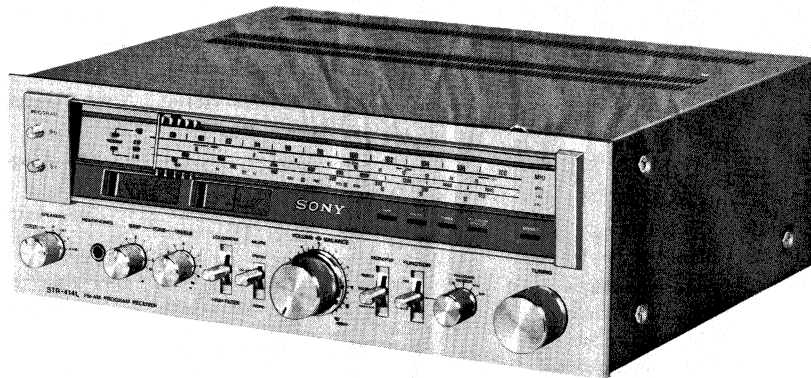


STR-414L

AEP Model



FM-AM PROGRAM RECEIVER

SPECIFICATIONS

GENERAL

Power Requirements:	120 V, 220 V or 240 V ac adjustable, 50 Hz
Power Consumption:	250 W
Dimensions:	Approx. 410 (w) x 145 (h) x 375 (d) mm 16 (w) x 5 3/4 (h) x 14 3/4 (d) inches including projecting parts and controls
Weight:	Approx. 9.1 kg, 20 lb 1 oz (net) Approx. 11.2 kg, 24 lb 12 oz (in shipping carton)


FM SECTION

Frequency Range:	87.5 – 108 MHz
Antenna:	300 Ω balanced 75 Ω unbalanced
Intermediate Frequency:	10.7 MHz
Sensitivity at 50dB Quieting:	3.5 μ V (10.7 dB) (MONO) 45 μ V (33 dB) (STEREO)
Sensitivity at 46dB Quieting:	4 μ V (12 dB) (MONO) 50 μ V (34 dB) (STEREO) (at 40 kHz deviation)

Usable Sensitivity:	1.8 μ V (5 dB), IHF (at 40 kHz deviation) 1.6 μ V (4 dB), S/N=26 dB
S/N Ratio:	75 dB (MONO) 70 dB (STEREO)
Harmonic Distortion:	At 100 Hz 0.15 % (MONO) 0.3 % (STEREO) At 1 kHz 0.15 % (MONO) 0.3 % (STEREO) At 10 kHz 0.2 % (MONO) 0.5 % (STEREO)
IM Distortion:	0.15 % (MONO) 0.3 % (STEREO)
Separation:	35 dB at 100 Hz 45 dB at 1 kHz 35 dB at 10 kHz
Frequency Response:	40 – 12,500 Hz +0.5 dB -1.0 dB 30 – 15,000 Hz +0.5 dB -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

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

SW/MW/LW SECTION

Frequency Range: SW: 5.8 – 15.8 MHz
 MW: 530 – 1,605 kHz
 LW: 150 – 350 kHz
Antenna: SW/MW: External antenna terminal
 Attached antenna wire
 LW: Built-in Ferrite-rod antenna
 External antenna terminal
Intermediate Frequency: 468 kHz
Usable Sensitivity: SW: 30 μ V (29.5 dB),
 external antenna (10 MHz)
 MW: 100 μ V (40 dB),
 external antenna (1,000 kHz)
 LW: 500 μ V/m (53.8 dB/m),
 built-in antenna (250 kHz)
 100 μ V (40 dB),
 external antenna (250 kHz)
S/N Ratio: SW/MW: 52 dB (5 mV)
 LW: 52 dB (50 mV/m)
Harmonic Distortion: SW/MW: 0.3 % (5 mV, 400 Hz)
 LW: 0.3 % (50 mV/m, 400 Hz)
Selectivity: 28 dB (9 kHz)
 30 dB (10 kHz)

AUDIO AMPLIFIER SECTION

Continuous RMS Power Output: Less than 0.3 % THD, both channels driven simultaneously
 At 20 – 20,000 Hz
 40 W + 40 W (8 Ω)
 At 1 kHz
 45 W + 45 W (8 Ω)
 According to DIN 45500
 40 W + 40 W (8 Ω)
 40 W + 40 W (4 Ω)

Dynamic Power Output: IHF constant power supply method
 130 W (8 Ω)
Power Bandwidth: 10 – 40,000 Hz, IHF
Damping Factor: 30 at 1 kHz (8 Ω)
Harmonic Distortion: Less than 0.3 % at rated output (8 Ω)
 Less than 0.7 % at rated output (4 Ω)
 Less than 0.1 % at 1 W output
IM Distortion: Less than 0.3 % at rated output
 (60 Hz : 7 kHz = 4 : 1) Less than 0.1 % at 1 W output
Residual Noise: Less than 0.08 μ V (at 8 Ω)
Frequency Response: PHONO:
 RIAA equalization curve \pm 0.5 dB
 TAPE:
 10 – 50,000 Hz +1 dB
 -3 dB

Inputs:

	Sensitivity	Impedance	S/N	Weighting network
PHONO	2.5 mV (-50 dB)	50 k Ω	80 dB	A
TAPE 1, 2	150 mV (-14.5 dB)	100 k Ω	95 dB	A

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

Outputs: (with rated input)

	Voltage	Impedance
REC OUT 1, 2	150 mV (-14.5 dB)	10 k Ω

Headphones: Accepts all low or high impedance headphones

Speaker: 4 – 16 Ω speakers are suitable.

Tone Controls: BASS: \pm 9 dB at 100 Hz
 TREBLE: \pm 7 dB at 10 kHz

Loudness Control: +8 dB at 100 Hz
 (att. 30 dB) +3 dB at 10 kHz

High Filter: 6 dB/oct. above 7.5 kHz

SECTION 1 OUTLINE

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

Program Sensor

The FM or LW band can be changed automatically through the optical detection by the following procedures;

- 1 Set the FUNCTION switch (S1) to band selector position (center position).
- 2 Then, Set the band selector switch (S3) to PROGRAM SENSOR position.
- 3 Match the dial pointer to the desired station marker. (See Fig. 2)
- 4 The FM or LW band changes automatically.

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

- a) The light of IC301 (Photo Interrupter) is intercepted by the marker, bias voltage is applied to the base of Q303 through R305, and Q303 is turned on.
- b) The collector voltage of Q303 reduces and D203 is turned on.
- c) D203 is conducted, B+ voltage through R217 is decreased.
- d) D201 is opened, B+ voltage is not supplied to the terminal ②③ of IC201.
- e) 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 R217, R216 and D201, the receiver is in LW mode.

- f) At the same time, PL905 (FM indicator lamp) lights because of Q304 operating.

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

- a) As the light of IC301 is not intercepted, Q303 and D203 are turned off. As a result, B+ voltage is applied to the terminal ②③ of IC201 through R217 and R216. On the other hand, the light

of IC302 is intercepted by the LW station marker.

- b) Q306 and Q305 are turned on.
- c) B+ voltage is applied to L208 (LW oscillator coil).
- d) LW circuit operates. When Q305 is on, PL906 (LW indicator lamp) simultaneously lights.

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

- a) Q303 and Q304 are turned on by intercepting the light of IC301. On the other hand, the light of IC302 is also intercepted and the bias voltage is applied to the base of Q306, but because the collector voltage of Q304 is high, D304 is turned off. The emitter voltage of Q306 rises and B+ voltage is not applied to L208 (LW oscillator coil) and PL906. Consequently, only the FM station signal is received.

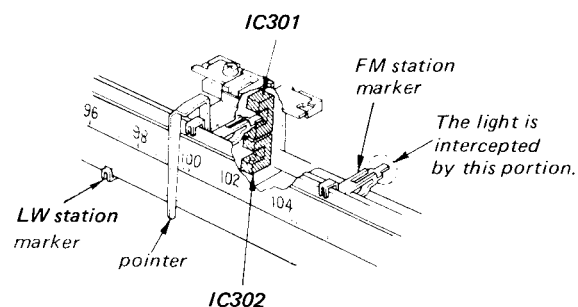


Fig. 2

Q302 and 301

Q302 operates to improve the rise time of PL905 (FM indicator lamp) or PL906 (LW indicator lamp) when tuning the receiver, and at the same time Q302 switches Q301. Q301 serves as a high-speed-muting switch which is turned on or off as soon as the station signal is tuned or detuned.

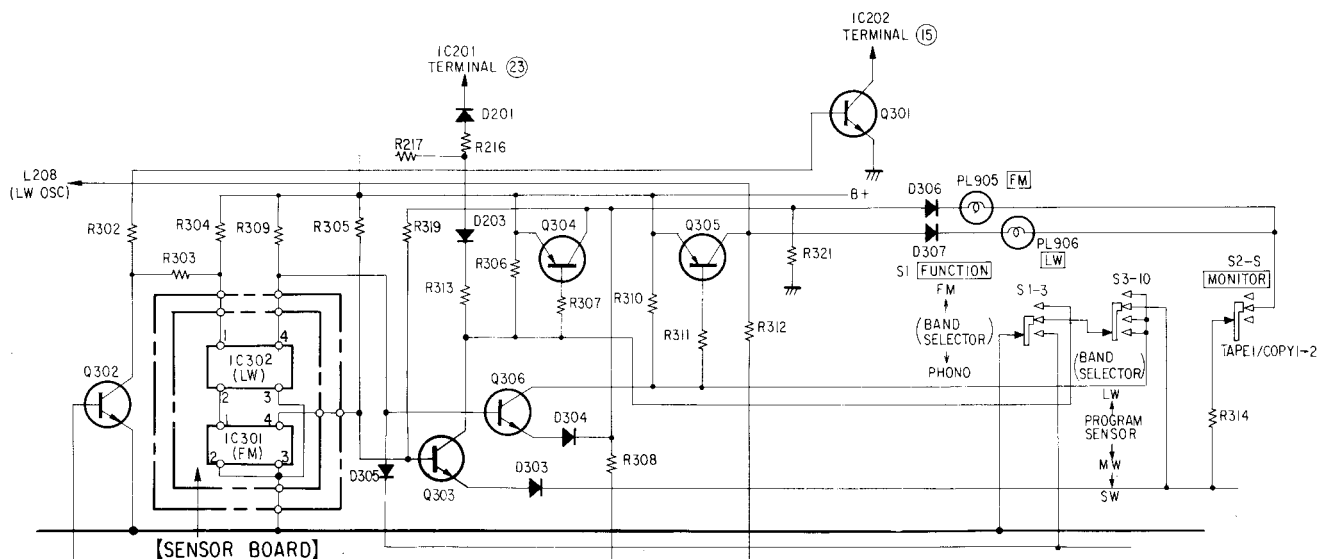


Fig. 1

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

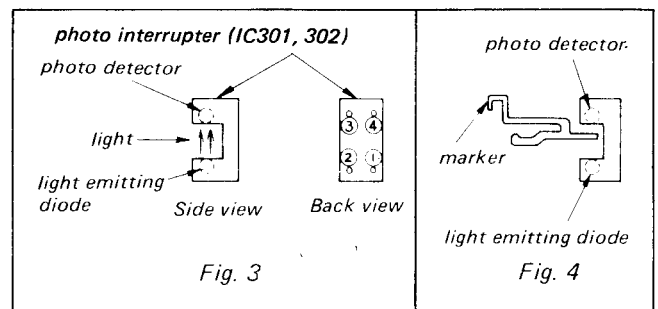
<General>

- Muting Gate
- Regulator
- Muting Canceler Circuit
- Pop-noise Canceler
- Hysteresis Circuit

