

ST-818

SERVICE MANUAL

E Model



This set is the tuner section in FH-717R/818R

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/300 ohm balanced
Intermediate frequency 10.7 MHz

AM tuner section

Intermediate frequency 450 kHz

MW/SW tuner section

	MW	SW1	SW2
Tuning range	531 - 1,602 kHz	3.2 - 7.3 MHz	9.5 - 21.75 MHz
Antenna	AM loop antenna, External antenna terminals		
Intermediate frequency	450 kHz		

FM/MW/SW TIMER TUNER
SONY®

• **Power supply for service**

Since this machine has no power source in itself, the power is supplied form AMP TA-818 or TA-818M used for this series.

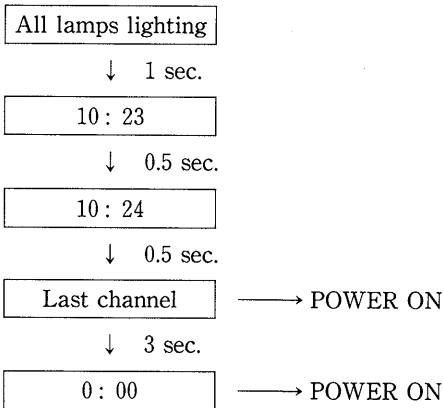
As shown in the following table, this machine requires 4types of voltage, and supplying each type of voltage separately makes complicated connections.

Accordingly, make connection with TA-818/818M 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-818/818M, and set the power switch of TA-818/818M to the state of STANDBY.
- 2) Set the time of tuner to a proper time (any time).
- 3) Press 3 switches simultaneously, namely, PRESET ¹○, ⁶○ and ○ 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 (0.47μF) while power OFF and discharging electricity.

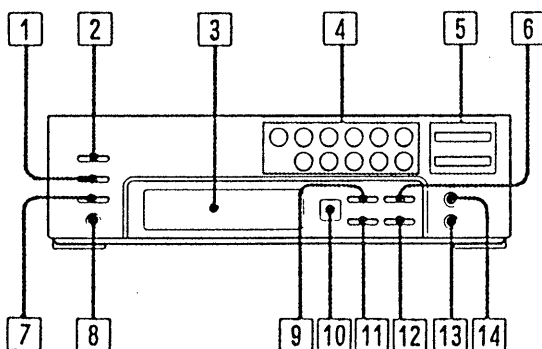
After resetting, the following frequencies are pre-set to the memory.

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

FM		MW		SW1		SW2	
A1	87.5 MHz	A6	531 kHz	B1	3.2 MHz	B6	9.5 MHz
A2	88.0 MHz	A7	603 kHz	B2	3.5 MHz	B7	10.0 MHz
A3	98.0 MHz	A8	999 kHz	B3	5.0 MHz	B8	15.0 MHz
A4	100.0 MHz	A9	1,404 kHz	B4	6.5 MHz	B9	20.0 MHz
A5	108.0 MHz	A0	1,602 kHz	B5	7.3 MHz	B0	21.75 MHz

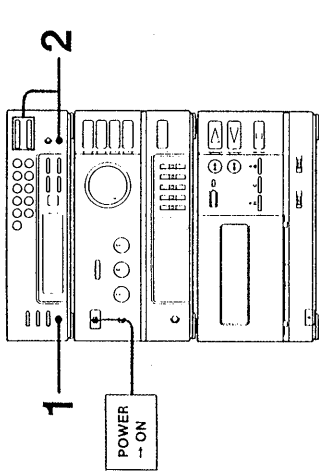
**SECTION 1
GENERAL**

1-1. PARTS IDENTIFICATION



- 1 TIMER SET button
- 2 TIMER CONTROL switch
- 3 Display window
- 4 PRESET STATION buttons
- 5 + / - buttons
- 6 MEMORY SCAN button
- 7 SLEEP button
- 8 CLOCK button
- 9 STEREO/MUTING button
- 10 Remote sensor
Receives the remote-control signals.
- 11 TIME/FREQUENCY button
- 12 TUNING/PRESET button
- 13 MEMORY/NEXT button
- 14 BAND selector

1-2. CLOCK SETTING



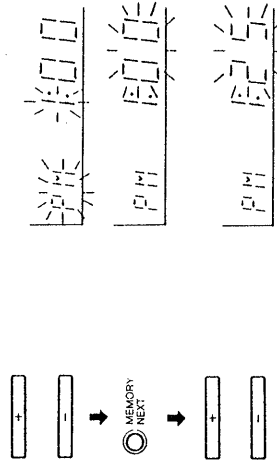
→ See illustrations on left for operation.
The clock shows the time in a 12-hour system with AM or PM indication
 12-hour system: "AM 0:00" is midnight, and "PM 0:00" is noon.

When a power interruption occurs
 The time will blink and the clock will be delayed for 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.)

1



2 Set the time. (e.g. PM 1:25)

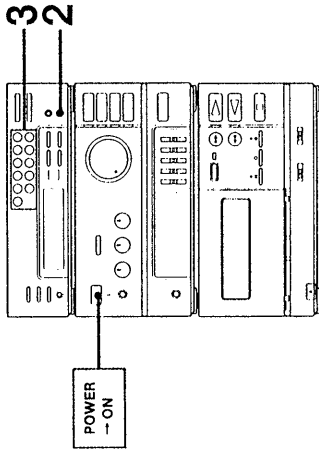


Press MEMORY NEXT as soon as you hear the time signal.



The clock starts operating.

1-3. STORING STATIONS IN THE MEMORY



The codes are denoted by a single letter (either A, B or C) followed by a digit number (1-9, 0). Therefore, there are 30 codes in total.
 You can store a desired station on any of these codes.
 The stored station can be recalled simply by entering its corresponding code.

→ See illustrations on left for operation.

To tune into a Preset Station:

Press SHIFT and the numeric button to select the desired code.

1 Tune in a desired station.

2

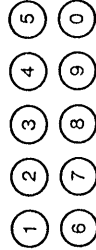


3 Allot one of the following codes:

A-1, A-2, ..., A-9,
 B-1, ..., B-9,
 C-1, ..., C-9, C-0

① First, select alphabet.

② Select number.



4 Repeat these steps for each station to be preset.

If you cannot store a station successfully
 Press MEMORY again, and then enter the desired code.
 Be sure to enter the code while the MEMORY indication is lit.

When you have pressed the wrong code
 Press MEMORY and then enter the correct code.

Can a previously stored station be erased?

No Erasing only is not possible, but storing a new station erases the previously stored one.

Important

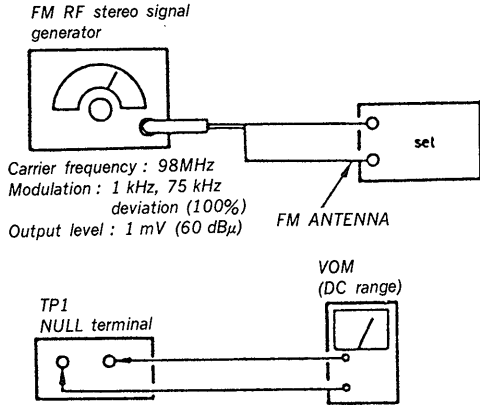
If you leave the unit disconnected from the wall outlet for more than one month, stored stations may be erased from memory. In this case, store the stations again.

