SOLID STATE AM/FM STEREO TUNER

# TX-500A

KU
FV
FVZ

## OPERATING INSTRUCTIONS

PIONEER®

# LINE VOLTAGE AND FUSE

The TX-500A is available in two models: one model operates only on 120V, and the other operates on one of the five line voltages, 110V, 120V, 130V, 220V, and 240V. If your TX-500A is the latter model, set the unit to the proper line voltage by following the procedure described below.

### CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, turn the fuse cap located on the line voltage selector in the direction indicated by the arrow. Then remove the fuse plug from the unit. Put the fuse plug back so that the proper line voltage marking can be seen through the cut in the edge of the plug. Whenever the position of the selector switch is changed, check the rating of the fuse. A 0.2A fuse is to be used for either 220V or 240V operation and a 0.3A rating for 110V, 120V or 130V operation. If the rating of the fuse is correct, replace cap. See Fig. 1.

### FUSE REPLACEMENT

When the fuse blows, remove the fuse cap and replace the fuse with a new one.

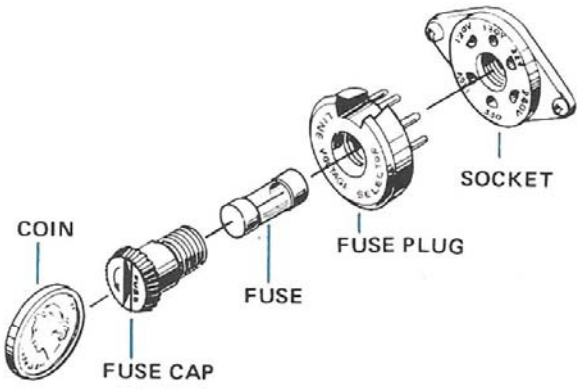



Fig. 1

# INSTALLATION

The TX-500A is a tuner employing silicon transistors. While a great deal of concern over dissipation of generated heat is not required, still the following places should be avoided.

- Those exposed to direct sunlight, those near stoves or other heating units.
- Those over or near a stereo amplifier which radiates a large amount of heat, those near power transformers.
  (Note that tube-type amplifiers in particular give off a large amount of heat.)

# STEREO SYSTEM

Fig. 2 shows a typical arrangement of a home stereo system including the TX-500A tuner, a stereo amplifier, tape and record equipment as well as a pair of speaker boxes.

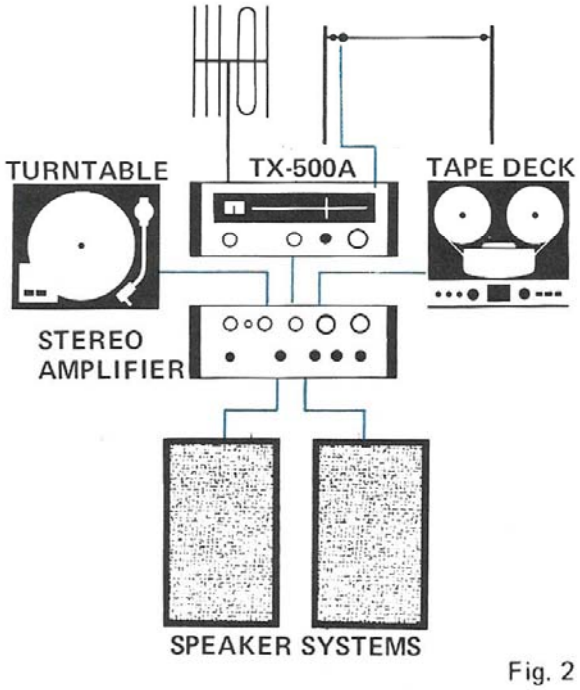



Fig. 2

# CONNECTION TO STEREO AMPLIFIER

Connecting cords are supplied with the TX-500A. If quality shielded leads are used, the distance to the stereo amplifier may be increased beyond that which the length of these cords allows.
Connect the OUTPUT jacks of the TX-500A to the TUNER (or AUX) INPUT terminals of the stereo amplifier with the accessory cords. The upper (lower) output jack is the left (right) channel. Make sure that these connections are correct.

# ANTENNA AND GROUND CONNECTIONS

## FM ANTENNA

FM broadcast signals are attenuated somewhat by mountains, buildings, and other obstacles. Therefore, even if a station is nearby, a high gain antenna may be required. Select the antenna in accordance with the following:

- If the tuner is to be located in a wooden building and stations are nearby, use the T-type antenna which comes with the TX-500A. As shown in Fig. 3, connect the feeder terminals of the antenna to the FM antenna terminals. Stretch out the antenna proper and secure it to the ceiling or a wall in such a manner that pickup is optimum, as determined by listening to the stations to be received. Refer to "FM RECEPTION" on page 7.
- If orientation of the T-type antenna does not eliminate background noise, connect an outdoor antenna to the antenna terminals shown in Fig. 4. In lieu of an antenna, a combination FM/TV antenna may be used.

NOTES:
- A number of FM antennas are available. Consult your sales dealer for selection.
- In locations adjacent to heavily traveled streets, around factories, or near high-voltage power transmission lines, use of an FM antenna may not give the desired noise attenuation. In such cases, consult you sales dealer concerning a coaxial cable feeder (75-ohm) for the FM antenna. When coaxial cable is used, make connection to the tuner as shown in Fig. 5.

