

ST-88

AEP,
UK and USA Model



FM STEREO/ FM-AM TUNER

SPECIFICATIONS

Fm Tuner Section

Tuning range: 87.5 to 108 MHz

Antenna: 300 ohms balanced

Intermediate frequency: 10.7 MHz

Usable sensitivity: 2.2 μ V (IHF)
1.7 μ V (S/N = 30 dB)

S/N ratio: 65 dB

Capture ratio: 2.5 dB

Selectivity: 50 dB (IHF)

Image rejection: 45 dB

Spurious rejection: 75 dB

A-m suppression: 45 dB

Frequency response: 30 Hz to 15 kHz \pm 2 dB

Harmonic distortion: Mono; 0.5 % at 400 Hz 100 % Mod.
Stereo; 0.8 % at 400 Hz 100 % Mod.

Fm Stereo separation: greater than 36 dB at 400 Hz

A-m Tuner Section

Tuning range: 530 to 1,605 kHz

Antenna: Built-in bar antenna with external antenna provision

Intermediate frequency: 455 kHz (USA and AEP Model)
468 kHz (UK Model)

Sensitivity: 48 dB/m, built-in antenna
100 μ V, external antenna

19 kHz, 38 kHz suppression: 45 dB

S/N ratio: 50 dB

Image rejection: 40 dB at 1,000 kHz
45 dB at 1,400 kHz

I-f rejection: 30 dB at 1,000 kHz

Harmonic distortion: 0.8 %

General

Power requirements: 120 V, 60 Hz ac (USA Model)
110, 127, 220, 240 V 50/60 Hz ac (AEP and UK Model)

Power consumption: 10 W

Dimensions: 128 (w) x 232 (h) x 210 (d) mm
5 $\frac{1}{16}$ (w) x 9 $\frac{1}{8}$ (h) x 8 $\frac{1}{4}$ (d) inches

Net weight: approx. 2.7 kg (5 lb 15 oz)

Shipping weight: approx. 3.2 kg (7 lb 1 oz)

SONY[®]

SERVICE MANUAL

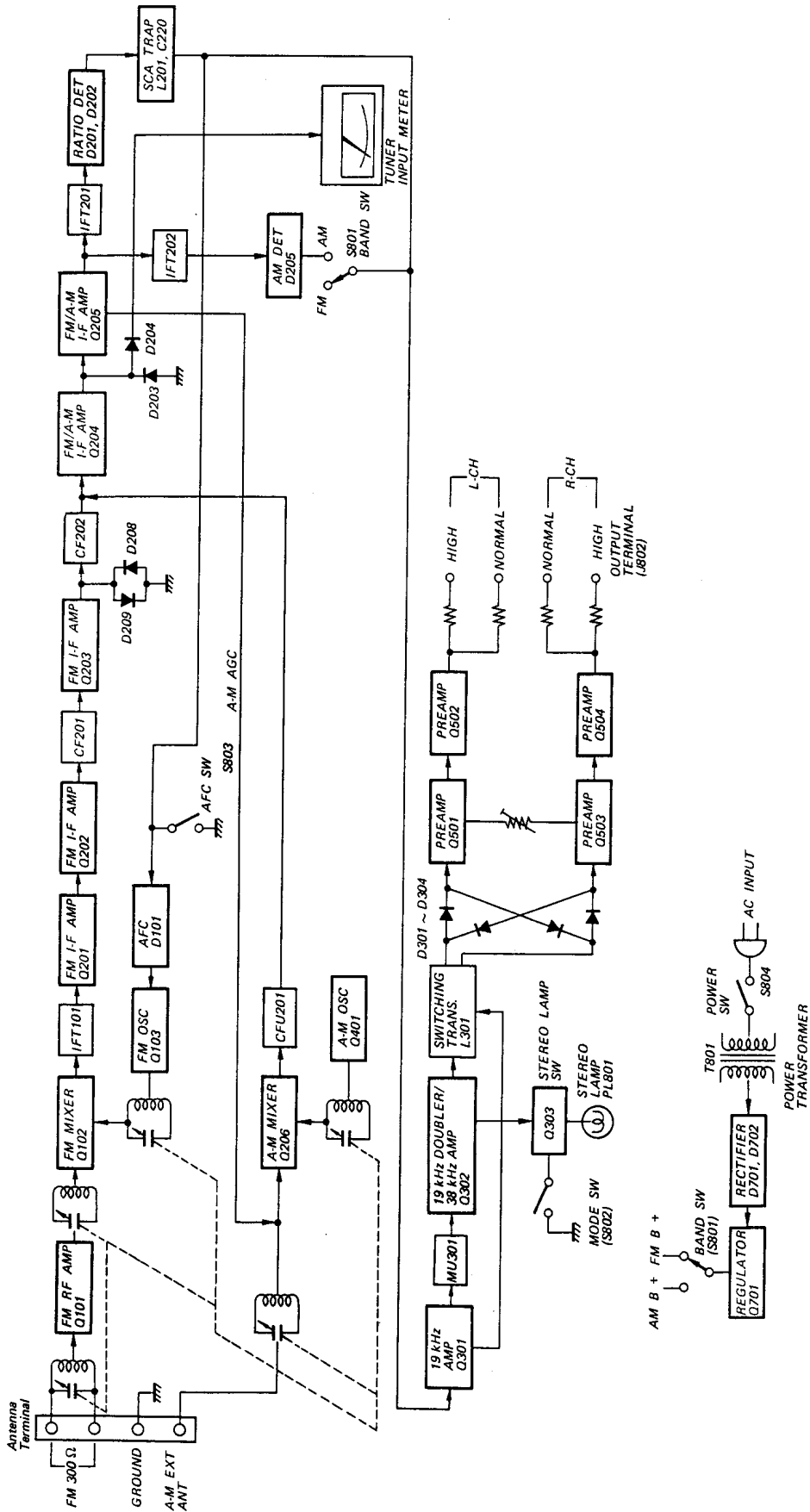
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SECTION 1

TECHNICAL DESCRIPTION

1-1. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY AND REPLACEMENT

Note: All screws in this service manual are Phillips type (cross recess), unless otherwise specified.
 (-): slotted head

2-1. WOODEN CASE REMOVAL

1. Remove the four screws (P 4 x 16) securing the wooden case to the chassis along with the rubber feet.
2. Remove the two screws as shown in Fig. 2-1.

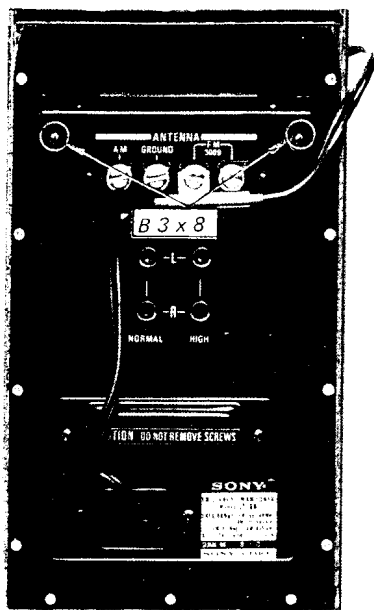


Fig. 2-1. Wooden case removal

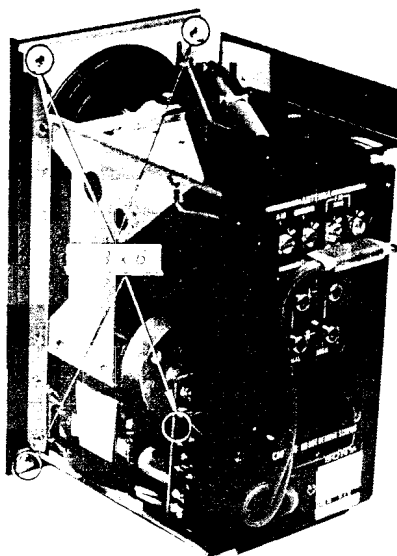


Fig. 2-2. Front panel removal (1)

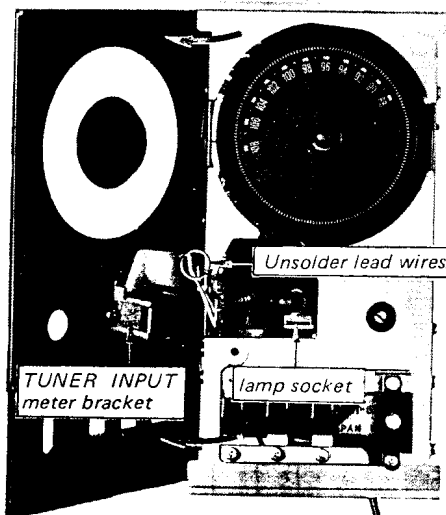


Fig. 2-3. Front panel removal (2)

2-2. FRONT PANEL REMOVAL

1. Remove the wooden case as described in Procedure 2-1.
2. Pull out the tuning knob.
3. Remove the four screws securing the front panel to the chassis as shown in Fig. 2-2.
4. Remove the front panel in the arrow direction shown in Fig. 2-3.
5. Unsolder the two lead wires from the TUNER INPUT meter and pull out the lamp socket from the TUNER INPUT meter bracket as shown in Fig. 2-3.

2-3. FRONT SUBCHASSIS REMOVAL

1. Remove the wooden case and the front panel as described in Procedures 2-1 and 2-2.
2. Remove the nine screws (A) as shown in Fig. 2-4 and Fig. 2-5.
3. Pull off the STEREO lamp from the grommet.

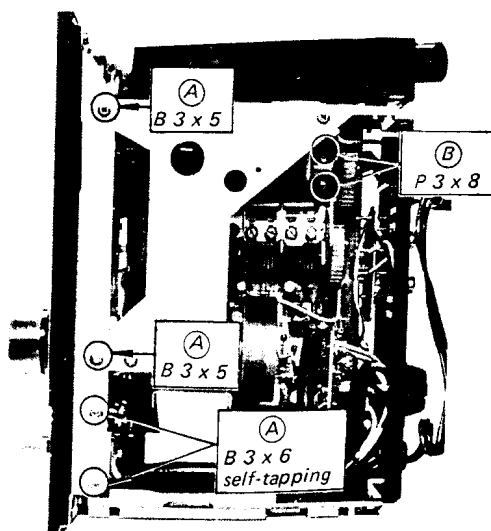


Fig. 2-4. Front subchassis removal

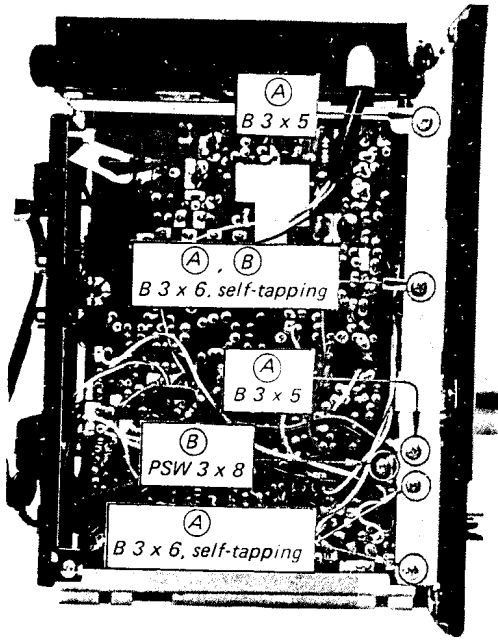


Fig. 2-5. Front subchassis removal (2)

2-4. FM (A-M) FRONT-END/I-F AMP/MPX AND PREAMPLIFIER BOARD REMOVAL

1. Remove the wooden case as described in Procedure 2-1.
2. Unsolder the ribbon antenna at the fm (a-m) front-end/i-f amp/MPX and preamplifier board as shown in Fig. 2-6.
3. Remove the rear panel in the arrow direction by loosening the three screws (C) as shown in Fig. 2-6.
4. Loosen the two screws (B) as shown in Fig. 2-4.

