

ICF-9650W

*US Model
Canadian Model*




FM/AM 2-BAND RADIO

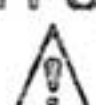
SPECIFICATIONS

Frequency Range:	FM: 87.5–108 MHz AM: 530–1,605 kHz (566–187 m)
Antennas:	FM: Line antenna External antenna terminals (75 Ω) AM: Built-in ferrite-rod antenna
Speaker:	Approx. 16 cm (6 ³ / ₈ inches) dia.
Power Requirements:	120 V ac, 60 Hz
Power Consumption:	20 W
Dimensions:	Approx. 367 (w) x 236 (h) x 142 (d) mm 14 ¹ / ₂ (w) x 9 ³ / ₈ (h) x 5 ⁵ / ₈ (d) inches including projecting parts and controls
Weight:	Approx. 2.8 kg, 6 lb 3 oz

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND  MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS 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.

ATTENTION AU COMPOSANT AYANT RAPPORT
À LA SÉCURITÉ !

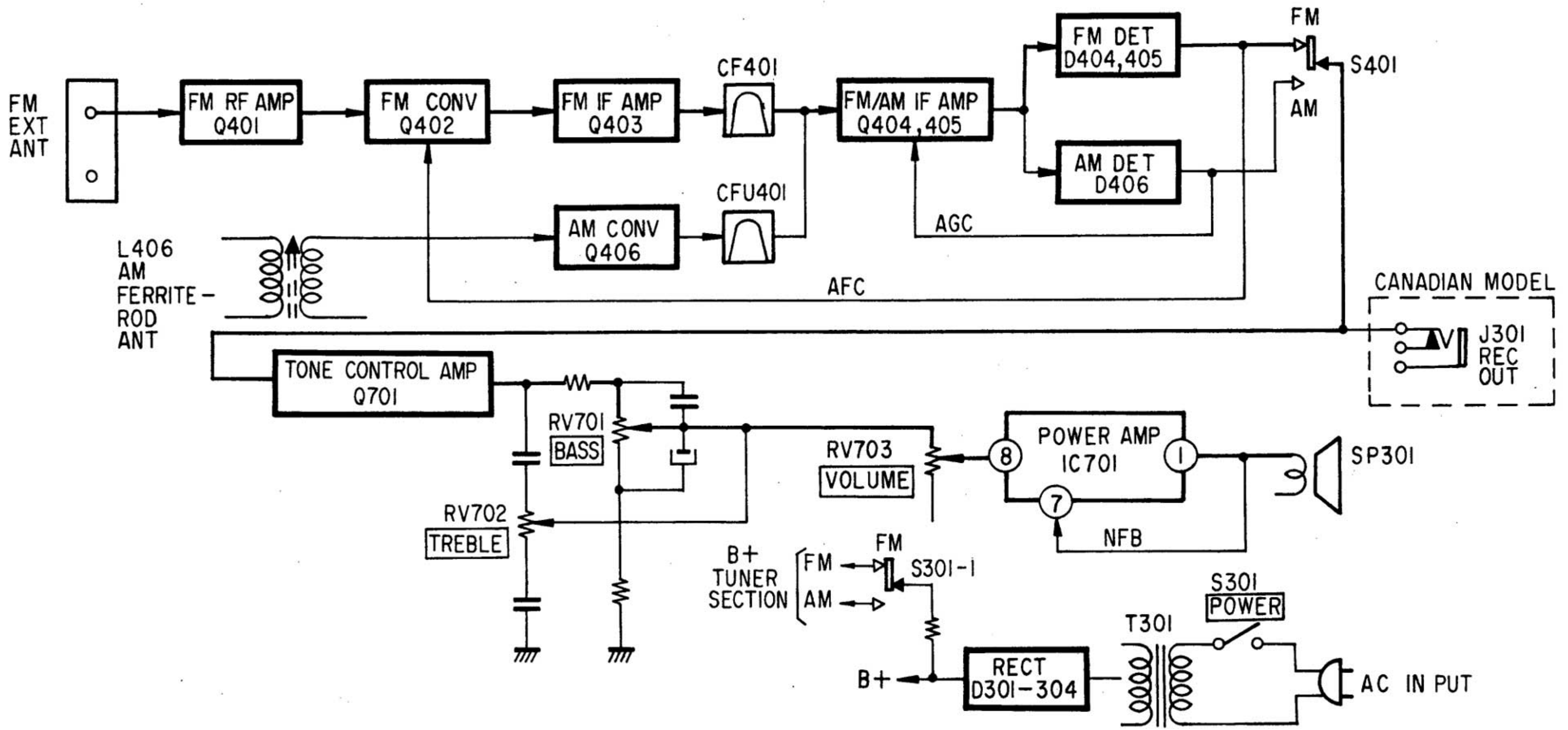
LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE  SUR LES DIAGRAMMES SCHEMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SONY[®]

SERVICE MANUAL

SECTION 1 OUTLINE

1-1. BLOCK DIAGRAM

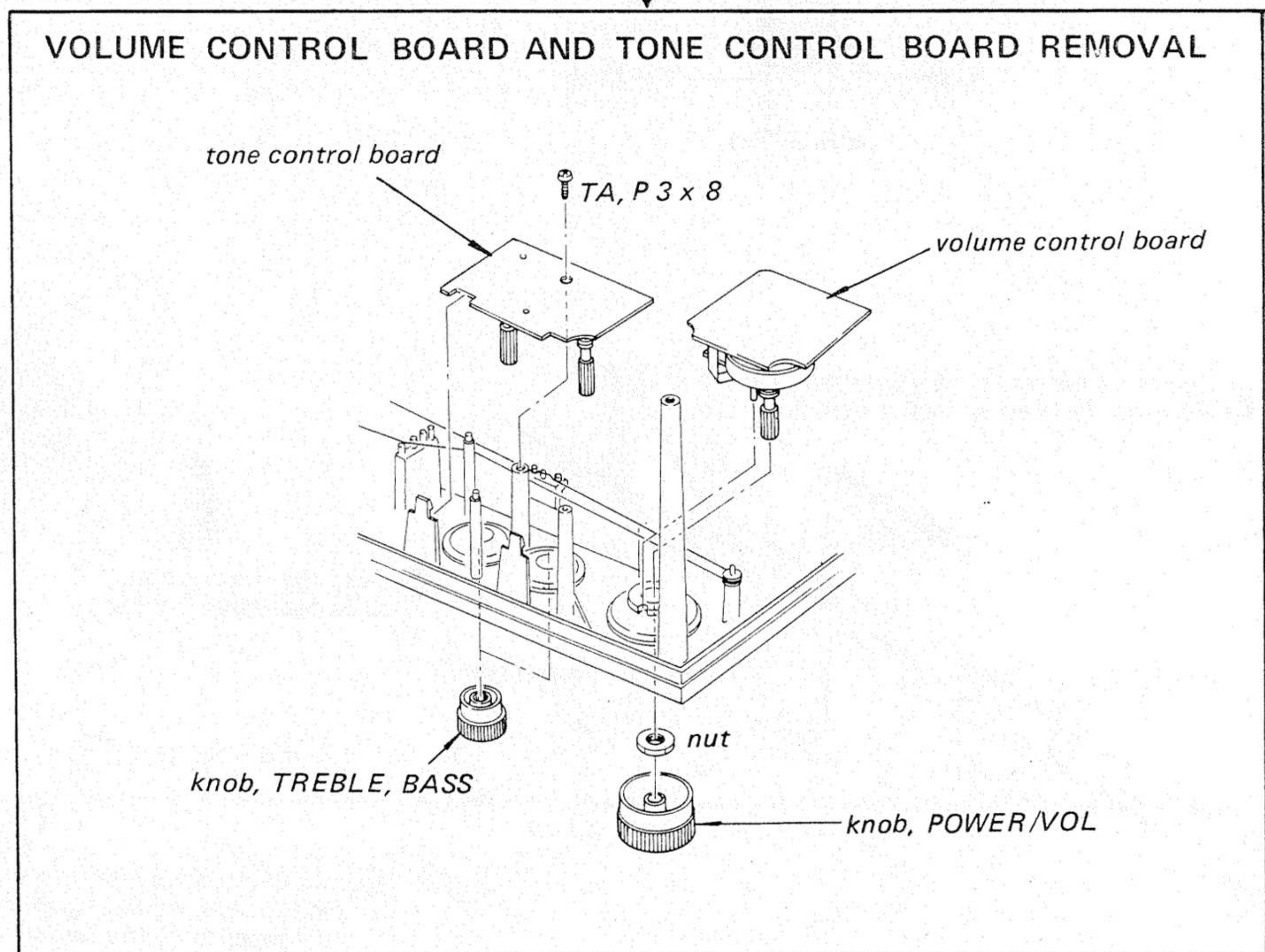
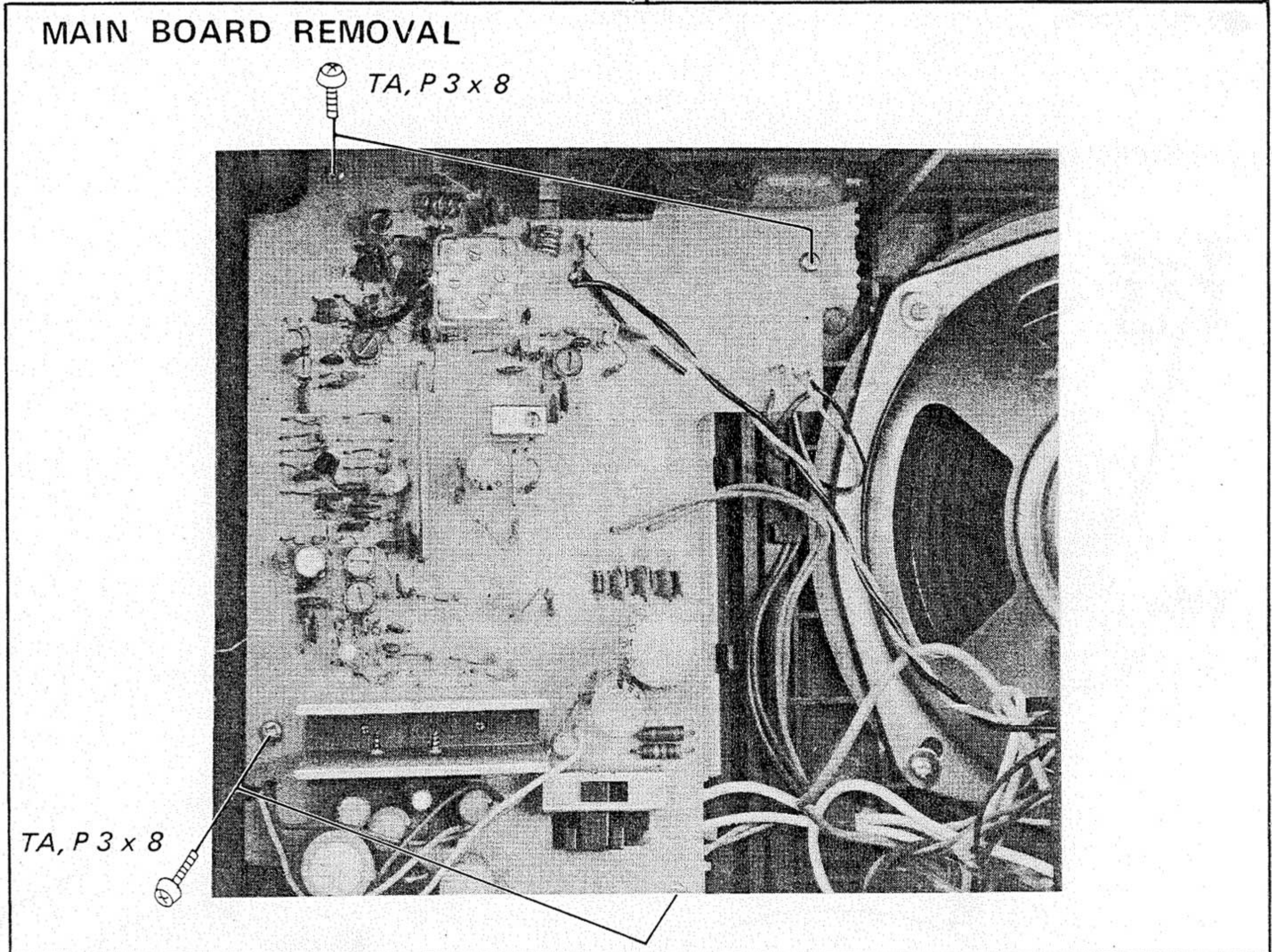