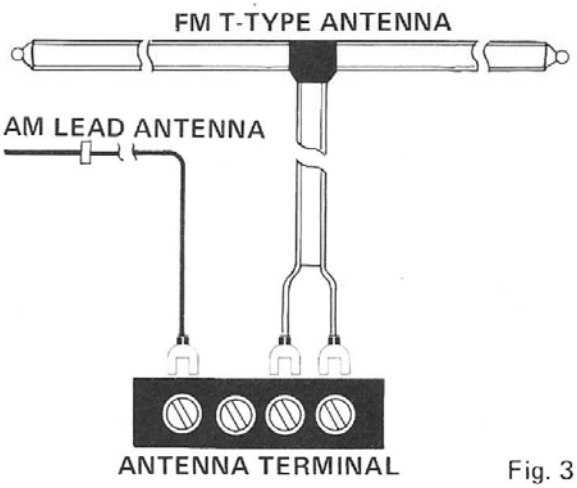


Fig. 3

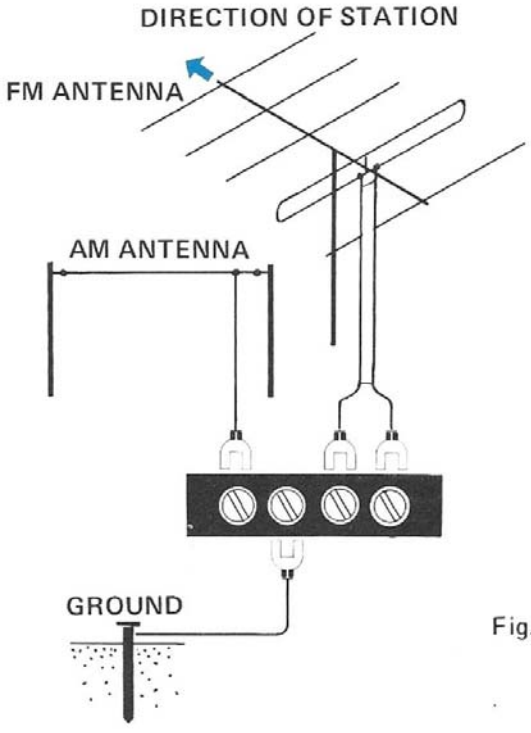


Fig. 4

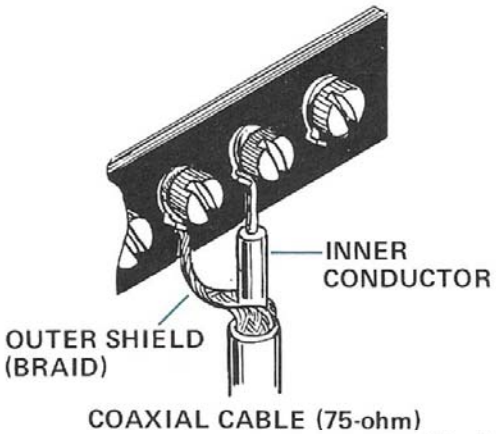


Fig. 5

### AM ANTENNA

- Refer to "AM RECEPTION" on page 7. With an AM station tuned in, position the ferrite antenna for optimum pickup. See Fig. 6.
- If positioning of the ferrite antenna does not yield satisfying results, stretch out the AM lead antenna and connect it to the AM antenna terminal. Keep the other end of the antenna lead as high as possible.
- If use of the lead antenna does not give satisfying results, erect an outdoor antenna and connect it as shown in Fig. 4. Special construction is not required: Vinyl-insulated wire may be stretched between two masts or other supports.

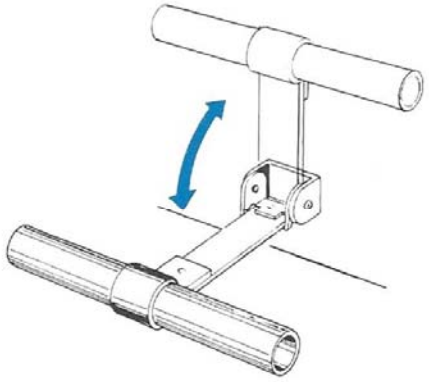


Fig. 6

### GROUNDING

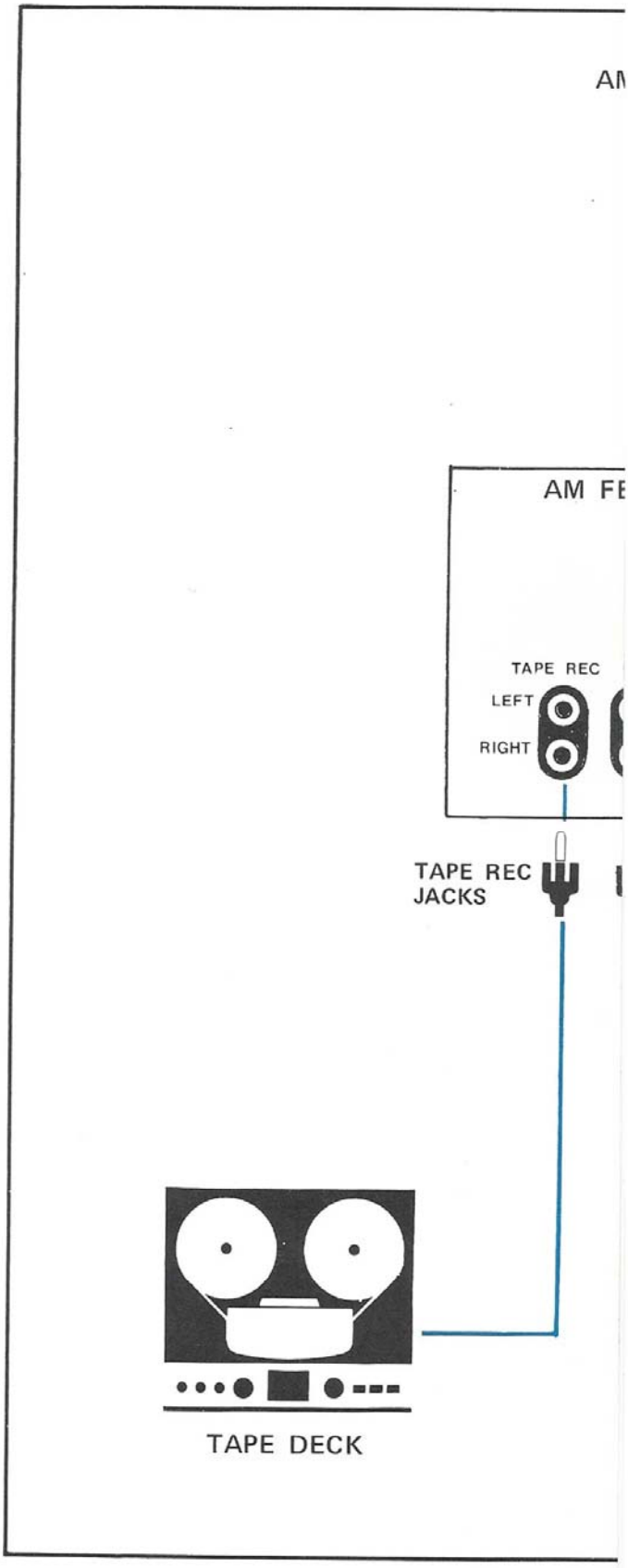
- A ground lead may not be necessary for reception. Still, when thinking about safety and elimination of noise, one should be used.

