ISO

Set using ISO screws

CRF-220

GEP Model

NEP Model

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

SECTION 1
OUTLINE

1-1. SPECIFICATIONS

Circuit System: Superheterodyne (FM, MW, LW, SW1)
Double superheterodyne (SW2 ~ SW19)

Semiconductor: 25 transistors, 3 FET's for reception, 17 transistors for auxiliary functions, 33 diodes, 2 thermistors

Frequency Coverage:
FM ; 87.5 - 108 MHz
MW ; 530 - 1,605 kHz (566 - 187 m)
LW ; 150 - 400 kHz (2,000 - 750 m)
SW1 ; 1.6 - 4.5 MHz (187 - 66 m; Marine Band)
SW2 ; 2.0 - 2.6 MHz (120 m)
SW3 ; 3.0 - 3.6 MHz (90 m)
SW4 ; 3.5 - 4.1 MHz (75 - 81 m)
SW5 ; 4.5 - 5.1 MHz (60 m)
SW6 ; 5.8 - 6.4 MHz (49 m)
SW7 ; 7.0 - 7.6 MHz (40 - 41 m)
SW8 ; 9.5 - 10.1 MHz (31 m)
SW9 ; 11.5 - 12.1 MHz (25 m)
SW10 ; 14.0 - 14.6 MHz (20 m)
SW11 ; 15.0 - 15.6 MHz (19 m)
SW12 ; 17.5 - 18.1 MHz (16 m)
SW13 ; 21.0 - 21.6 MHz (15 m)
SW14 ; 21.4 - 22.0 MHz (13 m)
SW15 ; 25.5 - 26.1 MHz (11 m)
SW16 ; 26.8 - 27.4 MHz (11 m)
SW17 ; 28.0 - 28.6 MHz (10 m)
SW18 ; 28.6 - 29.2 MHz (10 m)
SW19 ; 29.2 - 29.8 MHz (10 m)

Intermediate Frequency:
FM ; 10.7 MHz
MW, LW, SW1 ; 455 kHz
SW2 ~ SW19 ; 1st : 1.6 - 2.2 MHz
2nd: 455 kHz

Antenna System:
FM ; telescopic antennas 1,000 mm 2 pcs
external antenna terminals (300 Ω, 75 Ω) are provided
MW, LW ; built-in ferrite bar antenna, 10 mm dia x 180 mm
external antenna terminals are provided
SW1 ~ SW19 ; telescopic antenna 1,470 mm
external antenna terminals are provided

Power Requirements:
AC 110, 127, 220, 240 V, 50/60 Hz
DC 9 V, battery (size "D") 6 pcs
DC 12 V, with SONY car battery cord DCC-126 (optional)

Power Output: at 10% distortion
4 W with AC power supply
1.5 W with DC power supply

Current Drain: at zero signal
AC 180 mA
DC 90 mA

Maximum Sensitivity: at output 50 mW, S/N 6 dB
FM ; -2 dB (0.8 μV)
MW ; 28 dB/m (25 μV/m)
LW ; 36 dB/m (63 μV/m)
SW ; 0 dB (1 μV); average

Selectivity:	LW, MW, SW1 ~ SW19; 40 dB at BROAD position 60 dB at SHARP position
Muting Level:	10 ~ 30 dB (adjustable)
Signal-to-Noise Ratio:	FM ; 63 dB at 54 dB input, 400 Hz, 30% modulation MW ; 37 dB at 60 dB input, 400 Hz, 30% modulation LW ; 30 dB at 60 dB input, 400 Hz, 30% modulation SW ; 44 dB at 44 dB input, 400 Hz, 30% modulation
Image Rejection:	FM ; 72 dB at 98 MHz MW ; 60 dB at 1,605 kHz LW ; 80 dB at 360 kHz SW1 ; 30 dB at 4.5 MHz SW2 ; 80 dB at 2.5 MHz SW19 ; 30 dB at 29 MHz
Frequency Response:	100 - 20,000 Hz within ±10 dB by tone control
AUX IN Jack	
input impedance:	5 kΩ
maximum sensitivity:	−53 dB (1.7 mV) at 50 mW output
MPX OUT Jack	
output impedance:	5 kΩ
output level:	−24 dB (49 mV) at 5 kΩ load impedance
Record Jack	
output impedance:	2.2 kΩ
output level:	−50 dB (2.5 mV)
REC OUT Connector	
output impedance:	80 kΩ
output level:	−29.5 dB (26 mV)
EXT SP Jack:	3 ~ 8 Ω speakers can be connected
HEADPHONE Jack:	8 Ω headphone can be connected
EARPHONE Jack:	8 Ω earphone can be connected
Special Controls:	BATTERY CHECK switch CALIBRATOR knob MGC knob BFO control knob SELECTIVITY switch ANL switch MUTING switch SENSITIVITY switch AFC switch
Dimensions:	17 13/16" (W) x 12 13/16" (H) x 7 1/2" (D) (452 mm x 325 mm x 190 mm)
Weight:	30 lb, 13.5 kg (without batteries)
Supplied Accessories:	AC power cord Polishing cloth

1-2. BLOCK DIAGRAM

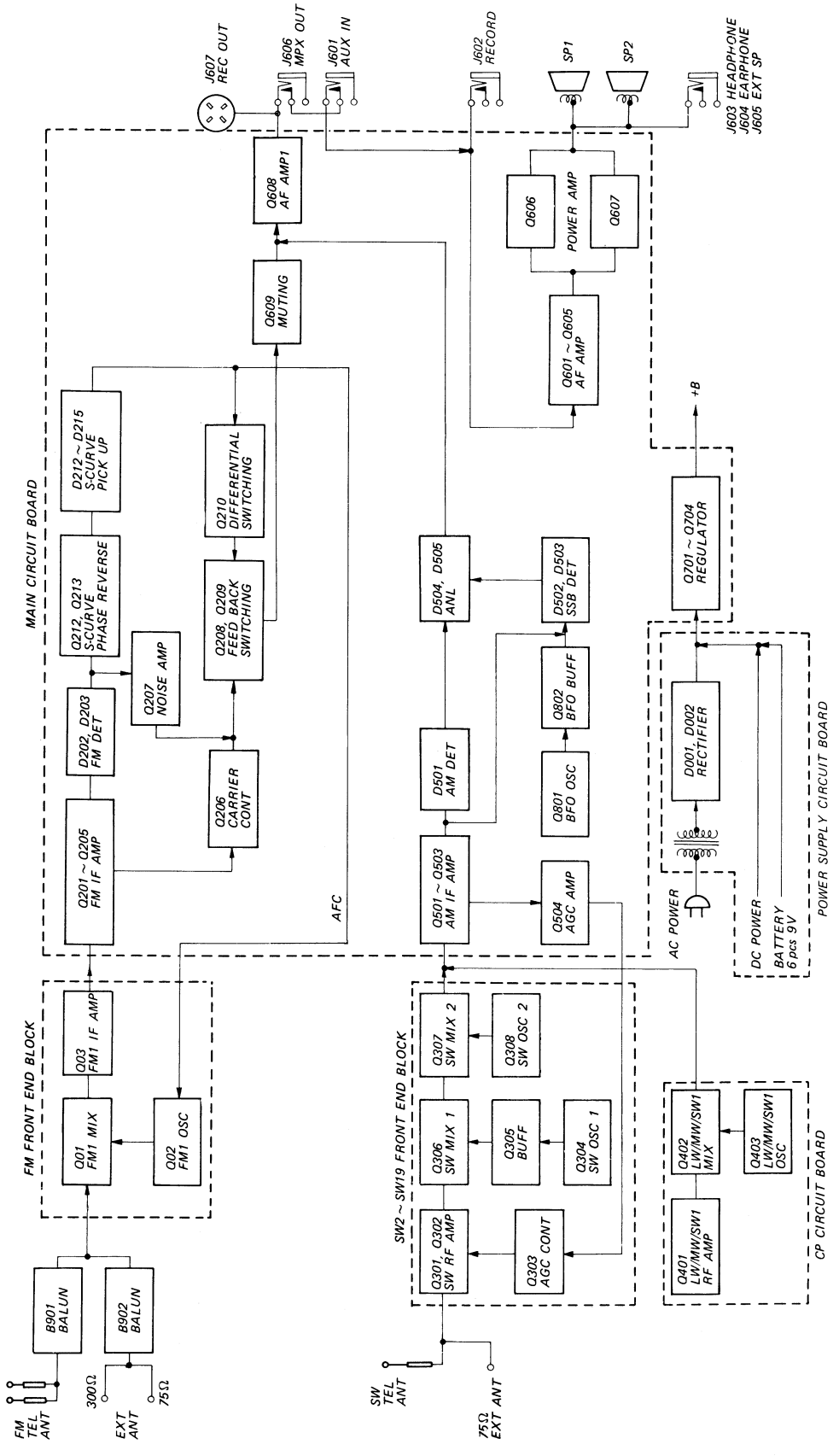


Fig. 1-1.

1-3. TECHNICAL FEATURES

The SONY Model CRF-220 is a high-performance radio receiver having many features found in communication receivers. Among them are the following:

- A total of 22 bands covering the broadcast frequencies of any country in the world. Included are an FM band, 19 SW bands, an MW band and an LW band.
- FET (Field Effect Transistor) front ends in FM and SW bands provide superior sensitivity, image rejection, and stability.
- Easy-to-tune SW bands due to a dual-conversion system providing a uniform 600 kHz tuning range on each band.
- Product detector for receiving ssb signals.
- An fm i-f circuit employing ceramic filters. An a-m i-f circuit employing two ceramic filters with two-step adjustable selectivity.
- Individual tuning knobs for SW2 ~ 19 bands, SW1/MW/LW bands and FM band. Preset-tuning of three stations is available.
- The power supply will operate from household current in any country of the world (via built-in voltage selector), internal battery, or car battery.
- Stable, noise-free FM tuning by means of AFC and a muting system.
- ANL (Automatic Noise Limiter) to minimize noise.
- Up to 4 watts of undistorted audio power output with two built-in speakers or external speakers.

1-4. CIRCUIT OPERATIONS

AFC (Automatic Frequency Control)

The automatic frequency control employed in the CRF-220 for the FM band is a little different circuitry from ordinary ones as shown in Fig. 1-2. Output signals from the detector diodes are applied to the bases of Q211 and Q212 in the manner of phase-reversal. Hence, the outputs at the collectors of Q211 and Q212 are phase-reversed each other. R260, R261, R262 and R263 in the output circuit of the transistors compose a balanced bridge circuit, and the d-c voltage at the junction of R260 and R261, point Ⓐ, is maintained constant at 1.5 volts. This constant 1.5 V d-c is applied to the variable-capacitance diode D101 for biasing through the AFC switch S202 in the AFC OFF mode. When the AFC switch is set to the AFC ON position, control bias is taken from the point Ⓑ and the AFC circuit is activated.

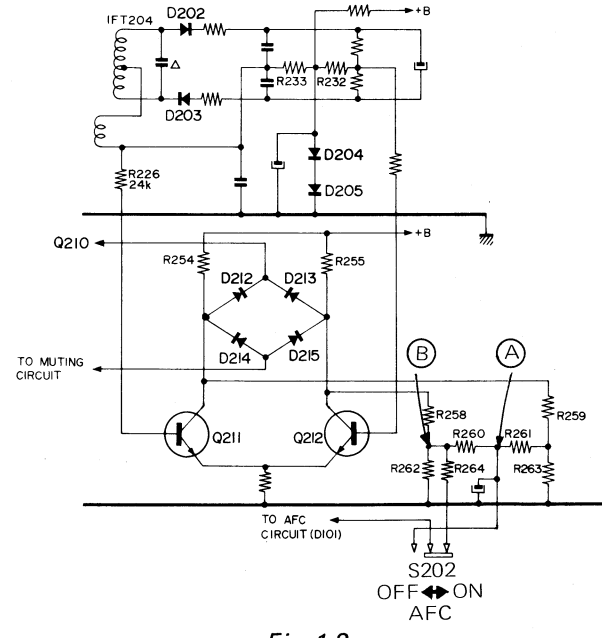


Fig. 1-2

Muting Circuit:

When the receiver is detuned from a signal, the signal decreases. Since less i-f signal is then rectified by diodes D207 and D208, the negative output voltage of these rectifiers can no longer back the positive voltage applied to the base of transistor Q206 through adjustable resistor VR901 (Fig. 1-3). This allows Q206 to conduct lowering its collector voltage. Since the collector of Q206 is connected to the base of PNP transistor Q209, Q209 conducts when its base voltage decreases (with respect to ground), thereby causing transistor Q208 to conduct. The collector voltage of Q208 then drops to near ground potential. The voltage at the collector of Q208 is fed to the base of transistor Q609 through MUTING switch S203. Since this voltage is so low Q609 cannot conduct and complete the emitter circuit of transistor Q608. This prevents Q608 from amplifying the detector output.

When tuned to a signal, the opposite actions occur. I-f signal through capacitor C227 is rectified into negative d-c voltage by diodes D207 and D208. This voltage cuts off transistor Q206 and eventually turns on transistor Q609, thereby enabling transistor Q608 to amplify the detector output. The muting level can be adjusted by potentiometer VR901. The muting level is usually set approximately 20 dB lower than the signal level. If the receiver tuning is shifted within range B of Fig. 1-4, the difference between the collector voltages of transistors Q211 and Q212 becomes large enough drops across resistors R251 and R252, thus lowering the base voltage of PNP transistor Q209 and results in its conduction. As before, the conduction of Q209 begins a chain of events which prevents Q608 from amplifying. If the tuning is shifted within range C of Fig. 1-4, the difference between the collector voltages of transistors Q211 and Q212 is so small that transistor Q210 is turned off within this range as well as in range A. Noise components caused by detuning, however, are coupled to transistor Q207 through capacitor C240 and resistor R247 from the detector output.

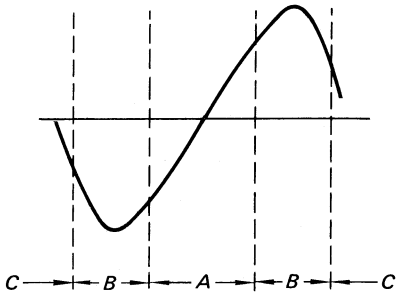


Fig. 1-4 Discriminator characteristic

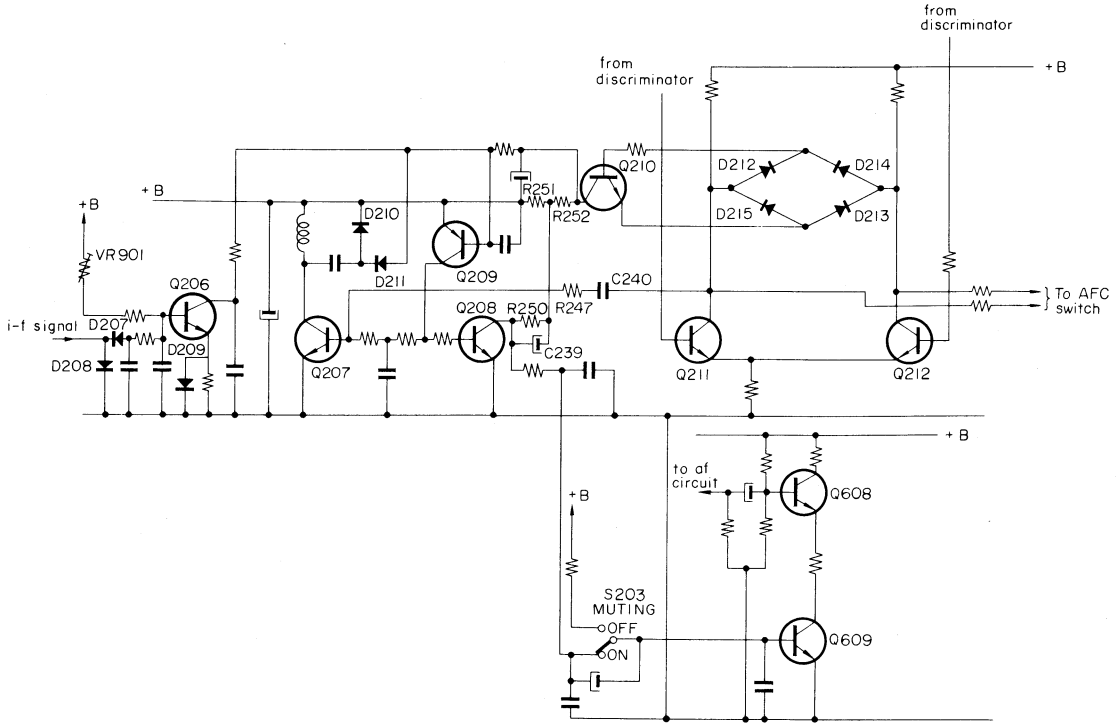


Fig. 1-3

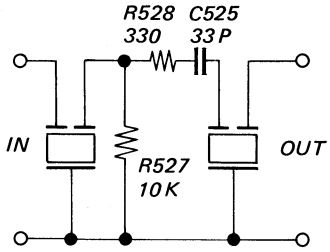
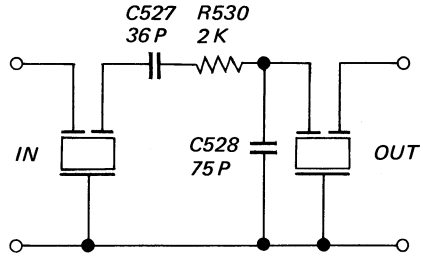
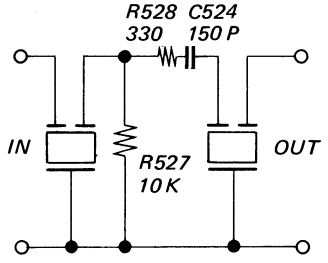
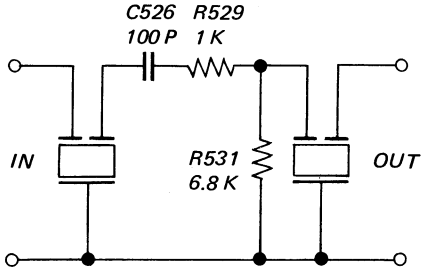
The noise is amplified, rectified into negative d-c voltage by diodes D210 and D211, and applied to the base of transistor Q209 to turn it on. Since the base voltage of Q207 is controlled by the collector voltage of Q209, the amplification of transistor Q207 increases due to increased base bias, and transistor Q209 is held conducting quite reliably. As before, transistor Q608 cuts off the detector output.

Positive feedback through resistor R250 and capacitor C239 from transistor Q209 aids in turning off Q208.

Adjustable Selectivity Employing Ceramic Filters:

The bandwidth in a-m reception can be altered by changing the coupling between the sections of ceramic filters in the a-m i-f circuit. Ceramic filters CF501 and CF502 can be manually set to narrow or wide bandwidth by switch S501.

The net result of the switch manipulations on the ceramic filter circuits are summarized in Table. The overall selectivity curves of the a-m i-f strip are shown in Fig. 1-5.

Band width	CF501 (S501-1)	CF502 (S501-2 ~ 3)	Overall response (Fig. 1-5)
Sharp			A
Broad			B

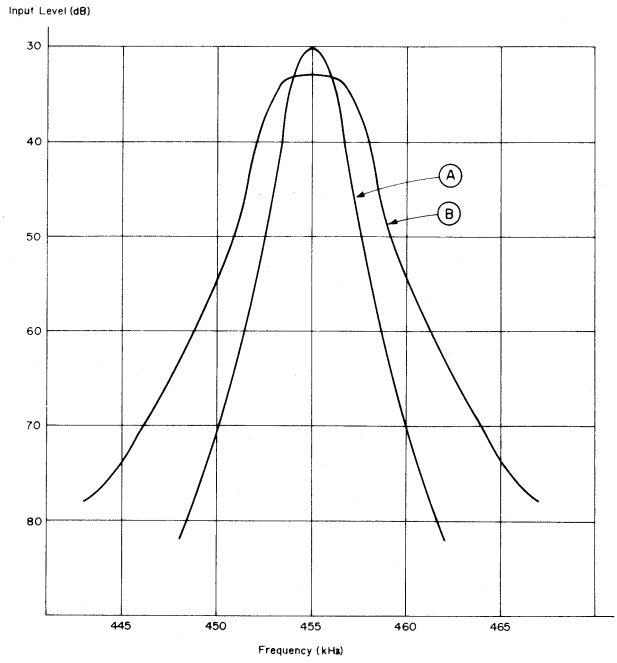


Fig. 1-5 Overall i-f response curve

ANL (Automatic Noise Limiter):

This limiter in the a-m section clips any noise pulses accompanying the signal to a level no longer than the signal amplitude. The clipping level is automatically adjusted to match the variations in signal level. The collector voltage of i-f amplifier Q502 forward biases diodes D504 and D505 through resistors R509 and R521, while the output voltage of detector D501 provides a reverse-bias voltage (Fig. 1-6). These two bias voltages adjust the clipping level of diodes D504 and D505 to match the average signal level.

Product Detector for Single-Sideband Reception:

A product detector is a type of heterodyne detector. Single-sideband signals can be recovered by passing them through nonlinear device after being mixed with a carrier identical in frequency to that used during modulation at the transmitter. That is, these two signals, sideband and carrier, are converted into two beat signals, upper and lower, against the carrier frequency by heterodyne action. The upper beat signal is eliminated by passing through the filter circuit and the lower beat signal is fed to the next stage as audio signals.

In the model CRF-220, the detector utilizes the square-law characteristic (output current proportional to the square of the effective value of the input voltage) of a diode for the nonlinear device.

To minimize distortion, two diodes D502 and D503 are connected in reverse each other and applied the signals respectively positive in phase. That is because the range of square-law curve of one diode is narrow causing distorted detection for strong input signal.

The BFO injection voltage used for carrier reinsertion is comparatively high (about 0.8 volt is optimum) to set the operating point of the detector within a linear portion of the diodes' characteristic. This results to minimize distortion of the recovered audio signal.

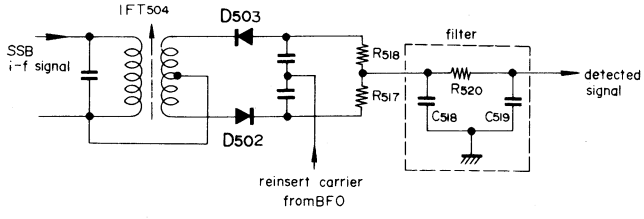


Fig. 1-7 Product detector

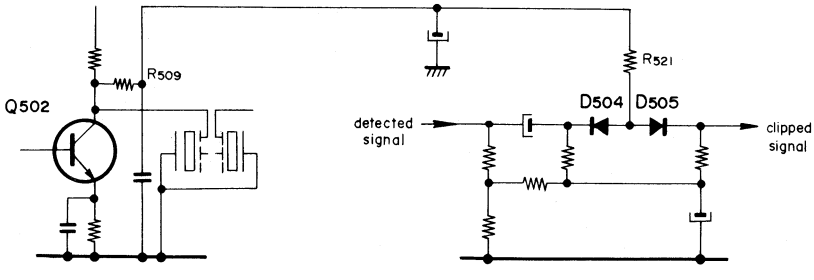


Fig. 1-6 Automatic noise limiter circuit

1-5. EXTERNAL VIEW

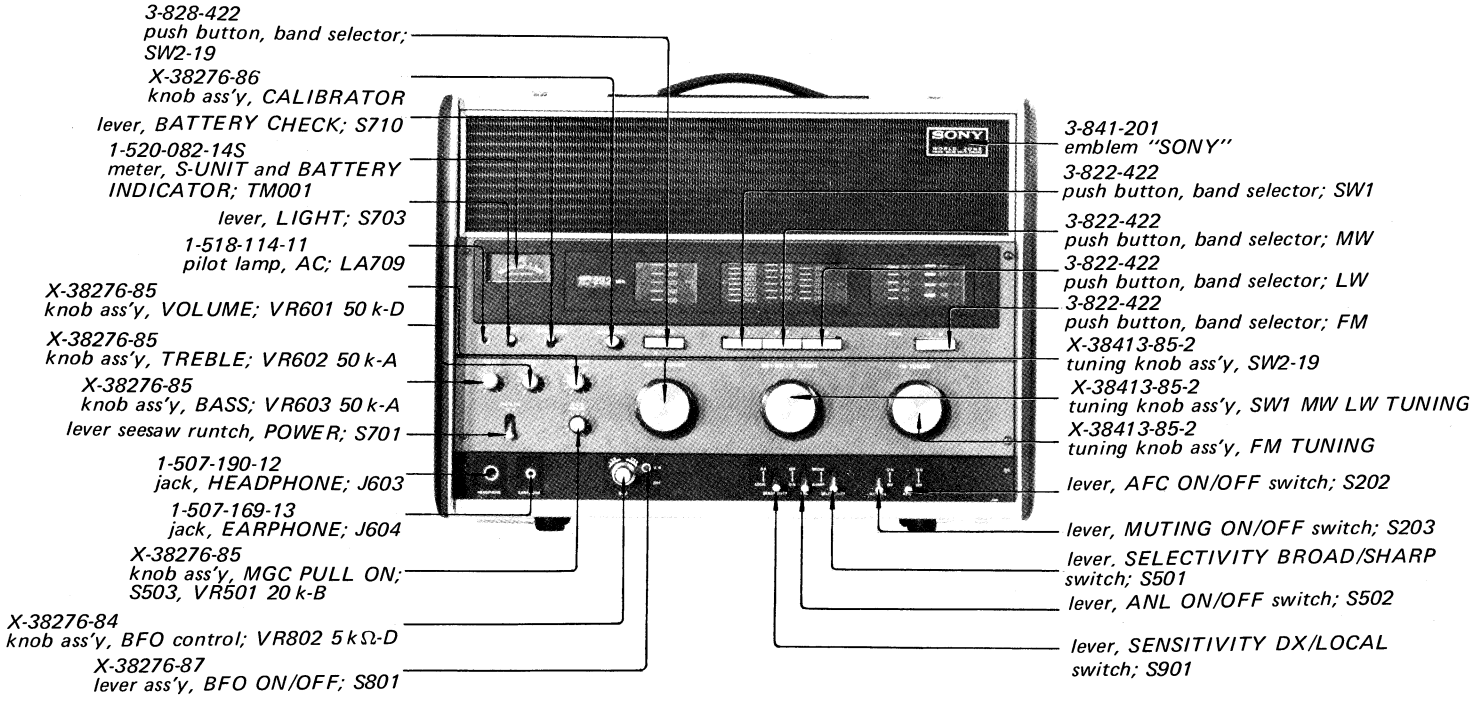


Fig. 1-8

1-6. INTERNAL VIEW

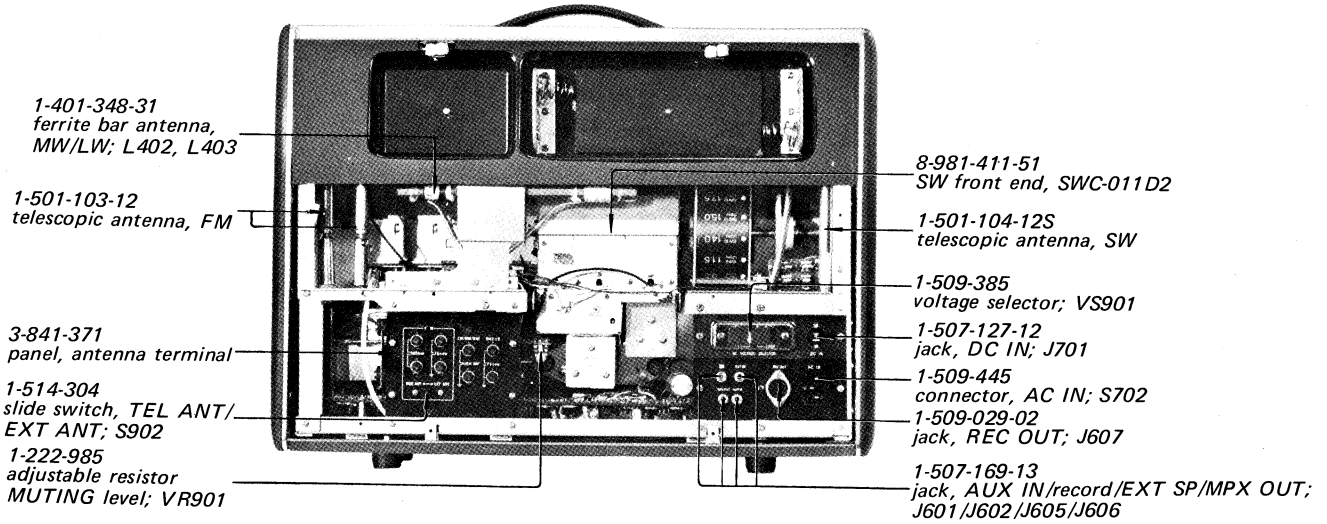


Fig. 1-9.

