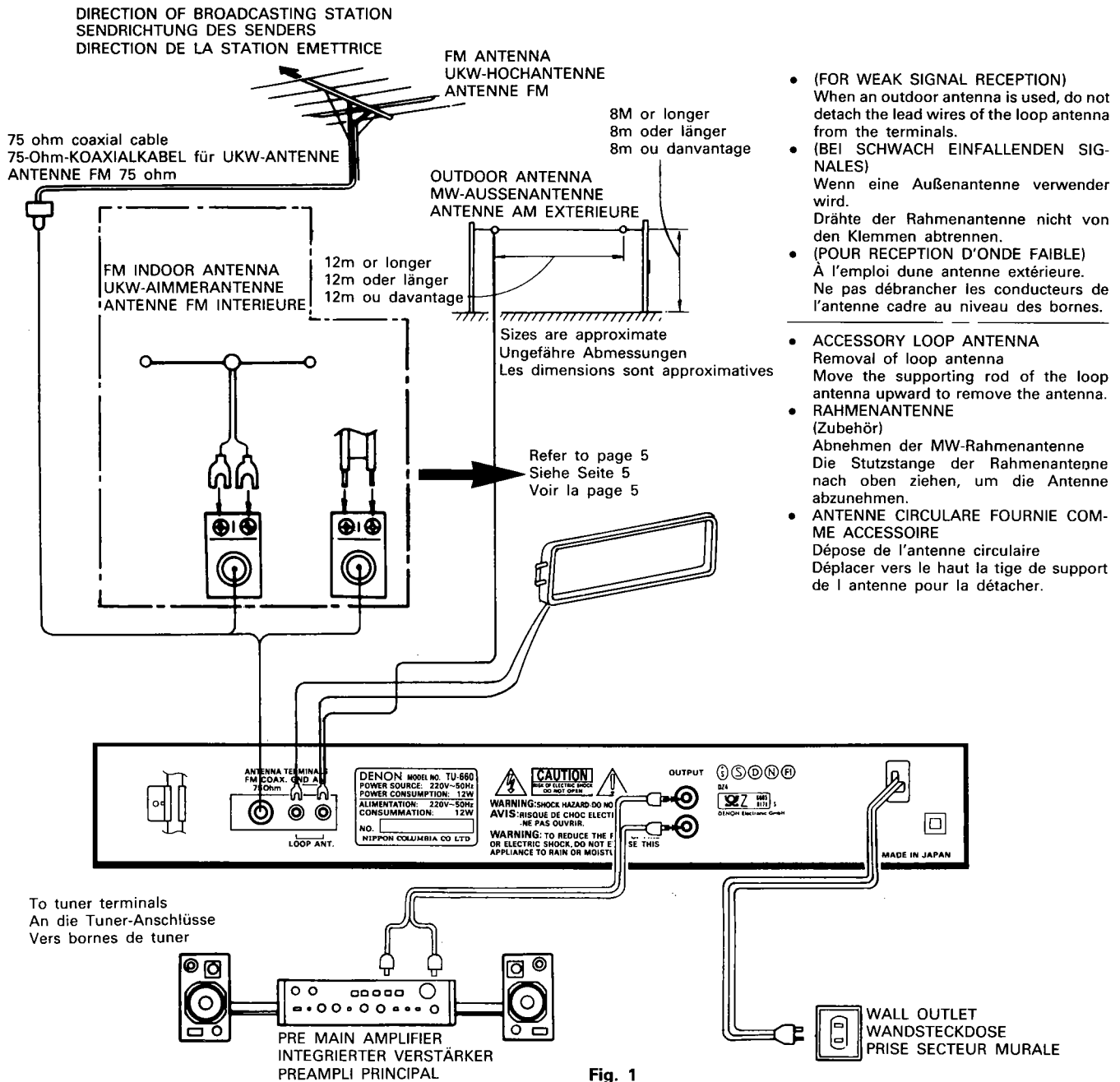
Bonn, den 14.5.1979

Der Bundesminister
für das Post- und Fernmeldewesen
Im Auftrag
Haist

"SERIAL NO. _____"

PLEASE RECORD UNIT SERIAL NUMBER ATTACHED TO THE REAR OF THE CABINET FOR FUTURE REFERENCE"

**CONNECTIONS
ANSCHLÜSSE
CONNEXIONS**



- (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 verwendet wird.
Drähte der Rahmenantenne nicht von den Klemmen abtrennen.
- (POUR RECEPTION D'ONDE FAIBLE)
À l'emploi d'une antenne extérieure.
Ne pas débrancher les conducteurs de l'antenne cadre au niveau des bornes.
- ACCESSORY LOOP ANTENNA
Removal of loop antenna
Move the supporting rod of the loop antenna upward to remove the antenna.
- RAHMENANTENNE (Zubehör)
Abnehmen der MW-Rahmenantenne
Die Stützstange der Rahmenantenne nach oben ziehen, um die Antenne abzunehmen.
- ANTENNE CIRCULAIRE FOURNIE COMME ACCESSOIRE
Dépose de l'antenne circulaire
Déplacer vers le haut la tige de support de l'antenne pour la détacher.

Fig. 1
Abb. 1

• **MULTI-VOLTAGE MODEL ONLY**

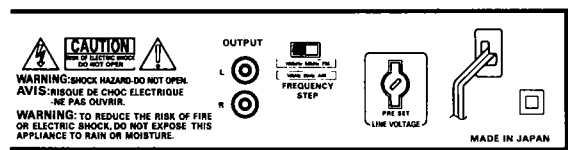
Setting the line voltage

- The customer can set the VOLTAGE SELECTOR KNOB on the back panel for appropriate line voltage by using a screwdriver.
- Do not use excessive force in setting the VOLTAGE SELECTOR KNOB - you may damage it.
- If the VOLTAGE SELECTOR KNOB does not turn smoothly, call qualified service personnel.

Setting the frequency step

Set the FREQUENCY STEP switch as described below.

- In the U.S.A. and Canada - set the switch to 100 kHz/10 kHz side.
With this setting, the frequency varies in 100 kHz steps in the range of 87.5 to 108.0 MHz (FM) and in 10 kHz steps in 520 to 1710 kHz (AM).
- Elsewhere - set the switch to 50 kHz/9 kHz side.
With this setting, the frequency varies in 50 kHz steps in the range of 87.50 to 108.00 MHz (FM) and in 9 kHz steps (AM) in 522 to 1611 kHz (AM).



ANTENNA INSTALLATION INSTALLATION DER ANTENNE INSTALLATION D'UNE ANTENNE

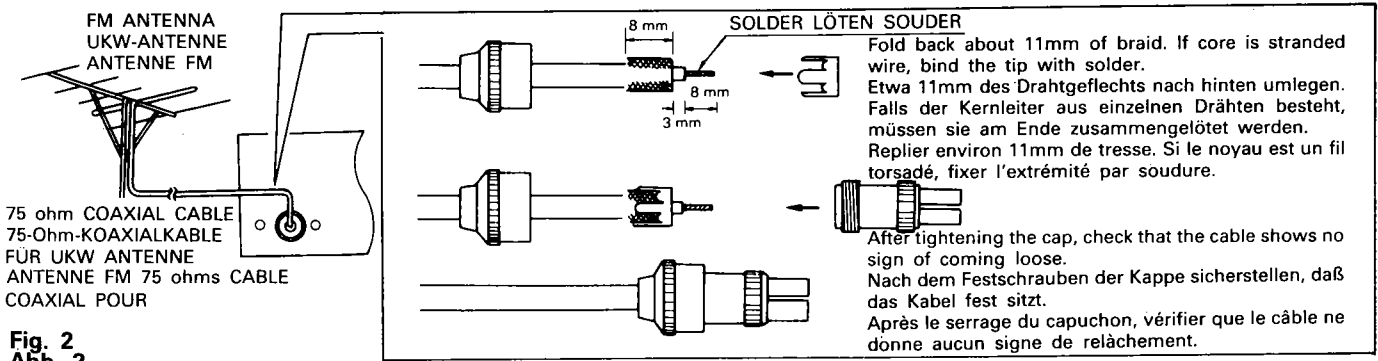


Fig. 2
Abb. 2

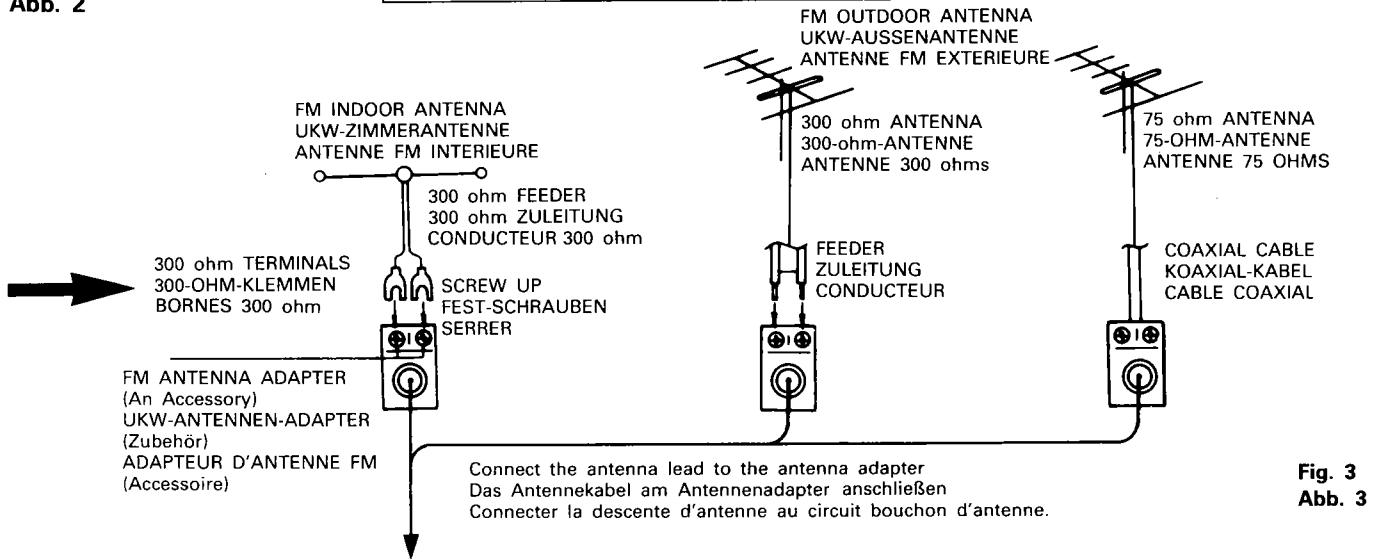
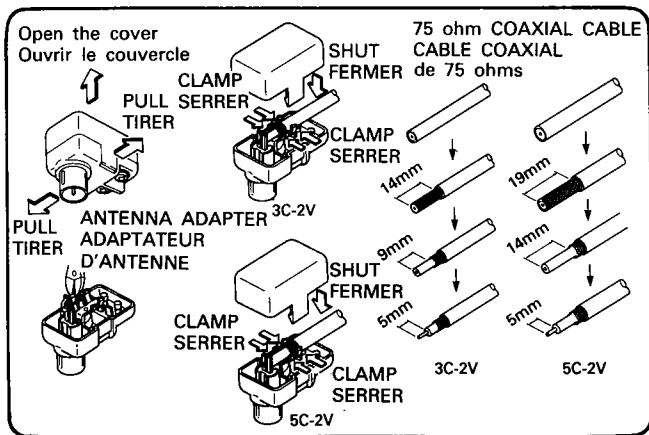
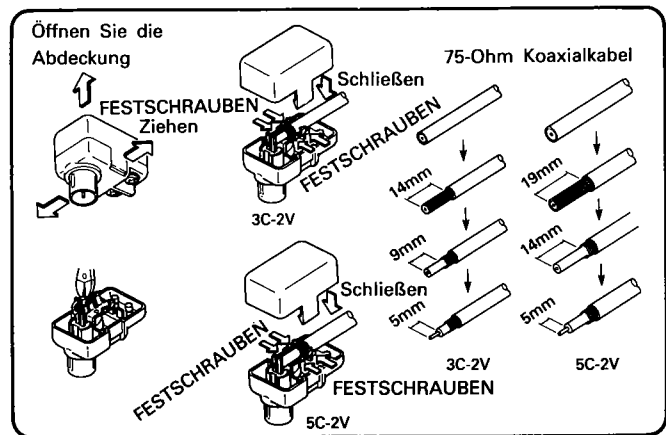


Fig. 3
Abb. 3



For English Readers/Pour les lecteurs (Français)



Für Deutsche Leser

Note:

- Please keep away AM loop antenna lead terminals from the metal parts of the back panel.

Bitte beachten:

- Die Anschlüsse der MW-Rahmenantenne dürfen die Metallteile der Geräte-Rückseite nicht berühren.

Remarque:

- Eloigner les bornes de l'antenne en boucle AM de toute partie métallique du panneau arrière.