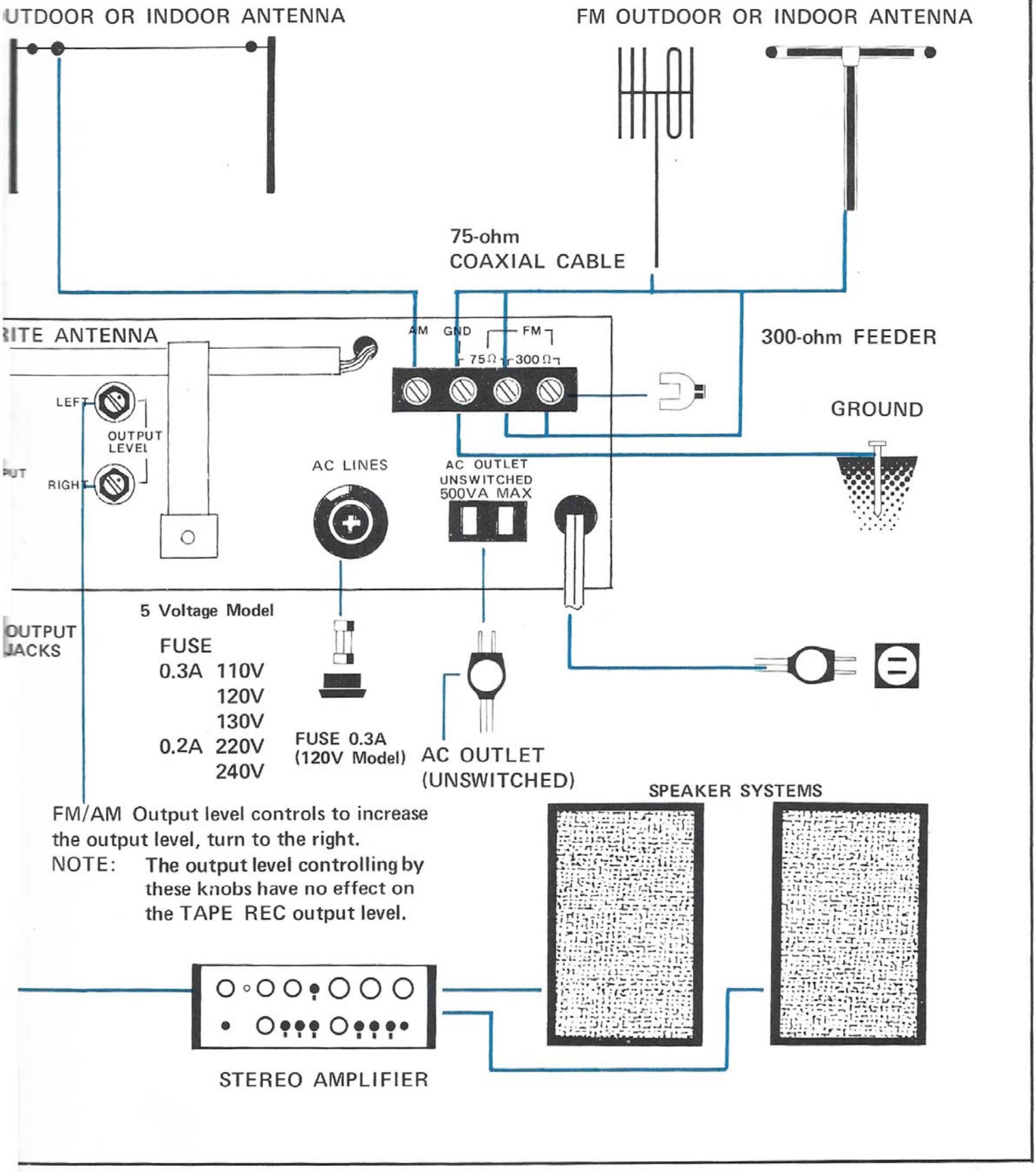
## TAPE DECK CONNECTIONS

- Connect the TAPE REC jacks of the TX-500A to the LINE INPUT terminals of the tape deck or tape recorder, with the connecting cord.
  The upper (lower) jack is the left (right) channel.

NOTE: The TAPE REC output level is not adjustable. Level must be adjusted at the tape deck or tape recorder.

## CONNECTION DIAGRAM

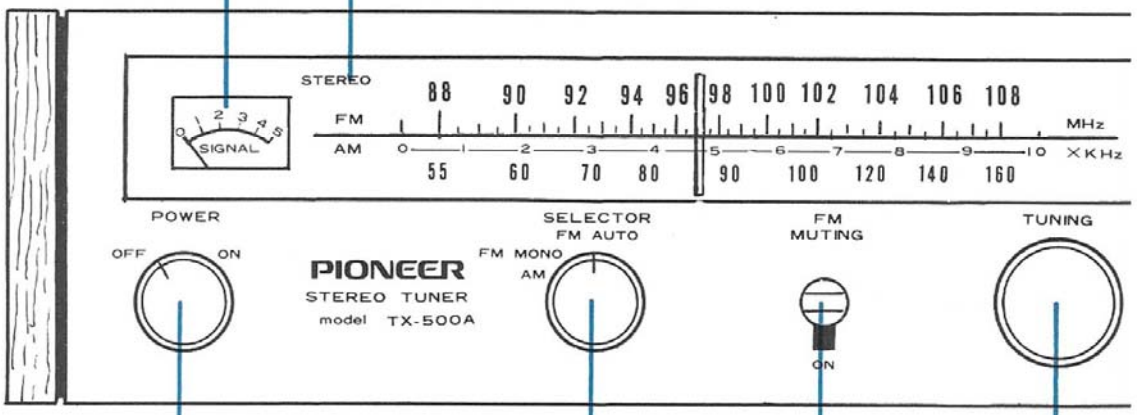





FM/AM Output level controls to increase the output level, turn to the right.

NOTE: The output level controlling by these knobs have no effect on the TAPE REC output level.