1-7. CHASSIS VIEW

— Front —

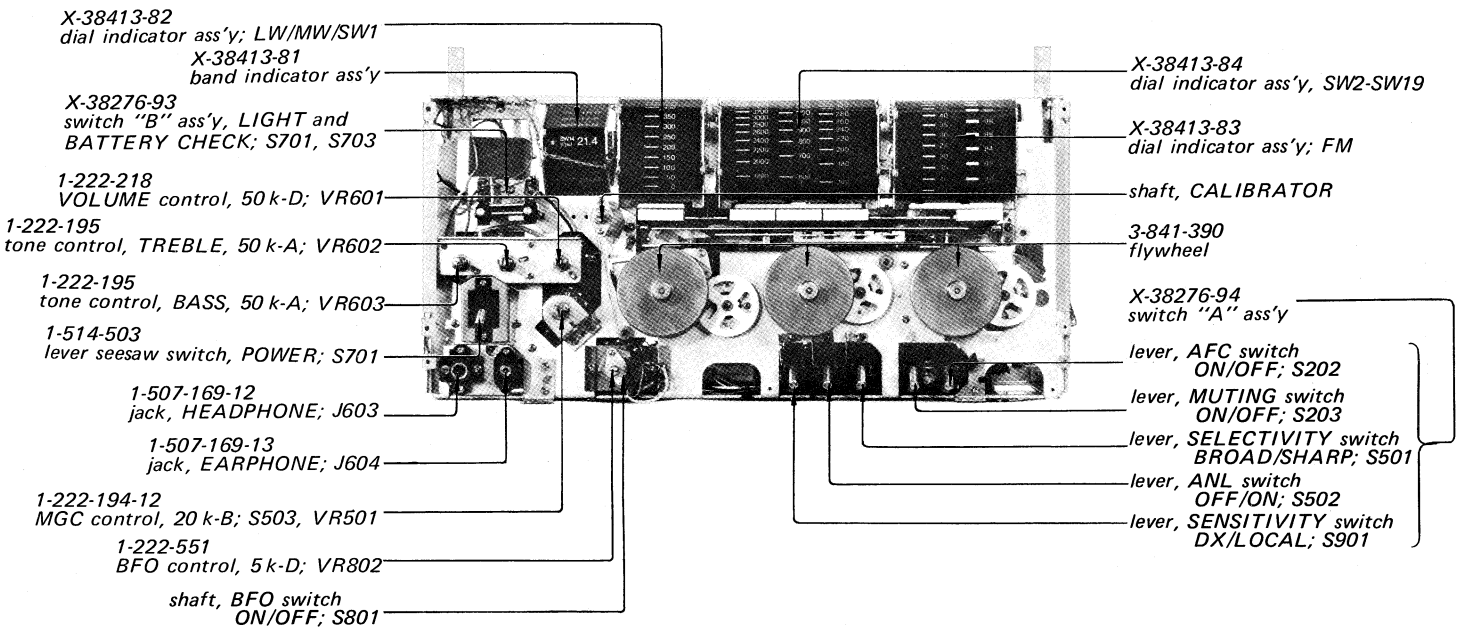


Fig. 1-10

— Bottom —

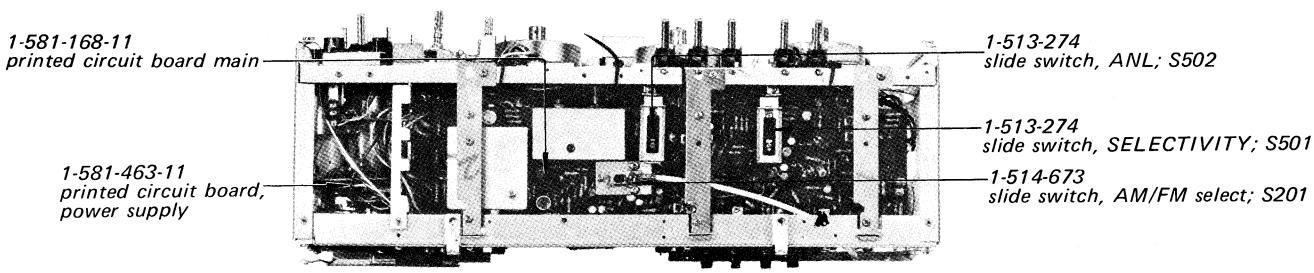


Fig. 1-11

SECTION 2
DISASSEMBLY

2-1. REAR COVER REMOVAL

1. Remove the six screws marked Ⓐ in Fig. 2-1.
2. Remove the rear cover in the direction shown by the arrow Ⓑ.
3. Remove the two wood screws marked Ⓒ in Fig. 2-1.

2-2. CABINET REMOVAL

1. Remove the four screws marked Ⓔ in Fig. 2-1.
2. Push up the three telescopic antennas' bottom.
3. Remove the six screws marked Ⓕ and Ⓖ in details (1) and (3) of Fig. 2-1.
4. Unsolder the coaxial cable and the three lead wires shown in details (1) and (3) of Fig. 2-1.
5. Loosen the three set screws fixing band selector knob shown in detail (2) of Fig. 2-1 and pull off the band selector knob.

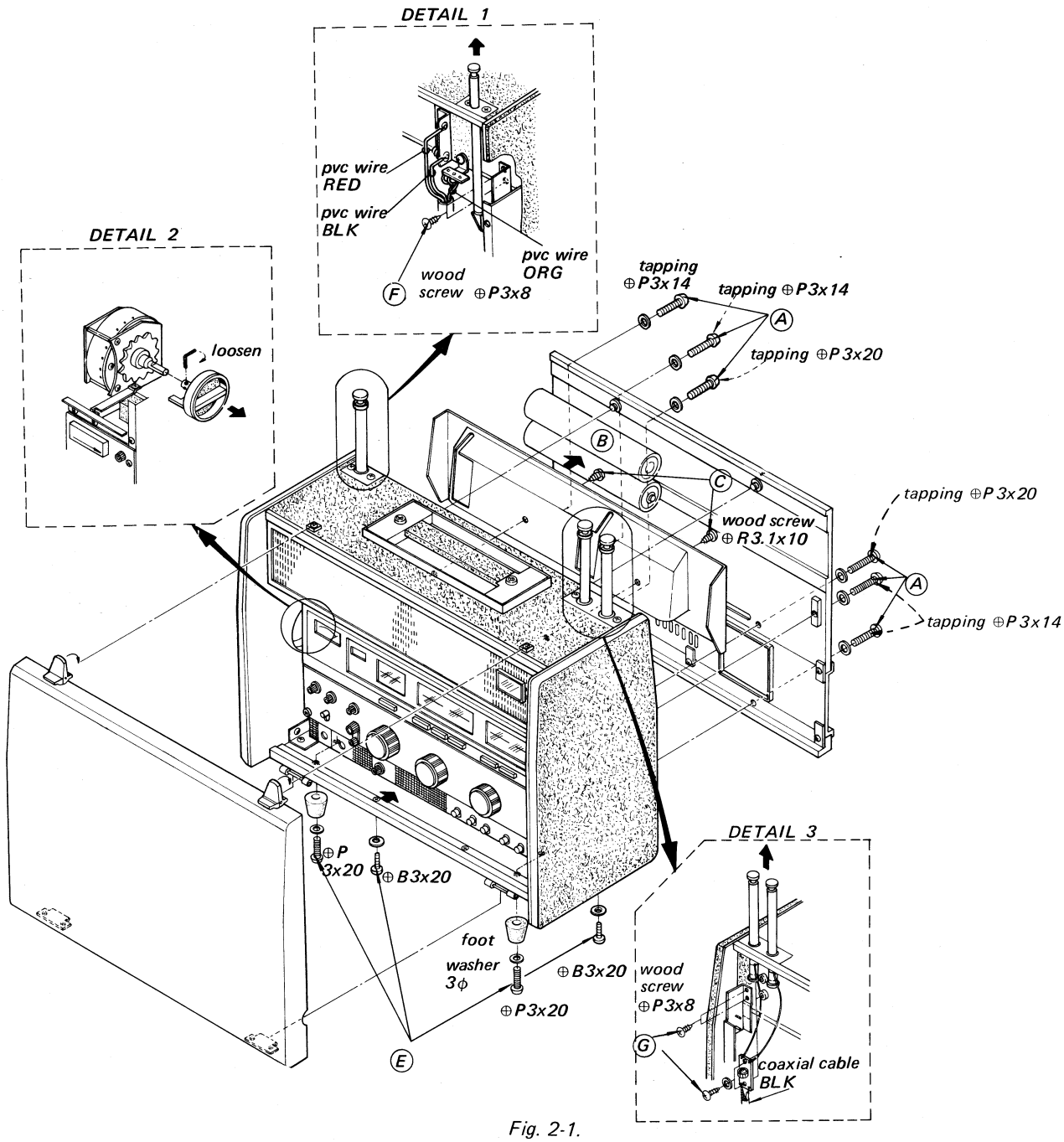


Fig. 2-1.

2-3. FRONT PANEL REMOVAL

1. Remove the three TUNING knobs and the CALIBRATOR knob by loosening their set-screws.
2. Pull off the five control knobs marked ※ in Fig. 2-2.
3. Remove the six screws marked Ⓗ and remove the main panel and the sub-panel.

2-4. SPEAKER REMOVAL

1. Remove the rear cover and battery case.
2. Remove the three truss head screws marked Ⓘ in Fig. 2-3.
3. Now, baffle board and two speakers are removable as shown in Fig. 2-3.

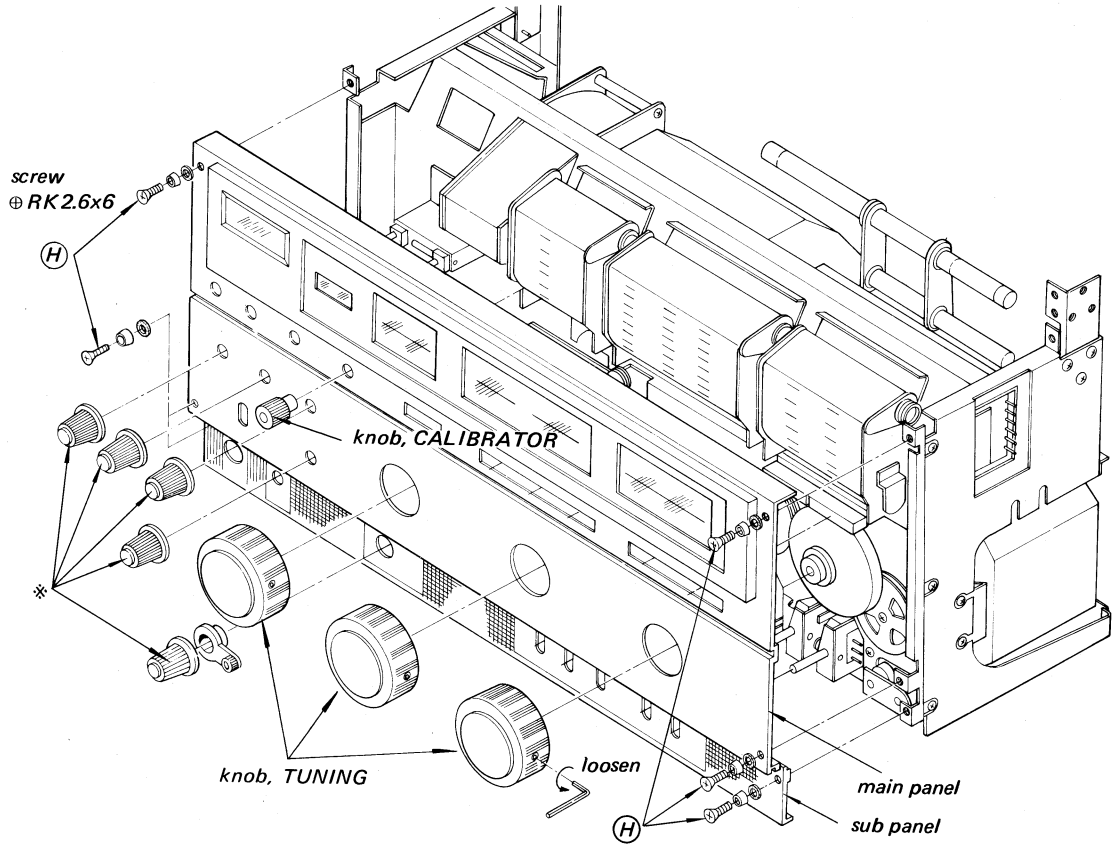


Fig. 2-2.

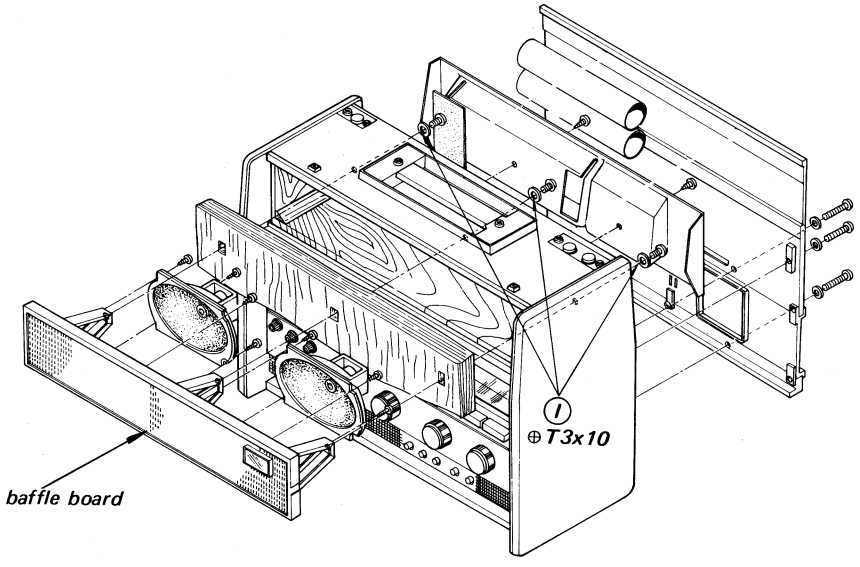


Fig. 2-3.

2-5. FM FRONT END BLOCK REMOVAL

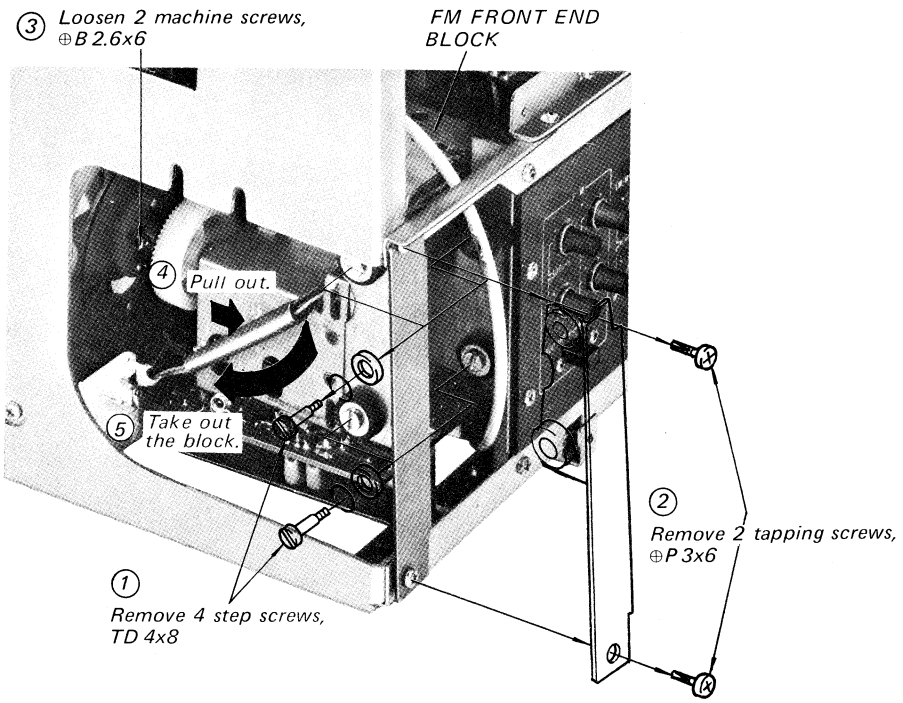


Fig. 2-4

2-6. MAIN CIRCUIT BOARD REMOVAL

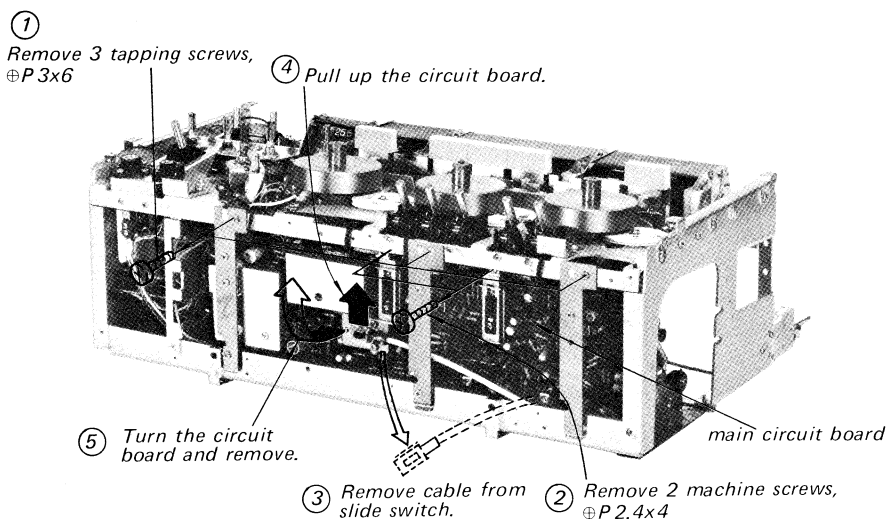
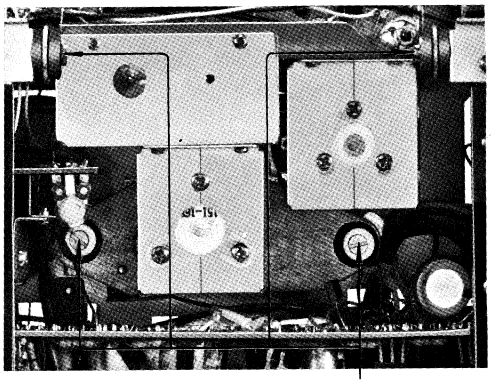


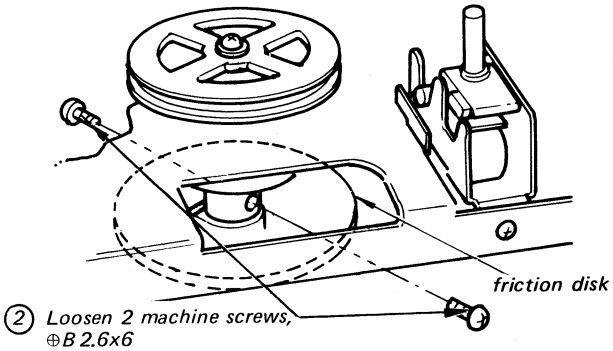
Fig. 2-5

2-7. SW FRONT END BLOCK REMOVAL



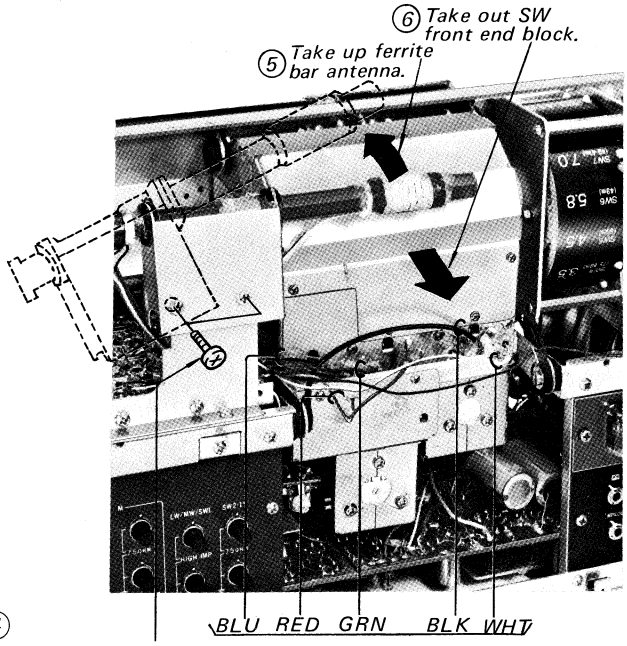
(1) Remove 4 step screws, TD 4x8

Fig. 2-6



(2) Loosen 2 machine screws, ⊕B 2.6x6

Fig. 2-7



(6) Take out SW front end block.

(5) Take up ferrite bar antenna.

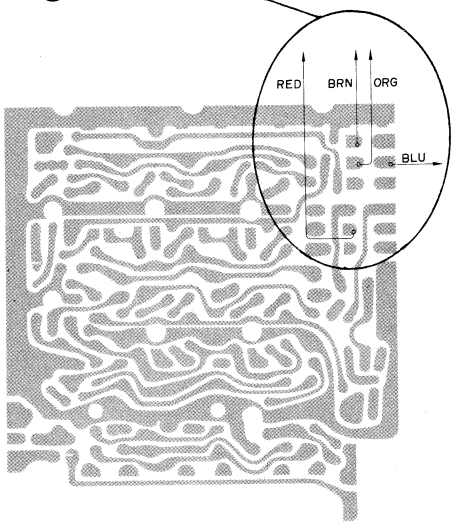
(4) Remove 2 tapping screws, ⊕P 3x6

(3) Unsolder the five pvc wires.

Fig. 2-8

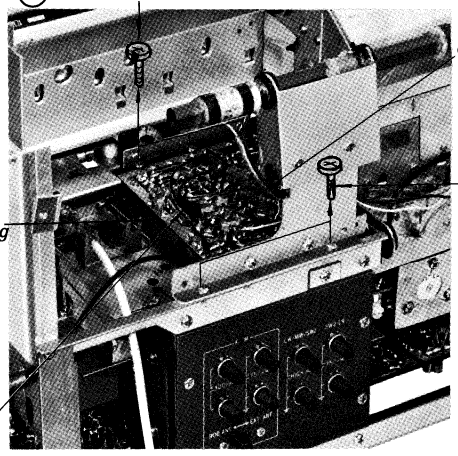
2-8. CP CIRCUIT BOARD REMOVAL

Locate the cp circuit board from Fig. 2-10.



(1) Remove 4 leads.

Fig. 2-9



(3) Remove 3 machine screws, ⊕P 2.6x4

cp circuit board

(2) Remove 2 tapping screws, ⊕P 3x6

(4) Unsolder tuning capacitor leads (3 YEL and 3 BLK. See Fig. 4-4.)

(5) Turn the circuit board.

