

ST-H500

SERVICE MANUAL

US Model

This set is the tuner section in MHC-5500.



SPECIFICATIONS

System	FM stereo, FM/AM superheterodyne tuner
FM tuner section	
Tuning range	87.5 – 108 MHz
Antenna	Telescopic antenna
Antenna terminals	75 ohms unbalanced
Intermediate frequency	10.7 MHz
AM tuner section	
Tuning range	AM : 530 – 1,710 kHz
Antenna	AM loop antenna, External antenna terminals
Intermediate frequency	450 kHz

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.

FM-AM TIMER TUNER
SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

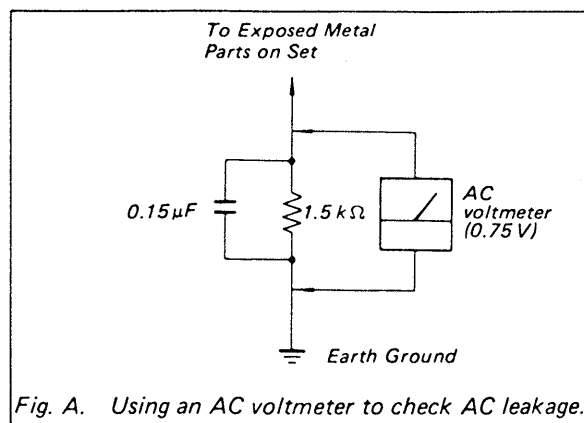


Fig. A. Using an AC voltmeter to check AC leakage.

• Power supply for service

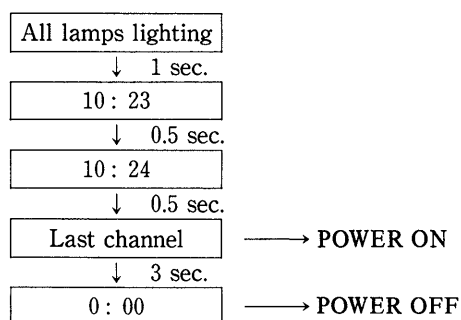
Since this machine has no power source in itself, the power is supplied from AMP TA-H500 used for this series. As shown in the following table, this machine requires 4 types of voltage, and supplying each type of voltage separately makes complicated connections.

Accordingly, make connection with TA-H500 at time of service, such as electrifying repair.

AC 3.9V	FL-tube filament voltage
DC -24V	Display controller IC701, grid voltage
DC 5V	Display controller IC701, V _{cc}
DC 13V	PLL control voltage

• Service mode for checking the timer ON/OFF

- 1) Connect with AMP TA-H500 and set the power switch of TA-H500 to the state of STANDBY.
- 2) Set the time of tuner to a proper time (any time).
- 3) Press 3 switches simultaneously, namely, PRESET $\text{1}\bigcirc$, $\text{6}\bigcirc$ and $\bigcirc$ BAND.
- 4) FL-tube display



- 5) End

—Caution for Service—

• Reset of IC701

The display controller IC701 is reset by short-circuiting both edges of C702 (0.47 μ F) while power OFF and discharging electricity.

After resetting, the following frequencies are pre-set to the memory.

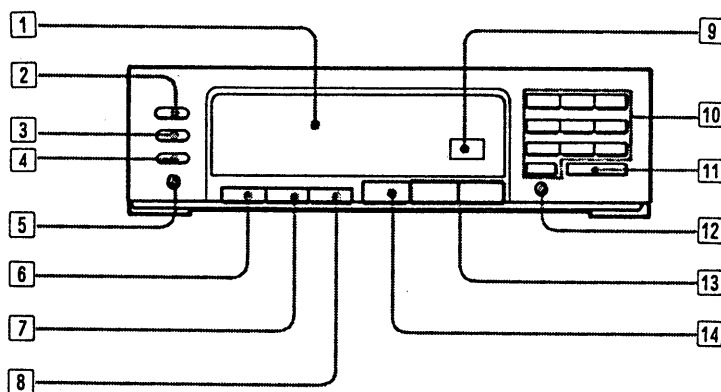
When the repair is completed, return the memory to the preceding state (content).

FM		AM	
A1	87.5 MHz	A6	530 kHz
A2	88.0 MHz	A7	620 kHz
A3	98.0 MHz	A8	1050 kHz
A4	100.0 MHz	A9	1490 kHz
A5	108.0 MHz	A0	1710 kHz

SECTION 1

GENERAL

1-1. PARTS IDENTIFICATION

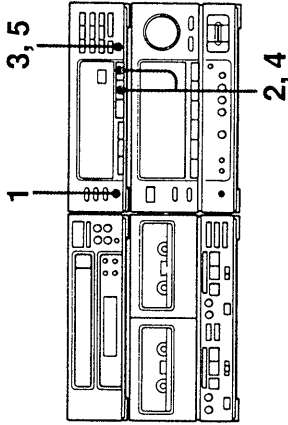


- 1 Display window
- 2 TIMER CONTROL button
- 3 SLEEP timer button
- 4 TIMER SET button
- 5 CLOCK button
- 6 TIME/FREQUENCY button
- 7 STEREO/MUTING button
- 8 AUTO/MANUAL tuning button
- 9 Remote control sensor
- 10 Preset stations buttons
- 11 SHIFT (memory page select) button
- 12 MEMORY/NEXT button
- 13 TUNING/TIMER +/- buttons
- 14 BAND selector

1-2. CLOCK SETTING

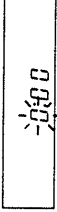
Setting the Clock

- Example: Set to 9:25 in the morning.
- 1 Press **CLOCK**.
 - 2 Set the hour with the **TUNING/TIMER +/-** buttons.
 - 3 Press **MEMORY/NEXT**.
 - 4 Set the minute with the **TUNING/TIMER +/-** buttons.
 - 5 Press **MEMORY/NEXT**.
- The clock starts operating.



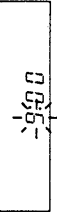
1

CLOCK



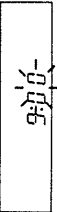
2

- TUNING/TIMER- +



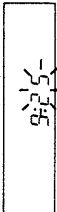
3

MEMORY/NEXT



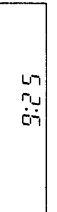
4

- TUNING/TIMER- +



5

MEMORY/NEXT

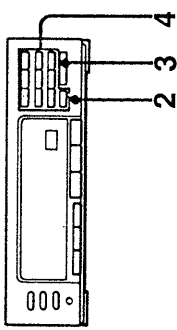


When a power interruption occurs
The time will blink and the clock will be behind by the length of time of the power interruption. After the power is restored, the display must be reset to the proper time. (Timer setting is not cancelled by power interruption.)

To change the frequency display into the time display
Press **TIME/FREQUENCY**. Each time you press **TIME/FREQUENCY**, the display changes.

