TV-112UM

B&W TV

SPECIFCATIONS

Picture tube: 11" 90° deflection

Semiconductors: 31 transistors, 22 diodes, 1 thermistor, 1 IC and 1 high voltage selenium rectifier

Channel coverage:
VHF; French F2, F4-F12
CCIR Western European, Belgian E2-E12
Italian B (E4), D (E5) H (E10), H1 (E-11)
UHF; 21 ~ 69

Antenna system:
VHF; Built-in telescopic antenna
Terminals for 300 Ω external antenna
UHF; Loop antenna
Terminals for 300 Ω external antenna

IF circuit: 3 stages with 4 stagger tuned elements

Intermediate frequency:

				Video IF	Sound IF
Intercarrier system	CCIR	VHF UHF	625	38.9 MHz	33.4 MHz
Separate-carrier system	French	VHF	625 819	38.9 MHz, 34.9 MHz	27.75 MHz, 46.05 MHz
	French	UHF	625 819	38.9 MHz	32.4 MHz
	Belgian	VHF	625	38.9 MHz	33.4 MHz

Sound system:
Power output; 800 mV (less than 10 % distortion)
Speaker; 80 mm x 120 mm (3 1/8" x 4 3/4"), impedance; 16 Ω

Automatic controls:
TU VIF mean value forward AGC
AM SIF mean value AGC
Single pulse AFC

Power requirements:
AC 110 V, 130 V, 220 V 50 Hz
DC 12 V

Power consumption:
AC 37 W (maximum)
DC 21 W (maximum)

Dimensions: 302 mm (W) x 314 mm (H) x 303 mm (D) (11 7/8" x 12 3/8" x 11 5/6")

Weight: 7.4 kg (16 lb 5 oz)

Accessories:
Earphone (ME-20B)
Loop antenna (AN-8)
Instruction manual
Polishing cloth

Optional accessories:
Battery pack BP-7 (Sony)
Battery #564 (Eveready) TOB-1235 SY (Sonnenschein)
Car battery cord DCC-11,5
External antenna connector EAC-10
Car antenna VCA-1, -1H, -2

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM

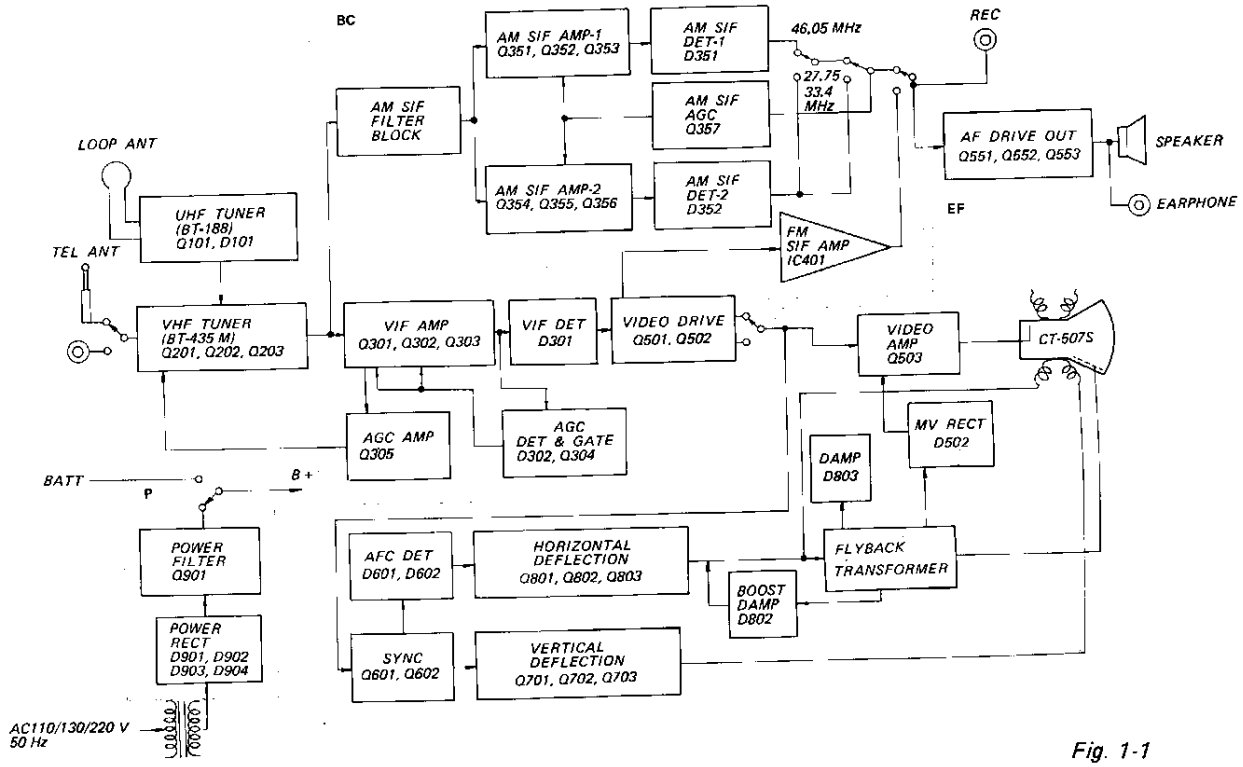


Fig. 1-1

1-2. EXTERNAL VIEW

1-501-122-11
telescopic antenna ass'y

X-43029-04-0
carrying handle ass'y

X-40199-01-0
cabinet ass'y, front

X-40199-03-0
protector ass'y

4-019-917-00
knob, push-button switch; CCIR

X-40150-06-0
knob ass'y, PULL ON/VOL control

4-019-917-00
knob, push-button switch; 625B

4-019-917-00
knob, push-button switch; 625F

4-019-917-00
knob, push-button switch; 819F

X-40199-02-0
cabinet ass'y, rear

4-010-719-31
knob, CONTR control

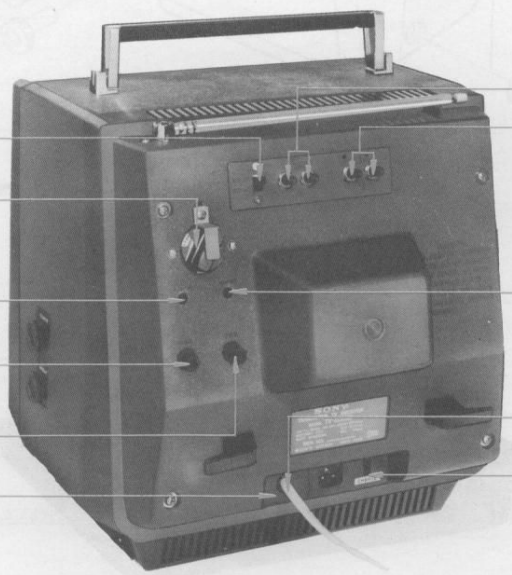
4-010-719-31
knob, BRIGHT control

4-020-017-00
knob, fine tuning

X-40199-04-0
knob ass'y, VHF channel selector

X-40150-07-0
knob ass'y, UHF dial

Fig. 1-2.



VHF antenna terminal

UHF antenna terminal

1-514-429-00
switch, antenna selector

1-509-344-00
socket, voltage selector

1-222-811-00
adjustable resistor VR702, V LIN

4-011-434-61
knob, HOR control

4-011-434-61
knob, VER control

4-019-928-00
grommet, power supply cord

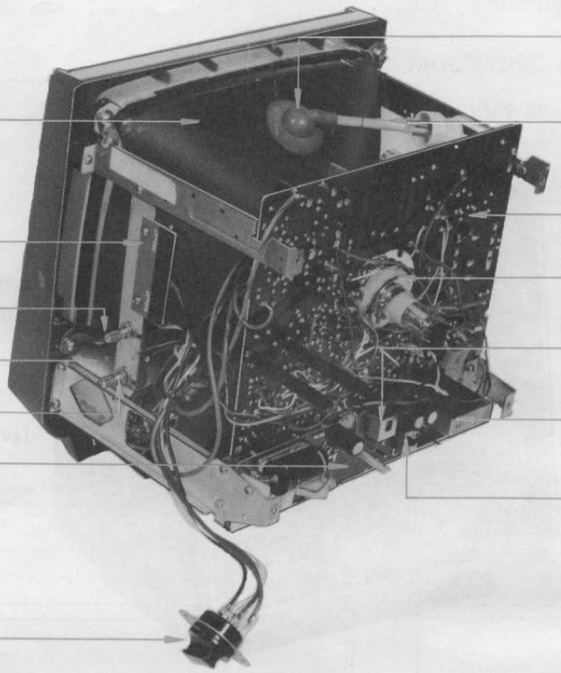
1-222-811-00
adjustable resistor VR703, HEIGHT

1-534-587-00
cord, power supply

1-514-330-00
switch, charging (S905)

Fig. 1-3.

1-3. INTERNAL VIEW



4-009-751-00
cover, anode cap

8-731-911-10
picture tube, CT-507S

1-531-028-00
selenium rectifier, high voltage

8-980-210-35
deflection circuit board (EF),complete

1-533-096-12
holder, fuse

1-451-087-00
deflection yoke

1-222-181-00
variable resistor,CONTR

1-516-097-00
switch, ac-dc selector

1-463-046-00
VHF tuner (BT-435M)

1-222-182-00
variable resistor, BRIGHT

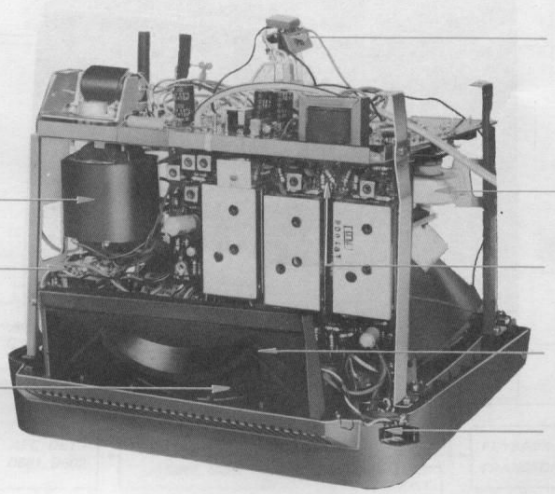
1-421-193-00
choke coil,vertical output; VCH

8-980-210-55
power supply circuit board (P), complete

1-514-330-00
switch, charging (S905)

1-509-344-00
socket, voltage selector

Fig. 1-4.



1-526-096-41
socket ass'y, picture tube

1-441-907-00
transformer, power

1-439-122-00
transformer, flyback; HOT

1-516-098-00
switch,rotary

8-980-210-25
signal circuit board (BC), complete

X-40175-04-0
baffle board ass'y,speaker

1-502-209-00
speaker

1-507-174-23
jack, earphone

Fig. 1-5.

SECTION 2
DISASSEMBLY

2-1. REAR CABINET REMOVAL

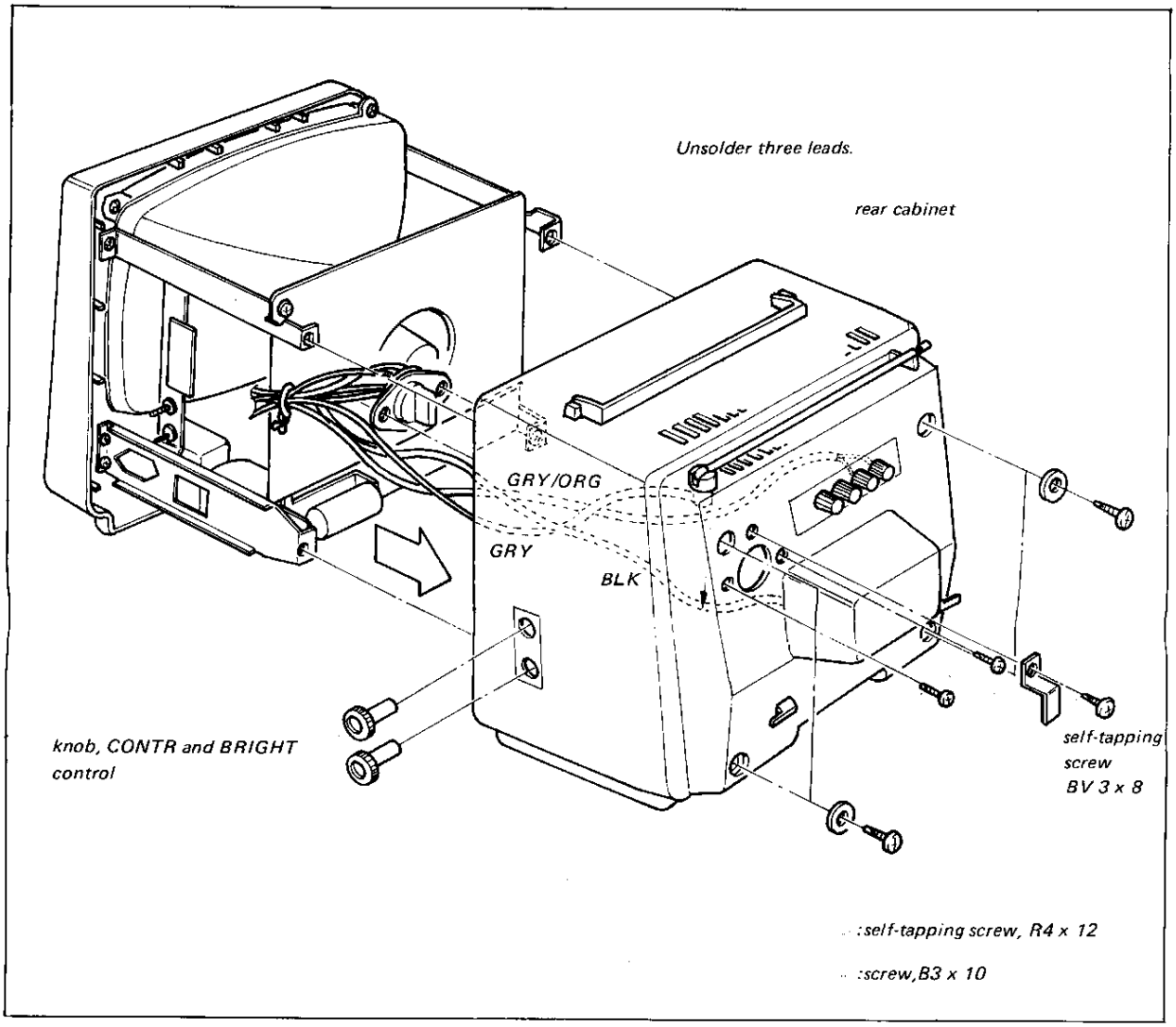


Fig. 2-1.