DESIGNATIONS AND FUNCTIONS OF PANEL CONTROLS

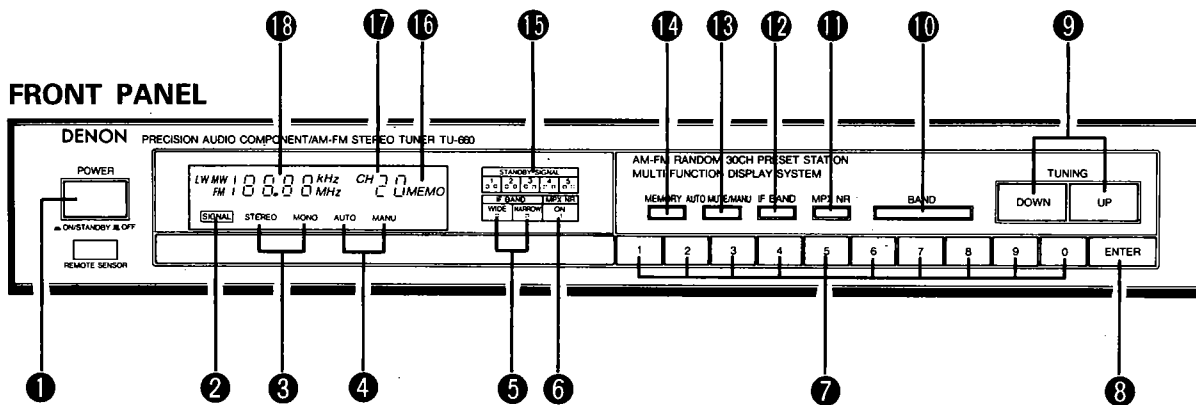


Fig. 4

- 1 POWER (Power ON-STANDBY/OFF Switch)**
The unit works 2 to 3 seconds after this switch is turned on. When the power is turned off by remote control, the unit is set to the standby mode and the STANDBY indicator (the first signal LED) lights. Set the power switch to the OFF position when not using for long periods of time.
- 2 SIGNAL (Signal Indicator)**
This lights when a station can be received.
- 3 STEREO/MONO (Stereo/Mono Indicator)**
"STEREO" lights automatically when receiving a stereo broadcast.
"MONO" lights when receiving a monaural broadcast or no broadcast at all.
- 4 TUNING MODE (AUTO/MANUAL)**
Pressing MODE **4** causes "AUTO" and "MANUAL" to light up alternately.
TU-660L: Pressing this button does not switch the tuner to Auto Tuning Mode, during reception of LW only.
- 5 WIDE/NARROW (IF BAND LED Indicator)**
Pressing "IF BAND" **12** causes WIDE and NARROW to light up alternately.
- 6 MPX NR (MPX NR Indicator)**
This LED indicator lights up when the MPX NR button **11** is pressed and this circuit is operated.
- 7 TEN KEYS (Ten Key Buttons)**
Used to specify numbers for Memory, Preset Call. Channels 1-30 can be specified using these buttons.
Preset Call Setting Method
A station that has already been preset can be fetched by the following method.
Pressing **1**, **2**, **ENTER** in order fetches the station present in memory for channel 12.
- 8 ENTER (Enter Button)**
Used for setting Memory, and Preset Call.
- 9 TUNING (Tuning Buttons)**
Used to change the received frequency to a higher frequency (UP) or a lower frequency (DOWN).
- 10 BAND (Band Button)**
Selects between FM or AM (MW).
TU-660L: Pressing this button changes the tuner from FM to MW to LW, then back to FM, in that order.
- 11 MPX NR (MPX NR Button)**
Switches MPX NR "ON" or "OFF". Lights "ON" LED **6**.
ON: Suppresses noise when a stereo broadcast with a weak signal is being received.
OFF: Does not carry out the above operation.
- 12 IF BAND (IF Bandwidth Selector Button)**
Selects the bandwidth of the FM and AM (MW) intermediate frequency amplifier from 2 ranges, "WIDE" and "NARROW".
This LED indicator **5** lights up at this time.
- 13 AUTO MUTE/MANU (Tuning Mode Button)**
This switches between auto and manual tuning.
Auto tuning: When the UP key is pressed, the radio is tuned automatically to a higher frequency. Press the DOWN key 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.
TU-660L: Not available in this model, during reception of LW only.
- 14 MEMORY (Memory Button)**
Used to store the frequency of the station currently received.
Pressing **MEMORY**, **1**, **2**, **ENTER** in order stores the station on channel 12 in memory. Up to 30 channels of either FM or AM can be stored in memory.
- 15 SIGNAL (Signal-Strength Indicators)**
The number of LEDs that light increases in correspondence with the strength of the signal being picked up by the antenna.
- 16 MEMORY (Memory Indicator)**
This indicator lights when the MEMORY button **14** is pressed.
- 17 CHANNEL (Channel Indicator)**
This displays the number of the channel at which the station is stored.
- 18 DIGITAL FREQUENCY INDICATOR**
Reception frequencies are digitally indicated with numbers. The FM frequency unit is MHz; the AM (MW) frequency unit is kHz.

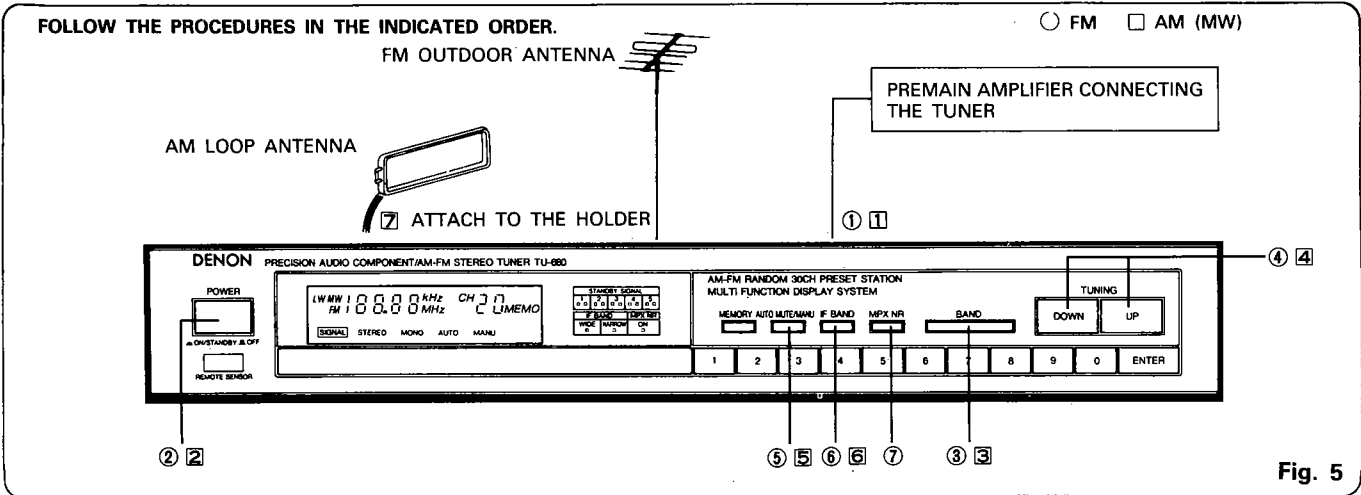


Fig. 5

OPERATION INSTRUCTIONS

PREPARATION

CHECKING CONNECTIONS

- Check all the connections by referring to connection diagram (Fig. 1).
 - Check that the right (R) and left (L) channels of the speakers are connected to the corresponding right (R) and left (L) plugs, and check that polarities (positive and negative) are correctly matched.
 - Check that the right (R) and left (L) pins are correctly inserted to the corresponding jacks.
 - Check that all the cords are firmly connected.
- * Turn on the power with the POWER switch after checking all the connections.

CHECKING ANTENNA

1. Do not incorrectly connect the loop antenna. If you are not sure how to connect the loop antenna, refer to Fig. 1
2. Use of loop antenna: Keep the loop antenna away from the main body. If the antenna contacts a metal body, reception sensitivity is degraded, thus resulting in unclear reproduction.

CAUTION

1. Noise may be generated if a near-by television set is on during AM (MW), FM broadcasting reception. The tuner should be used as far away from a television as possible.
2. Effective period of memory back-up is about a month under normal temperature. If the memorized stations cannot be called back, preset the stations again.

NOTE ON USE

	<ul style="list-style-type: none"> ● Avoid high temperatures ● Allow for sufficient heat dispersion when installed on a rack. 		<ul style="list-style-type: none"> ● Keep the set free from moisture, water, and dust.
	<ul style="list-style-type: none"> ● Handle the power cord carefully. ● Hold the plug when unplugging the cord. 		<ul style="list-style-type: none"> ● Unplug the power cord when not using the set for long periods of time.
	<ul style="list-style-type: none"> ● Do not let foreign objects in the set. 		<ul style="list-style-type: none"> ● Do not let insecticides, benzene, and thinner come in contact with the set.
			<ul style="list-style-type: none"> ● Do not obstruct the ventilation holes. *(for sets equipped with ventilation holes)
			<ul style="list-style-type: none"> ● NEVER disassemble or modify the set in any way.

TECHNICAL DATA

● FM SECTION

Frequency Range:	87.5 MHz ~ 108.0 MHz
Antenna Terminals:	75 ohm Unbalanced
Usable Sensitivity:	0.8 μV (9.3 dBf) (DIN) 1.0 μV (11.2 dBf) (IHF)
S/N50 dB Sensitivity:	Monaural 1.6 μV (15.3 dBf) Stereo 20 μV (37.2 dBf) (μV is at 75 ohm, 0 dBf = 10 ⁻¹⁵ W) [New IHF Standard]
Image Interference Ratio:	80 dB
IF Interference Ratio:	100 dB
AM Suppression Ratio:	60 dB
Effective Selectivity:	NARROW 75 dB (±400 kHz) WIDE 50 dB (±400 kHz)
Capture Ratio:	1.3 dB
Frequency Characteristics:	20 Hz ~ 15 kHz +0.5 dB, -1.5 dB
Signal-to-noise Ratio:	Monaural DIN 84 dB, 88 dB (IHF-A) Stereo DIN 78 dB, 82 dB
Total Harmonic Distortion:	Mono 1 kHz (at 75 kHz dev.) 0.06% Stereo 1 kHz (at 67.5 kHz dev.) 0.1%, 0.8% (DIN)
Stereo Separation 1 kHz:	50 dB

● AM SECTION (MW and LW) MEDIUM WAVE

Frequency Range:	522 kHz ~ 1611 kHz (For Europe) 520 kHz ~ 1710 kHz (For U.S.A., Canada)
Antenna Terminals:	Terminal Type with Loop Ant.
Usable Sensitivity:	18 μV
Signal-to-noise Ratio:	53 dB

LONG WAVE

Frequency Range:	153 kHz ~ 281 kHz
Usable Sensitivity:	30 μV
Signal-to-noise Ratio:	50 dB

● REMOTE CONTROL UNIT

Remote control system:	Infrared pulse
Power Supply:	DC 3V with two R03 (AAA) batteries
External dimensions:	58 (W) × 125 (H) × 19.5 (D) mm
Weight:	80 g (including batteries)

● OTHERS

Power Supply:	AC 220V or 240V 50 Hz AC 110/120/220/240V 50/60 Hz (Multiple)
Power Consumption:	12 W
Dimensions:	(W)×(H)×(D) 434 (17-3/32") (W) × 74 (2-29/32") (H) × 287 (11-19/64") mm 3.1 kg (6 lbs 13 oz)
Net Weight:	

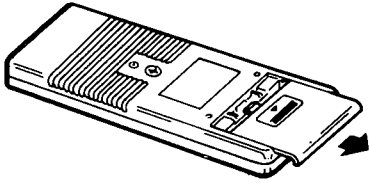
* Specifications are subject to change without notice.

REMOTE CONTROL UNIT

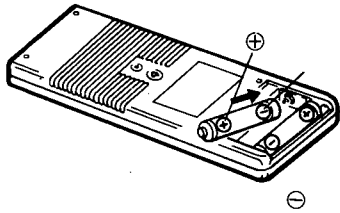
The accessory RC-126 remote control unit is used to control the tuner from a distance.

● Inserting the dry cell batteries

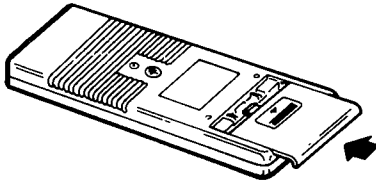
- 1 Remove the rear cover on the remote control unit.



- 2 Insert two size R03 ("AAA") dry cell batteries as shown in the diagram on the battery supply unit.



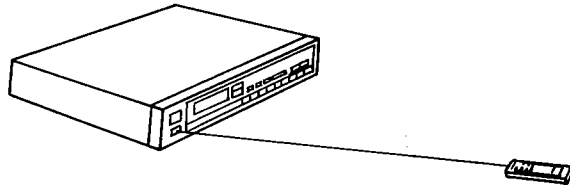
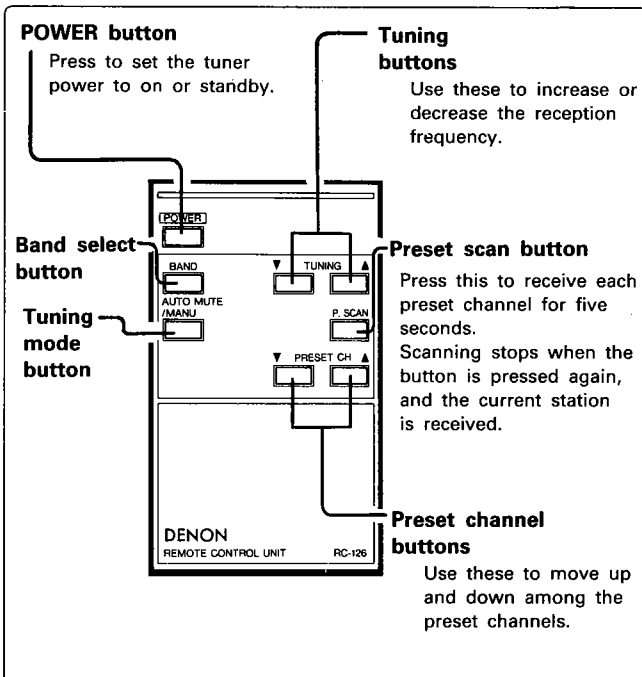
- 3 Replace the rear cover.