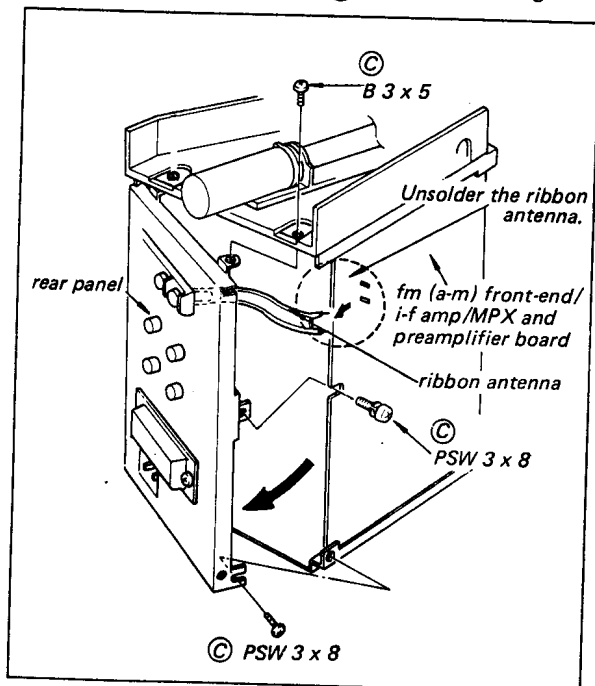


Fig. 2-6. Fm (a-m) front-end/i-f amp/MPX and preamplifier board removal

5. Remove the two screws (B) as shown in Fig. 2-5.
6. Carefully remove the board from the chassis taking care not to break the lead wires.

2-5. POWER SUPPLY BOARD REMOVAL

1. Remove the wooden case as described in Procedure 2-1.
2. Unsolder the three lead wires (red, white and black) connecting the power supply board and the fm (a-m) front-end/i-f amp/MPX and preamplifier board.
3. Unsolder the ribbon antenna as shown in Fig. 2-6.
4. Loosen the three screws (C) as shown in Fig. 2-6.
5. Carefully open the rear panel in the arrow direction shown in Fig. 2-6 taking care not to break the lead wires.
6. Remove the two screws (B 3 x 5) securing the power supply board.

2-6. DIAL CORD RESTRINGING

1. Remove the wooden case, front panel and front subchassis as described in Procedures 2-1, 2-2 and 2-3.
2. Make a loop of the dial cord as shown in Fig. 2-7.
3. Make a knot and hook a spring to the dial cord and then fasten the knot as shown in Fig. 2-8.
4. Loosen the two screws securing the dial scale ass'y to the tuning drum shaft and remove the dial scale ass'y.
5. Hook the spring to the tab on the dial scale ass'y and string the dial cord around the dial scale ass'y and the tuning shaft in numerical order as shown in Fig. 2-9 and 2-10.
6. Install the dial scale ass'y to the tuning drum shaft and fix a dial scale set screw temporarily.
7. Set the AFC switch to OFF.
8. Tune the set to the local fm station by turning the tuning shaft.
9. Loosen the dial scale set screw and turn the dial scale ass'y to the position where the fm pointer on the dial front glass indicates the local fm station's carrier frequency.
10. Fix the two dial scale set screws.
11. Make sure that the correct dial calibration is also done at a-m mode.

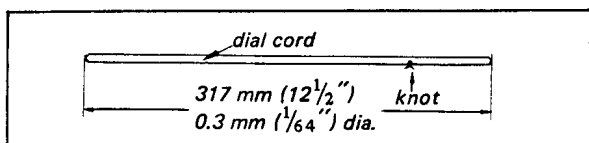


Fig. 2-7. Dial cord

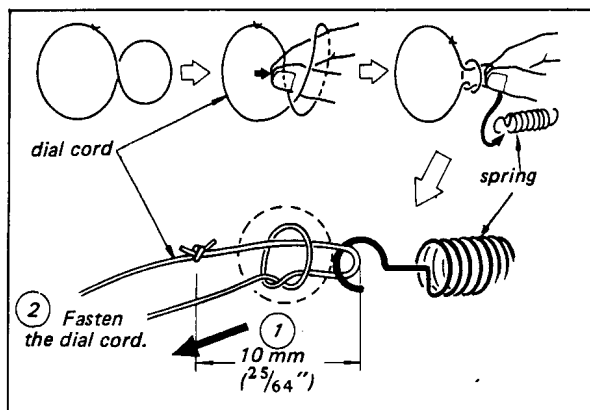


Fig. 2-8. Finish point of dial cord

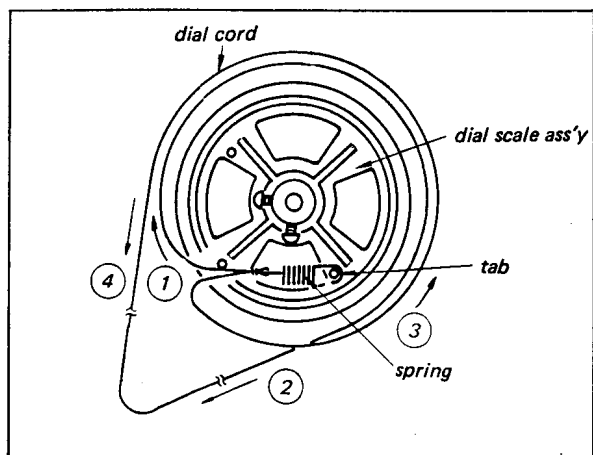


Fig. 2-9. Dial cord restringing (Back View)

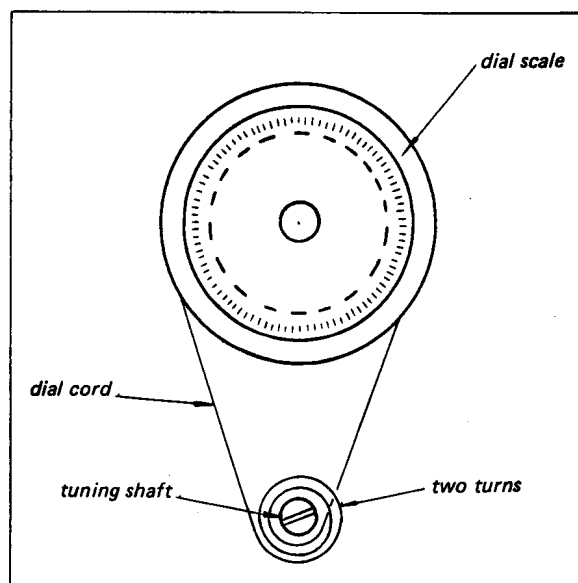


Fig. 2-10. Dial cord restringing (Front View)

2-7. DIAL LAMP REPLACEMENT

1. Remove the wooden case and front panel as described in Procedures 2-1 and 2-2.
2. Slide the lamp socket forward to permit removal of lamp as shown in Fig. 2-11.
3. Unscrew the lamp from the socket and install a new one and push the socket back to its original place.

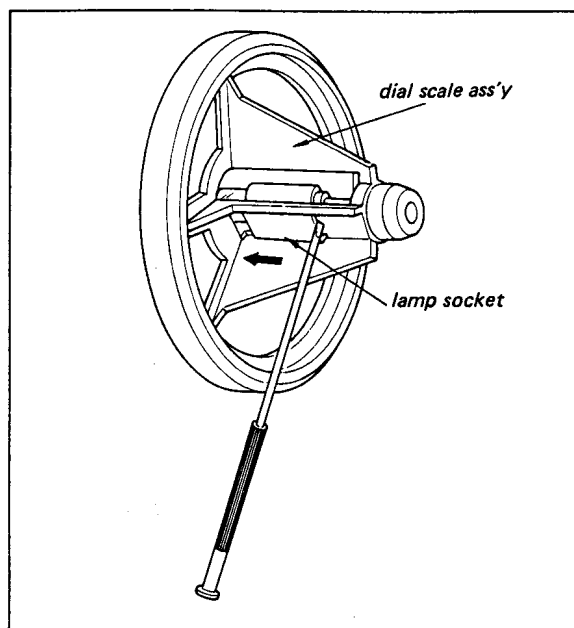


Fig. 2-11. Dial lamp removal

2-8. TUNER INPUT METER REPLACEMENT

1. Remove the wooden case and front panel as described in Procedures 2-1 and 2-2.
2. Unsolder the two lead wires and remove the two screws as shown in Fig. 2-12.
3. Install a new one.

2-9. BAND, MODE, AFC AND POWER SWITCH REPLACEMENT

1. Remove the wooden case and front panel as described in Procedures 2-1 and 2-2.
2. Remove the two screws securing each switch to the chassis as shown in Fig. 2-13.
3. Unsolder the switch lead wires.
4. Install a new one.