All screws in this set are phillips type (cross recess type).

2-2. P AND EF BOARD REMOVAL

1. Remove the rear cabinet.
2. Remove the P and EF boards in numerical order.

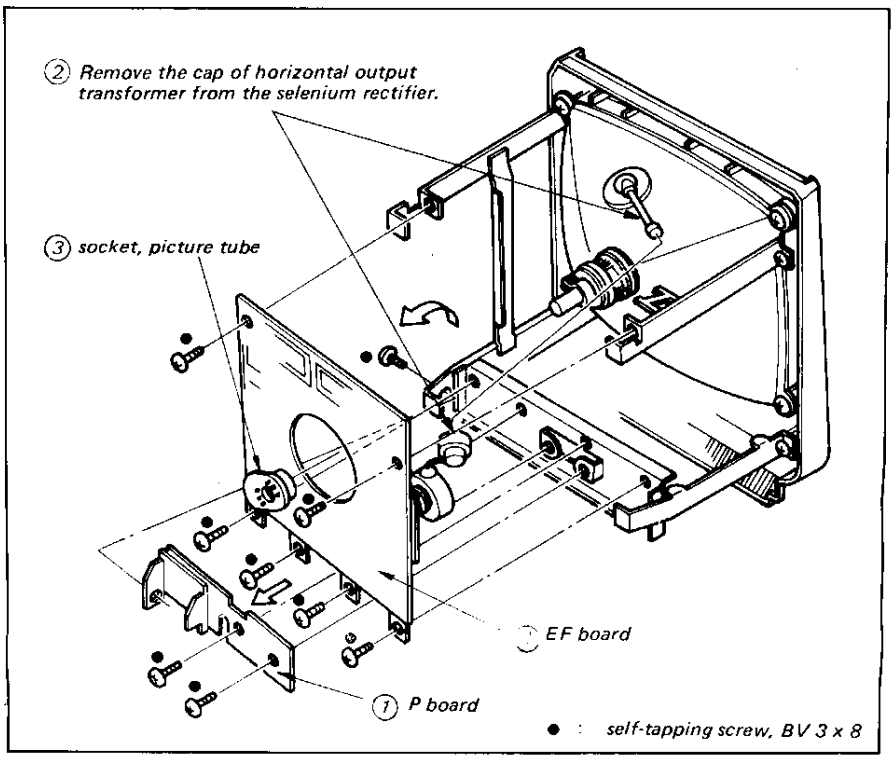


Fig. 2-2.

2-3. BC BOARD REMOVAL

Remove the rear cabinet.

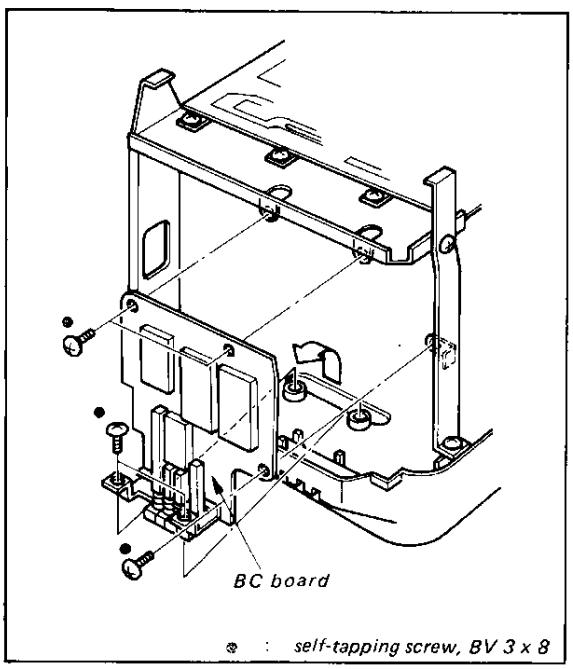


Fig. 2-3.

2-4. PROTECTOR REMOVAL

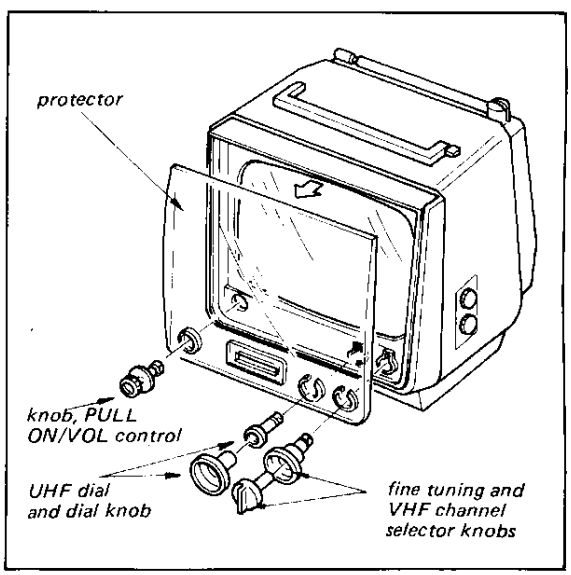


Fig. 2-4.

2-5. TUNER REMOVAL

1. Remove the rear cabinet.
2. Remove the tuners in numerical order;
   ① ~ ④ for VHF tuner removal,
   ⑤ ~ ⑧ for UHF tuner removal.
3. To remove the two screws securing the tuner brackets, use a long screwdriver as shown.

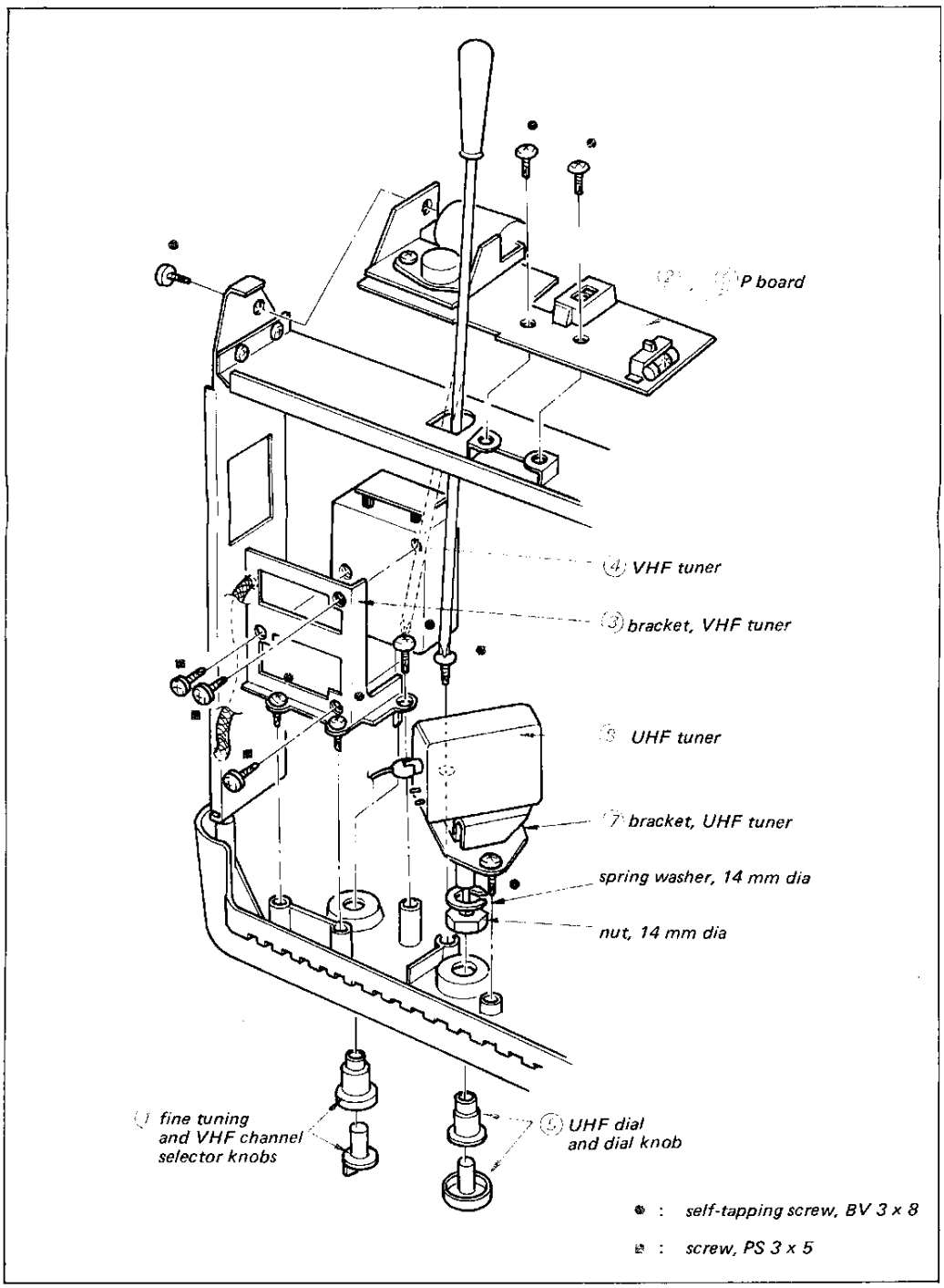


Fig. 2-5.

2-6. PICTURE TUBE REMOVAL

1. Remove the rear cabinet.
2. Remove the picture tube in numerical order.

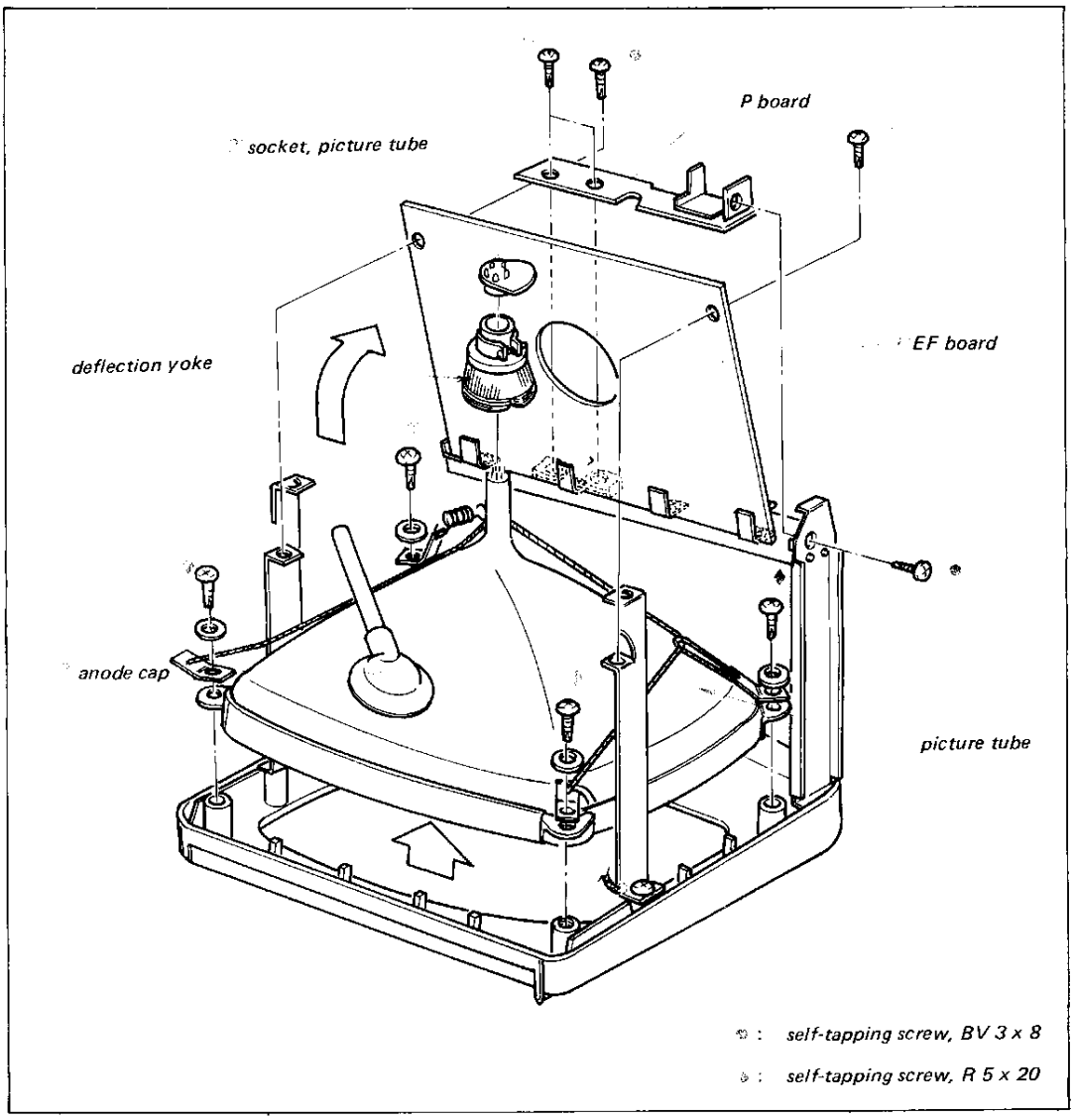


Fig. 2-6.