Notes on Use of the Batteries

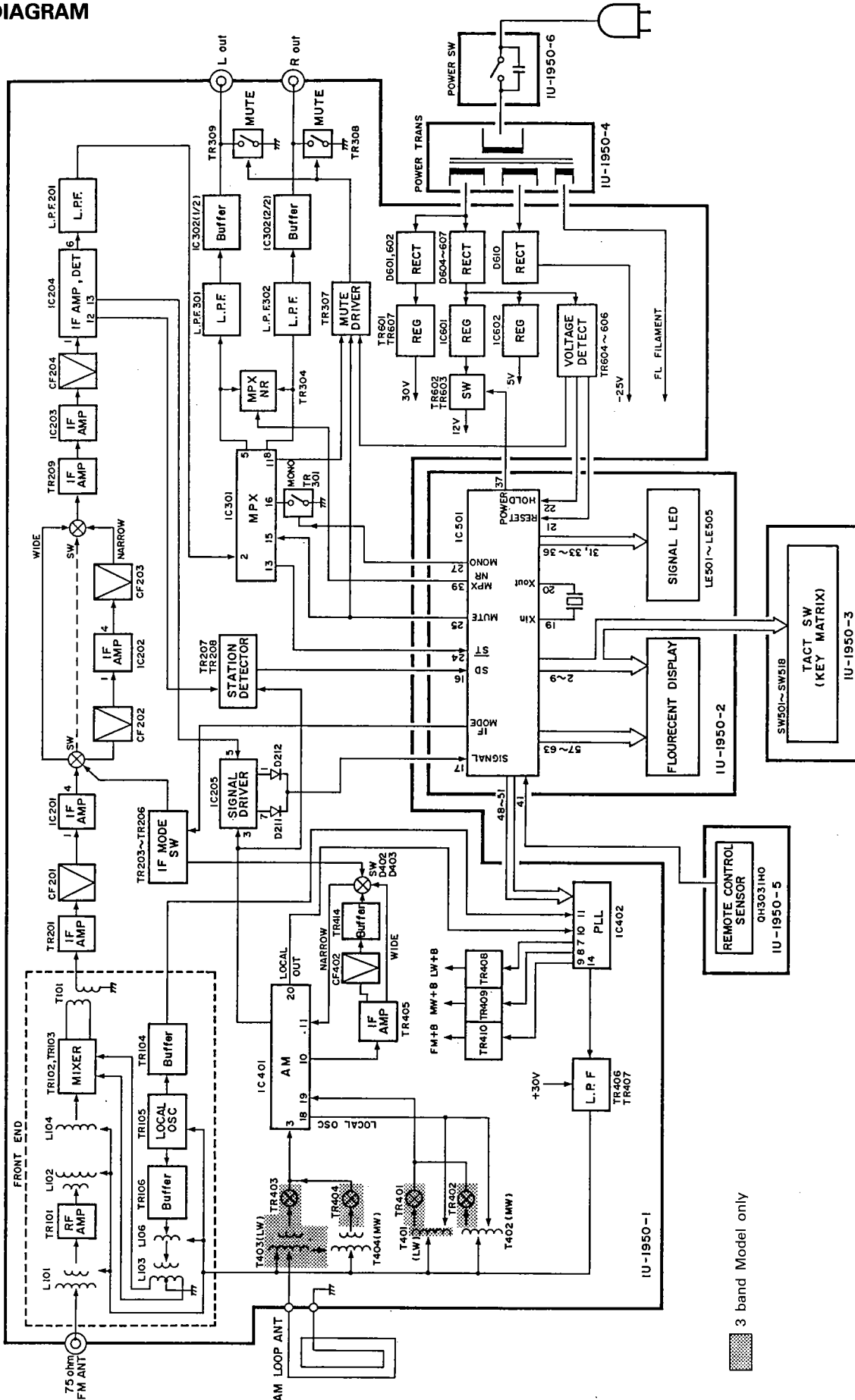
- The remote control unit uses size R03 ("AAA") dry cell batteries.
- The batteries will need to be replaced approximately once a year. This will depend upon how often the remote control unit is used.
- If, in less than a year from the time new batteries were inserted, the remote control fails to operate this unit from a near-by position, it is time to replace the batteries.
- Insert the batteries properly, following the diagram on the remote control battery supply unit, and making sure to align the plus and minus sides of each battery.
- Batteries are prone to damage and leakage. Therefore:
 - Do not combine new batteries with used ones.
 - Do not combine different types of batteries.
 - Do not jumper the opposite poles of the batteries, expose them to heat or break them open, or put them into open fire.
- When the remote control unit is not to be used for a long period of time, remove the batteries from the unit.
- If the batteries have leaked, remove any battery fluid from the inside of the battery supply unit by wiping it out thoroughly, and insert new batteries.

● Using the remote control unit



- Set the POWER switch on the tuner to OFF () when not using for long periods of time.
- Point the remote control unit towards the remote control sensor on the tuner when pressing keys.
- The remote control unit can be used at a distance of about 8 meters directly in front of the tuner. The remote control unit uses infrared rays, so it will not work if there are obstacles between it and the tuner. Also, if used at an angle, the distance from which operation is possible will be shortened.
- Do not press keys on the tuner and the remote control unit simultaneously, as this may result in malfunction.
- The remote control unit may not function if intense light is shining on the tuner's remote control sensor.
- Do not operate two remote control units simultaneously, as this may result in malfunction.

BLOCK DIAGRAM

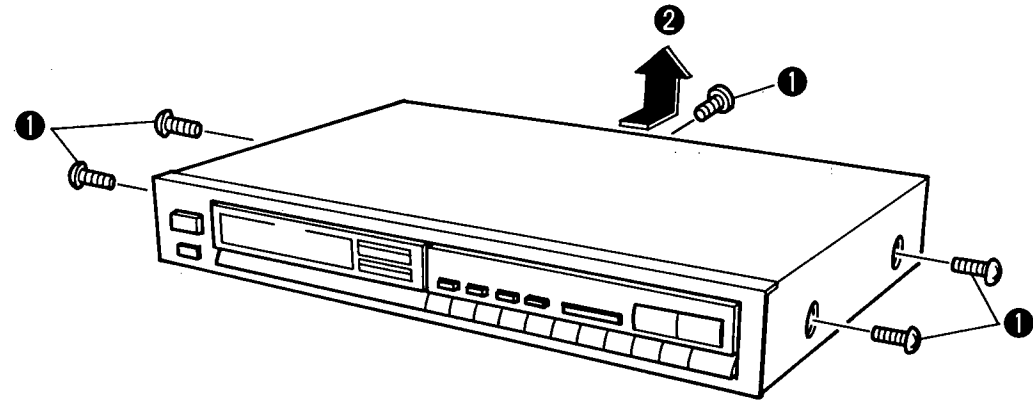


3 band Model only

REMOVAL OF EACH SECTION

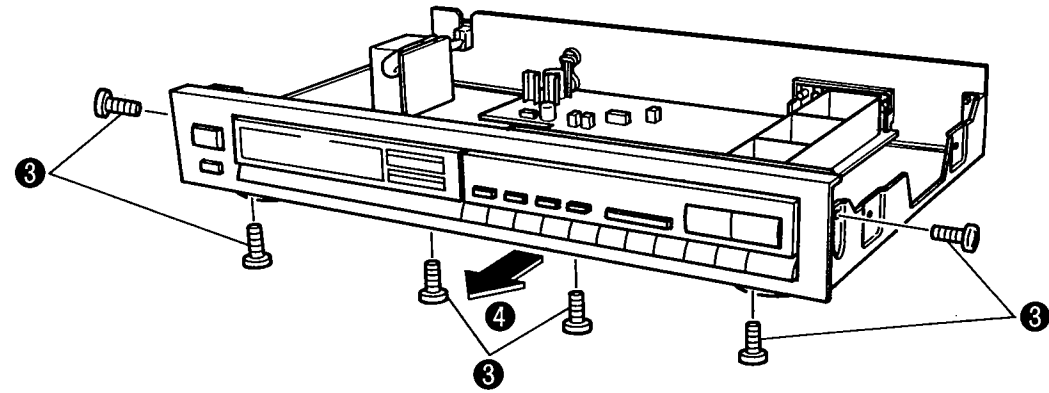
1. Removing the Top Cover

- ① Remove the five top cover installation screws (four on the sides, one on the rear).
- ② Slip the top cover slightly to the rear in the direction of the arrow, then lift it off.



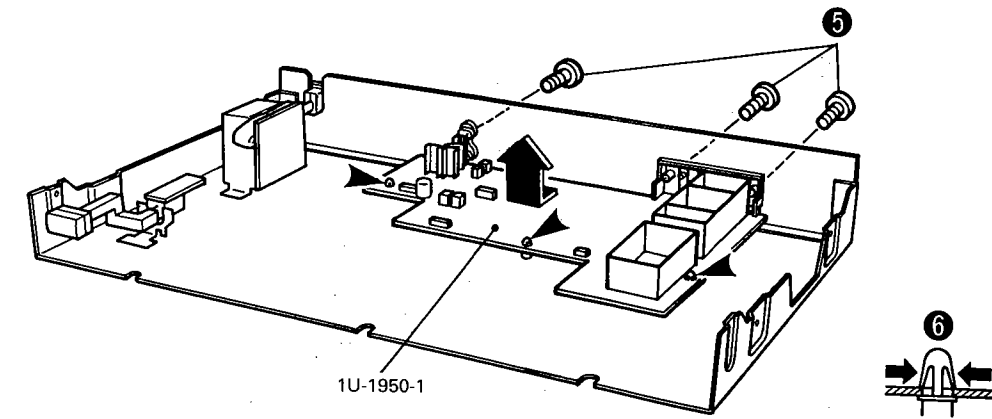
2. Removing the Front Panel Assembly

- ③ Remove the six front panel assembly installation screws (two on the sides, four on the bottom).
- ④ Pull the front panel assembly forward and off in the direction of the arrow.



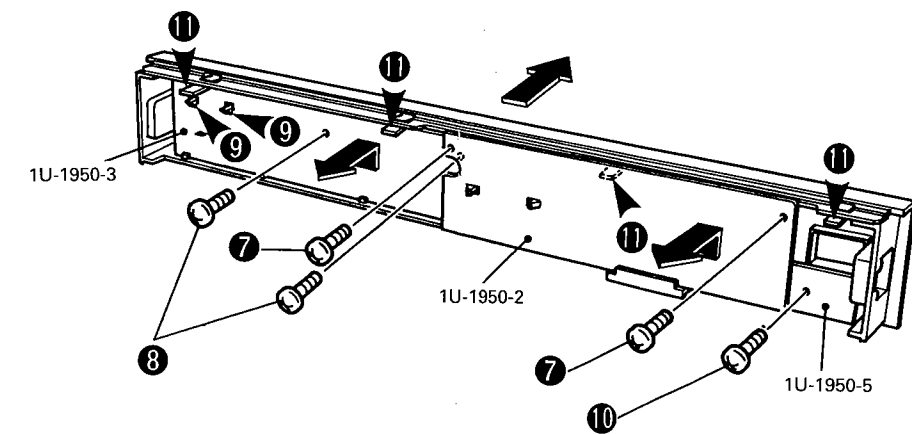
3. Removing each Circuit Board

- ⑤ Remove the three installation screws securing the terminals of the 1U-1950-1 board.
- ⑥ Use radio pliers to grasp the P.W.B. holder (shown by the arrow) securing the 1U-1950-1 board, then remove the 1U-1950-1 board.
- ⑦ Remove the two installation screws from the 1U-1950-2 board, lift slightly up in the direction of the arrow, then pull forward and remove the 1U-1950-2 board.
- ⑧ Remove the two installation screws from the 1U-1950-3 board.
- ⑨ Unclasp the two installation hooks from the 1U-1950-3 board, lift the 1U-1950-3 board slightly up, then pull forward and remove.
- ⑩ Remove the installation screw from the 1U-1950-5 board, then pull forward and remove the 1U-1950-5 board.



4. Removing the Front Panel

- ⑪ Use a screwdriver to press the four hooks on the front panel (shown by arrows), then pull the front panel forward and remove.

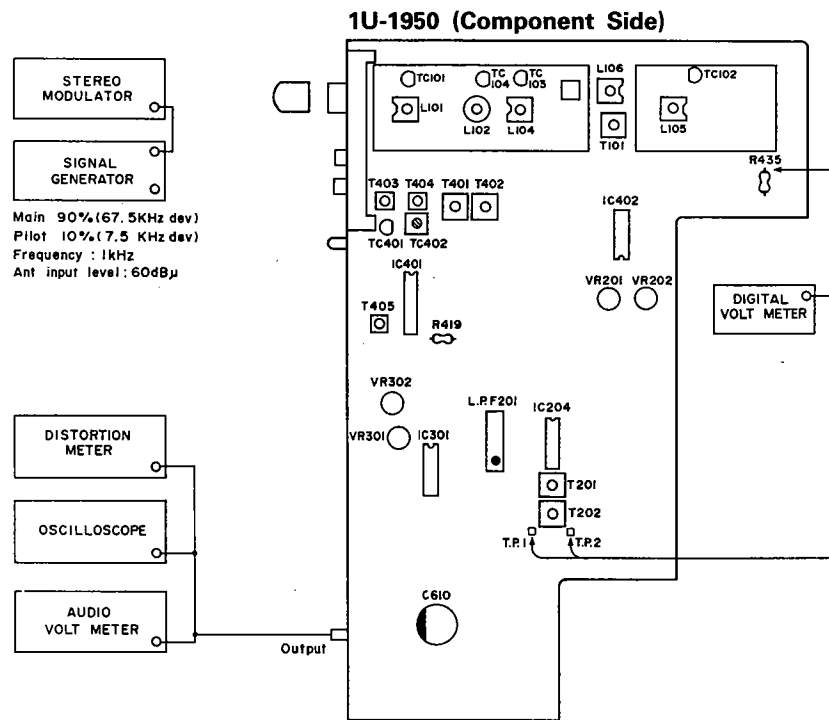


METHOD OF ADJUSTMENT

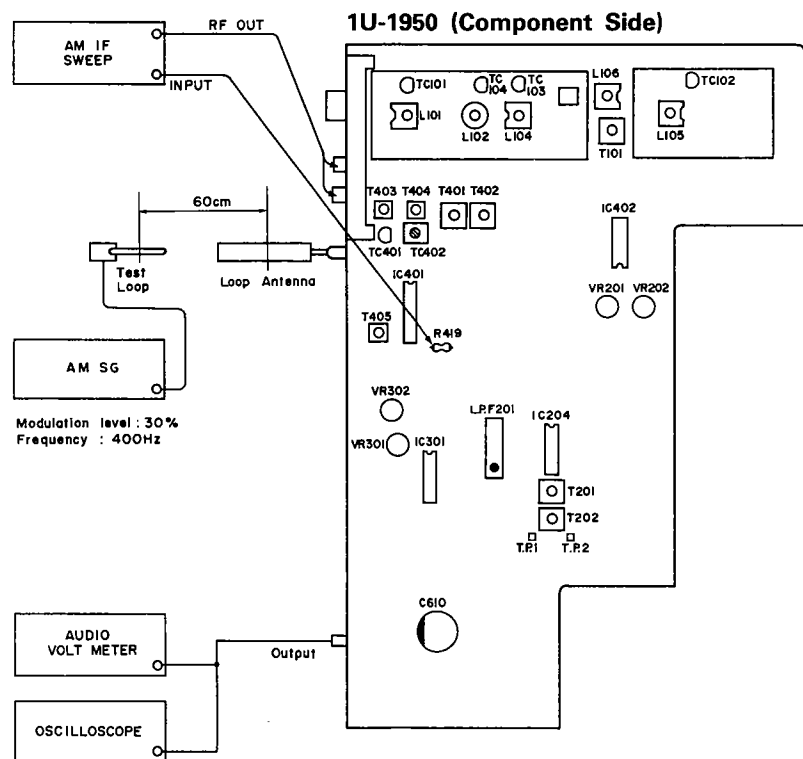
CONNECTION DIAGRAM OF MEASURING INSTRUMENTS

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 humidity.

