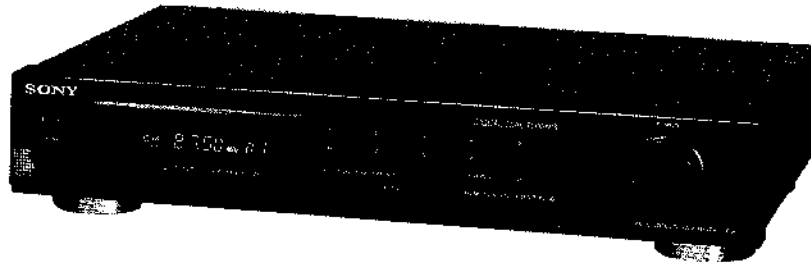


ST-S117

SERVICE MANUAL

AEP Model



SPECIFICATIONS

Tuner		AM tuner	
Circuit system	FM stereo, FM/AM superheterodyne tuner Quartz-locked PLL digital synthesizer system	Frequency range	MW : 531 - 1,602 kHz LW : 153 - 279 kHz
FM tuner		Antenna	AM loop antenna External antenna terminal
Frequency range	87.5 - 108 MHz	Intermediate frequency	450kHz
Antenna terminals	75 ohms unbalanced	Usable sensitivity (with AM loop antenna)	300 μ V/m (999 kHz) 1 mV/m (216 kHz)
Intermediate frequency	10.7MHz	Signal-to-noise ratio	54 dB (50 mV/m) (999 kHz) 50 dB (50 mV/m) (216 kHz)
Sensitivity	18.0 dBf, 2.2 μ V (mono) 40.0 dBf, 24.5 μ V (stereo) (at 46 dB quieting)	Harmonic distortion	0.5% (50 mV/m, 400 Hz)
Signal-to-noise ratio	74 dB (mono) 69 dB (stereo) (at 40 kHz deviation)	Selectivity	32 dB
Harmonic distortion	0.3% (mono), 0.5% (stereo) (at 1 kHz)	General	
Separation	40 dB (at 1kHz)	Power requirements	220-230V AC (or 240V AC adjustable by authorized Sony personnel), 50/60Hz
Frequency response	40 Hz - 12.5 kHz \pm 0.5dB	Power consumption	8 W
Selectivity	55 dB (at 400 kHz)	Dimensions	Approx. 430 x 85 x 295 mm (w/h/d) (17 x 3 $\frac{3}{8}$ x 11 $\frac{5}{8}$ inches)
Capture ratio	1.0 dB	Weight	Approx. 2.8 kg (6 lb 3 oz)
AM suppression ratio	54 dB	Accessories supplied	Remote control cord (1) Connecting cord (1) FM antenna (1) AM loop antenna (1)
Image response ratio	50 dB		
IF response ratio	90 dB		
Spurious response ratio	70 dB		
Automatic tuning threshold	17.8 μ V (30 dBf)		
Output	410 mV, 4.7 kohms (at 40 kHz deviation)		

Design and specifications subject to change without notice.

FM STEREO/FM-AM TUNER
SONY®



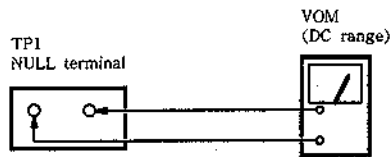
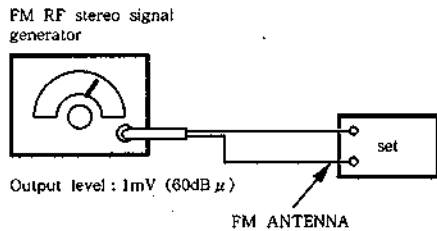
SECTION 1 ELECTRICAL ADJUSTMENTS

FM SECTION

SSG	Carrier frequency	98MHz
	Modulation	MONO : 1kHz, 40kHz deviation
		STEREO : Audio 1kHz, 16.25kHz deviation Pilot 19kHz, 7.5kHz deviation Sub-carrier 38kHz, 16.25kHz deviation

• FM Discriminator Alignment (NULL check)

Setting :



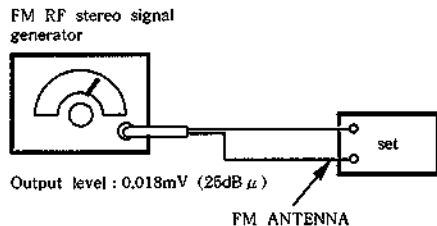
Procedure :

1. Tune the set to 98MHz.
2. Adjust T21 for 0V reading on the VOM.

Note : FM tuning level adjustment should be made after FM discriminator alignment.

• FM Tuning Level Adjustment

Setting :

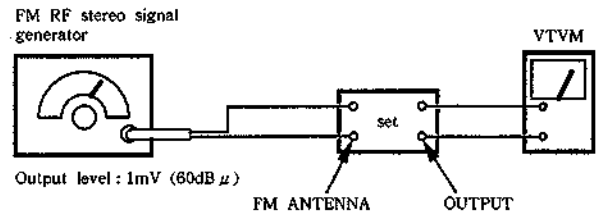


Procedure :

1. Tune the set to 98MHz.
2. Adjust RV24 so that the TUNED LED goes on.

• FM Stereo Separation Adjustment

Setting :



Procedure :

Tune the set to 98MHz

FM stereo Signal generator Output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV21 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV21 for minimum reading.

L-CH Stereo separation : Ⓐ - Ⓑ

R-CH Stereo separation : Ⓒ - Ⓓ

The separations of both channels should be equal.

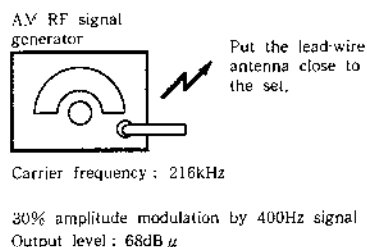
AM SECTION

• AM Tuning Level Adjustment

Setting :

BAND selector : LW

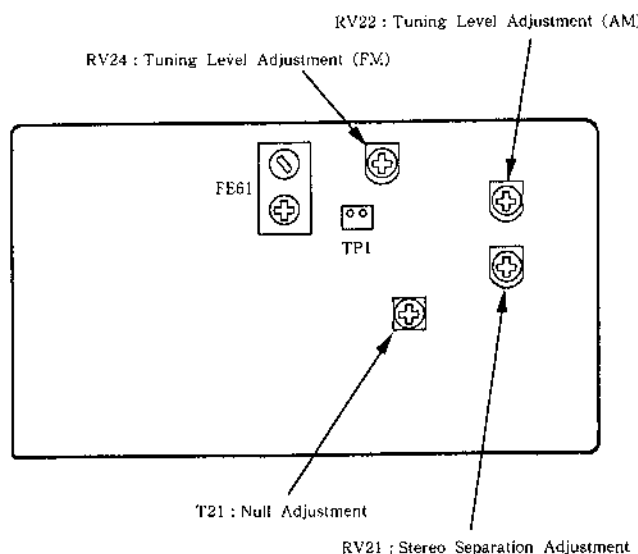
Procedure :



1. Tune the set to 216kHz
2. Adjust the RV22 so that the TUNED LED goes on.

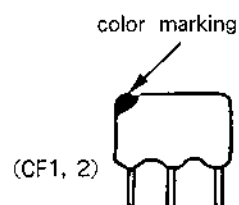
Parts Arrangement Diagram for Adjustments

—tuner board—



Note on Ceramic Filter (CF1, 2) Replacement.

This set employs three ceramic filters (CF1, 2) which should have the same color marking to identify their center frequency. Therefore FM IF offset adjustment by D708, D709 mounted is necessary to match the center frequency of the ceramic filters used with FM intermediate frequency.



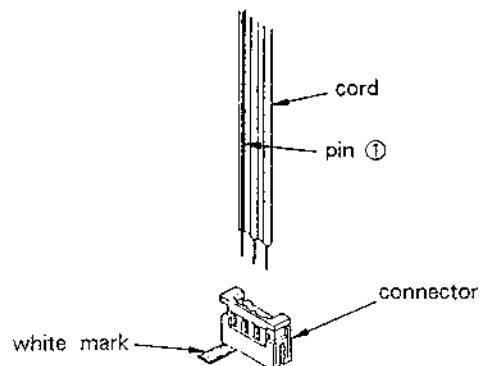
○ : Mounted
× : not Mounted

Ceramic filter		Mount		FM intermediate frequency (MHz)
Color mark	Center frequency (MHz)	*A D708	*B D709	
White	10.750	×	○	10.750
Red	10.700	○	○	10.700
Black	10.650	○	×	10.650

FM intermediate frequency is determined by the three types as shown above. Ceramic filters of same center frequency, i. e., of same color coding should be used for CF1 and CF2. When replacing the ceramic filters, perform the FM Discriminator Adjustment.

[Note on Inserting the Cord to the Connector on Tuner Board]

- Insert the cord to the connector fitting Pin ① of the cord in accordance with the white mark on the board at the connector as shown in the figure.



**SECTION 2
EXPLANATION OF IC TERMINALS**

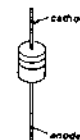
TMP47C670N-1247 is a high-speed, high-functional 4 bit single chip microcomputer with a built-in fluorescent display lamp drive circuit, a 4 bit A/D conversion input, and a 14 bit D/A conversion output.

PIN FUNCTIONS

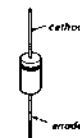
Pin.No	Pin Name	I/O	Function
1	VKK	Power	Power terminal for fluorescent display lamp drive
2-11	S0-S9	O	FL lamp segment output
14	CINO	I	Signal input
15	K01	I	Key input
16	K02	I	Key input
17	K03	I	Key input
18	TEST	I	Terminal for shipping test (Not used on the set)
19	X IN	I	Oscillator connection terminal (High frequency)
20	X OUT	O	
21	RESET	I	Reset signal input
22	HOLD	I	Demand/release signal input for hold operation
24	R60	I	Key input
25	R60	I	Key input
27	R63	I	Signal meter level conversion
28	P10	O	Key output
29	P11	O	Key output
30	P12	O	Key output
31	P13	O	Key output
32	VSS	Power	GND (0V)
33	P20	O	Key output
34	P21	O	Key output
35	P22	O	Key output
37	R70	I	AUTO STOP level input TUNED input
39	R72	O	MUTING input
40	R73	I	STEREO input
41	INT2	I	Remote controller input
42	R81	I	Rotary encoder input
43	R82	I	Rotary encoder input
44	R83	O	CE output
45	SI	I	Serial data input
46	SO	O	Serial data output
47	SCK	O	Serial clock output
54-62		O	FL lamp digit output
64	VDD	Power	+5V

• SEMICONDUCT

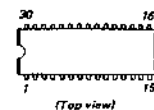
EQA02-06C
RD30ES-B3
1SS120



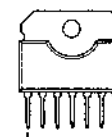
10E2N



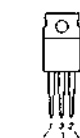
LA1851N



LA5667



LC7218



COMMON IN OUT

SECTION 2
EXPLANATION OF IC TERMINALS

TMP47C670N-1247 is a high-speed, high-functional 4 bit single chip microcomputer with a built-in fluorescent display lamp drive circuit, a 4 bit A/D conversion input, and a 14 bit D/A conversion output.

