

CF-950S

*E Model
UK Model
AEP Model*



SW/FM/MW CASSETTE-CORDER

SPECIFICATIONS

GENERAL

- Power Requirements:** 110, 120, 220, 240 V ac, 50/60 Hz (E, AEP Model)
240 V ac, 50 Hz (UK Model)
6 V dc
Battery size – D, 4 pcs
(IEC designation R20)
- Power Consumption:** 14 W ac (E, AEP Model)
10 W ac (UK Model)
- Speaker:** Approx. 15 x 10 cm (6 x 4 inches)
- Dimensions:** Approx. 432 (w) x 305 (h) x 148 (d) mm
17 (w) x 12 (h) x 5⁷/₈ (d) inches
including projecting parts and controls
- Weight:** Approx. 5.6 kg, 12 lb 6 oz, with batteries

RADIO SECTION

- Antennas:** FM/SW: telescopic antenna
MW: ferrite-rod antenna
FM/SW/MW: external antenna terminals
- Frequency Ranges:** FM: 87.5 – 108 MHz (3.43 – 2.78 m)
MW: 530 – 1,605 kHz (566 – 187 m)
SW1: 1.6 – 4.0 MHz (188 – 75 m)
SW2: 4.0 – 10.0 MHz (75 – 30 m)
SW3: 11.7 – 22.0 MHz (25.6 – 13.6 m)

TAPE RECORDER SECTION

- Track:** 2-track monaural
- Fast Forward
Rewind Time:** Approx. 1 minutes 50 seconds with
Sony cassette C-60
- Frequency Response:** 50 – 10,000 Hz
- Battery Life:** In continuous recording with built-in
microphone:
Approx. 13 hours with Sony long-life
battery size – D
- Inputs:** MIC (mini jack)
Maximum sensitivity: 0.2 mV (–72 dB)
Impedance: 10 k Ω or higher
for low-impedance
microphone
- LINE IN (mini jack)
Sensitivity: 0.1 V (–17 dB)
Impedance: 680 k Ω
- Outputs:** EARPHONE (mini jack)
8 Ω earphone or load impedance
10 k Ω or higher
HEADPHONES (stereo binaural jack)
for 8 Ω impedance headphones
MPX OUT (mini jack)
- Other Jack:** Remote control jack

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®

SERVICE MANUAL

CF-950S

MODEL IDENTIFICATION

UK model

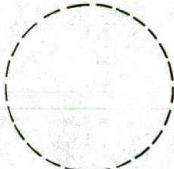
SONY®

CASSETTE-CORDER 5 BANDS CF-950S

FREQ. RANGE: FM 87.5–108 MHz
 MW 530–1605 kHz
 SW1 1.6–4.0 MHz
 SW2 4.0–10.0 MHz
 SW3 11.7–22.0 MHz

AC: 240 V ~ 50 Hz 10W
 DC: 6 V = FLASHLIGHT BATT
 SIZE D x 4 OR EQUIV

MADE IN JAPAN



AEP, E model

SONY®

CASSETTE-CORDER 5 BANDS CF-950S

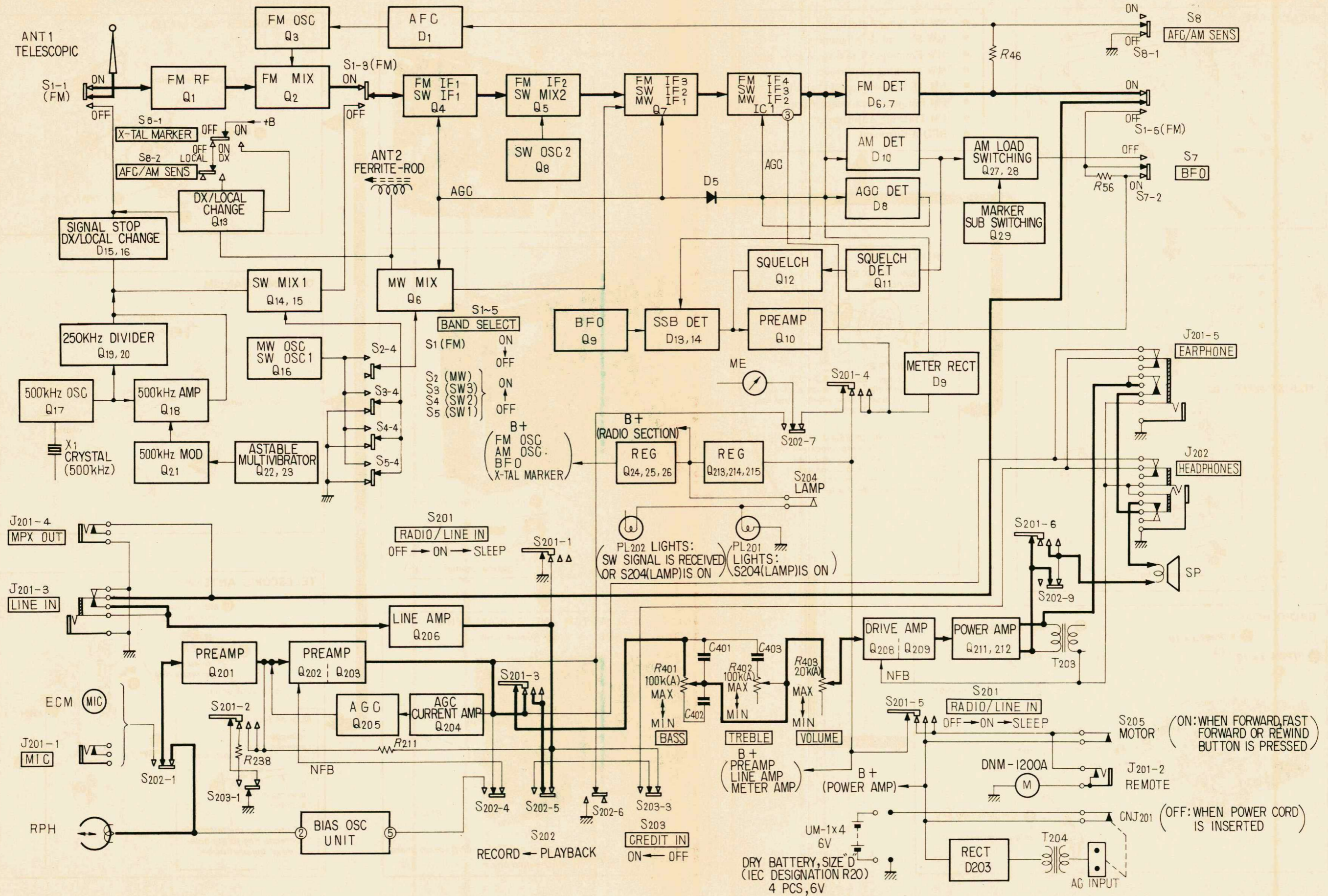
FREQ. RANGE: FM 87.5–108 MHz
 MW 530–1605 kHz
 SW1 1.6–4.0 MHz
 SW2 4.0–10.0 MHz
 SW3 11.7–22.0 MHz

AC: 110, 120, 220, 240 V ~
 50/60 Hz 14W
 DC: 6 V = FLASHLIGHT BATT
 SIZE D x 4 OR EQUIV

MADE IN JAPAN

SECTION 1
OUTLINE

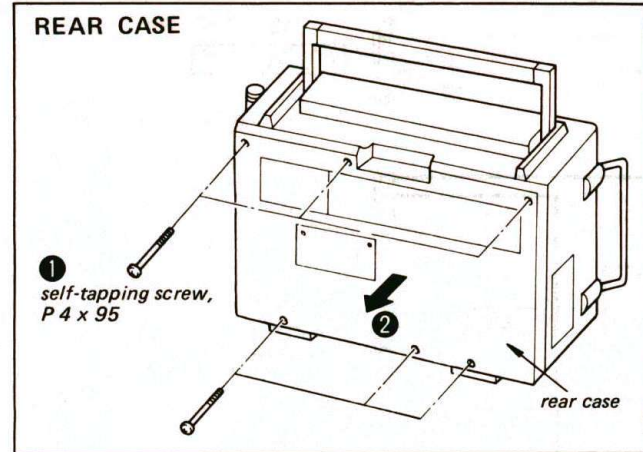
1-1. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

2-1. REMOVAL

REAR CASE

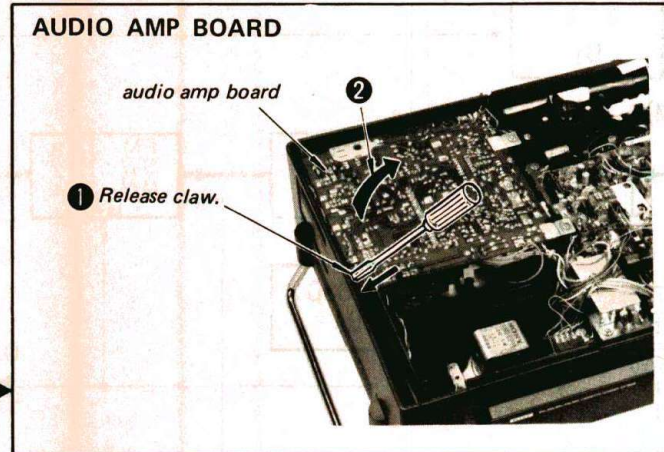


1 self-tapping screw, P 4 x 95

2 rear case

- SW Tracking Adjustment
- MW/SW 2nd IF Alignment
- MW Frequency Coverage Adjustment
- MW Tracking Adjustment
- FM IF Adjustments, (1) and (2)
- FM Frequency Coverage Adjustment
- FM Tracking Adjustment
- BFO Adjustment

AUDIO AMP BOARD

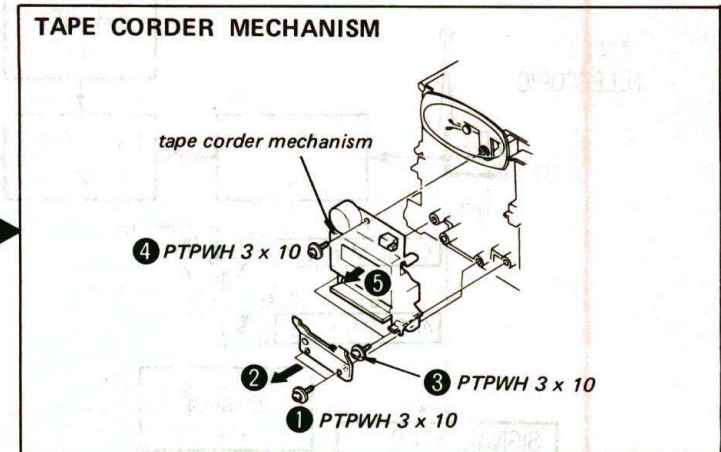


audio amp board

1 Release claw.

2

TAPE CORDER MECHANISM



tape corder mechanism

4 PTPWH 3 x 10

5

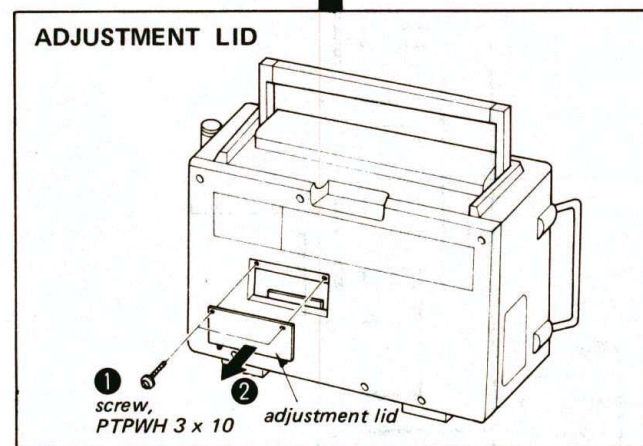
2

3 PTPWH 3 x 10

1 PTPWH 3 x 10

- SW Dial Scale Adjustment
- SW 1st Mixer Adjustment
- SW 2nd Oscillator Adjustment
- MARKER Adjustment

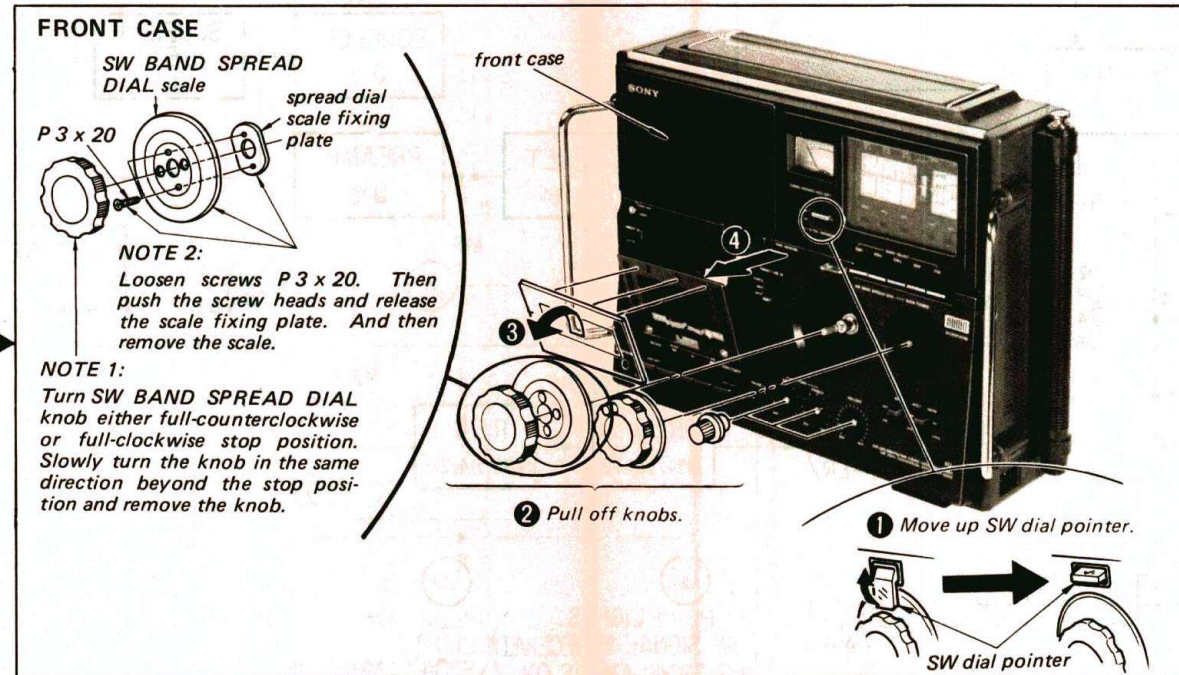
ADJUSTMENT LID



1 screw, PTPWH 3 x 10

2 adjustment lid

FRONT CASE



front case

SW BAND SPREAD DIAL scale

spread dial scale fixing plate

P 3 x 20

NOTE 2:
Loosen screws P 3 x 20. Then push the screw heads and release the scale fixing plate. And then remove the scale.

NOTE 1:
Turn SW BAND SPREAD DIAL knob either full-counterclockwise or full-clockwise stop position. Slowly turn the knob in the same direction beyond the stop position and remove the knob.

