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ST-242L

AEP Model
UK Model

FM-AM PROGRAM TUNER

SPECIFICATIONS

GENERAL

- Power Requirements:** 240 V ac (or 220 V ac adjustable by authorized Sony personnel), 50 Hz (UK model)
220 V ac (or 240 V ac adjustable by authorized Sony personnel), 50 Hz (AEP model)
- Power Consumption:** 15 W
- Dimensions:** Approx. 430 (w) x 110 (h) x 315 (d) mm
17 (w) x 4 1/4 (h) x 12 3/8 (d) inches
including projecting parts and controls
- Weight:** Approx. 4.3 kg, 9 lb 8 oz (net)
Approx. 5.8 kg, 12 lb 13 oz (in shipping carton)

FM TUNER SECTION

- Tuning Range:** 87.5 – 108 MHz
- Antenna Terminals:** 300 Ω balanced
75 Ω unbalanced
- Intermediate Frequency:** 10.7 MHz

- Sensitivity at 46dB Quieting**
(at 40kHz deviation): 4.0 μ V (mono)
45 μ V (stereo)
- Usable Sensitivity:** IHF 1.8 μ V, 10.3 dBf
1.6 μ V (S/N = 26 dB, 40 kHz deviation)
- Signal-to-Noise Ratio:** 69 dB (mono)
64 dB (stereo)
- Harmonic Distortion:** 0.2 % (mono)
0.3 % (stereo)
at 1 kHz
- IM Distortion:** 0.2 % (mono)
0.3 % (stereo)
- Separation:** 45 dB at 1 kHz
- Frequency Response:** 40 Hz – 12.5 kHz $+0.5$ dB
 -1 dB
- Selectivity at 300kHz**
(at 40kHz deviation,
S/N = 26dB): 40 dB

— Continued on page 2 —

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.

SONY[®]

SERVICE MANUAL

ST-242L

Capture Ratio: 1.5 dB
AM Suppression Ratio: 48 dB
Image Response Ratio: 45 dB
Spurious Response Ratio: 70 dB
Muting Threshold: Approx. 5 μ V
Output Level: 450 mV, 15 k Ω (40 kHz deviation)

MW/LW TUNER SECTION

	MW	LW
Tuning range	522 kHz – 1,602 kHz	150 kHz – 350 kHz
Antenna	Built-in ferrite-rod antenna, External antenna terminal	
Intermediate frequency	450 kHz	
Usable sensitivity	250 μ V/m, built-in antenna (1,000 kHz) 100 μ V, external antenna (1,000 kHz)	500 μ V/m, built-in antenna (230 kHz) 100 μ V, external antenna (230 kHz)
Signal-to noise ratio	52 dB (50 mV/m)	52 dB (50 mV/m)
Harmonic distortion	0.3 % (50 mV/m, 400 Hz)	0.3 % (50 mV/m, 400 Hz)
Selectivity	35 dB (9 kHz)	35 dB (9 kHz)

SERVICING NOTE

MELF (Metal Electrodes Face-Bonding) Components

Warning

If MELF components are forcibly removed from the printed circuit board with pincers or pliers, the circuit board pattern is likely to peel away. Always remove MELF components according to the procedure described on the next page. Replace MELF components with the lead type components.

MELF components are soldered directly to the surface of the printed circuit board.

MELF resistors and capacitors have the same dimensions and are distinguished by their background colors: light brown for resistors, and pink or light green for capacitors.

The MELF resistor color coding is the same as for conventional resistors, and MELF capacitor color coding is the same as for tube-type ceramic capacitors. Note, however, that all MELF resistors are rated at $\frac{1}{4}$ W and $\pm 5\%$.

Components larger than resistors and without a color code are cross conductors, which are used instead of jumper wires.

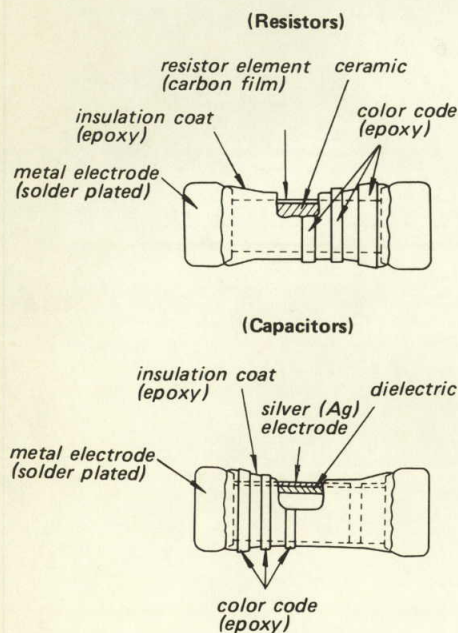
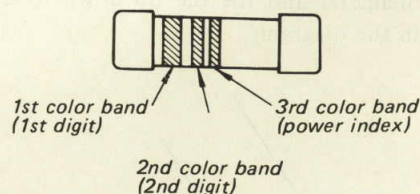
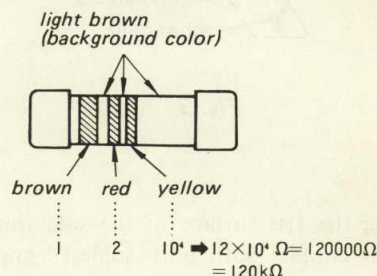
1. Structure

Fig. 1

2. Color Code Reading**(Example of Resistor)****(Example of Capacitor)**

background color { pink 25 V voltage resistance
light green 50 V voltage resistance

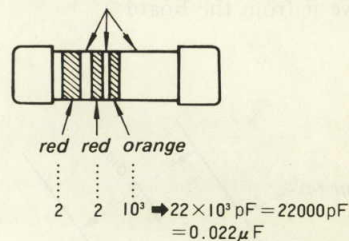


Fig. 2

3. How to Remove MELF Components and Mount Replacements

Use a soldering iron of at least 40W with an iron tip 4 mm in diameter and file the tip down to the angle shown in the diagram.

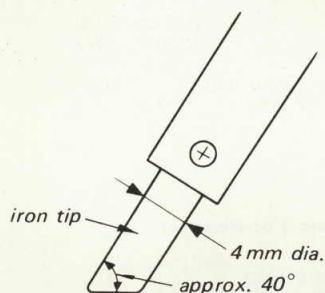


Fig. 3

1. Bring the flat surface of the soldering iron in equal contact with both soldered ends of the component.
2. The solder should melt in about 4 seconds. (The solder will melt more readily if a small amount of solder is attached to the iron tip and the iron tip is placed against the component.)
3. Once the solder has melted, tap the component aside with the tip of the soldering iron, and remove it from the board.

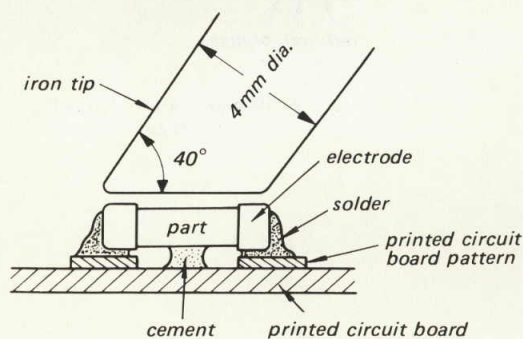


Fig. 4

4. Use lead type resistors or capacitors to replace the MELF components.

These replacements may be mounted either with short leads (see Fig. 5), or by covering a lead with tubing (see Fig. 6).

