

ST-S590ES

SERVICE MANUAL

AEP Model



SPECIFICATIONS

FM tuner

Frequency range	87.5 - 108 MHz
Antenna terminals	75 Ω unbalanced
Intermediate frequency	10.7 MHz
Sensitivity	(mono S/N 26 dB) 10.3 dBf, 0.9 μ V/75 Ω (stereo S/N 46 dB) 38.5 dBf, 23 μ V/75 Ω
Usable sensitivity	10.3 dBf, 0.9 μ V/75 Ω (IHF)
Signal-to-noise ratio	(at 40 kHz deviation) 80 dB (mono) 76 dB (stereo)
Harmonic distortion	WIDE 0.03% (mono); 0.04% (stereo) NARROW 0.05% (mono); 0.07% (stereo)
Frequency response	15 Hz - 15 kHz, ($\pm$ 0.2 dB)
Separation	60 dB (at 1 kHz)
Selectivity	(at 400kHz) WIDE 80 dB NARROW 90 dB (at 300kHz) WIDE 45 dB NARROW 70 dB
Output	(at 40 kHz deviation) 600 mV

AM tuner

Frequency range	Italy MW: 522 - 1,611 kHz (9 kHz step) LW: 144 - 288 kHz (1 kHz step) Other MW: 531 - 1,602 kHz (9 kHz step) LW: 153 - 279 kHz (1 kHz step)
Intermediate frequency	450 kHz
Usable sensitivity	(with AM loop antenna) MW: 250 μ V/m LW: 700 μ V/m
Signal-to-noise ratio	54 dB
Harmonic distortion	0.3%
Selectivity	32 dB

General

Power requirements	220 - 230 V AC, 50/60 Hz (adjustable to 240 V AC by Sony personnel)
Power consumption	14 W
Dimensions	Approx. 430 mm (W) x 85 mm (H) x 345 mm (D) (17 x 3 ³ / ₈ x 13 ⁵ / ₈ inches)
Weight	Approx. 4.0 kg (8 lb. 13 oz.)
Accessories supplied	Remote control cord (1); Connecting cord (1); AM loop antenna (1)

Design and specifications are subject to change without notice.

FM STEREO / FM-AM TUNER
SONY[®]

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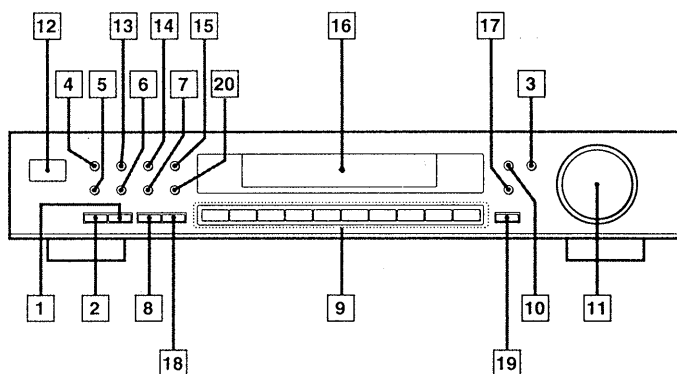
SAFETY-RELATED COMPONENT WARNING!!

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

SECTION 1 GENERAL

This section is extracted from instruction manual.

Identifying the Controls



- 1** RDS button (46, 48)
- 2** AF button (46)
- 3** PTY button (48)
- 4** ANT button (10)
- 5** ANT ATT button (24)
- 6** IF BAND button (24)
- 7** MUTING button (22)
- 8** MEMORY button (26, 28)
- 9** Preset buttons (12, 26, 30, 36)
- 10** TUNING/PRESET button (16, 18, 32, 34, 44, 52)
- 11** TUNING/CHARACTER/PTY SELECT knob (16, 18, 26, 32-36, 44-52)
- 12** Power switch
- 13** CHARACTER button (36)
- 14** DISPLAY button (30, 44)
- 15** DISPLAY MODE button (12)
- 16** Display window
- 17** TUNE MODE button (16, 18, 28, 32, 34, 44, 48, 52)
- 18** BAND button (16-20)
- 19** SHIFT button (26, 30, 36)
- 20** FM MODE button (24)

(The numbers in parenthesis indicate the page(s) where the control is described.)

SECTION 2 ADJUSTMENTS

- Refer to Adjustment Location on page 6.

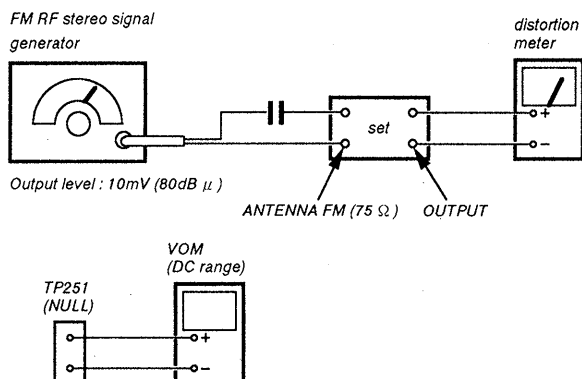
Note : As a front-end (FE101, 421 etc.) is difficult to repair if faulty, replace it with new one.

FM SECTION

- Standard Setting of FM Stereo RF Signal Generator.

STEREO STANDARD SIGNAL	MONAURAL STANDARD SIGNAL
Carrier frequency : 98MHz Modulation : Audio 1kHz, 16.25kHz (21.7%) deviation Subchannel 38kHz, 16.25kHz (21.7%) deviation Pilot 19kHz, 7.5kHz deviation (13.3%)	98MHz 1kHz, 40kHz deviation (53%)

FM Discriminator Adjustment (NULL and MONO Distortion)

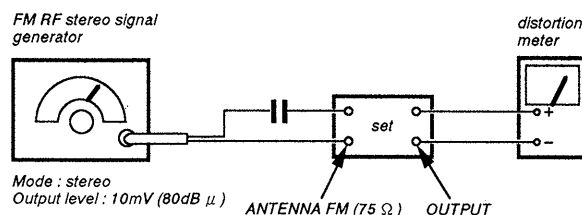


Procedure :

1. Tune the set to 98MHz.
2. Adjust T252 for 0V reading on the VOM.NULL
3. Adjust T253 for a minimum reading on the distortion meter. MONO Distortion
4. Repeat the adjustments of 2 and 3 several times.

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

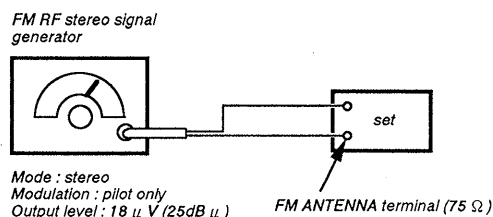
FM Stereo Distortion Adjustment



Procedure :

1. Tune the set to 98MHz.
Set SSG output level to 80dB μ
2. Adjust IFT in FE101 for a minimum reading on the distortion meter.

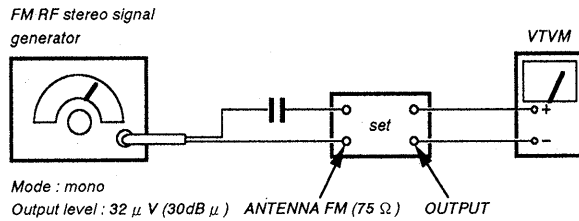
FM Stereo Indication Lighting Level Adjustment



Procedure :

1. Tune the set to 98MHz.
MUTING "OFF", FM MODE "AUTO STEREO"
Set SSG output level to 25dB μ
2. Adjust RV251 to the place where "STEREO", "TUNED" indication lights.

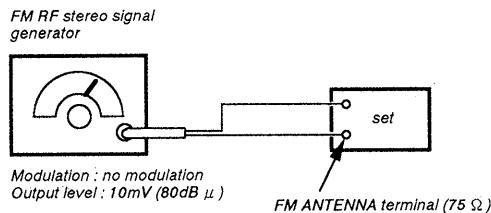
FM Muting Level Adjustment



Procedure :

1. Tune the set to 98MHz.
2. Push the MUTING switch and put on the light the "MUTING" indicator in the fluorescent display.
3. Set SSG output level to 32 μ V (30dB μ).
4. Adjust RV252 so that the reading of VTVM becomes within 25 μ V (28dB μ) – 40 μ V (32dB μ).

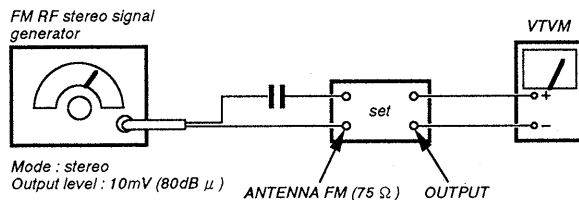
FM Signal Level Adjustment



Procedure :

1. Tune the set to 98MHz.
2. Push the display button to change the display mode for signal strength indication.
3. Adjust RV221 to the place where level 10 in the signal strength bar indicator lights and "75dB" indication lights on fluorescent tube.

FM Stereo Separation Adjustment



Procedure :

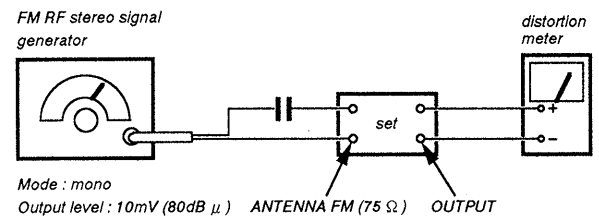
FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	(A)
R-CH	L-CH	(B) Adjust RV301 minimum reading.
R-CH	R-CH	(C)
L-CH	R-CH	(D) Adjust RV 301 for minimum reading.

L-CH Stereo separation : (A)–(B)

R-CH Stereo separation : (C)–(D)

The separation of both channels should be equal.

