CRF-230

Serial No. 30,001 and later

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

SECTION 1
OUTLINE

1-1. SPECIFICATIONS

Circuit System: Superheterodyne (FM-1, FM-2, MW, LW, SW-1)
Double superheterodyne (SW-2 ~ SW-19)

Semiconductor: 27 transistors, 3 FET for reception, 18 transistors for auxiliary functions, 34 diodes, 1 thermistor

Frequency Coverage:

FM-1	64 - 90 MHz
FM-2	87 - 108 MHz
MW	530 - 1,605 kHz (566 - 187 m)
LW	150 - 400 kHz (2,000 - 750 m)
SW-1	1.6 - 2.2 MHz (160 m)
SW-2	2.0 - 2.6 MHz (120 m)
SW-3	3.0 - 3.6 MHz (90 m)
SW-4	3.5 - 4.1 MHz (75 - 81 m)
SW-5	4.5 - 5.1 MHz (60 m)
SW-6	5.8 - 6.4 MHz (49 m)
SW-7	7.0 - 7.6 MHz (40 - 41 m)
SW-8	9.5 - 10.1 MHz (31 m)
SW-9	11.5 - 12.1 MHz (25 m)
SW-10	14.0 - 14.6 MHz (20 m)
SW-11	15.0 - 15.6 MHz (19 m)
SW-12	17.5 - 18.1 MHz (16 m)
SW-13	21.0 - 21.6 MHz (15 m)
SW-14	21.4 - 22.0 MHz (13 m)
SW-15	25.5 - 26.1 MHz (11 m)
SW-16	26.8 - 27.4 MHz (11 m)
SW-17	28.0 - 28.6 MHz (10 m)
SW-18	28.6 - 29.2 MHz (10 m)
SW-19	29.2 - 29.8 MHz (10 m)

Intermediate Frequency:

FM	10.7 MHz
MW, LW, SW-1	455 kHz
SW-2 ~ SW-19	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
SW-1, MW, LW	built-in ferrite bar antenna, 10φ x 180 mm external antenna terminal is provided
SW-2 ~ SW-19	telescopic antenna 1,470 mm external antenna terminal is provided

Power Requirement:

AC	100, 117, 220, 240 V, 50/60 Hz (c/s)
DC	9 V, battery size "D" 6 pcs
DC	12 V, with SONY car battery cord DCC-2AW

Power Output: at 10% distortion
3 W with AC power supply
1 W with DC power supply

Current Drain: at zero signal

AC	250 mA
DC	140 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; 30 dB at BROAD position
45 dB at SHARP position
SW ; 50 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 Frequency Rejection: FM-1 ; 77 dB at 77 MHz
FM-2 ; 72 dB at 98 MHz
MW ; 60 dB at 1,605 kHz
LW ; 80 dB at 360 kHz
SW-1 ; 70 dB at 2 MHz
SW-2 ; 80 dB at 2.5 MHz
SW-19; 30 dB at 29 MHz

Frequency Response: 100 - 20,000 Hz ±3 dB (flat response)

AUX Input Jack
input impedance: 5 kΩ
maximum sensitivity: -53 dB (1.7 mV) at 50 mW output

MPX Output Jack
output impedance: 5 kΩ
output level: -24 dB (49 mV) at 5 kΩ load impedance

Recording Jack
output impedance: 2.2 kΩ
output level: -50 dB (2.5 mV)

Recording Connector
output impedance: 80 kΩ
output level: -50 dB (2.5 mV)

External Speaker Jack: 3 ~ 8Ω speakers can be connected

Headphone Jack: 8Ω headphone can be connected

Earphone Jack: 8Ω earphone can be connected

Other Controls: Battery check switch
Calibrator reset knob
AGC/MGC knob
BFO control knob
Selectivity switch
Noise limiter switch
Muting switch
Sensitivity 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: 31 lb, 14 kg (without batteries)

Supplied Accessories: AC power cord
polishing cloth

1-2. BLOCK DIAGRAM

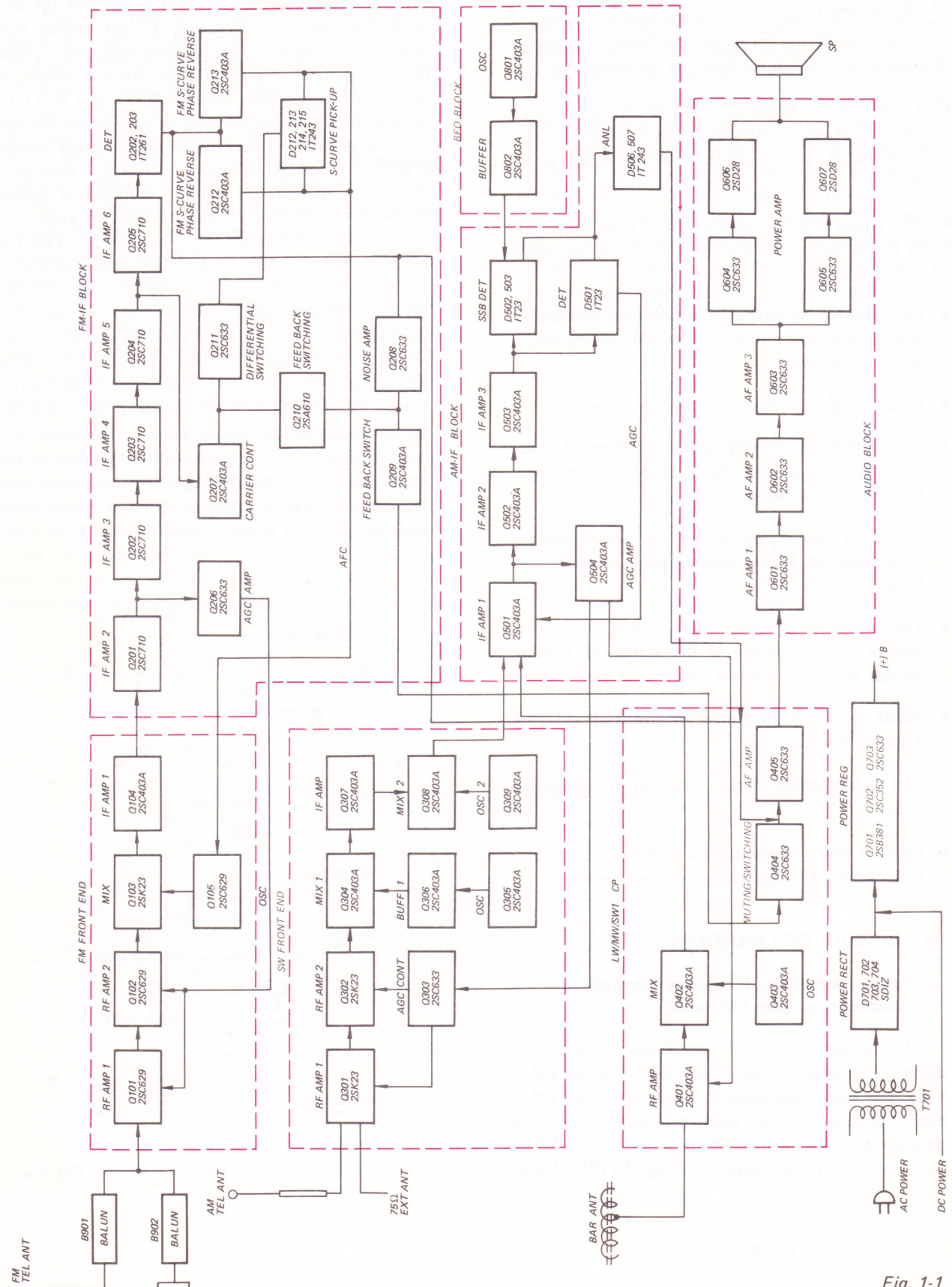


Fig. 1-1

1-3. TECHNICAL FEATURES

The SONY Model CRF-230 is a high-performance radio receiver having many features found in communication receivers. Among them are the following:

- A total of 23 bands covering the broadcast frequencies of any country in the world. Included are 2 fm bands, 19 sw bands, a mw band and a 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 four-step adjustable selectivity.
- Individual tuning knobs for sw bands, mw/lw bands and fm bands. 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 3 watts of undistorted audio power output with two built-in speakers or external speakers.

1-4. CIRCUIT EXPLANATIONS

AFC (Automatic Frequency Control) Available for Both FM Bands:

In the Model CRF-230, the local oscillator frequency is above the signal frequency for the FM-1 band, but below the signal frequency for the FM-2 band. Because of this, oscillator drift produces a detector dc output-voltage change of difference polarity on the FM-1 band than occurs on the FM-2 band. Therefore, dc control voltages taken directly from the detector output can not be used to stabilize the frequency of the local oscillator. To get around this problem, a comparator circuit with selectable output polarity is used (Fig. 1-2). The detector output is divided by equal-value resistors R232 and R233 to provide two voltages identical in magnitude but opposite in polarity. These voltages are compared against a reference voltage of approximately 1.5 volts produced by the forward voltage drop across diodes D204 and D205. The resultant voltages are applied to the bases of transistors Q212 and Q213. The FM band selector switches automatically select the proper collector voltage for the band in use and feed this voltage through AFC switch S903 to variable-capacitance diode D101. This diode is voltage sensitive, so its capacitance (and hence the oscillator frequency) depends on the magnitude of the control voltage. Load resistors R258, R259, R260 and R261 of transistors Q212 and Q213 are connected in a balanced-bridge circuit. The constant voltage at the junction of R260 and R261 is used as a fixed bias voltage for variable-capacitance diode D101 when AFC switch S903 is set to OFF.

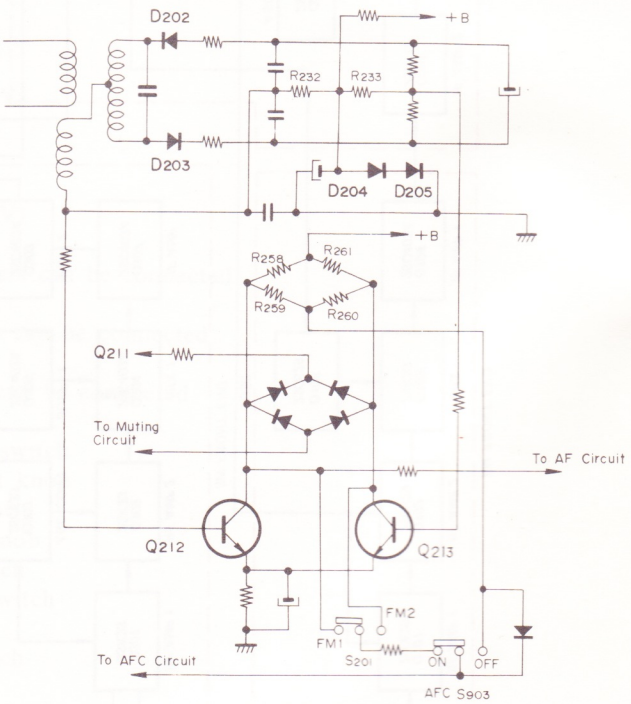


Fig. 1-2

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 Q207 through adjustable resistor R265 (Fig. 1-3). This allows Q207 to conduct lowering its collector voltage. Since the collector of Q207 is connected to the base of PNP transistor Q210, Q210 conducts when its base voltage decreases (with respect to ground), thereby causing transistor Q209 to conduct. The collector voltage of Q209 then drops to near ground potential. The voltage at the collector of Q209 is fed to the base of transistor Q405 through MUTING switch S904. Since this voltage is so low Q405 cannot conduct and complete the emitter circuit of transistor Q404. This prevents Q404 from amplifying the detector output.

When tuned to a signal, the opposite actions occur. I-f signal through capacitor C228 is rectified into negative d-c voltage by diodes D207 and D208. This voltage cuts off transistor Q207 and eventually turns on transistor Q405, thereby enabling transistor Q404 to amplify the detector output. The muting level can be adjusted by potentiometer R265. 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 Q212 and Q213 becomes large enough drops across resistors R254 and R255, thus lowering the base voltage of PNP transistor Q210 and results in its conduction. As before, the conduction of Q210 begins a chain of events which prevents Q404 from amplifying. If the tuning is shifted within range C of Fig. 1-4, the difference between the collector voltages of transistors Q212 and Q213 is so small that transistor Q211 is turned off within this range as well as in range A. Noise components caused by detuning, however, are coupled to transistor Q208 through capacitor C234 and resistor R249 from the detector output.

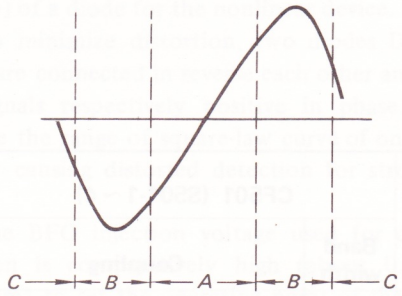


Fig. 1-4 Discriminator characteristic

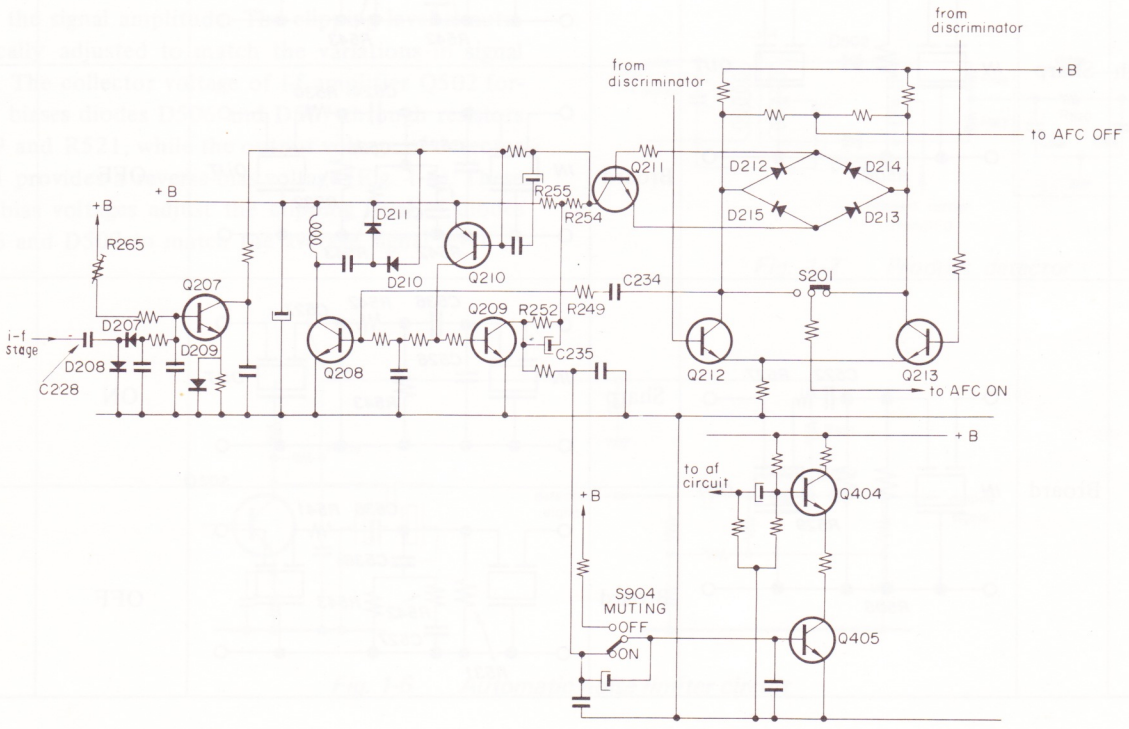


Fig. 1-3

The noise is amplified, rectified into negative d-c voltage by diodes D210 and D211, and applied to the base of transistor Q210 to turn it on. Since the base voltage of Q208 is controlled by the collector voltage of Q210, the amplification of transistor Q208 increases due to increased base bias, and transistor Q210 is held conducting quite reliably. As before, transistor Q404 cuts off the detector output.

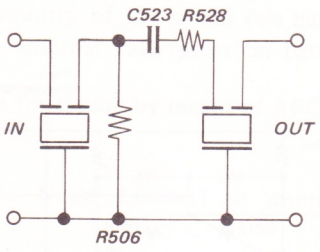
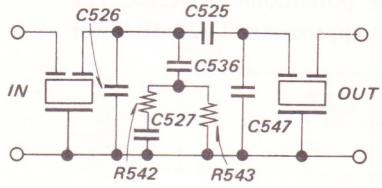
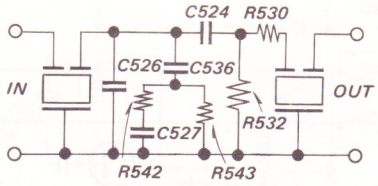
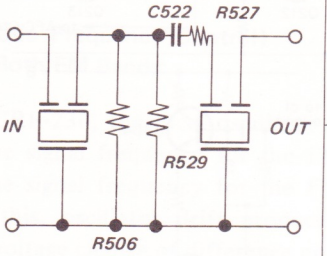
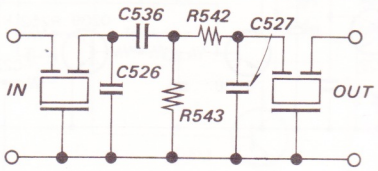
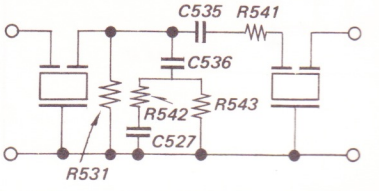
Positive feedback through resistor R252 and capacitor C235 from transistor Q210 aids in turning off Q209.

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. When bands SW2 through SW19 are selected, ceramic filter CF501 is automatically set to narrow bandwidth by switch S501. Similarly, when bands LW, MW or SW1 are selected, a wide bandwidth is automatically selected.

Ceramic filter CF502 can be manually set to narrow or wide bandwidth by switch S502. When set to SHARP, switch S502 also connects in the high-cut filter consisting of coil L507 and capacitors C537, C538 and C541.

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 at each of the four possible switch combinations are shown in Fig. 1-5.

Band setting	CF501 (S501-1 ~ 4)		CF502 (S502-1 ~ 4)		High-cut filter (S502-5, 6)	Overall response (Fig. 1-5)
	Band width	Coupling	Band width	Coupling		
SW2 through SW19	Sharp		Sharp		ON	A
			Broard		OFF	B
LW MW SW1	Broard		Sharp		ON	C
			Broard		OFF	D

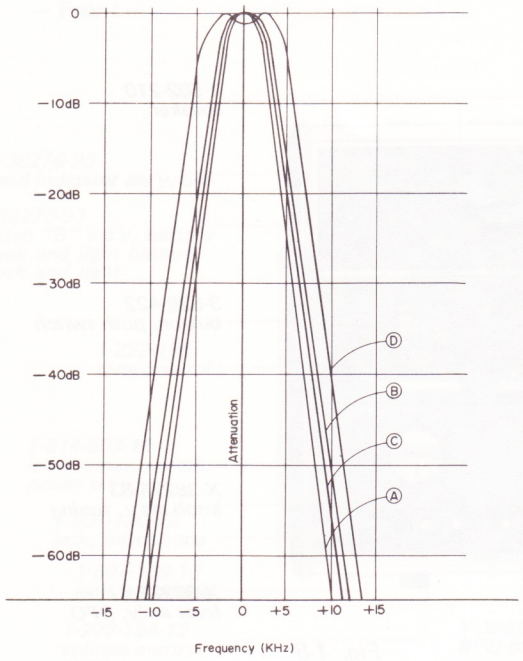


Fig. 1-5 Overall i-f response curve

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 D506 and D507 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 D506 and D507 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-230, the detector utilizes the square-low 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.

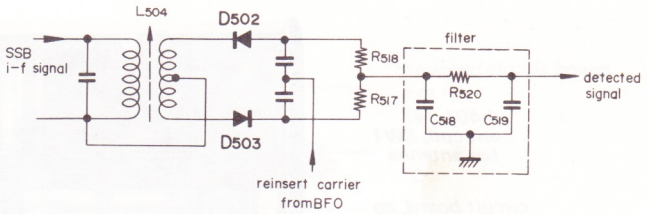


Fig. 1-7 Product detector

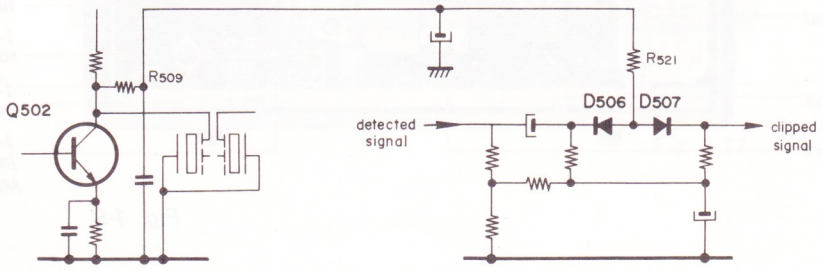


Fig. 1-6 Automatic noise limiter circuit

1-5. EXTERNAL VIEW

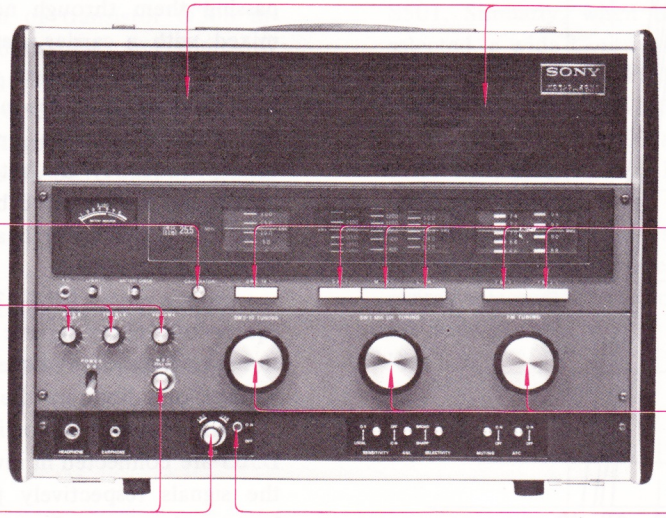


Fig. 1-8

1-6. INTERNAL VIEW

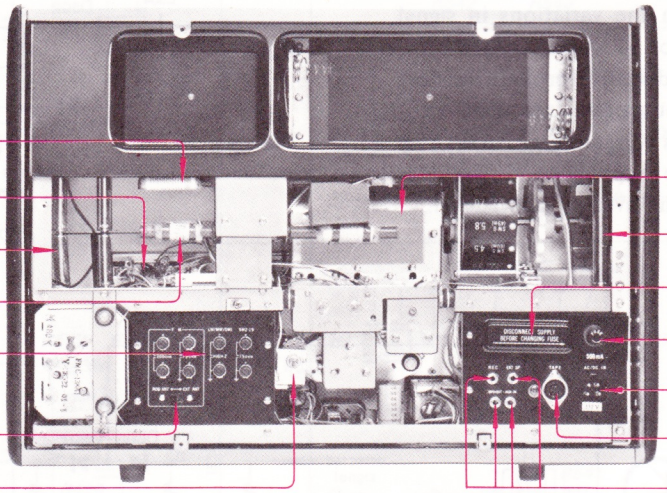


Fig. 1-9

1-7. CHASSIS VIEW

— Front —

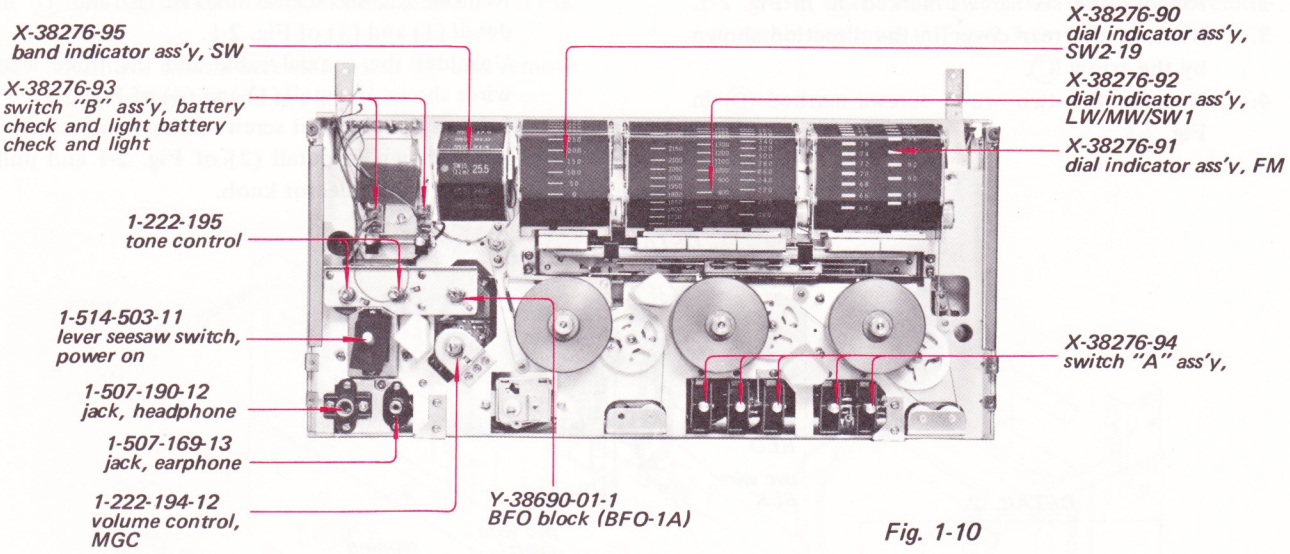


Fig. 1-10

— Bottom —

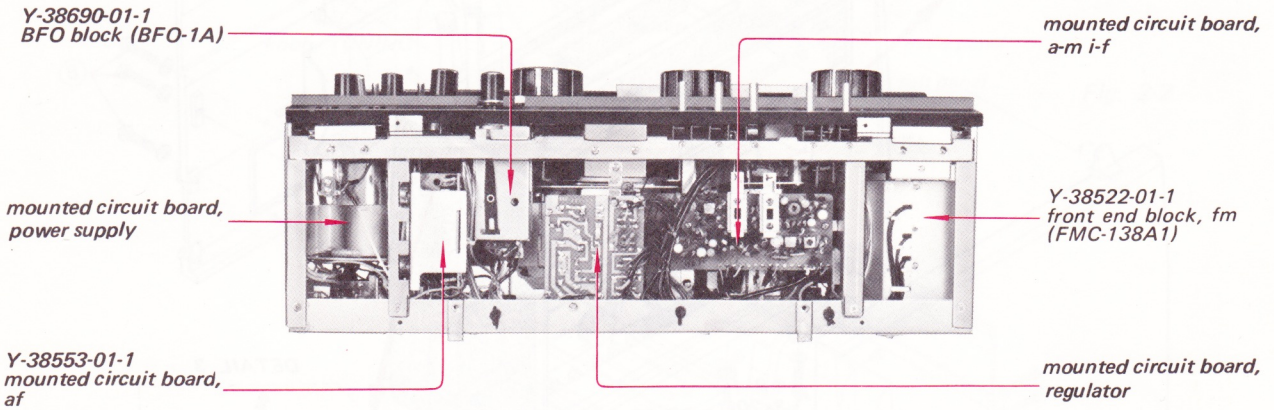


Fig. 1-11

SECTION 2
DISASSEMBLY

2-1. REAR COVER REMOVAL

1. Loosen the two rear-cover-holding screws marked Ⓐ in Fig. 2-1.
2. Remove the six screws marked Ⓑ in Fig. 2-1.
3. Remove the rear cover in the direction shown by the arrow Ⓒ.
4. 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 detail (1) and (3) of Fig. 2-1.
4. Unsolder the coaxial cable and the three lead wires shown in detail (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 out the band selector knob.

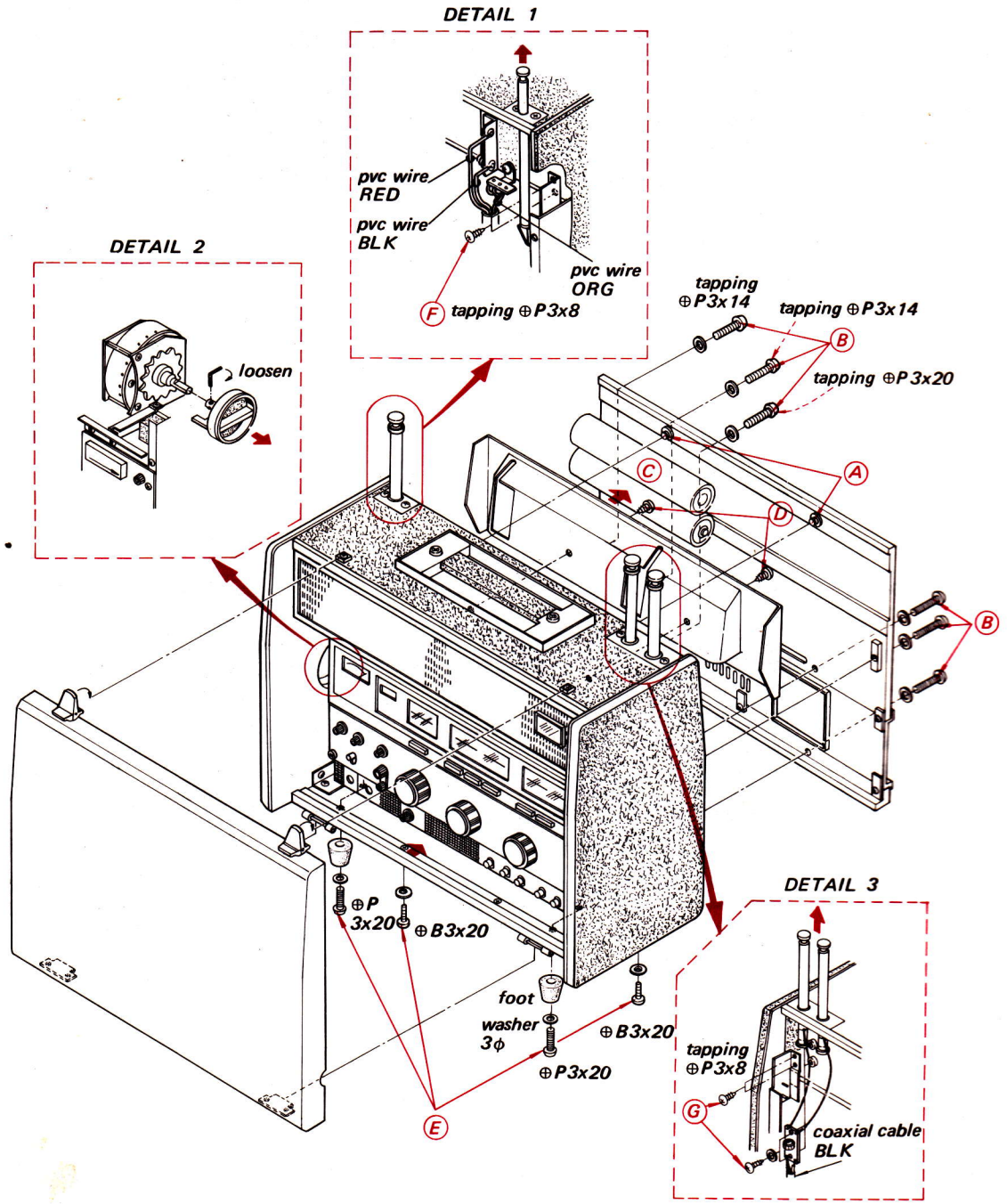


Fig. 2-1

2-3. FRONT PANEL REMOVAL

1. Remove the three TUNING knobs and the CALIBRATOR knob by loosening their set-screws.
2. Pull out the five control knobs marked ※ in Fig. 2-2.
3. Remove the six screws marked (H) 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 (I) in Fig. 2-3.
3. Now, baffle board and two speakers are removable as shown in Fig. 2-3.

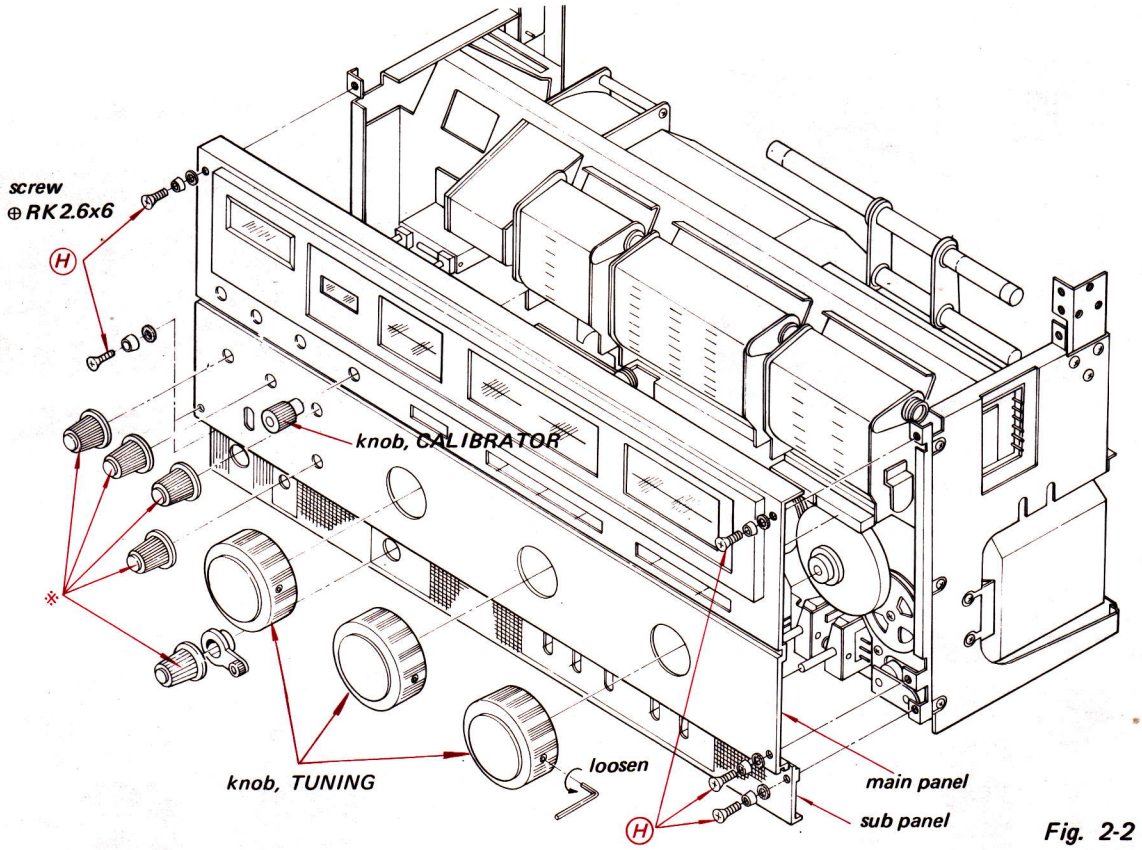


Fig. 2-2

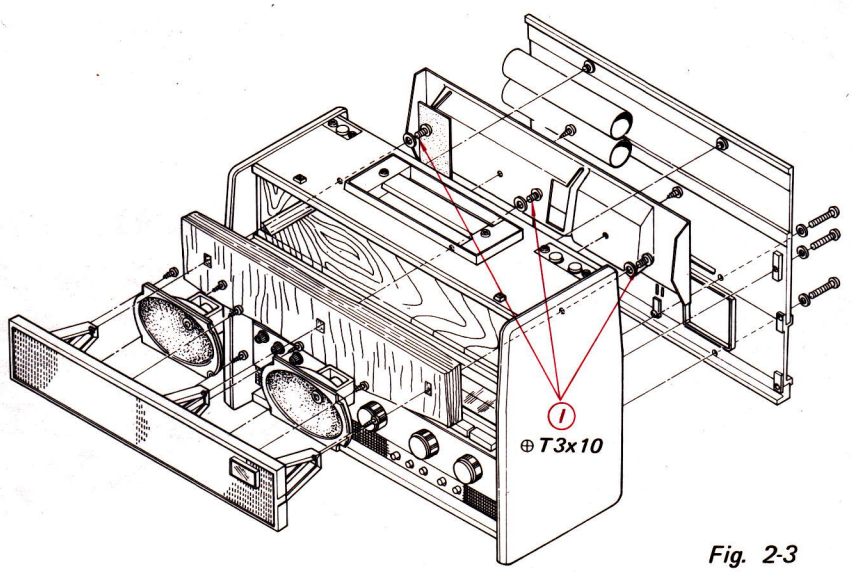


Fig. 2-3

2-5. FM FRONT END BLOCK REMOVAL

1. Remove the four screws shown in Fig. 2-4.
2. Unsolder the two pvc wires shown in Fig. 2-4.
3. Remove the three shield wire (①, ② and ⑤) shown in Fig. 2-5.
4. Remove the FM1/FM2 selector lever as shown in Fig. 2-6.
5. Remove the fm front end block in the direction shown by the arrow.

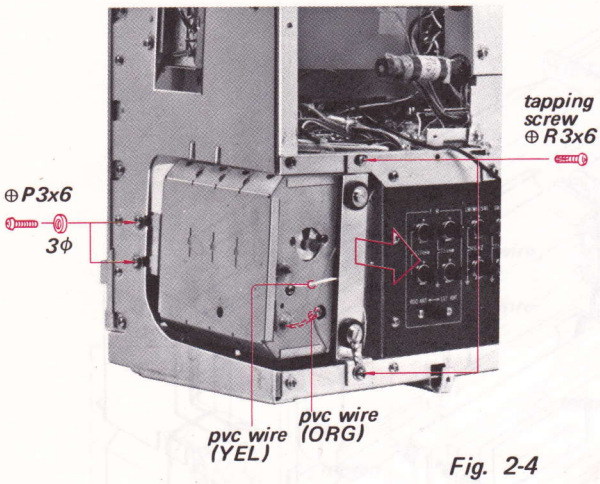


Fig. 2-4

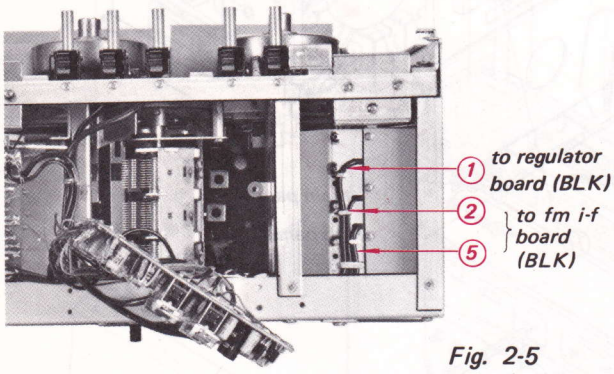


Fig. 2-5

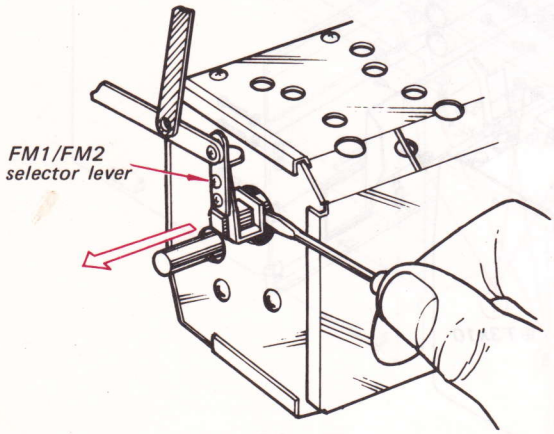


Fig. 2-6

2-6. AM IF CIRCUIT BOARD REMOVAL

1. Remove the two screws shown in Fig. 2-7.
2. Loosen the screw marked ※ in Fig. 2-8 and remove the selectivity switch connector from the selectivity switch retaining plate.
3. Remove the circuit board as shown in Fig. 2-9.