PIN FUNCTIONS

Pin.No	Pin Name	I/O	Function
1	VKK	Power	Power terminal for fluorescent display lamp drive
2-11	S0-S9	O	FL lamp segment output
14	CINO	I	Signal input
15	K01	I	Key input
16	K02	I	Key input
17	K03	I	Key input
18	TEST	I	Terminal for shipping test (Not used on the set)
19	X IN	I	Oscillator connection terminal (High frequency)
20	X OUT	O	
21	RESET	I	Reset signal input
22	HOLD	I	Demand/release signal input for hold operation
24	R60	I	Key input
25	R60	I	Key input
27	R63	I	Signal meter level conversion
28	P10	O	Key output
29	P11	O	Key output
30	P12	O	Key output
31	P13	O	Key output
32	VSS	Power	GND (0V)
33	P20	O	Key output
34	P21	O	Key output
35	P22	O	Key output
37	R70	I	AUTO STOP level input TUNED input
39	R72	O	MUTING input
40	R73	I	STEREO input
41	INT2	I	Remote controller input
42	R81	I	Rotary encoder input
43	R82	I	Rotary encoder input
44	R83	O	CE output
45	SI	I	Serial data input
46	SO	O	Serial data output
47	SCK	O	Serial clock output
51-62		O	FL lamp digit output
64	VDD	Power	+5V

○ : Mounted
× : not Mounted

*B	FM intermediate frequency (MHz)
○	10.750
○	10.700
×	10.650

... by the three types
... center frequency, i.
... for CP1 and CP2.
... s, perform the FM

Connector on Tuner

... tting Pin ① of the cord
... k on the board at the

... ord

... ①

... connector

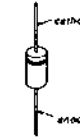
SECTION 3
DIAGRAMS

• SEMICONDUCTOR LEAD LAYOUTS

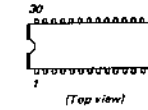
EQA02-06C
RD30ES-B3
1SS120



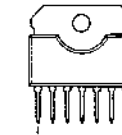
10E2N



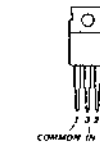
LA1851N



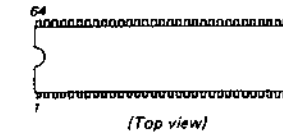
LA5667



LC7218



TMP47C670N-1247



DTA114ES
DTC114ES
2SA1317-STU
2SC2603-EF
2SC2669-OY



2SC2785-HFE



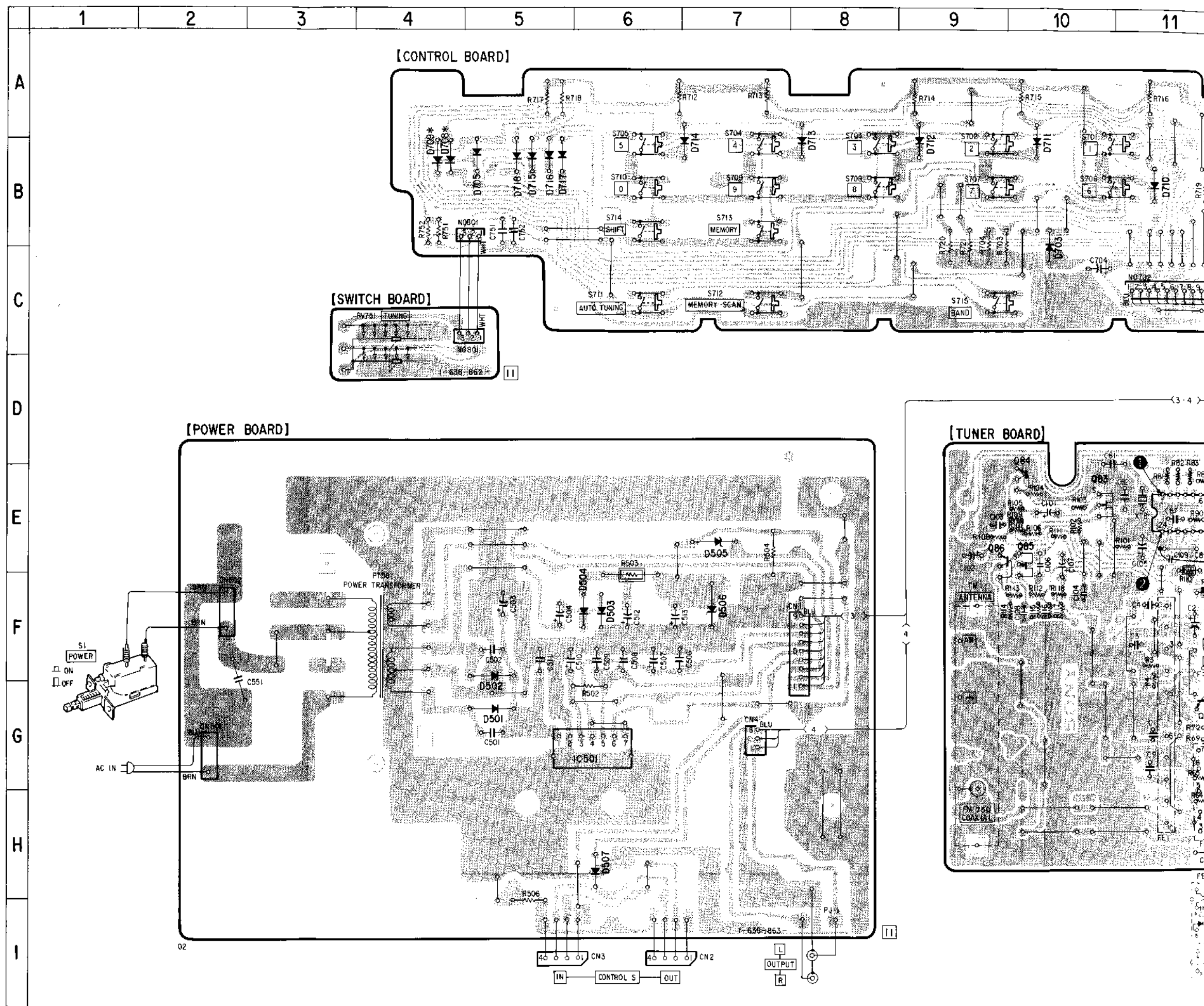
2SC3113-AB



3-1. PRINTED WIRING BOARDS

• SEMICONDUCTOR LOCATION

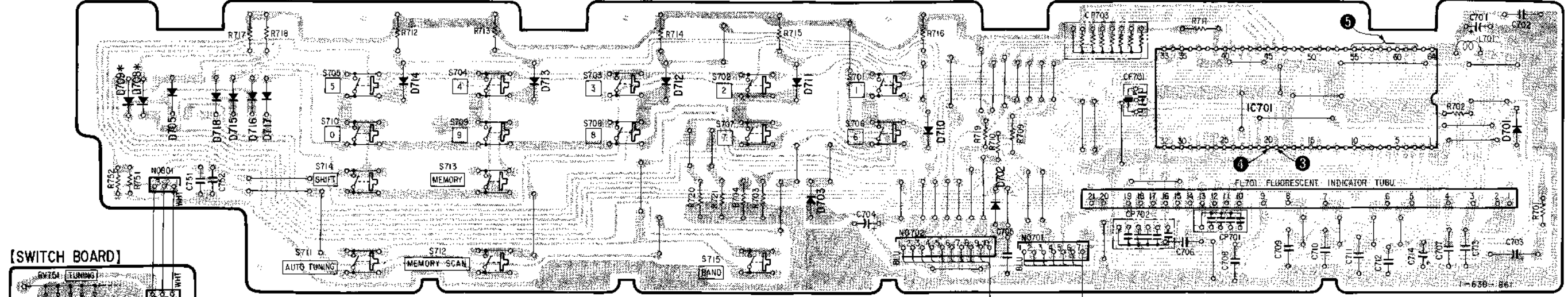
Ref. No.	Location	Ref. No.	Location
IC21	G-14	D501	G-5
IC81	E-11	D502	F-5
IC501	G-6	D503	F-6
IC701	B-14	D504	F-6
		D505	F-7
Q1	F-11	D506	F-7
Q2	F-12	D507	H-6
Q21	F-15	D701	B-16
Q22	F-15	D702	C-11
Q26	H-15	D703	B-10
Q27	F-15	D705	B-5
Q28	G-15	D708	B-4
Q61	G-12	D709	B-4
Q62	G-12	D710	B-11
Q63	G-12	D711	B-11
Q64	G-11	D712	B-9
Q65	G-13	D713	B-8
Q81	E-13	D714	B-7
Q82	F-13	D715	B-5
Q83	E-10	D716	B-5
Q84	E-10	D717	B-5
Q85	E-10	D718	B-5
Q86	E-9		
D21	G-15		
D22	G-15		
D23	G-16		
D24	G-16		
D61	G-12		



Note:

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- : indicates side identified with part number.

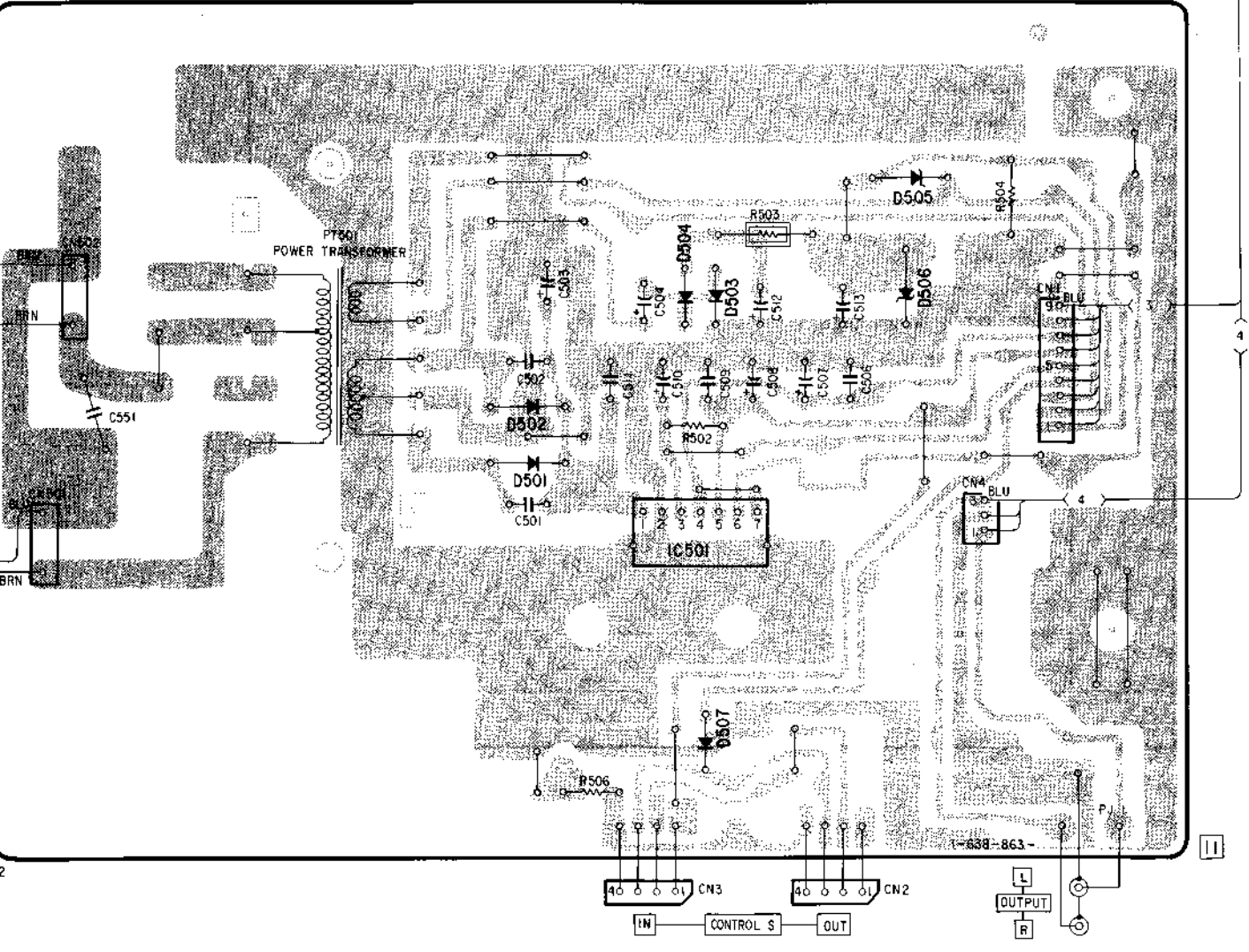
[CONTROL BOARD]