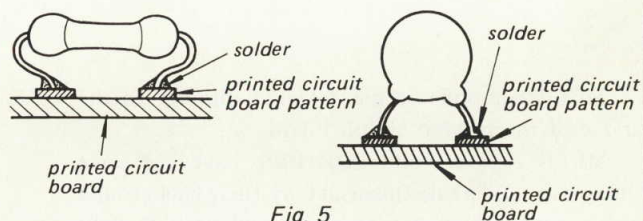


Fig. 5

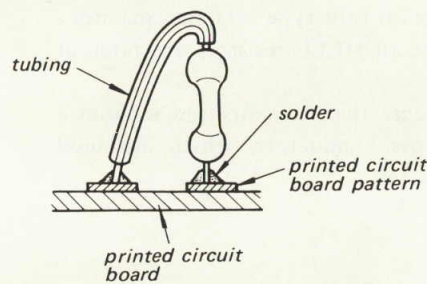
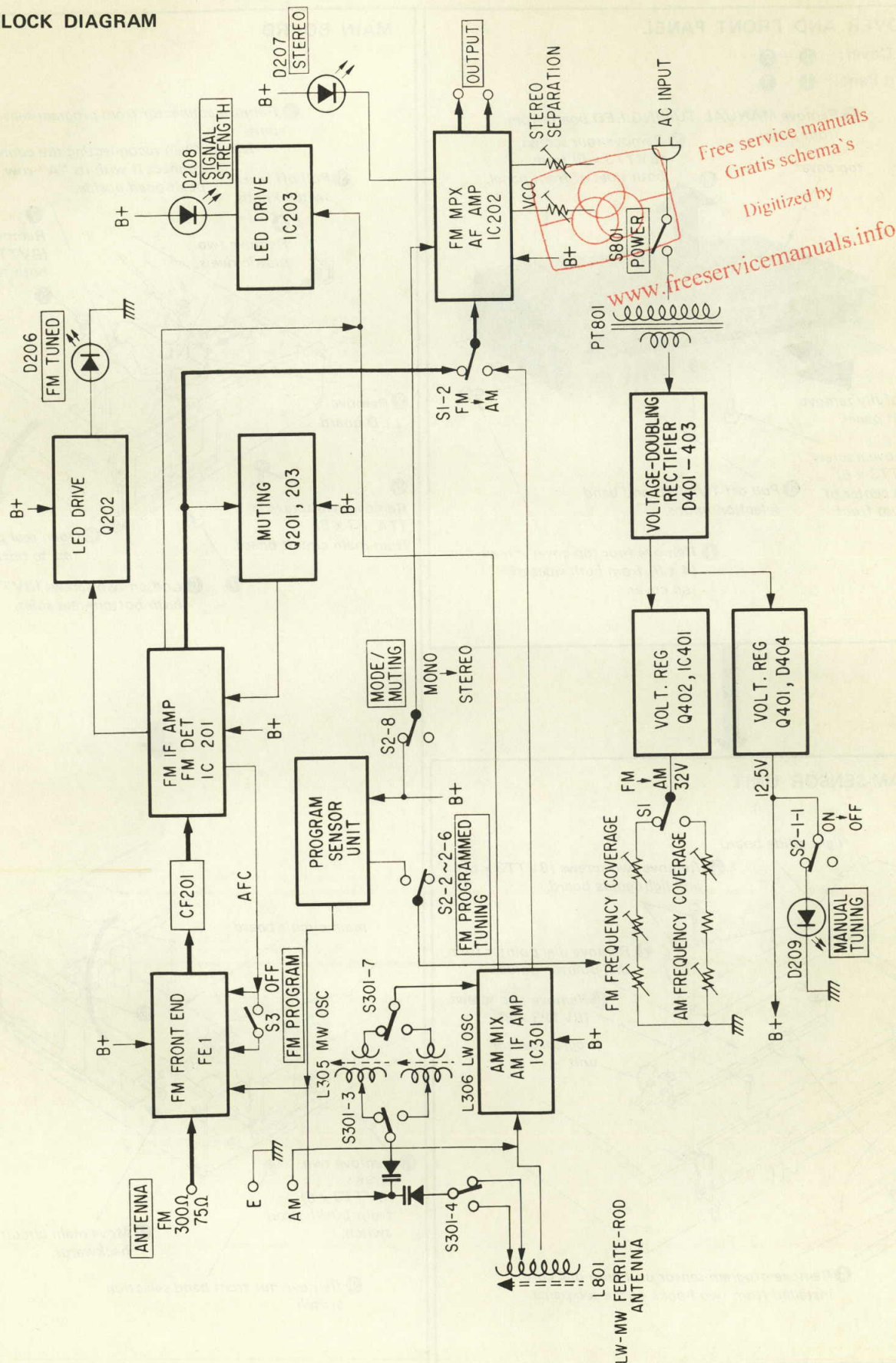


Fig. 6

SECTION 1 OUTLINE

1-1. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY

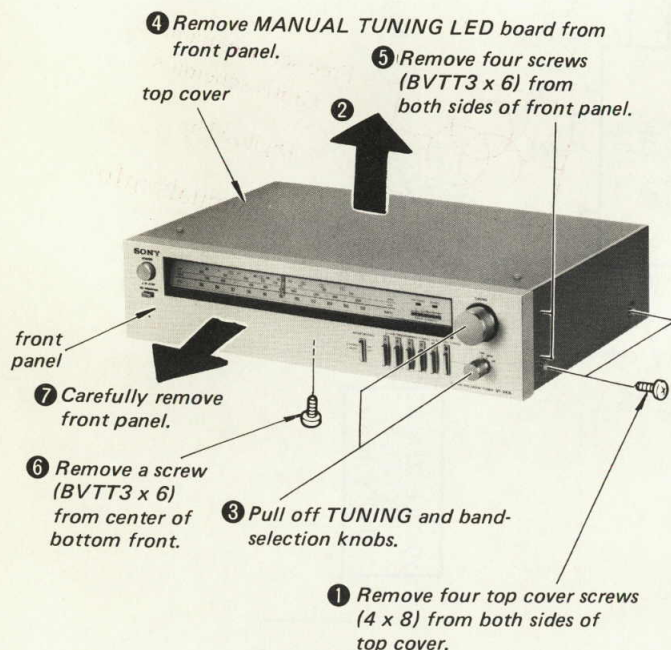
2-1. DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

