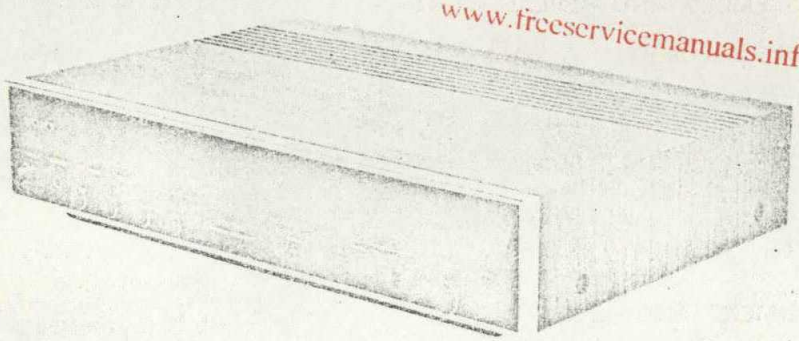
M. W. TAX

STR-700

AEP Model
UK Model



FM STEREO/FM-AM RECEIVER

SPECIFICATIONS

FM TUNER SECTION

Frequency range:	87.5 to 108 MHz
Usable sensitivity:	2.2 μV (6.5 dB), S/N = 30 dB
Signal-to-noise ratio:	65 dB
Harmonic distortion:	Mono 0.5 % at 400 Hz Stereo 1.0 % at 400 Hz
Fm-stereo separation:	Better than 35 dB

AM TUNER SECTION

Frequency range:	MW 530 to 1,605 kHz LW 150 to 350 kHz
Sensitivity:	MW 250 μV/m (48 dB/m), built-in antenna 20 μV (26 dB), external antenna LW 400 μV/m (52 dB/m), built-in antenna 180 μV (45 dB), external antenna
Signal-to-noise ratio:	MW/LW 50 dB
Harmonic distortion:	MW/LW 0.8 dB at 400 Hz

AUDIO AMPLIFIER SECTION

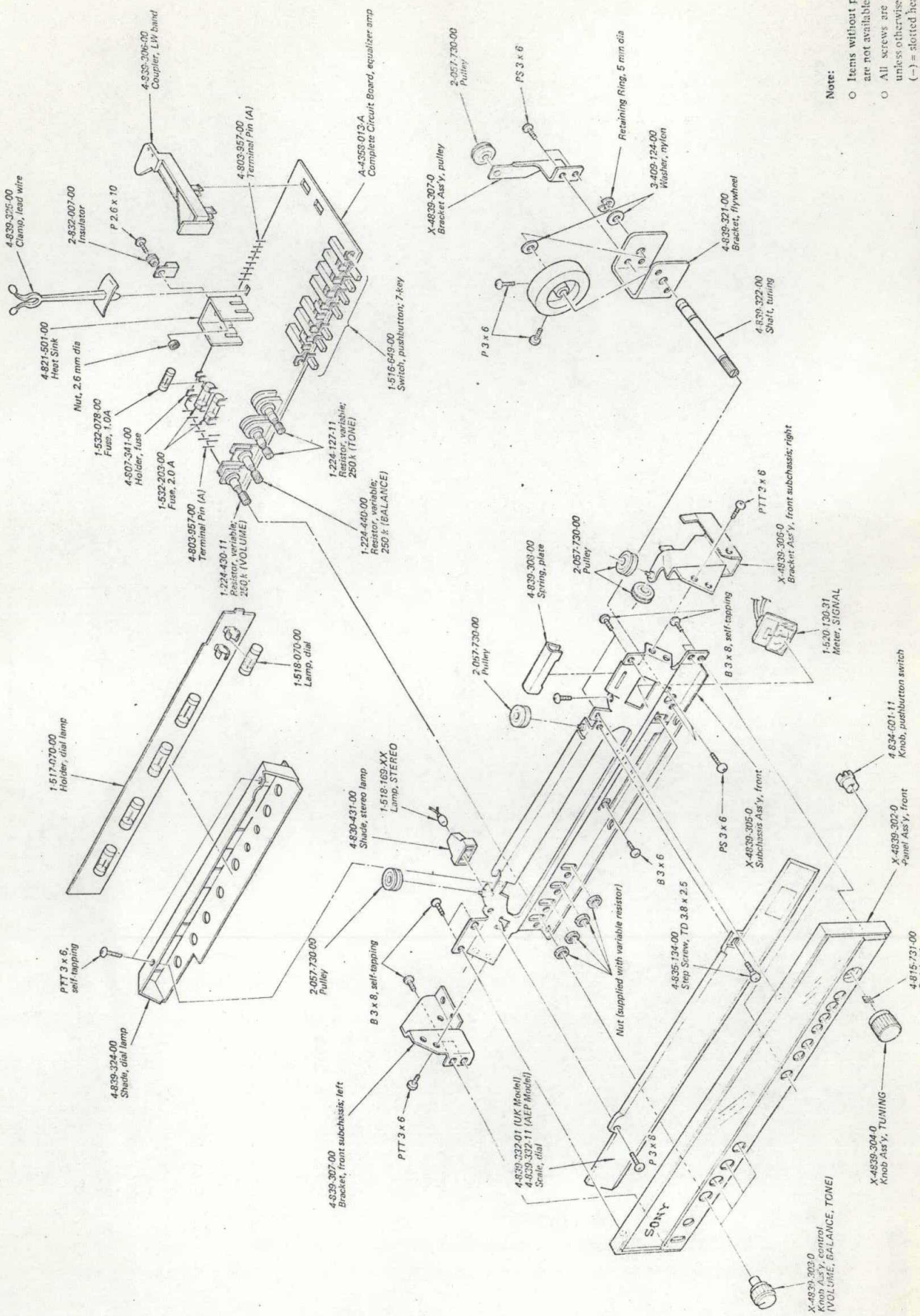
Continuous RMS power output: (THD = 1.0 %, 1 kHz)	2 x 10 W
Music power output: (THD = 1.0 %, 1 kHz)	2 x 16 W
Harmonic distortion:	Less than 1.0 % at 1 kHz at continuous RMS power output
Frequency response:	TAPE: 70 Hz to 40 kHz at 1-watt output

GENERAL

Power requirements:	110, 127, 220, 240 volts, 50 Hz ac (AEP Model) 240 volts, 50 Hz ac (UK Model)
Power consumption:	85 watts
Dimensions:	500 (w) x 118 (h) x 346 (d) mm 19 3/4 (w) x 4 5/8 (h) x 13 5/8 (d) inches
Net weight:	7.2 kg (15 lb 13 oz)