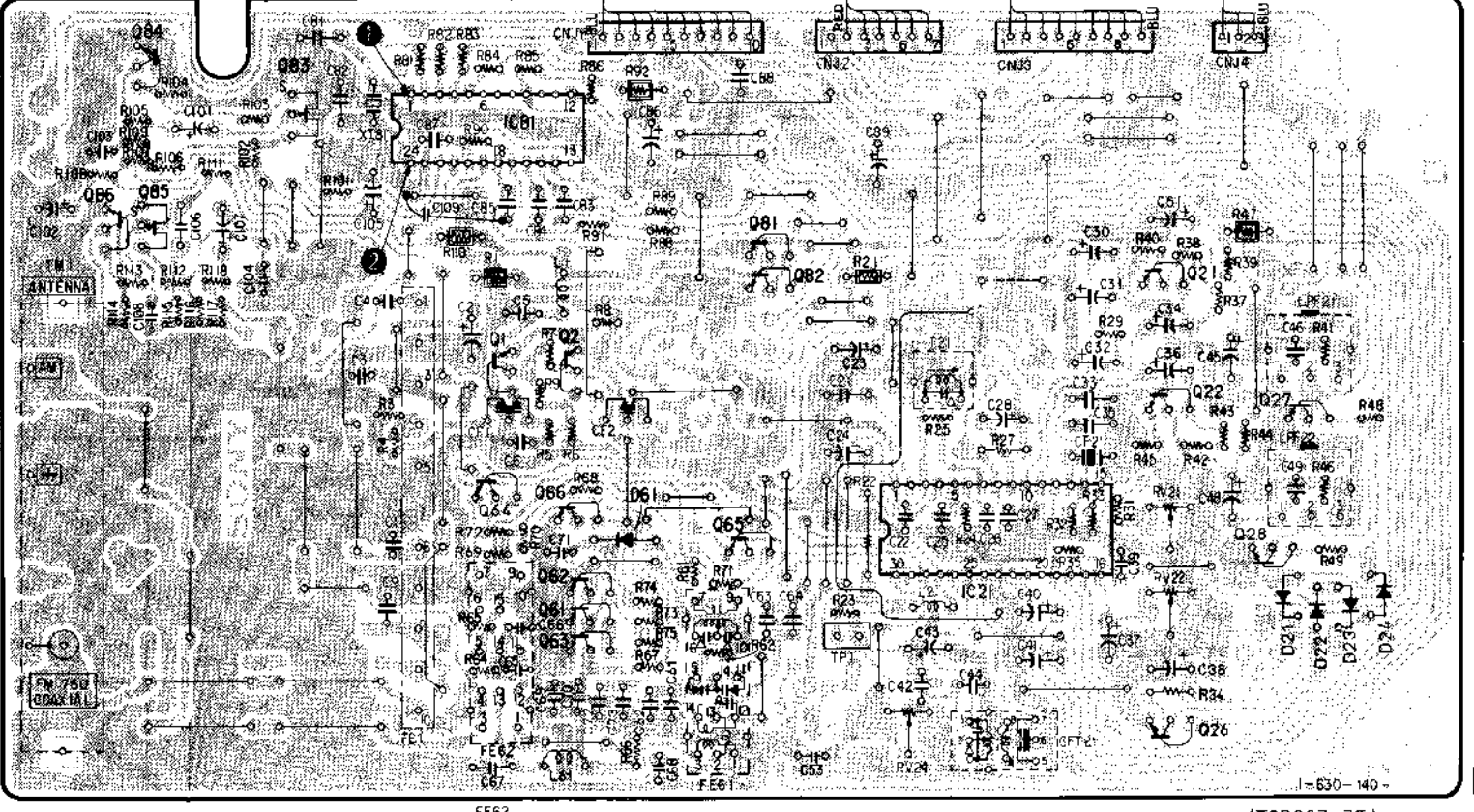
[SWITCH BOARD]

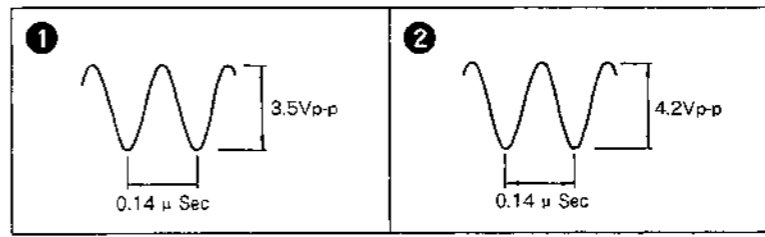
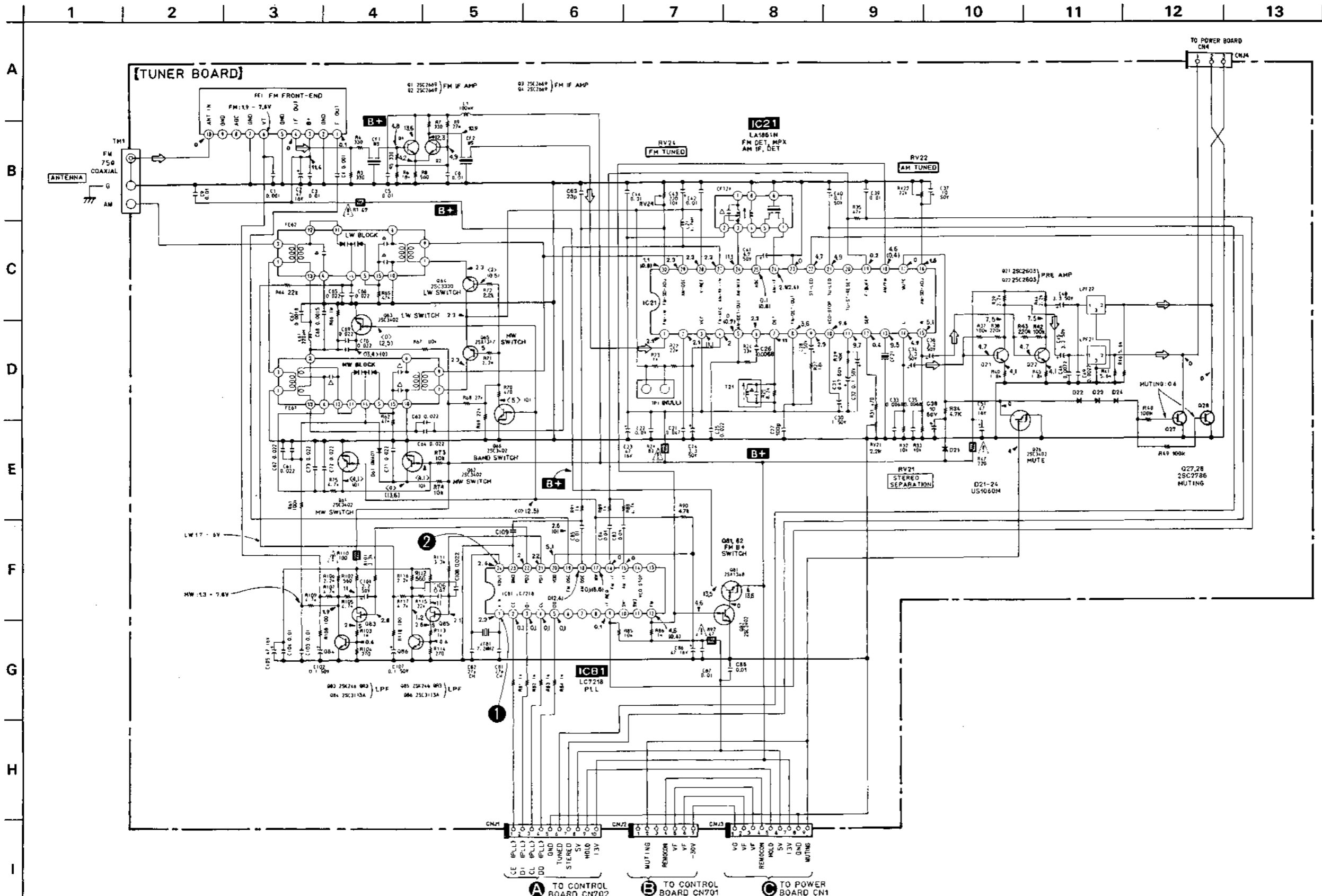


[POWER BOARD]