1-3. RADIO

A



1 Tune in the desired station.

2 Press **MEMORY/NEXT**. **MEMORY** appears for several seconds.

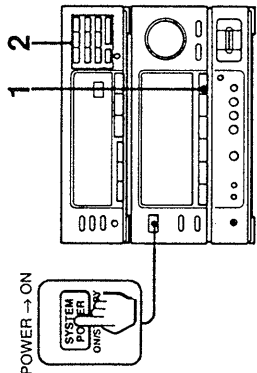
3 While **MEMORY** is on, press **SHIFT** to select the memory page (A, B or C). The memory pages (A, B or C) can be classified according to the music category, station band, etc.

4 While **MEMORY** is on, select the number (1, 2, 3 ... 8, 9, 0) with the numeric buttons. **MEMORY** disappears, and the station is stored.

5 Repeat 1 to 4 for each station to be stored.

B

POWER → ON



1 Press **TUNER**.

2 Press **SHIFT** and the numeric buttons to select the desired code.

If you cannot store a station successfully Press **MEMORY/NEXT** again so that **MEMORY** appears, and then select the desired page and number. Be sure to do this while **MEMORY** is on (approx. 4 seconds.)

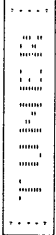
When you have selected the wrong page and number
Press **MEMORY/NEXT** and then select the correct one.

Can a previously stored station be erased?
No. Erasing only is not possible, but storing a new station erases the previous one.

Important
The stored stations remain for approximately 2-3 weeks even if no power is supplied (e.g. the power cord is disconnected, etc.). If the stations are erased, store them again.

1

TUNER



2

SHIFT



Storing Stations A

- A total of 30 stations can be stored in any desired sequence, so that you can tune in the stored station directly by entering the memory page and number.
- 1 Tune in the desired station.
 - 2 Press **MEMORY/NEXT**. **MEMORY** appears for several seconds.
 - 3 While **MEMORY** is on, press **SHIFT** to select the memory page (A, B or C). The memory pages (A, B or C) can be classified according to the music category, station band, etc.
 - 4 While **MEMORY** is on, select the number (1, 2, 3 ... 8, 9, 0) with the numeric buttons. **MEMORY** disappears, and the station is stored.
 - 5 Repeat 1 to 4 for each station to be stored.

To Tune in a Preset Station B

- 1 Press **TUNER**.
- 2 Press **SHIFT** and the numeric buttons to select the desired code.

If you cannot store a station successfully Press **MEMORY/NEXT** again so that **MEMORY** appears, and then select the desired page and number. Be sure to do this while **MEMORY** is on (approx. 4 seconds.)

When you have selected the wrong page and number
Press **MEMORY/NEXT** and then select the correct one.

Can a previously stored station be erased?
No. Erasing only is not possible, but storing a new station erases the previous one.

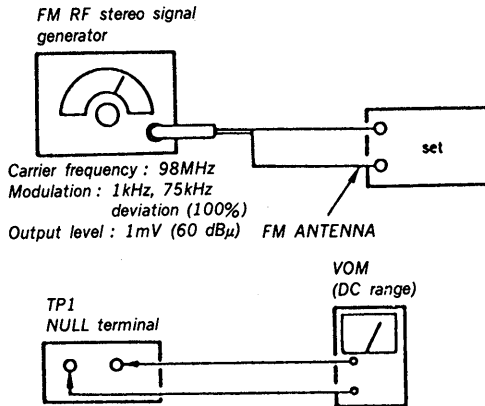
Important
The stored stations remain for approximately 2-3 weeks even if no power is supplied (e.g. the power cord is disconnected, etc.). If the stations are erased, store them again.

SECTION 2 ELECTRICAL ADJUSTMENTS

FM SECTION

• FM Discriminator Alignment (NULL check)

Setting :

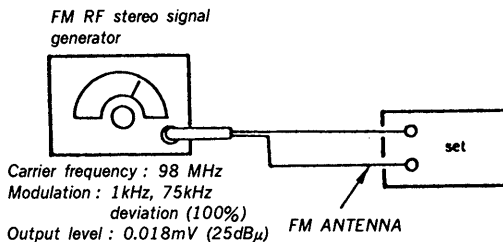


Procedure :

1. Tune the set to 98 MHz.
 2. Adjust T21 for 0 V reading on the VOM.
- Note : FM TUNING LEVEL adjustment should be made after FM discriminator alignment.

• FM TUNING LEVEL Adjustment

Setting :

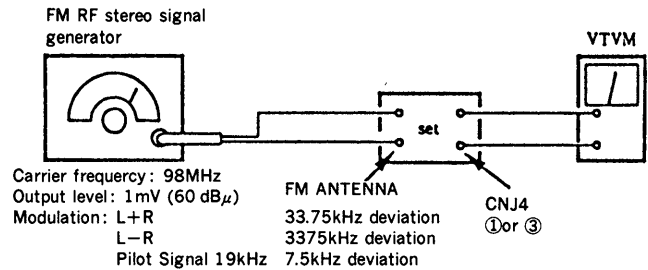


Procedure :

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

• FM Stereo Separation Adjustment

Setting :



Procedure :

Tune the set to 98 MHz

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 : Ⓐ—Ⓑ

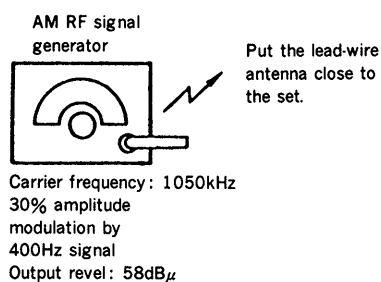
R-CH Stereo separation : Ⓒ—Ⓓ

The separations of both channels should be equal.

AM SECTION

• AM TUNING LEVEL Adjustment

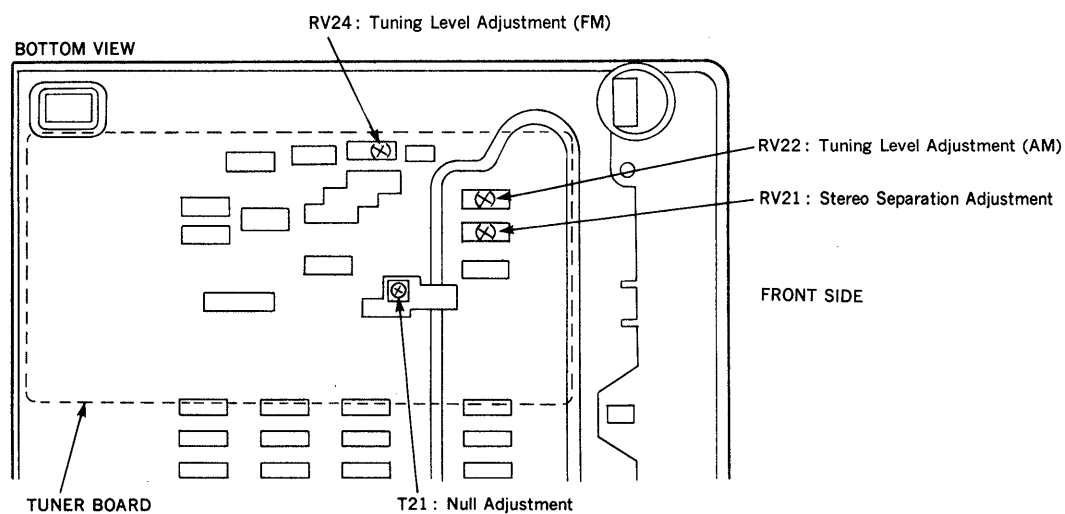
Setting :