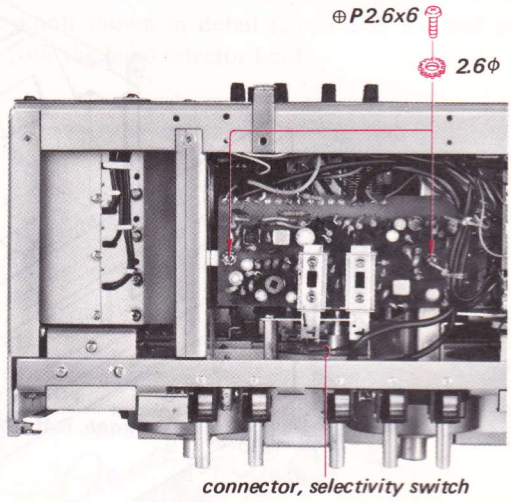


Fig. 2-7

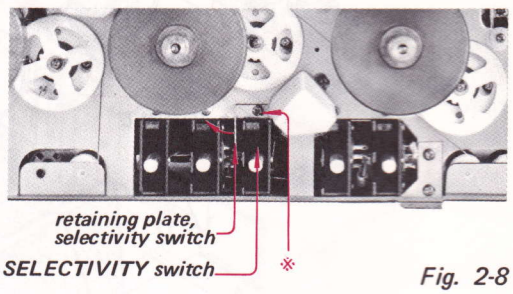


Fig. 2-8

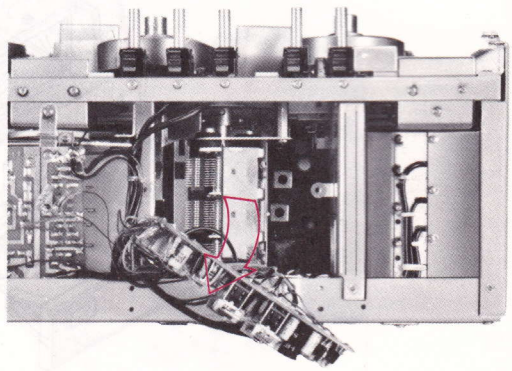


Fig. 2-9

2-7. FM IF BLOCK REMOVAL

1. Remove the four screws shown in Fig. 2-10.
2. Remove the screw shown in Fig. 2-11 and remove the fm i-f block in the direction shown by the arrow.

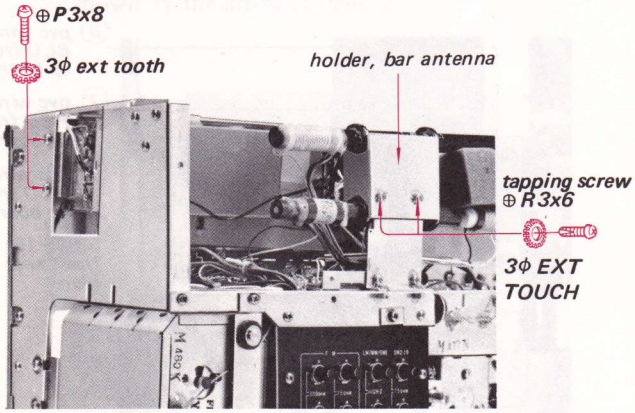


Fig. 2-10

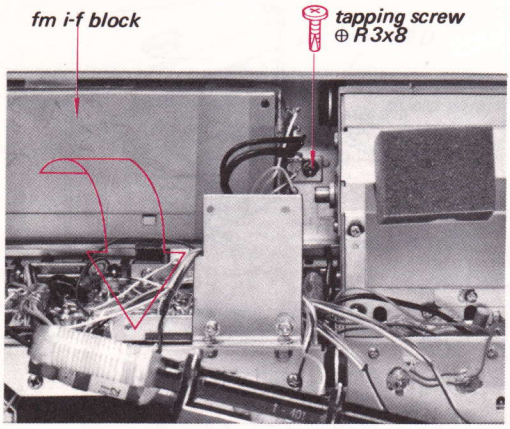


Fig. 2-11

3. Unsolder all the wires shown in Fig. 2-12 and Fig. 2-13.
   Note: When replacing the circuit board, remove the three screws shown in Fig. 2-14 and unsolder all the wires.

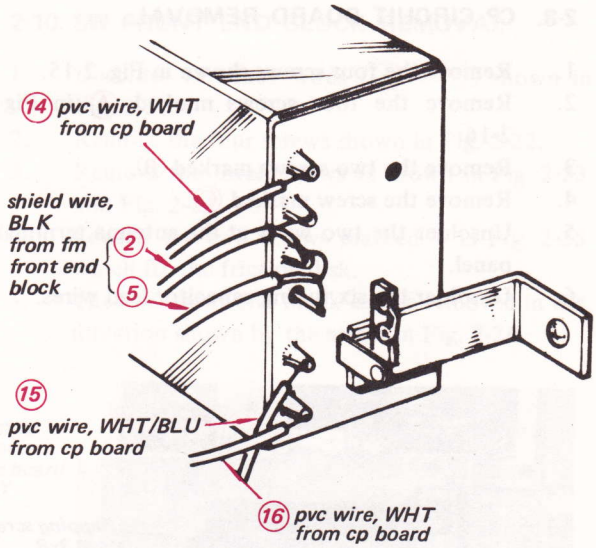


Fig. 2-12

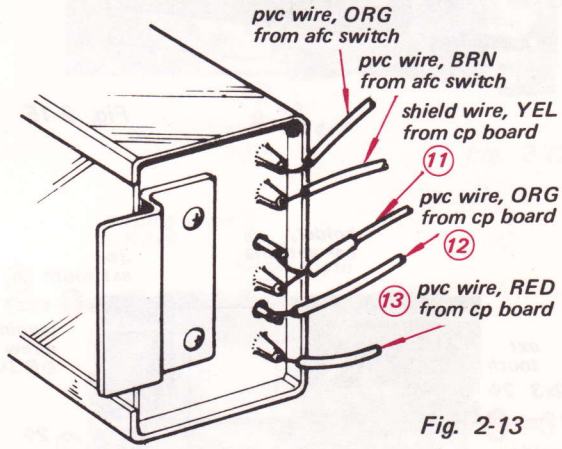


Fig. 2-13

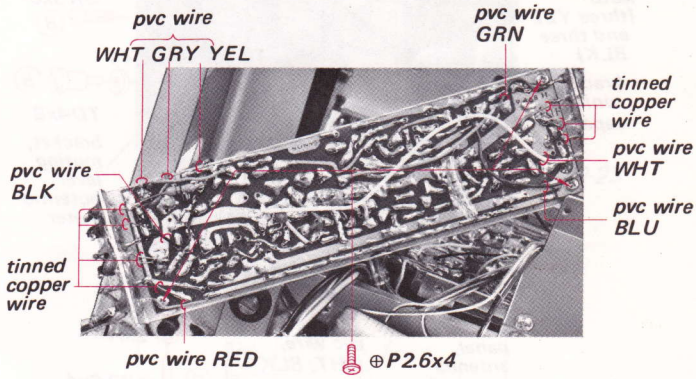


Fig. 2-14

2-8. CP CIRCUIT BOARD REMOVAL

1. Remove the four screws shown in Fig. 2-15.
2. Remove the four screws marked Ⓐ in Fig 2-16.
3. Remove the two screws marked Ⓑ.
4. Remove the screw marked Ⓒ.
5. Unsolder the two wires at the antenna terminal panel.
6. Unsolder the six tuning capacitor lead wires.
7. Unsolder the three wires (⑥ ⑦ ⑧) which come from the sw front end as shown in Fig. 2-17.
8. Unsolder all the wires shown in Fig. 2-18.
9. Remove the circuit board in the direction shown by the arrow in Fig. 2-16.

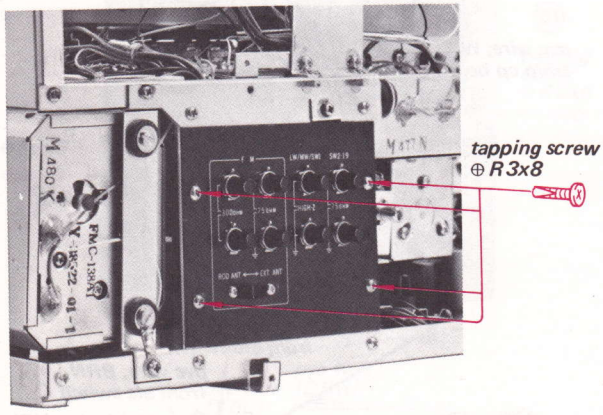


Fig. 2-15

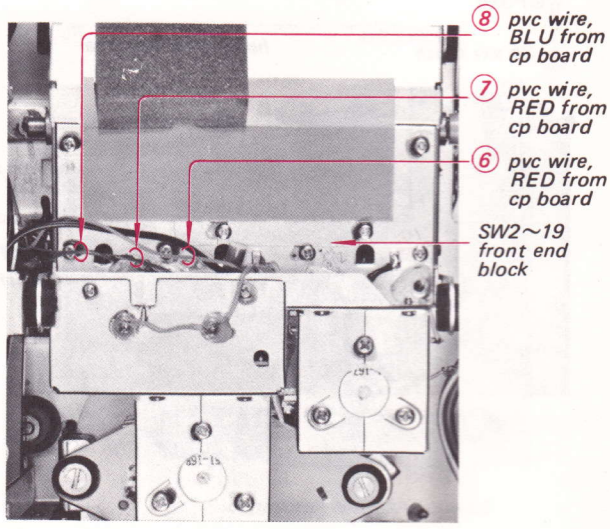


Fig. 2-17

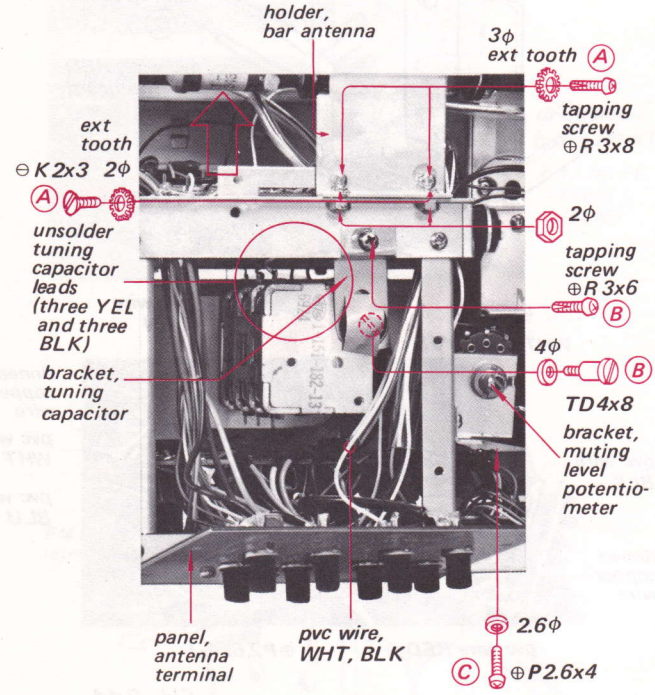


Fig. 2-16

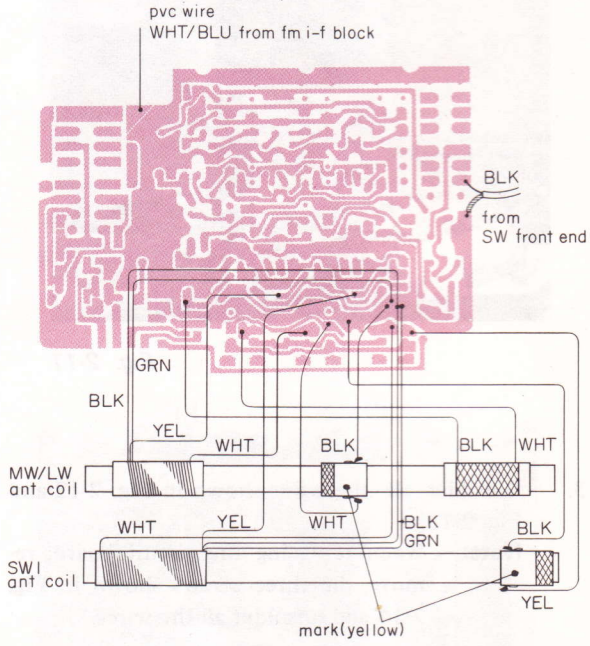


Fig. 2-18

2-9. BFO BLOCK REMOVAL

1. Remove the two screws shown in Fig. 2-19 and push the bfo block backward.
2. Unsolder the five wires shown in Fig. 2-20.
3. Remove the two screws and straighten the two tabs shown in Fig. 2-21.
4. Take out the shield cover in the direction shown by the arrow ① and ②

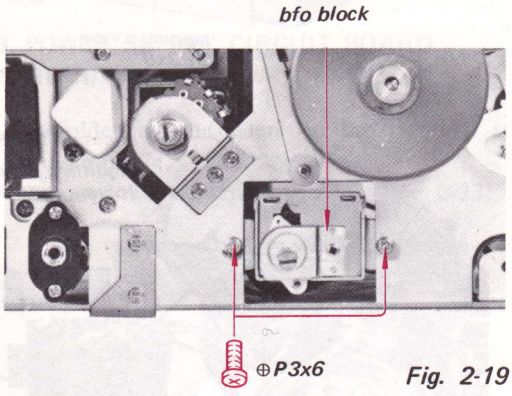


Fig. 2-19

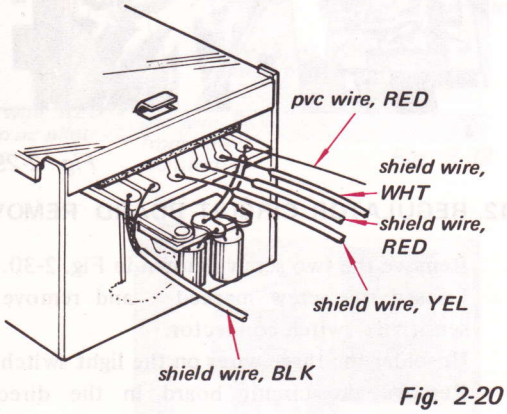


Fig. 2-20

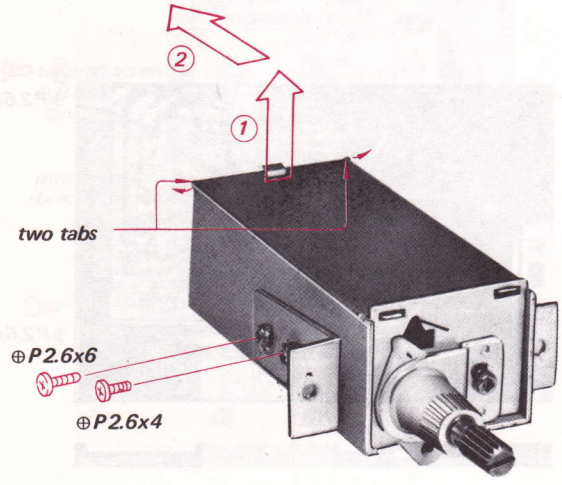


Fig. 2-21

2-10. SW FRONT END BLOCK REMOVAL

1. Unsolder the four wires (⑥ ~ ⑨) shown in Fig. 2-22.
2. Remove the four screws shown in Fig. 2-22.
3. Remove the three screws as shown in Fig. 2-23 and Fig. 2-24.
4. Loosen the two screws marked ※ in Fig. 2-25 which fix the friction disk.
5. Then sw front end block can be removed in the direction shown by the arrow in Fig. 2-26.

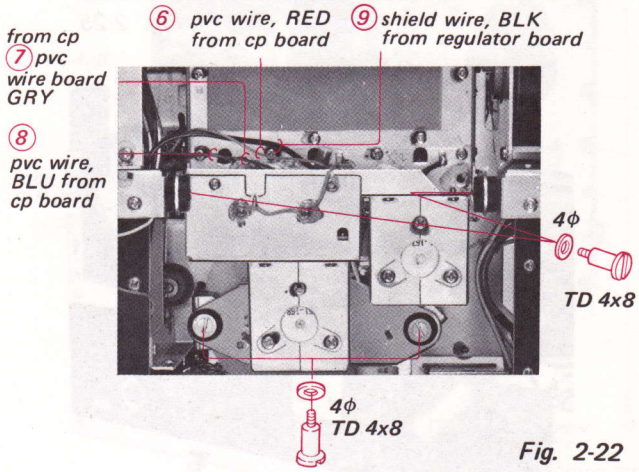


Fig. 2-22

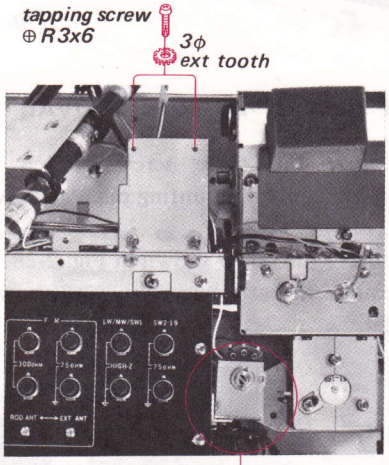


Fig. 2-23

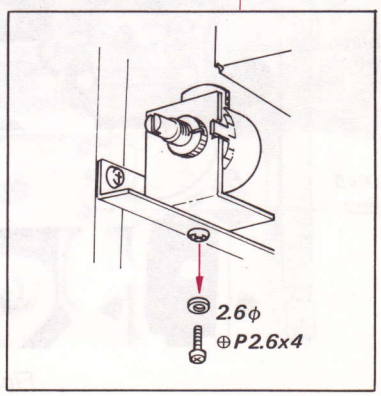


Fig. 2-24

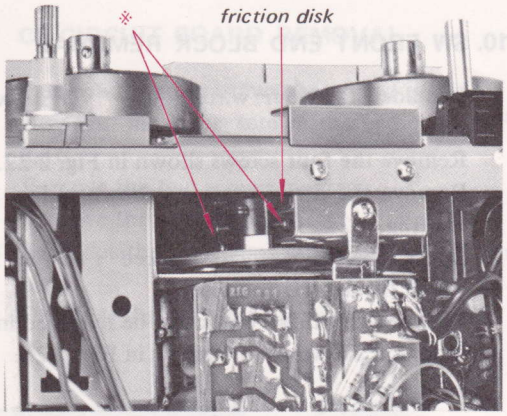


Fig. 2-25

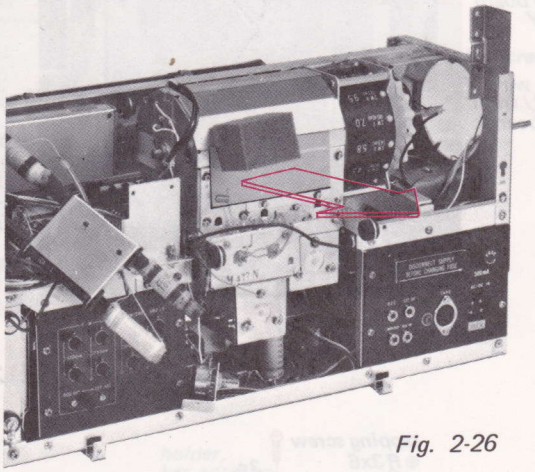


Fig. 2-26

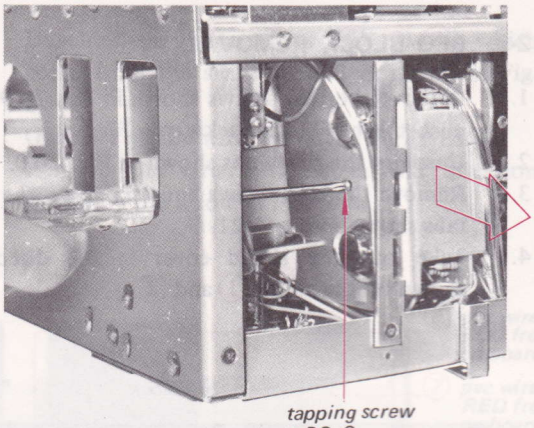


Fig. 2-28

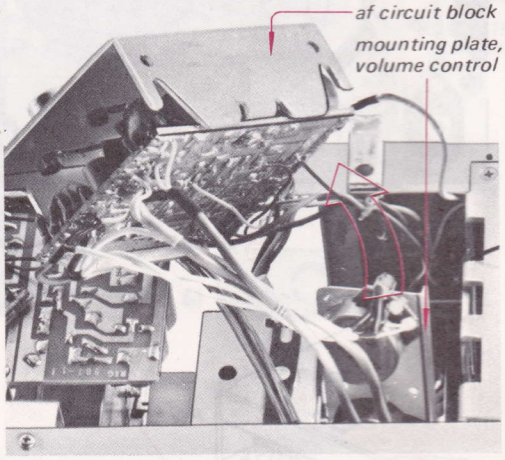


Fig. 2-29

2-11. AF CIRCUIT BOARD REMOVAL

1. Remove the three screws which hold the volume control mounting plate as shown in Fig. 2-27.
2. Remove the screw shown in Fig. 2-28.
3. Remove the af circuit board as shown in Fig. 2-29.

2-12. REGULATOR CIRCUIT BOARD REMOVAL

1. Remove the two screws shown in Fig. 2-30.
2. Loosen the screw marked ※ and remove the sensitivity switch connector.
3. Unsolder the three wires on the light switch.
4. Remove the circuit board in the direction shown by the arrow in Fig. 2-30.

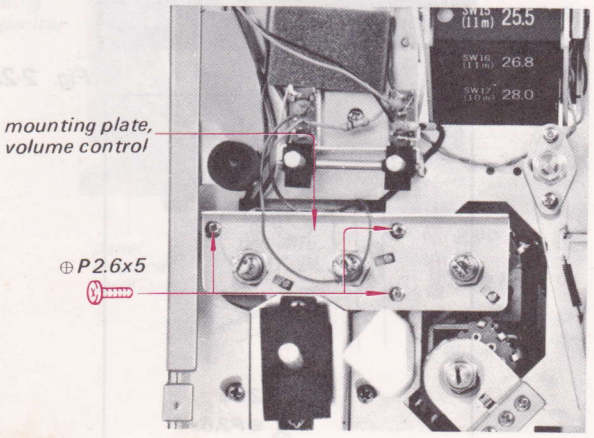


Fig. 2-27

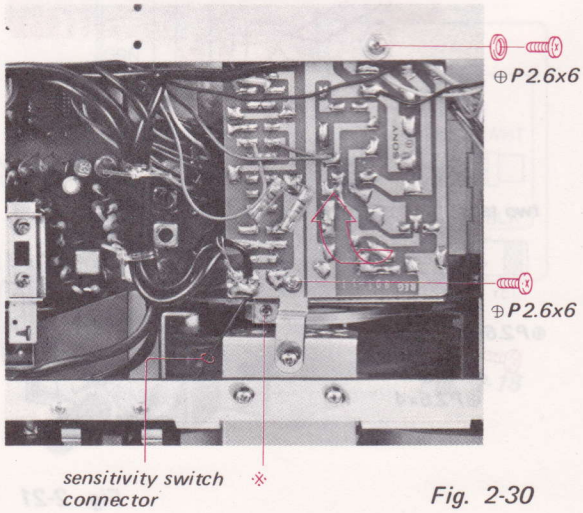


Fig. 2-30

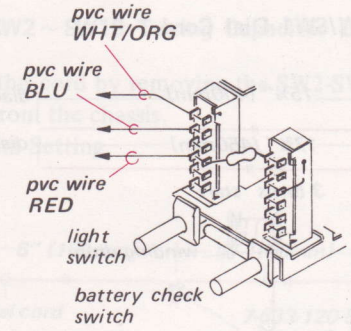


Fig. 2-31

2-13. POWER SUPPLY CIRCUIT BOARD REMOVAL

1. Unsolder all the wiers on the terminal strip shown in Fig. 2-32.
2. Remove the two screws shown in Fig. 2-33.

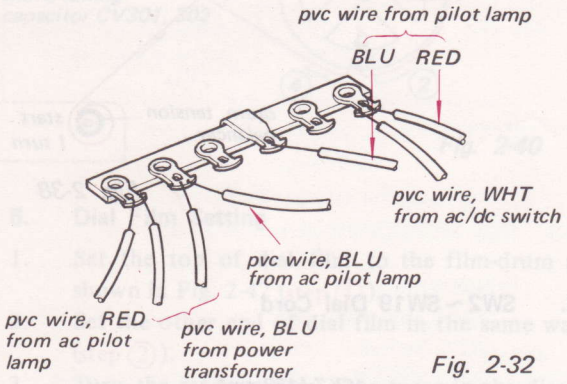


Fig. 2-32

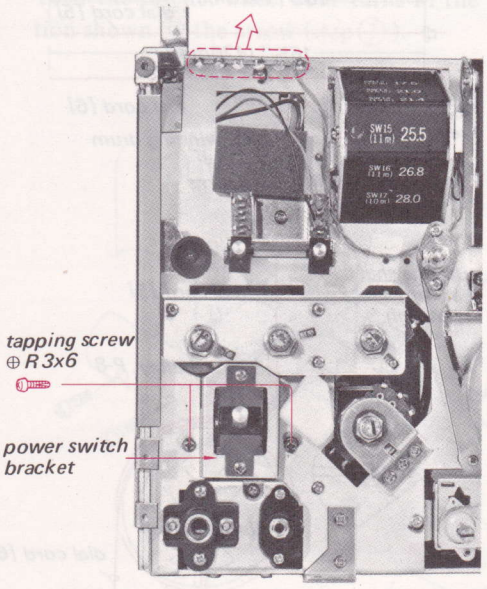


Fig. 2-33

3. Remove the eighteen screws shown in Fig. 2-34.
4. Remove the four jack nuts.
5. Remove the power supply circuit board as shown in Fig. 2-34.

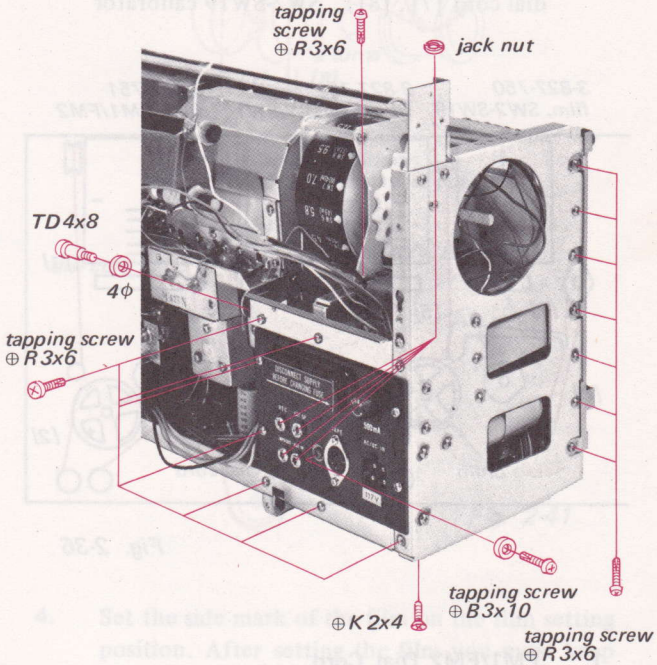


Fig. 2-34

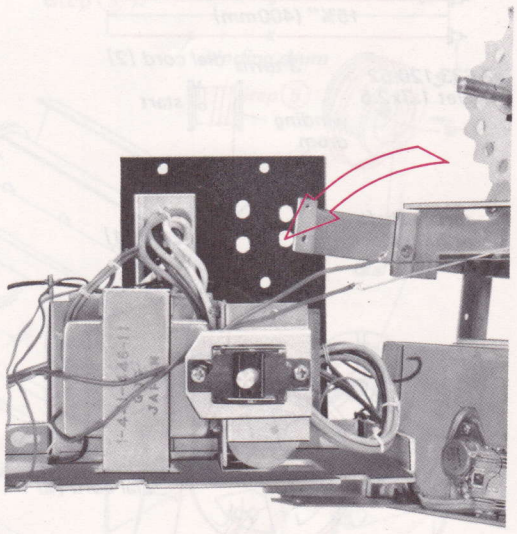


Fig. 2-35

2-14. DIAL CORD STRINGING

Dial cord and dial film is shown in Fig. 2-36.

dial cord Part No. 7-633-120-52
dial cord [1], [2]: FM1/FM2
dial cord [3], [4]: MW/LW/SW1
dial cord [5], [6]: SW2-SW19
dial cord [7], [8]: SW2-SW19 calibrator

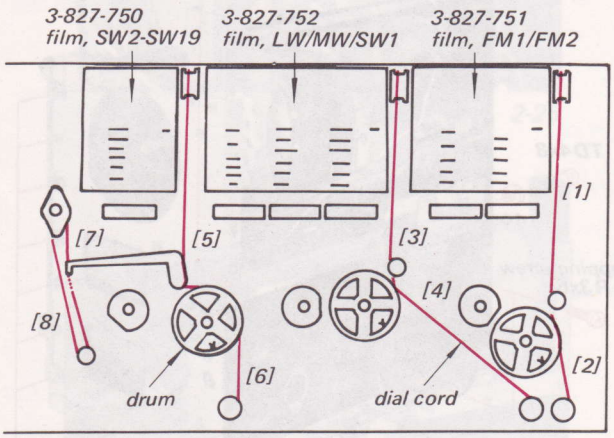


Fig. 2-36

1. FM1/FM2 Dial Cord

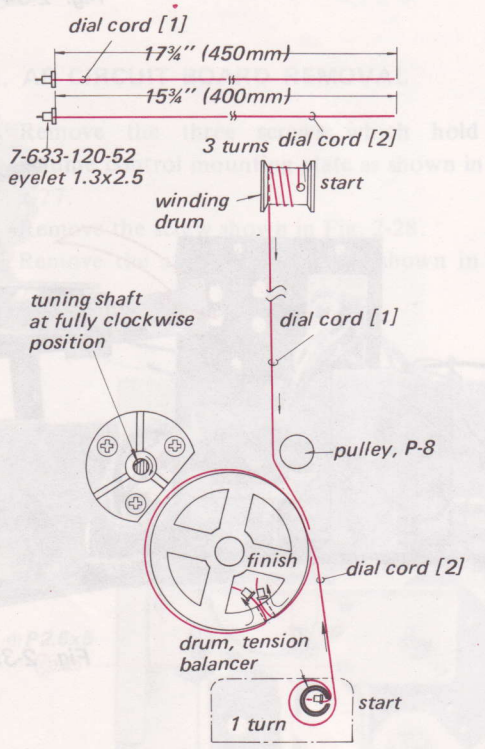


Fig. 2-37

2. MW/LW/SW1 Dial Cord

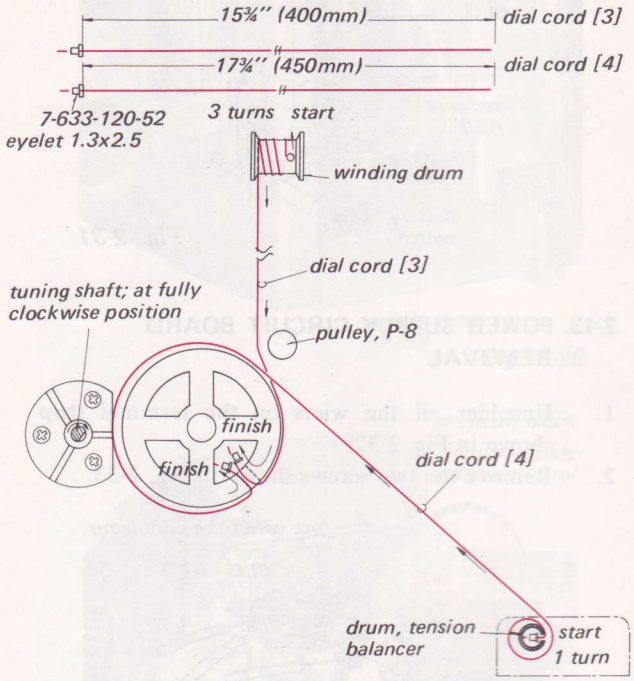


Fig. 2-38

3. SW2 ~ SW19 Dial Cord

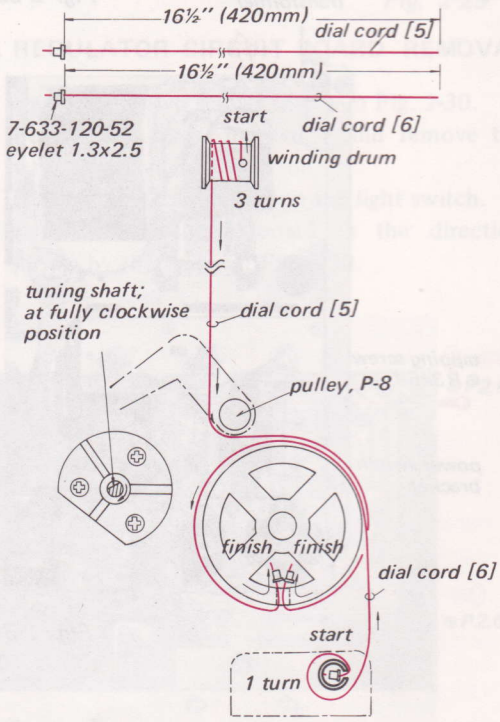


Fig. 2-39

4. SW2 ~ SW19 Tuning Capacitor Driving Cord

String the cord by removing the SW2-SW19 front end block from the chassis.
Dial Film Setting

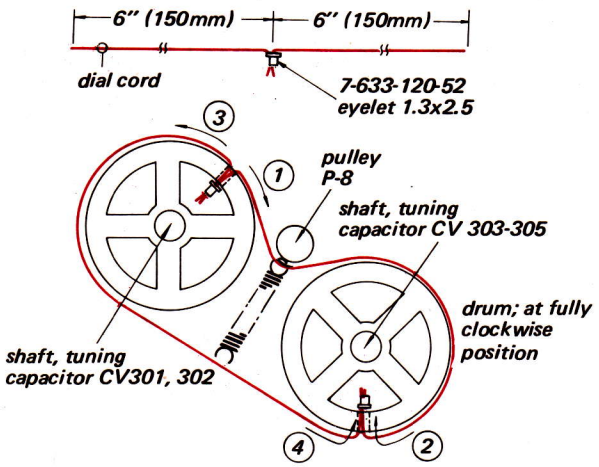


Fig. 2-40

5. SW2 ~ SW19 Calibrator Dial Cord

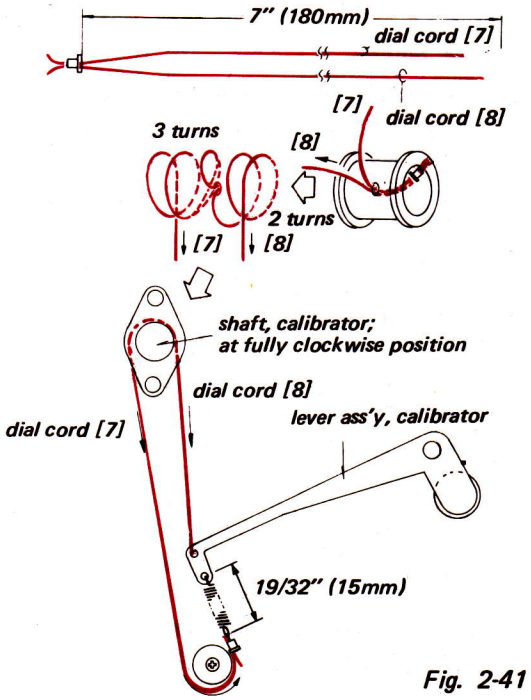


Fig. 2-41

6. Dial Film Setting

1. Set the top of dial film to the film-drum as shown in Fig. 2-42 (step ①).
2. Set the other end of dial film in the same way (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. 2-42 (step ⑤).

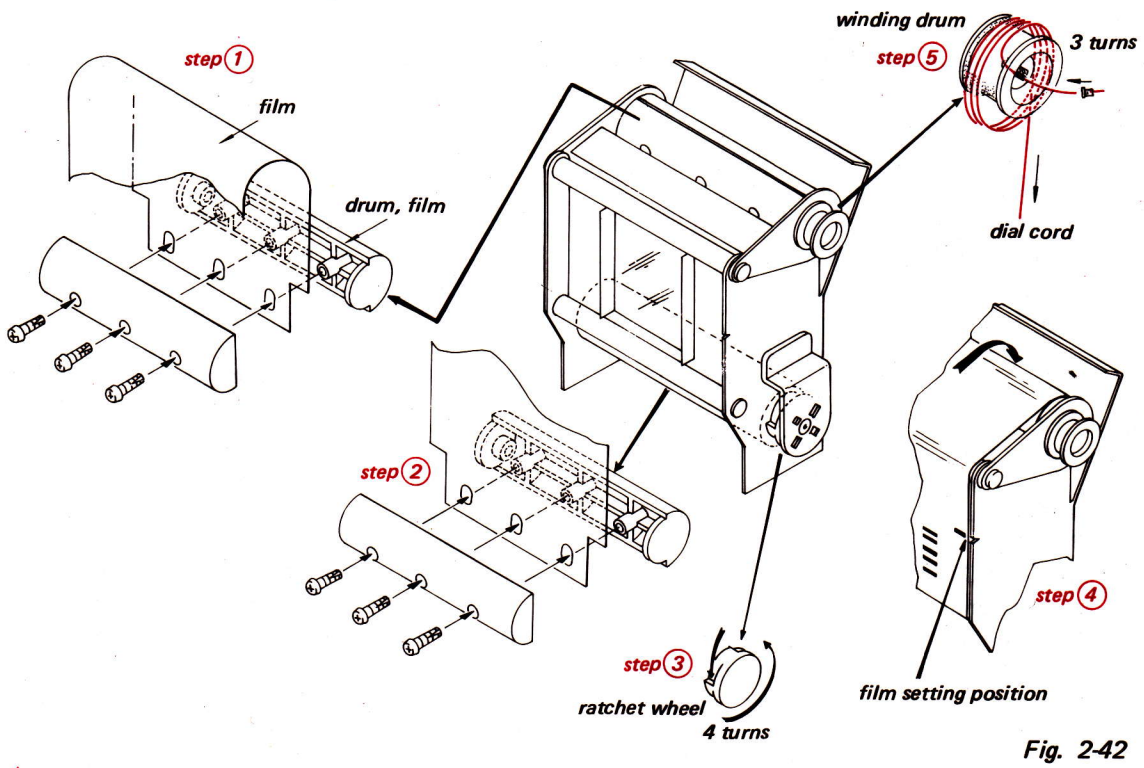


Fig. 2-42

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

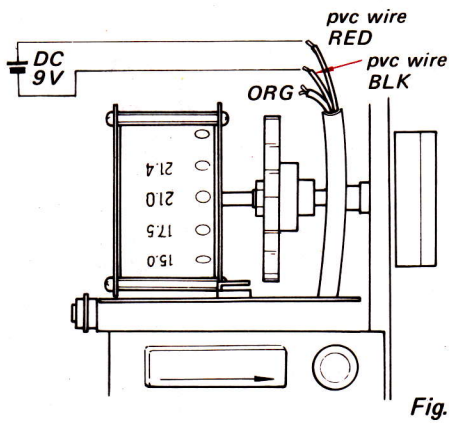


Fig. 3-1

3-2. AM IF 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

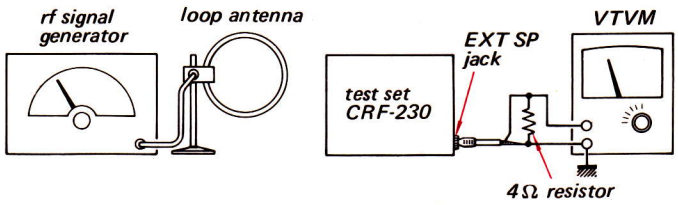


Fig. 3-2 A-m i-f alignment setup

Rf Signal Generator Frequency	Adjust	Remarks
455 kHz	IFT A401 IFT A501 IFT A502 IFT A504	Adjust for maximum meter reading on VTVM.

3-3. SSB DETECTOR ADJUSTMENT

Preparation:

Band Selector: MW
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.