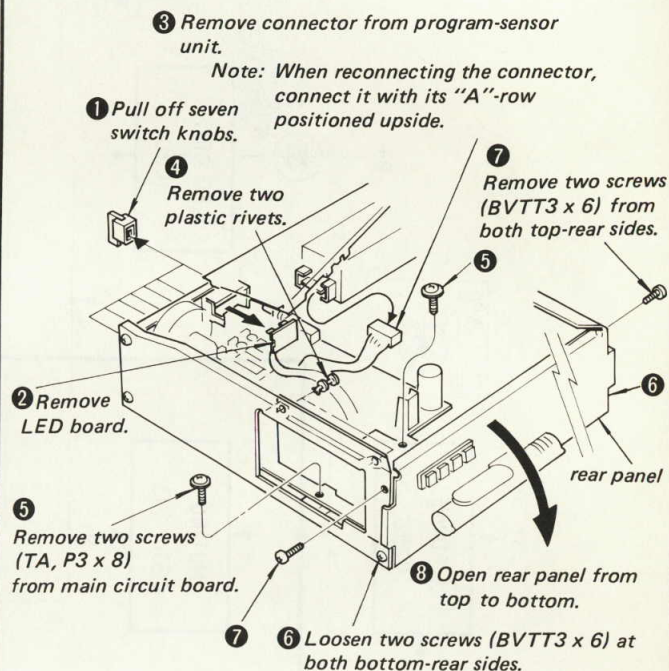
TOP COVER AND FRONT PANEL

Top Cover: ① - ②

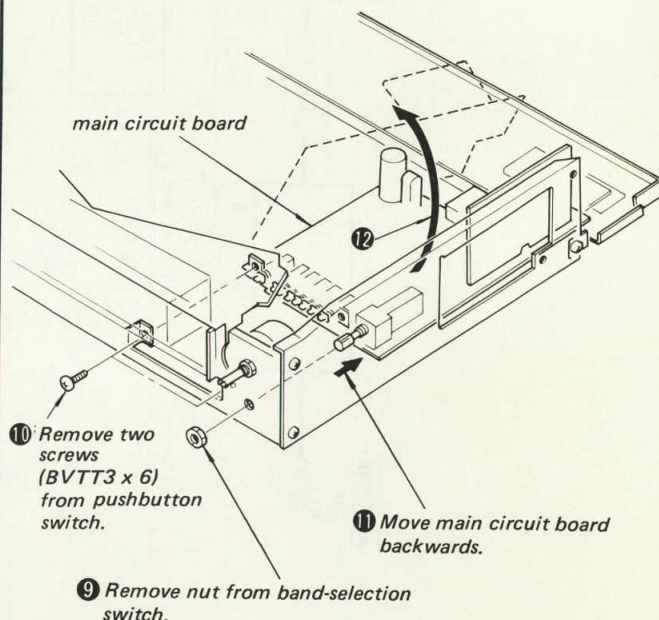
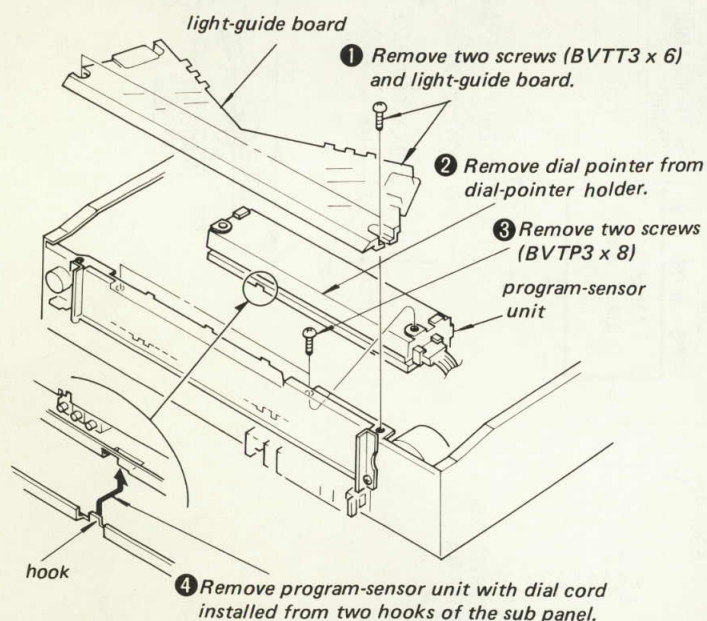
Front Panel: ① - ⑦



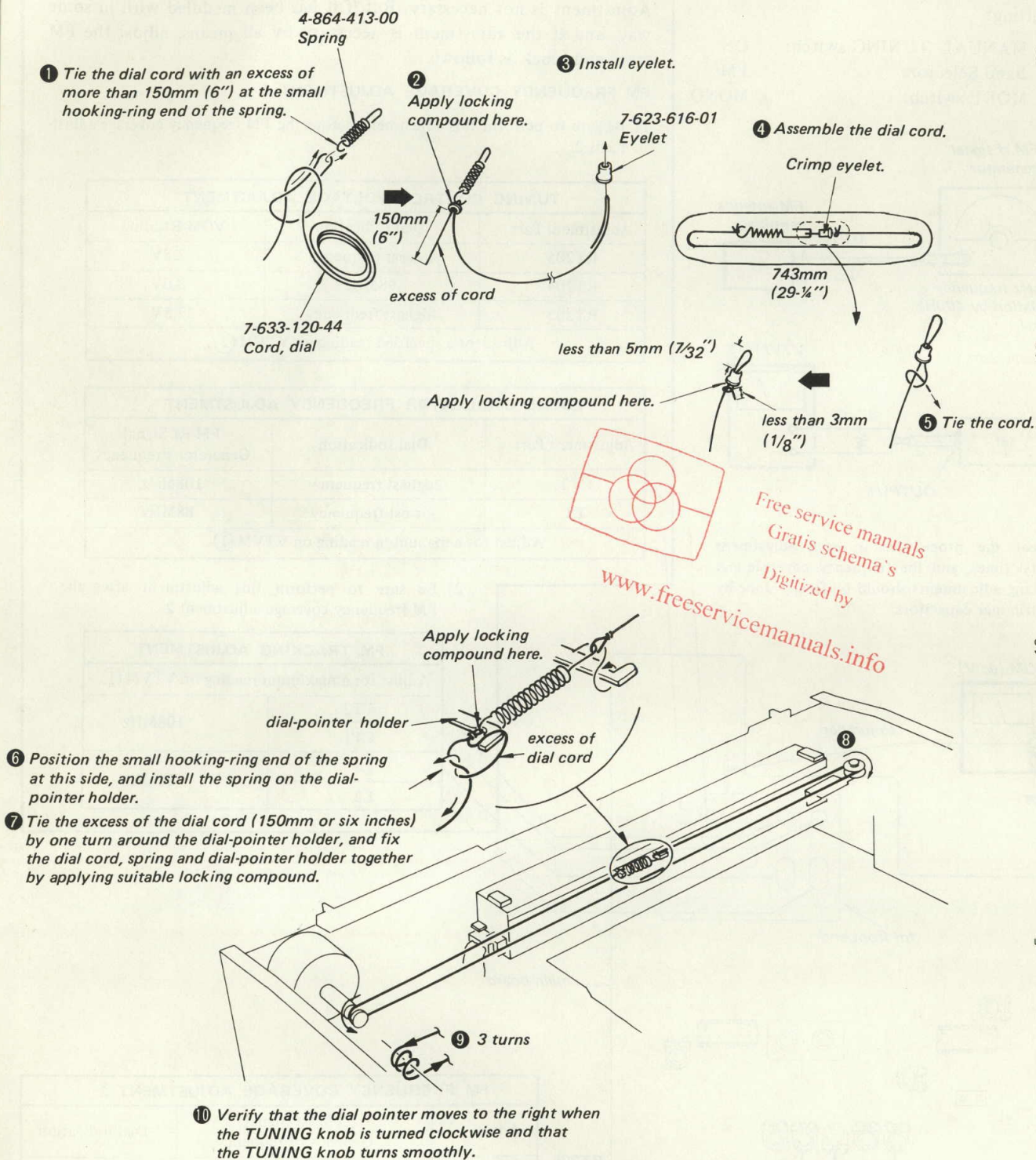
MAIN BOARD



PROGRAM-SENSOR UNIT



2-2. DIAL-CORD STRINGING



Setting:

MANUAL TUNING switch: ON
Band Selector: FM
MODE switch: MONO

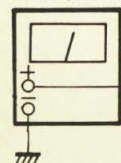
75kHz frequency
deviation by 400Hz
signal

VTVM (1)

OUTPUT

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

VOM (dc V)



to jumper

fm front end

- *main board*

FM FRONT-END BLOCK

Adjustment is not necessary. But if it has been meddled with in some way, and if the adjustment is necessary by all means, adjust the FM front-end block as follows.

FM FREQUENCY COVERAGE ADJUSTMENT 1

- 1) Be sure to perform this adjustment before the FM frequency coverage adjustment 2.

TUNING CONTROL VOLTAGE ADJUSTMENT

Adjustment Part	Dial Indication	VOM Reading
RT205	lowest frequency	2.8V
RT204	98MHz	8.0V
RT203	highest frequency	22.5V

Adjust for a specified reading on VTVM ②.

LOCAL OSCILLATOR FREQUENCY ADJUSTMENT

Adjustment Part	Dial Indication	FM Rf Signal Generator Frequency
CT3	highest frequency	108MHz
T2	lowest frequency	88MHz

Adjust for a maximum reading on VTVM ①.

- 2) Be sure to perform this adjustment after the FM frequency coverage adjustment 2.

FM TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM ①.

CT2	108MHz
CT1	
L4	88MHz
L2	

FM FREQUENCY COVERAGE ADJUSTMENT 2

Adjust	FM Rf Signal Generator Frequency	Dial Indication
RT205	88MHz	88MHz
RT204	98MHz	98MHz
RT203	108MHz	108MHz
Adjust for a maximum reading on VTVM (1).		