SECTION 2 ELECTRICAL ADJUSTMENTS

FM SECTION

• FM Discriminator Alignment (NULL check)

Setting :

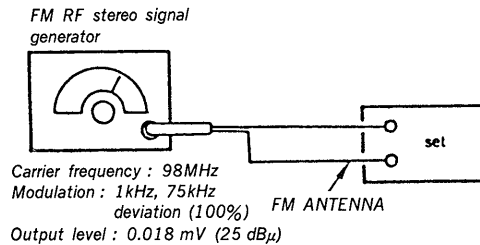


Procedure :

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 :

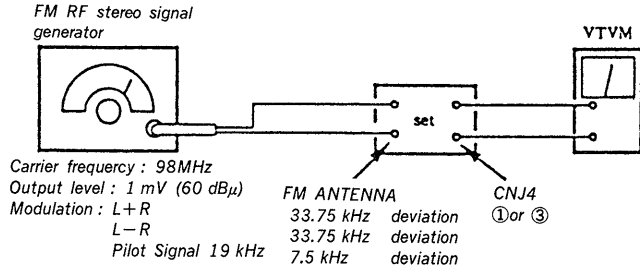


Procedure :

1. Tune the set to 98 MHz.
2. Adjust RV23 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 : Ⓒ-Ⓓ

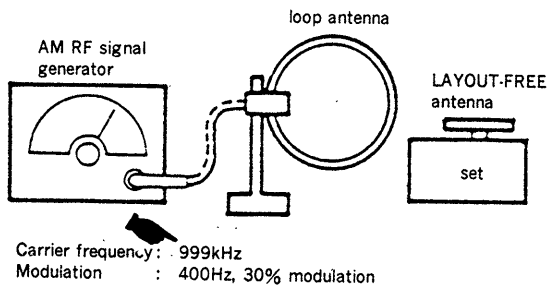
The separations of both channels should be equal.

REVISED

AM SECTION

• **MW TUNING LEVEL Adjustment**

Setting :



Procedure :

1. Set loop antenna so that the LAYOUT-FREE antenna input level becomes 58 dBμ.
2. Tune the set to 999 kHz.
3. Adjust the RV22 so that the TUNED LED goes on.

• **SW1/SW2 CONTROL VOLTAGE Adjustment (FREQUENCY COVERAGE Adjustment) a**

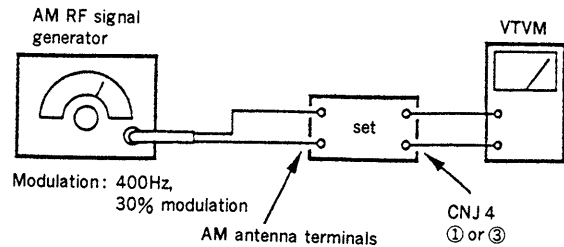
Procedure :

1. Connect digital voltmeter to diode D77 center lead and ground.
2. Adjust for a following value reading on digital voltmeter.

	Set frequency	Adjustment part	Reading on digital voltmeter
SW1	f min. 3.2MHz	T62	1.05V
	f max. 7.3MHz	CT62	8.7V
SW2	f min. 9.5MHz	T64	1.05V
	f max. 21.75MHz	CT64	8.7V

• **SW1/SW2 TRACKING Adjustment**

Setting :



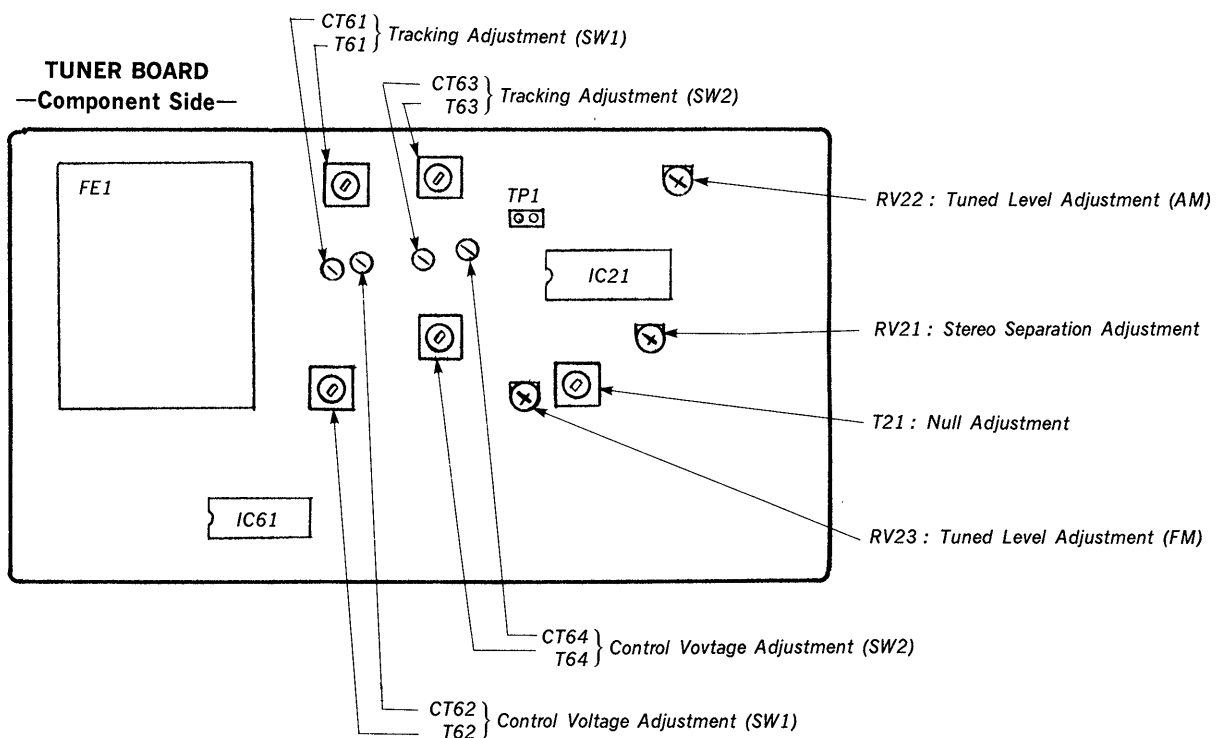
Procedure :

Adjust for a maximum reading on VTVM.

	Set frequency	Adjustment part
SW1	f low. 3.5MHz	T61
	f high. 6.5MHz	CT61
SW2	f low. 10.0MHz	T63
	f high. 20.0MHz	CT63