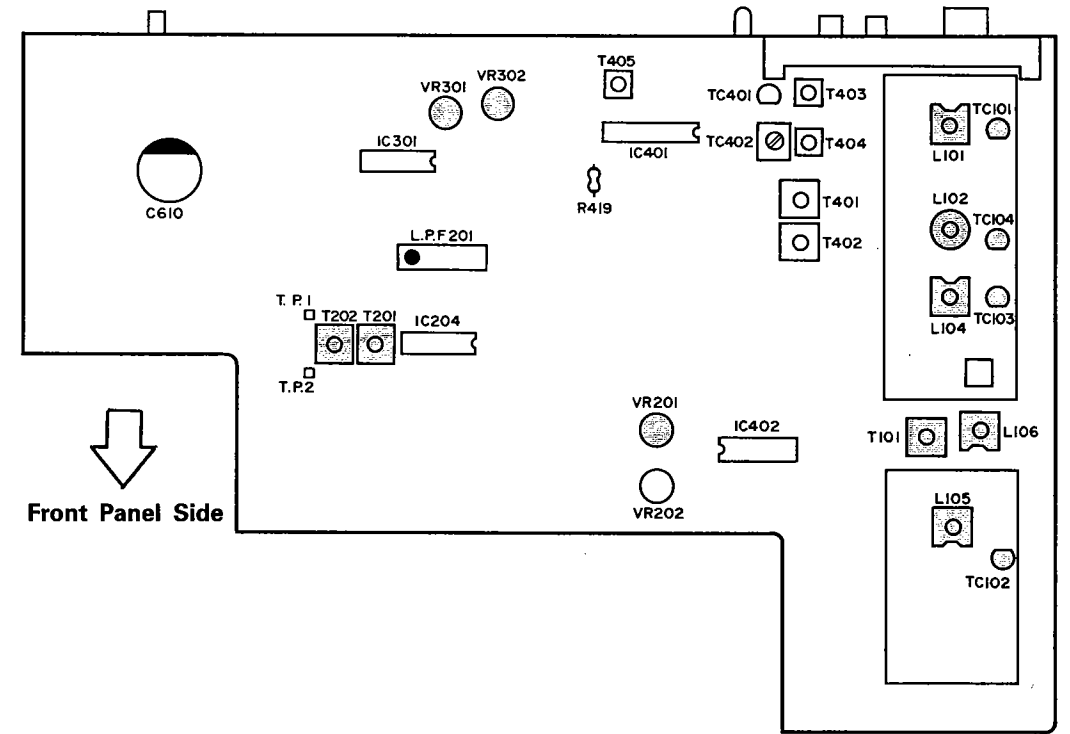
• **FM**



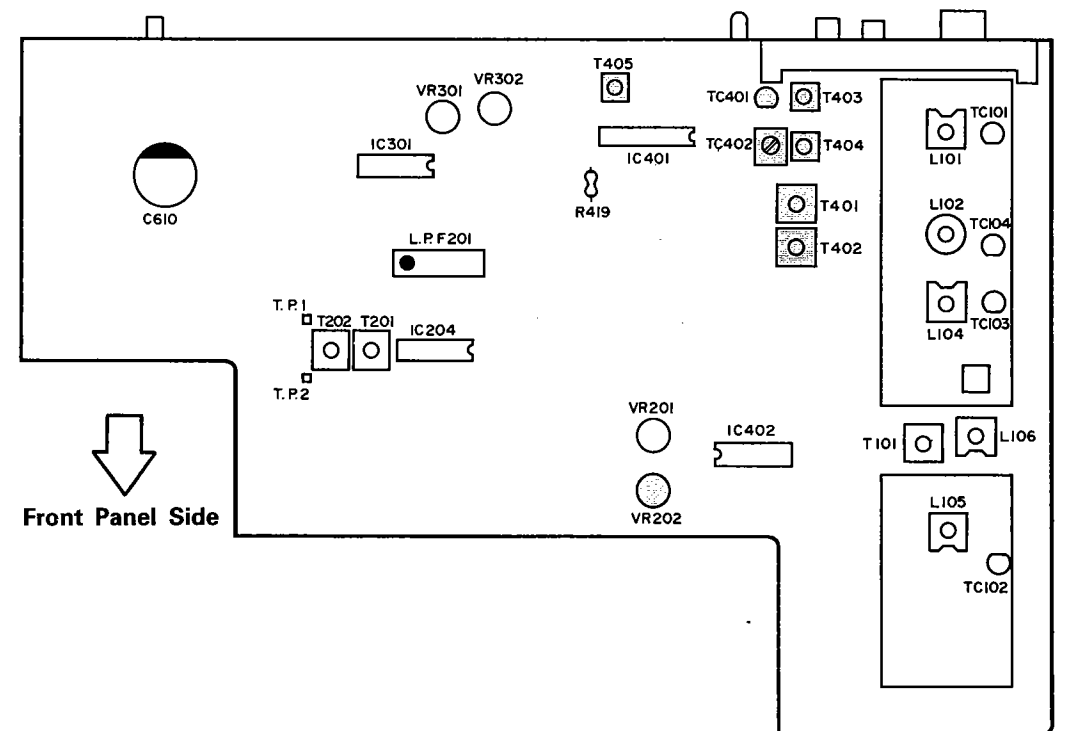
• **AM**



1U-1950 TUNER UNIT FM Alignment Points (Component Side)



1U-1950 TUNER UNIT AM (MW, LW Alignment Points) (Component Side)



FRONTEND ALIGNMENT

Item	Alignment Item	Tuning Frequency Setting	Input					Output		Adjustment		Remarks
			Type	Frequency	Input Level	Modulation	Coupling	Type	Connect to	Points	Adjust to	
1	Tuning Voltage	108 MHz	FMSSG	108 MHz	0 dB μ	Mono 1 kHz 100%	Antenna Terminal	DC Voltmeter	R435	TC102	25.0V	IF BAND : WIDE MUTE : off
2		88 MHz	FMSSG	88 MHz	0 dB μ	Mono 1 kHz 100%	Antenna Terminal	DC Voltmeter	R435	L105	5.0V	
3	Repeat several times from 1 to 2 to obtain accurate tuning voltage.											
4	Tracking Alignment	108 MHz	FMSSG	108 MHz	0 dB μ	Mono 1 kHz 100%	Antenna Terminal	Audio Voltmeter	Output Terminal (L)	TC101~103 104	Maximum Output	
5		88 MHz	FMSSG	88 MHz	0 dB μ	Mono 1 kHz 100%	Antenna Terminal	Audio Voltmeter	Output Terminal (L)	L101~102 104, 106	Maximum Output	
6	Repeat several times from 4 to 5 obtain maximum output level.											

FM ALIGNMENT

1	Center Adjustment	98 MHz	FMSSG	98 MHz	60 dB μ	Mono 1 kHz 100%	Antenna Terminal	Digital Voltmeter	Tr. 1,2	T201	\pm 50 mV	IF BAND: WIDE
2	Distortion	98 MHz	FMSSG	98 MHz	60 dB μ	Mono 1 kHz 100%	Antenna Terminal	Distortion Meter	Output Terminal (L)	T202	Minimum Distortion	IF BAND: WIDE
3	Distortion	98 MHz	FMSSG	98 MHz	60 dB μ	Stereo (L) 1 kHz 100%	Antenna Terminal	Distortion Meter	Output Terminal (L)	T101	Minimum Distortion	IF BAND: WIDE
4	Separation	98 MHz	FMSSG	98 MHz	60 dB μ	Stereo (L) 1 kHz 100%	Antenna Terminal	AC Voltmeter	Output Terminal (R)	VR301	Maximum Separation	IF BAND: WIDE
5	Separation	98 MHz	FMSSG	98 MHz	60 dB μ	Stereo (L) 1 kHz 100%	Antenna Terminal	AC Voltmeter	Output Terminal (R)	VR302	Maximum Separation	IF BAND: NARROW
6	Signal Level	98 MHz	FMSSG	98 MHz	15 dB μ	off	Antenna Terminal			VR201	Light 1st Signal LED	IF BAND: WIDE

AM ALIGNMENT

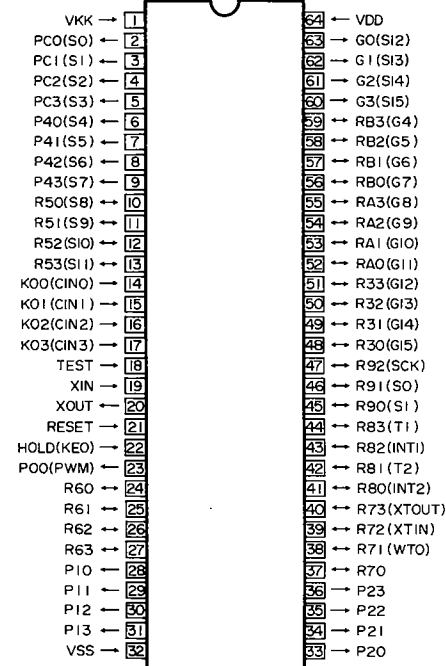
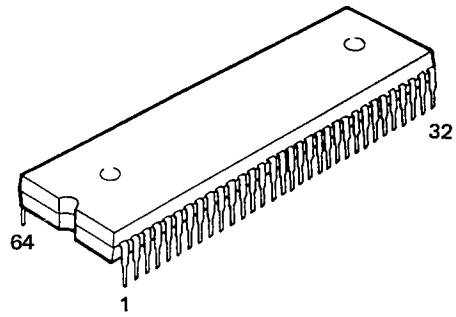
•MW & LW (): U.S.A. and Canada models.

1	IF	-	IF Sweep	-	Input level is not over to work A.G.C.	-	Antenna Terminal	AM IF Sweep	R419	T405	Maximum Height and Best Symmetry Curve	Function: MW Center of Wave Form: 450 kHz IF: WIDE
2	Tracking Alignment AM or MW	603 kHz (600)	AM SSG	603 kHz (600)	Input level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M	Output Terminal (L)	T402	Maximum Output	Function: MW
		1404 kHz (1500)	AM SSG	1404 kHz (1500)	Input level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M	Output Terminal (L)	TC402	Maximum Output	Function: MW
3	Tracking Alignment LW	163 kHz	AM SSG	163 kHz	Input level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M	Output Terminal (L)	T403	Maximum Output	Function: LW
		270 kHz	AM SSG	270 kHz	Input level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M	Output Terminal (L)	TC401	Maximum Output	Function: LW

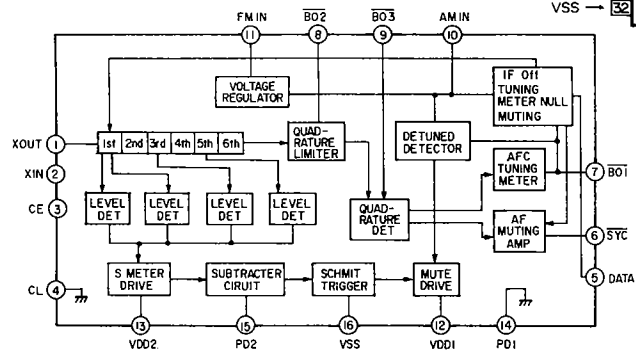
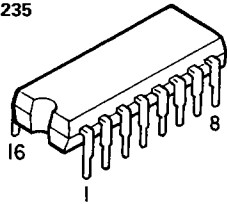
SEMICONDUCTORS

• IC's

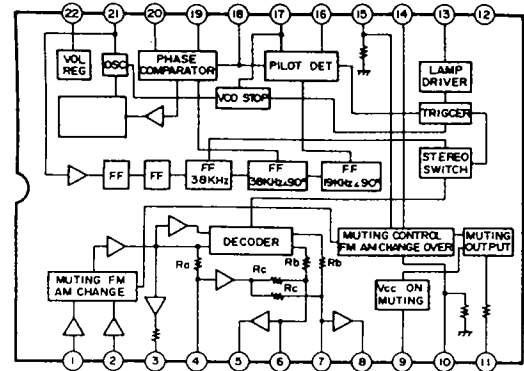
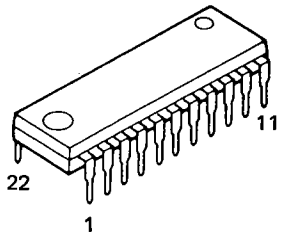
TMP47C670N-1304



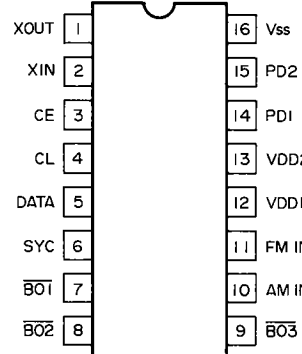
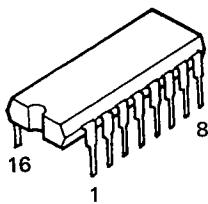
LA1235



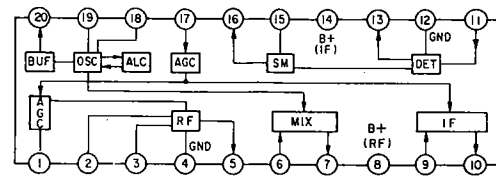
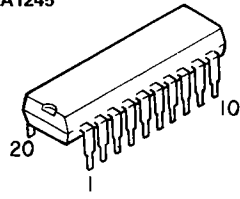
LA3401



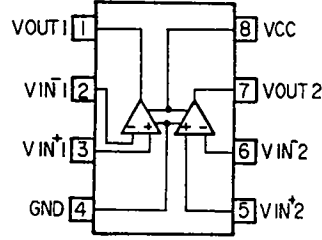
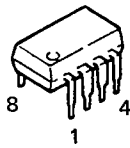
LM7001



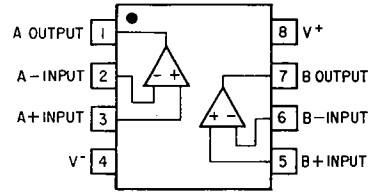
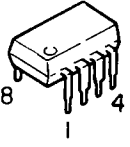
LA1245