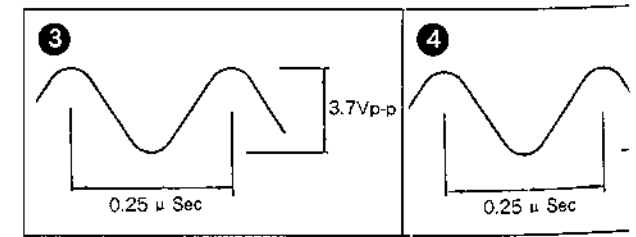
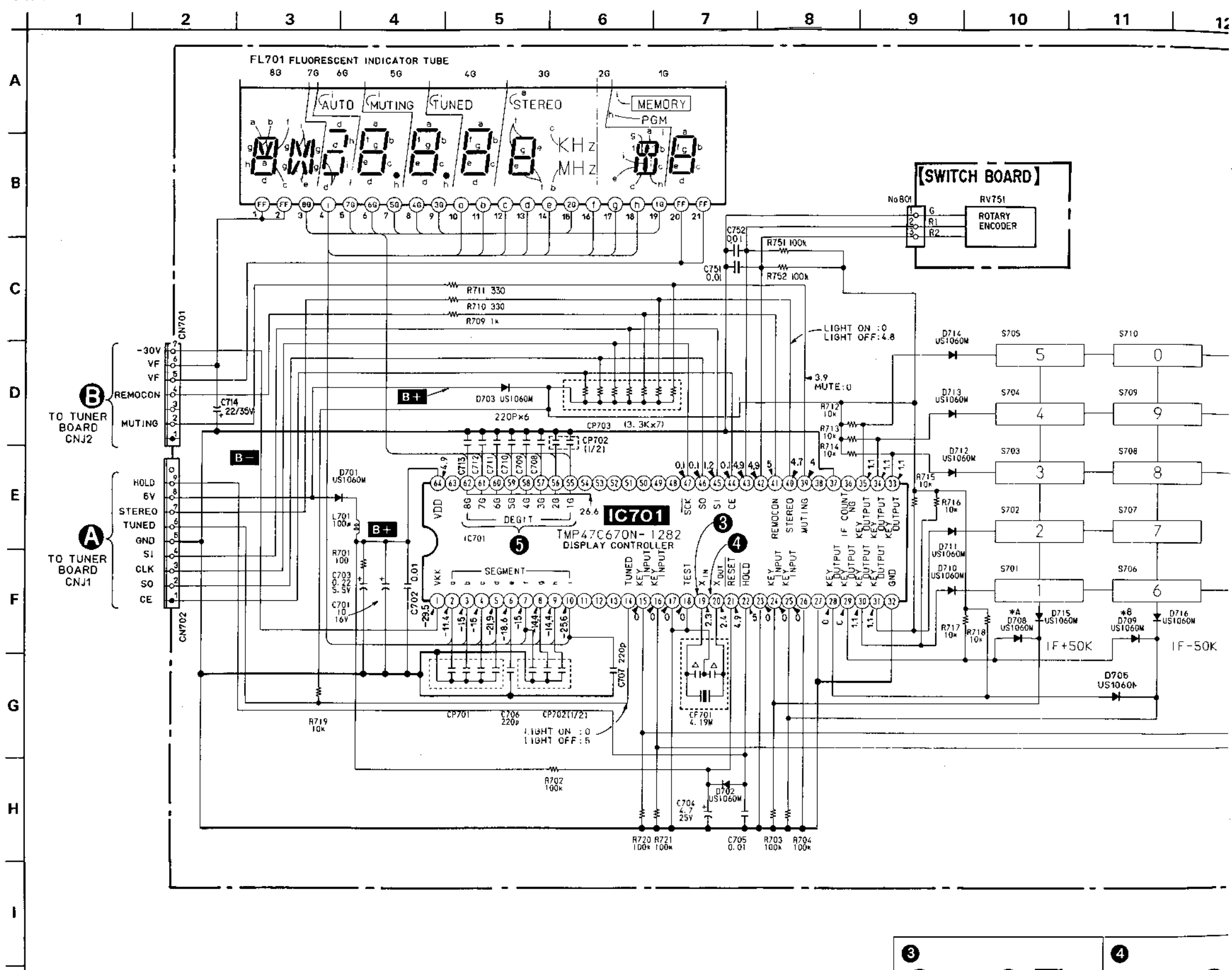
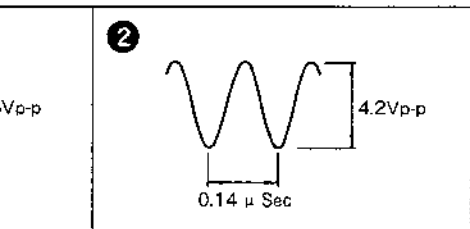
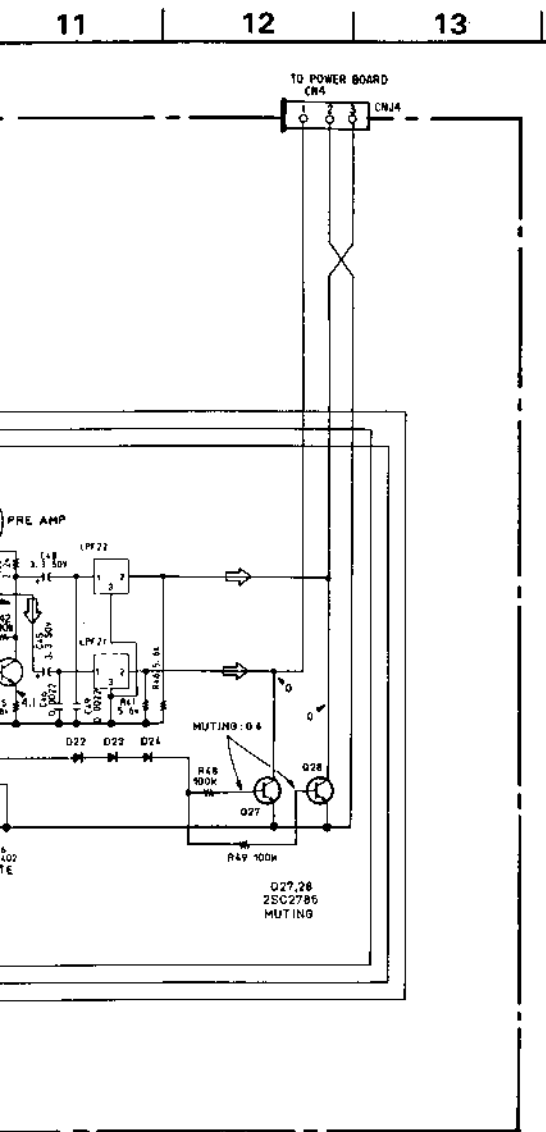


[TUNER BOARD]



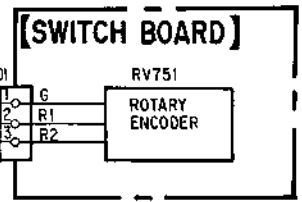
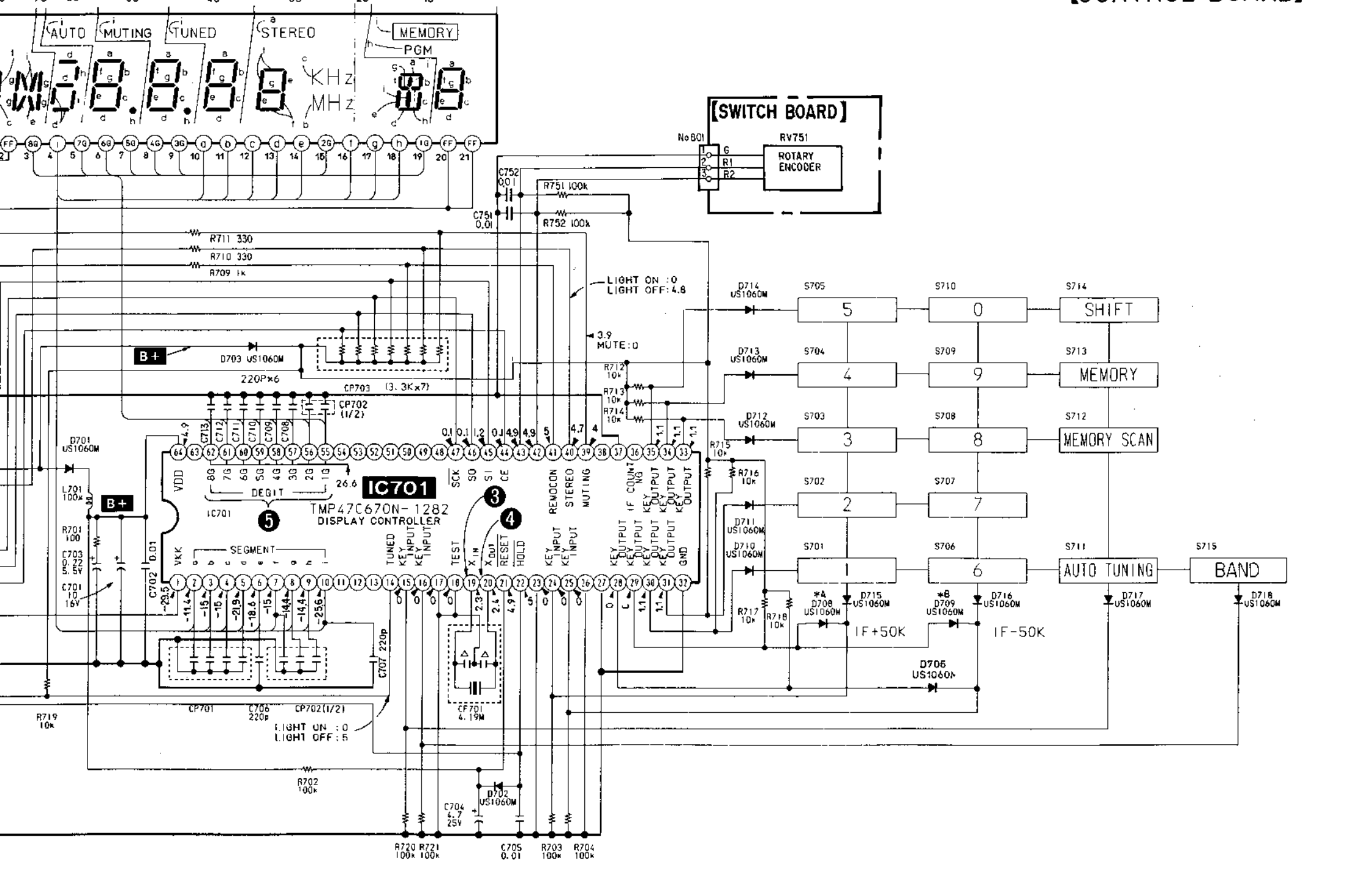


3.3. SCHEMATIC DIAGRAM - Control Section -



FLUORESCENT INDICATOR TUBE

[CONTROL BOARD]



Note:

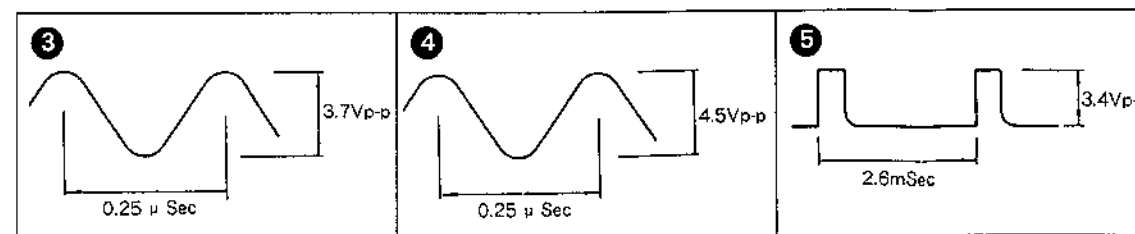
- *A, *B: See page 4 Note on Ceramic Filter (CF1, 2) Replacement.
- All capacitors are in μF unless otherwise noted. pF: $\mu \mu F$. 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}W$ or less unless otherwise specified.
- Δ : internal component.
- \square : nonflammable resistor.