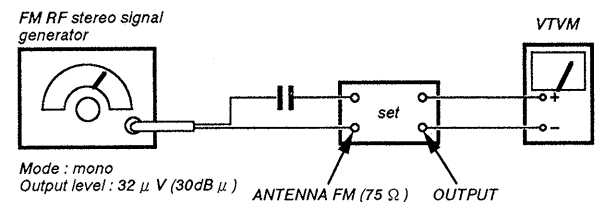
FM Narrow Distortion Adjustment



Procedure :

1. Tune the set to 98MHz.
2. Push the IF BAND switch and put on the light the "NARROW" indicator in the fluorescent display.
3. Set SSG output level to 80dB μ .
4. Adjust RV232 for a minimum reading on the distortion meter.

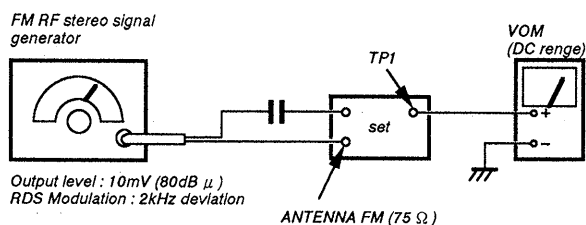
FM Narrow Gain Adjustment



Procedure :

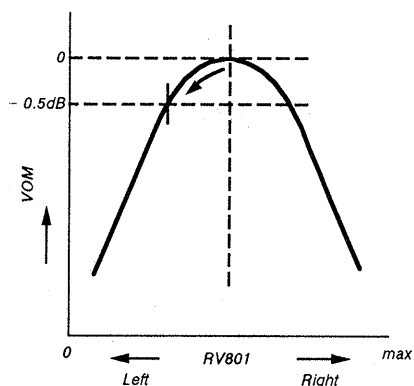
1. Tune the set to 98MHz.
2. Push the IF BAND switch and put on the light the "NARROW" indicator in the fluorescent display.
3. Set SSG output level to 32 μ V (30dB μ).
4. Adjust RV231 so that the reading on VTVM becomes within 25 μ V (28dB μ) – 40 μ V (32dB μ).

RDS, BPF Adjustment

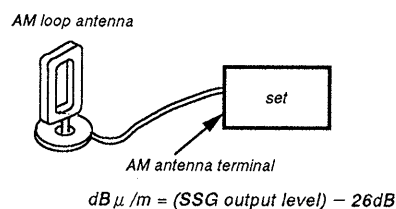
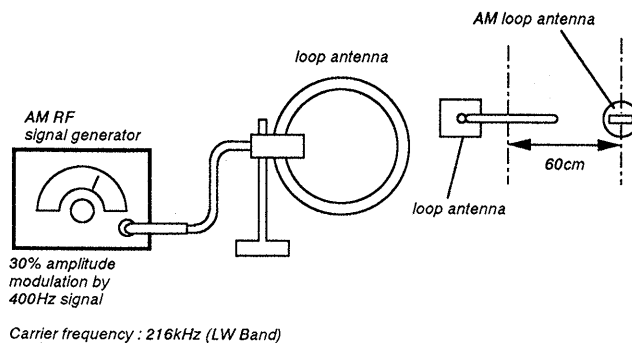


Procedure :

1. Tune RV801 to counterclockwise (left) and set the level below 0.5dB than maximum reading on the VOM. (refer to below drawing.)



AM SECTION

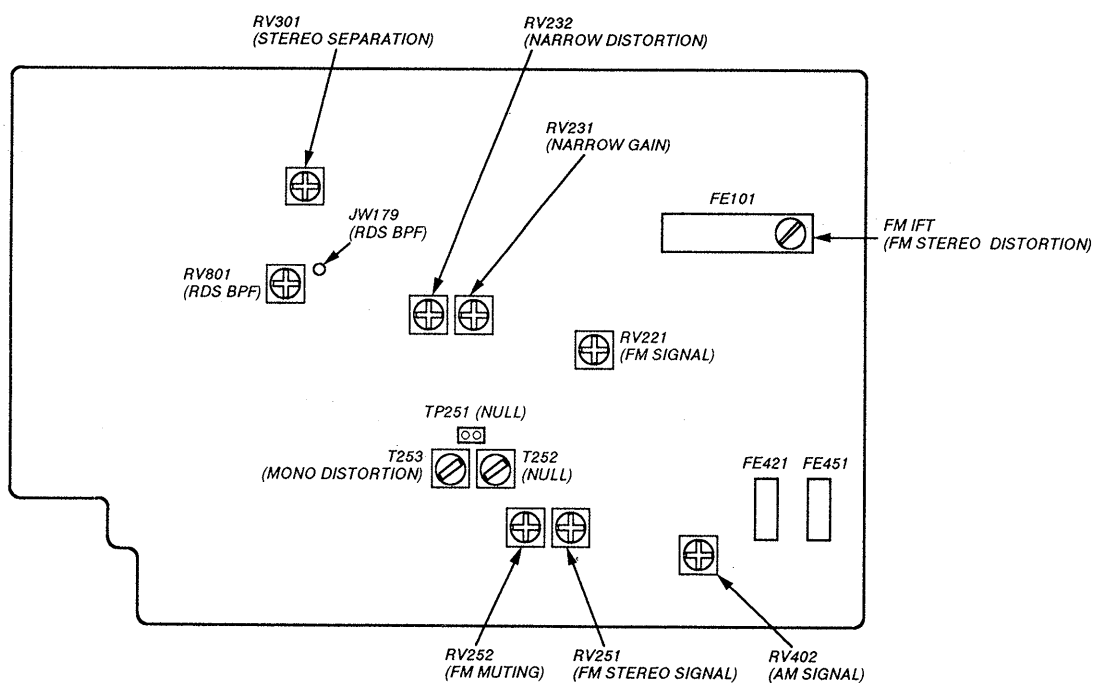


AM Signal Level Adjustment

Procedure :

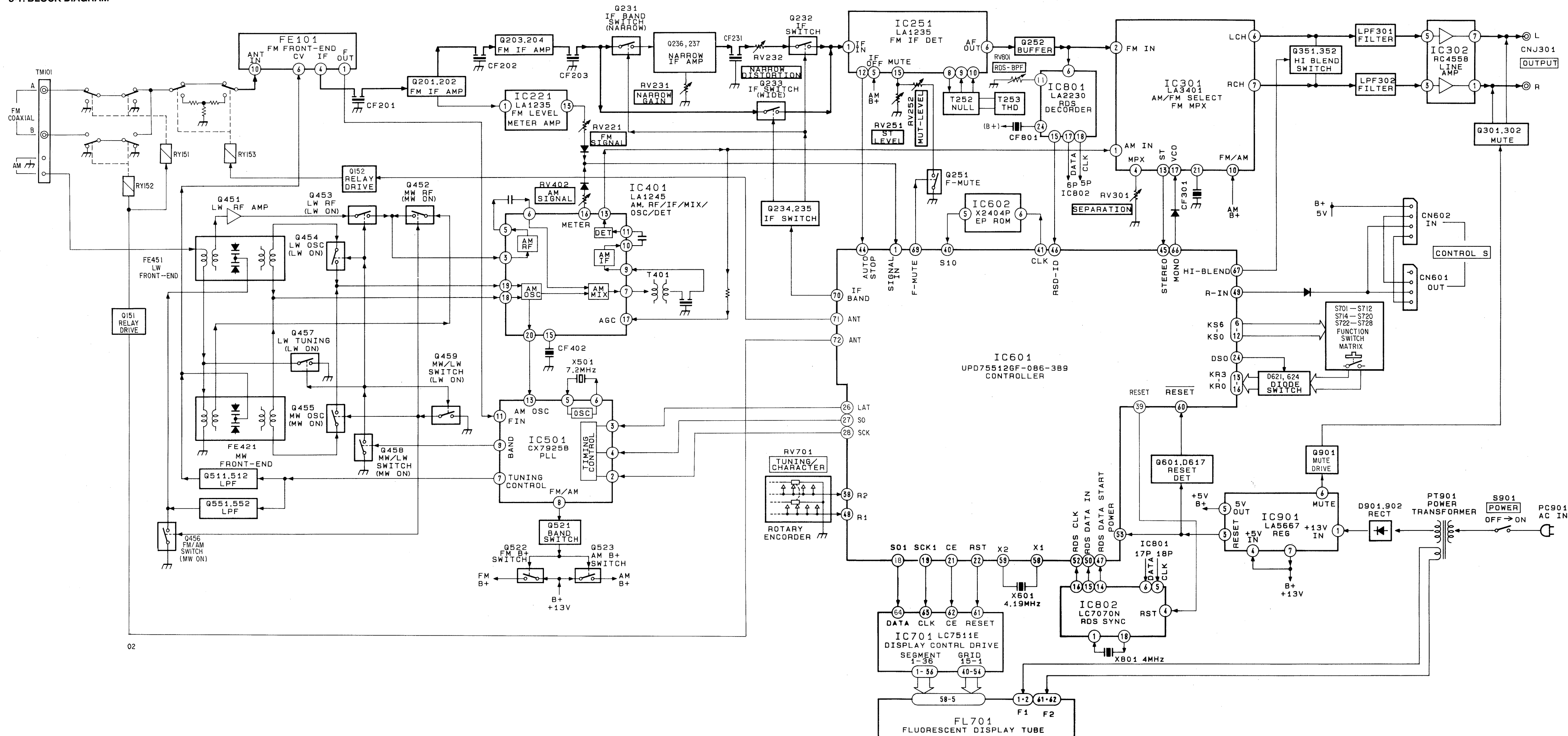
1. Set SSG output level so that antenna input level of the set becomes 5.0mV (74dB μ /m).
2. Adjust RV402 to the place where level 10 in the signal strength indicator turns from dark to light.