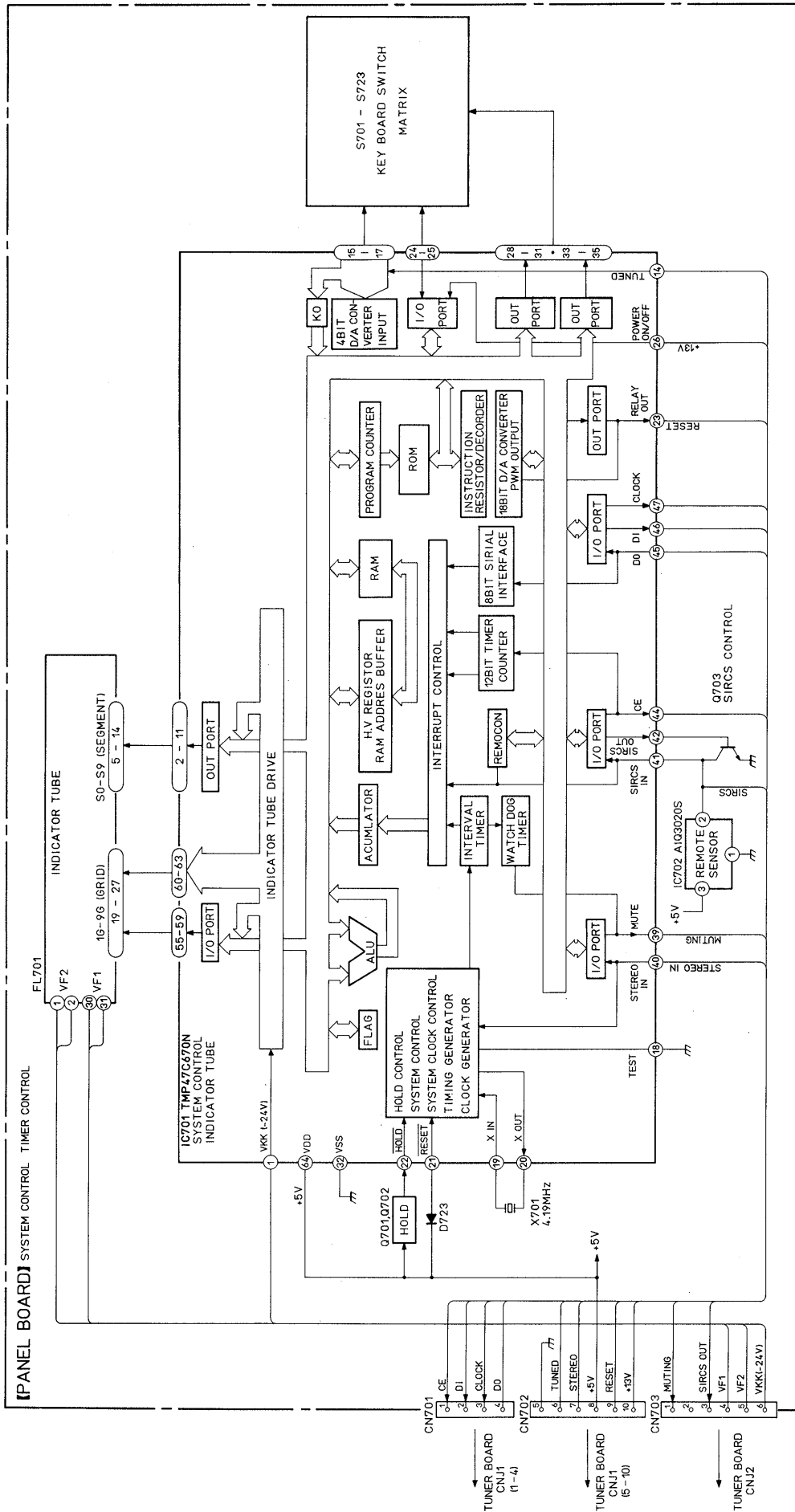
- Repeat the procedures is each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

[Parts Arrangement Diagram for Adjustments]