CAUTION

In this model a new type picture tube is employed. Any former type picture tube can not be replaced. Use only CT-507S type picture tube (Part No. 8-731-911-10).

SECTION 3
CIRCUIT ADJUSTMENTS

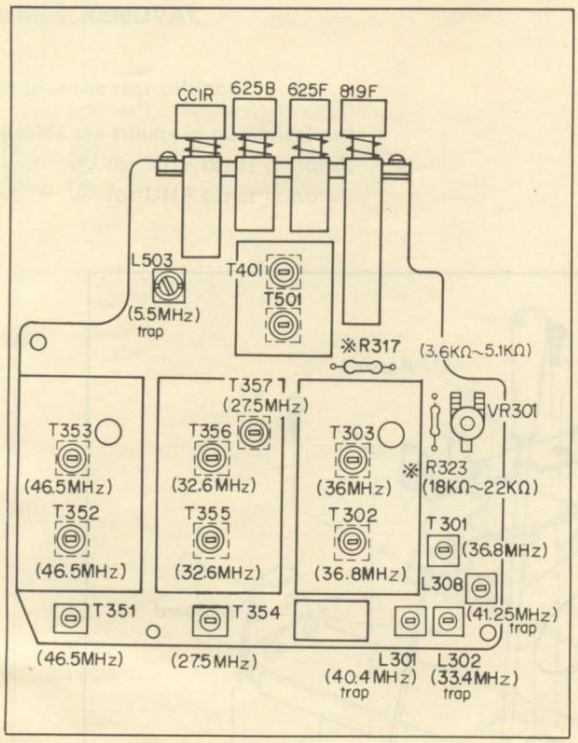


Fig. 3-1. Adjusting parts location of VIF and SIF adjustment

Equipment Required

Sweep generator
Signal generator
Marker generator
Oscilloscope
VOM
Rheostat (250 kΩ)

Preparation

1. Make sure that the normal power voltage is obtained.
2. Set the channel selector to the highest inactive channel in the area.

3-1. VIF ADJUSTMENT

Emitter Current Ie Adjustment of Q301

See Fig. 3-2.

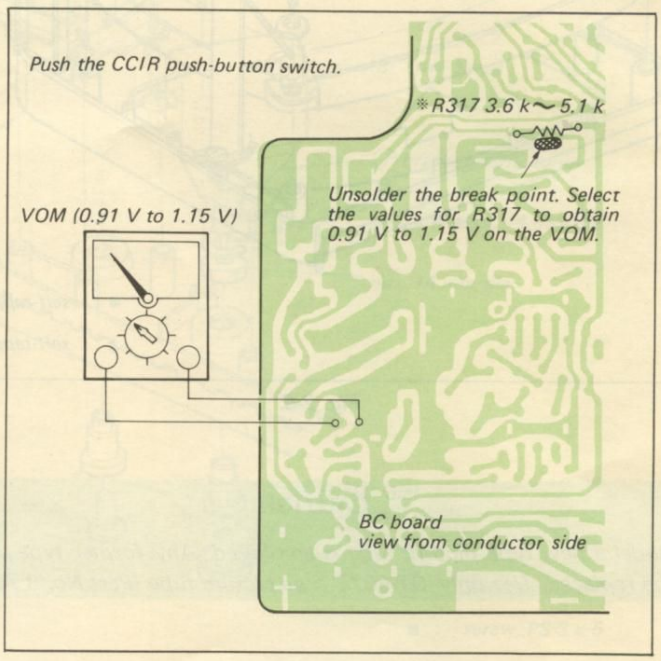


Fig. 3-2.

33.4 MHz, 40.4 MHz and 41.25 MHz Trap Coil Adjustment

1. See Fig. 3-3.
2. Push the CCIR push-button switch.
3. Supply each strong signal of 33.4 MHz, 40.4 MHz and 41.25 MHz, with 1 kHz 40 % a-m modulation from the signal generator.
4. Turn the 250 kΩ rheostat to obtain the optimum waveform for adjustment.
5. Adjust L301, L302 and L308 for minimum output waveform.

VIF Response Curve Adjustment

1. See Fig. 3-3.
2. Push the CCIR push-button switch.
3. Turn the 250 kΩ rheostat to obtain 2.25 V on the VOM.
4. Supply each signal of 36 MHz, 36.8 MHz and 38 MHz, with 1 kHz 40 % a-m modulation from the signal generator.
5. Adjust T301, T302 and T303, and L207 for maximum output waveform on the scope.
6. If the sweep generator is available, make sure that the optimum response curve is obtained on the scope as shown.

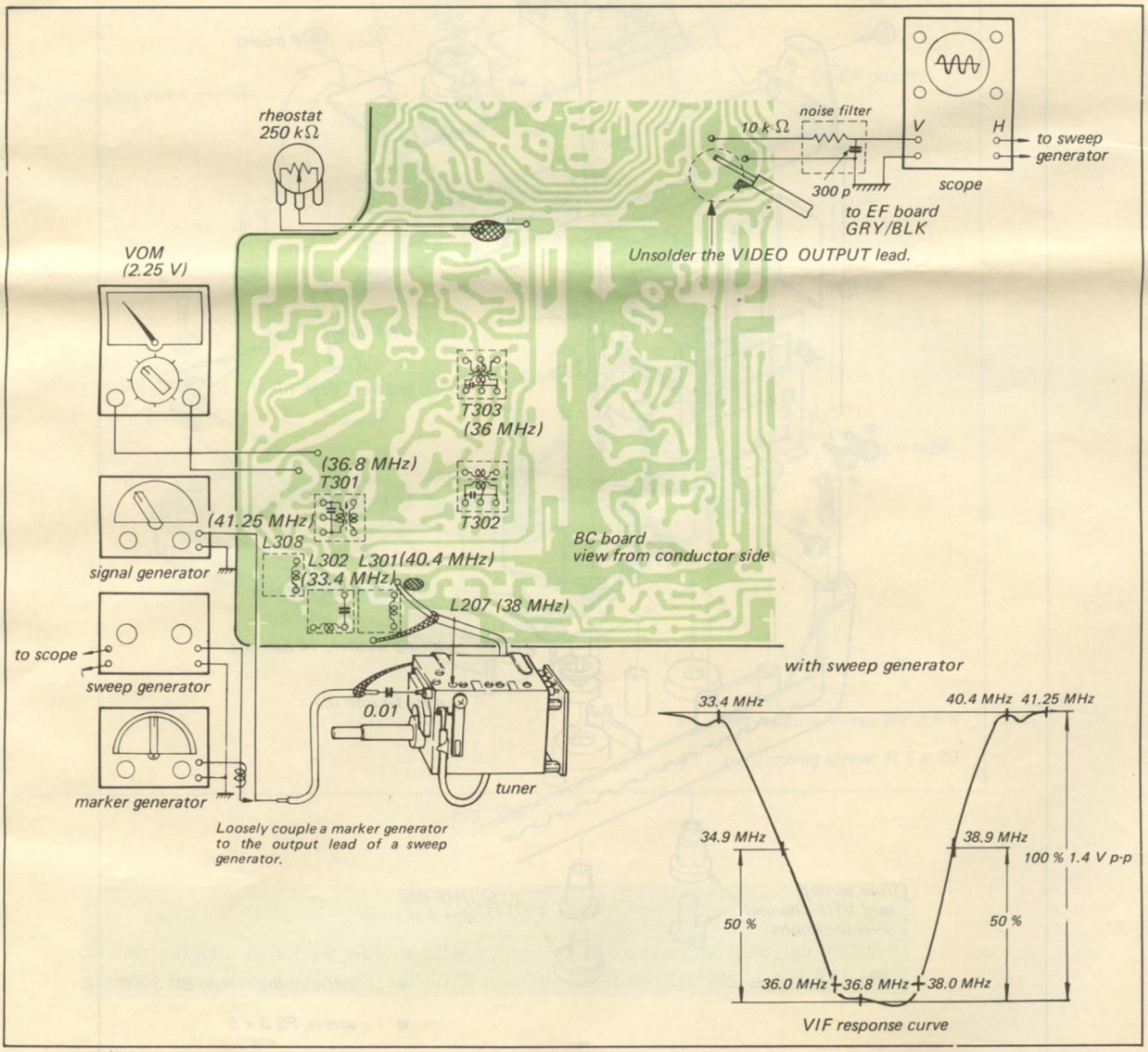


Fig. 3-3.

Tuner AGC Adjustment

1. See Fig. 3-4.
2. Push the CCIR push-button switch.
3. Select the values for R323 to obtain 1.25 V to 1.35 V on the VOM.

AGC Delay Adjustment

1. See Fig. 3-4.
2. Push the CCIR push-button switch.
3. Measure the voltage on the VOM with no signal. It should be 1.25 V to 1.35 V.
4. Supply the same frequency signal (with 1 kHz, 40 % a-m modulation) as the channel signal of the TV set.
5. Adjust the VR301 to obtain 0.2 V higher than the voltage measured at step 3.

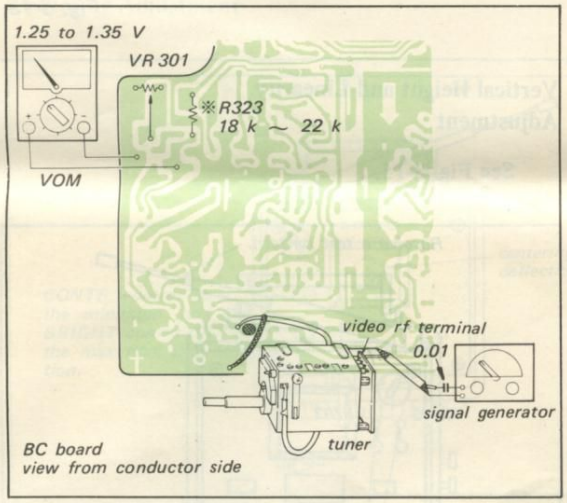


Fig. 3-4.

3-2. SIF ADJUSTMENT

FM SIF Adjustment

1. See Fig. 3-5.
2. Push the CCIR push-button switch.
3. Set the signal generator to 5.5 MHz with 1 kHz 30 % a-m modulation (50 dB).
4. Turn the core of T401 counterclockwise two or three times.
5. Adjust T501 for maximum output waveform.
6. Adjust T401 for minimum output waveform.
7. If the sweep generator is available, make sure that the optimum response curve is obtained.
8. Make sure that the buzz sound is not heard from the speaker.

5.5 MHz Trap Coil Adjustment

1. See Fig. 3-5 and 3-6.
2. Push the CCIR push-button switch.
3. Supply the strong 5.5 MHz signal with 400 Hz 40 % a-m modulation from the signal generator.
4. Adjust L503 to eliminate the stripe from the picture.

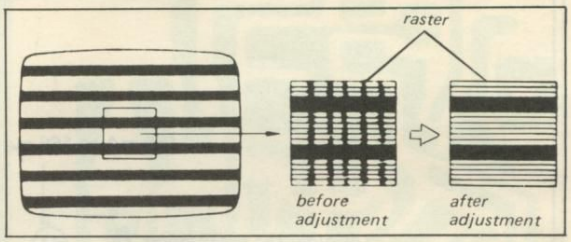


Fig. 3-6.

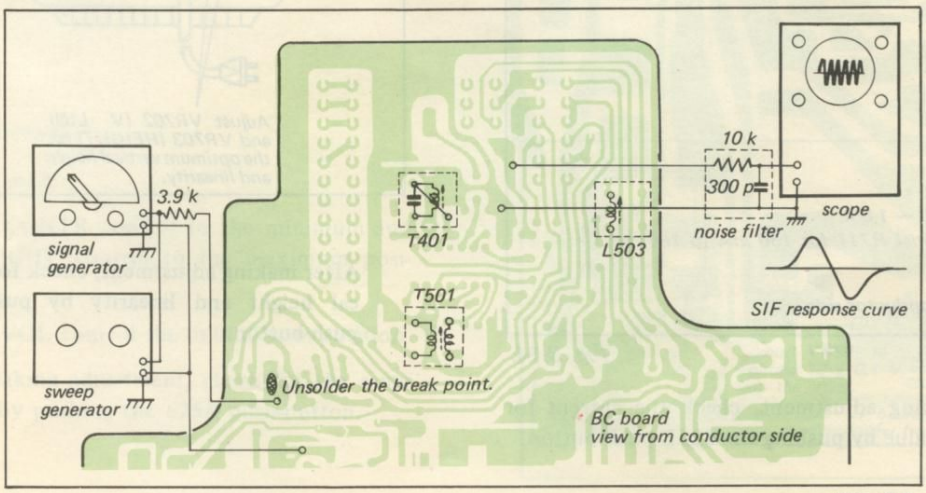


Fig. 3-5.

AM SIF-1 Adjustment

1. See Fig. 3-7.
2. Push the 819F push-button.
3. Supply the 46.5 MHz signal with 1 kHz 40 % a-m modulation from the signal generator.
4. Adjust T351, T352 and T353 for maximum output on the scope.

   Note: The height of the modulated waveform changes, when adjusting transformers. Readjust the output level of the signal generator to obtain 0.1 V (p-p) waveform constantly.
5. If a sweep generator is available, make sure that the optimum response curve is obtained.

AM SIF-2 Adjustment

1. See Fig. 3-7.
2. Push the 625B push-button.
3. Supply the 27.5 MHz signal with 1 kHz 40 % a-m modulation from the signal generator.
4. Adjust T354 and T357 for maximum output on the scope.
5. Change the frequency of signal generator to 32.6 MHz.
6. Adjust T355 and T356 for maximum output on the scope.
7. If a sweep generator is available, make sure that the optimum response curve is obtained.