SONY®

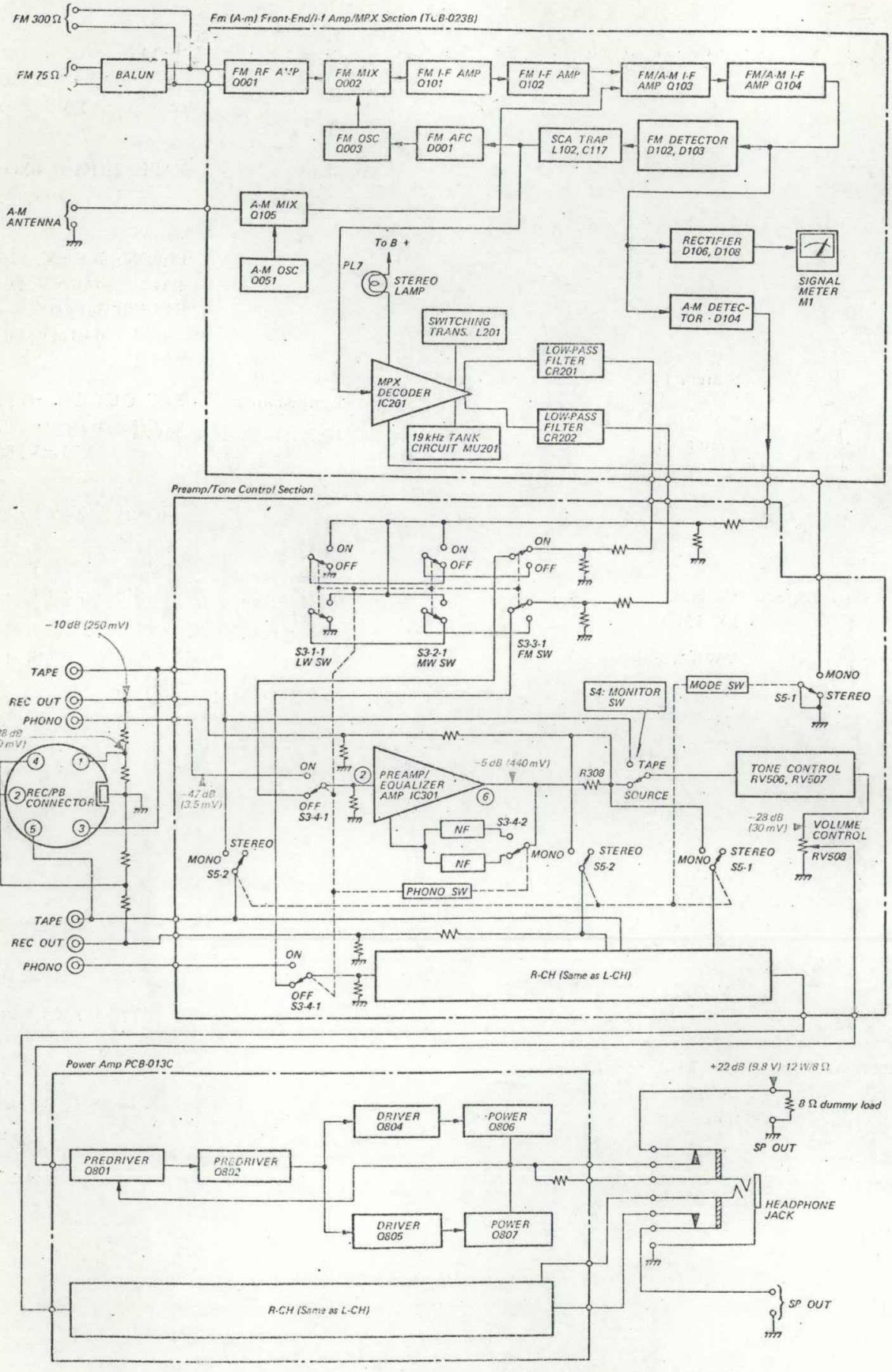
SERVICE MANUAL



Note:

- Items without part number and description are not available.
- All screws are Philips (cross recessed) unless otherwise noted.
  (–) = slotted head
- "PTT" type screws may be replaced

2. BLOCK/LEVEL DIAGRAM



Note: Signal voltages are measured with ac VTVM and expressed in dB referred to 0.775 V, 1 kHz.

SECTION 3

ALIGNMENT AND ADJUSTMENT

1. FM I-F AND DISCRIMINATOR ALIGNMENT

CAUTION

The ceramic filters in the fm i-f circuit are selected according to their specified center frequencies and color coded as shown in Fig. 3-1 and listed in Table 3-1. Check the color code of the filters to identify the same center frequency when replacing any of these filters.

TABLE 3-1.
FM I-F CERAMIC FILTERS

Part No.	*Color*	*Specified Center Freq.*
1-527-220-11	red	10.70 MHz
1-527-220-21	blue	10.67 MHz
1-527-220-31	orange	10.73 MHz
1-527-220-41	black	10.64 MHz
1-527-220-51	white	10.76 MHz

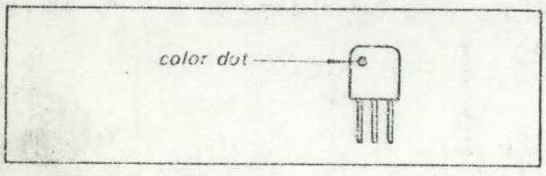


Fig. 3-1. Color dot on ceramic filters

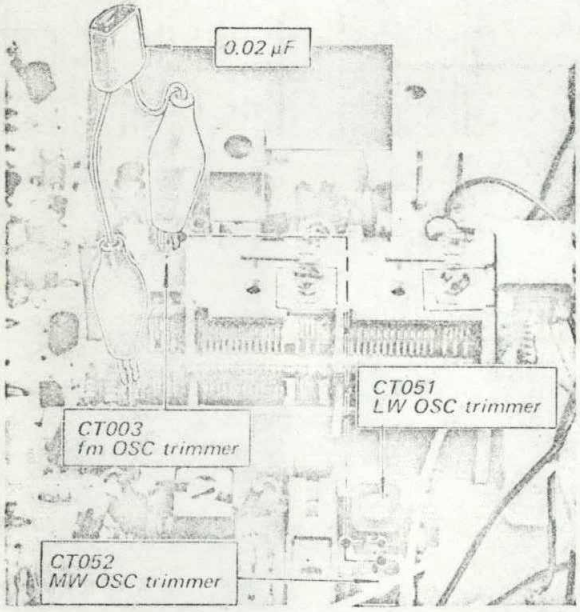


Fig. 3-2. Interruption of fm or a-m local oscillator operation

Note: Local oscillator should be killed when performing this alignment. To stop the local oscillator's operation, shunt the oscillator capacitor with a 0.02µF capacitor as shown in Fig. 3-2.

Signal Generator Method

Test Equipment Required

1. Signal generator capable of generating a 10.7-MHz a-m/fm signal.
2. Oscilloscope
   Vertical sensitivity . . . 100 mV/cm minimum
3. Alignment tools
4. Ac VTVM

Preparation

1. Connect the input cable of the oscilloscope with alligator clips to connection point of R154 and C116, and ground on the fm (a-m) front-end/i-f amp/MPX board and solder a 0.02 µF capacitor across these clips as shown in Fig. 3-3.
2. Connect the output cable of the signal generator across CT002 on the fm (a-m) front-end/i-f amp/MPX board through a 0.02 µF coupling capacitor as shown in Fig. 3-4.

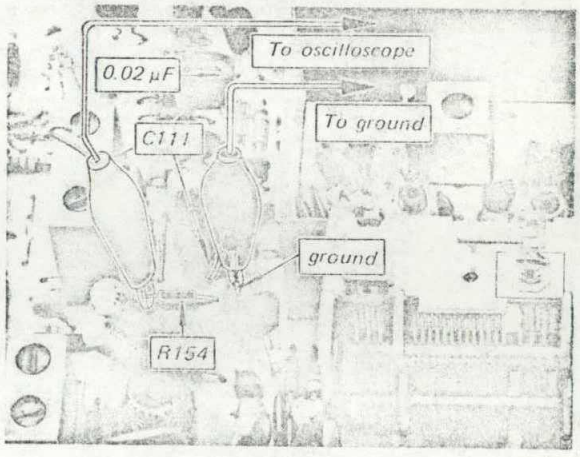


Fig. 3-3. Fm discriminator output connection

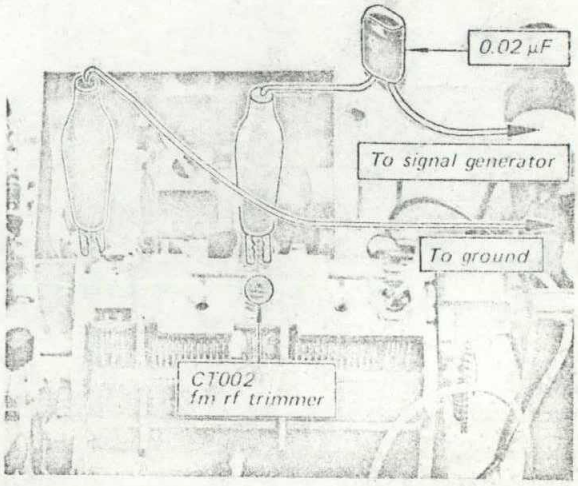


Fig. 3-4. 10.7 MHz signal injection

Procedure

With the equipment connected as shown in Fig. 3-5, set the signal-generator controls as follows:

Frequency ..... Specified center frequency of ceramic filter. See Table 3-1.
Modulation ..... Fm, 400 Hz, 100% (75 kHz deviation)
Output level ..... 1,000 μV (60 dB)

Set the receiver controls as follows:

FUNCTION switch ..... FM
VOLUME control ..... Minimum

Adjust the signal generator frequency slightly to obtain a maximum output, and then change the signal generator's modulation to a-m, 400-Hz 30%.

4. If the discriminator transformer IFT102 (See Fig. 3-13) is not aligned correctly, 400 Hz ripple will be observed as shown in Fig. 3-6.

5. Turn the secondary side core (green) of discriminator transformer IFT102 (See Fig. 3-13) with an alignment tool to obtain a minimum indication on the oscilloscope as shown in Fig. 3-6.

Fig. 3-6. Fm discriminator alignment output response

Note: Turn the core carefully and slowly because the output appearing on the oscilloscope jumps up and down when turning the core. This might cause difficulty in determining the point of minimum output.
Also, at both extreme positions of the secondary core, decreased output will be observed. The real null point should be obtained in the middle of the core thread length, and maximum output appears at each side of the true null point.

6. Change the signal generator modulation to fm, 400 Hz 100% (75 kHz deviation).

7. Turn the core of fm i-f transformer IFT001 (See Fig. 3-13) and the primary side core (brown) of discriminator transformer IFT102 (See Fig. 3-13), to obtain the maximum output.

3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Note: Before starting this alignment, be sure that the fm i-f and discriminator alignment has been performed, and that the dial is mechanically calibrated as described in Procedure 2-6.

Signal Generator Method

Test Equipment Required

1. Fm signal generator
2. Ac VTVM
3. Alignment tools
4. Oscilloscope

Preparation

1. Connect the equipment as shown in Fig. 3-7.
2. Set the receiver controls as follows:

   FUNCTION switch ..... FM
   VOLUME control ..... Minimum

3. Short the connection point of R154 and C111 (AFC circuit) to ground as shown in Fig. 3-8.

Procedure

Follow the procedures given in Table 3-2 when performing this alignment with an fm signal generator.