Procedure :

1. Tune the set to 1050 kHz.
2. Adjust the RV22 so that the TUNED LED goes on.

[Parts Arrangement Diagram for Adjustments]

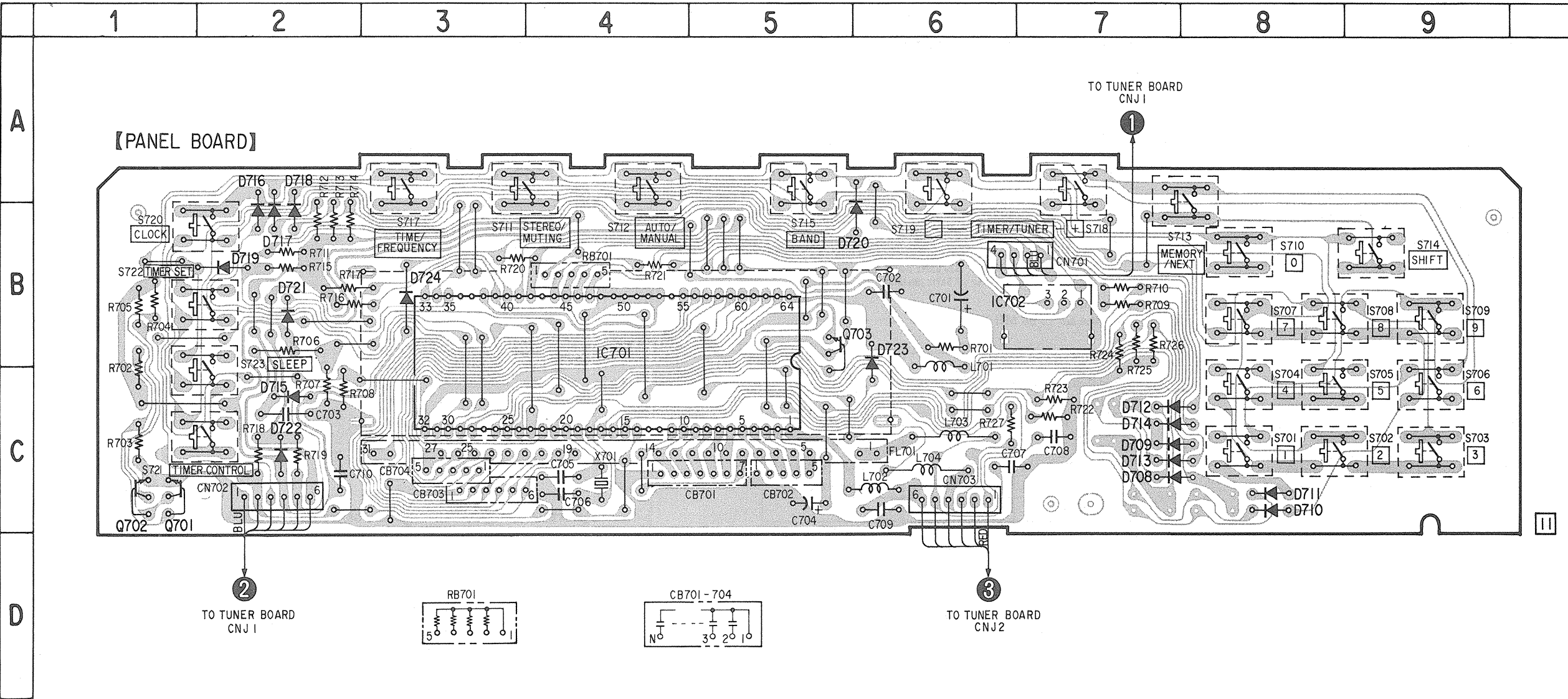


SECTION 3
DIAGRAMS

• Semiconductor Location

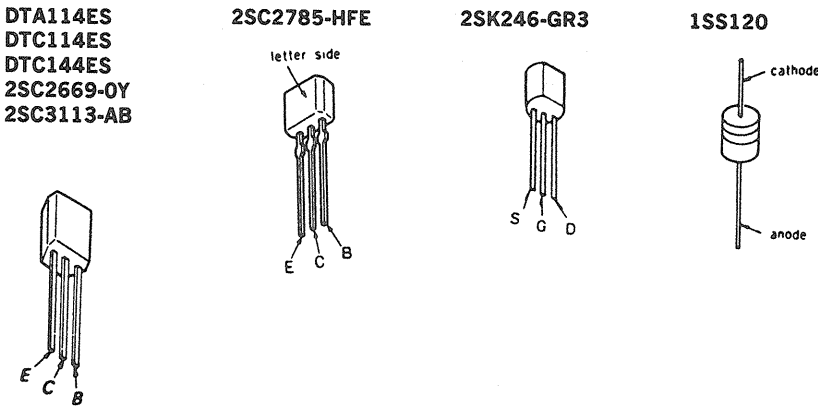
Ref. No.	Location
D708	C-7
D709	C-7
D710	C-8
D711	C-8
D712	C-7
D713	C-7
D714	C-7
D715	C-2
D716	B-2
D717	B-2
D718	B-2
D719	B-2
D720	B-6
D721	B-2
D722	C-2
D723	B-6
D724	B-3
IC701	B-4
IC702	B-7
Q701	C-1
Q702	C-1
Q703	B-5

3-1. PRINTED WIRING BOARD—CONTROL SECTION—

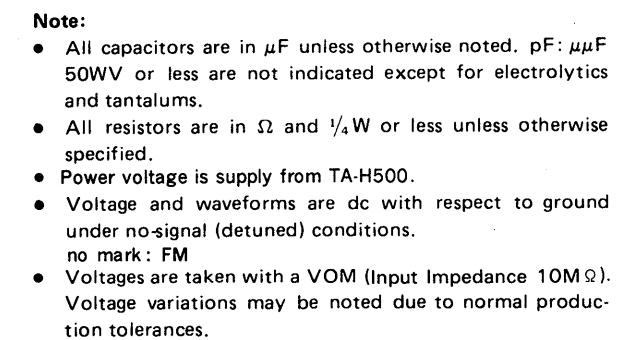


Note:
• — : parts extracted from the component side.