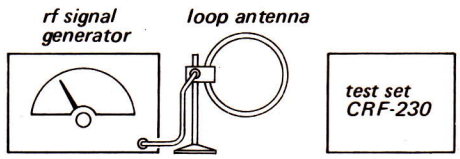


Fig. 3-3 Ssb detector adjustment setup

Rf Signal Generator Frequency	Adjust	Remarks
455 kHz unmodulated signal	BFO osc coil L 801	Adjust for zero beat hearing

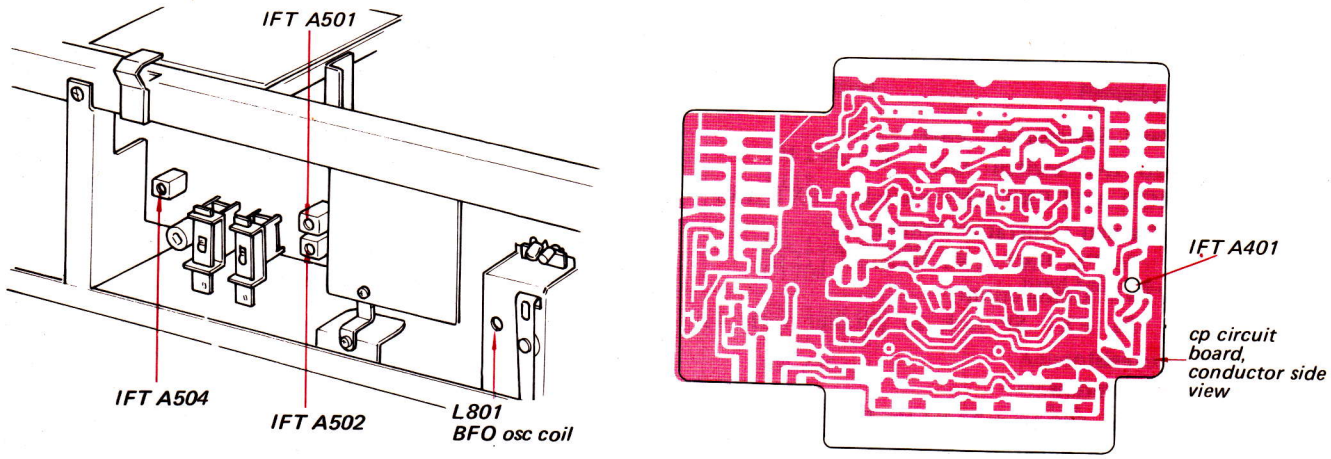


Fig. 3-4 Adjusting parts location

3-4. FM IF ALIGNMENT

Preparation:

Band Selector: FM1 or FM2
Sweep/Marker Generator Connection:
Across the hermetic terminal HT 201
Oscilloscope Connection:
Across the hermetic terminal HT 203
Sweep Generator Center Frequency:
10.7 MHz
Marker Generator Center Frequency:
10.7 MHz

Procedure:

1. Turn the core of discriminator transformer (IFT 204) fully counterclockwise.
2. Turn the core of fm i-f transformer (IFT201-IFT203) to obtain the maximum amplitude response curve.
3. Turn the core of discriminator (IFT 204) to obtain the "S" curve.

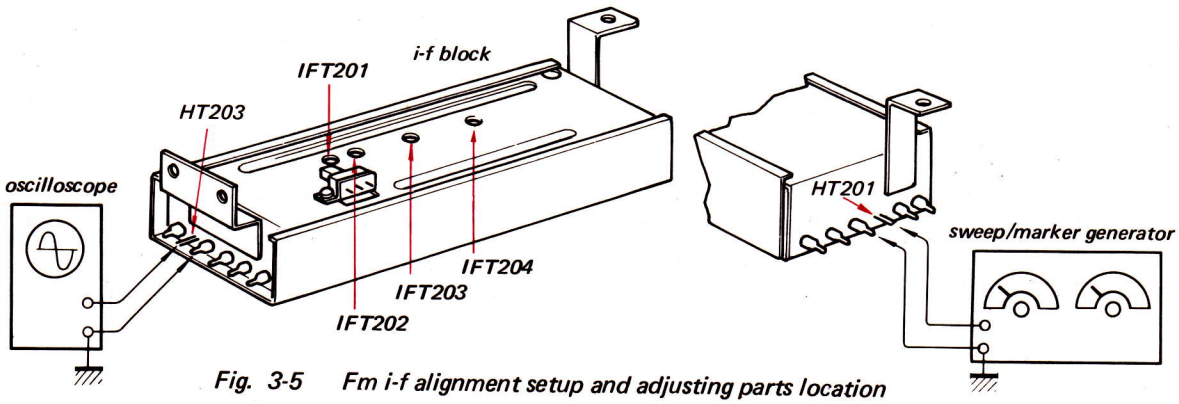


Fig. 3-5 Fm i-f alignment setup and adjusting parts location

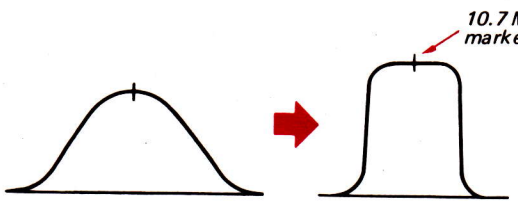


Fig. 3-6 Response curve

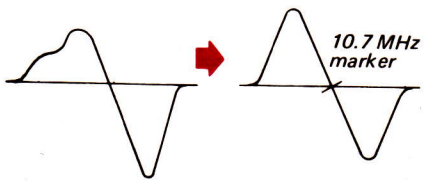


Fig. 3-7 "S" curve

Sweep Generator Connection	Sweep Generator Frequency	Oscilloscope Connection	Adjust	Remarks
Hermetic terminal HT 201	10.7 MHz	Hermetic terminal HT 203	IFT201 IFT202 IFT203 IFT204	Adjust for maximum amplitude with "S" curve.

3-5. MUTING LEVEL SETTING

Preparation:

Band Selector: FM1
MUTING Switch: ON
ROD ANT-EXT ANT Switch: EXT ANT
Rf signal Generator Connection:
To FM EXT ANT terminal (75 Ω)
VTVM Connection:
To EXT SP jack in parallel with 4 Ω resistor
Modulation:
Fm 400-Hz ± 22.5-kHz frequency-modulated signal

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

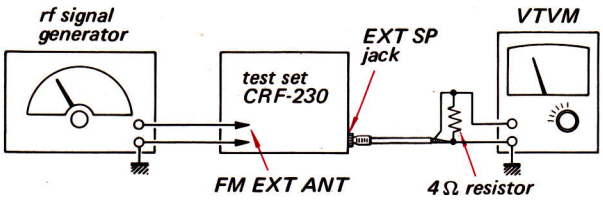


Fig. 3-8 Muting level setting setup

Procedure:

1. Turn the muting level potentiometer R265 fully counterclockwise.
2. Gradually turn R265 clockwise and set it at the position that the VTVM shows 0 V.

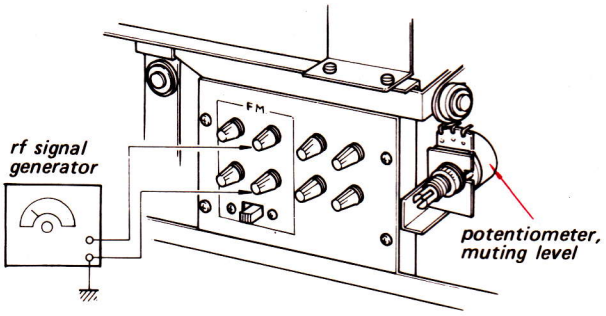


Fig. 3-9 Rf signal generator connection and muting level potentiometer

Rf Signal Generator Frequency	Receiver Dial Setting	Adjust
77.5 MHz	Tune to 77.5 MHz signal	Muting level potentiometer R265

3-6. FM1/FM2 FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Preparation:

ROD ANT-EXT ANT Switch: EXT ANT
Rf Signal Generator Coupling:
Direct connection across FM EXT ANT terminal (75 Ω)
Rf Signal Modulation:
400-Hz ± 22.5-kHz frequency-modulated signal
VTVM Connection:
To EXT SP jack in parallel with 4 Ω resistor

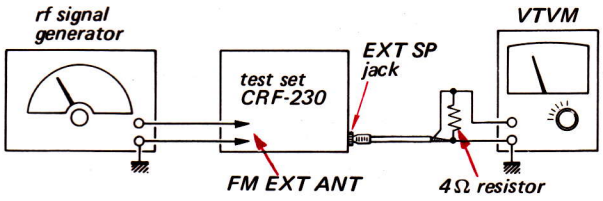


Fig. 3-10 FM1/FM2 frequency coverage and tracking adjustment setup

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
FM 1 Frequency Coverage	63 MHz	Fully counter-clockwise	FM 1 osc coil L110	Adjust for maximum meter reading on VTVM. Band Selector: FM 1
	91.5 MHz	Fully clockwise	FM 1 osc trimmer CT107	
FM 1 Tracking	67 MHz	Tune to 67 MHz signal	FM 1 ant coil L101, L102, FM 1 rf coil L106	
	90 MHz	Tune to 90 MHz signal	FM 1 ant trimmer CT101, CT102, FM 1 rf trimmer CT105	

Adjusting Item	Rf Signal Generator Frequency	Receiver Tuning Knob Setting	Adjust	Remarks
FM 2 Frequency Coverage	86 MHz	Fully counter-clockwise	FM 2 osc coil L111	Band Selector: FM 2 Adjust for maximum meter reading on VTVM.
	109.5 MHz	Fully clockwise	FM 2 osc trimmer CT108	
FM 2 Tracking	86 MHz	Tune to 86 MHz signal	FM 2 ant coil L103, L105, FM 2 rf coil L107	
	109.5 MHz	Tune to 109.5 MHz signal	FM 2 ant trimmer CT103, CT104, FM 2 rf trimmer CT106	

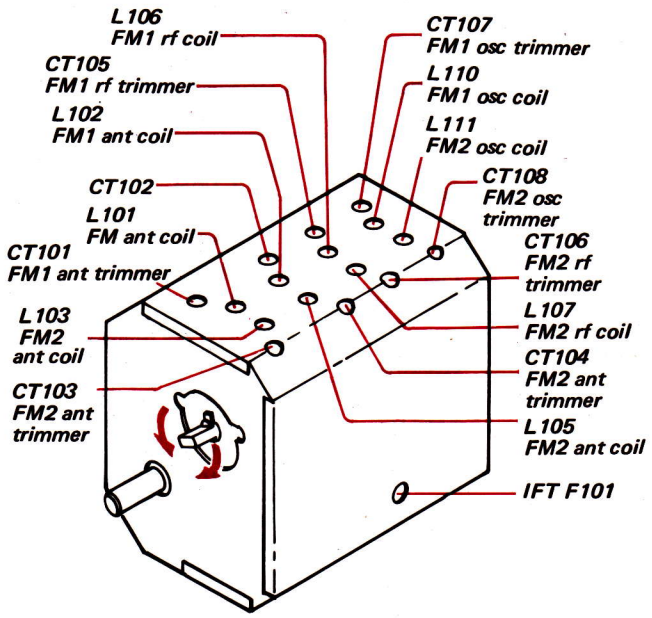


Fig. 3-11 Adjusting parts location

Note: IFT F101 (shown in Fig. 3-11) is to be adjusted for i-f alignment. Adjust IFT F101 for maximum meter reading on VTVM with the same setup of frequency coverage and tracking adjustment.

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

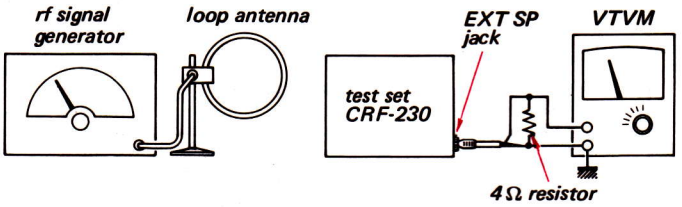


Fig. 3-12 LW/MW/SW1 frequency coverage and tracking adjustment setup

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 CT429	
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 CT404, LW rf trimmer CT417	
MW Frequency Coverage	520 kHz	Fully counterclockwise	MW osc coil L408	Band Selector: MW
	1,680 kHz	Fully clockwise	MW osc trimmer CT426	
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 CT403, MW rf trimmer CT416	
SW1 Frequency Coverage	1,550 kHz	Fully counterclockwise	SW1 osc coil L407	Band Selector: SW1
	2,250 kHz	Fully clockwise	SW1 osc trimmer CT423	
SW1 Tracking	1,600 kHz	Tune to 1,600 kHz signal	SW1 ant coil L401, SW1 rf coil L404	Adjust for maximum meter reading on VTVM.
	2,200 kHz	Tune to 2,200 kHz signal	SW1 ant trimmer CT402, SW1 rf trimmer CT415	

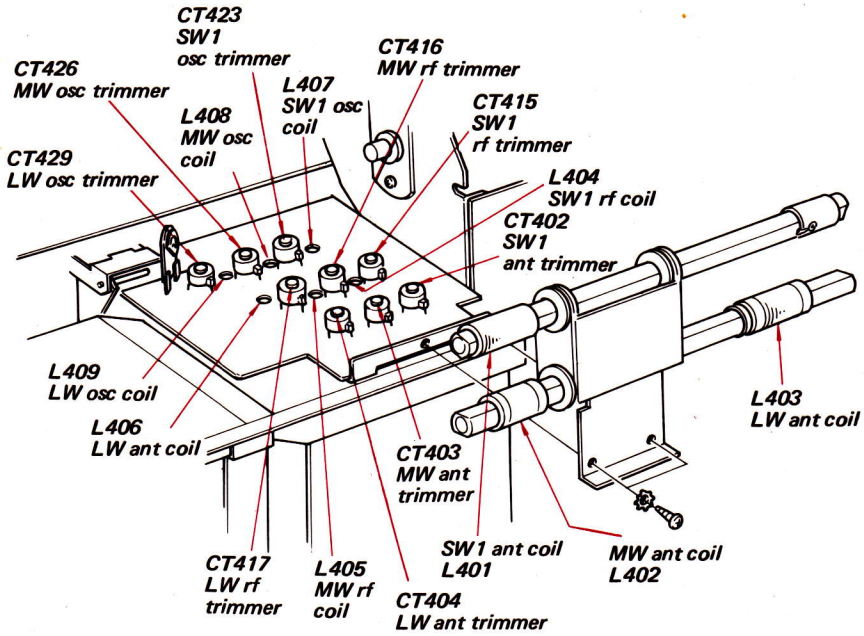


Fig. 3-13 Adjusting parts location

3-8. SW2-SW19 1st IF 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

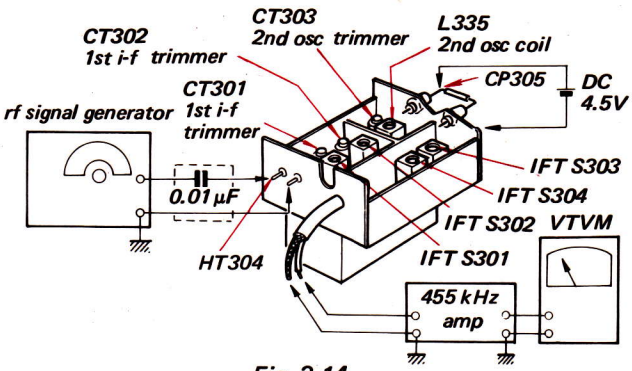


Fig. 3-14

Adjustment Item	Rf Signal Generator Frequency	Adjust	Remarks
Frequency Coverage	1.6 MHz	2nd osc coil L355	Adjust for maximum meter reading.
	2.2 MHz	2nd osc trimmer CT303	
Tracking	1.6 MHz	IFT S301 IFT S302	- ditto -
	2.2 MHz	CT301 CT302	
I-f Alignment	1.6 MHz ~ 2.2 MHz	IFT S303 IFT S304	- 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 antenna terminal SW2 ~ 19

VTVM Connection:

To EXT SP jack in parallel with 4Ω load resistor

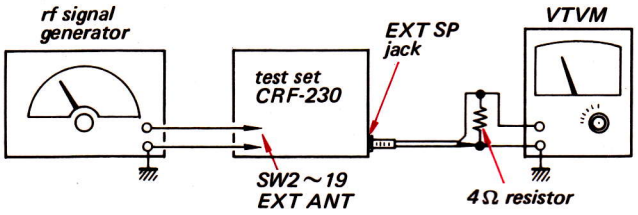


Fig. 3-15 SW2 ~ SW19 frequency coverage and tracking adjustment setup

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 L313	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 L314	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 L315	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 L316	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 L317	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 L318	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 L319	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 L320	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 L321	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 L322	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 L323	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 L324	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 L325	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 L326	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 L327	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 L328	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 L329	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 L330	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.

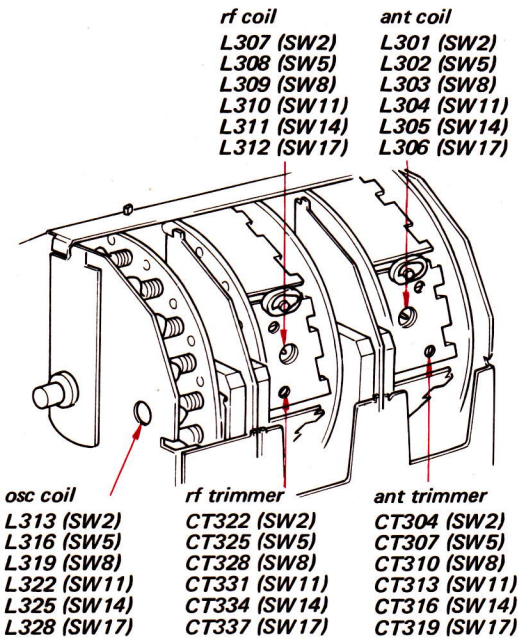


Fig. 3-16 Adjusting parts location for SW2, SW5, SW8, SW11, SW14 and SW17

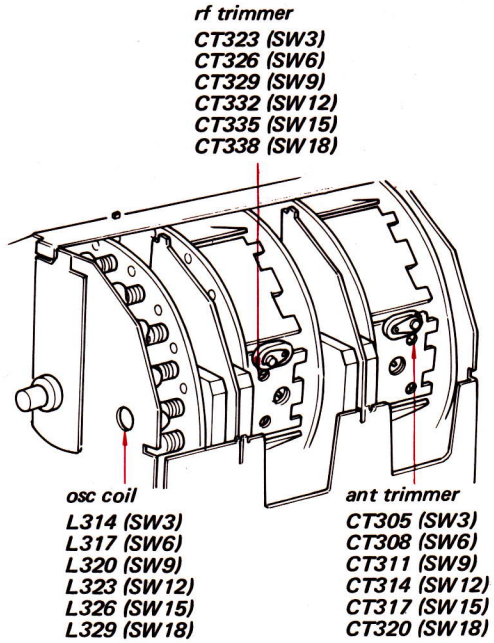


Fig. 3-17 Adjusting parts location for SW3, SW6,SW9, SW12, SW15 and SW18

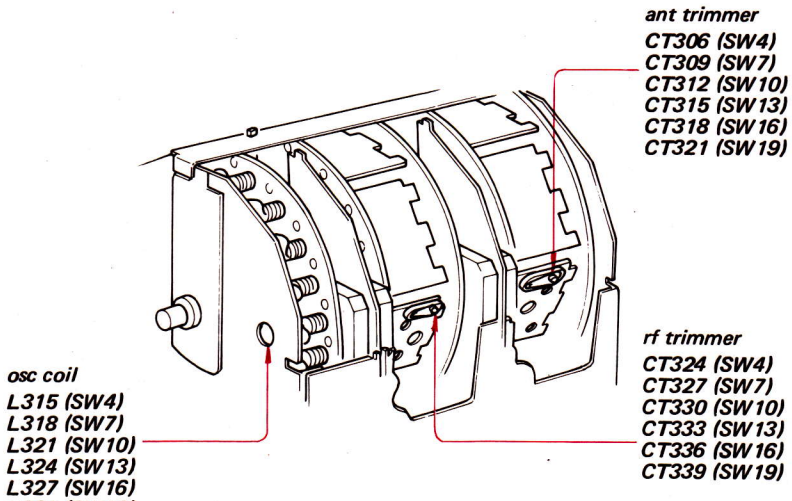


Fig. 3-18 Adjusting parts location for SW4, SW7, SW10, SW13, SW16 and SW19

3-10. VOLTAGE AND CURRENT ADJUSTMENT

A. Emitter Voltage of Q202

1. Band Selector: FM
2. R207 is to be selected to obtain 0.35 ± 0.01V at the emitter of Q202.

R207	1-244-706-	24kΩ
	1-244-707-	27kΩ
	1-244-708-	30kΩ
	1-244-709-	33kΩ
	1-244-710-	36kΩ

B. FM AGC Current

1. Band Selector: FM
2. Connect a 2kΩ-carbon resistor to the collector of Q206 as shown in Fig. 3-18 and Fig. 3-19.
3. Select the resistance value of R238 to obtain 4 ± 0.1V across the 2kΩ-carbon resistor. Then fm agc current may be adjusted at 2mA.

R238	1-244-632-	20Ω
	1-244-633-	22Ω
	1-244-634-	24Ω
	1-244-635-	27Ω
	1-244-636-	30Ω
	1-244-637-	36Ω
	1-244-638-	39Ω

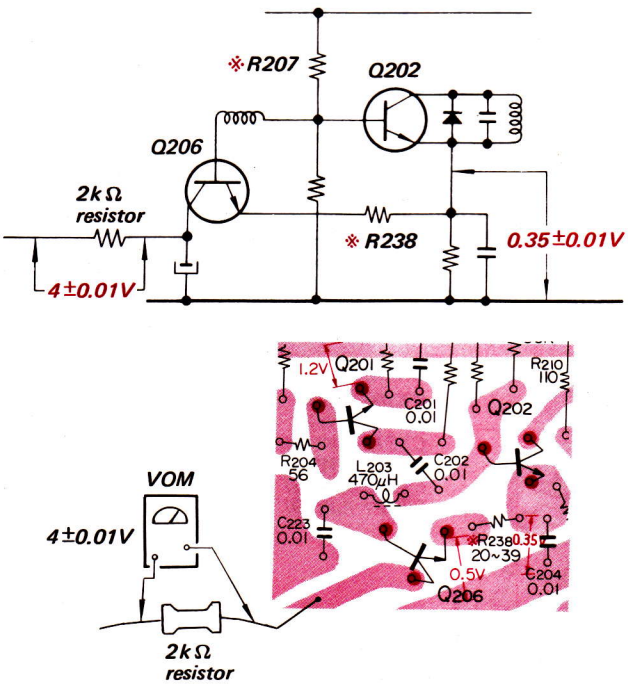


Fig. 3-19 2kΩ resistor connection

C. Collector Current of Q401

1. Band Selector: MW
2. Select the resistance value of R402 to obtain 0.27V at the emitter of Q401. Then collector current may be adjusted at 270μA.

R402	1-240-515-	56kΩ
	1-240-516-	62kΩ
	1-240-517-	68kΩ
	1-240-518-	75kΩ

D. Collector Current of Q402

1. Band Selector: MW
2. Select the resistance value of R408 to obtain 0.27V at the emitter of Q402. Then collector current may be adjusted at 270μA.

R408	1-244-489-	4700Ω
	1-244-490-	5100Ω
	1-244-491-	5600Ω
	1-244-492-	6200Ω

E. Collector Current of Q501

1. Band Selector: MW
2. Select the resistance value of R503 to obtain 0.31V at the emitter of Q501. Then collector current may be adjusted at 600μA.

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

F. Collector Current of Q502

1. Band Selector: MW
2. Select the resistance value of R507 to obtain 0.41V at the emitter of Q502. Then collector current may be adjusted at 800μA.

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

G. Regulator Voltage Adjustment

Select the resistance value of R709 to obtain 4.5V at the emitter of Q702.

R709	1-244-647-	82Ω
	1-244-649-	100Ω
	1-244-651-	120Ω
	1-244-653-	150Ω
	1-244-655-	180Ω

H. Tuning Meter Calibration

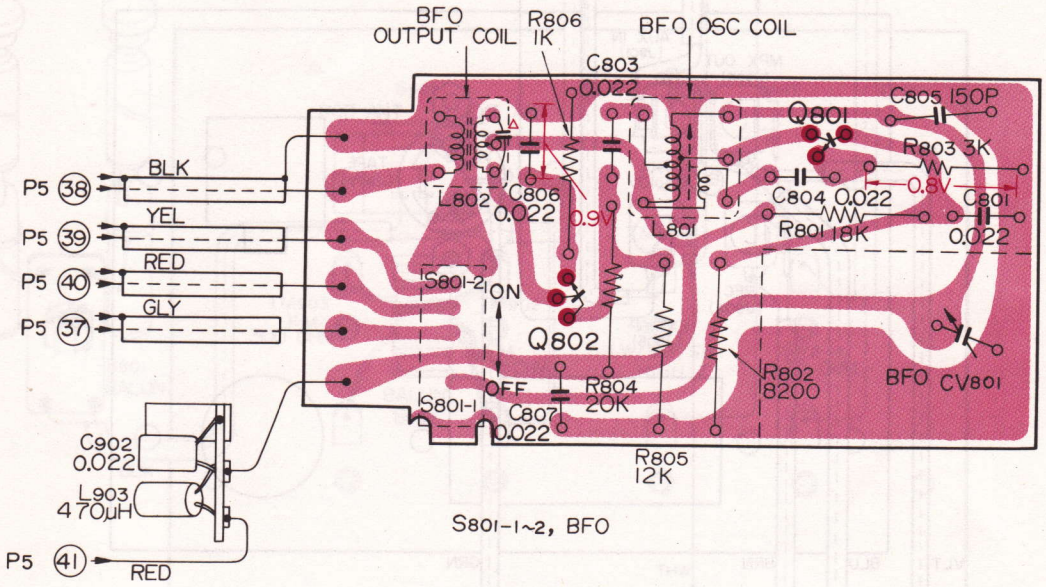
1. Band Selector: MW
2. Supply a 1-kHz signal of 3.1 mV (70 dB) to the LW/MW/SW/EXT ANT terminal.
3. Adjust the adjustable resistor R241 (5 kΩ) so that the meter indicates between 8 and 9.

SECTION 4

MOUNTING AND SCHEMATIC DIAGRAMS

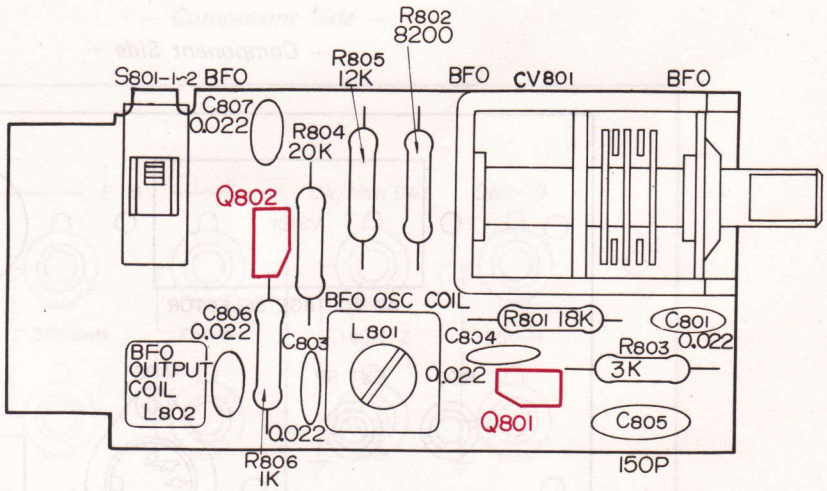
4-1. BFO BLOCK (P8) (BFO-1A)

– Conductor Side –

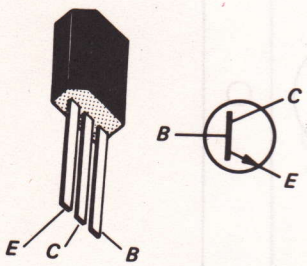


S801-1~2, BFO

– Component Side –

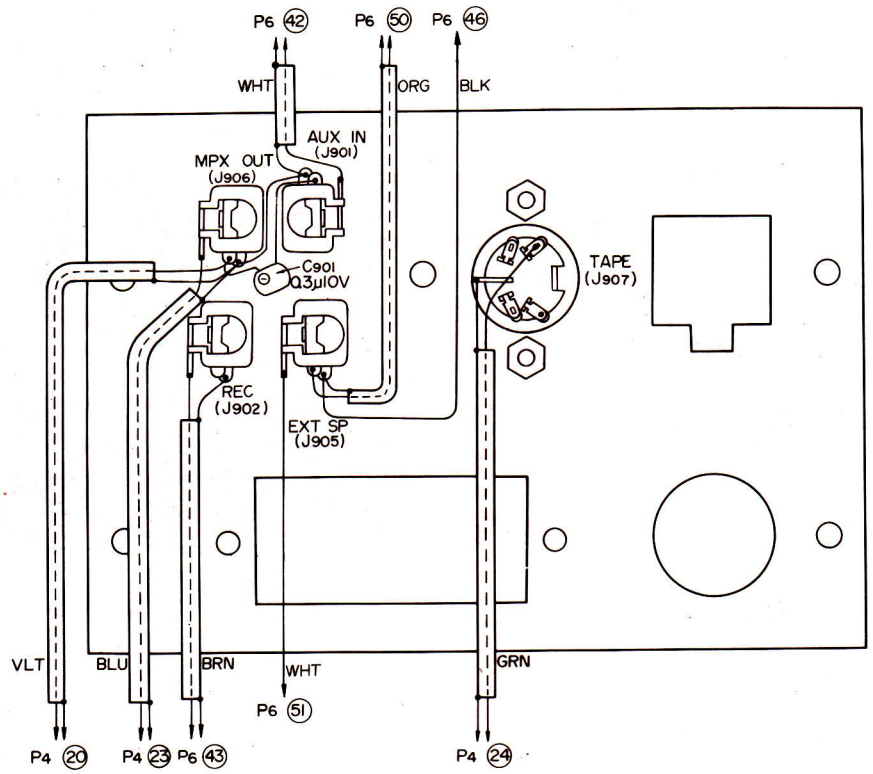


Q801, Q802; 2S403A

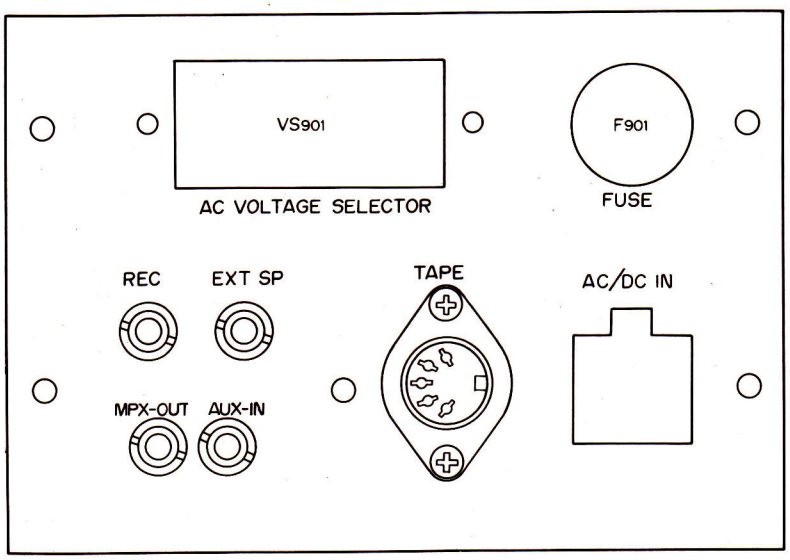


4-2. JACK PANEL (P9-1)

– Conductor Side –

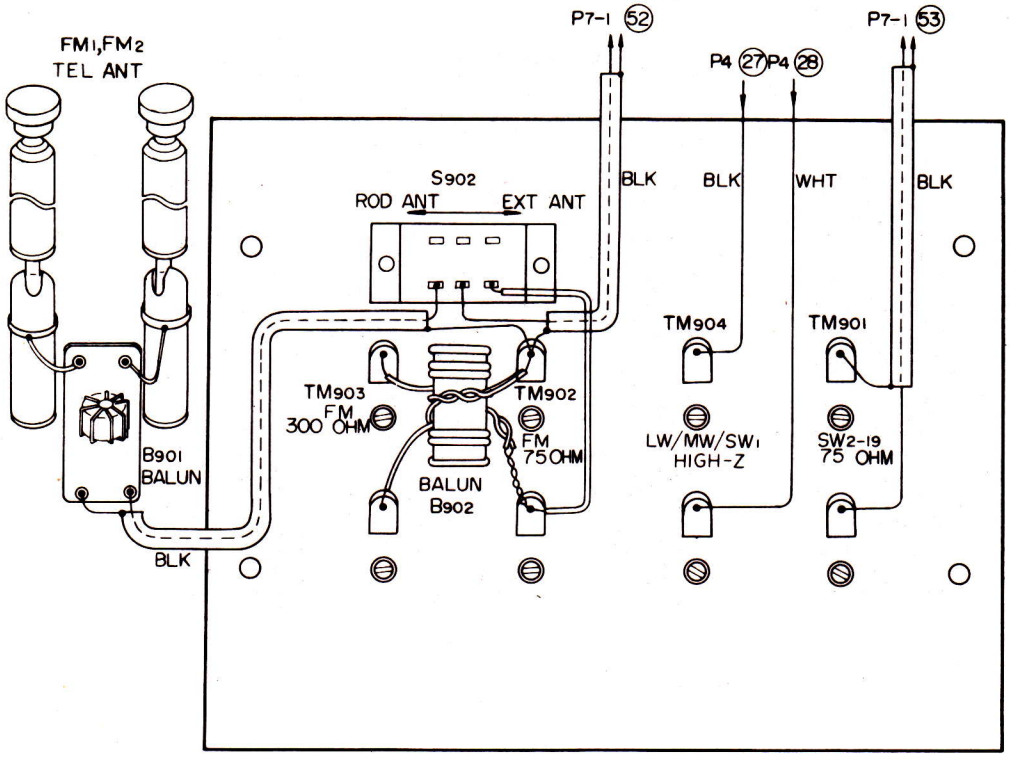


– Component Side –

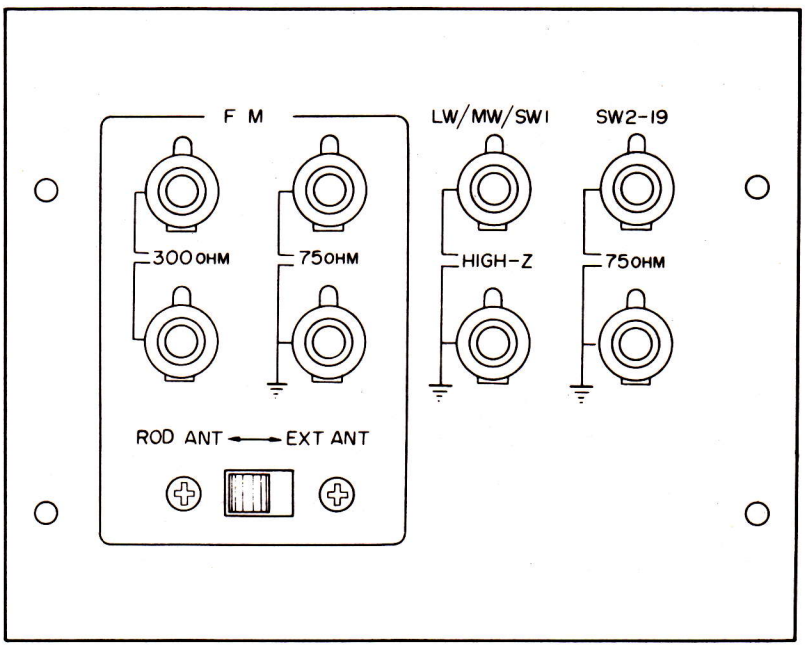


4-3. ANTENNA TERMINAL (P9-2)

— Conductor Side —

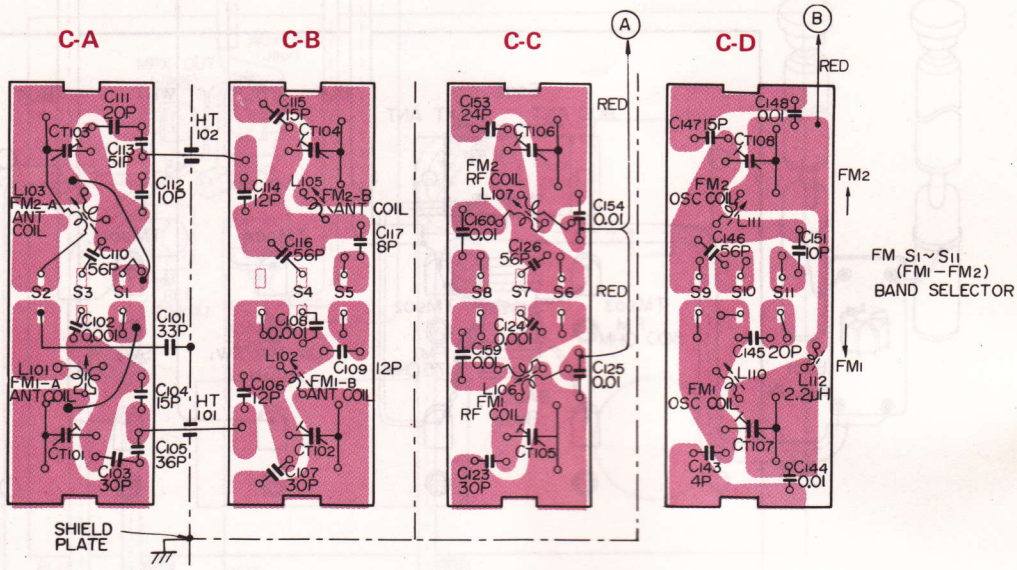


— Component Side —

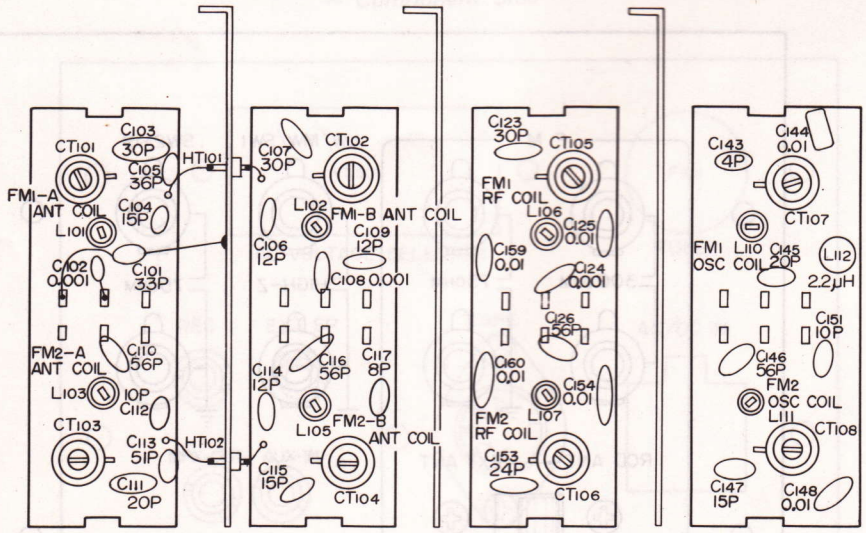


4-4. FM FRONT END BLOCK (P1) (FMC-138A1) (1)

– Conductor Side –

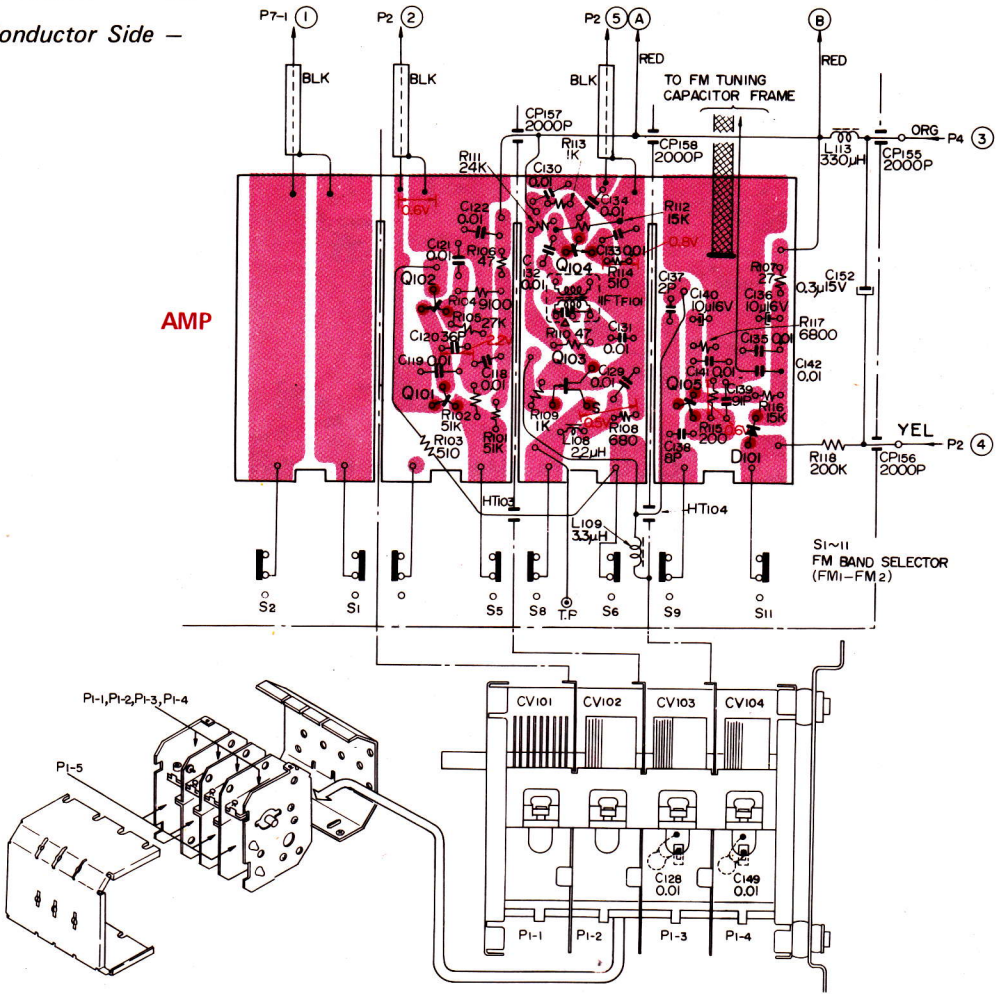


– Component Side –

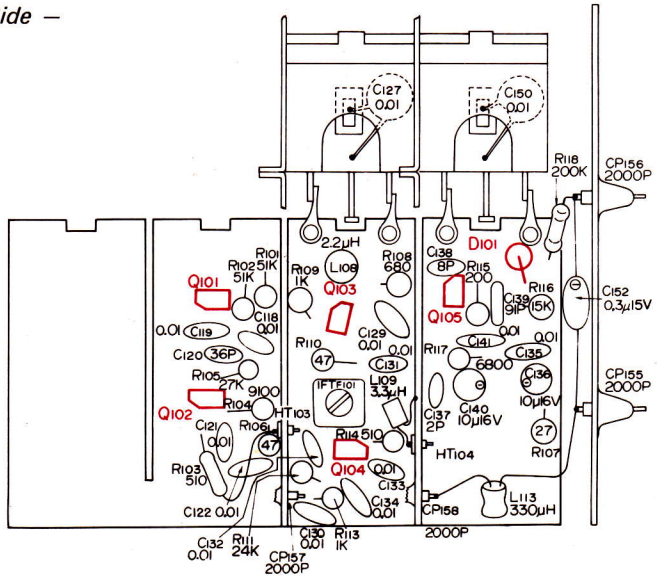


4-5. FM FRONT END BLOCK (P1) (FMC-138A1) (2)