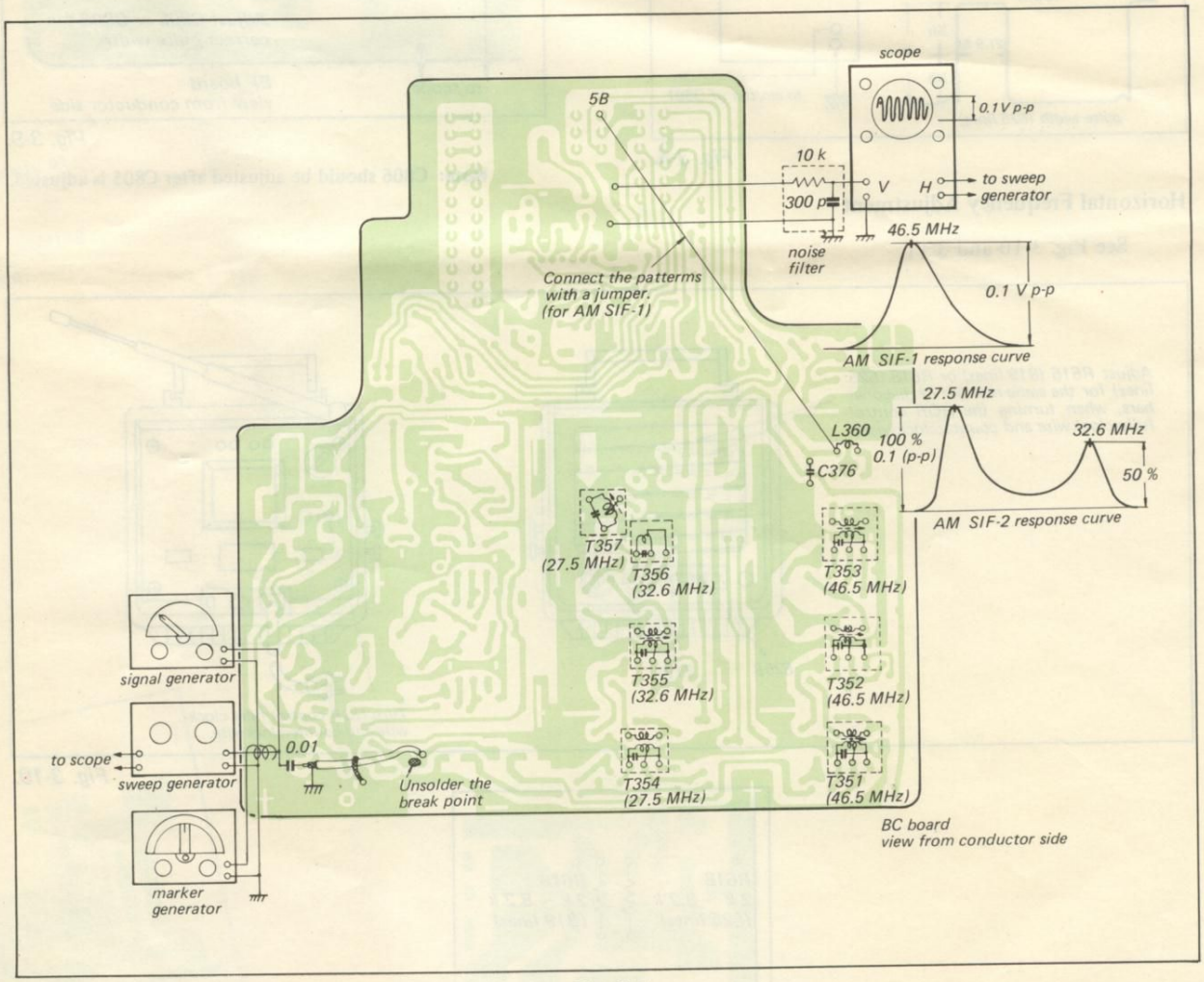


Fig. 3-7.

3-3. DEFLECTION CIRCUIT ADJUSTMENT

Preparation

1. Make sure that the normal power voltage is obtained.
2. Receive an off-the-air signal.
3. Push the 819F push-button.
4. Set the CONTR and BRT controls to the position where optimum picture can be obtained.
5. After making adjustment for 819 lines, perform the same steps by pushing the 625B push-button.

Horizontal Pulse-width Adjustment

See Fig. 3-8 and 3-9.

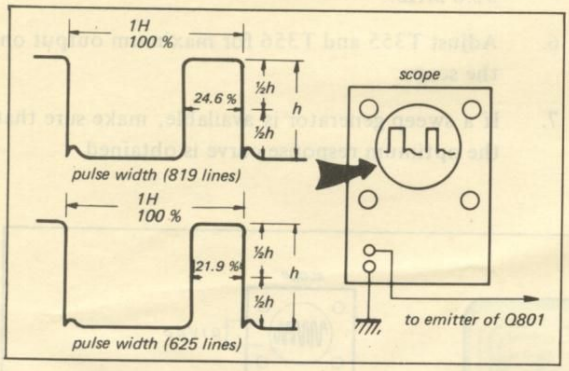


Fig. 3-8.

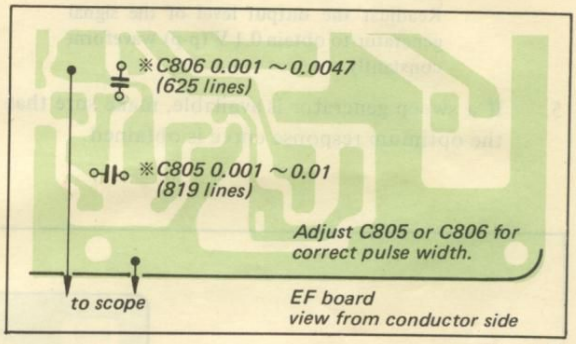


Fig. 3-9.

Note: C806 should be adjusted after C805 is adjusted.

Horizontal Frequency Adjustment

See Fig. 3-10 and 3-11.

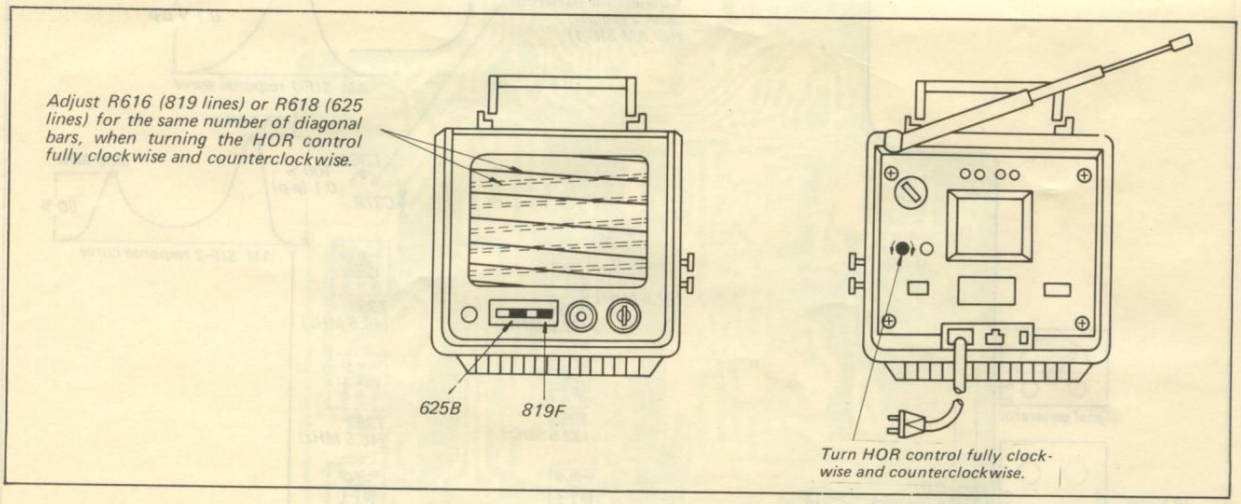


Fig. 3-10.

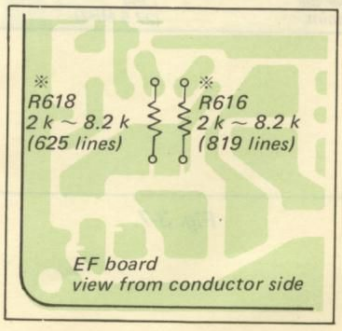


Fig 3-11.

Horizontal Size Adjustment

See Fig. 3-12 and 3-13.

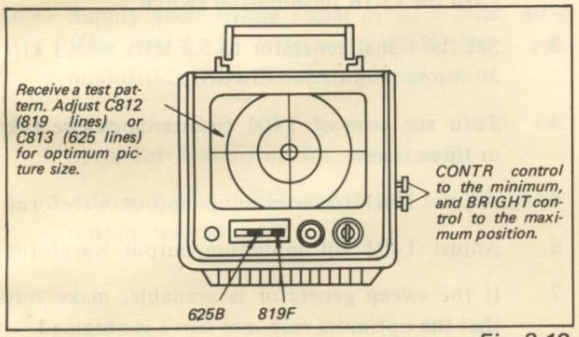


Fig. 3-12.

Note: C813 should be adjusted after C812 is adjusted.

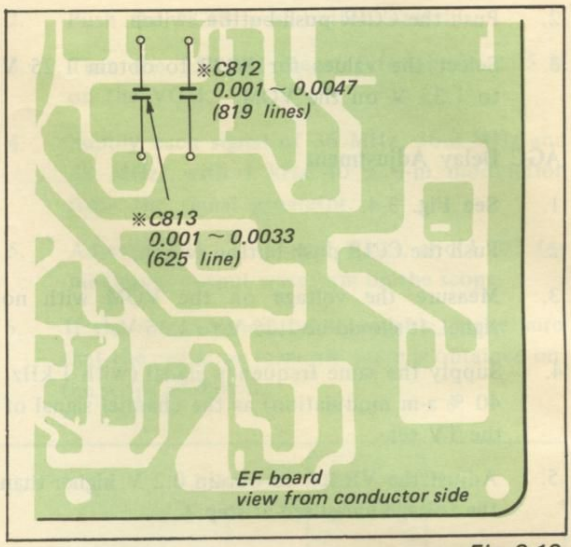


Fig. 3-13.

Vertical Bias Adjustment

See Fig. 3-14.

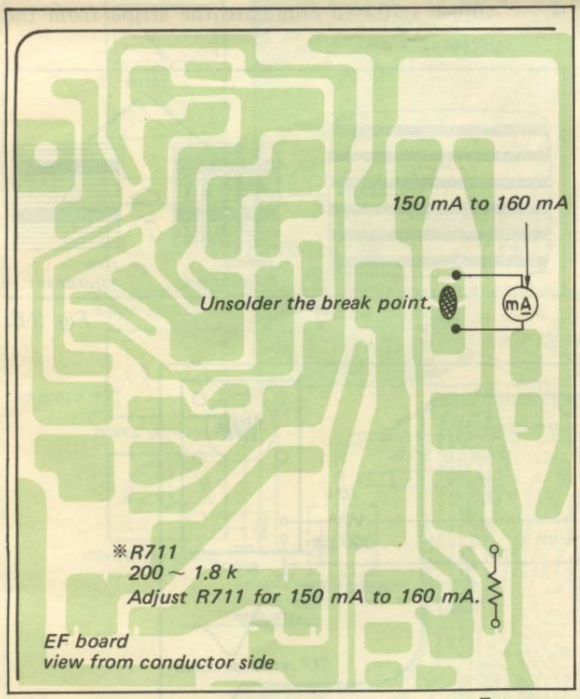


Fig. 3-14.

After making adjustment, check the current for the same value by pushing the 625B push-button.

Vertical Height and Linearity Adjustment

See Fig. 3-15.

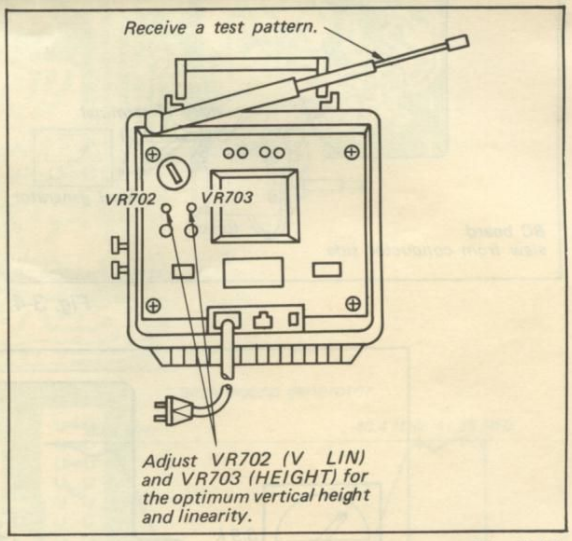


Fig. 3-15.

After making adjustment, check for the same vertical height and linearity by pushing the 625B push-button.

Ic of Q503 Adjustment

1. See Fig. 3-16.
2. Set the CONTR control to the minimum and the BRT control to the maximum position.
3. After making adjustment, check for the same Ic by pushing the 625B push-button.

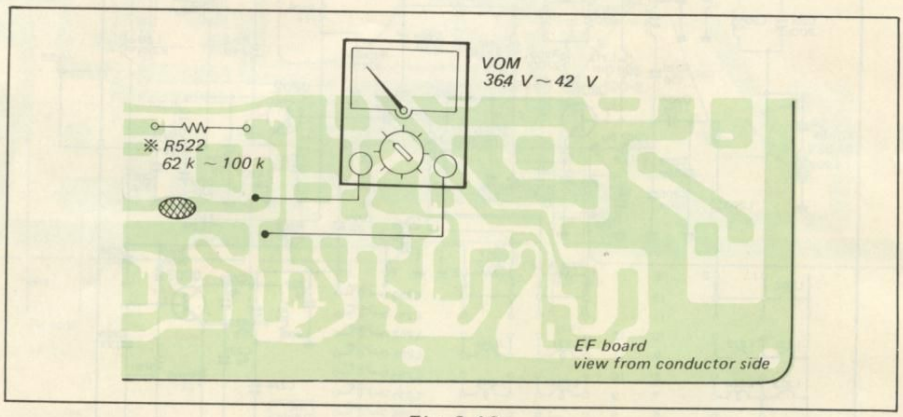


Fig. 3-16.

