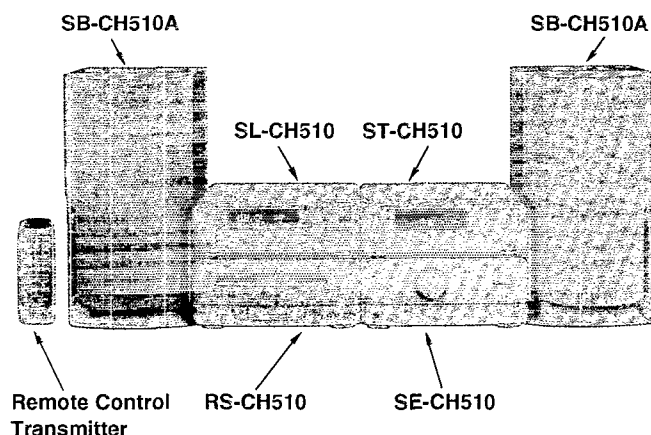


# Service Manual

## Tuner/Sound Processor

## Tuner

# ST-CH510



Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

### Colour

(K) ..... Black Type

### Areas

Suffix for Model No.	Area	Colour
(E)	Europe	(K)
(EG)	Germany and Italy	
(GC)	Asia, Latin America, Middle Near East and Africa, Oceania	

## Specifications

### ■ Pre-amplifier section

Input sensitivity/impedance

For (E) and (EG) areas

PHONO 2.5 mV/47 k $\Omega$   
DCC 250 mV/15 k $\Omega$

For (GC) area

AUX 250 mV/15 k $\Omega$   
DCC 250 mV/15 k $\Omega$

Output level

DCC RECOUT 150 mV/1.5 k $\Omega$

Frequency response

For (E) and (EG) areas

PHONO 30 Hz – 15 kHz/+1.5 to –2.0 dB  
DCC 30 Hz – 20 kHz

For (GC) area

AUX 30 Hz – 20 kHz  
DCC 30 Hz – 20 kHz

### ■ EQ, SFP section

Center frequency

200 Hz, 1 kHz, 7 kHz

Fixed mode

5 modes HALL, HEAVY, CLEAR, CAR, HP ST

### ■ FM tuner section

Frequency range

87.50 – 108.00 MHz  
(0.05 MHz steps)

Sensitivity

1.8  $\mu$ V (IHF usable)  
1.5  $\mu$ V

S/N 26 dB

S/N

MCNO 70 dB (75 dB, IHF)

Stereo separation 1 kHz

35 dB

Antenna terminal(s)

75  $\Omega$  (unbalance)

### ■ AM tuner section

Frequency range

MW

522 – 1611 kHz (9 kHz steps)

530 – 1620 kHz (10 kHz steps)

144 – 288 kHz (9 kHz steps)

LW

Sensitivity (S/N 20 dB)

MW

500  $\mu$ V/m

LW

50  $\mu$ V

### ■ Timer section

Clock

Quartz-lock type

Function

24-hour programmable;

Play timer (1 time), Rec timer (1 time),

Sleep (120 min., 1 min. intervals)

Setting

1 minute – 23 hours 59 minutes (1 min. intervals)

### ■ General

Dimensions (W  $\times$  H  $\times$  D)

270  $\times$  89  $\times$  274 mm

Weight

1.75 kg

### Notes:

1. Specifications are subject to change without notice.

Weight and dimensions are approximate.

2. Total harmonic distortion is measured by the digital spectrum analyzer.

System	Tuner/sound processor	Compact disc player	Amplifier	Cassette Deck	Speakers
SC-CH510	ST-CH510	SL-CH510	SE-CH510	RS-CH510	* SB-CH510A

# Technics®

\*: For (E), (EG) areas ..... Made in PAES  
For (GC) area ..... Made in NABEL

## Contents

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### NOTE:

Refer to the service manual for Model No. SE-CH510 (ORDER No. AD9407197C8) for information on "Accessories", "Stacking the Components", "Connections" and "Packaging".

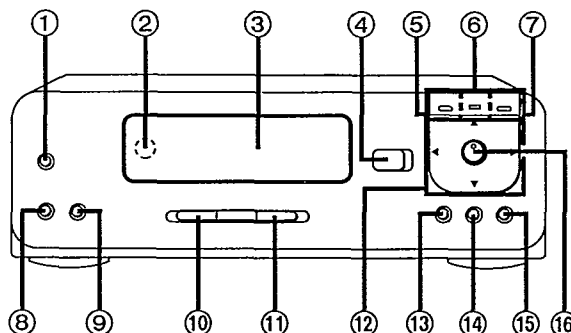
This unit (tuner/sound processor ST-CH510) is equipped with a self-diagnostic function.

For details of the self-diagnostic function, refer to the service manual (ORDER No. AD9407191C2) for SL-CH510 (CD player).

## Location of Controls

- ① Auto preset button
- ② Remote control signal sensor
- ③ Display section
- ④ Source input select button
- ⑤ FM button
- ⑥ Tuner indicator
- ⑦ LW/MW select button
- ⑧ Flat button
- ⑨ EQ SPACE mode select button
- ⑩ KARAOKE mode select button
- ⑪ V.bass button
- ⑫ Tuning/select button and indicators
- ⑬ Clock/timer button
- ⑭ Record timer button
- ⑮ Play timer button
- ⑯ Set button and indicator

(To be continued)



## Setting the Time

This is a 24-hours display clock.

These instructions explain how to set the timer for 16:25 (4:25 p.m.) on Wednesday.

- 1** Switch on the power.
- 2**
  - ① Press **CLOCK/TIMER** to show "CLOCK".
  - Within 8 seconds
  - ② Press **SET**.
- 3**
  - ① Press **◀ SELECT** or **SELECT ▶** to select the day.
  - ② Press **SET**.
- 4**
  - ① Press **◀ SELECT** or **SELECT ▶** to select the hour.
  - ② Press **SET**.
- 5**
  - ① Press **◀ SELECT** or **SELECT ▶** to select the minutes.
  - ② Press **SET** to finish setting the time.

The display will return to the previous display after about 2 seconds.

### When "SUN 0:00" flashes **A**

It flashes when you connect the AC power supply cord for the first time or if there has been a power failure.

If this happens, reset the time.

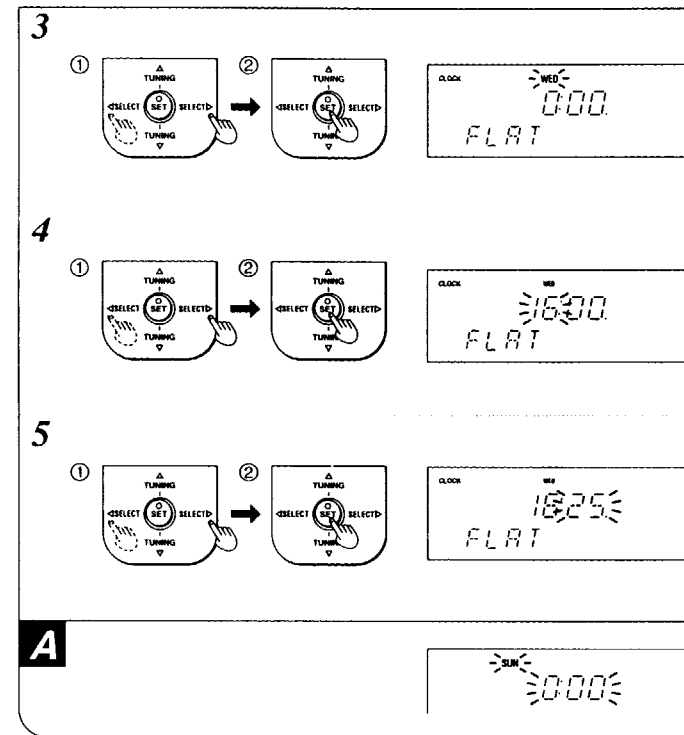
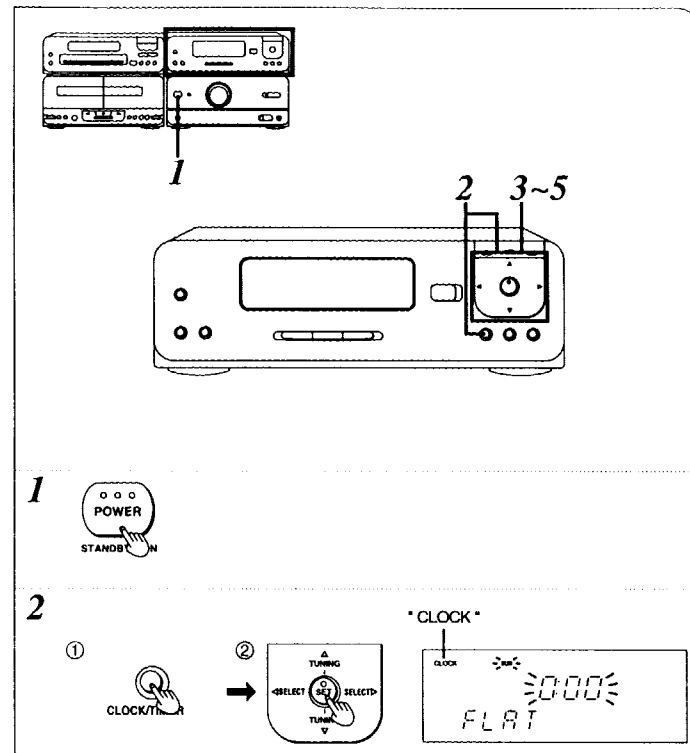
### If the minutes setting has gone wrong:

1. Press **CLOCK/TIMER**.
2. Press **SET** 3 times.
3. Press **◀ SELECT** or **SELECT ▶** to set the minutes, and then press **SET**.

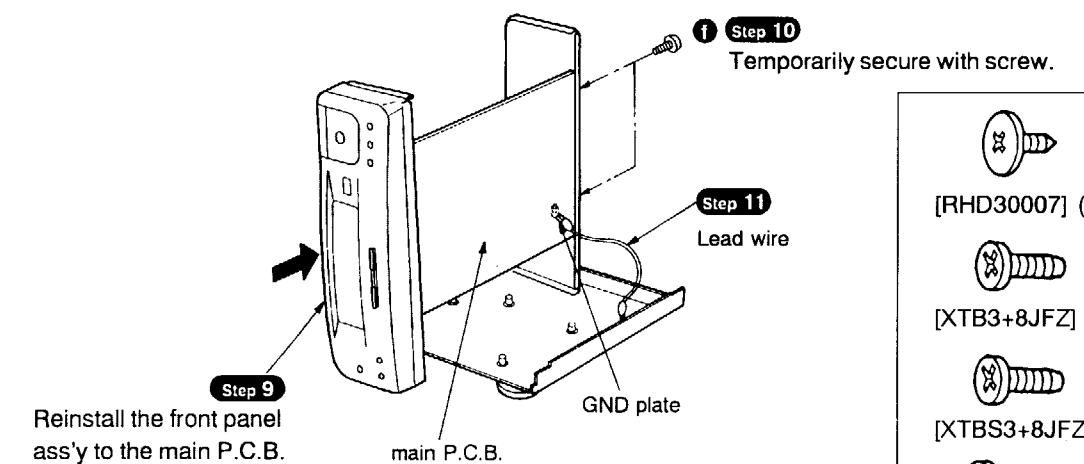
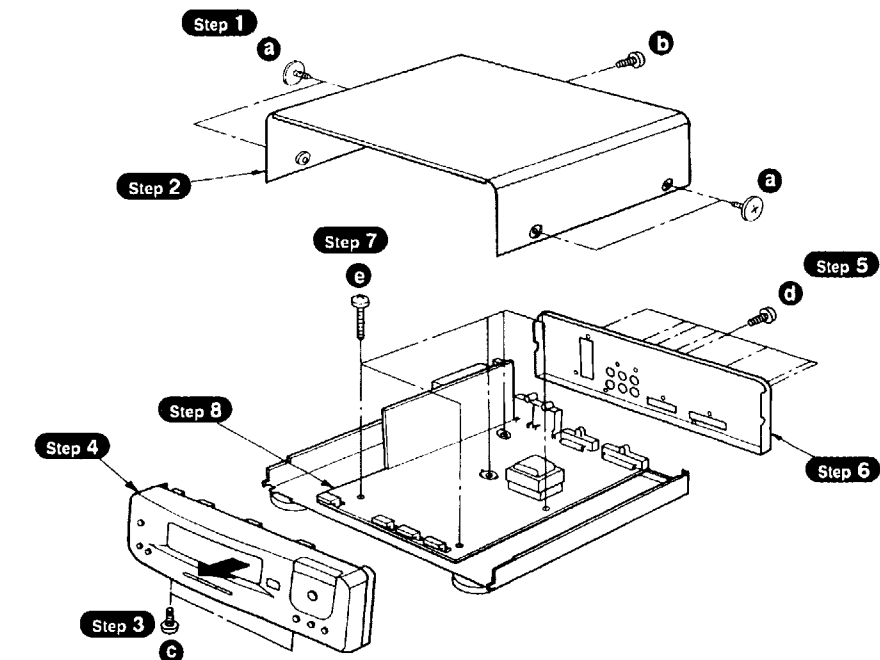
### To display the clock again:






Press **CLOCK/TIMER**.

The clock display will appear for about 8 seconds.



## 2. Checking for the main P.C.B.

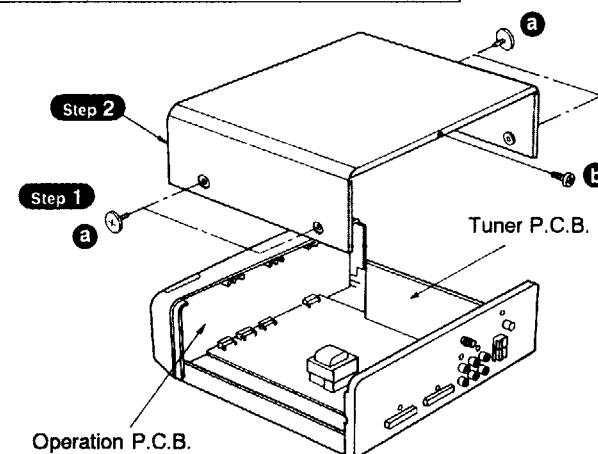




-  a  
[RHD30007] (Black)
-  b  
[XTB3+8JFZ] (Black)
-  c, d  
[XTBS3+8JFZ1] (Black)
-  e  
[XTB3+16JFZ] (Black)
-  f  
[XTBS3+8JFZ1] (Black)

## ■ Operation Check and Main Component Replacement Procedures

- NOTE**
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
  2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
  3. Illustrated screws are equivalent to actual size.

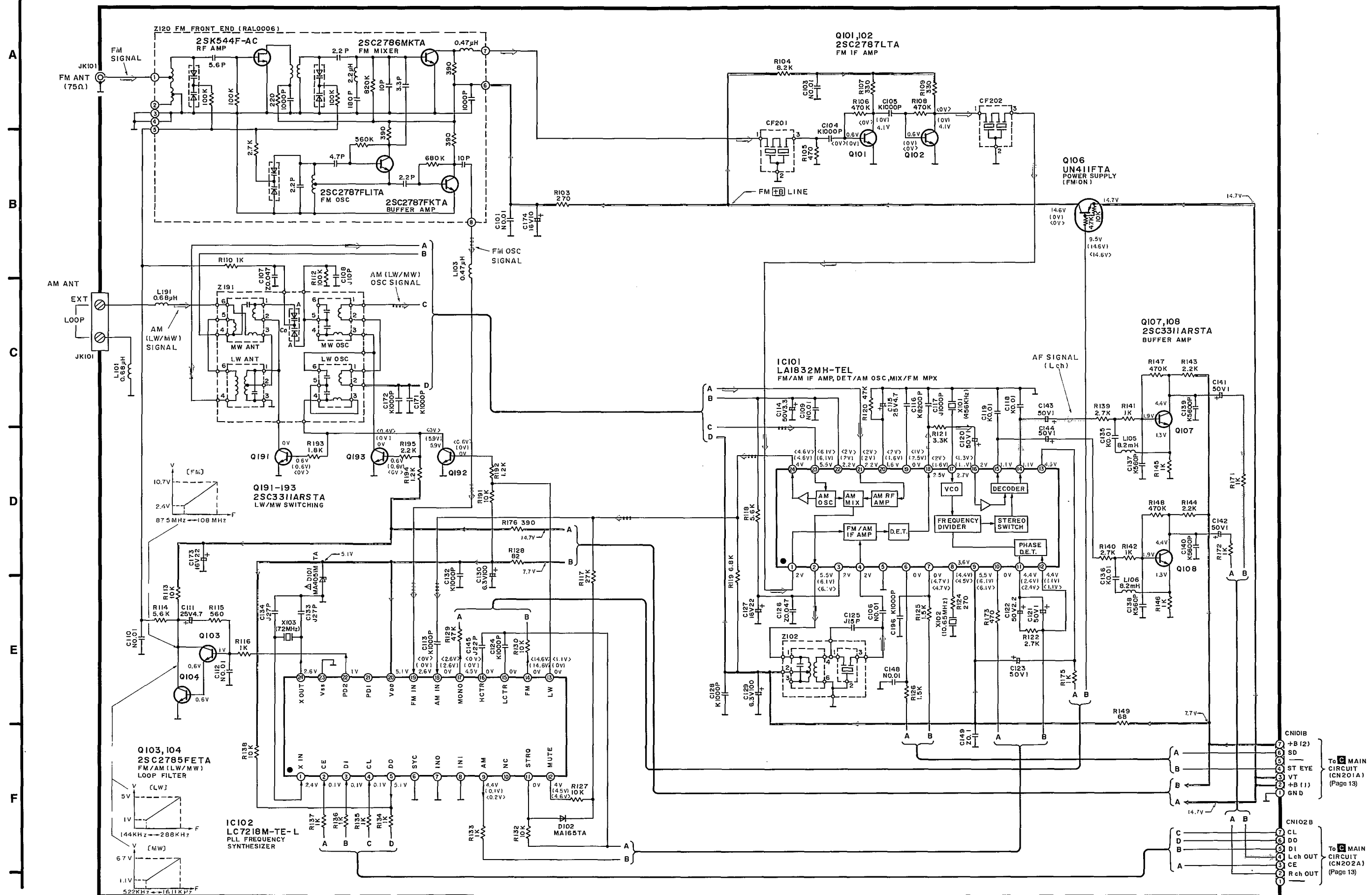
## 1. Checking for the tuner P.C.B. and operation P.C.B.