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

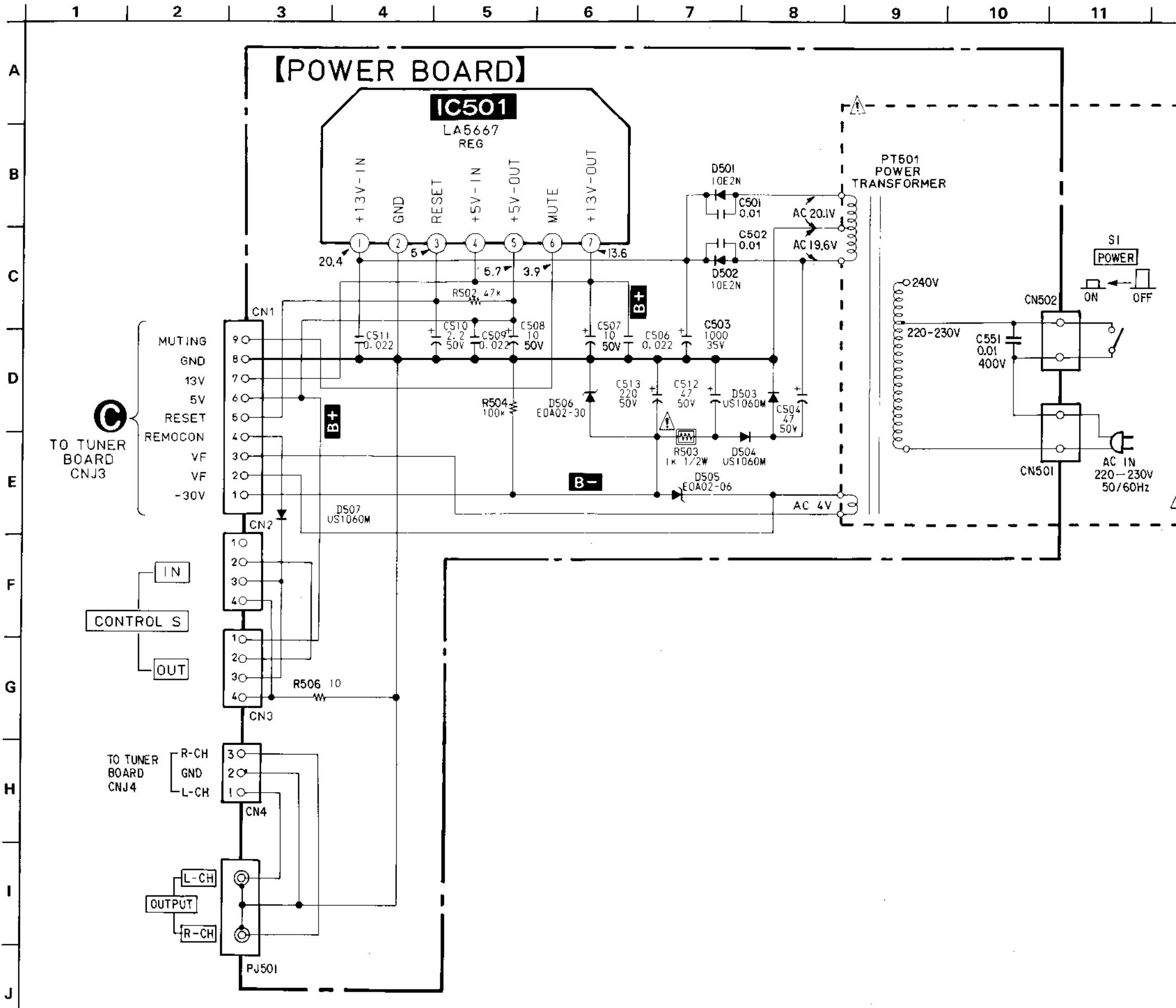
- B+**: B+ Line
- B-**: B- Line
- \square : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
- (): AM or MW
- < >: LW
- Voltagages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- \Rightarrow : FM

[Service Note]

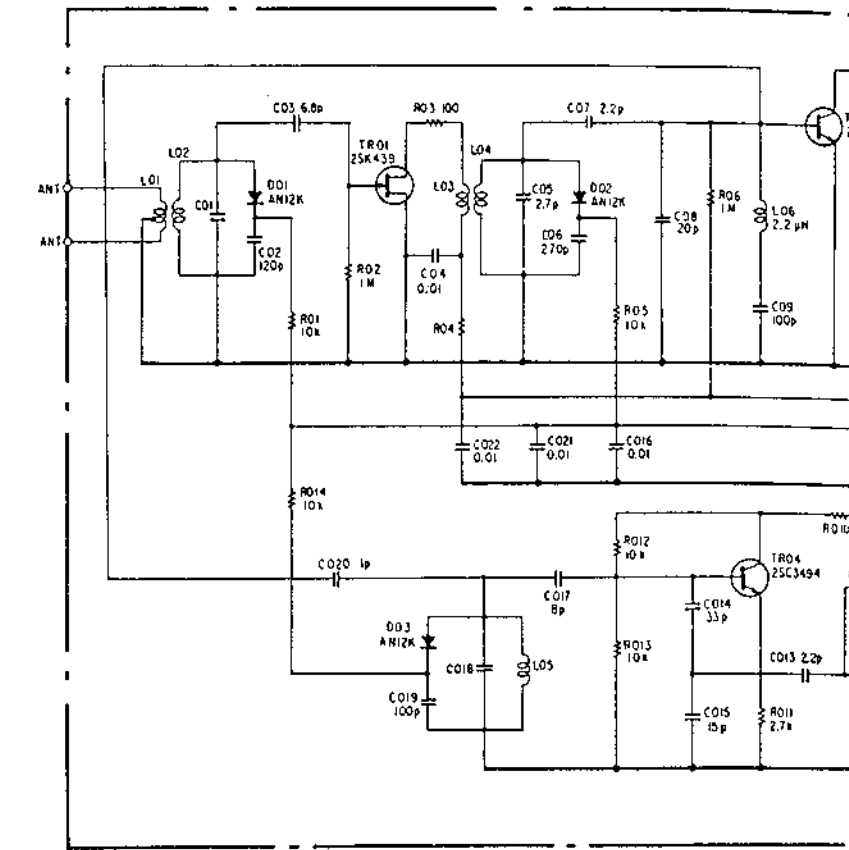
INDICATOR TUBE ALL LIGHT-UP MODE
When turning POWER switch on while pressing PRESET 1 and AUTO TUNING KEYS simultaneously, all the segments of FL701 will light.



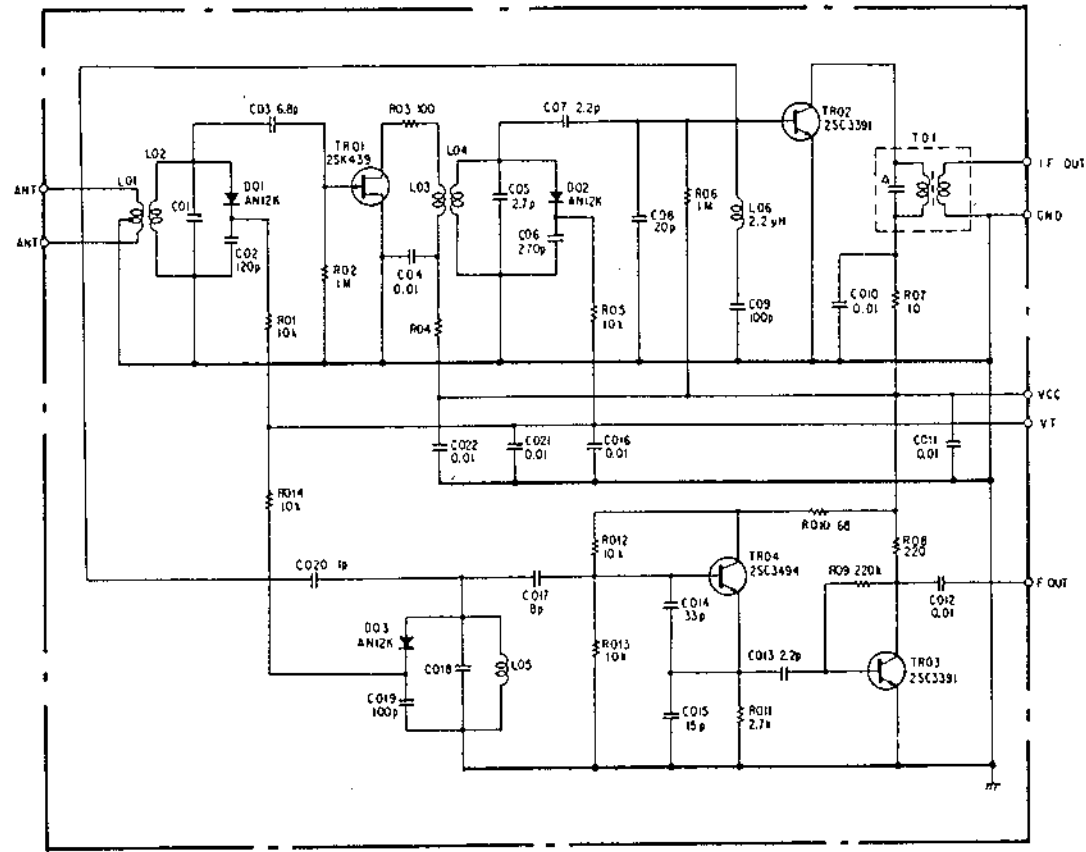
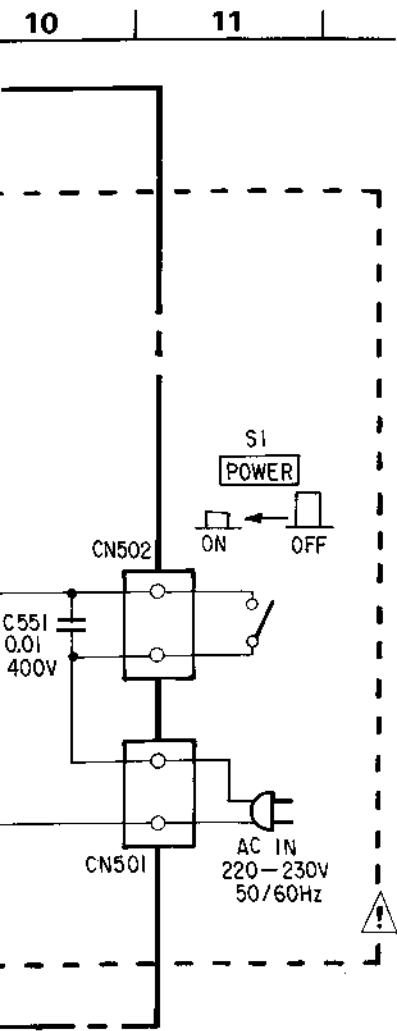
3.4. SCHEMATIC DIAGRAM -Power Section- Refer to page 13 for note.