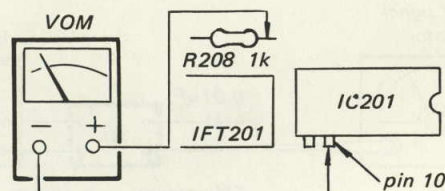
FM DISCRIMINATOR ALIGNMENT 1**Setting:**

MANUAL TUNING switch: ON
 Band Selector: FM
 MODE switch: MONO
 TUNING: Detuned position

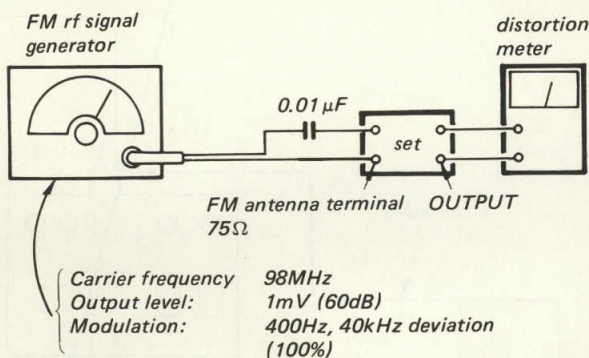
Procedure:

Adjust the orange core (primary-side) of IFT201 for 0V reading on VOM.

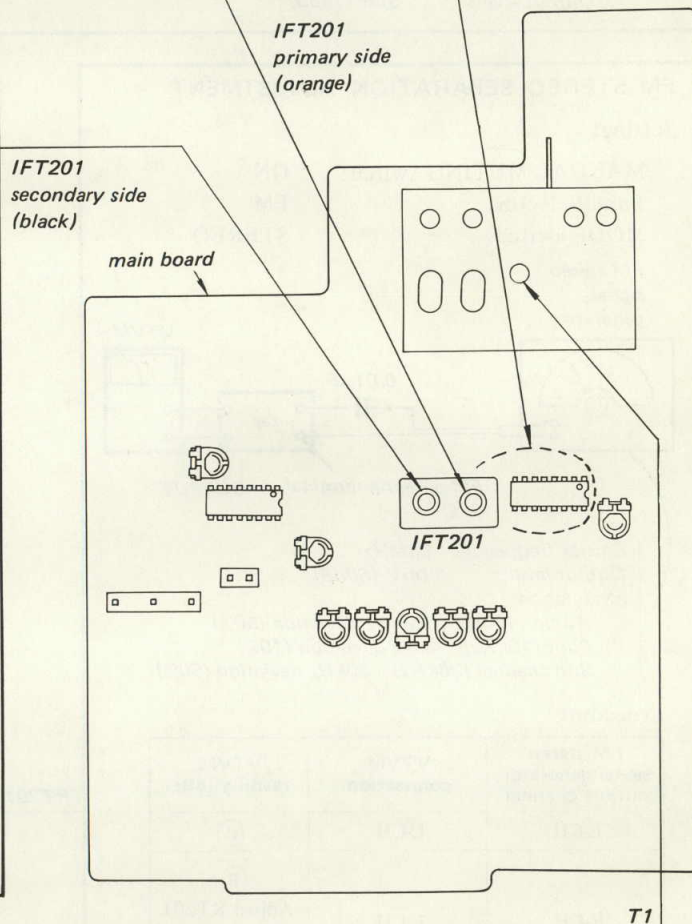
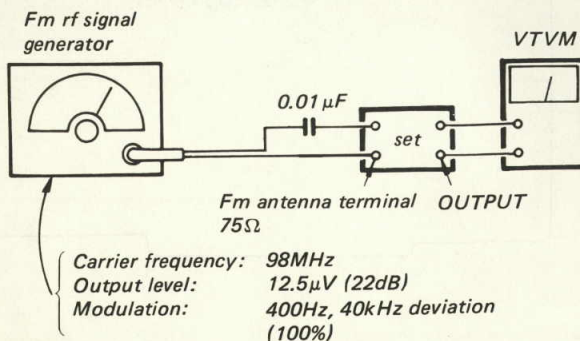
Note: When replacing the ceramic filter (CF201), perform this alignment.

**FM DISCRIMINATOR ALIGNMENT 2****Setting:**

MANUAL TUNING switch: ON
 Band Selector: FM
 MODE switch: MONO

**Procedure:**

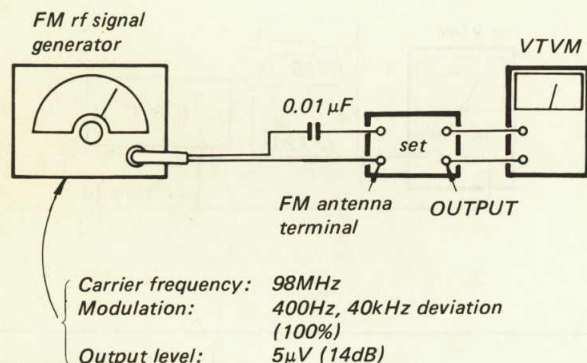
Adjust the black core (secondary side) of IFT201 for minimum distortion.

**FM IF ALIGNMENT****Setting:**

MANUAL TUNING switch: ON
 Band Selector: FM
 MODE switch: MONO

Procedure:

Adjust T1 for maximum reading on the VTVM.

ST-242L**MUTING LEVEL ADJUSTMENT****Setting:**

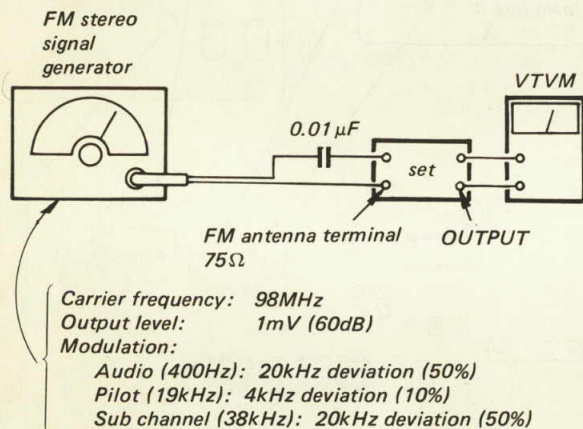
MANUAL TUNING switch: ON
 MODE switch: STEREO

Procedure:

1. Turn RT208 and stop it just when the VTVM indication suddenly increases.
2. If necessary, turn RT208 fully clockwise and make sure that the VTVM indication increases when the output level of the FM rf signal generator is set to 16μV (24dB).