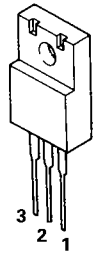
LA6358



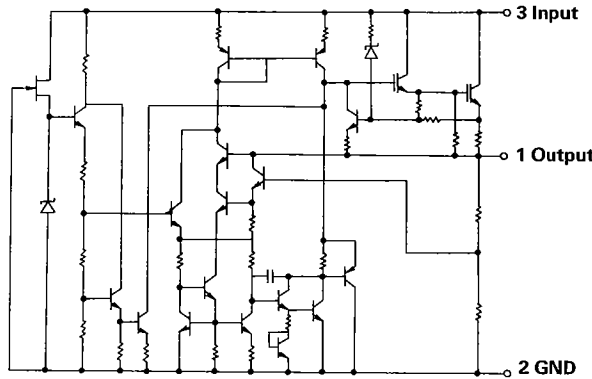
NJM4558D-D



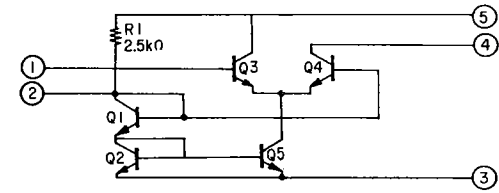
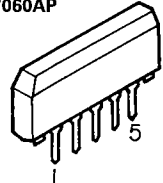
NJM78M06FA
NJM78M12FA



1: Output
2: GND
3: Input

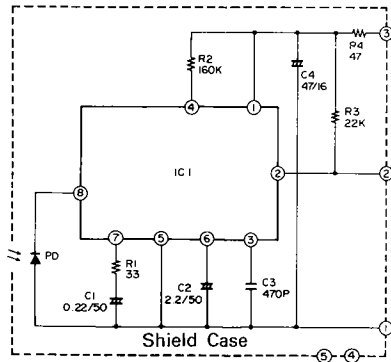
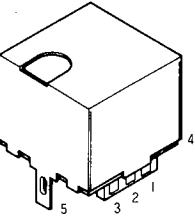


TA-7060AP



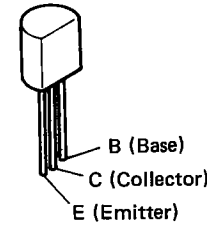
QH3031HO

(Remocon Receiver)

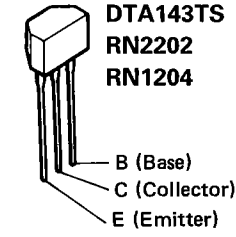


IC₁: μPC1490G
PD: Equivalent PD410P1
① GND
② V_{OUT}
③ V_{CC}
④ Case fin
⑤ Case fin

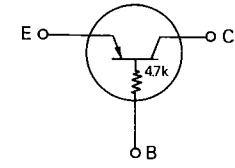
• Transistors
2SA1015 (Y/GR)
2SC2878 (A/B)
2SC1815



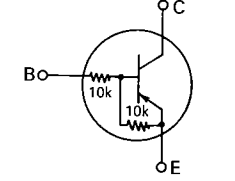
2SC2839 (E)
2SA1048 (Y/GR)
2SC2458 (Y/GR)



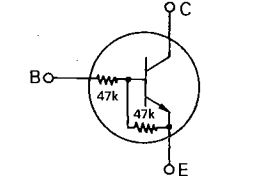
DTA143TS (4.7k)



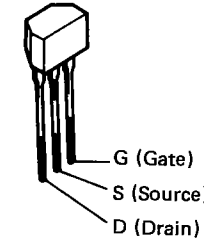
RN2202 (10k-10k)



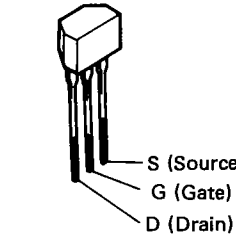
RN1204 (47k-47k)



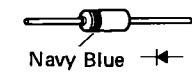
2SK161 (GR)



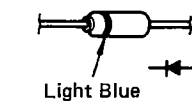
2SK365 (BL/GR)



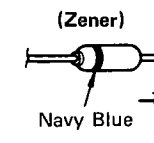
• Diodes (LED)
ISS270A



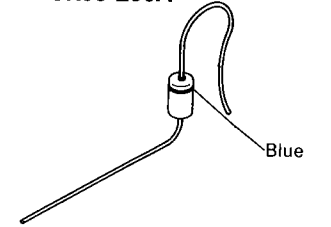
IS2076



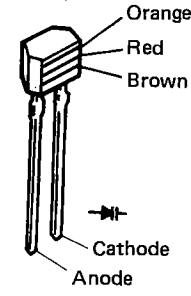
HZS6B-2
HZS9A-2
HZ9A-2



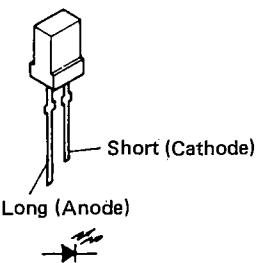
ISR35-200A



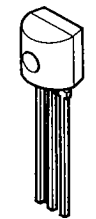
SVC321SPA-D-2
(Varactor)



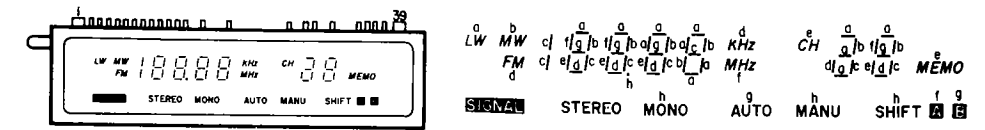
(LED)
SEL1321G (Green)



KV1320-5



FLD (FIP10TM7)




TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ELECTRODE	F	F	BG	P(h)	P(g)	P(f)	P(e)	P(d)	BG	P(c)	7G	P(b)	P(a)	6G	NP	5G	NP	NP	4G	NP
TERMINAL NO.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
ELECTRODE	NP	NP	NP	NP	NP	4G	NP	P	P	3G	NP	2G	NP	NP	P	1G	P	P	F	F

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

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 "1" (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.
- Please order CD101 through 105 (KV1320-5) in 5-piece sets. It is necessary to make replacements in 5-piece sets.
- Please order CD401 and 403 (SVC321SPA-D-2) in 2-piece sets. It is necessary to make replacements in 2-piece sets.

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

Resistors

Ex.: RN 14K 2E 182 G FR

Type	Shape and performance	Power Resistance	Allowable error	Others
RD : Carbon	2B : 1/4W	F : ±1%	P : Pulse-resistant type	
RC : Fixed	2E : 1/2W	G : ±2%	NL : Low noise type	
RS : Metallic 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 ⇒ 1800Ω = 1.8kΩ
Indicates number of zeros after effective number
2-digit effective number, decimal point indicated by R.
• Units: Ω

Capacitors

Ex.: CE 04W 1H 2R2 M BP

Type	Shape and performance	Dielectric strength	Capacity Allowable error	Others
CE : Aluminum foil electrolyte	0J : 6.3V	F : ±1%	HS : High stability type	
CA : Aluminum solid electrolyte	1A : 10V	G : ±2%	BP : Non-polar type	
CS : Tantalum electrolyte	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%	U : UL part	
CP : Oil	2A : 100V	-20%	C : CSA part	
CM : Mica	2B : 125V	P : +100%	W : UL-CSA type	
CF : Metallized	2C : 160V	-0%	F : Lead wire forming	
CH : Metallized	2D : 200V	C : ±0.25pF		
	2E : 250V	D : ±0.5pF		
	2H : 500V	= : Others		
	2J : 630V			

★ Capacity

2 R 2 ⇒ 2.2μF
1-digit effective number, decimal point indicated by R.
2-digit effective number, decimal point indicated by R.
• Units: μF, (for P, pF (μμF))
• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

PRINTED WIRING BOARD PARTS LIST

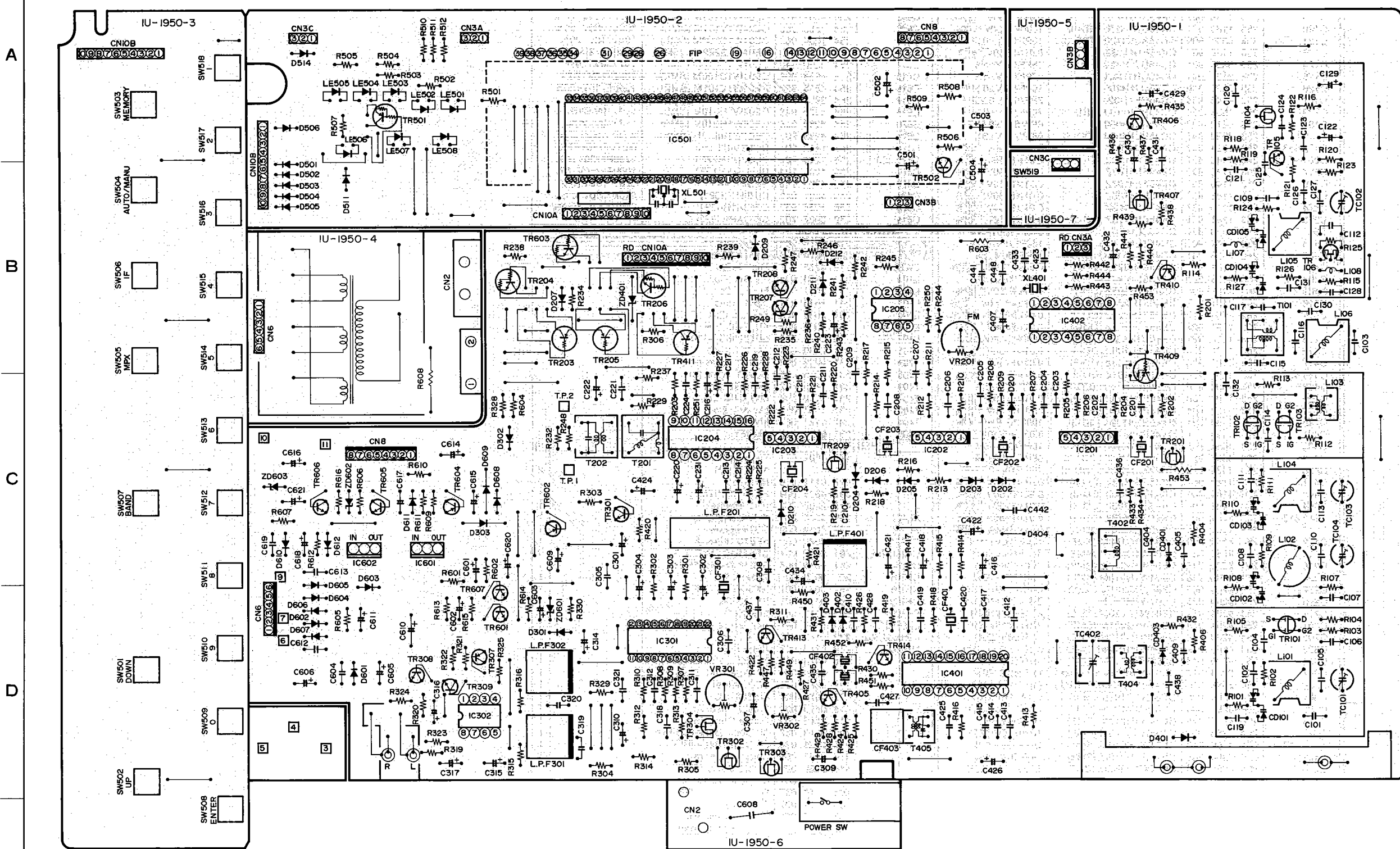
1U-1950 TUNER UNIT (2 Band Black Version Parts List for Europe Model)

Ref. No.	Part No.	Part Name	Remarks	Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS				RESISTORS (not included Carbon Film ±5%, 1/4W Type)			
IC201~203	263 0099 007	TA-7060AP		ZD401	276 0218 910	HZ9A-2	
IC204	263 0520 000	LA1235		ZD601	276 0462 915	HZS6B-2	
IC205	263 0237 005	LA6358		ZD602,603	276 0467 910	HZS9A-2	
IC301	263 0439 007	LA3401		LE501~508	393 9261 027	LED SEL1321G (D2/3)	
IC302	263 0081 002	NJM4558D		CAPACITORS			
IC401	263 0145 003	LA1245		TC101~104	213 0041 021	Trimmer Condenser	
IC402	262 0719 009	LM7001		TC402	213 0022 008	Trimmer Condenser	
IC501	262 1216 006	TMP47C670N-1304		C101	253 4536 996	CC45SL1H240J (DD-3)	24PF/50V±5%
IC601	263 0571 004	NJM78M12FA		C102	253 4538 907	CC45SL1H680J (DD-3)	68PF/50V±5%
IC602	263 0586 002	NJM78M06FA		C103	253 4536 909	CC45SL1H100D (DD-3)	10PF/50V±0.5PF
TR101~103	275 0063 007	3SK73GR		C104,105	253 4535 955	CC45SL1H050C (DD-3)	5PF/50V±0.25PF
TR104	275 0051 909	2SK161 (GR)		C106,107	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR105	273 0357 908	2SC2839 (E)		C108	253 4538 907	CC45SL1H680J (DD-3)	68PF/50V±5%
TR106	275 0051 909	2SK161 (GR)		C109	253 3141 900	CC45CH1H680J	68PF/50V±5%
TR202	275 0051 909	2SK161 (GR)		C110	253 4535 997	CC45SL1H090D (DD-3)	9PF/50V±0.5PF
TR203	269 0100 907	DTA143TS (4.7k)		C111	253 4538 907	CC45SL1H680J (DD-3)	68PF/50V±5%
TR204	269 0029 907	RN1204 (47k-47k)		C112,113	253 4535 926	CC45SL1H020C (DD-3)	2PF/50V±0.25PF
TR205	269 0100 907	DTA143TS (4.7k)		C114	253 4535 968	CC45SL1H060D (DD-3)	6PF/50V±0.5PF
TR206	269 0029 907	RN1204 (47k-47k)		C115,116	253 4539 906	CC45CH1H101J	100PF/50V±5%
TR207,208	273 0222 907	2SC2458 (Y/GR)		C117	253 1148 905	CK45F1H223Z	0.022μF/50V±80%
TR209	275 0051 909	2SK161 (GR)		C119	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR301	273 0222 907	2SC2458 (Y/GR)		C120	253 1180 921	CK45B1H102K (DD-3)	1000PF/50V±10%
TR302~304	275 0053 907	2SK365 (BL/GR)		C121	253 4536 909	CC45SL1H100D (DD-3)	10PF/50V±0.5PF
TR307	271 0194 903	2SA1048 (Y/GR)		C122	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR308,309	273 0253 918	2SC2878 (A/B)		C123	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR405,406	273 0222 907	2SC2458 (Y/GR)		C124	253 3535 901	CC45UJ1H150J	15PF/50V±5%
TR407	275 0053 907	2SK365 (BL/GR)		C125	253 3137 901	CC45CH1H470J	47PF/50V±5%
TR409	269 0100 907	DTA143TS (4.7k)		C126	253 3531 905	CC45UJ1H100D	10PF/50V±0.5PF
TR410	271 0194 903	2SA1048 (Y/GR)		C127	253 4540 908	CC45CK1H020C	2PF/50V±0.25PF
TR411	269 0100 907	DTA143TS (4.7k)		C128	253 4536 909	CC45SL1H100D (DD-3)	10PF/50V±0.5PF
TR413,414	273 0222 907	2SC2458 (Y/GR)		C130	253 4410 902	CC45SL1H080D	8PF/50V±0.5PF
TR501	269 0100 907	DTA143TS (4.7k)		C131	253 4538 907	CC45SL1H680J (DD-3)	68PF/50V±5%
TR502	273 0222 907	2SC2458 (Y/GR)		C132,133	253 1024 003	CK45F1H103Z	0.01μF/50V±80%
TR601	273 0198 947	2SC1815 (Y/GR)		C201~215	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR602	271 0102 937	2SA1015 (GR/Y)		C217	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR603	269 0029 907	RN1204 (47k-47k)		C219	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR604	271 0194 903	2SA1048 (Y/GR)		C221	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
TR605~607	273 0222 907	2SC2458 (Y/GR)		C224	253 1146 907	CK45F1H103Z	0.01μF/50V±80%
D201~207	276 0432 903	ISS270A		C305	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
D209,210	276 0432 903	ISS270A		C311,312	253 4453 901	CC45SL1H511J	510PF/50V±5%
D211,212	276 0432 903	ISS270A		C405	253 4536 967	CC45SL1H180J (DD-3)	18PF/50V±5%
D301,302	276 0432 903	ISS270A		C409	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
D303	276 0049 901	IS2076		C410	253 1181 917	CK45F1H223Z (DD-3)	0.022μF/50V±80%
D401~403	276 0432 903	ISS270A		C412	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
D501~506	276 0432 903	ISS270A		C413	253 1180 921	CK45B1H102K (DD-3)	1000PF/50V±10%
D511	276 0432 903	ISS270A		C414	253 1182 903	CK45F--473Z (DD-3)	0.047μF±80%
D601~607	276 0553 905	ISR35-200A (T93X)		C415	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
D608	276 0432 903	ISS270A		C417	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
D609	276 0049 901	IS2076		C419,420	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
D610	276 0553 905	ISR35-200A (T93X)		C423	253 4536 954	CC45SL1H160J (DD-3)	16PF/50V±5%
D611,612	276 0432 903	ISS270A		C425	253 1181 904	CK45F1H103Z (DD-3)	0.01μF/50V±80%
CD101~105	276 0556 009	KV1320-5					
CD401	276 0302 004	SVC321SPA-D-2					
CD403	276 0302 004	SVC321SPA-D-2					