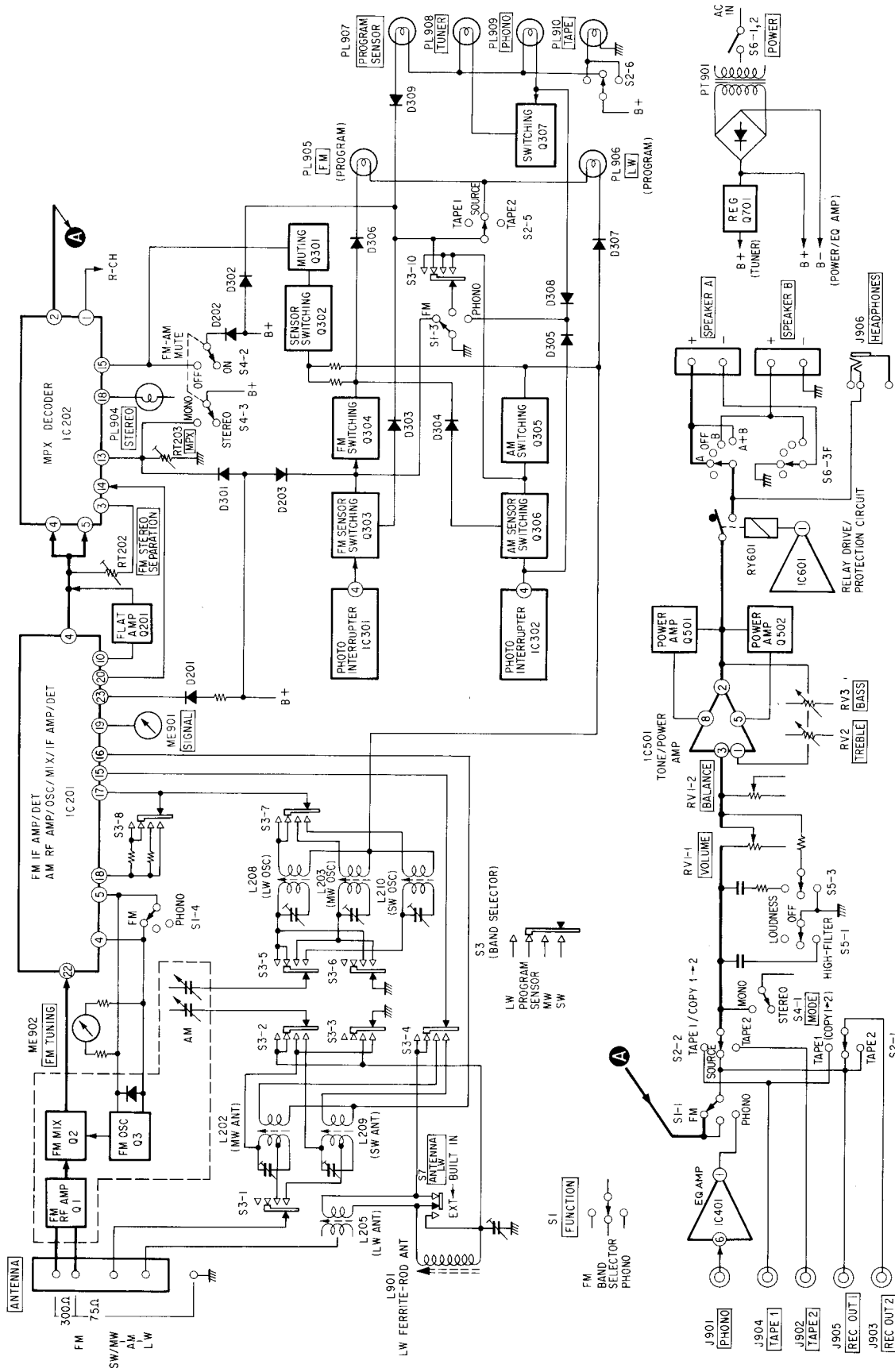
Photo Interrupter (IC301, 302)

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



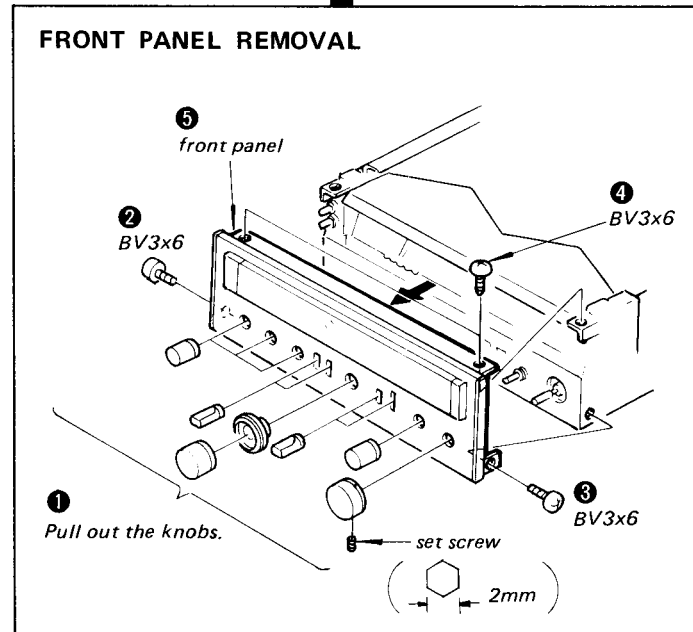
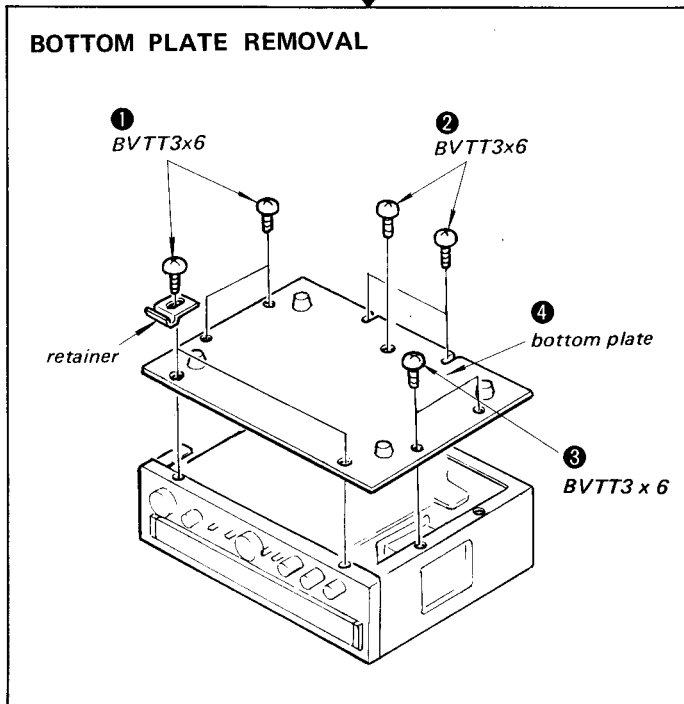
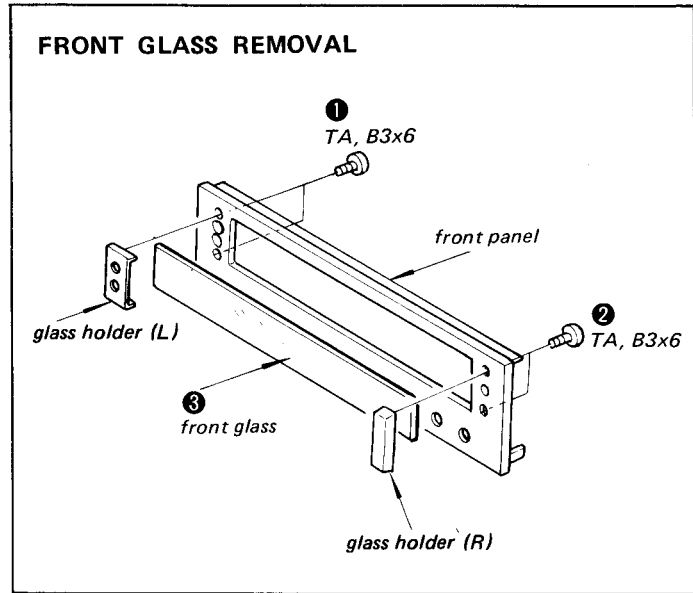
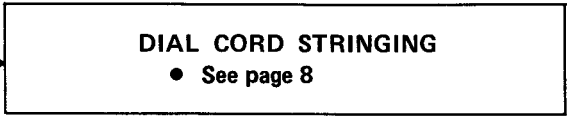
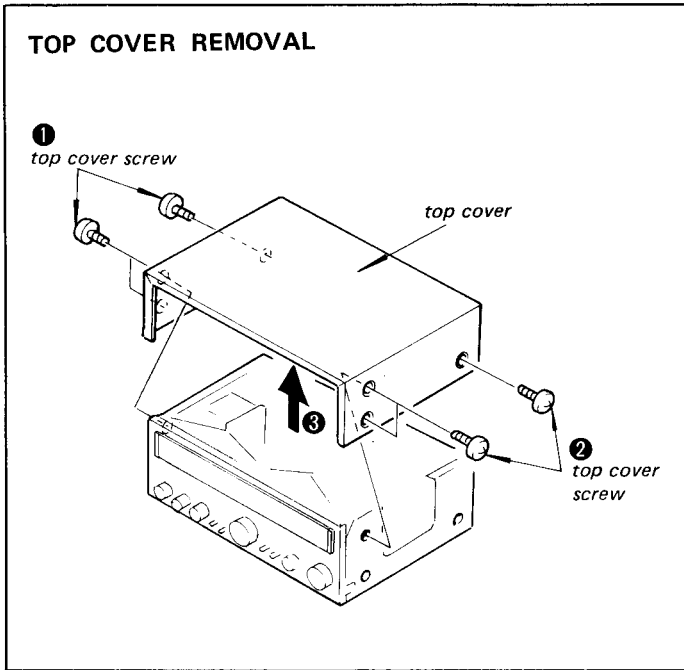
1-2. BLOCK DIAGRAM



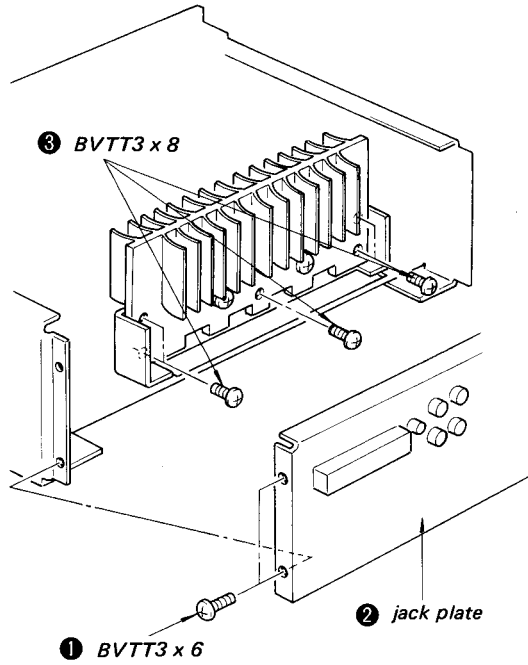
— R-CH SAME AS L-CH. —

**SECTION 2
DISASSEMBLY**

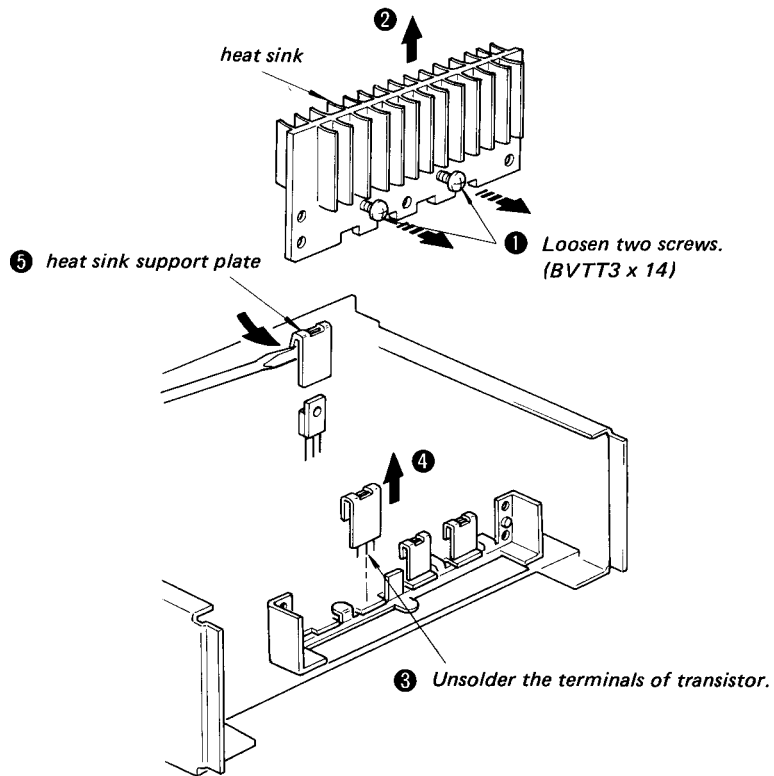
- Follow the disassembly procedure in the numerical order given.