# FRONT PANEL FACILITIES




**SIGNAL METE**

Meter for indicatir

**STEREO INDIC**

STEREO appears i

**POWER SWITCH**

Two positions, ON and OFF.

**SELECTOR SWITCH**

Used to select the mode of operation.

| | |
|---|---|
| AM: | AM reception. |
| FM MONO: | FM monophonic reception only. |
| FM AUTO: | FM reception by automatic switching for either stereo or monophonic program. |

**TUNING KNOE**

Used to select desi

**FM MUTING SV**

This switch is usec tuning. In a fringe to suppress the des

receiving signal strength.

ATOR

red when the broadcast is in stereo.

d stations.

ITCH

to suppress much noise between FM stations when
ea, however, this switch should be kept off in order
ed station signal at the same time.

## FM RECEPTION

1. Set the SELECTOR switch to FM AUTO.
2. Set the MUTING switch to off (See NOTES.).
3. Turn the TUNING knob to select the desired station, adjusting it so that the reading of the SIGNAL meter peaks.
4. When the received program is in stereo, the STEREO indicator will appear in red, but if not stereophonic but monophonic, it will not light. If the received signal is very weak or loaded with noise, automatic switching to monophonic reception takes place.

NOTES:
- To eliminate background hiss between stations and reception of undesired remote (weak) stations, set the MUTING switch to ON. To receive very weak signals, turn this switch to OFF.
- In the case of very weak signals, much noise will be heard when the SELECTOR switch is set to the FM AUTO position. To limit this noise, set the SELECTOR switch to FM MONO. Note, however, that stereo broadcasts will be received in monophonic form.

## AM RECEPTION

1. Set the SELECTOR switch to AM.
2. Turn the TUNING knob to select the desired station, peaking the SIGNAL meter.

NOTE: If noise seems excessive during either FM or AM reception, re-check the antenna and ground connections, making sure that they are secured.

## ABOUT THE LEVEL CONTROL

If the output level from the tuner is greater than that from any other program source such as a record or a tape, the output level from the tuner can be matched to that from the other program source by means of the LEVEL control provided on the rear of the tuner.

When a high-sensitivity stereo amplifier is used, TX-500A output may be excessive and make sound distort. Adjust output to the required level.

# CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

| SYMPTOM | SUSPECTED SOURCE OF NOISE | DIAGNOSIS AND REMEDY |
|---|---|---|
| Continuous or intermittent noise like jjjjj or zzzzz. | • Static (lightning)<br>• Fluorescent lamp, motor, or thermostat may be in use in house or in the vicinity of the house. | In many cases, it is very difficult to remove the source of noise. In order to make the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding. |
| When a station is tuned in, hum is mixed in the program. | • Poor fluorescent lamp, motor, or electric heater may be in use in house or near the house. | Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise. |
| Hissing sound noise in AM (medium wave) reception. | • The frequency of an adjacent station is interfering with that of the station being tuned in (10kHz beat interference).<br>• TV set is on in the same house with the tuner. | Impossible to remove such interference. If the cause of such noise is in the TV set, increase the distance between.the TV set and tuner. |
| Static noise (in particular, when automobiles run close to the house). | • White noise generated from automobile engines.<br>• High frequency sewing machine or welding machine being used near your house. | In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an outdoor FM antenna having many director elements. |
| Reception of FM stereo program contains more noise than FM mono program. | Note that the service area covered by an FM stereo broadcast is about 50% of that of a regular mono broadcast. | Increasing FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-type antenna. |

# SPECIFICATIONS

## SEMICONDUCTORS

| | |
|---|---|
| FET | 1 |
| Transistors | 14 |
| Diodes | 21 |

## FM TUNER SECTION

| | |
|---|---|
| Frequency Range | 88MHz to 108MHz<br>87.5MHz to 108MHz<br>(FTZ Approved) |
| Usable Sensitivity (IHF) | 2.3 μV |
| Capture Ratio (IHF) | 3.5 dB |
| Image Rejection | More than 50 dB (98MHz) |
| IF Rejection | More than 80 dB (90MHz) |
| Spurious Rejection | More than 70 dB (98MHz) |
| AM Suppression | 45 dB |
| Signal-to-Noise Ratio (IHF) | 70 dB |
| Harmonic Distortion | Mono: Less than 0.6% (100% Mod.)<br>Stereo: Less than 0.8% (100% Mod.) |
| Tuning Indicator | Signal Strength type |
| Muting | Switchable to ON-OFF |
| Stereo Separation | More than 40 dB (1kHz) |
| Sub Carrier Suppression | More than 35 dB |
| Output Voltage | Controllable, from 60mV to 1.8V (100% Mod.) |
| Antenna Input | Impedance 300Ω balanced and 75Ω unbalanced. |
| De-emphasis switch | 50μS/75μS switchable (without FTZ approved and 120V use model) |

## AM TUNER SECTION

| | |
|---|---|
| Frequency Range | 525kHz to 1,605kHz |
| Usable Sensitivity (IHF) | 15μV |
| Selectivity (IHF) | More than 22 dB |
| Image Rejection | More than 45 dB (1,000kHz) |
| IF Rejection | More than 35 dB |
| Signal-to-Noise Ratio | More than 50 dB (30% Mod.) |
| Output Voltage | Controllable from 60mV to 1.8V (100% Mod.) |
| Antenna | Built-in Ferrite Loopstick Antenna |

## AUDIO SECTION

| | |
|---|---|
| Output Impedance | 3kΩ |
| Recording Output | FM: 600mV<br>AM: 600mV |
| Level Control | AM/FM (L and R) |