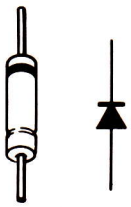
– Conductor Side –



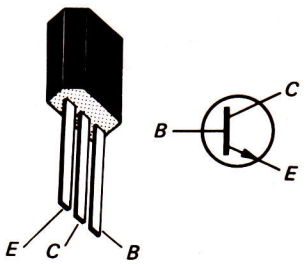
– Component Side –



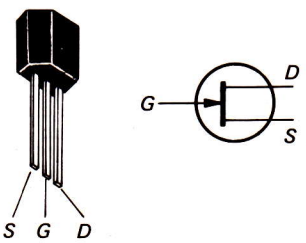
D101; 1S351



Q101, Q102, Q105; 2SC629
Q104; 2SC403A



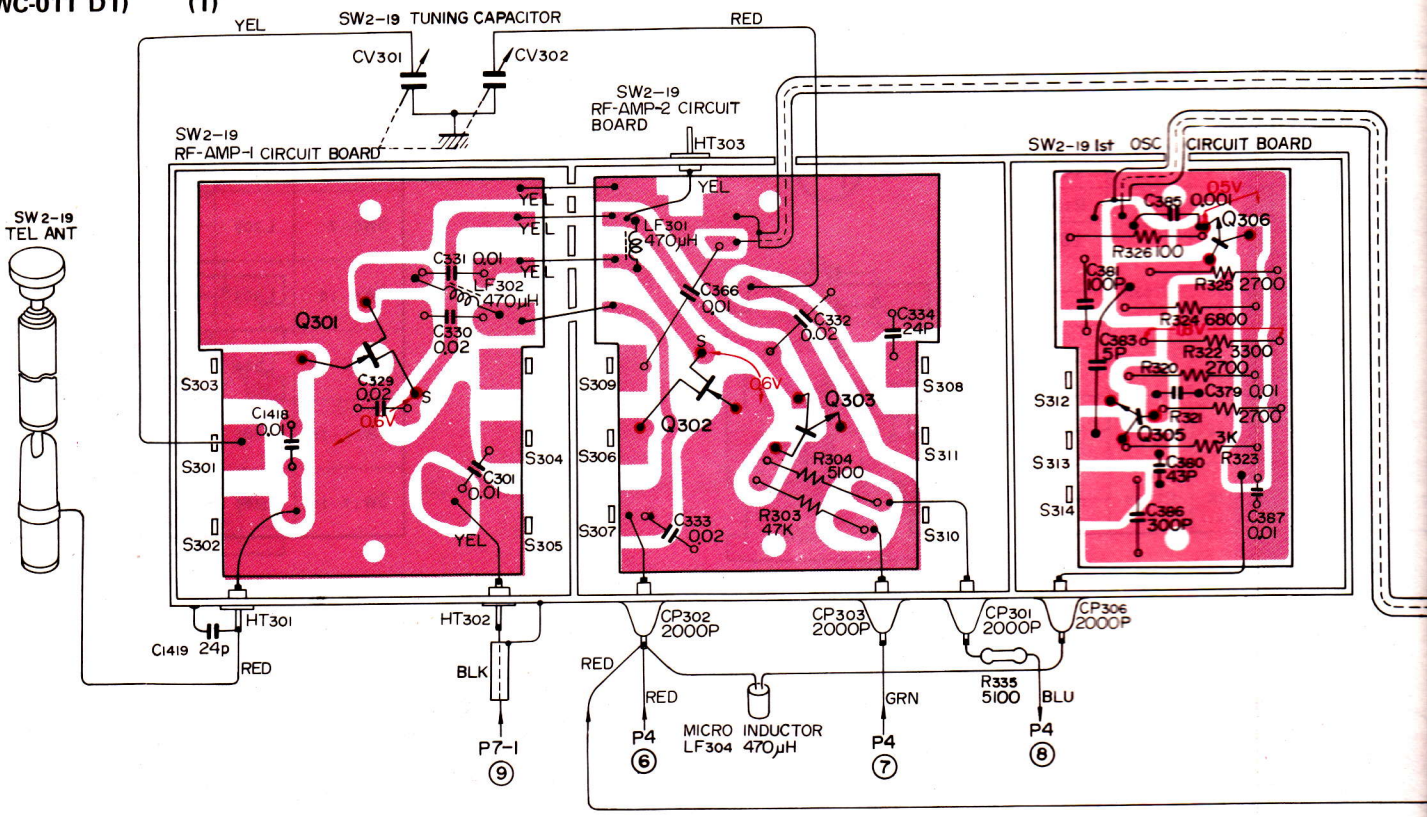
Q103; 2SK23



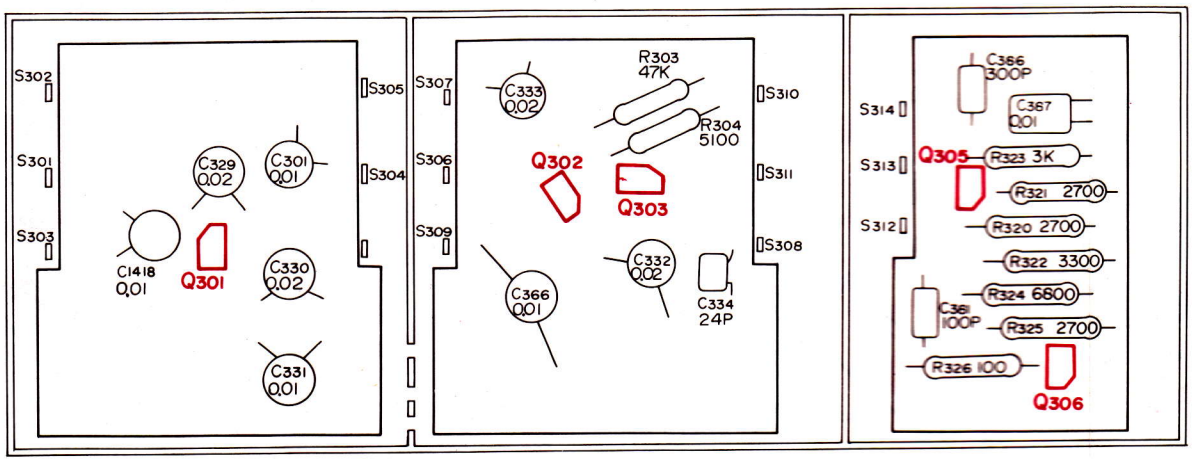
R112; mounted on the conductor side.

4-6. SW2 ~ 19 FRONT END BLOCK (P3) (SWC-011 D1) (1)

— Conductor Side



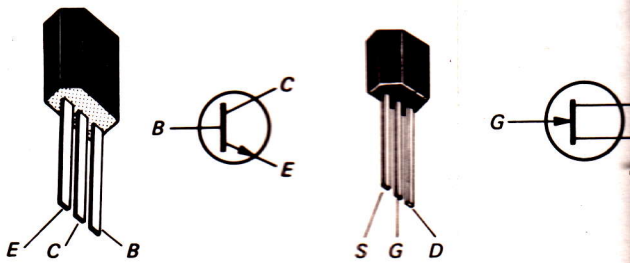
RF-1 RF-2 RF-3 — Component Side



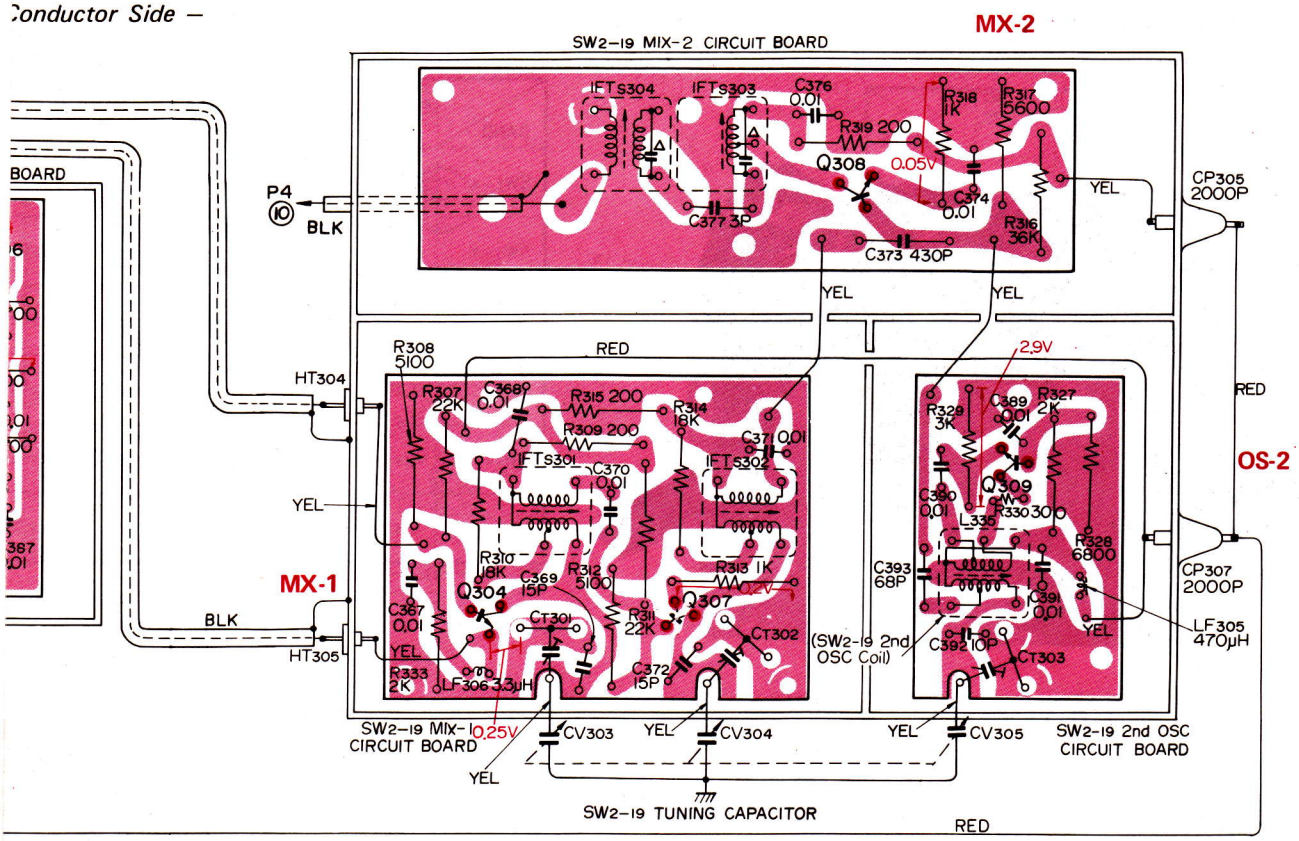
The following parts are mounted on the conductor side.
Q301, Q302, Q303, Q305, Q306, LF301, LF302, C379 C380, C383 and C385.

Q303; 2SC633
Q304 ~ Q309; 2SC403A

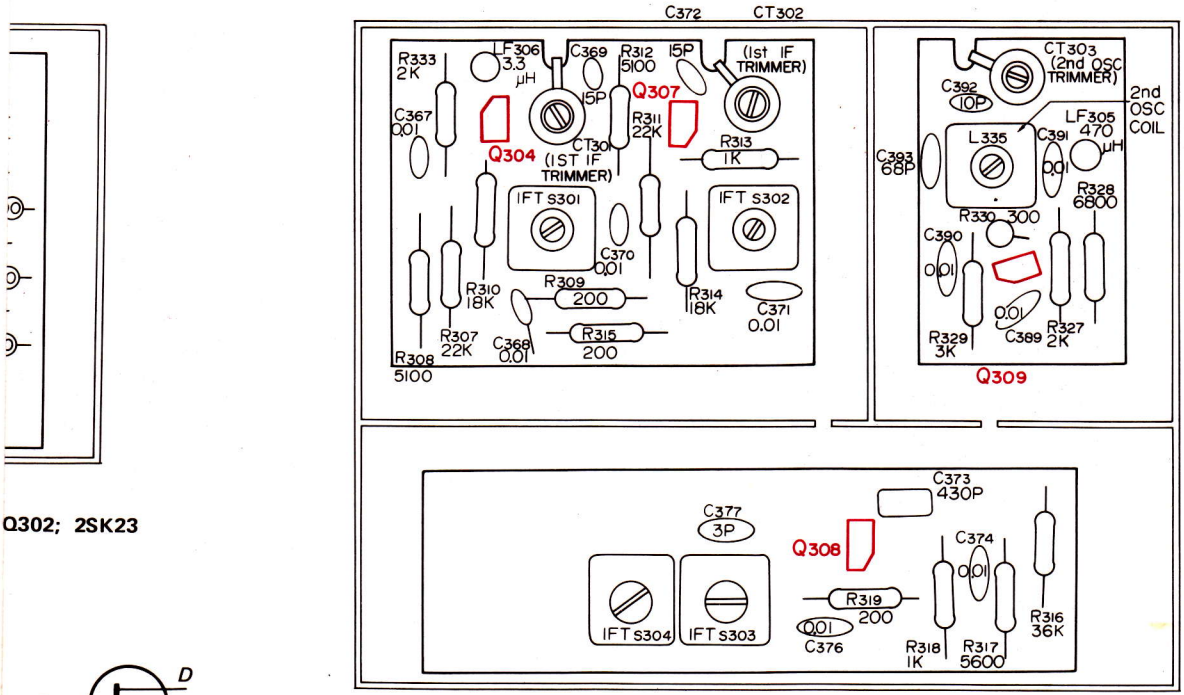
Q301, Q302; 2SK23



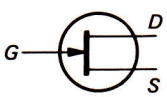
Conductor Side —



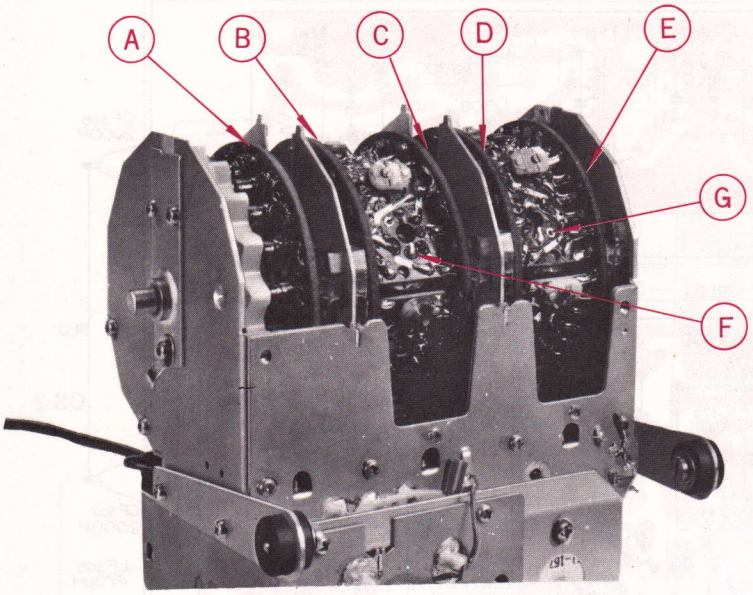
Component Side —



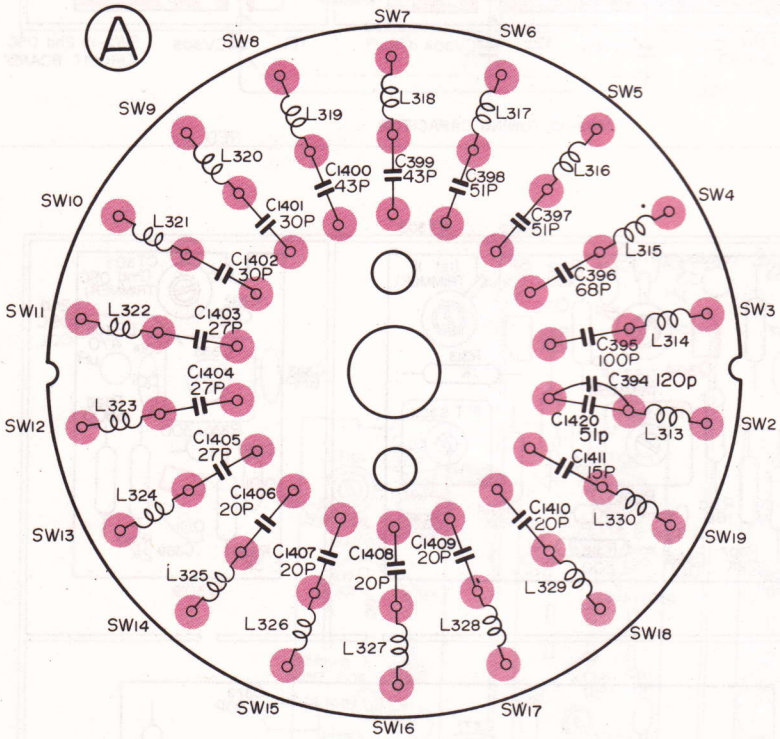
Q302; 2SK23

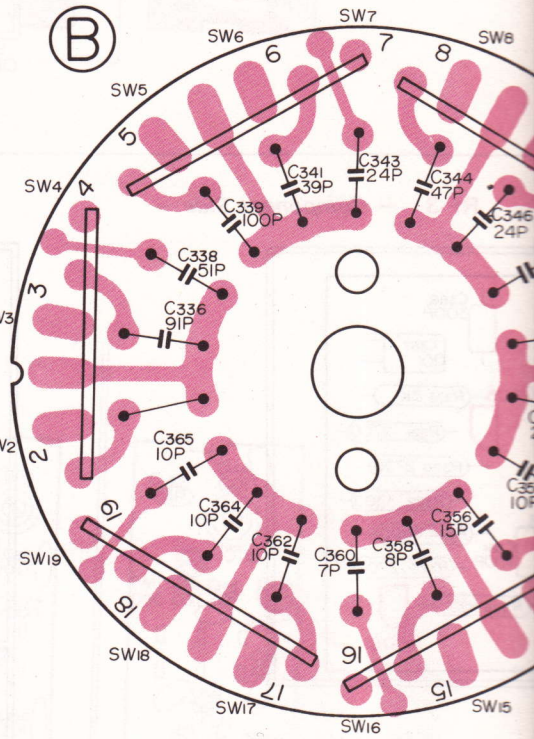


4-7. SW2-SW19 FRONT END BLOCK (P3) (SWC-011 D1) (2)



BAND	SW2 19 RF-2 COIL				TRIMMER CAPACITOR		
	LB	CD	CE	CF	CTD	CTE	CTF
SW2~4	L307	C335	C337		CT322	CT323	CT324
		82P	10P				
SW5~7	L308	C340	C342	C1413	CT325	CT326	CT327
		68P	39P	5P			
SW8~10	L309	C345	C347	C349	CT328	CT329	CT330
		82P	39P	15P			
SW11~13	L310	C351	C353		CT331	CT332	CT333
		39P	15P				
SW14~16	L311	C357	C359		CT334	CT335	CT336
		24P	5P				
SW17~19	L312	C363	C1415	C1417	CT337	CT338	CT339
		7P	5P	5P			



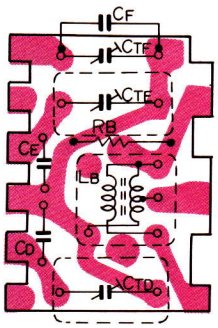


L313~330 SW2-19 : Ist OSC Coil.
L313~330 C394~1411 : Mounted on the Conductor Side.

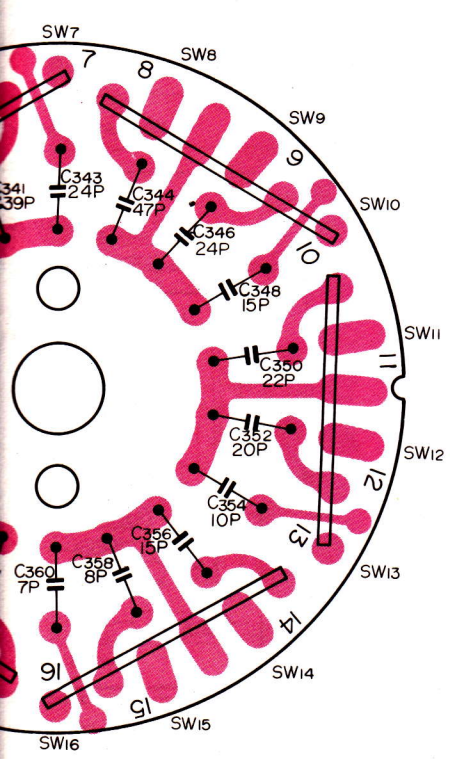
C336~365 : Mounted on the Conductor S

TRIMMER CAPACITOR			
CTD	CTE	CTF	RB
T322	CT323	CT324	R305 18K
T325	CT326	CT327	R306 18K
T328	CT329	CT330	
T331	CT332	CT333	
T334	CT335	CT336	
T337	CT338	CT339	

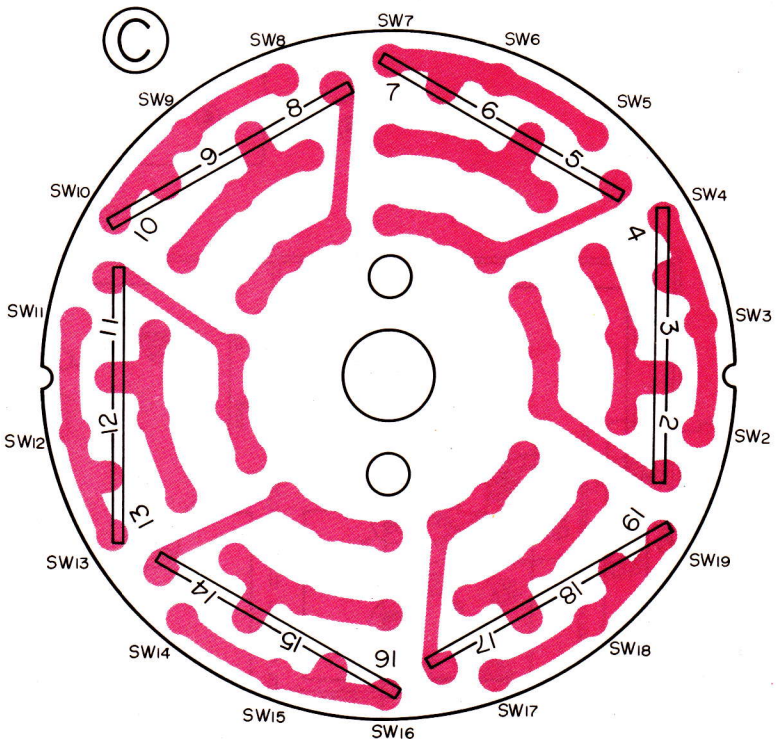
F



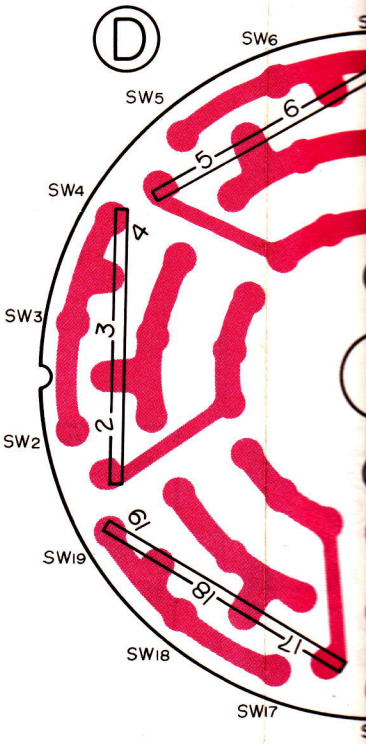
BAND	SW2~19 ANT.1 COIL				TRIMMER CAPACITOR		
	LA	CA	CB	CC	CTA	CTB	CTC
SW2~4	L301	C302 82P			CT304	CT305	CT306
SW5~7	L302	C306 68P	C308 24P	C412 5P	CT307	CT308	CT309
SW8~10	L303	C311 82P	C313 38P	C315 15P	CT310	CT311	CT312
SW11~13	L304	C317 39P	C319 20P		CT313	CT314	CT315
SW14~16	L305	C322 24P			CT316	CT317	CT318
SW17~19	L306	C326 5P	C1414 5P	C1416 5P	CT319	CT320	CT321



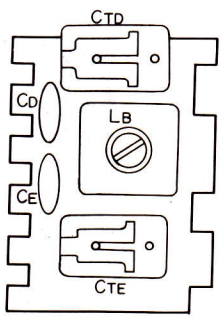
C



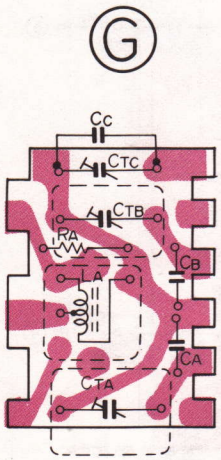
D



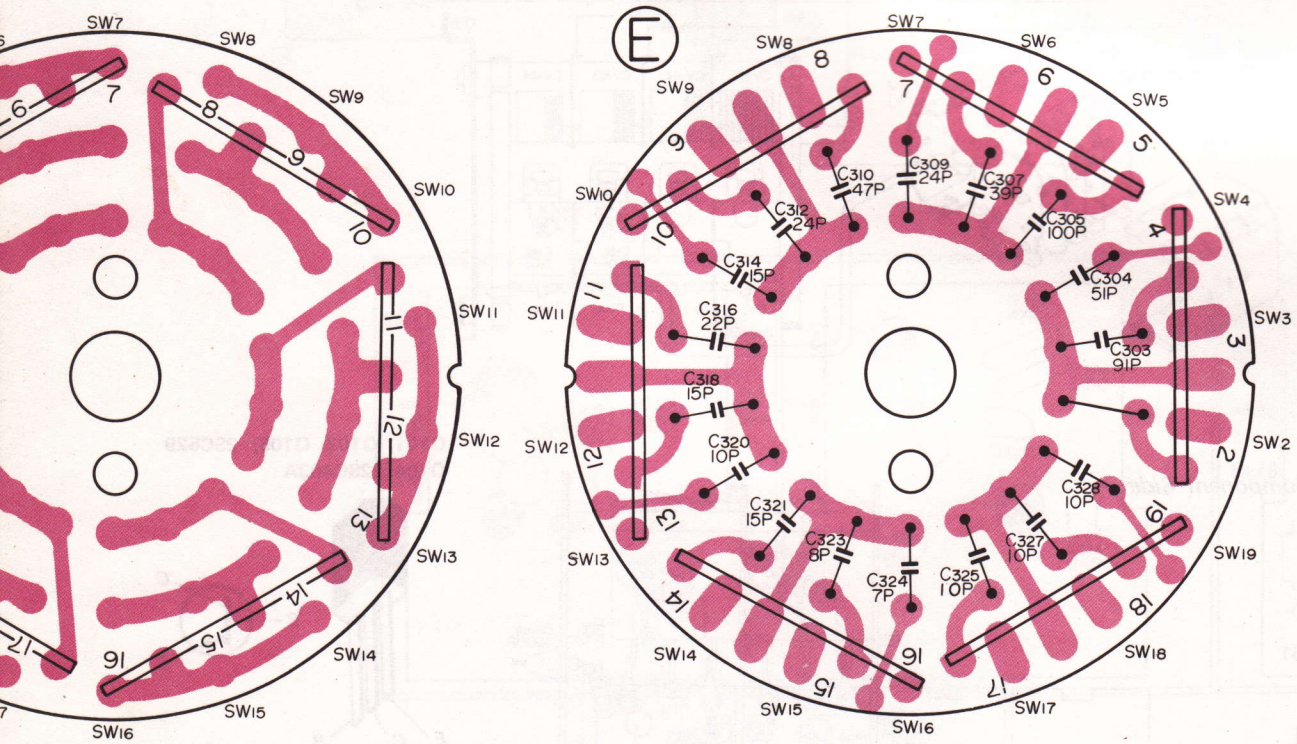
on the Conductor Side.

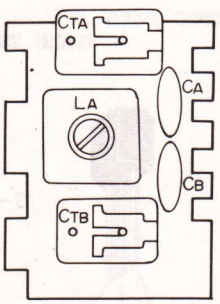


CITOR	
CTC	RA
CT306	R301
	18K
CT309	R302
	18K
CT312	
CT315	
CT318	
CT321	



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

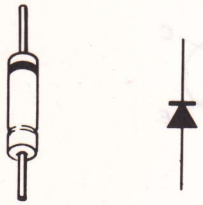




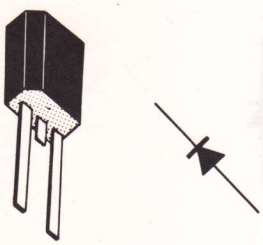
C303~328 : Mounted on the Conductor Side.

4-8. FM IF BLOCK (P2) (IF-5A)

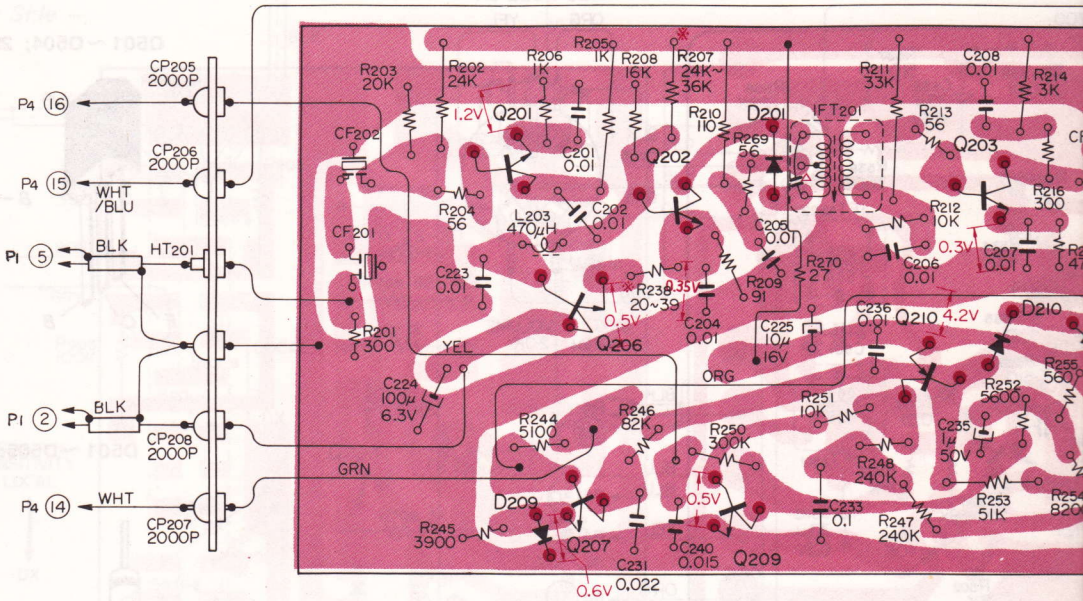
D202, D203; 1T261
D206 ~ D211, D216 } 1T262



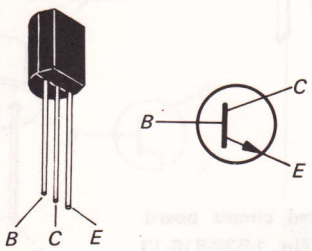
D201, D204, D205
D212 ~ D215; 1T243



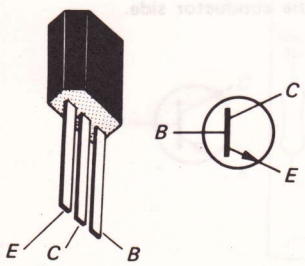
1T243

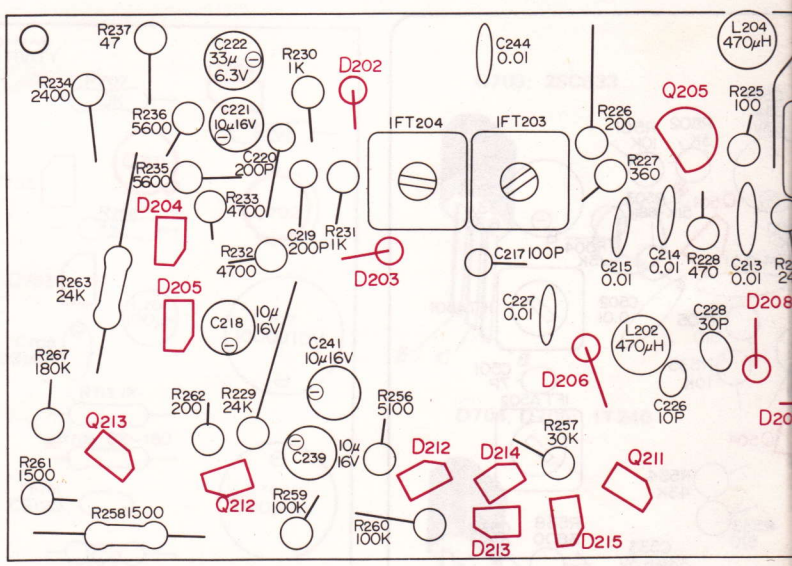


Q201 ~ Q205; 2SC710



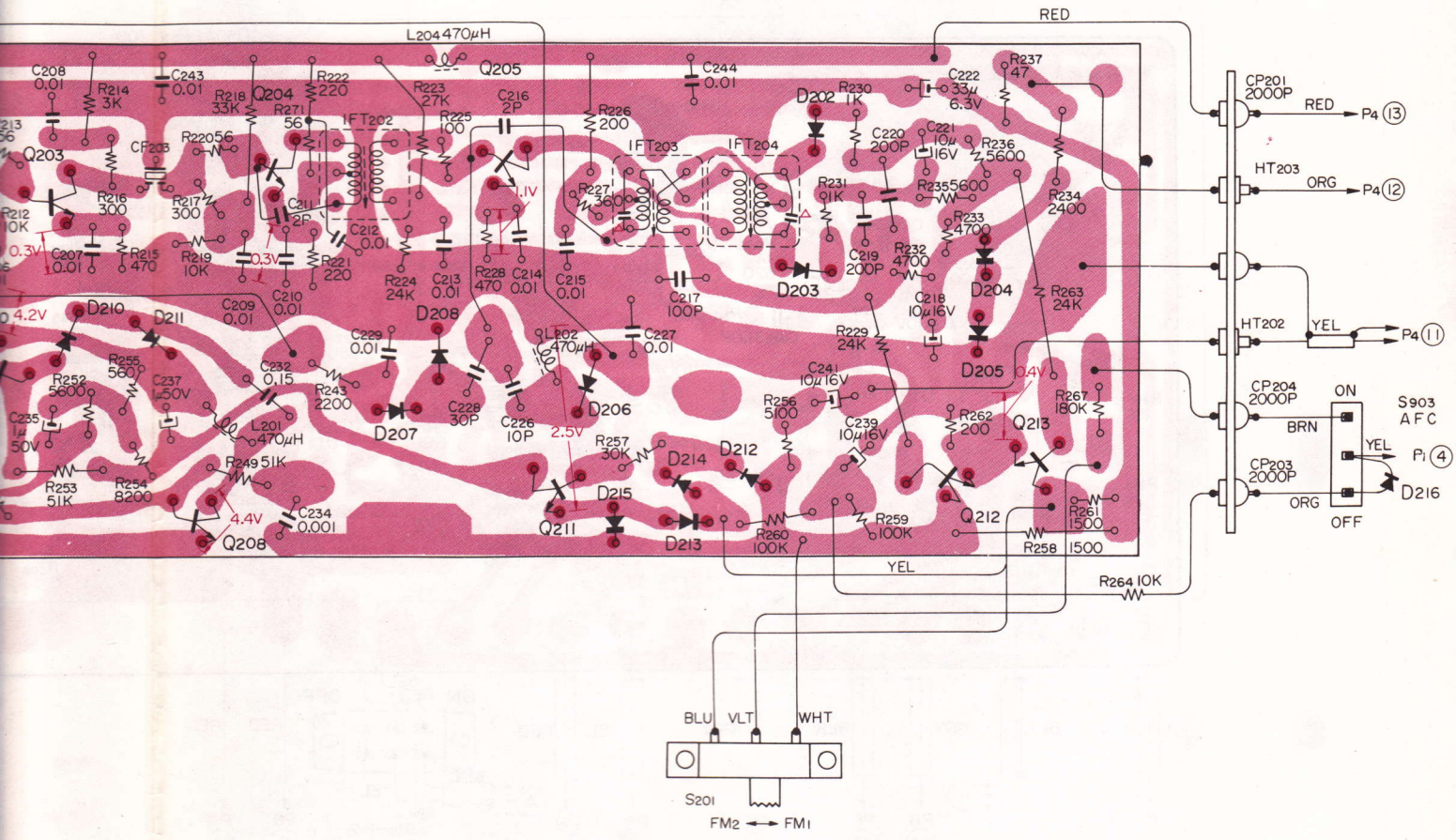
Q206, Q208; 2SC633
Q207, Q209; 2SC403A



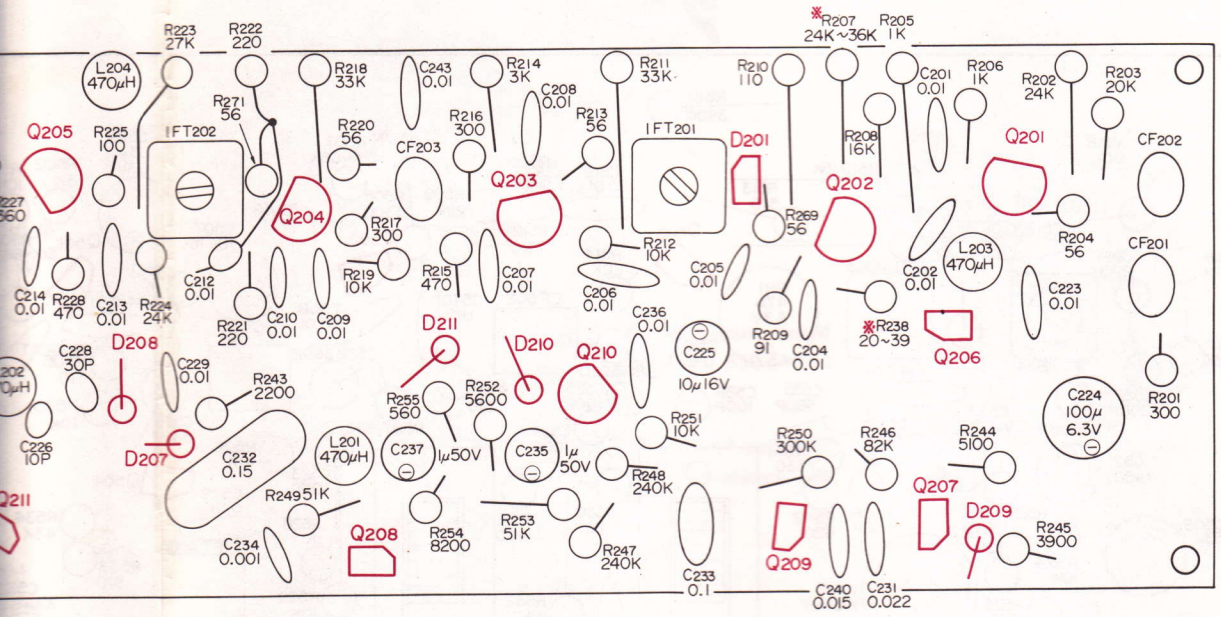


Printed circuit board, Part No; 1-539-468-11
C211, C216 and R270; mounted on the conductor side.