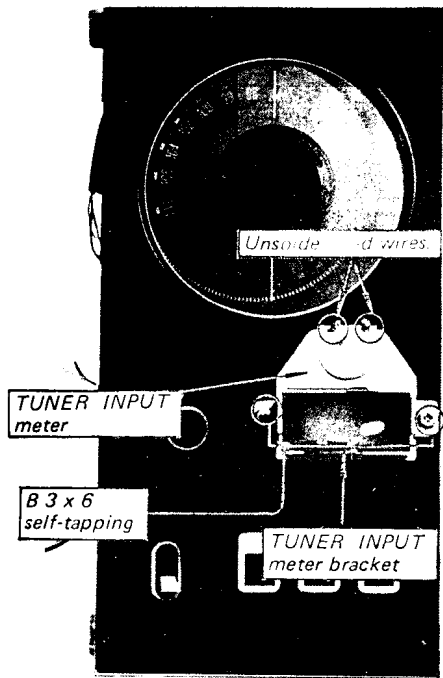


Fig. 2-12. Tuner input meter replacement

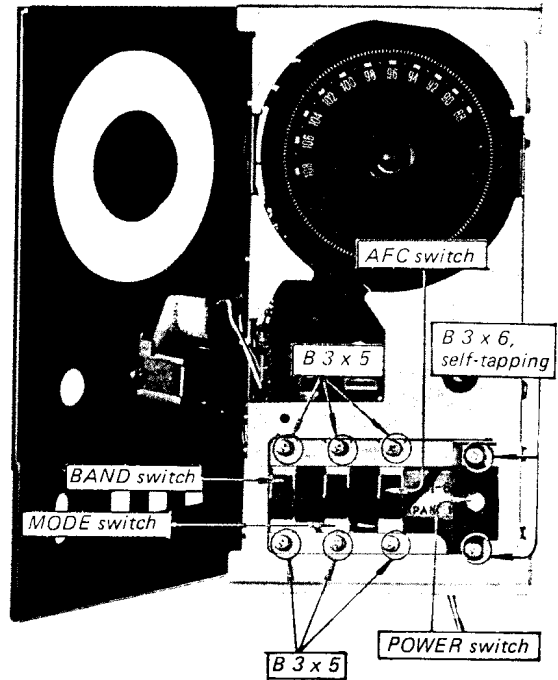


Fig. 2-13. BAND, MODE, AFC and POWER switch replacement

2-10. CHASSIS LAYOUT

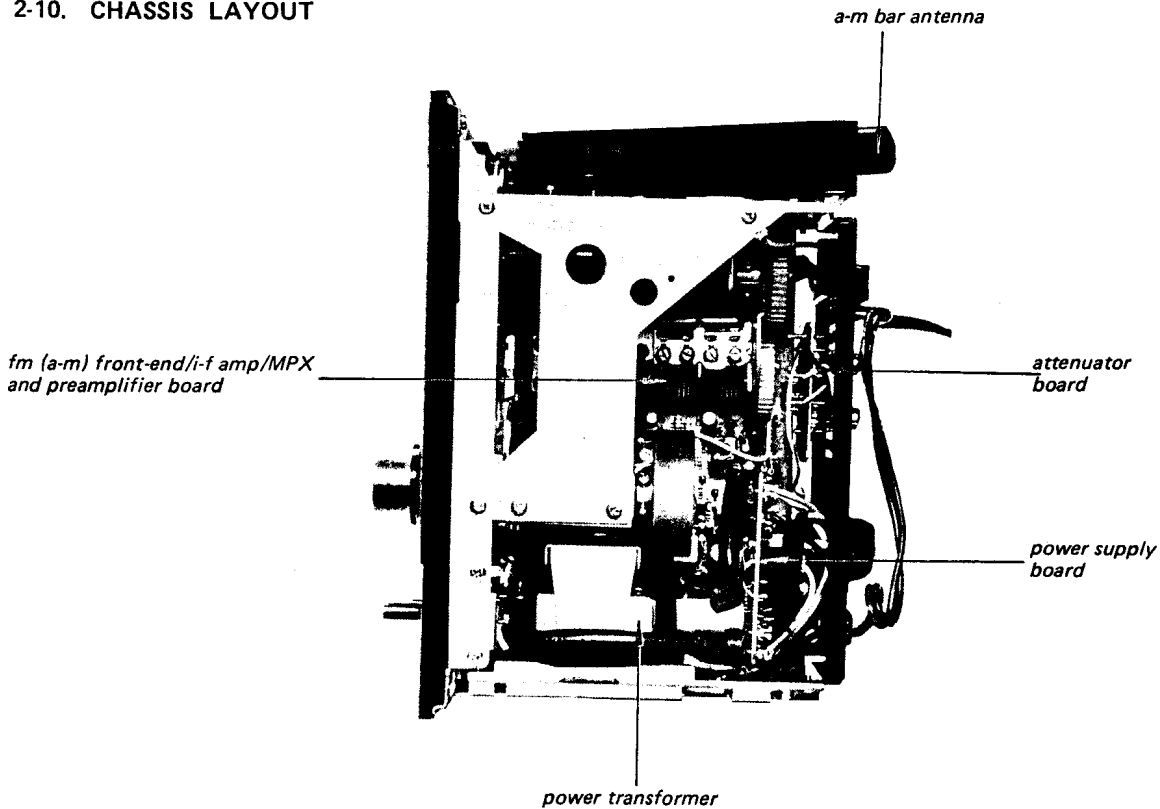


Fig. 2-14. Chassis layout

SECTION 3

ALIGNMENT AND ADJUSTMENT

3-1. 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

<u>Part No.</u>	<u>Color</u>	<u>Specified Center Freq.</u>
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

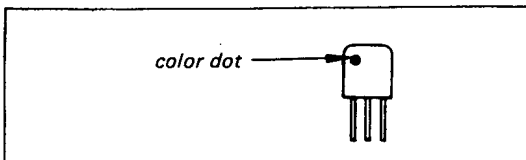


Fig. 3-1. Color dot on ceramic filter

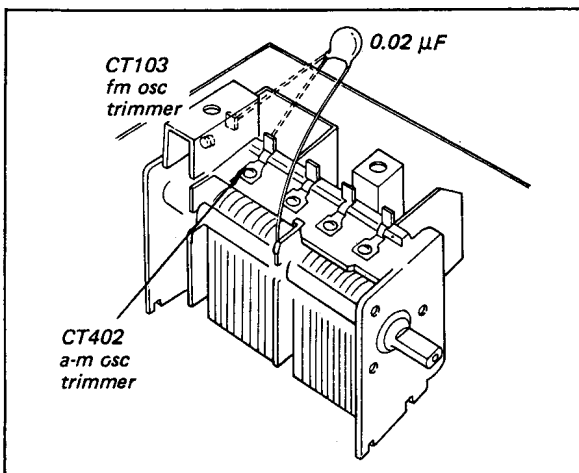


Fig. 3-2. Interruption of fm or a-m local oscillator operation

Note: Local oscillator should be killed when performing this alignment. To stop the local oscillator operation, shunt the oscillator capacitor with a 0.02 μF 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. Ac VTVM
4. Alignment tools

Preparation:

1. Connect the input cable of the oscilloscope with alligator clips to R229 and ground on the fm (a-m) front-end/i-f amp/MPX and preamplifier board, and solder a 0.02 μF capacitor across these clips as shown in Fig. 3-3.
2. Connect the output cable of the generator across CV102 on the fm (a-m) front-end/i-f amp/MPX and preamplifier board through a 0.02 μF coupling capacitor as shown in Fig. 3-4.

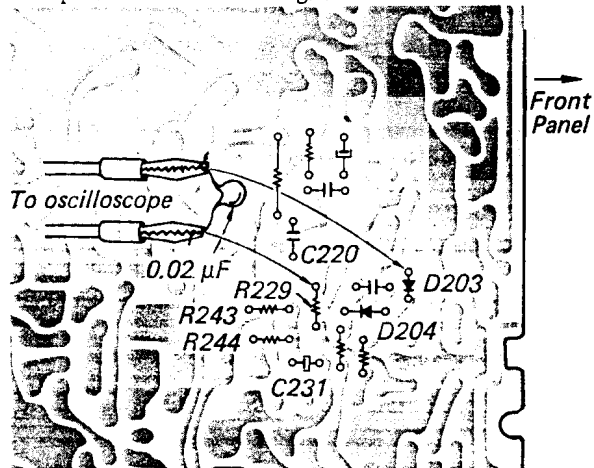


Fig. 3-3. Fm discriminator output connection

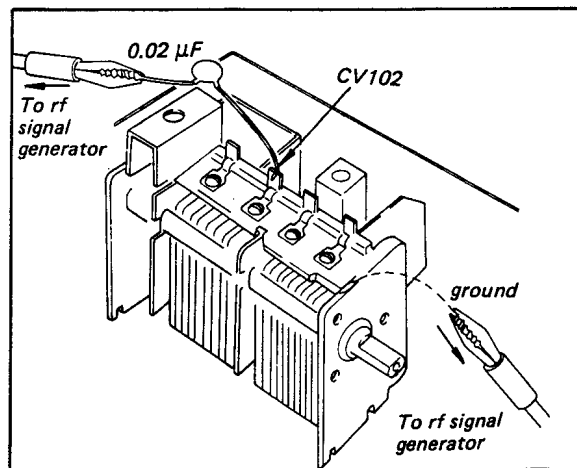


Fig. 3-4. 10.7-MHz signal injection

Procedure:

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

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

2. Set the tuner switches as follows:

BAND switch FM
MODE switch MONO
AFC switch OFF

3. Adjust the signal generator frequency slightly to obtain a maximum output, and then change the signal generator modulation to a-m, 400 Hz 30 %.
4. If the discriminator transformer IFT201 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 IFT201 (see Fig. 3-10) with an alignment tool to obtain a minimum indication on the oscilloscope as shown in Fig. 3-6.

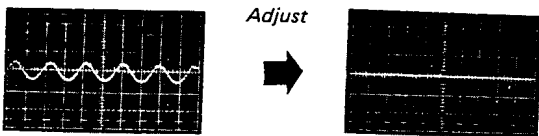


Fig. 3-6. Fm discriminator alignment output response

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 top core, decreased output will be observed. The real null point should be obtained in the middle of the

core thread length, and maximum output occurs at each side of the true null point.

6. Change the signal generator modulation to fm, 400 Hz 100 %.
7. Turn the core of fm IFT101 and primary side core (brown) of discriminator transformer IFT201 (see Fig. 3-10) to obtain the maximum output.

3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Note: Before starting this alignment, the fm i-f and discriminator alignment should be performed.

Test Equipment Required

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

Preparation:

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

BAND switch FM
MODE switch MONO
AFC switch OFF

Signal Generator Method

Follow the procedures given in Table 3-2 when performing this alignment with an fm signal generator. Be sure that the dial is mechanically calibrated.

Off-the-Air Signal Method

Accurate dial calibration, and a frequency coverage test can also be performed by utilizing off-the-air local fm signals. However, before performing the following procedure, be sure that the dial is mechanically calibrated.