-  a  
[RHD30007] (Black)
-  b  
[XTBS3+8JFZ] (Black)

# Schematic Diagram • Tuner circuit for (E) and (GC) areas (Parts list on Page 26~30)

## A TUNER CIRCUIT For [E, GC] areas.



● Tuner circuit for (EG) area (Parts list on Page 26~30)

● This schematic diagram may be modified at any time with the development of new technology.

Notes:

● Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

● Voltage values and waveforms are measured as indicated in the schematic diagram when test points between **TP901** and **TP902**, and between **TP903** and **TP904** are shorted.

No mark : FM mode ( ) : AM (MW) mode < > : AM (LW) mode

● Important safety notice:

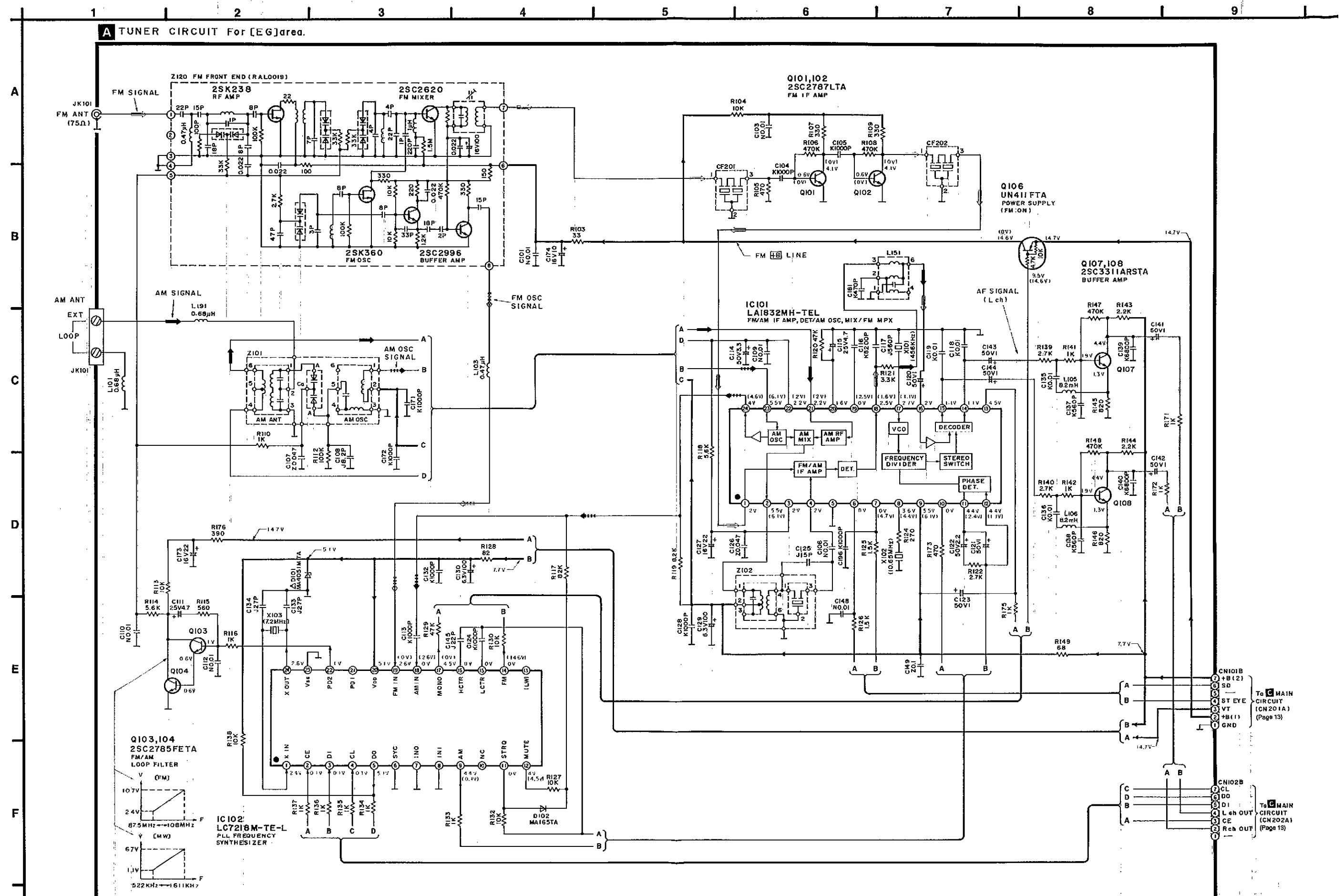
Components identified by  $\Delta$  mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

● Caution!

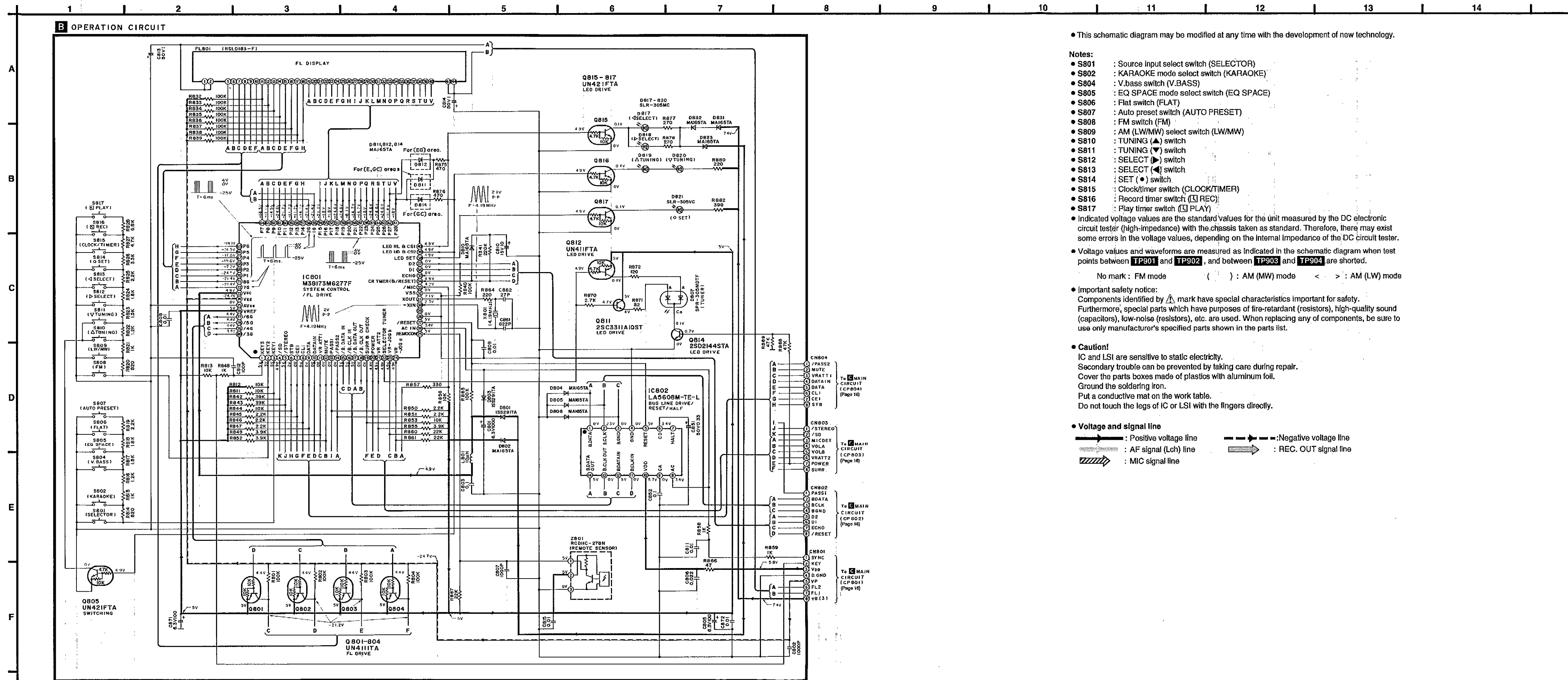
IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair. Cover the parts boxes made of plastics with aluminum foil. Ground the soldering iron. Put a conductive mat on the work table. Do not touch the legs of IC or LSI with the fingers directly.