3

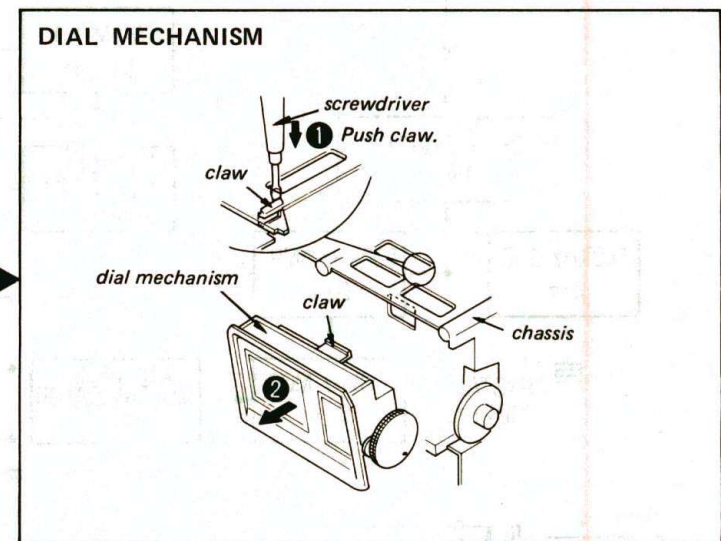
4

2 Pull off knobs.

1 Move up SW dial pointer.

SW dial pointer

DIAL MECHANISM



screwdriver

1 Push claw.

claw

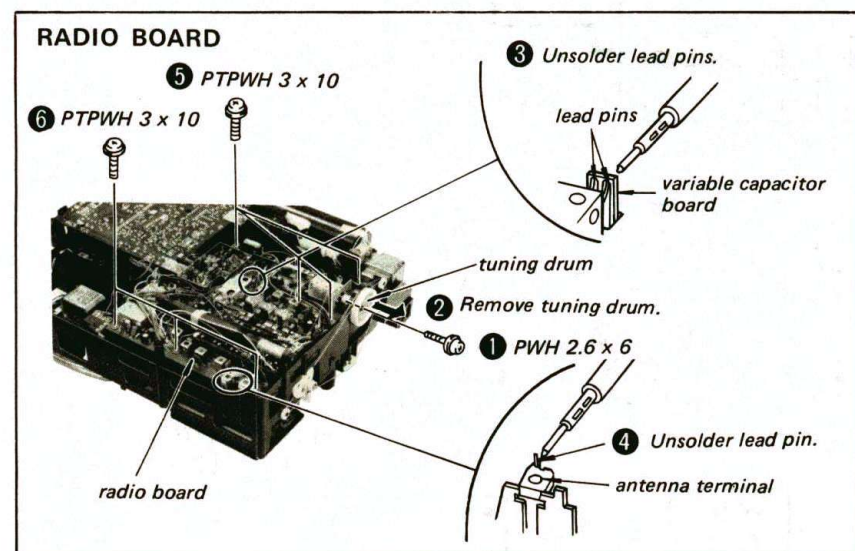
dial mechanism

claw

chassis

2

RADIO BOARD



5 PTPWH 3 x 10

6 PTPWH 3 x 10

3 Unsolder lead pins.

lead pins

variable capacitor board

tuning drum

2 Remove tuning drum.

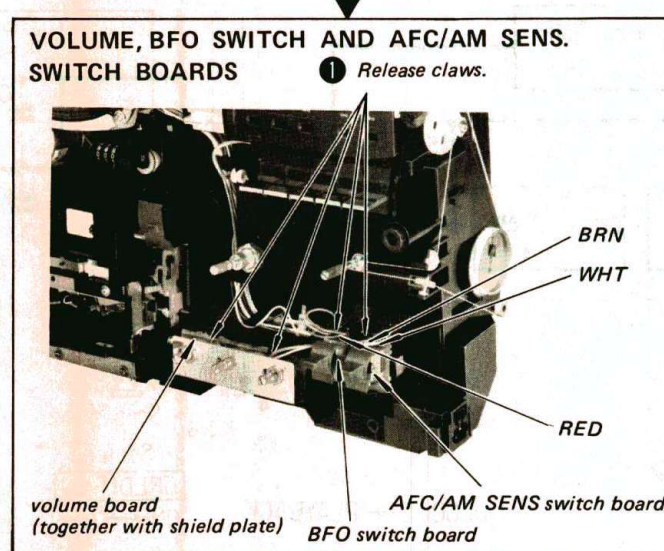
1 PWH 2.6 x 6

4 Unsolder lead pin.

antenna terminal

radio board

VOLUME, BFO SWITCH AND AFC/AM SENS. SWITCH BOARDS



1 Release claws.

BRN

WHT

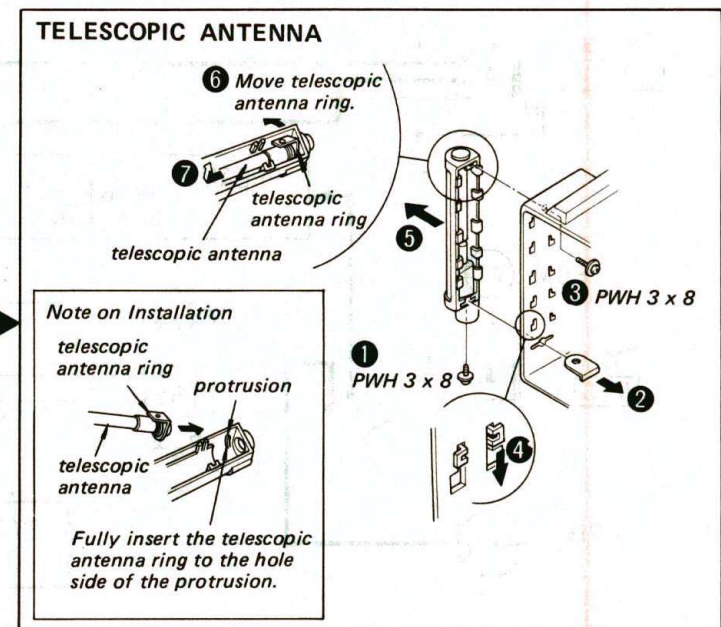
RED

volume board (together with shield plate)

AFC/AM SENS switch board

BFO switch board

TELESCOPIC ANTENNA



6 Move telescopic antenna ring.

7

telescopic antenna ring

telescopic antenna

5

3 PWH 3 x 8

1 PWH 3 x 8

2

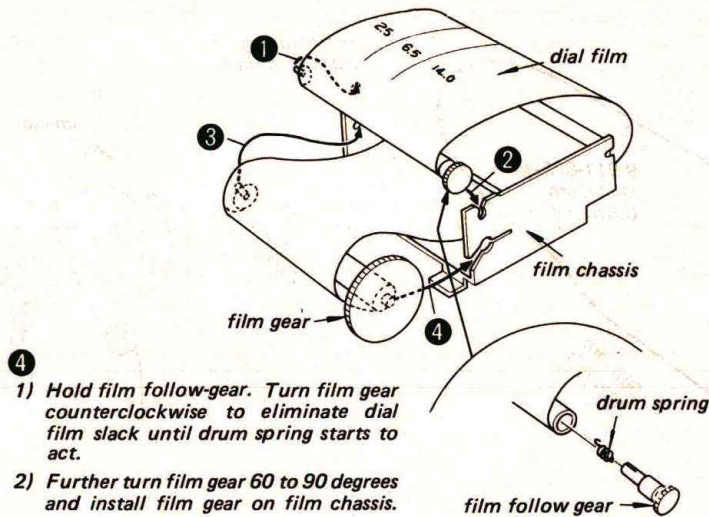
Note on Installation
telescopic antenna ring

protrusion

telescopic antenna

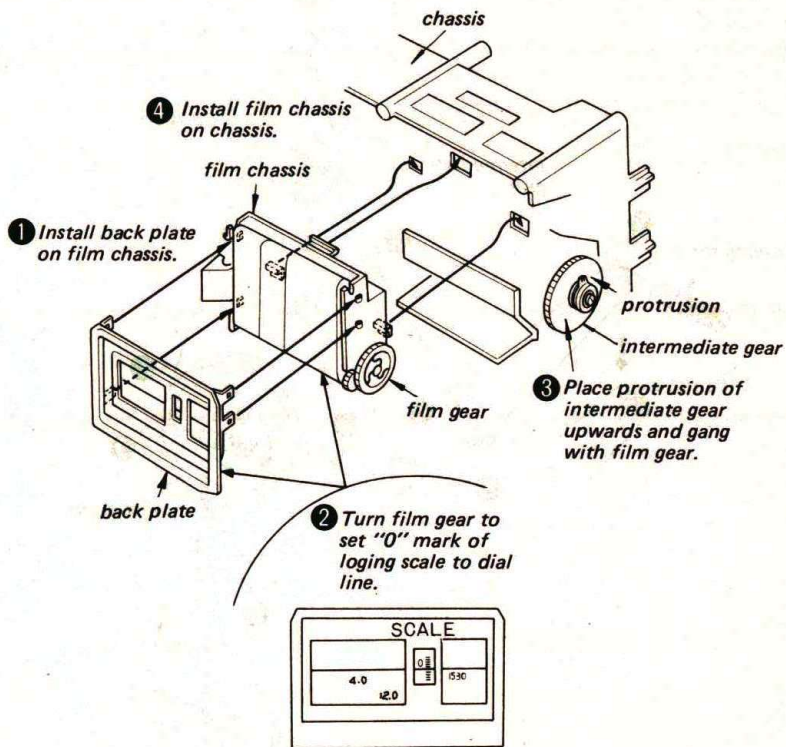
Fully insert the telescopic antenna ring to the hole side of the protrusion.

2-2. DIAL FILM INSTALLATION



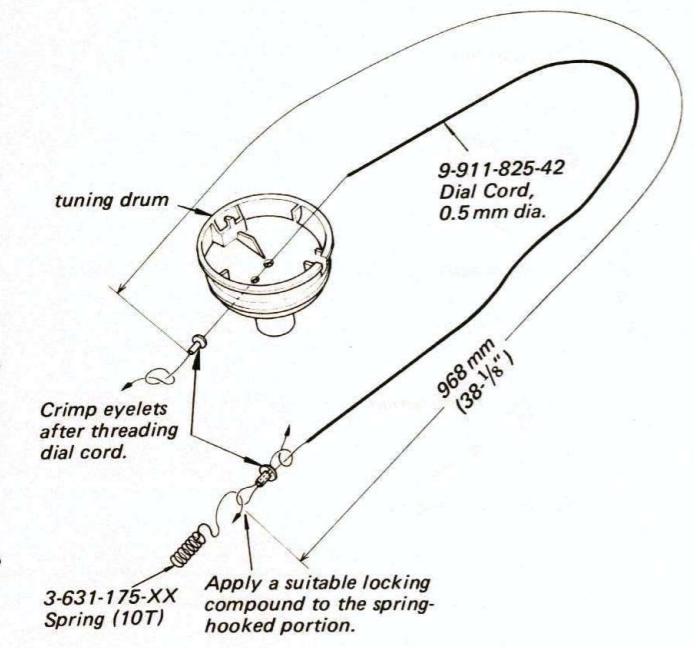
- 1) Hold film follow-gear. Turn film gear counterclockwise to eliminate dial film slack until drum spring starts to act.
- 2) Further turn film gear 60 to 90 degrees and install film gear on film chassis.

2-3. BACK PLATE AND FILM CHASSIS INSTALLATION

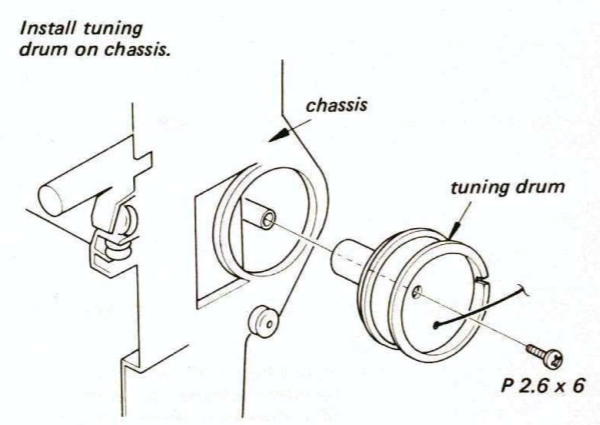


2-4. DIAL CORD STRINGING

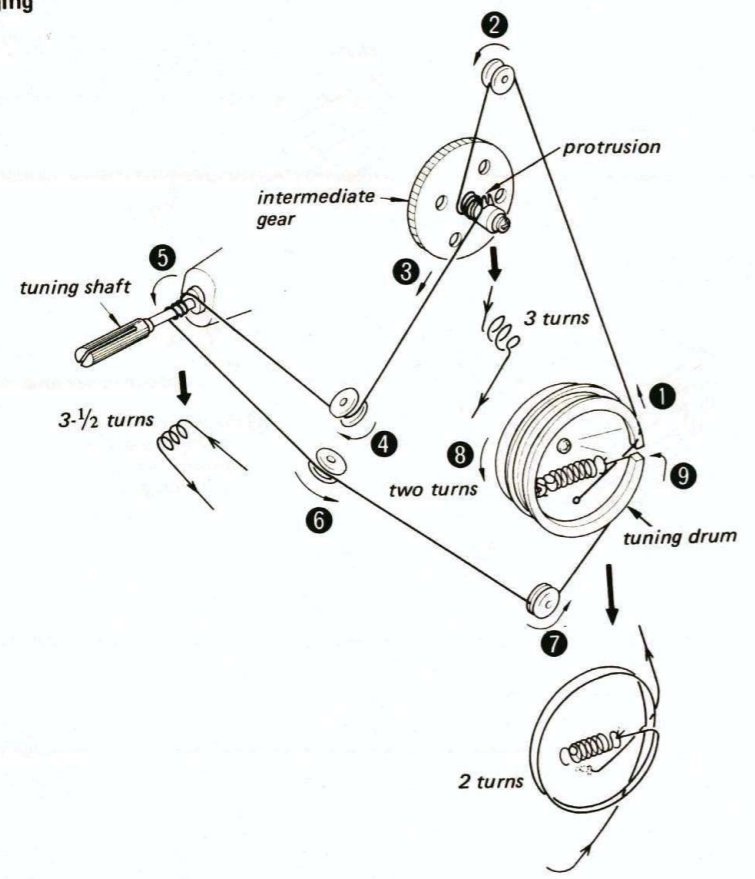
1) Dial Cord Preparation



2) Tuning Drum Installation



3) Dial Cord Stringing



SECTION 3
ADJUSTMENTS

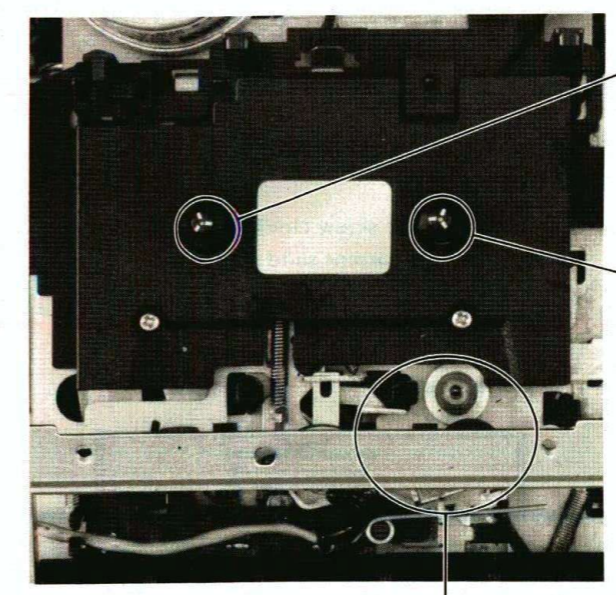
TAPE RECORDER SECTION

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustment.
4. After the adjustments, apply a suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

1. MECHANICAL ADJUSTMENT



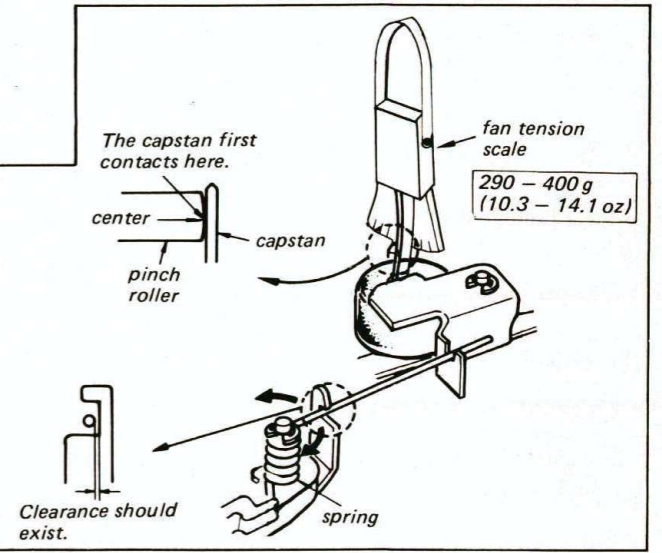
Rewind Torque
Use type CQ-201A cassette torque meter.
55 - 100 g · cm (0.8 - 1.3 oz · inch)

Forward and Fast Forward Torque
Forward torque: Use type CQ-101A, CQ-102A or CQ-103A cassette torque meter.
22.5 - 55 g · cm (0.35 - 0.75 oz · inch)
Fast forward torque: Use type CQ-201A cassette torque meter.
55 - 100 g · cm (0.8 - 1.3 oz · inch)

Pinch Roller Pressure Adjustment

— playback mode —

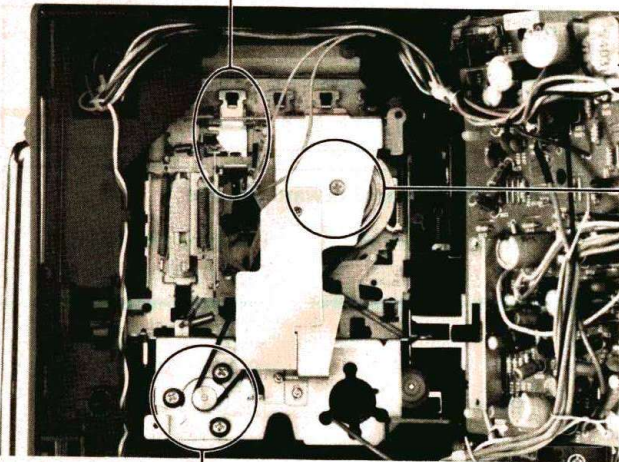
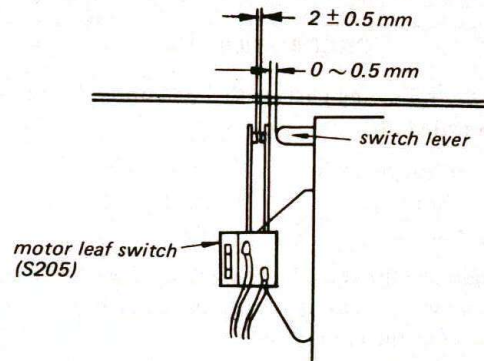
1. Push the pinch roller.
2. Slowly return the pinch roller and read the fan tension scale just when the pinch roller starts to rotate.