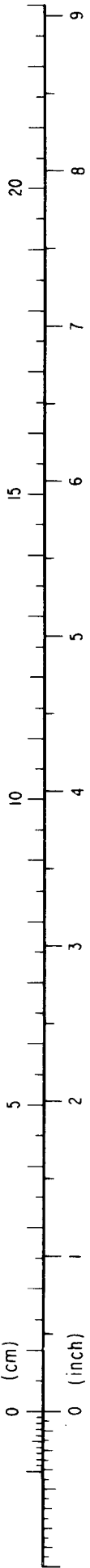


POWER TRANSISTOR (Q501, 502, 551, 552) REPLACEMENT (1)



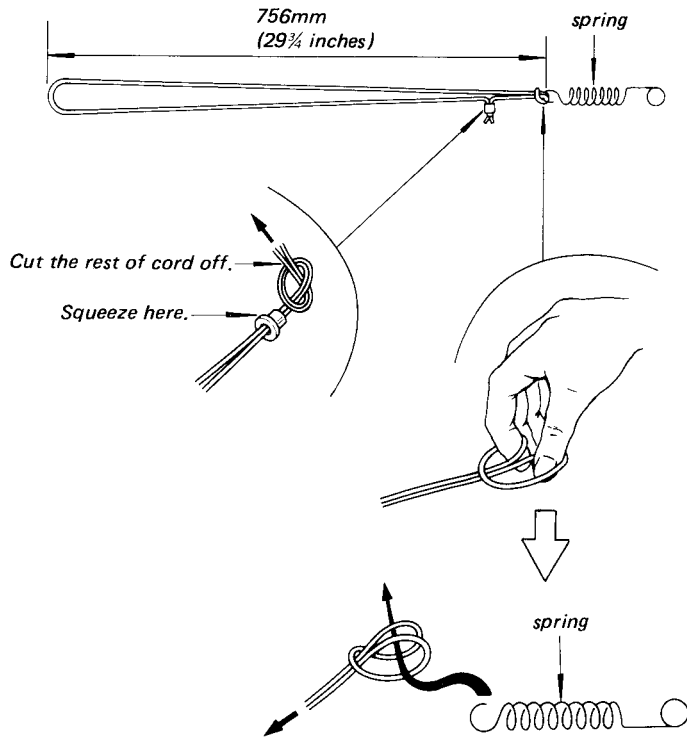
POWER TRANSISTOR (Q501, 502, 551, 552) REPLACEMENT (2)





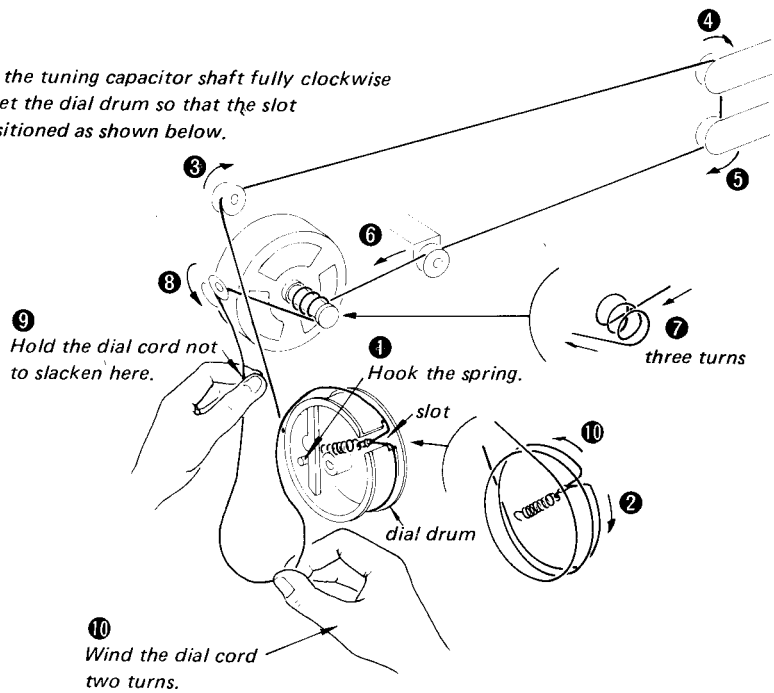
DIAL CORD STRINGING

1) Preparation



2) Stringing

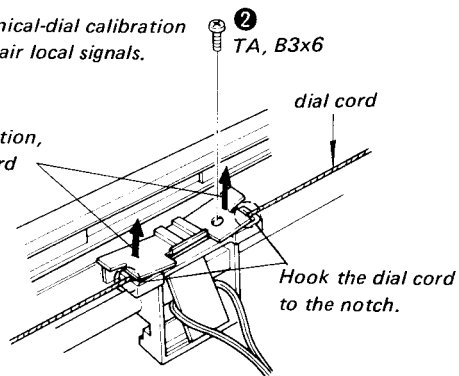
Turn the tuning capacitor shaft fully clockwise and set the dial drum so that the slot is positioned as shown below.



3) Dial Pointer Installation

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

1 After dial calibration, string the dial cord while taking the dial pointer up.



SECTION 3 ELECTRICAL ADJUSTMENTS

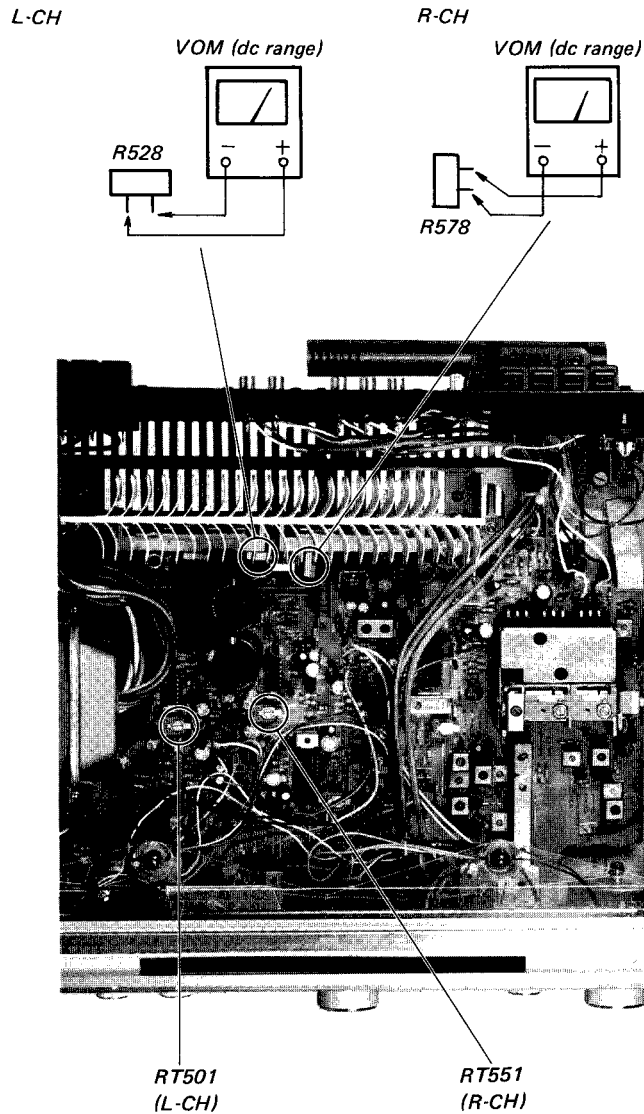
DC BIAS ADJUSTMENT

Setup:

1. Detune the set.
2. Perform this adjustment one minute or more after turning the power switch on.

Procedure:

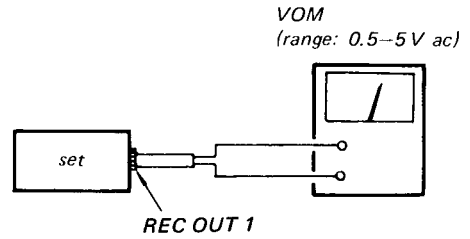
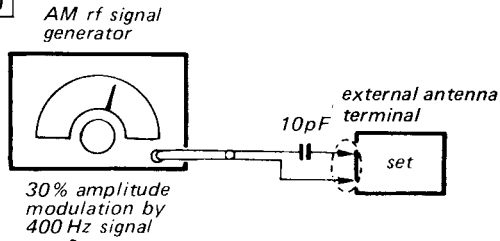
1. Adjust RT501 (L-CH) and RT551 (R-CH) for a 9mV dc on the VOM.



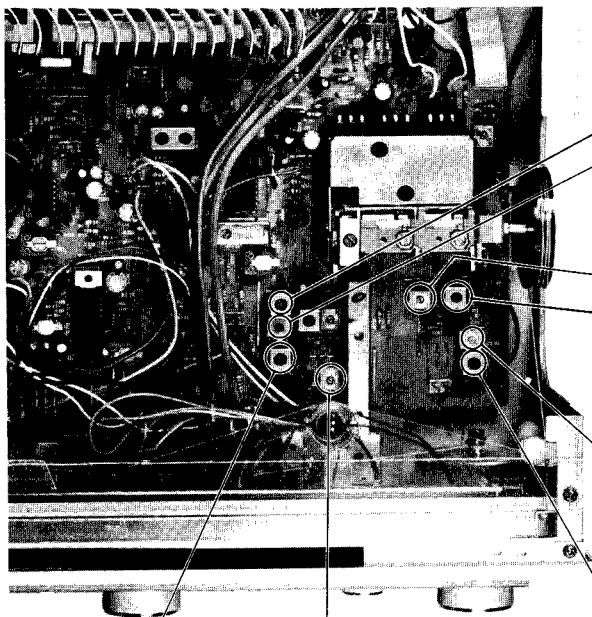
SW, MW SECTION

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.

L203	520 kHz
CT204	1680 kHz

MW TRACKING ADJUSTMENT

Adjust for a maximum reading on VOM.

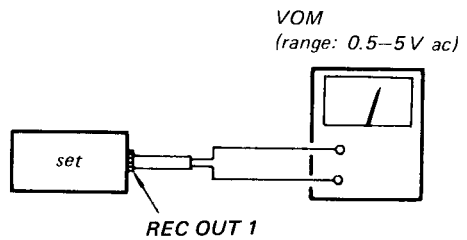
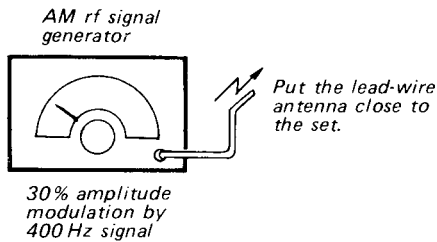
CT203	1400 kHz
L202	600 kHz

L210	CT206
5.5 MHz	16.1 MHz
Adjust for a maximum reading on VOM.	
SW FREQUENCY COVERAGE ADJUSTMENT	

L209	CT205
6 MHz	15 MHz
Adjust for a maximum reading on VOM.	
SW TRACKING ADJUSTMENT	

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

AM rf signal generator

LW dummy antenna

Carrier frequency: 170 kHz
30% amplitude modulation by 400 Hz signal

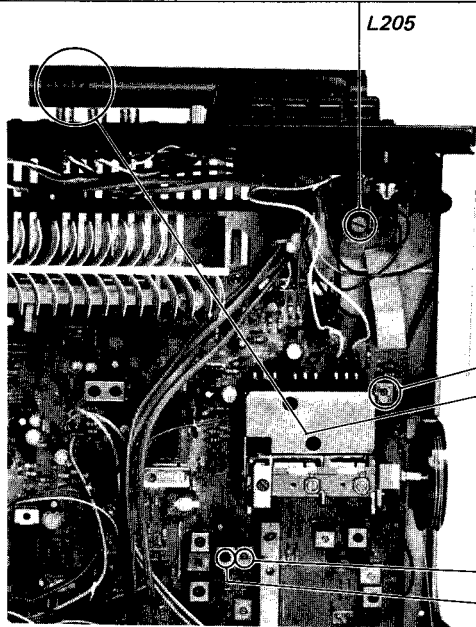
external antenna terminal

set

VOM

REC OUT 1

1. Set the ANTENNA LW switch to EXT position.
2. Tune the set to 170 kHz and adjust L205 for a maximum reading on VOM.

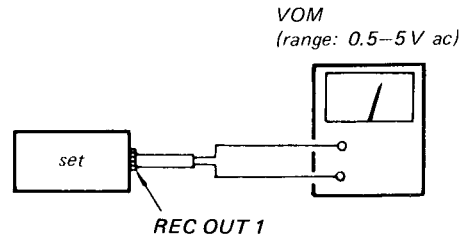
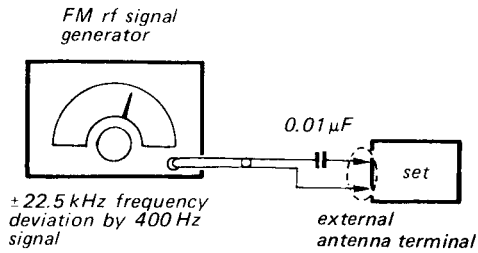


LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT201	310 kHz
L901	170 kHz

LW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT202	365 kHz
L208	145 kHz

FM SECTION

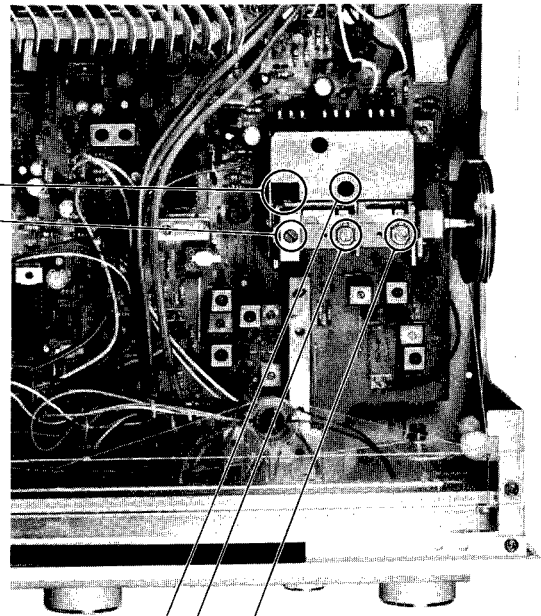
Setting: FUNCTION switch: FM



- 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)	CT3

() : in West Germany

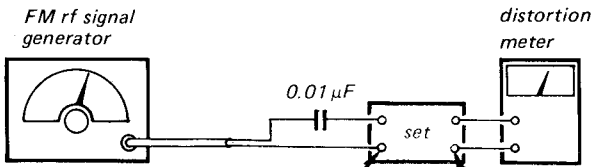


87.1 MHz (87.5 MHz)	L2
108.5 MHz (108 MHz)	CT2
	CT1
Adjust for a maximum reading on VOM.	
FM TRACKING ADJUSTMENT	

() : in West Germany

FM DISCRIMINATOR ALIGNMENT 2

Procedure:



Carrier frequency: 98 MHz
 Output level: 1mV (60 dB)
 Modulation: 400 Hz, 75 kHz deviation (100%)

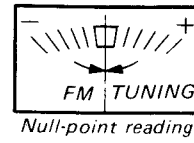
1. Set MODE switch to MONO.
2. Turn the core (secondary side) of IFT201 for a minimum distortion reading on the distortion meter.

IFT201
 (secondary side: black)

FM DISCRIMINATOR ALIGNMENT 1

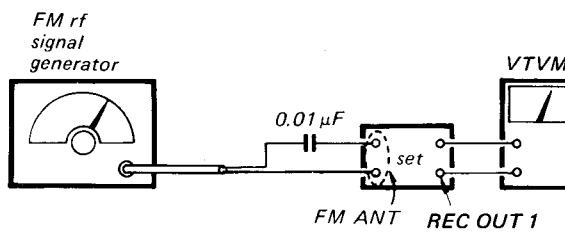
Procedure:

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



IFT201
 (primary side: blue)

FM IF ALIGNMENT



FM Signal Generator Setting:

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

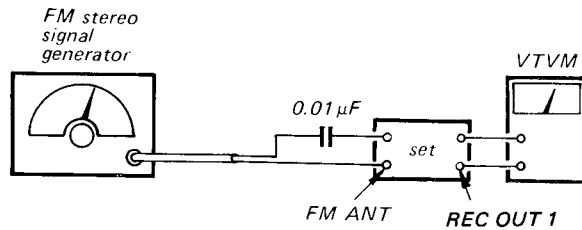
Procedure:

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

IFT1

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

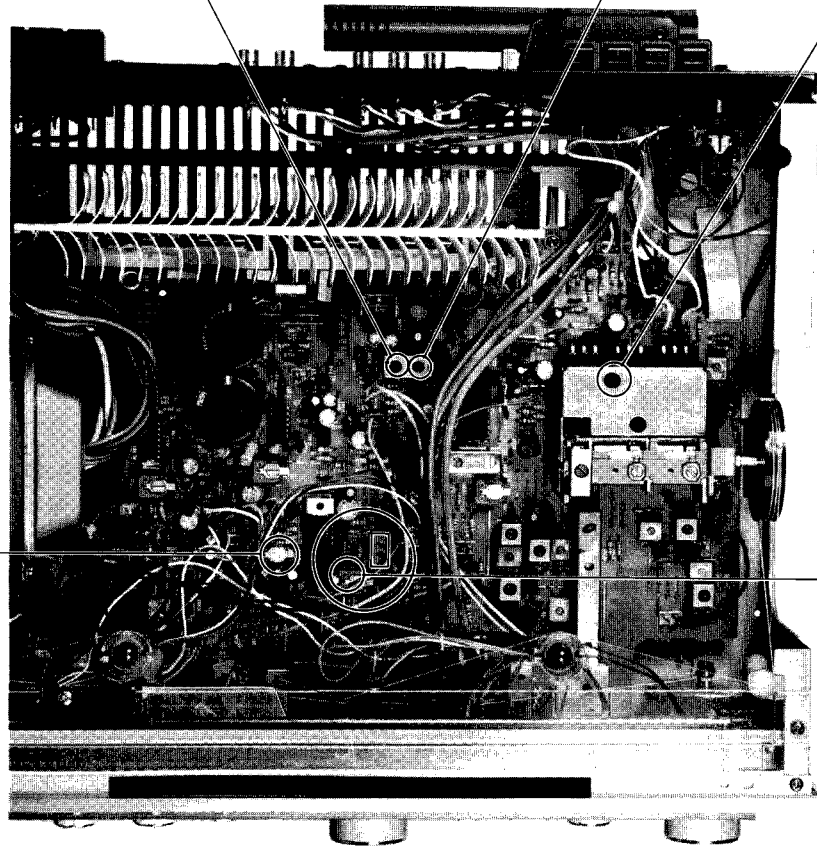
FM stereo signal generator output channel	VTVM connection	VTVM reading
L-CH	L-CH	(A)
R-CH	L-CH	(B) Adjust RT202 for minimum reading.
R-CH	R-CH	(C)
L-CH	R-CH	(D) Adjust RT202 for minimum reading.

L-CH Stereo separation: (A) - (B)
 R-CH Stereo separation: (C) - (D)

The separations of both channels should be equal.

RT202

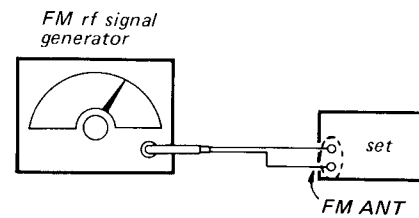
RT203



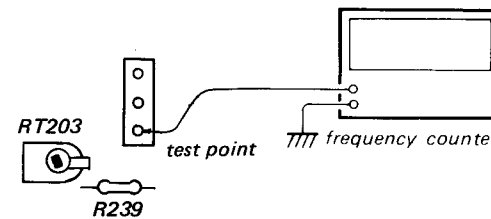
MPX ADJUSTMENT

A) Regular Method

Procedure:



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

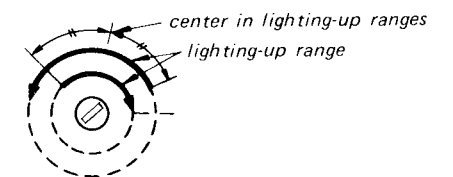


1. Tune the set to 98 MHz.
2. Adjust RT203 for 76 kHz ±100Hz on the counter.

B) Simple Method

Procedure:

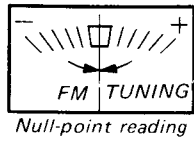
1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT203 clockwise or counterclockwise and memorize the lighting-up range of STEREO lamp.
3. Secure RT203 at the center in lighting-up range of both turns as shown below.



FM DISCRIMINATOR ALIGNMENT 1

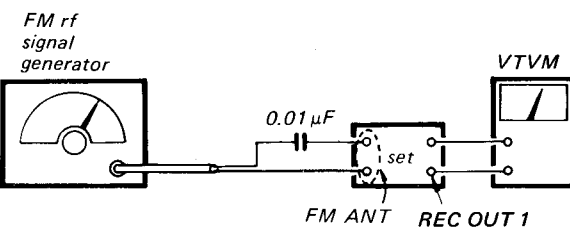
Procedure:

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



IFT201
(primary side: blue)

FM IF ALIGNMENT



FM Signal Generator Setting:

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

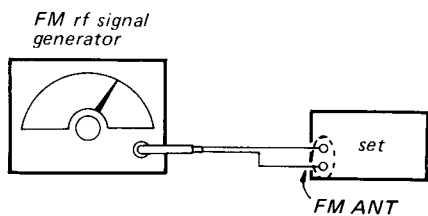
Procedure:

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

MPX ADJUSTMENT

A) Regular Method

Procedure:

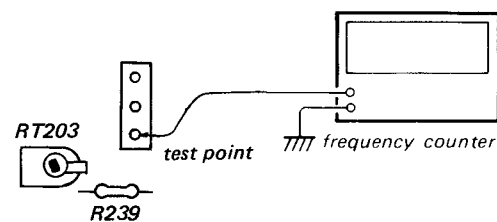
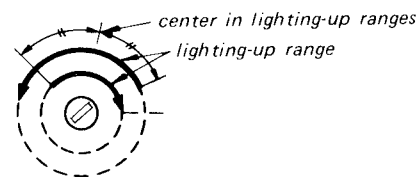


- Carrier frequency: 98 MHz
- Modulation: no modulation
- Output level: 1 mV (60 dB)

B) Simple Method

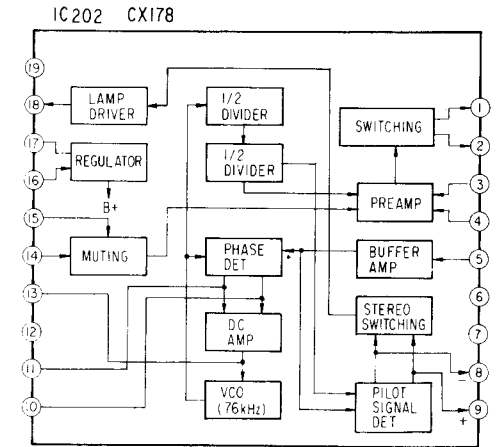
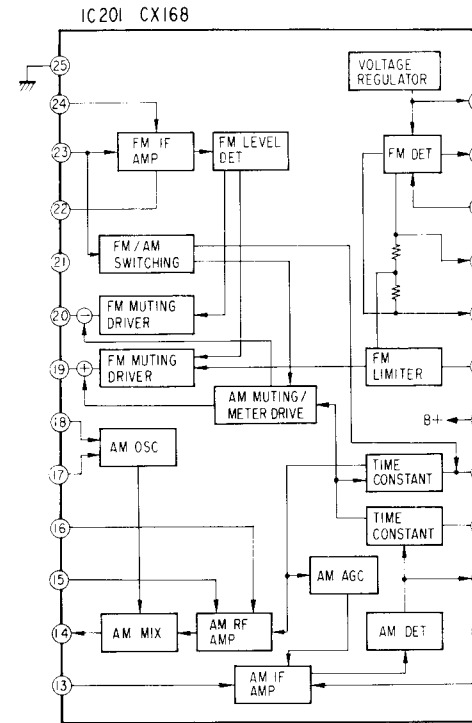
Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT203 clockwise or counterclockwise and memorize the lighting-up range of STEREO lamp.
3. Secure RT203 at the center in lighting-up range of both turns as shown below.

