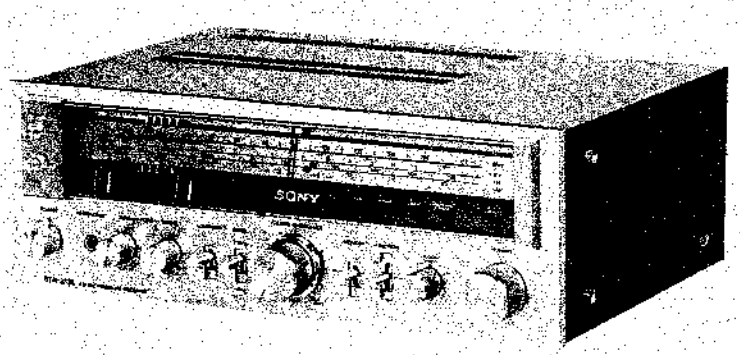
STR-313L

AEP Model
UK Model



FM-AM PROGRAM RECEIVER

SPECIFICATIONS

GENERAL

Power Requirements: 240V ac, 50Hz(UK model)
120V, 220V or 240V ac adjustable, 50Hz(AEP model)

Power Consumption: 210W(UK model)
180W(AEP model)

Dimensions: Approx. 410(w)x145(h)x310(d)mm
16(w)x5 3/4 (h)x12 1/8 (d) inches
including projecting parts and controls

Weight: Approx. 7.6kg, 16 lb 13 oz (net)
Approx. 8.8kg, 19 lb 7 oz (in shipping carton)

FM SECTION

Frequency Range: 87.5—108MHz

Antenna: 300 Ω balanced
75 Ω unbalanced

Intermediate Frequency: 10.7MHz

Sensitivity at 50dB Quieting: 3.5μV (10.7dB) (MONO)
45μV (33dB) (STEREO)

Sensitivity at 46dB Quieting: 4μV (12dB) (MONO)
(at 40kHz deviation) 50μV (34dB) (STEREO)

Usable Sensitivity: 1.8μV (5dB), IHF
(at 40kHz deviation) 1.6μV (4dB), S/N=26dB

S/N Ratio: 75dB (MONO)
70dB (STEREO)

Harmonic Distortion: At 100Hz
0.2% (MONO)
0.3% (STEREO)
At 1kHz
0.2% (MONO)
0.3% (STEREO)
At 10kHz
0.3% (MONO)
0.5% (STEREO)

IM Distortion: 0.2% (MONO)
0.3% (STEREO)

Separation: 30dB at 100Hz
45dB at 1 kHz
35dB at 10kHz

Frequency Response: 40—12, 500Hz $^{+0.5}_{-1.0}$ dB
30—15, 000Hz $^{+0.5}_{-2.0}$ 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

STR-313L

Selectivity: 60dB (400kHz)
40dB (300kHz, S/N=26dB, 40kHz deviation)
Capture Ratio: 1.0dB
AM Suppression Ratio: 54dB
Image Response Ratio: 45dB
IF Response Ratio: 90dB
Spurious Response Ratio: 75dB
RF Intermodulation: 60dB
Muting Threshold: Approx. 5μV

SW/MW/LW SECTION

Frequency Range: SW: 5.8–15.8MHz
MW: 530–1,605kHz
LW: 150–350kHz
Antenna: SW/MW: External antenna terminal
Attached antenna wire
LW: Built-in Ferrite-rod antenna
External antenna terminal
Intermediate Frequency: 468kHz
Usable Sensitivity: SW: 30μV (29.5dB), external antenna (10MHz)
MW: 100μV (40dB), external antenna (1,000kHz)
LW: 500μV/m (53.8dB/m), built-in antenna
100μV (40dB), external antenna (230kHz)
S/N Ratio: SW/MW: 52dB (5mV)
LW: 52dB (50mV/m)
Harmonic Distortion: SW/MW: 0.3% (5mV, 400Hz)
LW: 0.3% (50mV/m, 400Hz)
Selectivity: 28dB (9kHz)
30dB (10kHz)

AUDIO AMPLIFIER SECTION

Continuous RMS Power Output: Less than 0.5% THD, both channels driven simultaneously
At 20–20,000Hz
25W+25W (8 Ω)
At 1kHz
27W+27W (8 Ω)
According to DIN 45500
25W+25W (8 Ω)
25W+25W (4 Ω, less than 0.7% THD)

Dynamic Power Output: IHF constant power supply method
90W (8 Ω)
Power Bandwidth: 10–40,000Hz, IHF
Damping Factor: 20 at 1kHz (8 Ω)
Harmonic Distortion: Less than 0.5% at rated output (8 Ω)
Less than 0.7% at rated output (4 Ω)
Less than 0.2% at 1W output (8 Ω)
Less than 0.3% at 1W output (4 Ω)
IM Distortion: (60Hz: 7kHz=4:1) Less than 0.5% at rated output
Less than 0.2% at 1W output
Residual Noise: Less than 0.08μW (at 8Ω)
Frequency Response: PHONO:
RIAA equalization curve ±1 dB
TAPE:
10–50,000 Hz $^{+1dB}_{-3dB}$

Inputs:

	Sensitivity	Impedance	S/N	Weighting network
PHONO	2.5mV (–50dB)	50 kΩ	70 dB	A
TAPE	150mV (–15.5dB)	100 kΩ	90 dB	A

Measured with rated output power into 8 Ω loads (both channels driven simultaneously) at 1kHz.

Outputs: (with rated input)

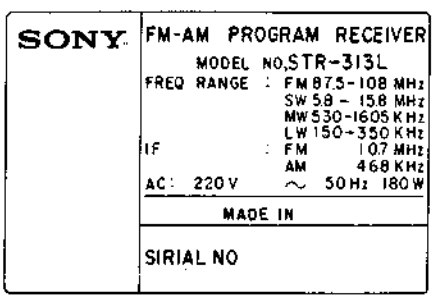
	Voltage	Impedance
REC OUT	150mV (–15.5dB)	10 kΩ

Headphones: Accepts all low or high impedance headphones
Speaker: 4–16 Ω speakers are suitable.
Tone Controls: BASS ±8dB at 100Hz
TREBLE ±8dB at 10kHz
Loudness Control: (att. 30dB) +8dB at 100Hz
+3dB at 10kHz

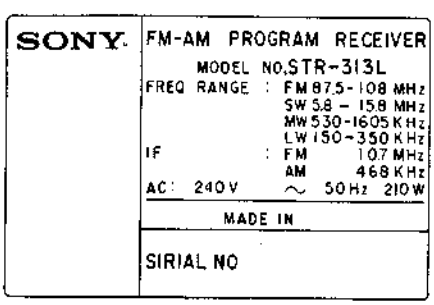
• MODEL IDENTIFICATION

– Rear Panel –

AEP model

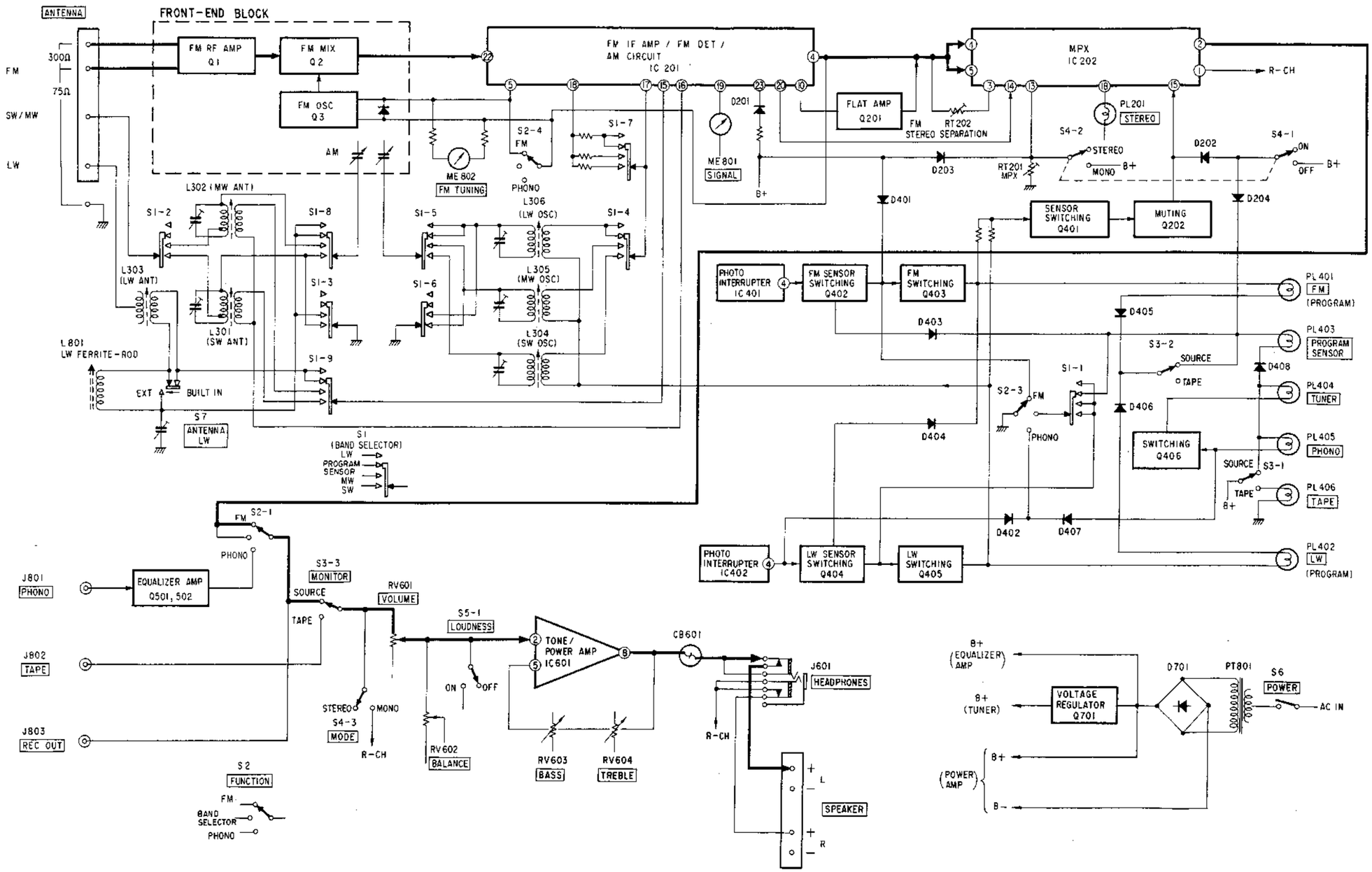


UK model



SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM



IC201 (CX168), IC202 (CX178)

These two ICs form a system. Both of them are bipolar-linear-ICs. CX168 integrates 343 elements and CX178 integrates 260 elements. They include many functions and are improved upon the degree of integration now available as a linear-ICs for tuner use. They have high performance in FM reception and form a muting system having an FM muting attenuation of 90dB. In addition, because a muting circuit is newly employed in the AM circuit not only is there high performance in FM reception but AM station signal can be received with fine tone quality and sensitivity as with FM broadcasting station. As an additional function, they operate for FM/AM continuous station selection, FM/AM signal-strength meter output, FM/AM muting output switching and enforced AGC at FM reception.