Motor Leaf Switch (S205) Position Adjustment

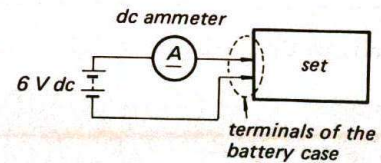
— stop mode —

Adjust the leaves of the switch to obtain the indicated clearances between switch contacts and between switch leaf and switch lever.

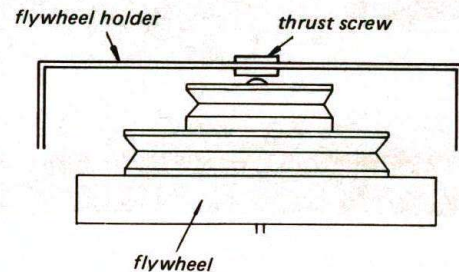


Flywheel Thrust Play Adjustment

— playback mode —



1. Loosen the screw until the screw detaches from the flywheel shaft.
2. Gradually turn the screw clockwise to the position where the motor current suddenly increases.
3. Then, loosen the screw about $\frac{1}{4}$ turn from the position obtained in step 2.

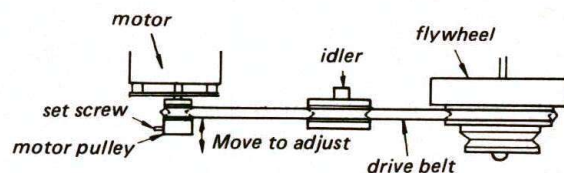


Motor Pulley Height Adjustment

After replacing the motor pulley or the flywheel, this adjustment should be performed.

Procedure:

1. Keep the set horizontal.
2. Adjust the motor pulley height so that the drive belt is straight without twist.



2. ELECTRICAL ADJUSTMENT

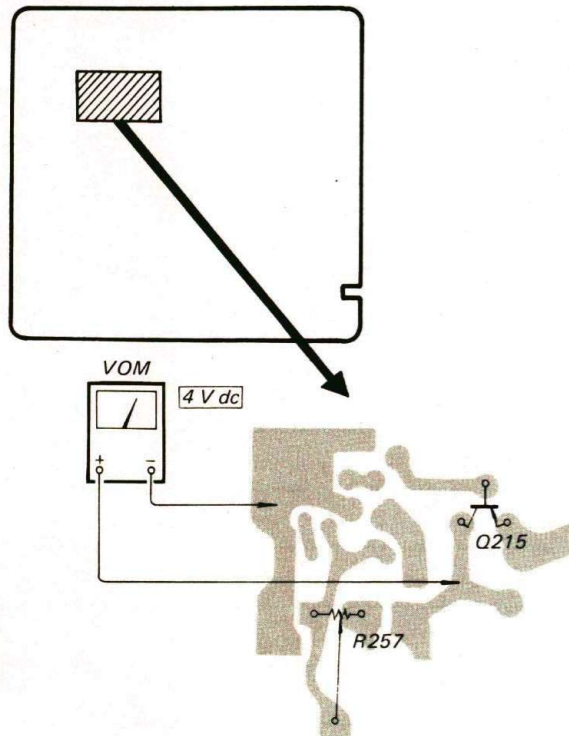
B+ Voltage Adjustment

Settings:

Power supply voltage: 6 V dc
 RADIO/LINE IN switch: OFF
 VOLUME control: minimum
 Mode: playback with no signal

Adjustment Location and Specification:

— audio amp board —



Note: When R257 is turned clockwise, B+ voltage rises.

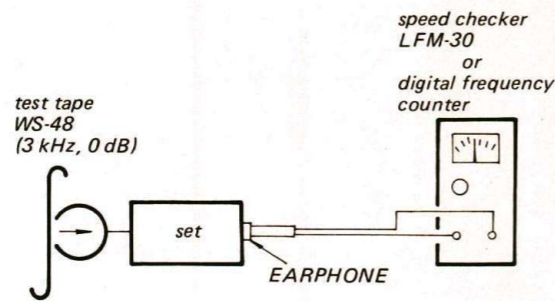
Tape Speed Adjustment

Setting:

VOLUME control: center of rotation

Procedure:

Mode: playback

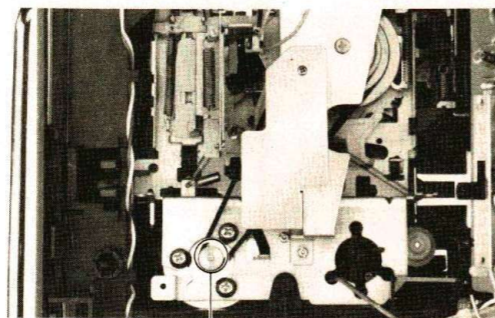


Specification:

Speed Checker	Digital Frequency Counter
+1.5, -2 %	2,940 - 3,045 Hz

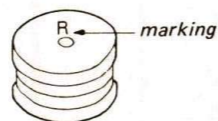
Frequency difference between beginning and end of tape should be within 1 % (30 Hz).

Adjustment Location:



motor pulley

If necessary, replace the motor pulley.



Motor Pulley Part No.	Marking	Tape Speed Change
3-701-813-07	N	-2 %
3-701-813-07	P	-1 %
3-701-813-08	Q	
3-701-813-08	R	+1 %
3-701-813-09	S	+2 %

Note: Perform the motor pulley height adjustment.

Record/Playback Head Azimuth Adjustment

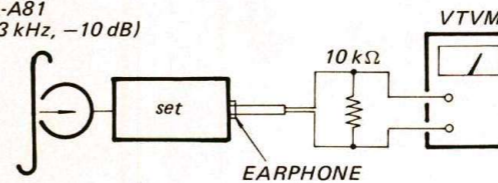
Setting:

VOLUME control: center of rotation

Procedure:

1. Mode: playback

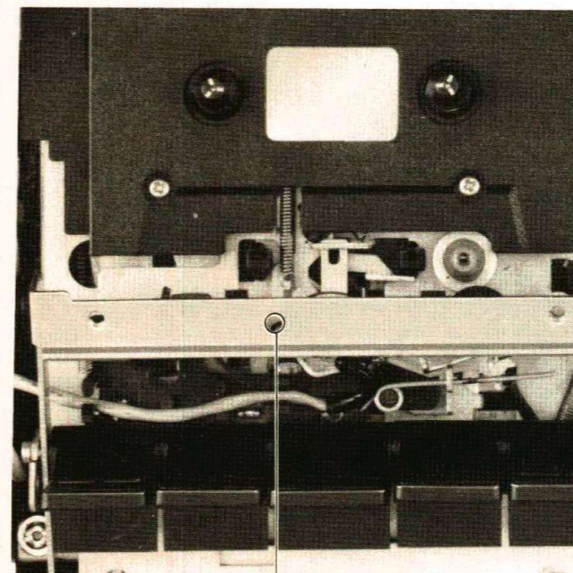
test tape P-4-A81 (6.3 kHz, -10 dB)



2. Turn the adjustment screw for the highest VTVM reading.

Note: Several peaks may appear, take the highest.

Adjustment Location:



adjustment screw

Battery Meter Calibration

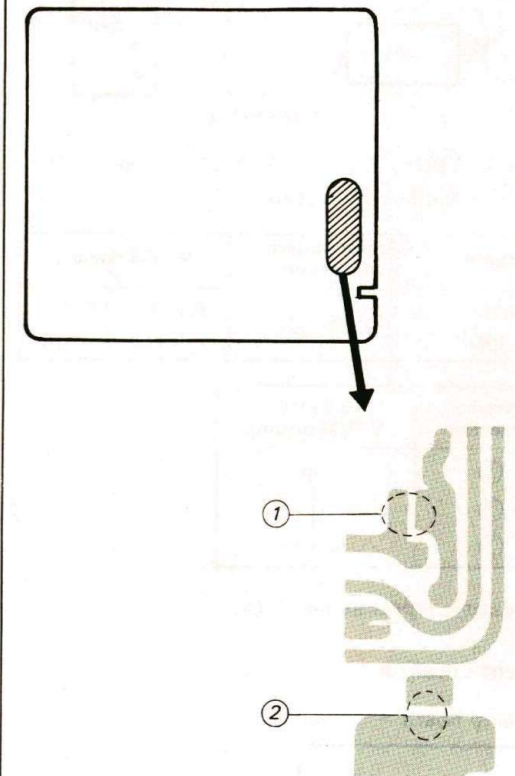
Setting:

Power Supply Voltage: 4.4 V dc
 VOLUME control: minimum
 RADIO/ LINE IN switch: OFF
 Mode: playback with no cassette loaded
 Place the set vertically

Adjustment Location and Specification:

Pattern Connection	Pointer Deflection	Meter Indication
open	up	
①		
②		
① and ②	down	

— audio amp board —



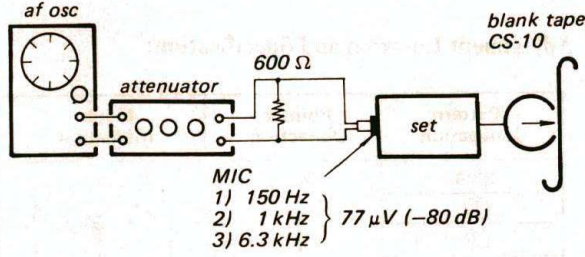
Record Bias Adjustment

Setting:

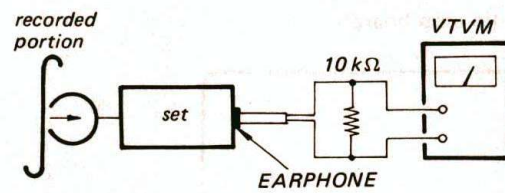
TONE controls: center of rotation
 RADIO/LINE IN switch: OFF

Procedure:

1. Mode: record



2. Mode: playback



Playback 1 kHz. Adjust VOLUME control for 0.25 V (-10 dB) VTVM reading.

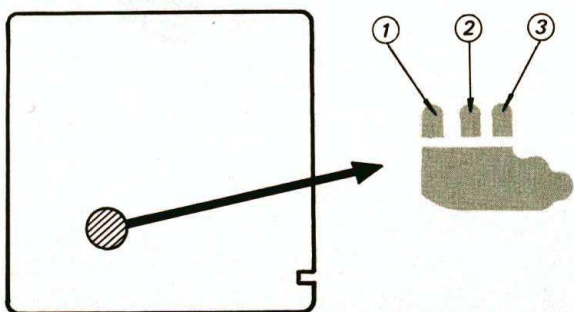
Playback	Adjust pattern connection	VTVM reading
150 Hz 6.3 kHz	①, ②, ③	0.17 V - 0.35 V (- 13 dB -- 7 dB)

Pattern connection	6.3 kHz VTVM reading
①	up
②	↕
③	down

4. If necessary, repeat above steps.

Adjustment Location:

- audio amp board -

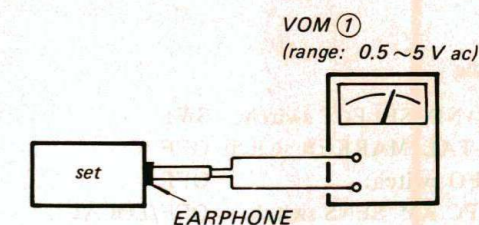
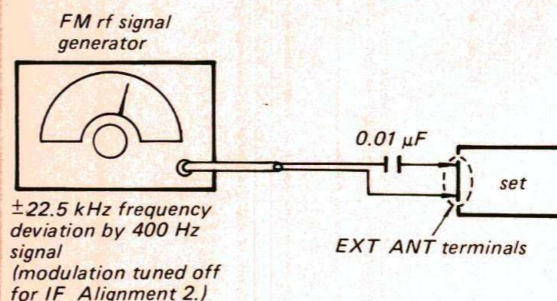
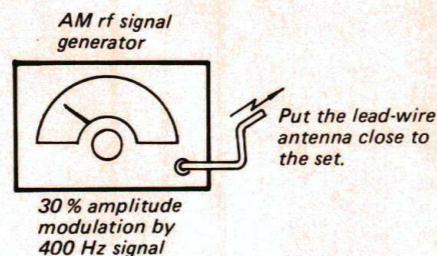


MEMO

CF-950S CF-950S

RADIO SECTION

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- AFC/AM SENS switch: OFF/LOCAL
- BFO switch: OFF
- SW BAND SPRED DIAL: 0



FM IF ALIGNMENT 1 (Select frequency according to the center frequency determined by the ceramic filter. Refer to the chart given in the SW 2nd Oscillator Adjustment.)	
Adjust for a maximum reading on VOM (V).	
T1	
T2	
T3	

MW/SW 2nd IF ALIGNMENT	
Adjust for a maximum VOM (V) reading.	
455 kHz (E, AEP Model) 468 kHz (UK Model)	CFA 1 (Do not adjust.)
T4	

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for maximum reading on VOM (V).	
87.1 MHz (87.5 MHz)	108.5 MHz (108 MHz)
L6	CT1-2

(): in West Germany

BFO ADJUSTMENT

- Set the AM rf signal generator's dial to 1,400 kHz and turn the modulation off.
- Set the dial of the set to 1,400 kHz and turn BFO switch ON.
- Remove VOM from EARPHONE jack.
- Adjust T6 to hear a zero beat from the speaker.

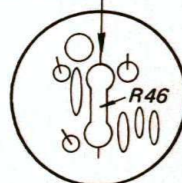
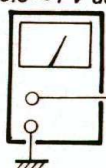
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM (V).	
L3	87.1 MHz (87.5 MHz)
CT1-1	108.5 MHz (108 MHz)

(): in West Germany

MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM (V).	
T11	520 kHz
CT10	1,680 kHz

FM IF ALIGNMENT 2 (With no modulation)	
Adjust for 0 V reading on VOM (V).	
T3	

VOM (V)
0.5 ~ 1 V dc



Identification color label (the same color as ceramic filter's color mark)

T9 (SW1)	T8 (SW2)	T7 (SW3)
1.75 MHz	4 MHz	12 MHz
Adjust for a maximum reading on VOM (V).		
SW TRACKING ADJUSTMENT		

EXT ANT terminals

Setting:

- BAND SELECT switch: SW1
- X-TAL MARKER switch: OFF
- BFO switch: OFF
- AFC/AM SENS switch: OFF/LOCAL
- MAIN TUNING: f max

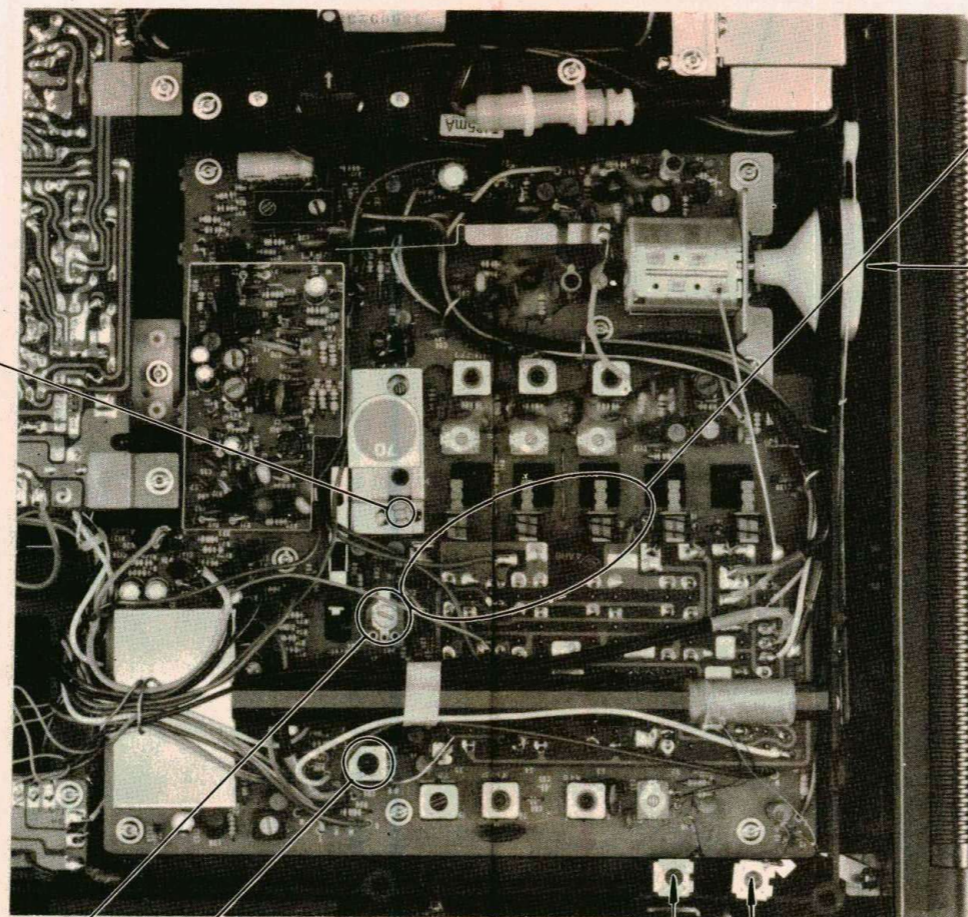
MARKER ADJUSTMENT

Note: Perform this adjustment after SW 2nd Oscillator Adjustment.