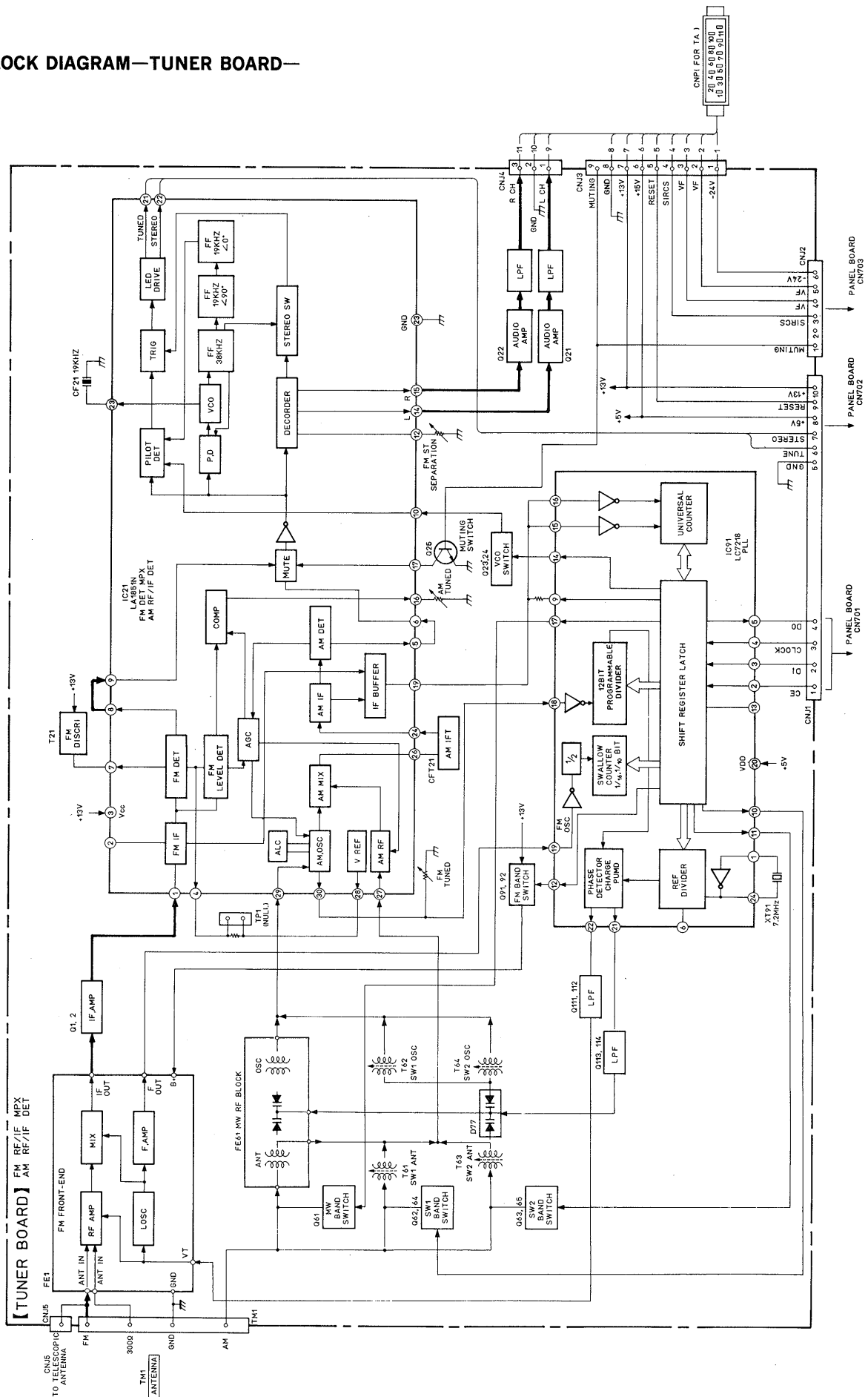


SECTION 3 DIAGRAMS

3-1. BLOCK DIAGRAM —PANEL BOARD—

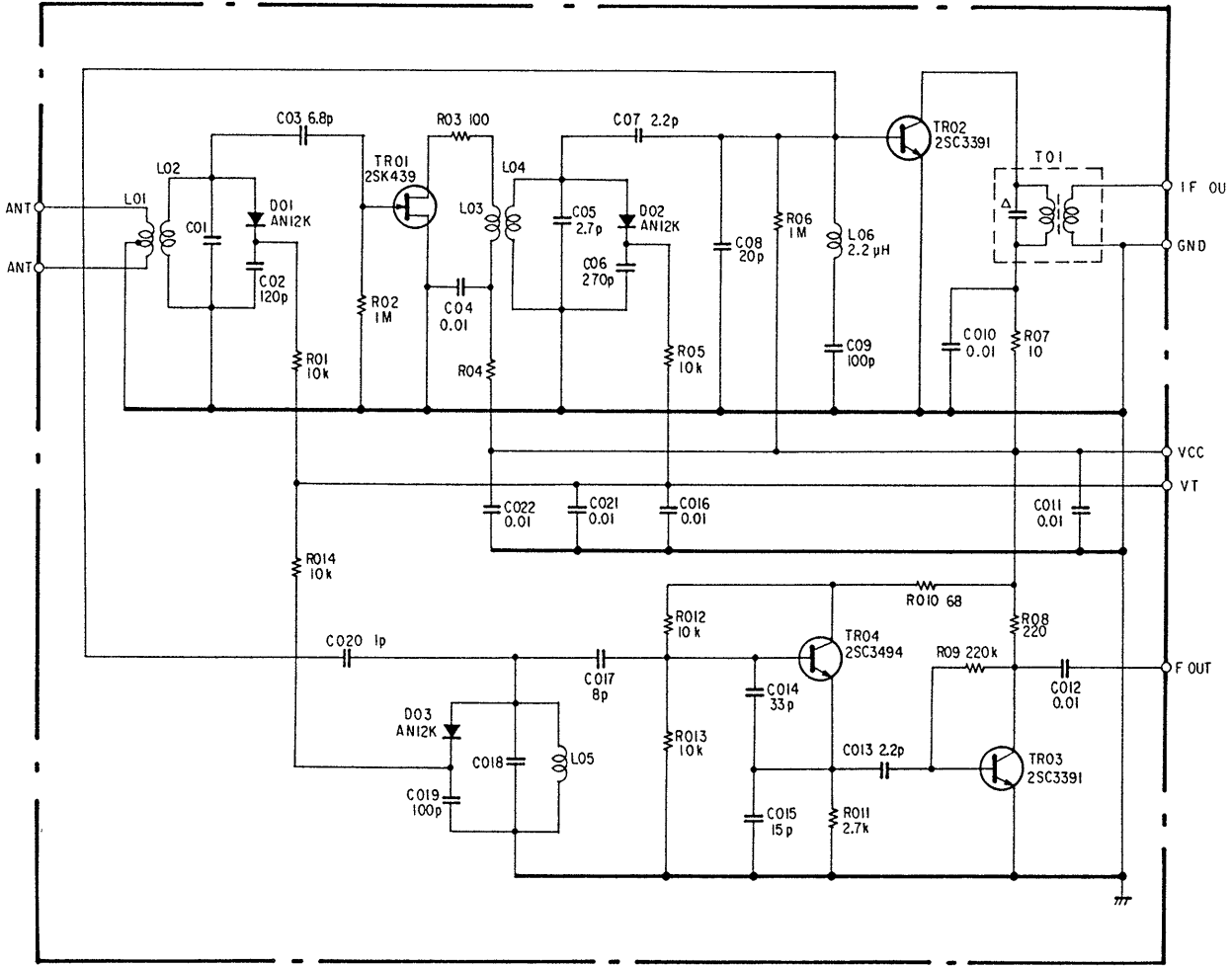


3-2. BLOCK DIAGRAM—TUNER BOARD—



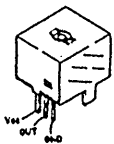
REVISED

3-3. FM FRONT END SCHEMATIC DIAGRAM

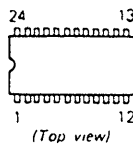


• SEMICONDUCTOR LEAD LAYOUTS

A1QH3020S



LC7218



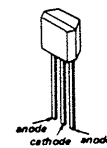
DTA114ES
DTC114ES
DTC144ES
2SC2669
2SC3330S



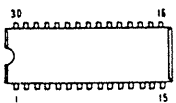
2SK246-GR3



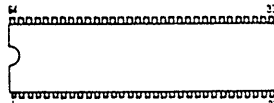
KV1560



LA1851N



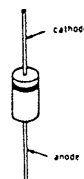
TMP47C670N



2SC3112B



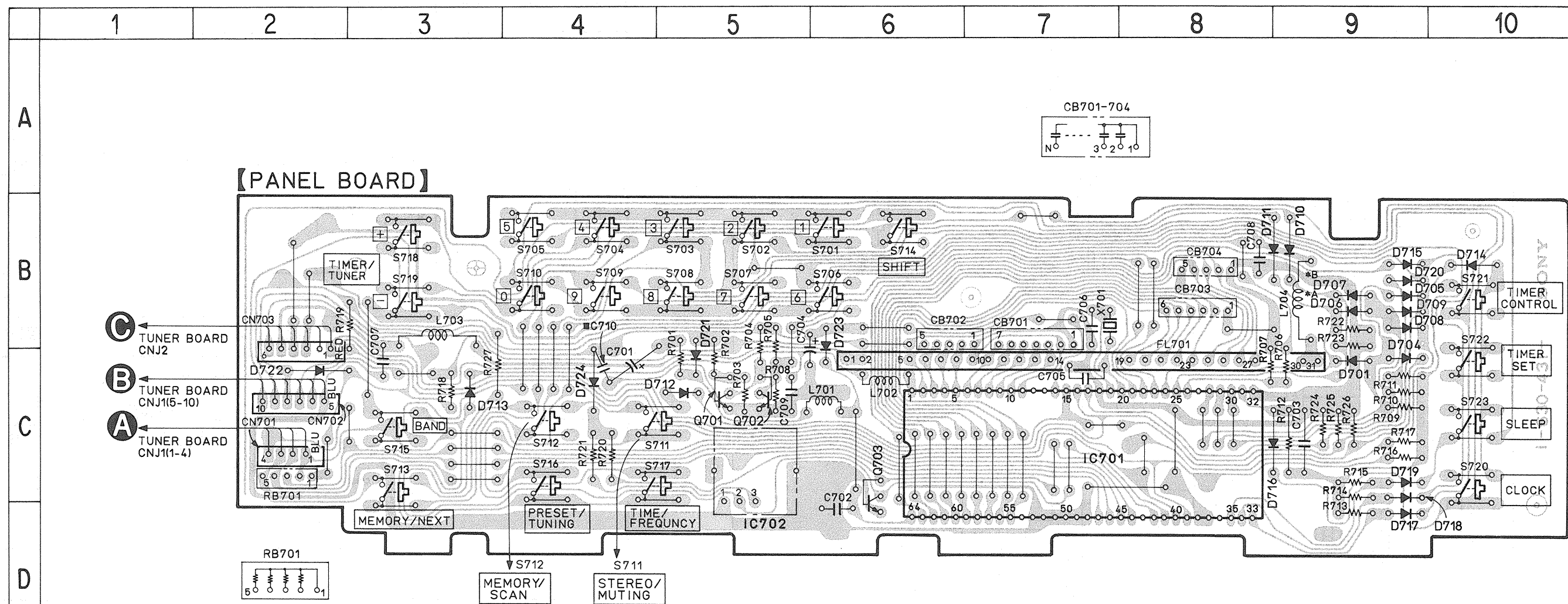
US1060M



2SK246GR3



3-4. PRINTED WIRING BOARD —PANEL BOARD—



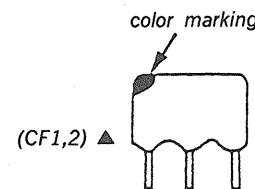
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D701	C-9	D724	C-4
D704	C-9	IC701	C-7
D705	B-9	Q701	C-5
D706	B-9	Q702	C-5
D707	B-9	Q703	C-6
D708	B-9		
D709	B-9		
D710	B-9		
D712	C-5		
D713	C-3		
D714	B-10		
D715	B-9		
D716	C-9		
D717	B-8		
D718	C-9		
D719	C-9		
D720	B-9		
D721	C-5		
D722	C-2		
D723	B-6		

- : parts extracted from the component side.
- : parts mounted on the conductor side.