Off-the-Air Signal Method

The frequency-coverage alignment can also be performed by utilizing off-the-air local fm signals.

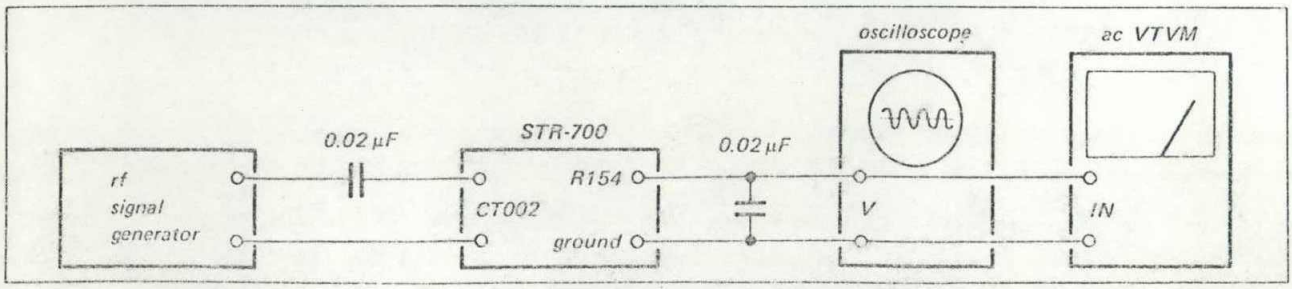


Fig. 3-5. Fm i-f and discriminator alignment setup by rf signal generator

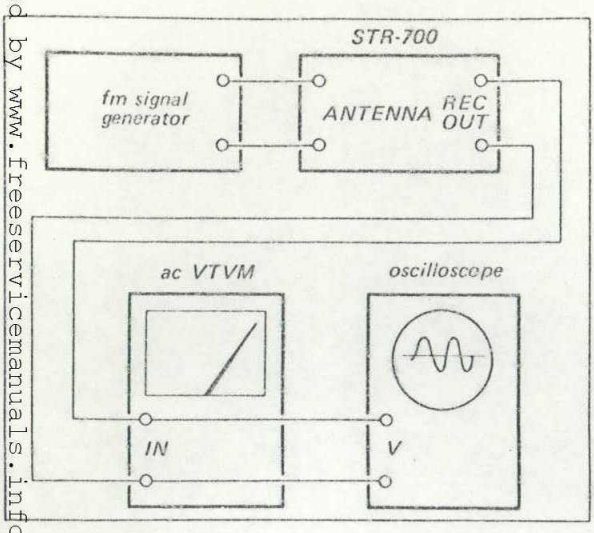


Fig. 3-7. Fm frequency coverage and tracking alignment setup

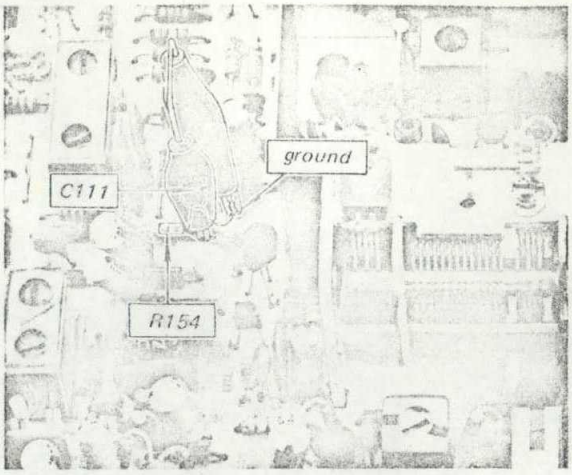


Fig. 3-8. Interruption of AFC circuit

TABLE 3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Step	SG Coupling	SG Frequency and Output Level	Dial Indication	Ac VTVM Connection	Adjust	Indication
	FM FREQUENCY COVERAGE ALIGNMENT					
1.	Direct coupling	87.2 MHz (※ 87.5 MHz) 400 Hz 75 kHz deviation (100%) mod. Output level; as low as possible	lowest position	REC OUT	OSC coil L002 See Fig. 3-13.	Maximum VTVM reading
2.	Same as above	108.4 MHz (※ 108.0 MHz) 400 Hz 75 kHz deviation (100%) mod. Output level; as low as possible	highest position	Same as above	OSC trimmer CT003 See Fig. 3-13.	Same as above
	FM TRACKING ALIGNMENT					
1.	Direct coupling	87.2 MHz (※ 87.5 MHz) 400 Hz 75 kHz deviation (100%) mod. Output level; as low as possible	lowest position	REC OUT	Antenna coil L001 RF coil L003 See Fig. 3-13.	Maximum VTVM reading
2.	Same as above	108.4 MHz (※ 108.0 MHz) 400 Hz 75 kHz deviation (100%) mod. Output level; as low as possible	highest position	Same as above	Antenna trimmer CT001 RF trimmer CT002 See Fig. 3-13.	Same as above

Note: ※ West Germany Model only

3-3. FM STEREO SEPARATION ADJUSTMENT

Test Equipment Required

1. Fm stereo signal generator
2. Ac VTVM
3. Oscilloscope
4. Alignment tools

Preparation

1. Remove the wooden case as described in Procedure 2-1 on page 5.
2. Connect the equipment as shown in Fig. 3-9, then set the fm stereo signal generator controls as follows:
   Carrier frequency ..... 98 MHz
   Output level ..... 1,000 μV (60 dB)
   Mode ..... Stereo
   Audio (400 Hz) Mod .. 67.5 kHz (90 %)*
   Pilot (19 kHz) Mod .... 7.5 kHz (10 %)

*Note: 75 kHz (100 %) if the metering indicates total modulation (audio+pilot).

Procedure

1. Precisely tune the receiver to the carrier frequency of stereo signal generator, then turn the top core of switching transformer L201 (See Fig. 3-13) to obtain maximum output at the left channel. Note that this adjustment has a close relationship with stereo distortion.
2. Record the output level of the left channel when the stereo signal generator input selector is set to the left channel.
3. Switch the stereo signal generator input selector to the right channel and read the residual signal level of the left channel.
4. The output-level to residual-level ratio represents the separation. Turn the top core of switching transformer L201 (See Fig. 3-13) for minimum residual level. Check the right channel for separation. Readjust switching transformer for minimum difference between left and right-channel separation.