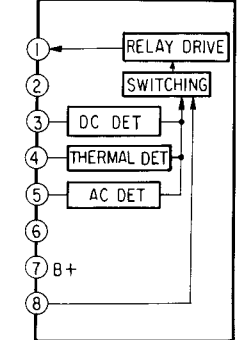


1. Tune the set to 98 MHz.
2. Adjust RT203 for 76 kHz ±100Hz on the counter.

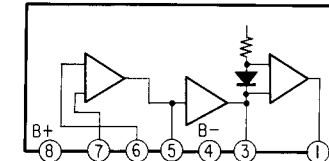
• IC Block Diagrams



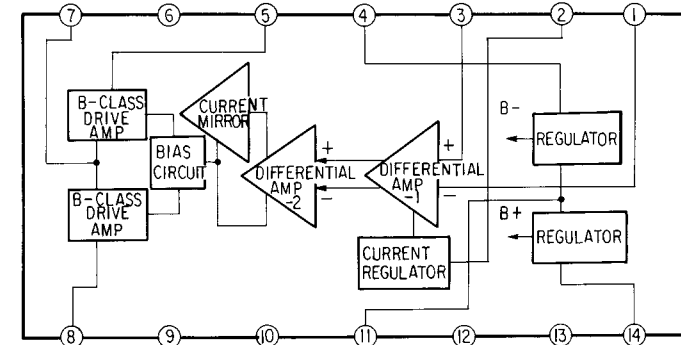
IC601 HAI2002



IC401, 451 HAI457



IC501, 551 CX171

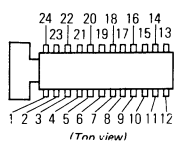


SECTION 4
DIAGRAMS

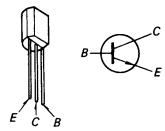
4-1. MOUNTING DIAGRAM
— Conductor Side —

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

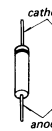
IC201: CX168



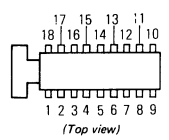
Q201
Q301-303 : 2SC1364 (2SC945)
Q306, 307



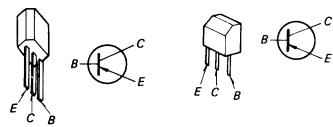
D201-203
D301-309
D502, 504, 506-511 : 1S1555
D552, 554, 556-561
D602
D501, 551 : 1T22AM (1T22A)
D503, 505 : 1S2076A
D553, 555



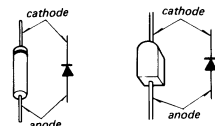
IC202: CX178



Q304, 305: 2SA678 (2SA844)



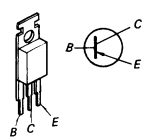
D601: 10E2 (RA12)



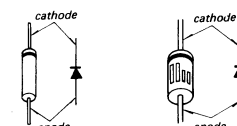
IC301, 302: SPI201



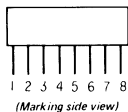
Q501, 551: 2SA771



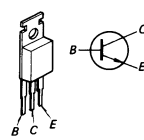
D701-704: 10E2 (SIB01-02)



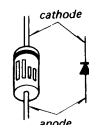
IC401, 451: HA1457
IC601: HA12002



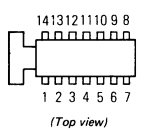
Q502, 552: 2SC1986C (2SC1986)
Q701: 2SC1173



D705, 706: EQB01-22 (EQA01-22R)
D707: EQB01-16 (EQA01-16R)

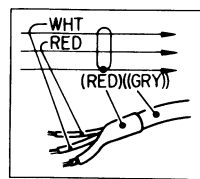


IC501, 551: CX171



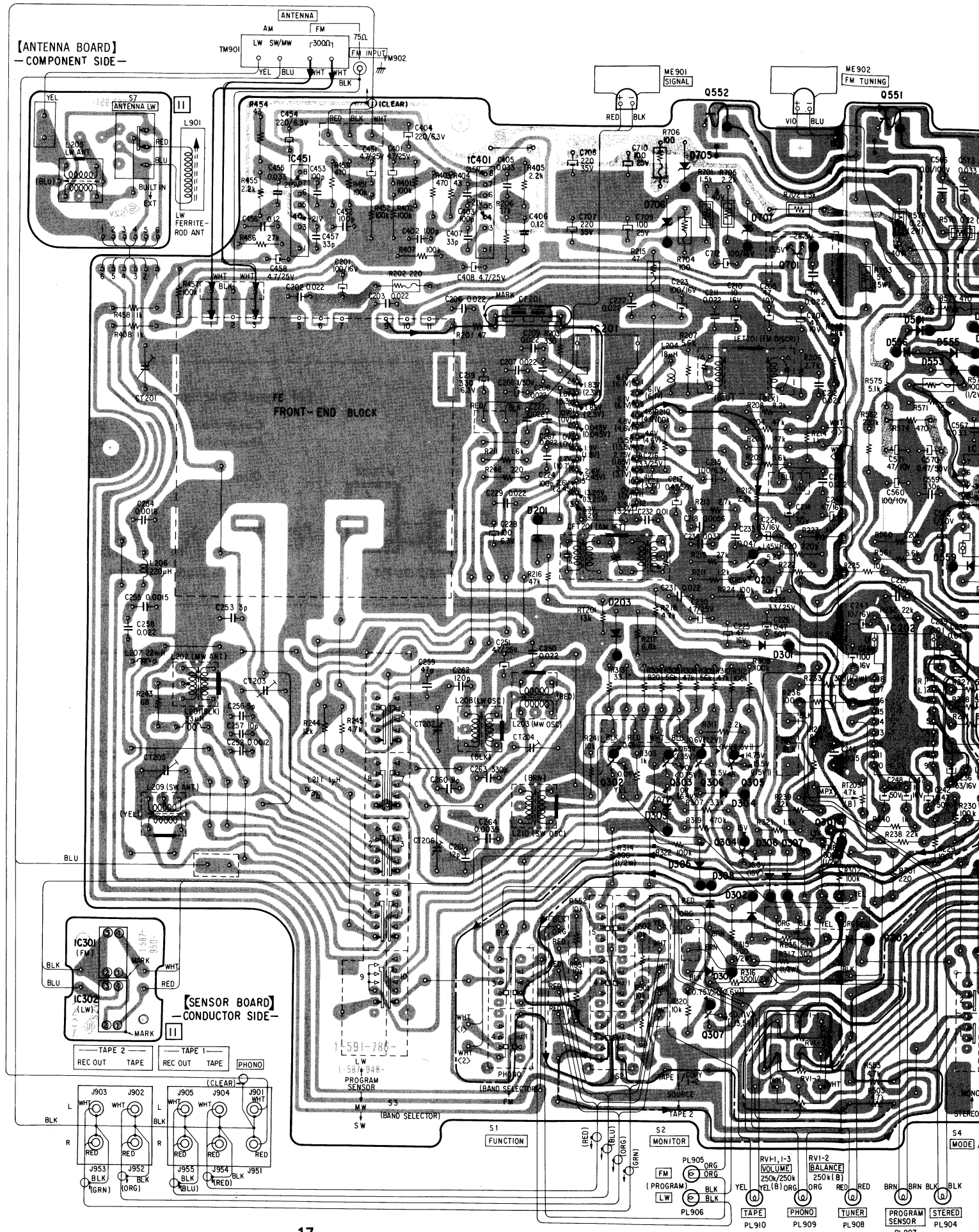
Note: indicates side identified with part number. part mounted on the conductor side. Color code of sleeving over the end of the jacket.

TERMINAL No.	FM no mark	FM STEREO	FM MUTING ON	AM MUTING ON	TERMINAL No.	FM no mark	FM STEREO	FM MUTING ON	AM MUTING ON
1	7.8V	7.8V	7.8V	7.8V	10	2.8V	2.8V	2.8V	2.8V
2	7.7V	7.7V	7.7V	7.7V	11	2.8V	2.8V	2.8V	2.8V
3	4V	4V	4V	4V	12	0V	0V	0V	0V
4	4V	4V	4V	4V	13	4.8V	2.6V	2.6V	6.8V
5	4V	4V	4V	4V	14	0.05V	5V	1V	0.05V
6	0V	0V	0V	0V	15	13V	2.1V	0.04V	0.04V
7	0V	0V	0V	0V	16	12.5V	12.5V	13.5V	13.5V
8	2.8V	2.75V	2.8V	2.8V	17	4V	4V	4V	4V
9	2.8V	2.75V	2.8V	2.8V	18	15.5V	0.25V	15.5V	15.5V



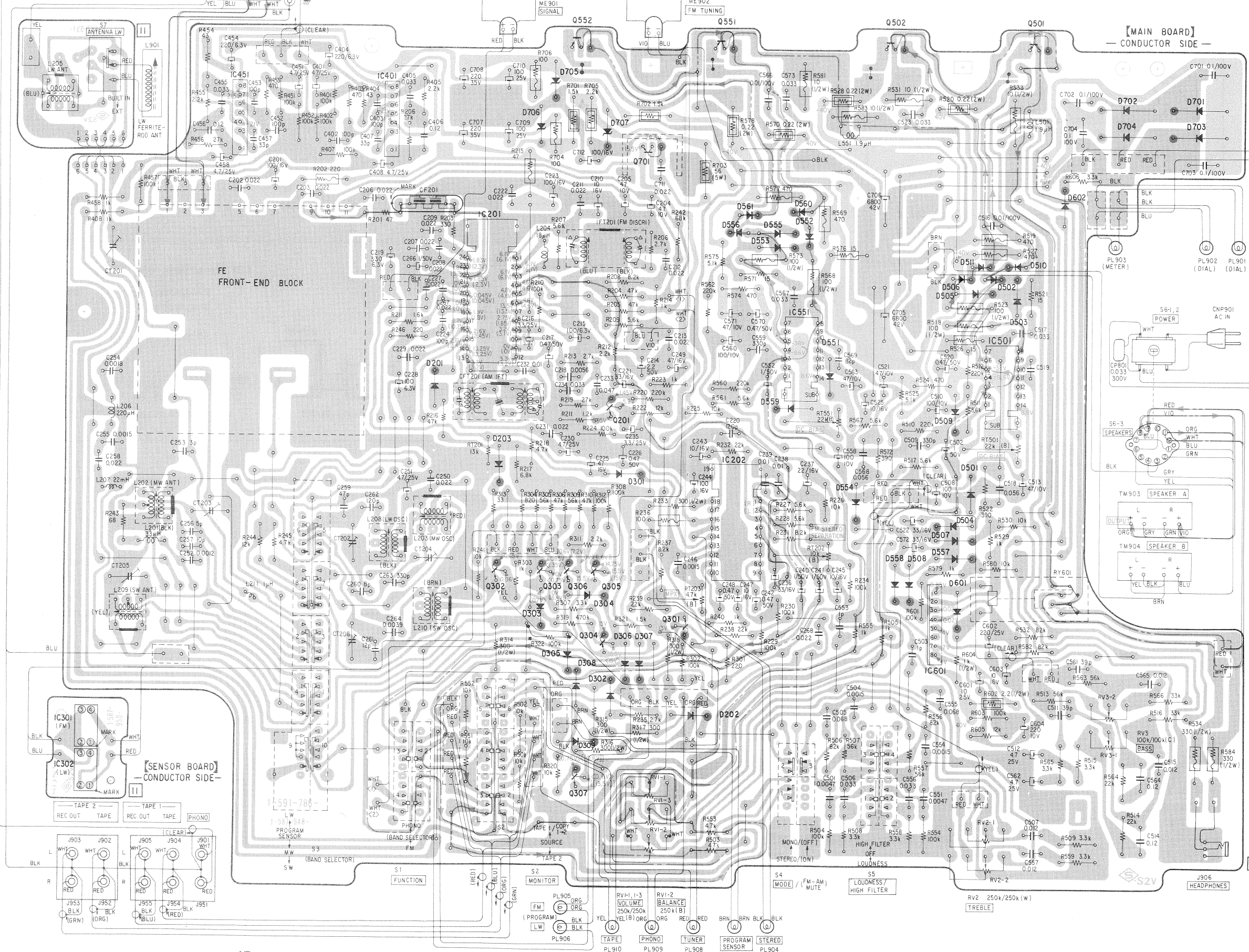
- : B+ pattern.
- : B- pattern.
- Signal Path
 - - - - - : L-CH
 - - - - - : R-CH