FM STEREO SEPARATION ADJUSTMENT**Setting:**

MANUAL MUTING switch: ON
 Band Selector: FM
 MODE switch: STEREO

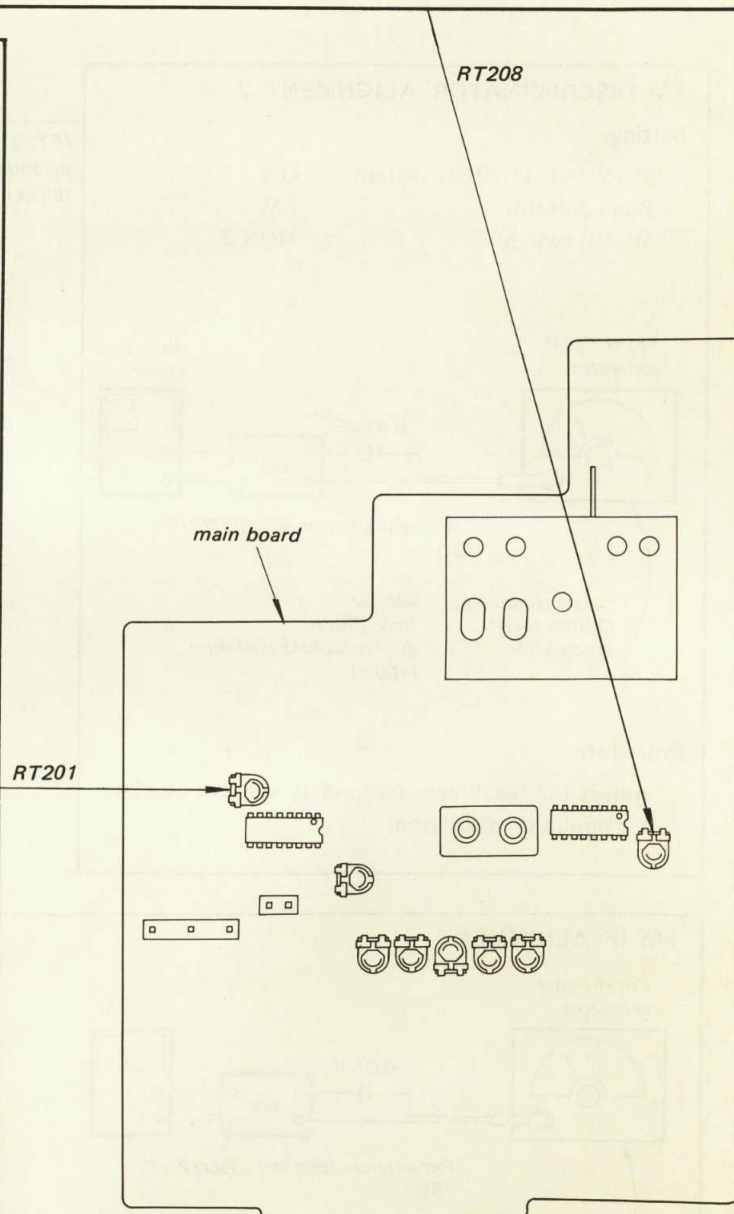
**Procedure:**

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	(A)
R-CH	L-CH	(B) Adjust RT201 for minimum reading.
R-CH	R-CH	(C)
L-CH	R-CH	(D) Adjust RT201 for minimum reading.

L-CH Stereo separation: (A) - (B)

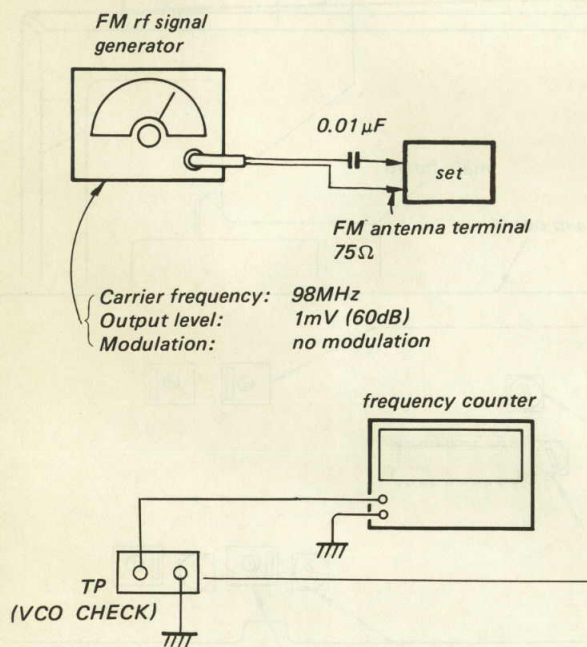
R-CH Stereo separation: (C) - (D)

The difference between separations (A) - (B) and (C) - (D) are to be equal.



19kHz VCO ADJUSTMENT**Setting:**

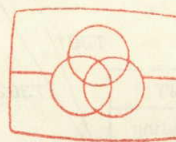
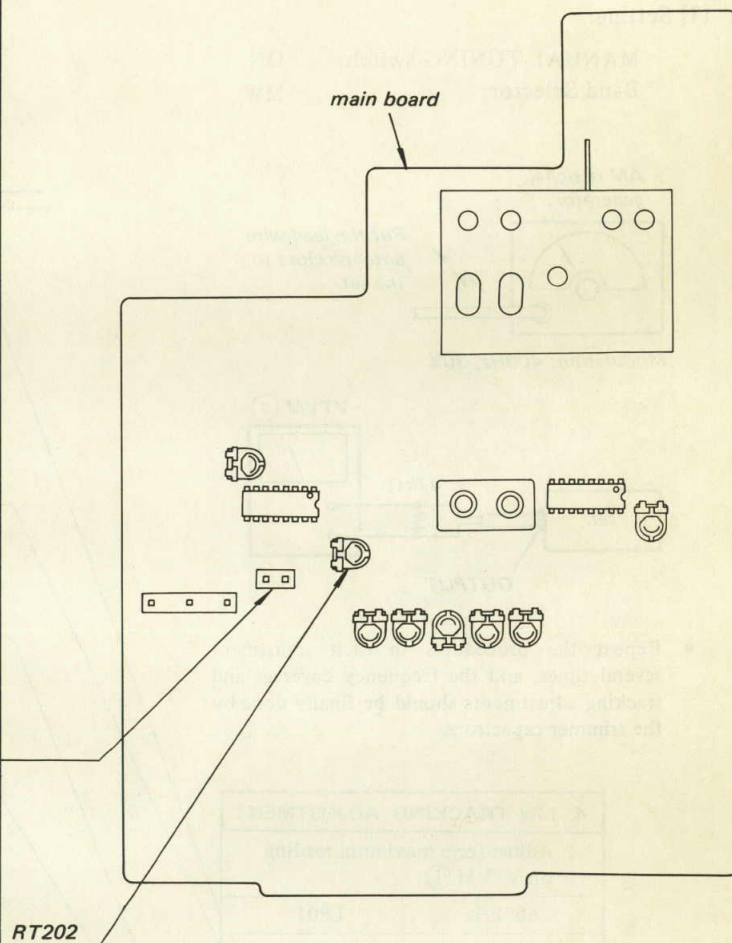
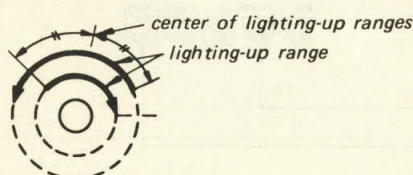
FUNCTION switch: TUNER
 Band Selector: FM
 MODE switch: STEREO

A) Regular Method**Procedure:**

Adjust RT202 for 19kHz $\pm$ 50Hz on the frequency counter.

B) Simple Method

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT202 clockwise or counterclockwise and memorize the lighting-up ranges of STEREO lamp.
3. Secure RT202 at the center of the overlapped lighting-up range in both turning directions as shown below.



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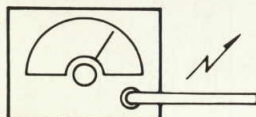
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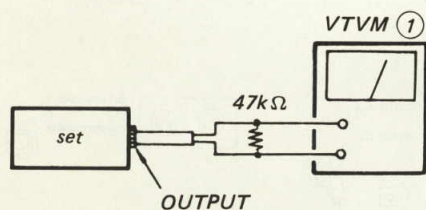
ST-242L**AM SECTION****(1) Setting:**

MANUAL TUNING switch: ON

Band Selector: MW

AM rf signal
generatorPut the lead-wire
antenna close to
the set.