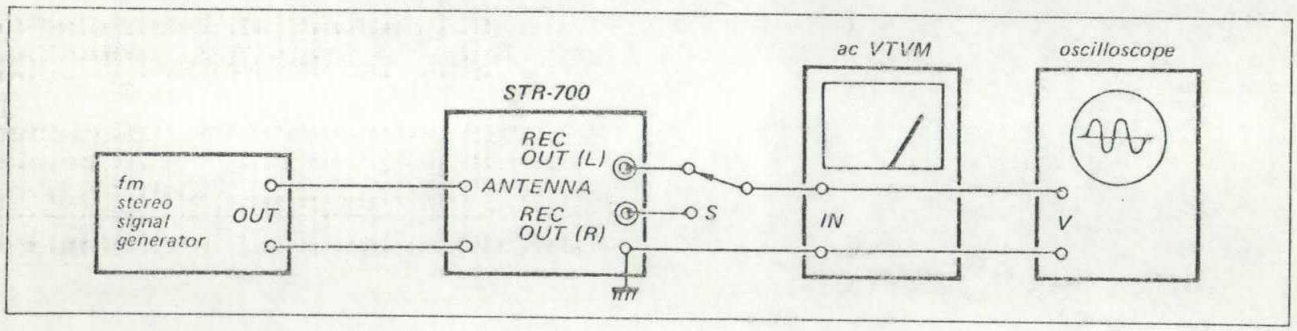


Fig. 3-9. Fm stereo separation adjustment setup

SECTION 4

DIAGRAMS

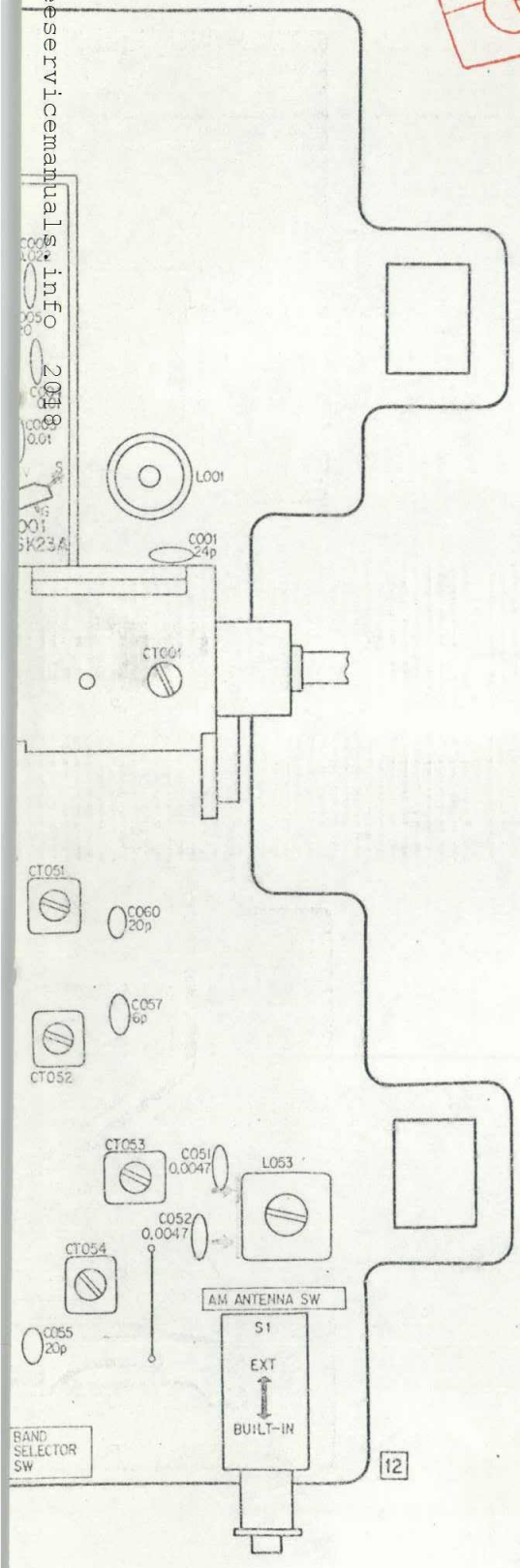
MOUNTING DIAGRAM – Fm (A-m) Front-end/I-f Amp/MPX Circuit Board (TCB-023B) –

– Component Side –

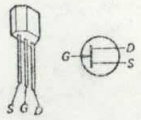
Parts Location

IC, Q	D	ADJ
Q101		
Q102	D110 D109	
		IFT001
Q103 Q002		
		L002 L003 L001
Q003		
Q001	D001	
Q104		
Q106		CT001 CT002 CT003
Q105		
	D108 D106	IFT102
	D102 D103	L051 IFT101 CT051
Q051		
	D104	CT052
	D105	L052
IC201		CT053
	D107	L053 CT054 L201

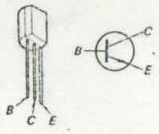
※ : Mounted on conductor side.



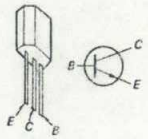
2SK23A



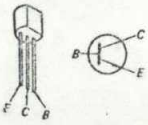
2SC710



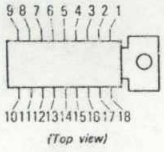
2SC403C
2SC634A



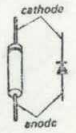
2SC945



CX-0441
CX-0431



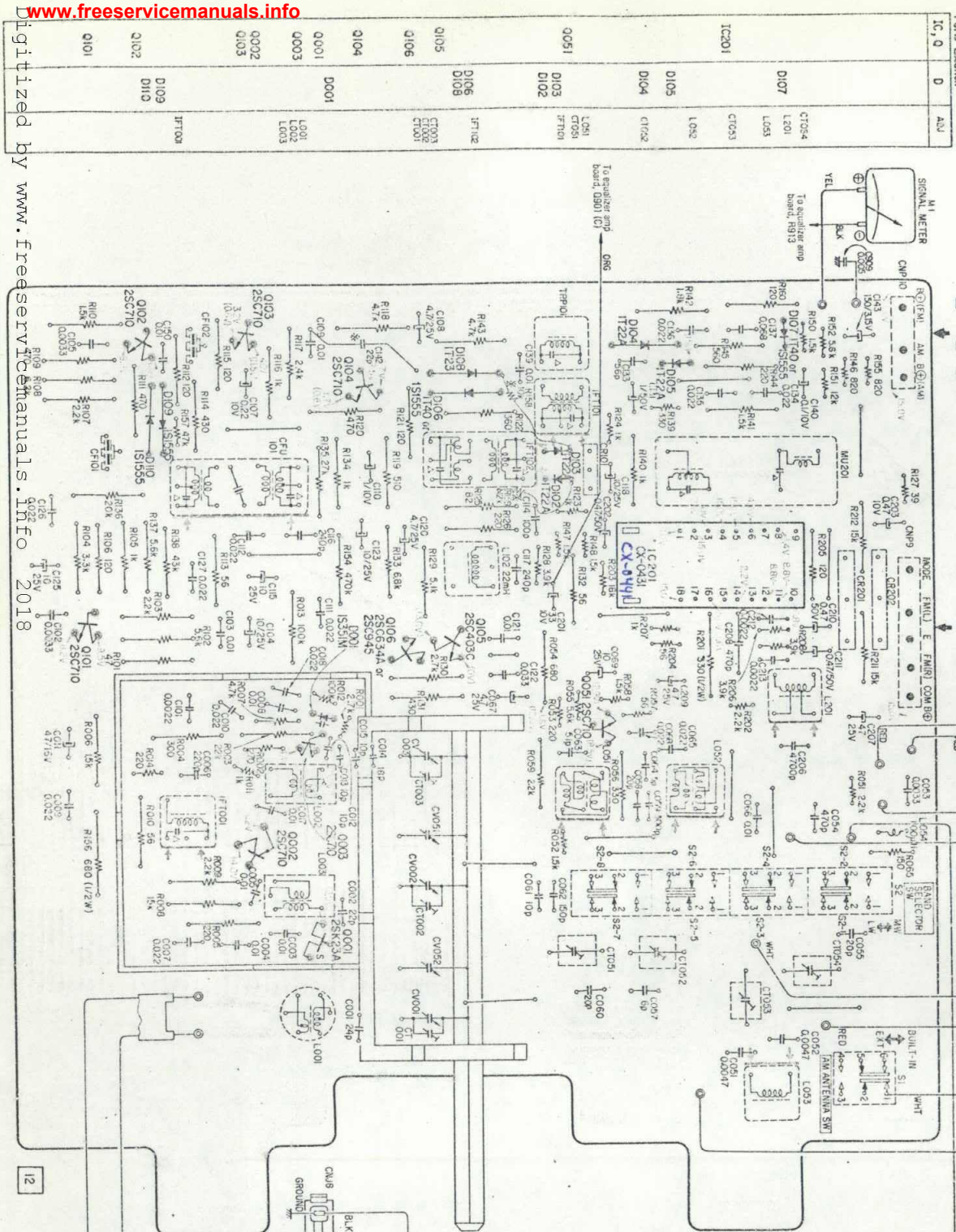
1S1555
1S351M
1T22A
1T23
1T40



Note: [ ] Shows the location of stencilled part number. Refer to this mark when replacing the part.
Capacitors marked △ are built in transformers.
( ): A-m operation
< >: STEREO operation