3-2. SEMICONDUCTOR LEAD LAYOUTS

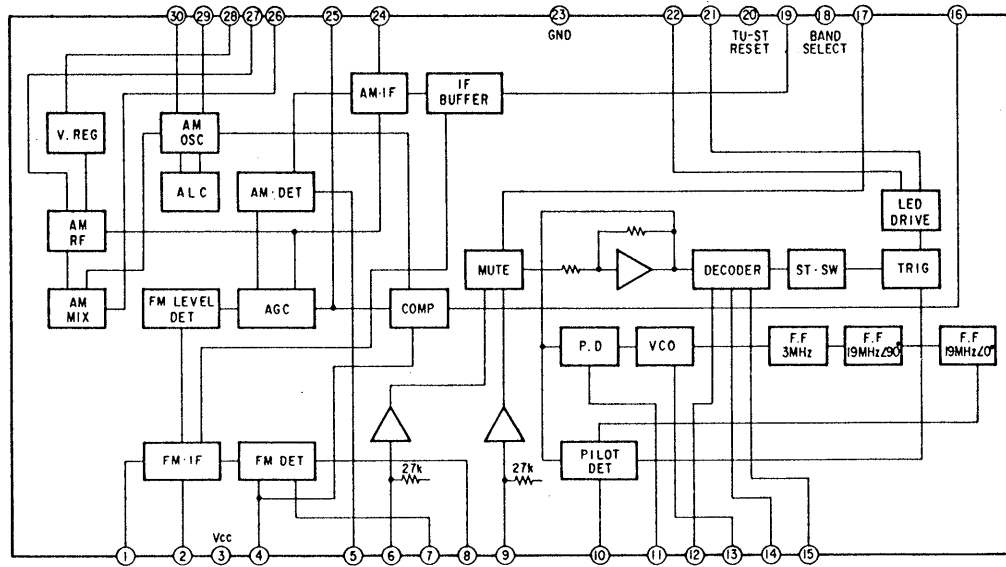


	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
--	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	--