Fig. 2-10

2-9. POWER SUPPLY CIRCUIT BOARD REMOVAL

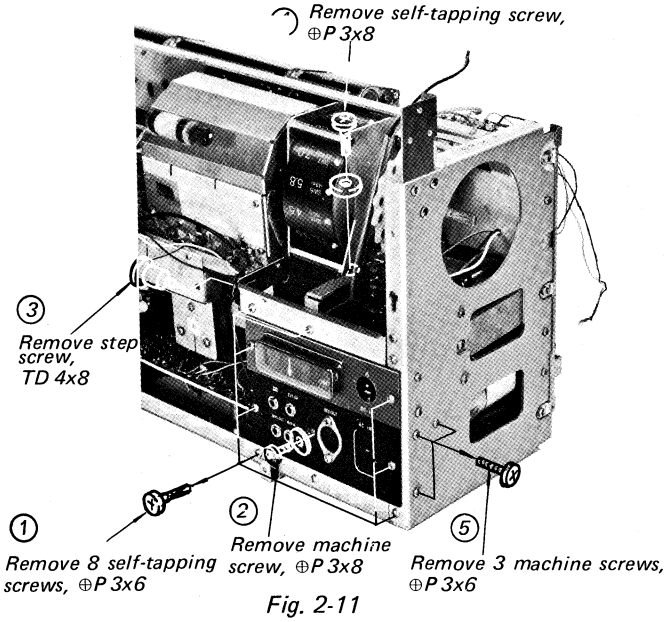


Fig. 2-11

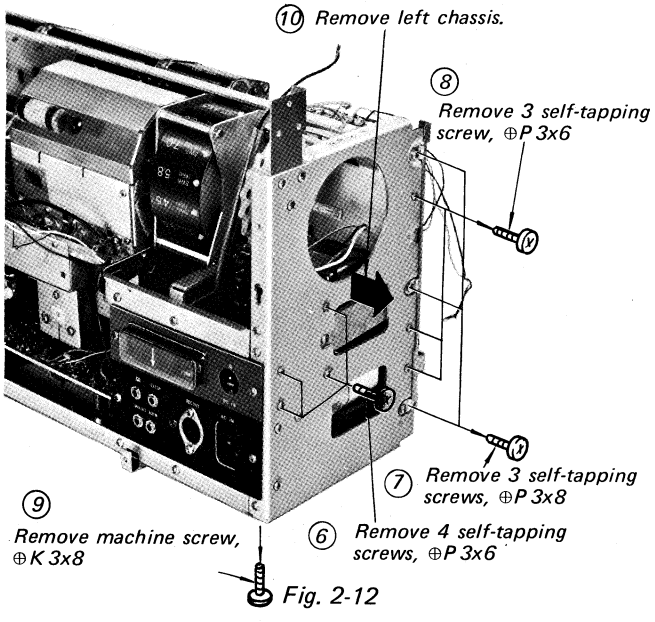


Fig. 2-12

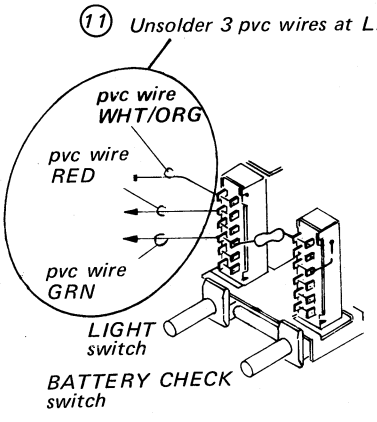


Fig. 2-13

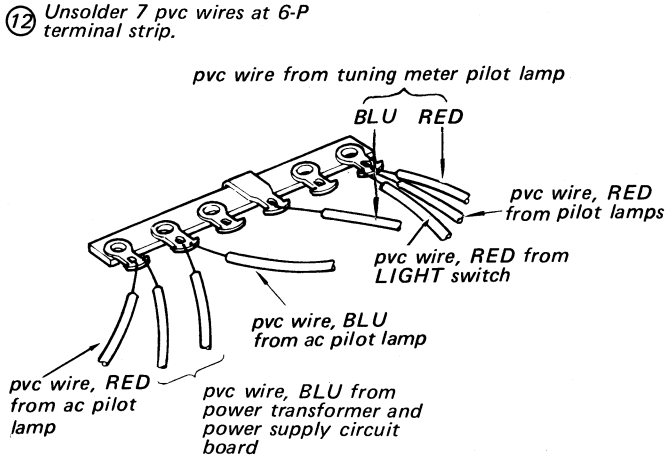


Fig. 2-14

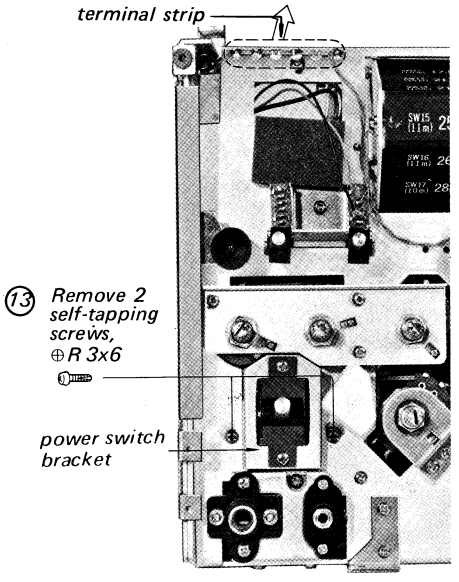


Fig. 2-15

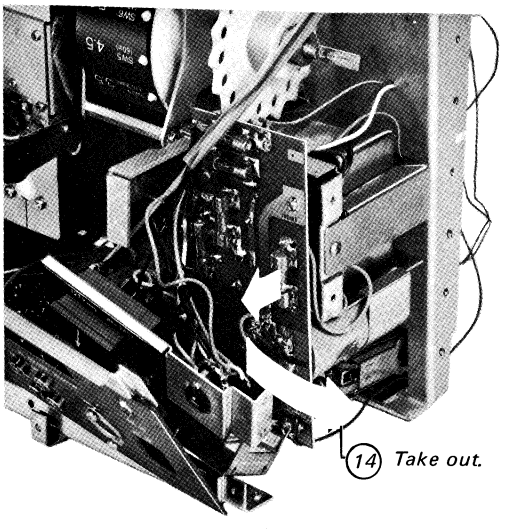


Fig. 2-16

2-10. DIAL CORD STRINGING

Dial cord and dial film is shown in Fig. 2-23.
dial cord Part No. 7-633-120-52
dial cord [1] : FM
dial cord [2] : MW/LW/SW1
dial cord [3] : SW2 ~ SW19
dial cord [4], [5] : SW2 ~ SW19 calibrator

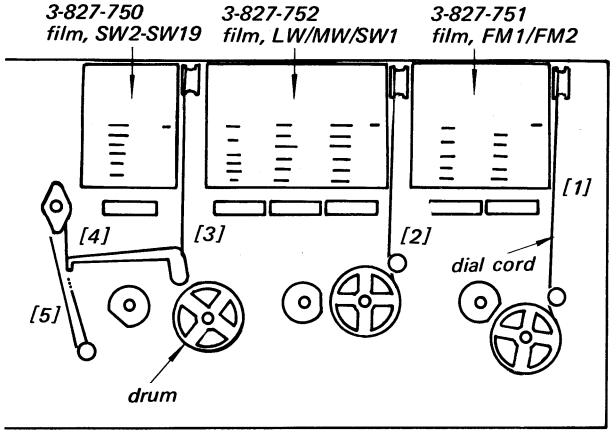


Fig. 2-17

1. FM Dial Cord

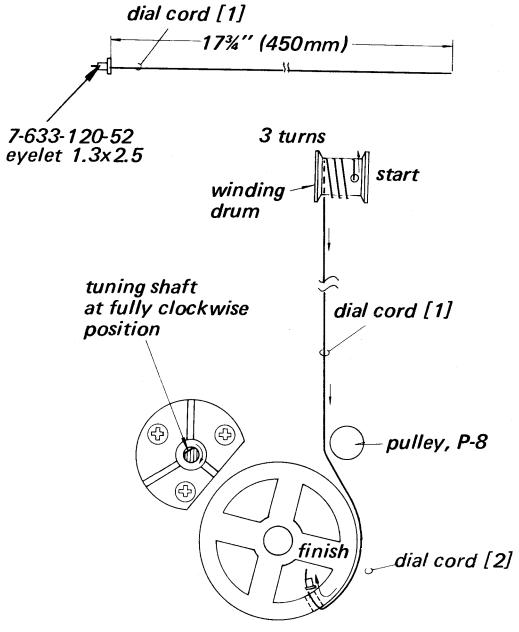


Fig. 2-18

2. MW/LW/SW1 Dial Cord

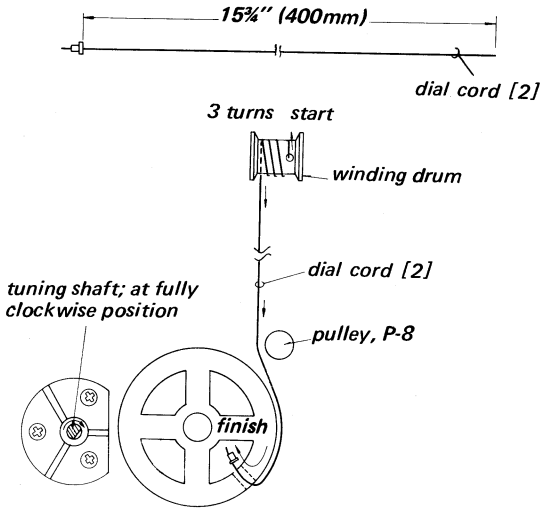


Fig. 2-19

3. SW2 ~ SW19 Dial Cord

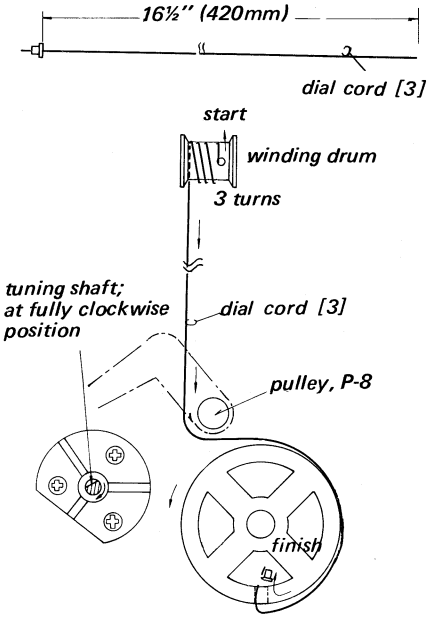


Fig. 2-20

4. SW2 ~ SW19 Tuning Capacitor Driving Cord

String the cord by removing the SW2 ~ SW19 front end block from the chassis.

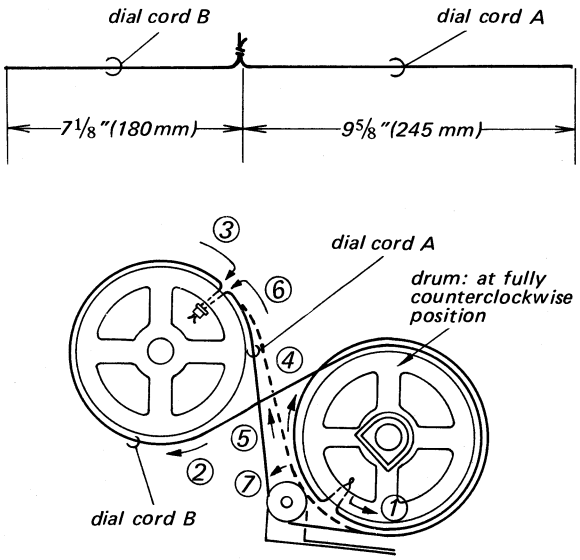


Fig. 2-21

5. SW2 ~ SW19 Calibrator Dial Cord

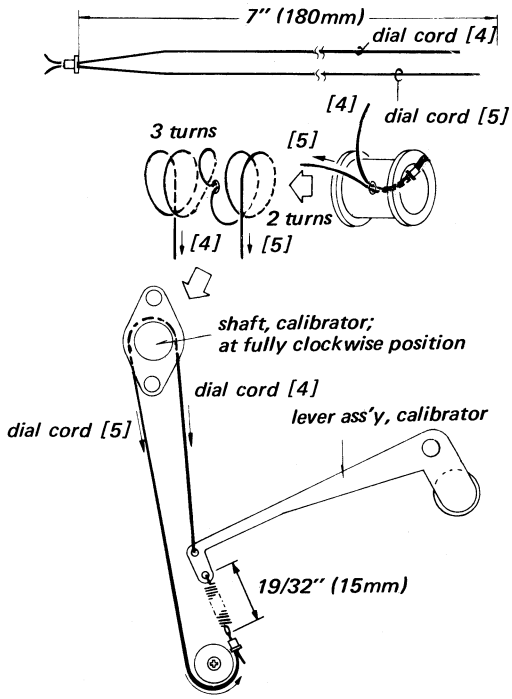


Fig. 2-22

6. Dial Film Setting

1. Set the top of dial film to the film-drum as shown in Fig. 2-29 (step ①).
2. Attach the other end of dial film with an adhesive tape (step ②).
3. Turn the ratchet-wheel four turns in the direction shown by the arrow (step ③).
4. Set the side mark of the film on the film setting position. After setting the film you must keep the film with fingers or adhesive tape so that the film does not move.
5. String the dial cord as shown in Fig. 2-29 (step ⑤).

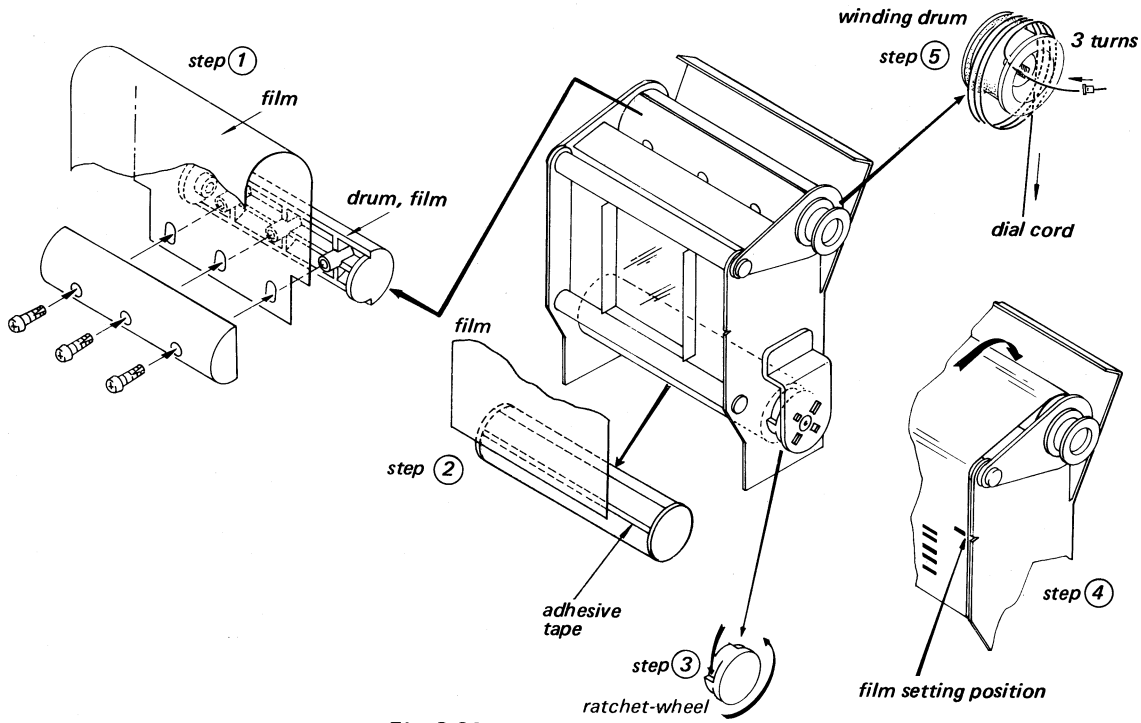


Fig. 2-23

SECTION 3
CIRCUIT ADJUSTMENTS

3-1. PREPARATION

1. Power Supply

At circuit adjustment remove the cabinet and front panel, and supply dc 9V across the red and the black lead wires shown in Fig. 3-1.

2. Receiver Control Setting

Set control knobs as follows except noted in each adjustment.

* VOLUME Control : Maximum
* BASS Control : FLAT
* TREBLE Control : FLAT
* SENSITIVITY : DX
* SELECTIVITY : SHARP
* ANL : OFF
* BFO : OFF
* AFC : OFF
* MUTING : OFF

3. Test Equipment/Tools Required

* Rf Signal Generator
* 10.7 MHz Sweep/Marker Generator
* Loop Antenna
* Oscilloscope
* VTVM
* 0.01 μF ceramic capacitor
* 4Ω Resistor
* Screwdriver For Alignment

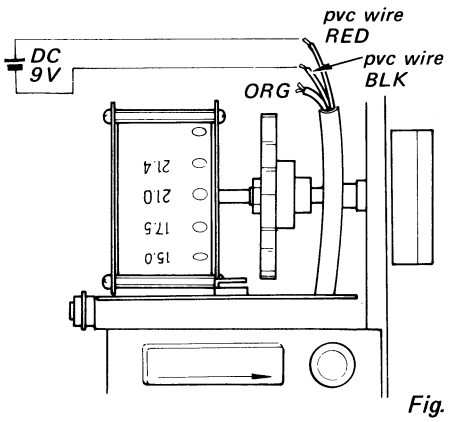


Fig. 3-1

3-2. AM I-F ALIGNMENT

Preparation:

Band Selector: MW
Rf Signal Generator Coupling:
Loop antenna (See Fig. 3-2)
Modulation:
1-kHz 30% amplitude-modulated signal

VTVM Connection:
To EXT SP jack in parallel with 4Ω resistor

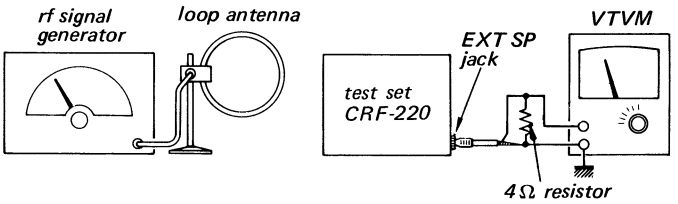


Fig. 3-2 A-m i-f alignment setup

Rf Signal Generator Frequency	Adjust	Remarks
455 kHz	IFT 401 IFT 501 IFT 502 IFT 504	Adjust for maximum meter reading on VTVM.

Note: IFT401 is on the cp circuit board. See Fig. 3-13 on page 25.

3-3. SSB DETECTOR ADJUSTMENT

Preparation:

Band Selector: MW
SELECTIVITY switch: SHARP
BFO Switch: ON
BFO Knob: Mechanical mid position
Rf Signal Generator Coupling: Loop antenna
Setup: See Fig. 3-3.

Note: Be sure that a-m i-f section is aligned for the normal operating condition before adjusting ssb detector.

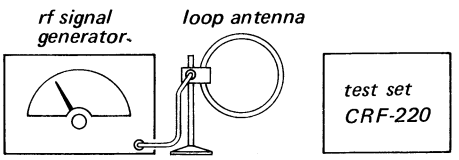


Fig. 3-3 Ssb detector adjustment setup

Rf Signal Generator Frequency	Adjust	Remarks
455 kHz unmodulated signal	BFO osc coil LT 801 See Fig. 3-7.	Adjust for zero beat hearing

3-4. FM I-F ALIGNMENT

Test Equipment/Tools Required

* 10.7 MHz Sweep/Marker Generator
* Oscilloscope
* 1 kΩ carbon type resistor
* Screwdriver for Alignment

Preparation:

Sweep/Marker Generator Connection:
On the main circuit board with 1 kΩ resistor in series (See Fig. 3-4).
Oscilloscope Connection: MPX OUT jack
Sweep Generator Center Frequency:
10.7 MHz
Marker Generator Center Frequency:
10.7 MHz
Band Selector: FM

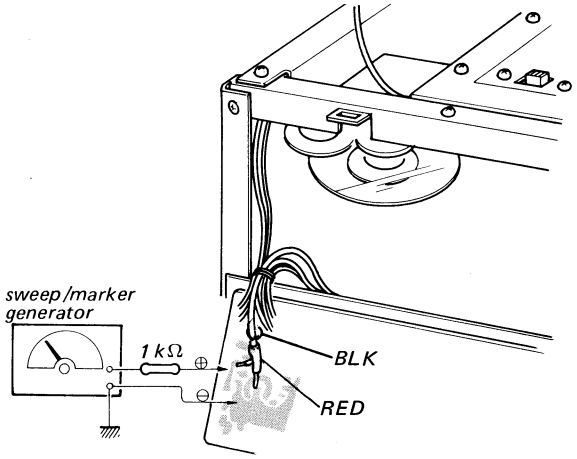


Fig. 3-4

Procedure:

1. Turn the core of discriminator transformer (IFT 204) fully counterclockwise.
2. Turn the core of fm i-f transformer (IFT 201, IFT 202) and discriminator transformer (IFT 203) to obtain the maximum amplitude response curve shown in Fig. 3-5.
3. Turn the core of discriminator transformer (IFT 204) to obtain the S curve response shown in Fig. 3-6.

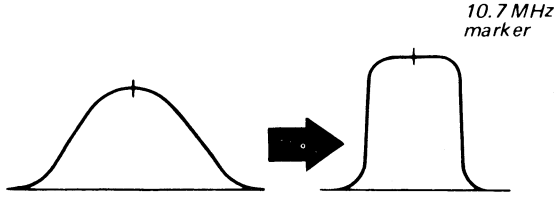


Fig. 3-5 Response curve

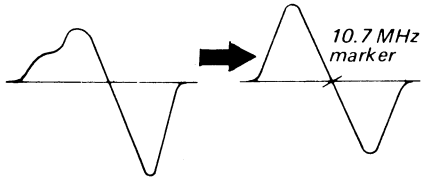


Fig. 3-6 "S" curve

Sweep/Marker Generator Coupling	Sweep/Marker Generator Frequency	Oscilloscope Connection	Adjust	Remarks
On the main circuit board with 1 kΩ resistor in series. (See Fig. 3-4)	10.7 MHz	MPX OUT jack	IFT201 IFT202 IFT203 IFT204	Band Selector: FM AFC Switch: OFF Adjust for maximum amplitude and symmetrical S curve on the scope.

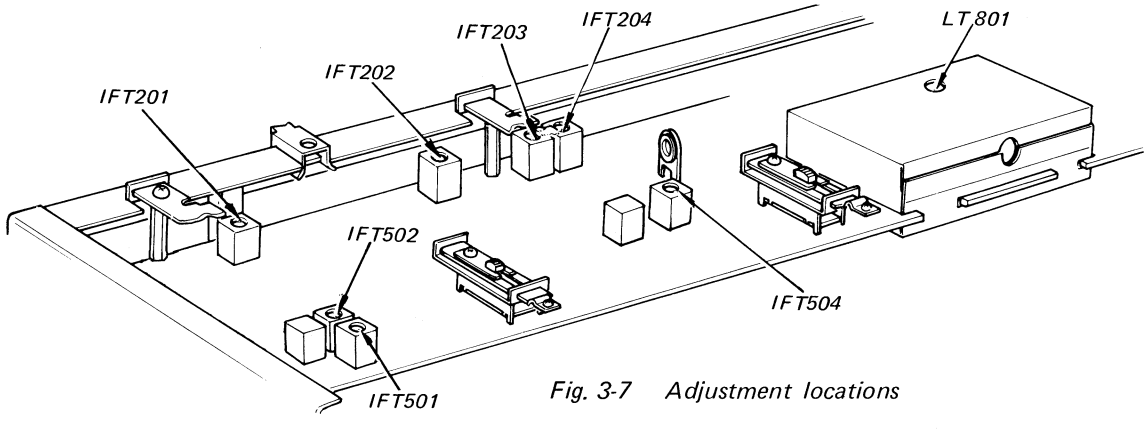


Fig. 3-7 Adjustment locations

3-5. MUTING LEVEL SETTING

Preparation:

Band Selector: FM
MUTING Switch: ON
ROD ANT-EXT ANT Switch: EXT ANT
Rf signal Generator Coupling:
To FM EXT ANT 75 OHM terminals
VTVM Connection:
To EXT SP jack in parallel with 4Ω resistor
Rf Signal Modulation:
Fm 400-Hz ±22.5-kHz frequency-modulated signal (rf signal: 98 MHz)

Note: Be sure that fm i-f section is operating in normal condition before setting the muting level.

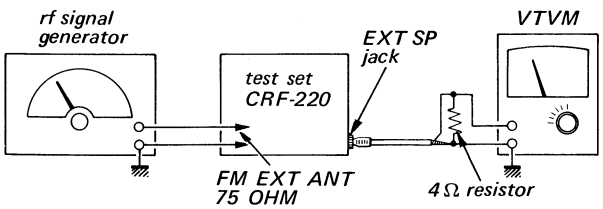


Fig. 3-8 Muting level setting setup

Procedure:

1. Detune from rf signal.
2. Turn the muting level adjustable resistor VR901 fully counterclockwise.
3. Gradually turn VR901 clockwise and set it at the position that the VTVM shows minimum indication.

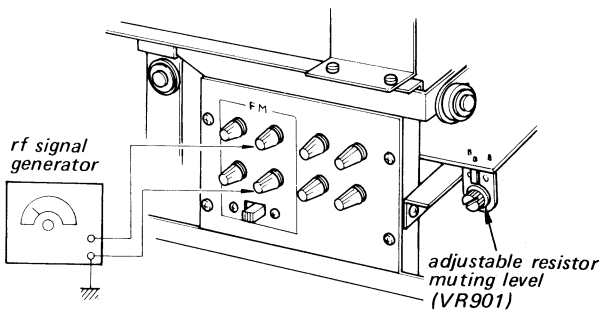


Fig. 3-9. Rf signal generator coupling and parts location

Rf Signal Generator Frequency	Receiver Dial Setting	Adjust
98 MHz	90 MHz (Detune from rf signal of 98 MHz)	Muting level adjustable resistor VR901

3-6. FM FREQUENCY COVERAGE ADJUSTMENT

Preparation:

Band Selector: FM
ROD ANT-EXT ANT Switch: EXT ANT
Rf Signal Generator Coupling:
Direct connection across FM EXT ANT 75 OHM terminals
Rf Signal Modulation:
400-Hz ±22.5-kHz frequency-modulated signal
VTVM Connection:
To EXT SP jack in parallel with 4Ω resistor
Adjustment Setup: Same as Fig. 3-8.

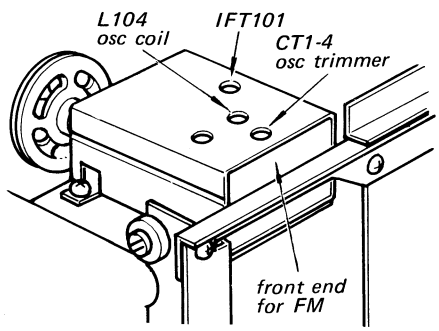


Fig. 3-10. Adjustment locations

Note: 1. In West Germany the FM frequency coverage should be within the range between 87.5 MHz and 108 MHz. Make the frequency coverage by adjusting osc coil L104 and osc trimmer CT1-4 with the intended frequency signal from the rf signal generator.
2. The special test equipment required for tracking adjustment makes this strictly a factory adjustment.
3. IFT101 shown in Fig. 3-10 is to be adjusted for i-f alignment. Adjust IFT101 for maximum meter reading on VTVM with the same setup as FM frequency coverage adjustment.