3.5. FE1 (FRONT END) SCHEMATIC DIAGRAM

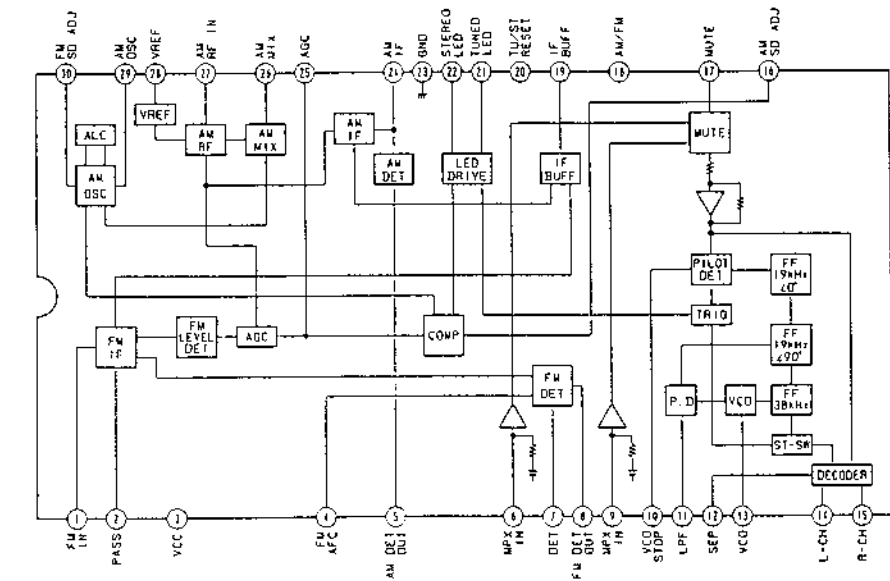


3.5. FE1 (FRONT END) SCHEMATIC DIAGRAM

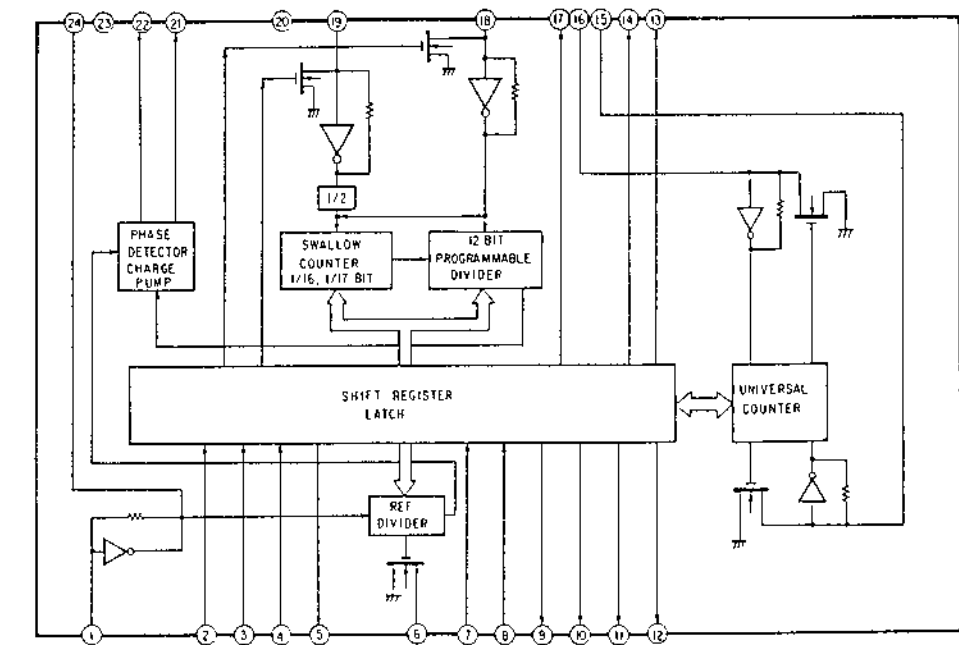


• IC BLOCK DIAGRAMS

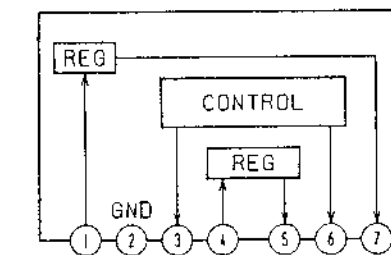
IC21 LA1851N



IC81 LC7218

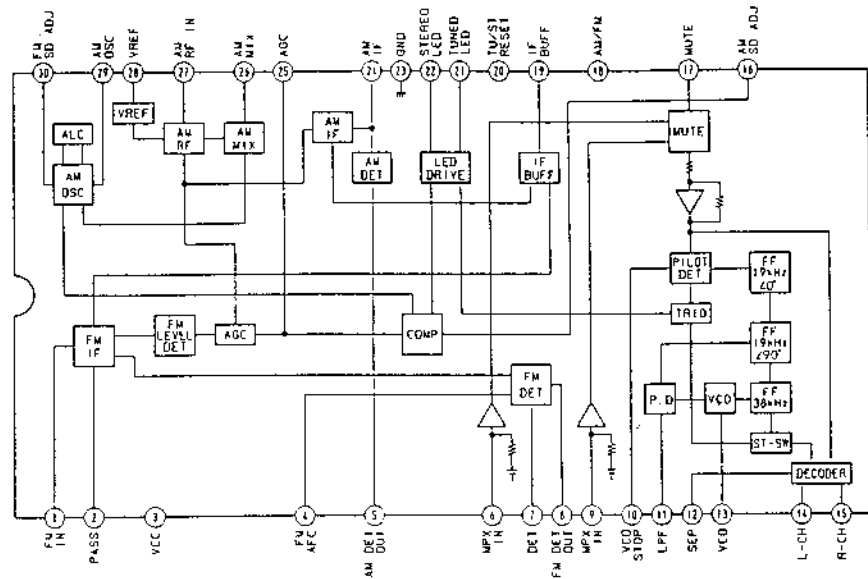


IC501 LA5667

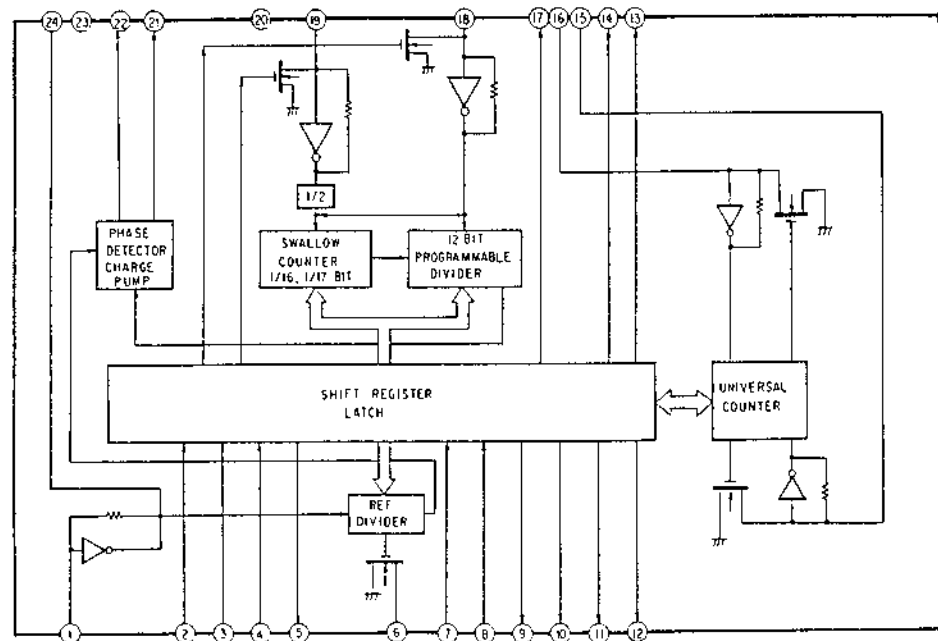


• IC BLOCK DIAGRAMS

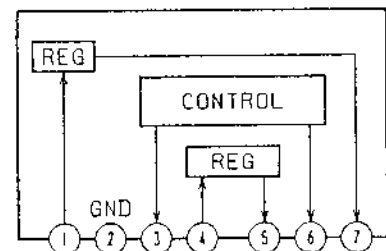
IC21 LA1851N



IC81 LC7218



IC501 LA5667



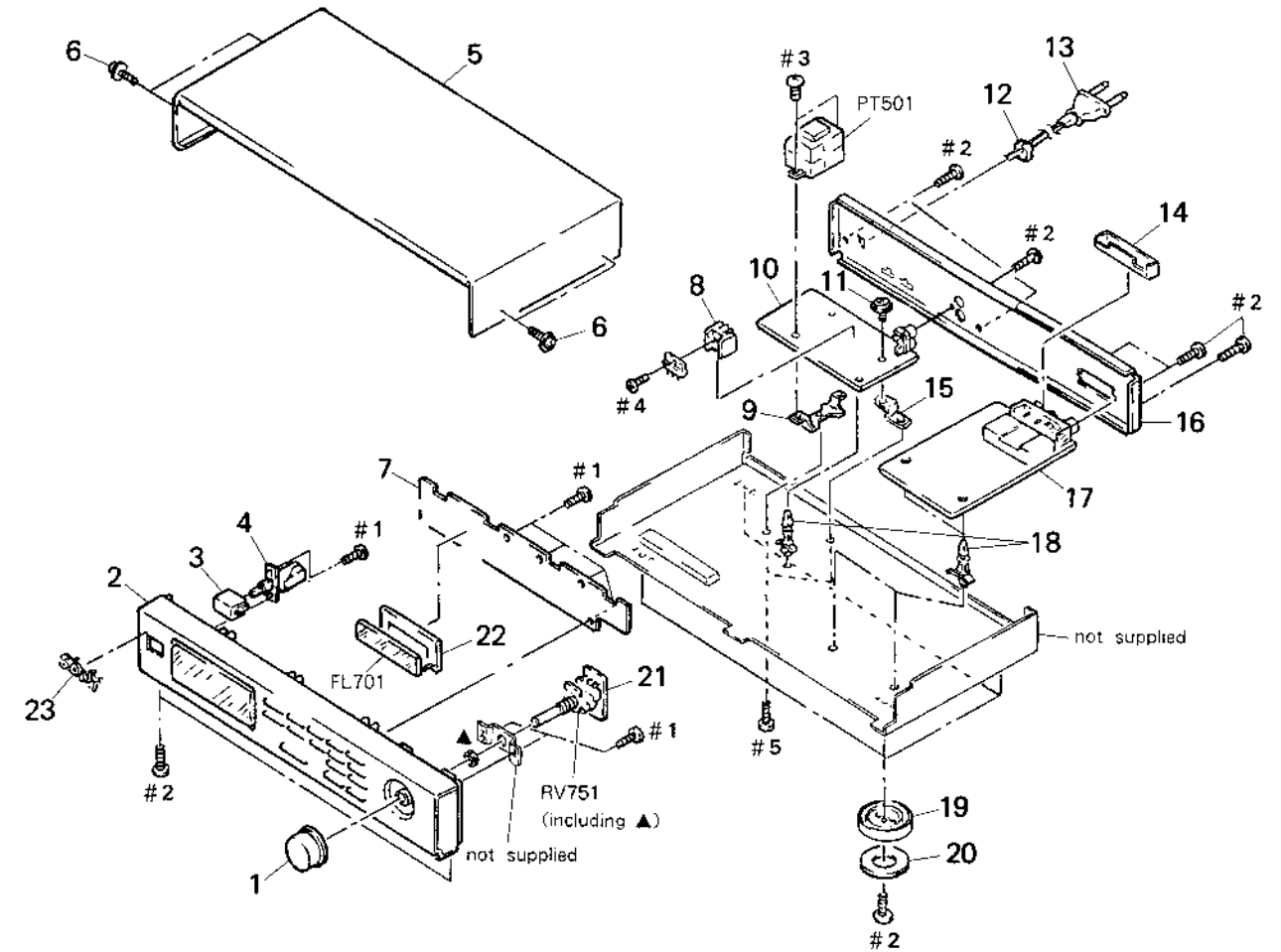
SECTION 4
EXPLODED VIEW

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.