MOUNTING DIAGRAM — Fm (A-m) Front-end/I-f Amp/MPX Circuit Board (TCB-023B) —

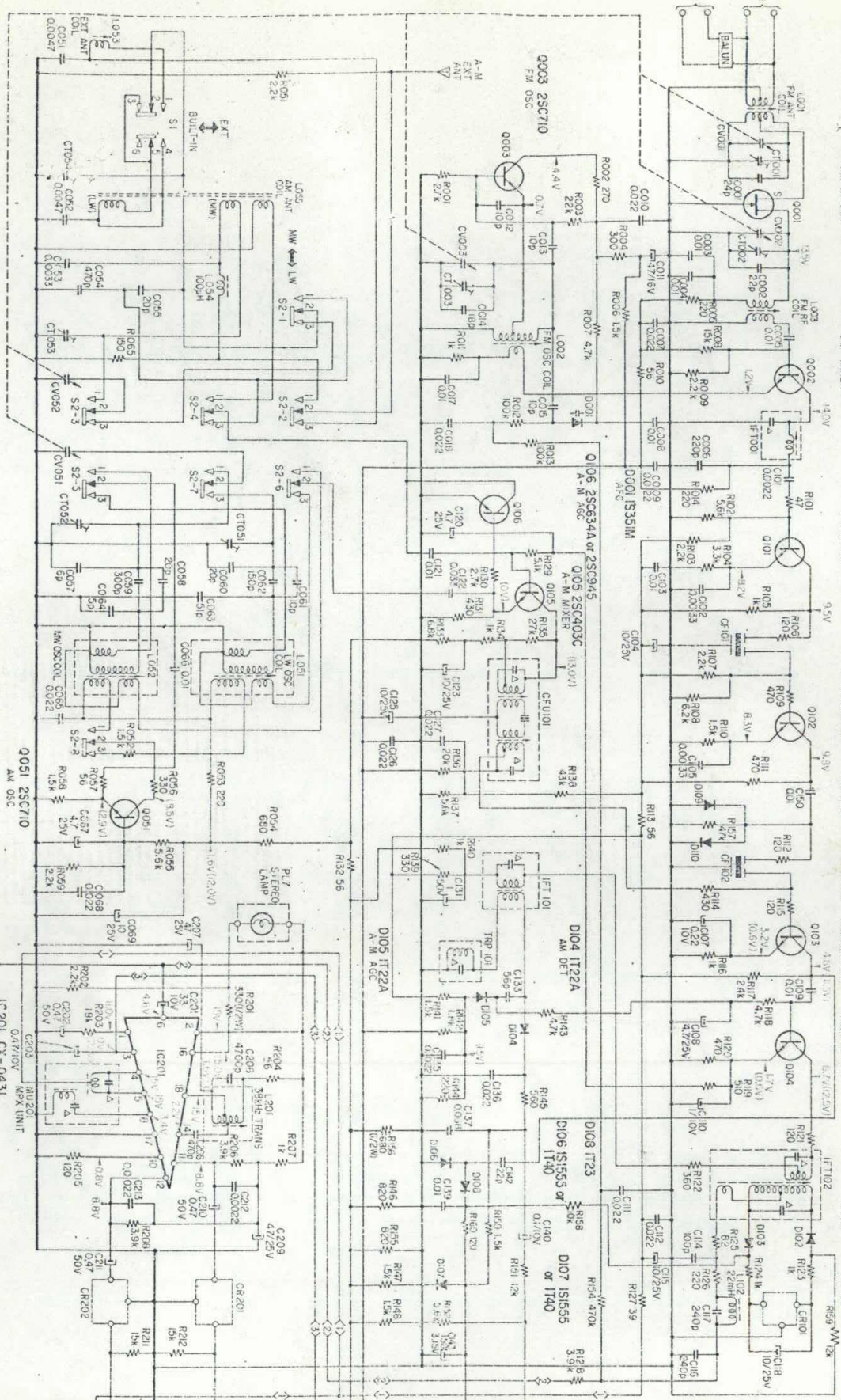
— Conductor Side —



Note:

Shows the location of stencilled part number.
Refer to this mark when replacing the part.
A-m operation
STEREO operation

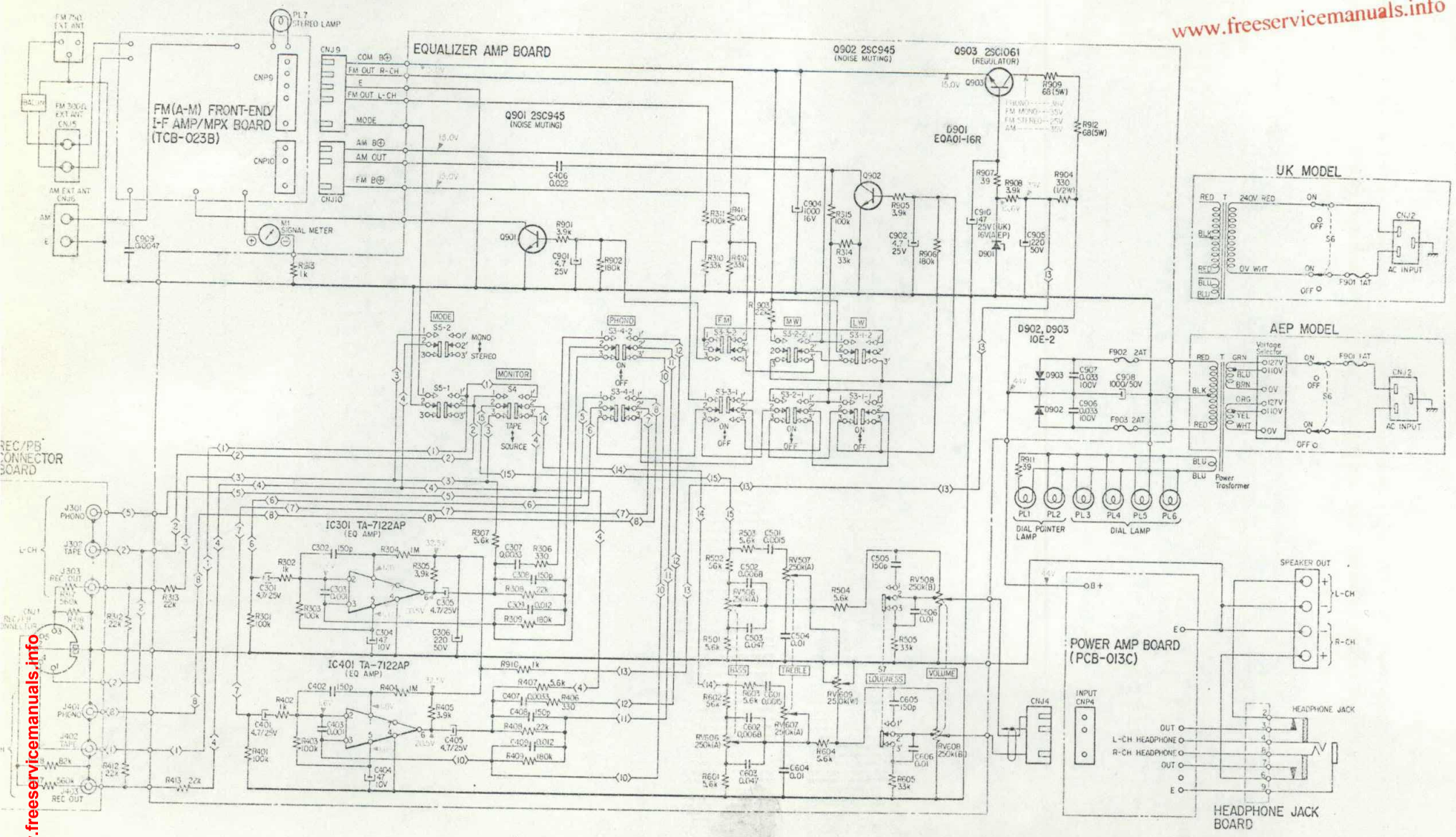
4-2. SCHEMATIC DIAGRAM – Fm (A-m) Front-end/I-f Amp/MPX Section (TCB-023B) –



Note: All resistance values are in ohms. k = 1,000, M = 1,000 k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.
Voltage variations may be noted because of normal production tolerances.
Capacitors marked ^ are built in transformers.

Ref. No.	Description	Position
S1	A-M ANTENNA SW (BUILT-IN – EXT)	BUILT-IN
S2	A-M BAND SW (LW-MW)	LW

8. SCHEMATIC DIAGRAM – Audio Amp and Power Supply Section –

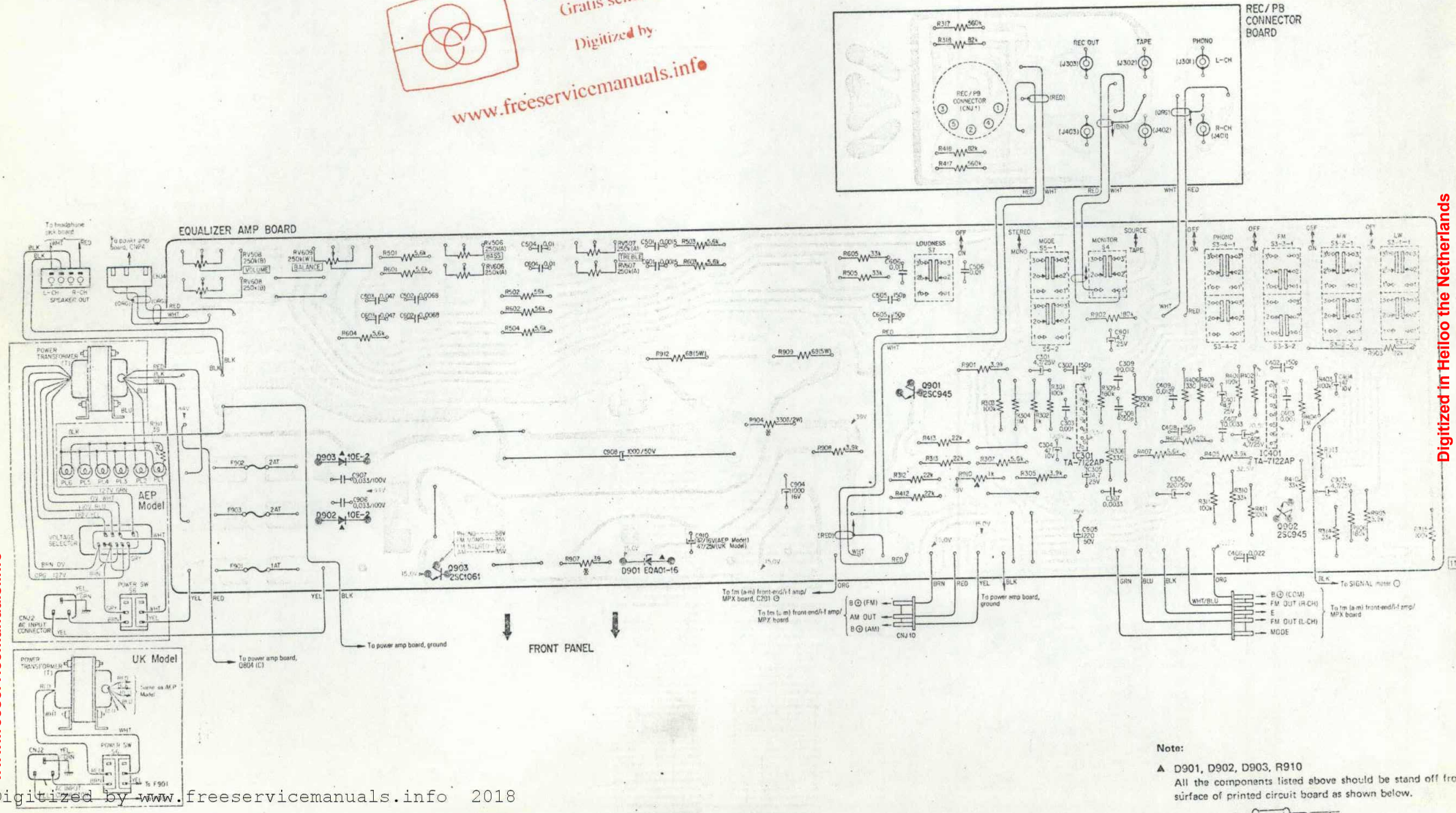


Ref. No.	Description	Position
S3-1~4	FUNCTION SW (PHONO-FM-MW-LW)	FM
S4	MONITOR SW	SOURCE