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 D706, D707 mounted is necessary to match the center frequency of the ceramic filters used with FM intermediate frequency.



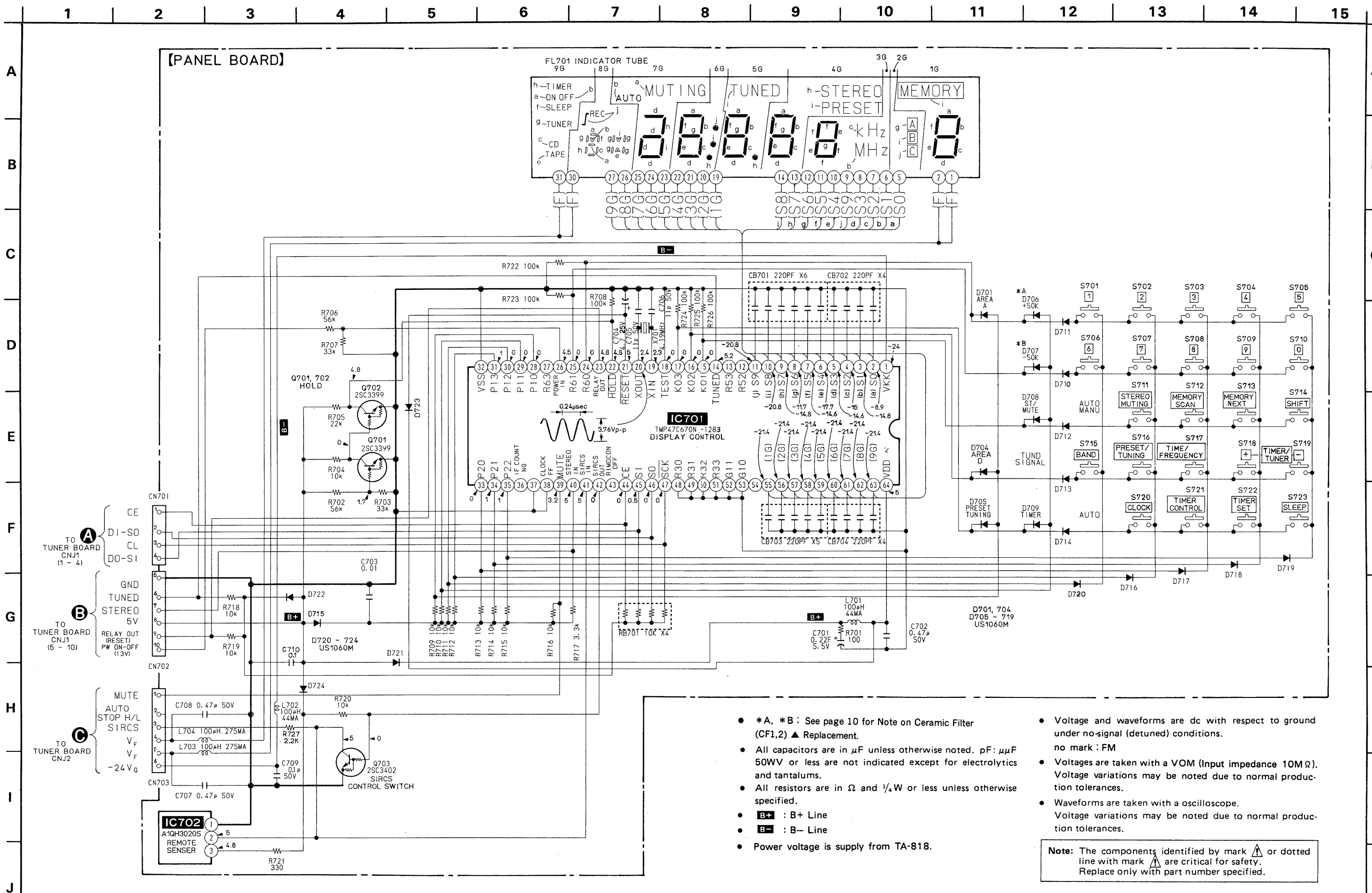
- : Mounted
- × : not Mounted

Ceramic filter		Mount		FM intermediate frequency (MHz)
Color mark	Center frequency (MHz)	* A D706	* B D707	
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 CF 1 and CF 2.

When replacing the ceramic filters, perform the FM Discriminator Adjustment.

3-5. SCHEMATIC DIAGRAM — PANEL BOARD—



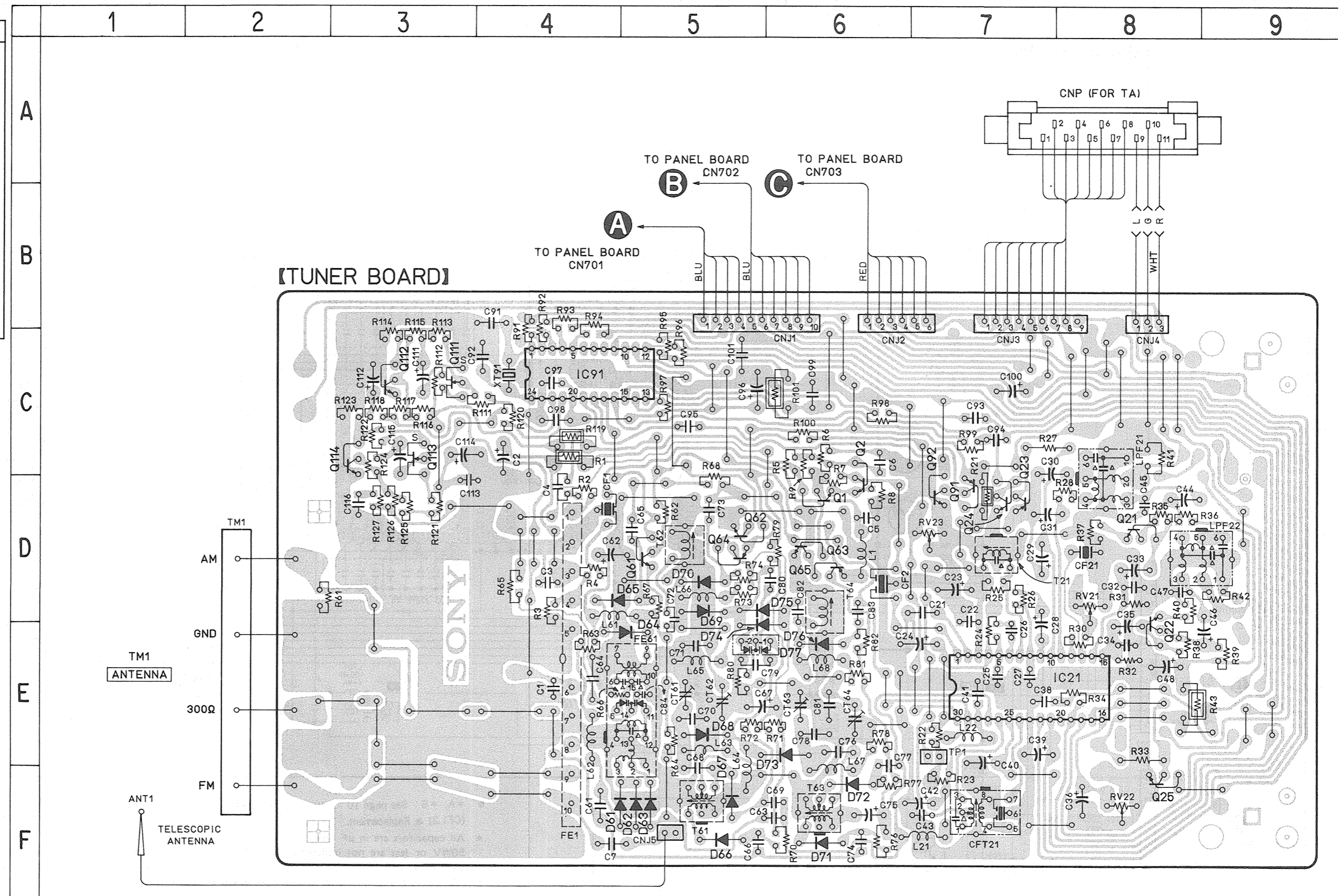
- *A, *B: See page 10 for Note on Ceramic Filter (CF1,2) ▲ Replacement.
- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- B+ : B+ Line
- B- : B- Line
- Power voltage is supply from TA-818.
- 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 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.