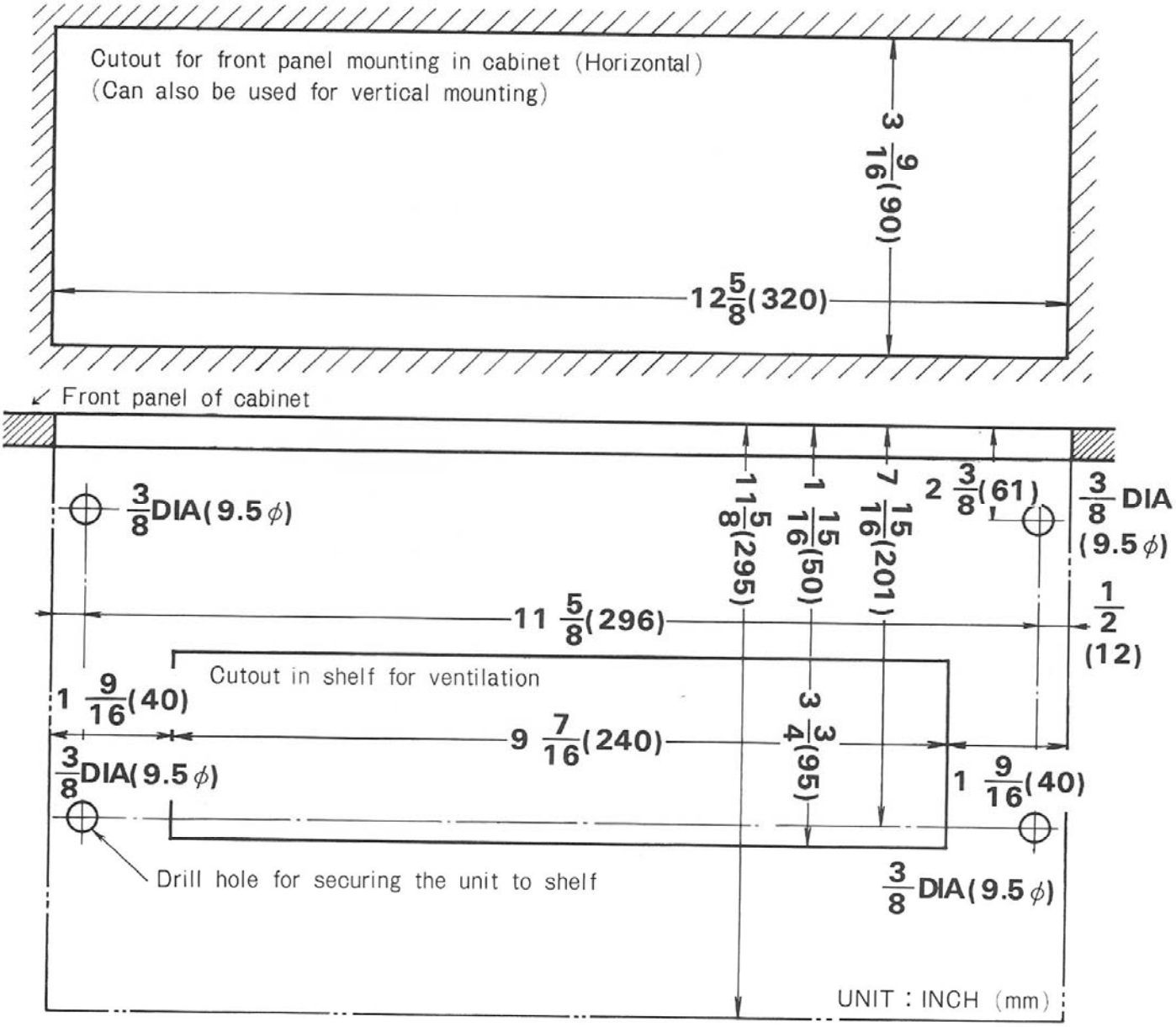
## MISCELLANEOUS

| | |
|---|---|
| Power Requirements | 120V, 60Hz or 110V, 120V, 130V, 220V and 240V (switchable) 50-60Hz. |
| Power Consumption | 12W |
| Dimensions (overall) | 13in./330mm (width)<br>4-5/8in./118mm (height)<br>13-1/3in./338mm (depth) |
| Weight without package | 10lb. 3oz/4.6kg. |
| with package | 13lb. 3oz./6kg. |
| Furnished Accessories | FM T-type Antenna 1<br>Polishing Cloth 1<br>Connecting Cord 1<br>Operating Instructions 1 |
| Fuse | 0.3A 2 |
| (5-line voltage model) | 0.2A 1 |

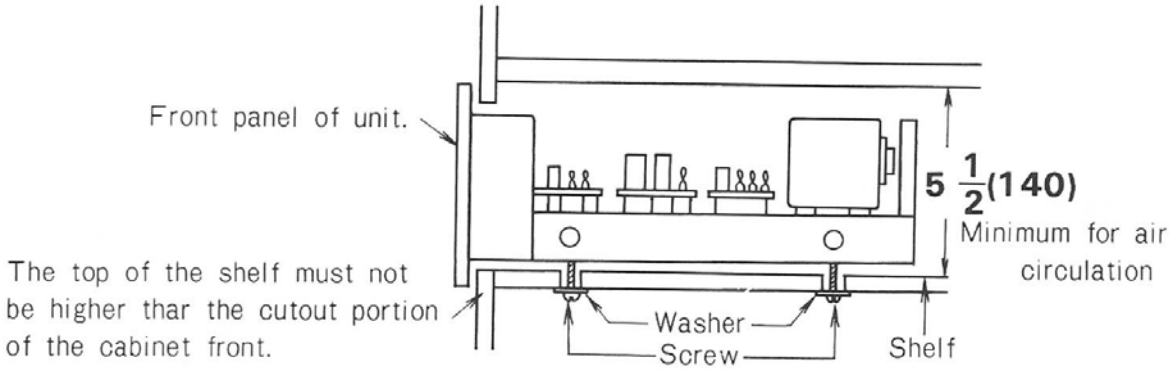
* No fuse is included for 120-voltage model.

NOTE: Specifications and the design subject to possible modification without notice due to improvements

# MOUNTING TEMPLATE




Remove the four feet on the bottom plate of the unit



# FM TUNER TRACKING ALIGNMENT

Set is factory adjusted, no re-adjustments should normally be required. If re-adjustment is required, observe following steps.

## Connections

Connect FM signal generator to FM antenna terminals. Connect V.T.V.M. to TAPE REC outputs. Adjust signal generator output level at 20dB, apply 400Hz 30% modulation.

## Procedure

1. Turn tuning knob to extreme left and confirm that pointer is at scale end.
2. Set signal generator frequency at 87.4MHz. Adjust oscillator coil in figure to obtain maximum output reading on V.T.V.M.
3. Turn tuning knob to 106MHz, adjust signal generator for 106MHz. Adjust oscillator trimmer capacitor to obtain maximum output reading.
4. Adjust receiver and signal generator at 90MHz. Adjust RF and antenna coils core to obtain maximum output reading.
5. Return to 106MHz setting. Adjust RF and antenna trimmer capacitors to obtain maximum output reading.
6. Repeat steps 2 – 5 to optimum output alignment.