Adjustment Location : TUNER BOARD (Component Side)

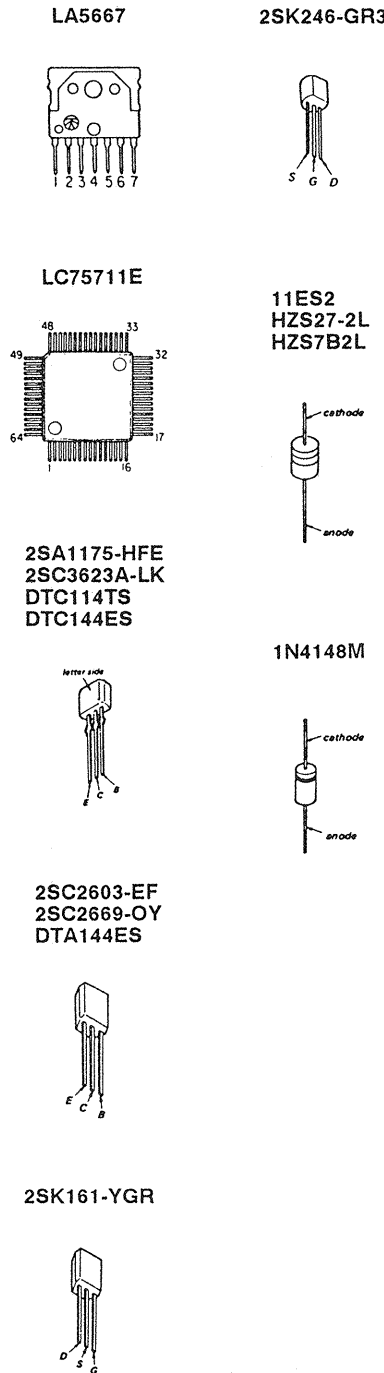


SECTION 3 DIAGRAMS

3-1. BLOCK DIAGRAM



● SEMICONDUCTOR LEAD LAYOUTS



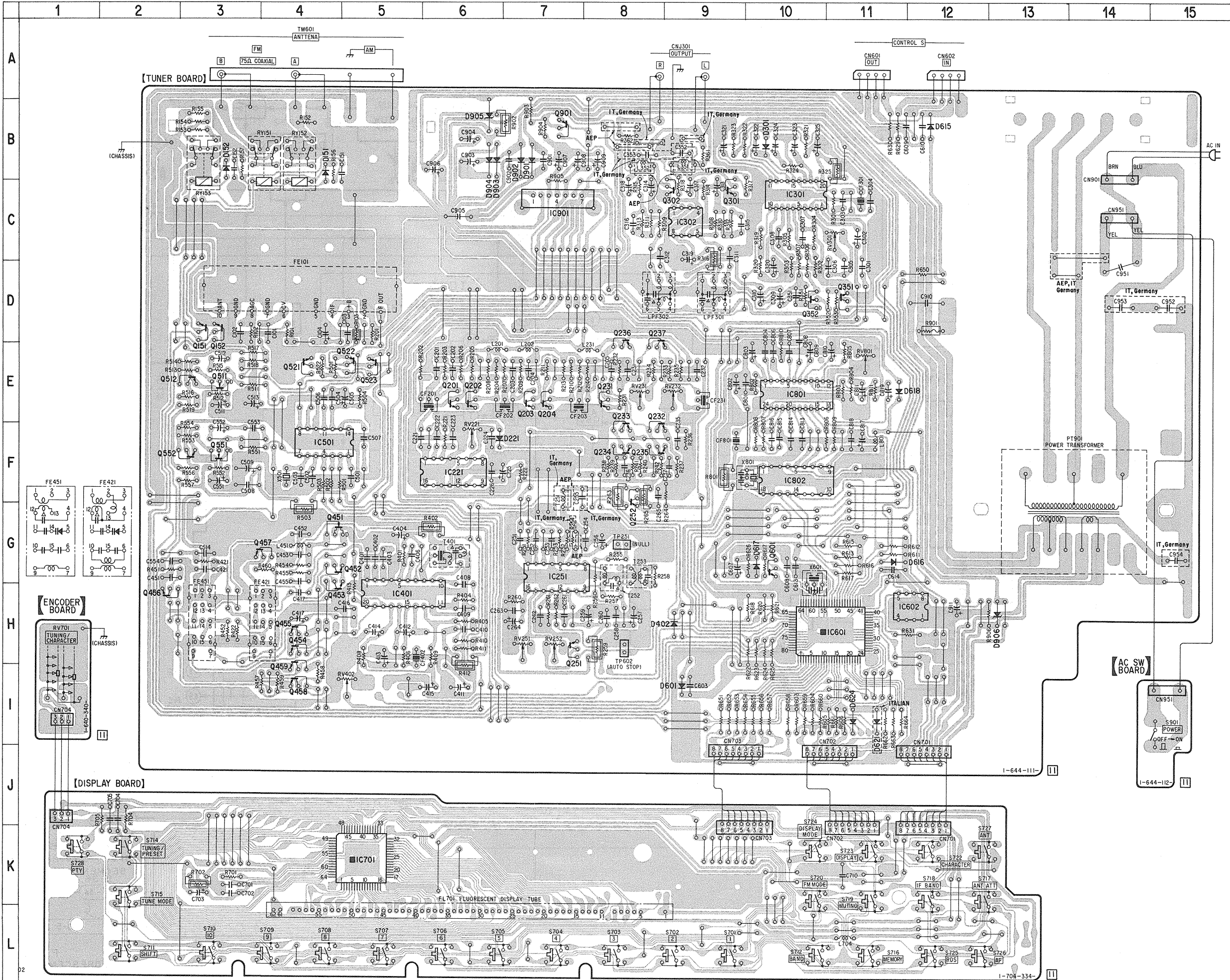
● SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
D151	B - 4	Q301	C - 9
D152	B - 3	Q302	C - 9
D221	F - 6	Q351	D - 11
D301	B - 10	Q352	D - 10
D402	H - 9	Q451	G - 4
D601	I - 9	Q452	G - 4
D615	B - 12	Q453	H - 4
D616	G - 11	Q454	H - 4
D617	G - 10	Q455	H - 4
D618	E - 11	Q456	H - 2
D621	I - 11	Q457	G - 4
D623	I - 11	Q458	I - 4
D624	I - 11	Q459	H - 4
D901	B - 7	Q511	E - 3
D902	B - 7	Q512	E - 3
D903	B - 6	Q521	E - 4
D904	B - 6	Q522	E - 5
D905	B - 6	Q523	E - 5
D906	H - 13	Q551	F - 3
		Q552	F - 3
IC221	F - 6	Q601	G - 10
IC251	G - 7	Q901	B - 7
IC301	C - 10		
IC302	C - 9		
IC401	H - 5		
IC501	F - 4		
IC601	H - 11		
IC602	H - 12		
IC701	K - 5		
IC801	E - 10		
IC802	F - 10		
IC901	C - 7		
Q151	D - 3		
Q152	D - 3		
Q201	E - 6		
Q202	E - 7		
Q203			
Q204	E - 7		
Q231	E - 8		
Q232	E - 8		
Q233	F - 8		
Q234			
Q235	F - 8		
Q236	D - 8		
Q237	D - 8		
Q251	F - 8		
Q252			

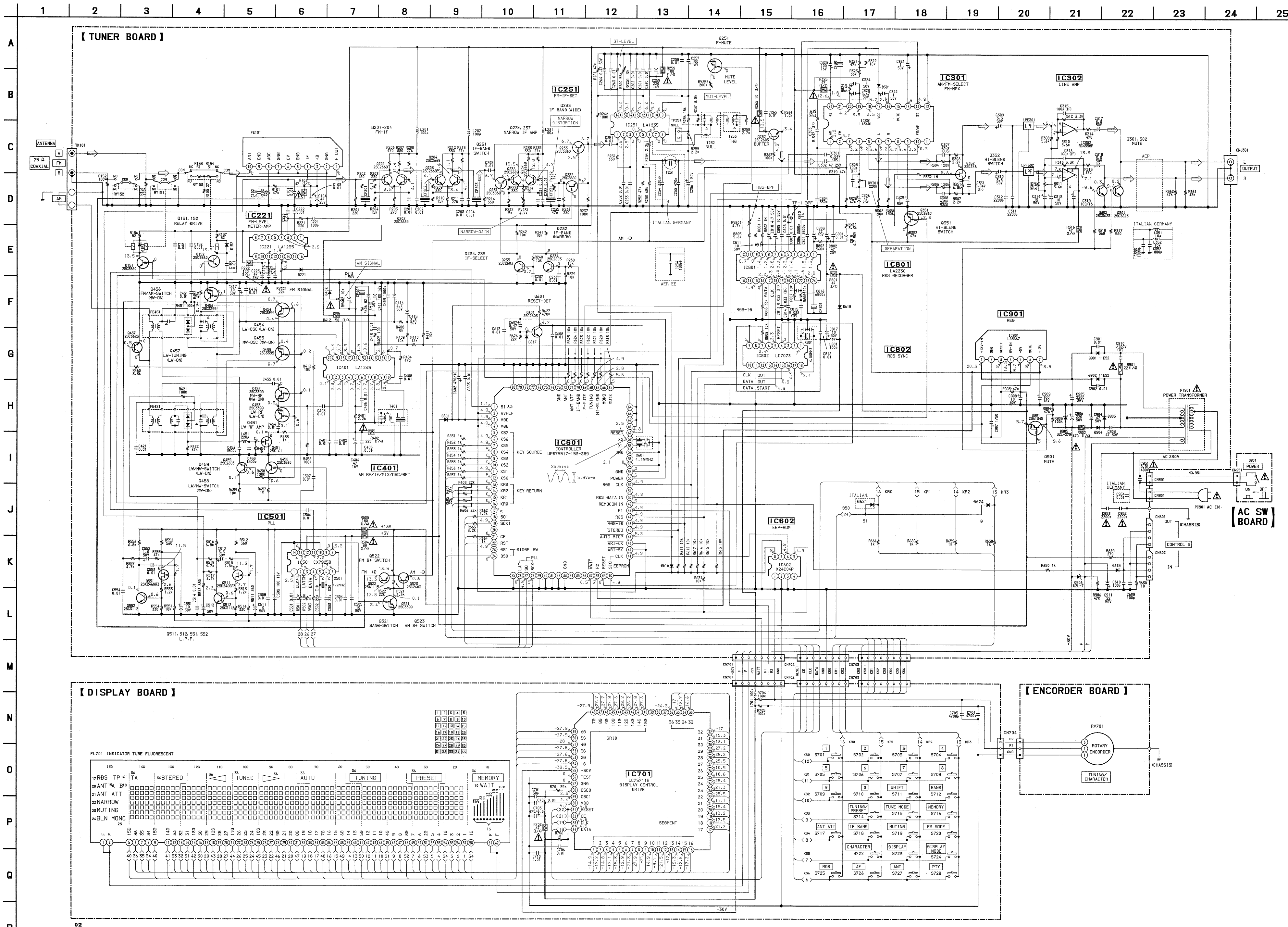
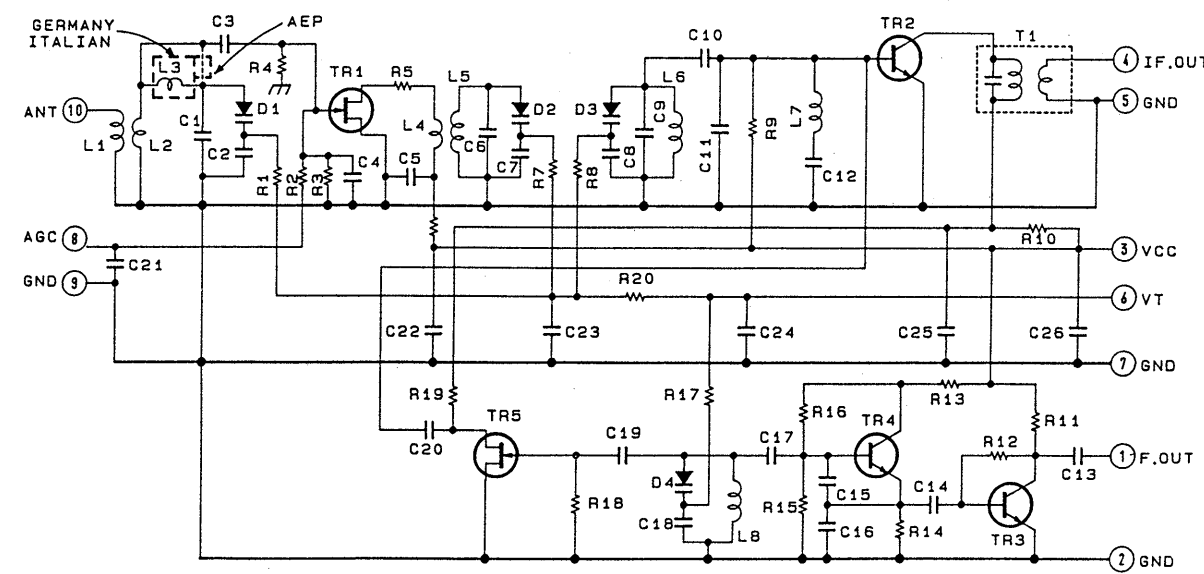
Note:

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- ⬅ : indicates side identified with part number.
- ▨ : Pattern on the side which is seen.

3-2. PRINTED WIRING BOARDS



3-3. SCHEMATIC DIAGRAM

3-4. FM FRONT-END (EF01)
- AEP, IT, G Model -

Note :

- All capacitors are in μF unless otherwise noted; pF: μF 50V or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4W$ or less unless otherwise specified.
- Δ : internal component.
- $\square$: nonflammable resistor.
- $\square$: fusible resistor.

Note : The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

- $\square$: B+ Line
- $\square$: B- Line
- $\square$: adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FM
- Voltages are taken with a VOM (Input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Signal path.
- $\Rightarrow$: FM

IC601 μ PD75517GF
IC801 LA2230
IC802 LC7073

DSB-MODULATED COMPOSIT SIGNAL (FROM FM DEMODURATION OUTPUT)

IN → 6

57kHz BPF

DSB DEMOD

57kHz SUBCARRIER REGENERATOR

ARI SK DECODER

2PSK DEMOD.

DIFFERENTIAL DECODER

BIT-RATE CLOCK RECOVERY

ARI DK DECODER

1.1875kHz

DATA → 6

GROUP & BLOCK SYNCHRONIZATION

ERROR DETECTION & CORRECTION

RESET → 4

IC802 LC7073 SYNCHRONIZATION IC

DATA → 50

CLOCK → 52

DATA START → 47

MICRO CONTROLLER

IC601

μ PD75517GF

RDS DATA PROCESSOR

DISPLAY

CONTROL

ETC.

RDS IND → 15

ARI SK IND → 14

ARI DK IND → 13

IC801 LA2230 RDS DECODER IC = WITH BPF

The block diagram illustrates the internal circuitry of a radio receiver, with components and their connections as follows:

- Pin Connections (Numbered Circles):**
 - Pin 1:** Connected to the FM IF AMP LIMITER.
 - Pin 2:** Connected to the FM IF AMP LIMITER.
 - Pin 3:** Connected to the FM IF AMP LIMITER.
 - Pin 4:** Ground (GND).
 - Pin 5:** Connected to the FM IF AMP LIMITER.
 - Pin 6:** Connected to the AF AMP.
 - Pin 7:** Connected to the AF / NULL METER.
 - Pin 8:** Connected to the AF / NULL METER.
 - Pin 9:** Connected to the DETUNE DET.
 - Pin 10:** Connected to the QUADRATURE DET.
 - Pin 11:** Connected to the QUADRATURE DET.
 - Pin 12:** Connected to the DETUNE DET.
 - Pin 13:** Connected to the MUTING CIRCUIT.
 - Pin 14:** Connected to the MUTING CIRCUIT.
 - Pin 15:** Connected to the MUTING CIRCUIT.
 - Pin 16:** Connected to the MUTING CIRCUIT.
- Internal Components and Connections:**
 - FM IF AMP LIMITER:** Receives input from pins 1, 2, 3, and 5. Its output is connected to the QUADRATURE DET.
 - QUADRATURE DET:** Receives input from pins 10 and 11. Its output is connected to the AF / NULL METER.
 - AF AMP:** Receives input from pin 6. Its output is connected to the AF / NULL METER.
 - AF / NULL METER:** Receives input from the QUADRATURE DET and the AF AMP. Its output is connected to pin 7 and pin 8.
 - DETUNE DET:** Receives input from pins 9 and 12. Its output is connected to the METER DRIVE.
 - METER DRIVE:** Receives input from the DETUNE DET. Its output is connected to the LEVEL DET.
 - LEVEL DET:** Receives input from the METER DRIVE. Its output is connected to the MUTING CIRCUIT.
 - MUTING CIRCUIT:** Receives input from pins 13, 14, 15, and 16. Its output is connected to pin 12.
 - IF OFF NULL METER SHORTING:** Receives input from the AF / NULL METER. Its output is connected to the QUADRATURE DET.

The diagram shows a radio receiver circuit with 20 test points numbered 1 through 20. The components and their connections are as follows:

- Test Points 1-5:** Located at the bottom left. Test point 1 is connected to the AGC block. Test point 2 is connected to the AM RF AMP block. Test point 3 is connected to the GND block. Test point 4 is connected to the GND block. Test point 5 is connected to the GND block.
- Test Points 6-10:** Located at the bottom right. Test point 6 is connected to the AM MIXING block. Test point 7 is connected to the AM MIXING block. Test point 8 is connected to the B+(RF) block. Test point 9 is connected to the AM IF AMP block. Test point 10 is connected to the AM IF AMP block.
- Test Points 11-15:** Located at the top right. Test point 11 is connected to the AM DET block. Test point 12 is connected to the AM DET block. Test point 13 is connected to the AM DET block. Test point 14 is connected to the B+(IF) block. Test point 15 is connected to the B+(IF) block.
- Test Points 16-20:** Located at the top left. Test point 16 is connected to the AM MIXING block. Test point 17 is connected to the AM MIXING block. Test point 18 is connected to the AM OSC block. Test point 19 is connected to the AM OSC block. Test point 20 is connected to the AM OSC block.
- Other Components:**
 - AGC:** Automatic Gain Control block.
 - AM RF AMP:** AM Radio Frequency Amplifier block.
 - AM MIXING:** AM Mixer block.
 - AM IF AMP:** AM Intermediate Frequency Amplifier block.
 - AM DET:** AM Detector block.
 - AM OSC:** AM Oscillator block.
 - B+(RF):** Bias for RF block.
 - B+(IF):** Bias for IF block.
 - METER DRIVE:** Meter Drive block.
 - GND:** Ground connection.

The block diagram illustrates the M.V. GENERATION TIMING & CONTROL system. It features a central CONTROL LOGIC block that coordinates the system. Key components and their interconnections include:

- START STOP LOGIC:** Receives SDA (pin 5) and provides a START CYCLE signal to the CONTROL LOGIC.
- SLAVE ADDRESS REGISTER COMPARATOR:** Receives SCL (pin 6) and provides a LOAD signal to the WORD ADDRESS COUNTER.
- WORD ADDRESS COUNTER:** Receives SCL (pin 6) and provides an INC signal to the CONTROL LOGIC and an R/W signal to the VDEC block.
- XDEC (64):** Receives a 5-bit signal from the CONTROL LOGIC and provides a 64-bit signal to the E PROM.
- E PROM (64x64):** Receives a 64-bit signal from XDEC and provides a 64-bit signal to the VDEC block.
- VDEC:** Receives a 64-bit signal from the E PROM and provides an 8-bit signal to the DATA REGISTER.
- DATA REGISTER:** Receives an 8-bit signal from VDEC and provides a DOUT signal to the DOUT ACK block.
- DOUT ACK:** Receives the DOUT signal and provides a feedback signal to the CONTROL LOGIC.
- TEST (pin 7):** Provides a signal to the CONTROL LOGIC.
- Power and Ground:** VCC (pin 8) and VSS (pin 4) are connected to the system. A ground symbol is shown at the bottom left.