Centering Adjustment

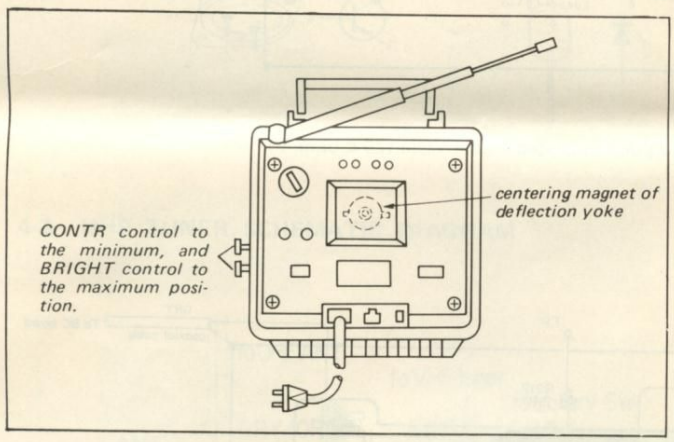


Fig. 3-17.

1. See Fig. 3-17.
2. Adjust the centering magnet to set a picture at the center of the screen.
3. After making adjustment, make a centering check by pushing the 625B push-button.

B+ Line Adjustment

1. See Fig. 3-18.
2. Set the CONTR control to the minimum and the BRIGHT control to the maximum position.
3. Set the VOL control the to minimum position.
4. After making adjustment, check for the same voltage by pushing the 625B push-button.

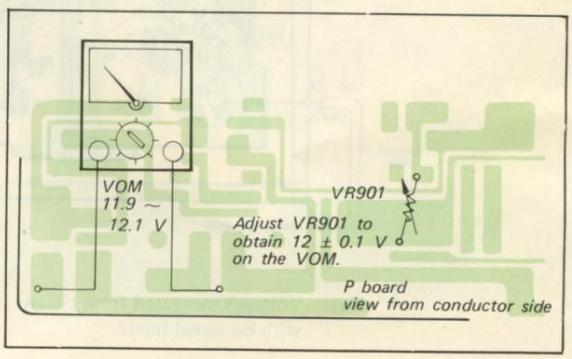


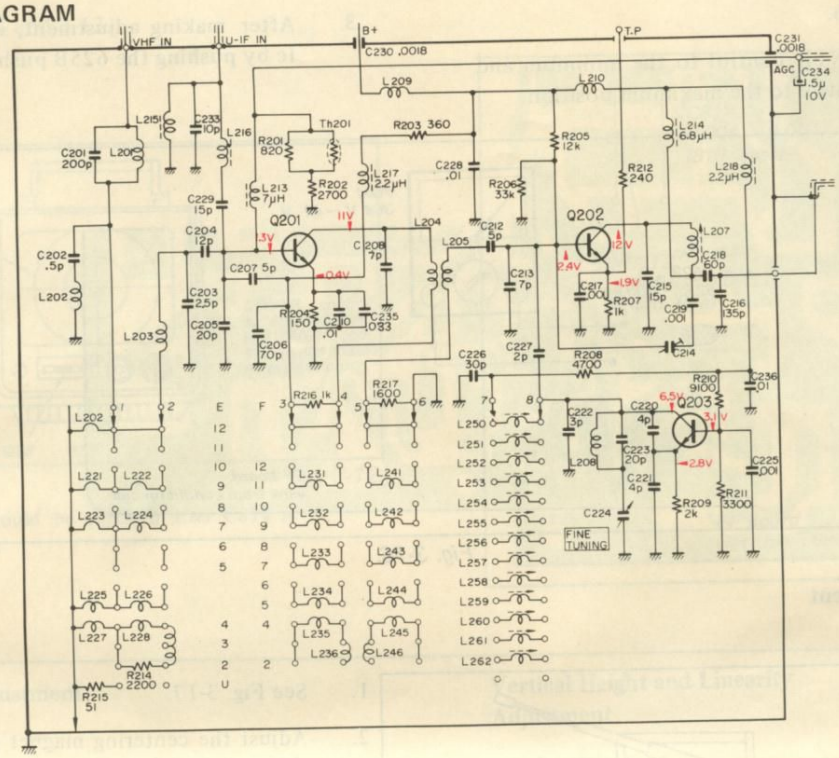
Fig. 3-18.

SECTION 4

MOUNTING AND SCHEMATIC DIAGRAMS

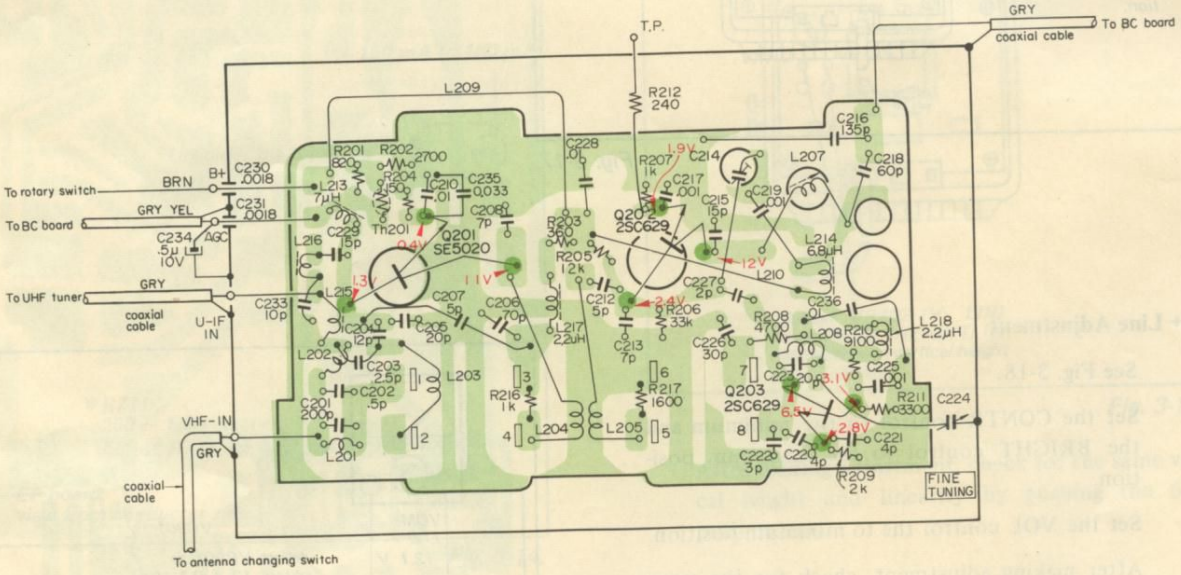
4-1. VHF TUNER

SCHEMATIC DIAGRAM



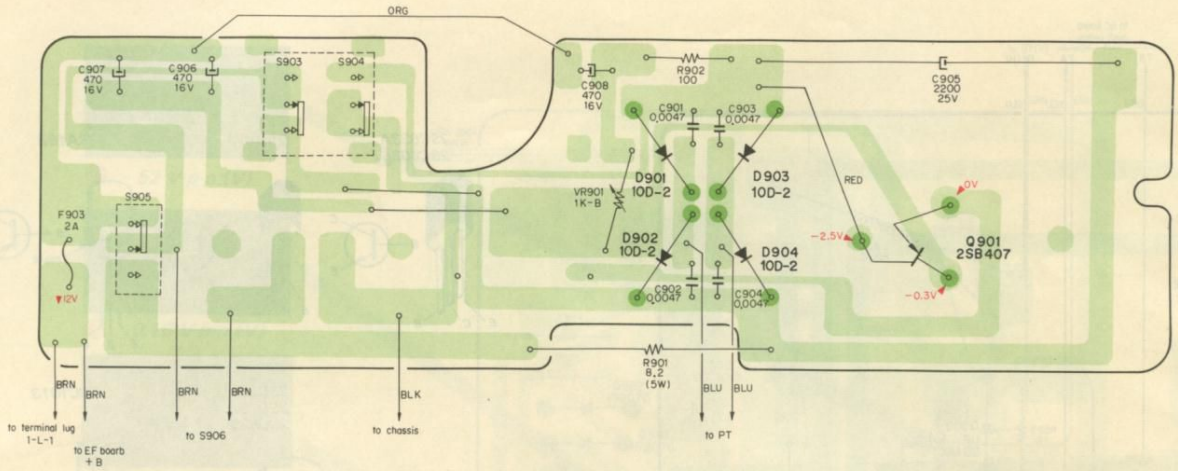
Note: Voltages measured from chassis to point indicated with a VOM (20 k ohm/V), with no signal input.

MOUNTING DIAGRAM



Note: Voltages measured from chassis to point indicated with a VOM (DC 20 k ohms/V) with no signal input.

4-2. P CIRCUIT BOARD



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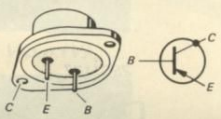
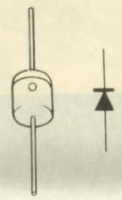
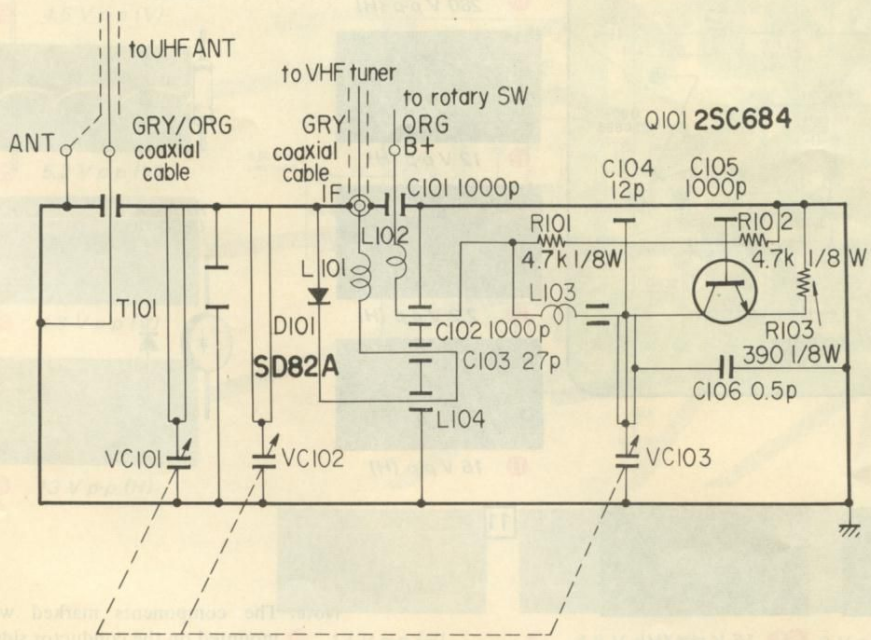
2SB407



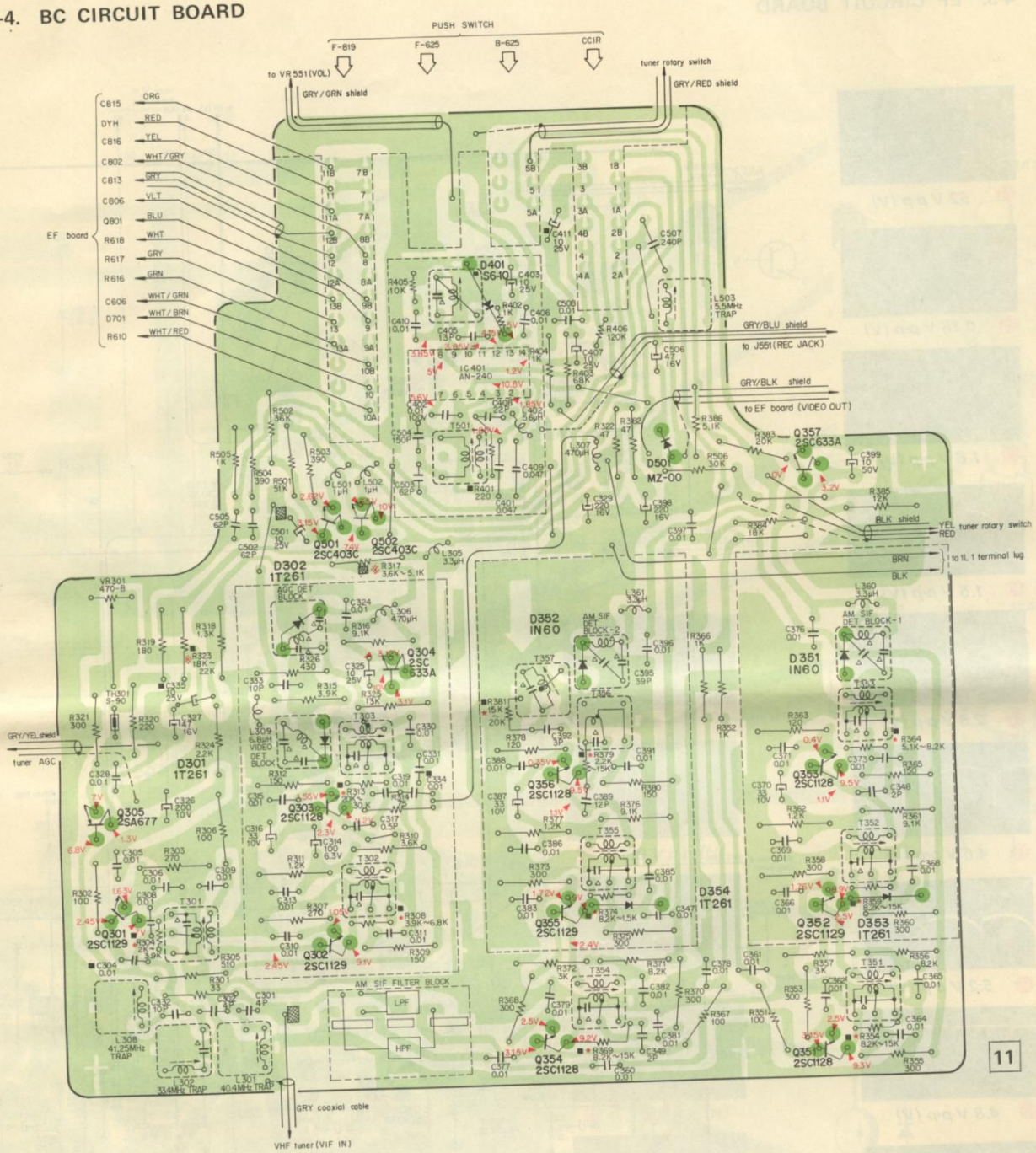
10D-2



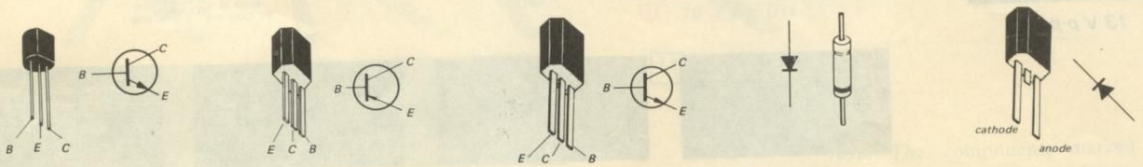
4-3. UHF TUNER SCHEMATIC DIAGRAM



4-4. BC CIRCUIT BOARD



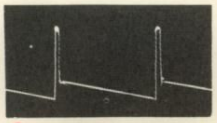
2SC1128, 2SC1129 | 2SA677 | 2SC633A, 2SC403C | IT261, IN60, S6-10 | MZ-00



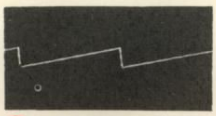
Note: 1. The components marked with ■ are mounted on the conductor side.