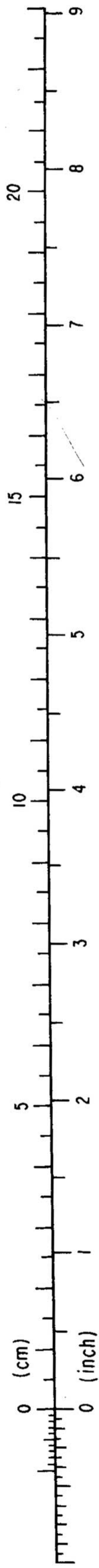
SECTION 2 DISASSEMBLY

2-1. REMOVAL

REAR BOARD REMOVAL

Remove five screws (TA, P 3 x 20) and two screws (TA, P 3 x 12) from the rear board.

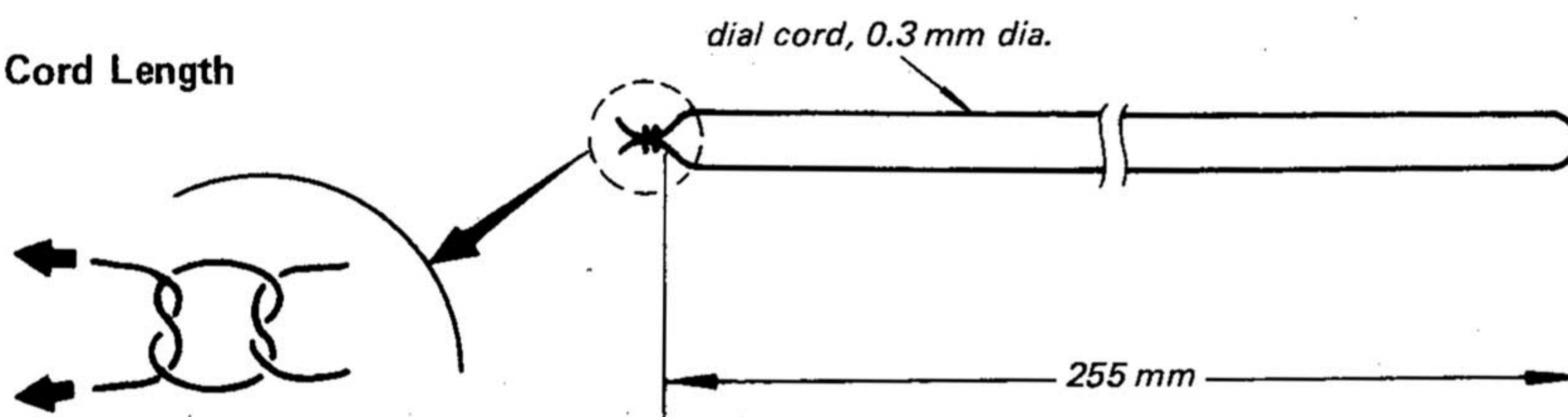




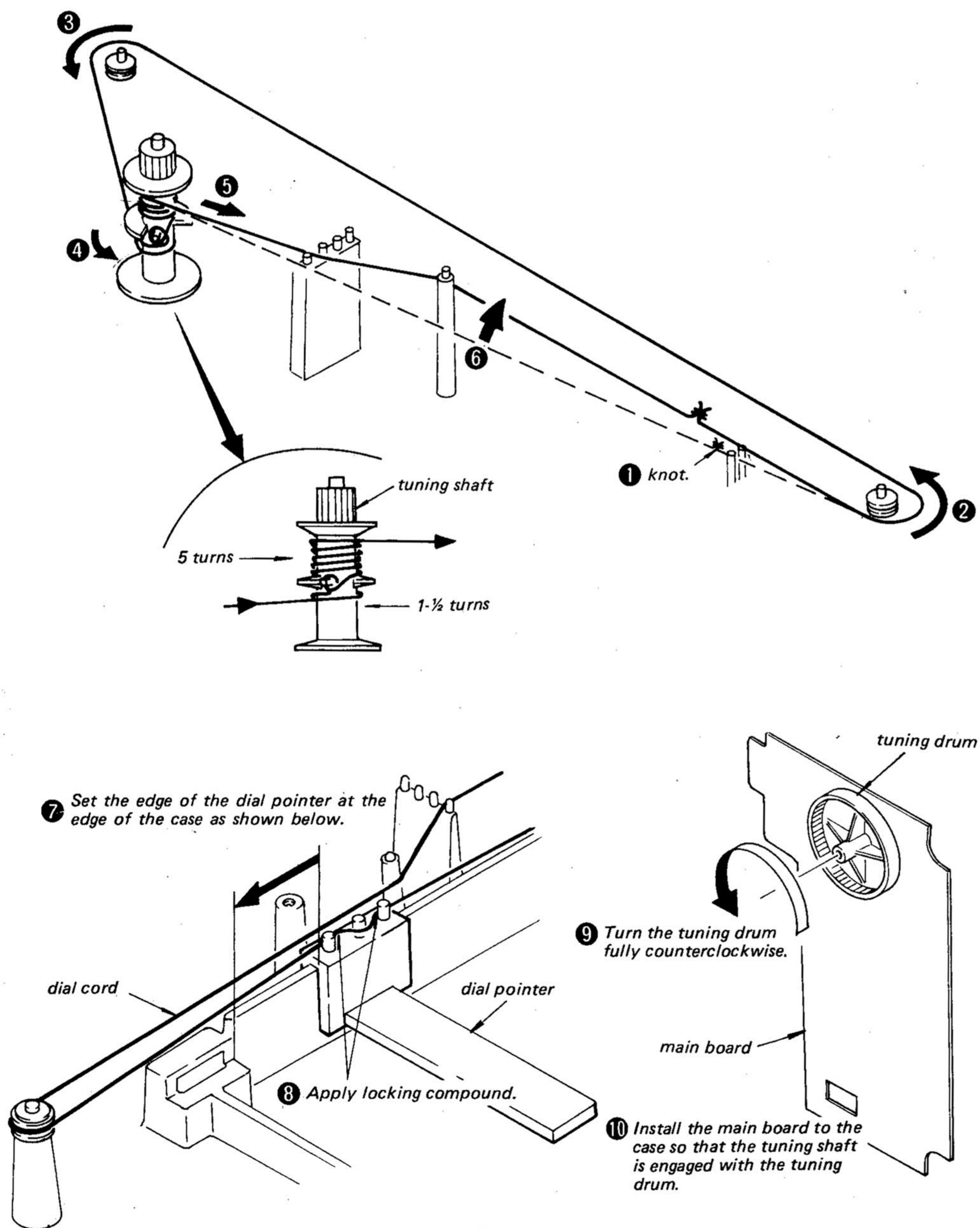
2-2. DIAL CORD STRINGING

• Follow the disassembly procedure in the numerical order given.