Modulation: 400Hz, 30%



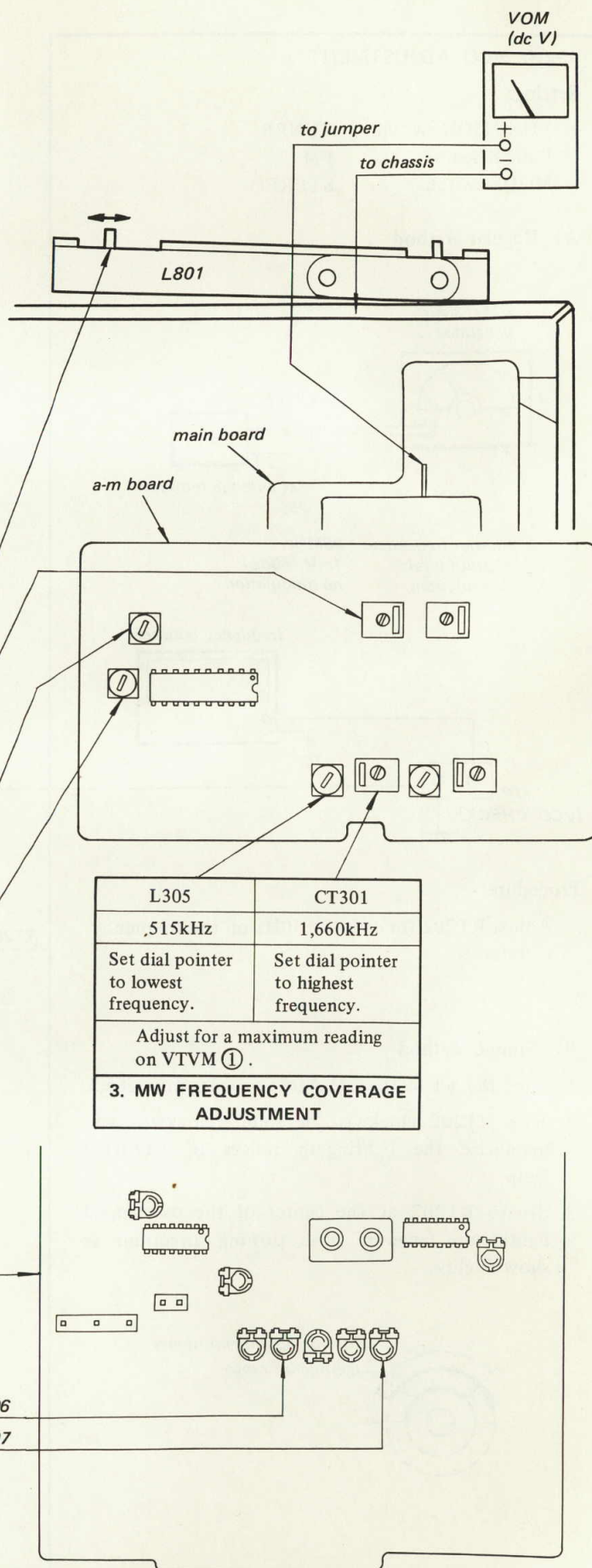
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

4. MW TRACKING ADJUSTMENTAdjust for a maximum reading
on VTVM ①.

600kHz	L801
1,400kHz	CT301

1. AM IF ALIGNMENTAdjust for a maximum reading
on VTVM ①.

450kHz	T301, T302
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**2. AM TUNING VOLTAGE ADJUSTMENT**

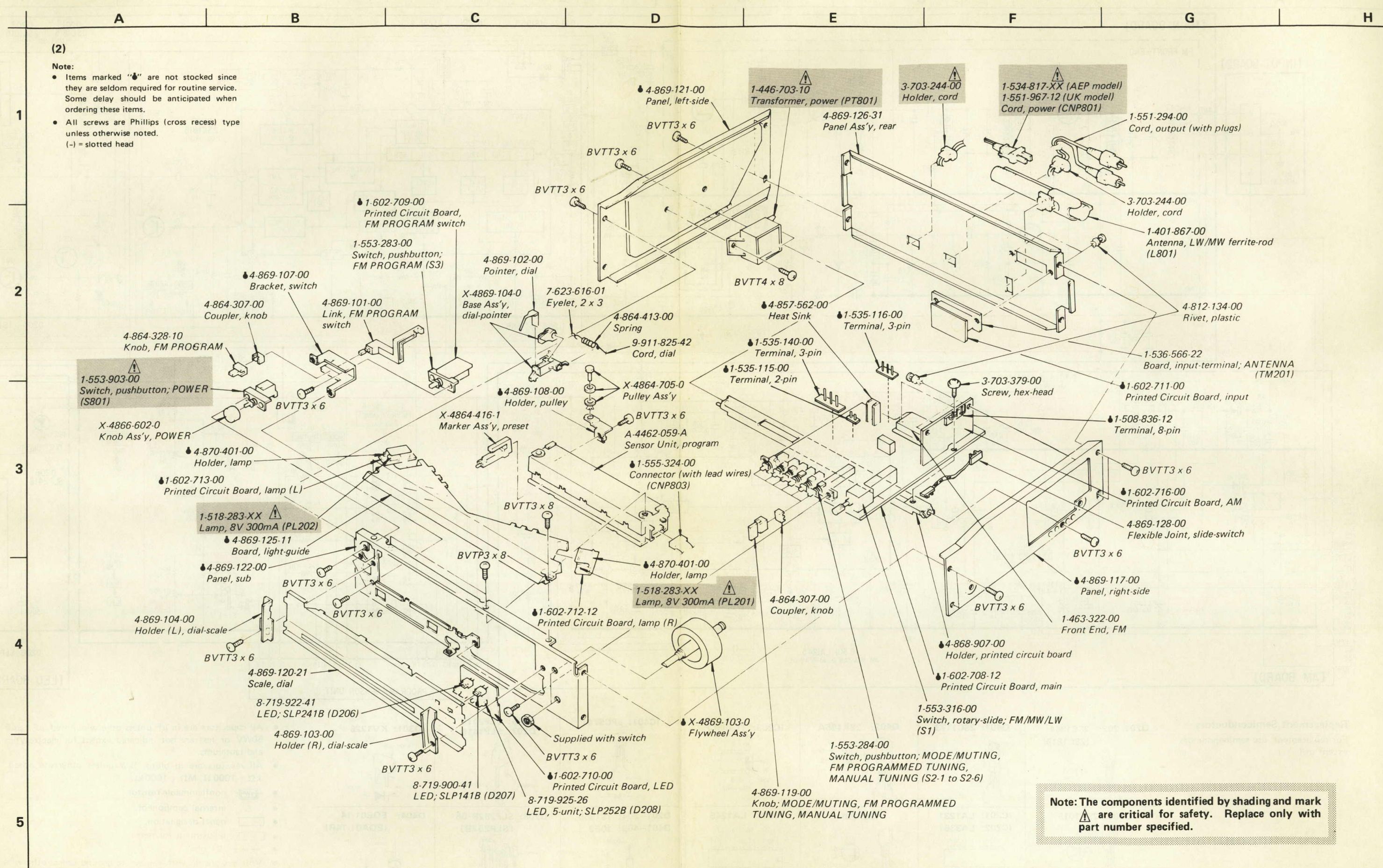
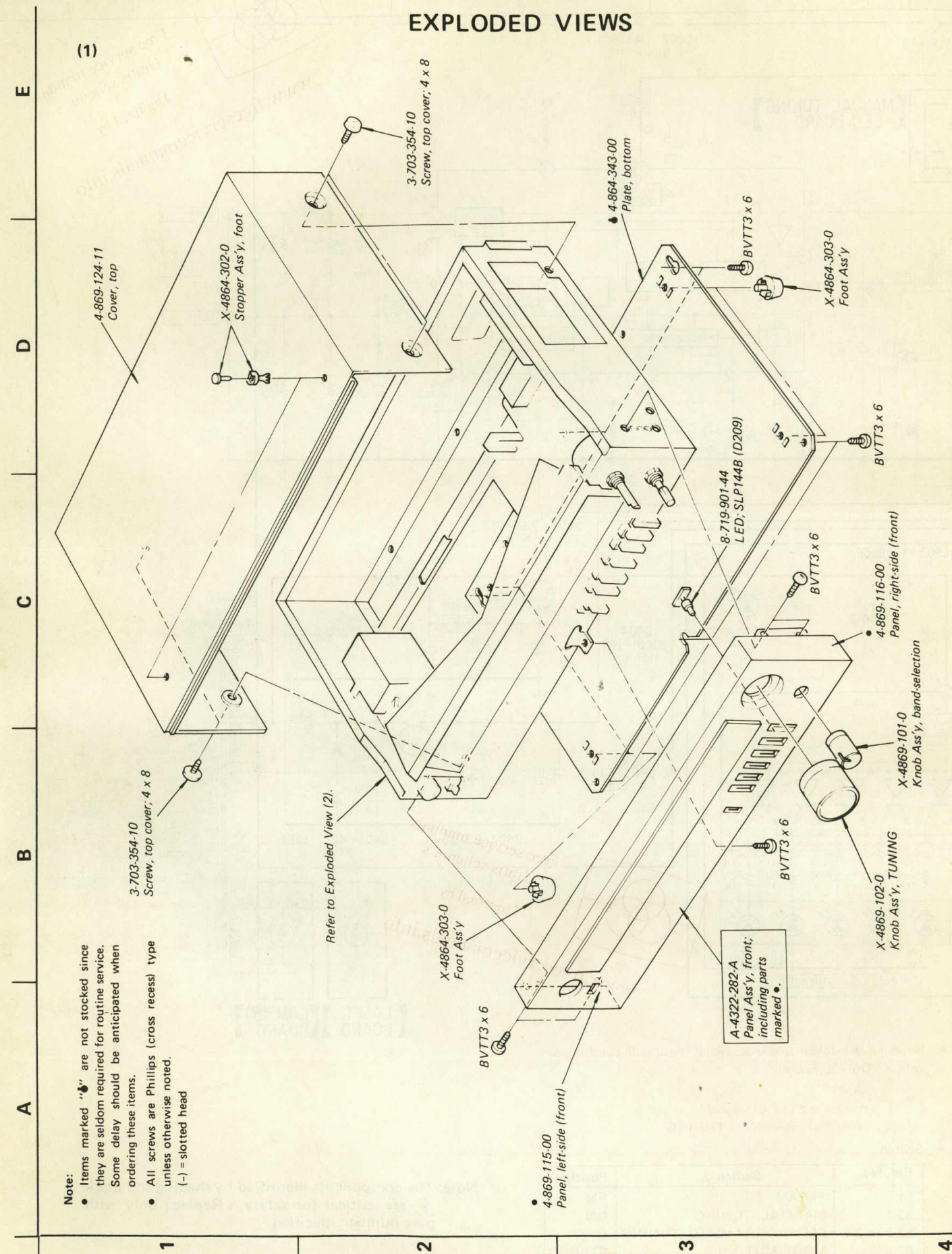
Dial Indication	VOM Reading	Adjust
highest frequency	25V	RT206
lowest frequency	1V	RT207