2. As for the resistors marked ★, replace the same value when it is necessary.

4-5. EF CIRCUIT BOARD



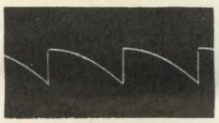
㉑ 52 V p-p (V)



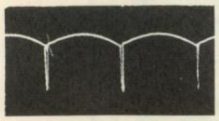
⑳ 0.16 V p-p (V)

⑱ 1.6 V p-p (V)

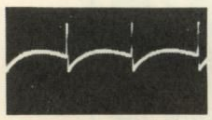
⑲ 1.5 V p-p (V)



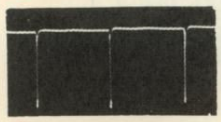
⑰ 2.8 V p-p (V)



⑯ 4.6 V p-p (V)

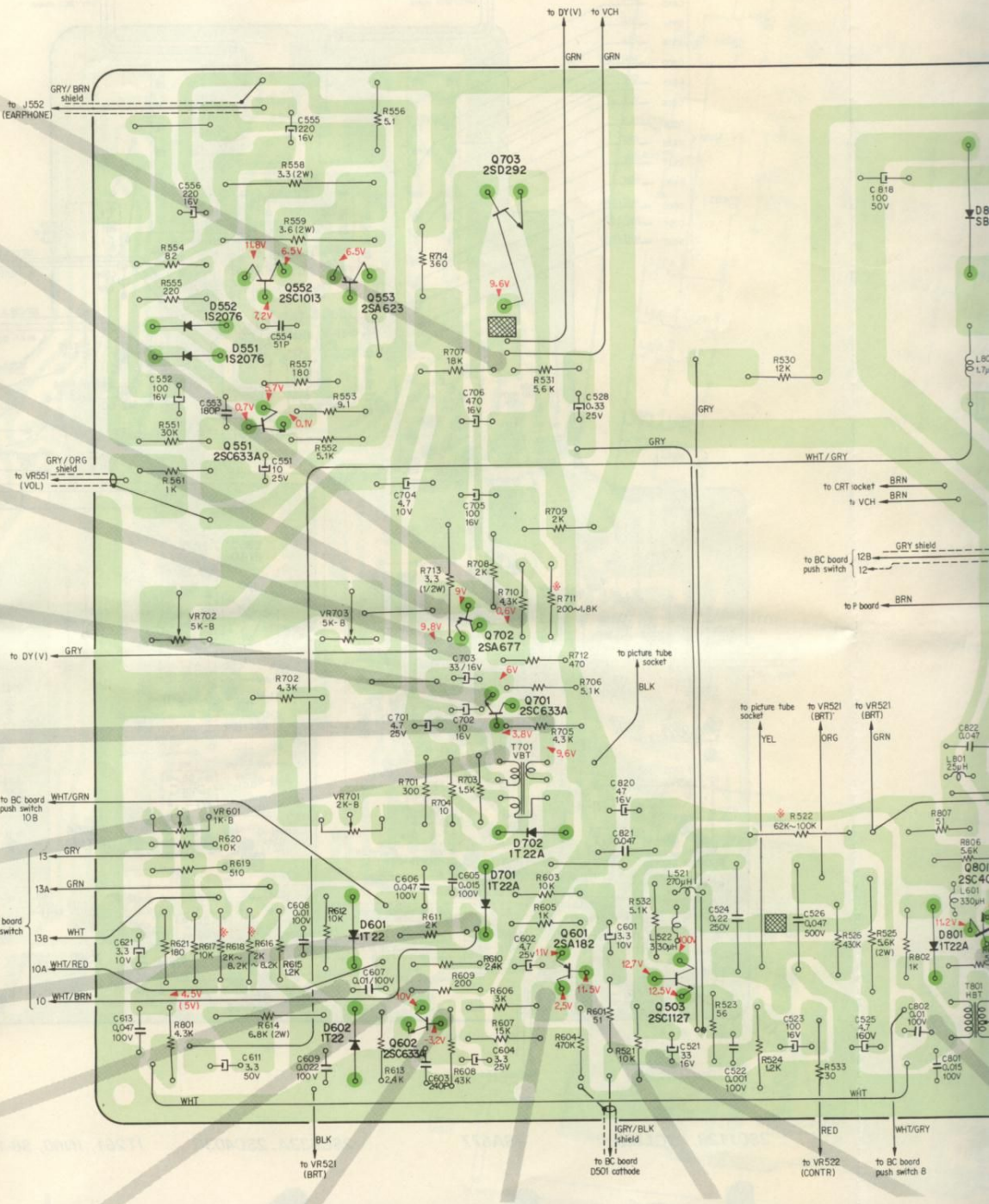


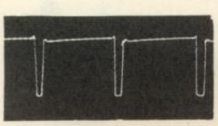
⑮ 5.2 V p-p (V)



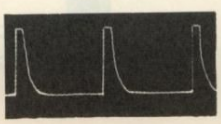
⑭ 4.8 V p-p (V)

⑥ 13 V p-p (H)

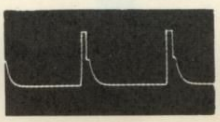




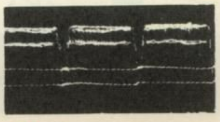
⑤ 12 V p-p (H)



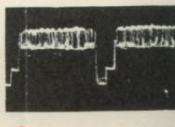
④ 4.8 V p-p (H)



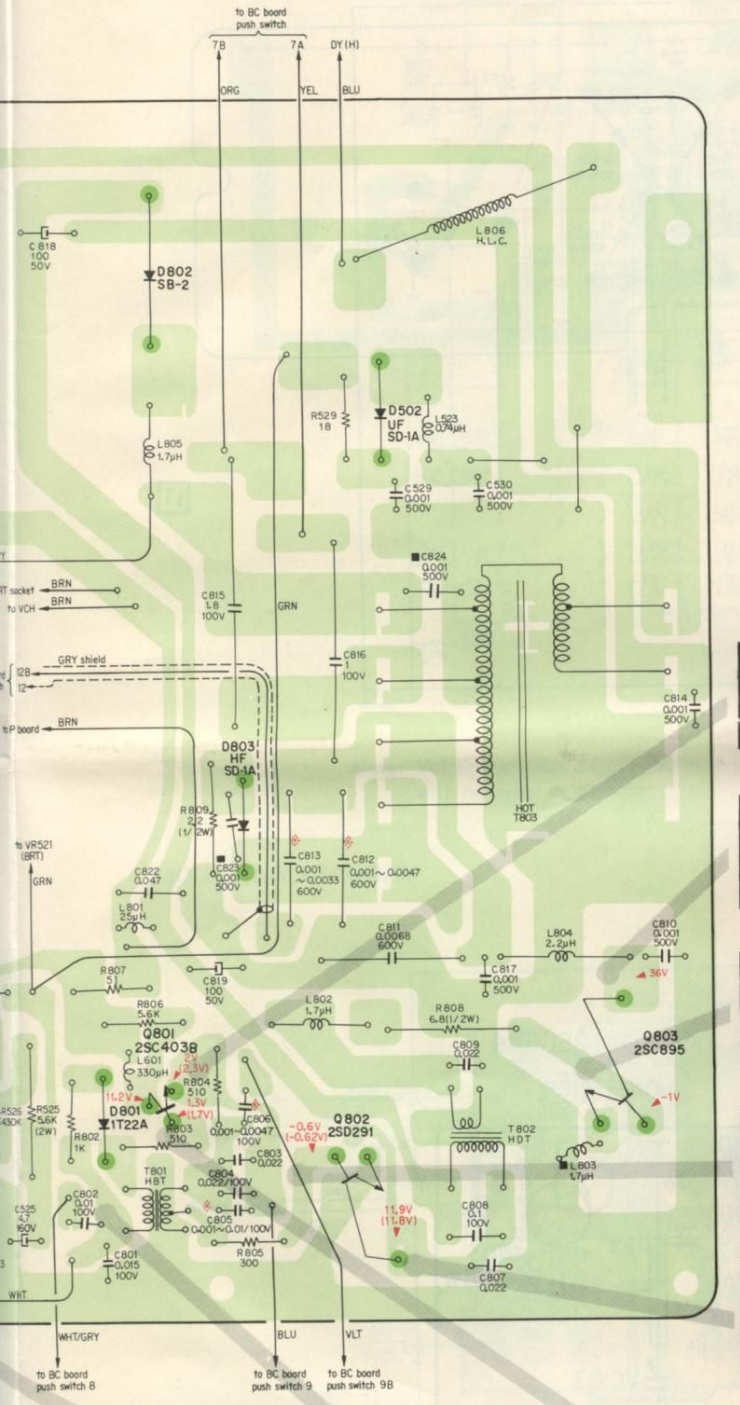
③ 9 V p-p (H)

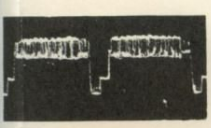


② 1.1 V p-p (V)

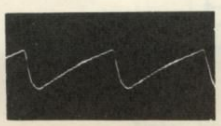


① 1.1 V p-p (H)

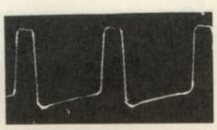




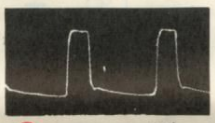
1 1.1 V p-p (H)



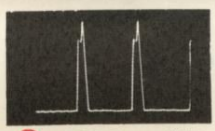
7 1.6 V p-p (H)



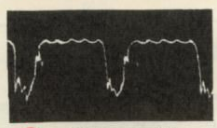
8 15 V p-p (H)



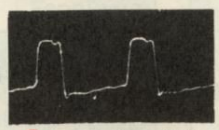
9 13 V p-p (H)



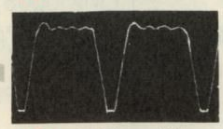
13 280 V p-p (H)



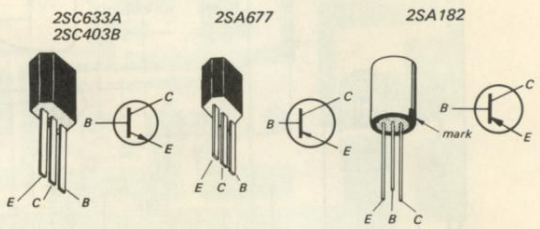
12 12 V p-p (H)

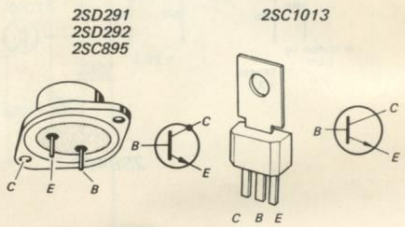


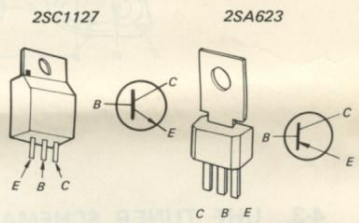
10 2.2 V p-p (H)

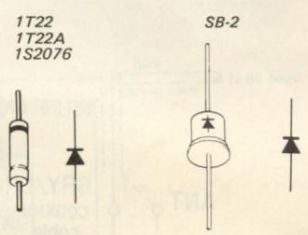


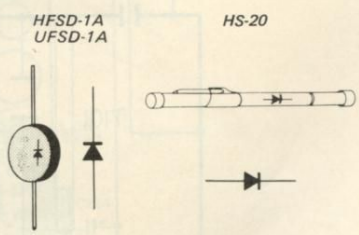
11 16 V p-p (H)