Procedure:

1. Set SW BAND SPREAD DIAL to "0" kHz.
2. Short-circuit check pins 1 and 2 as shown at upper-right corner.
3. Turn MAIN TUNING dial to obtain a zero beat.
4. Turn X-TAL MARKER on.
5. Adjust CT4 for a zero beat.
6. Turn X-TAL MARKER off. If the zero beat is off, i.e., a beat note is heard, repeat steps 2 through 5.
7. Remove the short.

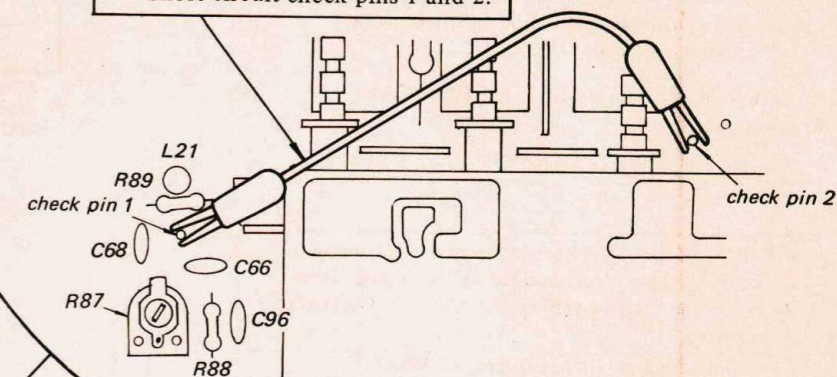
CT4



MARKER ADJUSTMENT

Step 2.

Short-circuit check pins 1 and 2.



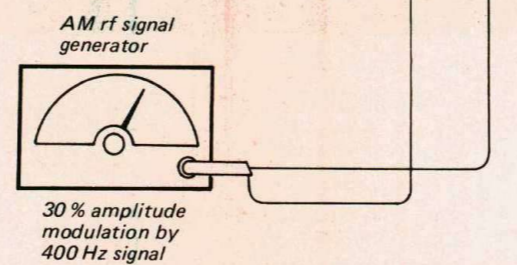
SW 1st MIXER ADJUSTMENT

Procedure:

1. Set the VOM to 2.5 V ac range and connect it to EARPHONE jack.
2. Set the frequency of the AM rf signal generator to 4 MHz.
3. Set SW BAND SPREAD DIAL to "0" kHz.
4. Set R87 to the full-counterclockwise stop.
5. Adjust T10 for a maximum VOM reading.
6. Adjust R87 for a minimum VOM reading.

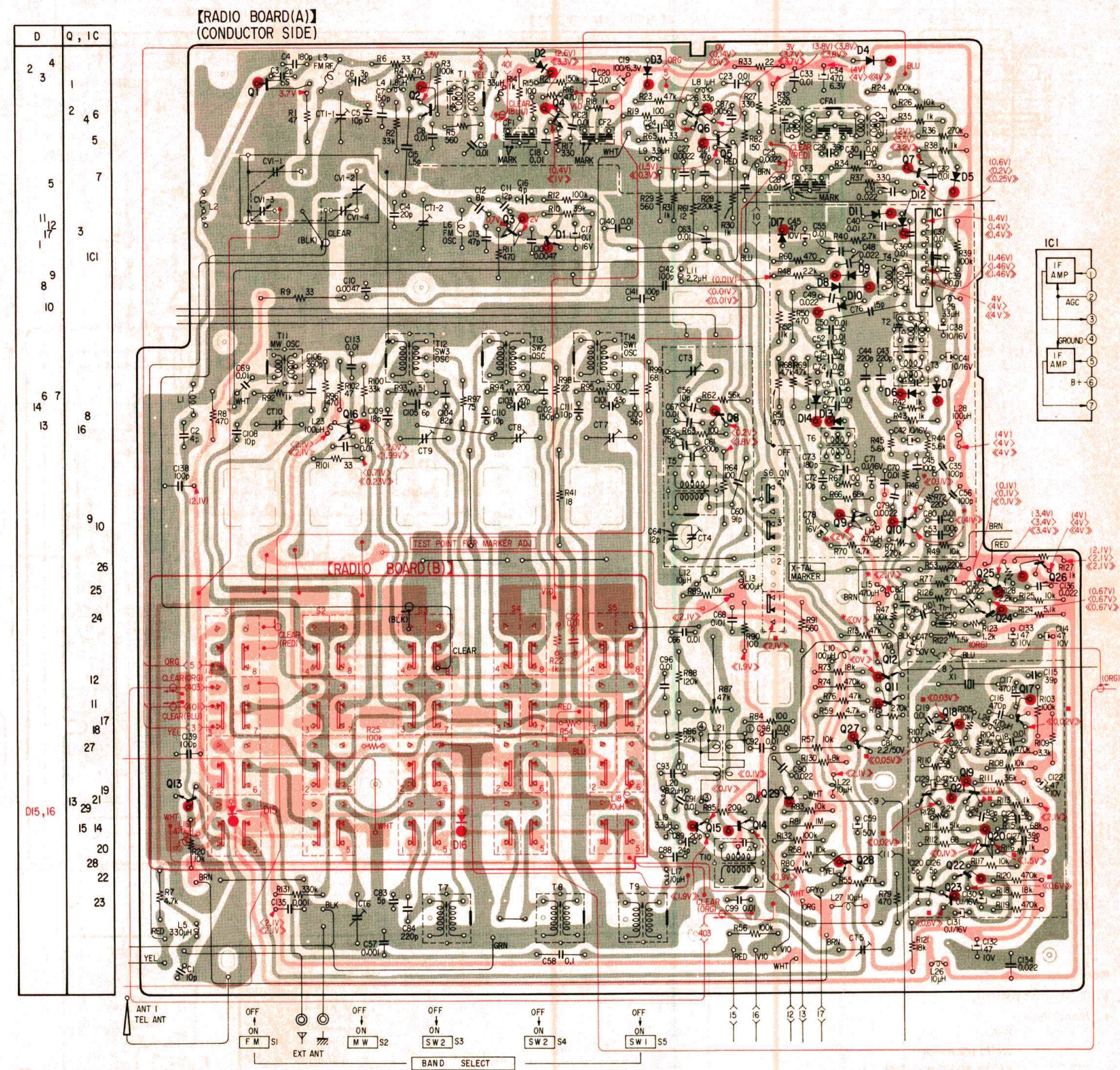
R87

T10



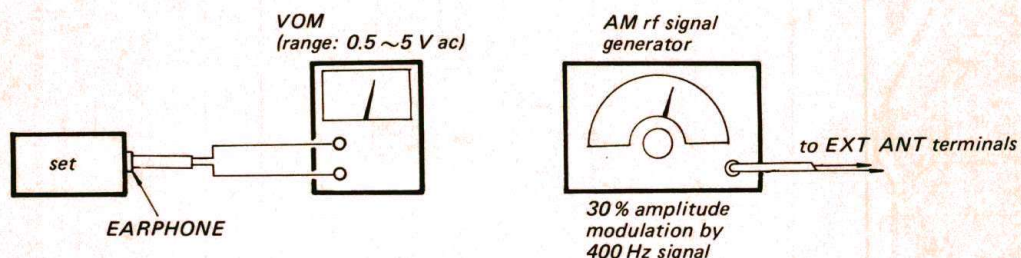
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM - Conductor Side -

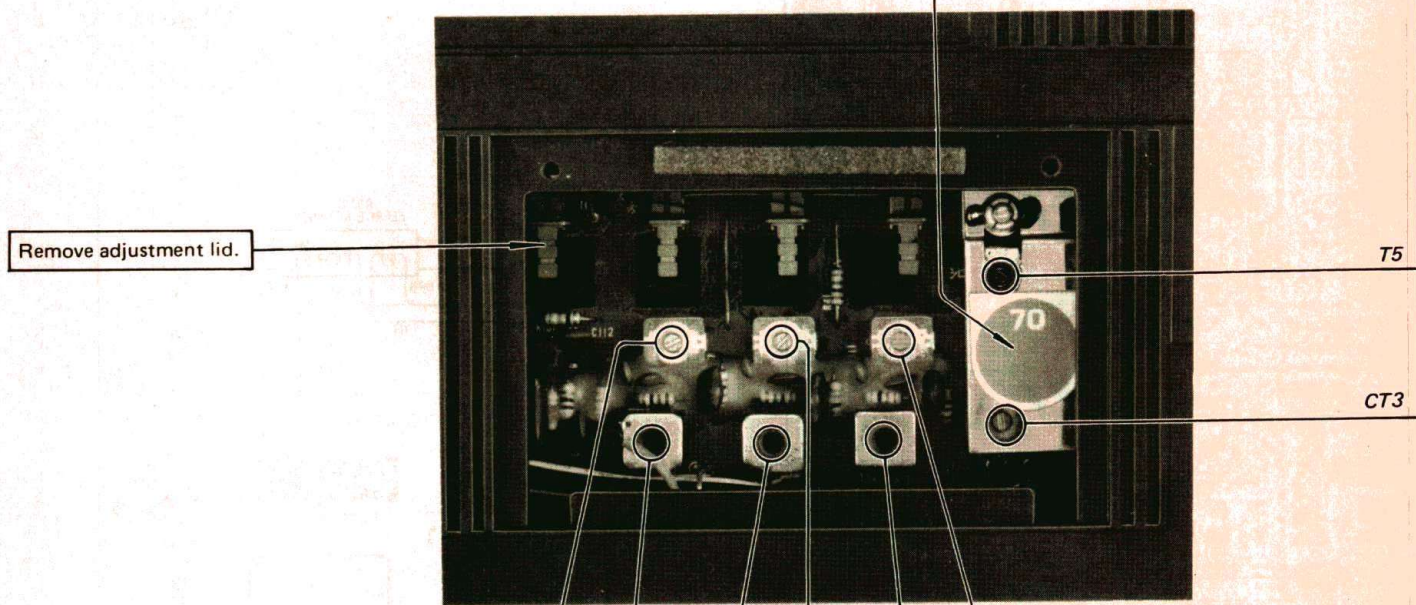


Setting:

- X-TAL MARKER switch: OFF
- BFO switch: OFF
- AFC/AM SENS switch: OFF/LOCAL



Identification Color Label
in accordance with ceramic
filter's color mark

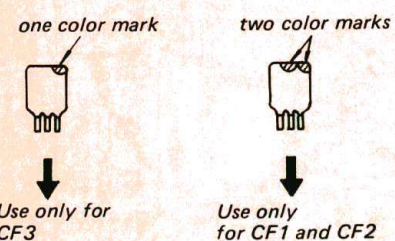


CT9	T12	T13	CT8	T14	CT7
22 MHz	12 MHz	4 MHz	10 MHz	1.75 MHz	4 MHz
SW3		SW2		SW1	
Set SW BAND SPREAD DIAL to "0" kHz. Adjust for a maximum VOM reading.					
SW DIAL SCALE ADJUSTMENT					

SW 2nd OSCILLATOR ADJUSTMENT

- Note:**
1. Proceed to the Marker Adjustment after this adjustment.
 2. This adjustment is important to retain the receiver's SW BAND SPREAD DIAL accuracy. Precisely perform adjustment to retain a frequency coverage of 300 kHz \pm 3kHz.
 3. The adjustment range of T5 is wide. Be careful not to adjust T5 to the image frequency, i.e., the frequency 910kHz higher than the wanted frequency. The wanted frequency is obtained with the T5's core set at the more circuit-board side.
 4. The center frequency of ceramic filters CF1 through CF3 is dependent upon the color mark on them. The color mark of all the ceramic filters CF1 through CF3 should be the same.

Identifying the Ceramic Filters



Procedure:

Adjust for maximum VOM reading.

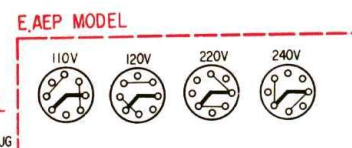
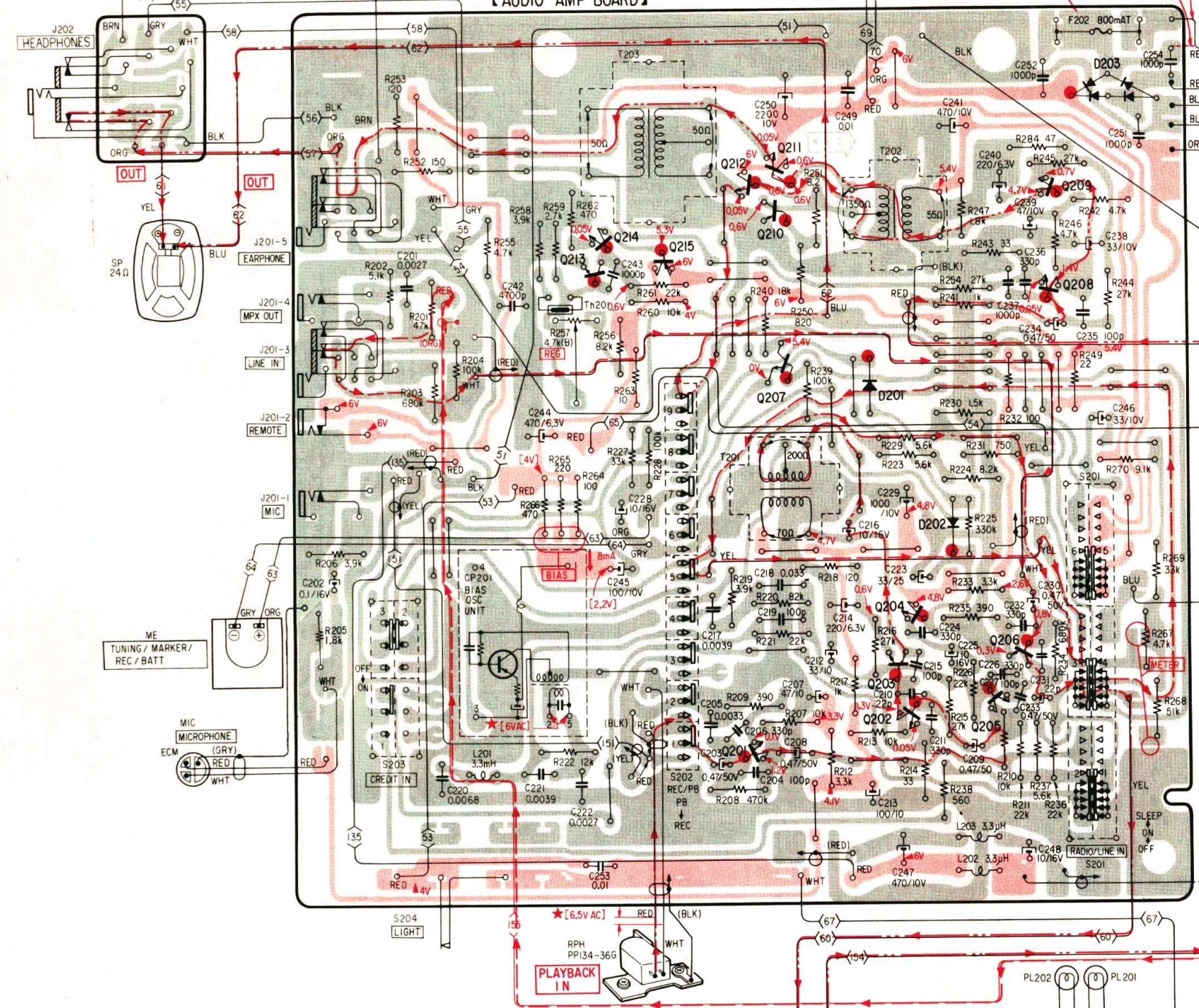
Color Mark of CF1,2,3	Center Frequency of Ceramic Filters	SW BAND SPREAD DIAL	
		Full-counter-clockwise Stop (- side)	Full-clockwise Stop (+ side)
		Adjust CT3	Adjust T5
green	10.61 MHz	10.76 MHz	10.46 MHz
black	10.64 MHz	10.79 MHz	10.49 MHz
blue	10.67 MHz	10.82 MHz	10.52 MHz
red	10.70 MHz	10.85 MHz	10.55 MHz
orange	10.73 MHz	10.88 MHz	10.58 MHz
white	10.75 MHz	10.91 MHz	10.61 MHz
yellow	10.79 MHz	10.94 MHz	10.64 MHz