# ABSTIMMUNG DES FM-EMPFANGSTEILS

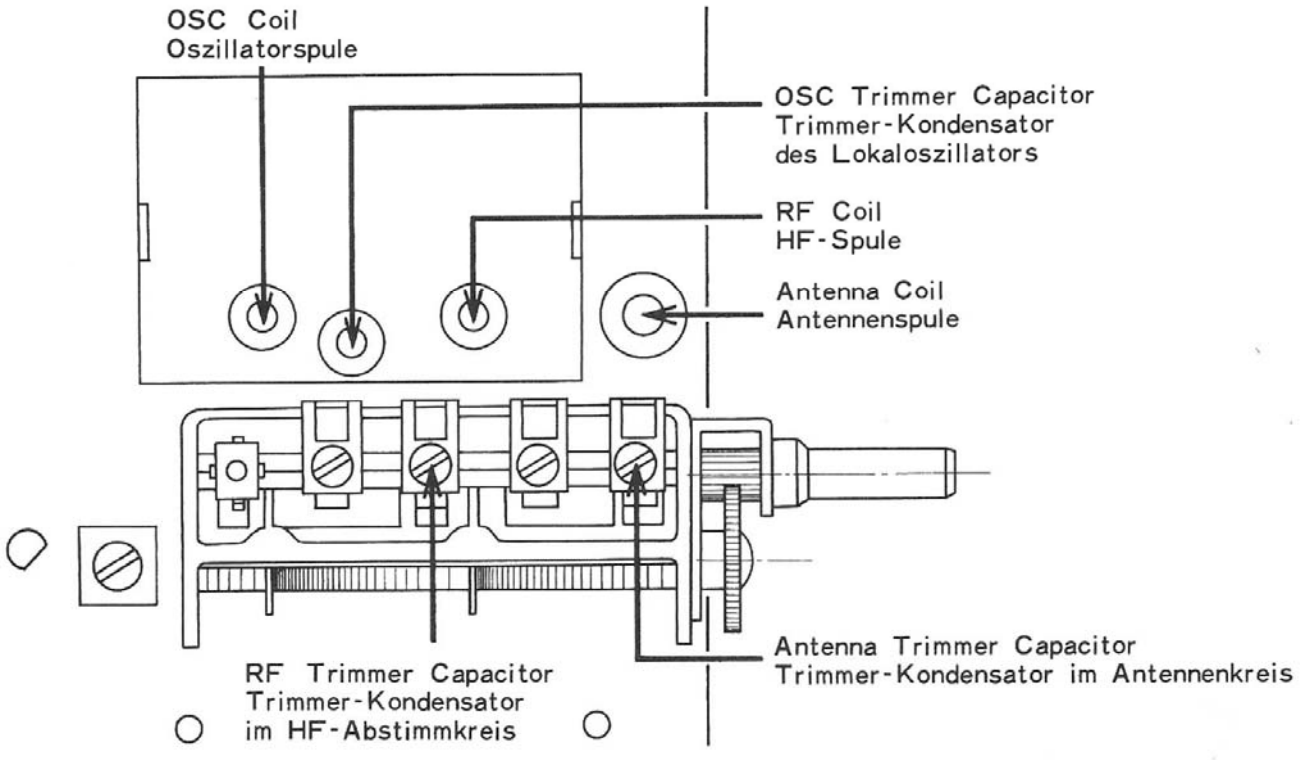
Nachjustierungen dürften normalerweise nocht erforderlich sein. Gegebenenfalls wie folgt vorgehen, um die FTZ-Bestimmungen zu erfüllen.

## Anschlüsse

Testgenerator an UKW-Antennenanschlüsse, Röhrenvoltmesser an TAPE REC Ausgänge anschliessen. Testgenerator auf 20dB Ausgangspegel, 400Hz 30% Modulation einstellen.