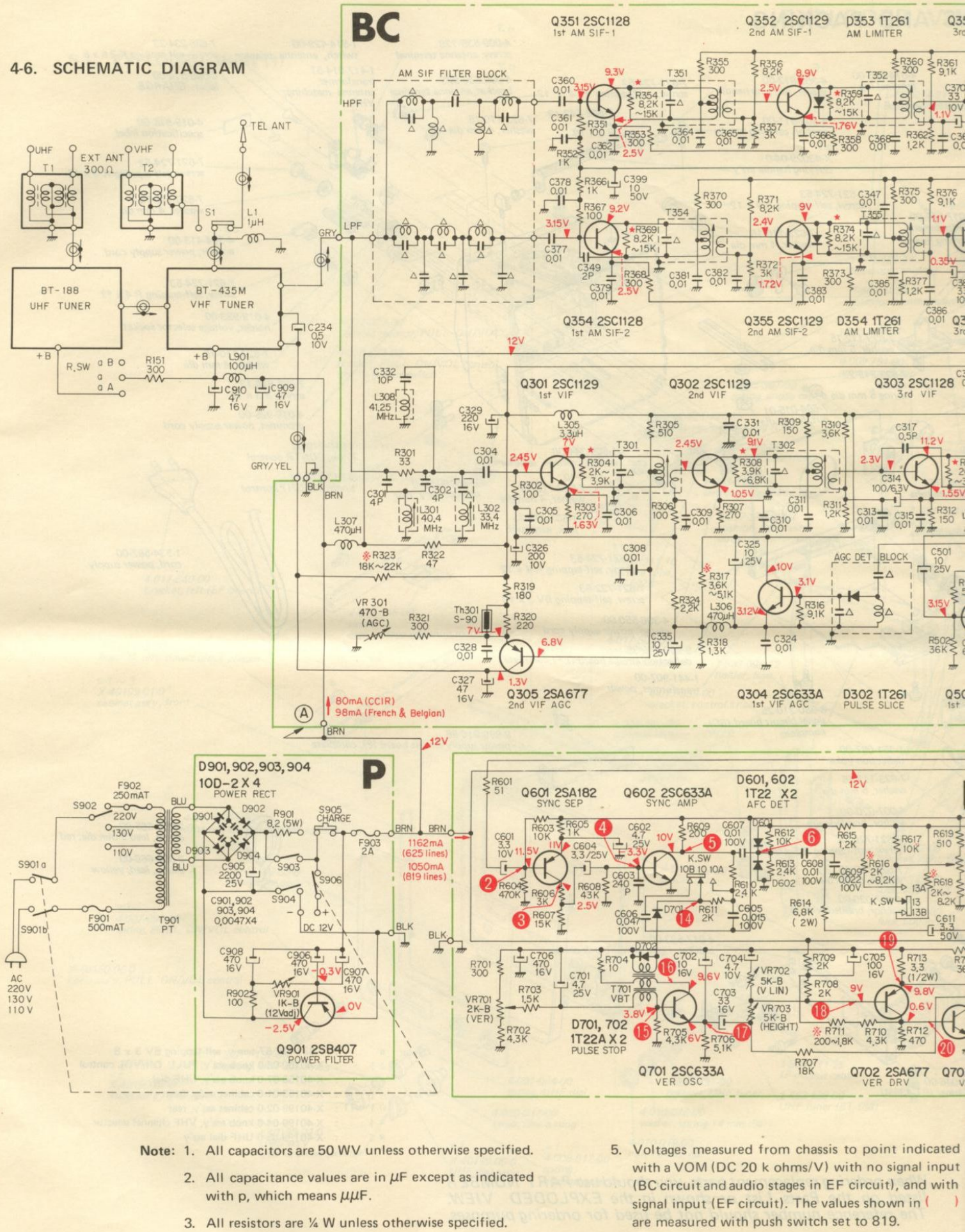




11

Note: The components marked with ■ are mounted on the conductor side.

4-6. SCHEMATIC DIAGRAM



Note: 1. All capacitors are 50 WV unless otherwise specified.

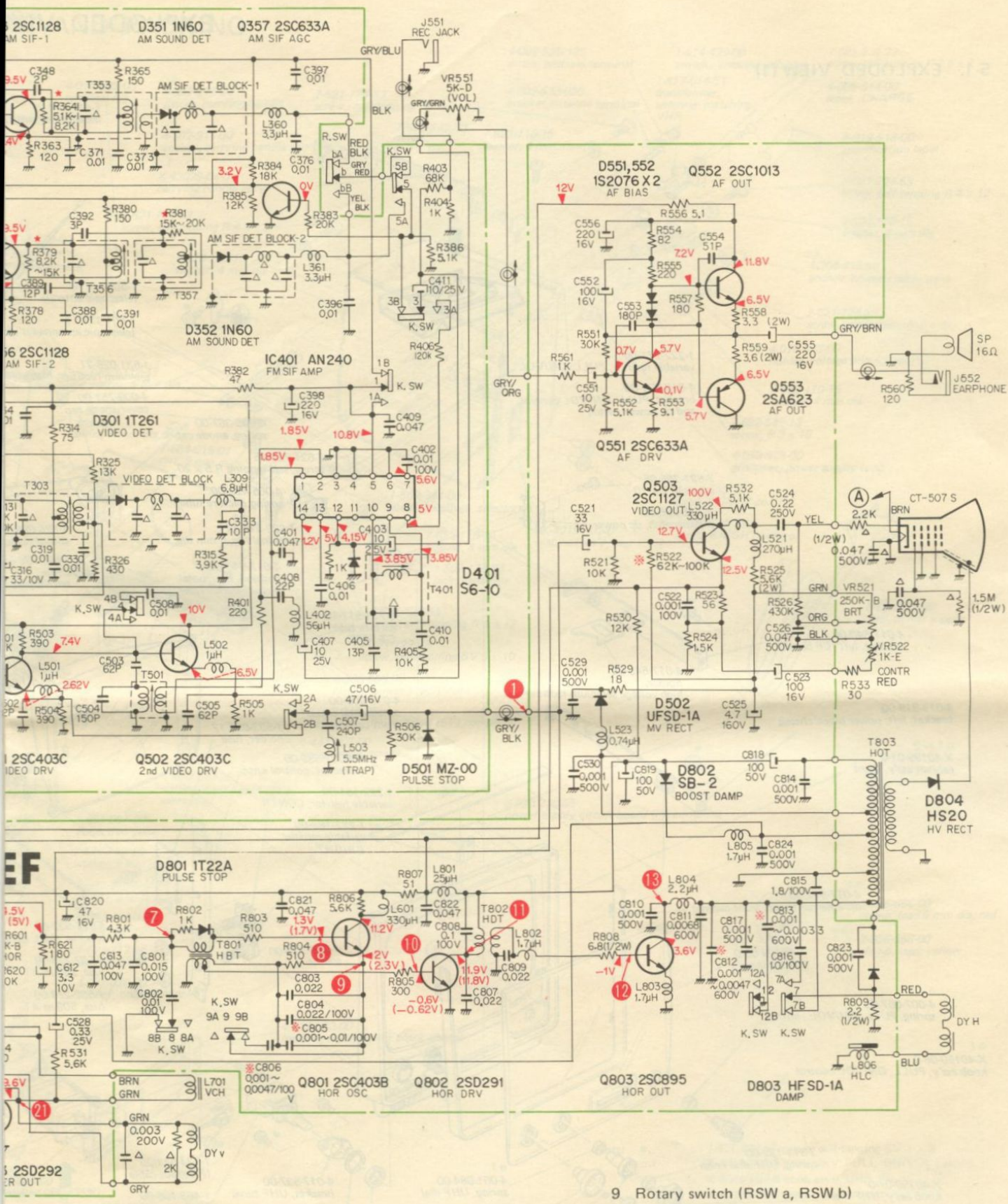
2. All capacitance values are in μF except as indicated with p, which means μμF.

3. All resistors are ¼ W unless otherwise specified.

4. All resistance values are in ohms. k = 1000.

5. Voltages measured from chassis to point indicated with a VOM (DC 20 k ohms/V) with no signal input (BC circuit and audio stages in EF circuit), and with signal input (EF circuit). The values shown in ( ) are measured with push switch set to 819.

6. Resistance and capacitance values marked ※ are to be selected to yield specified operating conditions.



7. The red circled numbers (❶ ～ ㉑) indicate the waveforms on pages 19 and 20.

8. Push-button switch (KSW 1 to KSW 13)

A	;	on (push) position
B	;	off position
KSW 1 ～ 4	;	CCIR
KSW 5	;	625B
KSW 7 ～ 13	;	819F

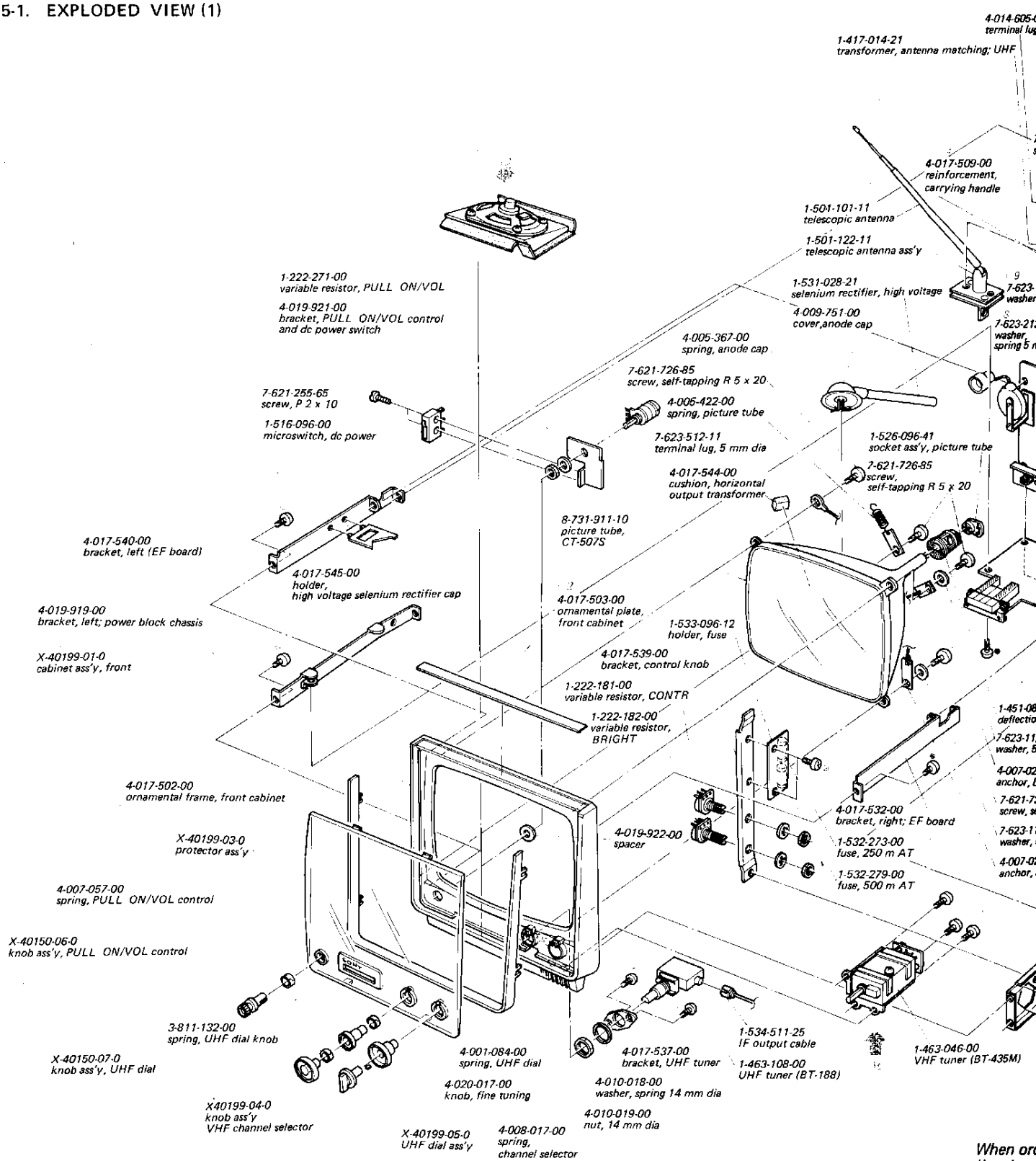
9 Rotary switch (RSW a, RSW b)

RSW a	aA	;	UHF
	aB	;	VHF
RSW b	bA	;	F2, 4, 5, 8, 10, 12 ch.
	bB	;	F6, 7, 9, 11, U ch.

10. As for the resistors marked ★ , replace the same value when it is necessary.

11. △ mark shows the internal components.