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

3-6. PRINTED WIRING BOARD —TUNER BOARD—

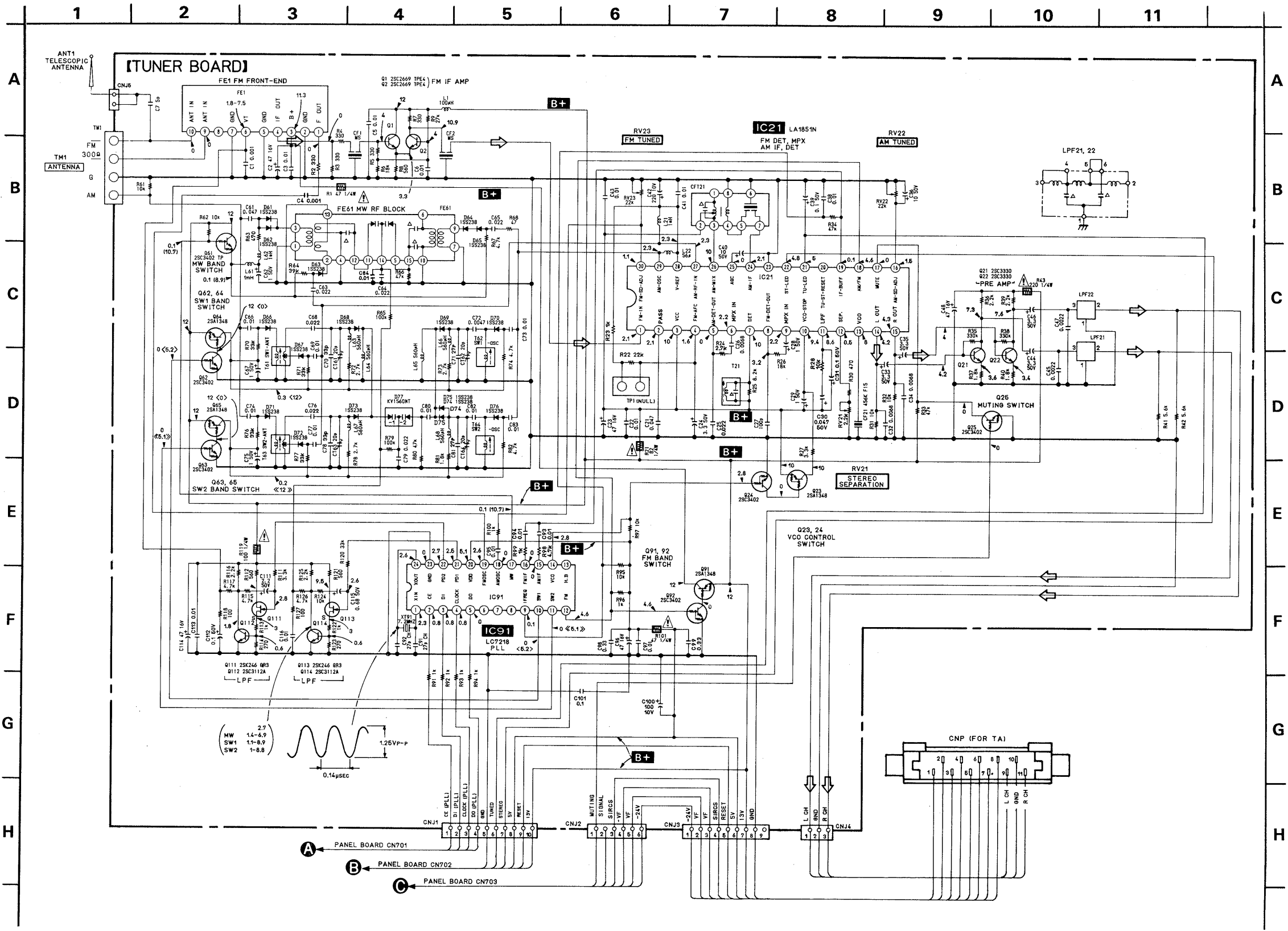
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D61	F-5	Q1	D-6
D62	F-5	Q2	D-6
D63	F-5	Q21	D-8
D64	E-5	Q22	E-8
D65	D-5	Q23	D-7
D66	F-5	Q24	D-7
D67	F-5	Q25	F-8
D68	E-5	Q61	D-5
D69	D-5	Q62	D-5
D70	D-5	Q63	D-6
D71	F-6	Q64	D-5
D72	F-6	Q65	D-6
D73	E-6	Q91	D-7
D74	E-5	Q92	D-7
D75	D-5	Q111	C-3
D76	E-6	Q112	C-3
D77	E-5	Q113	C-3
		Q114	C-3
IC21	E-7		
IC91	C-4		



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

3-7. SCHEMATIC DIAGRAM —TUNER BOARD—



- All capacitors are in μF unless otherwise noted. pF : $\mu\mu\text{F}$ 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.
- Δ : internal component.
- \square : nonflammable resistor.
- **B+** : B+ Line
- \square : adjustment for repair.
- Power voltage is supply from TA-818.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FM
- () : MW
- < > : SW1
- < >> : SW2
- Voltages are taken with a VOM (Input impedance $10\text{M}\Omega$). 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