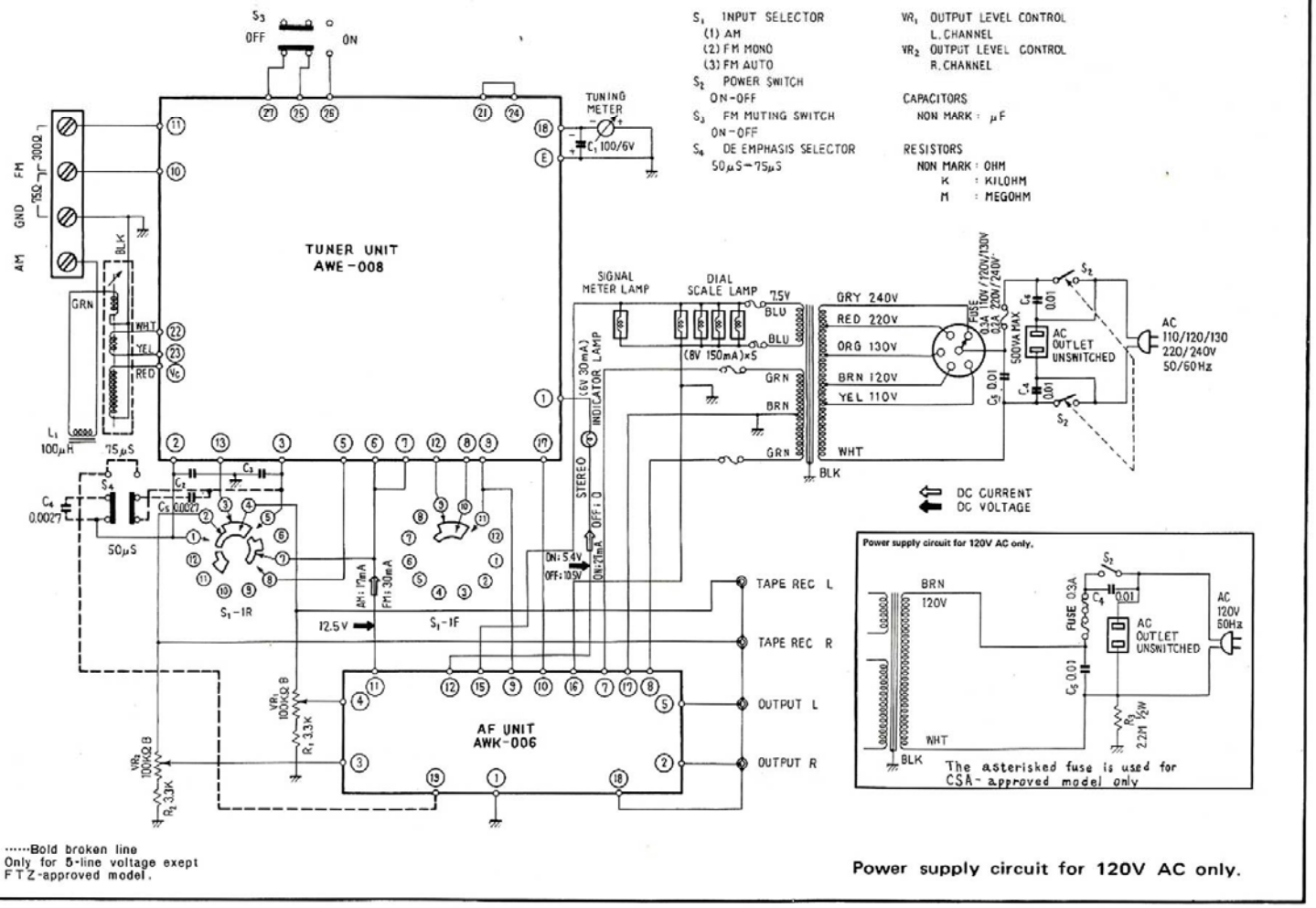
## Abgleichverfahren

1. Sendereinstellung auf extrem links drehen. Zeiger muss am Skalenende stehen.
2. Testgeneratorfrequenz auf 87.4MHz einstellen. Oszillatorspule in Abbildung so justieren, dass maximaler Ausgangspegel am Voltmesser abgelesen wird.
3. Sendereinstellung und Testgenerator auf 106MHz einstellen. Trimmer-Kondensator des Lokaloszillators wiederum auf maximalen Ausgangspegel einstellen.
4. Empfänger und Testgenerator auf 90MHz einstellen. Kerne der HF- und Antennenspulen auf maximalen Ausgangspegel abgleichen.
5. Wieder auf 106MHz übergehen. Trimmer-Kondensatoren im HF-Abstimmkreis und Antennenkreis auf maximalen Ausgangspegel justieren.
6. Schritte 2 – 5 wiederholen, bis bestmögliche Abstimmung erzielt ist.