● Voltage and signal line

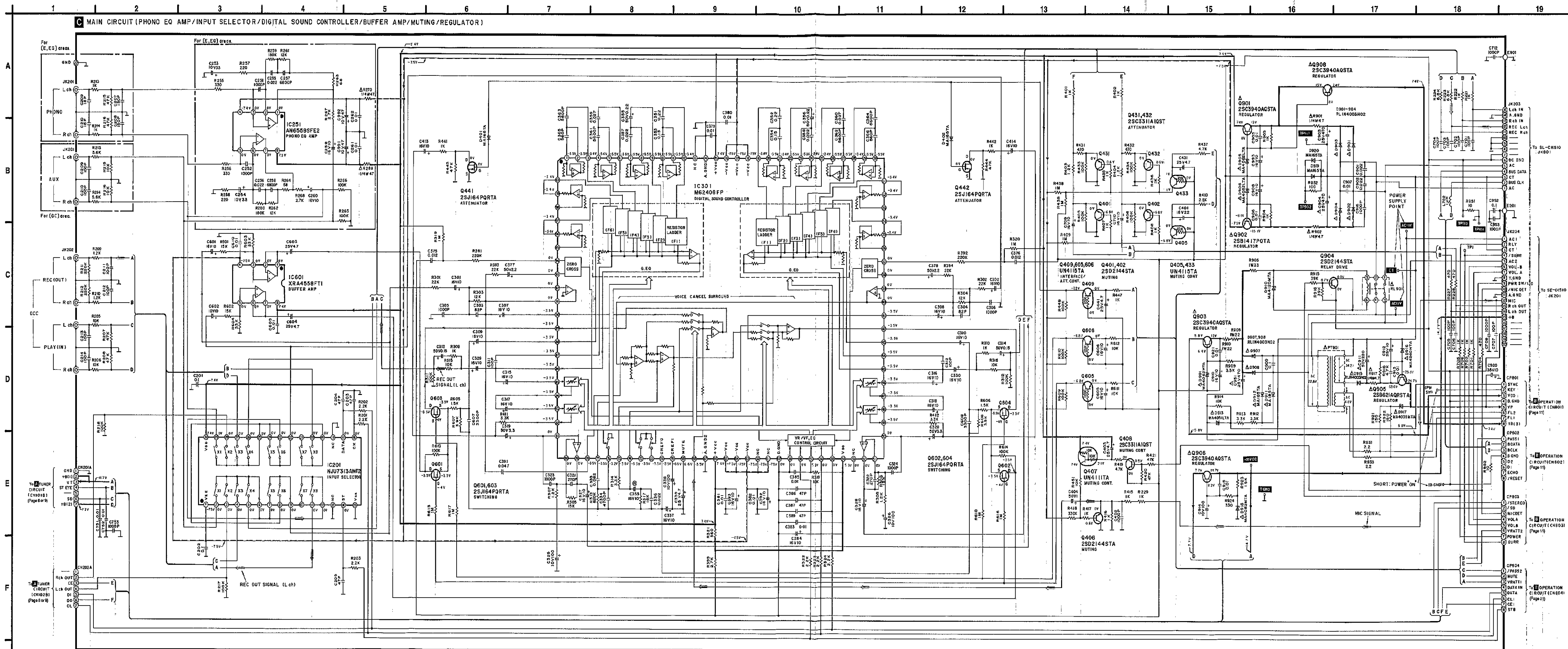
— : Positive voltage line  
 — : AM (LW/MW) signal line  
 — : FM signal line  
 — : AF signal (Lch) line  
 — : AM (LW/MW) OSC signal line  
 — : FM OSC signal line



● Operation circuit (Parts list on Page 26~30)



## Main circuit (Parts list on Page 26~30)

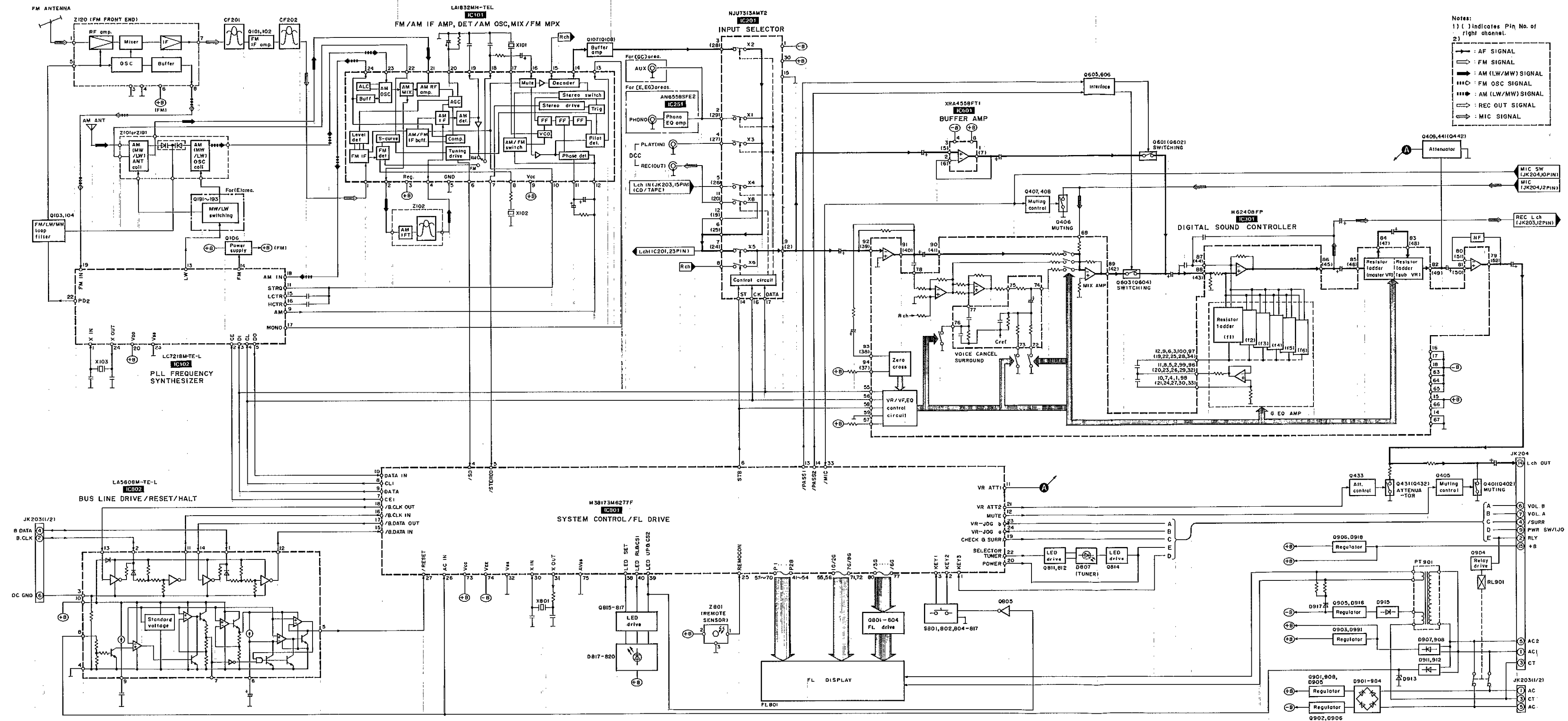




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# Block Diagram



## ■ Power Supply with Tuner ST-CH510

This unit ST-CH510 is designed to operate on power supplied from the Amplifier SE-CH510.