[illegible]

SECTION 4 EXPLODED VIEW

NOTE:

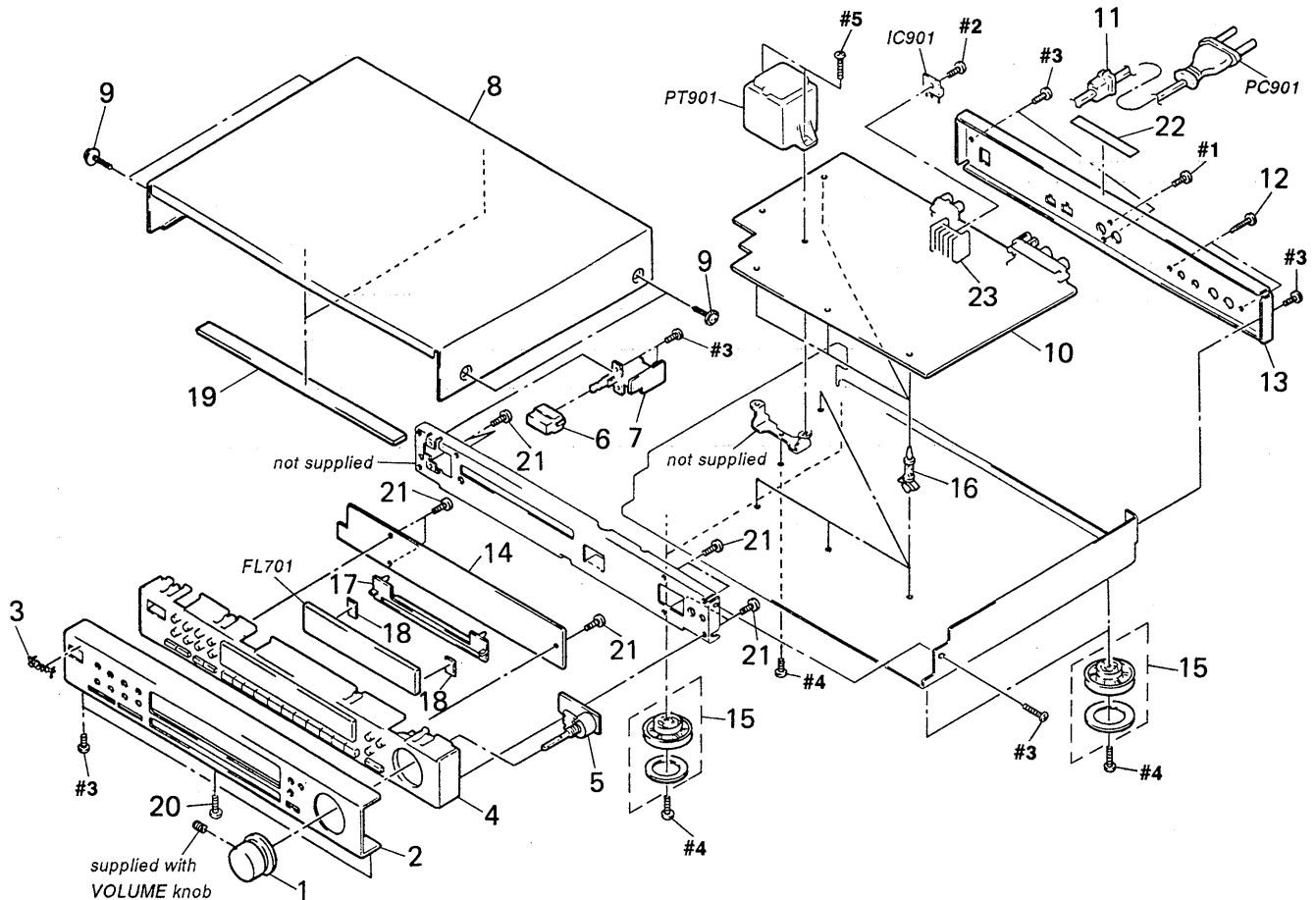
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE).... (RED)

Parts color Cabinet's color

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.



Ref.No.	Part No.	Description	Remark
1	4-945-871-01	KNOB (DIA. 50)	
2	4-952-984-01	PANEL, FRONT	
3	4-908-848-01	EMBLEM, SONY	
4	X-4942-750-1	PANEL (BASE) ASSY	
* 5	1-640-340-11	ENCODER BOARD	
6	3-354-912-01	KNOB, POWER	
* 7	1-644-112-11	AC SW (A) BOARD	
8	4-923-420-71	CASE	
9	3-704-366-01	SCREW (CASE) (M3X8)	
* 10	A-4347-585-A	TUNER BOARD, COMPLETE(AEP)	
* 10	A-4347-588-A	TUNER BOARD, COMPLETE(Germany)	
* 10	A-4347-589-A	TUNER BOARD, COMPLETE(ITALIAN)	
* 11	3-703-244-00	BUSHING (2104), CORD	
12	3-704-242-01	SCREW, TERMINAL, + BVTP CLAW	

Ref.No.	Part No.	Description	Remark
* 13	4-950-075-41	PANEL, BACK	
* 14	A-4347-587-A	DISPLAY BOARD, COMPLETE	
15	X-3304-944-1	FOOT ASSY	
* 16	3-346-265-11	HOLDER, PC BOARD	
* 17	4-945-292-01	HOLDER, INDICATION TUBE	
* 18	4-932-810-11	CUSHION (FL)	
* 19	4-916-782-41	DAMPER	
20	3-703-685-21	SCREW (+BV 3X8)	
21	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
22	3-839-335-01	CUSHION	
* 23	4-911-383-01	HEAT SINK	
	FL701	1-519-719-11 INDICATOR TUBE, FLUORESCENT	
	IC901	8-759-820-09 IC LA5667	
	PC901	1-574-383-11 CORD, POWER	
	PT901	1-450-408-11 TRANSFORMER, POWER	

ENCODER

DISPLAY

SECTION 5 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal oxide-film resistor
F: nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA: μ A, uPA: μ PA
uPB: μ PB, uPC: μ PC
uPD: μ PD
- CAPACITORS
uF: μ F
- COILS
uH: μ H

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref.No.	Part No.	Description	Remark
*	1-640-340-11	ENCODER BOARD *****	
		< VARIABLE RESISTOR >	
	RV701 1-466-336-11	ENCODER, ROTARY(TUNING/CHARACTER/PTY) *****	
*	A-4347-587-A	DISPLAY BOARD, COMPLETE *****	
*	4-932-810-11	CUSHION (FL)	
*	4-945-292-01	HOLDER, INDICATION TUBE	
		< CAPACITOR >	
C701	1-102-962-00	CERAMIC 30PF 5% 50V	
C702	1-164-095-11	CERAMIC 0.01uF 10% 16V	
C703	1-128-183-11	ELECT 470uF 20% 6.3V	
C704	1-161-377-00	CERAMIC 0.0047uF 30% 16V	
C705	1-161-377-00	CERAMIC 0.0047uF 30% 16V	
C706	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C710	1-161-379-00	CERAMIC 0.01uF 20% 25V	
		< CONNECTOR >	
* CN701	1-564-342-11	PIN, CONNECTOR 8P	
* CN702	1-564-342-61	PIN, CONNECTOR 8P	
* CN703	1-564-342-11	PIN, CONNECTOR 8P	
		< FILTER >	
FL701	1-519-719-11	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC701	8-759-823-57	IC LC75711E	

Ref.No.	Part No.	Description	Remark
		< COIL >	
L701	1-410-977-11	INDUCTOR 100uH	
		< RESISTOR >	
R701	1-249-436-11	CARBON 39K 5% 1/4W	
Δ R702	1-249-401-11	CARBON 47 5% 1/4W	
R704	1-249-441-11	CARBON 100K 5% 1/4W	
R705	1-249-441-11	CARBON 100K 5% 1/4W	
R706	1-249-417-11	CARBON 1K 5% 1/4W	
		< SWITCH >	
S701	1-554-303-21	SWITCH, TACTILE(1)	
S702	1-554-303-21	SWITCH, TACTILE(2)	
S703	1-554-303-21	SWITCH, TACTILE(3)	
S704	1-554-303-21	SWITCH, TACTILE(4)	
S705	1-554-303-21	SWITCH, TACTILE(5)	
S706	1-554-303-21	SWITCH, TACTILE(6)	
S707	1-554-303-21	SWITCH, TACTILE(7)	
S708	1-554-303-21	SWITCH, TACTILE(8)	
S709	1-554-303-21	SWITCH, TACTILE(9)	
S710	1-554-303-21	SWITCH, TACTILE(0)	
S711	1-554-303-21	SWITCH, TACTILE(SHIFT)	
S712	1-554-303-21	SWITCH, TACTILE(BAND)	
S714	1-554-303-21	SWITCH, TACTILE(TUNING/PRESET)	
S715	1-554-303-21	SWITCH, TACTILE(TUNE MODE)	
S716	1-554-303-21	SWITCH, TACTILE(MEMORY)	
S717	1-554-303-21	SWITCH, TACTILE(ANT ATT)	
S718	1-554-303-21	SWITCH, TACTILE(IF BAND)	
S719	1-554-303-21	SWITCH, TACTILE(MUTING)	
S720	1-554-303-21	SWITCH, TACTILE(FM MODE)	
S722	1-554-303-21	SWITCH, TACTILE(CHARACTER)	
S723	1-554-303-21	SWITCH, TACTILE(DISPLAY)	
S724	1-554-303-21	SWITCH, TACTILE(DISPLAY MODE)	

DISPLAY

AC SW(A)

TUNER

Ref.No.	Part No.	Description	Remark
S725	1-554-303-21	SWITCH, TACTILE(RDS)	
S726	1-554-303-21	SWITCH, TACTILE(AF)	
S727	1-572-184-11	SWITCH, KEYBOARD(ANT)	
S728	1-572-184-11	SWITCH, KEYBOARD(PHY)	

*	1-644-112-11	AC SW (A) BOARD	

		< SWITCH >	
S901	1-572-267-51	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)	

*	A-4347-585-A	TUNER BOARD, COMPLETE(AEP)	

*	A-4347-588-A	TUNER BOARD, COMPLETE(Germany)	

*	A-4347-589-A	TUNER BOARD, COMPLETE(ITALIAN)	

*	4-911-383-01	HEAT SINK	
	7-682-548-09	SCREW +B 3X8	
		< CAPACITOR >	
C101	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C102	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C103	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C104	1-126-022-11	ELECT 47uF 20% 25V	
C151	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C152	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C153	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C201	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C202	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C203	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C204	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C205	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C221	1-162-282-31	CERAMIC 100PF 10% 50V	
C222	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C223	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C224	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C225	1-126-022-11	ELECT 47uF 20% 25V	
C226	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C231	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C232	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C235	1-162-215-31	CERAMIC 47PF 5% 50V	
C236	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C237	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C251	1-161-379-00	CERAMIC 0.01uF 20% 25V	