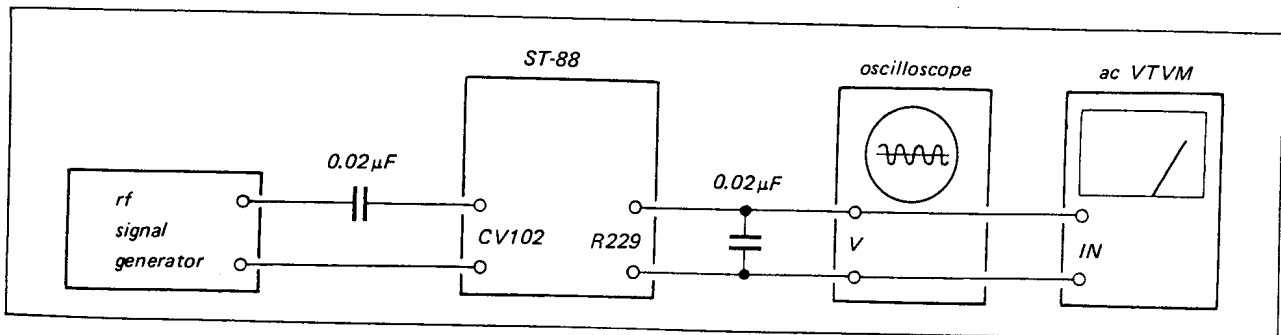


Fig. 3-5. Fm i-f and discriminator alignment test setup by rf signal generator

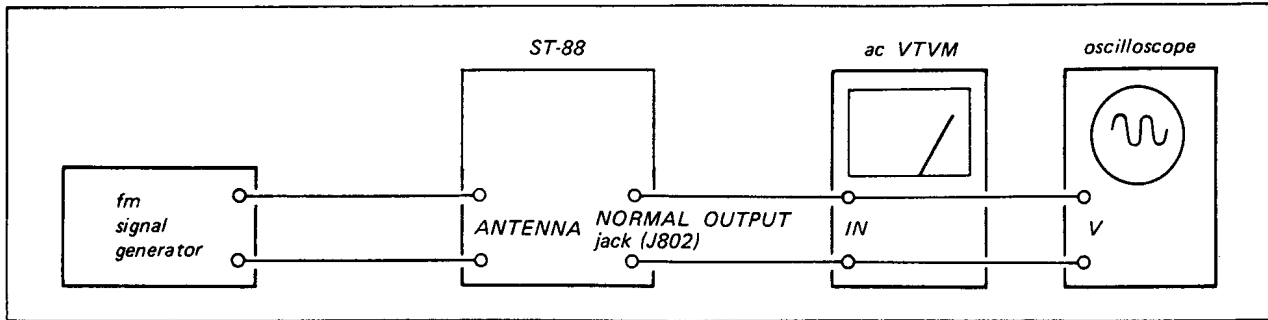


Fig. 3-7. Fm frequency coverage and tracking alignment test setup

TABLE 3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

FREQUENCY COVERAGE ALIGNMENT		SG Coupling Direct SG Output Level . . 400 Hz, 100 % mod; as low as possible			
Step	SG Frequency	Dial Indication	Ac VTVM Connection	Adjust	Indication
1	87.5 MHz	87.5 MHz	NORMAL OUTPUT jack (J802)	OSC coil L103 See Fig. 3-10.	Maximum VTVM reading
2	108 MHz	108 MHz		OSC trimmer CT103 See Fig. 3-10.	
TRACKING ALIGNMENT		SG Coupling Direct SG Output Level . . 400 Hz, 100 % mod; as low as possible			
1	87.5 MHz	87.5 MHz	NORMAL OUTPUT jack (J802)	Antenna coil L101 RF coil L102 See Fig. 3-10.	Maximum VTVM reading
2	108 MHz	108 MHz		Antenna trimmer CT101 RF trimmer CT102 See Fig. 3-10.	

3-3. FM STEREO SEPARATION ADJUSTMENT

Procedure:

Test Equipment Required

1. Fm stereo signal generator
2. Ac VTVM
3. Oscilloscope

Preparation:

1. Remove the wooden case as described in Procedure 2-1 on page 2.
2. Connect the test equipment as shown in Fig. 3-8, then set the fm stereo signal generator controls as follows:

Carrier frequency . . . 98 MHz
 Output level 1,000 μ V (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).

1. Precisely tune the set to the carrier frequency of stereo signal generator, then turn the top core of switching transformer L301 (see Fig. 3-10) 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 in the left channel.
4. The output-level to residual-level ratio represents the separation. Adjust separation adj. control RV501 (see Fig. 3-10) for minimum residual level. Check the right channel for separation. Usually, about an 8 to 9 dB difference in channel separation exists. Readjust RV501 for minimum difference between left- and right-channel separation. While

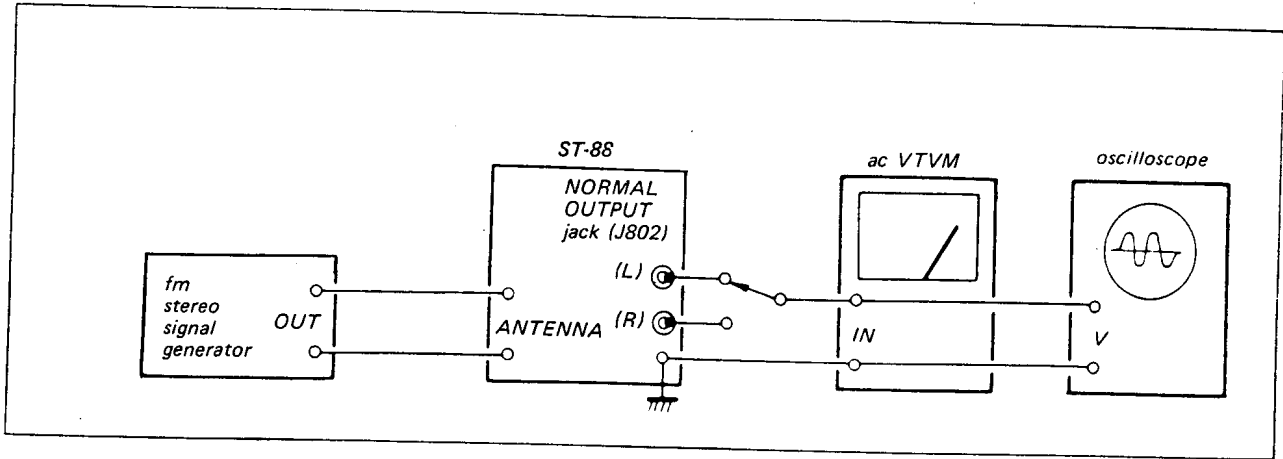


Fig. 3-8. Fm stereo separation adjustment test setup

doing this, remember that the output level also changes according to the setting of RV501.

3-4. A-M I-F STRIP ALIGNMENT

Note: The a-m i-f transformers (CFU201 and IFT202) are shipped from the factory with all adjustments set for correct operation. Therefore no adjustment is required in field service.

3-5. A-M FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Preparation:

Set BAND switch to AM.

Signal Generator Method

Test Equipment Required

1. Signal generator

2. Loop antenna

3. Ac VTVM or oscilloscope

Procedure:

With the equipment connected as shown in Fig. 3-9, follow the procedures given in Table 3-3 when performing this alignment with an a-m signal generator.

Off-the-Air Signal Method

Accurate dial calibration, and a frequency-coverage and tracking test can also be performed by utilizing off-the-air local a-m signals. However, before performing the following procedure, be sure that the dial is mechanically calibrated.

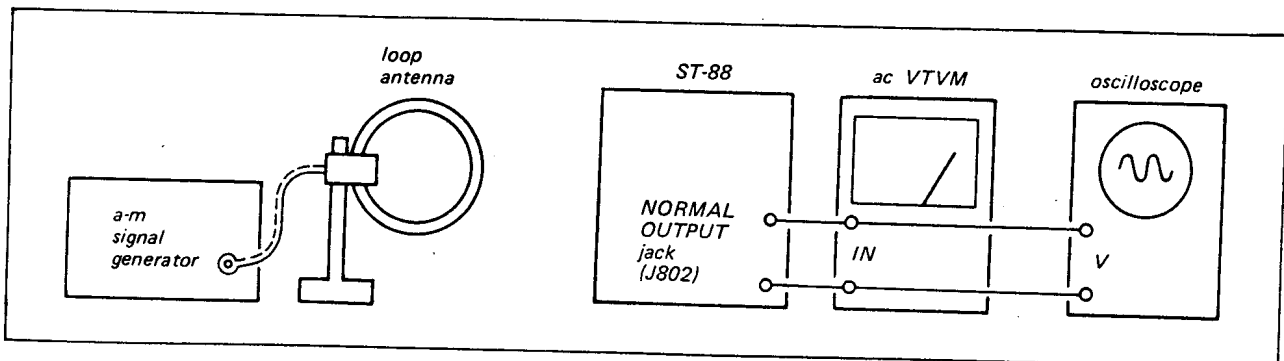


Fig. 3-9. A-m frequency coverage and tracking alignment test setup

TABLE 3-3. A-M FREQUENCY COVERAGE AND TRACKING ALIGNMENT

FREQUENCY COVERAGE ALIGNMENT			SG Coupling Loop antenna SG Output Level . . 400 Hz, 30 % mod; as low as possible		
Step	SG Frequency	Dial Indication	Ac VTVM Connection	Adjust	Indication
1	550 kHz	550 kHz	NORMAL OUTPUT jack (J802)	OSC coil L402 See Fig. 3-10.	Maximum VTVM reading
2	1,600 kHz	1,600 kHz		OSC trimmer CT402 See Fig. 3-10.	
TRACKING ALIGNMENT			SG Coupling Loop antenna SG Output Level . . 400 Hz, 30 % mod; as low as possible		
1	600 kHz	Tune to the SG signal.	NORMAL OUTPUT jack (J802)	Position of bar antenna L401	Maximum VTVM reading
2	1,400 kHz			Antenna trimmer CT401 See Fig. 3-10.	

Adjustment Parts Location:

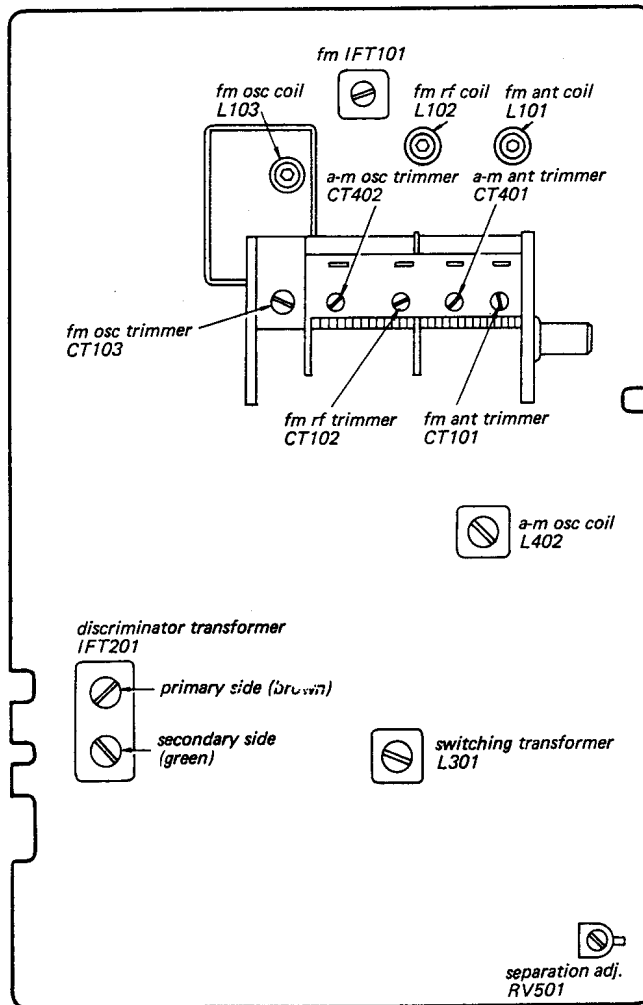


Fig. 3-10. Adjustment parts location

The original shipping carton and packing materials are the ideal containers for shipping the unit. However to secure the maximum protection, the set must be repacked in these materials precisely as before. The proper repacking procedures are shown in Fig. 4-1.