When operating the unit ST-CH510 alone for testing and servicing, without having power supplied from the Amplifier SE-CH510, use the following method.

### Power Supply to Main Circuit

- Short the section between the test points **TP903** and **TP904** on the resistor **R951** as well as the section between the test points **TP902** (Anode side) and **TP901** (Cathode side) of the diode **D919**.
- Apply 11 V AC power to the section between the point **AC 11 V (AC)** of the jumper **J224** and the point **CT (CT)** of the jumper **J225** as well as the section between the point **AC 11 V (AC)** of the jumper **J226** and the point **CT (CT)** of the jumper **J225**. (10 V AC power can be also applied when using power supply tool.) This unit comes to stand-by mode.
- Short the section between the jumper **J59** and the point **D.GND** of the jumper **J255** for a moment. The main circuit comes to power ON mode. (Whenever this operation is performed, power, ON/OFF mode is repeated.)

### Power Supply to Tuner Circuit

- Apply power source to the main circuit.
- Connect the DC +15 V terminal to the jumper **J302**, and the GND terminal to both the point **T.GND** of the jumper **J208** and the point **CT (CT)** of the jumper **J225** using the DC power supply tool.

**Note:** If the GND terminal of the DC power supply tool is connected to the point **CT (CT)** of the jumper **J225**, an error occurs in measurement values for voltage and waveform.

### To Check Signals

Connect the oscilloscope or the speaker with the built-in amplifier to the section between LINE OUT (R-ch) of the capacitor **C706** and the test point **TP904** of the resistor **R951** as well as the section between LINE OUT (L-ch) of the capacitor **C705** and the test point **TP904** of the resistor **R951** and check if the signals are outputting from this unit.

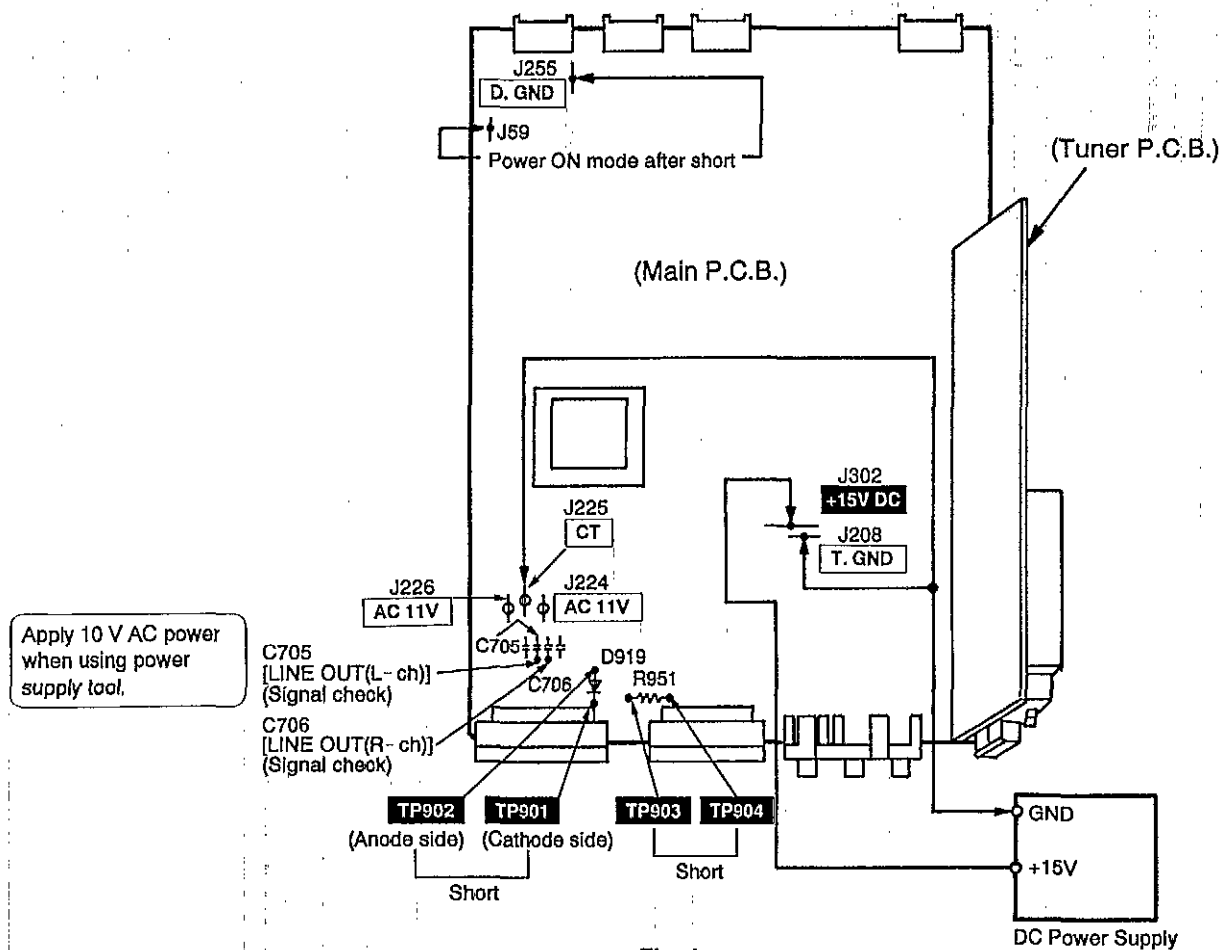


Fig. 1

**Note:** This unit is not required to adjust.

## ■ Function of IC Terminals

● IC801 (M38173M6277F)

Pin No.	Terminal Name	I/O	Function
1	KEY3	I	Power ON/OFF operation detect signal input
2	KEY2	I	Operation key signal input
3	KEY1	I	Operation key signal input
4	/SD	I	SD signal input for tuner
5	/STEREO	I	STEREO signal input for tuner
6	STB	O	Strobe signal output to IC201 and operation key
7	CE1	O	Chip enable signal output to IC102
8	CL1	O	Clock signal output to IC301, IC201 and IC102
9	DATA	O	Data signal output to IC301, IC201 and IC102
10	DATA IN	I	Data signal input from IC102
11	VR ATT1	O	Attenuator signal (-10 dB) output for main volume
12	MUTE	O	Main muting signal output
13	PASS1	O	Output the ON/OFF control signal for Q606
14	/PASS2	O	Output the ON/OFF control signal for Q605
15	/B.DATA IN	I	Bus data input
16	/B.CLK IN	I	Bus clock input
17	/B.DATA OUT	O	Bus data output
18	/B.CLK OUT	O	Bus clock output
19	SURR & CHECK	O	POWER ON mode: Output for SPACE "ON"/ECHO "ON" POWER OFF mode: Demultiplier output for clock control
20	POWER	I/O	Power control output (During POWER ON: "H")
21	VR ATT2	O	Attenuator signal (-10 dB) output for main volume
22	SELECTOR TUNER	O	Selector TUNER output
23	VR JOG B	I	Rotary encoder input for main volume
24	VR JOG A	I	Rotary encoder input for main volume
25	REMOCON	I	Input for remote control
26	AC IN	I	AC power source input terminal for an electricity failure
27	/RESET	I	Reset input terminal
28	XCIN	—	Connect to GND
29	XCOUT	—	Unused, open
30	XIN	I	Connected to a oscillator for system clock X801 (4.194304 MHz)
31	XOUT	O	
32	VSS	—	Connected to GND