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
FM Frequency Coverage	87.5 MHz	Fully counterclockwise	FM osc coil L104	Band Selector: FM Adjust for maximum meter reading on VTVM.
	108 MHz	Fully clockwise	FM osc trimmer CT1-4	

3-7. LW/MW/SW1 FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Preparation:

Rf Signal Generator Coupling:
Loop antenna
Rf Signal Modulation:
1-kHz 30% amplitude-modulated signal
VTVM Connection:
To EXT SP jack in parallel with 4Ω load resistor

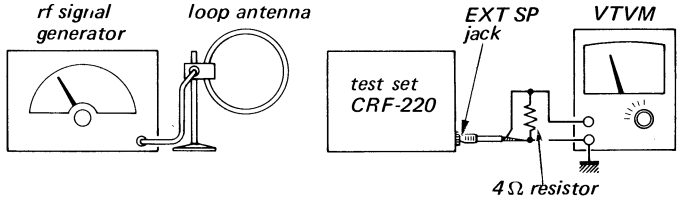


Fig. 3-11 LW/MW/SW1 frequency coverage and tracking adjustment setup

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
LW Frequency Coverage	145 kHz	Fully counterclockwise	LW osc coil L409	Band Selector: LW
	410 kHz	Fully clockwise	LW osc trimmer CT409	
LW Tracking	160 kHz	Tune to 160 kHz signal	LW ant coil L403, LW rf coil L406	Adjust for maximum meter reading on VTVM.
	360 kHz	Tune to 360 kHz signal	LW ant trimmer CT403, LW rf trimmer CT406	
MW Frequency Coverage	520 kHz	Fully counterclockwise	MW osc coil L408	Band Selector: MW
	1,680 kHz	Fully clockwise	MW osc trimmer CT408	
MW Tracking	620 kHz	Tune to 620 kHz signal	MW ant coil L402, MW rf coil L405	Adjust for maximum meter reading on VTVM.
	1,400 kHz	Tune to 1,400 kHz signal	MW ant trimmer CT402, MW rf trimmer CT405	
SW1 Frequency Coverage	1,550 kHz	Fully counterclockwise	SW1 osc coil L407	Band Selector: SW1
	4,600 kHz	Fully clockwise	SW1 osc trimmer CT407	
SW1 Tracking	1,800 kHz	Tune to 1,800 kHz signal	SW1 ant coil L401, SW1 rf coil L404	Adjust for maximum meter reading on VTVM.
	4,200 kHz	Tune to 4,200 kHz signal	SW1 rf trimmer CT404	

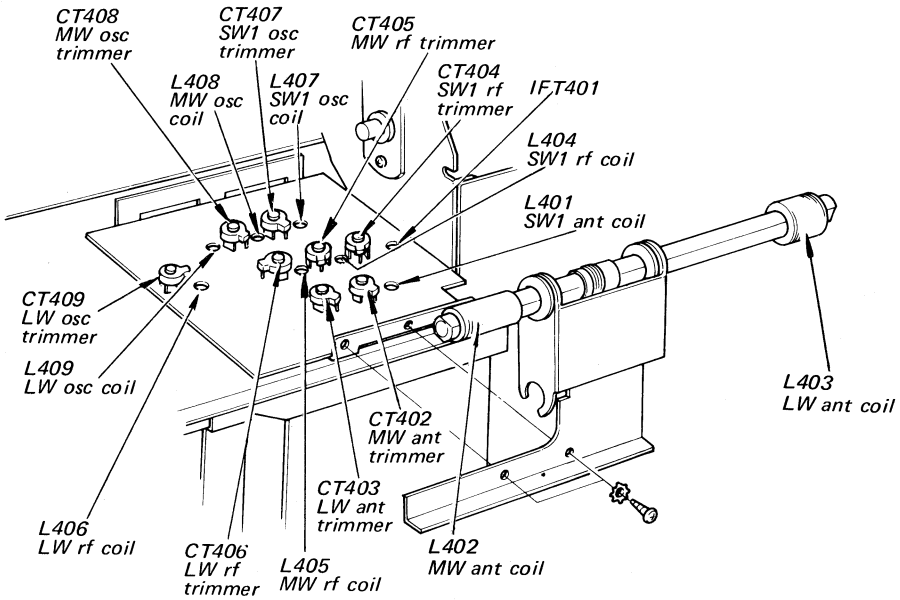


Fig. 3-12 Adjustment locations

3-8. SW2-SW19 1st I-F ALIGNMENT, FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Preparation:

Rf Signal Modulation:
1-kHz 30% amplitude-modulation

Rf Signal Generator Coupling:
To hermetic terminal HT304 with 0.01μF ceramic capacitor

VTVM Connection:
Across the coaxial cable (to cp circuit board) through the 455-kHz amplifier

DC 4.5V Supply:
To feed-through capacitor CP305

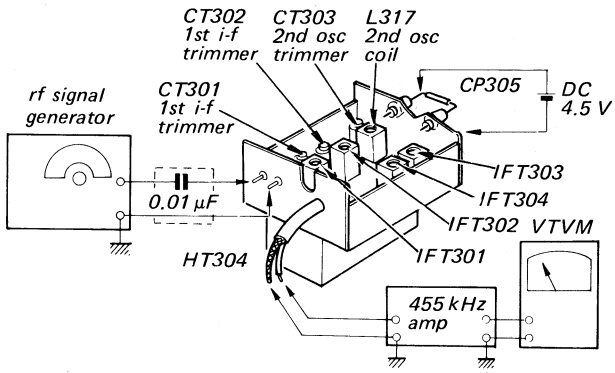


Fig. 3-13 Adjustment setup and adjustment locations

Adjustment Item	Rf Signal Generator Frequency	Adjust	Remarks
Frequency Coverage	1.6 MHz	2nd osc coil L317	Adjust for maximum meter reading.
	2.2 MHz	2nd osc trimmer CT303	
Tracking	1.6 MHz	IFT 301 IFT 302	- ditto -
	2.2 MHz	CT301 CT302	
I-f Alignment	1.6 MHz ~ 2.2 MHz	IFT 303 IFT 304	- ditto -

3-9. SW2 ~ SW19 FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Preparation:

Rf Signal Modulation:
1-kHz 30% amplitude-modulated signal

Rf Signal Generator Coupling:
Direct connection across the SW2 ~ SW19 75 OHM antenna terminals

VTVM Connection:
To EXT SP jack in parallel with 4Ω load resistor

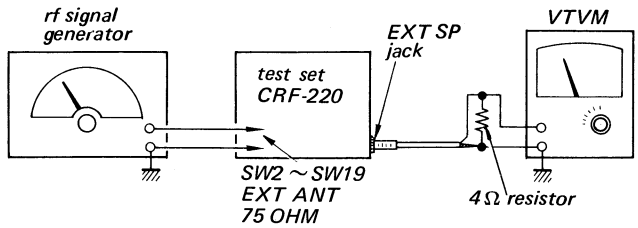


Fig. 3-14 SW2 ~ SW19 frequency coverage and tracking adjustment setup

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
SW 2 Frequency Coverage	2.0 MHz	Fully counterclockwise	SW 2 osc coil L324	Band Selector: SW 2
SW 2 Tracking	2.1 MHz	Tune to 2.1 MHz signal	SW 2-4 ant coil L301, SW 2-4 rf coil L307	
	2.5 MHz	Tune to 2.5 MHz signal	SW 2 ant trimmer CT304, SW 2 rf trimmer CT322	Adjust for maximum meter reading on VTVM.
SW 3 Frequency Coverage	3.0 MHz	Fully counterclockwise	SW 3 osc coil L325	Band Selector: SW 3
SW 3 Tracking	3.5 MHz	Tune to 3.5 MHz signal	SW 3 ant trimmer CT305 SW 3 rf trimmer CT323	Adjust for maximum meter reading on VTVM.
SW 4 Frequency Coverage	3.5 MHz	Fully counterclockwise	SW 4 osc coil L326	Band Selector: SW 4
SW 4 Tracking	4.0 MHz	Tune to 4.0 MHz signal	SW 4 ant trimmer CT306, SW 4 rf trimmer CT324	Adjust for maximum meter reading on VTVM.
SW 5 Frequency Coverage	4.5 MHz	Fully counterclockwise	SW 5 osc coil L327	Band Selector: SW 5
SW 5 Tracking	4.6 MHz	Tune to 4.6 MHz signal	SW 5-7 ant coil L302, SW 5-7 rf coil L308	
	5.0 MHz	Tune to 5.0 MHz signal	SW 5 ant trimmer CT307 SW 5 rf trimmer CT325 trimmer	Adjust for maximum meter reading on VTVM.
SW 6 Frequency Coverage	5.8 MHz	Fully counterclockwise	SW 6 osc coil L328	Band Selector: SW 6
SW 6 Tracking	6.3 MHz	Tune to 6.3 MHz signal	SW 6 ant trimmer CT308, SW 6 rf trimmer CT326	Adjust for maximum meter reading on VTVM.

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
SW 7 Frequency Coverage	7.0 MHz	Fully counterclockwise	SW 7 osc coil L329	Band Selector: SW 7
SW 7 Tracking	7.5 MHz	Tune to 7.5 MHz signal	SW 7 ant trimmer CT309, SW 7 rf trimmer CT327	Adjust for maximum meter reading on VTVM.
SW 8 Frequency Coverage	9.5 MHz	Fully counterclockwise	SW 8 osc coil L330	Band Selector: SW 8
SW 8 Tracking	9.6 MHz	Tune to 9.6 MHz signal	SW 8-10 ant coil L303, SW 8-10 rf coil L309	
	10.0 MHz	Tune to 10.0 MHz signal	SW 8 ant trimmer CT310, SW 8 rf trimmer CT328	Adjust for maximum meter reading on VTVM.
SW 9 Frequency Coverage	11.5 MHz	Fully counterclockwise	SW 9 osc coil L331	Band Selector: SW 9
SW 9 Tracking	12.0 MHz	Tune to 12.0 MHz signal	SW 9 ant trimmer CT311, SW 9 rf trimmer CT329	Adjust for maximum meter reading on VTVM.
SW 10 Frequency Coverage	14.0 MHz	Fully counterclockwise	SW 10 osc coil L332	Band Selector: SW 10
SW 10 Tracking	14.5 MHz	Tune to 14.5 MHz signal	SW 10 ant trimmer CT312, SW 10 rf trimmer CT330	Adjust for maximum meter reading on VTVM.
SW 11 Frequency Coverage	15.0 MHz	Fully counterclockwise	SW 11 osc coil L333	Band Selector: SW 11
SW 11 Tracking	15.1 MHz	Tune to 15.1 MHz signal	SW 11-13 ant coil L304 SW 11-13 rf coil L310	
	15.5 MHz	Tune to 15.5 MHz signal	SW 11 ant trimmer CT313, SW 11 rf trimmer CT331	Adjust for maximum meter reading on VTVM.
SW 12 Frequency Coverage	17.5 MHz	Fully counterclockwise	SW 12 osc coil L334	Band Selector: SW 12
SW 12 Tracking	18.0 MHz	Tune to 18.0 MHz signal	SW 12 ant trimmer CT314, SW 12 rf trimmer CT322	Adjust for maximum meter reading on VTVM.

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
SW 13 Frequency Coverage	21.0 MHz	Fully counterclockwise	SW 13 osc coil L335	Band Selector: SW 13
SW 13 Tracking	21.5 MHz	Tune to 21.5 MHz signal	SW 13 ant trimmer CT315, SW 13 rf trimmer CT333	Adjust for maximum meter reading on VTVM.
SW 14 Frequency Coverage	21.4 MHz	Fully counterclockwise	SW 14 osc coil L336	Band Selector: SW 14
SW 14 Tracking	21.5 MHz	Tune to 21.5 MHz	SW 14-16 ant coil L305, SW 14-16 rf coil L311	Adjust for maximum meter reading on VTVM.
	21.9 MHz	Tune to 21.9 MHz signal	SW 14 ant trimmer CT316, SW 14 rf trimmer CT334	
SW 15 Frequency Coverage	25.5 MHz	Fully counterclockwise	SW 15 osc coil L337	Band Selector: SW 15
SW 15 Tracking	26.0 MHz	Tune to 26.0 MHz signal	SW 15 ant trimmer CT317, SW 15 rf trimmer CT335	Adjust for maximum meter reading on VTVM.
SW 16 Frequency Coverage	26.8 MHz	Fully counterclockwise	SW 16 osc coil L338	Band Selector: SW 16
SW 16 Tracking	27.3 MHz	Tune to 27.3 MHz signal	SW 16 ant trimmer CT318 SW 16 rf trimmer CT336	Adjust for maximum meter reading on VTVM.
SW 17 Frequency Coverage	28.0 MHz	Fully counterclockwise	SW 17 osc coil L339	Band Selector: SW 17
SW 17 Tracking	28.1 MHz	Tune to 28.1 MHz signal	SW 17-19 ant coil L306, SW 17-19 rf coil L312	Adjust for maximum meter reading on VTVM.
	28.5 MHz	Tune to 28.5 MHz signal	SW 17 ant trimmer CT319, SW 17 rf trimmer CT337	
SW 18 Frequency Coverage	28.6 MHz	Fully counterclockwise	SW 18 osc coil L340	Band Selector: SW 18
SW 18 Tracking	29.1 MHz	Tune to 29.1 MHz	SW 18 ant trimmer CT320, SW 18 rf trimmer CT338	Adjust for maximum meter reading on VTVM.

Adjusting	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
SW 19 Frequency Coverage	29.2 MHz	Fully counterclockwise	SW 19 osc coil L341	Band Selector: SW 19
SW 19 Tracking	29.7 MHz	Tune to 29.7 MHz signal	SW 19 ant trimmer CT321, SW 19 rf trimmer CT339	Adjust for maximum meter reading on VTVM.

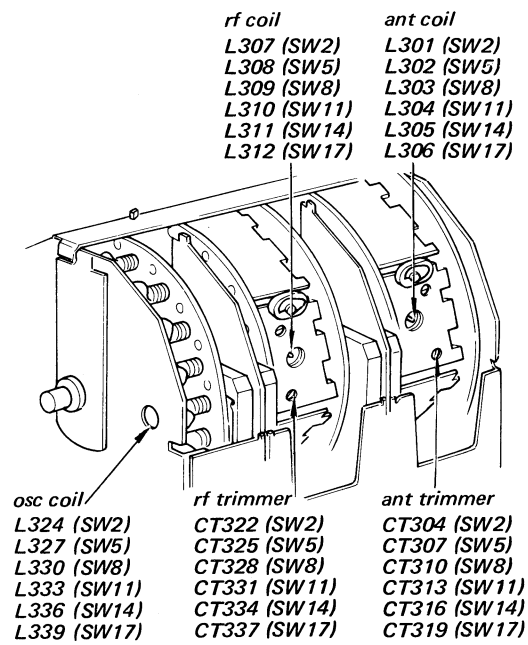


Fig. 3-15. Adjustment locations for SW2, SW5, SW8, SW11, SW14 and SW17

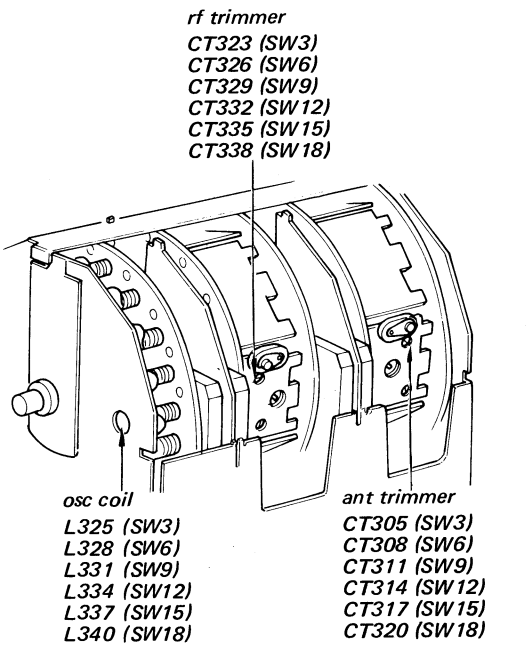


Fig. 3-16. Adjustment locations for SW3, SW6, SW9, SW12, SW15 and SW18

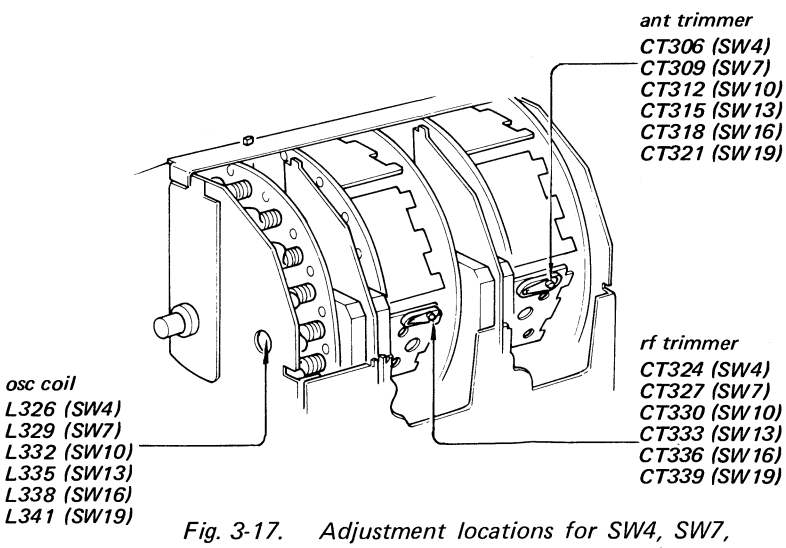


Fig. 3-17. Adjustment locations for SW4, SW7, SW10, SW13, SW16 and SW19

3-10. VOLTAGE AND CURRENT ADJUSTMENT

A. Emitter Voltage of Q201

1. Band Selector: FM
2. R202 is to be selected to obtain 1.0 ±0.1 V at the emitter of Q201.
   Locate R202 from Fig. 3-18.

R202	1-244-706	24 kΩ
	1-244-707	27 kΩ
	1-244-708	30 kΩ
	1-244-709	33 kΩ

B. Collector Current of Q401

1. Band Selector: MW
2. Select the resistance value of R401 to obtain 0.27 ±0.02 V at the emitter of Q401. Then collector current may be adjusted at 270 μA.
   Locate R401 from Fig. 3-18.

R401	1-242-717	68 kΩ
	1-242-718	75 kΩ
	1-242-719	82 kΩ

C. Collector Current of Q501

1. Band Selector: MW
2. Select the resistance value of R503 to obtain 0.32 ±0.03 V at the emitter of Q501. Then collector current may be adjusted at 600 μA.
   Locate R503 from Fig. 3-18.

R503	1-240-514	51 kΩ
	1-240-515	56 kΩ
	1-240-516	62 kΩ
	1-240-517	68 kΩ

D. Collector Current of Q502

1. Band Selector: MW
2. Select the resistance value of R507 to obtain 0.40 ±0.04 V at the emitter of Q502. Then collector current may be adjusted at 800 μA.
   Locate R507 from Fig. 3-18.

R507	1-240-514	51 kΩ
	1-240-515	56 kΩ
	1-240-516	62 kΩ
	1-240-517	68 kΩ

E. Regulator Voltage Adjustment

Select the resistance value of R703 to obtain 4.5 ±0.1 V at the emitter of Q701.
Locate R703 from Fig. 3-18.

R703	1-244-652	130 Ω
	1-244-653	150 Ω
	1-244-654	160 Ω
	1-244-655	180 Ω
	1-244-656	200 Ω
	1-244-657	220 Ω

F. Tuning Meter Calibration

1. Band Selector: FM
2. Supply a 98 MHz signal of 310 μV (50 dB) to the FM EXT ANT 75 OHM terminals.
3. Adjust the adjustable resistor VR201 (5 kΩ) so that the meter indicates between 8 and 9.
   Locate VR201 from Fig. 3-18.

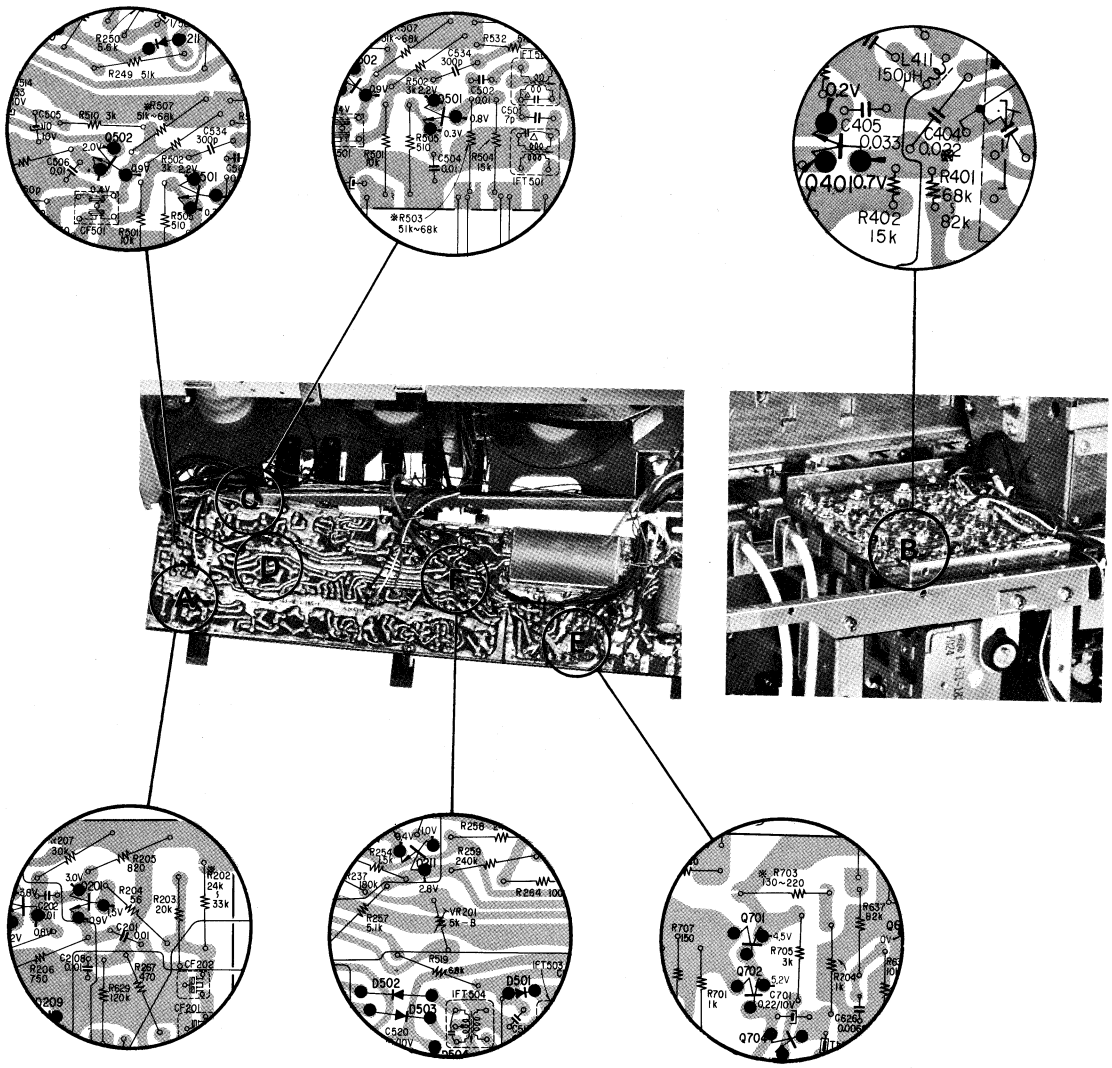


Fig. 3-18 Adjustment locations for voltage and current adjustment

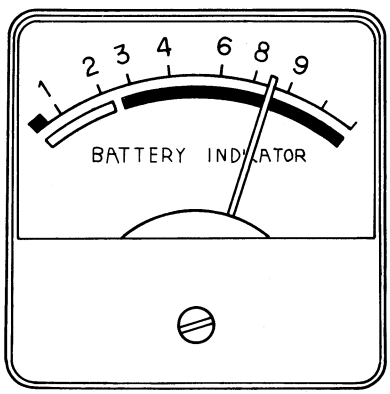
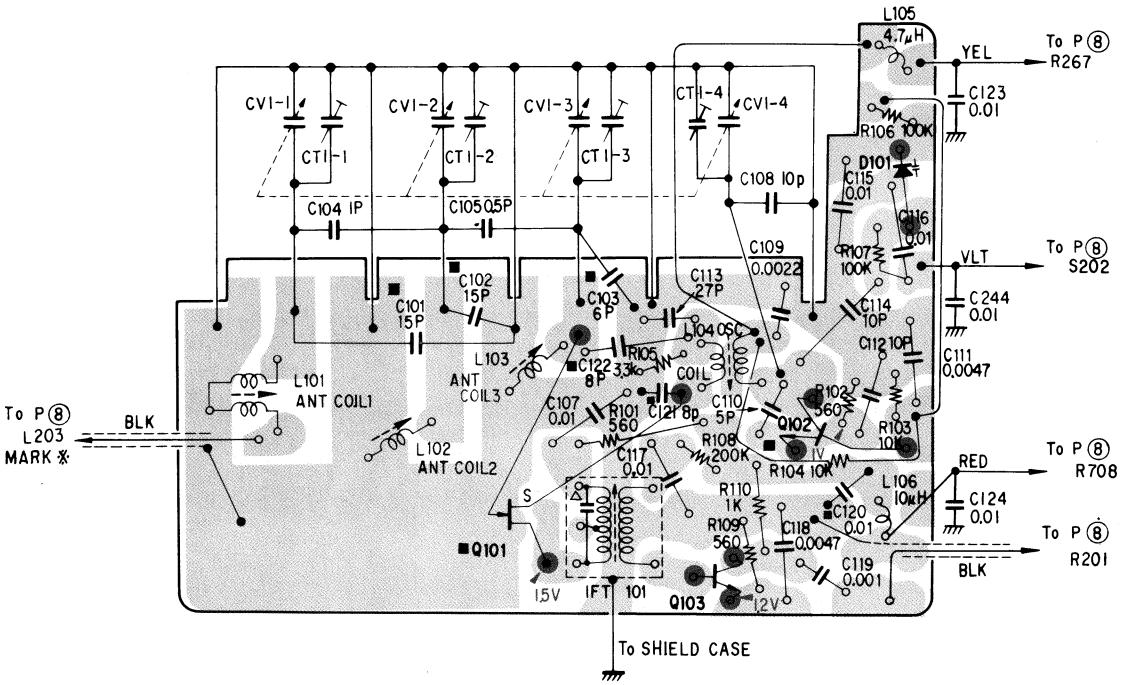


Fig. 3-19 Tuning meter calibration

SECTION 4
MOUNTING AND SCHEMATIC DIAGRAMS

4-1. FM FRONT END (P2)

– Conductor Side –



Printed circuit board, Part No. 1-538-793-12
The parts marked ■ are mounted on the conductor side.

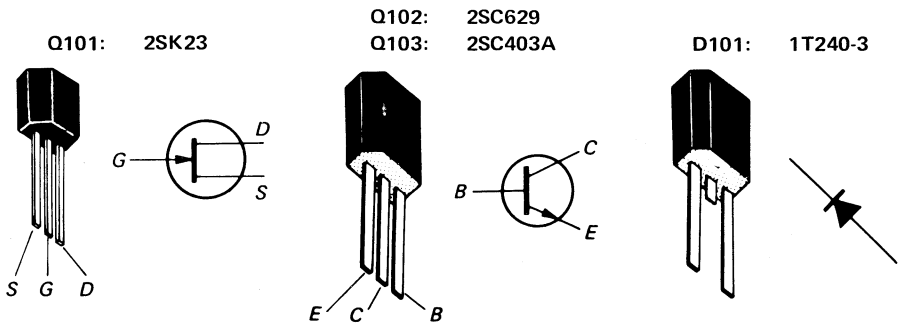


Fig. 4-1.

4-2. ANTENNA TERMINAL (P3)

– Conductor Side –

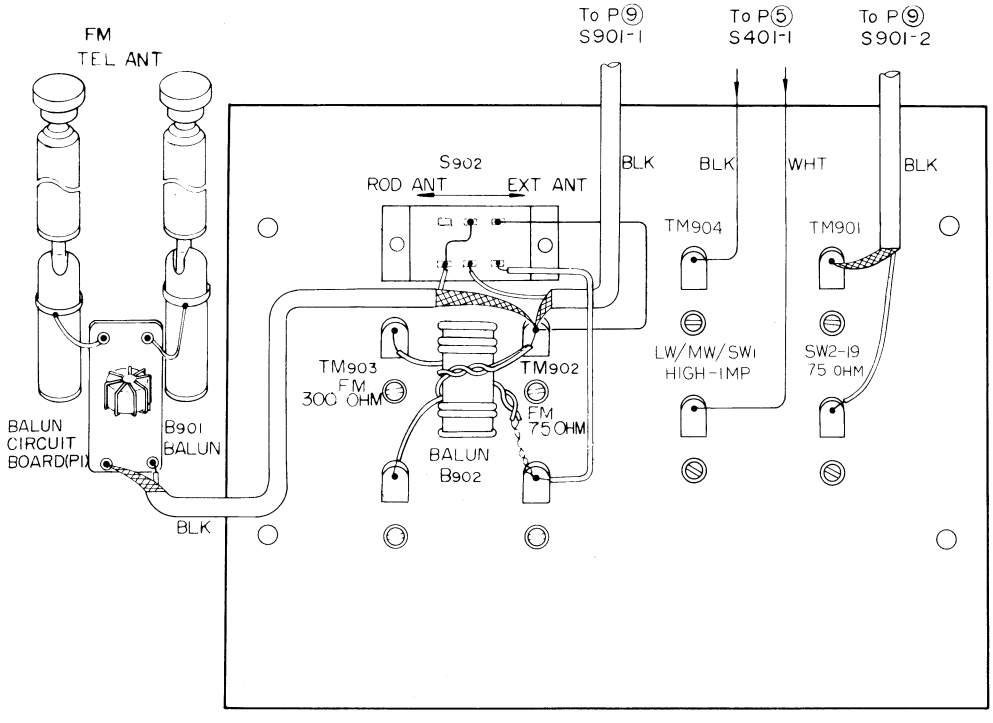


Fig. 4-2.