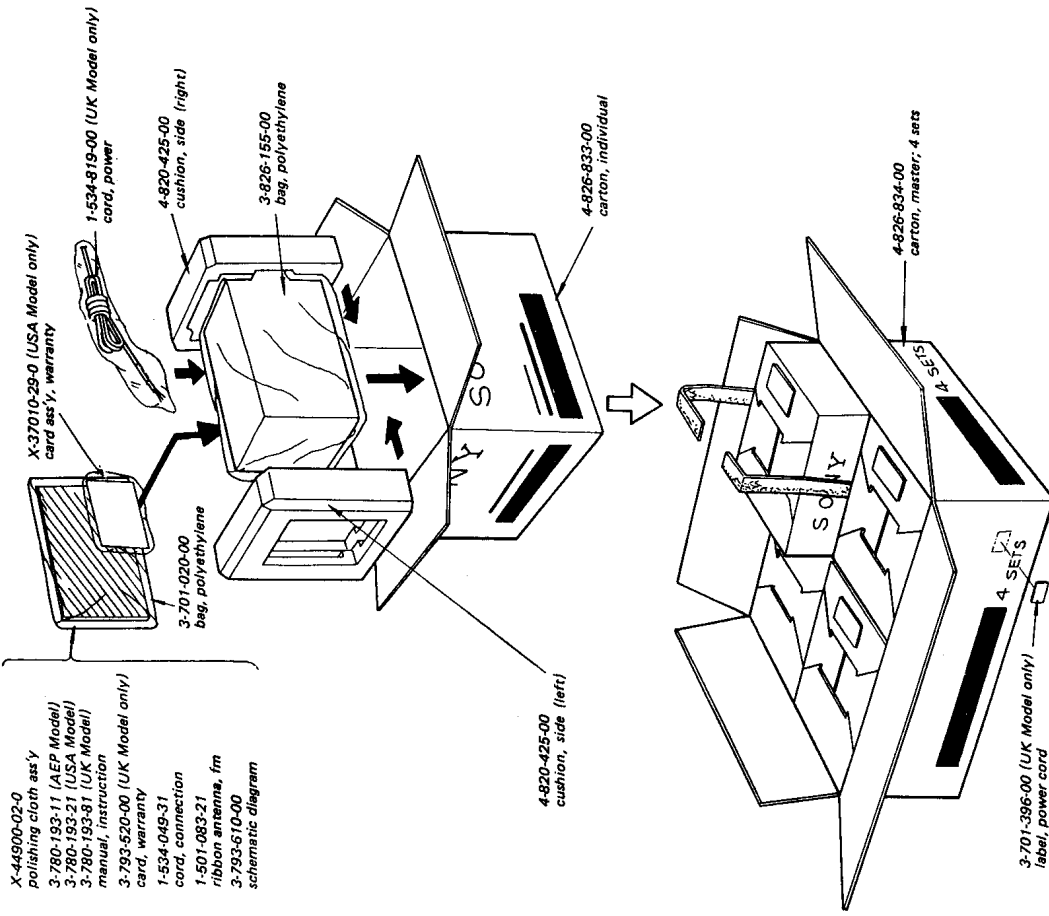


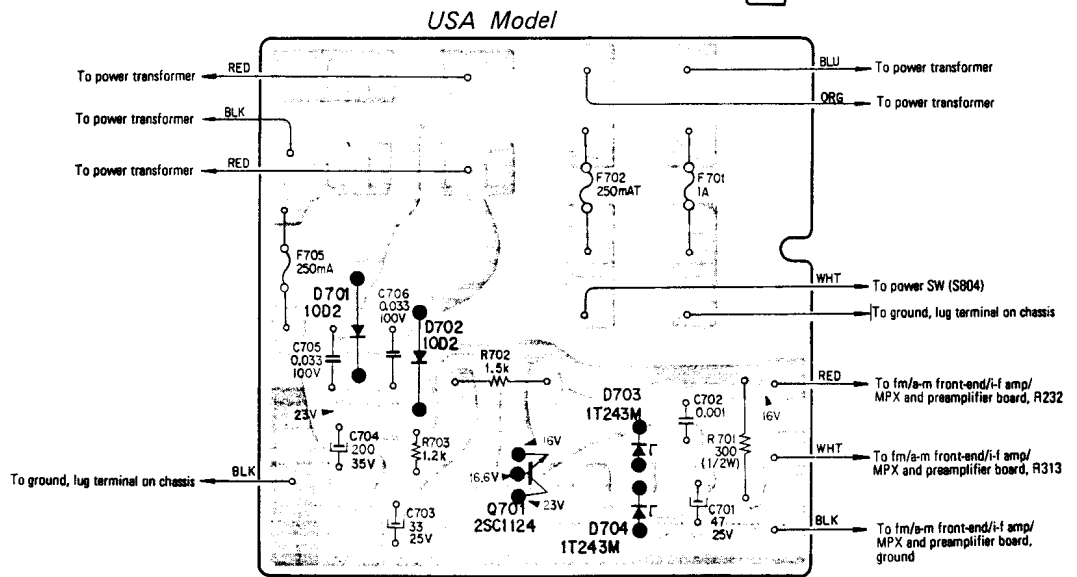
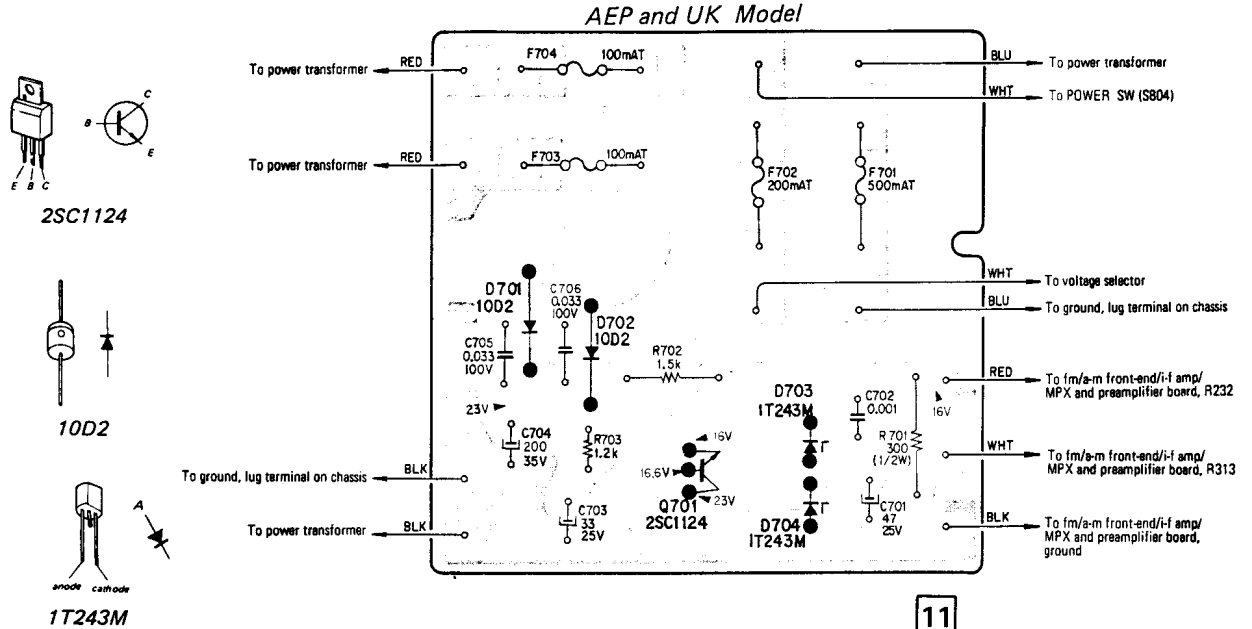
Fig. 4-1. Repacking

SECTION 5 DIAGRAMS

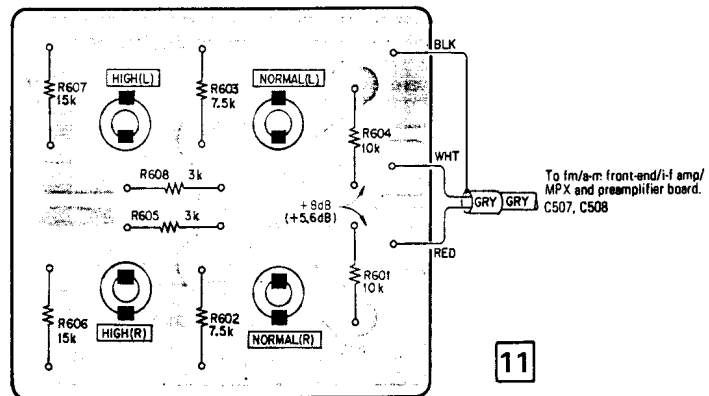
Note: AEP Model (Serial No. 900,001 and later)
UK Model (Serial No. 400,001 and later)
USA Model (Serial No. 800,001 and later)

5-1. MOUNTING DIAGRAM – Power Supply and Attenuator Boards – – Conductor Side –

[Power Supply Board]