Pin No.	Terminal Name	I/O	Function
33	/MIC	I	Input for MIC detection (Connection: "L")
34	CR TIMER	I/O	CR timer (Back up signal detect for clock)
35	ECHO	O	Output for ECHO "ON"
36	D1	O	Output for echo level set
37	D2	O	
38	LED SET	O	LED drive signal (SET)
39	LED UD & CS2	O	LED drive signal (TUNING)
		I	Input for chip select signal
40	LED RL & CS1	O	LED drive signal (PRESET or SELECT)
		I	Input for chip select signal
41	P28	O	Segment output for FL display and chip select signal output
44	P25	O	
45	P24	O	Segment output for FL display
54	P15	O	
55	1G	O	Grid output for FL display
56	2G	O	
57	P14	O	Segment output for FL display
70	P1	O	
71	8G	O	Grid output for FL display
72	7G	O	
73	VCC	I	Supplied (+5V)
74	VEE	I	Supplied power to FL display for pulling down
75	AVSS	—	Connected to GND
76	VREF	—	Standard voltage for A/D converter (Connected to VCC)
77	/6G	O	Grid output for FL display
80	/3G	O	

## ■ Replacement Parts List

**Notes:** \*Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

\*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

\*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		D101	MA4051MTA	DIODE	Δ
				D102	MA165	DIODE	
				D401, 402	MA165	DIODE	
IC101	LA1832MH-TEL	I. C. FM/AM IF AMP.		D801	1SS291TA	DIODE	
IC102	LC7218M-TE-L	I. C. PLL FREQ. SYNTHESIZER		D802	MA165	DIODE	
IC201	NJU7313AMT2	I. C. INPUT SELECTOR		D803	1SS291TA	DIODE	
IC251	AN6558SFE2	I. C. PHONO EQ AMP.	(E, EG)	D804-806	MA165	DIODE	
IC301	M62408FP	I. C. DIGITAL SOUND CONT.		D807	SPR-305MDTF	LED	
IC601	XRA4558FT1	I. C. BUFFER AMP.		D810	MA165	DIODE	
IC801	M38173M6277F	I. C. SYSTEM CONT. /FL DRIVE		D811	MA165	DIODE	(E, GC)
IC802	LA5608M-TE-L	I. C. BUS LINE/HALF/RESET		D812	MA165	DIODE	(EG)
				D814	MA165	DIODE	(GC)
		TRANSISTOR(S)		D817-820	SLR-305MC	LED	
				D821	SLR-305VC	LED	
Q101, 102	2SC2787L	TRANSISTOR		D831-833	MA165	DIODE	
Q103, 104	2SC2785FE	TRANSISTOR		D901-904	RL1M4003N02	DIODE	Δ
Q106	UN411FTA	TRANSISTOR		D905, 906	MA4082LTA	DIODE	Δ
Q107, 108	2SC3311ARSTA	TRANSISTOR		D907, 908	RL1M4003N02	DIODE	Δ
Q191-193	2SC3311ARSTA	TRANSISTOR	(E, GC)	D910	MA4120	DIODE	
Q401, 402	2SD2144S	TRANSISTOR		D911, 912	MA185TA	DIODE	Δ
Q405	UN4115	TRANSISTOR		D913	MA4051-L	DIODE	Δ
Q406	2SD2144S	TRANSISTOR		D915	RL1M4003N02	DIODE	Δ
Q407	UN4111	TRANSISTOR		D916	MA4240H	DIODE	Δ
Q408	2SC3311AIQST	TRANSISTOR		D917	MA4039MTA	DIODE	Δ
Q409	UN4115	TRANSISTOR		D918	MA4082MTA	DIODE	Δ
Q431, 432	2SC3311AIQST	TRANSISTOR		D919, 920	MA165	DIODE	
Q433	UN4115	TRANSISTOR		D991	MA4062-H	DIODE	Δ
Q441, 442	2SJ164PQRTA	TRANSISTOR				COMPONENT COMBINATION(S)	
Q601-604	2SJ164PQRTA	TRANSISTOR					
Q605, 606	UN4115	TRANSISTOR					
Q801-804	UN4111	TRANSISTOR		Z101	RLA22002M-T	COMPONENT COMBINATION	(EG)
Q805	UN421FTA	TRANSISTOR		Z102	RL122006M-T	COMPONENT COMBINATION	
Q811	2SC3311AIQST	TRANSISTOR		Z120	RA10006	FM FRONT END	(E, GC)
Q812	UN411FTA	TRANSISTOR		Z120	RA10019	FM FRONT END	(EG)
Q814	2SD2144S	TRANSISTOR		Z191	RLA62005M-T	COMPONENT COMBINATION	(E, GC)
Q815-817	UN421FTA	TRANSISTOR		Z801	RCDHC-278N	REMOTE SENSOR	
Q801	2SC3940AQSTA	TRANSISTOR	Δ			COIL(S)	
Q802	2SB1417PQTA	TRANSISTOR	Δ				
Q803	2SC3940AQSTA	TRANSISTOR	Δ				
Q804	2SD2144S	TRANSISTOR		L101	ELESNR68MA	COIL	
Q805	2SB621A-R	TRANSISTOR	Δ	L103	ELETR47MA9	COIL	
Q806	2SC3940AQSTA	TRANSISTOR	Δ	L105, 106	ELELN822KL	COIL	
Q808	2SC3940AQSTA	TRANSISTOR	Δ	L151	SLM1810M-1M	COIL	(EG)
				L191	ELESNR68MA	COIL	
				L702	ELEXT101KA9	COIL	
				L801	RLQA100JT-Y	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
				PT901	RTP114G005-M	POWER TRANSFORMER	△
		FILTER(S)				RELAY	
CF201, 202	RLFFETWNO1M	CERAMIC FILTER	(E, GC)				
CF201, 202	RLFFETMGO1L	CERAMIC FILTER	(EG)	RL901	RSY0017M-0	RELAY	△
		OSCILLATOR(S)				JACK(S)	
X101	RSXZ456KM07M	OSCILLATOR(456KHz)		JK101	RJH5210M	EXT ANT	
X102	RLFDGT0011	OSCILLATOR(10.65MHz)		JK201	SJF3068-7N	PHONO	
X103	RSXC7M20S04T	OSCILLATOR(7.2MHz)		JK202	SJF3069-5N	DAT/DCC	
X801	RSXA4M19S03	OSCILLATOR(4.19MHz)		JK203	RJT065K15	CONNECTOR(15P)	
		DISPLAY TUBE		JK204	RJT065K20	CONNECTOR(20P)	
FL801	RSL0183-F	DISPLAY TUBE					
		SWITCH(ES)					
S801	EVQ21405R	SW, SELECTOR					
S802	EVQ21405R	SW, KARAOKE					
S804	EVQ21405R	SW, V. BASS					
S805	EVQ21405R	SW, EQ SPACE					
S806	EVQ21405R	SW, FLAT					
S807	EVQ21405R	SW, AUTO PRESET					
S808	EVQ21405R	SW, FM					
S809	EVQ21405R	SW, AM(LW/ME)					
S810	EVQ21405R	SW, TUNING					
S811	EVQ21405R	SW, TUNING					
S812	EVQ21405R	SW, SELECT					
S813	EVQ21405R	SW, SELECT					
S814	EVQ21405R	SW, SET					
S815	EVQ21405R	SW, CLOCK/TIMER					
S816	EVQ21405R	SW, REC					
S817	EVQ21405R	SW, PLAY					
		CONNECTOR(S)					
CN801-804	RJT003K008-1	CONNECTOR(8P)					
CN201A	RJT057W007-1	CONNECTOR(7P)					
CN202A	RJT057W007-1	CONNECTOR(7P)					
CN101B	RJU057W007	SOCKET(7P)					
CN102B	RJU057W007	SOCKET(7P)					
CP801-804	RJU003K008M1	SOCKET(8P)					
		EARTH TERMINAL(S)					
E201	SNE1004-2	GND PLATE					
E901	SNE1004-2	GND PLATE					
		TRANSFORMER					