(1) Dial Cord Length

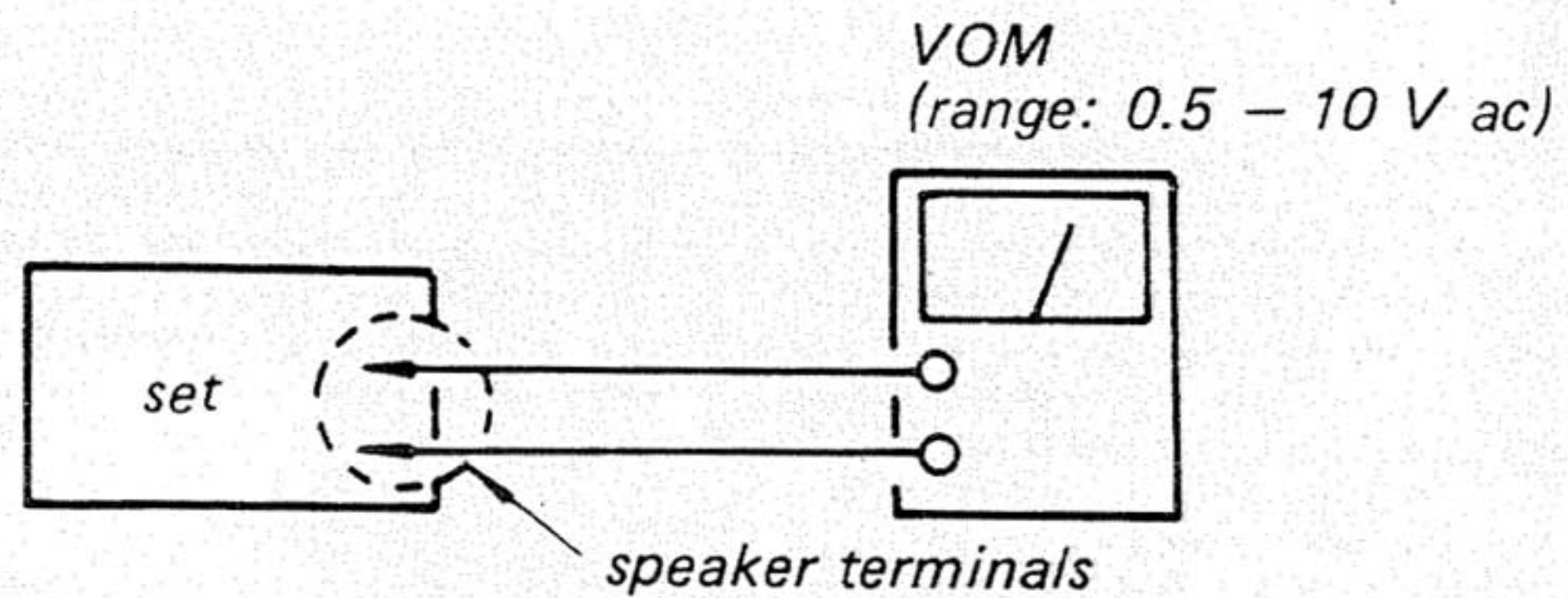
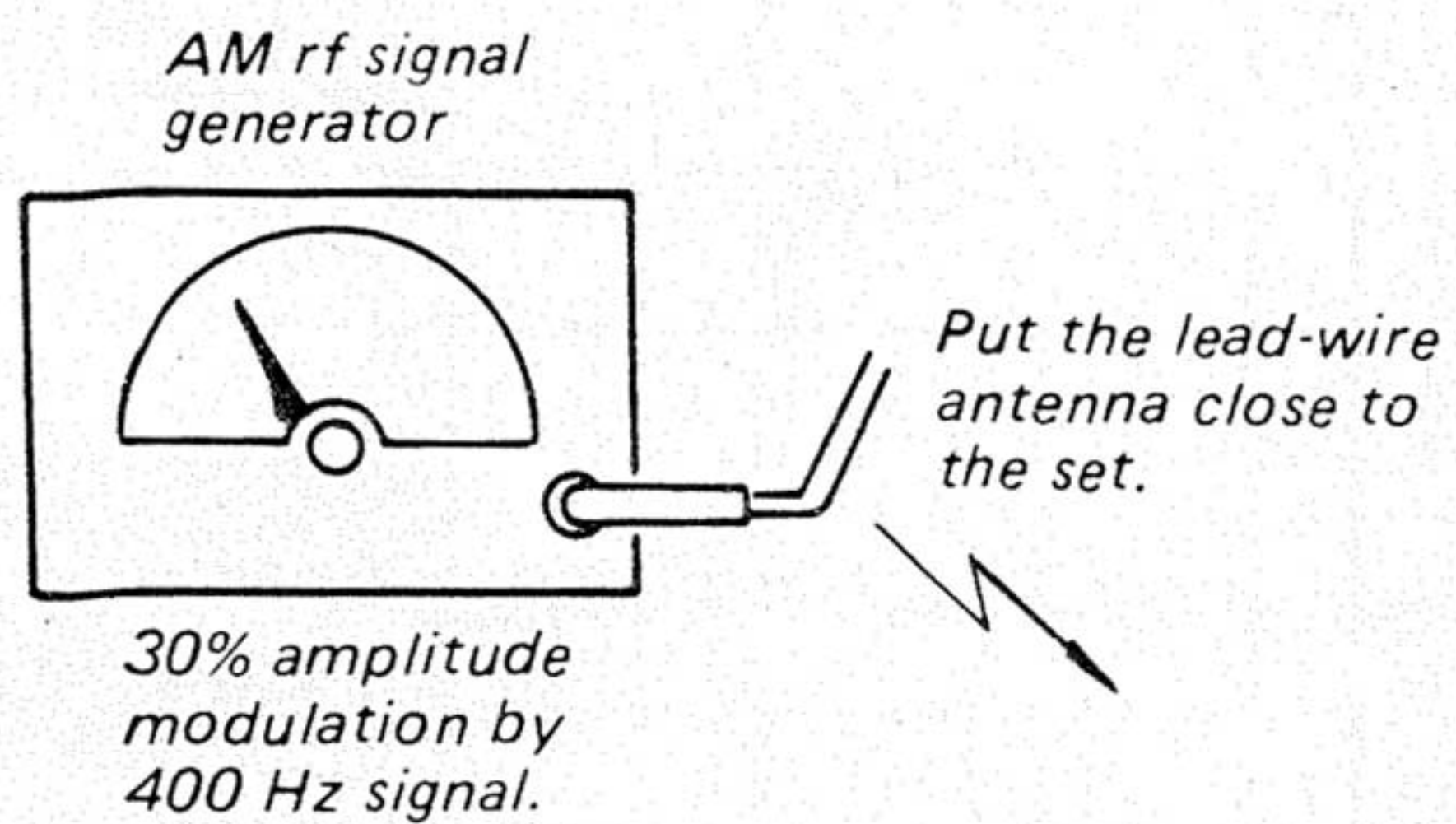


(2) Dial Cord Stringing

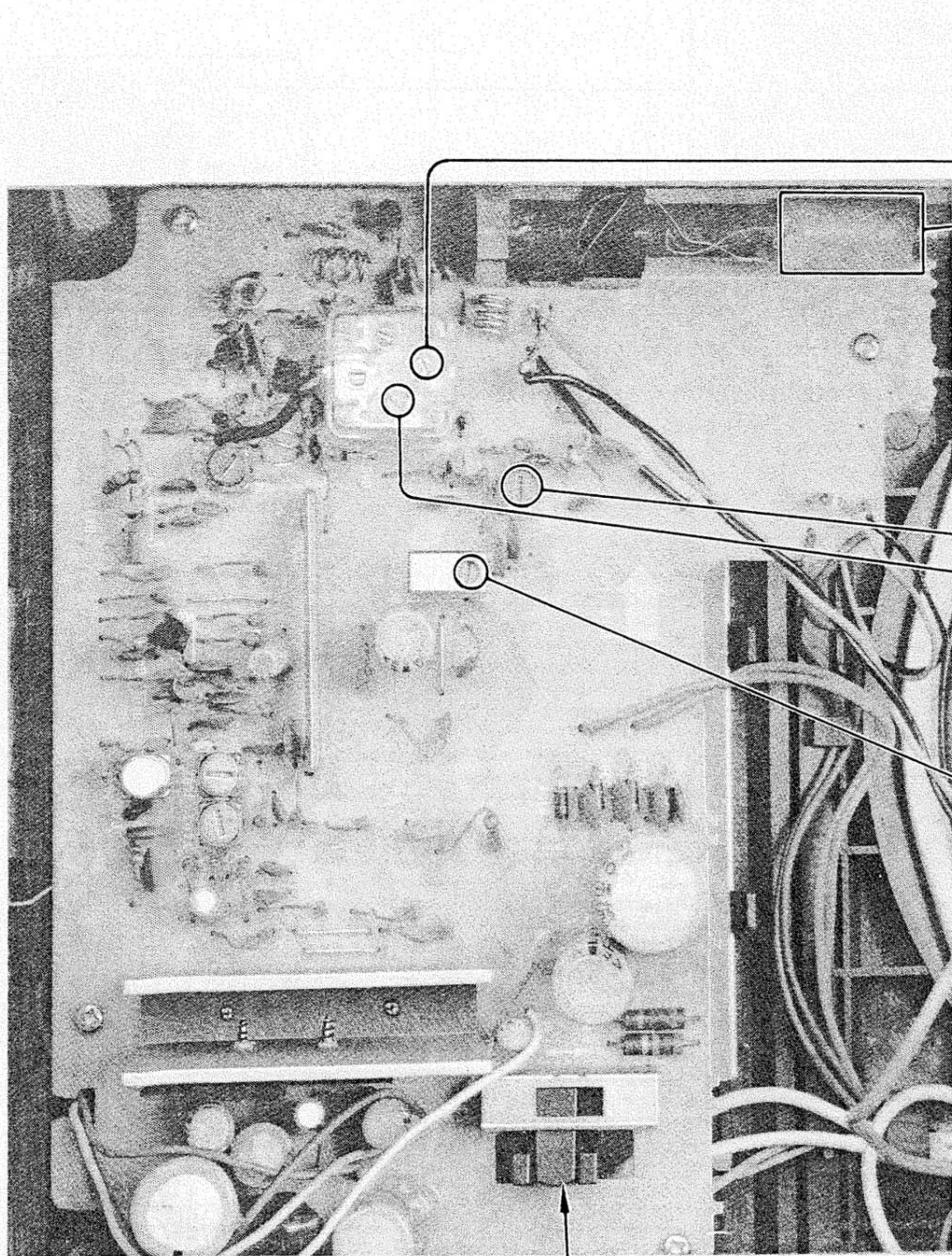


SECTION 3 ADJUSTMENTS

AM SECTION



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



AM TRACKING ADJUSTMENT	
Adjust for maximum reading on VOM.	
CT403	1,400 kHz
L406	620 kHz