Ref.No.	Part No.	Description	Remark
C252	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C253	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C254	1-162-282-31	CERAMIC 100PF 10% 50V	(AEP, EE)
C254	1-162-288-31	CERAMIC 330PF 10% 50V	(Germany, ITALIAN)
C255	1-162-290-31	CERAMIC 470PF 10% 50V	(Germany, ITALIAN)
C256	1-126-044-11	ELECT 1uF 20% 50V	
C257	1-126-023-11	ELECT 100uF 20% 16V	
C258	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C259	1-126-024-11	ELECT 220uF 20% 16V	
C260	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C261	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C262	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C263	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C264	1-126-043-11	ELECT 0.47uF 20% 50V	
C265	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C301	1-136-161-00	FILM 0.047uF 5% 50V	
C302	1-126-022-11	ELECT 47uF 20% 25V	
C303	1-136-161-00	FILM 0.047uF 5% 50V	
C304	1-162-288-31	CERAMIC 330PF 10% 50V	
C305	1-110-335-11	MYLAR 100PF 5% 50V	
C306	1-126-022-11	ELECT 47uF 20% 25V	
C307	1-104-293-11	POLYSTYRENE 430PF 5% 50V	
C308	1-104-293-11	POLYSTYRENE 430PF 5% 50V	
C309	1-123-382-00	ELECT 3.3uF 20% 100V	
C310	1-123-382-00	ELECT 3.3uF 20% 100V	
C311	1-161-375-00	CERAMIC 0.0022uF 20% 50V	
C312	1-161-375-00	CERAMIC 0.0022uF 20% 50V	
C313	1-126-059-11	ELECT 10uF 20% 50V	
C314	1-126-059-11	ELECT 10uF 20% 50V	
C315	1-110-335-11	MYLAR 100PF 5% 50V	
C316	1-110-335-11	MYLAR 100PF 5% 50V	
C317	1-123-382-00	ELECT 3.3uF 20% 100V	
C318	1-123-382-00	ELECT 3.3uF 20% 100V	
C319	1-126-023-11	ELECT 100uF 20% 16V	
C320	1-126-044-11	ELECT 1uF 20% 50V	
C321	1-126-044-11	ELECT 1uF 20% 50V	
C322	1-126-044-11	ELECT 1uF 20% 50V	
C323	1-126-043-11	ELECT 0.47uF 20% 50V	
C324	1-126-044-11	ELECT 1uF 20% 50V	
C325	1-126-023-11	ELECT 100uF 20% 16V	
C351	1-136-161-00	FILM 0.047uF 5% 50V	
C352	1-162-294-31	CERAMIC 0.001uF 10% 50V	(Germany, ITALIAN)
C353	1-162-294-31	CERAMIC 0.001uF 10% 50V	(Germany, ITALIAN)
C401	1-161-379-00	CERAMIC 0.01uF 20% 25V	

TUNER

Ref.No.	Part No.	Description	Remark		
C402	1-161-379-00	CERAMIC	0.01uF	20%	25V
C403	1-161-379-00	CERAMIC	0.01uF	20%	25V
C404	1-126-022-11	ELECT	47uF	20%	25V
C405	1-161-379-00	CERAMIC	0.01uF	20%	25V
C406	1-161-379-00	CERAMIC	0.01uF	20%	25V
C408	1-161-379-00	CERAMIC	0.01uF	20%	25V
C409	1-162-294-31	CERAMIC	0.001uF	10%	50V
C410	1-161-379-00	CERAMIC	0.01uF	20%	25V
C411	1-126-023-11	ELECT	100uF	20%	16V
C412	1-126-044-11	ELECT	1uF	20%	50V
C413	1-126-044-11	ELECT	1uF	20%	50V
C414	1-126-163-11	ELECT	4.7uF	20%	50V
C415	1-123-382-00	ELECT	3.3uF	20%	100V
C416	1-161-379-00	CERAMIC	0.01uF	20%	25V
C417	1-126-059-11	ELECT	10uF	20%	50V
C421	1-161-379-00	CERAMIC	0.01uF	20%	25V
C451	1-161-379-00	CERAMIC	0.01uF	20%	25V
C452	1-161-374-11	CERAMIC	0.0015uF	20%	50V
C453	1-161-374-11	CERAMIC	0.0015uF	20%	50V
C454	1-161-379-00	CERAMIC	0.01uF	20%	25V
C455	1-161-379-00	CERAMIC	0.01uF	20%	25V
C501	1-161-379-00	CERAMIC	0.01uF	20%	25V
C502	1-102-959-00	CERAMIC	22PF	5%	50V
C503	1-102-959-00	CERAMIC	22PF	5%	50V
C504	1-161-379-00	CERAMIC	0.01uF	20%	25V
C505	1-126-059-11	ELECT	10uF	20%	50V
C506	1-161-379-00	CERAMIC	0.01uF	20%	25V
C507	1-161-379-00	CERAMIC	0.01uF	20%	25V
C508	1-161-379-00	CERAMIC	0.01uF	20%	25V
C509	1-126-023-11	ELECT	100uF	20%	16V
C511	1-126-059-11	ELECT	10uF	20%	50V
C512	1-123-382-00	ELECT	3.3uF	20%	100V
C513	1-126-044-11	ELECT	1uF	20%	50V
C514	1-161-379-00	CERAMIC	0.01uF	20%	25V
C551	1-126-059-11	ELECT	10uF	20%	50V
C552	1-126-044-11	ELECT	1uF	20%	50V
C553	1-161-379-00	CERAMIC	0.01uF	20%	25V
C554	1-161-379-00	CERAMIC	0.01uF	20%	25V
C602	1-124-997-11	ELECT	470uF	20%	10V
C603	1-161-379-00	CERAMIC	0.01uF	20%	25V
C607	1-126-043-11	ELECT	0.47uF	20%	50V
C608	1-161-379-00	CERAMIC	0.01uF	20%	25V
C609	1-162-282-31	CERAMIC	100PF	10%	50V
C610	1-162-282-31	CERAMIC	100PF	10%	50V
C613	1-161-379-00	CERAMIC	0.01uF	20%	25V
C614	1-161-379-00	CERAMIC	0.01uF	20%	25V
C801	1-161-379-00	CERAMIC	0.01uF	20%	25V
C802	1-126-022-11	ELECT	47uF	20%	25V
C803	1-126-049-11	ELECT	22uF	20%	50V

Ref.No.	Part No.	Description	Remark		
C804	1-161-327-00	CERAMIC	0.0033uF	30%	16V
C806	1-161-327-00	CERAMIC	0.0033uF	30%	16V
C807	1-161-379-00	CERAMIC	0.01uF	20%	25V
C808	1-161-379-00	CERAMIC	0.01uF	20%	25V
C809	1-126-059-11	ELECT	10uF	20%	50V
C810	1-126-163-11	ELECT	4.7uF	20%	50V
C811	1-126-059-11	ELECT	10uF	20%	50V
C813	1-136-157-00	FILM	0.022uF	5%	50V
C814	1-136-159-00	FILM	0.033uF	5%	50V
C815	1-136-159-00	FILM	0.033uF	5%	50V
C816	1-161-329-00	CERAMIC	0.0068uF	30%	16V
C817	1-126-059-11	ELECT	10uF	20%	50V
C818	1-161-379-00	CERAMIC	0.01uF	20%	25V
C819	1-126-163-11	ELECT	4.7uF	20%	50V
C901	1-101-004-00	CERAMIC	0.01uF		50V
C902	1-101-004-00	CERAMIC	0.01uF		50V
C903	1-126-051-11	ELECT	47uF	20%	50V
C904	1-126-051-11	ELECT	47uF	20%	50V
C905	1-124-602-00	ELECT	2200uF	20%	35V
C906	1-126-053-11	ELECT	220uF	20%	50V
C907	1-126-044-11	ELECT	1uF	20%	50V
C908	1-126-059-11	ELECT	10uF	20%	50V
C909	1-126-023-11	ELECT	100uF	20%	16V
C910	1-130-789-00	FILM	1uF	5%	100V
C911	1-126-049-11	ELECT	22uF	20%	50V
△C951	1-161-744-00	CERAMIC	0.01uF		400V
△C952	1-161-742-00	CERAMIC	0.0022uF	20%	400V
△C953	1-161-742-00	CERAMIC	0.0022uF	20%	400V
C954	1-101-004-00	CERAMIC	0.01uF		50V

(Germany, ITALIAN)

< FILTER >

CF201	1-567-389-11	FILTER, CERAMIC
CF202	1-567-389-11	FILTER, CERAMIC
CF203	1-567-389-11	FILTER, CERAMIC
CF231	1-567-107-71	FILTER, CERAMIC
CF301	1-567-250-11	OSCILLATOR, CERAMIC

CF402	1-527-981-00	FILTER, CERAMIC
CF801	1-577-075-11	OSCILLATOR, CERAMIC

< CONNECTOR >

CN601	1-564-980-11	PIN, CONNECTOR 4P (CONTROL-S IN)
CN602	1-564-980-11	PIN, CONNECTOR 4P (CONTROL-S OUT)
* CN701	1-564-342-11	PIN, CONNECTOR 8P
* CN702	1-564-342-61	PIN, CONNECTOR 8P
* CN703	1-564-342-11	PIN, CONNECTOR 8P
* CN901	1-564-321-00	PIN, CONNECTOR 2P
CN951	1-564-321-00	PIN, CONNECTOR 2P