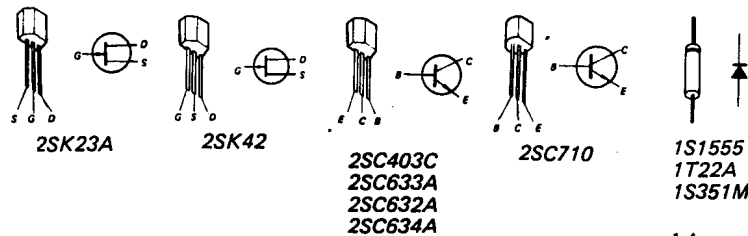
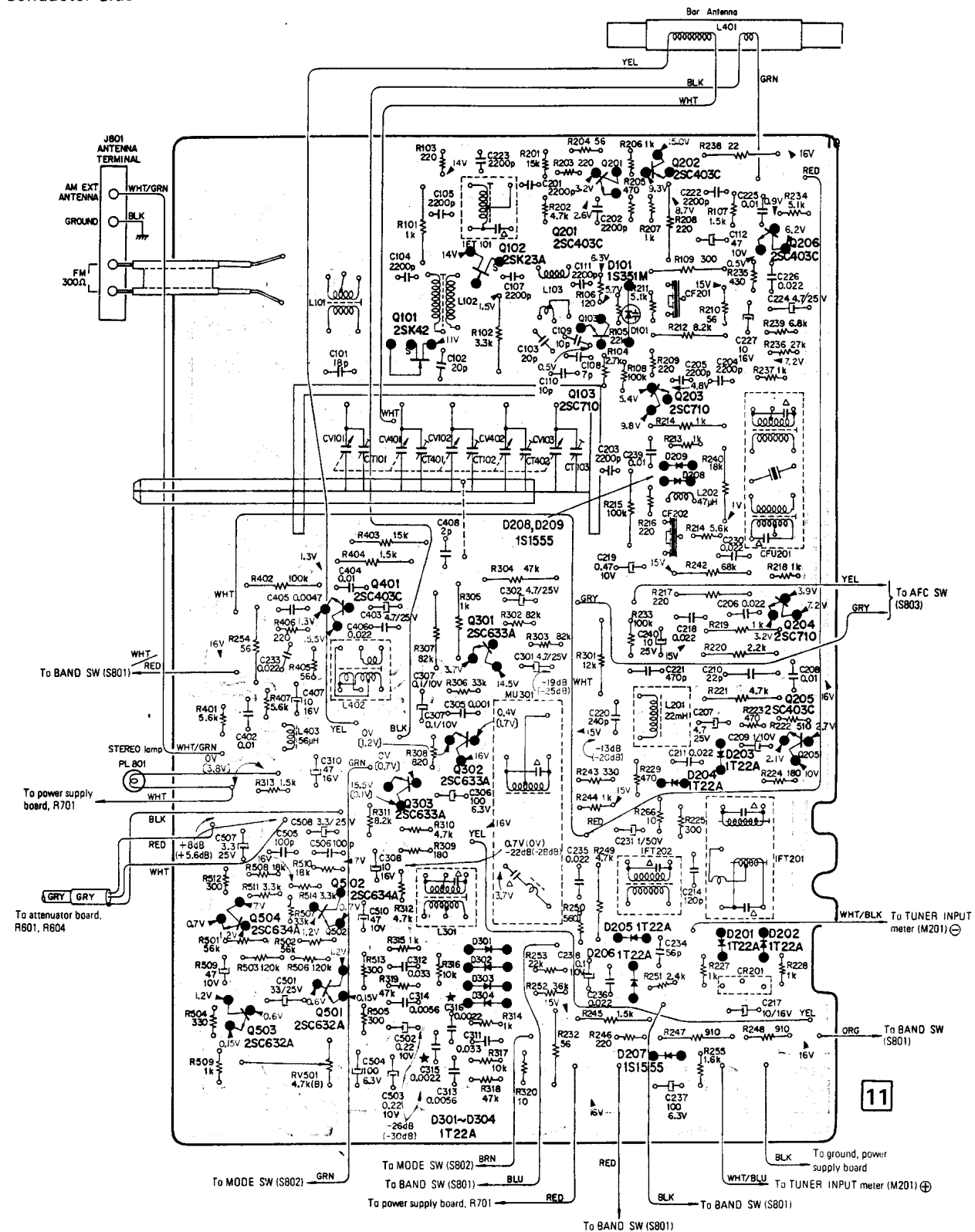
[Attenuator Board]



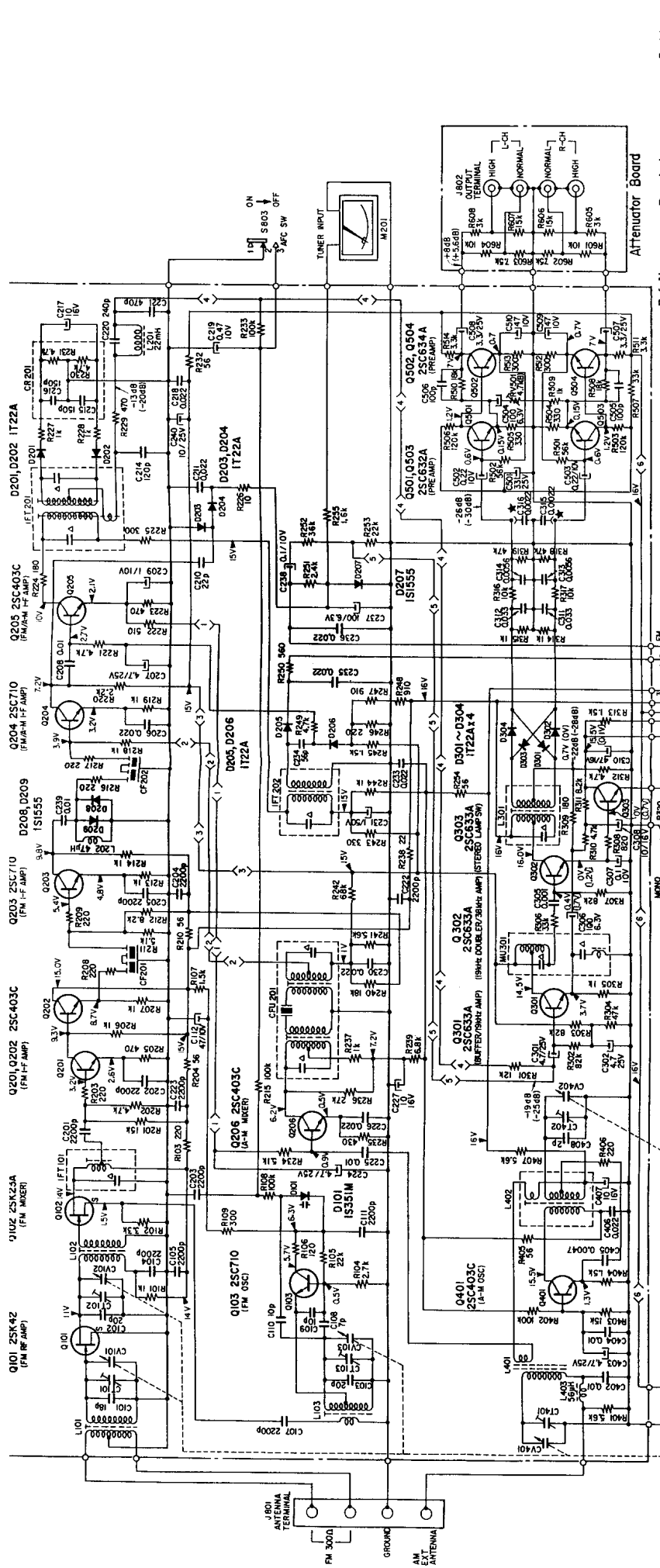
5-2. MOUNTING DIAGRAM – Fm (A-m) Front-End/I-F Amp/MPX and Preamp Board –
 – Conductor Side –

Transistors and
Adjustment
Parts Location

Q202
Q201
IFT101
Q206
Q102
L101
L103
L102
Q103
Q101
Q203
CT101
CT401
CT102
CT402
Q401
Q204
Q301
L402
Q205
Q302
Q303
IFT201
Q502
Q504
L301
Q501
Q503
RV501



Note: Audio signals are expressed in "dB" referred to 0.775 V(0 dB) 400 Hz, receiving fm rf signal of 98 MHz [1000 μV (60 dB), 75 kHz (100 % Mod.)].
 [:] : stereo operation
 (. . dB) : stereo operation



Ref. No.	Description	Position
S801	BAND SW (FM-AM)	FM
S802	MODE SW (STEREO-MONO)	STEREO
S803	AFC SW (ON-OFF)	ON
S804	POWER SW (ON-OFF)	OFF

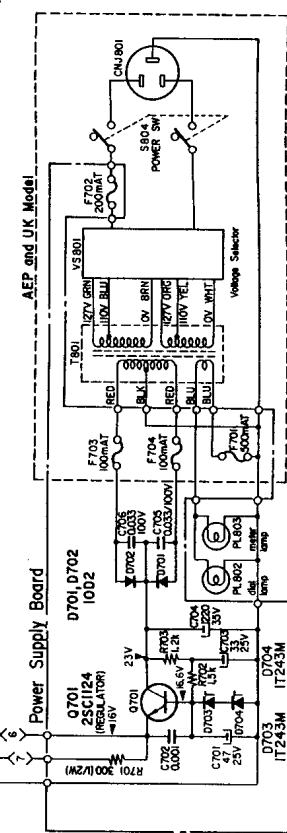
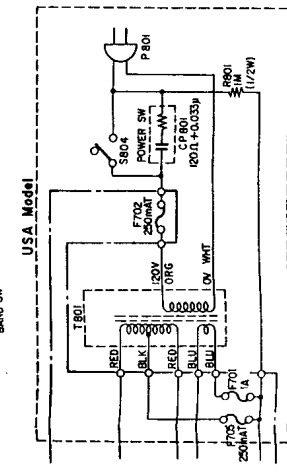
Note: All resistance values are in ohms, k = 1,000, M = 1,000,000. All capacitance values are in μF except as indicated with p, which means pF.

All voltages are dc measured with a VOM having 20 k ohms/volt input impedance. No signal in.

Voltage variations may be noted due to normal production tolerances.

Audio signals are expressed in "dB" referred to 0.775 V (0 dB) 400 Hz, receiving fm rf signal of 98 MHz (1,000 μV (60 dB), 75 kHz (100%) Mod.).

(. . dB) : } stereo operation
 * : C315 and C316 are for USA. Model only
 Capacitors marked Δ are built in each transformer.