Note: All resistance values are in ohms. k = 1,000, M = 1,000 k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages are dc measured with a VOM which has an input

4-4. MOUNTING DIAGRAM – Equalizer Amp Circuit Board –

– Conductor Side –

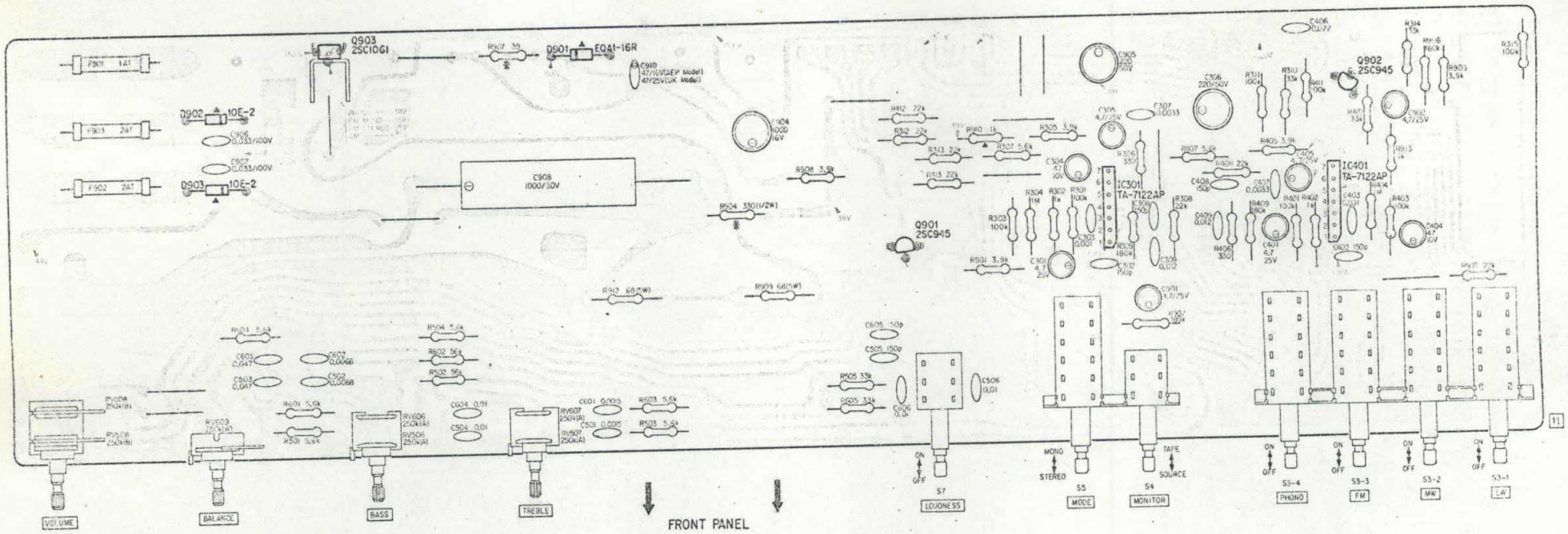


Note:

▲ D901, D902, D903, R910
All the components listed above should be stand off from surface of printed circuit board as shown below.

MOUNTING DIAGRAM – Equalizer Amp Circuit Board –

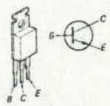
– Component Side –



TA7122AP

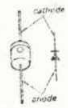
2SC945

2SC1061



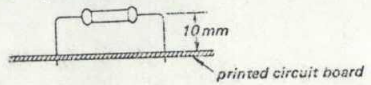
EQA01-16R

10E-2



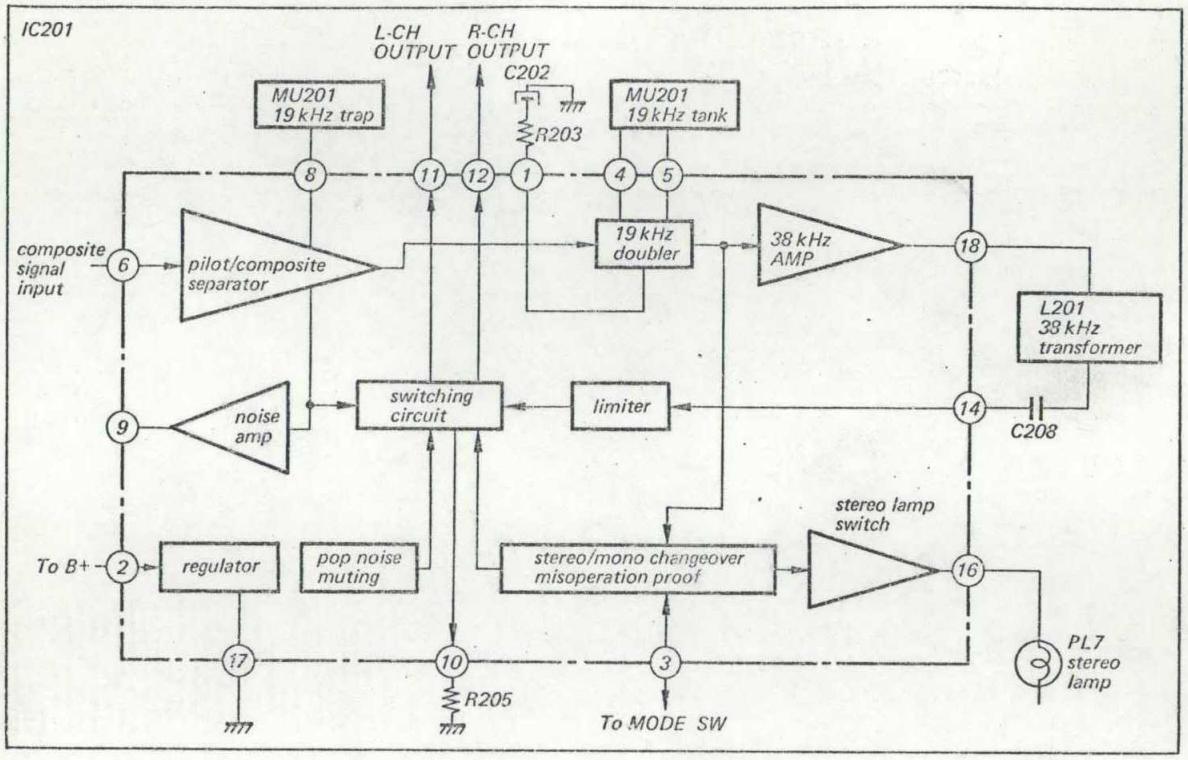
Note:

▲ D901, D902, D903, R910
All the components listed above should be stand off from the surface of printed circuit board as shown below.



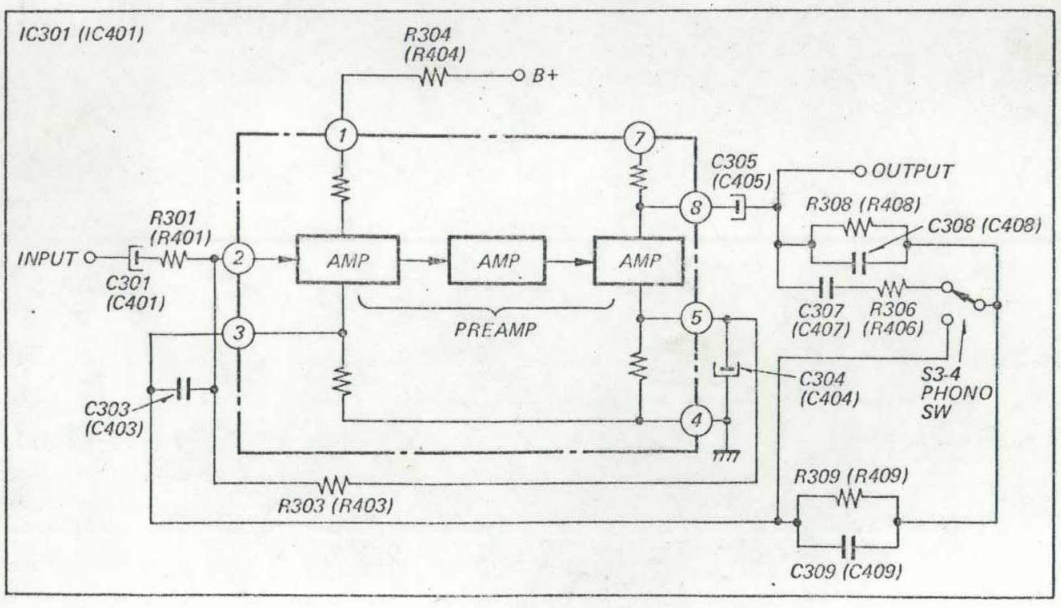
※ R904, R907 and R911 should be fuse-type metal-oxide resistors.