CX168 Main Function

<FM>
- IF Amplifier
- Quadrature detector
- Signal-strength Meter Output
- Muting Signal Output
- AFC Output for Converter
- Multipath Signal Output
- Bandpass Control Circuit

<AM>
- RF Attenuator
- Mixer
- Oscillator
- IF Amplifier and AGC
- AM Detector
- Signal-Strength Meter Output
- Signal Generator for AM Muting

<General>
- Regulator
- FM/AM Switching
- Regulator Output

CX178 Main Function

<FM Stereo Demodulator>
- FM Stereo Demodulator
- Phase Detector
- Stereo Indicating Circuit
- VCO
- VCO ON/OFF Circuit

<General>
- Muting Gate
- Regulator
- Muting Canceler Circuit
- Pop-noise Canceler
- Hysteresis Circuit

Photo Interrupter (IC401, 402)

The terminals (1) and (2) of the photo interrupter operate as the light emitting diode. On the other hand, the terminals (3) and (4) operate as the photo detector. When the photo detector receives the light as shown in Fig. 3, the terminal between terminals (3) and (4) is a low-impedance. When light is intercepted by the marker, as shown in Fig. 4, it becomes high-impedance.

When the photo detector receives the light **When light is intercepted**

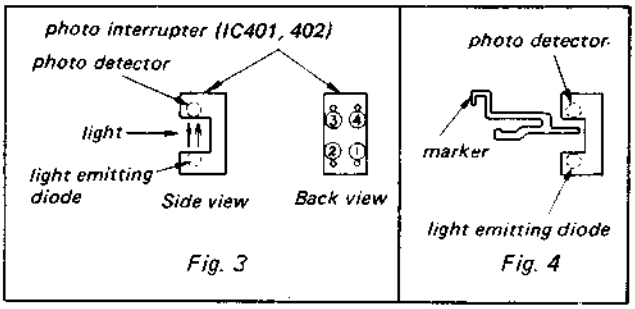


Fig. 3 Fig. 4

1-2. CIRCUIT DESCRIPTION (See Fig. 1)

Program Sensor

When the band selector switch (S1) and FUNCTION switch (S2) are set to PROGRAM position and band selector position respectively and the pointer matches with a station marker, FM or LW station is automatically selected through optical detection. (Fig. 2)

1) When the pointer matches only with the FM station marker:

a) The light of IC401 (Photo Interrupter) is intercepted by the marker, bias voltage is applied to the base of Q402 through R405, and Q402 is turned on.

b) The collecter voltage of Q402 reduces and D401 is turned on.

c) The terminal (23) of IC201 is grounded through D201, R204, D401, Q402 and D403.

d) FM circuit operates (The terminal (23) of IC201 serves as a switch).

Note: When B + voltage is applied to the terminal (23) of IC201 through R401, R204 and D201, the receiver is in AM mode. At the same time, as Q403 is on, PL401 (FM indicator lamp) lights.

2) When the pointer matches only with the LW station marker:

a) As the light of IC401 is not intercepted, Q402 and D401 are turned off. As a result, B + voltage is applied to the terminal (23) of IC201 through R401 and R204. On the other hand, the light of IC402 is intercepted by the LW station marker.

b) Q404 and Q405 are turned on.

c) B + voltage is applied to L306 (LW oscillator coil).

d) LW circuit operates. When Q405 is on, PL402 (LW indicator lamp) simultaneously lights.

3) When the pointer matches simultaneously with both the FM and LW station markers:

a) Q402 and Q403 are turned on by intercepting the light of IC401. On the other hand, the light of IC402 is also intercepted and the bias voltage is applied to the base of Q404, but because the collector voltage of Q403 is high, D404 is turned off. The emitter voltage of Q404 rises and B + voltage is not applied to L306 (LW oscillator coil) and PL402. Consequently, only the FM station signal is received.

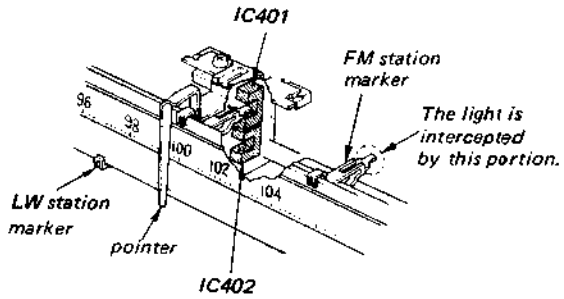


Fig. 2

Q202 and 401

Q401 operates to improve the rise time of PL401 (FM indicator lamp) or PL402 (LW indicator lamp) when tuning the receiver, and at the same time Q401 switches Q202. Q202 serves as a high-speed-muting switch which is turned on or off as soon as the station signal is tuned or detuned.

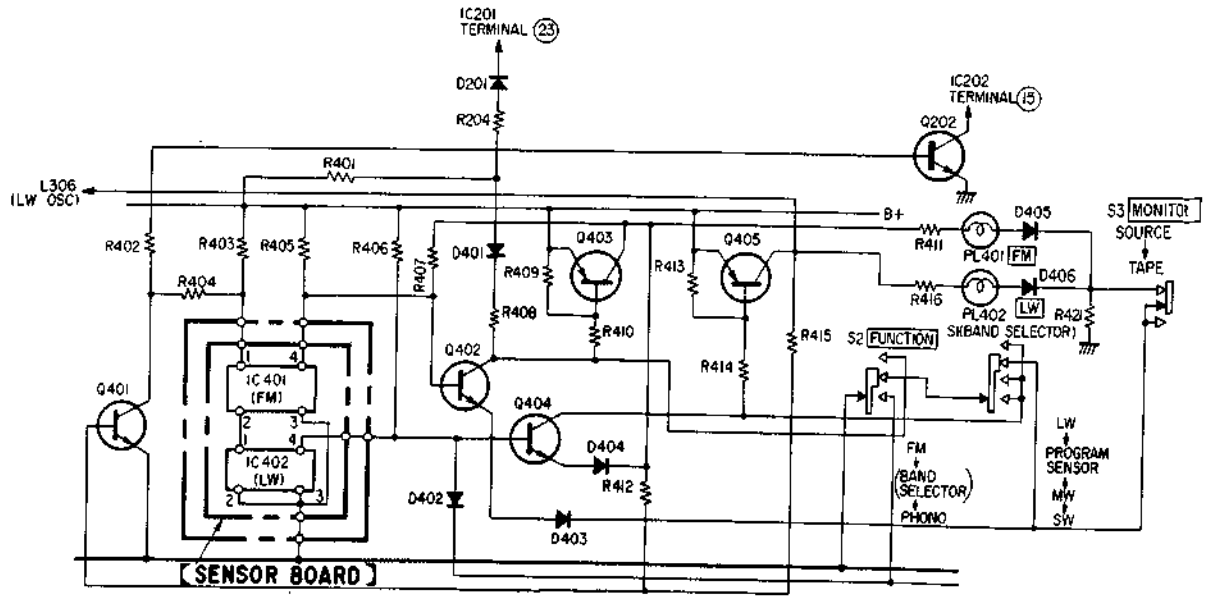
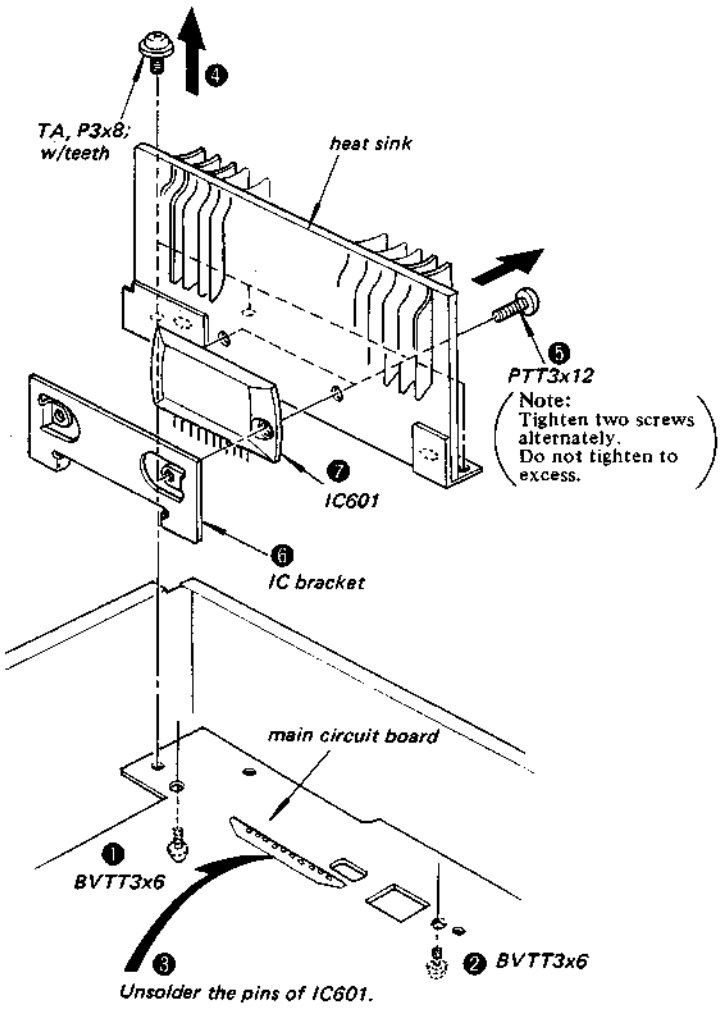