4-3. JACK PANEL (P4)

– Conductor Side –

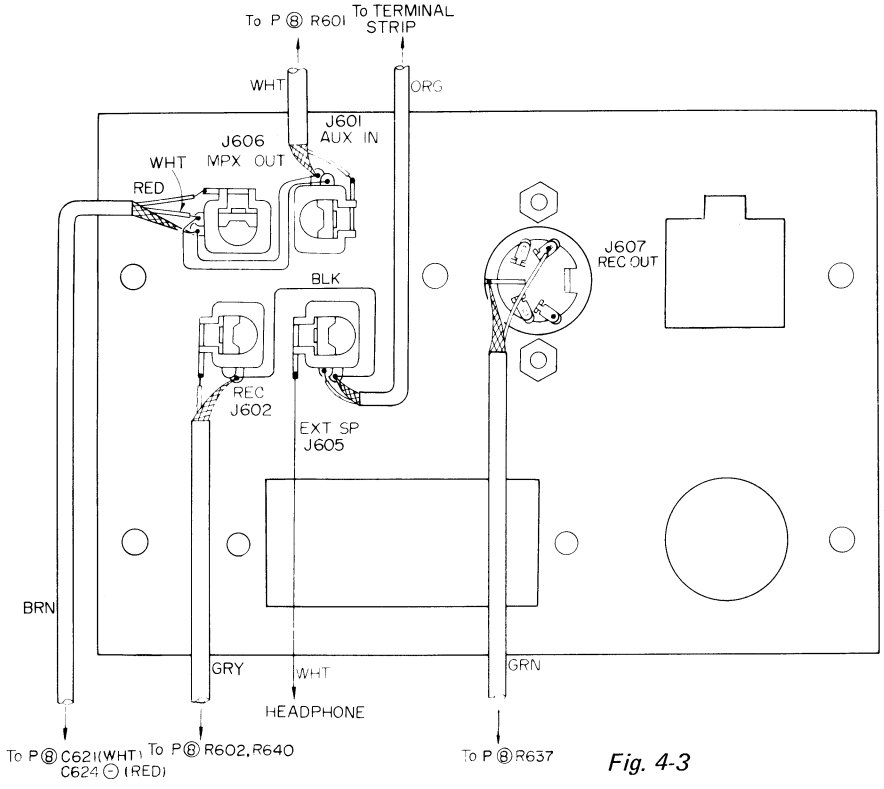
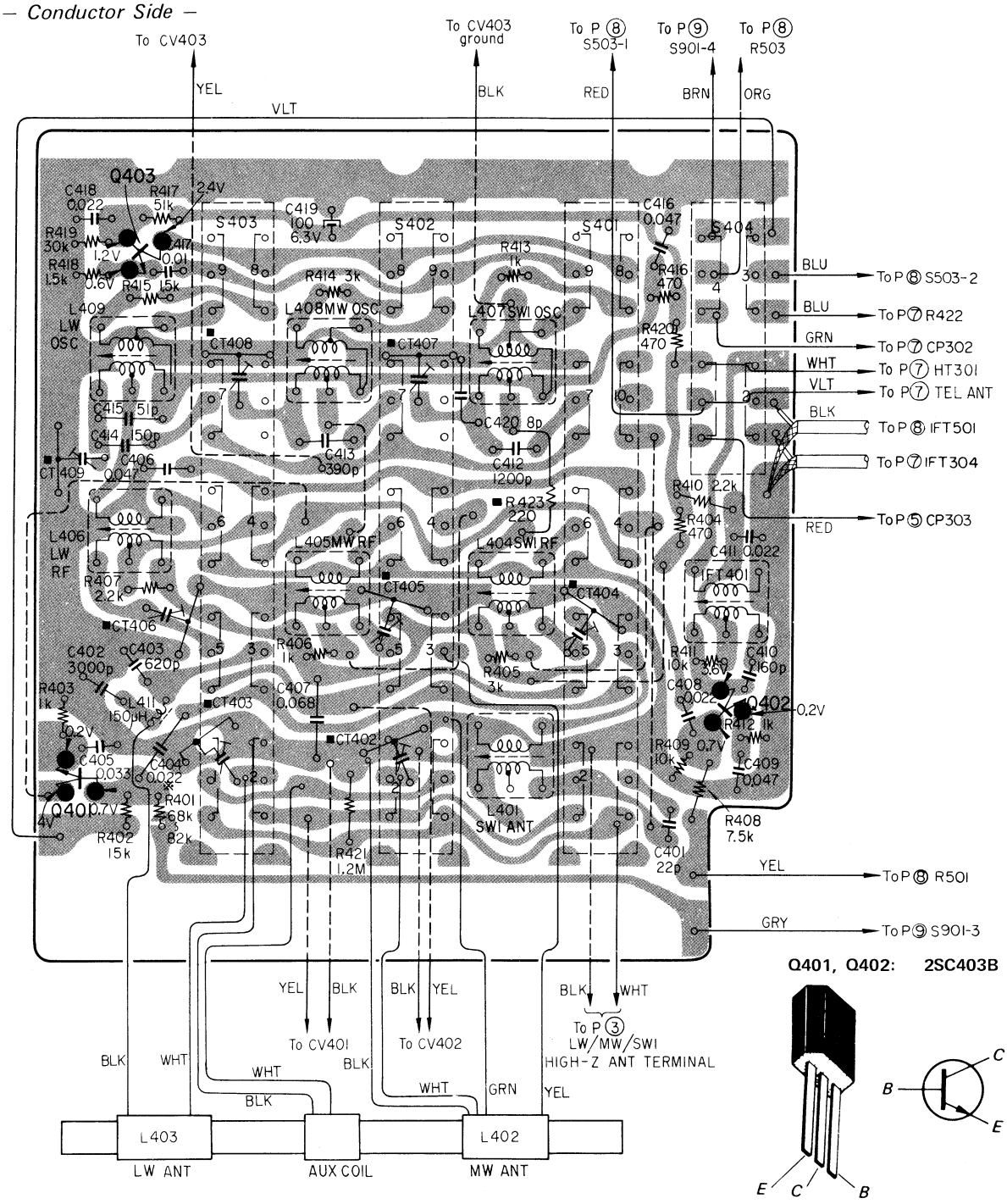


Fig. 4-3

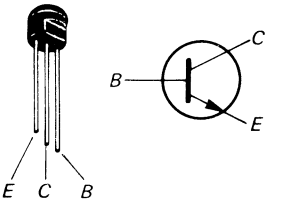
4-4. CP CIRCUIT BOARD (P5)

— Conductor Side —



Q401, Q402: 2SC403B

Q403: 2SC668

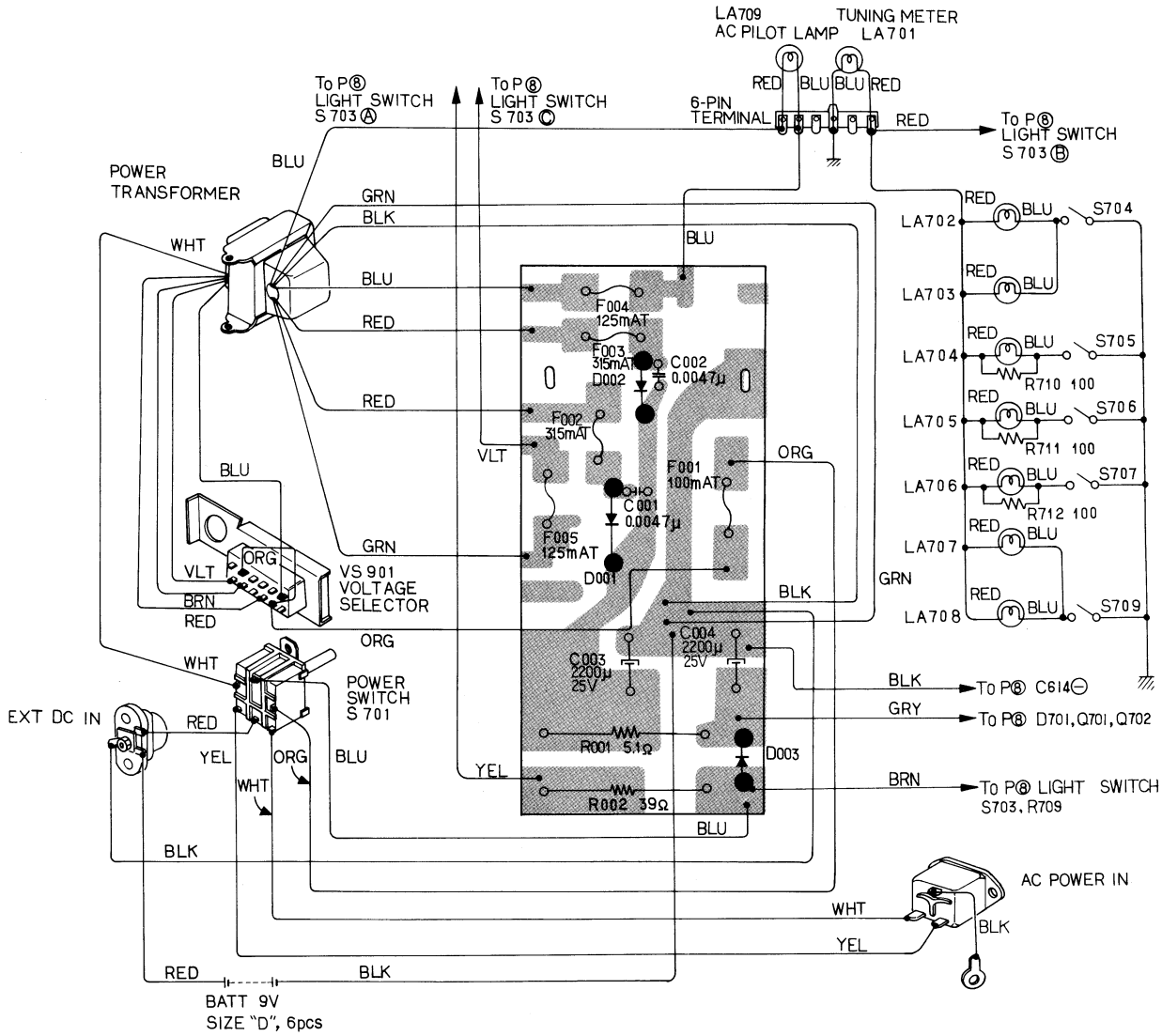


Printed circuit board, Part No. 1-581-165-11
The parts marked ■ are mounted on the conductor side.

Fig. 4-4.

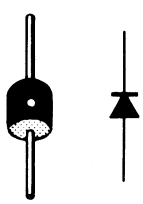
4-5. POWER SUPPLY CIRCUIT BOARD (P6)

– Conductor Side –



Printed circuit board, Part No. 1-581-463-11

D001, D002: 10D-2



D003: 2SB378B

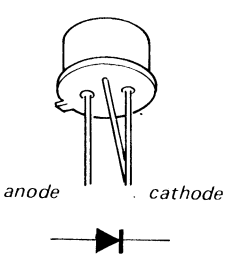


Fig. 4-5.

4-6. SW2 ~ SW19 FRONT END BLOCK (P7)

– Conductor Side –

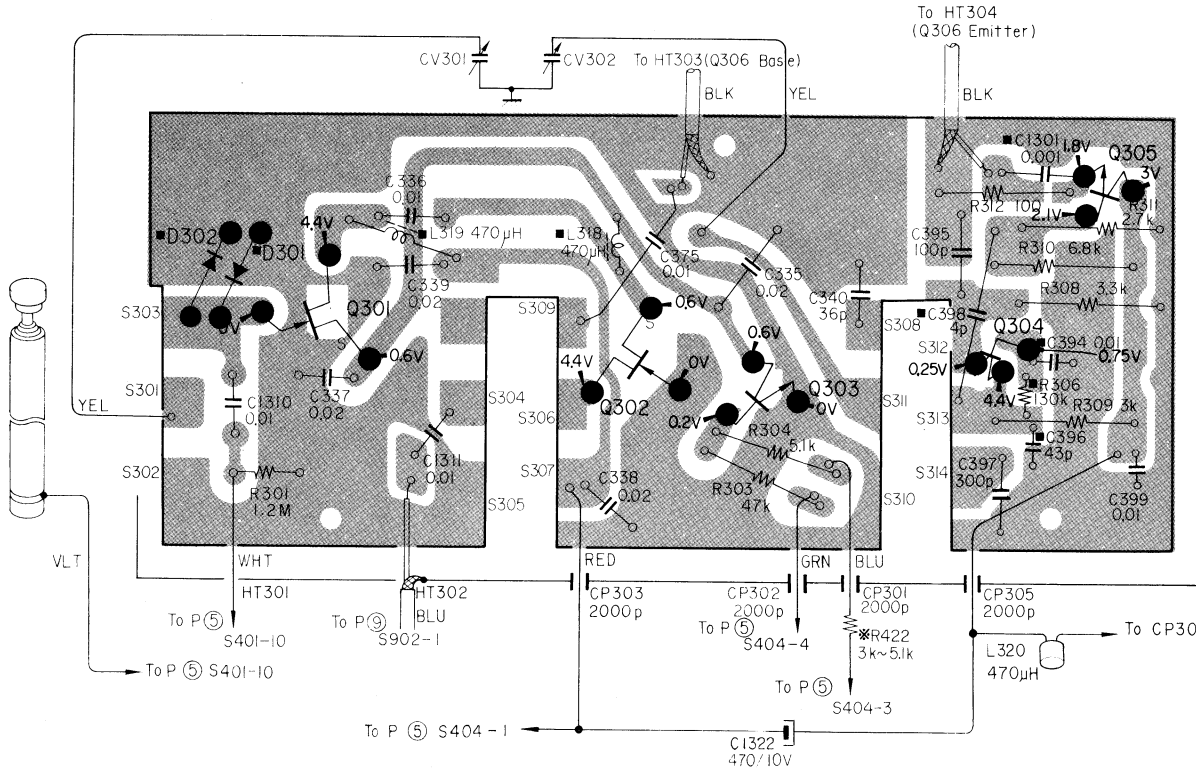


Fig. 4-6

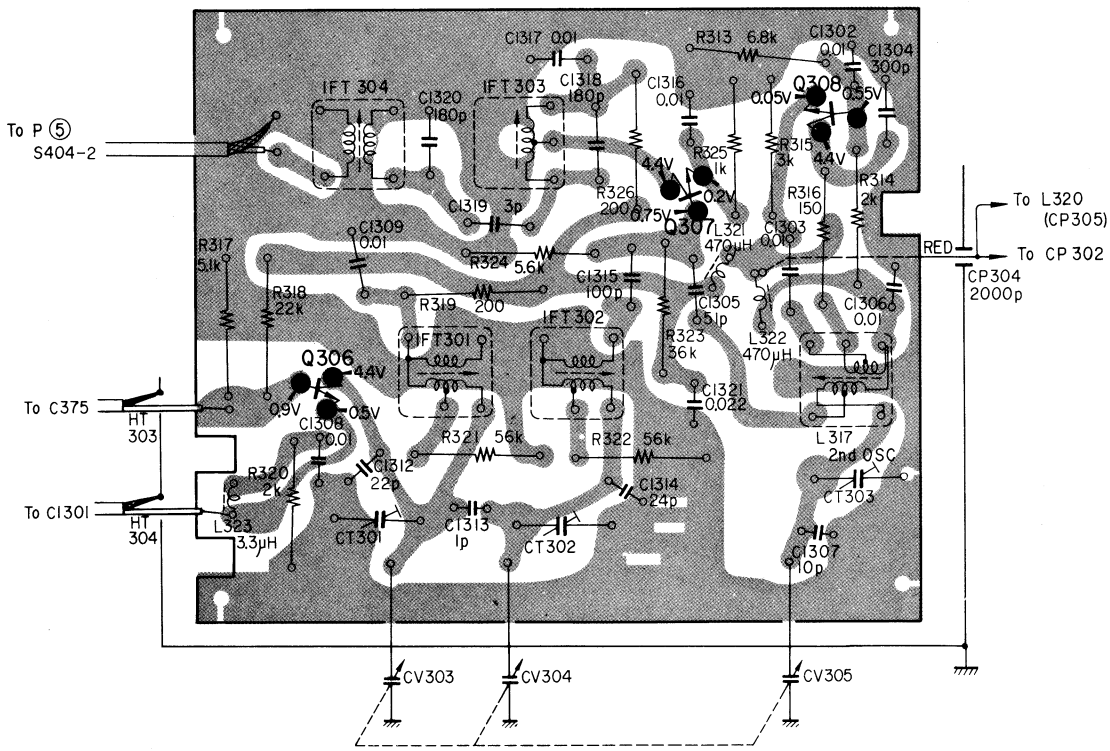
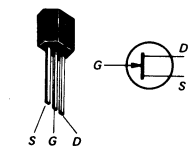
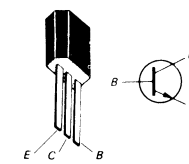


Fig. 4-7

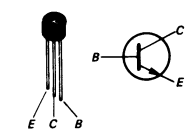
Q301, Q302: 2SK23



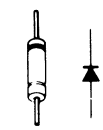
Q303: 2SC633A
Q305 ~ Q308: 2SC403B

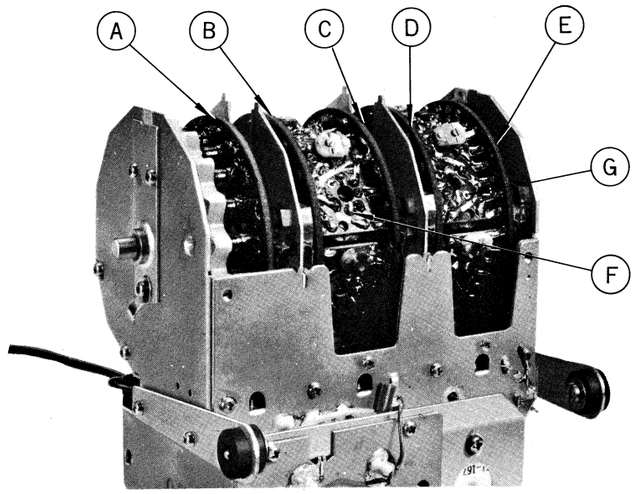


Q304: 2SC668



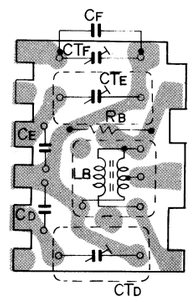
D301, D302: 1S1555





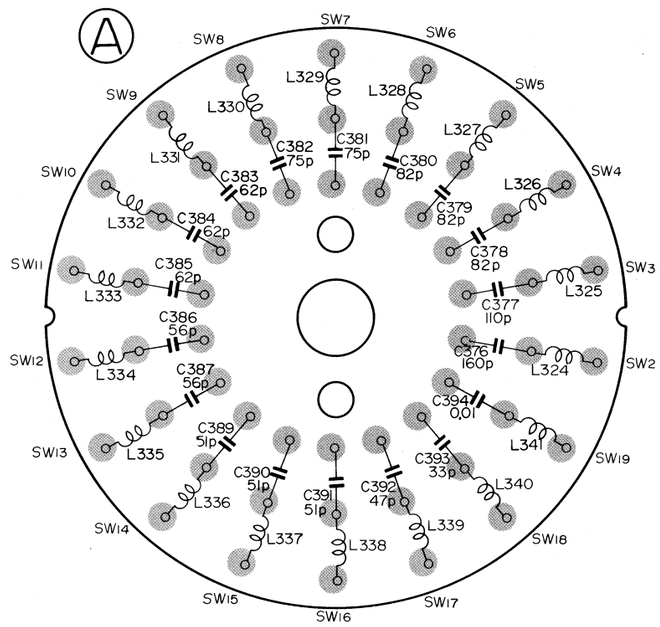
BAND	SW2～19 RF COIL				TRIMMER CAPACITOR			RB
	LB	CD	CE	CF	CTD	CTE	CTF	
SW2～SW4	L307	C342	C344	C346	CT322	CT323	CT324	R305
		220P	75P	43P				18 k
SW5～SW7	L308	C348	C350		CT325	CT326	CT327	R328
		75P	22P					33 k
SW8～SW10	L309	C353	C355		CT328	CT329	CT330	
		68P	24P					
SW11～SW13	L310	C359	C361		CT331	CT332	CT333	
		56P	27P					
SW14～SW16	L311	C365	C367		CT334	CT335	CT336	
		36P	10P					
SW17～SW19	L312	C370	C372	C374	CT337	CT338	CT339	
		10P	7P	7P				

F

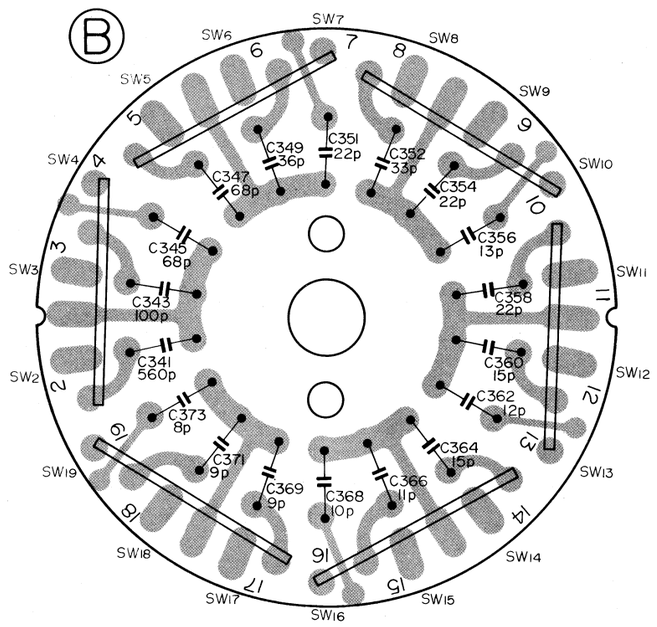


BAND	SW2～19 ANT COIL				TRIMMER CAPACITOR			RA
	LA	CA	CB	CC	CTA	CTB	CTC	
SW2～SW4	L301	C302	C304	C306	CT304	CT305	CT306	R302
		20P	75P	43P				18 k
SW5～SW7	L302	C308	C310		CT307	CT308	CT309	R327
		75P	22P					33 k
SW8～SW10	L303	C313	C315		CT310	CT311	CT312	
		68P	24P					
SW11～SW13	L304	C319	C321		CT313	CT314	CT315	
		56P	27P					
SW14～SW16	L305	C325	C327		CT316	CT317	CT318	
		36P	10P					
SW17～SW19	L306	C330	C332	C334	CT319	CT320	CT321	
		10P	7P	7P				

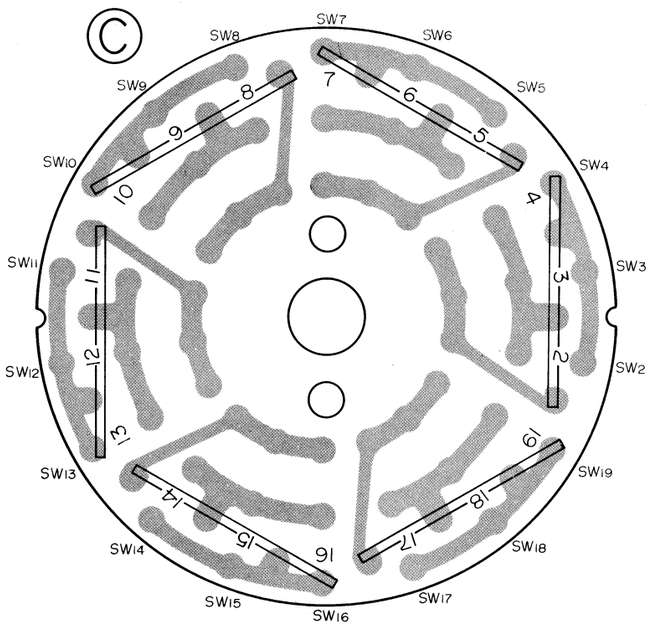
A



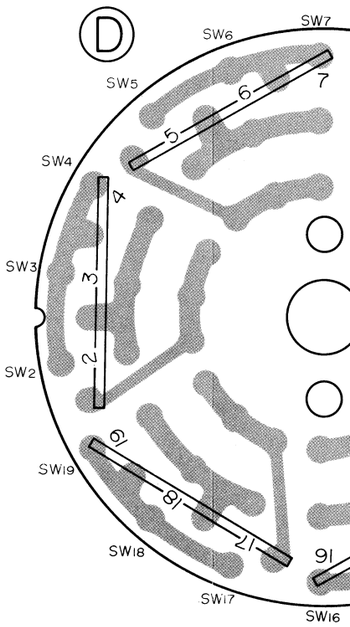
B



C

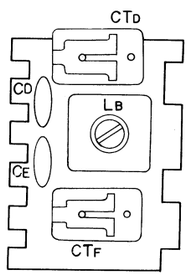


D

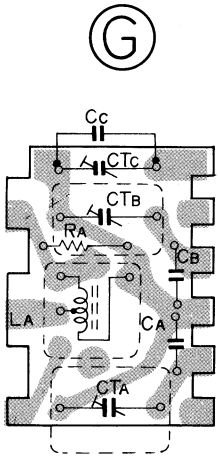


SW2～19: 1st OSC Coil.
All coils and capacitors: Mounted on the Conductor Side.