PRINTED WIRING BOARD (Pattern Side) 1U-1950 TUNER UNIT (for 2 Band Model)

1 2 3 4 5 6 7 8

Area	Unit No.
European	1U-1950
U.S.A. and Canada	1U-1950B
Asia	1U-1950E



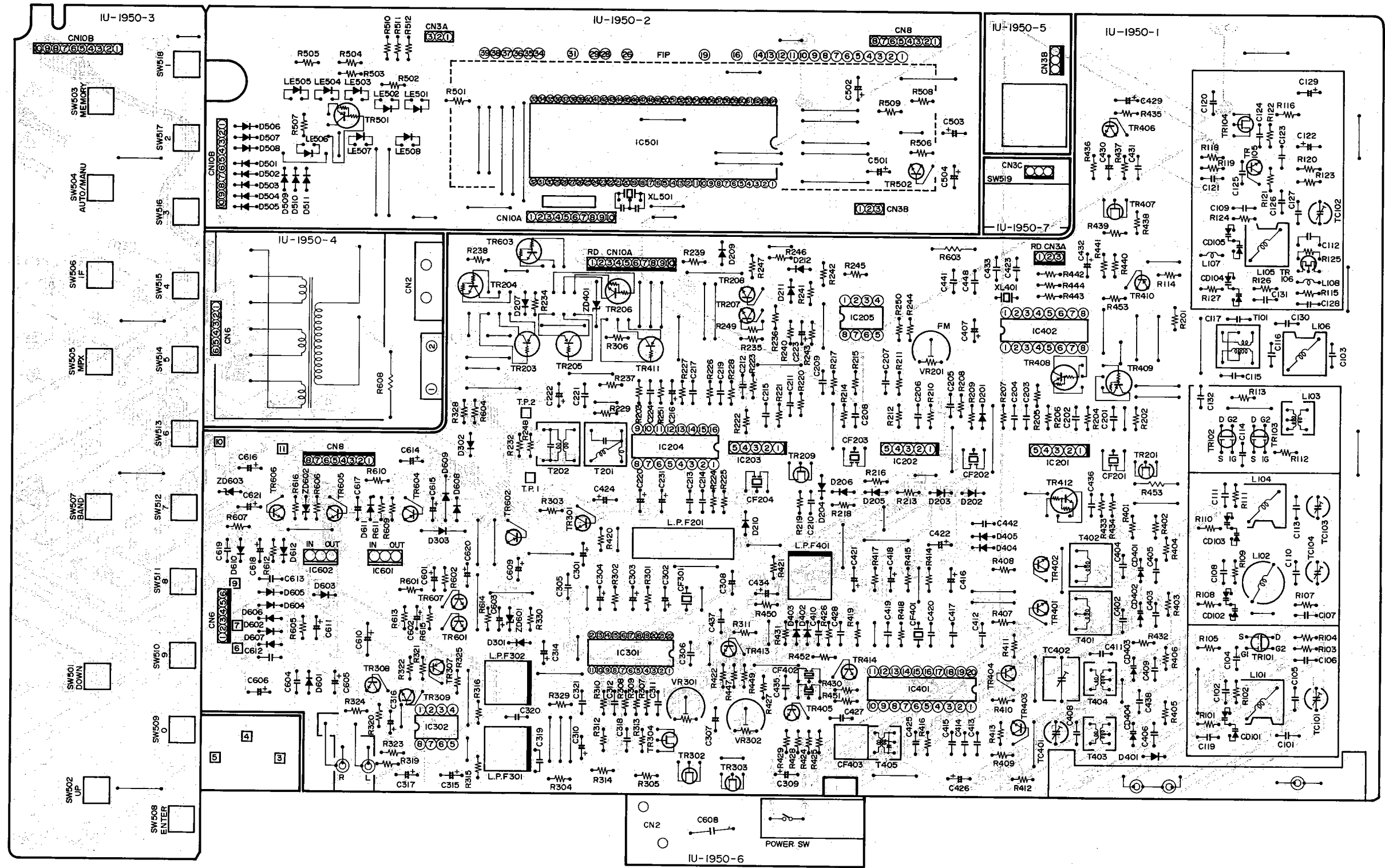
Note:

	R232	R307 R310	R308 R309	C311 C312	D506	D511	D514	R608	POWER TRANS	AC CORD	ANT TERMINAL	1U-1950-7 (SLIDE SW)	T402	C405
Europe	18K	150K	200K	330P	YES	YES	NONE	NONE	233572008	2062063009	205 0433 007	NONE	231 1118 003	18P
U.S.A. & Canada	10K	62K	75K	1200P	JUMPER	NONE	NONE	YES	2335781005	2062060002	205 0433 010	NONE	231 4901 000	16P
U.K. & Australia	18K	150K	200K	330P	YES	YES	NONE	NONE	U.K. 2062024006 A 2062025005	205 0433 007	205 0433 007	NONE	231 1118 003	18P
Multi-Voltage	18K	62K	75K	820P	YES	NONE	YES	NONE	2335782004	2006031026	205 0433 010	YES	231 4901 000	16P

1U-1950 TUNER UNIT (for 3 Band Model)

1 2 3 4 5 6 7 8

Area	Unit No.
Europe	1U-1950C
U.K.	1U-1950D



A
B
C
D
E

EXPLODED VIEW OF CHASSIS AND CABINET

1 2 3 4 5 6 7 8

A

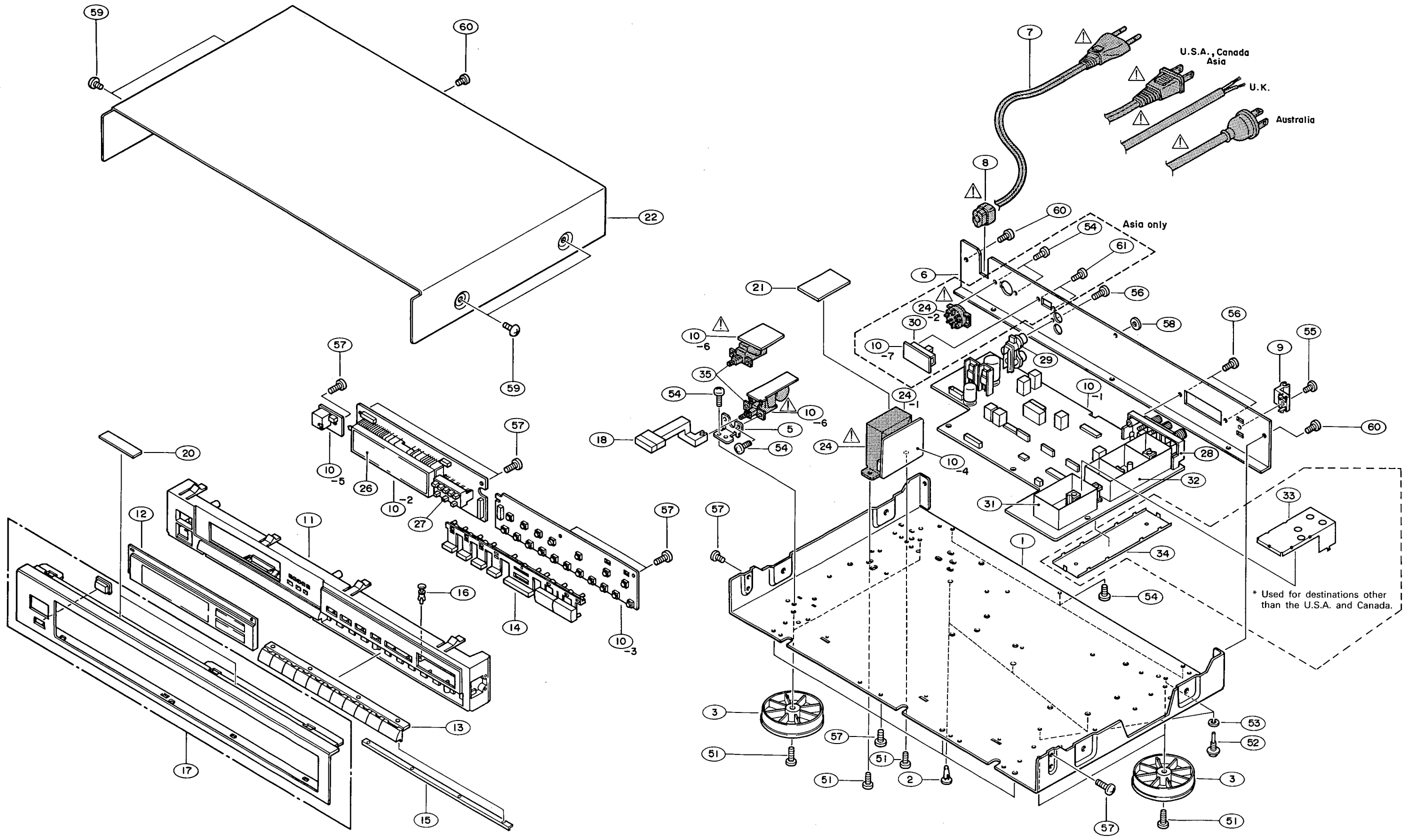
B

C

D

E

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



PARTS LIST OF EXPLODED VIEW Note: See addendum list (under list) for the parts with asterisk (*) on the Ref. No.

2 Band Black Version Parts List for Europe Model

• 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.

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
1●	411 0752 600	Main Chassis		1	32●	414 0543 009	Shield Case (B)		1
2●	412 1979 003	P.C.B. Holder		3	33●	414 0555 000	Shield Cover (A)		1
3	104 0208 007	Foot Ass'y		4	34●	414 0556 009	Shield Cover (B)		1
5●	441 0658 116	Switch Bracket		1	△ 35	212 0286 003	Power Switch		1
* 6●	105 0866 002	Back Panel		1	SCREWS & WASHER				
*△ 7	206 2063 009	AC Cord with Plug		1	51	473 7002 021	Tapping Screw (S) 3x8 (Black)		7
△ 8	445 0056 008	Cord Bush		1	52	477 0276 018	Earth Screw		2
9	146 0925 009	Ant. Holder		1	53	475 2003 005	3φ Spring Washer		2
* 10●	1U- 1950	Tuner Unit		1	* 54	473 7002 034	Tapping Screw (S) 3x6 (Black)		4
* 10-1		Tuner Unit		1	55	473 7006 027	Tapping Screw (S) 3x10 (Black)		1
* 10-2		Display Unit		1	56	477 0064 107	Fixing Screw		5
* 10-3		Tact SW Unit		1	57	473 7508 017	Tapping Screw (P) 3x10 (Black)		11
* 10-4		Power Trans Unit		1	58	415 0501 002	Washer		1
* 10-5		REM. CON. Unit		1	59	477 0263 005	3P Swelling Screw		4
* 10-6		Power Switch Unit		1	60	473 7015 018	Tapping Screw (S) 3x8 (Black)		3
11●	146 1018 452	Inner Panel		1	PACKING & ACCESSORIES (not included EXPLODED VIEW)				
* 12●	143 0653 000	Window		1	101-1●	505 8006 019	Envelope		1
13	113 1164 209	Push Knob (Preset)		1	* 101-2●	511 1895 002	Inst. Manual (Europe)		1
14	113 1277 002	Push Knob (Tuning)		1	101-3	203 2223 002	2P Pin Cord		1
15●	412 2880 104	Push Knob Bracket		1	101-4	231 1129 005	Loop Antenna		1
16	477 0096 007	Push Rivet		4	101-5	529 0072 005	FM Ant. Adaptor		1
* 17●	144 1818 041	Front Panel Ass'y		1	* 101-6	499 0147 008	RC-126 Remote Control Unit		1
18	113 1278 001	Power Knob Ass'y		1	102●	504 0090 017	Cabinet Cover		1
19	445 8004 007	Wire Clamper		3	103●	503 0762 106	Cushion		2
20●	122 0146 028	Himeron Sheet		2	104●	501 1323 056	Carton Case		1
21●	461 0551 000	Rubber Sheet		1	105●	513 1389 006	Control Card Base		1
22●	102 0122 271	Top Cover		1	106●	513 1349 004	Thermal Carbon Film		1
* 23●	513 1144 005	Masking Sheet		1					
△ 24-1	233 5720 008	Power Trans		1					
26	393 4043 004	FLD (FIP10TM7)		1					
27●	146 1087 001	LED Holder		1					
28	205 0433 007	3P Ant. Terminal (DIN)		1					
29	205 0274 004	2P Connector Base		1					
31●	414 0429 000	Shield Case (A)		1					