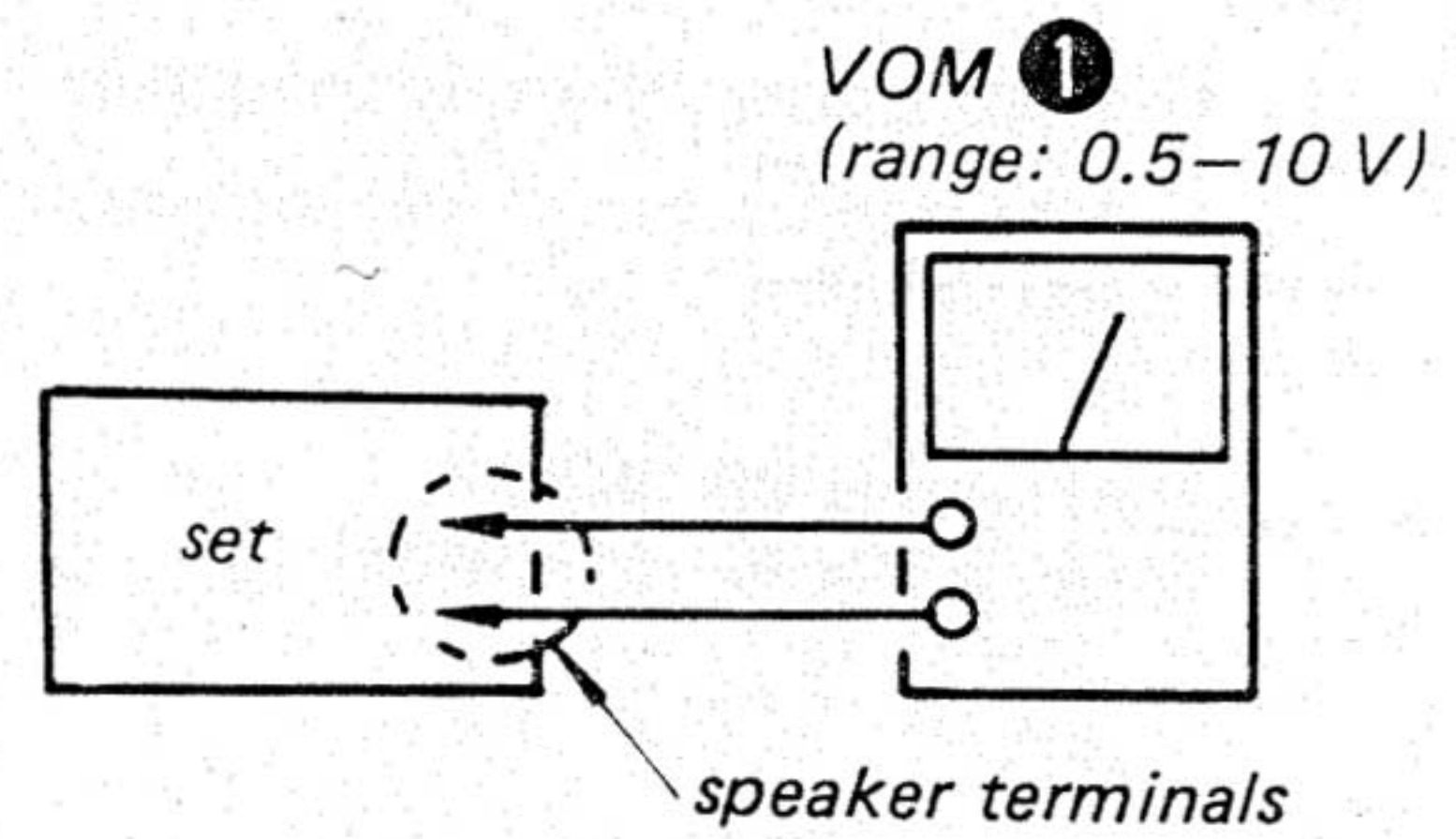
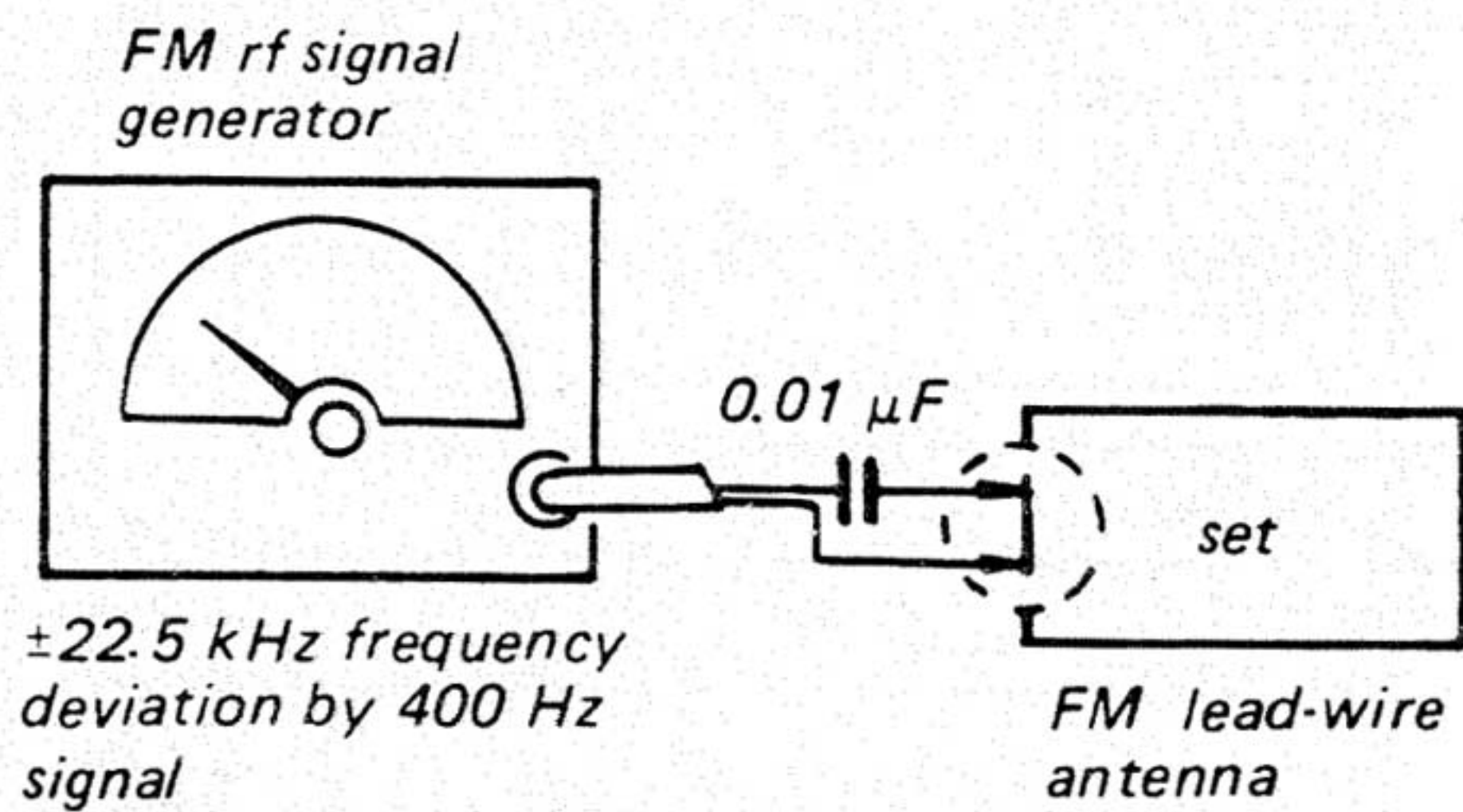
AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for maximum reading on VOM.	
L407	520 kHz
CT404	1,680 kHz