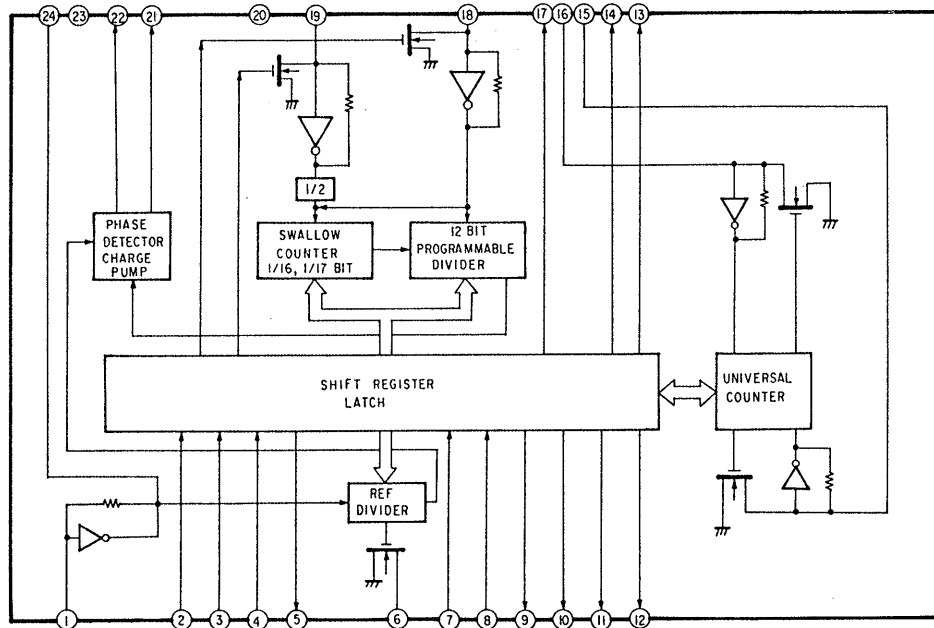


• IC Block Diagrams

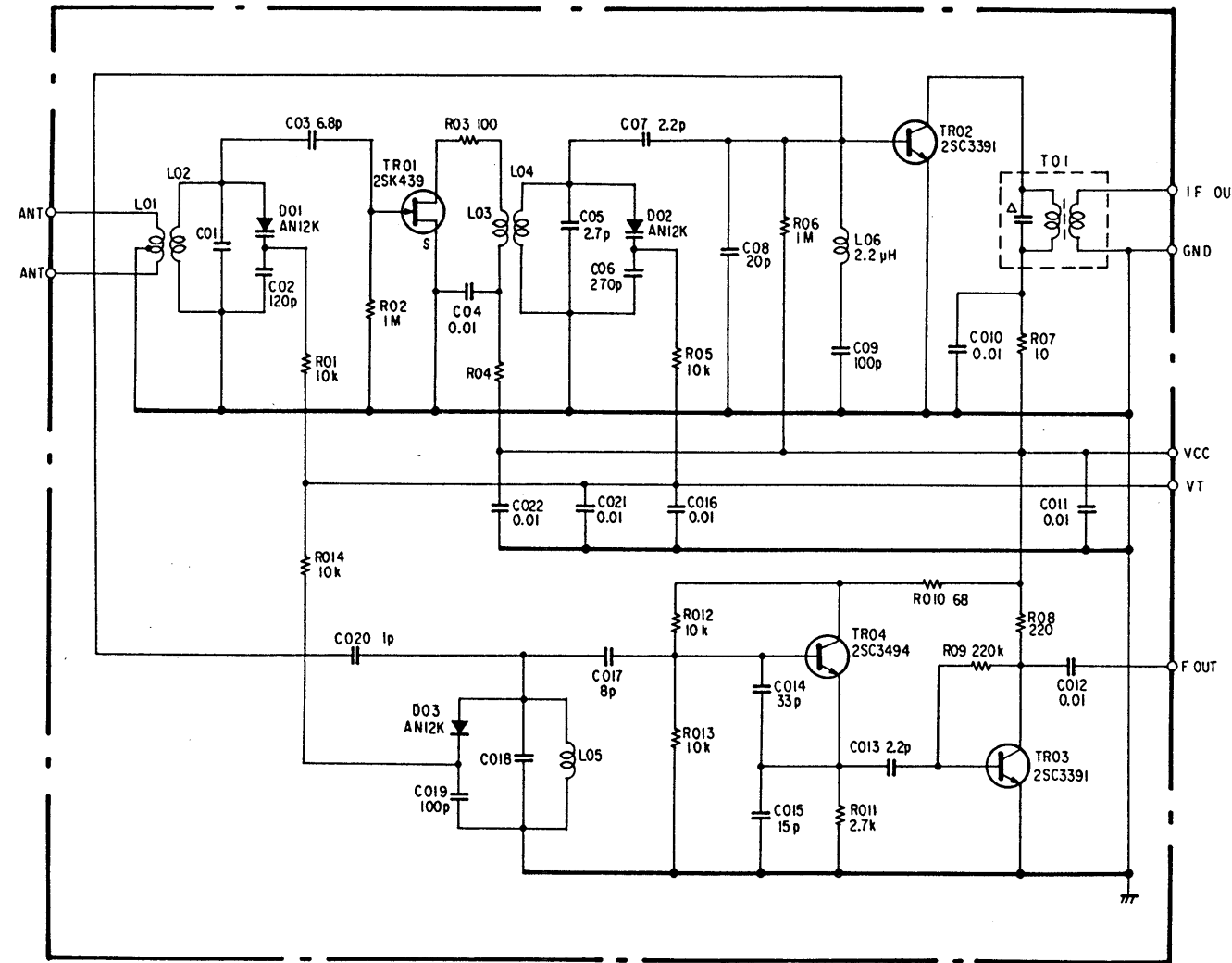
IC21 LA1851N



IC81 LC7218

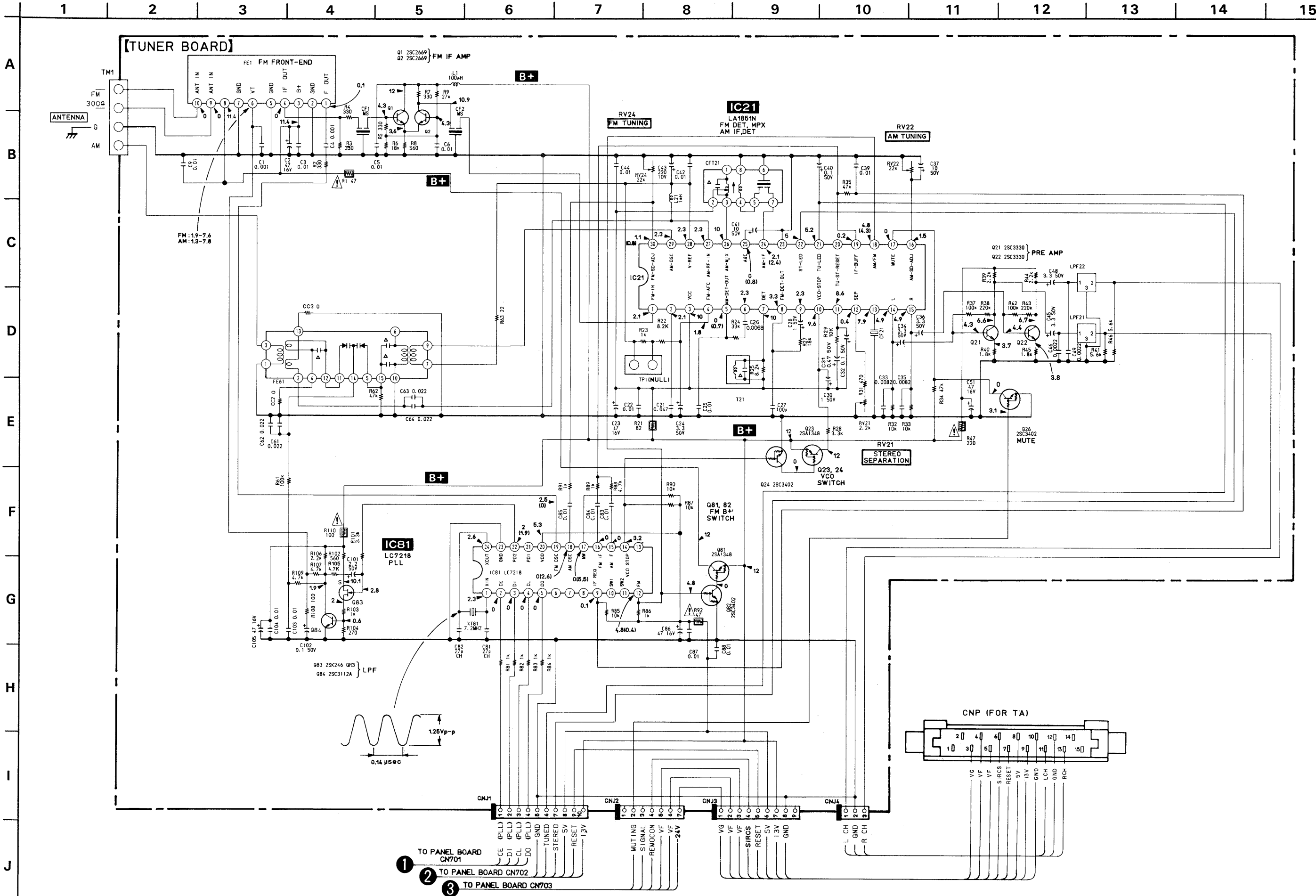


3-4. FM FRONT-END SCHEMATIC DIAGRAMS
FE1

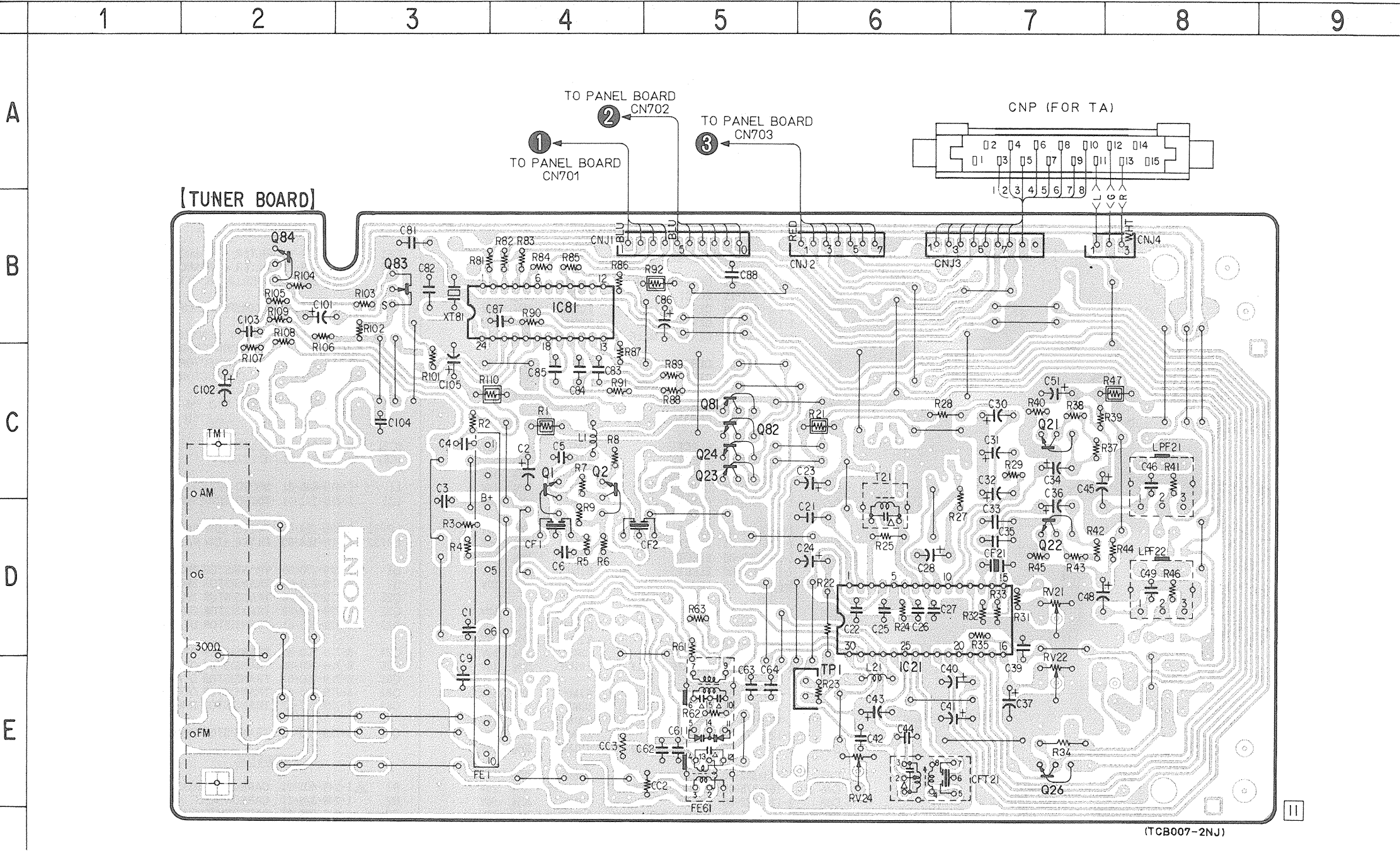


- Note:**
- All capacitors are in μF unless otherwise noted. pF : μF F 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
 - $\triangle$: internal component.
 - $\square$: nonflammable resistor.
- Note:** The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.
- $\square$: adjustment for repair.
 - Power voltage is supply from TA-H500.
 - Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
 - no mark: FM
 - (): AM
 - Voltages are taken with a VOM (Input Impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 - $\Rightarrow$: FM

3-5. SCHEMATIC DIAGRAM—TUNER SECTION—
• Refer to page 11 for IC Block Diagrams



3-6. PRINTED WIRING BOARD—TUNER SECTION—



• Semiconductor Location

Ref. No.	Location
IC21	D-6
IC81	B-4
Q1	C-4
Q2	C-4
Q21	C-7
Q22	D-7
Q23	C-5
Q24	C-5
Q26	E-7
Q81	C-5
Q82	C-5
Q83	B-3
Q84	B-2

Note:

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

SECTION 4 EXPLODED VIEW

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