Fig. 1

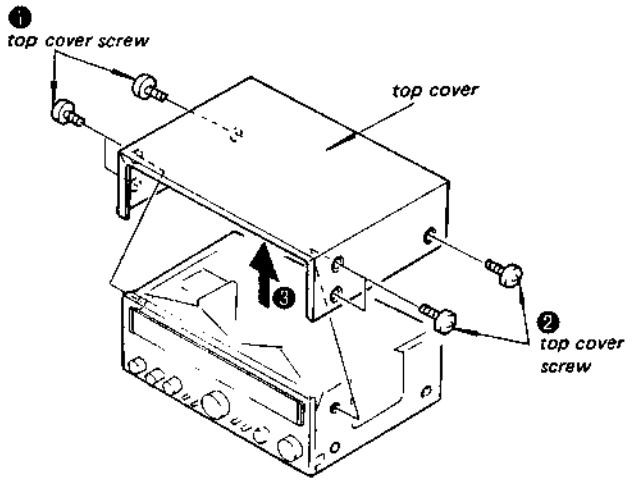
IC REPLACEMENT



SECTION 2
DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

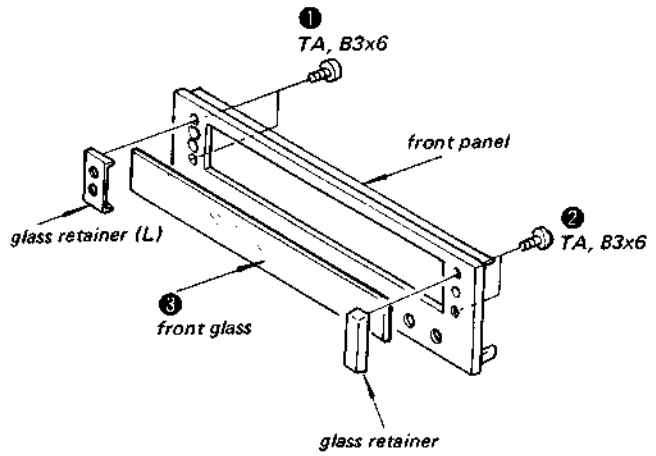
TOP COVER REMOVAL



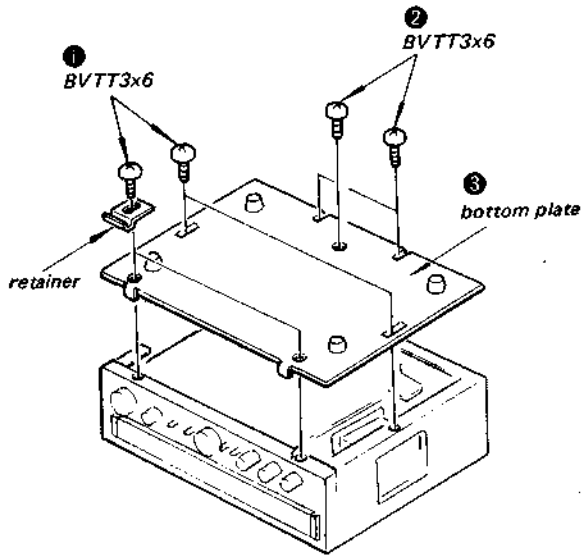
DIAL CORD STRINGING

• See page 9.

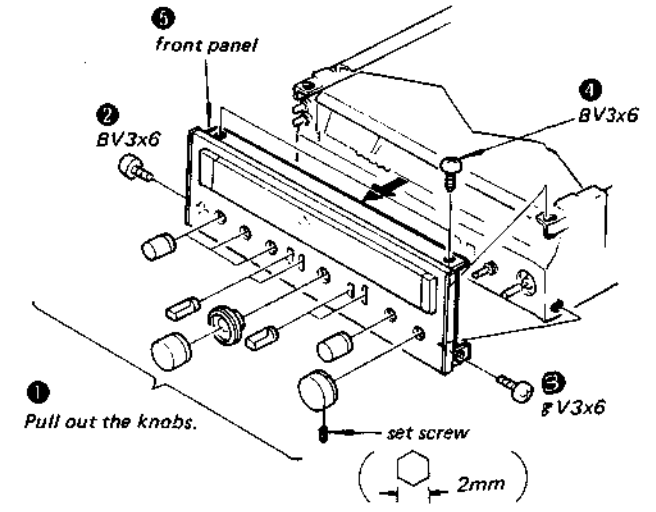
FRONT GLASS REMOVAL



BOTTOM PLATE REMOVAL

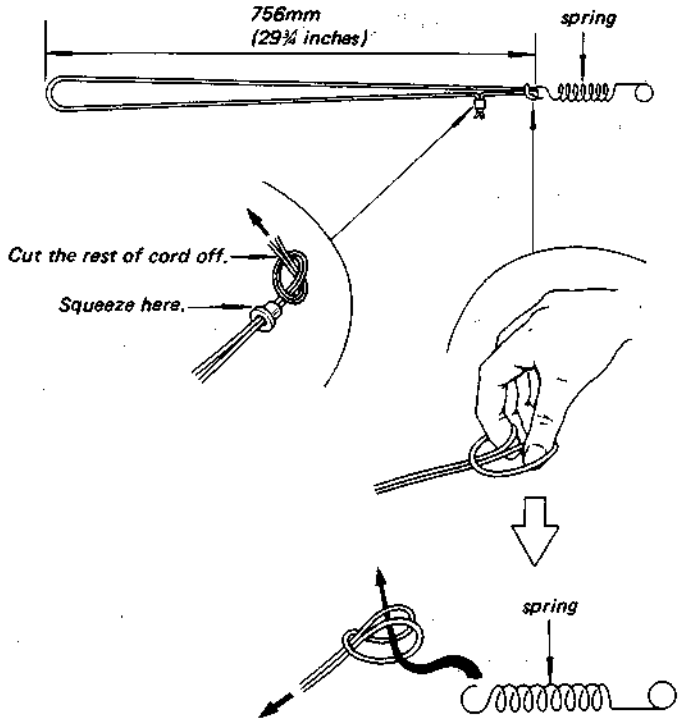


FRONT PANEL REMOVAL



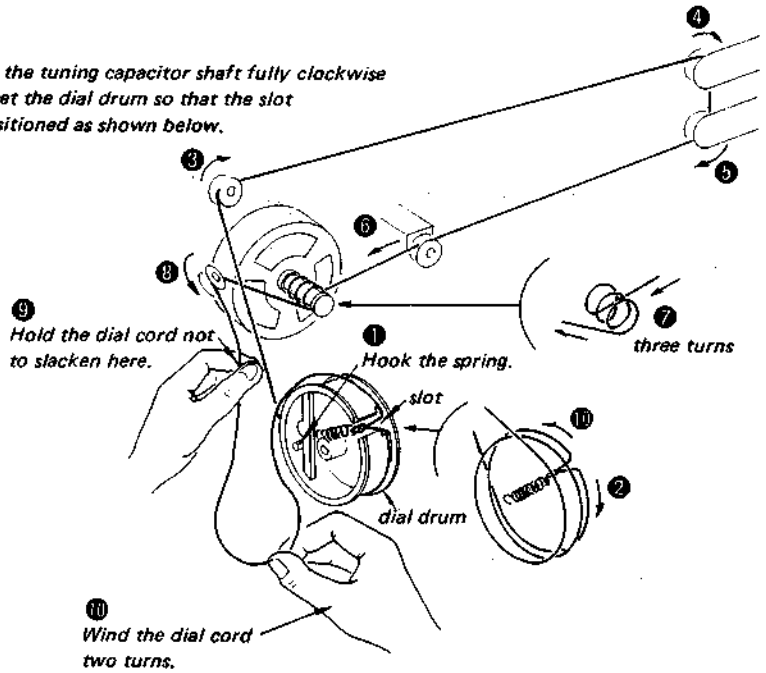
DIAL CORD STRINGING

1) Preparation



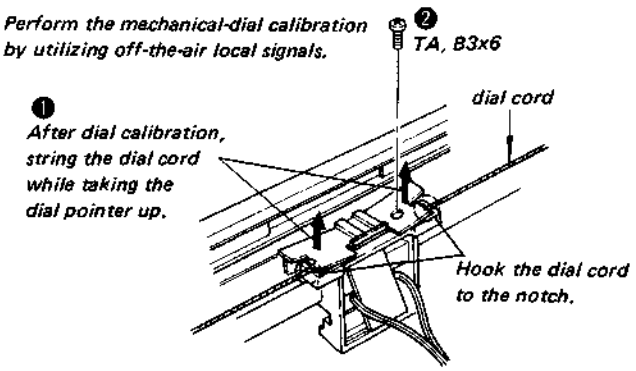
2) Stringing

Turn the tuning capacitor shaft fully clockwise and set the dial drum so that the slot is positioned as shown below.



3) Dial Pointer Installation

Perform the mechanical-dial calibration by utilizing off-the-air local signals.

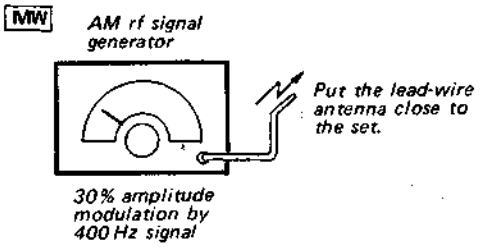


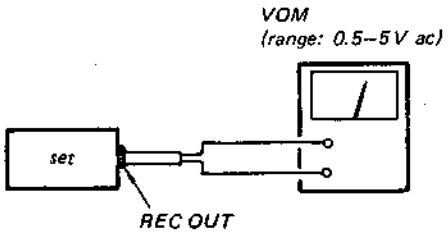
SECTION 3
ADJUSTMENTS

3-1. SW, MW SECTION

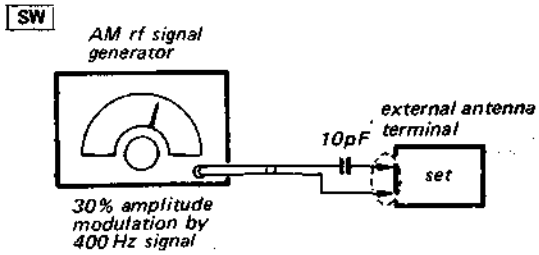
Setting: FUNCTION switch: (Band Selector)
(Band Selector) : SW, MW

MW

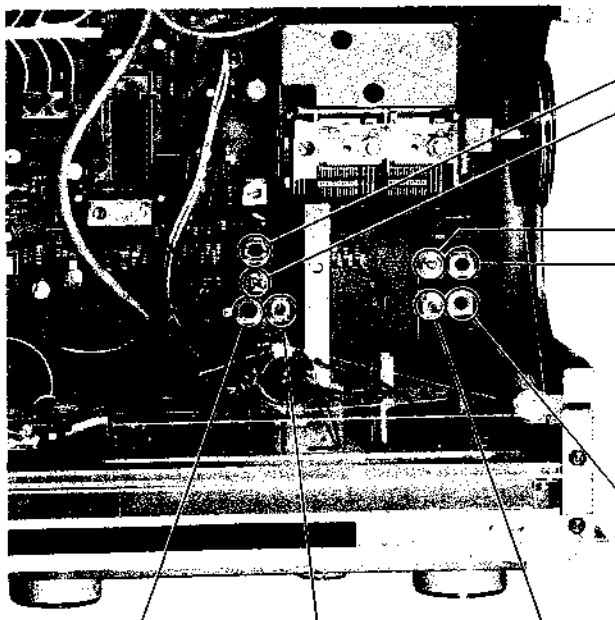




SW



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



MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L305	*520 kHz*
CT305	*1680 kHz*