AM IF ALIGNMENT	
Adjust for maximum reading on VOM.	
CFU401	455 kHz

band selector

AM ← FM

FM SECTION



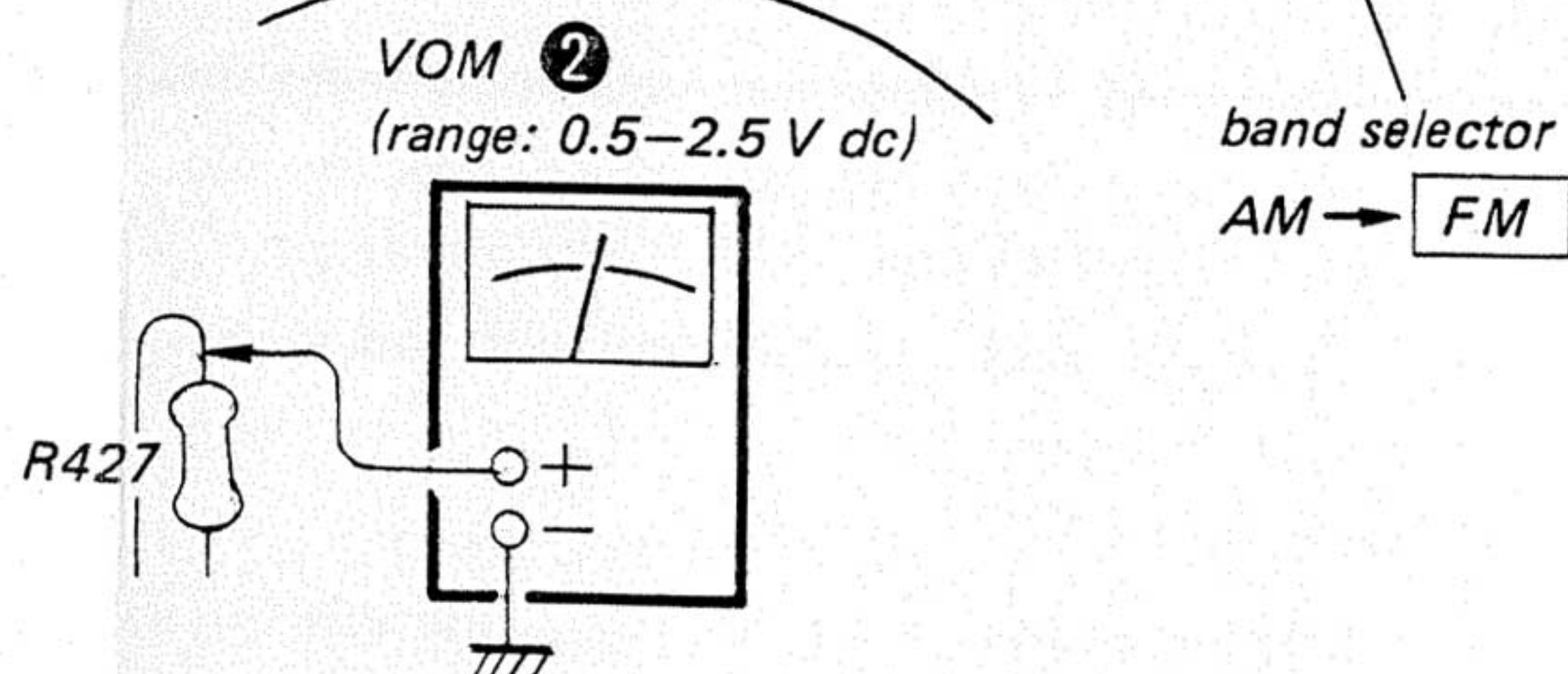
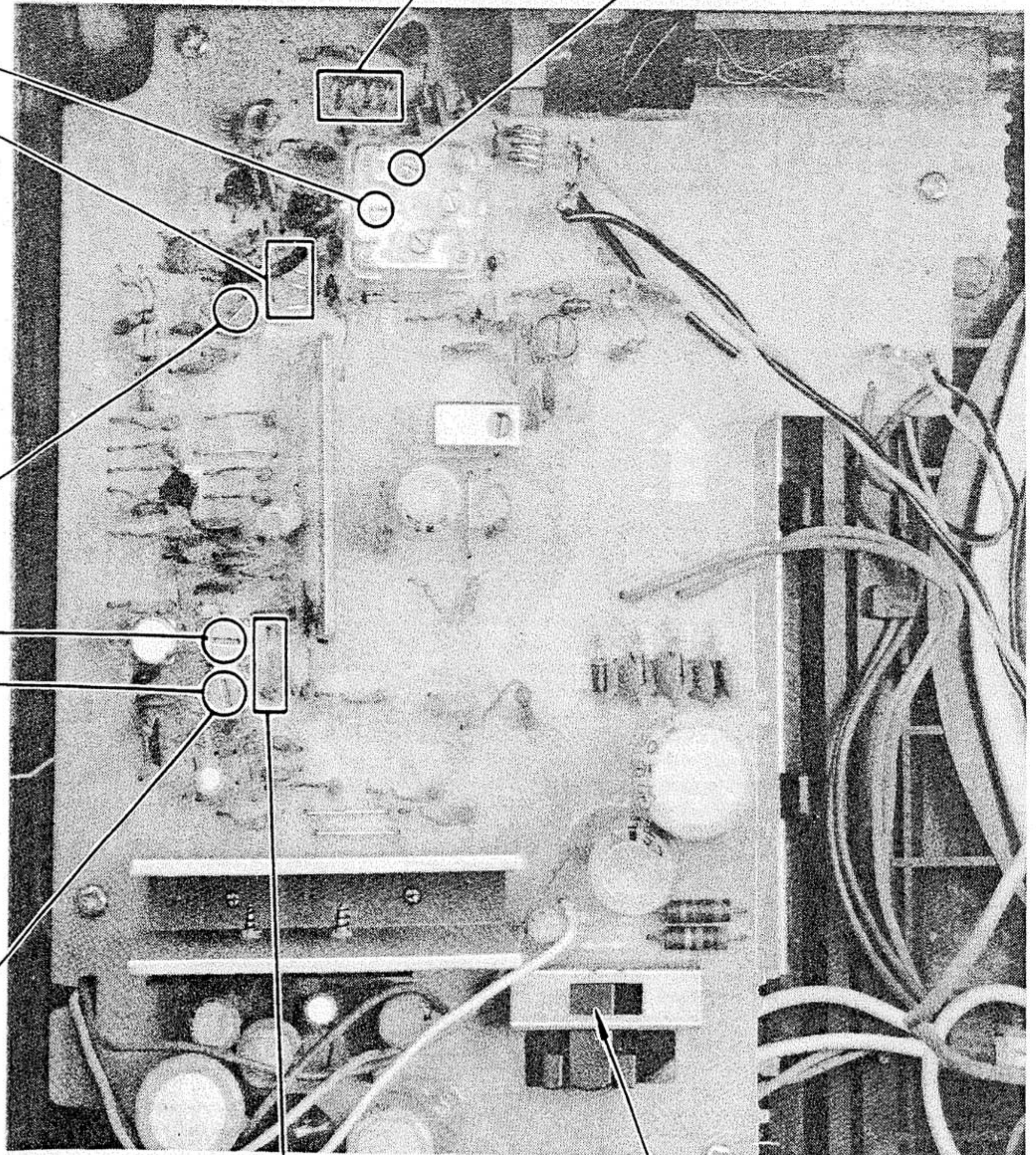
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for maximum reading on VOM 1 .	
109.5 MHz	CT402
86.5 MHz	L405

FM TRACKING ADJUSTMENT	
Adjust for maximum reading on VOM 1 .	
86.5 MHz	109.5 MHz
L402, L403	CT401

FM IF ALIGNMENT 1 (10.7 MHz with modulation)	
Adjust for maximum reading on VOM 1 .	T401
	T402
	T403

FM IF ALIGNMENT 2 (10.7 MHz with no modulation)	
Adjust for 0 V dc on VOM 2 .	T403

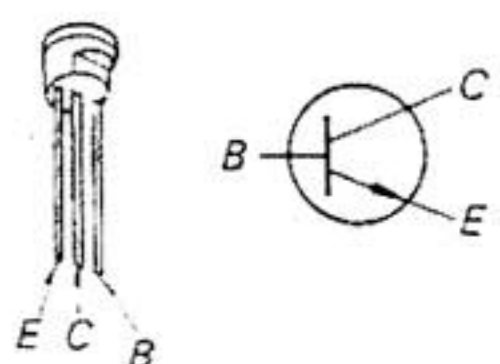


SECTION 4 DIAGRAMS

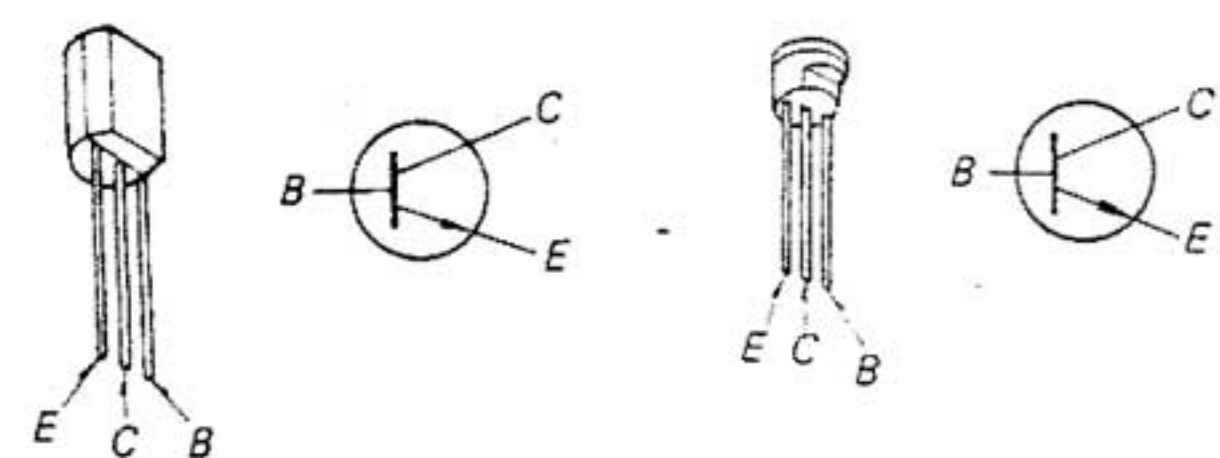
4.1. MOUNTING DIAGRAM — Conductor Side —

- **Replacement Semiconductors**
For replacement, use semiconductors except in () -