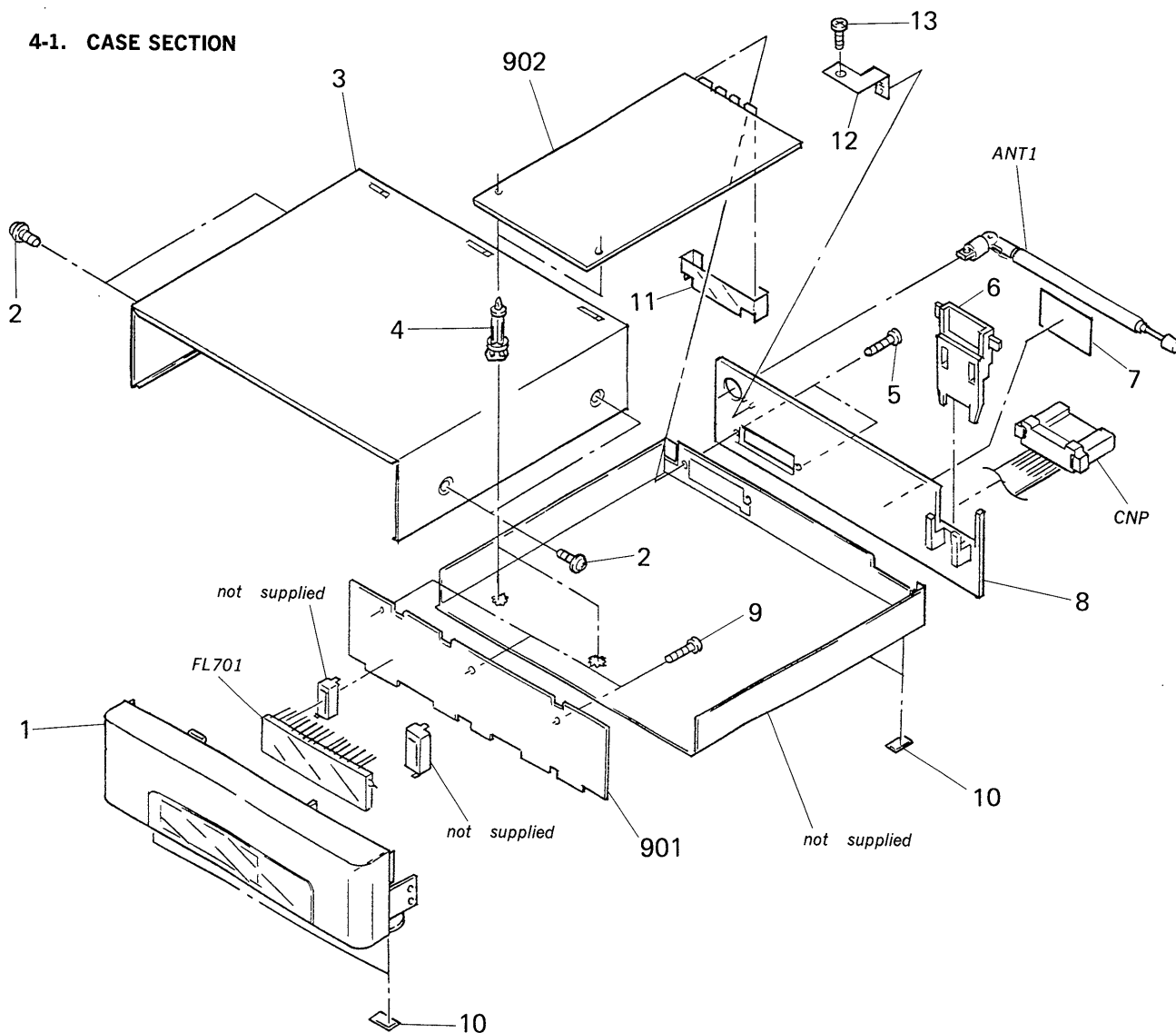
Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

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

4-1. CASE SECTION



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	X-4930-306-1	PANEL ASSY, FRONT		10	4-930-336-01	FOOT (FELT)	
2	3-704-366-01	SCREW (CASE) (M3X8)		11	*A-924-988-01	PLATE (ST), GROUND	
3	4-930-347-31	CASE		12	*4-930-335-01	BRACKET (ANTENNA)	
4	*4-914-008-01	HOLDER, PCB		13	7-682-549-09	SCREW +B 3X10	
5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S		901	*A-4333-345-A	MOUNTED PCB, PANEL	
6	4-930-344-01	HOLDER (CONNECTION CORD)		902	*A-4303-189-A	MOUNTED PCB, TUNER	
7	*4-930-317-01	LABEL, MODEL NUMBER (E)		ANT1	1-501-270-00	ANTENNA, TELESCOPIC	
8	4-930-346-11	PANEL (ST), BACK		CNP	1-574-636-11	COR (WITH CONNECTOR)	
9	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S		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.

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
901	*A-4333-345-A	MOUNTED PCB, PANEL				C69	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
902	*A-4303-189-A	MOUNTED PCB, TUNER				C70	1-102-963-00	CAP, CERAMIC 33PF UJ	5%	50V	
ANT1	1-501-270-00	ANTENNA, TELESCOPIC				C71	1-102-961-00	CAP, CERAMIC 27PF UJ	5%	50V	
C1	1-162-294-31	CERAMIC CHIP 0.001MF	20%	25V		C72	1-162-526-11	CERAMIC CHIP 0.0047MF	20%	12V	
C2	1-124-477-11	CAP, ELECT 47MF	20%	16V		C73	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C3	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C74	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C4	1-162-294-31	CERAMIC CHIP 0.001MF	20%	25V		C77	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C5	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C75	1-124-499-11	CAP, ELECT 1.0MF	20%	50V	
C6	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C76	1-101-005-00	CAP, CERAMIC 0.022MF F	20%	50V	
C7	1-102-942-00	CAP, CERAMIC 5PF SL	0.5PF	50V		C78	1-102-963-00	CAP, CERAMIC 33PF UJ	5%	50V	
C21	1-101-006-00	CAP, CERAMIC 0.047MF F	20%	50V		C79	1-101-005-00	CAP, CERAMIC 0.022MF F	20%	50V	
C22	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C80	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C23	1-124-477-11	CAP, ELECT 47MF	20%	16V		C81	1-102-961-00	CAP, CERAMIC 27PF UJ	5%	50V	
C24	1-123-382-00	CAP, ELECT 3.3MF	20%	50V		C82	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C25	1-163-063-00	CERAMIC MELF 0.022MF		25V		C83	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C26	1-162-527-11	CERAMIC CHIP 0.0068MF	20%	12V		C84	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C27	1-162-516-11	CERAMIC CHIP 100PF	10%	50V		C91	1-102-961-00	CAP, CERAMIC 27PF CH	5%	50V	
C28	1-124-499-11	CAP, ELECT 1.0MF	20%	50V		C92	1-102-961-00	CAP, CERAMIC 27PF CH	5%	50V	
C29	1-124-499-11	CAP, ELECT 1.0MF	20%	50V		C93	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C30	1-124-902-00	CAP, ELECT 0.47MF	20%	50V		C94	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C31	1-124-463-00	CAP, ELECT 0.1MF	20%	50V		C95	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C32	1-162-527-11	CERAMIC CHIP 0.0068MF	20%	12V		C96	1-124-477-11	CAP, ELECT 47MF	20%	16V	
C33	1-123-382-00	CAP, ELECT 3.3MF	20%	50V		C97	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C34	1-162-527-11	CERAMIC CHIP 0.0068MF	20%	12V		C98	1-136-171-00	CAP, METALIZED FILM 0.33MF	5%	50V	
C35	1-123-382-00	CAP, ELECT 3.3MF	20%	50V		C99	1-136-171-00	CAP, METALIZED FILM 0.33MF	5%	50V	
C36	1-123-875-11	CAP, ELECT 10MF	20%	50V		C100	1-124-443-00	CAP, ELECT 100MF	20%	10V	
C38	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C101	1-164-159-11	CAP, CERAMIC 0.1MF F		50V	
C39	1-124-463-00	CAP, ELECT 0.1MF	20%	50V		C111	1-124-925-11	CAP, ELECT 2.2MF	20%	50V	
C40	1-123-875-11	CAP, ELECT 10MF	20%	50V		C112	1-124-463-00	CAP, ELECT 0.1MF	20%	50V	
C41	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C113	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C42	1-126-176-11	CAP, ELECT 220MF	20%	10V		C114	1-124-477-11	CAP, ELECT 47MF	20%	16V	
C43	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C115	1-124-254-00	CAP, ELECT 0.68MF	20%	50V	
C44	1-123-382-00	CAP, ELECT 3.3MF	20%	50V		C116	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V	
C45	1-162-524-11	CERAMIC CHIP 0.0022MF	20%	25V		C701	1-125-486-11	CAP, DOUBLELAYERS 0.22F		5.5V	
C46	1-123-382-00	CAP, ELECT 3.3MF	20%	50V		C702	1-136-173-00	FILM 0.47MF	5%	50V	
C47	1-162-524-11	CERAMIC CHIP 0.0022MF	20%	25V		C703	1-161-379-00	CERAMIC 0.01MF	20%	16V	
C48	1-124-477-11	CAP, ELECT 47MF	20%	16V		C704	1-126-094-11	ELECT 4.7MF	20%	25V	
C61	1-101-006-00	CAP, CERAMIC 0.047MF F	20%	50V		C705	1-162-200-31	CERAMIC 11PF	5%	50V	
C62	1-124-499-11	CAP, ELECT 1.0MF	20%	50V		C706	1-162-200-31	CERAMIC 11PF	5%	50V	
C63	1-163-063-00	CERAMIC MELF 0.022MF		25V		C707	1-136-173-00	FILM 0.47MF	5%	50V	
C64	1-161-379-00	CAP, CERAMIC 10000PF Y	30%	16V		C708	1-136-173-00	FILM 0.47MF	5%	50V	
C65	1-163-063-00	CERAMIC MELF 0.022MF		25V		C709	1-164-159-11	CERAMIC 0.1MF		50V	
C66	1-163-059-00	CERAMIC MELF 0.01MF	20%	16V		C710	1-164-159-11	CERAMIC 0.1MF		50V	
C67	1-124-499-11	CAP, ELECT 1.0MF	20%	50V		CC2	1-249-997-11	CARBON MELF 0	5%	1/8W	
C68	1-101-005-00	CAP, CERAMIC 0.022MF F	20%	50V							