4-5. IC BLOCK DIAGRAM



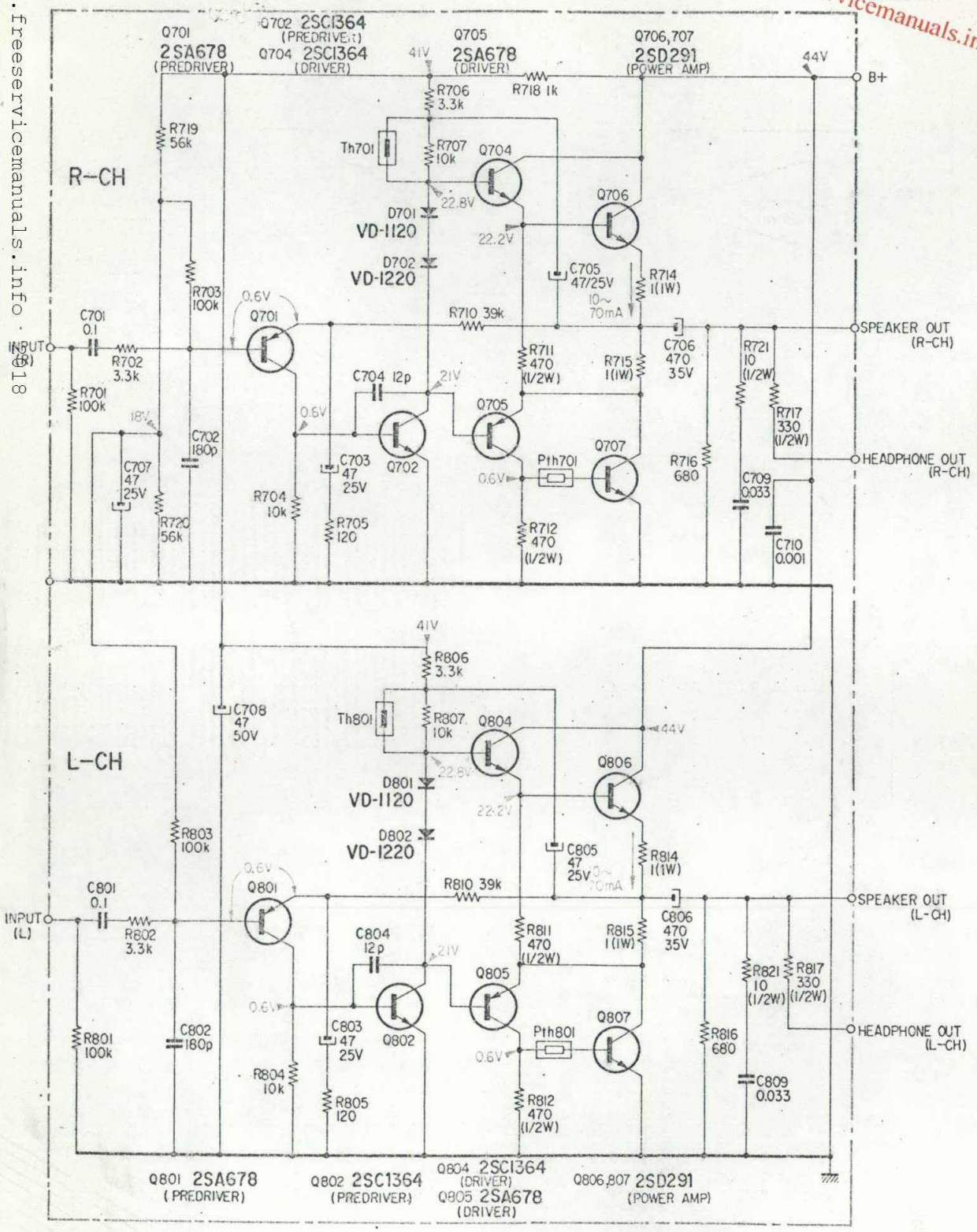
Detailed IC (CX-0431) diagram

CX-0441



Detailed IC (TA-7122AP) diagram

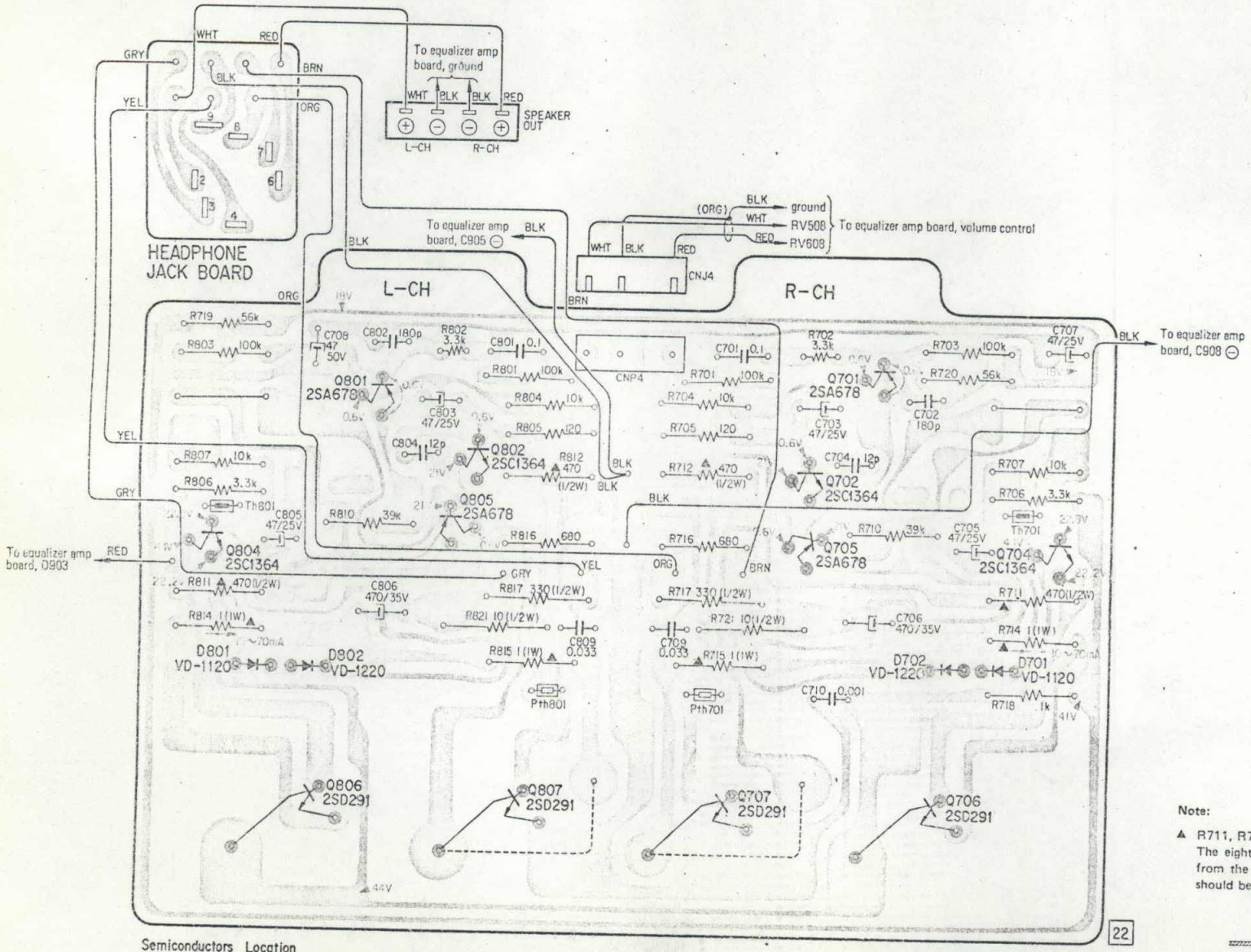
SCHEMATIC DIAGRAM – Power Amp Section (PCB-013C) –



Note: All resistance values are in ohms. k = 1,000, M = 1,000 k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.
Voltage variations may be noted because of normal production tolerances.