Notes : \* Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads(F)  
 \* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R194	ERDS2TJ122	1/4W 1.2K (E, GC)	R418	ERDS2TJ334	1/4W 330K
			R195	ERDS2TJ222	1/4W 2.2K (E, GC)	R419	ERDS2TJ472	1/4W 4.7K
			R201-203	ERDS2TJ222	1/4W 2.2K	R420, 421	ERDS2TJ473	1/4W 47K
R103	ERDS2TJ271	1/4W 270 (E, GC)	R205, 206	ERDS2TJ103	1/4W 10K	R431, 432	ERDS2TJ471	1/4W 470
R103	ERDS2TJ330T	1/4W 33 (EG)	R207, 208	ERDS2TJ473	1/4W 47K	R433, 434	ERDS2TJ104	1/4W 100K
R104	ERDS2TJ822	1/4W 8.2K (E, GC)	R209, 210	ERDS2TJ122	1/4W 1.2K	R435, 436	ERDS2TJ102	1/4W 1K
R104	ERDS2TJ103	1/4W 10K (EG)	R211, 212	ERDS2TJ224T	1/4W 220K	R437	ERDS2TJ472	1/4W 4.7K
R105	ERDS2TJ471	1/4W 470	R213, 214	ERDS2TJ102	1/4W 1K (E, EG)	R438, 439	ERDS2TJ105T	1/4W 1M
R106	ERDS2TJ474	1/4W 470K	R213, 214	ERDS2TJ562T	1/4W 5.6K (GC)	R441, 442	ERDS2TJ102	1/4W 1K
R107	ERDS2TJ331	1/4W 330	R215, 216	ERDS2TJ473	1/4W 47K (E, EG)	R443, 444	ERDS2TJ473	1/4W 47K
R108	ERDS2TJ474	1/4W 470K	R215, 216	ERDS2TJ103	1/4W 10K (GC)	R447	ERDS2TJ102	1/4W 1K
R109	ERDS2TJ331	1/4W 330	R217, 218	ERDS2TJ104	1/4W 100K	R448	ERDS2TJ104	1/4W 100K
R110	ERDS2TJ102	1/4W 1K	R221, 222	ERDS2TJ102	1/4W 1K	R451	ERDS2TJ103	1/4W 10K
R112	ERDS2TJ104	1/4W 100K	R223, 224	ERDS2TJ682T	1/4W 6.8K	R601, 602	ERDS2TJ153	1/4W 15K
R113	ERDS2TJ103	1/4W 10K	R227, 228	ERDS2TJ471	1/4W 470	R603, 604	ERDS2TJ333	1/4W 33K
R114	ERDS2TJ562	1/4W 5.6K	R229	ERDS2TJ102	1/4W 1K	R605, 606	ERDS2TJ152	1/4W 1.5K
R115	ERDS2TJ561	1/4W 560	R255, 256	ERDS2TJ331	1/4W 330 (E, EG)	R607, 608	ERDS2TJ392T	1/4W 3.9K
R116	ERDS2TJ102	1/4W 1K	R257, 258	ERDS2TJ221	1/4W 220 (E, EG)	R609, 610	ERDS2TJ104	1/4W 100K
R117	ERDS2TJ273	1/4W 27K (E, GC)	R259, 260	ERDS2TJ184T	1/4W 180K (E, EG)	R611, 612	ERDS2TJ103	1/4W 10K
R117	ERDS2TJ823T	1/4W 82K (EG)	R261, 262	ERDS2TJ123	1/4W 12K (E, EG)	R613, 614	ERDS2TJ104	1/4W 100K
R118	ERDS2TJ562	1/4W 5.6K	R263, 264	ERDS2TJ680T	1/4W 68 (E, EG)	R615-618	ERDS2TJ105T	1/4W 1M
R119	ERDS2TJ682T	1/4W 6.8K (E, GC)	R265, 266	ERDS2TJ104	1/4W 100K (E, EG)	R701, 702	ERDS2TJ102	1/4W 1K
R119	ERDS2TJ822T	1/4W 8.2K (EG)	R267, 268	ERDS2TJ272T	1/4W 2.7K (E, EG)	R704	ERDS2TJ471	1/4W 470
R120	ERDS2TJ473	1/4W 47K	R269, 270	ERD25FJ470	1/4W 47 $\Delta$ (E, EG)	R705, 706	ERDS2TJ102	1/4W 1K
R121	ERDS2TJ332	1/4W 3.3K	R301, 302	ERDS2TJ223	1/4W 22K	R801-804	ERDS2TJ104	1/4W 100K
R122	ERDS2TJ272T	1/4W 2.7K	R303, 304	ERDS2TJ123	1/4W 12K	R811-813	ERDS2TJ103	1/4W 10K
R124	ERDS2TJ271	1/4W 270	R305, 306	ERDS2TJ153	1/4W 15K	R814	ERDS2TJ821	1/4W 820
R125, 126	ERDS2TJ152	1/4W 1.5K	R307, 308	ERDS2TJ122	1/4W 1.2K	R815	ERDS2TJ102	1/4W 1K
R127	ERDS2TJ103	1/4W 10K	R309, 310	ERDS2TJ102	1/4W 1K	R816	ERDS2TJ122	1/4W 1.2K
R128	ERDS2TJ820	1/4W 82	R311, 312	ERDS2TJ104	1/4W 100K	R817	ERDS2TJ152	1/4W 1.5K
R129	ERDS2TJ473	1/4W 47K	R313	ERDS2TJ824	1/4W 820K	R818	ERDS2TJ182	1/4W 1.8K
R130	ERDS2TJ103	1/4W 10K	R314	ERDS2TJ332	1/4W 3.3K	R819	ERDS2TJ222	1/4W 2.2K
R132	ERDS2TJ103	1/4W 10K	R315, 316	ERDS2TJ103	1/4W 10K	R820	ERDS2TJ821	1/4W 820
R133-137	ERDS2TJ102	1/4W 1K	R317	ERDS2TJ183T	1/4W 18K	R821	ERDS2TJ102	1/4W 1K
R138	ERDS2TJ103	1/4W 10K	R318	ERDS2TJ103	1/4W 10K	R822	ERDS2TJ122	1/4W 1.2K
R139, 140	ERDS2TJ272T	1/4W 2.7K	R319, 320	ERDS2TJ105T	1/4W 1M	R823	ERDS2TJ152	1/4W 1.5K
R141, 142	ERDS2TJ102	1/4W 1K	R321	ERDS2TJ561	1/4W 560	R824	ERDS2TJ182	1/4W 1.8K
R143, 144	ERDS2TJ222	1/4W 2.2K	R322-324	ERDS2TJ222	1/4W 2.2K	R825	ERDS2TJ222	1/4W 2.2K
R145, 146	ERDS2TJ102	1/4W 1K (E, GC)	R391, 392	ERDS2TJ224T	1/4W 220K	R826	ERDS2TJ332	1/4W 3.3K
R145, 146	ERDS2TJ821T	1/4W 820 (EG)	R393, 394	ERDS2TJ223	1/4W 22K	R827	ERDS2TJ472	1/4W 4.7K
R147, 148	ERDS2TJ474	1/4W 470K	R399	ERDS2TJ272T	1/4W 2.7K	R828	ERDS2TJ682T	1/4W 6.8K
R149	ERDS2TJ680T	1/4W 68	R401, 402	ERDS2TJ102	1/4W 1K	R832-840	ERDS2TJ104	1/4W 100K
R171, 172	ERDS2TJ102	1/4W 1K	R403, 404	ERDS2TJ122	1/4W 1.2K	R841	ERDS2TJ224T	1/4W 220K
R173	ERDS2TJ471	1/4W 470	R405, 406	ERDS2TJ104	1/4W 100K	R842, 843	ERDS2TJ393	1/4W 39K
R175	ERDS2TJ102	1/4W 1K	R407, 408	ERDS2TJ102	1/4W 1K	R844	ERDS2TJ103	1/4W 10K
R176	ERDS2TJ391	1/4W 390	R409	ERDS2TJ105T	1/4W 1M	R845-847	ERDS2TJ222	1/4W 2.2K
R191	ERDS2TJ103	1/4W 10K (E, GC)	R410	ERDS2TJ222	1/4W 2.2K	R848	ERDS2TJ102	1/4W 1K
R192	ERDS2TJ122	1/4W 1.2K (E, GC)	R411, 412	ERDS2TJ332	1/4W 3.3K	R849	ERDS2TJ392T	1/4W 3.9K
R193	ERDS2TJ182	1/4W 1.8K (E, GC)	R415-417	ERDS2TJ102	1/4W 1K	R850, 851	ERDS2TJ222	1/4W 2.2K