Q, IC	D
552, 551 502, 501	
IC451, IC401	705
	702, 701 704, 703 707 706
701	602
	561, 560
IC201	552 556, 555 553
	511, 510 506, 502 505, 503
IC551 IC501	551
	201
	559
	201
	509
IC202	203
	501
	301 554
	504 507 557 558, 508
	601
302, 303 306, 305	304
	301
	303
	306, 307
	305
IC601	308 302
	202
IC301	
IC302	309
	307

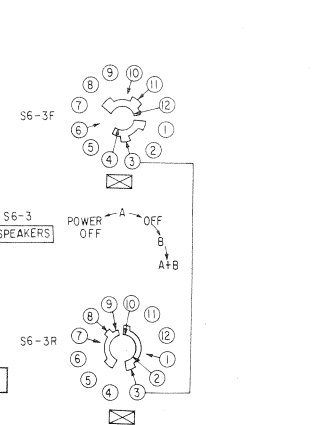
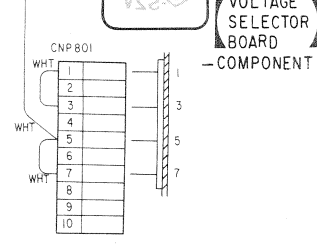
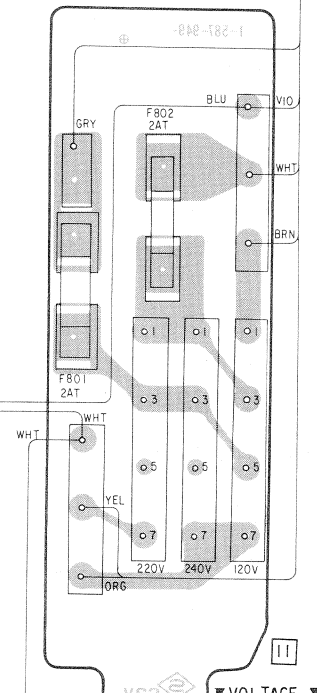
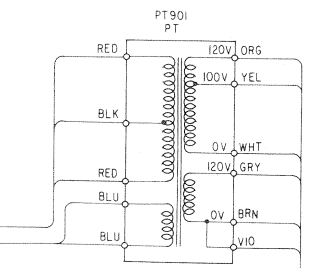


[ANTENNA BOARD] - COMPONENT SIDE -

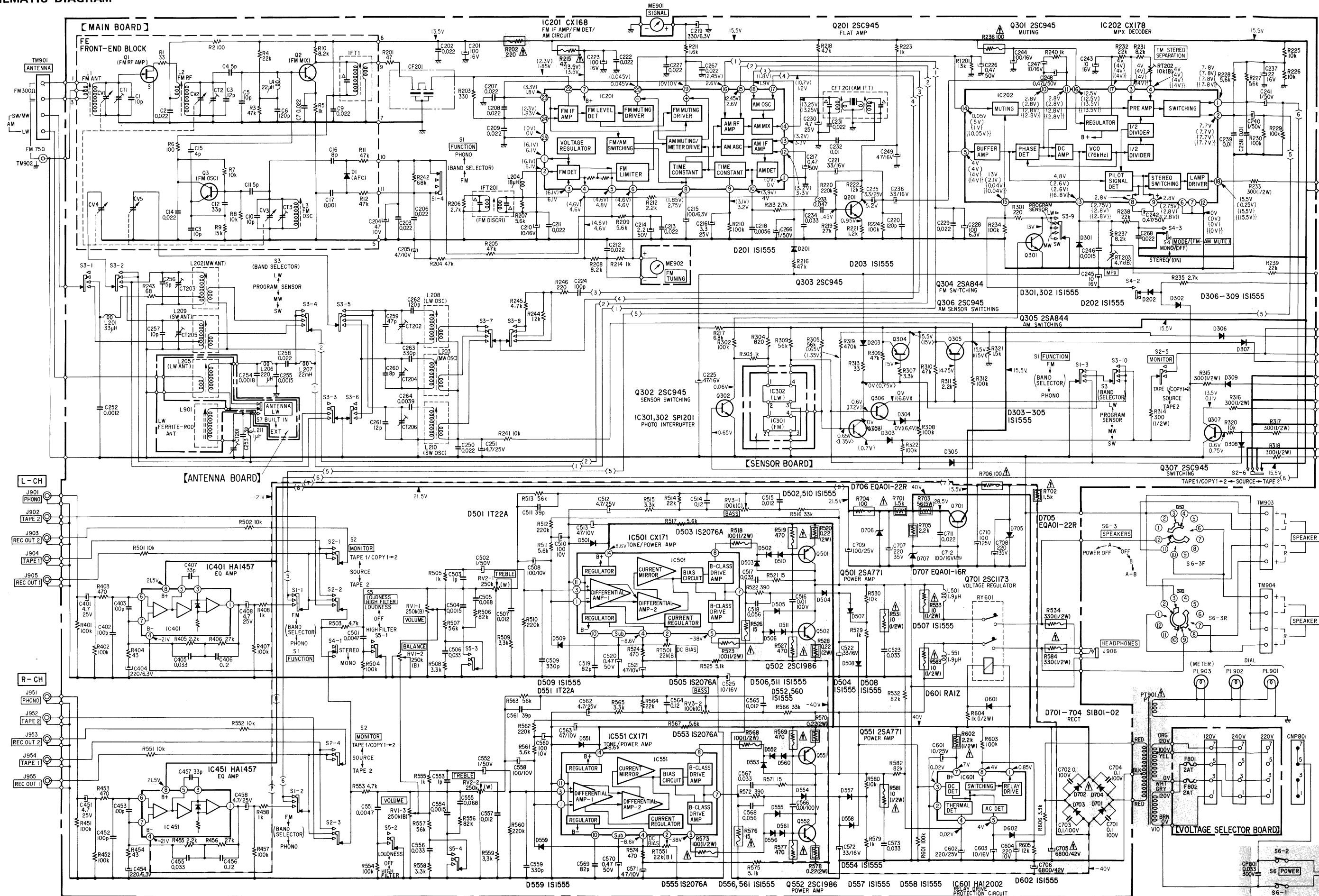
[MAIN BOARD] - CONDUCTOR SIDE -

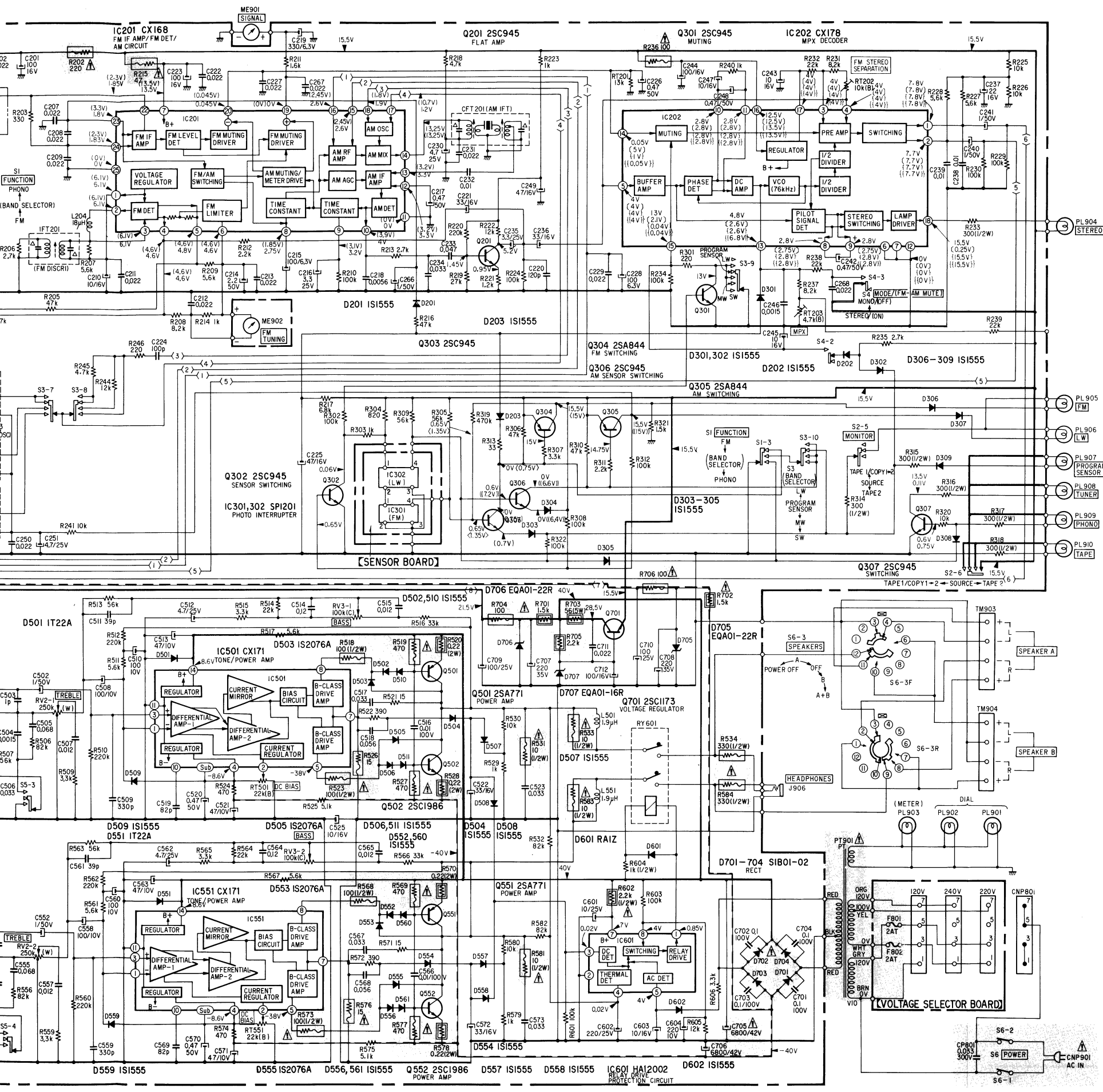


Q, IC	D
552,551 502,501	705
IC451, IC401	702,701 704,703 706
701	602
IC201	561,560 552 556,555 553
IC501 IC501	511,510 506,502 505, 503
201	551
201	559 509
IC202	203 501 301 554
302,303 306,305	504 507 557 558,508
301	601
304	304
IC601	303 306,307 305
IC301	308 302
IC302	202
307	309