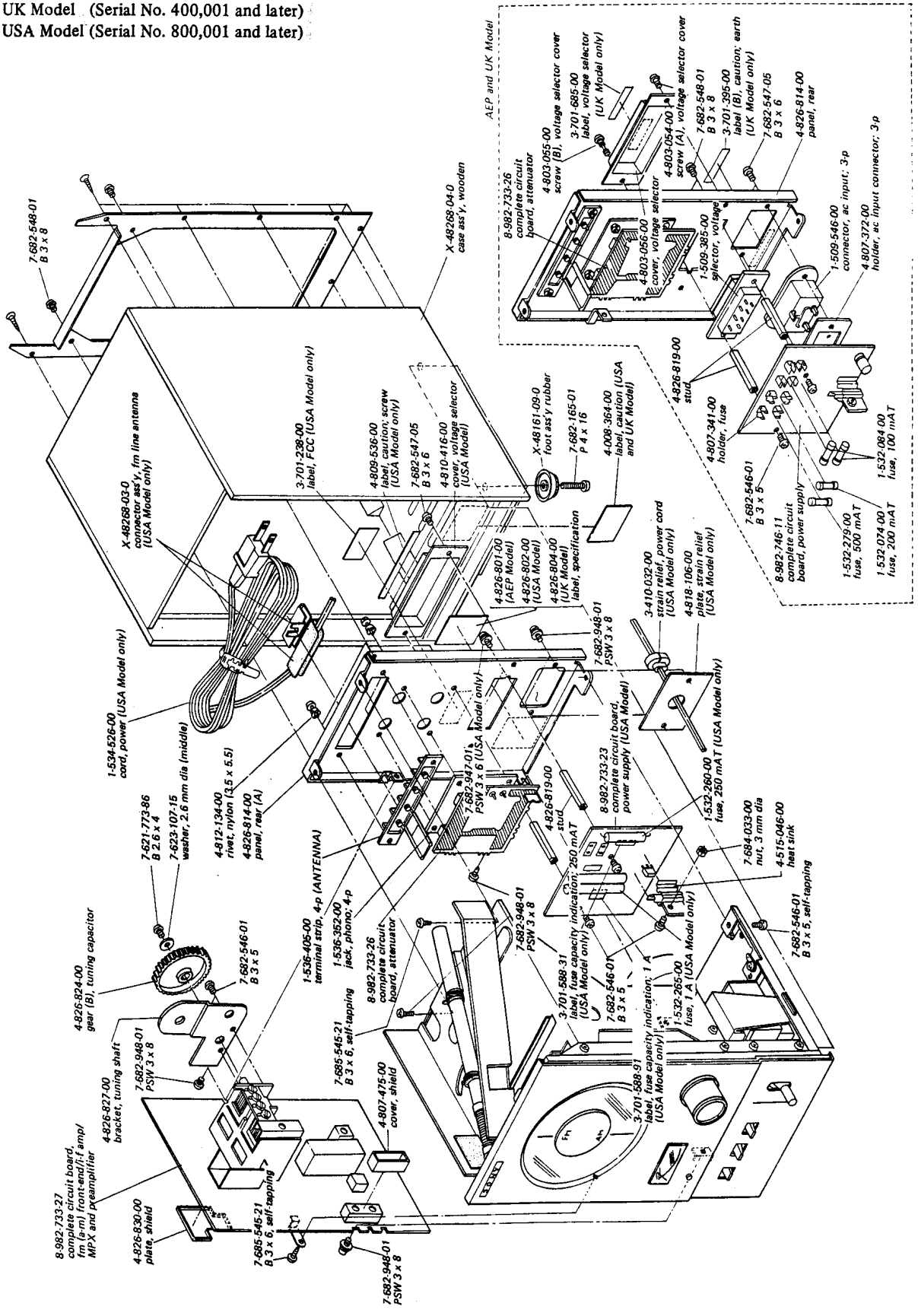


SECTION 6 EXPLODED VIEWS

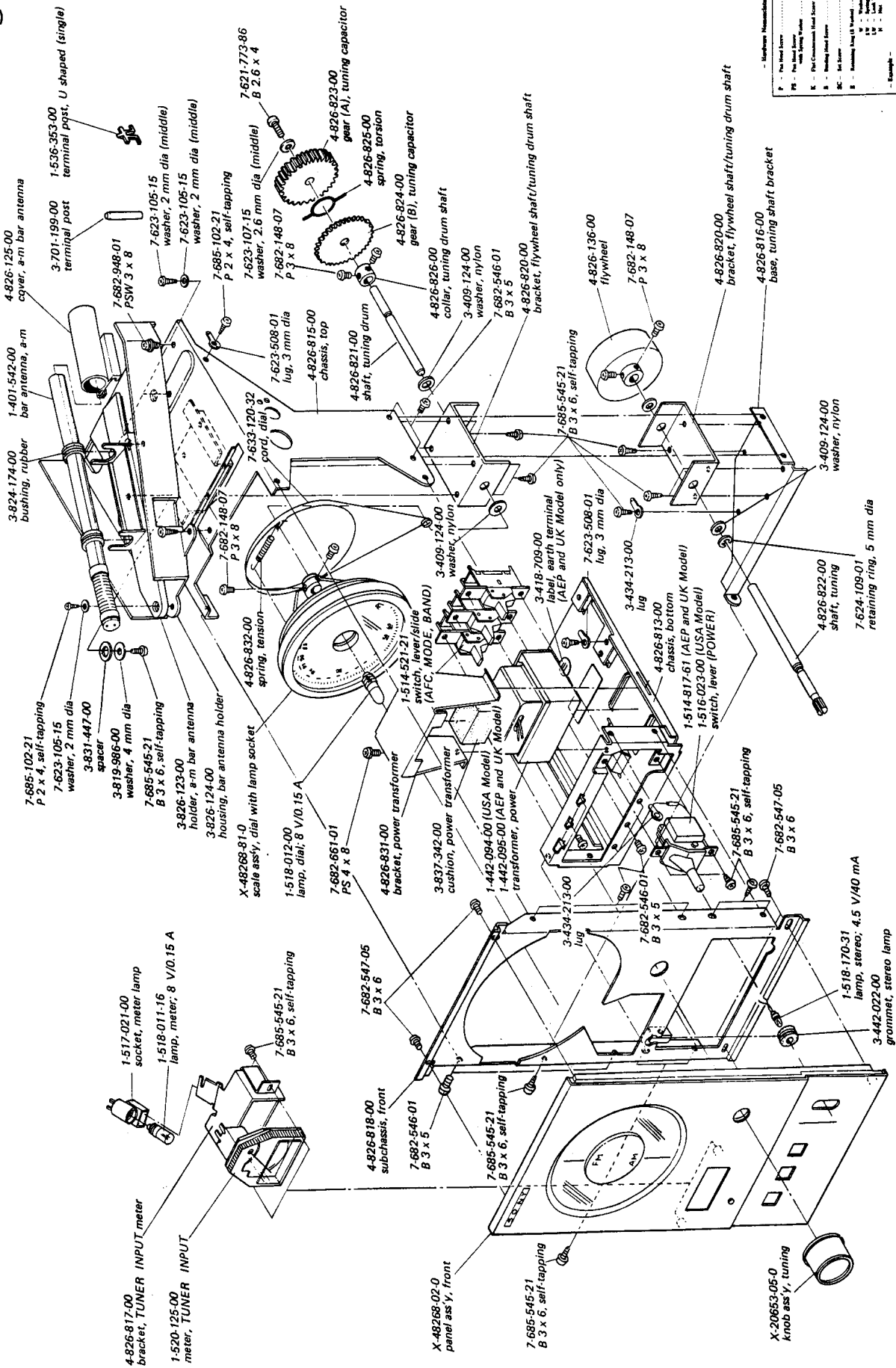
Note: All screws are Phillips type (cross recess type) unless otherwise indicated.

(-): slotted head

Note: AEP Model (Serial No. 900,001 and later) (1)
UK Model (Serial No. 400,001 and later)
USA Model (Serial No. 800,001 and later)



(2)



Hardware Identification

P	The Head Screw
PH	The Head Screw with Spring Washer
W	Per-Component Head Screw
B	Binding Head Screw
MC	Hex Screw
M	Binding Lug (8 Standard)
LP	Lock Washer
LS	Lock Spring
SP	Spring
TS	Torsion Spring
W	Washer
Y	Nylon
U	U-shaped Terminal Post

Example:
 4-826-823-00 Gear (A), tuning capacitor
 7-621-773-86 B 2.6 x 4

SECTION 7

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
COMPLETE CIRCUIT BOARDS			TRANSFORMERS, COILS AND INDUCTORS		
8-982-733-27		fm (a-m) front-end/i-f amp/MPX and preamplifier	CFU201	1-403-150-00	IFT (USA and AEP Model only)
8-982-733-26		attenuator	CFU201	1-403-830-00	IFT, (UK Model only)
8-982-733-23		power supply (USA Model)	IFT101	1-403-914-00	IFT, fm
8-982-746-11		power supply (AEP and UK Model)	IFT201	1-403-913-00	transformer, discriminator
SEMICONDUCTORS			IFT202	1-403-149-00	IFT, a-m
Q101	FET	2SK42	L101	1-401-541-00	coil, fm antenna
Q102	FET	2SK23A	L102	1-405-599-00	coil, fm rf
Q103	transistor	2SC710	L103	1-405-598-00	coil, fm osc
Q201	transistor	2SC403C	L201	1-407-418-00	inductor, 22 mH shielded
Q202	transistor	2SC403C	L202	1-407-165-00	inductor, micro; 47 μ H
Q203	transistor	2SC710	L301	1-425-688-00	transformer, switching
Q204	transistor	2SC710	L401	1-401-542-00	bar antenna, a-m
Q205	transistor	2SC403C	L402	1-405-486-00	coil, a-m osc
Q206	transistor	2SC403C	L403	1-407-166-00	inductor, micro; 56 μ H
Q301	transistor	2SC633A	MU301	1-425-687-00	MPX unit
Q302	transistor	2SC633A	T801	{ 1-442-094-00	transformer, power (USA Model)
Q303	transistor	2SC633A		{ 1-442-095-00	transformer, power (AEP and UK Model)
Q401	transistor	2SC403C	CAPACITORS		
Q501	transistor	2SC632A	All capacitance values are in μ F, except as indicated with p, which means μ μ F.		
Q502	transistor	2SC634A	C101	1-102-953-11	18 p $\pm 5\%$ 50 V ceramic
Q503	transistor	2SC632A	C102	1-102-958-11	20 p $\pm 5\%$ 50 V ceramic
Q504	transistor	2SC634A	C103	1-101-973-11	20 p $\pm 5\%$ 50 V ceramic
Q701	transistor	2SC1124	C104	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D101	diode	1S351M	C105	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D201	diode	1T22A	C106	-----	
D202	diode	1T22A	C107	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D203	diode	1T22A	C108	1-102-875-11	7 p ± 0.5 pF 50 V ceramic
D204	diode	1T22A	C109	1-101-978-11	10 p ± 0.5 pF 50 V ceramic
D205	diode	1T22A	C110	1-101-978-11	10 p ± 0.5 pF 50 V ceramic
D206	diode	1T22A	C111	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D207	diode	1S1555	C112	1-121-352-11	47 10 V electrolytic
D208	diode	1S1555	C201	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D209	diode	1S1555	C202	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D301	diode	1T22A	C203	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D302	diode	1T22A	C204	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D303	diode	1T22A	C205	1-102-257-11	2,200 p $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 50 V ceramic
D304	diode	1T22A	C206	1-105-677-12	0.022 $\pm 10\%$ 50 V mylar
D701	diode	10D2	C207	1-121-395-11	4.7 25 V electrolytic
D702	diode	10D2	C208	1-105-673-12	0.01 $\pm 10\%$ 50 V mylar
D703	diode	1T243M	C209	1-127-023-11	1 10 V solid aluminum
D704	diode	1T243M	C210	1-102-959-11	22 p $\pm 5\%$ 50 V ceramic
			C211	1-101-924-11	0.022 $\begin{matrix} +80 \\ -20 \end{matrix} \%$ 25 V ceramic
			C212	-----	
			C213	-----	
			C214	1-102-816-11	120 p $\pm 5\%$ 50 V ceramic
			C215	-----	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
C216		-----
C217	1-121-651-11	10 16 V electrolytic
C218	1-101-924-11	0.022 $\pm 80\%$ 25 V ceramic
C219	1-127-022-11	0.47 10 V solid aluminum
C220	1-107-140-11	240 p $\pm 10\%$ 50 V silvered mica
C221	1-102-824-11	470 p $\pm 5\%$ 50 V ceramic
C222	1-102-257-11	2,200 p $\pm 80\%$ 50 V ceramic
C223	1-102-257-11	2,200 p $\pm 20\%$ 50 V ceramic
C224	1-121-395-11	4.7 25 V electrolytic
C225	1-105-673-12	0.01 $\pm 10\%$ 50 V mylar
C226	1-105-677-12	0.022 $\pm 10\%$ 50 V mylar
C227	1-121-651-11	10 16 V electrolytic
C228		-----
C229		-----
C230	1-101-924-11	0.022 $\pm 80\%$ 25 V ceramic
C231	1-121-391-11	1 50 V electrolytic
C232		-----
C233	1-105-677-12	0.022 $\pm 10\%$ 50 V mylar
C234	1-101-884-11	56 p $\pm 5\%$ 50 V ceramic
C235	1-105-677-12	0.022 $\pm 10\%$ 50 V mylar
C236	1-105-677-12	0.022 $\pm 10\%$ 50 V mylar
C237	1-121-413-11	100 6.3 V electrolytic
C238	1-127-019-11	0.1 10 V solid aluminum
C239	1-101-923-11	0.01 $\pm 80\%$ 25 V ceramic
C240	1-121-398-11	10 25 V electrolytic
C301	1-121-395-11	4.7 25 V electrolytic
C302	1-121-395-11	4.7 25 V electrolytic
C303		-----
C304		-----
C305	1-105-661-12	0.001 $\pm 10\%$ 50 V mylar
C306	1-121-413-11	100 6.3 V electrolytic
C307	1-127-019-11	0.1 10 V solid aluminum
C308	1-121-651-11	10 16 V electrolytic
C309		-----
C310	1-121-409-11	47 16 V electrolytic
C311	1-105-679-12	0.033 $\pm 10\%$ 50 V mylar
C312	1-105-679-12	0.033 $\pm 10\%$ 50 V mylar
C313	1-105-670-12	0.0056 $\pm 10\%$ 50 V mylar
C314	1-105-670-12	0.0056 $\pm 10\%$ 50 V mylar
C315	1-105-665-12	0.0022 $\pm 10\%$ 50 V mylar (USA Model only)
C316	1-105-665-12	0.0022 $\pm 10\%$ 50 V mylar (USA Model only)
C401		-----
C402	1-105-673-12	0.01 $\pm 10\%$ 50 V mylar
C403	1-121-395-11	4.7 25 V electrolytic
C404	1-105-673-12	0.01 $\pm 10\%$ 50 V mylar
C405	1-102-102-11	0.0047 $\pm 20\%$ 50 V ceramic
C406	1-105-677-12	0.022 $\pm 10\%$ 50 V mylar
C407	1-121-651-11	10 16 V electrolytic
C408	1-102-935-11	2 p ± 0.25 p 50 V ceramic