4-2. MOUNTING DIAGRAM - Conductor Side -

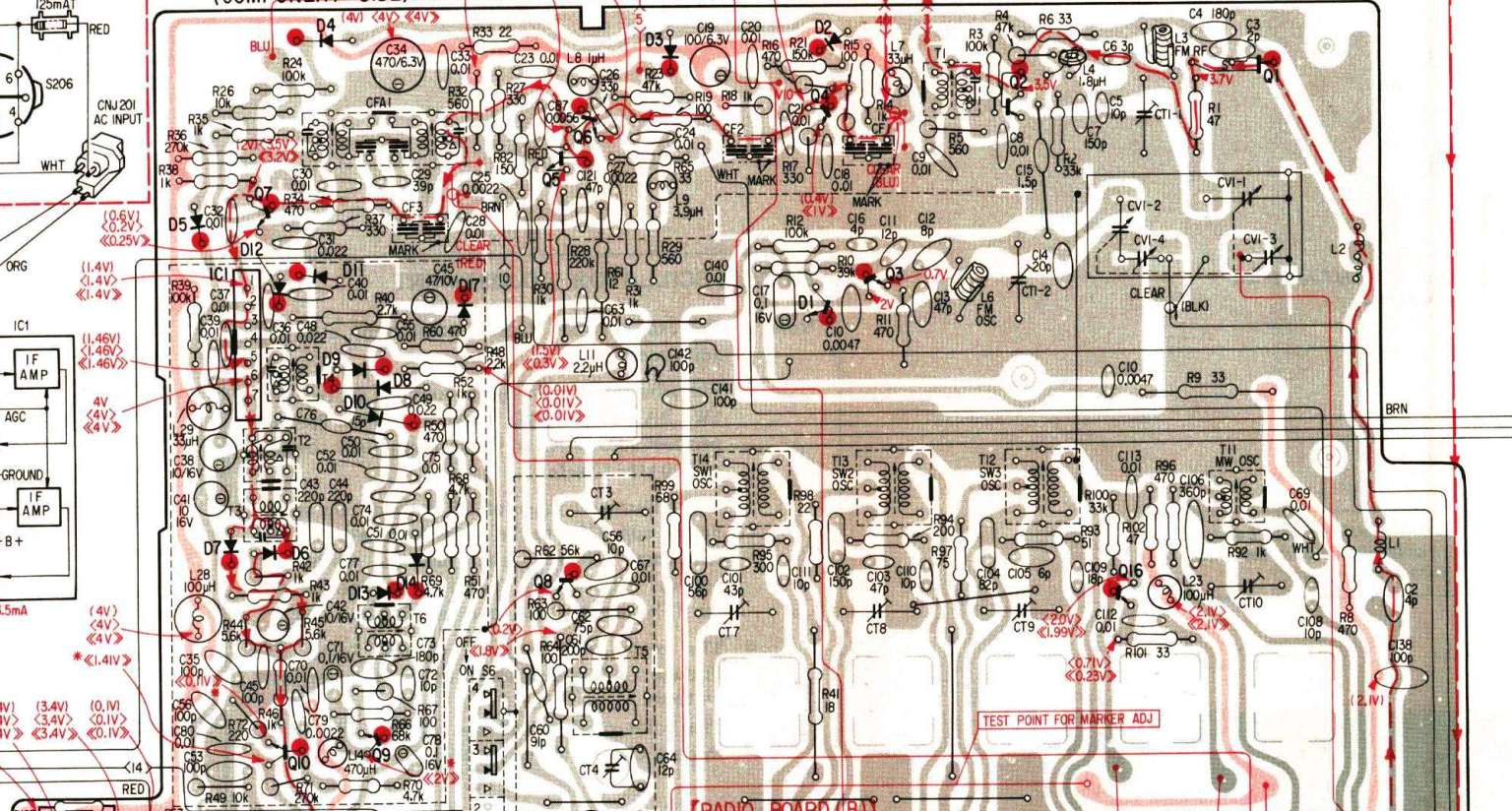
D		201	202	203
Q	213 214	215	212 210 211 201 207	203 204 205 206 209 208

[HEADPHONE BOARD]

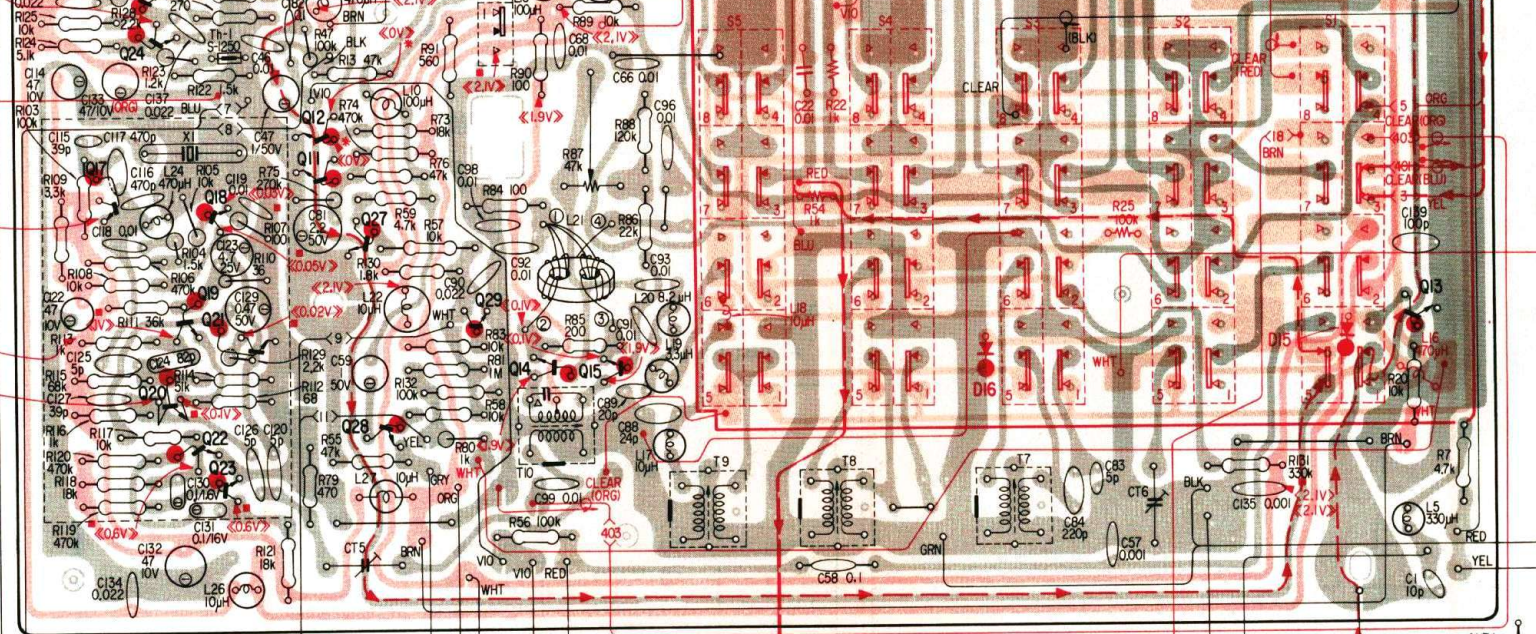
[AUDIO AMP BOARD]



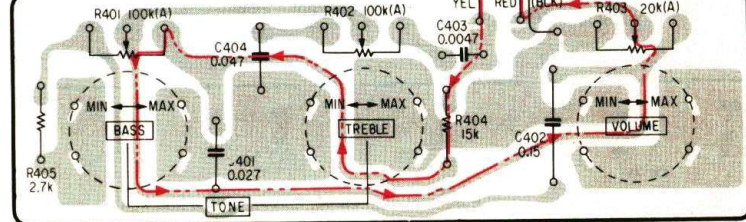
[RADIO BOARD (A)] (COMPONENT SIDE)



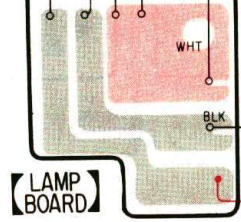
[RADIO BOARD (B)]



[VOLUME BOARD]

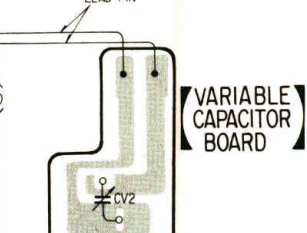
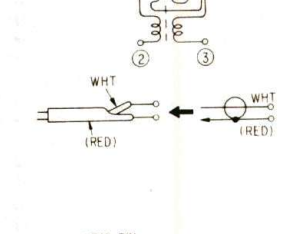
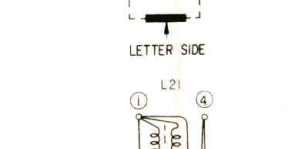


[LAMP BOARD]

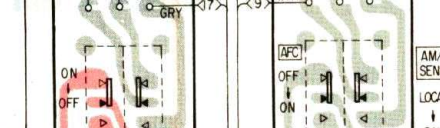
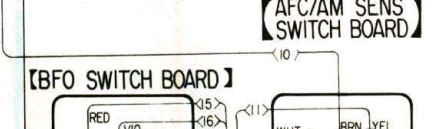
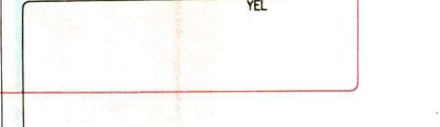
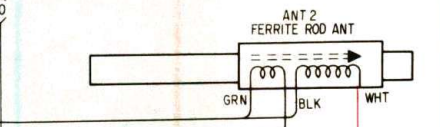


- Note:**
- : B+ pattern.
 - Signal Path
 - : FM
 - : audio playback
 - : FM or audio playback
 - DC resistance measurements are with coils connected on the circuit board, and are approximate.

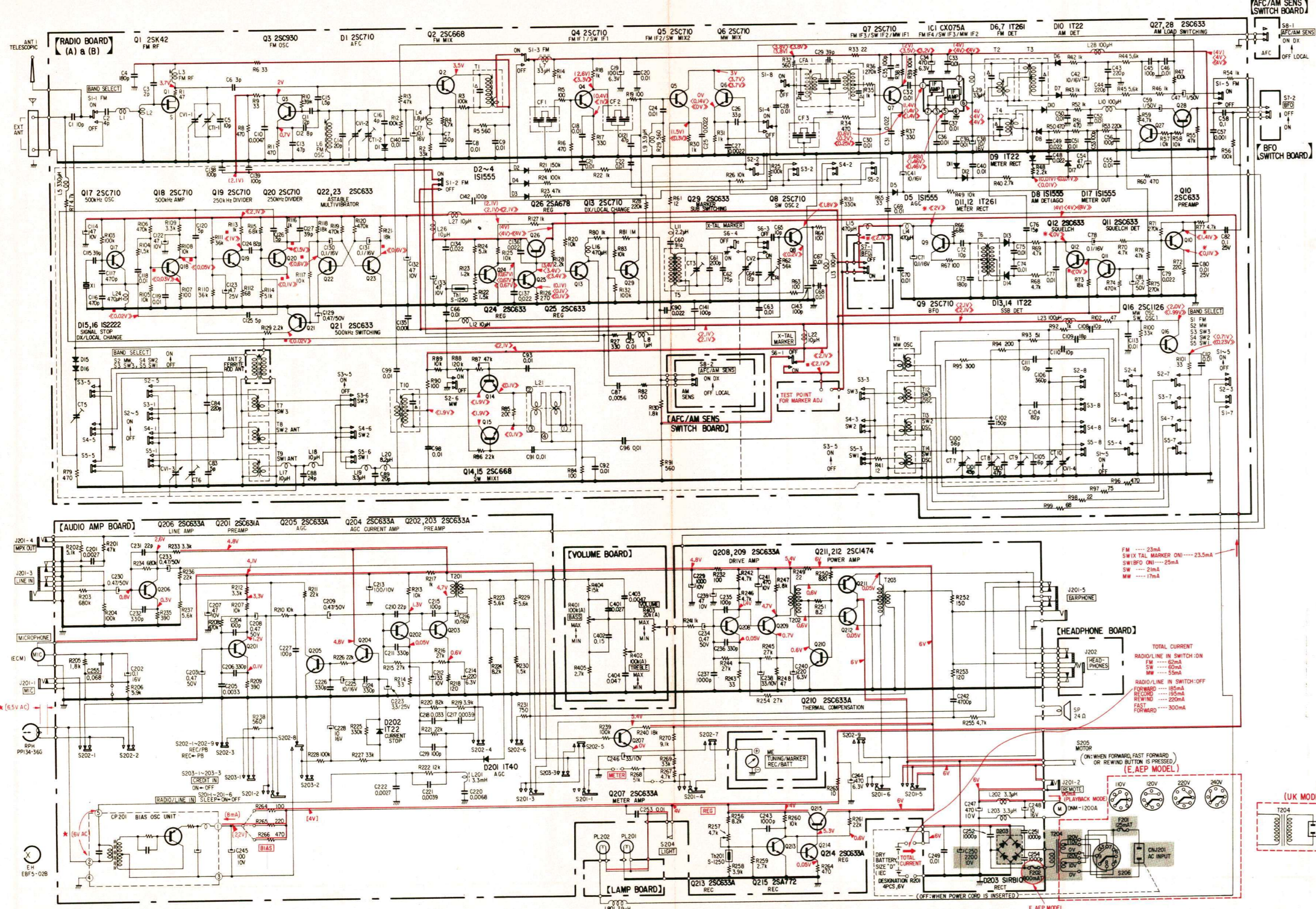
[BFO SWITCH BOARD]



IC	Q	D
		4,3,2
1	6,4,2	
5		
7	5	
3	12,11	
	17	
9	8	
10		
16	7,6,14	
8	13	
10,9		
26		
25		
24		
12	11	
17,18		
27		
13	19,29	16,15
20	21	
14	15	
20	28	
22		
23		



4-3. SCHEMATIC DIAGRAM



Note:

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F}$ 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, $\frac{1}{2}W$ unless otherwise noted. $\text{k}\Omega = 1000 \Omega$, $\text{M}\Omega = 1000 \text{k}\Omega$
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- Δ : internal component.
- \square : panel designation.
- \square : adjustment for repair.
- AC voltage readings indicated by * in the bias oscillator circuit are taken with a VTVM.
- Readings are taken under no-signal conditions with a VOM (20 $\text{k}\Omega/V$).
- RADIO SECTION**
 - \triangleleft \triangleright : MW
 - \triangleleft \triangleright : SW
 - * : WHEN S7 (BFO) IS ON
 - * : WHEN S6 (X-TAL MARKER) IS ON
 - no mark: FM
- AUDIO AMP SECTION**
 - [] : RECORD MODE
 - no mark: PLAYBACK MODE
- Total current is measured with no cassette installed.
- --- : B+ bus.

Switch

Ref. No.	Switch	Position
S1	FM	ON
S2	MW	OFF
S3	SW3	OFF
S4	SW2	OFF
S5	SW1	OFF
S6	X-TAL MARKER	OFF
S7	BFO	ON
S8	AFC/AM SENS	OFF/LOCAL
S201	RADIO/LINE IN	OFF
S202	REC/PB	PB
S203	CREDIT/IN	OFF
S204	LIGHT	OFF
S205	MOTOR	OFF
S206	VOLTAGE SELECTOR	110 V (E, AEP Model)

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Replacement Semiconductors

For replacement, use semiconductors except in ().