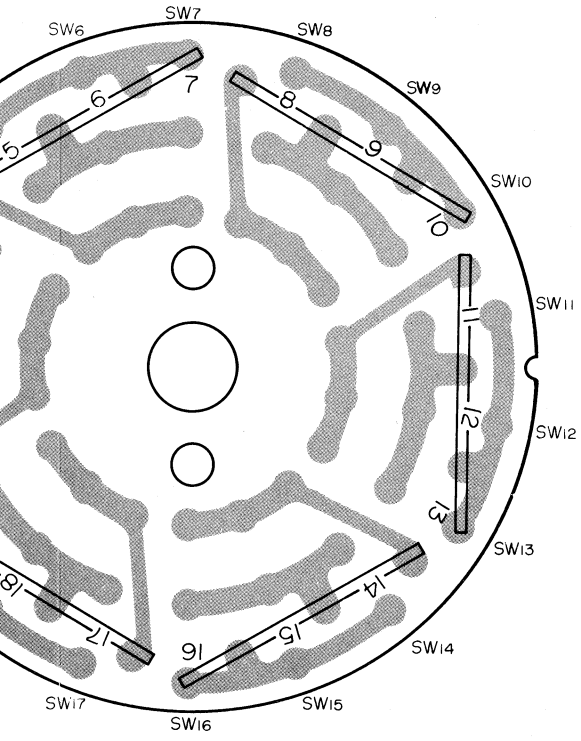
All capacitors: Mounted on the Conductor Side.

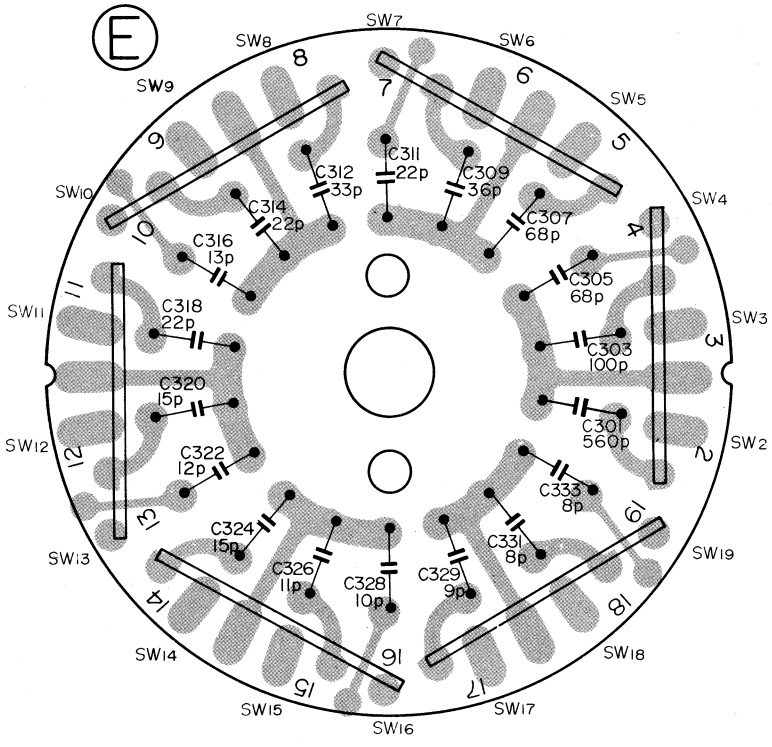


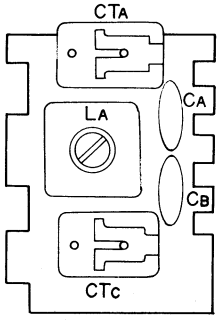
	RA
TC	
T306	R302
	18 k
T309	R327
	33 k
T312	
T315	
T318	
T321	



CC, CTC, RA: Mounted on the Conductor Side.





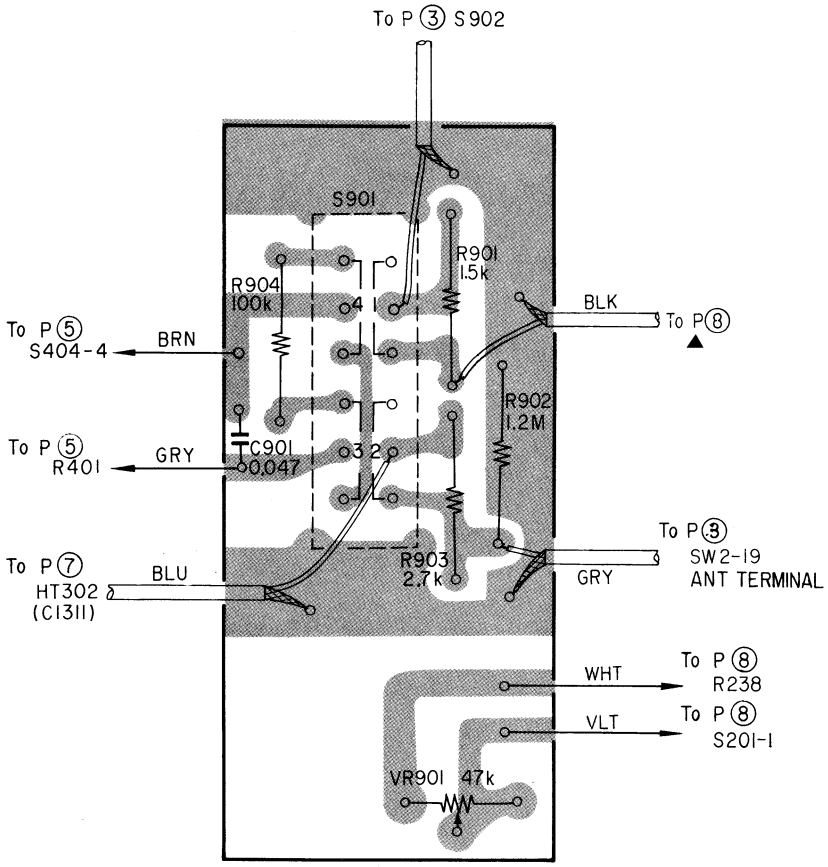


All capacitors: Mounted on the Conductor Side.

Fig. 4-8

4-7. SWITCH CIRCUIT BOARD (P9)

— Conductor Side —



Printed Circuit Board,
Part No. 1-581-166-11

Fig. 4-9

4-8. MAIN CIRCUIT BOARD (P8)

– Conductor Side –

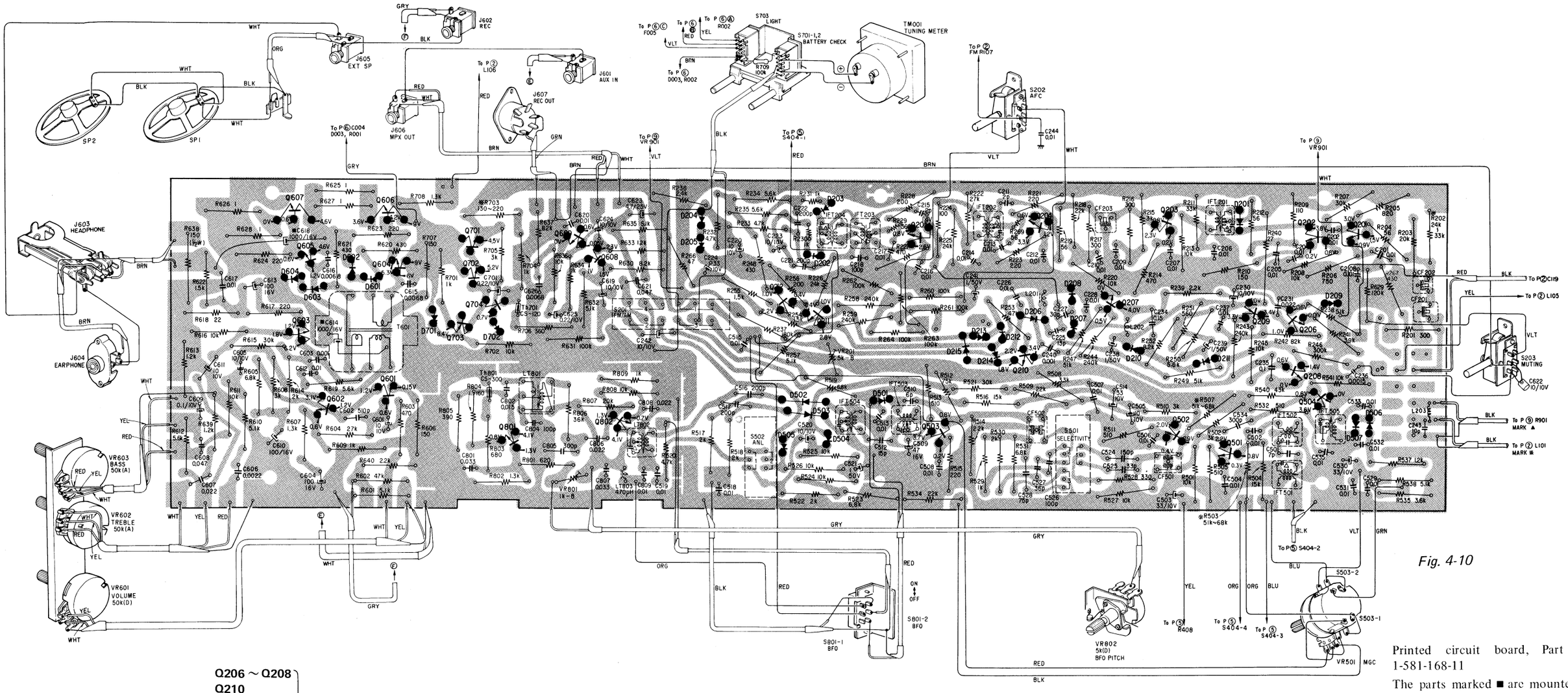


Fig. 4-10

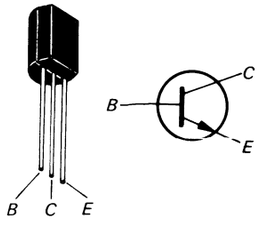
Printed circuit board, Part No. 1-581-168-11

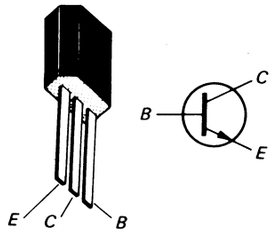
The parts marked ■ are mounted on the conductor side.

Q206 ~ Q208, Q210, Q601 ~ Q605, Q608, Q609, Q702, Q704: 2SC633A

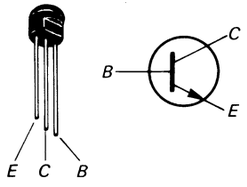
Q211, Q212, Q501 ~ Q504, Q802: 2SC403B

Q201 ~ Q205: 2SC710
Q801: 2SC870

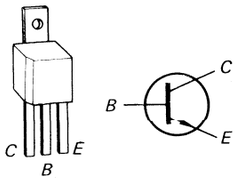




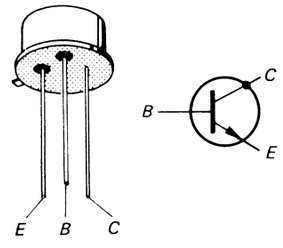
Q209: 2SC678



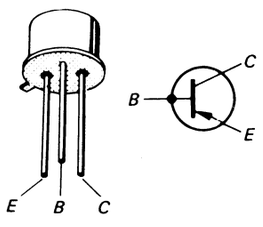
Q606, Q607: 2SC1014



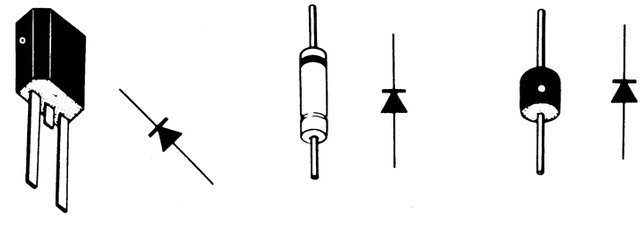
Q701: 2SC352A



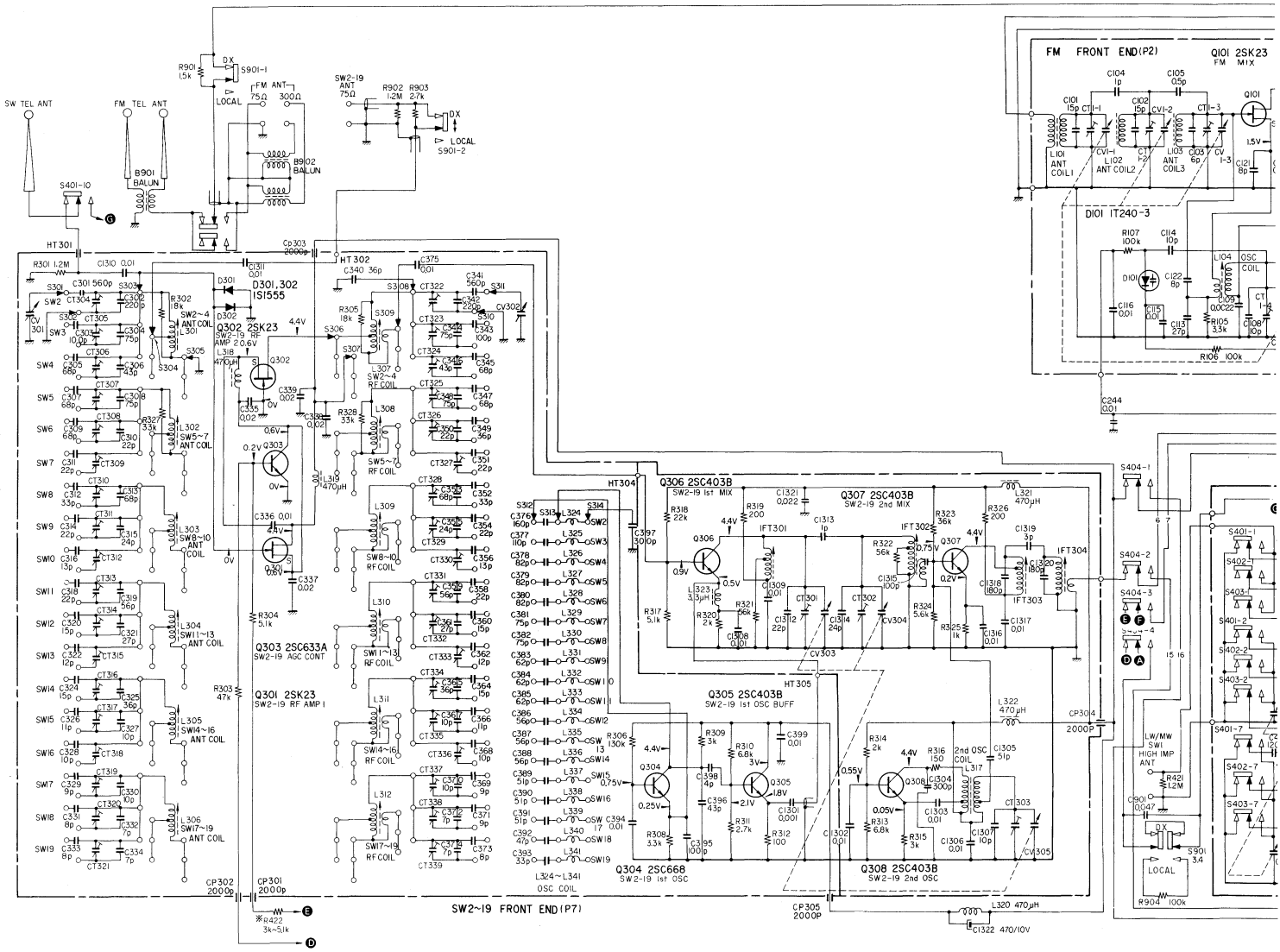
Q703: 2SB381



D201, D204, D205, D212 ~ D215, D504, D505, D701, D702: 1T243
D202, D203: 1T261
D206 ~ D211: 1T262
D501 ~ D503, D506, D507: 1T23
D601 ~ D604: 10D-2



4-9. SCHEMATIC DIAGRAM



Note:

1. ⏚ shows grounding to chassis.
2. All resistors and capacitors are in Ω and μF, unless otherwise indicated.
3. Capacitor marked △ is built in i-f transformer.
4. The symbol ·※· indicates a component whose value is selected to yield specified operating condition.
5. Voltage value is measured to ground circuit with a dc voltmeter (20 kΩ/V) and current value is measured with a dc ammeter. Voltage and current are taken with no radio signal received. Variations may be noted due to normal production tolerances.
6. Switch Position

Switch	Function	Position	Switch
S201	FM/AM select	FM	S701
S202	AFC	ON	
S203	MUTING	ON	S703
S401	Band Selector (SW1)	OFF	S704
S402	Band Selector (MW)	OFF	S709
S403	Band Selector (LW)	OFF	S710
S404	Band Selector (SW2–19)	ON	S801
S501	SELECTIVITY (BROAD/SHARP)	BROAD	S901
S502	ANL	OFF	S902
S503	MGC	OFF	

CRF-220

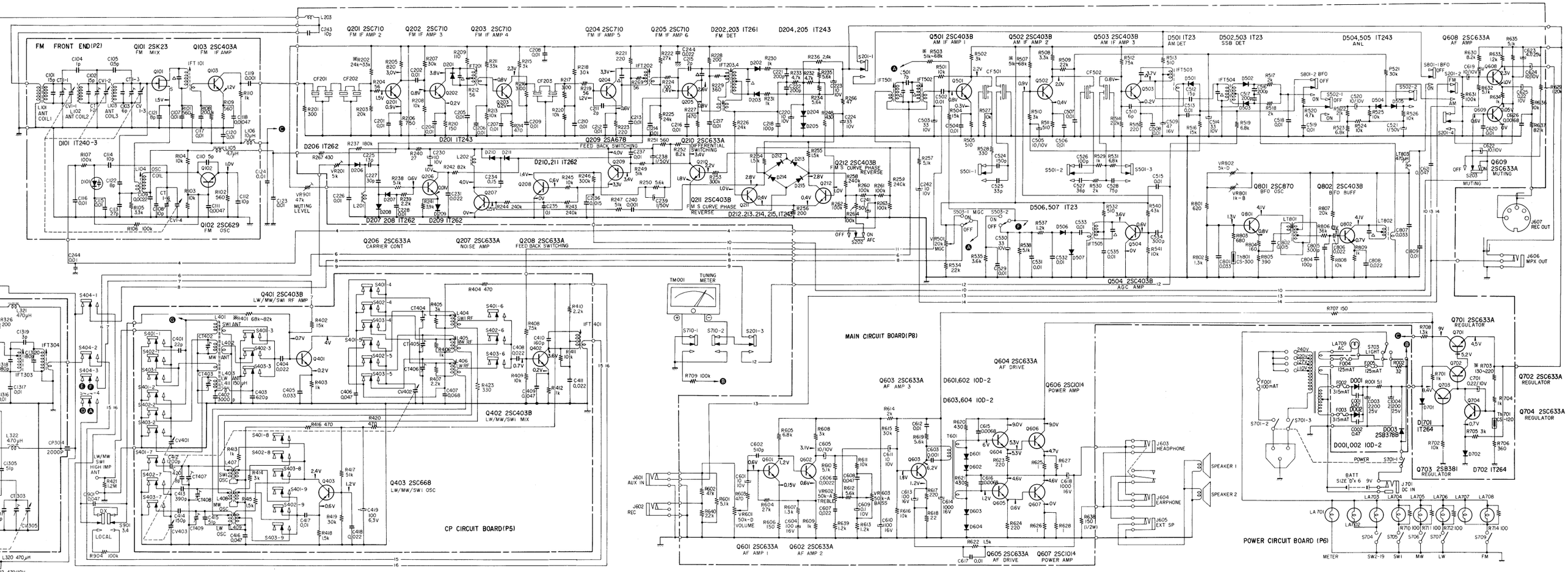


Fig. 4-11

Position	Switch	Function	Position
FM	S701	POWER	OFF
ON			OFF
ON	S703	LIGHT	(ON with ac power source)
OFF	S704	LIGHT	built in band selector
OFF	S709		
OFF	S710	BATTERY CHECK	ON
ON	S801	BFO	OFF
BROAD	S901	SENSITIVITY (LOCAL/DX)	DX
OFF	S902	ROD ANT/EXT ANT	ROD ANT
OFF			

SECTION 5
PACKING AND EXPLODED VIEWS

5-1. PACKING

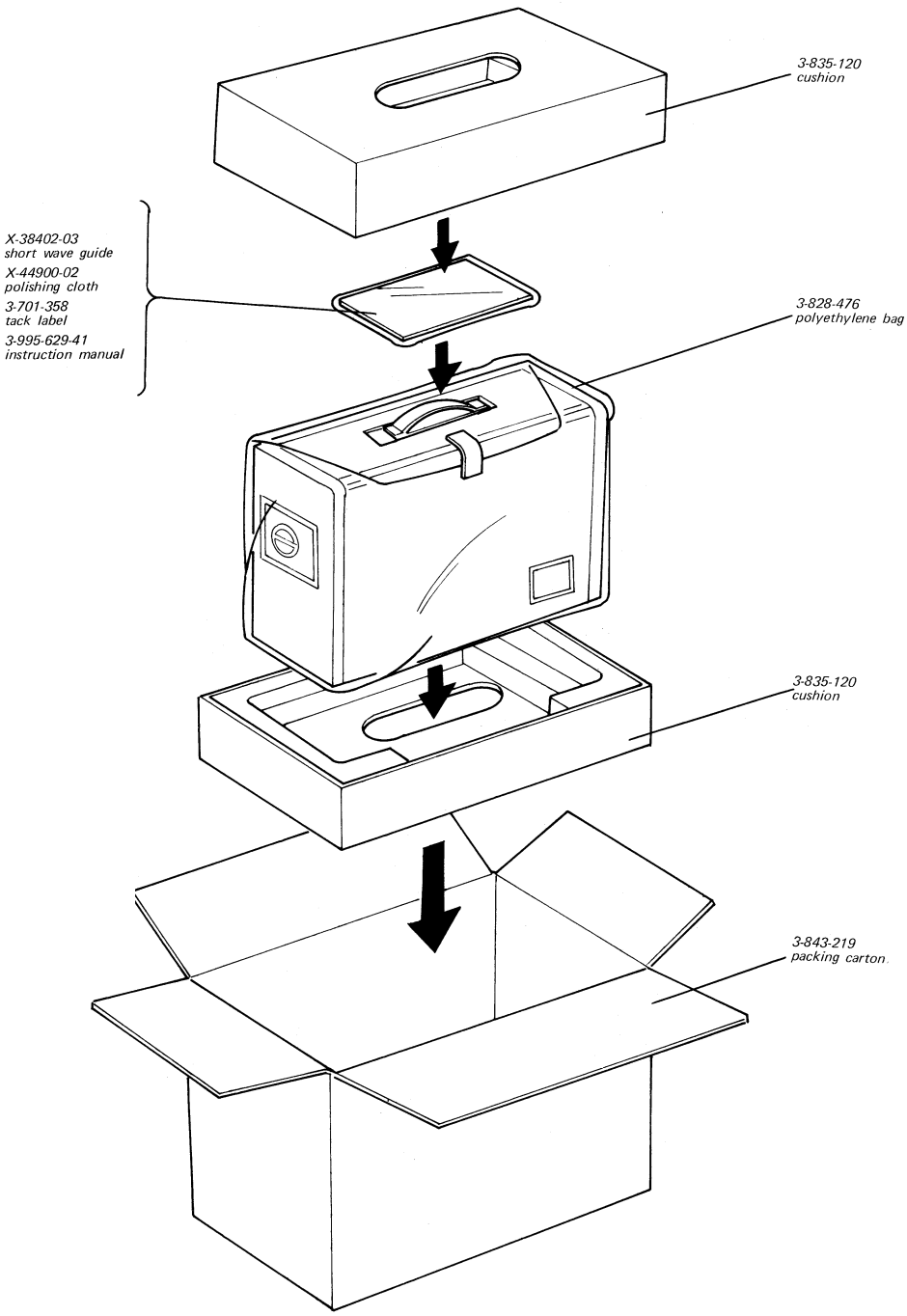
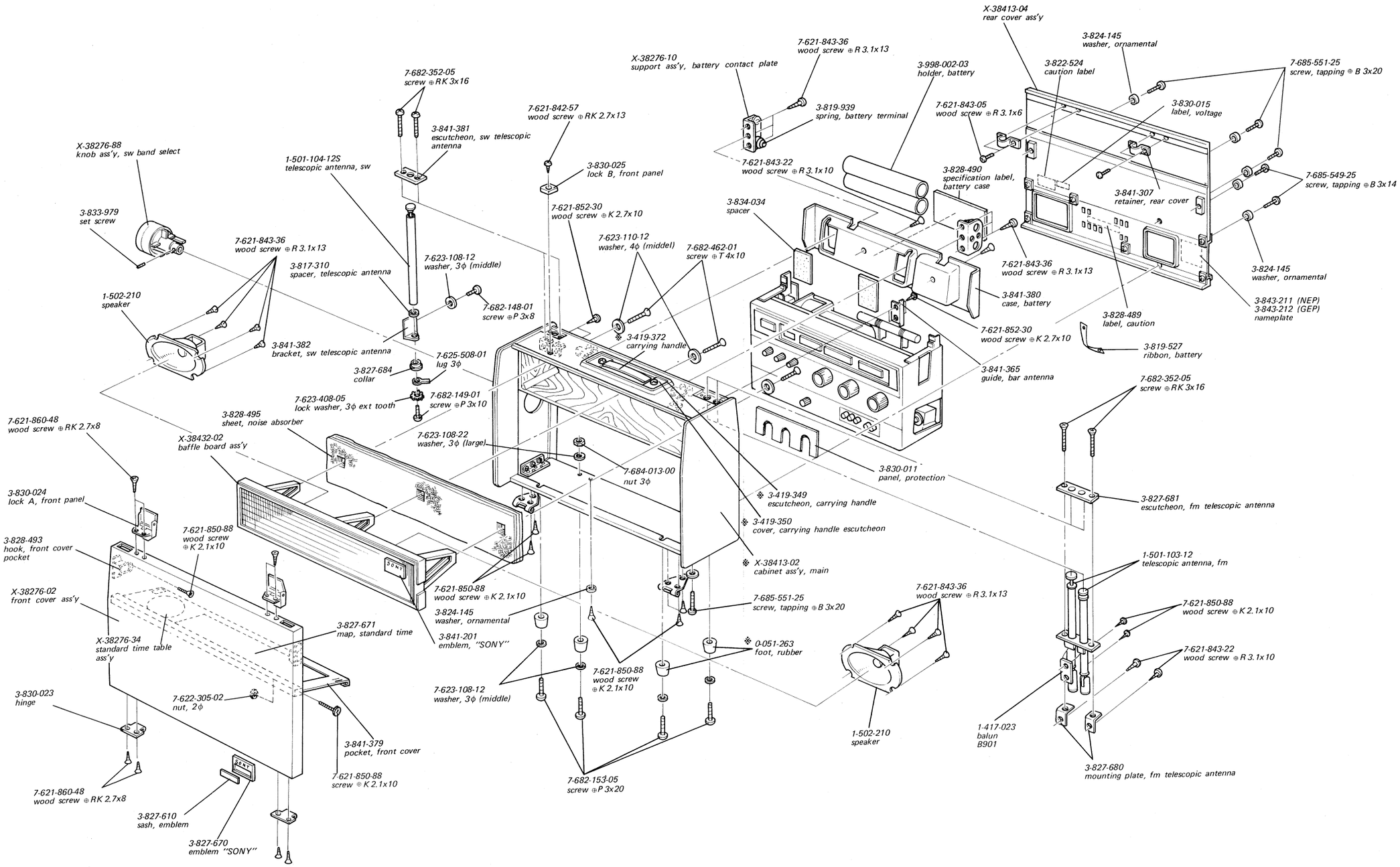


Fig. 5-1.