4-2. SCHEMATIC DIAGRAM






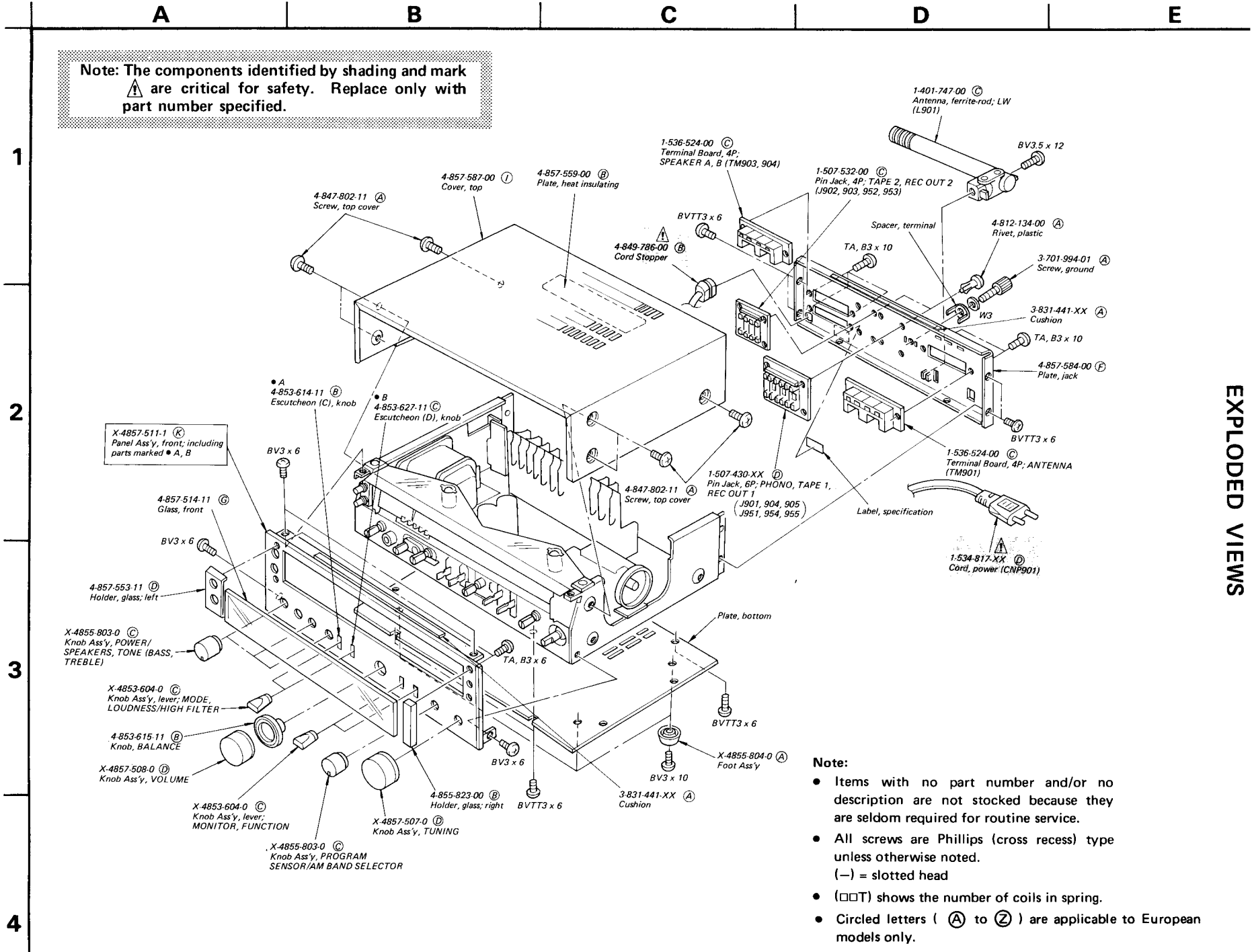
- Note:**
- All capacitors are in μF unless otherwise noted. μF : μF 50WV or less are not indicated except for electrolytics.
 - All resistors are in ohms, $\frac{1}{4}\text{W}$ unless otherwise noted. $\text{k}\Omega$: 1000Ω ; $\text{M}\Omega$: $1000\text{k}\Omega$.
 - : fusible resistor.
 - : nonflammable 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 $\text{k}\Omega/\text{V}$).
 - () : AM << >> : TUNER PROGRAM
 - [] : FM STEREO (()) : TAPE, PHONO
 - < > : PROGRAM FM { } : FM MUTING ON
 - (()) : PROGRAM LW { { } } : AM MUTING ON
 - No mark: FM MONO
 - Voltage variations may be noted due to normal production tolerances.
 - Switch

Ref. No.	Switch	Position
S1	FUNCTION	BAND SELECTOR
S2	MONITOR	SOURCE
S3	Band Selector	PROGRAM SENSOR
S4	MODE/(FM-AM MUTE)	STEREO/(ON)
S5	LOUDNESS/HIGH FILTER	OFF
S6	POWER/SPEAKERS	(ON)/A
S7	ANTENNA LW	BUILT IN

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

SECTION 5
EXPLODED VIEWS

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



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

A

B

C

D

E

Note:

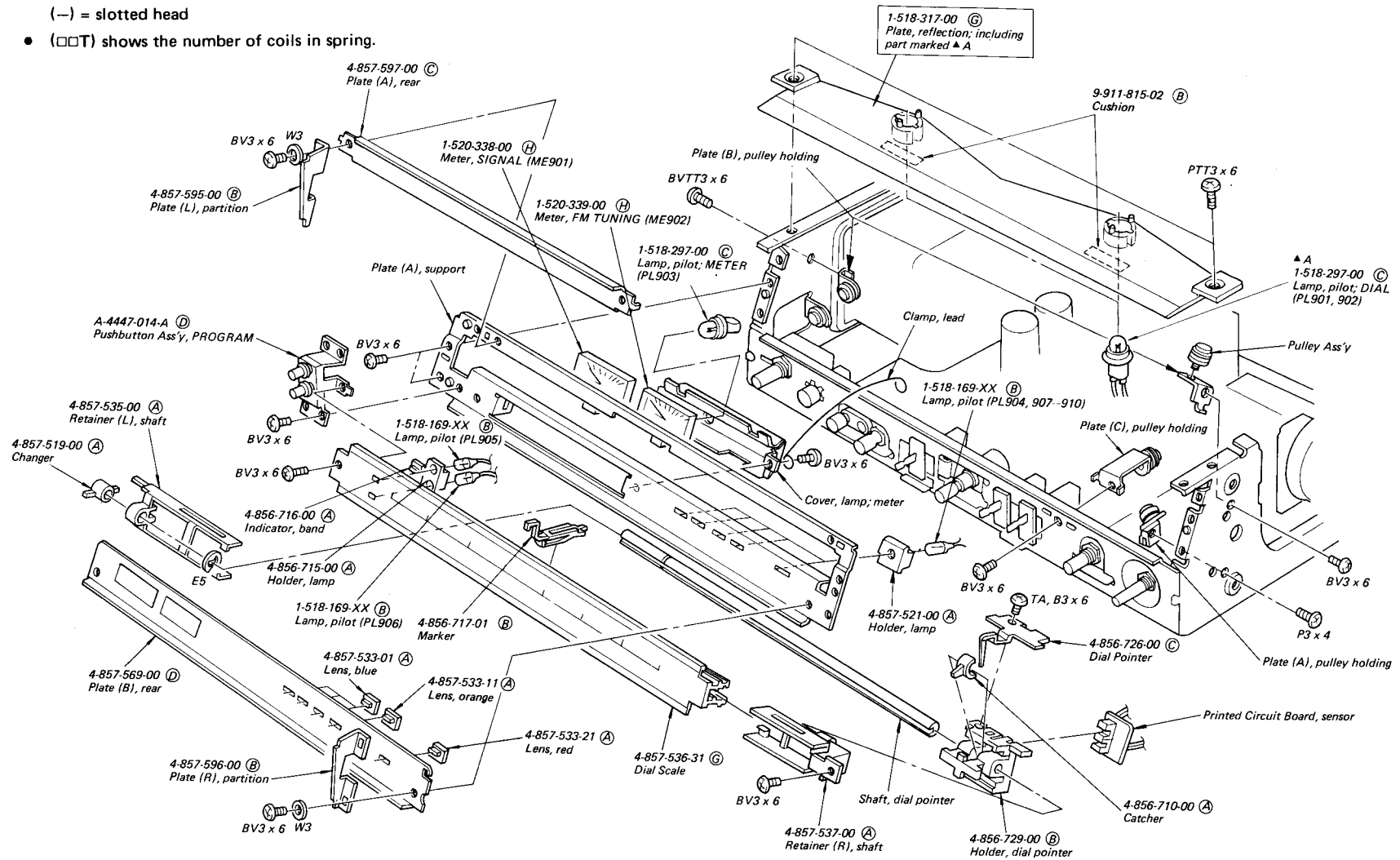
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
(→) = slotted head
- (□T) shows the number of coils in spring.
- Circled letters (A) to (Z) are applicable to European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

1

2

3

4



A

B

C

D

E

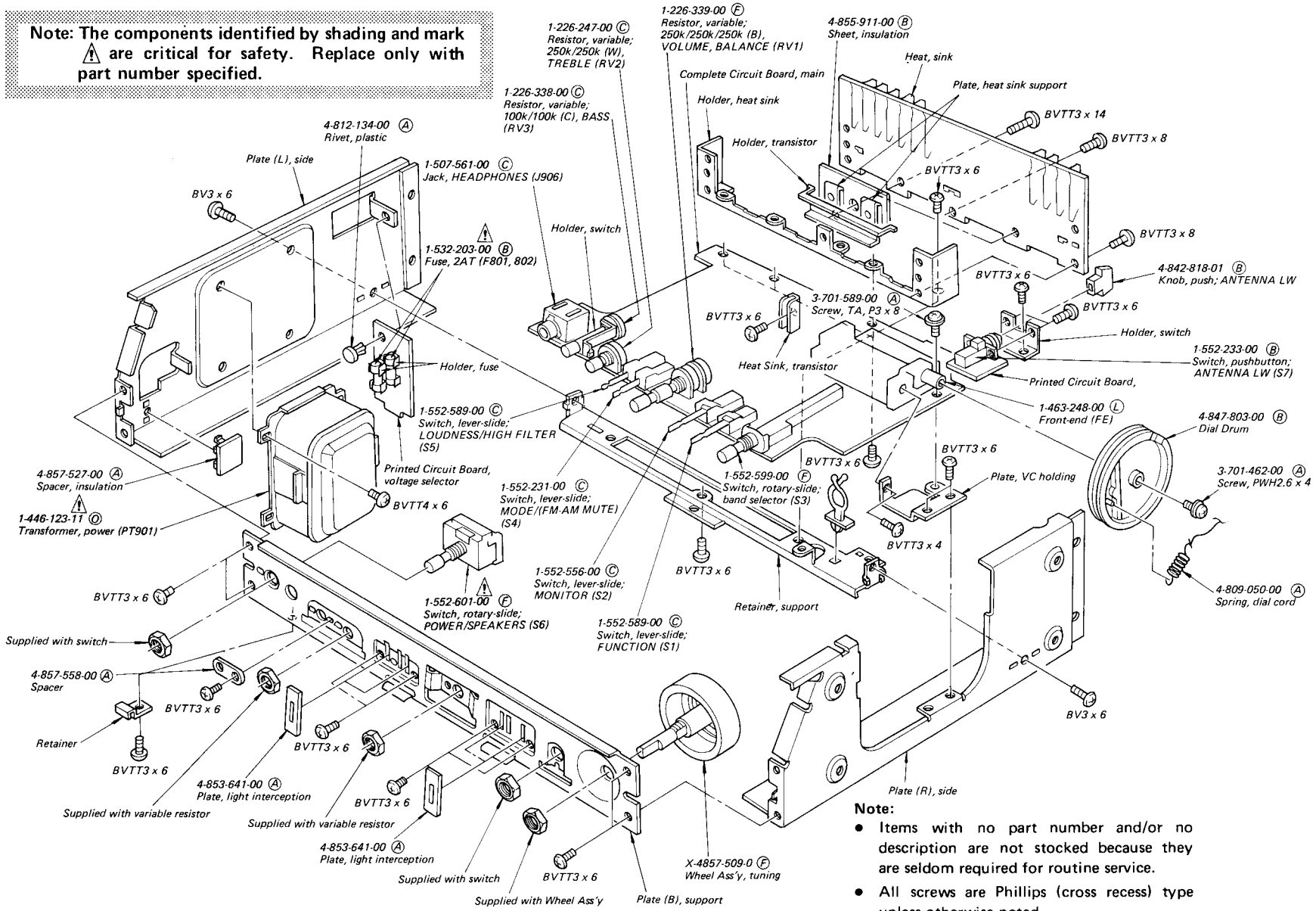
Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

1

2

3

4



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

**SECTION 6
ELECTRICAL PARTS LIST**

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

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
SEMICONDUCTORS		
Transistors		
⇒ Q201	8-729-663-47	B 2SC1364
⇒ Q301-303 ⇒ Q306, 307 ⇒ Q304, 305	8-729-663-47	B 2SC1364
	8-727-788-00	B 2SA678
Q501, 551	8-729-377-12	E 2SA771
⇒ Q502, 552	8-729-308-62	E 2SC1986C
Q701	8-729-217-33	C 2SC1173
ICs		
IC201	8-751-680-01	I CX168
IC202	8-751-780-00	G CX178
IC301, 302	8-719-902-01	B SPI201
IC401, 451	8-759-314-57	C HA1457
IC501, 551	8-751-710-00	G CX171
IC601	8-759-320-02	D HA12002
Diodes		
D201-203 D301-309	8-719-815-55	B 1S1555
⇒ D501, 551	8-719-422-21	B 1T22AM
D502, 504 D506-511	8-719-815-55	B 1S1555
D552, 554 D556-561	8-719-815-55	B 1S1555
D503, 505 D553, 555	8-719-923-76	B 1S2076A
⇒ D601	8-719-200-02	B 10E2
D602	8-719-815-55	B 1S1555
⇒ D701-704	8-719-200-02	B 10E2
⇒ D705, 706	8-719-931-22	B EQB01-22
⇒ D707	8-719-931-16	B EQB01-16