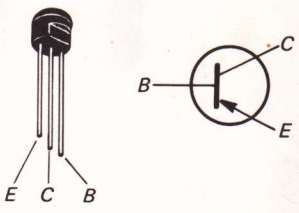
– Conductor Side –



– Component Side –

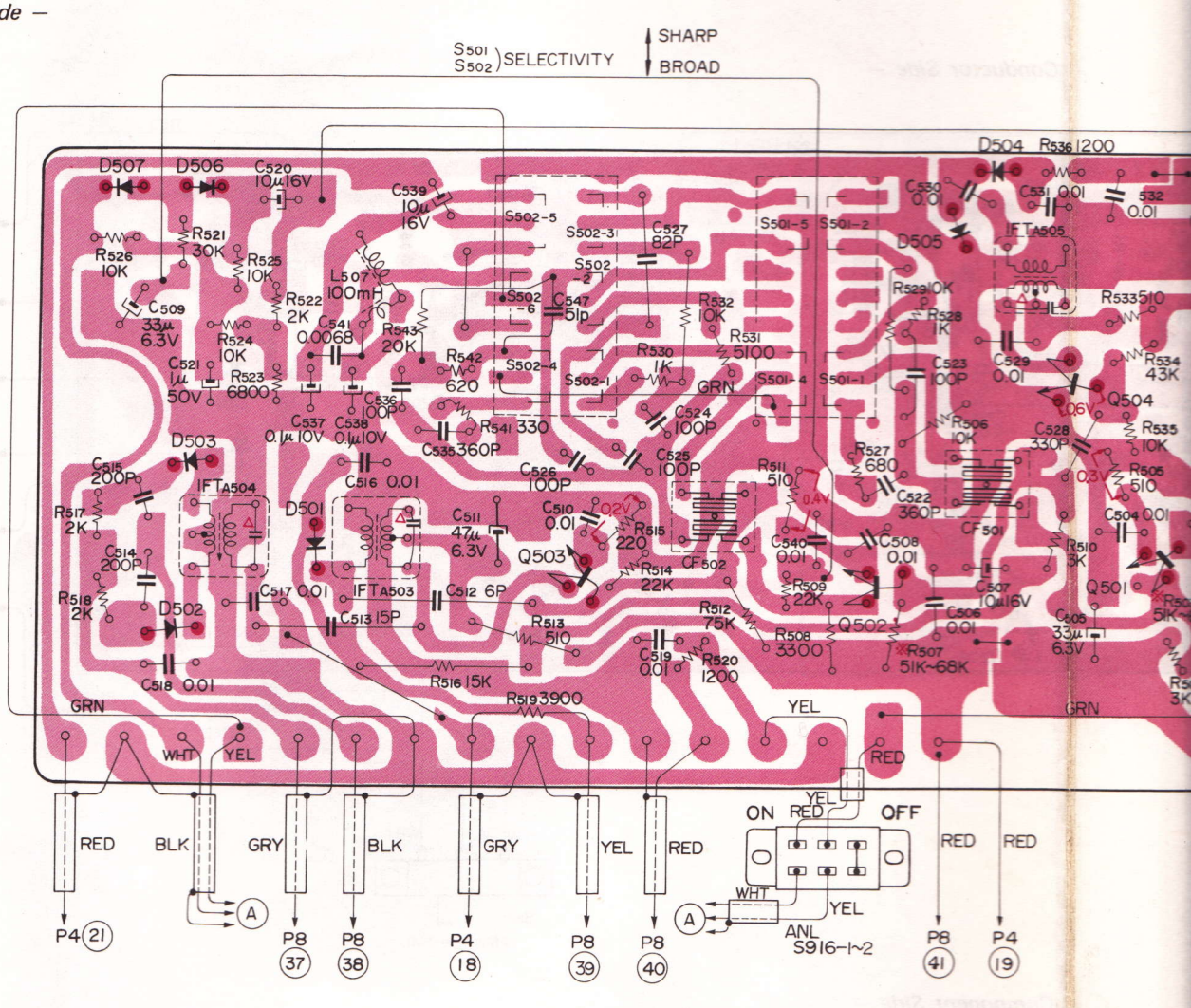


Q210; 2SA610

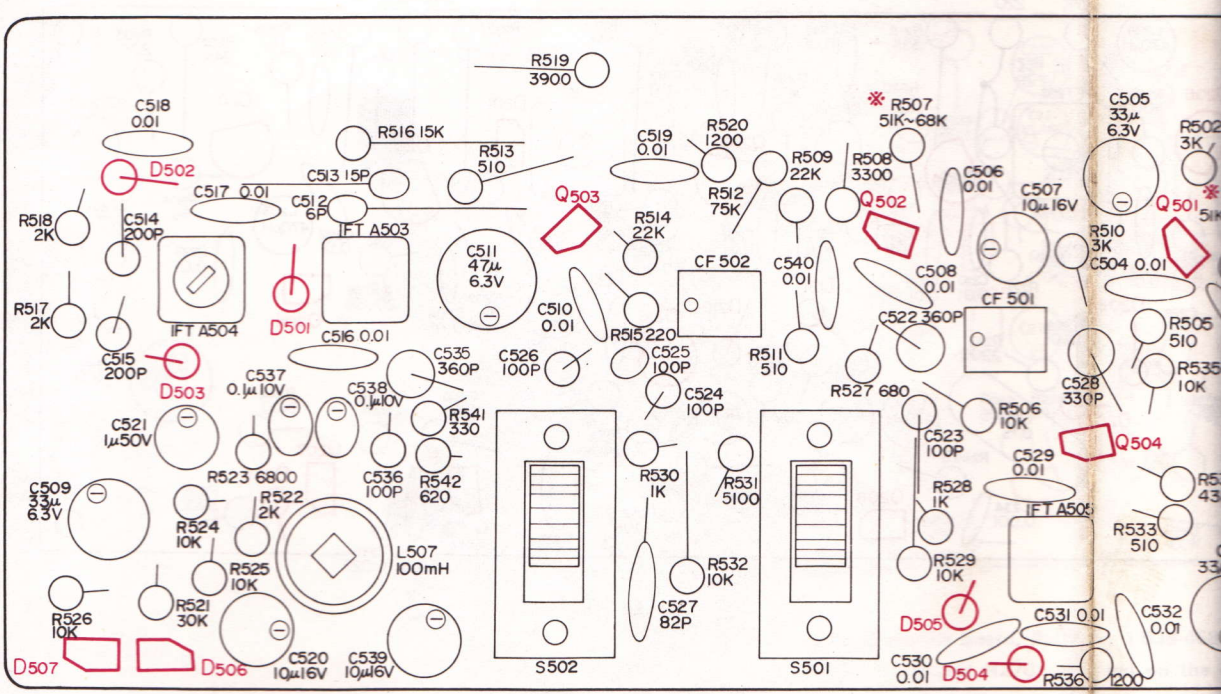


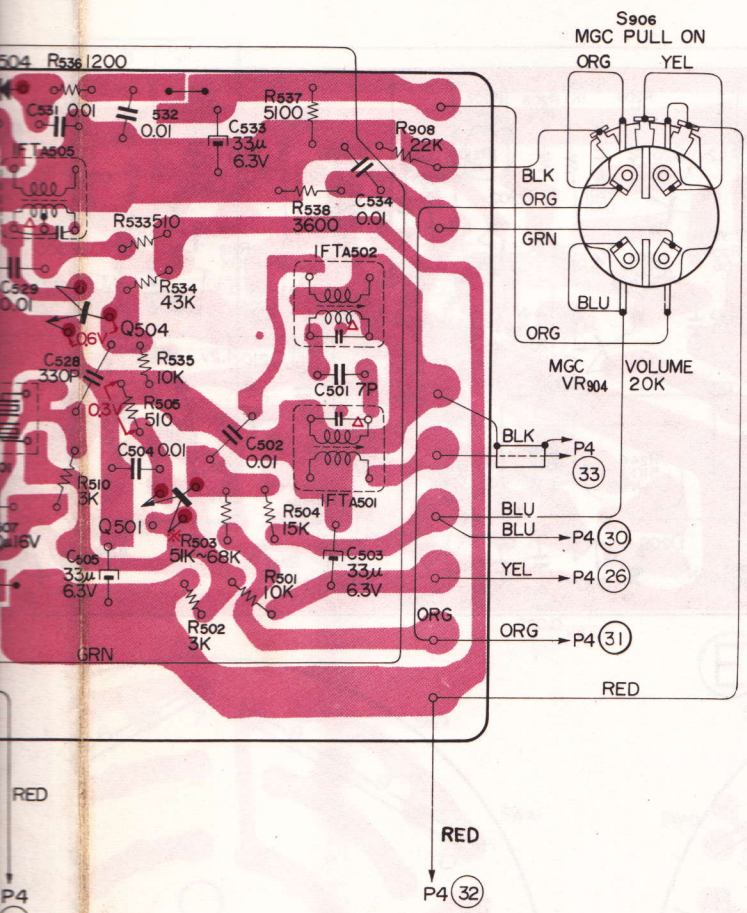
4-9. AM IF CIRCUIT BOARD (P5)

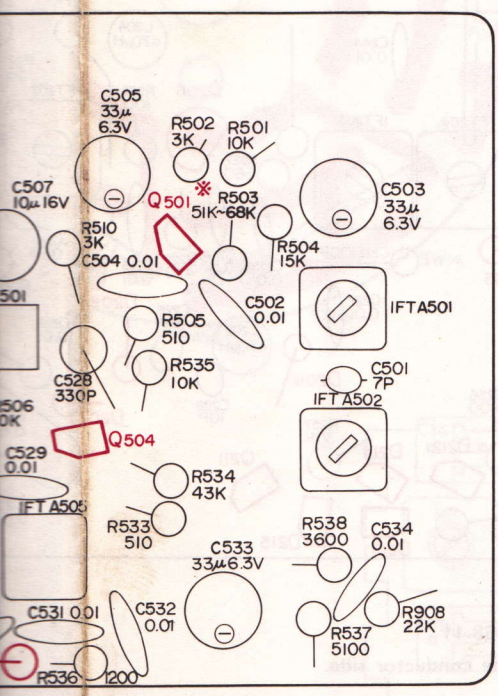
– Conductor Side –



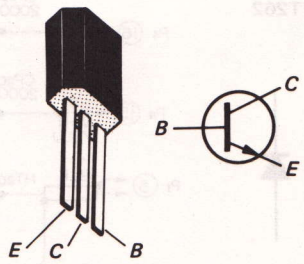
– Component Side –



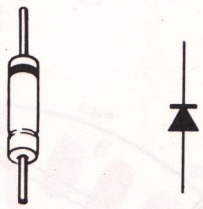




Q501 ~ Q504; 2SC403A

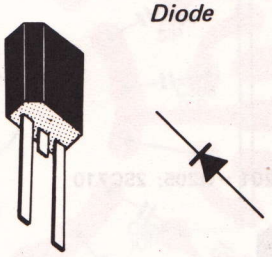


D501 ~ D505; 1T23



D506, D507; 1T243

Diode

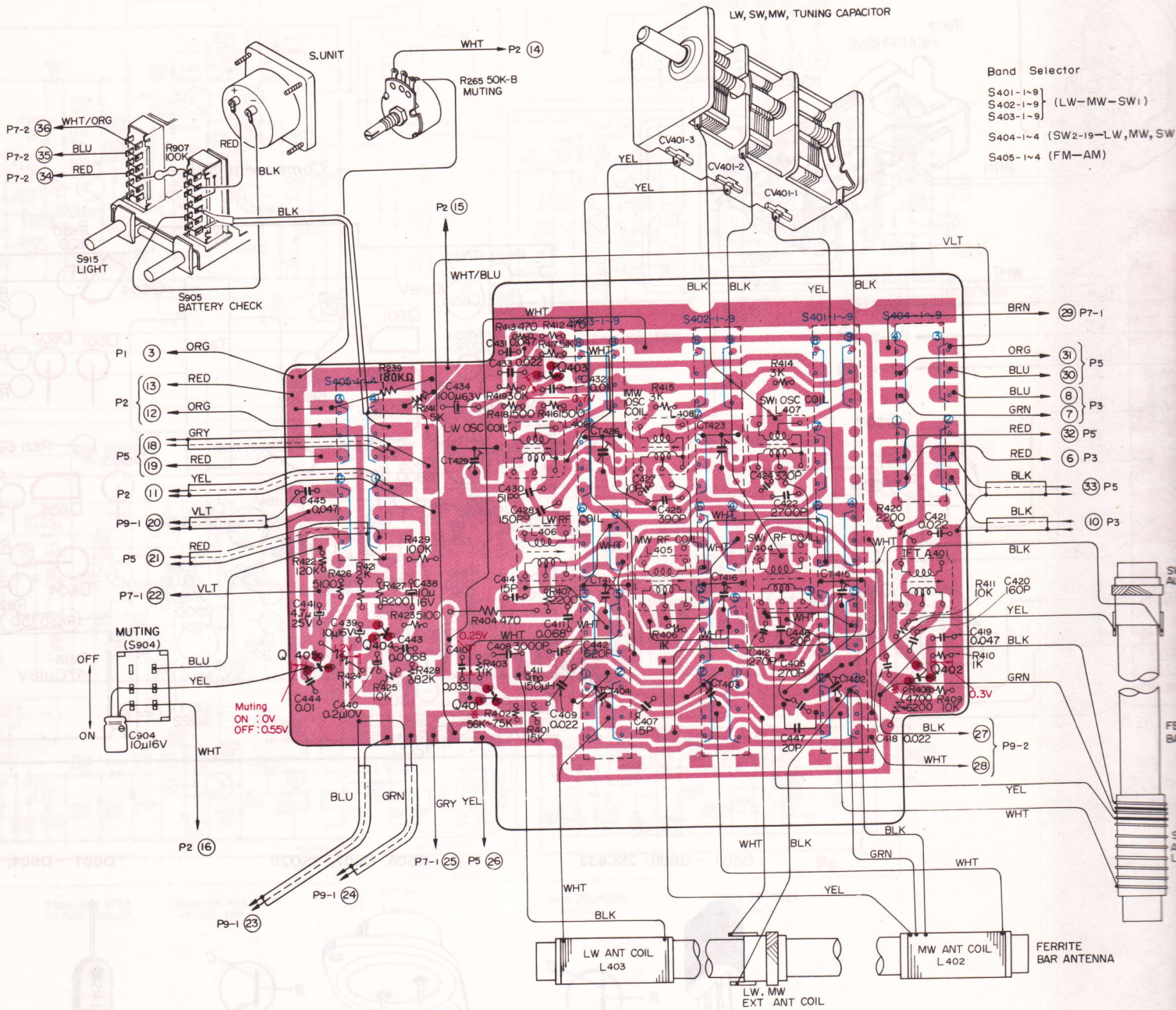


Printed circuit board
Part No. 1-538-818-13

C541, C547 and R543; mounted on the conductor side.

4-10. CP CIRCUIT BOARD (P4)

– Conductor Side –



The following parts are mounted on the conductor side.
CT402, CT403, CT404, CT415, CT416, CT417, CT423, CT426, CT429, C446, C447 and R241.

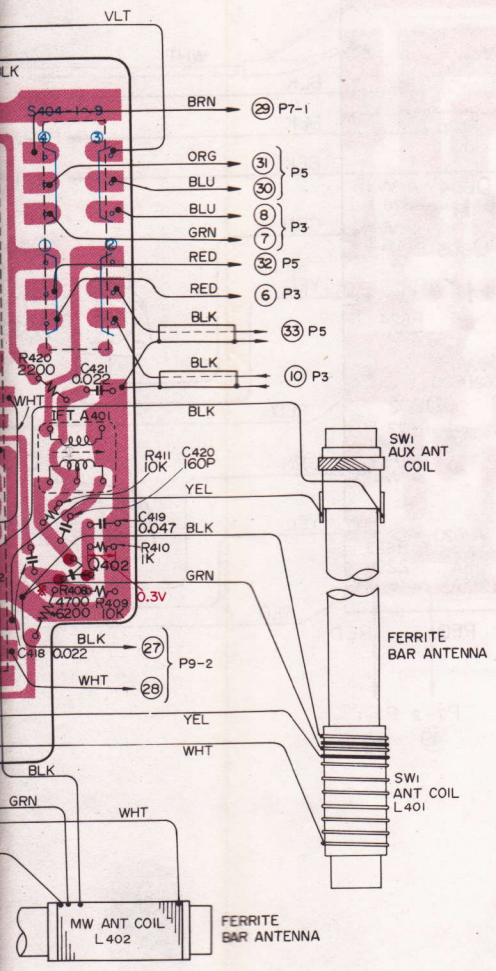
CITOR

Band Selector

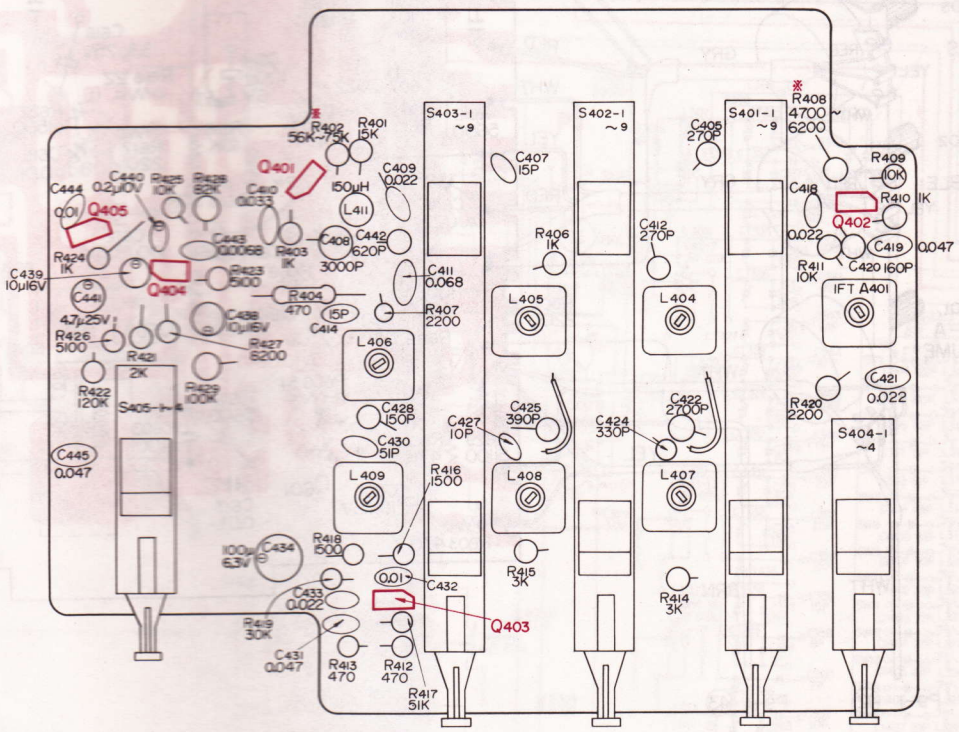
S401-1~9
S402-1~9
S403-1~9
} (LW—MW—SW1)

S404-1~4 (SW2-19—LW, MW, SW1)

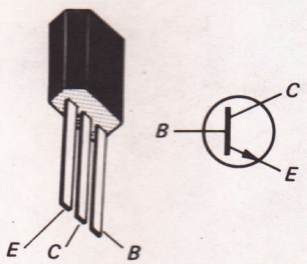
S405-1~4 (FM—AM)



— *Component Side* —



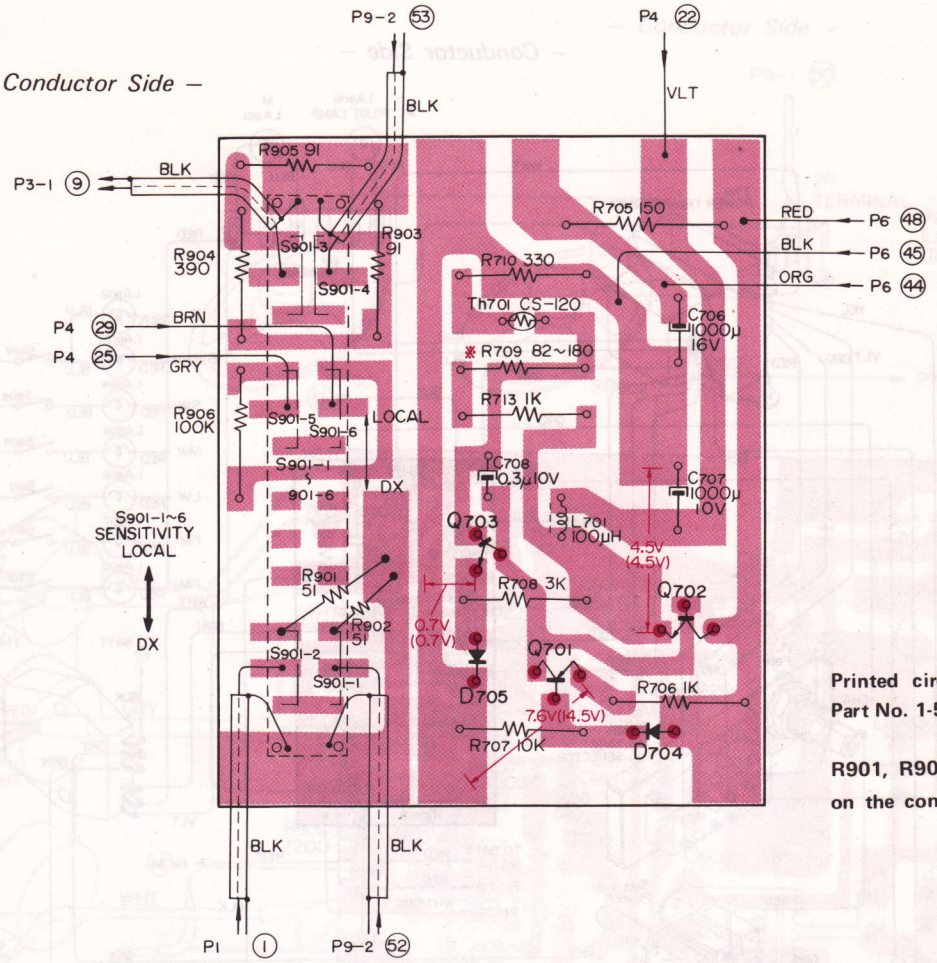
Q401 ~ Q403; 2SC403A
Q404, Q405; 2SC633



Printed circuit board
Part No. 1-538-860-14

4-11. REGULATOR CIRCUIT BOARD (P7-1)

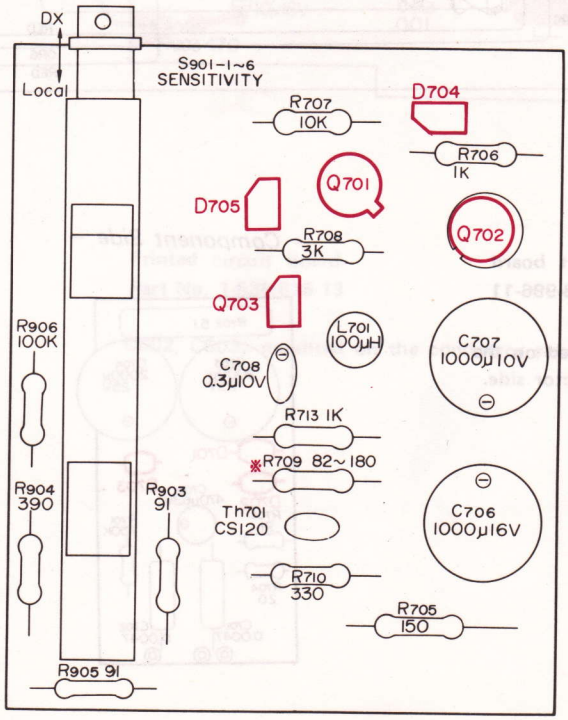
– Conductor Side –



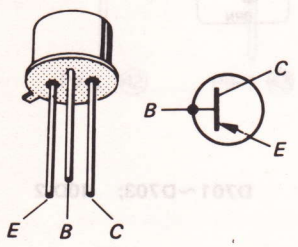
Printed circuit board
Part No. 1-538-901-11

R901, R902; mounted on the conductor side.

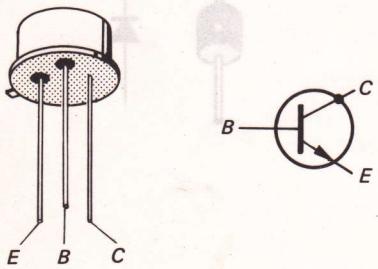
– Component Side –



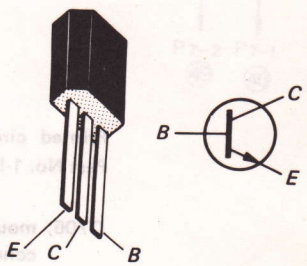
Q701; 2SB381



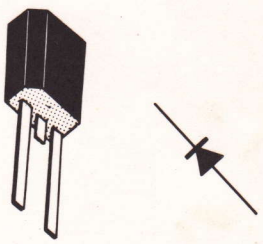
Q702; 2SC352



Q703; 2SC633

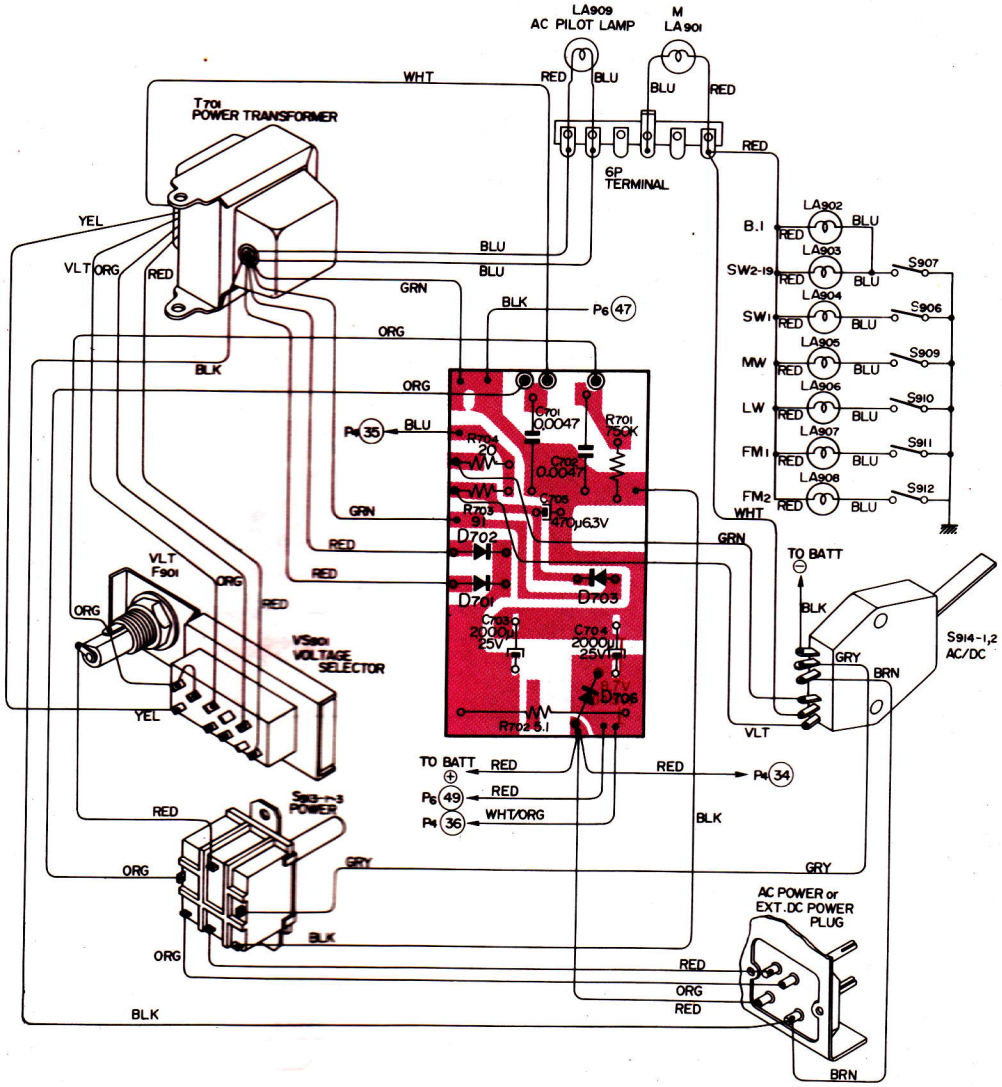


D704, D705; 1T240

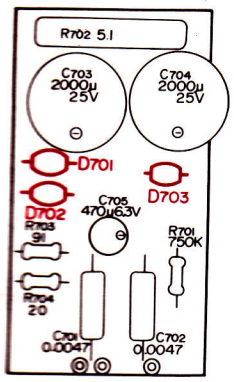


4-12. POWER SUPPLY CIRCUIT BOARD (P7-2)

— Conductor Side —



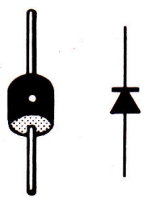
— Component Side —



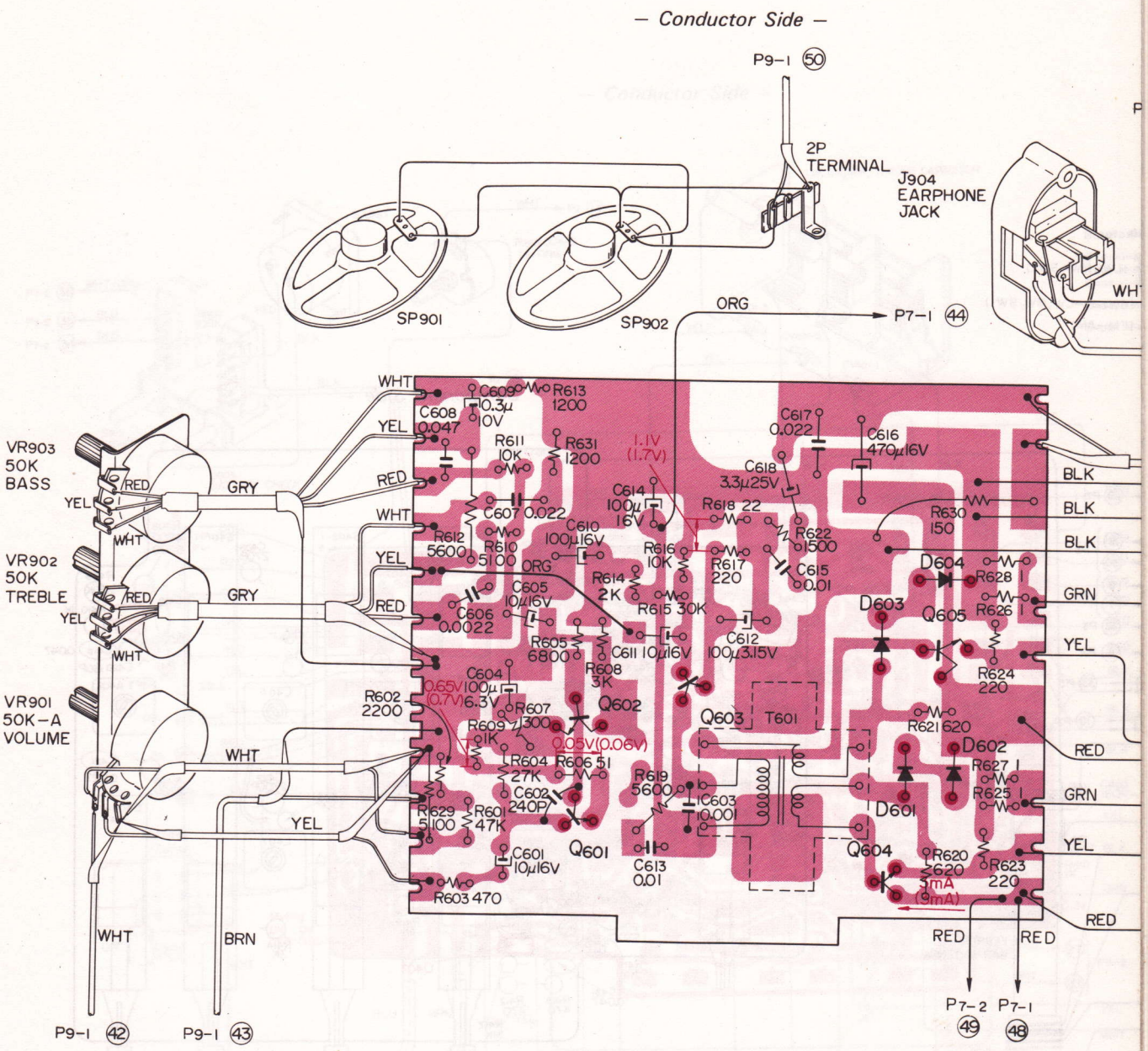
Printed circuit board
Part No. 1-538-996-11

D706; mounted on the conductor side.

D701～D703; 10D-2

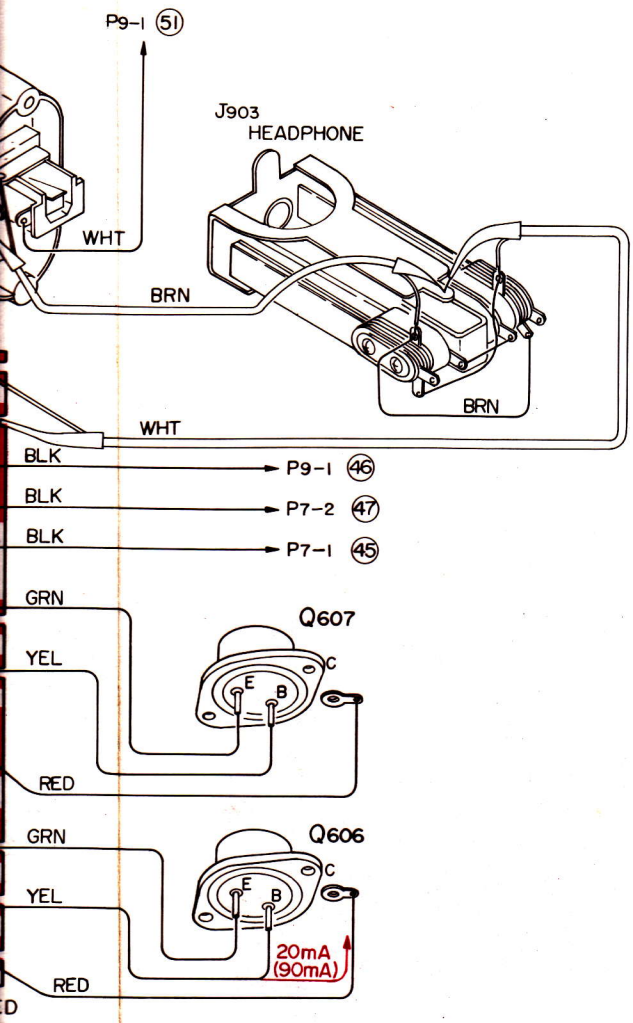


4-13. AF CIRCUIT BOARD (P6)

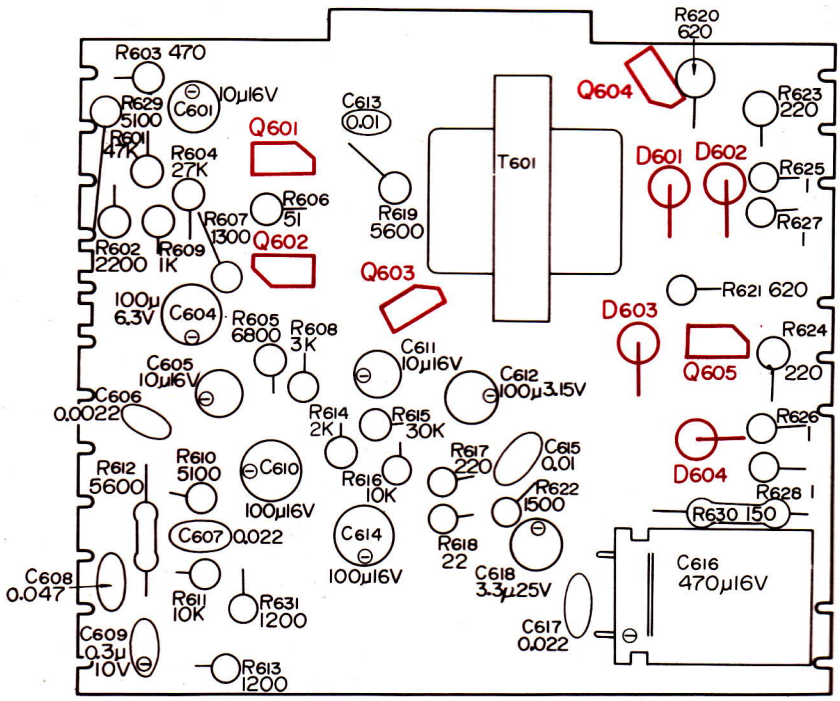


Printed circuit board
Part No. 1-538-816-13

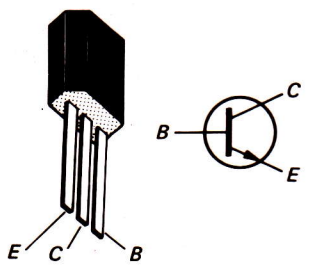
C602, C603; mounted on the conductor side.