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
C501	1-121-404-11	33 25 V electrolytic
C502	1-127-020-11	0.22 10 V solid aluminum
C503	1-127-020-11	0.22 10 V solid aluminum
C504	1-121-413-11	100 6.3 V electrolytic
C505	1-102-973-11	100 p $\pm 5\%$ 50 V ceramic
C506	1-102-973-11	100 p $\pm 5\%$ 50 V ceramic
C507	1-121-392-11	3.3 25 V electrolytic
C508	1-121-392-11	3.3 25 V electrolytic
C509	1-121-352-11	47 10 V electrolytic
C510	1-121-352-11	47 10 V electrolytic
C701	1-121-410-11	47 25 V electrolytic
C702	1-105-661-12	0.001 $\pm 10\%$ 50 V mylar
C703	1-121-404-11	33 25 V electrolytic
C704	1-123-063-11	220 35 V electrolytic
C705	1-105-719-12	0.033 $\pm 10\%$ 100 V mylar
C706	1-105-719-12	0.033 $\pm 10\%$ 100 V mylar
CV101,102	1-151-265-00	capacitor, tuning
103,401,402		
CT101,102		
103,401,402		

RESISTORS

All resistance values are in Ω , $\pm 5\%$, $\frac{1}{4}$ W and carbon type unless otherwise indicated.

R101	1-244-673-11	1 k
R102	1-244-685-11	3.3 k
R103	1-242-657-11	220
R104	1-242-683-11	2.7 k
R105	1-242-705-11	22 k
R106	1-242-651-11	120
R107	1-242-677-11	1.5 k
R108	1-242-721-11	100 k
R109	1-244-660-11	300
R201	1-242-701-11	15 k
R202	1-242-689-11	4.7 k
R203	1-242-657-11	220
R204	1-242-643-11	56
R205	1-242-665-11	470
R206	1-242-673-11	1 k
R207	1-242-673-11	1 k
R208	1-244-657-11	220
R209	1-242-657-11	220
R210	1-242-643-11	56
R211	1-242-690-11	5.1 k
R212	1-244-695-11	8.2 k
R213	1-242-673-11	1 k
R214	1-244-673-11	1 k
R215	1-244-721-11	100 k

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R216	1-242-657-11	220
R217	1-244-657-11	220
R218	1-242-673-11	1 k
R219	1-244-673-11	1 k
R220	1-244-681-11	2.2 k
R221	1-244-689-11	4.7 k
R222	1-242-666-11	510
R223	1-242-665-11	470
R224	1-242-655-11	180
R225	1-242-660-11	300
R226	1-242-625-11	10
R227	1-242-673-11	1 k
R228	1-242-673-11	1 k
R229	1-242-665-11	470
R230		-----
R231		-----
R232	1-244-643-11	56
R233	1-242-721-11	100 k
R234	1-242-690-11	5.1 k
R235	1-242-664-11	430
R236	1-242-707-11	27 k
R237	1-242-673-11	1 k
R238	1-244-633-11	22
R239	1-242-693-11	6.8 k
R240	1-244-703-11	18 k
R241	1-242-691-11	5.6 k
R242	1-244-717-11	68 k
R243	1-242-661-11	330
R244	1-242-673-11	1 k
R245	1-244-677-11	1.5 k
R246	1-242-657-11	220
R247	1-244-672-11	910
R248	1-242-672-11	910
R249	1-244-689-11	4.7 k
R250	1-242-667-11	560
R251	1-242-682-11	2.4 k
R252	1-242-710-11	36 k
R253	1-242-705-11	22 k
R254	1-244-643-11	56
R255	1-242-678-11	1.6 k
R301	1-244-699-11	12 k
R302	1-242-719-11	82 k
R303	1-242-719-11	82 k
R304	1-244-713-11	47 k
R305	1-244-673-11	1 k
R306	1-242-709-11	33 k
R307	1-244-719-11	82 k
R308	1-242-671-11	820
R309	1-242-655-11	180
R310	1-242-689-11	4.7 k
R311	1-242-695-11	8.2 k
R312	1-242-689-11	4.7 k
R313	1-242-677-11	1.5 k

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R314	1-242-673-11	1 k
R315	1-242-673-11	1 k
R316	1-242-697-11	10 k
R317	1-242-697-11	10 k
R318	1-242-713-11	47 k
R319	1-242-713-11	47 k
R320	1-242-625-11	10
R401	1-242-691-11	5.6 k
R402	1-244-721-11	100 k
R403	1-244-701-11	15 k
R404	1-244-677-11	1.5 k
R405	1-242-643-11	56
R406	1-242-657-11	220
R407	1-242-691-11	5.6 k
R501	1-242-715-11	56 k
R502	1-242-715-11	56 k
R503	1-242-723-11	120 k
R504	1-242-661-11	330
R505	1-242-661-11	330
R506	1-242-723-11	120 k
R507	1-242-709-11	33 k
R508	1-242-703-11	18 k
R509	1-242-673-11	1 k
R510	1-242-703-11	18 k
R511	1-242-685-11	3.3 k
R512	1-242-660-11	300
R513	1-242-660-11	300
R514	1-242-685-11	3.3 k
R601	1-244-697-11	10 k
R602	1-244-694-11	7.5 k
R603	1-244-694-11	7.5 k
R604	1-244-697-11	10 k
R605	1-244-684-11	3 k
R606	1-244-701-11	15 k
R607	1-244-701-11	15 k
R608	1-244-684-11	3 k
R701	1-202-560-11	300 ± 5 % ½ W composition
R702	1-244-677-11	1.5 k
R703	1-242-675-11	1.2 k
R801	1-202-645-11	1 M ± 5 % ½ W composition (USA Model only)
RV501	1-222-773-00	4.7 k, adjustable (separation adj.)
SWITCHES		
S801,802	} 1-514-521-21	lever (AFC, MODE, BAND)
803		

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
S804	1-514-817-61	lever (POWER) (AEP and UK Model)
	1-516-023-00	lever (POWER) (USA Model)
FILTERS		
CF201,202	1-527-220-11	fm (i-f), ceramic 10.70 MHz (red)
	1-527-220-21	fm (i-f), ceramic 10.67 MHz (blue)
	1-527-220-31	fm (i-f), ceramic 10.73 MHz (orange)
	1-527-220-41	fm (i-f), ceramic 10.64 MHz (black)
	1-527-220-51	fm (i-f), ceramic 10.76 MHz (white)
MISCELLANEOUS		
CNJ801	1-509-546-00	connector, ac input; 3-p (AEP and UK Model only)
CP801	1-231-057-00	encapsulated component, 120 Ω + 0.033 μ F (USA Model only)

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
CR201	1-231-175-00	encapsulated component
F701	1-532-265-00	fuse, 1 A (USA Model)
	1-532-279-00	fuse, 500 mA (AEP and UK Model)
F702	1-532-074-00	fuse, 200 mA (AEP and UK Model)
	1-532-260-00	fuse, 250 mA (USA Model)
F703,704	1-532-084-00	fuse, 100 mA (AEP and UK Model only)
F705	1-532-260-00	fuse, 250 mA (USA Model only)
J801	1-536-405-00	terminal strip, 4-p (ANTENNA)
J802	1-536-352-00	jack, phono; 4-p
M201	1-520-125-00	meter, TUNER INPUT
P801	1-534-526-00	cord, power (USA Model)
PL801	1-518-170-31	lamp, stereo 4.5 V/40 mA
PL802	1-518-012-00	lamp, dial 8 V/0.15 A
PL803	1-518-011-16	lamp, meter; 8 V/0.15 A
VS801	1-509-385-00	selector, voltage (AEP and UK Model only)
	1-517-021-00	socket, meter lamp
	1-536-353-00	terminal post, U shaped (single)

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