L306	CT302
145kHz	365kHz
Set dial pointer to lowest frequency.	Set dial pointer to highest frequency.
Adjust for a maximum reading on VTVM (1).	
LW FREQUENCY COVERAGE ADJUSTMENT	

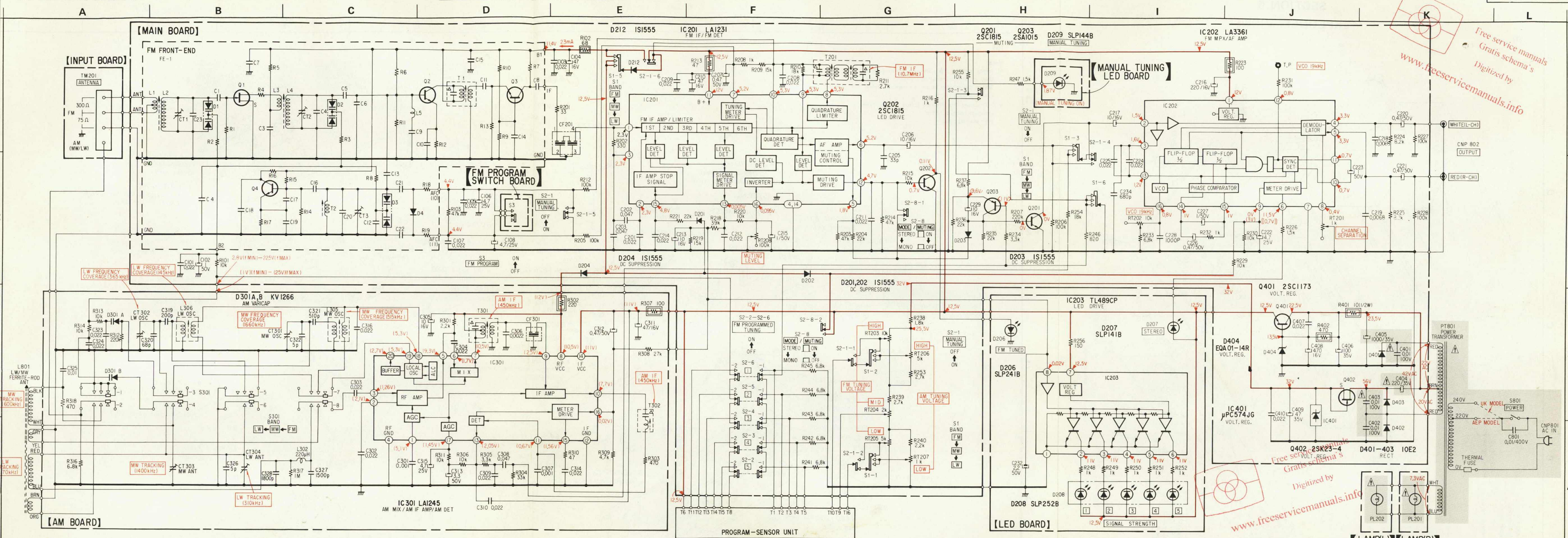
MEMO

SECTION 5

EXPLODED VIEWS



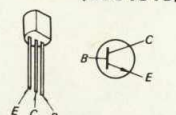
4-2. SCHEMATIC DIAGRAM



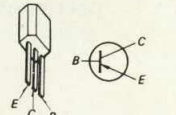
Replacement Semiconductors

For replacement, use semiconductors except in ()

Q201, 202: 2SC1364
(2SC1815)

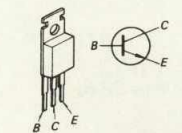


Q203: 2SA1015

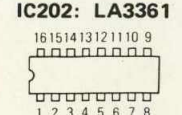


-17

Q401: 2SC1173

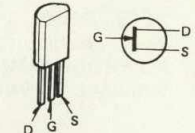


IC201: LA1231

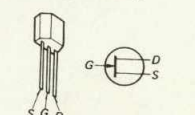


(Top view)

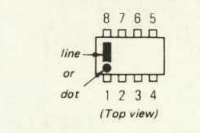
Q402: 2SK105A



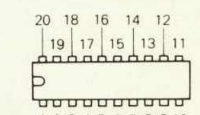
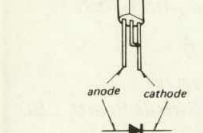
(2SK23)



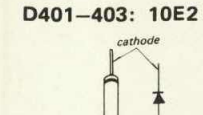
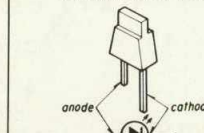
IC203: TL489CP



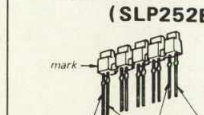
IC301: LA1245

IC401: μ PC574

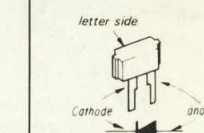
D201-204: 1S155

D206: SLP241
D207: SLP141

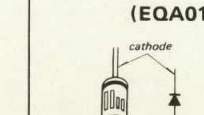
D208: SLP252B-



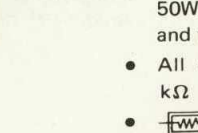
D301: KV1226



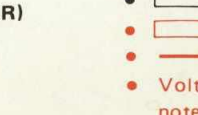
	D404: EQB01-
--	--------------



- All c



— • $\triangle$
— • $\square$



- All capacitors are in μF unless otherwise noted. $\text{pF} : \mu\text{F}$ 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, $\frac{1}{4}W$ unless otherwise noted.
 $k\Omega : 1000\Omega$, $M\Omega : 1000k\Omega$
-  : nonflammable resistor.
- $\triangle$: internal component.
-  : panel designation.
-  : adjustment for repair.
-  : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.

- Readings are taken under no-signal (detuned) conditions with a VOM (20 k Ω /V).