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-945-523-01	KNOB (TUNE)		14	* 4-924-988-11	PLATE (ST). GROUND	
2	X-4941-649-1	PANEL ASSY. FRONT		15	* 3-332-563-01	BRACKET (P)	
3	3-354-912-01	KNOB, POWER		16	4-944-121-61	PANEL, BACK (AE1)	
4	1-554-920-21	SWITCH, PUSH (AC POWER) (1 KEY)		16	4-944-121-91	PANEL, BACK (AE2)	
5	4-923-457-01	CASE		17	* A-4345-492-A	TUNER BOARD, COMPLETE	
6	3-704-366-01	SCREW (CASE) (M3X8)		18	* 3-346-265-11	HOLDER, PC BOARD	
7	* A-4345-162-A	CONTROL BOARD, COMPLETE		19	X-3304-938-2	FOOT ASSY	
8	* 4-363-146-31	HEAT SINK, V. OUT		20	4-923-836-11	CUSHION	
9	* 4-917-044-01	BRACKET (PT)		21	* 1-638-862-11	SWITCH BOARD	
10	* 1-638-863-11	POWER BOARD		22	* 4-495-525-01	HOLDER (FL)	
11	4-886-821-11	SCREW, S TIGHT, +PTWH 3X6		23	4-925-334-11	EMBLEM (5-A), SONY	
12	* 3-703-244-00	BUSHING (2104). CORD		FL701	1-519-512-11	INDICATOR TUBE, FLUORESCENT	
13	1-575-651-11	CORD, POWER		PT501	1-450-009-11	TRANSFORMER, POWER	
				RV751	1-466-513-11	ENCODER, ROTARY (TUNING)	

SECTION 5 ELECTRICAL PARTS LIST

CONTROL

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 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 name.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-4345-162-A	CONTROL BOARD, COMPLETE *****		D709	8-719-912-20	DIODE 1SS120	
		< CAPACITOR >		D710	8-719-912-20	DIODE 1SS120	
C701	1-126-157-11	ELECT 10uF 20% 16V		D711	8-719-912-20	DIODE 1SS120	
C702	1-161-379-00	CERAMIC 0.01uF 20% 25V		D712	8-719-912-20	DIODE 1SS120	
C703	1-125-486-11	DOUBLE LAYERS 0.22F 5.5V		D713	8-719-912-20	DIODE 1SS120	
C704	1-126-169-11	ELECT 4.7uF 20% 50V		D714	8-719-912-20	DIODE 1SS120	
C705	1-161-379-00	CERAMIC 0.01uF 20% 25V		D715	8-719-912-20	DIODE 1SS120	
C706	1-162-286-31	CERAMIC 220PF 10% 50V		D716	8-719-912-20	DIODE 1SS120	
C707	1-162-286-31	CERAMIC 220PF 10% 50V		D717	8-719-912-20	DIODE 1SS120	
C708	1-162-286-31	CERAMIC 220PF 10% 50V		D718	8-719-912-20	DIODE 1SS120	
C709	1-162-286-31	CERAMIC 220PF 10% 50V				< FILTER >	
C710	1-162-286-31	CERAMIC 220PF 10% 50V		FL701	1-519-512-11	INDICATOR TUBE, FLUORESCENT	
C711	1-162-286-31	CERAMIC 220PF 10% 50V				< IC >	
C712	1-162-286-31	CERAMIC 220PF 10% 50V		IC701	8-759-246-23	IC TMP47C670N-1247	
C713	1-162-286-31	CERAMIC 220PF 10% 50V				< COIL >	
C714	1-123-357-00	ELECT 22uF 20% 35V		L701	1-410-521-11	INDUCTOR 100uH	
C751	1-161-379-00	CERAMIC 0.01uF 20% 25V				< RESISTOR >	
C752	1-161-379-00	CERAMIC 0.01uF 20% 25V		R701	1-249-405-11	CARBON 100 5% 1/4W	
		< FILTER >		R702	1-249-441-11	CARBON 100K 5% 1/4W	
CF701	1-577-359-21	VIBRATOR, CERAMIC (4.19MHz)		R703	1-249-441-11	CARBON 100K 5% 1/4W	
		< CIRCUIT BLOCK >		R704	1-249-441-11	CARBON 100K 5% 1/4W	
CP701	1-233-148-11	COMPOSITION CIRCUIT BLOCK		R709	1-249-417-11	CARBON 1K 5% 1/4W	
CP702	1-233-187-11	COMPOSITION CIRCUIT BLOCK		R710	1-249-411-11	CARBON 330 5% 1/4W	
CP703	1-233-185-11	COMPOSITION CIRCUIT BLOCK		R711	1-249-411-11	CARBON 330 5% 1/4W	
		< DIODE >		R712	1-249-429-11	CARBON 10K 5% 1/4W	
D701	8-719-912-20	DIODE 1SS120		R713	1-249-429-11	CARBON 10K 5% 1/4W	
D702	8-719-912-20	DIODE 1SS120		R714	1-249-429-11	CARBON 10K 5% 1/4W	
D703	8-719-912-20	DIODE 1SS120					
D705	8-719-912-20	DIODE 1SS120					
D708	8-719-912-20	DIODE 1SS120					

CONTROL SWITCH POWER TUNER

Ref. No.	Part No.	Description	Remark
R715	1-249-429-11	CARBON 10K 5% 1/4W	
R716	1-249-429-11	CARBON 10K 5% 1/4W	
R717	1-249-429-11	CARBON 10K 5% 1/4W	
R718	1-249-429-11	CARBON 10K 5% 1/4W	
R719	1-249-429-11	CARBON 10K 5% 1/4W	
R720	1-249-441-11	CARBON 100K 5% 1/4W	
R721	1-249-441-11	CARBON 100K 5% 1/4W	
R751	1-249-441-11	CARBON 100K 5% 1/4W	
R752	1-249-441-11	CARBON 100K 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 (AUTO TUNING)
S712	1-554-303-21	SWITCH, TACTILE (MEMORY SCAN)
S713	1-554-303-21	SWITCH, TACTILE (MEMORY)
S714	1-554-303-21	SWITCH, TACTILE (SHIFT)
S715	1-554-303-21	SWITCH, TACTILE (BAND)

* 1-638-862-11 SWITCH BOARD

< VARIABLE RESISTOR >

RV751	1-466-513-11	ENCODER, ROTARY (TUNING)
-------	--------------	--------------------------

* 1-638-863-11 POWER BOARD

* 4-363-146-31 HEAT SINK, V. OUT
* 4-945-525-01 HOLDER (FL)
7-685-646-79 SCREW +BVTP 3X8 TYPE2

< CAPACITOR >

C501	1-101-004-00	CERAMIC 0.01uF 50V
C502	1-101-004-00	CERAMIC 0.01uF 50V
C503	1-126-105-11	ELECT 1000uF 20% 35V
C504	1-124-910-11	ELECT 47uF 20% 50V
C506	1-101-005-00	CERAMIC 22000PF 50V
C507	1-124-907-11	ELECT 10uF 20% 50V

Ref. No.	Part No.	Description	Remark
C508	1-124-907-11	ELECT 10uF 20% 50V	
C509	1-101-005-00	CERAMIC 22000PF 50V	
C510	1-124-925-11	ELECT 2.2uF 20% 100V	
C511	1-101-005-00	CERAMIC 22000PF 50V	
C512	1-124-910-11	ELECT 47uF 20% 50V	
C513	1-124-911-11	ELECT 220uF 20% 50V	
C551	▲ 1-161-744-00	CERAMIC 0.01uF 400V	

< CONNECTOR >

CN1	* 1-568-284-11	SOCKET, CONNECTOR 9P
CN2	1-564-980-11	PIN, CONNECTOR 4P
CN3	1-564-980-11	PIN, CONNECTOR 4P
CN4	1-568-269-11	SOCKET, CONNECTOR 3P
CN501	* 1-564-321-00	PIN, CONNECTOR 2P
CN502	* 1-564-321-21	PIN, CONNECTOR 2P

< DIODE >

D501	8-719-200-77	DIODE 10E2N
D502	8-719-200-77	DIODE 10E2N
D503	8-719-912-20	DIODE 1SS120
D504	8-719-912-20	DIODE 1SS120
D505	8-719-912-81	DIODE EQA02-06C
D506	8-719-110-73	DIODE RD30ESB3
D507	8-719-912-20	DIODE 1SS120

< IC >

IC501	8-759-820-09	IC LA5667
-------	--------------	-----------

< JACK >

PJ501	1-565-352-11	JACK, PIN 2P
-------	--------------	--------------

< TRANSFORMER >

PT501	▲ 1-450-009-11	TRANSFORMER, POWER
-------	----------------	--------------------

< RESISTOR >

R502	1-249-437-11	CARBON 47K 5% 1/4W
R503	▲ 1-247-752-11	CARBON 1K 5% 1/2W F
R504	1-249-441-11	CARBON 100K 5% 1/4W
R506	1-249-393-11	CARBON 10 5% 1/4W