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

TUNER

Ref.No.	Part No.	Description	Remark
		< JACK >	
CNJ301	1-568-250-21	JACK, PIN 2P (OUT PUT)	
		< DIODE >	
D151	8-719-987-63	DIODE 1N4148M	
D152	8-719-987-63	DIODE 1N4148M	
D221	8-719-987-63	DIODE 1N4148M	
D301	8-719-987-63	DIODE 1N4148M	
D402	8-719-987-63	DIODE 1N4148M	
D601	8-719-987-63	DIODE 1N4148M	
D615	8-719-987-63	DIODE 1N4148M	
D616	8-719-987-63	DIODE 1N4148M	
D617	8-719-987-63	DIODE 1N4148M	
D618	8-719-987-63	DIODE 1N4148M	
D621	8-719-987-63	DIODE 1N4148M (ITALIAN)	
D624	8-719-987-63	DIODE 1N4148M	
D901	8-719-200-82	DIODE 11ES2	
D902	8-719-200-82	DIODE 11ES2	
D903	8-719-987-63	DIODE 1N4148M	
D904	8-719-987-63	DIODE 1N4148M	
D905	8-719-934-18	LED HZS27-2L	
D906	8-719-933-47	DIODE HZS7B2L	
		< FRONT END >	
FE101	1-463-857-11	FRONT END (FM) (Germany, ITALIAN)	
FE101	1-465-219-11	FRONT END (AEP)	
FE421	1-236-462-11	ENCAPSULATED COMPONENT (MW)	
FE451	1-236-463-11	ENCAPSULATED COMPONENT (LW)	
		< IC >	
IC221	8-759-812-35	IC LA1235	
IC251	8-759-812-35	IC LA1235	
IC301	8-759-801-80	IC LA3401	
IC302	8-759-945-58	IC RC4558P	
IC401	8-759-812-45	IC LA1245	
IC501	8-757-925-20	IC CX7925B	
IC601	8-759-087-64	IC uPD75517GF-153-3B9	
IC602	8-759-720-89	IC X24C04P	
IC801	8-759-823-61	IC LA2230	
IC802	8-759-062-26	IC LC7073	
IC901	8-759-820-09	IC LA5667	
		< COIL >	
L201	1-410-977-11	INDUCTOR 100uH	
L202	1-410-977-11	INDUCTOR 100uH	
L231	1-410-977-11	INDUCTOR 100uH	

Ref.No.	Part No.	Description	Remark
L351	1-410-971-11	INDUCTOR 10uH (Germany, ITALIAN)	
L352	1-410-971-11	INDUCTOR 10uH (Germany, ITALIAN)	
L451	1-410-979-11	INDUCTOR 220uH	
L801	1-410-977-11	INDUCTOR 100uH	
		< FILTER >	
LPF301	1-235-164-00	FILTER, LOW PASS	
LPF302	1-235-164-00	FILTER, LOW PASS	
		< TRANSFORMER >	
△PT901	1-450-408-11	TRANSFORMER, POWER	
		< TRANSISTOR >	
Q151	8-729-904-39	TRANSISTOR DTC114TS	
Q152	8-729-904-39	TRANSISTOR DTC114TS	
Q201	8-729-230-XX	TRANSISTOR 2SC2669-0Y	
Q202	8-729-230-XX	TRANSISTOR 2SC2669-0Y	
Q203	8-729-230-XX	TRANSISTOR 2SC2669-0Y	
Q204	8-729-230-XX	TRANSISTOR 2SC2669-0Y	
Q231	8-729-904-39	TRANSISTOR DTC114TS	
Q232	8-729-904-39	TRANSISTOR DTC114TS	
Q233	8-729-904-39	TRANSISTOR DTC114TS	
Q234	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q235	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q236	8-729-230-XX	TRANSISTOR 2SC2669-0Y	
Q237	8-729-230-XX	TRANSISTOR 2SC2669-0Y	
Q251	8-729-900-89	TRANSISTOR DTC144ES	
Q252	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q301	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q302	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q351	8-729-904-39	TRANSISTOR DTC114TS	
Q352	8-729-202-67	TRANSISTOR 2SK246-GR3	
Q451	8-729-231-20	TRANSISTOR 2SK161-YGR	
Q452	8-729-900-89	TRANSISTOR DTC144ES	
Q453	8-729-900-89	TRANSISTOR DTC144ES	
Q454	8-729-900-89	TRANSISTOR DTC144ES	
Q455	8-729-900-89	TRANSISTOR DTC144ES	
Q456	8-729-900-89	TRANSISTOR DTC144ES	
Q457	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q458	8-729-904-39	TRANSISTOR DTC114TS	
Q459	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q511	8-729-202-67	TRANSISTOR 2SK246-GR3	
Q512	8-729-201-84	TRANSISTOR 2SC3112-B	
Q521	8-729-900-89	TRANSISTOR DTC144ES	
Q522	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q523	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q551	8-729-202-67	TRANSISTOR 2SK246-GR3	
Q552	8-729-201-84	TRANSISTOR 2SC3112-B	

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

TUNER

Ref. No.	Part No.	Description	Remark
Q601	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q901	8-729-900-65	TRANSISTOR DTA144ES	
< RESISTOR >			
R101	1-259-468-11	CARBON 47K 5% 1/6W	
R102	1-259-460-11	CARBON 22K 5% 1/6W	
△R103	1-249-401-11	CARBON 47 5% 1/4W	
R151	1-259-476-11	CARBON 100K 5% 1/6W	
R152	1-259-476-11	CARBON 100K 5% 1/6W	
R153	1-259-397-11	CARBON 51 5% 1/6W	
R154	1-259-397-11	CARBON 51 5% 1/6W	
R155	1-259-390-11	CARBON 27 5% 1/6W	
R156	1-259-402-11	CARBON 82 5% 1/6W	
R157	1-259-402-11	CARBON 82 5% 1/6W	
R201	1-259-412-11	CARBON 220 5% 1/6W	
R202	1-259-410-11	CARBON 180 5% 1/6W	
R203	1-259-416-11	CARBON 330 5% 1/6W	
R204	1-259-456-11	CARBON 15K 5% 1/6W	
R205	1-259-414-11	CARBON 270 5% 1/6W	
R206	1-259-420-11	CARBON 470 5% 1/6W	
R207	1-259-416-11	CARBON 330 5% 1/6W	
R208	1-259-462-11	CARBON 27K 5% 1/6W	
R209	1-259-416-11	CARBON 330 5% 1/6W	
R210	1-259-456-11	CARBON 15K 5% 1/6W	
R211	1-259-414-11	CARBON 270 5% 1/6W	
R212	1-259-416-11	CARBON 330 5% 1/6W	
R213	1-259-462-11	CARBON 27K 5% 1/6W	
R214	1-259-416-11	CARBON 330 5% 1/6W	
R221	1-259-416-11	CARBON 330 5% 1/6W	
△R222	1-249-405-11	CARBON 100 5% 1/4W	
R231	1-259-416-11	CARBON 330 5% 1/6W	
R232	1-259-456-11	CARBON 15K 5% 1/6W	
R233	1-259-416-11	CARBON 330 5% 1/6W	
R234	1-259-384-11	CARBON 15 5% 1/6W	
R235	1-259-462-11	CARBON 27K 5% 1/6W	
R236	1-259-412-11	CARBON 220 5% 1/6W	
R237	1-259-476-11	CARBON 100K 5% 1/6W	
R238	1-259-452-11	CARBON 10K 5% 1/6W	
R239	1-259-452-11	CARBON 10K 5% 1/6W	
R240	1-259-456-11	CARBON 15K 5% 1/6W	
R241	1-259-452-11	CARBON 10K 5% 1/6W	
R242	1-259-452-11	CARBON 10K 5% 1/6W	
R251	1-259-416-11	CARBON 330 5% 1/6W	
R252	1-259-468-11	CARBON 47K 5% 1/6W	
R253	1-259-472-11	CARBON 68K 5% 1/6W	
R254	1-259-436-11	CARBON 2.2K 5% 1/6W	
R255	1-259-436-11	CARBON 2.2K 5% 1/6W	
R256	1-259-458-11	CARBON 18K 5% 1/6W	
R257	1-259-442-11	CARBON 3.9K 5% 1/6W	

Ref. No.	Part No.	Description	Remark
R258	1-259-438-11	CARBON 2.7K 5% 1/6W	
△R259	1-249-405-11	CARBON 100 5% 1/4W	
R260	1-259-470-11	CARBON 56K 5% 1/6W	
R261	1-259-468-11	CARBON 47K 5% 1/6W	
R262	1-259-476-11	CARBON 100K 5% 1/6W	
R263	1-259-452-11	CARBON 10K 5% 1/6W	
R264	1-259-436-11	CARBON 2.2K 5% 1/6W	
△R265	1-249-393-11	CARBON 10 5% 1/4W	
R301	1-259-436-11	CARBON 2.2K 5% 1/6W	
R302	1-259-480-11	CARBON 150K 5% 1/6W	
R303	1-259-480-11	CARBON 150K 5% 1/6W	
R304	1-259-478-11	CARBON 120K 5% 1/6W	
R305	1-259-478-11	CARBON 120K 5% 1/6W	
R306	1-259-436-11	CARBON 2.2K 5% 1/6W	
R307	1-259-436-11	CARBON 2.2K 5% 1/6W	
R308	1-259-446-11	CARBON 5.6K 5% 1/6W	
R309	1-259-446-11	CARBON 5.6K 5% 1/6W	
R310	1-259-446-11	CARBON 5.6K 5% 1/6W	
R311	1-259-446-11	CARBON 5.6K 5% 1/6W	
R312	1-259-440-11	CARBON 3.3K 5% 1/6W	
R313	1-259-440-11	CARBON 3.3K 5% 1/6W	
R314	1-259-420-11	CARBON 470 5% 1/6W	
R315	1-259-420-11	CARBON 470 5% 1/6W	
R316	1-249-401-11	CARBON 47 5% 1/4W	
R317	1-259-422-11	CARBON 560 5% 1/6W	
R318	1-259-422-11	CARBON 560 5% 1/6W	
R319	1-259-468-11	CARBON 47K 5% 1/6W	
R320	1-259-468-11	CARBON 47K 5% 1/6W	
R321	1-259-468-11	CARBON 47K 5% 1/6W	
R322	1-259-452-11	CARBON 10K 5% 1/6W	
R323	1-259-464-11	CARBON 33K 5% 1/6W	
R324	1-259-446-11	CARBON 5.6K 5% 1/6W	
△R325	1-249-401-11	CARBON 47 5% 1/4W	
R351	1-259-448-11	CARBON 6.8K 5% 1/6W	
R352	1-259-500-11	CARBON 1M 5% 1/6W	
R353	1-259-468-11	CARBON 47K 5% 1/6W	
R361	1-259-468-11	CARBON 47K 5% 1/6W	
R362	1-259-468-11	CARBON 47K 5% 1/6W	
R401	1-259-436-11	CARBON 2.2K 5% 1/6W	
△R402	1-249-409-11	CARBON 220 5% 1/4W	
R404	1-259-420-11	CARBON 470 5% 1/6W	
R405	1-259-404-11	CARBON 100 5% 1/6W	
R406	1-259-402-11	CARBON 82 5% 1/6W	
R408	1-259-452-11	CARBON 10K 5% 1/6W	
R409	1-259-452-11	CARBON 10K 5% 1/6W	
R410	1-259-454-11	CARBON 12K 5% 1/6W	
R411	1-259-452-11	CARBON 10K 5% 1/6W	
△R412	1-249-407-11	CARBON 150 5% 1/4W	
R413	1-259-452-11	CARBON 10K 5% 1/6W	