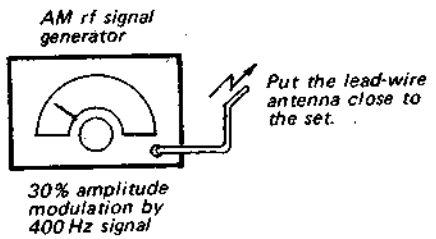
MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT302	*1400 kHz*
L302	*600 kHz*

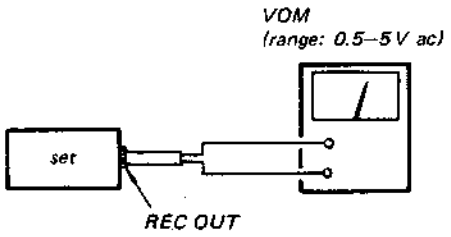
L304	*CT304*
5.5 MHz	*16.1 MHz*
Adjust for a maximum reading on VOM.	
SW FREQUENCY COVERAGE ADJUSTMENT	

CT301	*L301*
15 MHz	*6 MHz*
Adjust for a maximum reading on VOM.	
SW TRACKING ADJUSTMENT	

3-2. LW SECTION

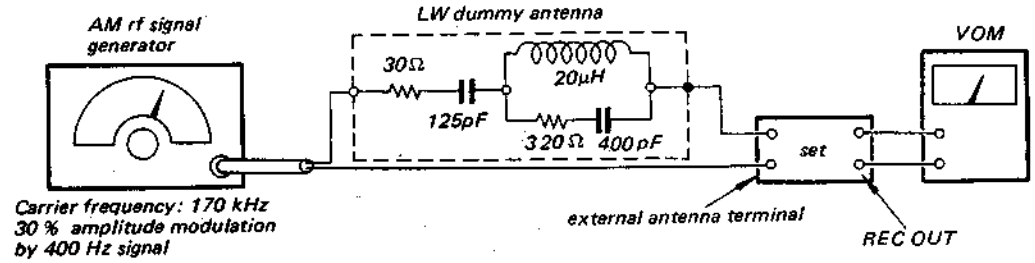
Setting: FUNCTION switch: (Band Selector)
(Band Selector): LW
ANTENNA LW switch: BUILT IN



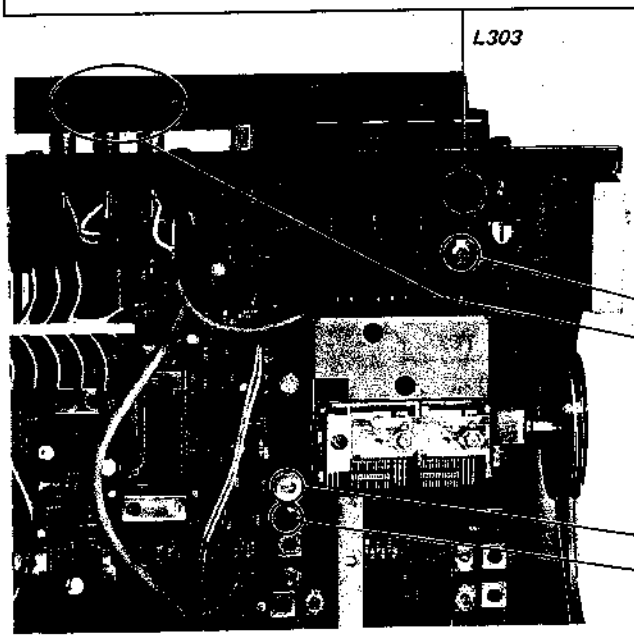


- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

LW EXT ANTENNA COIL ADJUSTMENT



1. Set the ANTENNA LW switch to EXT position.
2. Tune the set to 170 kHz and adjust L303 for a maximum reading on VOM.

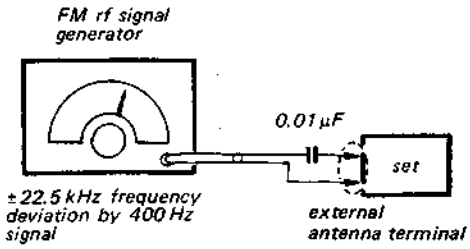


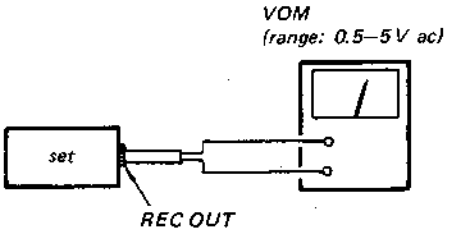
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT303	310 kHz
L801	170 kHz

LW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L306	145 kHz
CT306	365 kHz

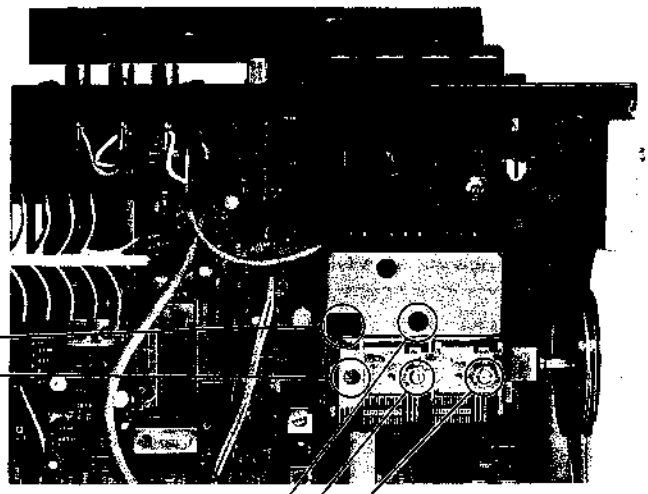
3-3. FM SECTION

Setting: FUNCTION switch: FM





- 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 a maximum reading on VOM.	
87.1 MHz (87.5 MHz)	*L3*
108.5 MHz (108 MHz)	*TC3*

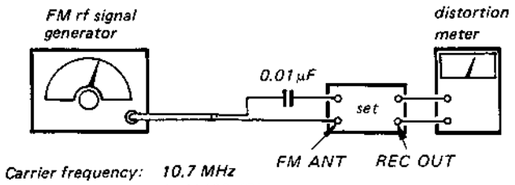
( ): in West Germany

87.1 MHz (87.5 MHz)	*L2*
108.5 MHz (108 MHz)	*TC2*
	TC1
Adjust for a maximum reading on VOM.	
FM TRACKING ADJUSTMENT	

( ): in West Germany

FM DISCRIMINATOR ALIGNMENT 2

Procedure:



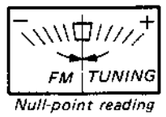
Carrier frequency: *10.7 MHz*
Output level: *1mV (60 dB)*
Modulation: *400 Hz, 75 kHz deviation (100%)*

1. Set MODE switch to MONO.
2. Turn the core (secondary side) of IFT201 for a minimum distortion reading on the distortion meter.

FM DISCRIMINATOR ALIGNMENT 1

Procedure:

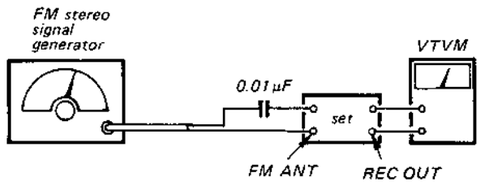
1. Detune the set.
2. Turn the core (primary side) of IFT201 for null-point reading on the FM TUNING meter.



Null-point reading

FM STEREO SEPARATION ADJUSTMENT

Procedure:



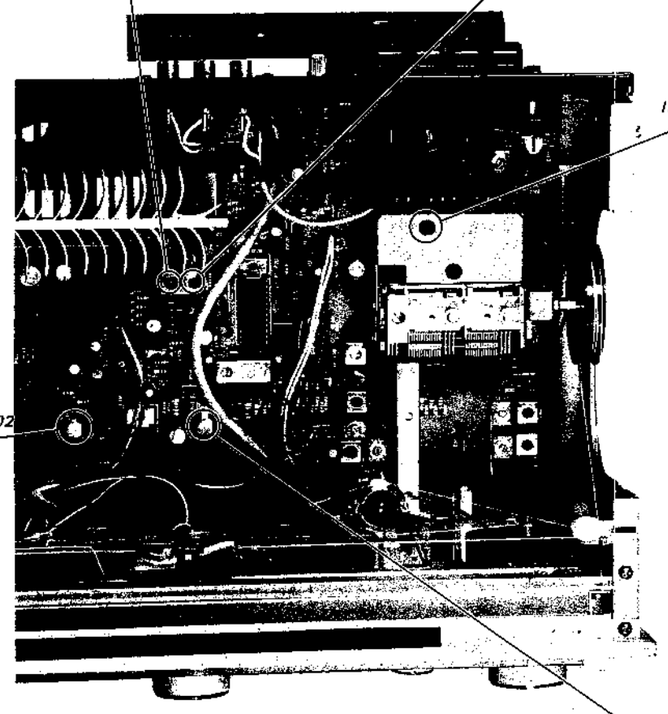
Carrier frequency: *98 MHz*
Output level: *1 mV (60 dB)*
Mode: *Stereo*
Modulation:
Audio (400 Hz): 67.5 kHz deviation (90%)
Pilot (19 kHz): 7.5 kHz deviation (10%)

MODE switch: STEREO

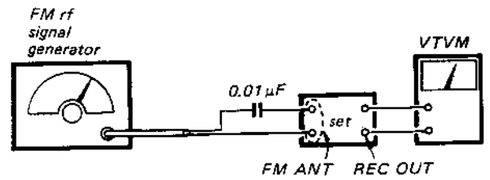
FM stereo signal generator output channel	VTVM connection	VTVM reading
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT202 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT202 for minimum reading.

L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.



FM IF ALIGNMENT



FM Signal Generator Setting:

Carrier frequency: *98 MHz*
Modulation: *400 Hz, 75 kHz deviation (100%)*
Output level: *12 μV (21.5dB)*

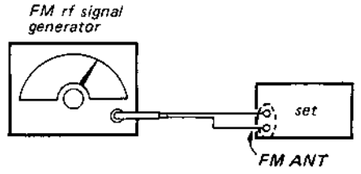
Procedure:

Tune the set to 98 MHz and adjust IFT1 for a maximum reading on the VTVM.