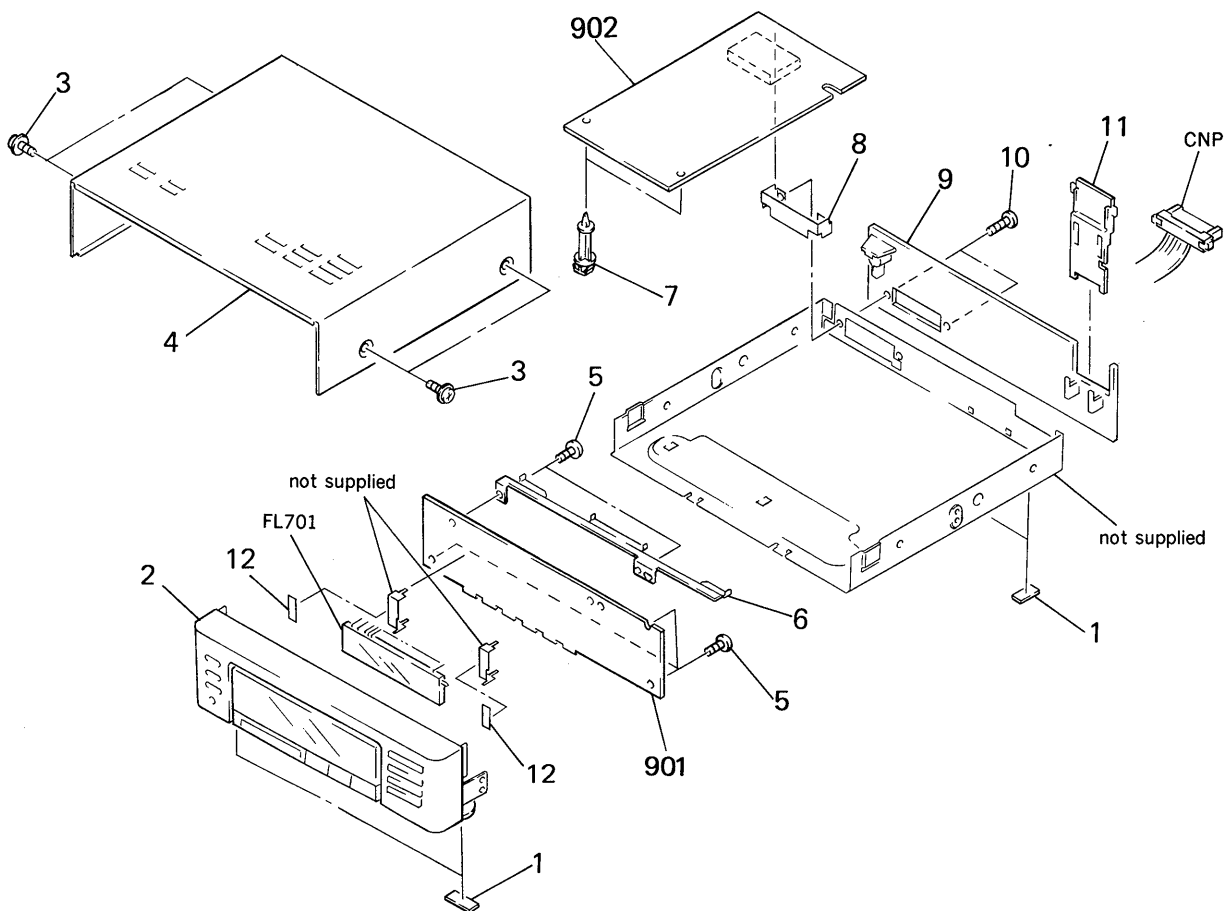
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.

- Color Indication of Appearance Parts
Example:
(RED) ... KNOB, BALANCE (WHITE)

↑
Cabinet's Color

↑
Parts Color

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	Remarks	Ref.No	Part No.	Description	Remarks
1	4-930-336-01	FOOT (FELT)		9	*4-930-346-21	PANEL (ST), BACK	
2	X-4930-314-1	PANEL ASSY, FRONT		10	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
3	3-704-366-01	SCREW (CASE) (M3X8)		11	*4-930-344-01	HOLDER (CONNECTION CORD)	
4	4-932-844-11	CASE		12	*4-932-856-01	CUSHION (FL)	
5	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S		901	*A-4341-180-A	MOUNTED PCB, PANEL	
6	*4-932-859-01	BRACKET (CASE)		902	*A-4303-186-A	MOUNTED PCB, TUNER (TCB007-2NJ)	
7	*4-914-008-01	HOLDER, PCB		CNP	1-575-679-11	CORD (WITH CONNECTOR)	
8	*4-924-988-11	PLATE (ST), GROUND		FL701	1-519-517-11	INDICATOR TUBE, FLUORESCENT	

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.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:MF: μ F, PF: μ PF.**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORSIn each case, U: μ , for example:UA....: μ A...., UPA....: μ PA....,UPC....: μ PC, UPD....: μ PD....