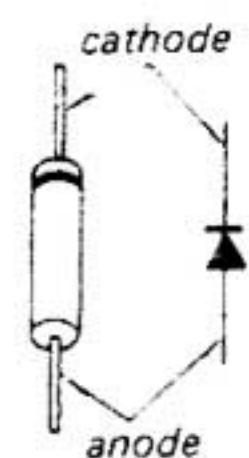
Q401-405: 2SC930
Q406: 2SC930 (2SC929)



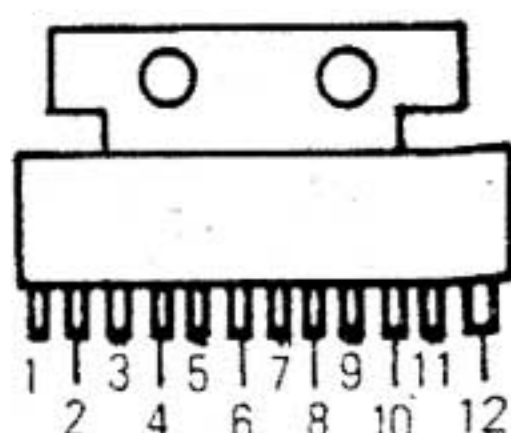
Q701: 2SC1364 (2SC536)



D301-304: 10E2 (1N4002)
D401, 403: 1S1555
D407: (1S953)
D402: 1S2139C (SD113)
D404, 405: 1T261 (1S188FM)
D406: 1T22AM (1S188AM)

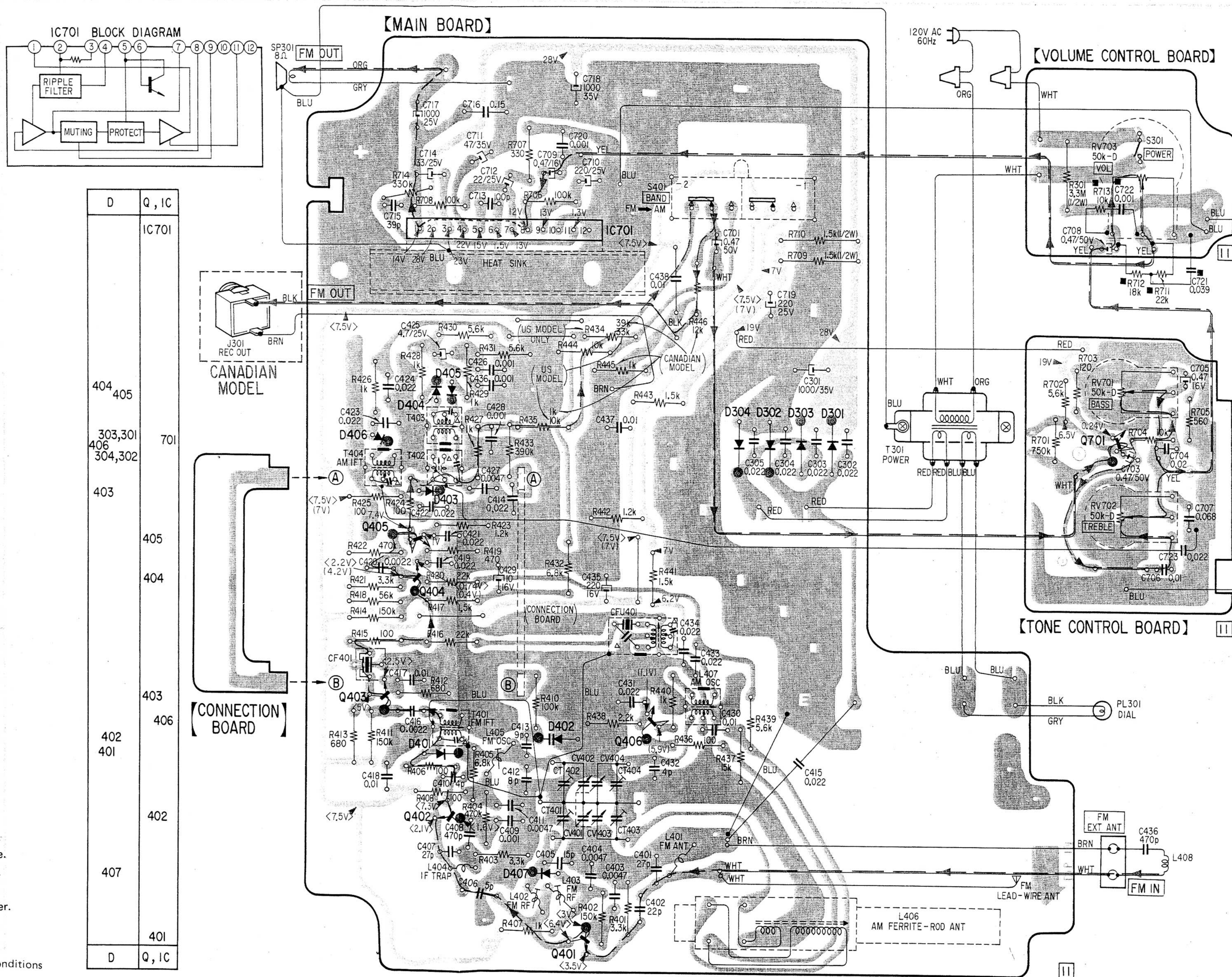


IC701: LA4230

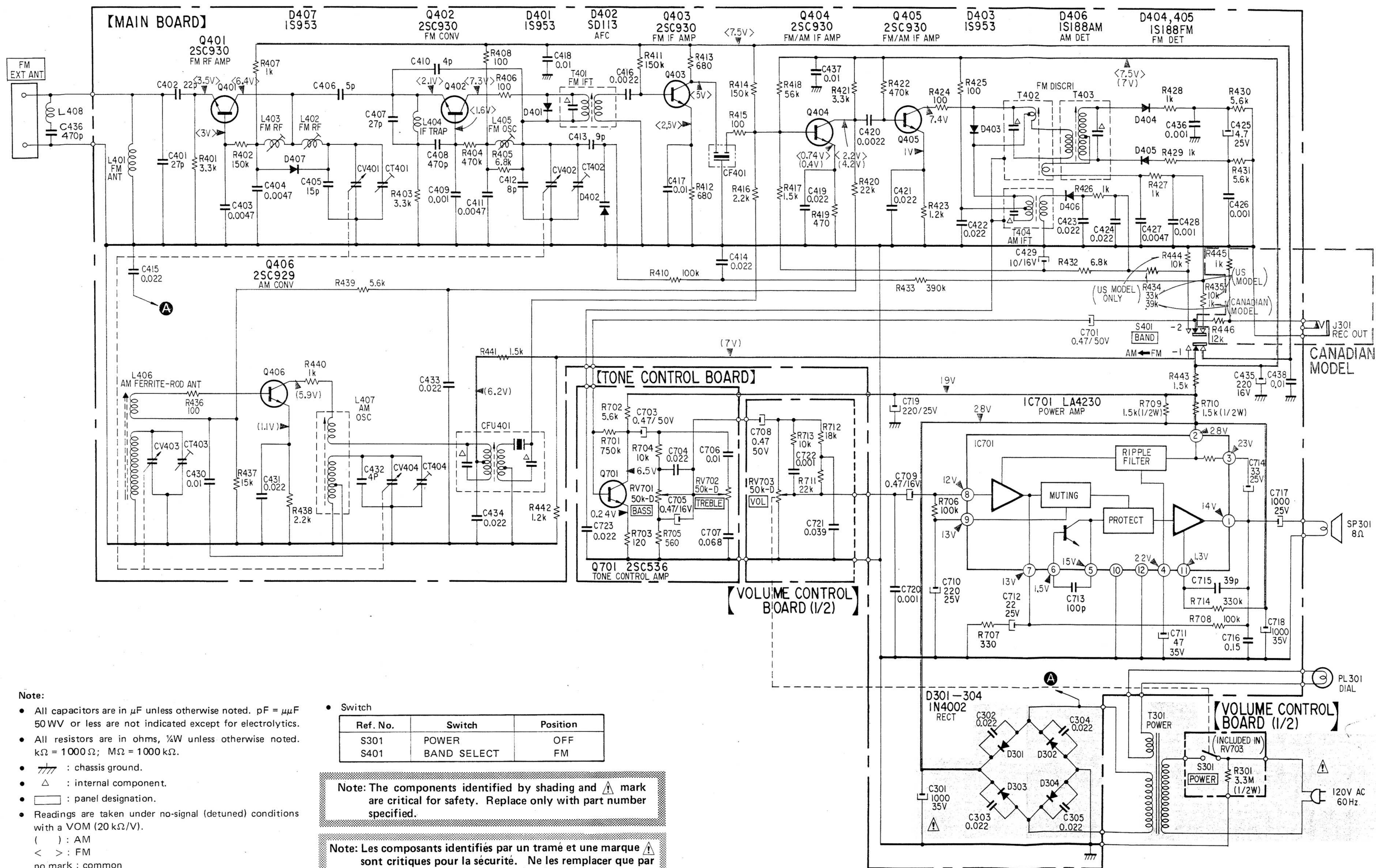


- Note:**
- — : parts extracted from the component side.
 - — : parts extracted from the conductor side.
 - : part mounted on the conductor side.
 - — : indicates side identified with part number.
 - ⊕ : B+ pattern.
 - ▶— : signal path.

- Readings are taken under no-signal (detuned) conditions with a VOM (20 kΩ/V).
- () : AM
- < > : FM
- no mark: common



D	Q, IC
	IC701
404	405
303, 301	701
406	304, 302
403	
405	
404	
403	
406	
402	
401	
402	
407	
D	Q, IC



Note:

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\mu\text{F}$. 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, $\frac{1}{2}\text{W}$ unless otherwise noted. $\text{k}\Omega = 1000\Omega$; $\text{M}\Omega = 1000\text{k}\Omega$.
- --- : chassis ground.
- \triangle : internal component.
- \square : panel designation.
- Readings are taken under no-signal (detuned) conditions with a VOM (20 $\text{k}\Omega/\text{V}$).
 () : AM
 < > : FM
 no mark : common
- --- : B+ bus.