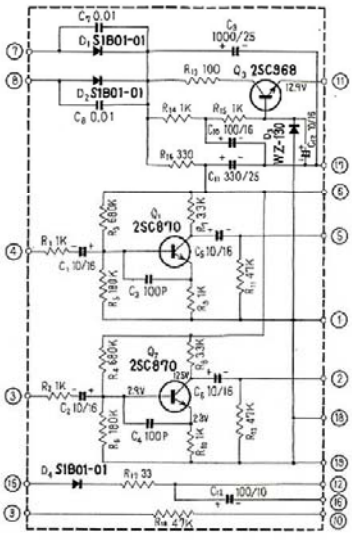
# SCHEMATIC DIAGRAMS

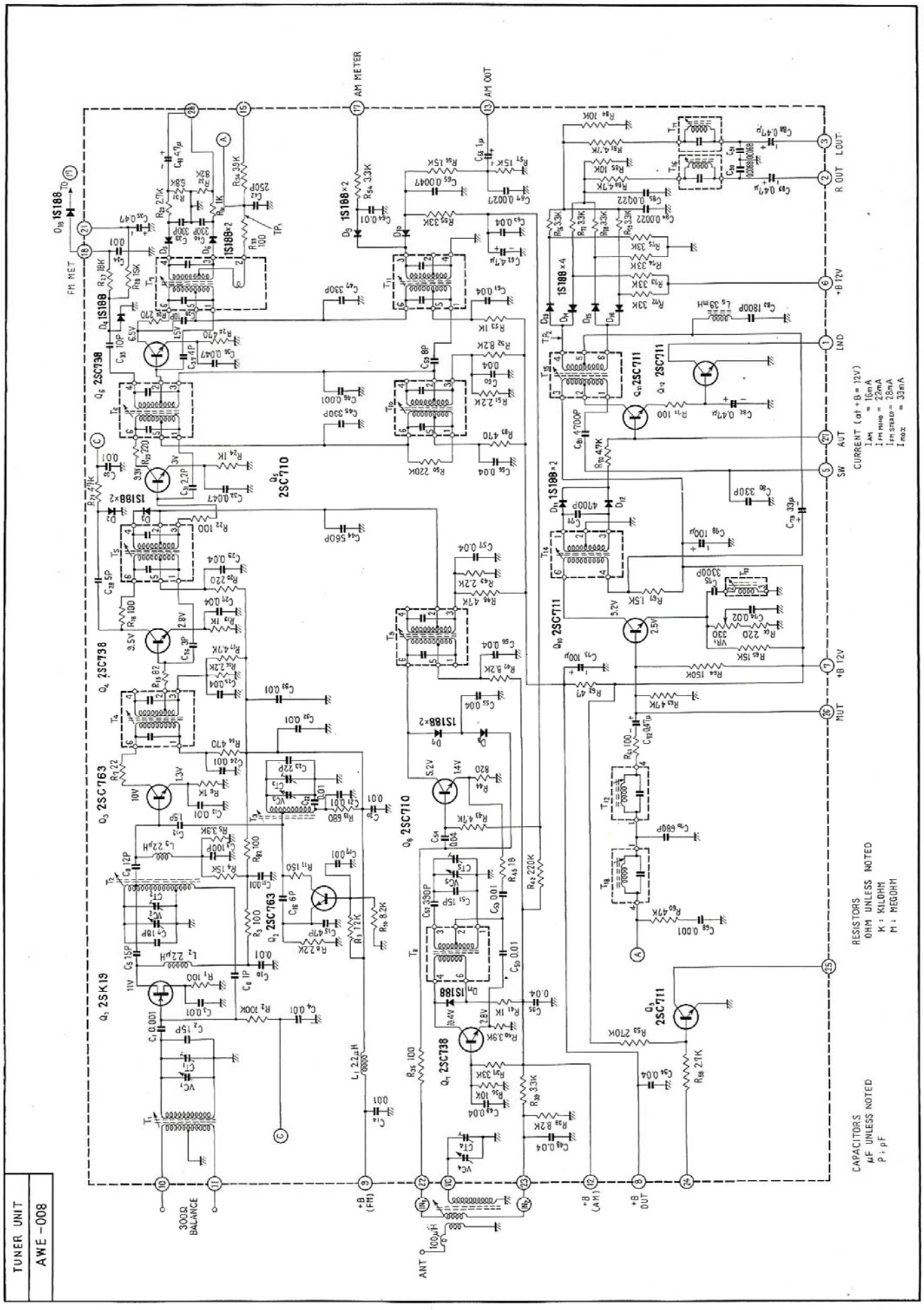
## TX-500A

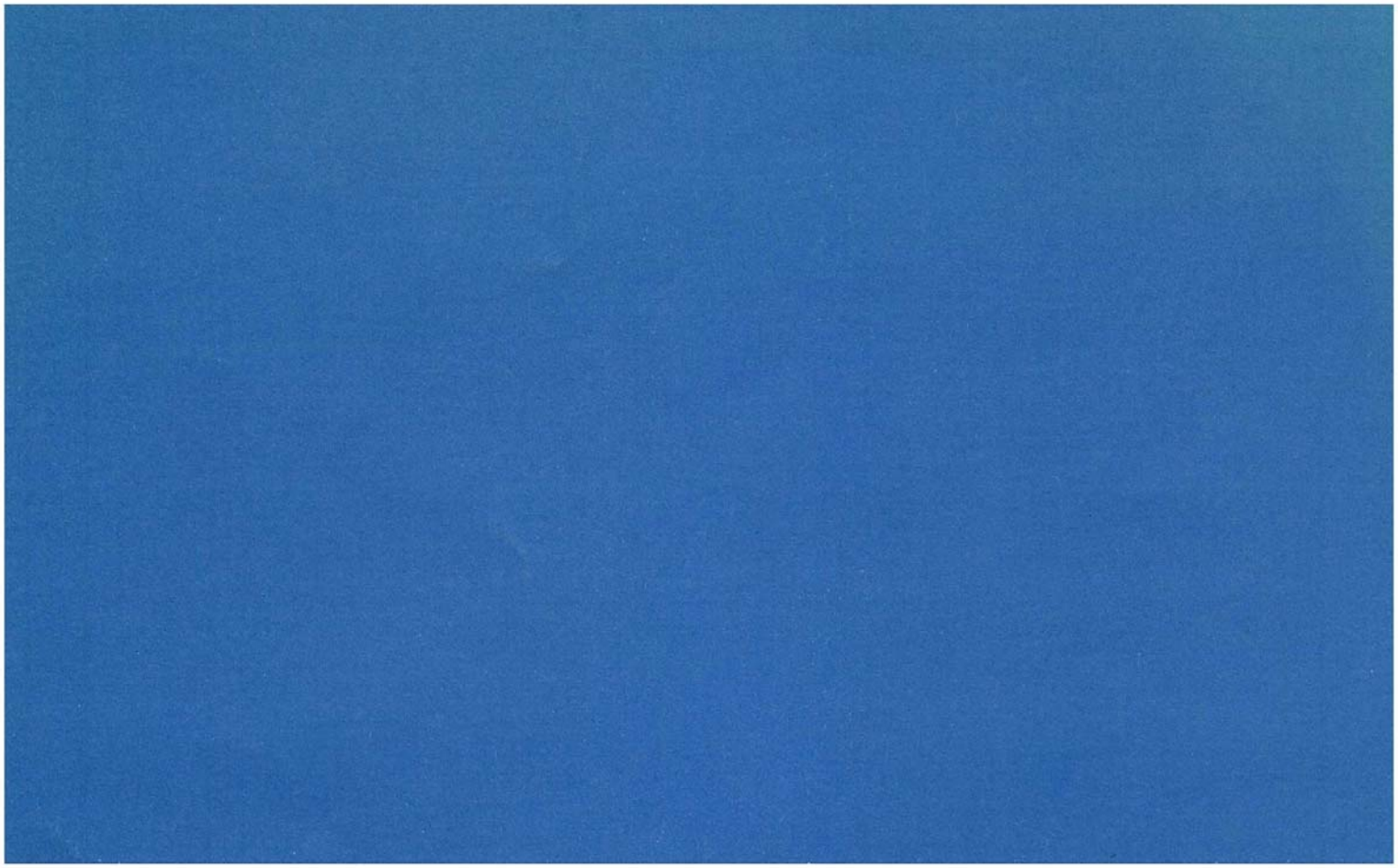



Power supply circuit for 120V AC only.

## AF UNIT AWK-006




TUNER UNIT
AWE-008
RESISTORS
OHM UNLESS NOTED
K : KILOHM
M : MEGOHM
CAPACITORS
μF UNLESS NOTED
P : pF
CURRENT (at +B = 12V)
IAM = 16mA
IFM Mono = 22mA
IFM Stereo = 28mA
Imax = 33mA
AM METER
AM OUT
FM MET
TO (17)
R OUT
L OUT
+B 12V
GND
SW AUT
MUT
+B 12V
300Ω BALANCE
+B (FM)
+B (AM)
+B OUT
ANT
Q1 2SK19
Q2 2SC763
Q3 2SC763
Q4 2SC738
Q5 2SC710
Q6 2SC710
Q7 2SC738
Q8 2SC711
Q9 2SC711
Q10 2SC711
Q11 2SC711
D1 1S188
D2 1S188×2
D3 1S188×2
D4 1S188
D5 1S188×2
D6 1S188×2
D7 1S188
D8 1S188×2
D9 1S188×2
D10 1S188
D11 1S188×4



**PIONEER ELECTRONIC CORPORATION**
15-5, 4-Chome, Ohmori-nishi, Ohta-ku, Tokyo, Japan
**U.S. PIONEER ELECTRONICS CORPORATION**
178 Commerce Road, Carlstadt New Jersey 07072 U.S.A.
**PIONEER ELECTRONIC (EUROPE) N.V.**
Meir-center, Meir 21, 2000 Antwerp, Belgium

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