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				
CAPACITOR						
C1	1-162-294-31	CERAMIC CHIP	0.001MF	20%	25V	
C2	1-124-477-11	ELECT	47MF	20%	16V	
C3	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C4	1-162-294-31	CERAMIC CHIP	0.001MF	20%	25V	
C5	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C6	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C9	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C10	1-162-516-11	CERAMIC CHIP	100PF	10%	50V	
C21	1-101-006-00	CERAMIC	0.047MF		50V	
C22	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C23	1-124-477-11	ELECT	47MF	20%	16V	
C24	1-123-382-00	ELECT	3.3MF	20%	50V	
C25	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C26	1-163-019-00	CERAMIC CHIP	0.0068MF	20%	16V	
C27	1-162-516-11	CERAMIC CHIP	100PF	10%	50V	
C28	1-124-791-11	ELECT	1.0MF	20%	50V	
C30	1-124-791-11	ELECT	1.0MF	20%	50V	
C31	1-124-902-00	ELECT	0.47MF	20%	50V	
C32	1-124-463-00	ELECT	0.1MF	20%	50V	
C33	1-130-482-00	FILM	0.0082MF	5%	50V	
C34	1-123-382-00	ELECT	3.3MF	20%	50V	
C35	1-130-482-00	FILM	0.0082MF	5%	50V	
C36	1-123-382-00	ELECT	3.3MF	20%	50V	
C37	1-123-875-11	ELECT	10MF	20%	50V	
C39	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C40	1-124-463-00	ELECT	0.1MF	20%	50V	
C41	1-123-875-11	ELECT	10MF	20%	50V	
C42	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C43	1-126-176-11	ELECT	220MF	20%	50V	
C44	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C45	1-123-382-00	ELECT	3.3MF	20%	50V	
C46	1-161-375-00	CERAMIC CHIP	0.0022MF	20%	25V	
C48	1-123-382-00	ELECT	3.3MF	20%	50V	
C49	1-161-375-00	CERAMIC CHIP	0.0022MF	20%	25V	
C51	1-124-477-11	ELECT	47MF	20%	16V	
C61	1-163-063-00	CERAMIC MELF	0.022MF		25V	
C62	1-163-063-00	CERAMIC MELF	0.022MF		25V	
C63	1-163-063-00	CERAMIC MELF	0.022MF		25V	
C64	1-163-063-00	CERAMIC MELF	0.022MF		25V	
C81	1-102-961-00	CERAMIC	27PF	5%	50V	
C82	1-102-961-00	CERAMIC	27PF	5%	50V	
C83	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C84	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C85	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C86	1-124-477-11	ELECT	47MF	20%	16V	
C87	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C88	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C101	1-124-925-11	ELECT	2.2MF	20%	50V	
C102	1-124-463-00	ELECT	0.1MF	20%	50V	
C103	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C104	1-163-059-00	CERAMIC MELF	0.01MF	20%	16V	
C105	1-124-477-11	ELECT	47MF	20%	16V	

Ref.No	Part No.	Description				
CF1	1-567-389-11	FILTER, CERAMIC				
CF2	1-567-389-11	FILTER, CERAMIC				
CF21	1-577-075-11	OSCILLATOR, CERAMIC				
CFT21	1-404-853-11	TRANSFORMER, IF (CERAMIC FILTER)				
CNJ1	*1-568-276-11	SOCKET, CONNECTOR 10P				
CNJ2	*1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P				
CNJ3	*1-568-419-11	PIN, CONNECTOR 9P				
CNJ4	*1-568-372-11	PIN, CONNECTOR 3P				
FE1	1-463-862-21	FRONT END, FM				
FE61	1-236-461-11	ENCAPSULATED COMPONENT				
IC21	8-759-821-45	IC LA1851N				
IC81	8-759-820-91	IC LC7218				
L1	1-410-645-31	MICRO INDUCTOR 100UH				
L21	1-410-171-11	MICRO INDUCTOR 1MMH				
LPF21	1-235-164-00	FILTER, LOW PASS				
LPF22	1-235-164-00	FILTER, LOW PASS				
Q1	8-729-230-99	TRANSISTOR 2SC2669-OY				
Q2	8-729-230-99	TRANSISTOR 2SC2669-OY				
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q23	8-729-900-61	TRANSISTOR DTA114ES				
Q24	8-729-900-80	TRANSISTOR DTC114ES				
Q26	8-729-900-80	TRANSISTOR DTC114ES				
Q81	8-729-900-61	TRANSISTOR DTA114ES				
Q82	8-729-900-80	TRANSISTOR DTC114ES				
Q83	8-729-202-67	TRANSISTOR 2SK246GR3				
Q84	8-729-230-93	TRANSISTOR 2SC3113-AB				

RESISTOR

R1	Δ 1-249-401-11	CARBON (SMALL) 47	5%	1/4W	F
R2	1-249-329-11	CARBON MELF 330	5%	1/8W	
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	Δ 1-249-404-00	CARBON (SMALL) 82	5%	1/4W	F
R22	1-249-428-11	CARBON (SMALL) 8.2K	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 (SMALL) 18K	5%	1/4W	
R28	1-249-423-11	CARBON (SMALL) 3.3K	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	
R32	1-249-347-11	CARBON MELF 10K	5%	1/8W	
R33	1-249-347-11	CARBON MELF 10K	5%	1/8W	
R34	1-249-437-11	CARBON (SMALL) 47K	5%	1/4W	
R35	1-249-355-11	CARBON MELF 47K	5%	1/8W	

Ref.No	Part No.	Description			
R37	1-249-359-11	CARBON MELF	100K	5%	1/8W
R38	1-249-363-11	CARBON MELF	220K	5%	1/8W
R39	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R40	1-249-338-11	CARBON MELF	1.8K	5%	1/8W
R41	1-249-344-11	CARBON MELF	5.6K	5%	1/8W
R42	1-249-359-11	CARBON MELF	100K	5%	1/8W
R43	1-249-363-11	CARBON MELF	220K	5%	1/8W
R44	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R45	1-249-338-11	CARBON MELF	1.8K	5%	1/8W
R46	1-249-344-11	CARBON MELF	5.6K	5%	1/8W
R47	△1-249-409-11	CARBON (SMALL) 220	5%	1/4W	F
R48	1-249-359-11	CARBON MELF	100K	5%	1/8W
R49	1-249-359-11	CARBON MELF	100K	5%	1/8W
R61	1-249-359-11	CARBON MELF	100K	5%	1/8W
R62	1-249-355-11	CARBON MELF	47K	5%	1/8W
R63	1-249-315-11	CARBON MELF	22	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
R87	1-249-347-11	CARBON MELF	10K	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	1-249-347-11	CARBON MELF	10K	5%	1/8W
R91	1-249-335-11	CARBON MELF	1K	5%	1/8W
R92	△1-249-401-11	CARBON (SMALL) 47	5%	1/4W	F
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
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 (SMALL) 100	5%	1/4W	F
CC2	1-249-366-11	CARBON MELF	0	5%	1/5W
CC3	1-249-366-11	CARBON MELF	0	5%	1/5W
RV21	1-238-598-11	RES, ADJ, CARBON 2.2K			
RV22	1-238-601-11	RES, ADJ, CARBON 22K			
RV24	1-238-601-11	RES, ADJ, CARBON 22K			
T21	1-404-807-11	TRANSFORMER, DISCRIMINATOR			
TM1	1-536-708-00	TERMINAL BOARD, PUSH 4P (ANTENNA)			
TP1	*1-560-060-00	PIN, CONNECTOR 2P			
XT81	1-577-126-11	VIBRATOR, CRYSTAL (2.7MHz)			