5-1. EXPLODED VIEW (1)

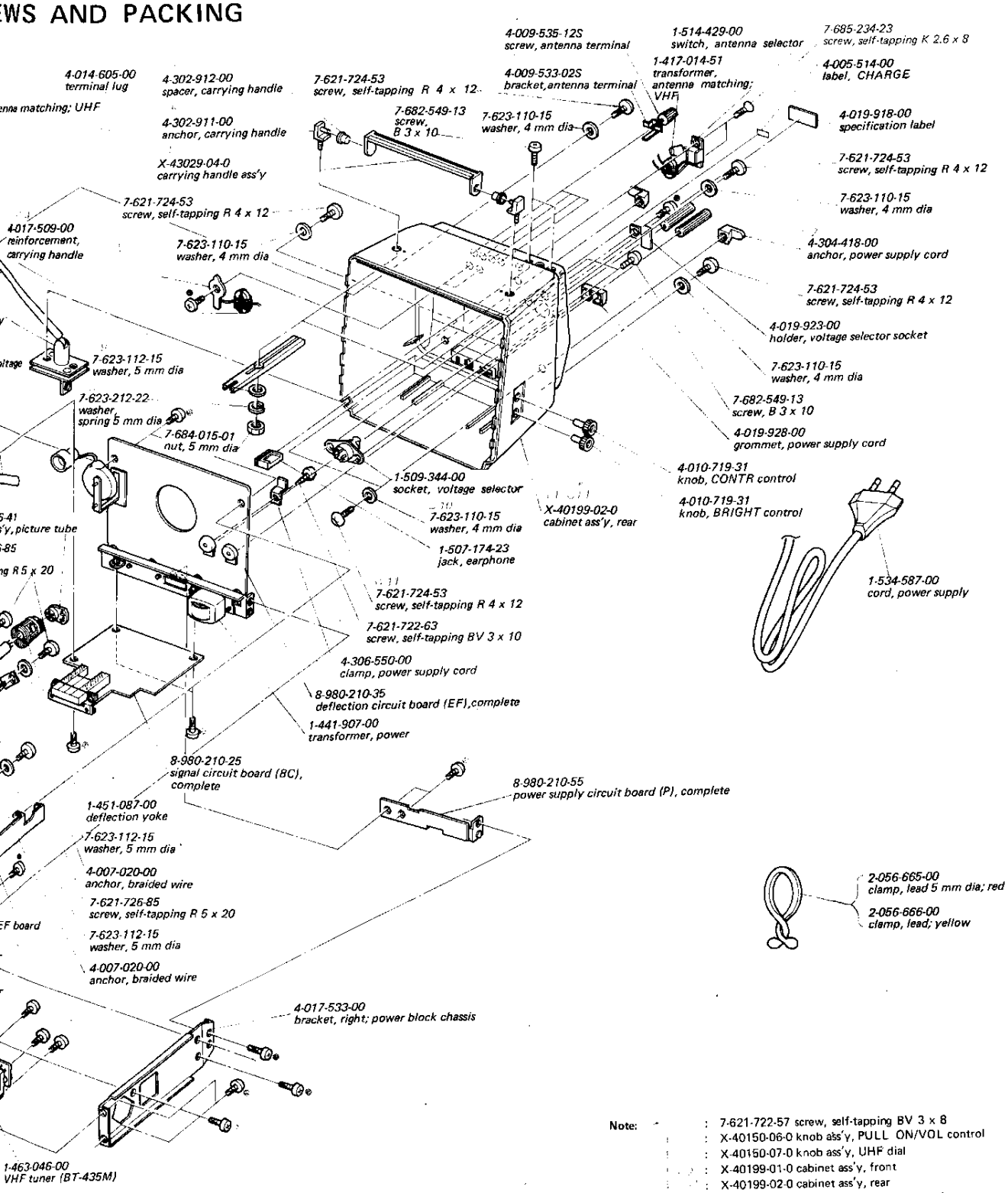


When or
listed on
The refe

Note:

TION 5

EWS AND PACKING

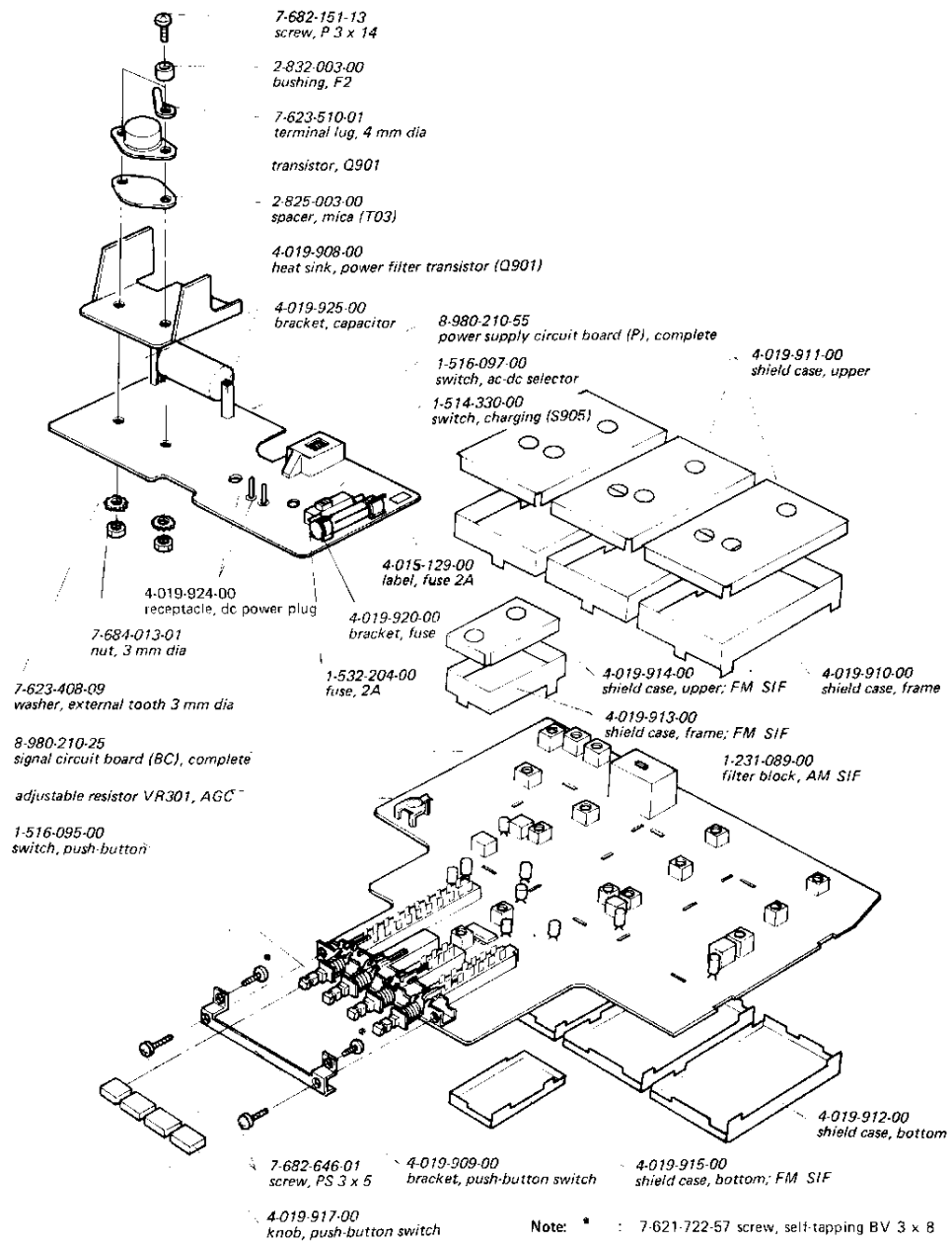


Note:
- : 7-621-722-57 screw, self-tapping BV 3 x 8
- : X-40150-06-0 knob ass'y, PULL ON/VOL control
- : X-40150-07-0 knob ass'y, UHF dial
- : X-40199-01-0 cabinet ass'y, front
- : X-40199-02-0 cabinet ass'y, rear
- : X-40199-04-0 knob ass'y, VHF channel selector
- : X-40199-05-0 UHF dial ass'y

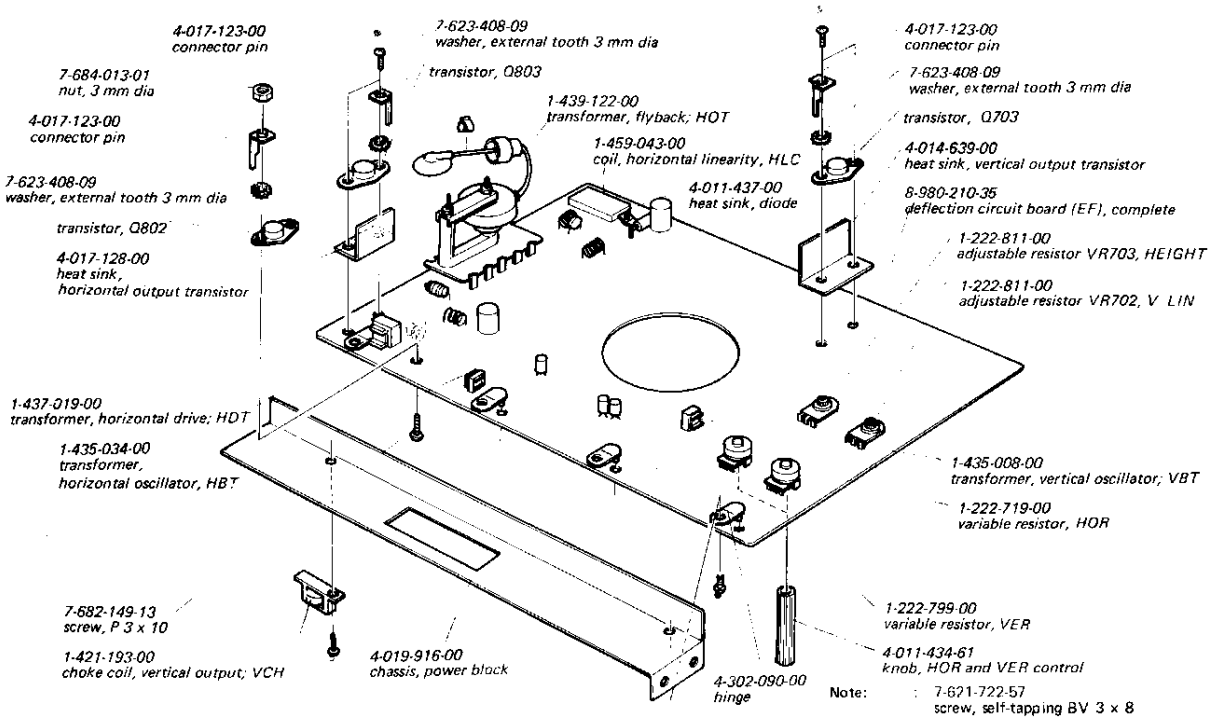
When ordering replacement parts, you should use PART NUMBER listed on the Parts List or shown in the EXPLODED VIEW. The reference number should not be used for ordering purposes.

Note: *All Screws in this set are Phillips type (cross recess type).*

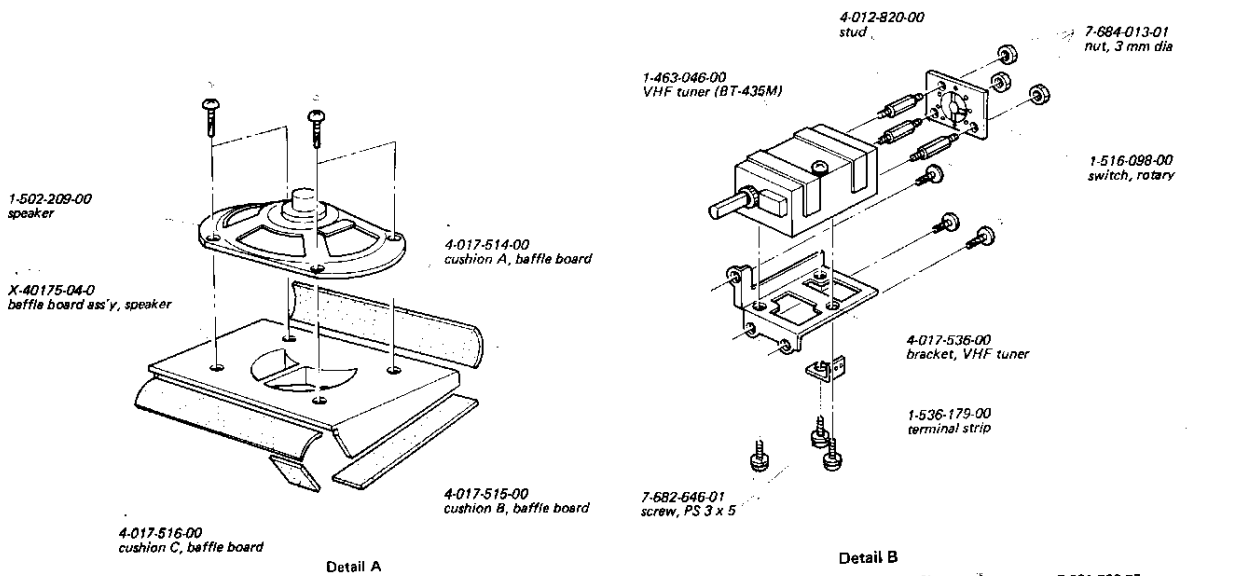
5-2. EXPLODED VIEW (2)



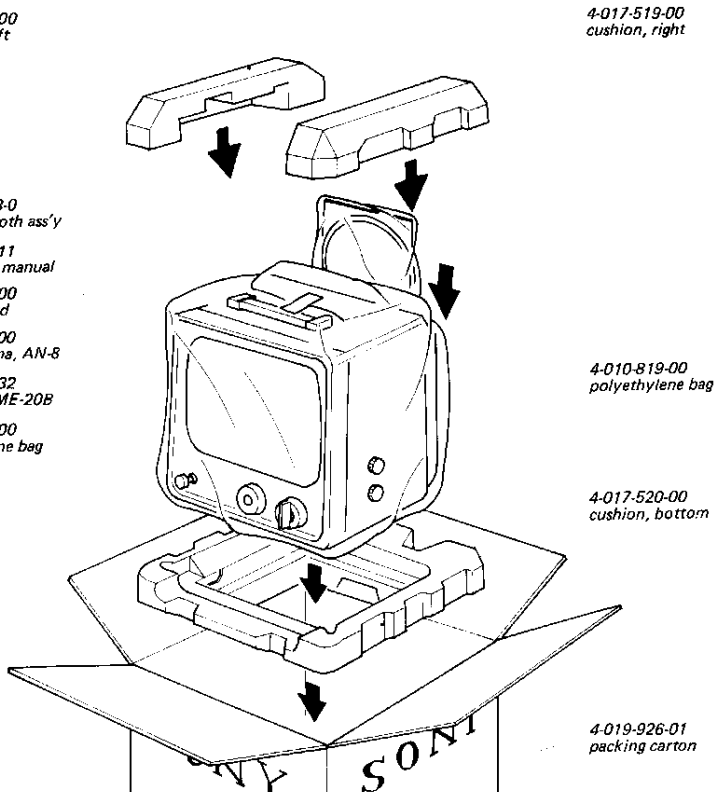
5-3. EXPLODED VIEW (3)



5-4. EXPLODED VIEW (4)



5-5. PACKING



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 3×10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head