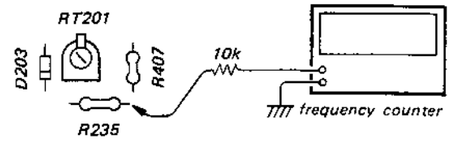
MPX ADJUSTMENT

A) Regular Method

Procedure:



Carrier frequency: *98 MHz*
Modulation: *no modulation*
Output level: *1 mV (60 dB)*

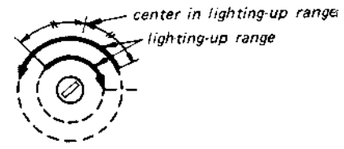


1. Tune the set to 98 MHz.
2. Adjust RT201 for 76 kHz ±100Hz on the counter.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT201 clockwise or counterclockwise and memorize the lighting-up range of STEREO lamp.
3. Secure RT201 at the center in lighting-up range of both turns as shown below.



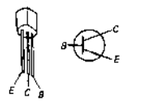
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

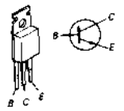
– Conductor Side –

- IC Block Diagram: See page 15.
- **Replacement Semiconductors**
  For replacement, use semiconductors except in ( ).

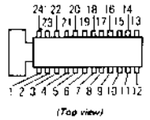
Q201
Q501, 502: 2SC1345
Q551, 552



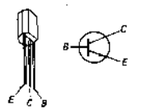
Q701: 2SC1173



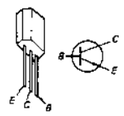
IC201: CX168



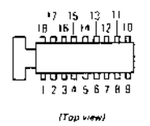
Q202
Q401, 402: 2SC1364
Q404, 406



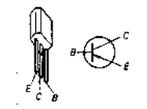
(2SC1633)



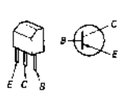
IC202: CX178



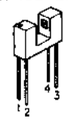
Q403, 405: 2SA678



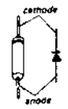
(2SA844)



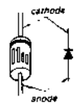
IC401, 402: SPI 201



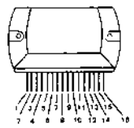
D201–204
D401–408: 1S1555



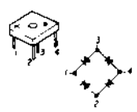
D601: EQB01–07 (EQA01–07R)
D702: EQB01–15 (EQA01–15R)



IC601: SI1125HD

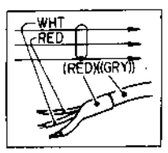


D701: S2VB20

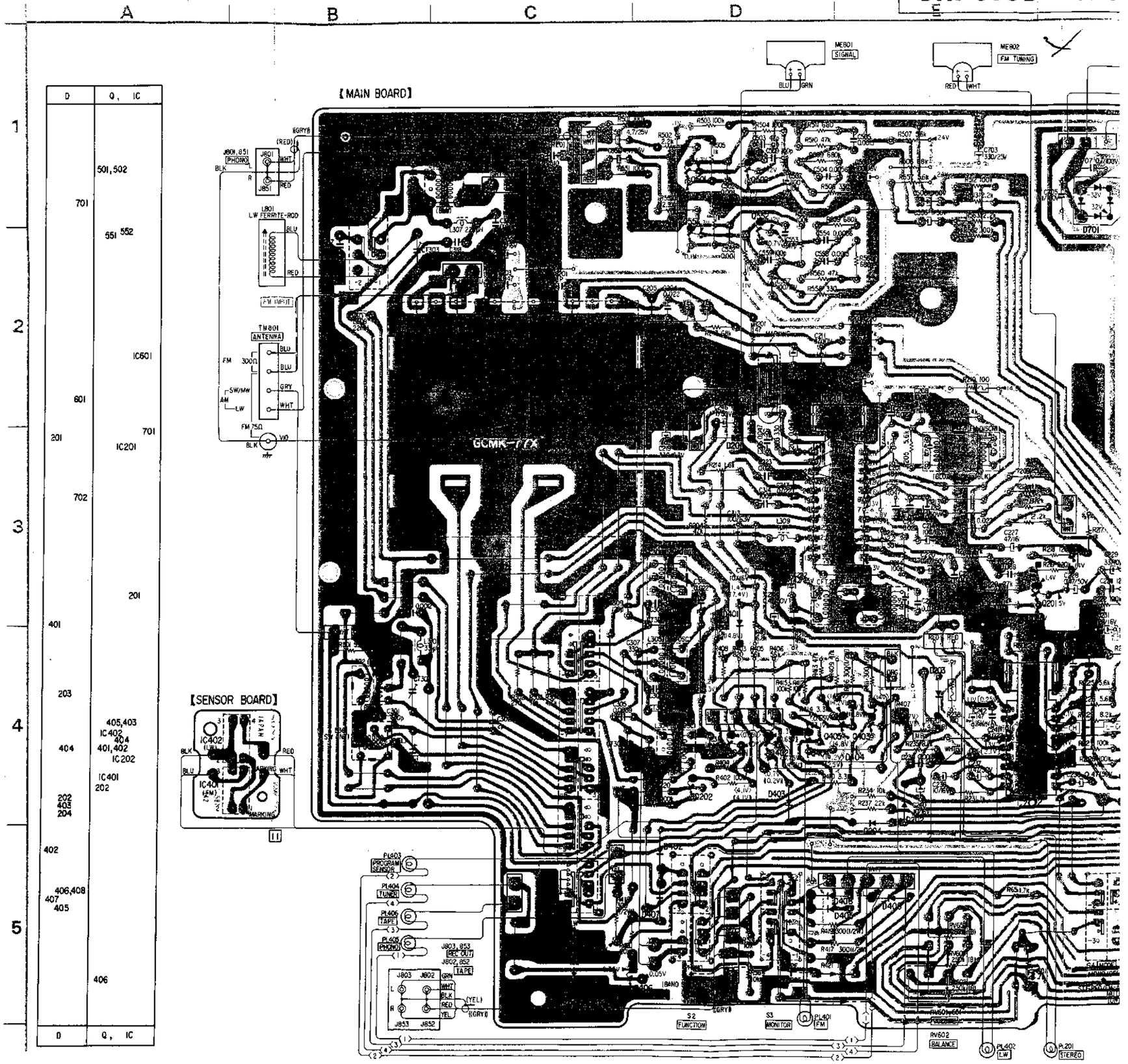


Note

- ⊡ : indicates side identified with part number.
- ■ : part mounted on the conductor side.
- Color code of sleeving over the end of the jacket.



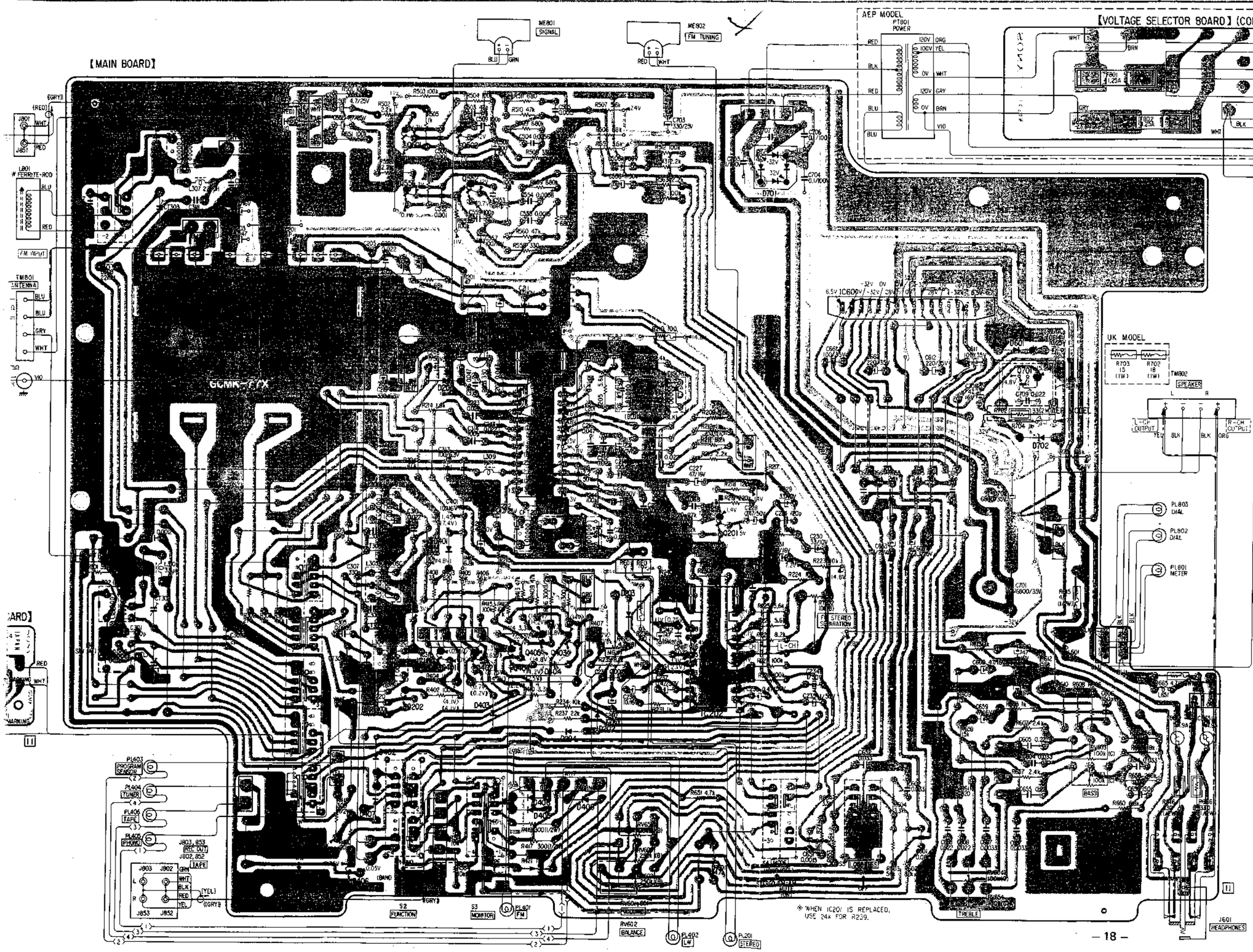
- ▭ : B + pattern
- ▬ : B – pattern
- Signal Path
  ——•——→ : L-CH
  - - •- - → : R-CH
- Readings are taken under no signal (detuned) conditions with a VOM (20 kΩ/V).
  ( ) : AM
  [ ] : FM STEREO
  < > : PROGRAM FM
  (( )) : PROGRAM LW
  no mark : FM