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

EXCEPT FOR TUNER

Ref.No	Part No.	Description
901	*A-4341-180-A	MOUNTED PCB, PANEL
902	*A-4303-186-A	MOUNTED PCB, TUNER (TCB007-2NJ)

CAPACITOR

C701	1-125-486-11	DOUBLE LAYERS	0.22F		5.5V
C702	1-136-173-00	FILM	0.47MF	5%	50V
C703	1-162-306-11	CERAMIC	0.01MF	20%	16V
C704	1-126-094-11	ELECT	4.7MF	20%	25V
C705	1-162-200-31	CERAMIC	11PF	5%	50V
C706	1-162-200-31	CERAMIC	11PF	5%	50V
C707	1-136-173-00	FILM	0.47MF	5%	50V
C708	1-136-173-00	FILM	0.47MF	5%	50V
C709	1-164-159-11	CERAMIC	0.1MF		50V
C710	1-164-159-11	CERAMIC	0.1MF		50V

CB701	1-233-130-11	COMPOSITION CIRCUIT BLOCK
CB702	1-233-148-11	COMPOSITION CIRCUIT BLOCK
CB703	1-233-187-11	COMPOSITION CIRCUIT BLOCK
CB704	1-233-148-11	COMPOSITION CIRCUIT BLOCK

CN701	*1-568-279-11	SOCKET, CONNECTOR 4P
CN702	*1-568-281-11	SOCKET, CONNECTOR 6P
CN703	*1-568-281-11	SOCKET, CONNECTOR 6P

CNP	1-575-679-11	CORD (WITH CONNECTOR)
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D708	8-719-912-20	DIODE 1SS120
D709	8-719-912-20	DIODE 1SS120
D710	8-719-912-20	DIODE 1SS120
D711	8-719-912-20	DIODE 1SS120
D712	8-719-912-20	DIODE 1SS120

D713	8-719-912-20	DIODE 1SS120
D714	8-719-912-20	DIODE 1SS120
D715	8-719-912-20	DIODE 1SS120
D716	8-719-912-20	DIODE 1SS120
D717	8-719-912-20	DIODE 1SS120

D718	8-719-912-20	DIODE 1SS120
D719	8-719-912-20	DIODE 1SS120
D720	8-719-912-20	DIODE 1SS120
D721	8-719-912-20	DIODE 1SS120
D722	8-719-912-20	DIODE 1SS120

D723	8-719-912-20	DIODE 1SS120
D724	8-719-912-20	DIODE 1SS120

FL701	1-519-517-11	INDICATOR TUBE, FLUORESCENT
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IC701	8-759-234-35	IC TMP47C670N-1283
IC702	8-749-920-59	IC A1QH3020S

L701	1-410-521-11	INDUCTOR	100UH
L702	1-410-521-11	INDUCTOR	100UH
L703	1-408-080-00	INDUCTOR	100UH
L704	1-408-080-00	INDUCTOR	100UH

Q701	8-729-900-89	TRANSISTOR DTC144ES
Q702	8-729-900-89	TRANSISTOR DTC144ES
Q703	8-729-900-80	TRANSISTOR DTC114ES

Ref.No	Part No.	Description
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RESISTOR

R701	1-249-405-11	CARBON	100	5%	1/4W
R702	1-249-438-11	CARBON	56K	5%	1/4W
R703	1-249-435-11	CARBON	33K	5%	1/4W
R704	1-249-429-11	CARBON	10K	5%	1/4W
R705	1-249-433-11	CARBON	22K	5%	1/4W

R706	1-249-438-11	CARBON	56K	5%	1/4W
R707	1-249-435-11	CARBON	33K	5%	1/4W
R708	1-249-441-11	CARBON	100K	5%	1/4W
R709	1-249-429-11	CARBON	10K	5%	1/4W
R710	1-249-429-11	CARBON	10K	5%	1/4W

R711	1-249-429-11	CARBON	10K	5%	1/4W
R712	1-249-429-11	CARBON	10K	5%	1/4W
R713	1-249-429-11	CARBON	10K	5%	1/4W
R714	1-249-429-11	CARBON	10K	5%	1/4W
R715	1-249-429-11	CARBON	10K	5%	1/4W

R716	1-249-429-11	CARBON	10K	5%	1/4W
R717	1-249-423-11	CARBON	3.3K	5%	1/4W
R718	1-249-429-11	CARBON	10K	5%	1/4W
R719	1-249-429-11	CARBON	10K	5%	1/4W
R720	1-249-429-11	CARBON	10K	5%	1/4W

R721	1-249-411-11	CARBON	330	5%	1/4W
R722	1-249-441-11	CARBON	100K	5%	1/4W
R723	1-249-441-11	CARBON	100K	5%	1/4W
R724	1-249-441-11	CARBON	100K	5%	1/4W
R725	1-249-441-11	CARBON	100K	5%	1/4W

R726	1-249-441-11	CARBON	100K	5%	1/4W
R727	1-249-421-11	CARBON	2.2K	5%	1/4W

RB701	1-233-125-11	COMPOSITION CIRCUIT BLOCK
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S701	1-554-303-21	SWITCH, KEY BOARD (1)
S702	1-554-303-21	SWITCH, KEY BOARD (2)
S703	1-554-303-21	SWITCH, KEY BOARD (3)
S704	1-554-303-21	SWITCH, KEY BOARD (4)
S705	1-554-303-21	SWITCH, KEY BOARD (5)

S706	1-554-303-21	SWITCH, KEY BOARD (6)
S707	1-554-303-21	SWITCH, KEY BOARD (7)
S708	1-554-303-21	SWITCH, KEY BOARD (8)
S709	1-554-303-21	SWITCH, KEY BOARD (9)
S710	1-554-303-21	SWITCH, KEY BOARD (0)

S711	1-554-303-21	SWITCH, KEY BOARD (STEREO/MUTING)
S712	1-554-303-21	SWITCH, KEY BOARD (AUTO/MANUAL)
S713	1-554-303-21	SWITCH, KEY BOARD (MEMORY/NEXT)
S714	1-554-303-21	SWITCH, KEY BOARD (SHIFT)
S715	1-554-303-21	SWITCH, KEY BOARD (BAND)

S717	1-554-303-21	SWITCH, KEY BOARD (TIME/FREQUENCY)
S718	1-554-303-21	SWITCH, KEY BOARD (TIMER/TUNER +)
S719	1-554-303-21	SWITCH, KEY BOARD (TIMER/TUNER -)
S720	1-554-303-21	SWITCH, KEY BOARD (CLOCK)
S721	1-554-303-21	SWITCH, KEY BOARD (TIMER CONTROL)

S722	1-554-303-21	SWITCH, KEY BOARD (TIMER SET)
S723	1-554-303-21	SWITCH, KEY BOARD (SLEEP)

X701	1-567-821-21	VIBRATOR, CRYSTAL (4.19MHz)
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