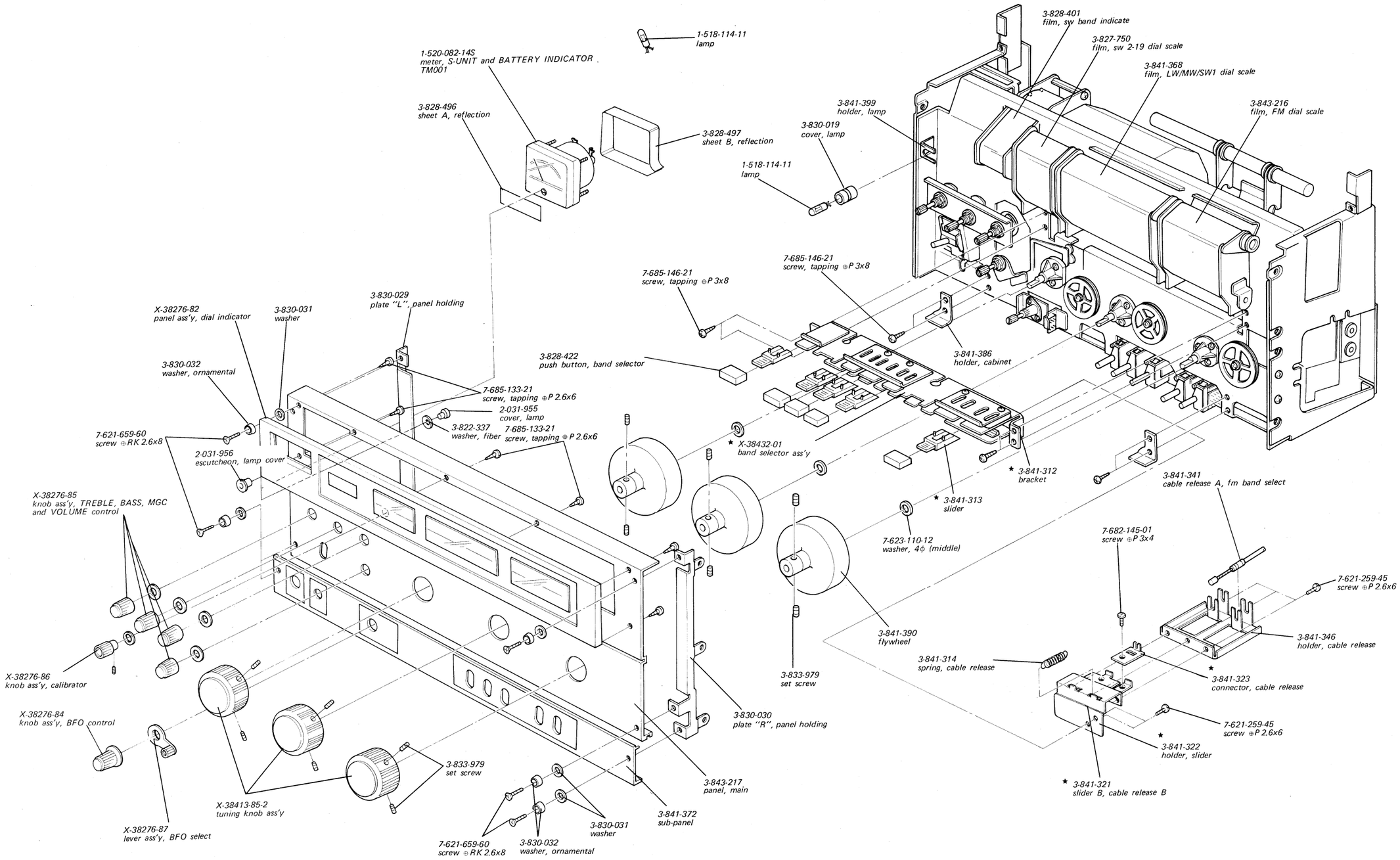
5-2. EXPLODED VIEW (1)



The parts marked ·※· are included in main cabinet ass'y, Part No. X-38413-02.

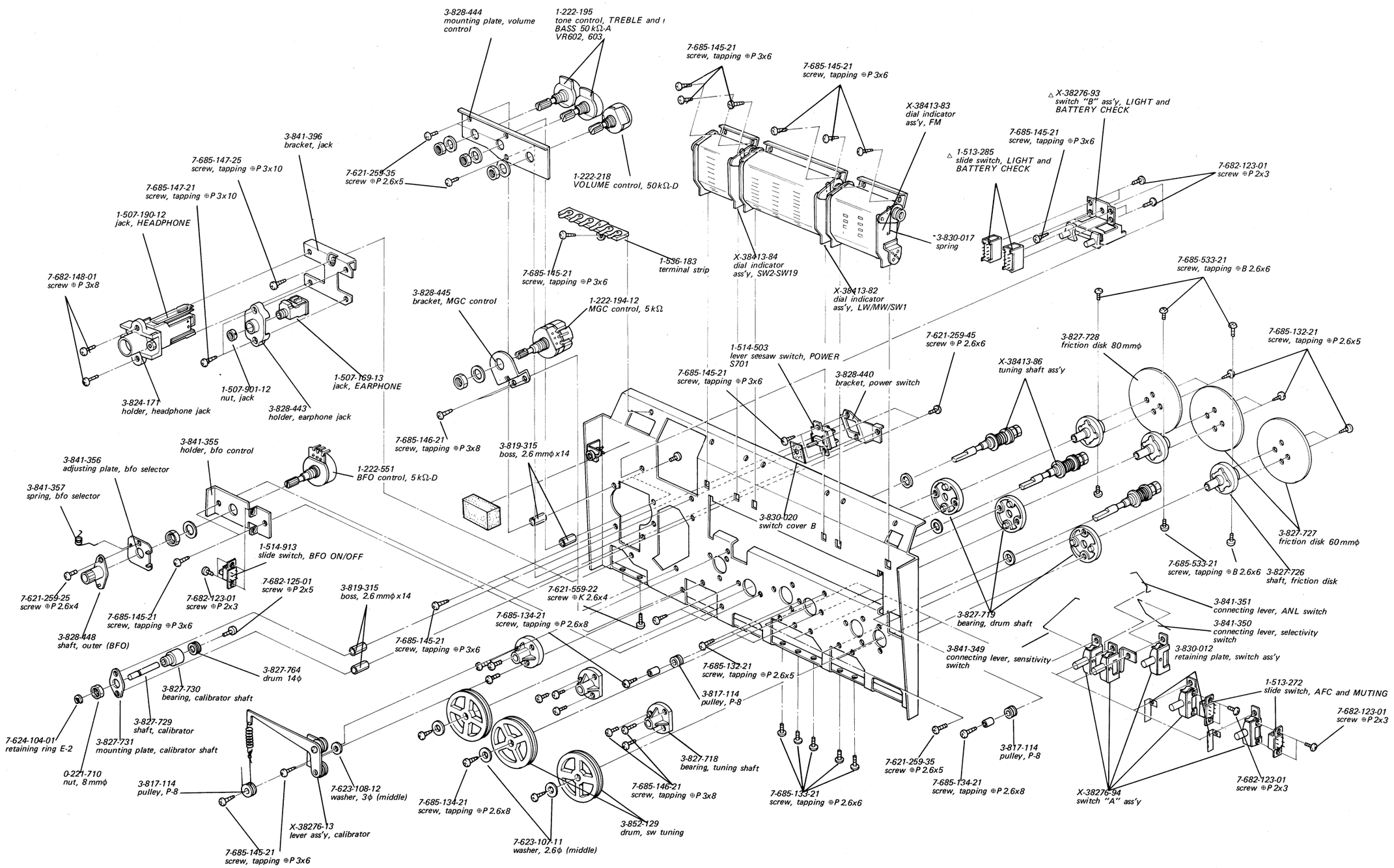
Fig. 5-2.

5-3. EXPLODED VIEW (2)

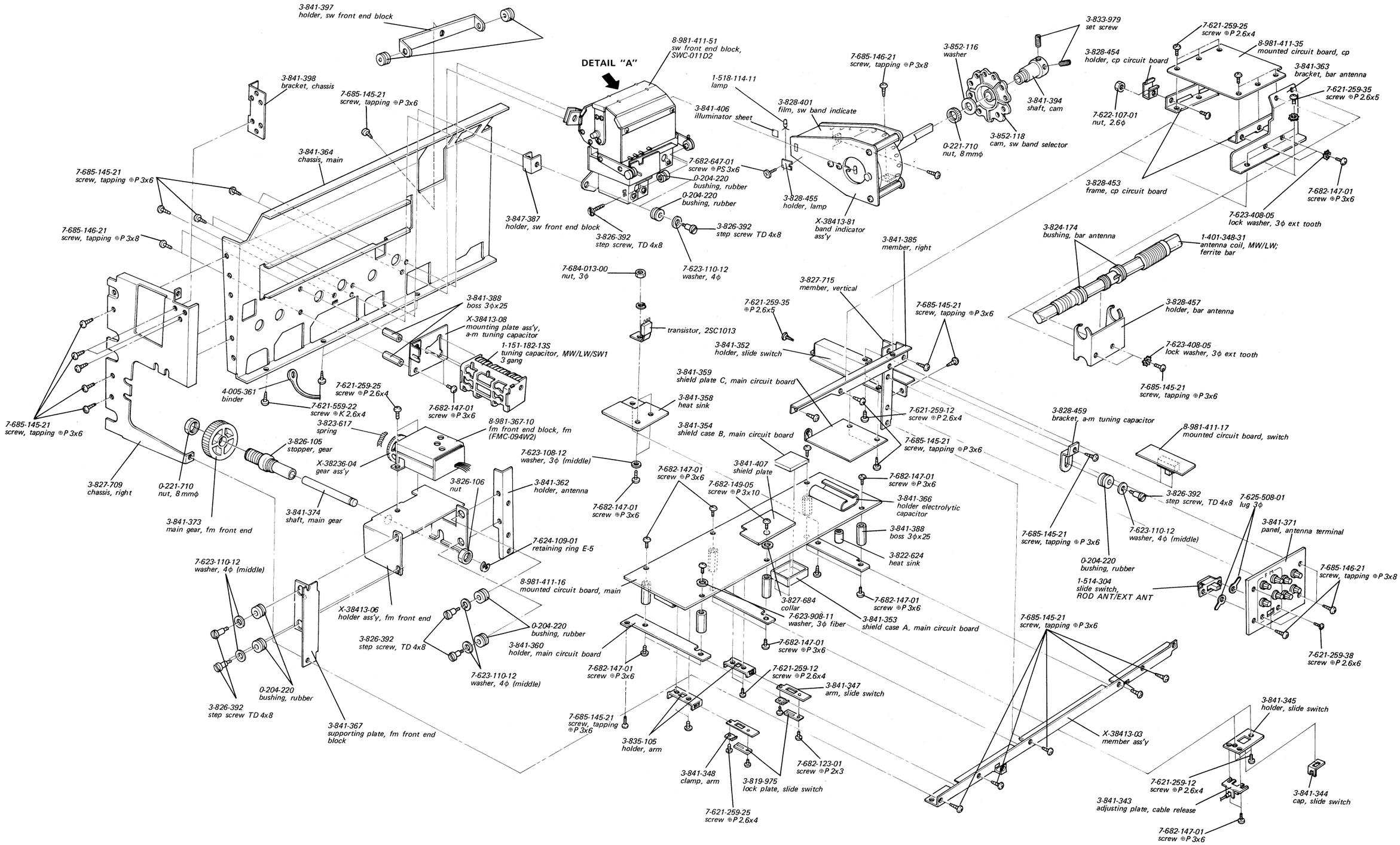


The parts marked ★ are included in band selector ass'y, Part No. X-38432-01-00.

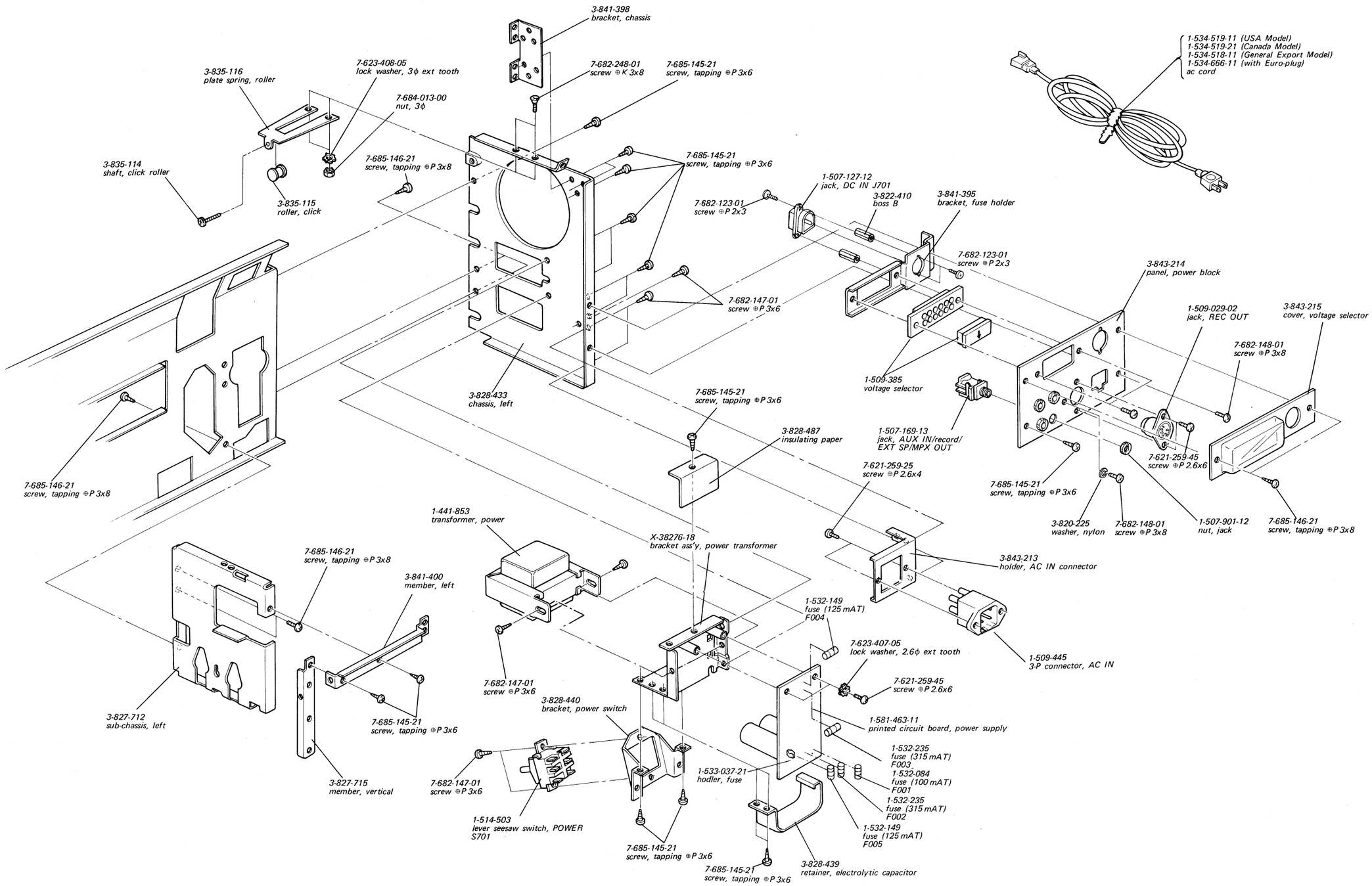
5-4. EXPLODED VIEW (3)



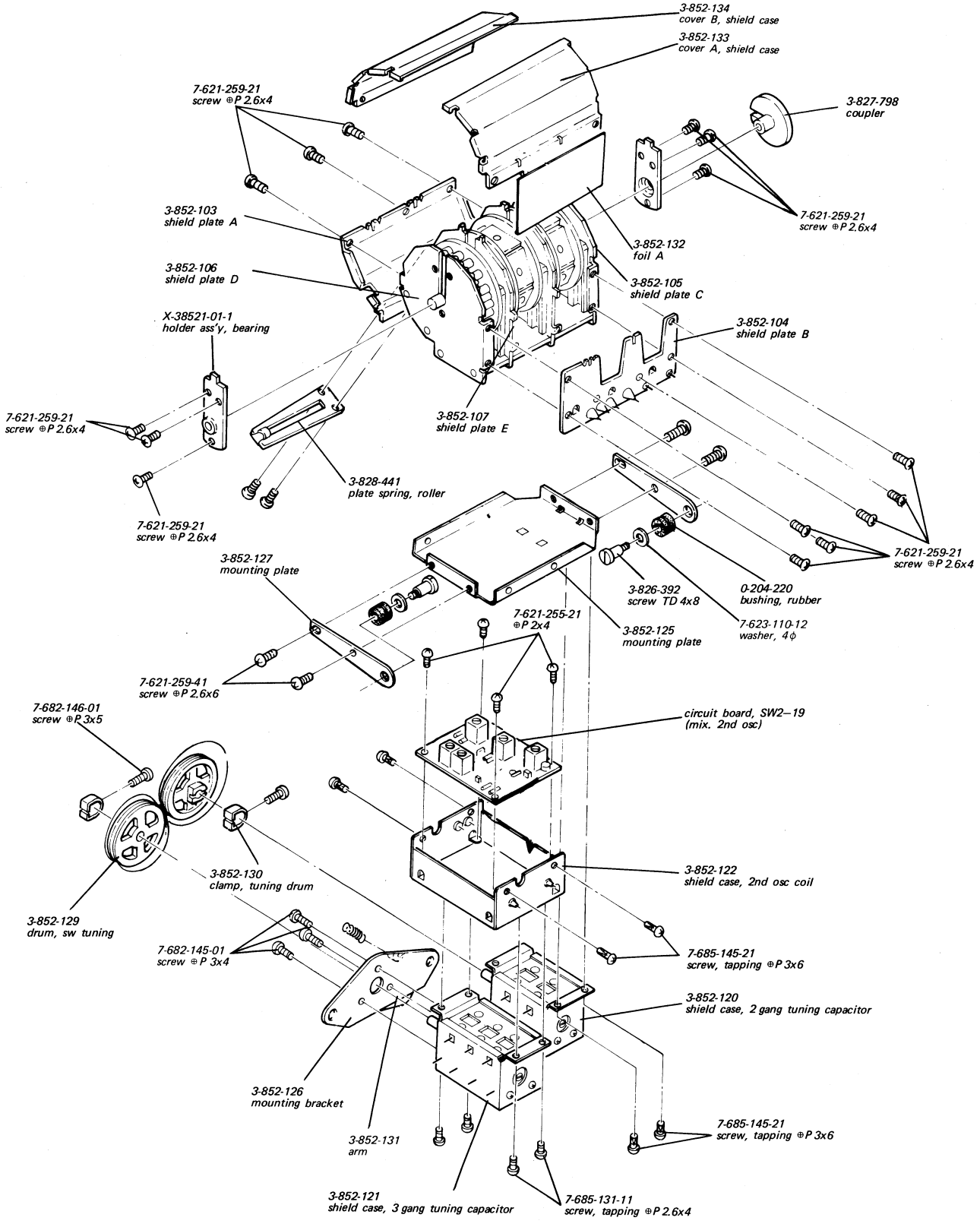
5-5. EXPLODED VIEW (4)



5-6. EXPLODED VIEW (5)



5-7. EXPLODED VIEW (6)



SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	
		SEMICONDUCTORS	
Q101		transistor	2SK23
Q102		transistor	2SC629
Q103		transistor	2SC403A
Q201		transistor	2SC710
Q202		transistor	2SC710
Q203		transistor	2SC710
Q204		transistor	2SC710
Q205		transistor	2SC710
Q206		transistor	2SC633A
Q207		transistor	2SC633A
Q208		transistor	2SC633A
Q209		transistor	2SC678
Q210		transistor	2SC633A
Q211		transistor	2SC403B
Q212		transistor	2SC403B
Q301		transistor	2SK23
Q302		transistor	2SK23
Q303		transistor	2SC633A
Q304		transistor	2SC668
Q305		transistor	2SC403B
Q306		transistor	2SC403B
Q307		transistor	2SC403B
Q308		transistor	2SC403B
Q401		transistor	2SC403B
Q402		transistor	2SC403B
Q403		transistor	2SC668
Q501		transistor	2SC403B
Q502		transistor	2SC403B
Q503		transistor	2SC403B
Q504		transistor	2SC403B
Q601		transistor	2SC633A
Q602		transistor	2SC633A
Q603		transistor	2SC633A
Q604		transistor	2SC633A
Q605		transistor	2SC633A
Q606		transistor	2SC1014
Q607		transistor	2SC1014
Q608		transistor	2SC633A
Q609		transistor	2SC633A
Q701		transistor	2SC352A
Q702		transistor	2SC633A
Q703		transistor	2SB381
Q704		transistor	2SC633A
Q801		transistor	2SC870
Q802		transistor	2SC403B
D001		diode	10D-2
D002		diode	10D-2
D003		diode	2SB378E
D101		diode	1T240-3
D201		diode	1T243
D202		diode	1T261
D203		diode	1T261
D204		diode	1T243
D205		diode	1T243
D206		diode	1T262
D207		diode	1T262
D208		diode	1T262
D209		diode	1T262
D210		diode	1T262
D211		diode	1T262
D212		diode	1T243
D213		diode	1T243
D214		diode	1T243
D215		diode	1T243
D301		diode	1S1555
D302		diode	1S1555
D501		diode	1T23
D502		diode	1T23
D503		diode	1T23
D504		diode	1T243
D505		diode	1T243
D506		diode	1T23
D507		diode	1T23
D601		diode	10D-2
D602		diode	10D-2
D603		diode	10D-2
D604		diode	10D-2
D701		diode	1T264
D702		diode	1T264
Th701		thermistor	CS-120
Th801		thermistor	CS-300
		COILS AND TRANSFORMERS	
L101	1-425-526	ant coil 1, FM	
L102	1-425-525	ant coil 2, FM	

Ref. No.	Part No.	Description
L103	1-425-525	ant coil 3, FM
L104	1-405-386	osc coil, FM
L105	1-407-186	4.7 μH, FM
L106	1-407-190	10 μH, FM
L201	1-407-177	470 μH, micro inductor
L202	1-407-177	470 μH, micro inductor
L203	1-425-740-00	inductor
L301	1-401-463	ant coil, SW2 ~ SW4
L302	1-401-341	ant coil, SW5 ~ SW7
L303	1-401-342	ant coil, SW8 ~ SW10
L304	1-401-343	ant coil, SW11 ~ SW13
L305	1-401-345	ant coil, SW14 ~ SW16
L306	1-401-345	ant coil, SW17 ~ SW19
L307	1-425-680	rf coil, SW2 ~ SW4
L308	1-425-429	rf coil, SW5 ~ SW7
L309	1-425-430	rf coil, SW8 ~ SW10
L310	1-425-431	rf coil, SW11 ~ SW13
L311	1-425-433	rf coil, SW14 ~ SW16
L312	1-425-433	rf coil, SW17 ~ SW19
L317	1-405-352	osc coil, SW 2nd
L318	1-407-177	470 μH, micro inductor
L319	1-407-177	470 μH, micro inductor
L320	1-407-177	470 μH, micro inductor
L321	1-407-177	470 μH, micro inductor
L322	1-407-177	470 μH, micro inductor
L323	1-407-184	3.3 μH, micro inductor
L324	1-405-334	osc coil, SW2
L325	1-405-335	osc coil, SW3
L326	1-405-336	osc coil, SW4
L327	1-405-337	osc coil, SW5
L328	1-405-338	osc coil, SW6
L329	1-405-339	osc coil, SW7
L330	1-405-340	osc coil, SW8
L331	1-405-341	osc coil, SW9
L332	1-405-342	osc coil, SW10
L333	1-405-343	osc coil, SW11
L334	1-405-344	osc coil, SW12
L335	1-405-345	osc coil, SW13
L336	1-405-346	osc coil, SW14
L337	1-405-347	osc coil, SW15
L338	1-405-348	osc coil, SW16
L339	1-405-349	osc coil, SW17
L340	1-405-350	osc coil, SW18
L341	1-405-351	osc coil, SW19
L401	1-401-467	ant coil, SW1
L402 L403	1-401-348-31	ant coil, MW/LW ferrite bar
L404	1-425-684	rf coil, SW1
L405	1-425-685	rf coil, MW
L406	1-425-444	rf coil, LW
L407	1-405-484	osc coil, SW1
L408	1-405-357	osc coil, MW
L409	1-405-358	osc coil, LW
L410	1-425-445	transformer, AM i-f
L411	1-407-171	150 μH, micro inductor
LT801	1-405-450	osc coil, bfo
LT802	1-403-128	output coil, bfo
LT803	1-407-177	470 μH, micro inductor
IFT101	1-403-294	transformer, FM i-f
IFT201	1-403-244-31	transformer, FM i-f
IFT202	1-403-244-31	transformer, FM i-f
IFT203	1-403-272-31	transformer, FM discriminator
IFT204	1-403-273-31	transformer, FM discriminator
IFT301	1-425-434	transformer, SW 1st i-f
IFT302	1-425-434	transformer, SW 1st i-f
IFT303	1-403-812	transformer, SW 1st i-f
IFT304	1-403-812	transformer, SW 1st i-f
IFT501	1-403-139	transformer, AM i-f
IFT502	1-403-139	transformer, AM i-f
IFT503	1-403-128	transformer, AM i-f
IFT504	1-403-135	transformer, AM i-f
IFT505	1-403-128	transformer, AM i-f
CF201	1-527-501	ceramic filter, FM i-f
CF202	1-527-501	ceramic filter, FM i-f
CF203	1-527-501	ceramic filter, FM i-f
CF501	1-403-161-13	ceramic filter, AM i-f
CF502	1-403-161-13	ceramic filter, AM i-f
B901	1-417-023	balun
B902	1-417-014	balun
T601	1-423-114	transformer, driver
T701	1-441-853	transformer, power

CAPACITORS

All fixed capacitors are in μF except as specified with p, which means μμF.