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

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.		
		U.S.A.	Canada	Asia
6●	Back Panel	105 0866 031	105 0866 044	105 0866 057
7	AC Cord with Plug	—	—	—
	AC Cord (Polarized)	206 2060 002	206 2060 002	—
	AC Cord	—	—	200 6031 026
10●	Tuner Unit	1U-1950B	1U-1950B	1U-1950E
10-1	Tuner Unit	—	—	—
10-2	Display Unit	—	—	—
10-3	Tact SW Unit	—	—	—
10-4	Power Trans Unit	—	—	—
10-5	REM. CON. Unit	—	—	—
10-6	Power Switch Unit	—	—	—
10-7	Freq. SW Unit	—	—	—
12●	Window	143 0653 013	143 0653 013	143 0653 000
17●	Front Panel Ass'y	144 1818 054	144 1818 054	144 1818 041
23●	Masking Sheet	—	—	—
	Blind Sheet	513 9224 008	—	—
△ 24-1	Power Trans	2335781005	2335781005	233 5782 004
△ 24-2	Voltage Sel Switch	—	—	212 9555 007
24-3	Vinyl Wire	—	—	—
24-4	Wire Clamper	—	—	445 8004 007
25	Preset Label	—	—	515 8030 008
30	Slide Switch	—	—	212 4293 005
54	Tapping Screw (S) 3x6 (Black)	473 7002 034 (4)	473 7002 034 (4)	473 7002 034 (6)
61	Cross Recessed Head Machine Screws 2.6x4	—	—	471 3201 024 (2)
101-2●	Inst Manual	511 1914 006	511 1914 006	511 1895 002
101-6	RC-126 Remote Control Unit	—	—	499 0147 008
101-7	FM Ant. Ass'y	395 0005 204	395 0005 204	395 0005 204
101-8●	DAI Warranty Home	515 0418 301	—	—
●	DIC Warranty	—	515 0388 004	—

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

2 Band Gold Version Parts List for Europe Model [Same as Black Version (Left Parts List) except the followings]

Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
11●	146 1018 465	Inner Panel		1	SCREW				
13	113 1164 238	Push Knob (Preset)		1	59	477 0263 018	3P Swelling Screw		4
14	113 1277 015	Push Knob (Tuning)		1	PACKING & ACCESSORIES (not included EXPLODED VIEW)				
17●	144 1818 067	Front Panel Ass'y		1	109●	501 1323 069	Carton Case		1
18	113 1278 014	Power Knob Ass'y		1	112●	513 9111 001	Color Label (Gold)	Add	2
22●	102 0122 284	Top Cover		1					

3 Band Black Version Parts List for Europe Model Note: See addendum list (under list) for the parts with asterisk (*) on the Ref. No.

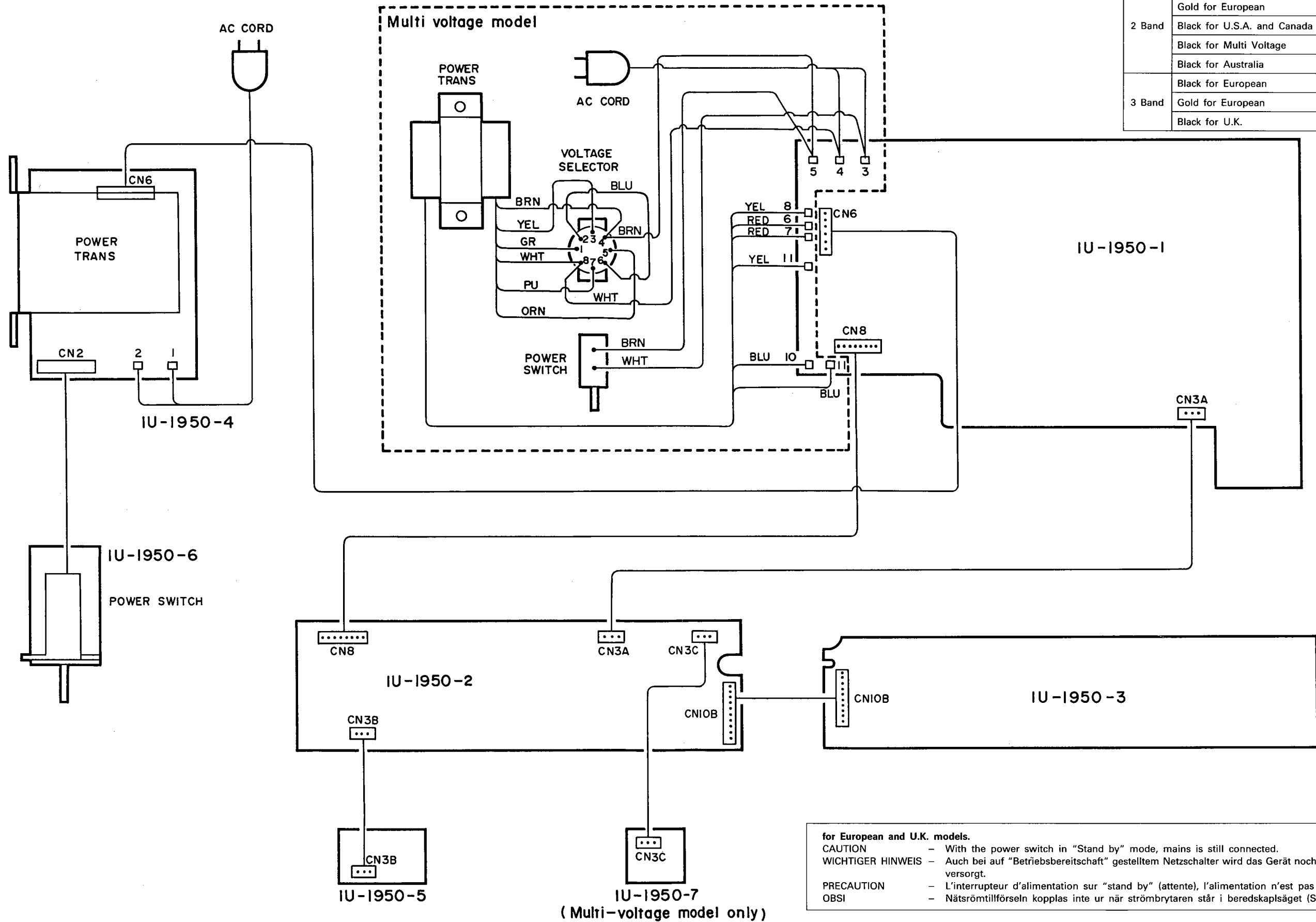
Ref. No.	Part No.	Part Name	Remarks	Q'ty	Ref. No.	Part No.	Part Name	Remarks	Q'ty
1●	411 0752 600	Main Chassis		1	32●	414 0543 009	Shield Case (B)		1
2●	412 1979 003	P.C.B. Holder		3	33●	414 0555 000	Shield Cover (A)		1
3●	104 0208 007	Foot Ass'y		4	34●	414 0556 009	Shield Cover (B)		1
5●	441 0658 116	Switch Bracket		1	△ 35	212 0286 003	Power Switch		1
* 6●	105 0866 015	Back Panel		1	SCREWS & WASHER				
*△ 7	206 2063 009	AC Cord with Plug		1	51	473 7002 021	Tapping Screw (S) 3x8 (Black)		7
△ 8	445 0056 008	Cord Bush		1	52	477 0276 018	Earth Screw		2
9	146 0925 009	Ant. Holder		1	53	475 2003 005	3φ Spring Washer		2
* 10●	1U- 1950 C	Tuner Unit		1	* 54	473 7002 034	Tapping Screw (S) 3x6 (Black)		4
* 10-1		Tuner Unit		1	55	473 7006 027	Tapping Screw (S) 3x10 (Black)		1
* 10-2		Display Unit		1	56	477 0064 107	Fixing Screw		5
* 10-3		Tact SW Unit		1	57	473 7508 017	Tapping Screw (P) 3x10 (Black)		11
* 10-4		Power Trans Unit		1	58	415 0501 002	Washer		1
* 10-5		REM. CON. Unit		1	59	477 0263 005	3P Swelling Screw		4
* 10-6		Power Switch Unit		1	60	473 7015 018	Tapping Screw (S) 3x8 (Black)		1
11●	146 1018 452	Inner Panel		1	PACKING & ACCESSORIES (not included EXPLODED VIEW)				
12●	143 0653 000	Window		1	101-1●	505 8006 019	Envelope		1
13	113 1164 209	Push Knob (Preset)		1	101-2●	511 1895 002	Inst. Manual (Europe)		1
14	113 1277 002	Push Knob (Tuning)		1	101-3	203 2223 002	2P Pin Cord		1
15	412 2880 104	Push Knob Bracket		1	101-4	231 1129 005	Loop Antenna		1
16	477 0096 007	Push Rivet		4	101-5	529 0072 005	FM Ant. Adaptor		1
17●	144 1818 070	Front Panel Ass'y		1	101-6	499 0147 008	RC-126		1
18	113 1278 001	Power Knob Ass'y		1	102●	504 0090 017	Cabinet Cover		1
19	445 8004 007	Wire Clamper		3	103●	503 0762 106	Cushion		2
20●	122 0146 028	Himeron Sheet		2	104●	501 1323 072	Carton Case		1
21●	461 0551 000	Rubber Sheet		1	105●	513 1389 006	Control Card Base		1
22●	102 0122 271	Top Cover		1	106●	513 1349 004	Thermal Carbon Film		1
△ 24-1	233 5720 008	Power Trans		1					
26	393 4043 004	FLD (FIP10TM7)		1					
27●	146 1087 001	LED Holder		1					
28	205 0433 007	3P Ant. Terminal (DIN)		1					
29	205 0274 004	2P Connector Base		1					
31●	414 0429 000	Shield Case (A)		1					

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.		
		U.K.		
6●	Back Panel	105 0866 028		
△ 7	AC Cord with Plug	—		
	AC Cord with Label	206 2024 006		
10●	Tuner Unit			
10-1	Tuner Unit	IU-1950D		
10-2	Display Unit			
10-3	Tact SW Unit			
10-4	Power Trans Unit			
10-5	REM. CON. Unit			
10-6	Power Switch Unit			
△ 24-1	Power Trans	233 5748 006		

WIRING DIAGRAM

	Model Name	Tuner Unit
2 Band	Black for European	1U-1950
	Gold for European	1U-1950
	Black for U.S.A. and Canada	1U-1950B
	Black for Multi Voltage	1U-1950E
3 Band	Black for Australia	1U-1950F
	Black for European	1U-1950C
	Gold for European	1U-1950C
	Black for U.K.	1U-1950D



for European and U.K. models.
 CAUTION - With the power switch in "Stand by" mode, mains is still connected.
 WICHTIGER HINWEIS - Auch bei auf "Betriebsbereitschaft" gestelltem Netzschalter wird das Gerät noch mit strom versorgt.
 PRECAUTION - L'interrupteur d'alimentation sur "stand by" (attente), l'alimentation n'est pas coupée.
 OBSI - Nätsrömtillförseln kopplas inte ur när strömbrytaren står i beredskapsläget (Stand by).

SCHEMATIC DIAGRAM (for 2 Band Model)