Q1: 2SK42-1
 D2 - 5 : 1S1555 (1T40)
 D8, 17 : 1T261
 D6, 7 : 1T261
 D11, 12 : 1T261
 D910 : 1T22A (1T22)
 D13, 14 : 1T22A (1T22)
 D202 : 1S1555 (1T40)

Q2, 14, 15: 28C1129 (2SC668)
 Q3: 2SC930
 Q4 - 8 : 2SC710-4 (2SC710)
 Q13 : 2SC710-3 (2SC710)
 Q9 : 2SC710-3 (2SC710)
 Q17 - 20 : 2SC710-3 (2SC710)
 D1 : 2SC1126-D (2SC1126)
 Q16: 2SC1126-D (2SC1126)

Q10 - 12 : 2SC1364-7 (2SC633)
 Q21 - 25 : 2SC1364-7 (2SC633)
 Q27 - 29 : 2SC1364-7 (2SC633)
 Q201: 2SC632A (2SC631A)
 Q202 - 204 : 2SC1364-7 (2SC633A)
 Q213, 214 : 2SC1364-7-1 (2SC633A)
 Q205: 2SC1364-7-1 (2SC633A)

D15, 16: 1S2222
 IC1: CX075B

Q26: 2SA678-7 (2SA678)
 Q211, 212: 2SC1474-3 (2SC1475)
 Q215: 2SA684-R (2SA772)

Q211, 212: 2SC1474-3 (2SC1475)

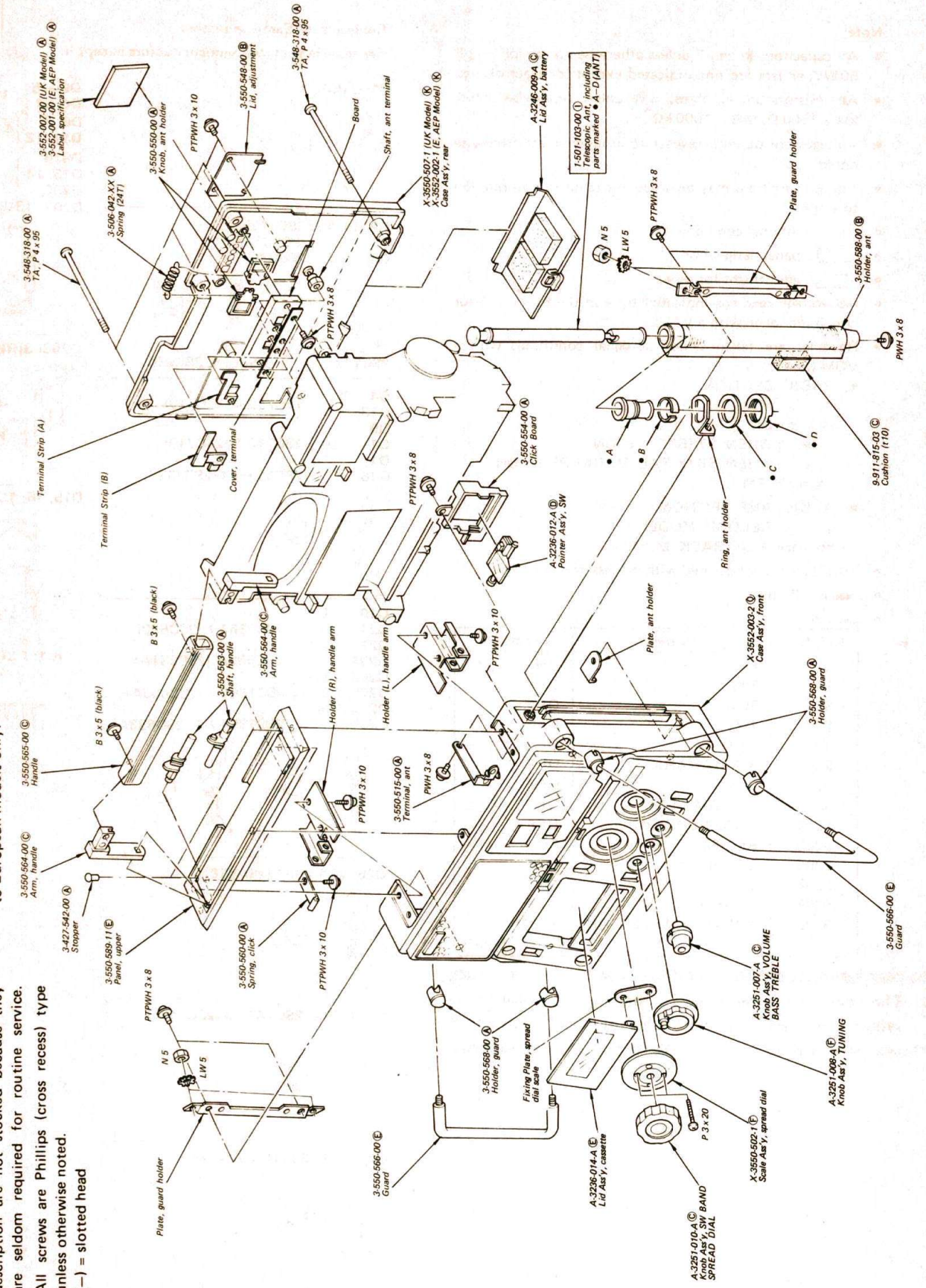
Q215: 2SA684-R (2SA772)

A B C D E

5.1.

Note: Circled letters (A to Z) are applicable to European models only.

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

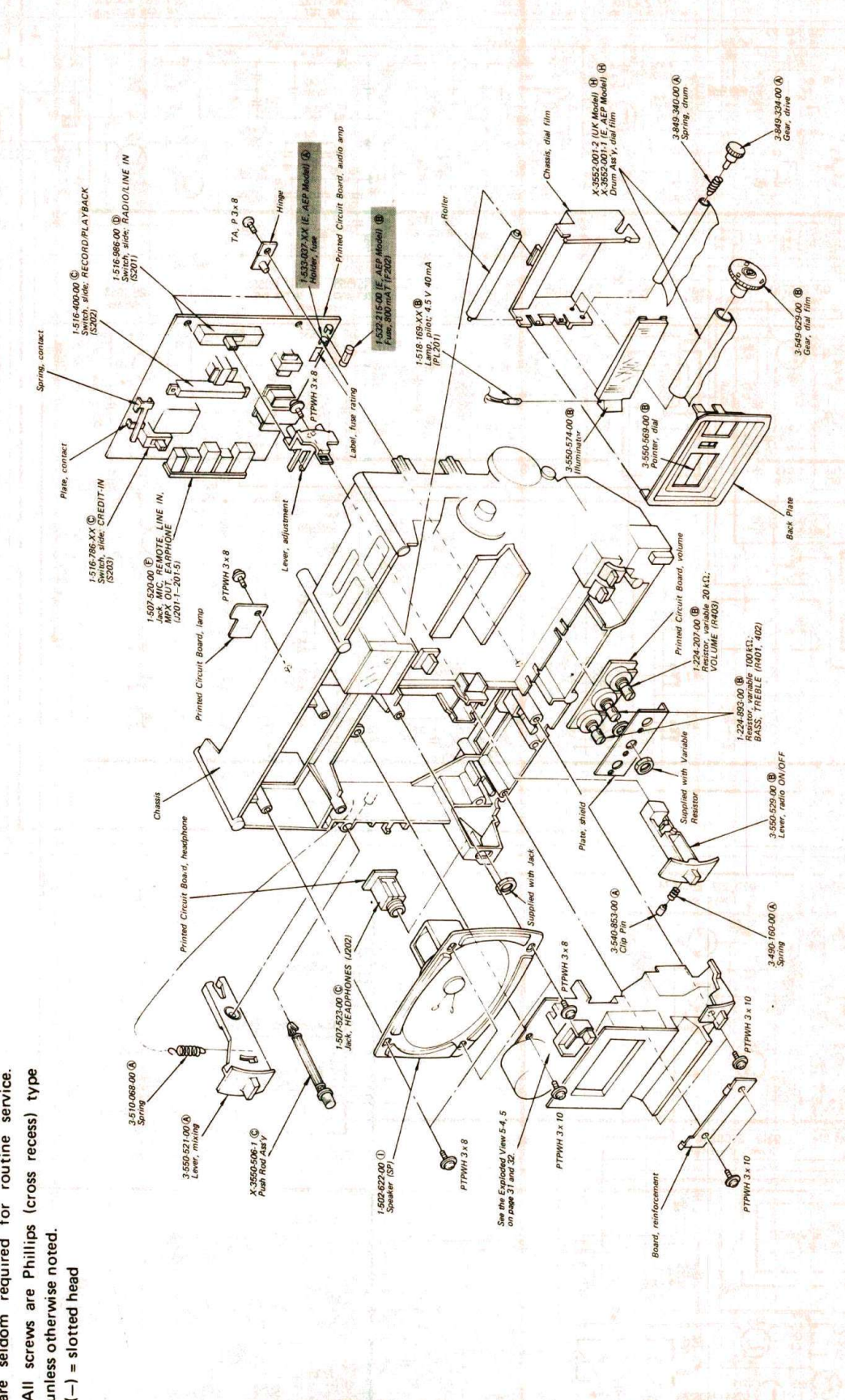


A B C D E

5.2.

Note: Circled letters (A to Z) are applicable to European models only.

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

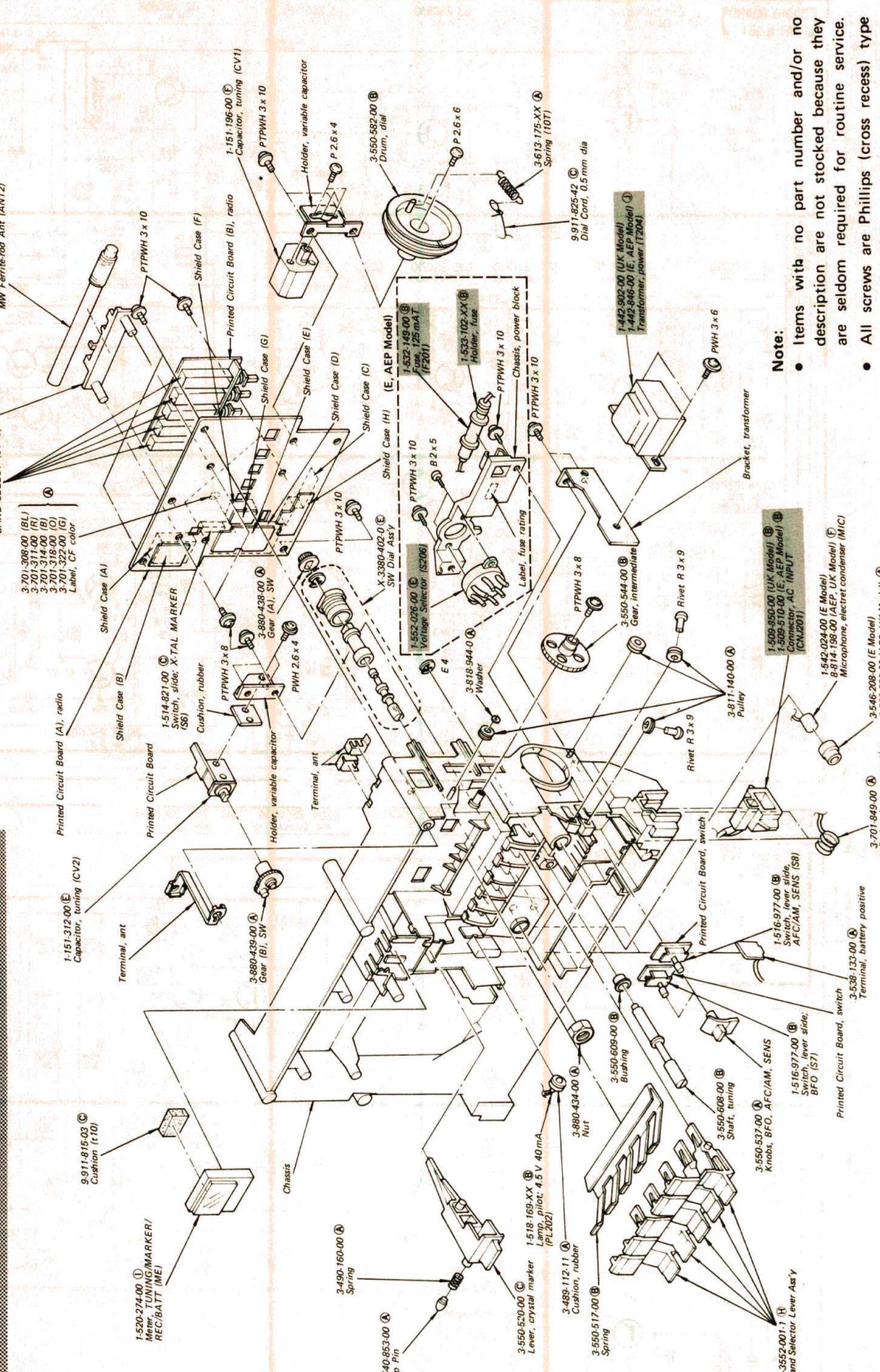


Note: The components identified by shading are critical for safety. Replace only with part number specified.

A B C D E

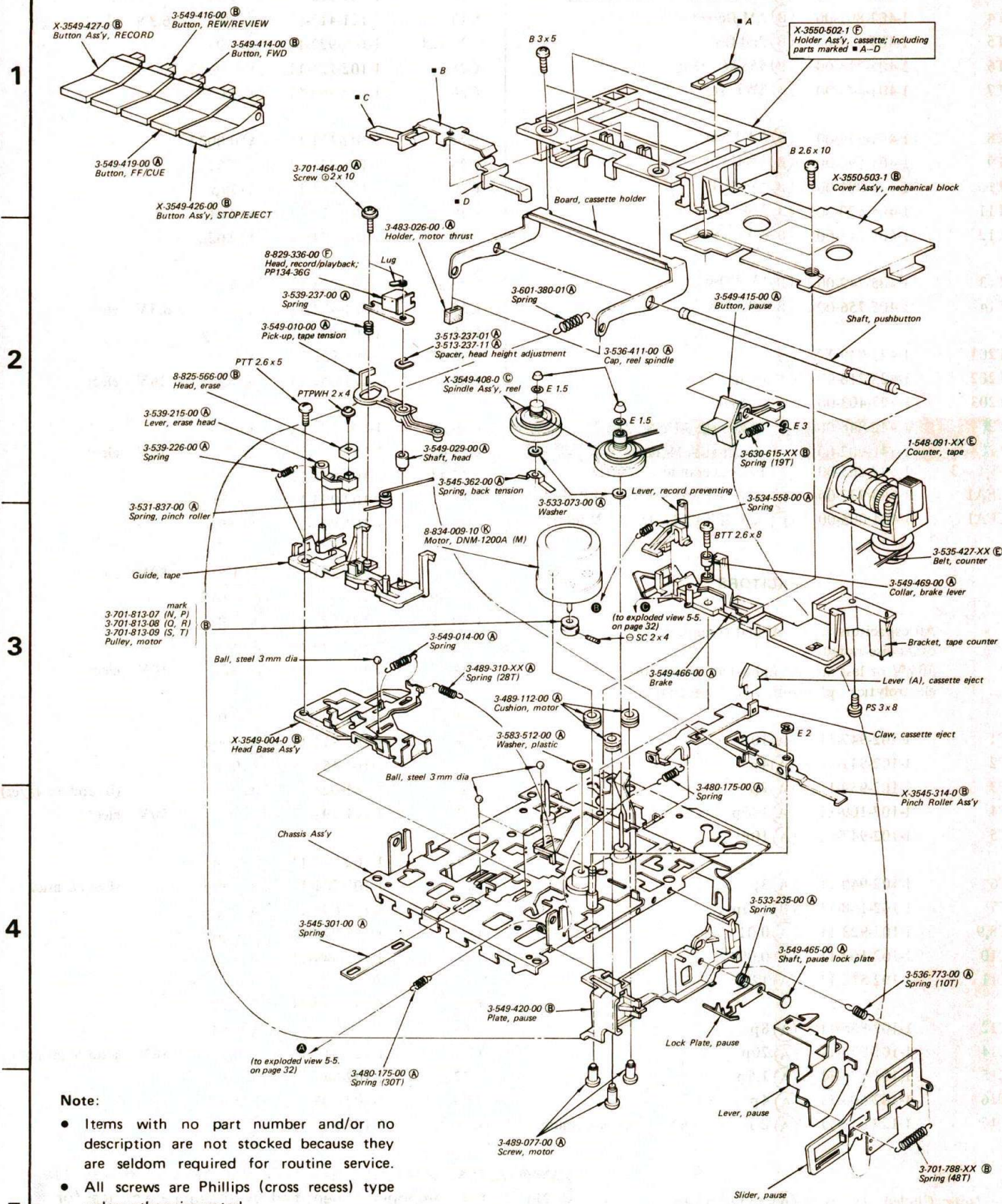
5.3.

Note: The components identified by shading are critical for safety. Replace only with part number specified.