CV1-1~1-4 CT1-1~1-4	1-151-223-12	tuning capacitor, FM
CV301, 302	1-151-214	tuning capacitor, SW 2 gang
CV303~305	1-151-168	tuning capacitor, SW 3 gang
CV401~403	1-151-182-13S	tuning capacitor, MW/LW/SW1 3 gang

Ref. No.	Part No.	Description
CT301	1-141-097	capacitor, trimmer (10p)
CT302	1-141-097	capacitor, trimmer (10p)
CT303	1-141-097	capacitor, trimmer (10p)
CT304	1-141-078	capacitor, trimmer (16p)
CT305	1-141-078	capacitor, trimmer (16p)
CT306	1-141-095	capacitor, trimmer (16p)
CT307	1-141-078	capacitor, trimmer (16p)
CT308	1-141-078	capacitor, trimmer (16p)
CT309	1-141-080	capacitor, trimmer (10p)
CT310	1-141-078	capacitor, trimmer (16p)
CT311	1-141-078	capacitor, trimmer (16p)
CT312	1-141-080	capacitor, trimmer (10p)
CT313	1-141-078	capacitor, trimmer (16p)
CT314	1-141-078	capacitor, trimmer (16p)
CT315	1-141-080	capacitor, trimmer (10p)
CT316	1-141-078	capacitor, trimmer (16p)
CT317	1-141-079	capacitor, trimmer (10p)
CT318	1-141-080	capacitor, trimmer (10p)
CT319	1-141-079	capacitor, trimmer (10p)
CT320	1-141-079	capacitor, trimmer (10p)
CT321	1-141-080	capacitor, trimmer (10p)
CT322	1-141-078	capacitor, trimmer (16p)
CT323	1-141-078	capacitor, trimmer (16p)
CT324	1-141-095	capacitor, trimmer (16p)
CT325	1-141-078	capacitor, trimmer (16p)
CT326	1-141-078	capacitor, trimmer (16p)
CT327	1-141-080	capacitor, trimmer (10p)
CT328	1-141-078	capacitor, trimmer (16p)
CT329	1-141-078	capacitor, trimmer (16p)
CT330	1-141-080	capacitor, trimmer (10p)
CT331	1-141-078	capacitor, trimmer (16p)
CT332	1-141-078	capacitor, trimmer (16p)
CT333	1-141-080	capacitor, trimmer (10p)
CT334	1-141-078	capacitor, trimmer (16p)
CT335	1-141-079	capacitor, trimmer (10p)
CT336	1-141-080	capacitor, trimmer (10p)
CT337	1-141-079	capacitor, trimmer (10p)
CT338	1-141-079	capacitor, trimmer (10p)
CT339	1-141-080	capacitor, trimmer (10p)
CT401		----------
CT402	1-141-135	capacitor, trimmer (30p)
CT403	1-141-135	capacitor, trimmer (30p)
CT404	1-141-135	capacitor, trimmer (30p)
CT405	1-141-135	capacitor, trimmer (30p)
CT406	1-141-135	capacitor, trimmer (30p)
CT407	1-141-135	capacitor, trimmer (30p)
CT408	1-141-135	capacitor, trimmer (30p)
CT409	1-141-135	capacitor, trimmer (30p)
C001	1-105-881-12	0.47 mylar
C002	1-105-881-12	0.47 mylar
C003	1-121-389-21	2,200 25V electrolytic

Ref. No.	Part No.	Description
C004	1-121-389-21	2,200 25V electrolytic
C101	1-101-861	15p ceramic
C102	1-101-861	15p ceramic
C103	1-101-956	6p ceramic
C104	1-101-937	1p ceramic
C105	1-101-936	0.5p ceramic
C106		----------
C107	1-101-072	0.01 ceramic
C108	1-102-508	10p ceramic
C109	1-102-121	0.0022 ceramic
C110	1-102-864	5p ceramic
C111	1-102-090	0.0047 ceramic
C112	1-102-508	10p ceramic
C113	1-101-869	27p ceramic
C114	1-101-976	10p ceramic
C115	1-101-072	0.01 ceramic
C116	1-101-072	0.01 ceramic
C117	1-101-072	0.01 ceramic
C118	1-105-829-12	0.0047 mylar
C119	1-101-918	0.001 ceramic
C120	1-101-072	0.01 ceramic
C121	1-101-958	8p ceramic
C122	1-101-958	8p ceramic
C123	1-101-072	0.01 ceramic
C124	1-101-072	0.01 ceramic
C201	1-105-673-12	0.01 mylar
C202	1-105-673-12	0.01 mylar
C203		----------
C204	1-105-673-12	0.01 mylar
C205	1-105-673-12	0.01 mylar
C206	1-105-673-12	0.01 mylar
C207	1-105-673-12	0.01 mylar
C208	1-105-673-12	0.01 mylar
C209	1-105-673-12	0.01 mylar
C210	1-105-673-12	0.01 mylar
C211	1-102-939	2p ceramic
C212	1-105-673-12	0.01 mylar
C213	1-105-673-12	0.01 mylar
C214	1-105-673-12	0.01 mylar
C215	1-102-939	2p ceramic
C216	1-105-673-12	0.01 mylar
C217	1-105-673-12	0.01 mylar
C218	1-107-085	100p silvered mica
C219		----------
C220	1-121-469	10 10V electrolytic
C221	1-107-092	200p silvered mica
C222	1-107-092	200p silvered mica
C223	1-121-469	10 10V electrolytic
C224	1-121-402	33 10V electrolytic
C225	1-102-950	13p ceramic
C226	1-105-673-12	0.01 mylar

Ref. No.	Part No.	Description		
C227	1-102-962	30p		ceramic
C228	1-105-673-12	0.01		mylar
C229		----------		
C230	1-121-469	10	10V	electrolytic
C231	1-105-677-12	0.022		mylar
C232		----------		
C233		----------		
C234	1-105-687-12	0.15		mylar
C235	1-105-685-12	0.1		mylar
C236	1-105-675-12	0.015		mylar
C237	1-105-673-12	0.01		mylar
C238	1-121-391	1	50V	electrolytic
C239	1-121-391	1	50V	electrolytic
C240	1-105-661-12	0.001		mylar
C241	1-121-391	1	50V	electrolytic
C242	1-121-469	10	10V	electrolytic
C243	1-102-508	10p		ceramic
C244	1-101-072	0.01		ceramic
C301	1-103-619	560p		styrol
C302	1-107-093	220p		silvered mica
C303	1-107-085	100p		silvered mica
C304	1-107-082	75p		silvered mica
C305	1-107-081	68p		silvered mica
C306	1-107-076	43p		silvered mica
C307	1-107-081	68p		silvered mica
C308	1-107-082	75p		silvered mica
C309	1-107-074	36p		silvered mica
C310	1-107-069	22p		silvered mica
C311	1-107-069	22p		silvered mica
C312	1-107-073	33p		silvered mica
C313	1-107-081	68p		silvered mica
C314	1-107-069	22p		silvered mica
C315	1-107-070	24p		silvered mica
C316	1-107-064	13p		silvered mica
C317		----------		
C318	1-107-069	22p		silvered mica
C319	1-107-079	56p		silvered mica
C320	1-107-065	15p		silvered mica
C321	1-107-071	27p		silvered mica
C322	1-107-063	12p		silvered mica
C323		----------		
C324	1-107-065	15p		silvered mica
C325	1-107-074	36p		silvered mica
C326	1-107-062	11p		silvered mica
C327	1-107-061	10p		silvered mica
C328	1-107-061	10p		silvered mica
C329	1-107-106	9p		silvered mica
C330	1-107-061	10p		silvered mica
C331	1-107-105	8p		silvered mica
C332	1-107-104	7p		silvered mica
C333	1-107-105	8p		silvered mica
C334	1-107-104	7p		silvered mica

Ref. No.	Part No.	Description	
C335	1-101-924	0.02	ceramic
C336	1-101-923	0.01	ceramic
C337	1-101-924	0.02	ceramic
C338	1-101-924	0.02	ceramic
C339	1-101-924	0.02	ceramic
C340	1-107-074	36p	silvered mica
C341	1-103-619	560p	styrol
C342	1-107-093	220p	silvered mica
C343	1-107-085	100p	silvered mica
C344	1-107-082	75p	silvered mica
C345	1-107-081	68p	silvered mica
C346	1-107-076	43p	silvered mica
C347	1-107-081	68p	silvered mica
C348	1-107-082	75p	silvered mica
C349	1-107-074	36p	silvered mica
C350	1-107-069	22p	silvered mica
C351	1-107-069	22p	silvered mica
C352	1-107-073	33p	silvered mica
C353	1-107-081	68p	silvered mica
C354	1-107-069	22p	silvered mica
C355	1-107-070	24p	silvered mica
C356	1-107-064	13p	silvered mica
C357		----------	
C358	1-107-069	22p	silvered mica
C359	1-107-079	56p	silvered mica
C360	1-107-065	15p	silvered mica
C361	1-107-071	27p	silvered mica
C362	1-107-063	12p	silvered mica
C363		----------	
C364	1-107-065	15p	silvered mica
C365	1-107-074	36p	silvered mica
C366	1-107-062	11p	silvered mica
C367	1-107-061	10p	silvered mica
C368	1-107-061	10p	silvered mica
C369	1-107-106	9p	silvered mica
C370	1-107-061	10p	silvered mica
C371	1-107-106	9p	silvered mica
C372	1-107-104	7p	silvered mica
C373	1-107-105	8p	silvered mica
C374	1-107-104	7p	silvered mica
C375	1-101-923	0.01	ceramic
C376	1-107-090	160p	silvered mica
C377	1-107-086	110p	silvered mica
C378	1-107-083	82p	silvered mica
C379	1-107-083	82p	silvered mica
C380	1-107-083	82p	silvered mica
C381	1-107-082	75p	silvered mica
C382	1-107-082	75p	silvered mica
C383	1-107-080	62p	silvered mica
C384	1-107-080	62p	silvered mica
C385	1-107-080	62p	silvered mica
C386	1-107-079	56p	silvered mica
C387	1-107-079	56p	silvered mica

Ref. No.	Part No.			Description
C388	1-107-079	56p		silvered mica
C389	1-107-078	51p		silvered mica
C390	1-107-078	51p		silvered mica
C391	1-107-078	51p		silvered mica
C392	1-107-077	47p		silvered mica
C393	1-107-073	33p		silvered mica
C394	1-105-673-12	0.01		mylar
C395	1-103-601	100p		styrol
C396	1-102-871	43p		ceramic
C397	1-103-612	300p		styrol
C398	1-107-101	4p		silvered mica
C399	1-105-673-12	0.01		mylar
C1301	1-101-918	0.001		ceramic
C1302	1-105-673-12	0.01		mylar
C1303	1-105-673-12	0.01		mylar
C1304	1-107-096	300p		silvered mica
C1305	1-107-078	51p		silvered mica
C1306	1-105-673-12	0.01		mylar
C1307	1-107-061	10p		silvered mica
C1308	1-105-673-12	0.01		mylar
C1309	1-105-673-12	0.01		mylar
C1310	1-101-923	0.01		ceramic
C1311	1-101-923	0.01		ceramic
C1312	1-107-069	22p		silvered mica
C1313	1-107-098	1p		silvered mica
C1314	1-107-070	24p		silvered mica
C1315	1-107-085	100p		silvered mica
C1316	1-105-673-12	0.01		mylar
C1317	1-105-673-12	0.01		mylar
C1318	1-103-607	180p		styrol
C1319	1-107-100	3p		silvered mica
C1320	1-103-607	180p		styrol
C1321	1-105-837-12	0.022		mylar
C1322	1-121-425	470	10V	electrolytic
C401	1-107-069	22p		silvered mica
C402	1-103-636	3,000p		styrol
C403	1-103-620	620p		styrol
C404	1-105-837-12	0.022		mylar
C405	1-105-839-12	0.033		mylar
C406	1-105-841-12	0.047		mylar
C407	1-105-843-12	0.068		mylar
C408	1-105-837-12	0.022		mylar
C409	1-105-841-12	0.047		mylar
C410	1-103-606	160p		styrol
C411	1-105-837-12	0.022		mylar
C412	1-103-627	1,200p		styrol
C413	1-103-615	390p		styrol
C414	1-107-089	150p		silvered mica
C415	1-101-882	51p		ceramic
C416	1-105-841-12	0.047		mylar
C417	1-105-833-12	0.01		mylar

Ref. No.	Part No.			Description
C418	1-105-837-12	0.022		mylar
C419	1-121-413	100	6.3V	electrolytic
C420	1-107-105	8p		silvered mica
C501	1-102-944	7p		ceramic
C502	1-105-673-12	0.01		mylar
C503	1-121-402	33	10V	electrolytic
C504	1-105-673-12	0.01		mylar
C505	1-121-469	10	10V	electrolytic
C506	1-105-673-12	0.01		mylar
C507	1-105-673-12	0.01		mylar
C508	1-105-673-12	0.01		mylar
C509	1-121-409	47	16V	electrolytic
C510	1-102-943	6p		ceramic
C511		----------		
C512	1-102-951	15p		ceramic
C513	1-105-673-12	0.01		mylar
C514	1-121-402	33	10V	electrolytic
C515	1-105-673-12	0.01		mylar
C516	1-107-092	200p		silvered mica
C517	1-107-092	200p		silvered mica
C518	1-105-673-12	0.01		mylar
C519	1-105-673-12	0.01		mylar
C520	1-121-469	10	10V	electrolytic
C521	1-121-391	1	50V	electrolytic
C522		----------		
C523		----------		
C524	1-107-089	150p		silvered mica
C525	1-107-073	33p		silvered mica
C526	1-107-085	100p		silvered mica
C527	1-107-074	36p		silvered mica
C528	1-107-082	75p		silvered mica
C529	1-105-673-12	0.01		mylar
C530	1-121-402	33	10V	electrolytic
C531	1-105-673-12	0.01		mylar
C532	1-105-673-12	0.01		mylar
C533	1-105-673-12	0.01		mylar
C534	1-107-096	300p		silvered mica
C535	1-105-673-12	0.01		mylar
C601	1-121-469	10	10V	electrolytic
C602	1-107-235	510p		silvered mica
C603	1-105-661-12	0.001		mylar
C604	1-121-415	100	16V	electrolytic
C605	1-121-469	10	10V	electrolytic
C606	1-105-665-12	0.0022		mylar
C607	1-105-677-12	0.022		mylar
C608	1-105-681-12	0.047		mylar
C609	1-127-019	0.1	10V	solid aluminum
C610	1-121-415	100	16V	electrolytic
C611	1-121-469	10	10V	electrolytic
C612	1-105-673-12	0.01		mylar
C613	1-121-415	100	16V	electrolytic

Ref. No.	Part No.	Description
C614	1-121-245	1,000 16V electrolytic
C615	1-105-671-12	0.0068 mylar
C616	1-105-671-12	0.0068 mylar
C617	1-105-673-12	0.01 mylar
C618	1-121-245	1,000 16V electrolytic
C619	1-121-469	10 10V electrolytic
C620	1-105-673-12	0.01 mylar
C621	1-105-681-12	0.047 mylar
C622	1-121-469	10 10V electrolytic
C623	1-121-395	4.7 25V electrolytic
C624	1-121-469	10 10V electrolytic
C625	1-127-020	0.22 10V solid aluminum
C626	1-105-671-12	0.0068 mylar
C701	1-127-020	0.22 10V solid aluminum
C801	1-105-679-12	0.033 mylar
C802	1-105-675-12	0.015 mylar
C803		----------
C804	1-101-914	100p ceramic
C805	1-107-096	300p silvered mica
C806	1-105-677-12	0.022 mylar
C807	1-105-679-12	0.033 mylar
C808	1-105-677-12	0.022 mylar
C809	1-105-673-12	0.01 mylar
C901	1-105-841-12	0.047 mylar
CP301～305	1-101-799	2,000p ceramic
HT301～304	1-535-036	hermetic terminal

RESISTORS

All fixed resistors are in Ω, ¼W, ±5% carbon film type unless otherwise noted.

VR201	1-221-635	adjustable resistor, 5 kΩ
VR501	1-222-194-12	MGC control, 20 kΩ-B
VR601	1-222-218	VOLUME control, 50 kΩ-D
VR602	1-222-195	tone control, TREBLE 50 kΩ-A
VR603	1-222-195	tone control, BASS 50 kΩ-A
VR801	1-221-634-12	adjustable resistor, 1 kΩ-B
VR802	1-222-551	BFO control, 5 kΩ-D
VR901	1-222-985	adjustable resistor, MUTING level
R101	1-208-027	560 1/16W ceramic
R102	1-208-027	560 1/16W ceramic
R103	1-244-697	10 k
R104	1-244-697	10 k
R105	1-208-045	3.3 k 1/16W ceramic
R106	1-208-145	100 k 1/16W ceramic
R107	1-208-145	100 k 1/16W ceramic
R108	1-208-088	200 k 1/16W ceramic
R109	1-208-027	560 1/16W ceramic
R110	1-208-033	1 k 1/16W ceramic
R201	1-244-660	300
⁂R202	1-244-706	24 k
	1-244-707	27 k
	1-244-708	30 k
	1-244-709	33 k
R203	1-244-704	20 k
R204	1-244-643	56
R205	1-244-671	820
R206	1-244-670	750
R207	1-244-708	30 k
R208	1-244-697	10 k
R209	1-244-650	110
R210	1-244-653	150
R211	1-244-709	33 k
R212	1-244-643	56
R213	1-244-697	10 k
R214	1-244-665	470
R215	1-244-684	3 k
R216	1-244-660	300
R217	1-244-660	300
R218	1-244-708	30 k
R219	1-244-643	56
R220	1-244-697	10 k
R221	1-244-657	220
R222	1-244-707	27 k
R223	1-244-657	220
R224	1-244-649	100
R225	1-244-706	24 k
R226	1-244-706	24 k
R227	1-244-665	470
R228	1-244-656	200
R229	1-244-662	360
R230	1-244-673	1 k
R231	1-244-673	1 k
R232	1-244-689	4.7 k
R233	1-244-689	4.7 k
R234	1-244-691	5.6 k
R235	1-244-691	5.6 k
R236	1-244-684	2.4 k
R237	1-244-727	180 k
R238	1-244-690	5.1 k
R239	1-244-681	2.2 k
R240	1-244-635	27
R241	1-244-687	3.9 k
R242	1-244-719	82 k
R243	1-244-730	240 k
R244	1-244-730	240 k
R245	1-244-697	10 k
R246	1-244-732	300 k

Ref. No.	Part No.	Description
R247	1-244-714	51 k
R248	1-244-664	430
R249	1-244-714	51 k
R250	1-244-691	5.6 k
R251	1-244-667	560
R252	1-244-695	8.2 k
R253	1-244-732	300 k
R254	1-244-677	1.5 k
R255	1-244-677	1.5 k
R256	1-244-656	200
R257	1-244-690	5.1 k
R258	1-244-730	240 k
R259	1-244-730	240 k
R260	1-244-721	100 k
R261	1-244-721	100 k
R262	1-244-721	100 k
R263	1-244-721	100 k
R264	1-244-721	100 k
R265		----------
R266	1-244-641	47
R267	1-244-664	430
R268		----------
R269	1-244-643	56
R301	1-202-647	1.2 M 1/2W composition
R302	1-244-703	18 k
R303	1-244-713	47 k
R304	1-244-690	5.1 k
R305	1-244-703	18 k
R306	1-244-724	130 k
R307		----------
R308	1-244-685	3.3 k
R309	1-244-684	3 k
R310	1-244-693	6.8 k
R311	1-244-683	2.7 k
R312	1-244-649	100
R313	1-244-693	6.8 k
R314	1-244-680	2 k
R315	1-244-684	3 k
R316	1-244-653	150
R317	1-244-690	5.1 k
R318	1-244-705	22 k
R319	1-244-656	200
R320	1-244-680	2 k
R321	1-244-715	56 k
R322	1-244-715	56 k
R323	1-244-710	36 k
R324	1-244-691	5.6 k
R325	1-244-673	1 k
R326	1-244-656	200
R327	1-244-709	33 k
R328	1-244-709	33 k

Ref. No.	Part No.	Description
※ R401	1-242-717	68 k
	1-242-718	75 k
	1-242-719	82 k
R402	1-242-701	15 k
R403	1-242-673	1 k
R404	1-242-665	470
R405	1-242-684	3 k
R406	1-242-673	1 k
R407	1-242-681	2.2 k
R408	1-242-694	7.5 k
R409	1-242-697	10 k
R410	1-242-681	2.2 k
R411	1-242-697	10 k
R412	1-242-673	1 k
R413	1-242-673	1 k
R414	1-242-684	3 k
R415	1-242-677	1.5 k
R416	1-242-665	470
R417	1-242-714	51 k
R418	1-242-677	1.5 k
R419	1-242-708	30 k
R420	1-242-665	470
R421	1-202-647	1.2 M 1/2W composition
※ R422	1-244-684	3 k
	1-244-685	3.3 k
	1-244-686	3.6 k
	1-244-687	3.9 k
	1-244-688	4.3 k
	1-244-689	4.7 k
	1-244-690	5.1 k
R423	1-244-661	330
R501	1-244-697	10 k
R502	1-244-684	3 k
※ R503	1-244-714	51 k
	1-244-715	56 k
	1-244-716	62 k
	1-244-717	68 k
R504	1-244-701	15 k
R505	1-244-666	510
R506		----------
※ R507	1-244-714	51 k
	1-244-715	56 k
	1-244-716	62 k
	1-244-717	68 k
R508	1-244-685	3.3 k
R509	1-244-705	22 k
R510	1-244-684	3 k
R511	1-244-666	510
R512	1-244-718	75 k
R513	1-244-666	510
R514	1-244-705	22 k
R515	1-244-657	220

Ref. No.	Part No.	Description
R516	1-244-701	15 k
R517	1-244-680	2 k
R518	1-244-680	2 k
R519	1-244-693	6.8 k
R520	1-244-689	4.7 k
R521	1-244-708	30 k
R522	1-244-680	2 k
R523	1-244-693	6.8 k
R524	1-244-697	10 k
R525	1-244-697	10 k
R526	1-244-697	10 k
R527	1-244-697	10 k
R528	1-244-661	330
R529	1-244-673	1 k
R530	1-244-680	2 k
R531	1-244-693	6.8 k
R532	1-244-666	510
R533		----------
R534	1-244-705	22 k
R535	1-244-686	3.6 k
R536		----------
R537	1-244-675	1.2 k
R538	1-244-690	5.1 k
R539		----------
R540	1-244-712	43 k
R541	1-244-697	10 k
R601	1-244-690	5.1 k
R602	1-244-713	47 k
R603	1-244-665	470
R604	1-244-707	27 k
R605	1-244-693	6.8 k
R606	1-244-653	150
R607	1-244-676	1.3 k
R608	1-244-684	3 k
R609	1-244-673	1 k
R610	1-244-690	5.1 k
R611	1-244-697	10 k
R612	1-244-691	5.6 k
R613	1-244-675	1.2 k
R614	1-244-680	2 k
R615	1-244-708	30 k
R616	1-244-697	10 k
R617	1-244-657	220
R618	1-244-633	22
R619	1-244-691	5.6 k
R620	1-244-664	430
R621	1-244-664	430
R622	1-244-677	1.5 k
R623	1-244-657	220
R624	1-244-657	220
R625	1-244-601	1
R626	1-244-601	1

Ref. No.	Part No.	Description
R627	1-244-601	1
R628	1-244-601	1
R629	1-244-723	120 k
R630	1-244-695	8.2 k
R631	1-244-721	100 k
R632	1-244-690	5.1 k
R633	1-244-675	1.2 k
R634	1-244-673	1 k
R635	1-244-690	5.1 k
R636	1-244-697	10 k
R637	1-244-719	82 k
R638	1-244-853	150 1/2W carbon
R639	1-244-675	1.2 k
R640	1-244-681	2.2 k
R701	1-244-673	1 k
R702	1-244-702	10 k
※ R703	1-244-652	130
	1-244-653	150
	1-244-654	160
	1-244-655	180
	1-244-656	200
	1-244-657	220
R704	1-244-673	1 k
R705	1-244-684	3 k
R706	1-244-662	360
R707	1-244-653	150
R708	1-244-676	1.3 k
R709	1-244-721	100 k
R710	1-244-650	110
R711	1-244-650	110
R712	1-244-650	110
R713	1-244-650	110
R714	1-244-650	110
R801	1-244-668	620
R802	1-244-676	1.3 k
R803	1-244-669	680
R804	1-244-654	160
R805	1-244-663	390
R806	1-244-710	36 k
R807	1-244-704	20 k
R808	1-244-697	10 k
R809	1-244-673	1 k
R901	1-244-677	1.5 k
R902	1-202-647	1.2 M 1/2W composition
R903	1-244-683	2.7 k
R904	1-244-721	100 k
R001	1-211-001	5.1 1W carbon
R002	1-202-539	39 1/2W composition

※: to be selected

Ref. No.	Part No.	Description
		MISCELLANEOUS
	1-538-793-12	printed circuit board, FM
	1-538-825-11	printed circuit board, G (SW front end)
	1-538-826-11	printed circuit board, F (SW front end)
	1-538-827-11	printed circuit board, disk E (SW front end)
	1-538-828-11	printed circuit board, disk D (SW front end)
	1-538-829-11	printed circuit board, disk C (SW front end)
	1-538-830-11	printed circuit board, disk B (SW front end)
	1-538-831-11	printed circuit board, disk A (SW front end)
	1-581-176-11	printed circuit board, rf (SW front end)
	1-581-177-12	printed circuit board, osc (SW front end)
	1-581-165-11	printed circuit board, cp
	1-581-168-11	printed circuit board, main
	1-581-166-11	printed circuit board, switch
	1-581-163-11	printed circuit board, power supply
F001	1-532-084	fuse, 100 mAT
F002	1-532-235	fuse, 315 mAT
F003	1-532-235	fuse, 315 mAT
F004	1-532-149	fuse, 125 mAT
F005	1-532-149	fuse, 125 mAT
S201	1-514-673	slide switch, FM/AM select
S202	1-513-272	slide switch, AFC
S203	1-513-272	slide switch, MUTING
S401	1-513-304	slide switch, band selector SW1
S402	1-513-304	slide switch, band selector MW
S403	1-513-304	slide switch, band selector LW
S404	1-513-302	slide switch, band selector SW2 ~ SW19
S501	1-513-274	slide switch, SELECTIVITY
S502	1-513-274	slide switch, ANL
S503		switch, MGC; built in MGC control (VR501)
S701	1-514-503	lever seesaw switch, POWER
S703	1-513-285	slide switch, LIGHT
S710	1-513-285	slide switch, BATTERY CHECK
S704 ~ 707, S709		switch, lamp; built in band selector
S801	1-514-913	slide switch, BFO ON/OFF
S901	1-514-673	slide switch, SENSITIVITY
S902	1-514-304	slide switch, ROD ANT/EXT ANT
	1-509-385	voltage selector
	1-533-037-21	holder, fuse
LA701~709	1-518-114-11	lamp
TM001	1-520-082-14S	meter, S-UNIT and BATTERY INDICATOR
	1-536-111	terminal strip
	1-536-183	terminal strip
FM TEL ANT	1-501-103-12	telescopic antenna, FM
SW TEL ANT	1-501-104-12S	telescopic antenna, SW
SP1	1-502-210	speaker
SP2	1-502-210	speaker
J601	1-507-169-13	jack, AUX IN
J602	1-507-169-13	jack, record
J603	1-507-190-12	jack, HEADPHONE
J604	1-507-169-13	jack, EARPHONE
J605	1-507-169-13	jack, EXT SP
J606	1-507-169-13	jack, MPX OUT
J607	1-509-029-02	jack, REC OUT
J701	1-507-127-12	jack, DC IN
	1-507-901-12	nut, jack
	1-509-445	connector, AC IN
	8-981-367-10	FM front end block, FM (FMC-094W)
	8-981-411-51	SW front end block, SW2~SW19 (SWC-011D2)
	8-981-411-16	mounted circuit board, main
	8-981-411-35	mounted circuit board, cp
	8-981-411-17	mounted circuit board, switch

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