• Switch

Ref. No.	Switch	Position
S301	POWER	OFF
S401	BAND SELECT	FM

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

Note: Les composants identifiés par un trame et une marque \triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 5 EXPLODED VIEW

E

D

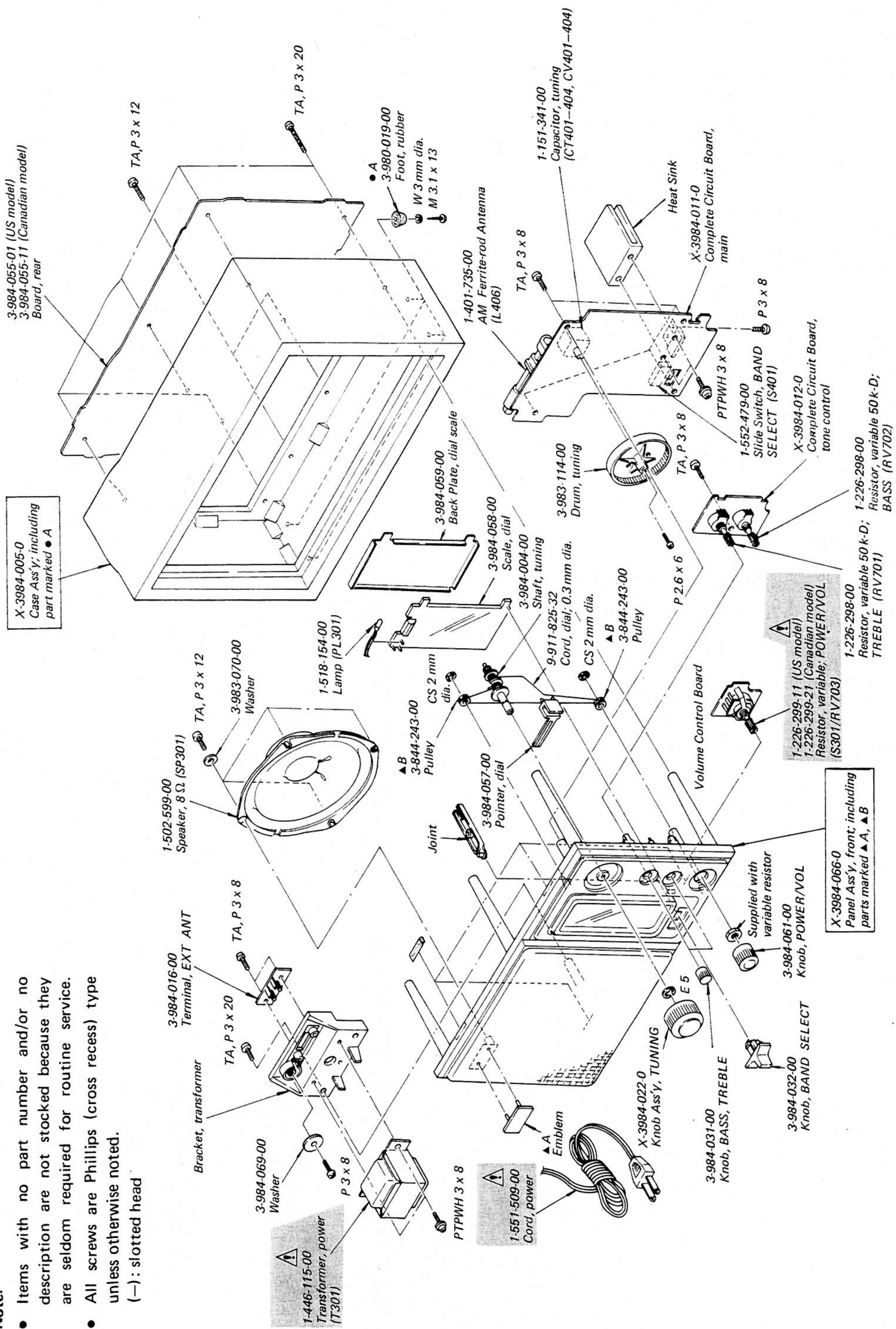
C

B

A

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



Note: Les composants identifiés par un trèfle et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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

1

2

3

4

SECTION 6

ELECTRICAL PARTS LIST

Ref. No. Part No. Description

CIRCUIT BOARDS

X-3984-011-0 Complete Circuit Board, main
X-3984-012-0 Complete Circuit Board, tone control

SEMICONDUCTORS

Transistors

Q401-405 8-729-803-04 2SC930
⇒ Q406 8-729-803-04 2SC930
⇒ Q701 8-729-663-47 2SC1364

IC

IC701 1-800-662-11 μ PC576H

Diodes

⇒ D301-304 \triangle 8-719-200-02 10E2
⇒ D401 8-719-815-55 1S1555
⇒ D402 8-719-713-93 1S2139C
⇒ D403 8-719-815-55 1S1555
⇒ D404, 405 8-719-026-11 1T261
⇒ D406 8-719-422-21 1T22AM
⇒ D407 8-719-815-55 1S1555

TRANSFORMERS

CFU401 1-403-163-00 CFZ, 455 kHz
T301 \triangle 1-446-115-00 Power
T401 1-403-930-00 FM IFT
T402 1-403-959-00 FM IFT
T403 1-403-916-00 FM IFT
T404 1-403-128-00 AM IFT

COILS

L406 1-401-735-00 AM Ferrite-rod Antenna
L407 1-405-685-00 AM Osc
L408 1-405-542-11 Coil

Ref. No. Part No. Description

CAPACITORS

All capacitors are in μ F and ceramic unless otherwise noted.
50WV or less are not indicated except for electrolytics.
pF = μ F, elect = electrolytic

C301 \triangle 1-121-388-11 1000 35 V elect
C302-305 \triangle 1-101-005-11 0.022

C401 1-102-968-11 27 p
C402 1-102-967-11 22 p
C403, 404 1-102-102-11 0.0047
C405 1-101-971-11 15 p
C406 1-102-864-11 5 p

C407 1-102-968-11 27 p
C408 1-102-836-11 470 p
C409 1-101-455-11 0.001
C410 1-102-504-11 4 p
C411 1-102-102-11 0.0047

C412 1-102-746-11 8 p
C413 1-102-507-11 9 p
C414 1-101-005-11 0.022
C415 1-101-005-11 0.022
C416 1-102-100-11 0.0022

C417, 418 1-101-004-11 0.01
C419 1-101-005-11 0.022
C420 1-102-100-11 0.0022
C421-424 1-101-005-11 0.022
C425 1-121-395-11 4.7 25 V elect

C426 1-101-001-11 0.001
C427 1-102-102-11 0.0047
C428 1-101-001-11 0.001
C429 1-121-651-11 10 16 V elect
C430 1-108-239-11 0.01 mylar

C431 1-101-005-11 0.022
C432 1-102-504-11 4 p
C433, 434 1-101-005-11 0.022
C435 1-121-421-11 220 16 V elect
C436 1-102-114-11 470 p

C437, 438 1-101-004-11 0.01

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

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

Note: Les composants identifiés par un trame et une marque \triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		
C701	1-121-726-11	0.47	50 V	elect
C703	1-121-726-11	0.47	50 V	elect
C704	1-108-587-12	0.022		mylar
C705	1-131-455-11	0.47	16 V	tantalum
C706	1-108-239-12	0.01		mylar
C707	1-108-599-12	0.068		mylar
C708	1-121-726-11	0.47	50 V	elect
C709	1-131-455-11	0.47	16 V	tantalum
C710	1-121-261-11	220	25 V	elect
C711	1-121-653-11	47	35 V	elect
C712	1-121-480-11	22	25 V	elect
C713	1-102-702-11	100 p		
C714	1-121-404-11	33	25 V	elect
C715	1-102-693-11	39 p		
C716	1-108-607-12	0.15		mylar
C717, 718	1-121-388-11	1000	25 V	elect
C719	1-121-422-11	220	25 V	elect
C720	1-101-001-11	0.001		
C721	1-161-058-11	0.039		(semiconductor)
C722	1-101-001-11	0.001		
C723	1-101-005-11	0.022		

CT401-404
CV401-404) 1-151-341-00 Tuning

RESISTORS

All resistors are in ohms. Common 1/4W carbon resistors are omitted. Refer to the list on page 13 for their resistance values. (kΩ = 1000 Ω, MΩ = 1000 kΩ)

R301	⚠ 1-202-657-11	3.3 M	1/2 W	composition
R709, 710	1-202-577-11	1.5 k	1/2 W	composition
RV701, 702	1-226-298-00	50 k-D, variable; TREBLE, BASS		
RV703	⚠ 1-226-299-11	50 k-D, variable; POWER/VOL (US model) with power switch (S301)		
RV703	⚠ 1-226-299-21	50 kΩ-D, variable; POWER/VOL (Canadian model) with power switch (S301)		

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MISCELLANEOUS		
CF401	1-527-206-00	Filter, ceramic; 10.7 MHz
J301	1-507-011-00	Jack, REC OUT (Canadian model)
PL301	1-518-154-00	Lamp, dial
S401	1-552-479-00	Switch, slide, BAND SELECT
SP301	1-502-599-00	Speaker
	⚠ 1-551-509-00	Cord, power

ACCESSORIES AND PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>
3-995-808-21	Manual, instruction (US model)
3-984-063-00	Cushion
3-984-064-00	Carton (US model)
3-984-071-00	Carton (Canadian model)
3-993-159-31	Manual, instruction (Canadian model)
3-993-166-31	Leaflet, instruction (Canadian model)