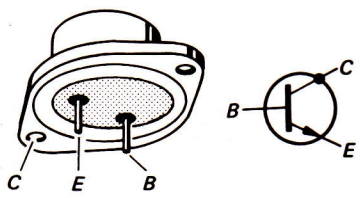
— Component Side —



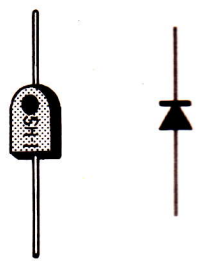
Q601 ~ Q605; 2SC633



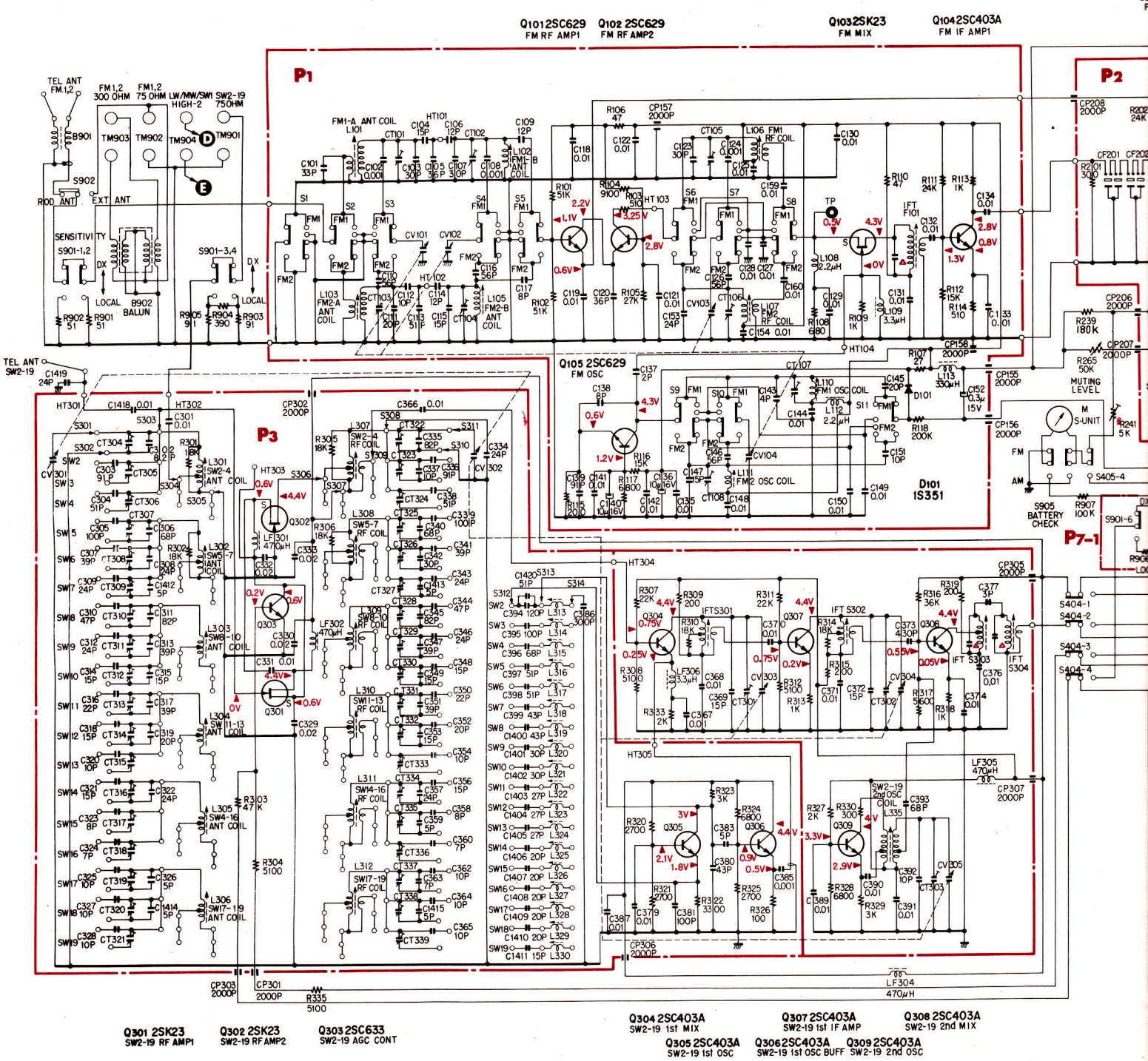
Q606, Q607; 2SD28



D601 ~ D604; SH1



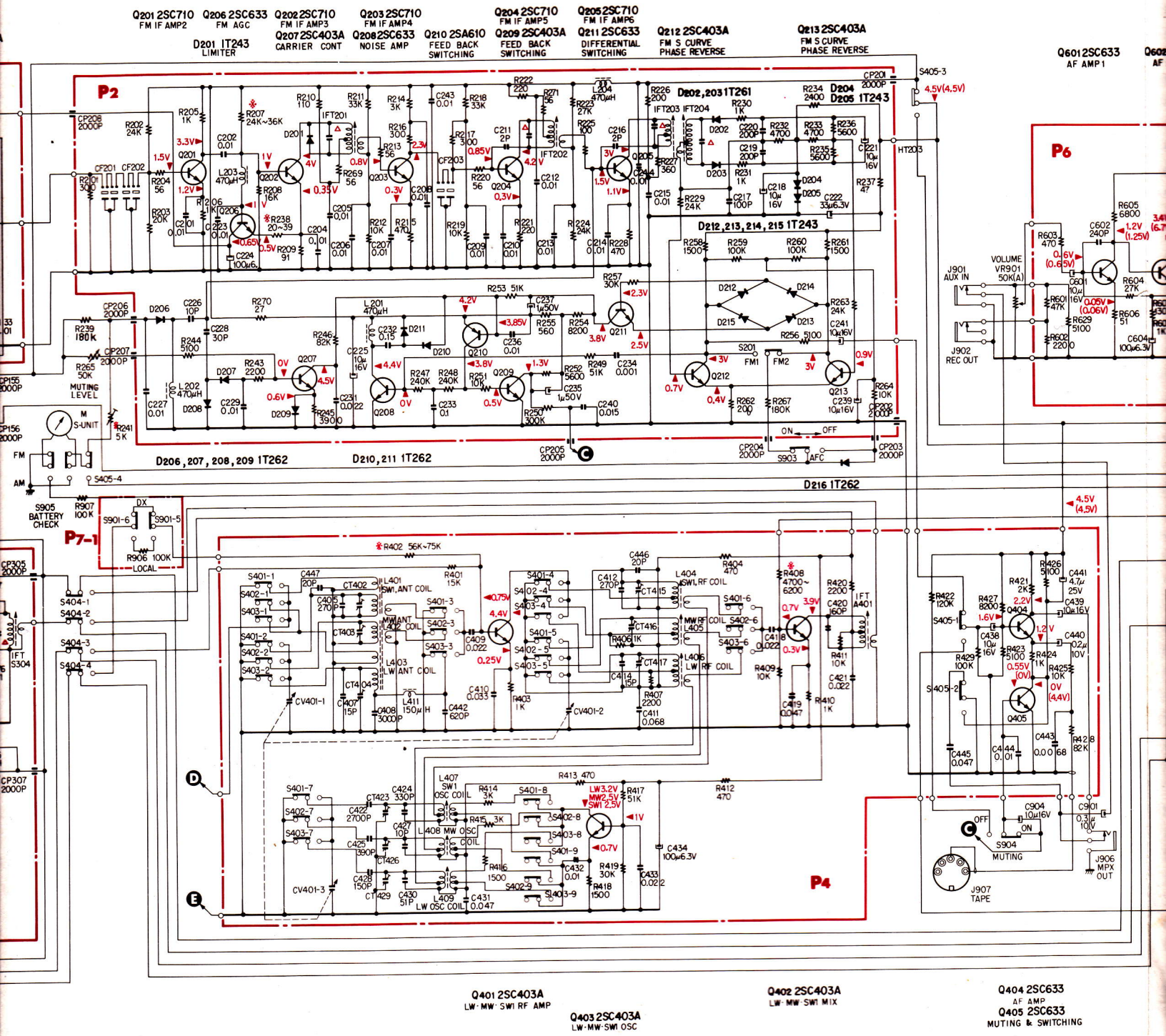
4-14. SCHEMATIC DIAGRAM



Note:

1. ⏚ shows grounding to the chassis.
2. All resistors and capacitors are in Ω and μF unless otherwise specified.
3. Capacitors marked △ are built in i-f transformers.
4. The symbol ※ indicates a component whose value is selected to yield normal operating condition.
5. Voltage values are measured from point indicated t a dc voltmeter (20 kΩ/V) and current values are ammeter.
   Voltage and current are taken with no radio signal
6. The values shown in ( ) are taken with ac [ ] with the muting switch set to on.
7. Variations may be noted due to normal productio

SCHEMATIC DIAGRAM

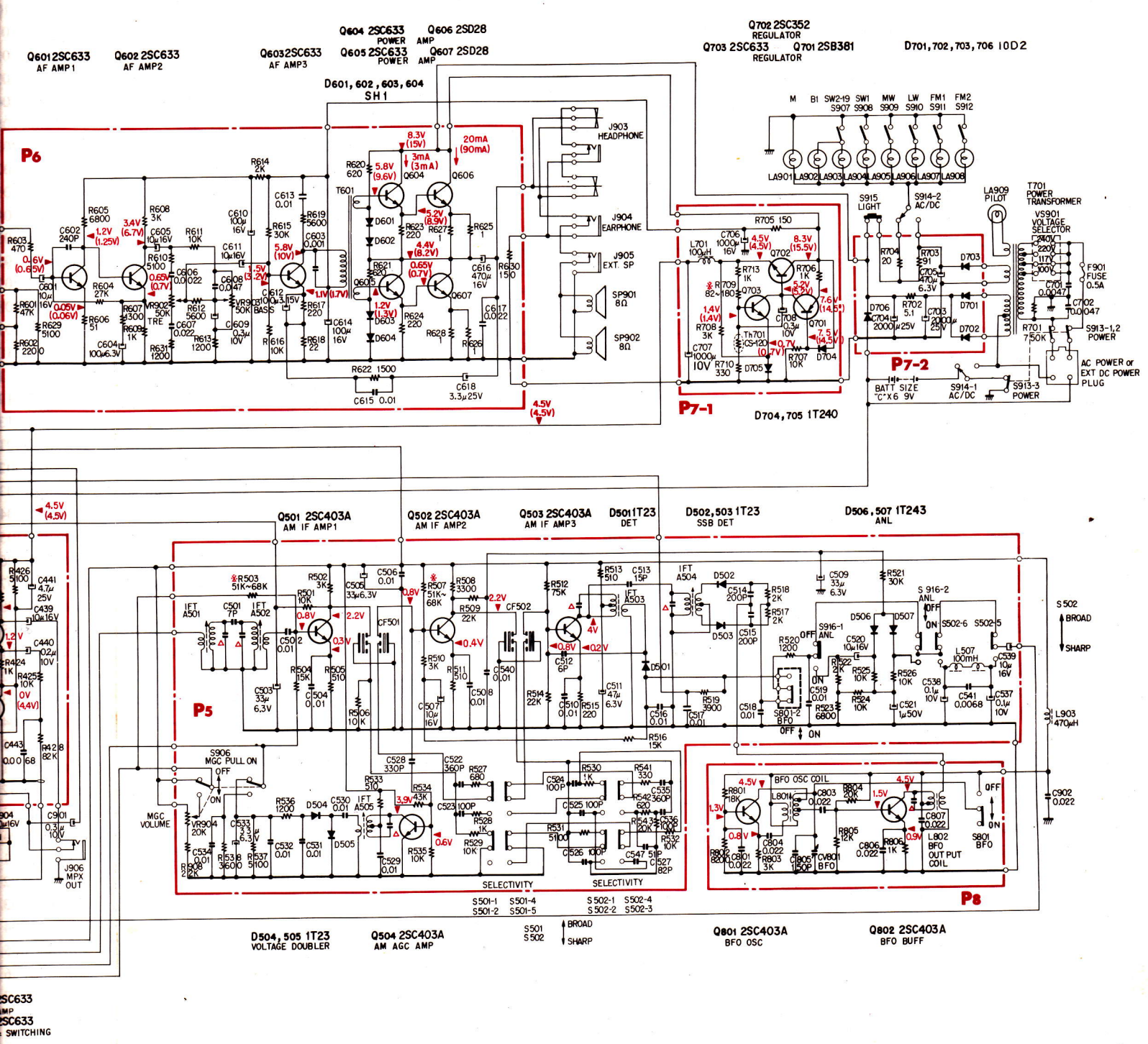


rom point indicated to ground circuit with
d current values are measured with a dc

with no radio signal received.

) are taken with ac power input and in
ch set to on.

to normal production tolerances.


Q601 2SC633
AF AMP1
Q602 2SC633
AF AMP2
Q603 2SC633
AF AMP3
Q604 2SC633
POWER AMP
Q605 2SC633
POWER AMP
Q606 2SD28
Q607 2SD28
D601, 602, 603, 604
SH1
Q702 2SC352
REGULATOR
Q703 2SC633
REGULATOR
Q701 2SB381
D701, 702, 703, 706 1OD2
P6
J903 HEADPHONE
J904 EARPHONE
J905 EXT. SP
SP901 8Ω
SP902 8Ω
P7-1
P7-2
D704, 705 1T240
LA901 LA902 LA903 LA904 LA905 LA906 LA907 LA908
S915 LIGHT
S914-2 AC/DC
LA909 PILOT
T701 POWER TRANSFORMER
VS901 VOLTAGE SELECTOR
F901 FUSE 0.5A
S913-1,2 POWER
AC POWER or EXT DC POWER PLUG
BATT SIZE "C"X6 9V
S914-1 AC/DC
S913-3 POWER
Q501 2SC403A
AM IF AMP1
Q502 2SC403A
AM IF AMP2
Q503 2SC403A
AM IF AMP3
D501 1T23
DET
D502, 503 1T23
SSB DET
D506, 507 1T243
ANL
P5
S906 MGC PULL ON
MGC VOLUME
SELECTIVITY
S501-1 S501-4
S501-2 S501-5
S502-1 S502-4
S502-2 S502-3
S501 S502
BROAD
SHARP
S 502 BROAD SHARP
L903 470μH
P8
BFO OSC COIL
D504, 505 1T23
VOLTAGE DOUBLER
Q504 2SC403A
AM AGC AMP
Q801 2SC403A
BFO OSC
Q802 2SC403A
BFO BUFF
J906 MPX OUT

SECTION 5
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
		SEMICONDUCTORS
Q101		transistor 2SC629
Q102		transistor 2SC629
Q103		transistor 2SK23
Q104		transistor 2SC403A
Q105		transistor 2SC629
Q201		transistor 2SC710
Q202		transistor 2SC710
Q203		transistor 2SC710
Q204		transistor 2SC710
Q205		transistor 2SC710
Q206		transistor 2SC633
Q207		transistor 2SC403A
Q208		transistor 2SC633
Q209		transistor 2SC403A
Q210		transistor 2SA610
Q211		transistor 2SC633
Q212		transistor 2SC403A
Q213		transistor 2SC403A
Q301		transistor 2SK23
Q302		transistor 2SK23
Q303		transistor 2SC633
Q304		transistor 2SC403A
Q305		transistor 2SC403A
Q306		transistor 2SC403A
Q307		transistor 2SC403A
Q308		transistor 2SC403A
Q309		transistor 2SC403A
Q401		transistor 2SC403A
Q402		transistor 2SC403A
Q403		transistor 2SC403A
Q404		transistor 2SC633
Q405		transistor 2SC633
Q501		transistor 2SC403A
Q502		transistor 2SC403A
Q503		transistor 2SC403A
Q504		transistor 2SC403A
Q601		transistor 2SC633
Q602		transistor 2SC633
Q603		transistor 2SC633
Q604		transistor 2SC633
Q605		transistor 2SC633
Q606		transistor 2SD28
Q607		transistor 2SD28
Q701		transistor 2SB381
Q702		transistor 2SC352
Q703		transistor 2SC633
Q801		transistor 2SC403A
Q802		transistor 2SC403A
D101		diode 1S351
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
D216		diode 1T262
D501		diode 1T23
D502		diode 1T23
D503		diode 1T23
D504		diode 1T23
D505		diode 1T23
D506		diode 1T243
D507		diode 1T243
D601		diode SH1
D602		diode SH1
D603		diode SH1
D604		diode SH1
D701		diode 10D2
D702		diode 10D2
D703		diode 10D2
D704		diode 1T240
D705		diode 1T240
D706		diode 10D2
TH701	8-691-001-11	thermistor CS120
		COILS AND TRANSFORMERS
L101	1-425-436-	antenna coil, fm 1-A
L102	1-425-437-	antenna coil, fm 1-B
L103	1-425-438-	antenna coil, fm 2-A
L104		– discarded –
L105	1-425-439-	antenna coil, fm 2-B
L106	1-425-440-	rf coil, fm 1
L107	1-425-441-	rf coil, fm 2
L108	1-407-182-	micro inductor, 2.2 µH
L109	1-407-184-	micro inductor, 3.3 µH
L110	1-407-354-	osc. coil, fm 1
L111	1-407-353-	osc. coil, fm 2
L112	1-407-182-	micro inductor, 2.2 µH
L113	1-407-175-	micro inductor, 330 µH
L201	1-407-177-	micro inductor, 470 µH
L202	1-407-177-	micro inductor, 470 µH
L203	1-407-177-	micro inductor, 470 µH
L204	1-407-177-	micro inductor, 470 µH
L301	1-401-340-	antenna coil, sw2-4
L302	1-401-341-	antenna coil, sw5-7
L303	1-401-342-	antenna coil, sw8-10

Ref. No.	Part No.	Description
L304	1-401-343-	antenna coil, sw11–13
L305	1-401-344-	antenna coil, sw14-16
L306	1-401-345-	antenna coil, sw17-19
L307	1-425-428-	rf coil, sw2-4
L308	1-425-429-	rf coil, sw5-7
L309	1-425-430-	rf coil, sw8-10
L310	1-425-431-	rf coil, sw11-13
L311	1-425-432-	rf coil, sw14-16
L312	1-425-433-	rf coil, sw17-19
L313	1-405-334-	osc coil, sw2
L314	1-405-335-	osc coil, sw3
L315	1-405-336-	osc coil, sw4
L316	1-405-337-	osc coil, sw5
L317	1-405-338-	osc coil, sw6
L318	1-405-339-	osc coil, sw7
L319	1-405-340-	osc coil, sw8
L320	1-405-341-	osc coil, sw9
L321	1-405-342-	osc coil, sw10
L322	1-405-343-	osc coil, sw11
L323	1-405-344-	osc coil, sw12
L324	1-405-345-	osc coil, sw13
L325	1-405-346-	osc coil, sw14
L326	1-405-347-	osc coil, sw15
L327	1-405-348-	osc coil, sw16
L328	1-405-349-	osc coil, sw17
L329	1-405-350-	osc coil, sw18
L330	1-405-351-	osc coil, sw19
L335	1-405-352-	osc coil, sw2-19 second
L401	1-401-347-	antenna coil, sw1
L402	1-401-348-	antenna coil, mw
L403	1-401-348-	antenna coil, lw
L404	1-425-442-	rf coil, sw1
L405	1-425-443-	rf coil, mw
L406	1-425-444-	rf coil, lw
L407	1-405-356-	osc coil, sw1
L408	1-405-357-	osc coil, mw
L409	1-405-358-	osc coil, lw
L410		– discarded –
L411	1-407-171-	micro inductor, 150 µH
L507	1-407-349-	micro inductor, 100 mH
L701	1-407-098-	micro inductor, 100 µH
L801	1-405-355-	osc coil, BFO
L802	1-403-128-	coil, BFO output
L903	1-407-177-	micro inductor, 470 µH
LF301	1-407-177-	micro inductor, 470 µH
LF302	1-407-177-	micro inductor, 470 µH
LF303		– discarded –
LF304	1-407-177-	micro inductor, 470 µH
LF305	1-407-177-	micro inductor, 470 µH
LF306	1-407-184-	micro inductor, 3.3 µH
IFT F101	1-403-244-31	transformer, i-f
IFT F201	1-403-244-31	transformer, i-f
IFT F202	1-403-244-31	transformer, i-f
IFT F203	1-403-272-31	discriminator, primary
IFT F204	1-403-273-31	discriminator, secondary

Ref. No.	Part No.	Description
IFT S301	1-425-434-	transformer, sw i-f
IFT S302	1-425-434-	transformer, sw i-f
IFT S303	1-403-134-	transformer, sw i-f
IFT S304	1-403-134-	transformer, sw i-f
IFT A401	1-425-445-	transformer, a-m i-f
IFT A501	1-403-139-	transformer, a-m i-f
IFT A502	1-403-139-	transformer, a-m i-f
IFT A503	1-403-128-	transformer, a-m i-f
IFT A504	1-403-135-	transformer, a-m i-f
IFT A505	1-403-128-	transformer, a-m 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, a-m i-f
CF502	1-403-161-13	ceramic filter, a-m i-f
T601	1-423-114-	transformer, input
T701	1-441-446-	transformer, power
B901	1-417-023-11	balun
B902	1-417-014-21	balun

CAPACITORS

C101	1-101-872-	33 pF	ceramic
C102	1-102-074-	0.001 µF	ceramic
C103	1-101-871-	30 pF	ceramic
C104	1-101-861-	15 pF	ceramic
C105	1-101-874-	36 pF	ceramic
C106	1-101-961-	12 pF	ceramic
C107	1-101-871-	30 pF	ceramic
C108	1-102-074-	0.001 µF	ceramic
C109	1-101-961-	12 pF	ceramic
C110	1-107-079-	56 pF	silvered mica
C111	1-101-864-	20 pF	ceramic
C112	1-101-959-	10 pF	ceramic
C113	1-101-882-	51 pF	ceramic
C114	1-101-961-	12 pF	ceramic
C115	1-101-861-	15 pF	ceramic
C116	1-107-079-	56 pF	silvered mica
C117	1-102-810-	8 pF	ceramic
C118	1-101-923-	0.01 µF	ceramic
C119	1-101-923-	0.01 µF	ceramic
C120	1-101-874-	36 pF	ceramic
C121	1-101-923-	0.01 µF	ceramic
C122	1-101-923-	0.01 µF	ceramic
C123	1-101-871-	30 pF	ceramic
C124	1-102-074-	0.001 µF	ceramic
C125	1-101-923-	0.01 µF	ceramic
C126	1-107-079-	56 pF	silvered mica
C127	1-101-923-	0.01 µF	ceramic
C128	1-101-923-	0.01 µF	ceramic
C129	1-101-923-	0.01 µF	ceramic
C130	1-101-923-	0.01 µF	ceramic
C131	1-101-923-	0.01 µF	ceramic
C132	1-101-923-	0.01 µF	ceramic
C133	1-101-923-	0.01 µF	ceramic
C134	1-101-923-	0.01 µF	ceramic

Ref. No.	Part No.	Description
C135	1-101-923-	0.01 μF ceramic
C136	1-121-347-	10 μF 16V electrolytic
C137	1-101-177-	2 pF ceramic
C138	1-102-870-	8 pF ceramic
C139	1-107-084-	91 pF silvered mica
C140	1-121-347-	10 μF 16V electrolytic
C141	1-101-923-	0.01 μF ceramic
C142	1-101-923-	0.01 μF ceramic
C143	1-102-868-	4 pF ceramic
C144	1-105-673-12	0.01 μF mylar
C145	1-102-867-	20 pF ceramic
C146	1-107-079-	56 pF silvered mica
C147	1-102-718-	15 pF ceramic
C148	1-105-673-12	0.01 μF mylar
C149	1-101-923-	0.01 μF ceramic
C150	1-101-923-	0.01 μF ceramic
C151	1-102-714-	10 pF ceramic
C152	1-127-203-	0.3 μF 15V electrolytic (alox)
C153	1-101-867-	24 pF ceramic
C154	1-101-923-	0.01 μF ceramic
C155		– discarded –
C156		– discarded –
C157		– discarded –
C158		– discarded –
C159	1-101-923-	0.01 μF ceramic
C160	1-101-923-	0.01 μF ceramic
C201	1-105-833-12	0.01 μF mylar
C202	1-105-833-12	0.01 μF mylar
C203		– discarded –
C204	1-105-833-12	0.01 μF mylar
C205	1-105-833-12	0.01 μF mylar
C206	1-105-833-12	0.01 μF mylar
C207	1-105-833-12	0.01 μF mylar
C208	1-105-833-12	0.01 μF mylar
C209	1-105-833-12	0.01 μF mylar
C210	1-105-833-12	0.01 μF mylar
C211	1-101-952-	2 pF ceramic
C212	1-105-833-12	0.01 μF mylar
C213	1-105-833-12	0.01 μF mylar
C214	1-105-833-12	0.01 μF mylar
C215	1-105-833-12	0.01 μF mylar
C216	1-101-952-	2 pF ceramic
C217	1-103-601-	100 pF polystyrene
C218	1-121-347-	10 μF 16V electrolytic
C219	1-103-608-	200 pF polystyrene
C220	1-103-608-	200 pF polystyrene
C221	1-121-347-	10 μF 16V electrolytic
C222	1-121-284-	33 μF 6.3V electrolytic
C223	1-105-833-12	0.01 μF mylar
C224	1-121-291-	100μF 6.3V electrolytic
C225	1-121-347-	10 μF 16V electrolytic
C226	1-101-959-	10 pF ceramic
C227	1-105-833-12	0.01 μF mylar
C228	1-101-871-	30 pF ceramic
C229	1-105-833-12	0.01 μF mylar

Ref. No.	Part No.	Description
C230		– discarded –
C231	1-105-837-12	0.022 μF mylar
C232	1-105-418-12	0.15 μF mylar
C233	1-105-685-12	0.1 μF mylar
C234	1-105-821-12	0.001 μF mylar
C235	1-121-343-	1 μF 50V electrolytic
C236	1-105-833-12	0.01 μF mylar
C237	1-121-343-	1 μF 50V electrolytic
C238		– discarded –
C239	1-121-347-	10 μF 16V electrolytic
C240	1-105-675-12	0.015 μF mylar
C241	1-121-347-	10 μF 16V electrolytic
C242		– discarded –
C243	1-105-833-12	0.01 μF mylar
C244	1-105-833-12	0.01 μF mylar
C301	1-101-923-	0.01 μF ceramic
C302	1-107-083-	82 pF silvered mica
C303	1-107-084-	91 pF silvered mica
C304	1-107-078-	51 pF silvered mica
C305	1-107-085-	100 pF silvered mica
C306	1-107-081-	68 pF silvered mica
C307	1-101-075-	39 pF silvered mica
C308	1-107-070-	24 pF silvered mica
C309	1-107-070-	24 pF silvered mica
C310	1-107-077-	47 pF silvered mica
C311	1-107-083-	82 pF silvered mica
C312	1-107-070-	24 pF silvered mica
C313	1-107-075-	39 pF silvered mica
C314	1-107-065-	15 pF silvered mica
C315	1-107-065-	15 pF silvered mica
C316	1-107-069-	22 pF silvered mica
C317	1-107-075-	39 pF silvered mica
C318	1-107-065-	15 pF silvered mica
C319	1-107-068-	20 pF silvered mica
C320	1-107-061-	10 pF silvered mica
C321	1-107-065-	15 pF silvered mica
C322	1-107-070-	24 pF silvered mica
C323	1-107-105-	8 pF silvered mica
C324	1-107-104-	7 pF silvered mica
C325	1-107-061-	10 pF silvered mica
C326	1-107-102-	5 pF silvered mica
C327	1-107-061-	10 pF silvered mica
C328	1-107-061-	10 pF silvered mica
C329	1-101-924-	0.02 μF ceramic
C330	1-101-924-	0.02 μF ceramic
C331	1-101-923-	0.01 μF ceramic
C332	1-101-924-	0.02 μF ceramic
C333	1-101-924-	0.02 μF ceramic
C334	1-107-070-	24 pF silvered mica
C335	1-107-083-	82 pF silvered mica
C336	1-107-084-	91 pF silvered mica
C337	1-107-061-	10 pF silvered mica
C338	1-107-078-	51 pF silvered mica
C339	1-107-083-	100 pF silvered mica
C340	1-107-081-	68 pF silvered mica

Ref. No.	Part No.	Description	
C341	1-107-075-	39 pF	silvered mica
C342	1-107-072-	30 pF	silvered mica
C343	1-107-070-	24 pF	silvered mica
C344	1-107-077-	47 pF	silvered mica
C345	1-107-083-	82 pF	silvered mica
C346	1-107-070-	24 pF	silvered mica
C347	1-107-075-	39 pF	silvered mica
C348	1-107-065-	15 pF	silvered mica
C349	1-107-065-	15 pF	silvered mica
C350	1-107-069-	22 pF	silvered mica
C351	1-107-075-	39 pF	silvered mica
C352	1-107-069-	20 pF	silvered mica
C353	1-107-065-	15 pF	silvered mica
C354	1-107-061-	10 pF	silvered mica
C355		– discarded –	
C356	1-107-065-	15 pF	silvered mica
C357	1-107-070-	24 pF	silvered mica
C358	1-107-105-	8 pF	silvered mica
C359	1-107-102-	5 pF	silvered mica
C360	1-107-104-	7 pF	silvered mica
C361		– discarded –	
C362	1-107-061-	10 pF	silvered mica
C363	1-107-104-	7 pF	silvered mica
C364	1-107-061-	10 pF	silvered mica
C365	1-107-061-	10 pF	silvered mica
C366	1-101-923-	0.01 μF	ceramic
C367	1-105-411-12	0.01 μF	mylar
C368	1-105-411-12	0.01 μF	mylar
C369	1-107-065-	15 pF	silvered mica
C370	1-105-411-12	0.01 μF	mylar
C371	1-105-411-12	0.01 μF	mylar
C372	1-107-065-	15 pF	silvered mica
C373	1-103-616-	430 pF	polystyrene
C374	1-105-411-12	0.01 μF	mylar
C375		– discarded –	
C376	1-105-411-12	0.01 μF	mylar
C377	1-107-100-	3 pF	silvered mica
C378		– discarded –	
C379	1-105-411-12	0.01 μF	mylar
C380	1-102-871-	43 pF	ceramic
C381	1-103-601-	100 pF	polystyrene
C382		– discarded –	
C383	1-107-102-	5 pF	silvered mica
C384		– discarded –	
C385	1-101-918-	0.001 μF	ceramic
C386	1-103-612-	300 pF	polystyrene
C387	1-105-411-12	0.01 μF	mylar
C388		– discarded –	
C389	1-105-411-12	0.01 μF	mylar
C390	1-105-411-12	0.01 μF	mylar
C391	1-105-411-12	0.01 μF	mylar
C392	1-107-061-	10 pF	silvered mica
C393	1-107-081-	68 pF	silvered mica
C394	1-107-171-	120 pF	silvered mica
C395	1-107-085-	100 pF	silvered mica

Ref. No.	Part No.	Description	
C396	1-107-081-	68 pF	silvered mica
C397	1-107-078-	51 pF	silvered mica
C398	1-107-078-	51 pF	silvered mica
C399	1-107-076-	43 pF	silvered mica
C1400	1-107-076-	43 pF	silvered mica
C1401	1-107-072-	30 pF	silvered mica
C1402	1-107-072-	30 pF	silvered mica
C1403	1-107-071-	27 pF	silvered mica
C1404	1-107-071-	27 pF	silvered mica
C1405	1-107-071-	27 pF	silvered mica
C1406	1-107-068-	20 pF	silvered mica
C1407	1-107-068-	20 pF	silvered mica
C1408	1-107-068-	20 pF	silvered mica
C1409	1-107-068-	20 pF	silvered mica
C1410	1-107-068-	20 pF	silvered mica
C1411	1-107-065-	15 pF	silvered mica
C1412	1-107-102-	5 pF	silvered mica
C1413	1-107-102-	5 pF	silvered mica
C1414	1-107-102-	5 pF	silvered mica
C1415	1-107-102-	5 pF	silvered mica
C1416		– discarded –	
C1417		– discarded –	
C1418	1-101-923-	0.01 μF	ceramic
C1419	1-107-070-	24 pF	silvered mica
C1420	1-107-078-	51 pF	silvered mica
C401		– discarded –	
C402		– discarded –	
C403		– discarded –	
C404		– discarded –	
C405	1-103-611-	270 pF	polystyrene
C406		– discarded –	
C407	1-101-861-	15 pF	ceramic
C408		– discarded –	
C409	1-105-413-12	0.022 μF	mylar
C410	1-105-414-12	0.033 μF	mylar
C411	1-105-416-12	0.068 μF	mylar
C412	1-103-611-	270 pF	polystyrene
C413		– discarded –	
C414	1-101-861-	15 pF	ceramic
C415		– discarded –	
C416		– discarded –	
C417		– discarded –	
C418	1-105-413-12	0.022 μF	mylar
C419	1-105-415-12	0.047 μF	myalr
C420	1-103-606-	160 pF	polystyrene
C421	1-105-411-12	0.022 μF	mylar
C422	1-103-635-	2700 pF	polystyrene
C423		– discarded –	
C424	1-103-613-	330 pF	polystyrene
C425	1-103-615-	390 pF	polystyrene
C426		– discarded –	
C427	1-101-960-	10 pF	ceramic
C428	1-103-605-	150 pF	polystyrene
C429		– discarded –	
C430	1-101-882-	51 pF	ceramic

Ref. No.	Part No.	Description
C431	1-105-415-12	0.047 µF mylar
C432	1-105-411-12	0.01 µF mylar
C433	1-105-413-12	0.022 µF myalr
C434	1-121-291-	100µF 6.3V electrolytic
C435		– discarded –
C436		– discarded –
C437		– discarded –
C438	1-121-347-	10 µF 16V electrolytic
C439	1-121-347-	10 µF 16V electrolytic
C440	1-127-020-	0.2 µF 10V electrolytic (alox)
C441	1-121-281-	4.7 uF 25V electrolytic
C442	1-103-620-	620 pF polystyrene
C443	1-105-831-12	0.0068 µF mylar
C444	1-105-441-12	0.01 µF mylar
C445	1-105-415-	0.047 µF mylar
C446	1-101-864-	20 pF ceramic
C447	1-101-864-	20 pF ceramic
C501	1-101-957-	7 pF ceramic
C502	1-105-411-12	0.01 µF mylar
C503	1-121-284-	33 µF 6.3V electrolytic
C504	1-105-411-12	0.01 µF mylar
C505	1-121-284-	33 µF 6.3V electrolytic
C506	1-105-411-12	0.01 µF mylar
C507	1-121-347-	10 µF 16V electrolytic
C508	1-105-411-12	0.01 µF mylar
C509	1-121-284-	33 µF 6.3V electrolytic
C510	1-105-411-12	0.01 µF mylar
C511	1-121-322-	47 µF 6.3V electrolytic
C512	1-101-956-	6 pF ceramic
C513	1-101-861-	15 pF ceramic
C514	1-103-608-	200 pF polystyrene
C515	1-103-608-	200 pF polystyrene
C516	1-105-411-12	0.01 µF mylar
C517	1-105-411-12	0.01 µF mylar
C518	1-105-411-12	0.01 µF mylar
C519	1-105-411-12	0.01 µF mylar
C520	1-121-347-	10 µF 16V electrolytic
C521	1-121-343-	1 µF 50V electrolytic
C522	1-103-714-	360 pF polystyrene
C523	1-103-874-	100 pF polystyrene
C524	1-103-874-	100 pF polystyrene
C525	1-103-874-	100 pF polystyrene
C526	1-103-874-	100 pF polystyrene
C527	1-101-892-	82 pF ceramic
C528	1-103-613-	330 pF polystyrene
C529	1-105-411-12	0.01 µF mylar
C530	1-105-411-12	0.01 µF mylar
C531	1-105-411-12	0.01 µF mylar
C532	1-105-411-12	0.01 µF mylar
C533	1-121-284-	33 µF 6.3V electrolytic
C534	1-105-411-12	0.01 µF mylar
C535	1-101-714-	360 pF polystyrene
C536	1-101-874-	100 pF ceramic
C537	1-127-019-	0.1 µF 10V electrolytic (alox)
C538	1-127-019-	0.1 µF 10V electrolytic (alox)

Ref. No.	Part No.	Description
C539	1-121-347-	10 µF 16V electrolytic
C540	1-105-411-12	0.01 µF mylar
C541	1-105-671-12	0.0068 µF mylar
C542		– discarded –
C543		– discarded –
C544		– discarded –
C545		– discarded –
C546		– discarded –
C547	1-101-882-	51 pF ceramic
C601	1-121-471-	10 µF 16V electrolytic
C602	1-103-660-	240 pF polystyrene
C603	1-105-821-12	0.001 µF mylar
C604	1-121-291-	100 µF 6.3V electrolytic
C605	1-121-471-	10 µF 16V electrolytic
C606	1-105-825-12	0.0022 µF mylar
C607	1-105-413-12	0.022 µF mylar
C608	1-105-415-12	0.047 µF mylar
C609	1-121-021-	0.3 µF 10V electrolytic
C610	1-121-356-	100 µF 16V electrolytic
C611	1-121-471-	10 µF 16V electrolytic
C612	1-121-491-	100µF 3.15V electrolytic
C613	1-105-411-12	0.01 µF mylar
C614	1-105-356-	100 µF 16V electrolytic
C615	1-105-411-12	0.01 µF mylar
C616	1-121-727-	470 µF 16V electrolytic
C617	1-105-413-12	0.022 µF mylar
C618	1-121-344-	3.3 µF 25V electrolytic
C701	1-115-071-	0.0047µF 600V paper
C702	1-115-071-	0.0047µF 600V paper
C703	1-121-014-	2000µF 25V electrolytic
C704	1-121-014-	2000µF 25V electrolytic
C705	1-121-359-	470 µF 6.3V electrolytic
C706	1-121-186-	1000 µF 16V electrolytic
C707	1-121-736-	1000µF 10V electrolytic
C708	1-127-021-	0.3 µF 10V electrolytic (alox)
C801	1-105-413-12	0.022 µF mylar
C802		– discarded –
C803	1-105-413-12	0.022 µF mylar
C804	1-105-413-12	0.022 µF mylar
C805	1-102-845-	150 pF ceramic
C806	1-105-413-12	0.022 µF mylar
C807	1-105-413-12	0.022 µF mylar
C901	1-127-021-	0.3 µF 10V electrolytic (alox)
C902	1-105-419-12	0.022 µF mylar
C903		– discarded –
C904	1-121-347-	10 µF 16V electrolytic
CP155	1-101-799-	2000 pF feed-through
CP156	1-101-799-	2000 pF feed-through
CP157	1-101-799-	2000 pF feed-through
CP158	1-101-799-	2000 pF feed-through
CP201	1-101-799-	2000 pF feed-through
CP202		– discarded –
CP203	1-101-799-	2000 pF feed-through
CP204	1-101-799-	2000 pF feed-through
CP205	1-101-799-	2000 pF feed-through

Ref. No.	Part No.	Description
CP206	1-101-799-	2000 pF feed-through
CP207	1-101-799-	2000 pF feed-through
CP208	1-101-799-	2000 pF feed-through
CP301	1-101-799-	2000 pF feed-through
CP302	1-101-799-	2000 pF feed-through
CP303	1-101-799-	2000 pF feed-through
CP304		– discarded –
CP305	1-101-799-	2000 pF feed-through
CP306	1-101-799-	2000 pF feed-through
CP307	1-101-799-	2000 pF feed-through
CV101-104	1-151-180-12S	tuning capacitor, fm 4 gang
CV301-302	1-151-167-12S	tuning capacitor, sw 2 gang
CV303-305	1-151-168-12S	tuning capacitor, sw 3 gang
CV401-1~3	1-151-182-13S	tuning capacitor, mw lw sw-1 3 gang
CV801	1-151-181-	variable capacitor, BFO
CT101	1-141-022-	capacitor, trimmer (20 pF)
CT102	1-141-022-	capacitor, trimmer (20 pF)
CT103	1-141-022-	capacitor, trimmer (20 pF)
CT104	1-141-022-	capacitor, trimmer (20 pF)
CT105	1-141-022-	capacitor, trimmer (20 pF)
CT106	1-141-022-	capacitor, trimmer (20 pF)
CT107	1-141-022-	capacitor, trimmer (20 pF)
CT108	1-141-022-	capacitor, trimmer (20 pF)
CT301	1-141-022-	capacitor, trimmer (20 pF)
CT302	1-141-022-	capacitor, trimmer (20 pF)
CT303	1-141-022-	capacitor, trimmer (20 pF)
CT304	1-141-078-	capacitor, trimmer (16 pF)
CT305	1-141-078-	capacitor, trimmer (16 pF)
CT306	1-141-080-	capacitor, trimmer (10 pF)
CT307	1-141-078-	capacitor, trimmer (16 pF)
CT308	1-141-079-	capacitor, trimmer (10 pF)
CT309	1-141-080-	capacitor, trimmer (10 pF)
CT310	1-141-078-	capacitor, trimmer (16 pF)
CT311	1-141-078-	capacitor, trimmer (16 pF)
CT312	1-141-080-	capacitor, trimmer (10 pF)
CT313	1-141-078-	capacitor, trimmer (16 pF)
CT314	1-141-079-	capacitor, trimmer (10 pF)
CT315	1-141-080-	capacitor, trimmer (10 pF)
CT316	1-141-079-	capacitor, trimmer (10 pF)
CT317	1-141-079-	capacitor, trimmer (10 pF)
CT318	1-141-080-	capacitor, trimmer (10 pF)
CT319	1-141-079-	capacitor, trimmer (10 pF)
CT320	1-141-079-	capacitor, trimmer (10 pF)
CT321	1-141-080-	capacitor, trimmer (10 pF)
CT322	1-141-078-	capacitor, trimmer (16 pF)
CT323	1-141-078-	capacitor, trimmer (16 pF)
CT324	1-141-080-	capacitor, trimmer (10 pF)
CT325	1-141-078-	capacitor, trimmer (16 pF)
CT326	1-141-079-	capacitor, trimmer (10 pF)
CT327	1-141-080-	capacitor, trimmer (10 pF)
CT328	1-141-078-	capacitor, trimmer (16 pF)
CT329	1-141-078-	capacitor, trimmer (16 pF)
CT330	1-141-080-	capacitor, trimmer (10 pF)
CT331	1-141-078-	capacitor, trimmer (16 pF)
CT332	1-141-079-	capacitor, trimmer (10 pF)
CT333	1-141-080-	capacitor, trimmer (10 pF)
CT334	1-141-079-	capacitor, trimmer (10 pF)
CT335	1-141-079-	capacitor, trimmer (10 pF)
CT336	1-141-080-	capacitor, trimmer (10 pF)
CT337	1-141-079-	capacitor, trimmer (10 pF)
CT338	1-141-079-	capacitor, trimmer (10 pF)
CT339	1-141-080-	capacitor, trimmer (10 pF)
CT402	1-141-082-11	capacitor, trimmer (20 pF)
CT403	1-141-082-11	capacitor, trimmer (20 pF)
CT404	1-141-082-11	capacitor, trimmer (20 pF)
CT415	1-141-082-11	capacitor, trimmer (20 pF)
CT416	1-141-082-11	capacitor, trimmer (20 pF)
CT417	1-141-082-11	capacitor, trimmer (20 pF)
CT423	1-141-082-11	capacitor, trimmer (20 pF)
CT426	1-141-082-11	capacitor, trimmer (20 pF)
CT429	1-141-082-11	capacitor, trimmer (20 pF)