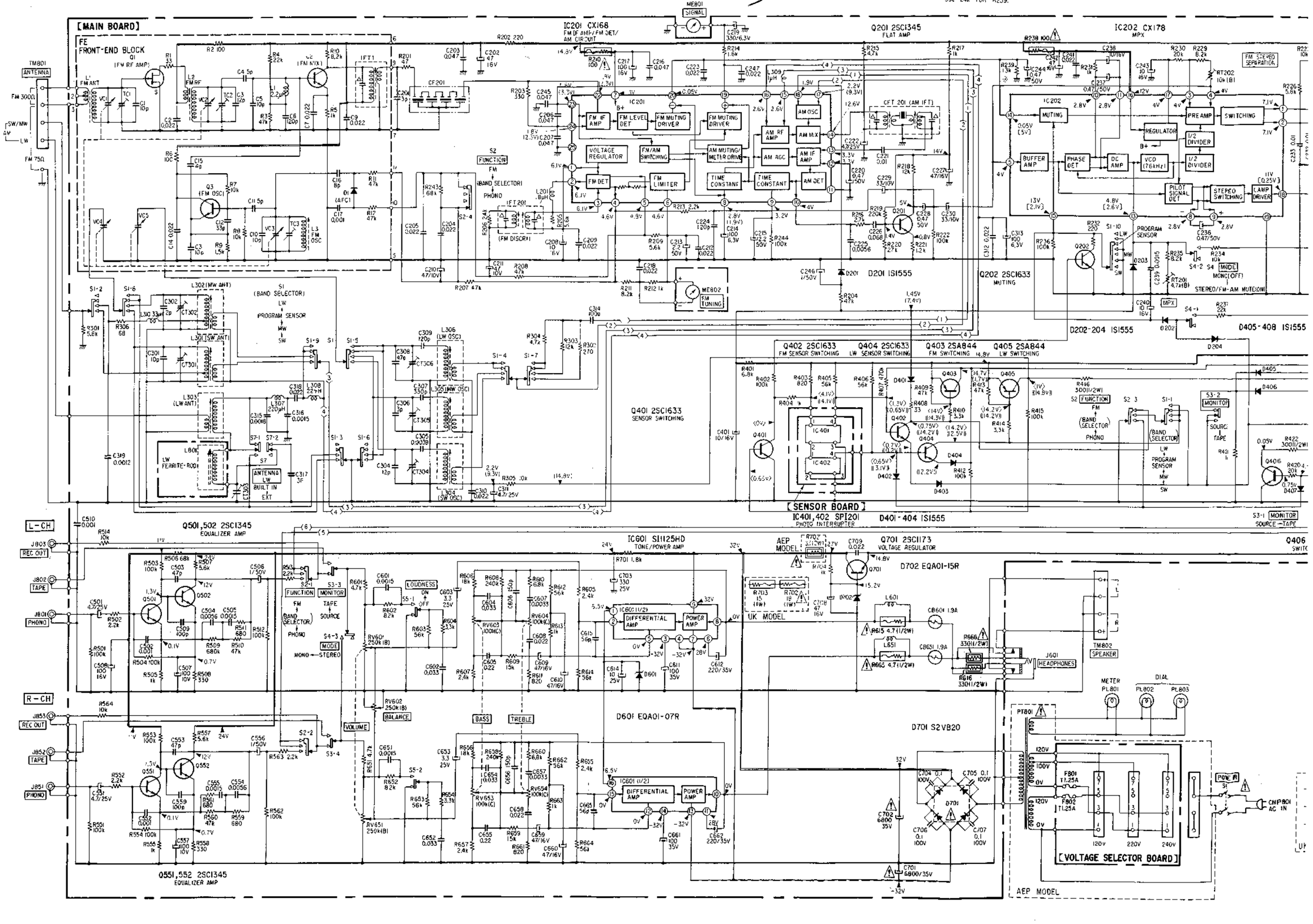
B C D E F G H I

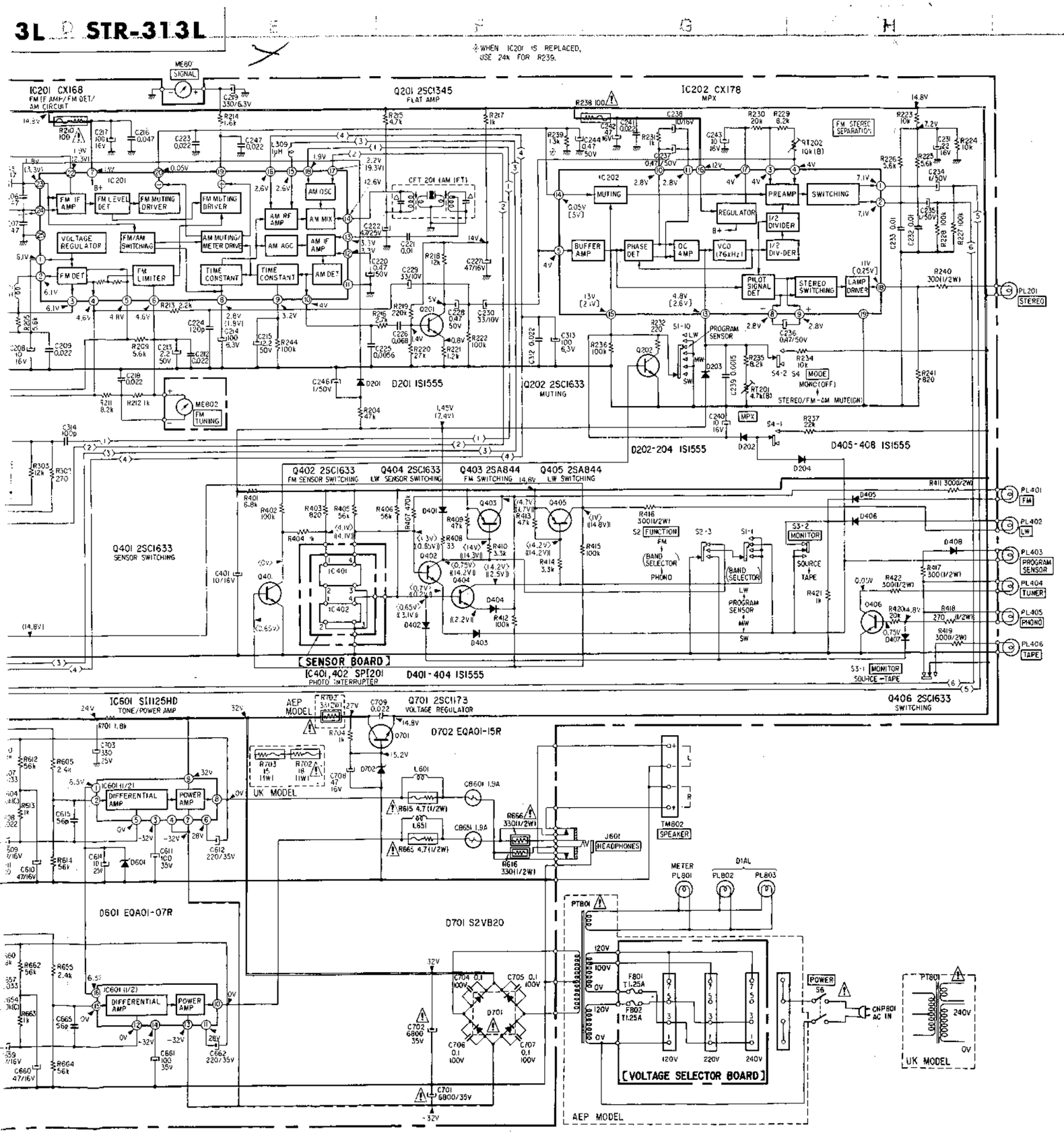
1 2 3 4 5

【MAIN BOARD】



4-2. SCHEMATIC DIAGRAM

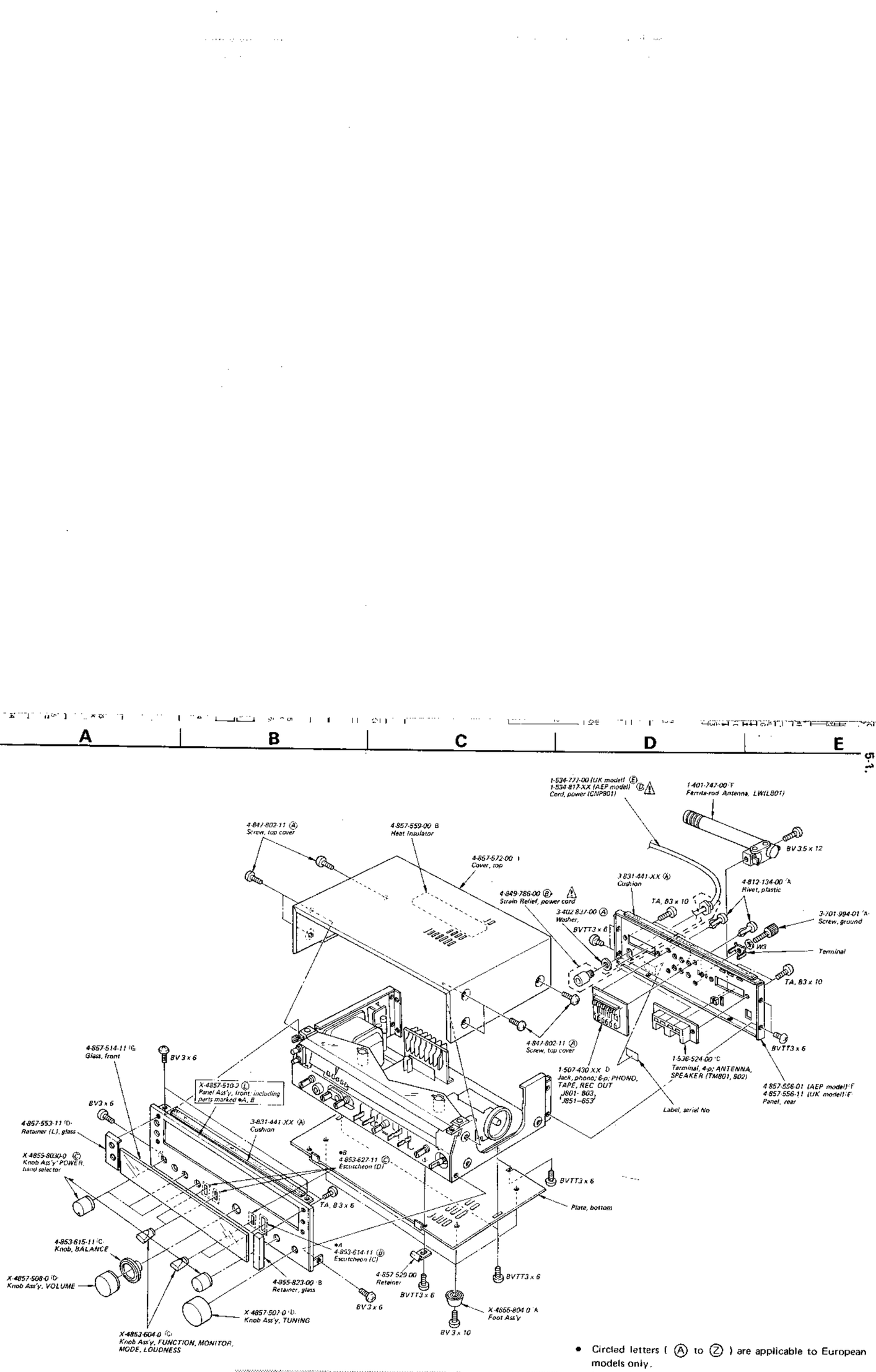




- All capacitors are in μF unless otherwise noted. pF = μμF 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000 Ω; MΩ : 1000 kΩ
- : fusible resistor.
- : nonflammable resistor.
- (N) : low-noise resistor.
- ——— : B+ bus.
- — — — : B— bus.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (20 kΩ/V).
  - ( ) : AM
  - [ ] : FM STEREO
  - < > : PROGRAM FM
  - (( )) : PROGRAM LW
  - no mark : FM
- Voltage variations may be noted due to normal production tolerances.
- Switch