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R852	ERDS2TJ392T	1/4W 3.9K	C115	ECEA1EKA4R7B	25V 4.7U	C327-330	ECEA1CA100B	16V 10U
R853	ERDS2TJ103	1/4W 10K	C116	ECBT1C822KS5	16V 8200P	C333	ECFR1E823KR	25V 0.082U
R855	ERDS2TJ392T	1/4W 3.9K	C117	ECQB1H102JF3	50V 1000P (E, GC)	C334	ECFR1E472KR	25V 4700P
R856	ERDS2TJ103	1/4W 10K	C117	ECQB1H561JF3	50V 560P (EG)	C335	ECEA1CN100SB	16V 10U
R857	ERDS2TJ331	1/4W 330	C118, 119	ECFR1C103KR	16V 0.01U	C336	ECBT0J223MS5	6.3V 0.022U
R858, 859	ERDS2TJ102	1/4W 1K	C120, 121	ECEA1HKA010B	50V 1U	C337	ECEA1CA100B	16V 10U
R860, 861	ERDS2TJ223	1/4W 22K	C122	ECEA1HKA2R2B	50V 2.2U	C338	ECEA1AKA101B	10V 100U
R864	ERDS2TJ221	1/4W 220	C123	ECEA1HKA010B	50V 1U	C339	ECEA1EKA4R7B	25V 4.7U
R865	ERDS2TJ104	1/4W 100K	C124	ECBT1H102KB5	50V 1000P	C351, 352	ECQV1H224JM3	50V 0.22U
R866	ERDS2TJ470	1/4W 47	C125	ECBT1H150JC5	50V 15P	C353, 354	ECQV1H154JM3	50V 0.15U
R867	ERDS2TJ223	1/4W 22K	C126	ECBT1H473ZF5	50V 0.047U	C355, 356	ECEA1HKA2R2B	50V 0.22U
R868, 869	ERDS2TJ473	1/4W 47K	C127	ECEA1CKA220B	16V 22U	C357, 358	ECFR1E223KR	25V 0.022U
R870	ERDS2TJ272T	1/4W 2.7K	C128	ECBT1H102KB5	50V 1000P	C359, 360	ECFR1E273KR	25V 0.027U
R871	ERDS2TJ820	1/4W 82	C129, 130	ECEA0JKA101B	6.3V 100U	C361-364	ECBT1C562KR5	16V 5600P
R872	ERDS2EJ121	1/4W 120	C132	ECBT1H102KB5	50V 1000P	C365, 366	ECBT1H561KB5	50V 560P
R875, 876	ERDS2TJ471	1/4W 470	C133, 134	ECBT1H270JU5	50V 27P	C375, 376	ECQB1H123JF3	50V 0.012U
R877, 878	ERDS2TJ271	1/4W 270	C135, 136	ECBT1C103KS5	16V 0.01U	C377, 378	ECEA1HKA2R2B	50V 2.2U
R880	ERDS2TJ221	1/4W 220	C137, 138	ECBT1H561KB5	50V 560P	C379-383	ECBT1E103ZF	25V 0.01U
R882	ERDS2TJ391	1/4W 390	C139, 140	ECBT1C562KR5	16V 5600P (E, GC)	C384	ECEA1CA100B	16V 10U
R901, 902	ERD2FCVJ4R7T	1/4W 4.7 Δ	C139, 140	ECBT1C682KR5	16V 6800P (EG)	C385	ECBT1E103ZF	25V 0.01U
R903, 904	ERDS2TJ102	1/4W 1K	C141-144	ECEA1HKA010B	50V 1U	C386, 387	ECBT1H470J5	50V 47P
R905	ERG1SJ220E	1W 22	C145	ECBT1H220JC5	50V 22P	C389	ECBT1H470J5	50V 47P
R906	ERG1SJ330E	1W 33	C148	ECBT1C103NS5	16V 0.01U	C391	ECFR1E473KR	25V 0.047U
R909	ERDS2TJ332	1/4W 3.3K	C149	ECBT1H104ZF5	50V 0.1U	C392, 393	ECEA1CA100B	16V 10U
R910	ERG1SJ220E	1W 22	C171, 172	ECBT1H102KB5	50V 1000P	C401	ECEA1CKA220B	16V 22U
R912, 913	ERDS2TJ332	1/4W 3.3K	C173	ECEA1CKA220B	16V 22U	C402	ECBT1H102KB5	50V 1000P
R914	ERDS2TJ103	1/4W 10K	C174	ECEA1CA100B	16V 10U	C403	ECEA1EKA4R7B	25V 4.7U
R915, 916	ERDS2TJ393	1/4W 39K	C181	ECBT1H471KB5	50V 470P (EG)	C404	ECEA1HKA010B	50V 1U
R917	ERD25FVJ4R7T	1/4W 4.7 Δ	C196	ECBT1H102KB5	50V 1000P	C413, 414	ECEA1CA100B	16V 10U
R918	ERDS2TJ472	1/4W 4.7K	C201, 202	ECBT1H104ZF5	50V 0.1U	C431	ECEA1EKA4R7B	25V 4.7U
R921, 922	ERDS2TJ151	1/4W 150	C203-205	ECBT1H470J5	50V 47P	C441	ECEA1EKA4R7B	25V 4.7U
R923	ERDS2TJ152	1/4W 1.5K	C207, 208	ECBT1H151KB5	50V 150P (E, EG)	C601, 602	ECEA1CA100B	16V 10U
R924	ERDS2TJ331	1/4W 330	C209, 210	ECBT1H180J5	50V 18P (E, EG)	C603, 604	ECEA1EKA4R7B	25V 4.7U
R931	ERDS2TJ2R2T	1/4W 2.2	C209, 210	ECBT1H101KB5	50V 100P (GC)	C605, 606	ECEA1CA100B	16V 10U
R932	ERDS2TJ101	1/4W 100	C211-214	ECBT1H101KB5	50V 100P	C607, 608	ECBT1C332KR5	16V 3300P
R933	ERDS2TJ2R2T	1/4W 2.2	C251, 252	ECBT1H102KB5	50V 1000P (E, EG)	C609, 610	ECBT1E103ZF	25V 0.01U
R951, 952	ERDS2TJ100	1/4W 10	C253, 254	ECEA1AKA330B	10V 33U (E, EG)	C701-707	ECBT1H101KB5	50V 100P
			C255, 256	ECBT0J223MS5	6.3V 0.022U (E, EG)	C708	ECBT1H102KB5	50V 1000P
			C257, 258	ECBT1C682KR5	16V 6800P (E, EG)	C709, 710	ECEA1CA100B	16V 10U
			C259, 260	ECEA1CA100B	16V 10U (E, EG)	C712	ECBT1H102KB5	50V 1000P
C101	ECBT1C103NS5	16V 0.01U	C261, 262	ECBT1E103ZF	25V 0.01U (E, EG)	C751, 752	ECBT1E103ZF	25V 0.01U
C103	ECBT1C103NS5	16V 0.01U	C301, 302	ECEA1CA100B	16V 10U	C753	ECBT1H102KB5	50V 1000P
C104, 105	ECBT1H102KB5	50V 1000P	C303, 304	ECBT1H820KB5	50V 82P	C801	ECA0JM102B	6.3V 1000P
C106	ECBT1C103NS5	16V 0.01U	C305, 306	ECBT1H102KB5	50V 1000P	C802	ECBT1H102KB5	50V 1000P
C107	ECBT1H473ZF5	50V 0.047U	C307-310	ECEA1CA100B	16V 10U	C803	ECBT1H104ZF5	50V 0.1U
C108	ECBT1H100JC5	50V 10P (E, GC)	C311, 312	ECBT1H101KB5	50V 100P	C805	ECEA0JKA101B	6.3V 100U
C108	ECBT1H8R2KC5	50V 8.2P (EG)	C313, 314	ECEA1HKA15B	50V 0.15U	C806	ECBT1E223ZF	25V 0.022U
C109, 110	ECBT1C103NS5	16V 0.01U	C315-318	ECEA1CA100B	16V 10U	C807	ECBT1H102KB5	50V 1000P
C111	ECEA1EKA4R7B	25V 4.7U	C319, 320	ECEA1HKA3R3B	50V 3.3U	C808, 809	ECBT1E103ZF	25V 0.01U
C112	ECBT1C103NS5	16V 0.01U	C321, 322	ECBT1H271KB5	50V 270P	C810	ECEA1CA100B	16V 10U
C113	ECBT1H102KB5	50V 1000P	C323, 324	ECBT1H102KB5	50V 1000P	C811	ECBT1E103ZF	25V 0.01U
C114	ECEA1HKA3R3B	50V 3.3U	C325, 326	ECEA1AKA101B	10V 100U	C812	ECBT1H101KB5	50V 100P

[illegible][illegible]

## ■ Cabinet Parts Location