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

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
COILS		
L202	1-401-728-00	B Antenna, MW
L203	1-405-797-00	B Osc, MW
L204	1-407-741-00	B Microinductor, 18μH
L205	1-401-709-00	C Antenna, LW
L207	1-407-210-XX	A Microinductor, 22mH
L208	1-405-813-00	B Osc, LW
L209	1-401-741-00	B Antenna, SW
L210	1-405-812-00	B Osc, SW
L211	1-407-178-XX	A Microinductor, 1μH
L901	1-401-747-00	C Antenna, ferrite-rod; LW
TRANSFORMERS AND FILTER		
CF201	1-527-277-91	G Filter, ceramic
CFT201	1-404-087-00	D AM IFT
IFT201	1-404-011-00	C FM Discriminator
PT901	A 1-446-123-11	C Power

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	1-121-415-00	A 100	16V	elect
C202, 203	1-101-924-00	A 0.022		
C204, 205	1-123-192-00	A 47	10V	elect
C206-209	1-101-924-00	A 0.022		
C210	1-121-651-00	A 10	16V	elect
C211-213	1-101-924-00	A 0.022		
C214	1-121-450-00	A 2.2	50V	elect
C215	1-121-413-00	A 100	6.3V	elect
C216	1-121-392-00	A 3.3	25V	elect
C217	1-121-726-00	A 0.47	50V	elect

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

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

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>				
C218	1-108-355-00	(A) 0.0056		mylar		
C219	1-121-751-00	(A) 330	6.3V	elect		
C220	1-102-816-00	(A) 120p				
C221	1-121-403-00	(A) 33	16V	elect		
C222	1-101-924-00	(A) 0.022				
C223	1-121-415-00	(A) 100	16V	elect		
C224	1-102-973-00	(A) 100p				
C225	1-121-409-00	(A) 47	16V	elect		
C226	1-121-726-00	(A) 0.47	50V	elect		
C227	1-101-924-00	(A) 0.022				
C228	1-121-413-00	(A) 100	6.3V	elect		
C229	1-101-924-00	(A) 0.022				
C230	1-121-395-00	(A) 4.7	25V	elect		
C231	1-101-924-00	(A) 0.022				
C232	1-101-923-00	(A) 0.01				
C233	1-108-246-00	(A) 0.047		mylar		
C234	1-108-244-00	(A) 0.033		mylar		
C235	1-121-392-00	(A) 3.3	25V	elect		
C236	1-121-403-00	(A) 33	16V	elect		
C237	1-121-479-00	(A) 22	16V	elect		
C238, 239	1-108-579-00	(A) 0.01		mylar		
C240, 241	1-121-391-00	(A) 1	50V	elect		
C242	1-121-726-00	(A) 0.47	50V	elect		
C243	1-121-651-00	(A) 10	16V	elect		
C244	1-121-415-00	(A) 100	16V	elect		
C245	1-121-651-00	(A) 10	16V	elect		
C246	1-104-081-00	(A) 0.0015		polyethylene		
C247	1-121-651-00	(A) 10	16V	elect		
C248	1-121-726-00	(A) 0.47	50V	elect		
C249	1-121-409-00	(A) 47	16V	elect		
C250	1-101-924-00	(A) 0.022				
C251	1-121-395-00	(A) 4.7	25V	elect		
C252	1-108-351-00	(A) 0.0012		mylar		
C253	1-102-936-00	(A) 3p				
C254	1-108-352-00	(B) 0.0018		mylar		
C255	1-108-228-00	(A) 0.0015		mylar		
C256	1-102-807-00	(A) 5p				
C257	1-102-947-00	(A) 10p				
C258	1-101-924-00	(A) 0.022				
C259	1-101-880-00	(A) 47p				
C260	1-102-282-00	(A) 8p				
C261	1-102-262-00	(A) 12p				
C262	1-104-055-00	(A) 120p				polyethylene
C263	1-104-065-00	(A) 330p				polyethylene
C264	1-104-091-11	(A) 0.0039				polyethylene
C266	1-121-391-00	(A) 1	50V	elect		
C267, 268	1-101-924-00	(A) 0.022				
C401	1-121-915-00	(A) 4.7	25V	elect		
C402, 403	1-102-973-00	(A) 100p				
C404	1-121-419-00	(B) 220	6.3V	elect		
C405	1-108-591-00	(A) 0.033		mylar		
C406	1-108-605-00	(B) 0.12		mylar		
C407	1-102-963-00	(A) 33p				
C408, 451	1-121-915-00	(B) 4.7	25V	elect		
C452, 453	1-102-973-00	(A) 100p				
C454	1-121-419-00	(B) 220	6.3V	elect		
C455	1-108-591-00	(A) 0.033		mylar		
C456	1-108-605-00	(B) 0.12		mylar		
C457	1-102-963-00	(A) 33p				
C458	1-121-915-00	(B) 4.7	25V	elect		
C501, 551	1-108-234-00	(A) 0.0047		mylar		
C502, 552	1-121-391-00	(A) 1	50V	elect		
C503, 553	1-102-938-00	(A) 1p				
C504, 554	1-108-228-00	(A) 0.0015		mylar		
C505, 555	1-108-249-00	(A) 0.068		mylar		
C506, 556	1-108-244-00	(A) 0.033		mylar		
C507, 557	1-108-357-00	(A) 0.012		mylar		
C508, 558	1-121-414-00	(A) 100	10V	elect		
C509, 559	1-102-820-00	(A) 330p				
C510, 560	1-121-414-00	(A) 100	10V	elect		
C511, 561	1-102-965-00	(A) 39p				
C512, 562	1-121-395-00	(A) 4.7	25V	elect		
C513, 563	1-123-192-00	(A) 47	10V	elect		
C514, 564	1-108-363-00	(A) 0.12		mylar		
C515, 565	1-108-357-00	(A) 0.012		mylar		
C516, 566	1-108-377-00	(A) 0.01	100V	mylar		
C517, 567	1-108-244-00	(A) 0.033		mylar		
C518, 568	1-108-361-00	(A) 0.056		mylar		
C519, 569	1-102-971-00	(A) 82p				
C520, 570	1-121-726-00	(A) 0.47	50V	elect		
C521, 571	1-123-192-00	(A) 47	10V	elect		

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
JACKS		
J901, 904 J905, 951 J954, 955	1-507-430-XX	Ⓓ Pin Jack, 6P; PHONO, TAPE 1, REC OUT 1
J902, 903 J952, 953		Ⓒ Pin Jack, 4P; TAPE 2, REC OUT 2
J906		Ⓒ Jack, HEADPHONES

Ref. No.	Part No.	Description
RY601	1-515-303-00	Ⓕ Relay
TM901,903 TM904	1-536-524-00	Ⓒ Terminal Board, 4P; ANTENNA, SPEAKER A, B
		1-518-317-00
PL901,902	1-518-297-00	Ⓒ Lamp, pilot; 8V 300mA, DIAL

MISCELLANEOUS

CNP901	△ 1-534-817-XX	Ⓓ Cord, power
F801, 802	△ 1-532-203-00	Ⓑ Fuse, 2AT
FE	1-463-248-00	⒴ Front-end
ME901	1-520-338-00	Ⓗ Meter, SIGNAL
ME902	1-520-339-00	Ⓗ Meter, FM TUNING
PL901,902	1-518-297-00	Ⓒ Lamp, pilot; 8V 300mA, DIAL
PL903	1-518-297-00	Ⓒ Lamp, pilot; 8V 300mA, METER
PL904 PL910	1-518-169-XX	Ⓑ Lamp, pilot; 4.5V 40mA

PACKING MATERIALS AND ACCESSORIES

Part No.	Description
1-501-184-00	Ⓒ Antenna, feeder
1-501-193-00	Ⓑ Antenna
3-701-630-00	Ⓐ Bag, polyethylene
3-770-599-11	Ⓓ Manual, instruction
4-809-251-00	Ⓐ Bag, polyethylene
4-847-802-11	Ⓐ Screw, case stopper
4-857-591-00	Ⓓ Carton
4-857-593-00	Ⓑ Cushion, upper
4-857-594-00	Ⓑ Cushion, lower

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	1-246-476-00	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	1-246-477-00	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	1-246-478-00	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	1-246-479-00	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	1-246-480-00	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	1-246-481-00	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	1-246-482-00	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	1-246-483-00	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	1-246-484-00	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	1-246-485-00	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	1-246-486-00	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	1-246-487-00	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		

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

Ref. No.	Part No.	Description
C522, 572	1-121-403-00	(A) 33 16V elect
C523, 573	1-108-244-00	(A) 0.033 mylar
C525	1-121-651-00	(A) 10 16V elect
C601	1-121-398-00	(A) 10 25V elect
C602	1-121-422-00	(B) 220 25V elect
C603	1-121-651-00	(A) 10 16V elect
C604	1-121-420-00	(B) 220 10V elect
C701-704	1-108-389-00	(B) 0.1 100V mylar
C705, 706	(A) 1-125-157-00	(D) 6800 42V elect
C707, 708	1-121-261-00	(B) 220 35V elect
C709, 710	1-121-417-00	(B) 100 25V elect
C711	1-101-005-00	(A) 0.022
C712	1-121-415-00	(A) 100 16V elect
CP801	(A) 1-108-750-00	(B) 0.033 300V mylar
CT201-206	1-141-171-00	(B) 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.

R202	(A) 1-212-889-00	(A) 220 ¼W fusible (nonflammable)
R215	(A) 1-217-395-00	(B) 47 ¼W fusible (nonflammable)
R233	1-244-860-00	(A) 300 ½W carbon
R236	(A) 1-217-399-00	(B) 100 ¼W fusible (nonflammable)
R314-318	1-244-860-00	(A) 300 ½W carbon
R518, 568	(A) 1-212-982-00	(A) 100 ½W fusible (nonflammable)
R519, 569	(A) 1-212-897-00	(A) 470 ¼W fusible (nonflammable)
R520, 570	(A) 1-217-151-00	(B) 0.22 2W wirewound
R523, 573	(A) 1-212-982-00	(A) 100 ½W fusible (nonflammable)
R526, 576	(A) 1-212-861-00	(A) 15 ¼W fusible (nonflammable)
R527, 577	(A) 1-212-897-00	(A) 470 ¼W fusible (nonflammable)
R528, 578	(A) 1-217-151-00	(B) 0.22 2W wirewound (nonflammable)

Ref. No.	Part No.	Description
R531, 581	(A) 1-212-958-00	(A) 10 ½W fusible (nonflammable)
R533, 583	(A) 1-211-626-00	(B) 330 ½W fusible (nonflammable)
R602	(A) 1-211-646-00	(B) 2.2k ½W carbon (nonflammable)
R604	1-244-873-00	(A) 1k ½W carbon
R701, 702	(A) 1-211-548-00	(B) 1.5k ¼W carbon (nonflammable)
R703	(A) 1-217-307-00	(B) 56 5W wirewound (nonflammable)
R704	(A) 1-217-399-00	(B) 100 ¼W fusible (nonflammable)
R705	(A) 1-211-945-00	(C) 2.2k ¼W carbon (nonflammable)
R706	(A) 1-217-399-00	(B) 100 ¼W fusible (nonflammable)
RT202	1-224-645-XX	(A) Adjustable, 10k (B); FM STEREO SEPARATION
RT203	1-224-644-XX	(A) Adjustable, 4.7k (B); MPX
RT501,551	1-224-646-XX	(A) Adjustable, 22k (B); DC BIAS
RV1	1-226-339-00	(F) Variable, 250k/250k/250k (B); VOLUME, BALANCE
RV2	1-226-247-00	(C) Variable, 250k/250k (W); TREBLE
RV3	1-226-338-00	(C) Variable, 100k/100k (C); BASS

SWITCHES

S1	1-552-589-00	(C) Lever-slide, FUNCTION
S2	1-552-556-00	(C) Lever-slide, MONITOR
S3	1-552-599-00	(F) Rotary-slide, band selector
S4	1-552-231-00	(C) Lever-slide, MODE/(FM-AM MUTE)
S5	1-552-589-00	(C) Lever-slide, LOUDNESS/HIGH FILTER
S6	(A) 1-552-601-00	(F) Rotary-slide, POWER/SPEAKERS
S7	1-552-233-00	(B) Pushbutton, ANTENNA LW

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