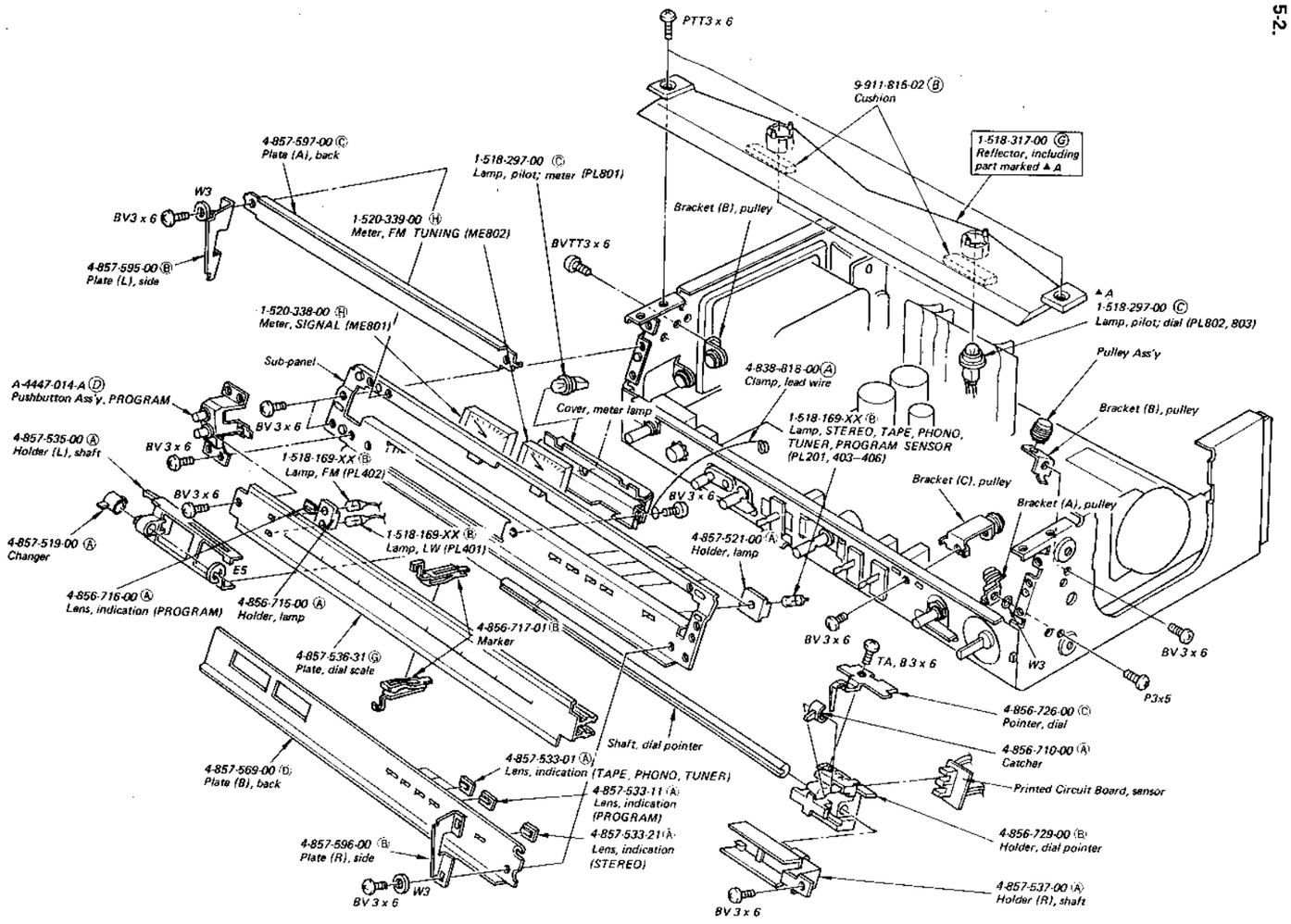
Ref. No.	Switch	Position
S1	Band Selector	PROGRAM SENSOR
S2	FUNCTION	FM
S3	MONITOR	SOURCE
S4	MODE	STEREO
S5	LOUDNESS	OFF
S6	POWER	OFF

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

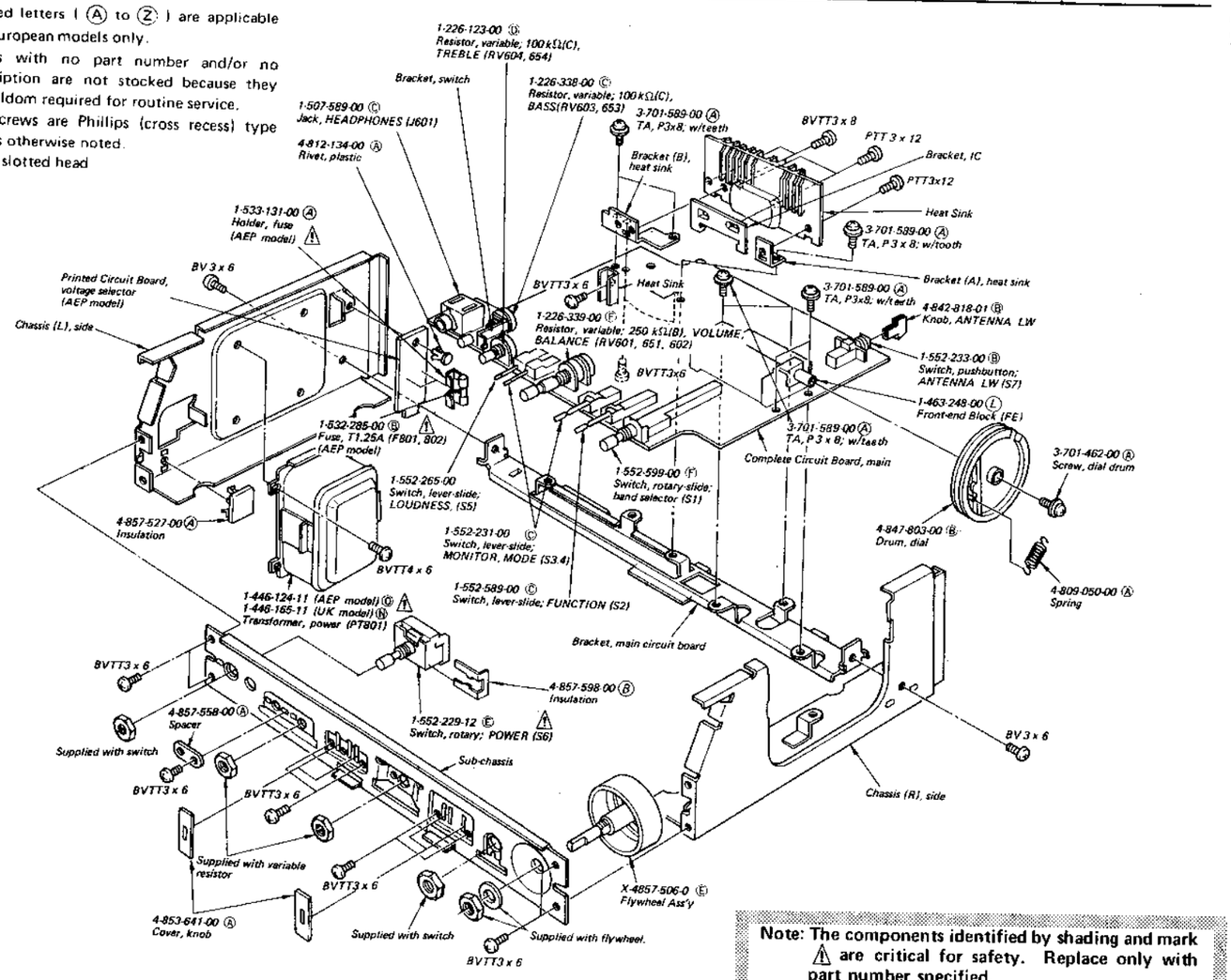


Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Circled letters (Ⓐ to Ⓩ) 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 (—) = slotted head.