2

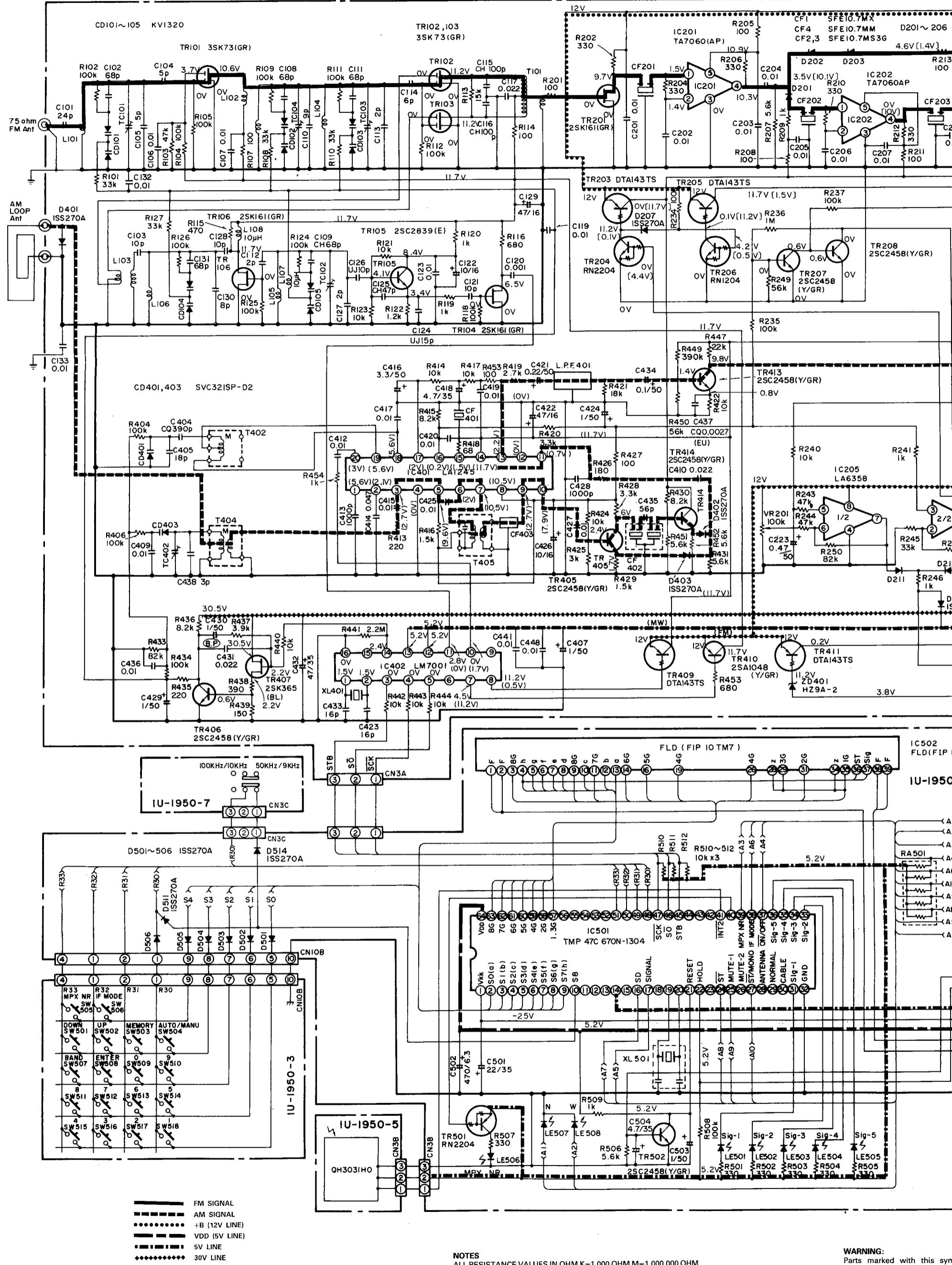
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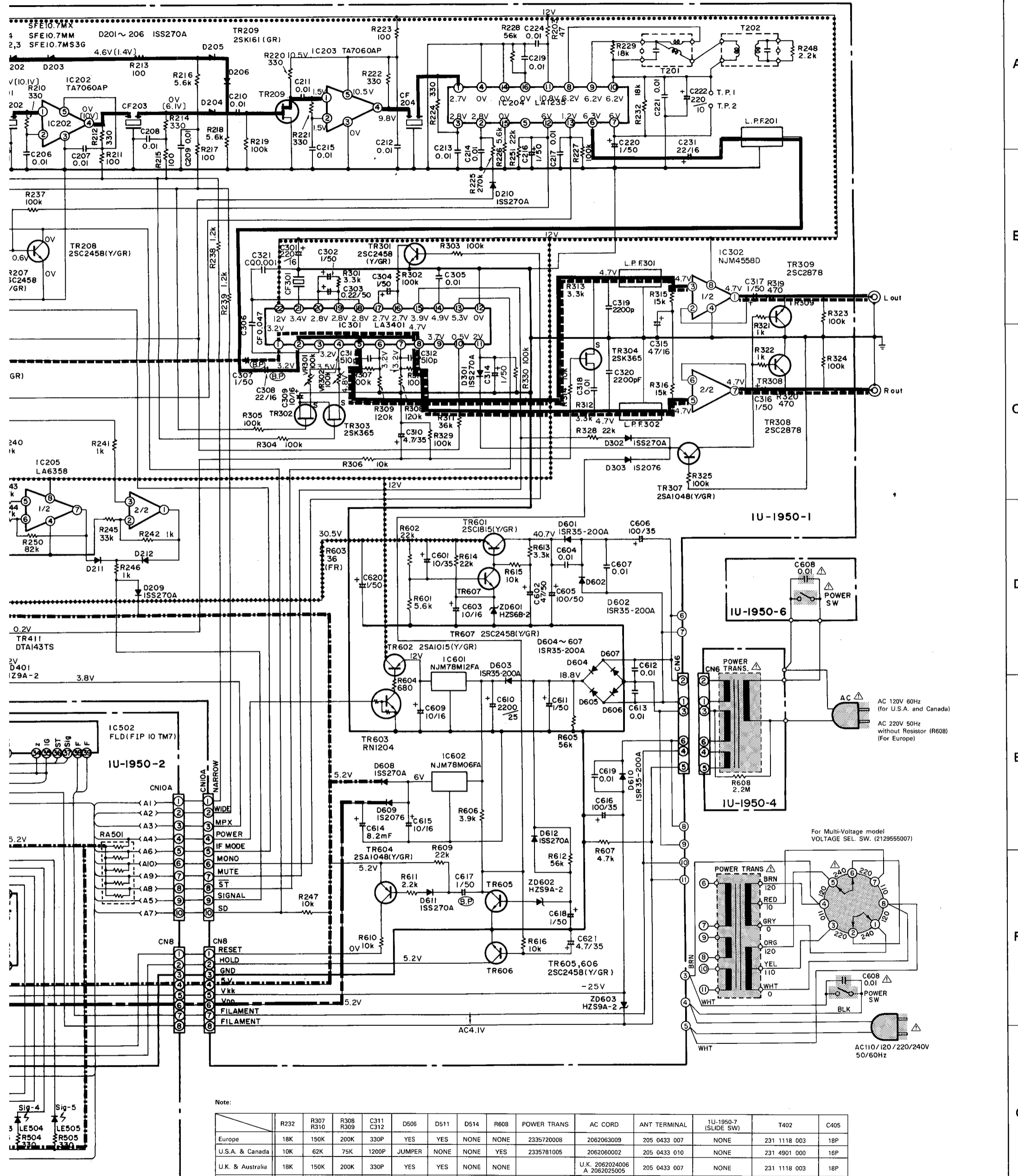
- FM SIGNAL
- - - AM SIGNAL
- +B (12V LINE)
- VDD (5V LINE)
- 5V LINE
- 30V LINE

NOTES
 ALL RESISTANCE VALUES IN OHM K=1,000 OHM M=1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD P=MICRO-MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WARNING:
 Parts marked with this sym replacement parts recommen

CAUTION:
 Before returning the unit to the check or (2) a line to chassis res or if the resistance from chass the unit is defective.

WARNING - DO NOT return t corrected.



Note:

	R232	R307 R310	R308 R309	C311 C312	D506	D511	D514	R608	POWER TRANS	AC CORD	ANT TERMINAL	IU-1950-7 (SLIDE SW)	T402	C405
Europe	18K	150K	200K	330P	YES	YES	NONE	NONE	233572008	2062063009	205 0433 007	NONE	231 1118 003	18P
U.S.A. & Canada	10K	62K	75K	1200P	JUMPER	NONE	NONE	YES	2335781005	2062060002	205 0433 010	NONE	231 4901 000	16P
U.K. & Australia	18K	150K	200K	330P	YES	YES	NONE	NONE	U.K. 2062024006 A 2062025005	2062024006	205 0433 007	NONE	231 1118 003	18P
Multi-Voltage	18K	62K	75K	820P	YES	NONE	YES	NONE	2335782004	2006031026	205 0433 010	YES	231 4901 000	16P

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.

A

B

C

D

E

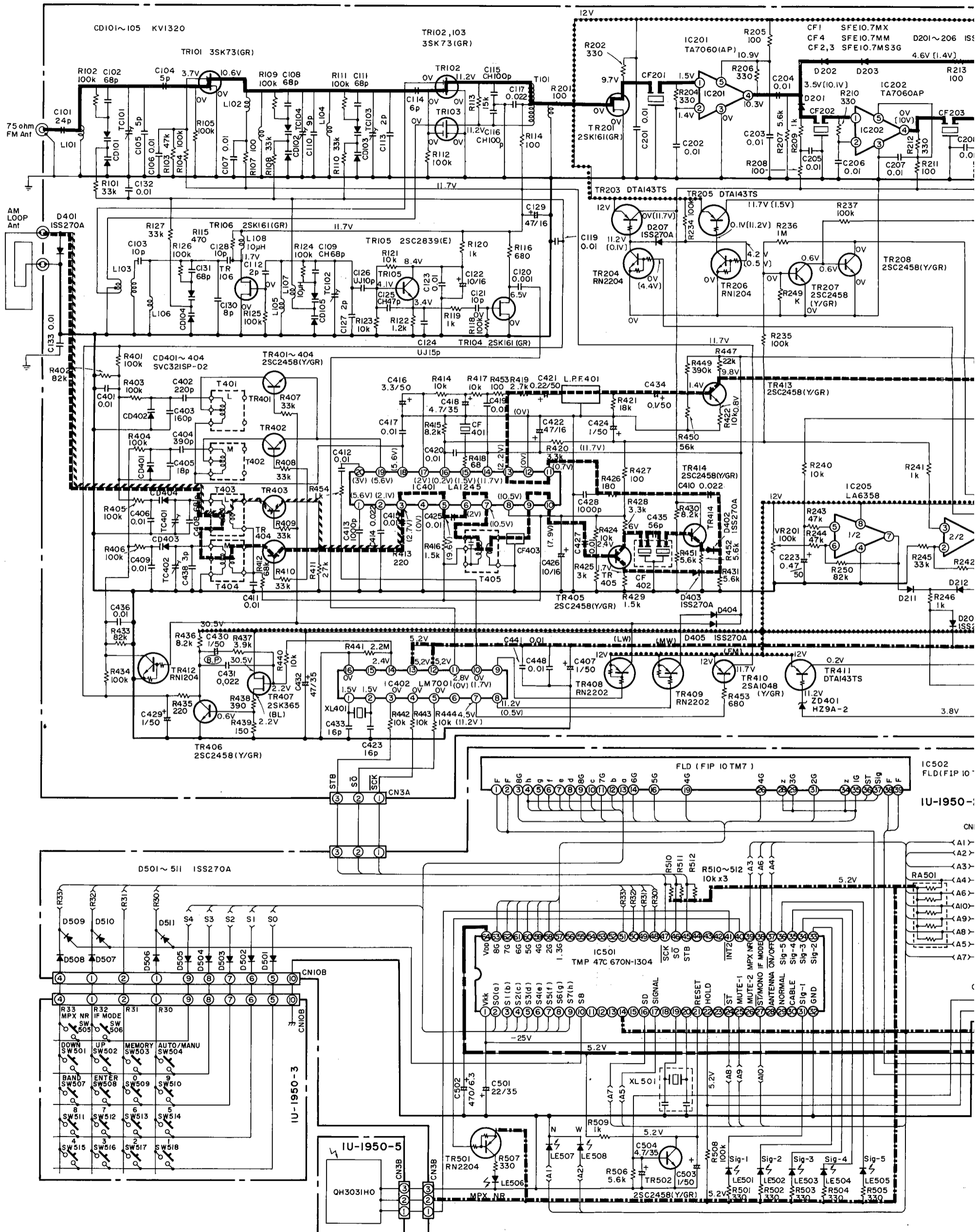
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H

SCHEMATIC DIAGRAM (for 3 Band Model)

1 2 3 4 5 6

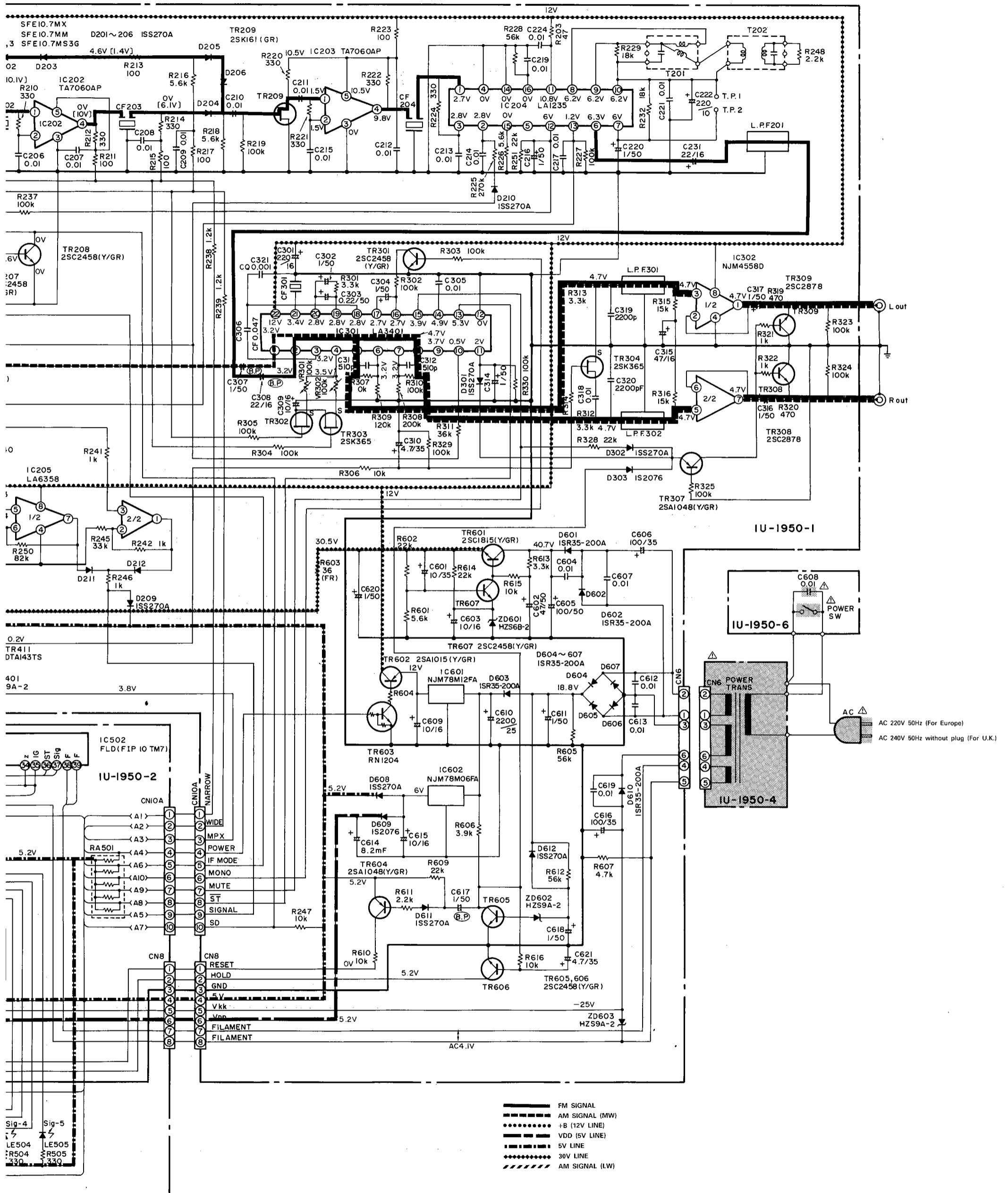


NOTES
 ALL RESISTANCE VALUES IN OHM K=1,000 OHM M=1,000,000 OHM
 ALL CAPACITANCE VALUES IN MICRO FARAD P=MICRO-MICRO FARAD
 EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WARNING:
 Parts marked with this symbol Δ replacement parts recommended by the m

CAUTION:
 Before returning the unit to the customer, ma check or (2) a line to chassis resistance check, or if the resistance from chassis to either sid the unit is defective.

WARNING - DO NOT return the unit to the corrected.



WARNING: Components marked with this symbol Δ have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

ATTENTION: 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 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.