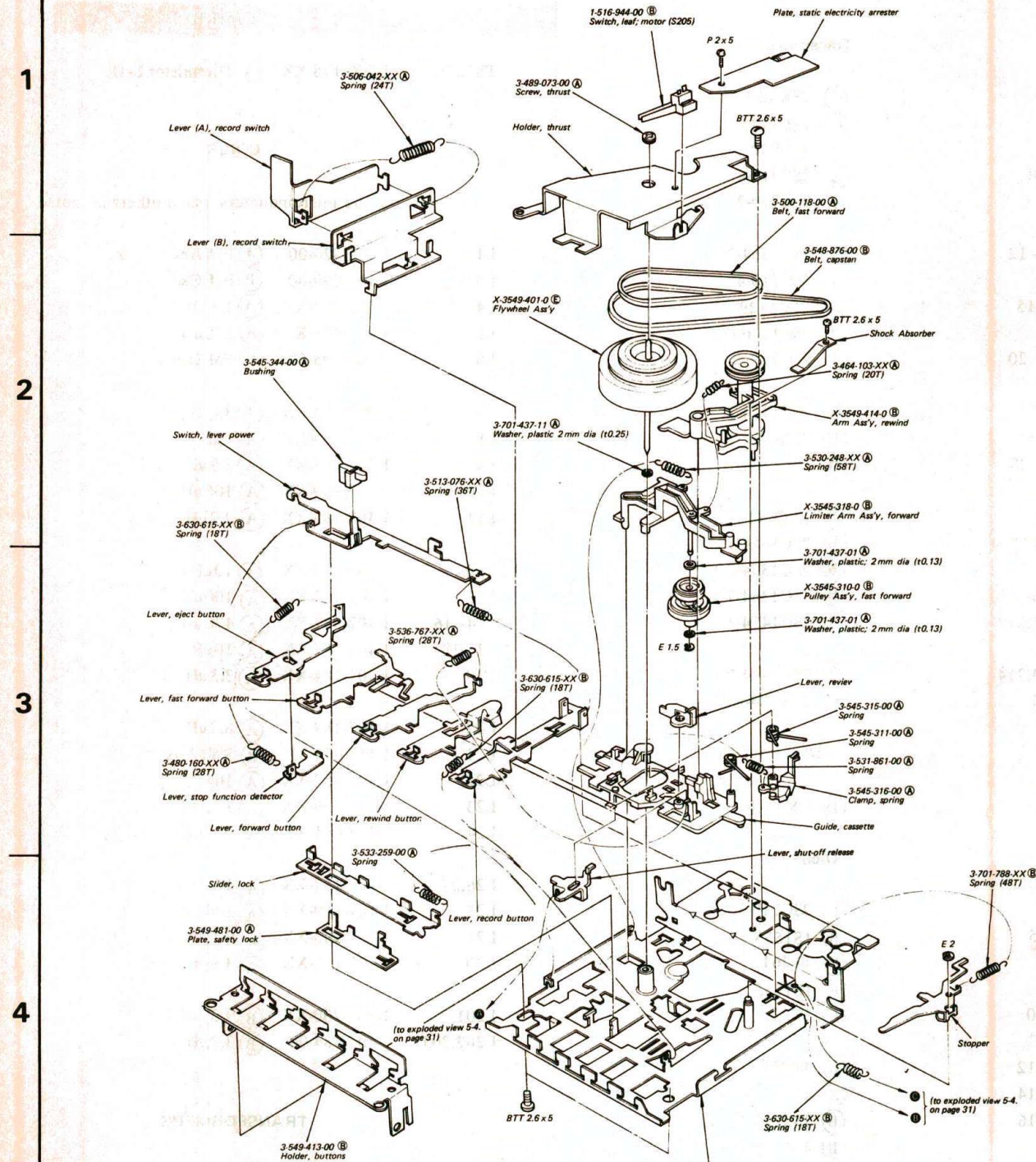
- Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
 - All screws are Phillips (cross recess) type unless otherwise noted.
 - Circled letters (A to Z) are applicable to European models only.

5-4.



- Note:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
 - All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head
 - (□□T) shows the number of coils in spring.
 - Circled letters (A) to (Z) are applicable to European models only.

5-5.



- Note:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
 - All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head
 - (□□T) shows the number of coils in spring.
 - Circled letters (A) to (Z) are applicable to European models only.

SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
SEMICONDUCTORS		
Transistors		
⇒ Q1	(C) 2SK42-1	
⇒ Q2	(C) 2SC1129	
Q3	(B) 2SC930	
⇒ Q4-8	(B) 2SC710-4	
⇒ Q9	(B) 2SC710-3	
⇒ Q10-12	(B) 2SC1364-7	
⇒ Q13	(B) 2SC710-4	
⇒ Q14,15	(C) 2SC1129	
⇒ Q16	(B) 2SC1126-D	
⇒ Q17-20	(B) 2SC710-3	
⇒ Q21-25	(B) 2SC1364-7	
⇒ Q26	(B) 2SA678-7	
⇒ Q27-29	(B) 2SC1364-7	
⇒ Q201	(B) 2SC632A	
⇒ Q202-204	(B) 2SC1364-7	
⇒ Q205	(B) 2SC1364-7-1	
⇒ Q206-210	(B) 2SC1364-7	
⇒ Q211,212	(B) 2SC1474-3	
⇒ Q213,214	(B) 2SC1364-7	
⇒ Q215	(C) 2SA684-R	
IC		
⇒ IC1	(D) CX075B	
Diodes		
⇒ D1	(B) 2SC710-3	
⇒ D2-5	(B) 1S1555	
⇒ D6,7	(B) 1T261	
D8	(B) 1S1555	
⇒ D9,10	(B) 1T22A	
D11,12	(B) 1T261	
⇒ D13,14	(B) 1T22A	
D15,16	(B) 1S2222	
⇒ D17	(B) 1S1555	
⇒ D201	(B) 1S1555	

Ref. No.	Part No.	Description
⇒ D202	(B) 1T22A	
D203	(C) SIRB10	
Th1,201	1-800-198-XX	(A) Thermistor S-1K
COILS		
All coils are microinductors unless otherwise noted.		
L1	1-401-526-00	(A) FM Ant
L3	1-405-699-00	(B) FM Osc
L4	1-407-181-XX	(A) 1.8μH
L5	1-407-175-XX	(A) 330μH
L6	1-405-705-00	(B) FM Osc
L7	1-407-163-XX	(A) 33μH
L8	1-407-178-XX	(A) 1μH
L9	1-407-185-XX	(A) 3.9μH
L10	1-407-169-XX	(A) 100μH
L11	1-407-182-XX	(A) 2.2μH
L12	1-407-157-XX	(A) 10μH
L13	1-407-169-XX	(A) 100μH
L14-16	1-407-661-XX	(A) 470μH
L17,18	1-407-157-XX	(A) 10μH
L19	1-407-184-XX	(A) 3.3μH
L20	1-407-189-XX	(A) 8.2μH
L21	1-417-014-31	(B) SW1 Mix
L22	1-407-157-XX	(A) 10μH
L23	1-407-169-XX	(A) 100μH
L24	1-407-661-XX	(A) 470μH
L26,27	1-407-157-XX	(A) 10μH
L28	1-407-169-XX	(A) 100μH
L29	1-407-163-XX	(A) 33μH
L30	1-407-185-XX	(A) 3.9μH
L201	1-407-200-XX	(B) 3.3 mH
L202,203	1-407-484-00	(B) 3.3μH
TRANSFORMERS		
T1	1-403-872-00	(B) FM IFT
T2	1-403-953-00	(B) FM Discriminator, primary

Ref. No.	Part No.	Description
T3	1-403-959-00	(B) FM Discriminator, secondary
T4	1-403-801-00	(B) AM Detector
T5	1-405-713-00	(B) 2nd Osc
T6	1-405-714-00	(B) 455 kHz Osc
T7	1-401-644-00	(B) SW3 Ant
T8	1-401-675-00	(B) SW2 Ant
T9	1-401-695-00	(B) SW1 Ant
T10	1-404-021-00	(B) SW IFT
T11	1-405-520-00	(B) MW Osc
T12	1-405-711-00	(B) SW3 Osc
T13	1-405-742-00	(B) SW2 Osc
T14	1-405-756-00	(B) SW1 Osc
T201	1-423-049-XX	(D) Input
T202	1-423-218-00	(C) Input
T203	1-427-403-00	(C) Output
T204	1-442-846-00	(J) Power (E, AEP Model)
T204	1-442-902-00	(I) Power (UK Model)
CF1 - 3	1-527-265-00	(E) Filter, ceramic 10.7 MHz
CFA1	1-403-972-00	(E) AM IFT 455 kHz (E, AEP Model)
CFA1	1-404-005-00	(E) AM IFT 468 kHz (UK Model)
CAPACITORS		
All capacitors are in μF and ceramic unless otherwise noted. 50WV or less are not indicated except for electrolytics. pF = μμF, elect = electrolytic		
C1	1-102-947-11	(A) 10p
C2	1-102-941-11	(A) 4p
C3	1-102-939-11	(A) 2p
C4	1-102-109-11	(A) 180p
C5	1-102-947-11	(A) 10p
C6	1-102-940-11	(A) 3p
C7	1-102-108-11	(B) 150p
C8,9	1-102-923-11	(A) 0.01
C10	1-102-102-11	(A) 0.0047
C11	1-102-510-11	(A) 12p
C12	1-102-865-11	(A) 8p
C14	1-101-973-11	(A) 20p
C15	1-101-576-11	(A) 1.5p
C16	1-102-504-11	(A) 4p
C17	1-127-019-11	(A) 0.1 16V solid aluminum

Ref. No.	Part No.	Description
C18	1-101-923-11	(A) 0.01
C19	1-121-413-11	(A) 100 6.3V elect
C20-24	1-101-923-11	(A) 0.01
C25	1-102-121-11	(A) 0.0022
C26	1-102-963-11	(A) 33
C27	1-102-121-11	(A) 0.0022
C28	1-101-923-11	(A) 0.01
C29	1-102-965-11	(A) 39p
C30	1-101-923-11	(A) 0.01
C31	1-101-924-11	(A) 0.022
C32,33	1-101-923-11	(A) 0.01
C34	1-121-424-11	(B) 470 6.3V elect
C35	1-102-973-11	(A) 100p
C36,37	1-101-923-11	(A) 0.01
C38	1-121-651-11	(A) 10 16V elect
C39,40	1-101-923-11	(A) 0.01
C41,42	1-121-651-11	(A) 10 16V elect
C43,44	1-102-978-11	(A) 220p
C45	1-102-973-11	(A) 100p
C46	1-101-923-11	(A) 0.01
C47	1-121-391-11	(A) 1 50V elect
C48,49	1-101-924-11	(A) 0.022
C50-52	1-101-923-11	(A) 0.01
C53	1-102-973-11	(A) 100
C54	1-121-352-11	(A) 47 10V elect
C55	1-101-923-11	(A) 0.01
C56	1-102-973-11	(A) 100p
C57	1-101-455-11	(A) 0.001
C58	1-161-025-11	(B) 0.1 (boundary layer)
C59	1-121-391-11	(A) 1 50V elect
C60	1-102-972-11	(A) 91p
C61	1-107-264-11	(B) 200p silvered mica
C62	1-102-699-11	(A) 75p
C63	1-101-923-11	(A) 0.01
C64	1-102-949-11	(A) 12p
C65	1-102-947-11	(A) 10p
C66-70	1-101-923-11	(A) 0.01
C71	1-127-019-11	(B) 0.1 16V solid aluminum
C72	1-102-947-11	(A) 10p
C73	1-102-705-11	(A) 180p
C74,75	1-101-923-11	(A) 0.01

⇒ : Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note: Circled letters (A to Z) are applicable to European models only.

Note: Circled letters (A to Z) are applicable to European models only.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C76	1-102-951-11	(A) 15p	C135	1-101-455-11	(A) 0.001	C239	1-121-352-11	(A) 47 10V elect			
C77	1-101-923-11	(A) 0.01	C136,137	1-101-924-11	(A) 0.022	C240	1-121-419-11	(B) 220 6.3V elect			
C78	1-127-019-11	(B) 0.1 16V solid aluminum	C138,139	1-102-973-11	(A) 100p	C241	1-121-425-11	(B) 470 10V elect			
C79	1-161-017-11	(A) 0.022 (boundary layer)	C140	1-101-923-11	(A) 0.01	C242	1-101-922-11	(A) 0.0047			
C80	1-161-013-11	(A) 0.01 (boundary layer)	C141-143	1-102-973-11	(A) 100p	C243	1-101-918-11	(A) 0.001			
C81	1-121-450-11	(A) 2.2 50V elect	C201	1-108-830-12	(A) 0.0027 mylar	C244	1-121-424-11	(B) 470 6.3V elect			
C82	1-161-025-11	(B) 0.1 (boundary layer)	C202	1-127-019-11	(B) 0.1 16V solid aluminum	C245	1-121-414-11	(A) 100 10V elect			
C83	1-102-942-11	(A) 5p	C203	1-121-726-11	(A) 0.47 50V elect	C246	1-121-402-11	(A) 33 10V elect			
C84	1-107-093-11	(A) 220 silvered mica	C204	1-102-975-11	(A) 100p	C247	1-121-425-11	(B) 470 10V elect			
C87	1-161-010-11	(A) 0.0056 (boundary layer)	C205	1-108-831-12	(A) 0.0033 mylar	C248	1-121-651-11	(A) 10 16V elect			
C88	1-102-960-11	(A) 24p	C206	1-102-832-11	(A) 330p	C249	1-101-923-11	(A) 0.01			
C89	1-102-958-11	(A) 20p	C207	1-121-352-11	(A) 47 10V elect	C250	1-121-659-11	(B) 2200 10V elect			
C90	1-101-924-11	(A) 0.022	C208,209	1-121-726-11	(A) 0.47 50V elect	C251,252	1-101-918-11	(A) 0.001			
C91-93	1-101-923-11	(A) 0.01	C210	1-102-967-11	(A) 22p	C253	1-101-923-11	(A) 0.01			
C96	1-101-923-11	(A) 0.01	C211	1-102-832-11	(A) 330	C254	1-101-918-11	(A) 0.001			
C98,99	1-101-923-11	(A) 0.01	C212	1-121-402-11	(A) 33 10V elect	C255	1-101-923-11 (A) 0.01 (E Model)				
C100	1-107-267-11	(A) 56p silvered mica	C213	1-121-414-11	(A) 100 10V elect		1-108-847-61 (A) 0.068 50V mylar				
C101	1-102-755-11	(A) 43p	C214	1-121-419-11	(B) 220 6.3V elect						
C102	1-107-263-11	(B) 150p silvered mica	C215	1-102-975-11	(A) 100p	C401	1-108-842-12	(A) 0.027 mylar			
C103	1-102-756-11	(A) 47p	C216	1-121-651-11	(A) 10 16V elect	C402	1-108-851-12	(B) 0.15 mylar			
C104	1-107-260-11	(B) 82p silvered mica	C217	1-108-832-12	(A) 0.0039 mylar	C403	1-108-833-12	(A) 0.0047 mylar			
C105	1-101-998-11	(A) 6p	C218	1-108-843-12	(A) 0.033 mylar	C404	1-108-845-12	(A) 0.047			
C106	1-107-265-11	(A) 360p silvered mica	C219	1-102-975-11	(A) 100p	CT1,2	1-141-138-XX	(B) Trimmer			
C108	1-102-286-11	(A) 10p	C220	1-108-835-12	(A) 0.0068 mylar	CT3	1-141-171-00	(B) Trimmer			
C109	1-102-953-11	(A) 18p	C221	1-108-832-12	(A) 0.0039 mylar	CT4	1-141-186-00	(B) Trimmer			
C110,111	1-102-947-11	(A) 10p	C222	1-108-830-12	(A) 0.0027 mylar	CT5	1-141-138-XX	(B) Trimmer			
C112,113	1-101-923-11	(A) 0.01	C223	1-121-392-11	(A) 3.3 25V elect	CT6-9	1-141-171-00	(B) Trimmer			
C114	1-121-352-11	(A) 47 10V elect	C224	1-102-832-11	(A) 330p	CT10	1-141-138-XX	(B) Trimmer			
C115	1-102-965-11	(A) 39p	C225	1-121-651-11	(A) 10 16V elect	CV1	1-151-196-00	(F) Tuning			
C116,117	1-102-114-11	(A) 470p	C226	1-102-832-11	(A) 330p	CV2	1-151-312-00	(E) Tuning			
C118,119	1-101-923-11	(A) 0.01	C227	1-102-975-11	(A) 100p						
C120	1-102-942-11	(A) 5p	C228	1-121-651-11	(A) 10 16V elect						
C122	1-121-352-11	(A) 47 10V elect	C229	1-121-736-11	(B) 1000 10V elect						
C123	1-121-395-11	(A) 4.7 25V elect	C230	1-121-726-11	(A) 0.47 50V elect						
C124	1-107-260-11	(B) 82p silvered mica	C231	1-102-967-11	(A) 22p						
C125,126	1-102-942-11	(A) 5p	C332	1-102-832-11	(A) 330p						
C127	1-102-965-11	(A) 39p	C233,234	1-121-726-11	(A) 0.47 50V elect						
C129	1-121-726-11	(A) 0.47 50V elect	C235	1-102-975-11	(A) 100p						
C130,131	1-127-019-11	(B) 0.1 16V solid aluminum	C236	1-102-832-11	(A) 330p						
C132,133	1-121-352-11	(A) 47 10V elect	C237	1-101-918-11	(A) 0.001						
C134	1-101-924-11	(A) 0.022	C238	1-121-402-11	(A) 33 10V elect						

Note: Circled letters (A) to (Z) are applicable to European models only.