* A-4345-492-A TUNER BOARD, COMPLETE

1-589-204-11 MOUNTED BOARD
* 4-924-988-11 PLATE (ST), GROUND

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	Ref. No.	Part No.	Description	Remark
< CAPACITOR >							
C1	1-162-294-31	CERAMIC CHIP	0.001uF 20% 25V	C71	1-163-063-00	CERAMIC CHIP	0.022uF 25V
C2	1-124-477-11	ELECT	47uF 20% 25V	C72	1-163-063-00	CERAMIC CHIP	0.022uF 25V
C3	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	C73	1-163-063-00	CERAMIC CHIP	0.022uF 25V
C4	1-162-294-31	CERAMIC CHIP	0.001uF 20% 25V	C81	1-102-961-00	CERAMIC	27PF 5% 50V
C5	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	C82	1-102-961-00	CERAMIC	27PF 5% 50V
C6	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	C83	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C9	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	C84	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C21	1-101-006-00	CERAMIC	0.047uF 50V	C85	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C22	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	C86	1-124-477-11	ELECT	47uF 20% 25V
C23	1-124-477-11	ELECT	47uF 20% 25V	C87	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C24	1-123-382-00	ELECT	3.3uF 20% 100V	C88	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C25	1-163-063-00	CERAMIC MELF	0.022uF 25V	C101	1-124-925-11	ELECT	2.2uF 20% 100V
C26	1-163-019-00	CERAMIC MELF	0.0068uF 20% 12V	C102	1-124-463-00	ELECT	0.1uF 20% 50V
C27	1-162-516-11	CERAMIC CHIP	100PF 10% 50V	C103	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C28	1-124-903-11	ELECT	1uF 20% 50V	C104	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V
C30	1-124-903-11	ELECT	1uF 20% 50V	C105	1-124-477-11	ELECT	47uF 20% 25V
C31	1-124-902-00	ELECT	0.47uF 20% 50V	C106	1-136-173-00	FILM	0.47uF 5% 50V
C32	1-124-463-00	ELECT	0.1uF 20% 50V	C107	1-124-463-00	ELECT	0.1uF 20% 50V
C33	1-130-481-00	MYLAR	0.0068uF 5% 50V	C108	1-163-063-00	CERAMIC CHIP	0.022uF 25V
C34	1-123-382-00	ELECT	3.3uF 20% 100V	C109	1-102-963-00	CERAMIC	33PF 5% 50V
C35	1-130-481-00	MYLAR	0.0068uF 5% 50V	< FILTER >			
C36	1-123-382-00	ELECT	3.3uF 20% 100V	CF1	1-567-389-11	FILTER, CERAMIC	
C37	1-124-907-11	ELECT	10uF 20% 50V	CF2	1-567-389-11	FILTER, CERAMIC	
C38	1-124-907-11	ELECT	10uF 20% 50V	CF21	1-577-075-11	OSCILLATOR, CERAMIC	
C39	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	CFT21	1-404-853-11	TRANSFORMER, IF (CERAMIC FILTER)	
C40	1-124-463-00	ELECT	0.1uF 20% 50V	< CONNECTOR >			
C41	1-124-927-11	ELECT	4.7uF 20% 100V	CNJ1	* 1-564-666-11	PIN, CONNECTOR 10P	
C42	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	CNJ2	* 1-564-341-11	PIN, CONNECTOR 7P	
C43	1-126-176-11	ELECT	220uF 20% 10V	CNJ3	* 1-568-313-11	SOCKET, CONNECTOR 9P	
C44	1-163-059-00	CERAMIC MELF	0.01uF 20% 16V	CNJ4	1-568-269-11	SOCKET, CONNECTOR 3P	
C45	1-123-382-00	ELECT	3.3uF 20% 100V	< DIODE >			
C46	1-163-059-00	CERAMIC MELF	0.0022uF 20% 25V	D21	8-719-912-20	DIODE 1SS120	
C48	1-123-382-00	ELECT	3.3uF 20% 100V	D22	8-719-912-20	DIODE 1SS120	
C49	1-161-375-00	CERAMIC MELF	0.0022uF 20% 25V	D23	8-719-912-20	DIODE 1SS120	
C51	1-124-477-11	ELECT	47uF 20% 25V	D24	8-719-912-20	DIODE 1SS120	
C53	1-163-467-11	CERAMIC CHIP	33PF 5% 50V	D61	8-719-912-20	DIODE 1SS120	
C61	1-163-063-00	CERAMIC MELF	0.022uF 25V	< FRONT END >			
C62	1-163-063-00	CERAMIC MELF	0.022uF 25V	FE1	1-463-862-21	FRONT END, FM	
C63	1-163-063-00	CERAMIC MELF	0.022uF 25V	FE61	1-236-462-11	ENCAPSULATED COMPONENT	
C64	1-163-063-00	CERAMIC MELF	0.022uF 25V	FE62	1-236-463-11	ENCAPSULATED COMPONENT	
C65	1-163-063-00	CERAMIC MELF	0.022uF 25V	< IC >			
C66	1-163-063-00	CERAMIC MELF	0.022uF 25V	IC21	8-759-821-45	IC LA1851N	
C67	1-102-120-00	CERAMIC	0.0018uF 10% 50V	IC81	8-759-820-91	IC LC7218	
C68	1-162-523-11	CERAMIC CHIP	0.0015uF 20% 25V				
C69	1-163-063-00	CERAMIC CHIP	0.022uF 25V				
C70	1-163-063-00	CERAMIC CHIP	0.022uF 25V				

TUNER

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< COIL >							
L1	1-410-645-31	INDUCTOR	100uH	R32	1-249-347-11	CARBON MELF	10K 5% 1/8W
L21	1-407-500-00	INDUCTOR	4.7mH	R33	1-249-347-11	CARBON MELF	10K 5% 1/8W
L61	1-410-525-11	INDUCTOR	220uH	R34	1-249-425-11	CARBON	4.7K 5% 1/4W
< FILTER >							
LPF21	1-235-164-00	FILTER, LOW PASS		R35	1-249-355-11	CARBON MELF	47K 5% 1/8W
LPF22	1-235-164-00	FILTER, LOW PASS		R37	1-249-359-11	CARBON MELF	100K 5% 1/8W
< TRANSISTOR >							
Q1	8-729-230-XX	TRANSISTOR 2SC2669-OY		R38	1-249-363-11	CARBON MELF	220K 5% 1/8W
Q2	8-729-230-XX	TRANSISTOR 2SC2669-OY		R39	1-249-339-11	CARBON MELF	2.2K 5% 1/8W
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE		R40	1-249-338-11	CARBON MELF	1.8K 5% 1/8W
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE		R41	1-249-344-11	CARBON MELF	5.6K 5% 1/8W
Q26	8-729-900-80	TRANSISTOR DTC114ES		R42	1-249-359-11	CARBON MELF	100K 5% 1/8W
Q27	8-729-620-05	TRANSISTOR 2SC2603-EF		R43	1-249-363-11	CARBON MELF	220K 5% 1/8W
Q28	8-729-620-05	TRANSISTOR 2SC2603-EF		R44	1-249-339-11	CARBON MELF	2.2K 5% 1/8W
Q61	8-729-900-80	TRANSISTOR DTC114ES		R45	1-249-338-11	CARBON MELF	1.8K 5% 1/8W
Q62	8-729-900-80	TRANSISTOR DTC114ES		R46	1-249-344-11	CARBON MELF	5.6K 5% 1/8W
Q63	8-729-900-80	TRANSISTOR DTC114ES		R47	△ 1-249-409-11	CARBON	220 5% 1/4W
Q64	8-729-620-05	TRANSISTOR 2SC2603-EF		R48	1-249-359-11	CARBON MELF	100K 5% 1/8W
Q65	8-729-821-04	TRANSISTOR 2SA1317-STU		R49	1-249-359-11	CARBON MELF	100K 5% 1/8W
Q66	8-729-900-80	TRANSISTOR DTC114ES		R61	1-249-359-11	CARBON MELF	100K 5% 1/8W
Q81	8-729-900-61	TRANSISTOR DTA114ES		R62	1-249-355-11	CARBON MELF	47K 5% 1/8W
Q82	8-729-900-80	TRANSISTOR DTC114ES		R64	1-249-351-11	CARBON MELF	22K 5% 1/8W
Q83	8-729-202-67	TRANSISTOR 2SK246GR3		R65	1-249-355-11	CARBON MELF	47K 5% 1/8W
Q84	8-729-230-93	TRANSISTOR 2SC3113-AB		R66	1-249-073-11	CARBON MELF	1M 5% 1/5W
Q85	8-729-202-67	TRANSISTOR 2SK246GR3		R67	1-249-359-11	CARBON MELF	100K 5% 1/8W
Q86	8-729-230-93	TRANSISTOR 2SC3113-AB		R68	1-249-352-11	CARBON MELF	27K 5% 1/8W
< RESISTOR >							
R1	△ 1-249-401-11	CARBON	47	5%	1/4W		
R3	1-249-329-11	CARBON MELF	330	5%	1/8W		
R4	1-249-329-11	CARBON MELF	330	5%	1/8W		
R5	1-249-329-11	CARBON MELF	330	5%	1/8W		
R6	1-249-350-11	CARBON MELF	18K	5%	1/8W		
R7	1-249-329-11	CARBON MELF	330	5%	1/8W		
R8	1-249-332-11	CARBON MELF	560	5%	1/8W		
R9	1-249-352-11	CARBON MELF	27K	5%	1/8W		
R21	△ 1-249-404-00	CARBON	82	5%	1/4W		
R22	1-249-433-11	CARBON	22K	5%	1/4W		
R23	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R24	1-249-353-11	CARBON MELF	33K	5%	1/8W		
R25	1-249-346-11	CARBON MELF	8.2K	5%	1/8W		
R27	1-249-432-11	CARBON	18K	5%	1/4W		
R29	1-249-347-11	CARBON MELF	10K	5%	1/8W		
R31	1-249-331-11	CARBON MELF	470	5%	1/8W		
R74	1-249-347-11	CARBON MELF	10K	5%	1/8W		
R75	1-249-343-11	CARBON MELF	4.7K	5%	1/8W		
R81	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R82	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R83	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R84	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R85	1-249-347-11	CARBON MELF	10K	5%	1/8W		
R86	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R88	1-249-343-11	CARBON MELF	4.7K	5%	1/8W		
R89	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R90	1-249-343-11	CARBON MELF	4.7K	5%	1/8W		
R91	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R92	△ 1-249-401-11	CARBON	47	5%	1/4W		
R101	1-249-341-11	CARBON MELF	3.3K	5%	1/8W		
R102	1-249-332-11	CARBON MELF	560	5%	1/8W		
R103	1-249-335-11	CARBON MELF	1K	5%	1/8W		
R104	1-249-328-11	CARBON MELF	270	5%	1/8W		
R105	1-249-343-11	CARBON MELF	4.7K	5%	1/8W		
R106	1-249-339-11	CARBON MELF	2.2K	5%	1/8W		
R107	1-249-343-11	CARBON MELF	4.7K	5%	1/8W		

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
R108	1-249-323-11	CARBON MELF 100	5% 1/8W
R109	1-249-343-11	CARBON MELF 4.7K	5% 1/8W
R110	△ 1-249-405-11	CARBON 100	5% 1/4W
R111	1-249-341-11	CARBON MELF 3.3K	5% 1/8W
R112	1-249-332-11	CARBON MELF 560	5% 1/8W
< VARIABLE RESISTOR >			
RV21	1-238-013-11	RES. ADJ. CARBON 2.2K (STEREO SEPARATION)	
RV22	1-238-017-11	RES. ADJ. CARBON 22K (AM TUNED)	
RV24	1-238-017-11	RES. ADJ. CARBON 22K (FM TUNED)	
< TRANSFORMER >			
T21	1-404-807-11	TRANSFORMER, DISCRIMINATOR	
< TERMINAL >			
TM1	* 1-537-138-31	TERMINAL BOARD (ANT)	
< CONNECTOR >			
TP1	* 1-560-060-00	PIN, CONNECTOR 2P (NULL)	
< CRYSTAL >			
XT81	1-577-126-11	VIBRATOR, CRYSTAL (7.2MHz)	

MISCELLANEOUS *****			
4	1-554-920-21	SWITCH, PUSH (AC POWER) (1 KEY)	
13	△ 1-575-651-11	CORD, POWER	
FL701	1-519-512-11	INDICATOR TUBE, FLUORESCENT	
PT501	△ 1-450-009-11	TRANSFORMER, POWER	
RV751	1-466-513-11	ENCODER, ROTARY (TUNING)	

Ref. No.	Part No.	Description	Remark
ACCESSORY & PACKING MATERIAL *****			
	1-501-369-11	ANTENNA	
	1-501-374-11	ANTENNA, LOOP	
	1-558-233-11	CORD (WITH CONNECTOR) (SIRCS) 4P	
	1-559-533-11	CORD, CONNECTION	
*	3-704-343-01	SHEET (STANDARD), PROTECTION	
	3-753-281-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH/SPANISH/ITALIAN)	
	3-753-281-41	MANUAL, INSTRUCTION (DUTCH/SWEDISH/PORTUGUESE/GERMAN)	
*	4-917-074-01	CUSHION	
*	4-944-049-11	INDIVIDUAL CARTON	

HARDWARE LIST *****			
# 1	7-621-773-93	SCREW (PANEL 2.6 TP2)	
# 2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
# 3	7-682-550-04	SCREW +BVTT 3X12 (S)	
# 4	7-685-646-79	SCREW +BVTP 3X8 TYPE2	
# 5	7-685-871-01	SCREW +BVTT 3X6 (S)	

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