RESISTORS

(carbon, ±5% unless otherwise specified)

R101	1-244-714-	51 kΩ
R102	1-244-714-	51 kΩ
R103	1-244-666-	510 Ω
R104	1-244-696-	9100 Ω
R105	1-244-707-	27 kΩ
R106	1-244-641-	47 Ω
R107	1-244-635-	27 Ω
R108	1-244-669-	680 Ω
R109	1-244-673-	1 kΩ
R110	1-244-641-	47 Ω
R111	1-244-706-	24 kΩ
R112	1-244-701-	15 kΩ
R113	1-244-673-	1 kΩ
R114	1-244-666-	510 Ω
R115	1-244-656-	200 Ω
R116	1-244-701-	15 kΩ
R117	1-244-693-	6800 Ω
R118	1-244-728-	200 kΩ
R201	1-244-660-	300 Ω
R202	1-244-706-	24 kΩ
R203	1-244-704-	20 kΩ
R204	1-244-634-	56 Ω
R205	1-244-673-	1 kΩ
R206	1-244-673-	1 kΩ
※ R207	1-244-706-	24 kΩ
	1-244-707-	27 kΩ
	1-244-708-	30 kΩ
	1-244-709-	33 kΩ
	1-244-710-	36 kΩ
R208	1-244-702-	16 kΩ
R209	1-244-648-	91 Ω
R210	1-244-650-	110 Ω
R211	1-244-709-	33 kΩ
R212	1-244-697-	10 kΩ
R213	1-244-643-	56 Ω
R214	1-244-684-	3 kΩ

Ref. No.	Part No.	Description
R215	1-244-665-	470 Ω
R216	1-244-660-	300 Ω
R217	1-244-660-	300 Ω
R218	1-244-709-	33 kΩ
R219	1-244-697-	10 kΩ
R220	1-244-643-	56 Ω
R221	1-244-657-	220 Ω
R222	1-244-657-	220 Ω
R223	1-244-707-	27 kΩ
R224	1-244-706-	24 kΩ
R225	1-244-649-	100 Ω
R226	1-244-656-	200 Ω
R227	1-244-662-	360 Ω
R228	1-244-665-	470 Ω
R229	1-244-706-	24 kΩ
R230	1-244-673-	1 kΩ
R231	1-244-673-	1 kΩ
R232	1-244-689-	4700 Ω
R233	1-244-689-	4700 Ω
R234	1-244-682-	2400 Ω
R235	1-244-691-	5600 Ω
R236	1-244-691-	5600 Ω
R237	1-244-641-	47 Ω
※ R238	1-244-632-	20 Ω
	1-244-633-	22 Ω
	1-244-634-	24 Ω
	1-244-635-	27 Ω
	1-244-636-	30 Ω
	1-244-637-	33 Ω
	1-244-638-	36 Ω
	1-244-639-	39 Ω
R239	1-244-727-	180 kΩ
R240		– discarded –
※ R241	1-221-635-	5 kΩ adjustable
R242		– discarded –
R243	1-244-681-	2200 Ω
R244	1-244-690-	5100 Ω
R245	1-244-687-	3900 Ω
R246	1-244-719-	82 kΩ
R247	1-244-730-	240 kΩ
R248	1-244-730-	240 kΩ
R249	1-244-714-	51 kΩ
R250	1-244-732-	300 kΩ
R251	1-244-697-	10 kΩ
R252	1-244-691-	5600 Ω
R253	1-244-714-	51 kΩ
R254	1-244-695-	8200 Ω
R255	1-244-667-	560 Ω
R256	1-244-690-	5100 Ω
R257	1-244-708-	30 kΩ
R258	1-244-677-	1500 Ω
R259	1-244-721-	100 kΩ
R260	1-244-721-	100 kΩ
R261	1-244-677-	1500 Ω

Ref. No.	Part No.	Description
R262	1-244-656-	200 Ω
R263	1-244-706-	24 kΩ
R264	1-244-697-	10 kΩ
R265	1-222-149-	50 kΩ muting control
R266		– discarded –
R267	1-244-721-	180 kΩ
R268		– discarded –
R269	1-244-643-	56 Ω
R270	1-244-635-	27 Ω
R271	1-244-643-	56 Ω
R301	1-244-703-	18 kΩ
R302	1-244-703-	18 kΩ
R303	1-244-713-	47 kΩ
R304	1-244-690-	5100 Ω
R305	1-244-703-	18 kΩ
R306	1-244-703-	18 kΩ
R307	1-244-705-	22 kΩ
R308	1-244-690-	5100 Ω
R309	1-244-656-	200 Ω
R310	1-244-703-	18 kΩ
R311	1-244-705-	22 kΩ
R312	1-244-690-	5100 Ω
R313	1-244-673-	1 kΩ
R314	1-244-703-	18 kΩ
R315	1-244-656-	200 Ω
R316	1-244-710-	36 kΩ
R317	1-244-691-	5600 Ω
R318	1-244-673-	1 kΩ
R319	1-244-656-	200 Ω
R320	1-244-683-	2700 Ω
R321	1-244-683-	2700 Ω
R322	1-244-685-	3300 Ω
R323	1-244-684-	3 kΩ
R324	1-244-693-	6800 Ω
R325	1-244-683-	2700 Ω
R326	1-244-649-	100 Ω
R327	1-244-680-	2 kΩ
R328	1-244-693-	6800 Ω
R329	1-244-684-	3 kΩ
R330	1-240-460-	300 Ω
R331		– discarded –
R332		– discarded –
R333	1-244-680-	2 kΩ
R334		– discarded –
R335	1-244-690-	5100 Ω
R401	1-240-501-	15 kΩ 1/8W
※ R402	1-240-515-	56 kΩ 1/8W
	1-240-516-	62 kΩ 1/8W
	1-240-517-	68 kΩ 1/8W
	1-240-518-	75 kΩ 1/8W
R403	1-240-473-	1 kΩ 1/8W
R404	1-244-665-	470 Ω
R405	1-244-484-	– discarded –

Note: The symbol ※ indicates a component whose value is selected to yield normal operating condition.

Ref. No.	Part No.	Description	
R406	1-244-473-	1 kΩ	1/8W
R407	1-244-481-	2200 Ω	1/8W
※ R408	1-244-489-	4700 Ω	1/8W
	1-244-490-	5100 Ω	1/8W
	1-244-491-	5600 Ω	1/8W
	1-244-492-	6200 Ω	1/8W
R409	1-244-497-	10 kΩ	1/8W
R410	1-244-473-	1 kΩ	1/8W
R411	1-244-497-	10 kΩ	1/8W
R412	1-244-465-	470 Ω	1/8W
R413	1-244-465-	470 Ω	1/8W
R414	1-244-484-	3 kΩ	1/8W
R415	1-244-485-	3 kΩ	1/8W
R416	1-244-477-	1500 Ω	1/8W
R417	1-244-514-	51 kΩ	1/8W
R418	1-244-477-	1500 Ω	1/8W
R419	1-244-508-	30 kΩ	1/8W
R420	1-244-480-	2200 Ω	1/8W
R421	1-244-480-	2 kΩ	1/8W
R422	1-244-523-	120 kΩ	1/8W
R423	1-244-490-	5100 Ω	1/8W
R424	1-244-473-	1 kΩ	1/8W
R425	1-244-497-	10 kΩ	1/8W
R426	1-244-490-	5100 Ω	1/8W
R427	1-244-495-	8200 Ω	1/8W
R428	1-244-519-	82 kΩ	1/8W
R429	1-244-521-	100 kΩ	1/8W
R501	1-244-497-	10 kΩ	1/8W
R502	1-244-484-	3 kΩ	1/8W
※ R503	1-240-514-	51 kΩ	1/8W
	1-240-515-	56 kΩ	1/8W
	1-240-516-	62 kΩ	1/8W
	1-240-517-	68 kΩ	1/8W
R504	1-240-501-	15 kΩ	1/8W
R505	1-240-466-	510 Ω	1/8W
R506	1-240-497-	10 kΩ	1/8W
※ R507	1-240-514-	51 kΩ	1/8W
	1-240-515-	56 kΩ	1/8W
	1-240-516-	62 kΩ	1/8W
	1-240-517-	68 kΩ	1/8W
R508	1-240-485-	3300 Ω	1/8W
R509	1-240-505-	22 kΩ	1/8W
R510	1-240-484-	3 kΩ	1/8W
R511	1-240-466-	510 Ω	1/8W
R512	1-240-518-	75 kΩ	1/8W
R513	1-240-466-	510 Ω	1/8W
R514	1-240-505-	22 kΩ	1/8W
R515	1-240-457-	220 Ω	1/8W
R516	1-244-701-	15 kΩ	
R517	1-240-480-	2 kΩ	1/8 W
R518	1-240-480-	2 kΩ	1/8W
R519	1-240-487-	3900 Ω	1/8W
R520	1-240-475-	1200 Ω	1/8W
R521	1-240-508-	30 kΩ	1/8W
R522	1-240-480-	2 kΩ	1/8W

Ref. No.	Part No.	Description		
R523	1-240-493-	6800 Ω	1/8W	
R524	1-240-497-	10 kΩ	1/8W	
R525	1-240-497-	10 kΩ	1/8W	
R526	1-240-497-	10 kΩ	1/8W	
R527	1-240-469-	680 Ω	1/8W	
R528	1-240-473-	1 kΩ	1/8W	
R529	1-240-497-	10 kΩ	1/8W	
R530	1-240-473-	1 kΩ	1/8W	
R531	1-240-490-	5100 Ω	1/8W	
R532	1-240-497-	10 kΩ	1/8W	
R533	1-240-466-	510 Ω	1/8W	
R534	1-240-512-	43 kΩ	1/8W	
R535	1-240-497-	10 kΩ	1/8W	
R536	1-240-475-	1200 Ω	1/8W	
R537	1-240-490-	5100 Ω	1/8W	
R538	1-242-679-	3600 Ω		
R539		– discarded –		
R540		– discarded –		
R541	1-240-461-	330 Ω	1/8W	
R542	1-240-468-	620 Ω	1/8W	
R543	1-244-504-	20 kΩ		
R601	1-242-713-	47 kΩ		
R602	1-242-609-	2200 Ω		
R603	1-242-665-	470 Ω		
R604	1-242-707-	27 kΩ		
R605	1-242-693-	6800 Ω		
R606	1-242-642-	51 Ω		
R607	1-242-676-	1300 Ω		
R608	1-242-684-	3 kΩ		
R609	1-242-673-	1 kΩ		
R610	1-242-690-	5100 Ω		
R611	1-242-697-	10 kΩ		
R612	1-244-691-	5600 Ω		
R613	1-242-675-	1200 Ω		
R614	1-242-680-	2 kΩ		
R615	1-242-708-	30 kΩ		
R616	1-242-697-	10 kΩ		
R617	1-242-657-	220Ω		
R618	1-242-633-	22 Ω		
R619	1-242-691-	5600 Ω		
R620	1-242-668-	620 Ω		
R621	1-242-668-	620 Ω		
R622	1-242-677-	1500 Ω		
R623	1-242-657-	220 Ω		
R624	1-242-657-	220 Ω		
R625	1-242-601-	1 Ω		
R626	1-242-601-	1 Ω		
R627	1-242-601-	1 Ω		
R628	1-242-601-	1 Ω		
R629	1-242-690-	5100 Ω		
R630	1-244-853-	150 Ω		
R631	1-242-675-	1200 Ω		
R701	1-201-564-	750 kΩ	½ W	composition
R702	1-211-001-	511 Ω	1 W	carbon
R703	1-202-548-	91 Ω	½ W	composition

Ref. No.	Part No.	Description
R704	1-201-532-	20 Ω ½ W composition
R705	1-244-653-	150 Ω
R706	1-244-673-	1 kΩ
R707	1-244-697-	10 kΩ
R708	1-244-684-	3 kΩ
※ R709	1-244-647-	82 Ω
	1-244-649-	100 Ω
	1-244-651-	120 Ω
	1-244-653-	150 Ω
	1-244-655-	180 Ω
R710	1-244-661-	330 Ω
R711		– discarded –
R712		– discarded –
R713	1-244-673-	1 kΩ
R801	1-244-703-	18 kΩ
R802	1-244-695-	8200 Ω
R803	1-244-684-	3 kΩ
R804	1-244-704-	20 kΩ
R805	1-244-699-	12 kΩ
R806	1-244-673-	1 kΩ
R901	1-244-642-	51 Ω
R902	1-244-642-	51 Ω
R903	1-244-648-	91 Ω
R904	1-244-663-	390 Ω
R905	1-244-648-	91 Ω
R906	1-244-721-	100 kΩ
R907	1-244-721-	100 kΩ
R908	1-244-705-	22 kΩ
VR901	1-222-196-11	volume control
VR902	1-222-195-11	tone control, treble
VR903	1-222-195-11	tone control, bass
VR904	1-222-194-12	volume control, MGC

MISCELLANEOUS

1-538-833-11	printed circuit board,		C-A
1-538-834-11	printed circuit board,	fm	C-B
1-538-835-11	printed circuit board,	front	C-C
1-538-836-11	printed circuit board,	end	C-D
1-538-837-12	printed circuit board,		AMP
1-539-468-11	printed circuit board, fm i-f		
1-538-819-12	printed circuit board,		RF-1
1-538-820-12	printed circuit board,		RF-2
1-538-821-11	printed circuit board,		OS-1
1-538-822-11	printed circuit board,		MX-1
1-538-823-11	printed circuit board,		MX-2
1-538-824-11	printed circuit board,	sw	OS-2
1-538-825-11	printed circuit board,	front	G
1-538-826-11	printed circuit board,	end	F
1-538-827-11	printed circuit board,		DISK-E
1-538-828-11	printed circuit board,		DISK-D
1-538-829-11	printed circuit board,		DISK-C
1-538-830-11	printed circuit board,		DISK-B
1-538-831-11	printed circuit board,		DISK-A
1-538-860-14	printed circuit board, CP		
1-538-818-13	printed circuit board, a-m i-f		

Ref. No.	Part No.	Description
	1-538-816-13	printed circuit board, a-f
	1-538-996-11	printed circuit board, power supply
	1-538-901-11	printed circuit board, regulator
	1-538-817-11	printed circuit board, BFO
S1 ~ S11	1-514-460-11	switch, fm band selector
S201	1-513-153-10	switch, fm band selector
S401	1-513-304-11	slide switch, sw1
S402	1-513-304-11	slide switch, mw
S403	1-513-304-11	slide switch, 1 w
S404	1-513-302-11	slide switch, a-m/sw
S405	1-513-302-11	slide switch, a-m/fm
S501	1-513-274-11	slide switch, selectivity
S502	1-513-274-11	slide switch, selectivity
S801	1-514-445-11	slide switch, BFO on/off
S901	1-513-261-12	slide switch, sensitivity
S902	1-514-304-11	slide switch, fm rod-ext antenna
S903	1-513-272-11	slide switch, AFC on/off
S904	1-513-272-11	slide switch, muting on/off
S905	1-514-504-11	leaf switch, battery check
S906	1-513-272-11	switch, MGC pull on
S907	– built in S404 –	lamp switch, sw2-19
S908	– built in S401 –	lamp switch, sw1
S909	– built in S402 –	lamp switch, mw
S910	– built in S403 –	lamp switch, 1 w
S911	– built in S201 –	lamp switch, fm1
S912	– built in S201 –	lamp switch, fm2
S913-1 ~ 3	1-514-503-11	lever seesaw switch, power on
S914	1-513-534-11	switch, ac/dc
S915	1-513-285-11	lever switch, light
S916	1-513-272-11	slide switch, ANL
VS901	1-526-165-11	voltage selector
TEL ANT FM1	1-501-103-12	telescopic antenna, fm
TEL ANT FM2	1-501-103-12	telescopic antenna, fm
TEL ANT SW2-19	1-501-104-12S	telescopic antenna, sw
SP901	1-502-210-	speaker, 8Ω
SP902	1-502-210-	speaker, 8Ω
TM901	1-520-082-13S	tuning meter
F901	1-532-228-11	fuse
LA901 ~ 908	1-518-051-12	lamp
J901	1-507-169-13	jack, AUX IN
J902	1-507-169-13	jack, REC OUT
J903	1-507-190-12	jack, HEADPHONE
J904	1-507-169-13	jack, EARPHONE
J905	1-507-169-13	jack, EXT. SP
J906	1-507-169-13	jack, MPX OUT
J907	1-509-029-01	connector, TAPE
HT101~104, HT201~203	1-535-036-11	hermetic terminal
	1-507-901-12	nut, earphone jack J904
	1-533-048-	holder, fuse
	1-536-111-	lug plate
	1-536-183-	lug plate
	1-506-078-	socket, ac plug
	1-534-518-11 (or 1-534-519-11)	ac cord

SECTION 6
EXPLODED VIEW AND PACKING

6-1 HARDWARE NOMENCLATURE

Part No.	*Description*
	Screws
7-621-255-12	machine, ⊕ P 2 x 3
7-621-255-21	machine, ⊕ P 2 x 4
7-621-255-61	machine, ⊕ P 2 x 10
7-621-259-21	machine, ⊕ P 2.6 x 4
7-621-259-35	machine, ⊕ P 2.6 x 5
7-621-259-45	machine, ⊕ P 2.6 x 6
7-621-261-25	machine, ⊕ P 3 x 4
7-621-261-35	machine, ⊕ P 3 x 5
7-621-261-45	machine, ⊕ P 3 x 6
7-621-262-22	machine, ⊕ P 3 x 20
7-621-262-32	machine, ⊕ P 3 x 22
7-621-305-22	machine, ⊖ F 2 x 4
7-621-712-22	machine, SET 2.6 x 3
7-621-713-27	machine, SET 3 x 4
7-621-720-21	tapping, ⊕ P 2 x 5
7-621-721-61	tapping, ⊕ P 2.6 x 5
7-621-721-71	tapping, ⊕ P 2.6 x 6
7-621-722-41	tapping, ⊕ P 3 x 6
7-621-722-51	tapping, ⊕ P 3 x 8
7-621-722-61	tapping, ⊕ P 3 x 10
7-621-773-72	tapping, ⊕ B 3 x 20
7-621-773-74	tapping, ⊕ B 3 x 14
7-621-840-90	wood, ⊕ RK 2.1 x 10
7-621-843-21	wood, ⊕ R 3.1 x 10
	Washers
7-623-105-12	washer, 2φ (middle)
7-623-107-12	washer, 2.6φ (middle)
7-623-108-12	washer, 3φ (middle)
7-623-110-12	washer, 4φ (middle)
7-623-112-22	washer, 5φ (large)
7-623-408-01	lock washer, ext tooth 3φ
7-623-412-05	lock washer, ext tooth 5φ
	Retaining Rings
7-623-605-00	eyelet, 1.3 x 2.5
7-623-631-00	eyelet, 3 x 3

When ordering replacement parts, you should use PART NUMBER listed on the Parts List or shown in the EXPLODED VIEW. The reference number should not be used for ordering purposes.

Hardware Nomenclature

P – Pan Head Screw

PS – Pan Head Screw with Spring Washer

K – Flat Countersunk Head Screw

B – Binding Head Screw

RK – Oval Countersunk Head Screw

T – Truss Head Screw

R – Round Head Screw

F – Flat Fillister Head Screw

SC – Set Screw

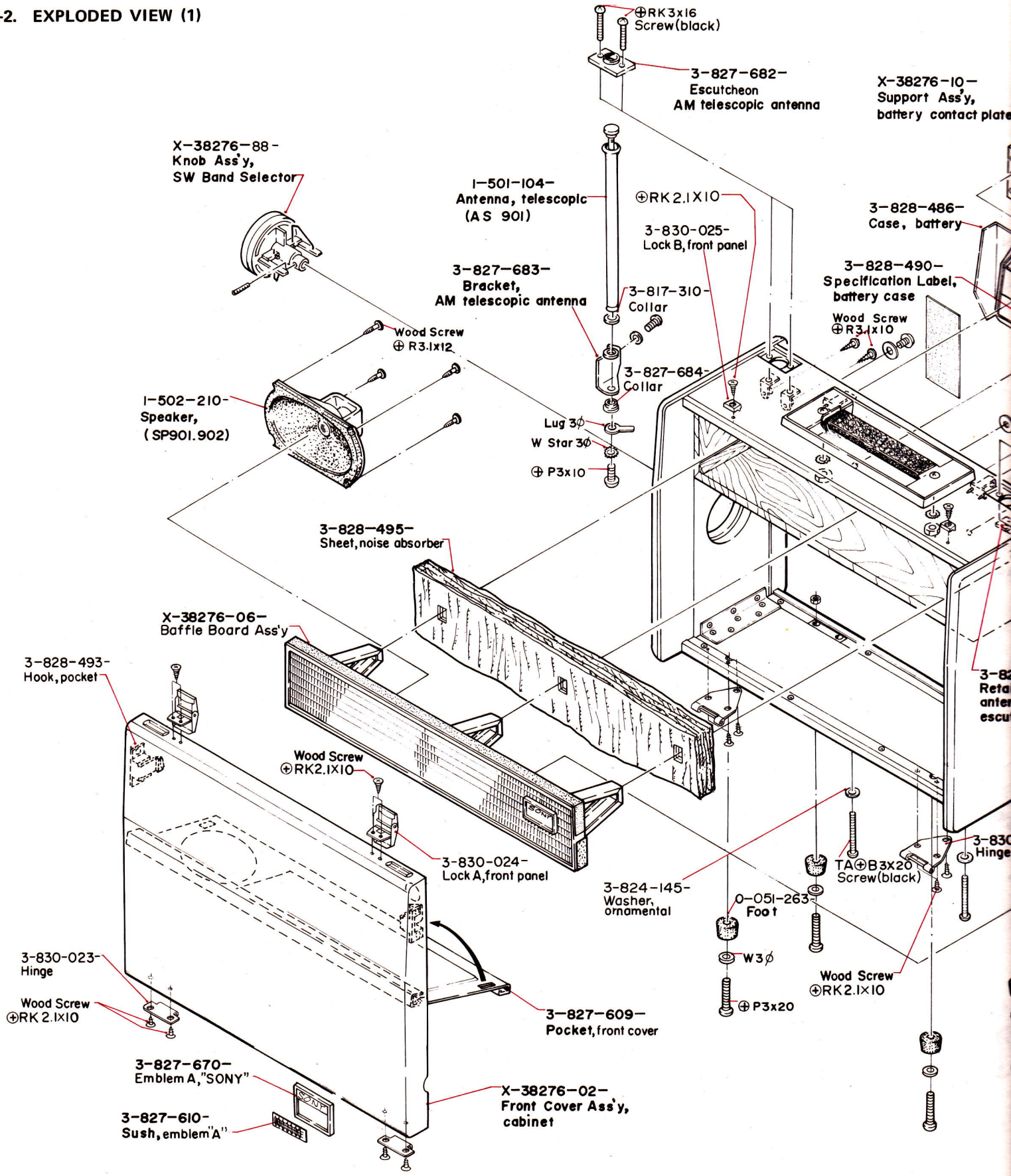
E – Retaining Ring (E Washer)

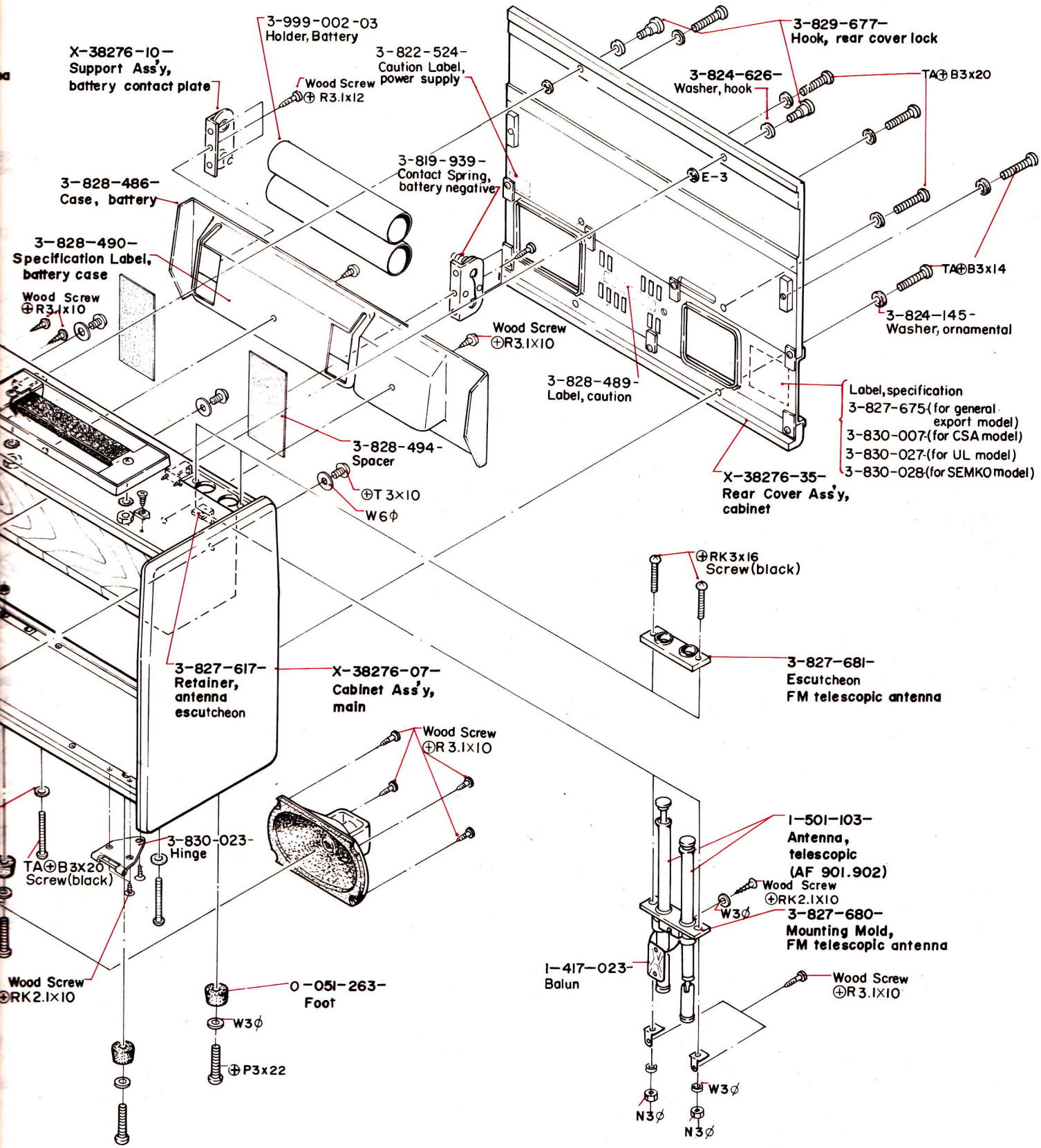
W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

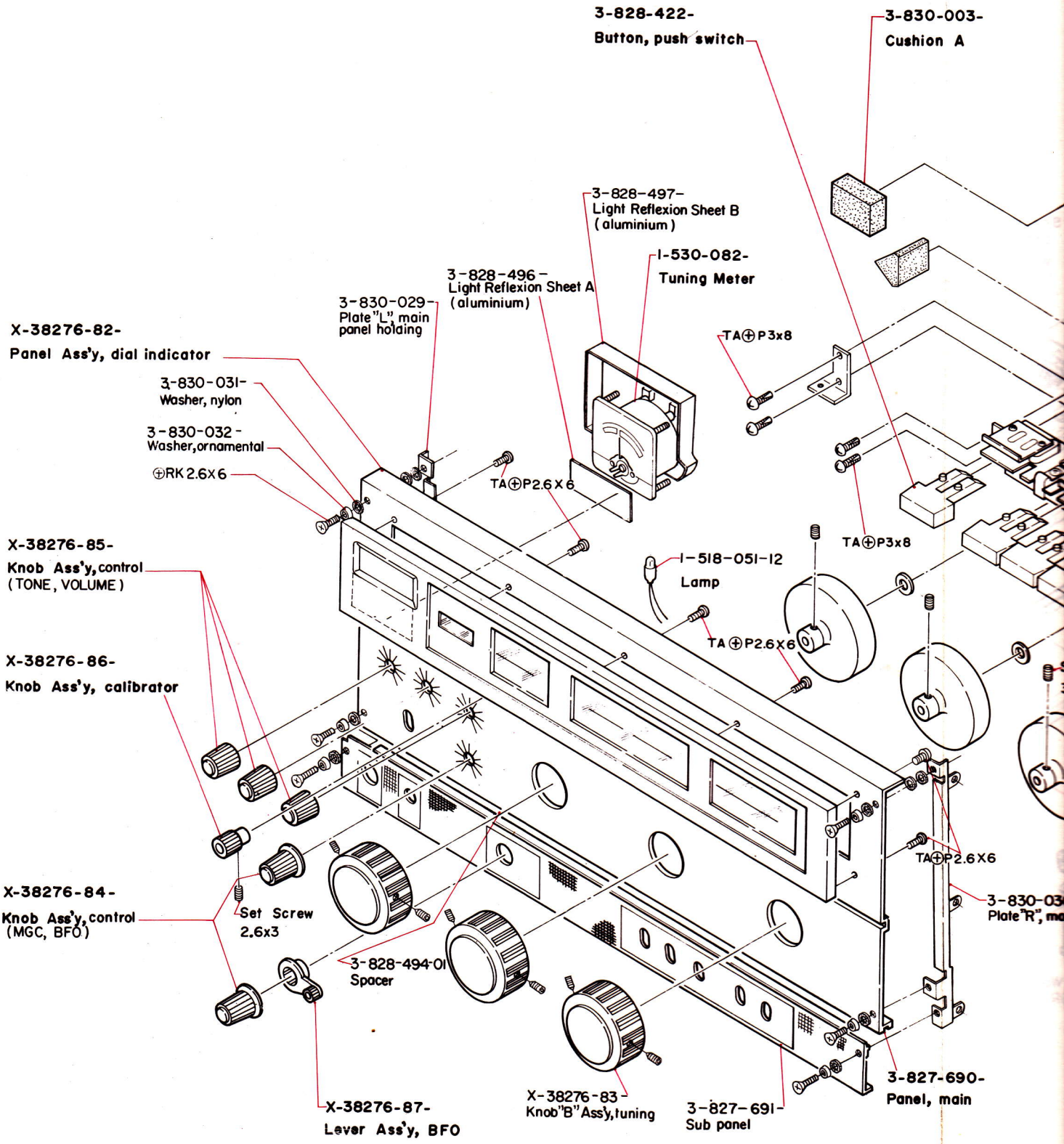
⊕ P 3x10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head

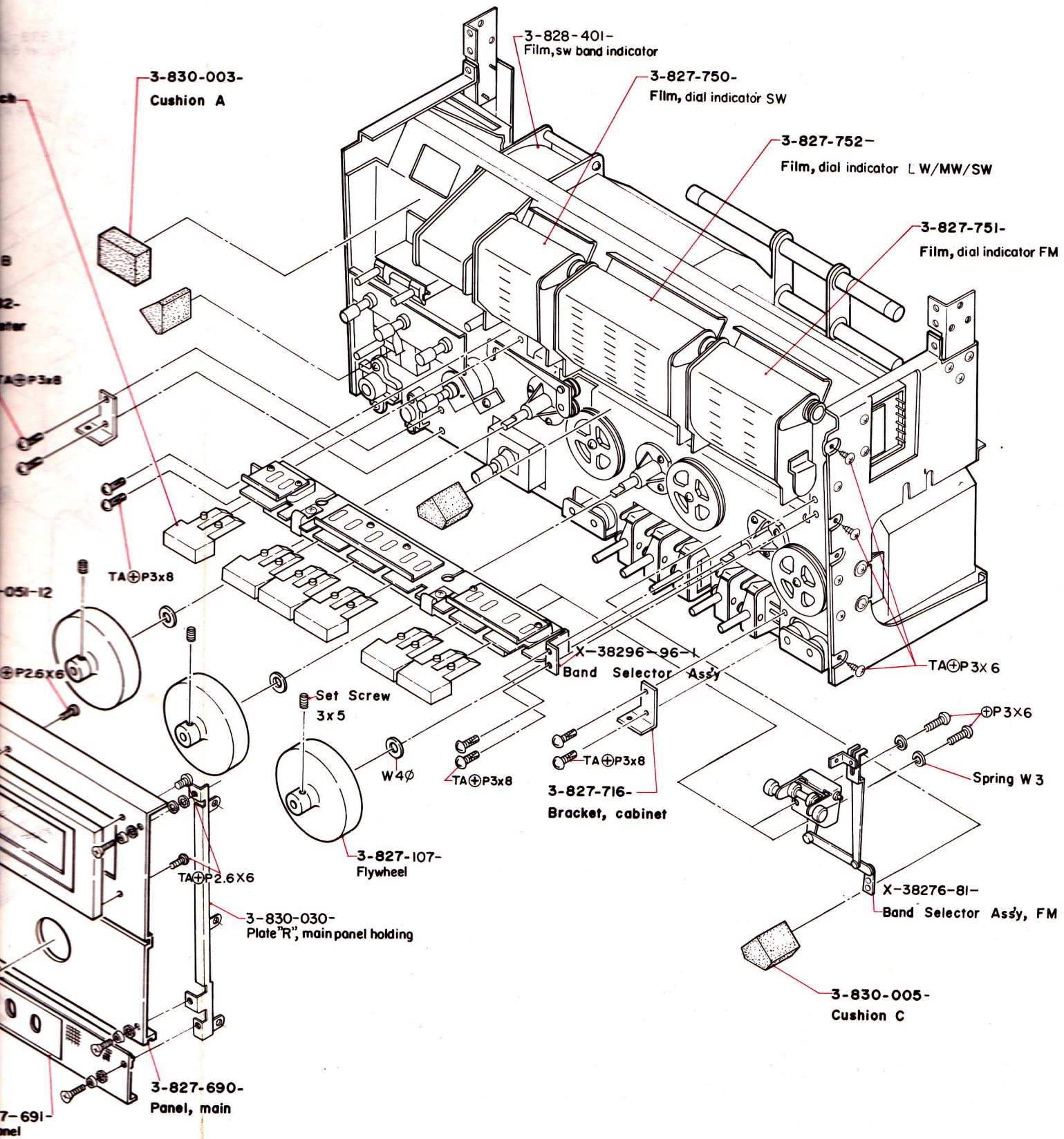
6-2. EXPLODED VIEW (1)



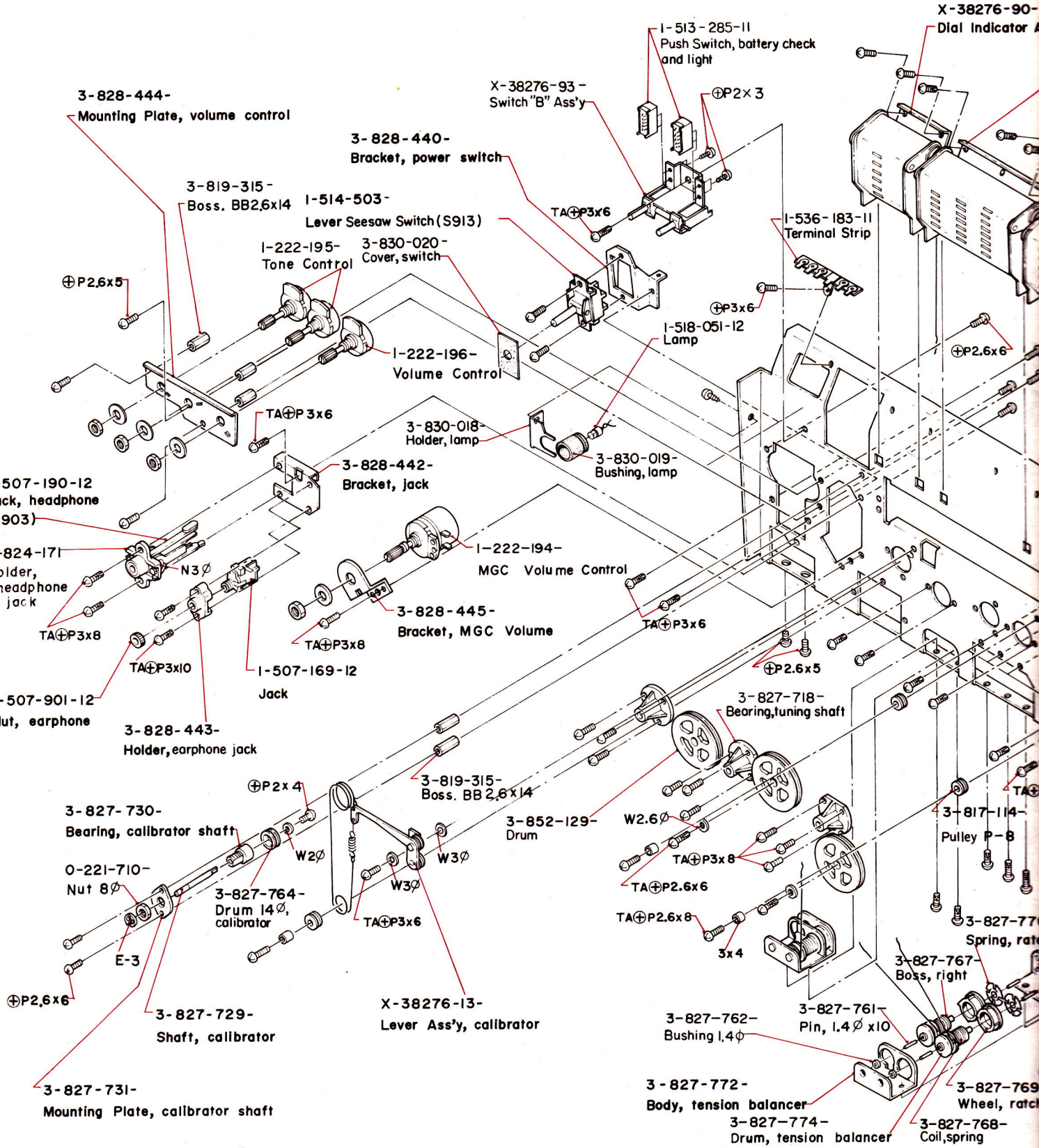

3-999-002-03
Holder, Battery
X-38276-10-
Support Ass'y,
battery contact plate
Wood Screw
⊕R3.1x12
3-822-524-
Caution Label,
power supply
3-829-677-
Hook, rear cover lock
3-824-626-
Washer, hook
TA⊕B3x20
3-819-939-
Contact Spring,
battery negative
E-3
3-828-486-
Case, battery
3-828-490-
Specification Label,
battery case
Wood Screw
⊕R3.1x10
TA⊕B3x14
3-824-145-
Washer, ornamental
Wood Screw
⊕R3.1x10
3-828-489-
Label, caution
Label, specification
3-827-675-(for general export model)
3-830-007-(for CSA model)
3-830-027-(for UL model)
3-830-028-(for SEMKO model)
3-828-494-
Spacer
⊕T 3x10
W6φ
X-38276-35-
Rear Cover Ass'y,
cabinet
⊕RK3x16
Screw(black)
3-827-681-
Escutcheon
FM telescopic antenna
3-827-617-
Retainer,
antenna
escutcheon
X-38276-07-
Cabinet Ass'y,
main
Wood Screw
⊕R3.1x10
TA⊕B3x20
Screw(black)
3-830-023-
Hinge
1-501-103-
Antenna,
telescopic
(AF 901.902)
Wood Screw
⊕RK2.1x10
W3φ
3-827-680-
Mounting Mold,
FM telescopic antenna
1-417-023-
Balun
Wood Screw
⊕R3.1x10
Wood Screw
⊕RK2.1x10
0-051-263-
Foot
W3φ
⊕P3x22
W3φ
N3φ
N3φ