- () : AM
 [] : tuned in STEREO signal.
 < > : FM PROGRAMMED TUNING

- Switch

Ref. No.	Switch	Position
S1	FM/AM	FM
S2-1	MANUAL TUNING	ON
S2-2 to 2-6	FM PROGRAMMED TUNING	OFF
S2-8	MODE/MUTING	STEREO
S3	FM PROGRAM	OFF
S801	POWER	OFF

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

SECTION 6

ELECTRICAL PARTS LIST

Ref. No. Part No. Description

SEMICONDUCTORS

Transistors

Q201, 202	8-729-663-47	2SC1364
Q203	8-729-201-52	2SA1015
Q401	8-729-217-33	2SC1173
Q402	8-729-105-40	2SK105A

ICs

IC201	8-759-812-31	LA1231
IC202	8-759-833-61	LA3361
IC203	8-759-904-89	TL489CP
IC301	8-759-812-45	LA1245
IC401	8-759-157-40	μ PC574J

Diodes

D201-204	8-719-815-55	1S1555
D206	8-719-922-41	SLP241B
D207	8-719-900-41	SLP141B
D208	8-719-925-26	SLP252B
D209	8-719-901-44	SLP144B
D301	8-719-912-27	KV1226
D401-403	8-719-200-02	10E2
D404	8-719-931-14	EQB01-14

COILS AND TRANSFORMERS

L302	1-407-173-XX	220 μ H, microinductor
L305	1-405-907-00	Coil, MW osc
L306	1-405-914-00	Coil, LW osc
L801	1-401-867-00	Antenna, LW/MW ferrite-rod

PT801	Δ 1-446-703-10	Transformer, power
-------	-----------------------	--------------------

T201	1-404-170-00	IFT, FM
T301	1-404-348-00	IFT, AM
T302	1-404-266-00	IFT, AM

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 and tantalum. p : μ F, elect : electrolytic

C401-403	Δ 1-108-377-00	0.01	100V	mylar
C404	Δ 1-123-346-00	220	35V	elect
C405	Δ 1-123-349-00	1000	35V	elect
C801	Δ 1-161-744-00	0.01	400V	ceramic

CT301-304	1-141-171-XX	Trimmer
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RESISTORS

All resistors are in ohms. Common $\frac{1}{4}$ W carbon resistors are omitted. Refer to the list on the last page for their part numbers.
k Ω : 1000 Ω , M Ω : 1000k Ω

R102	1-247-103-00	68	5%	carbon (nonflammable)
R213	1-247-099-00	47	5%	carbon (nonflammable)
R223	1-247-107-00	100	5%	carbon (nonflammable)
R302	1-247-115-00	220	5%	carbon (nonflammable)
R307	1-247-107-00	100	5%	carbon (nonflammable)

R316	1-202-593-00	6.8k	$\frac{1}{2}$ W	composition
R401	1-247-192-00	10	5%	$\frac{1}{2}$ W carbon (nonflammable)
R402	1-247-123-00	470	5%	carbon (nonflammable)
R801	1-202-723-00	2.2M	$\frac{1}{2}$ W	composition

RT201	1-226-233-00	1k (B), adjustable; stereo separation
RT202	1-226-236-00	10k (B), adjustable; 19kHz VCO
RT203	1-226-236-00	10k (B), adjustable; FM tuning voltage
RT204	1-226-234-00	2k (B), adjustable; FM tuning voltage
RT205	1-226-235-00	5k (B), adjustable; FM tuning voltage

RT206	1-226-235-00	5k (B), adjustable; AM tuning voltage
RT207	1-226-233-00	1k (B), adjustable; AM tuning voltage
RT208	1-226-239-00	100k (B), adjustable; FM muting level

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

SI-242L

Ref. No. Part No. Description

MISCELLANEOUS

CF201	1-527-534-00	Filter, FM
CF301	1-527-599-00	Filter, AM
CNP801	⚠ 1-534-817-XX	Cord, power (AEP model)
	⚠ 1-551-967-12	Cord, power (UK model)
CNP802	1-551-294-00	Cord, output (with plugs)
CNP803	⚡ 1-555-324-00	Connector (with lead wires)
FE1	1-463-322-00	Front End, FM
PL201, 202	⚠ 1-518-283-XX	Lamp, 8V 300mA
S1	1-553-316-00	Switch, rotary-slide; FM-MW-LW
S2	1-553-284-00	Switch, pushbutton; MODE/MUTING, FM PROGRAMMED TUNING, MANUAL TUNING
S3	1-553-283-00	Switch, pushbutton; FM PROGRAM
S301	1-553-314-00	Switch, slide; band-selection
S801	⚠ 1-552-903-00	Switch, pushbutton; POWER
TM201	1-536-566-22	Board, input-terminal; ANTENNA
	⚡ 1-508-836-12	Terminal, 8-pin
	⚡ 1-535-115-00	Terminal, 2-pin
	⚡ 1-535-116-00	Terminal, 3-pin
	⚡ 1-535-140-00	Terminal, 3-pin

PRINTED CIRCUIT BOARDS

⚡ 1-602-708-12	Main
⚡ 1-602-709-00	FM PROGRAM switch
⚡ 1-602-710-00	LED
⚡ 1-602-711-00	Input
⚡ 1-602-712-12	Lamp (R)
⚡ 1-602-713-00	Lamp (L)
⚡ 1-602-714-00	LED
⚡ 1-602-716-00	AM

- Items marked "⚡" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

ACCESSORIES AND PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>
1-501-184-00	Antenna, FM feeder
3-701-630-00	Bag, plastic
3-783-223-11	Manual, instruction
3-794-871-11	Card, instruction
3-794-962-11	Manual, instruction (Dutch and Swedish)
4-864-354-00	Sheet, plastic
4-868-927-11	Cushion (A)
4-868-928-11	Cushion (B)
4-869-132-00	Carton

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

ELECTROLYTIC CAPACITORS

RATING → : Use the high voltage rated one.						
CAP. (μF)	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	—	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	—
3300	1-121-661-00	1-123-075-00	1-123-071-00	—	—	—

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	—	—	—	—
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	—	1-123-028-00
3.3	1-121-995-00	—	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	—	—
47	1-123-251-00	1-121-919-00	—	—
100	1-123-084-00	—	—	—

CERAMIC CAPACITORS

RATING							
CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

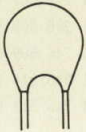
0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

RATING → : Use the high voltage rated one.					
CAP. (μF)	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

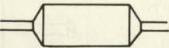
MYLAR CAPACITORS

RATING											
CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	—	—
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	—	—
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	—	—
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	—	—
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				



TANTALUM CAPACITORS

RATING → : Use the high voltage rated one.							
CAP. (μF)	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00
0.015						→	1-131-397-00
0.022						→	1-131-398-00
0.033						→	1-131-399-00
0.047						→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	—	—	—	—	1-131-412-00	→	1-131-406-00
0.68	—	—	—	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	—	—	1-131-418-00	—	1-131-413-00	→	1-131-408-00
1.5	—	1-131-421-00	—	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	—	1-131-419-00	—	1-131-414-00	1-131-355-00	1-131-349-00
3.3	—	1-131-422-00	—	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	—	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	—	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	—
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	—			
68	1-131-394-00	1-131-388-00	—	—			
100	1-131-395-00	—	—	—			



TANTALUM CAPACITORS

RATING						
CAP. (μF)	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			—	—	1-131-262-00	1-131-278-00
0.33			—	—	1-131-263-00	1-131-279-00
0.47			1-131-169-00	—	1-131-264-00	1-131-280-00
0.68			—	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	—	1-131-266-00	1-131-282-00
1.5		1-131-250-00	—	—	1-131-267-00	1-131-283-00
2.2		—	—	1-131-259-00	1-131-268-00	1-131-284-00
3.3		—	1-131-255-00	—	1-131-269-00	—
4.7		1-131-251-00	1-131-171-00	—	1-131-270-00	—
6.8		—	—	1-131-260-00	1-131-271-00	—
10	—	—	1-131-256-00	—	1-131-272-00	—
15	—	1-131-252-00	—	1-131-261-00		
22	—	—	1-131-257-00	—		
33	1-131-176-00	1-131-253-00	1-131-173-00	—		
47	1-131-288-00	1-131-174-00	—	—		
100	1-131-177-00					

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	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:

P 3 x 10

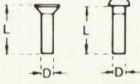
L: Length in mm

D: Diameter in mm

Type of head

Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

N 3

Diameter of usable screw or shaft

Reference designation

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	