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Note: The components identified by shading are critical for safety. Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
X1	1-527-269-51	(K) Crystal

1-533-037-XX	(A) Holder, fuse (E, AEP Model)
1-533-102-XX	(B) Holder, fuse (E, AEP Model)

ACCESSORIES & PACKING MATERIALS			
<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
X-3701-105-0	(A) Tips Ass'y, cleaning	3-550-601-00	(C) Cushion, side; left
1-504-059-00	(C) Earphone, ME-20H	3-550-602-00	(C) Cushion, side; right
1-506-309-00	(B) Plug, short (SP-100)	3-552-005-00	(E) Carton (E-1, AEP, UK Model)
1-526-565-00	(B) Adaptor, ac parallel blade plug (E-2 Model)	3-552-006-00	(E) Carton (E-2 Model)
1-534-840-XX	(E) Cord, power; w/euro-plug (E-1, AEP Model)	3-701-632-00	(A) Bag, plastic
1-551-218-00	(E) Cord, power (UK Model)	3-703-099-00	(A) Cushion, microphone (UK, AEP Model)
1-551-235-00	(E) Cord, power; w/parallel-blade plug (E-2 Model)	3-770-237-11	(F) Manual, instruction (AEP Model)
3-546-208-00	(A) Cushion, microphone (E Model)	3-770-237-41	(F) Manual, instruction (UK Model)
3-548-395-00	(B) Bag, plastic; set	3-770-237-51	(F) Manual, instruction (E Model)
		3-794-070-51	(C) Manual, instruction; arabic
		8-893-511-00	(F) Tape, demonstration; CD-805

Note: Circled letters (A) to (Z) are applicable to European models only.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

SW/FM/MW CASSETTE-CORDER

CF-950S

E Model
AEP Model
UK Model

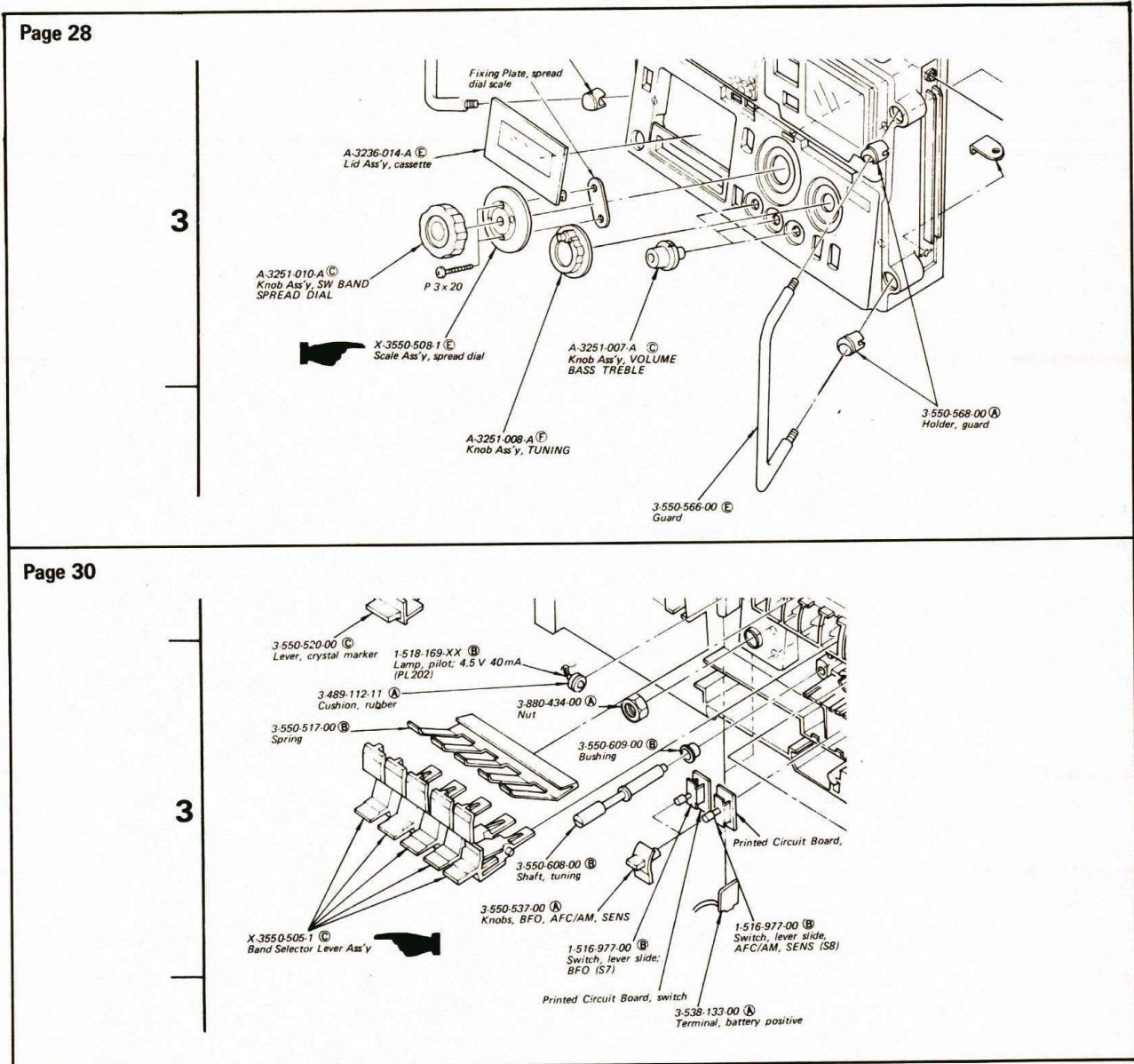
CORRECTION

Correct the service manual as shown below.

 : CORRECTED PORTION

No. 1

August, 1977



SONY® SERVICE MANUAL

Sony Corporation

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Printed in Japan

SW/FM/MW CASSETTE-CORDER

CF-950S

E Model
AEP Model
UK Model

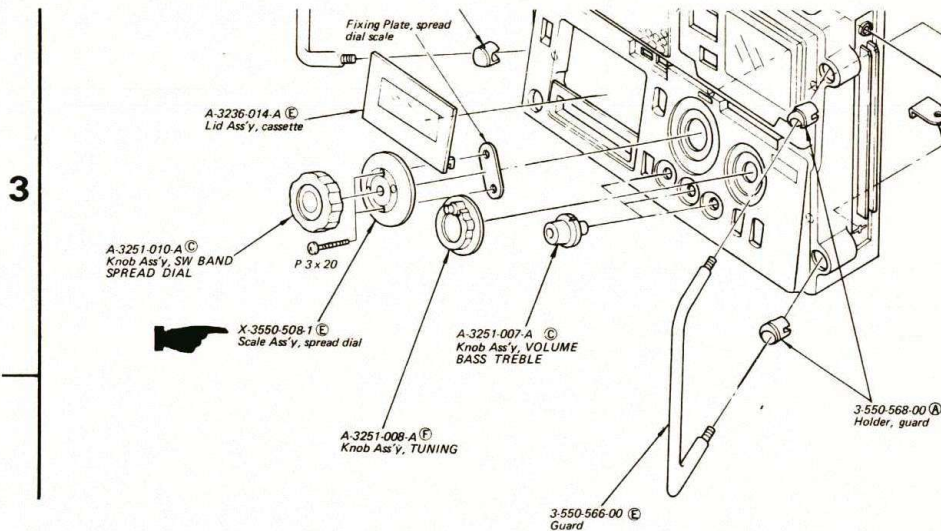
CORRECTION

Correct the service manual as shown below.

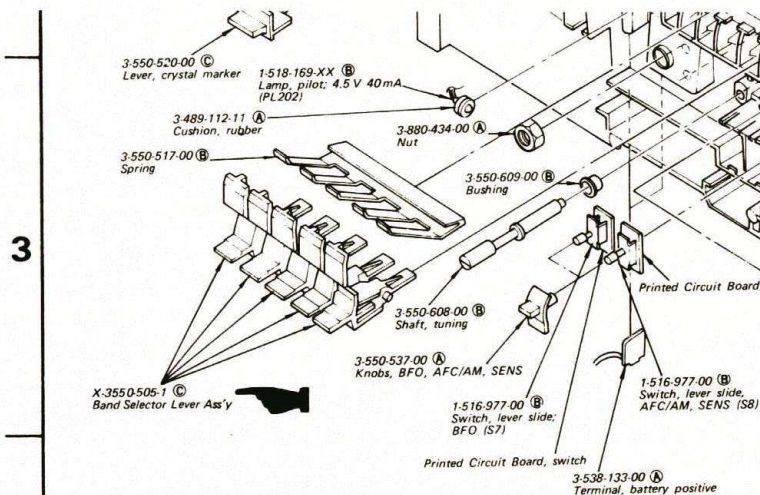
 : CORRECTED PORTION

No. 1
August, 1977

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SONY® SERVICE MANUAL

MW/FM/SW CASSETTE-CORDER

CF-950S

*E Model
UK Model
AEP Model*

SUPPLEMENT

Subject: CIRCUIT DESCRIPTION

No. 1
March, 1978

File this supplement with service manual

1. SW Dual Conversion System

- 1) Both the 1st and 2nd local oscillator frequencies can be varied by means of tuning capacitors. The variable range for the 2nd local oscillator is 300 kHz.
- 2) The 1st intermediate frequency (IF) is approximately 10.7 MHz and the 2nd one is 455 kHz.
- 3) Both the 1st and 2nd frequency conversions employ the upper heterodyne system. Therefore, 1st local oscillator frequency =
frequency of received signal + 10.7 MHz, and 2nd local oscillator frequency =
1st intermediate frequency + 455 kHz.
- 4) A bandpass filter (ceramic type, band width: approx. 350 kHz at 10.7 MHz) is employed for both 1st AM IF and FM IF.

In this dual conversion system, dial scales for the 1st local oscillator and the 2nd one are called the main dial and the band spread dial respectively. So unlike the ordinary system, tuning can be done independently within a range (± 150 kHz) by the band spread dial at any desired position along the main dial.

2. The 1st Frequency Converter Circuit (See Fig. 1)

This circuit employs 10.7 MHz as the 1st IF, so input signals should not be allowed to come out at the output. The operating principles are outlined below. Input signals are applied in phase to the bases of 1st mixer Q14 and Q15, and then amplified. Since T10 is tuned to 10.7 MHz and the center tap of its primary winding is grounded, no output signals from Q14 and Q15 will appear. On the other hand, with this circuit serving as a mixer, outputs from the 1st local oscillator are applied to Q14 and Q15 via L21 at 180° out-of-phase, so the mixed outputs will appear 180° out-of-phase on the collectors of Q14 and Q15. These two signals are then added together in T10, producing a converter output.

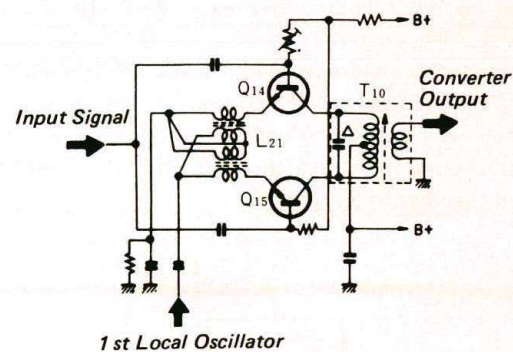


Fig. 1.

3. BFO Detector Circuit

The BFO detector circuit consists of 455 kHz oscillator Q9, an oscillator transformer T6 whose secondary winding serves as a balanced-detector coil, and a pair of balanced-detector diodes D13, D14. Both D13 and D14 conduct during every half cycle of the BFO 455 kHz signal, obtaining a detector output waveform produced by the SSB wave from the IF stage. This output is then applied to preamplifier Q10 in order to amplify the signal to a level closer in value to that of the AM detector output. The circuit components around preamplifier Q10 also serve as a bandpass filter, eliminating the low and high frequency portions, thereby improving the articulation of sound during reception of a SSB signal.

4. Built-in Crystal Marker

The use of a 250 kHz marker permits calibration of the main dial at every 250 kHz position. In addition, intermittent and continuous sounds are produced alternately in order to make calibration easier. First of all, the positions of desired frequencies are determined every 250 kHz along the main dial by means of this marker, and the more detailed frequencies within ± 150 kHz ranges (both sides of the marker) can be read off by using the band spread dial. As illustrated in the block diagram (Fig. 2), crystal-controlled oscillator Q17 generates a 500 kHz signal (Fig. 3-1). The frequency of this output is then divided by Q19 and Q20 into a 250 kHz signal (Fig. 3-2). The output from Q22 and Q23, which are oscillating (free-running) at 4 to 5 Hz, are applied to Q21. When Q21 then switches the 500 kHz signal at Q18, an intermittent sound is produced, and the output is combined with the 250 kHz output to be applied together to SW mixer 1.

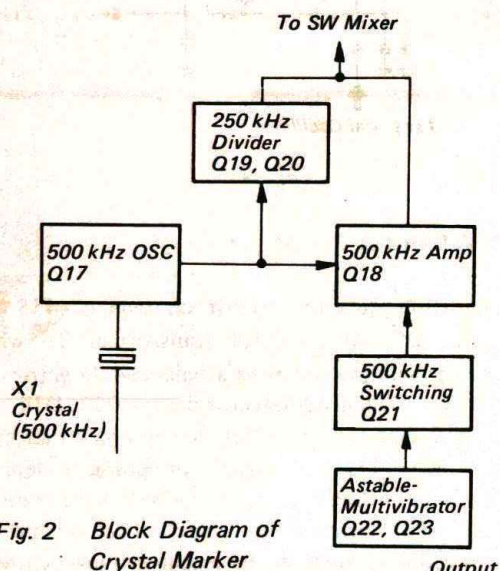


Fig. 2 Block Diagram of Crystal Marker

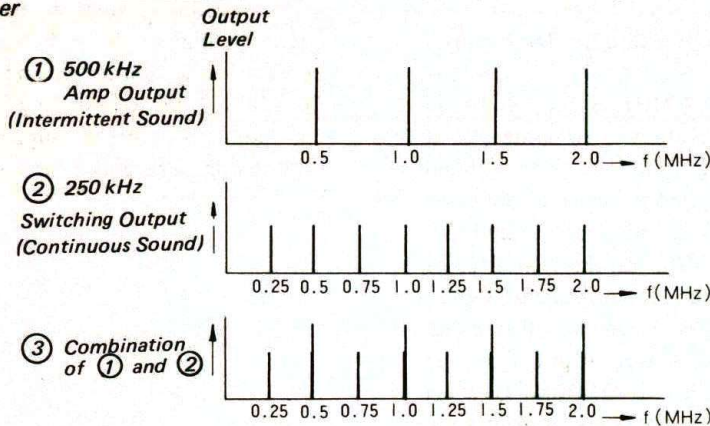


Fig. 3 Frequency Spectrum of Crystal Marker

5. Squelch Circuit (Q11, Q12)

The purpose of this circuit is to prevent any image of a marker from appearing between the genuine markers. All marker signals pass through the AM detector and SSB detector circuits. When genuine marker signals are detected, Q11 is turned on and Q12 turned off by the AM detector output (Fig. 4). Thus, squelch circuit is not operated in this case, and the SSB detector output is passed through the Q10 preamplifier and the line amplifier. When an image signal of a marker is detected, Q11 is turned off, and Q12 turned on by using the small AM detector output. Consequently, the SSB detector output is not passed on to Q10, but is grounded via Q12.

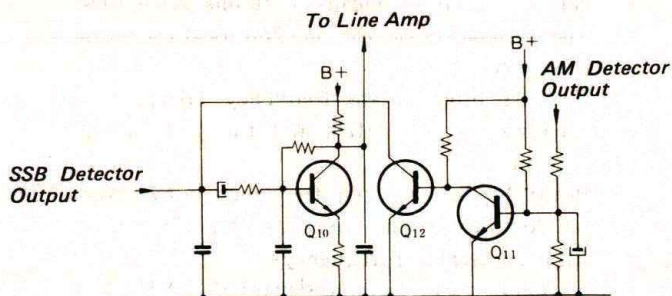


Fig. 4

6. Credit-In Switch

This switch permits the user to add comments while recording overseas short wave or other similar programs. When the switch is turned on, the recording level of the radio signal is decreased, permitting comments to be recorded via the built-in microphone, or an externally connected microphone, in a form of mic mixing. Monitoring is possible via an earphone, or a pair of headphones.