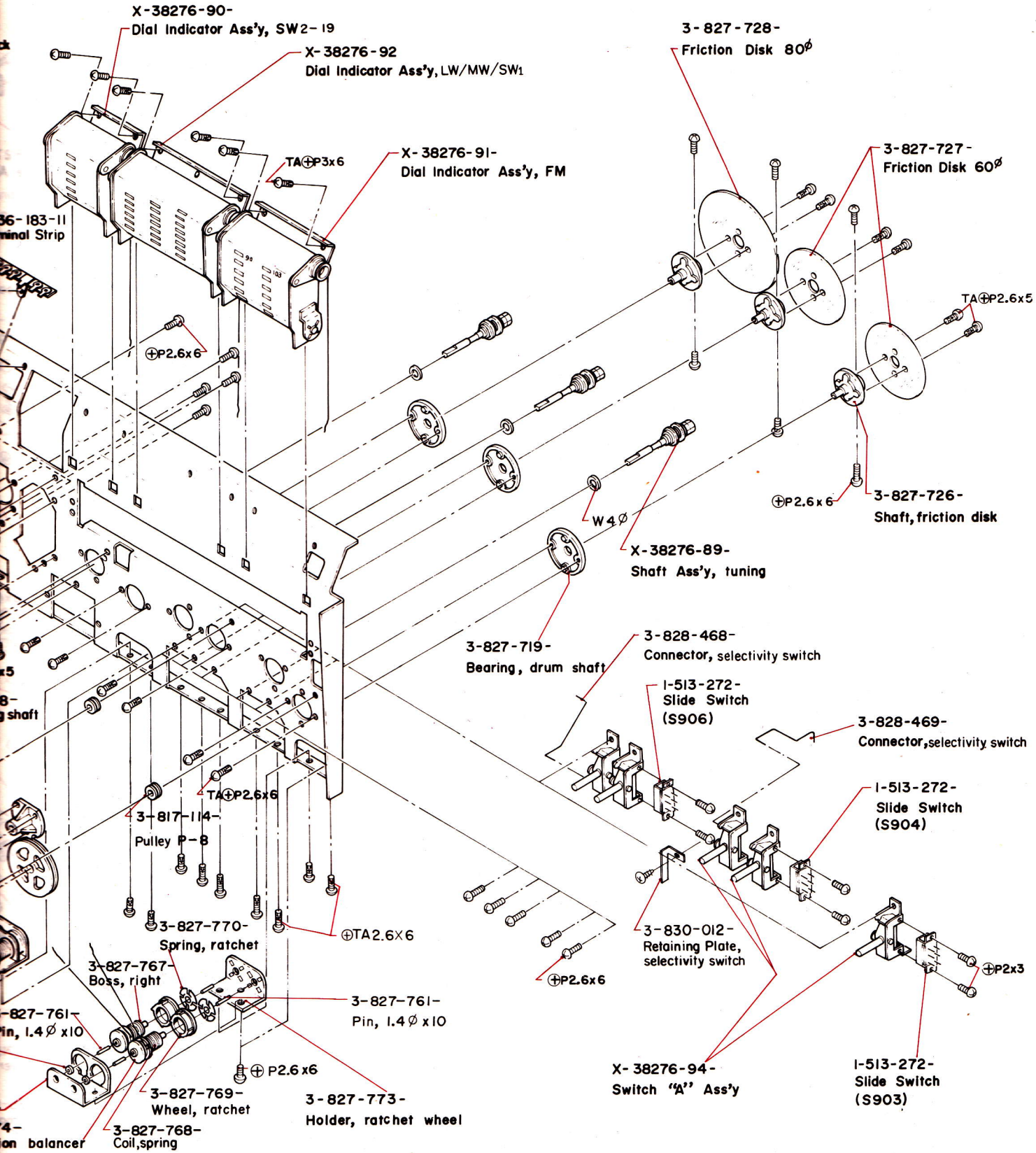
6-3. EXPLODED VIEW (2)



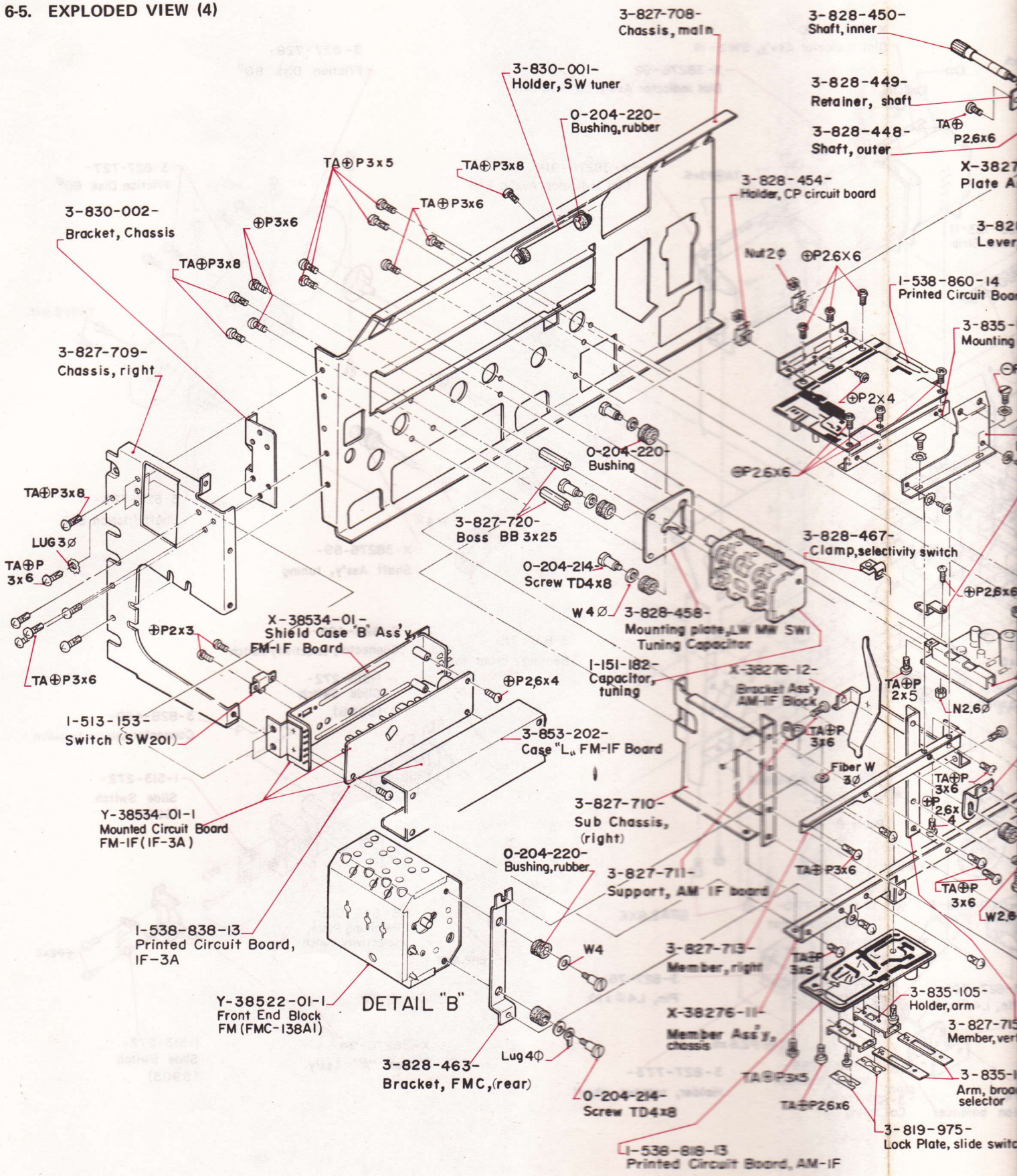

3-828-401-
Film, sw band indicator
3-827-750-
Film, dial indicator SW
3-827-752-
Film, dial indicator L W/MW/SW
3-827-751-
Film, dial indicator FM
3-830-003-
Cushion A
TA⊕P3x8
TA⊕P3x8
TA⊕P3X 6
X-38296-96-1
Band Selector Ass'y
Set Screw
3x5
W4ø
TA⊕P3x8
TA⊕P3x8
3-827-716-
Bracket, cabinet
⊕P3X6
Spring W 3
3-827-107-
Flywheel
TA⊕P2.6X6
3-830-030-
Plate "R", main panel holding
X-38276-81-
Band Selector Ass'y, FM
3-830-005-
Cushion C
3-827-690-
Panel, main

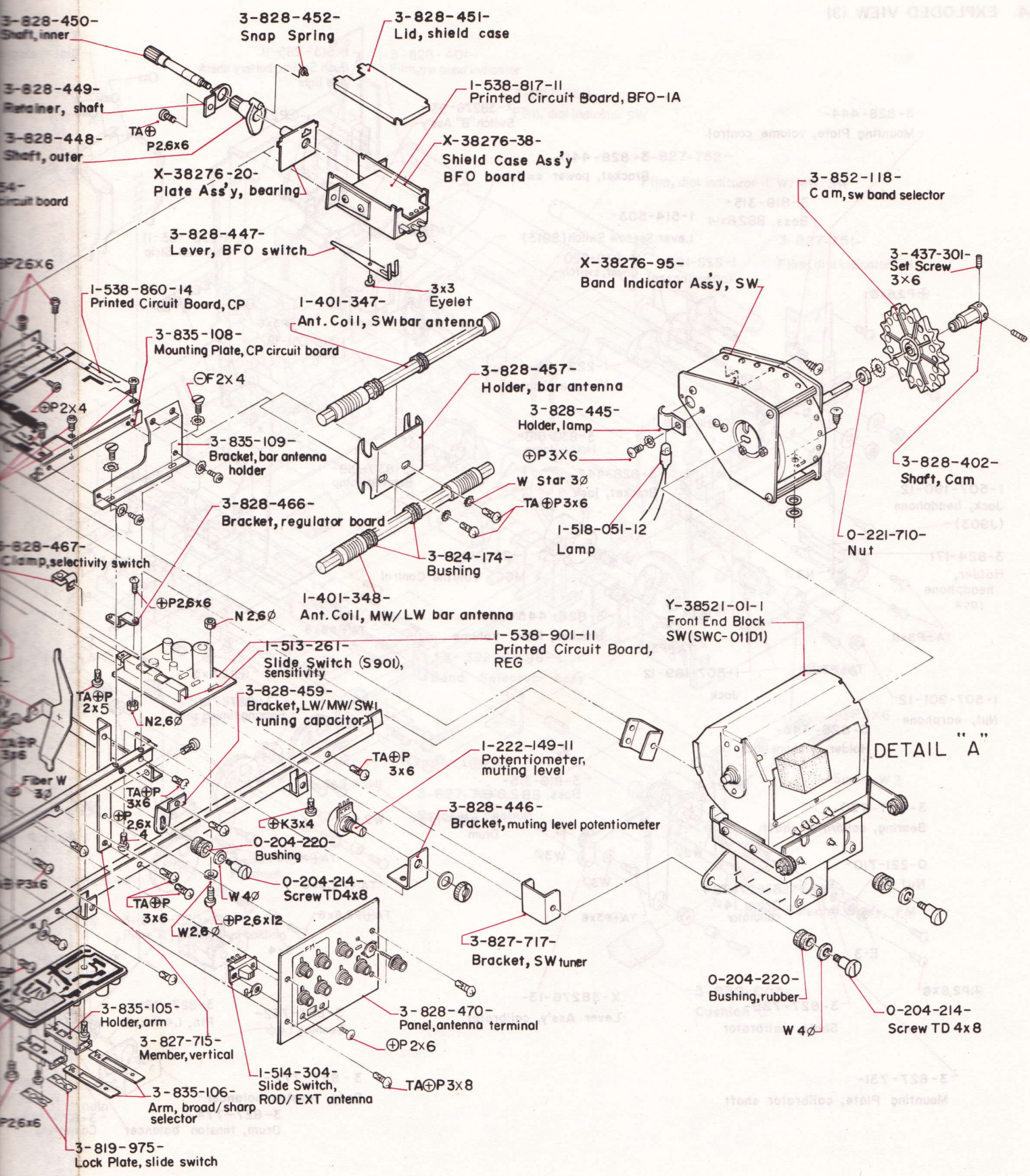
6-4. EXPLODED VIEW (3)



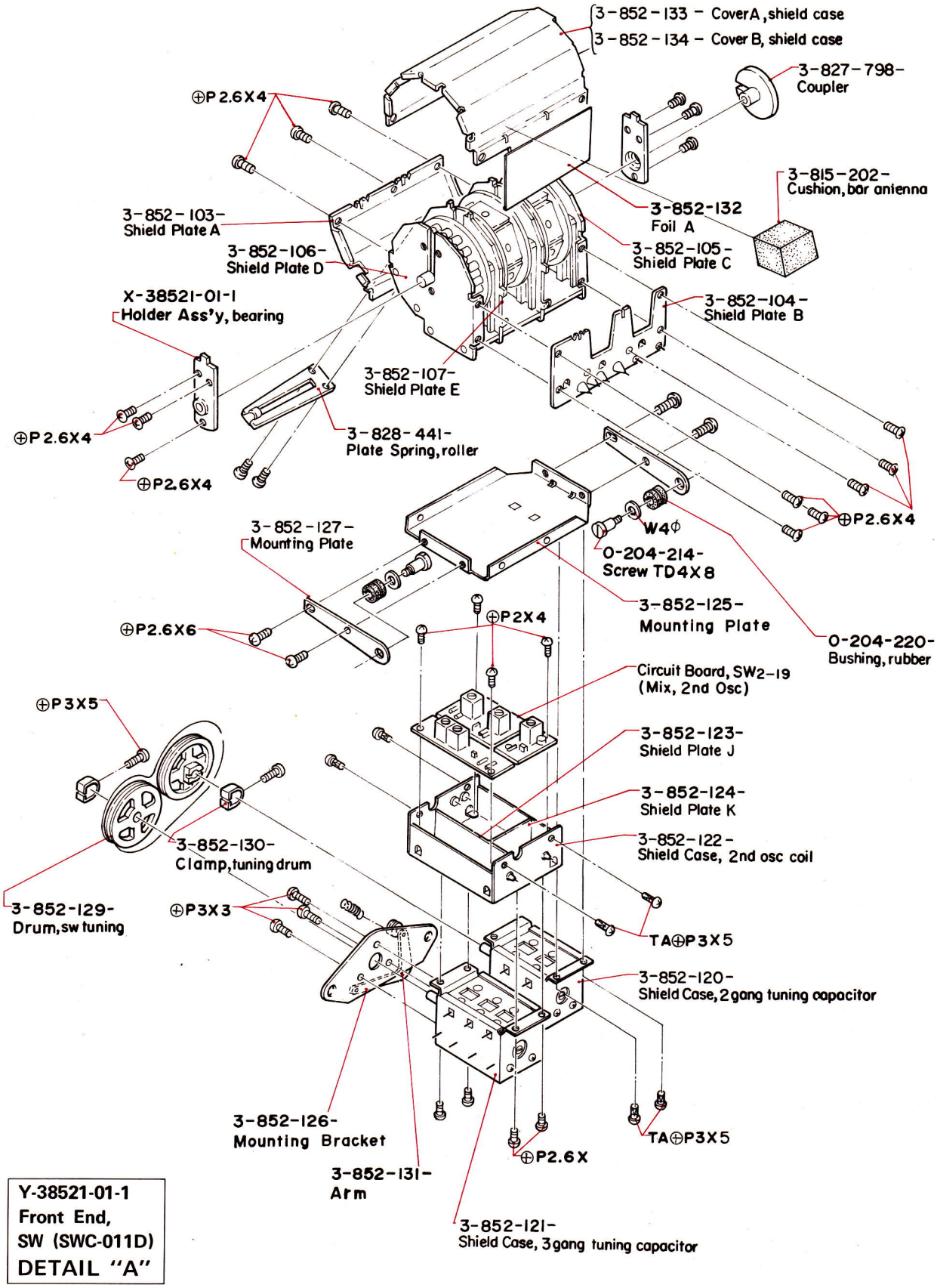

X-38276-90-
Dial Indicator Ass'y, SW2-19
X-38276-92
Dial Indicator Ass'y, LW/MW/SW1
X-38276-91-
Dial Indicator Ass'y, FM
TA⊕P3x6
⊕P2.6x6
3-827-728-
Friction Disk 80Ø
3-827-727-
Friction Disk 60Ø
TA⊕P2.6x5
⊕P2.6x6
3-827-726-
Shaft, friction disk
W4Ø
X-38276-89-
Shaft Ass'y, tuning
3-827-719-
Bearing, drum shaft
3-828-468-
Connector, selectivity switch
1-513-272-
Slide Switch
(S906)
3-828-469-
Connector, selectivity switch
1-513-272-
Slide Switch
(S904)
TA⊕P2.6x6
3-817-114-
Pulley P-8
3-827-770-
Spring, ratchet
⊕TA2.6X6
3-827-767-
Boss, right
3-827-761-
Pin, 1.4Ø x10
⊕P2.6x6
3-830-012-
Retaining Plate,
selectivity switch
⊕P2x3
⊕P2.6x6
3-827-769-
Wheel, ratchet
3-827-773-
Holder, ratchet wheel
X-38276-94-
Switch "A" Ass'y
1-513-272-
Slide Switch
(S903)
3-827-768-
Coil, spring

6-5. EXPLODED VIEW (4)

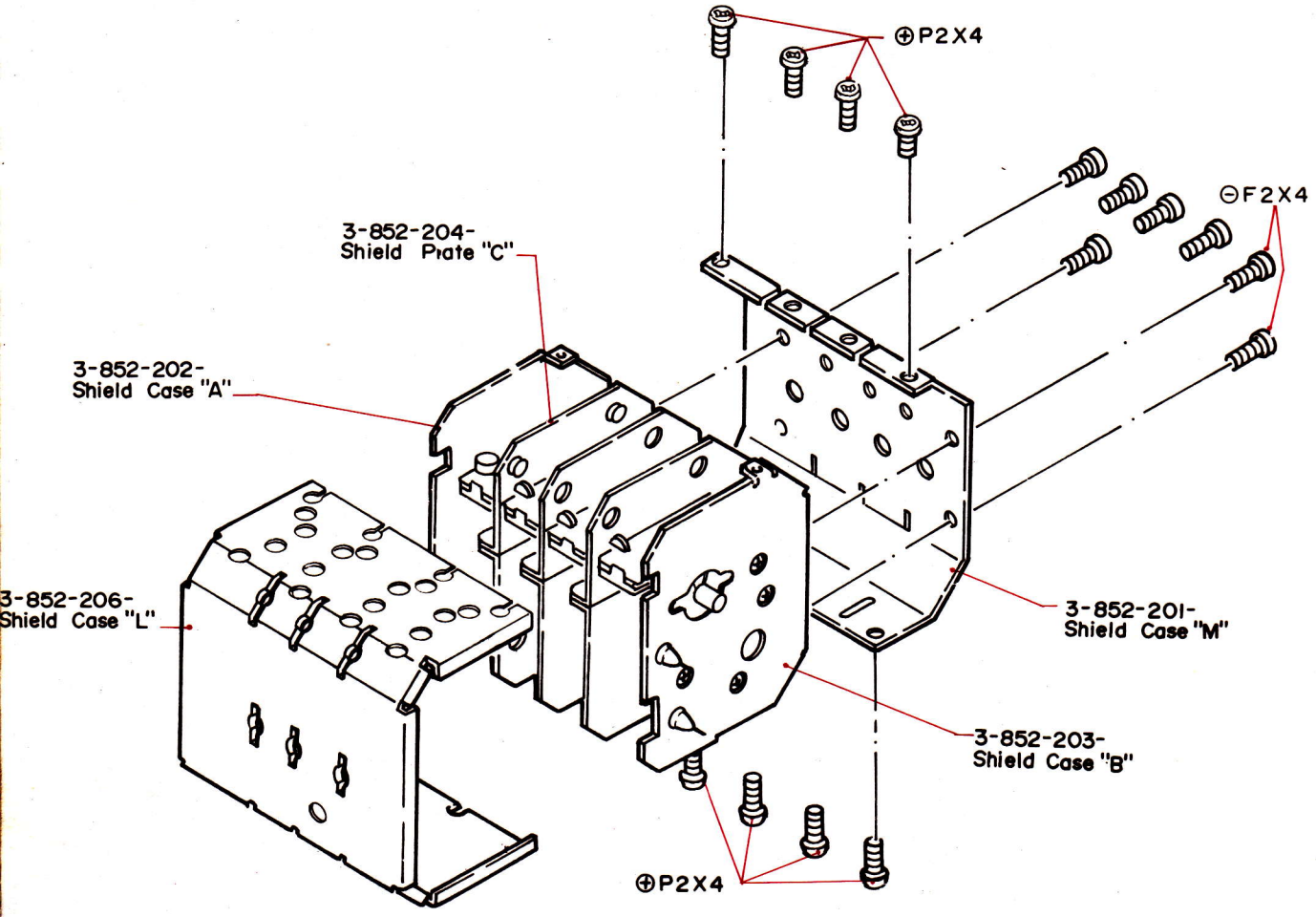



3-828-450-
Shaft, inner
3-828-452-
Snap Spring
3-828-451-
Lid, shield case
1-538-817-11
Printed Circuit Board, BFO-1A
3-828-449-
Retainer, shaft
TA⊕ P2.6x6
3-828-448-
Shaft, outer
X-38276-38-
Shield Case Ass'y
BFO board
X-38276-20-
Plate Ass'y, bearing
3-828-447-
Lever, BFO switch
3x3
Eyelet
1-538-860-14
Printed Circuit Board, CP
1-401-347-
Ant. Coil, SW bar antenna
3-835-108-
Mounting Plate, CP circuit board
⊖F2x4
⊕P2x4
3-828-457-
Holder, bar antenna
3-835-109-
Bracket, bar antenna holder
3-828-466-
Bracket, regulator board
W Star 3Ø
TA⊕P3x6
3-824-174-
Bushing
1-401-348-
Ant. Coil, MW/LW bar antenna
⊕P2.6x6
N 2.6Ø
1-538-901-11
Printed Circuit Board, REG
1-513-261-
Slide Switch (S901), sensitivity
TA⊕P 2x5
N2.6Ø
3-828-459-
Bracket, LW/MW/SW tuning capacitor
TA⊕P 3x6
1-222-149-11
Potentiometer, muting level
Fiber W 3Ø
TA⊕P 3x6
⊕P 2.6x 4
⊕K3x4
3-828-446-
Bracket, muting level potentiometer
0-204-220-
Bushing
0-204-214-
Screw TD4x8
W 4Ø
TA⊕P 3x6
⊕P2.6x12
W2.6Ø
3-827-717-
Bracket, SW tuner
3-828-470-
Panel, antenna terminal
⊕P 2x6
TA⊕P3x8
3-835-105-
Holder, arm
3-827-715-
Member, vertical
1-514-304-
Slide Switch, ROD/EXT antenna
3-835-106-
Arm, broad/sharp selector
3-819-975-
Lock Plate, slide switch
3-852-118-
Cam, sw band selector
X-38276-95-
Band Indicator Ass'y, SW
3-437-301-
Set Screw 3x6
⊕P3X6
3-828-445-
Holder, lamp
1-518-051-12
Lamp
3-828-402-
Shaft, Cam
0-221-710-
Nut
Y-38521-01-1
Front End Block SW(SWC-011D1)
DETAIL "A"
0-204-220-
Bushing, rubber
W 4Ø
0-204-214-
Screw TD 4x8

6-6. EXPLODED VIEW (5)

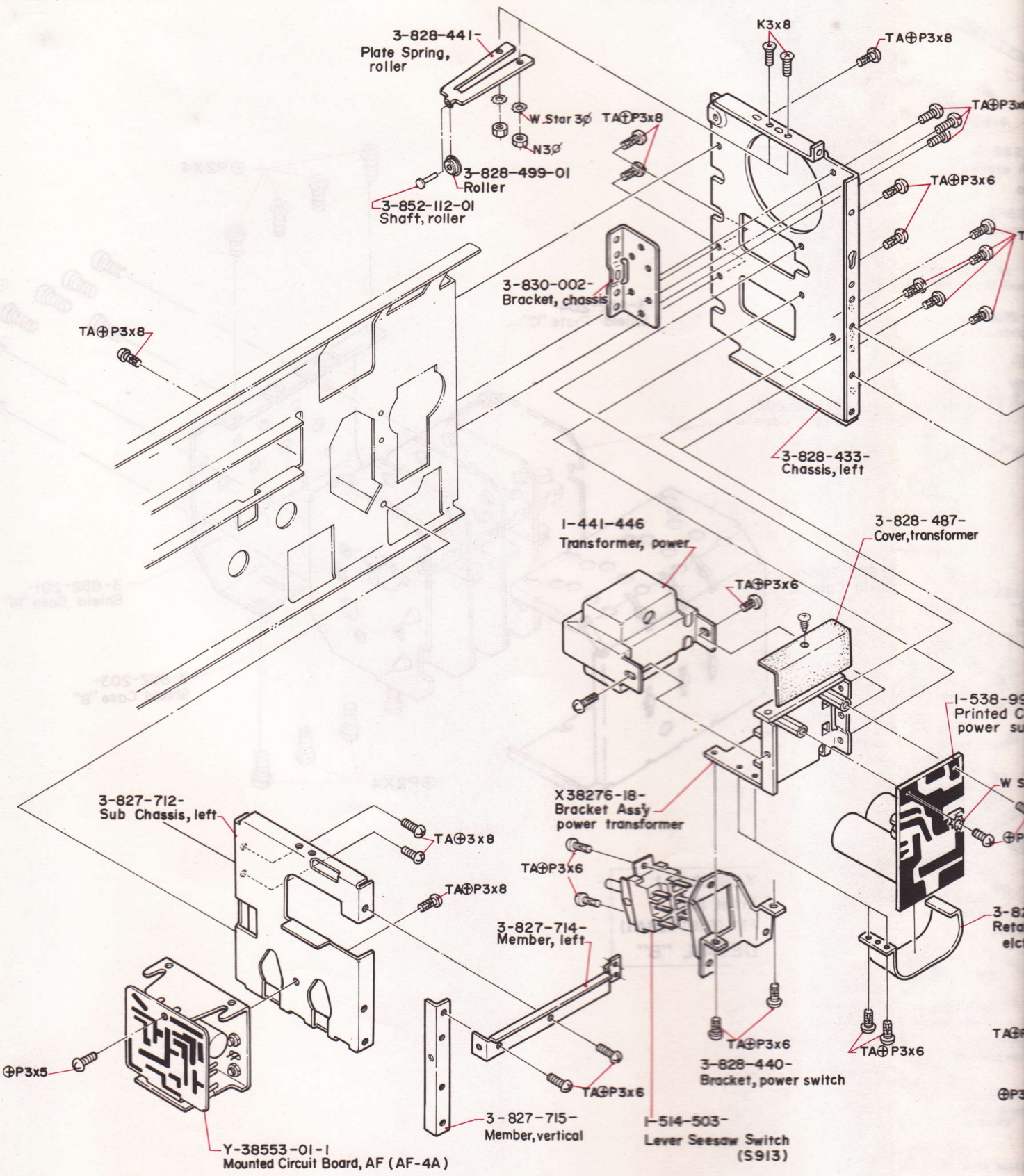


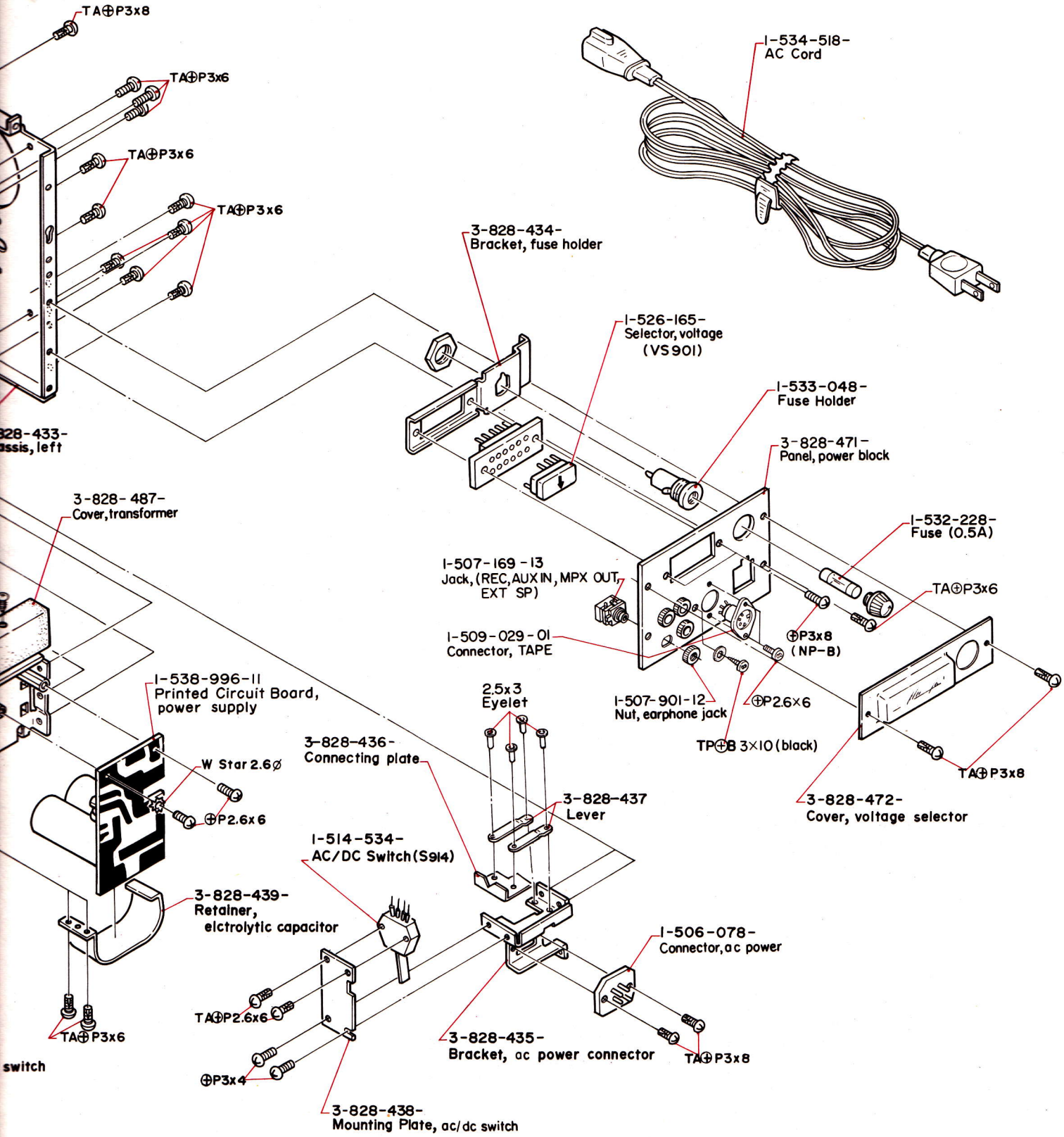
6-7. EXPLODED VIEW (6)



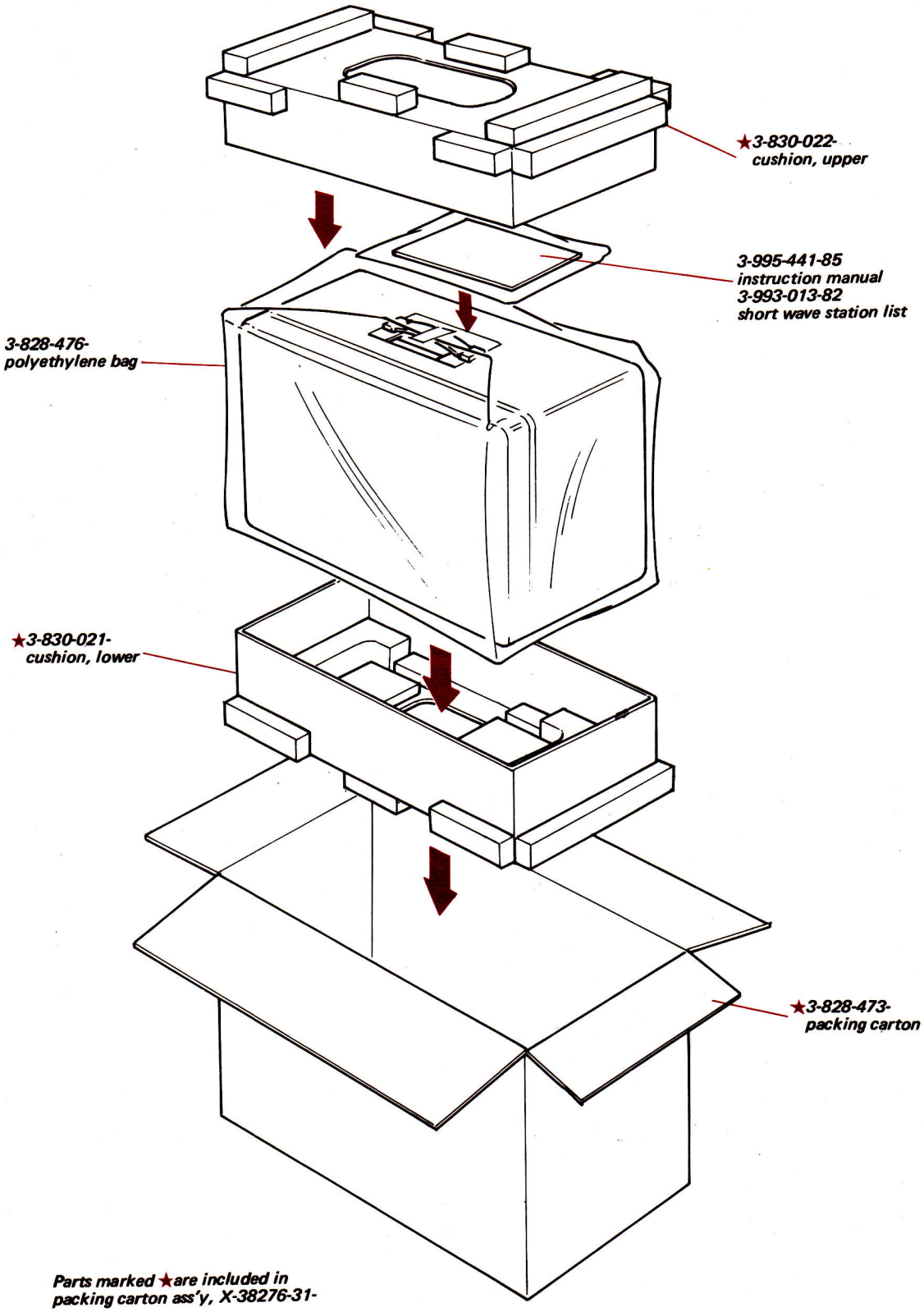
Y-38522-01-1 Front End, FM (FMC-138A1) DETAIL "B"

6-8. EXPLODED VIEW (7)



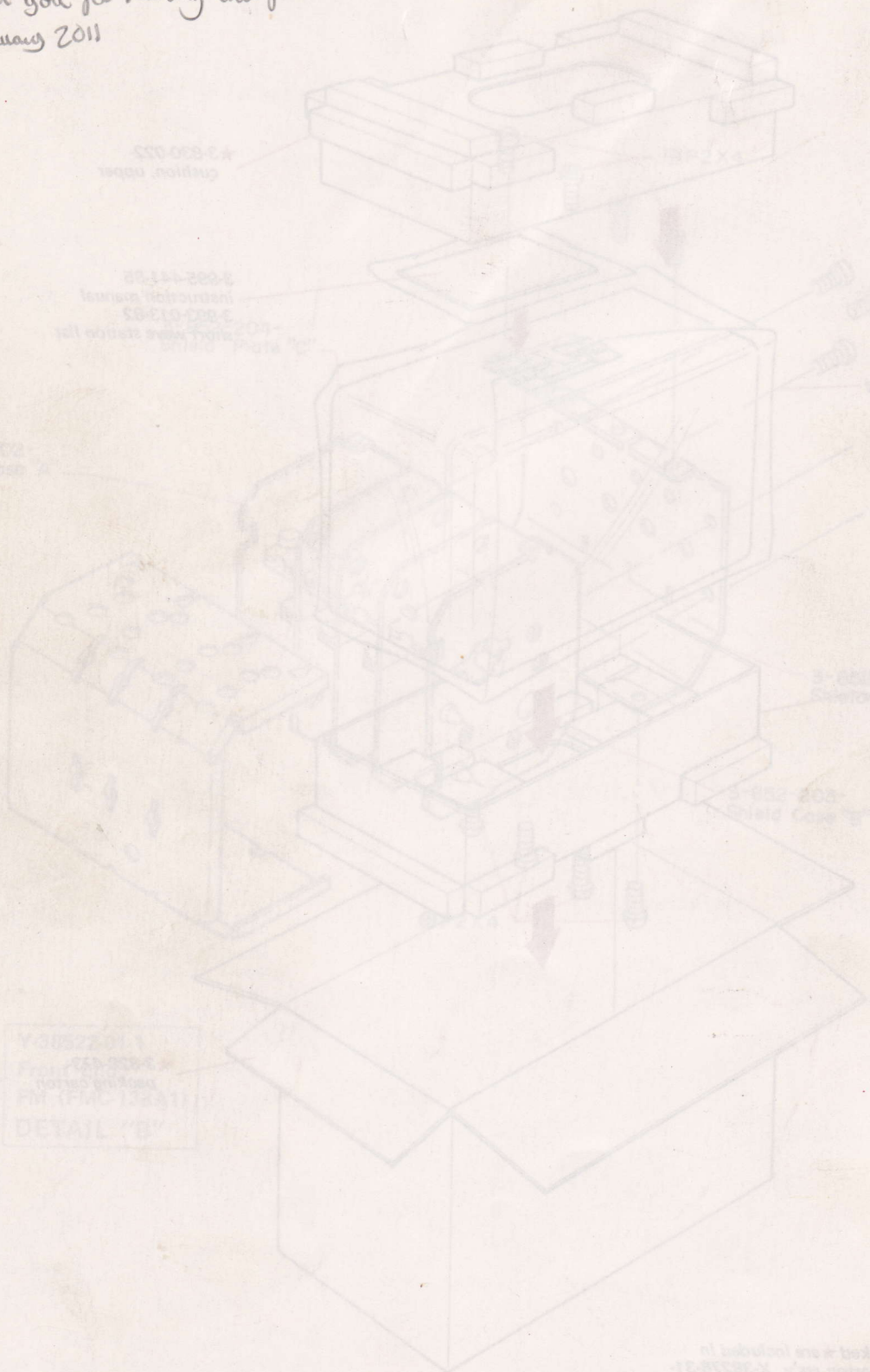

TA⊕P3x8
TA⊕P3x6
TA⊕P3x6
TA⊕P3x6
1-534-518-
AC Cord
3-828-434-
Bracket, fuse holder
1-526-165-
Selector, voltage
(VS901)
1-533-048-
Fuse Holder
3-828-471-
Panel, power block
3-828-433-
assis, left
3-828-487-
Cover, transformer
1-532-228-
Fuse (0.5A)
1-507-169-13
Jack, (REC, AUX IN, MPX OUT,
EXT SP)
TA⊕P3x6
1-509-029-01
Connector, TAPE
⊕P3x8
(NP-B)
1-538-996-11
Printed Circuit Board,
power supply
2.5x3
Eyelet
1-507-901-12
Nut, earphone jack
⊕P2.6x6
TP⊕B 3x10 (black)
TA⊕P3x8
3-828-436-
Connecting plate
W Star 2.6ø
⊕P2.6x6
3-828-437
Lever
3-828-472-
Cover, voltage selector
1-514-534-
AC/DC Switch (S914)
3-828-439-
Retainer,
elctrolytic capacitor
1-506-078-
Connector, ac power
TA⊕P2.6x6
TA⊕P3x6
switch
3-828-435-
Bracket, ac power connector
TA⊕P3x8
⊕P3x4
3-828-438-
Mounting Plate, ac/dc switch

6-9. PACKING



Parts marked ★are included in packing carton ass'y, X-38276-31-

This service manual was scanned in by Chris Walkwork for the benefit of all those interested in old radios.
Thank you for reading this far.
January 2011



SONY CORPORATION