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

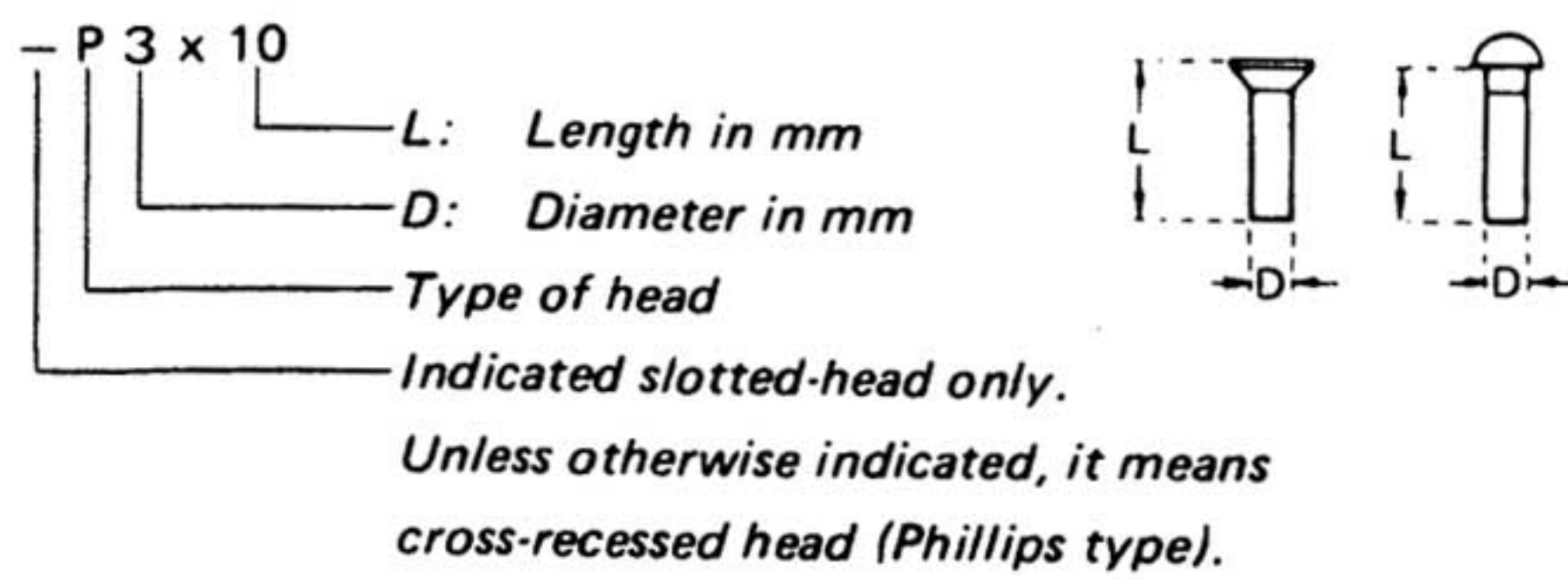
Note: Les composants identifiés par un trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

1/4 WATT CARBON RESISTORS

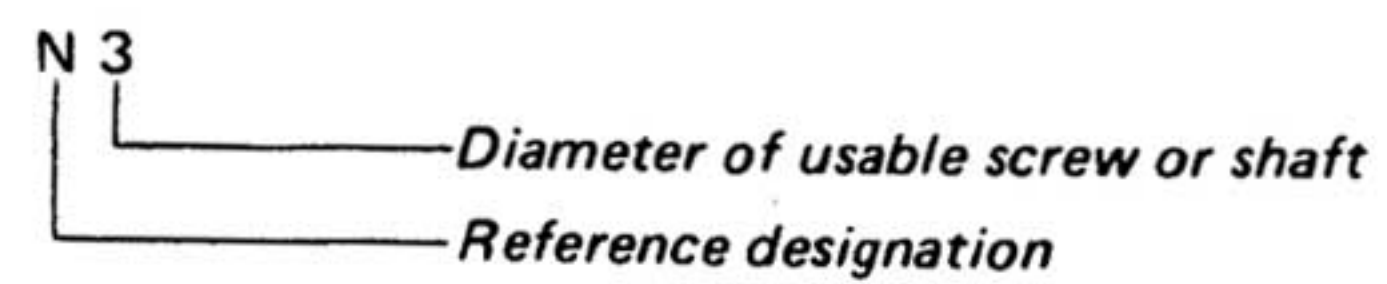
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-244-601-11	10	1-244-625-11	100	1-244-649-11	1.0k	1-244-673-11	10k	1-244-697-11	100k	1-244-721-11	1.0M	1-244-745-11
1.1	1-244-602-11	11	1-244-626-11	110	1-244-650-11	1.1k	1-244-674-11	11k	1-244-698-11	110k	1-244-722-11	1.1M	1-244-746-11
1.2	1-244-603-11	12	1-244-627-11	120	1-244-651-11	1.2k	1-244-675-11	12k	1-244-699-11	120k	1-244-723-11	1.2M	1-244-747-11
1.3	1-244-604-11	13	1-244-628-11	130	1-244-652-11	1.3k	1-244-676-11	13k	1-244-700-11	130k	1-244-724-11	1.3M	1-244-748-11
1.5	1-244-605-11	15	1-244-629-11	150	1-244-653-11	1.5k	1-244-677-11	15k	1-244-701-11	150k	1-244-725-11	1.5M	1-244-749-11
1.6	1-244-606-11	16	1-244-630-11	160	1-244-654-11	1.6k	1-244-678-11	16k	1-244-702-11	160k	1-244-726-11	1.6M	1-244-750-11
1.8	1-244-607-11	18	1-244-631-11	180	1-244-655-11	1.8k	1-244-679-11	18k	1-244-703-11	180k	1-244-727-11	1.8M	1-244-751-11
2.0	1-244-608-11	20	1-244-632-11	200	1-244-656-11	2.0k	1-244-680-11	20k	1-244-704-11	200k	1-244-728-11	2.0M	1-244-752-11
2.2	1-244-609-11	22	1-244-633-11	220	1-244-657-11	2.2k	1-244-681-11	22k	1-244-705-11	220k	1-244-729-11	2.2M	1-244-753-11
2.4	1-244-610-11	24	1-244-634-11	240	1-244-658-11	2.4k	1-244-682-11	24k	1-244-706-11	240k	1-244-730-11	2.4M	1-244-754-11
2.7	1-244-611-11	27	1-244-635-11	270	1-244-659-11	2.7k	1-244-683-11	27k	1-244-707-11	270k	1-244-731-11	2.7M	1-244-755-11
3.0	1-244-612-11	30	1-244-636-11	300	1-244-660-11	3.0k	1-244-684-11	30k	1-244-708-11	300k	1-244-732-11	3.0M	1-244-756-11
3.3	1-244-613-11	33	1-244-637-11	330	1-244-661-11	3.3k	1-244-685-11	33k	1-244-709-11	330k	1-244-733-11	3.3M	1-244-757-11
3.6	1-244-614-11	36	1-244-638-11	360	1-244-662-11	3.6k	1-244-686-11	36k	1-244-710-11	360k	1-244-734-11	3.6M	1-244-758-11
3.9	1-244-615-11	39	1-244-639-11	390	1-244-663-11	3.9k	1-244-687-11	39k	1-244-711-11	390k	1-244-735-11	3.9M	1-244-759-11
4.3	1-244-616-11	43	1-244-640-11	430	1-244-664-11	4.3k	1-244-688-11	43k	1-244-712-11	430k	1-244-736-11	4.3M	1-244-760-11
4.7	1-244-617-11	47	1-244-641-11	470	1-244-665-11	4.7k	1-244-689-11	47k	1-244-713-11	470k	1-244-737-11	4.7M	1-244-761-11
5.1	1-244-618-11	51	1-244-642-11	510	1-244-666-11	5.1k	1-244-690-11	51k	1-244-714-11	510k	1-244-738-11	5.1M	1-244-762-11
5.6	1-244-619-11	56	1-244-643-11	560	1-244-667-11	5.6k	1-244-691-11	56k	1-244-715-11	560k	1-244-739-11		
6.2	1-244-620-11	62	1-244-644-11	620	1-244-668-11	6.2k	1-244-692-11	62k	1-244-716-11	620k	1-244-740-11		
6.8	1-244-621-11	68	1-244-645-11	680	1-244-669-11	6.8k	1-244-693-11	68k	1-244-717-11	680k	1-244-741-11		
7.5	1-244-622-11	75	1-244-646-11	750	1-244-670-11	7.5k	1-244-694-11	75k	1-244-718-11	750k	1-244-742-11		
8.2	1-244-623-11	82	1-244-647-11	820	1-244-671-11	8.2k	1-244-695-11	82k	1-244-719-11	820k	1-244-743-11		
9.1	1-244-624-11	91	1-244-648-11	910	1-244-672-11	9.1k	1-244-696-11	91k	1-244-720-11	910k	1-244-744-11		

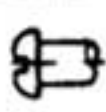







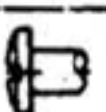

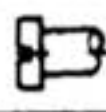
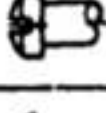
HARDWARE NOMENCLATURE

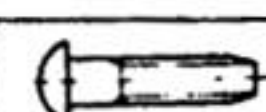
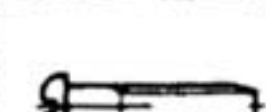

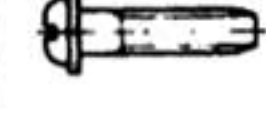
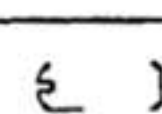
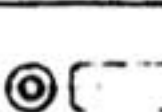







Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	