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

TUNER

Ref.No.	Part No.	Description	Remark		
R421	1-259-476-11	CARBON	100K	5%	1/6W
R422	1-259-468-11	CARBON	47K	5%	1/6W
R451	1-259-476-11	CARBON	100K	5%	1/6W
R452	1-259-468-11	CARBON	47K	5%	1/6W
R454	1-259-500-11	CARBON	1M	5%	1/6W
R455	1-259-428-11	CARBON	1K	5%	1/6W
R456	1-259-476-11	CARBON	100K	5%	1/6W
R457	1-259-428-11	CARBON	1K	5%	1/6W
R458	1-259-476-11	CARBON	100K	5%	1/6W
R459	1-259-452-11	CARBON	10K	5%	1/6W
R460	1-259-440-11	CARBON	3.3K	5%	1/6W
R501	1-259-452-11	CARBON	10K	5%	1/6W
R502	1-259-452-11	CARBON	10K	5%	1/6W
R503	1-259-452-11	CARBON	10K	5%	1/6W
△R504	1-249-400-11	CARBON	39	5%	1/4W
△R505	1-249-408-11	CARBON	180	5%	1/4W
R511	1-259-422-11	CARBON	560	5%	1/6W
R512	1-259-422-11	CARBON	560	5%	1/6W
R513	1-259-430-11	CARBON	1.2K	5%	1/6W
R514	1-259-416-11	CARBON	330	5%	1/6W
R515	1-259-434-11	CARBON	1.8K	5%	1/6W
R516	1-259-448-11	CARBON	6.8K	5%	1/6W
R517	1-259-444-11	CARBON	4.7K	5%	1/6W
R518	1-259-424-11	CARBON	680	5%	1/6W
R519	1-259-444-11	CARBON	4.7K	5%	1/6W
R521	1-259-440-11	CARBON	3.3K	5%	1/6W
R522	1-259-460-11	CARBON	22K	5%	1/6W
R551	1-259-452-11	CARBON	10K	5%	1/6W
R552	1-259-422-11	CARBON	560	5%	1/6W
R553	1-259-430-11	CARBON	1.2K	5%	1/6W
R554	1-259-416-11	CARBON	330	5%	1/6W
R555	1-259-468-11	CARBON	47K	5%	1/6W
R556	1-259-448-11	CARBON	6.8K	5%	1/6W
R557	1-259-444-11	CARBON	4.7K	5%	1/6W
R603	1-259-460-11	CARBON	22K	5%	1/6W
R604	1-259-460-11	CARBON	22K	5%	1/6W
R605	1-259-460-11	CARBON	22K	5%	1/6W
R606	1-259-460-11	CARBON	22K	5%	1/6W
R611	1-259-452-11	CARBON	10K	5%	1/6W
R612	1-259-452-11	CARBON	10K	5%	1/6W
R613	1-259-452-11	CARBON	10K	5%	1/6W
R615	1-259-452-11	CARBON	10K	5%	1/6W
R616	1-259-452-11	CARBON	10K	5%	1/6W
R617	1-259-452-11	CARBON	10K	5%	1/6W
R618	1-259-452-11	CARBON	10K	5%	1/6W
R620	1-259-452-11	CARBON	10K	5%	1/6W
R621	1-259-452-11	CARBON	10K	5%	1/6W
R622	1-259-452-11	CARBON	10K	5%	1/6W
R623	1-259-452-11	CARBON	10K	5%	1/6W

Ref.No.	Part No.	Description	Remark		
R624	1-259-452-11	CARBON	10K	5%	1/6W
R625	1-259-452-11	CARBON	10K	5%	1/6W
R626	1-259-460-11	CARBON	22K	5%	1/6W
R627	1-259-492-11	CARBON	470K	5%	1/6W
R629	1-259-414-11	CARBON	270	5%	1/6W
R630	1-259-380-11	CARBON	10	5%	1/6W
R631	1-259-452-11	CARBON	10K	5%	1/6W
R650	1-259-428-11	CARBON	1K	5%	1/6W
R651	1-259-428-11	CARBON	1K	5%	1/6W
R652	1-259-428-11	CARBON	1K	5%	1/6W
R653	1-259-428-11	CARBON	1K	5%	1/6W
R654	1-259-428-11	CARBON	1K	5%	1/6W
R655	1-259-428-11	CARBON	1K	5%	1/6W
R656	1-259-428-11	CARBON	1K	5%	1/6W
R657	1-259-428-11	CARBON	1K	5%	1/6W
R658	1-259-428-11	CARBON	1K	5%	1/6W
R659	1-259-428-11	CARBON	1K	5%	1/6W
R660	1-259-428-11	CARBON	1K	5%	1/6W
R661	1-259-428-11	CARBON	1K	5%	1/6W
R662	1-259-436-11	CARBON	2.2K	5%	1/6W
R663	1-249-428-11	CARBON	8.2K	5%	1/4W
R664	1-259-428-11	CARBON	1K	5%	1/6W
△R801	1-249-401-11	CARBON	47	5%	1/4W
R802	1-259-494-11	CARBON	560K	5%	1/6W
R803	1-259-500-11	CARBON	1M	5%	1/6W
R804	1-259-428-11	CARBON	1K	5%	1/6W
R805	1-259-446-11	CARBON	5.6K	5%	1/6W
R806	1-259-464-11	CARBON	33K	5%	1/6W
R807	1-259-452-11	CARBON	10K	5%	1/6W
R808	1-259-460-11	CARBON	22K	5%	1/6W
R809	1-259-452-11	CARBON	10K	5%	1/6W
R810	1-259-428-11	CARBON	1K	5%	1/6W
R811	1-259-440-11	CARBON	3.3K	5%	1/6W
△R901	1-212-865-00	FUSIBLE	22	5%	1/4W F
△R902	1-249-413-11	CARBON	470	5%	1/4W
R903	1-259-476-11	CARBON	100K	5%	1/6W
R904	1-259-468-11	CARBON	47K	5%	1/6W
R905	1-259-468-11	CARBON	47K	5%	1/6W
R906	1-259-468-11	CARBON	47K	5%	1/6W

< VARIABLE RESISTOR >

RV221	1-238-601-11	RES, ADJ, CARBON 22K (FM SIGNAL)
RV231	1-238-599-11	RES, ADJ, CARBON 4.7K (NARROW GAIN)
RV232	1-238-596-11	RES, ADJ, CARBON 470 (NARROW DISTORTION)
RV251	1-238-600-11	RES, ADJ, CARBON 10K (MUTE LEVEL)
RV252	1-238-604-11	RES, ADJ, CARBON 220K (FM MUTING)
RV301	1-238-604-11	RES, ADJ, CARBON 220K (STEREO SEPARATION)
RV402	1-238-600-11	RES, ADJ, CARBON 10K (AM SIGNAL)
RV801	1-238-599-11	RES, ADJ, CARBON 4.7K (BPF ADJ)

Note: The components identified by mark **△** or dotted line with mark **△** are critical for safety.
Replace only with part number specified.

TUNER

Ref.No.	Part No.	Description	Remark
		< RELAY >	
RY151	1-515-614-11	RELAY	
RY152	1-515-614-11	RELAY	
RY153	1-515-614-11	RELAY	
		< TRANSFORMER >	
T251	1-235-126-00	ENCAPSULATED COMPONENT (Germany, ITALIAN)	
T252	1-404-845-11	COIL, DISCRI (PRIMARY)	
T253	1-404-846-11	COIL, DISCRI (SECONDARY)	
T401	1-404-713-11	TRANSFORMER, IF	
		< TERMINAL >	
* TM101	1-537-406-11	TERMINAL BOARD (ANT)	
		< TEST PIN >	
* TP251	1-565-513-11	PIN, CONNECTOR 2P (NULL)	
		< VIBRATOR >	
X501	1-567-826-21	VIBRATOR, CRYSTAL (7.2MHz)	
X601	1-577-359-21	VIBRATOR, CERAMIC (4.19MHz)	
X801	1-577-358-21	VIBRATOR, CERAMIC (4.00MHz)	

		MISCELLANEOUS	

△PC901	1-574-383-11	CORD, POWER	

		ACCESSORIES & PACKING MATERIALS	

	1-501-374-11	ANTENNA, LOOP	
	1-558-233-11	CORD (WITH CONNECTOR) (SIRCS) 4P	
	1-558-271-11	CORD, CONNECTION	
	1-559-533-11	CORD, CONNECTION	
	3-755-055-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (AEP)	
	3-755-055-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP, IT)	
	3-755-055-51	MANUAL, INSTRUCTION (GERMAN) (G)	
	4-935-823-31	INDIVIDUAL CARTON (AEP, G, IT)	

Ref.No.	Part No.	Description	Remark
		***** HARDWARE LIST *****	
#1	7-621-849-00	SCREW (BV/RING)	
#2	7-682-548-09	SCREW +B 3X8	
#3	7-682-547-09	SCREW +BVTT 3X6 (S)	
#4	7-682-549-09	SCREW +BVTT 3X10 (S)	
#5	7-682-550-04	SCREW +BVTT 3X12 (S)	

Note: The components identified by mark **△** or dotted line with mark **△** are critical for safety.
Replace only with part number specified.