4-7. MOUNTING DIAGRAM – Power Amp Circuit Board (PCB-013C) –

– Conductor Side –

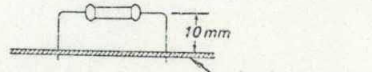


Semiconductors Location

Q804 D801 D802 Q801 Q802 Q805 Q702 Q701 Q704

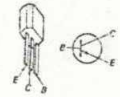
Note:

▲ R711, R712, R714, R715, R811, R812, R814, R815
The eight metal-oxide resistors listed above should be stand off from the surface of printed circuit board as shown below, and should be a fuse type.

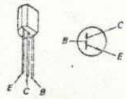


Th701 and Th801 should be in direct contact with R714 and

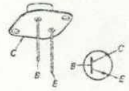
2SA678



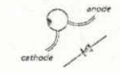
2SC1364



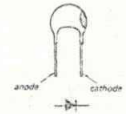
2SD291

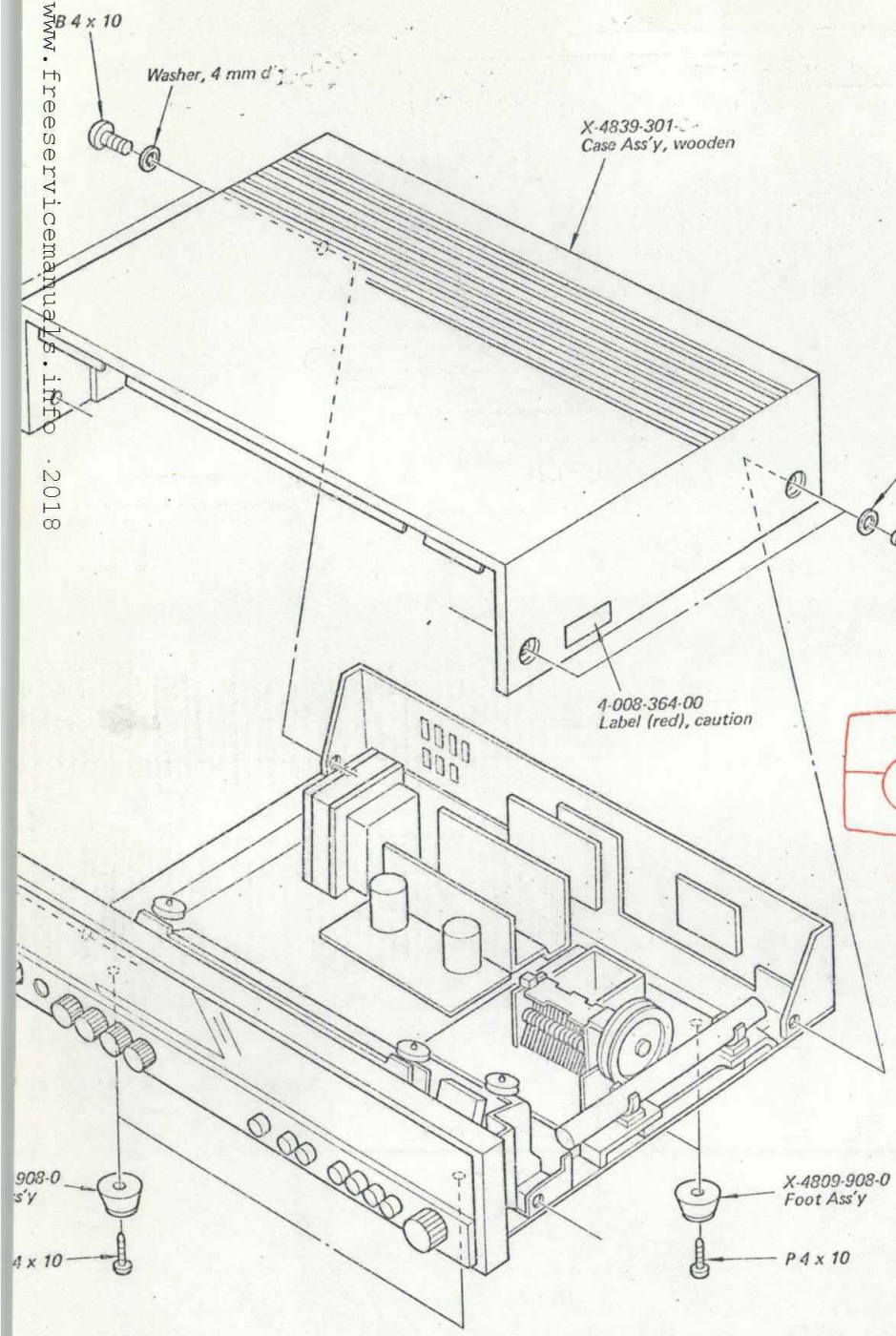


VD-1120



VD-1220





– Hardware Nomenclature –

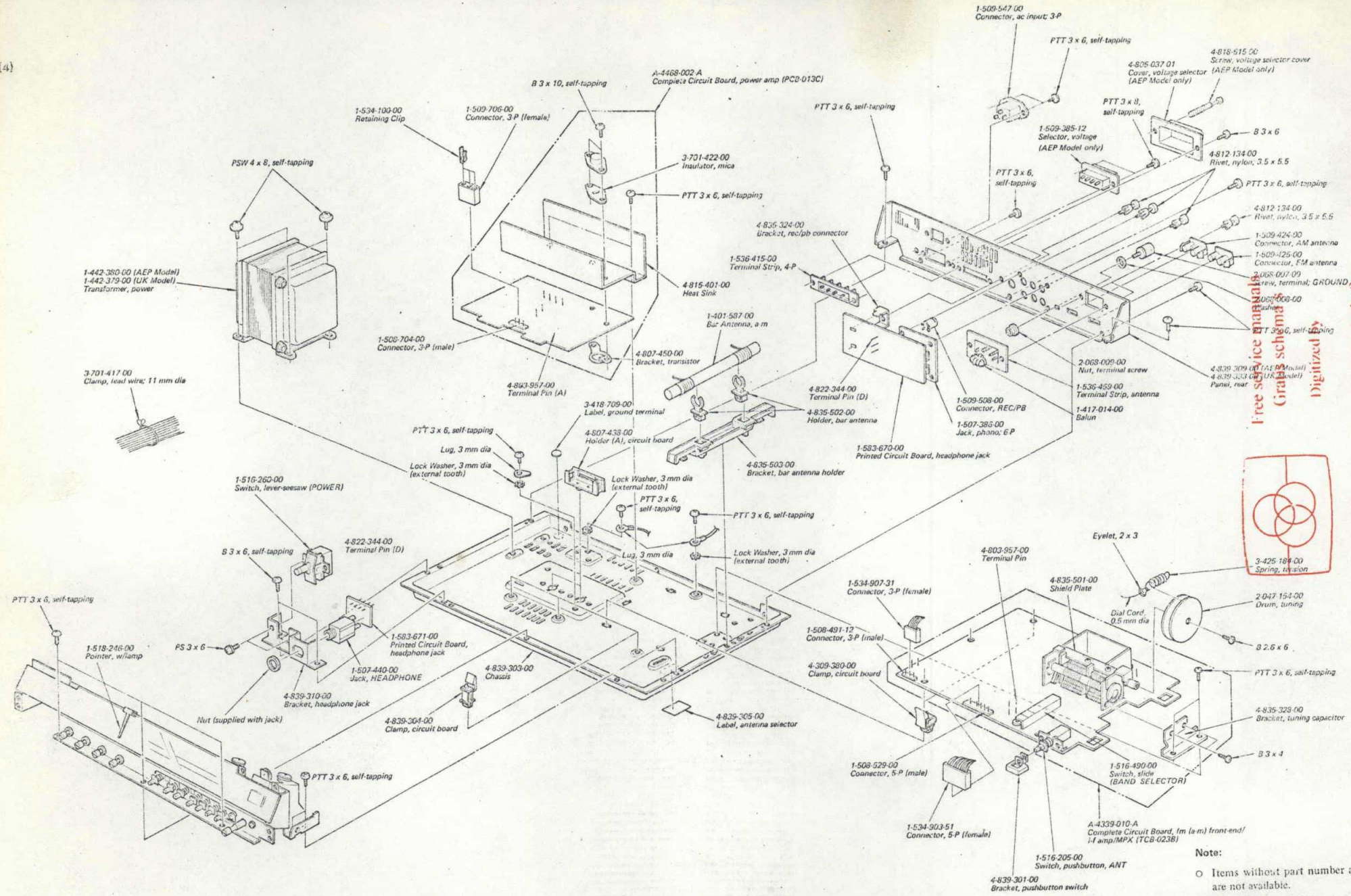
P	– Pan Head Screw	⊕
PS	– Pan Head Screw with Spring Washer	⊕
K	– Flat Countersunk Head Screw	⊕
B	– Binding Head Screw	⊕
RK	– Oval Countersunk Head Screw	⊕
T	– Truss Head Screw	⊕
R	– Round Head Screw	⊕
F	– Flat Fillister Head Screw	⊖
SC	– Set Screw	⊖
E	– Retaining Ring (E Washer)	

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

⊕ P 3x10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head

ems without part number and description
e not available.
ll screws are Phillips (cross recess) type
nless otherwise noted.
-) = slotted head



Note:

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- "PTT" type screws may be replaced with "B" type screws.