- Circled letters (Ⓐ to Ⓩ) 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



- Circled letters (Ⓐ to Ⓩ) 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 and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 6
ELECTRICAL PARTS LIST

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

Ref. No.	Part No.	Description
		SEMICONDUCTORS
		Transistors
Q201	8-729-334-58	Ⓑ 2SC1345
⇒Q202	8-729-663-47	Ⓑ 2SC1364
⇒Q401,402	8-729-663-47	Ⓑ 2SC1364
⇒Q403	8-727-788-00	Ⓑ 2SA678
⇒Q404	8-729-663-47	Ⓑ 2SC1364
⇒Q405	8-727-788-00	Ⓑ 2SA678
⇒Q406	8-729-663-47	Ⓑ 2SC1364
Q501,551 Q502,552	8-729-334-58	Ⓑ 2SC1345
Q701	8-729-217-33	Ⓒ 2SC1173
		ICs
IC201	8-751-680-01	Ⓘ CX168
IC202	8-751-780-00	Ⓖ CX178
IC401,402	8-719-902-01	Ⓓ SPI201
IC601	8-759-301-25	Ⓛ SI1125HD
		Diodes
D201–204 D401–408	8-719-815-55	Ⓑ 1S1555
⇒D601	8-719-931-07	Ⓑ EQB01-07
⚠D701	8-719-502-20	Ⓒ S2VB20
⇒D702	8-719-931-15	Ⓑ EQB01-15
		COILS
L201	1-407-741-00	Ⓐ 18μH, microinductor
L301	1-401-741-00	Ⓑ SW Ant
L302	1-401-728-00	Ⓑ MW Ant
L303	1-401-709-00	Ⓒ LW Ant
L304	1-405-812-00	Ⓑ SW Osc
L305	1-405-797-00	Ⓑ MW Osc
L306	1-405-813-00	Ⓑ LW Osc
L308	1-407-210-XX	Ⓑ 22mH, microinductor
L801	1-401-747-00	Ⓕ LW Ferrite-rod Ant

Ref. No.	Part No.	Description
		TRANSFORMERS
CFT201	1-404-087-00	Ⓒ AM IFT
IFT201	1-404-011-00	Ⓒ FM Discriminator
⚠PT801	1-446-124-11	Ⓞ Power (AEP model)
	1-446-165-11	Ⓝ Power (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

C201	1-102-936-11	Ⓐ 3P		
C202	1-121-409-11	Ⓐ 47	16V	elect
C203	1-101-006-11	Ⓐ 0.047		
C204,205	1-101-005-11	Ⓐ 0.022		
C206,207	1-101-006-11	Ⓐ 0.047		
C208	1-121-651-11	Ⓐ 10	16V	elect
C209	1-101-005-11	Ⓐ 0.022		
C210,211	1-121-352-11	Ⓐ 47	10V	elect
C212	1-101-005-11	Ⓐ 0.022		
C213	1-121-450-11	Ⓐ 2.2	50V	elect
C214	1-121-414-11	Ⓐ 100	6.3V	elect
C215	1-121-450-11	Ⓐ 2.2	50V	elect
C216	1-101-006-11	Ⓐ 0.047		
C217	1-121-415-11	Ⓐ 100	16V	elect
C218	1-101-005-11	Ⓐ 0.022		
C219	1-121-751-11	Ⓐ 330	6.3V	elect
C220	1-121-726-11	Ⓐ 0.47	50V	elect
C221	1-101-004-11	Ⓐ 0.01		
C222	1-121-395-11	Ⓐ 4.7	25V	elect
C223	1-101-005-11	Ⓐ 0.022		
C224	1-102-816-11	Ⓐ 120p		
C225	1-108-355-12	Ⓐ 0.0056		mylar
C226	1-108-249-11	Ⓐ 0.068		mylar
C227	1-121-409-11	Ⓐ 47	16V	elect
C228	1-121-726-11	Ⓐ 0.47	50V	elect
C229,230	1-121-403-11	Ⓐ 33	10V	elect
C231	1-121-479-11	Ⓐ 22	16V	elect

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

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

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

Ref. No.	Part No.	Description		
C232,233	1-108-239-12	Ⓐ 0.01		mylar
C234,235	1-121-391-11	Ⓐ 1	50V	elect
C236,237	1-121-726-11	Ⓐ 0.47	50V	elect
C238	1-121-651-11	Ⓐ 10	16V	elect
C239	1-104-081-11	Ⓐ 0.0015		polystyrol
C240	1-121-651-11	Ⓐ 10	16V	elect
C241	1-101-005-11	Ⓐ 0.022		
C242	1-121-409-11	Ⓐ 47	16V	elect
C243	1-121-651-11	Ⓐ 10	16V	elect
C244	1-121-726-11	Ⓐ 0.47	50V	elect
C245	1-101-006-11	Ⓐ 0.047		
C246	1-121-391-11	Ⓐ 1	50V	elect
C247	1-101-005-11	Ⓐ 0.022		
C301	1-102-947-11	Ⓐ 10p		
C302	1-102-935-11	Ⓐ 2p		
C304	1-102-262-11	Ⓐ 12p		
C305	1-104-091-11	Ⓐ 0.0039		polystyrol
C306	1-102-241-11	Ⓐ 8p		
C307	1-103-713-11	Ⓐ 330p		polystyrol
C308	1-101-880-11	Ⓐ 47p		
C309	1-103-703-11	Ⓐ 120p		polystyrol
C310	1-101-005-11	Ⓐ 0.022		
C311	1-121-395-11	Ⓐ 4.7	25V	elect
C312	1-101-005-11	Ⓐ 0.022		
C313	1-121-414-11	Ⓐ 100	6.3V	elect
C314	1-102-973-11	Ⓐ 100p		
C315	1-102-120-11	Ⓐ 0.0018		
C316	1-102-119-11	Ⓐ 0.0015		
C317	1-102-940-11	Ⓐ 3p		
C318	1-101-005-11	Ⓐ 0.022		
C319	1-102-118-11	Ⓐ 0.0012		
C401	1-121-651-11	Ⓐ 10	16V	elect
C501,551	1-121-915-11	Ⓑ 4.7	25V	elect
C502,552	1-101-001-11	Ⓐ 0.001		
C503,553	1-101-880-11	Ⓐ 47p		
C504,554	1-108-355-12	Ⓐ 0.0056		mylar
C505,555	1-108-228-12	Ⓐ 0.0015		mylar
C506,556	1-121-391-11	Ⓐ 1	50V	elect

Ref. No.	Part No.	Description		
C507,557	1-121-414-11	Ⓐ 100	10V	elect
C508	1-121-415-11	Ⓐ 100	16V	elect
C509,559	1-102-973-11	Ⓐ 100p		
C510	1-101-001-11	Ⓐ 0.001		
C601,651	1-108-228-12	Ⓐ 0.0015		mylar
C602,652	1-108-244-12	Ⓐ 0.033		mylar
C603,653	1-121-392-11	Ⓐ 3.3	25V	elect
C604,654	1-108-244-12	Ⓐ 0.033		mylar
C605,655	1-108-254-12	Ⓑ 0.22		mylar
C606,656	1-101-361-11	Ⓐ 150p		
C607,657	1-108-232-12	Ⓐ 0.0033		mylar
C608,658	1-108-242-12	Ⓐ 0.022		mylar
C609,659	1-121-409-11	Ⓐ 47	16V	elect
C610,660	1-121-409-11	Ⓐ 47	16V	elect
C611,661	1-123-062-11	Ⓑ 100	35V	elect
C612,662	1-121-655-11	Ⓑ 220	35V	elect
C614	1-121-398-11	Ⓐ 10	25V	elect
C615,665	1-101-884-11	Ⓐ 56p		
C701,702	⚠1-125-155-11	Ⓔ 6800	35V	elect
C703	1-121-657-11	Ⓑ 330	25V	elect
C704–707	1-108-389-12	Ⓑ 0.1	100V	mylar
C708	1-121-409-11	Ⓐ 47	16V	elect
C709	1-101-005-11	Ⓐ 0.022		
CT301–306	1-141-171-00	Ⓑ trimmer		
		RESISTORS		

All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on the last page for their part-numbers.

R210,238	⚠1-212-881-11	Ⓐ 100	¼W	fusible
R240	1-244-860-11	Ⓐ 300	½W	carbon
R411 R416,417	1-244-860-11	Ⓐ 300	½W	carbon
R418	1-244-859-11	Ⓐ 270	½W	carbon
R419,422	1-244-860-11	Ⓐ 300	½W	carbon
R615,665	⚠1-212-950-11	Ⓐ 4.7	½W	fusible
R616,666	⚠1-211-626-11	Ⓐ 330	½W	carbon (nonflammable)

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

Ref. No.	Part No.	Description
R702 ⚠	1-206-475-11	Ⓐ 33 2W metal oxide (AEP model) (nonflammable)
	1-213-066-11	Ⓐ 18 1W fusible (UK model)
R703 ⚠	1-213-064-11	Ⓐ 15 1W fusible (UK model)
RT201	1-224-644-XX	Ⓑ 4.7k-B adjustable ; MPX
RT202	1-224-645-XX	Ⓑ 10k-B adjustable . FM Stereo separation
RV601,602 RV651	1-226-339-00	Ⓕ 250k-B, variable; VOLUME BALANCE
RV603,653	1-226-338-00	Ⓒ 100k-C, variable; BASS
RV604,654	1-226-123-00	Ⓓ 100k-C, variable; TREBLE
	SWITCHES	
S1	1-552-599-00	Ⓕ Rotary-slide, band selector
S2	1-552-589-00	Ⓒ Lever-slide, FUNCTION
S3,4	1-552-231-00	Ⓒ Lever-slide, MONITOR, MODE
S5	1-552-265-00	Ⓒ Lever-slide, LOUDNESS
S6 ⚠	1-552-229-12	Ⓔ Rotary, POWER
S7	1-552-233-00	Ⓑ Pushbutton, ANTENNA LW
	MISCELLANEOUS	
CB601,651	1-532-380-61	Ⓔ Circuit Breaker, 1.9A
CF201	1-527-277-91	Ⓖ Filter, ceramic
CNP801 ⚠	1-534-817-XX	Ⓓ Cord, power (AEP model)
	1-534-777-00	Ⓔ Cord, power (UK model)
F801,802 ⚠	1-532-285-00	Ⓑ Fuse, T1.25A (AEP model)
FE	1-463-248-00	Ⓛ FM Front End
J601	1-507-589-00	Ⓒ Jack, HEADPHONES
J801–803 J851–853	1-507-430-XX	Ⓓ Jack, phono; 6p
ME801	1-520-338-00	Ⓗ Meter, SIGNAL
ME802	1-520-339-00	Ⓗ Meter, FM TUNING
PL201 PL401–406	1-518-169-XX	Ⓑ Lamp, STEREO, FM, LW, PROGRAM SENSOR, TUNER, PHONO, TAPE
PL801–803	1-518-297-00	Ⓒ Lamp, meter, dial
TM801,802	1-536-524-00	Ⓒ Terminal, 4p; ANTENNA, SPEAKER
	1-518-317-00	Ⓖ Reflector, w/lamp
	⚠1-533-131-00	Ⓐ Holder, fuse (AEP model)

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

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

ACCESSORIES AND PACKING MATERIALS

Part No.	Description
1-501-184-00	Ⓒ Antenna, ribbon; FM
1-501-193-00	Ⓑ Antenna wire, MW/SW
3-701-622-00	Ⓐ Bag, plastic (UK model)
3-701-630-00	Ⓐ Bag, plastic
3-770-594-11	Ⓓ Manual, instruction
4-857-573-00	Ⓑ Cushion, lower (left)
4-857-574-00	Ⓑ Cushion, lower (right)
4-857-575-00	Ⓑ Cushion, upper
4-857-577-00	Ⓓ Carton
4-891-037-00	Ⓑ Bag, plastic

1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

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	1-244-737-11	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: – 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		brazier-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	

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