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
CF1	1-567-389-11	FILTER, CERAMIC	D715	8-719-000-26	DIODE US1060M
CF2	1-567-389-11	FILTER, CERAMIC	D716	8-719-000-26	DIODE US1060M
CF21	1-577-075-11	OSCILLATOR, CERAMIC (456kHz)	D717	8-719-000-26	DIODE US1060M
CFT21	1-404-853-11	TRANSFORMER,IF(CERAMIC FILTER)	D718	8-719-000-26	DIODE US1060M
CN701	*1-568-279-11	SOCKET, CONNECTOR 4P	D719	8-719-000-26	DIODE US1060M
CN702	*1-568-281-11	SOCKET, CONNECTOR 6P	D720	8-719-000-26	DIODE US1060M
CN703	*1-568-281-11	SOCKET, CONNECTOR 6P	D721	8-719-000-26	DIODE US1060M
CNJ1	*1-568-276-11	SOCKET, CONNECTOR 10P	D722	8-719-000-26	DIODE US1060M
CNJ2	*1-568-272-11	SOCKET, CONNECTOR 6P	D723	8-719-000-26	DIODE US1060M
CNJ3	*1-568-419-11	PIN, CONNECTOR 9P	D724	8-719-000-26	DIODE US1060M
CNJ4	*1-568-372-11	PIN, CONNECTOR 3P	FE1	1-463-862-21	FRONT END, FM
CNJ5	*1-568-268-11	SOCKET, CONNECTOR 2P	FE61	1-236-464-11	ENCAPSULATED COMPONENT (MW RF BLOCK)
CNP	1-574-636-11	COR (WITH CONNECTOR)	FL701	1-519-517-11	INDICATOR TUBE, FLUORESCENT
CT61	1-141-227-00	CAP, TRIMMER	IC21	8-759-821-45	IC LA1851N
CT64			IC91	8-759-820-91	IC LC7218
D61	8-719-801-24	DIODE 1SS238TP	IC701	8-759-234-35	IC TMP47C670N-1283
D62	8-719-801-24	DIODE 1SS238TP	IC702	8-749-920-59	IC A1QH3020S
D63	8-719-801-24	DIODE 1SS238TP	L1	1-410-521-11	MICRO INDUCTOR
D64	8-719-801-24	DIODE 1SS238TP	L21	1-410-171-11	MICRO INDUCTOR
D65	8-719-801-24	DIODE 1SS238TP	L22	1-410-518-41	MICRO INDUCTOR
D66	8-719-801-24	DIODE 1SS238TP	L61	1-410-171-11	MICRO INDUCTOR
D67	8-719-801-24	DIODE 1SS238TP	L62	1-410-171-11	MICRO INDUCTOR
D68	8-719-801-24	DIODE 1SS238TP	L63	1-410-624-11	MICRO INDUCTOR
D69	8-719-801-24	DIODE 1SS238TP	L64	1-410-624-11	MICRO INDUCTOR
D70	8-719-801-24	DIODE 1SS238TP	L65	1-410-624-11	MICRO INDUCTOR
D71	8-719-801-24	DIODE 1SS238TP	L66	1-410-624-11	MICRO INDUCTOR
D72	8-719-801-24	DIODE 1SS238TP	L67	1-410-624-11	MICRO INDUCTOR
D73	8-719-801-24	DIODE 1SS238TP	L68	1-410-624-11	MICRO INDUCTOR
D74	8-719-801-24	DIODE 1SS238TP	L701	1-410-521-11	INDUCTOR 100UH
D75	8-719-801-24	DIODE 1SS238TP	L702	1-410-521-11	INDUCTOR 100UH
D76	8-719-801-24	DIODE 1SS238TP	L703	1-408-080-00	INDUCTOR 100UH
D77	8-719-975-10	DIODE KV-1560NT	L704	1-408-080-00	INDUCTOR 100UH
D701	8-719-000-26	DIODE US1060M	LPF21	1-235-164-00	FILTER, LOW PASS
D704	8-719-000-26	DIODE US1060M	LPF22	1-235-164-00	FILTER, LOW PASS
D705	8-719-000-26	DIODE US1060M	Q1	8-729-266-93	TRANSISTOR 2SC2669
D708	8-719-000-26	DIODE US1060M	Q2	8-729-266-93	TRANSISTOR 2SC2669
D709	8-719-000-26	DIODE US1060M	Q21	8-729-820-23	TRANSISTOR 2SC3330-S
D710	8-719-000-26	DIODE US1060M	Q22	8-729-820-23	TRANSISTOR 2SC3330-S
D711	8-719-000-26	DIODE US1060M	Q23	8-729-900-61	TRANSISTOR DTA114ES
D712	8-719-000-26	DIODE US1060M	Q24	8-729-900-80	TRANSISTOR DTC114ES
D713	8-719-000-26	DIODE US1060M	Q25	8-729-900-80	TRANSISTOR DTC114ES
D714	8-719-000-26	DIODE US1060M	Q61	8-729-900-80	TRANSISTOR DTC114ES
			Q62	8-729-900-80	TRANSISTOR DTC114ES
			Q63	8-729-900-80	TRANSISTOR DTC114ES
			Q64	8-729-900-61	TRANSISTOR DTA114ES
			Q65	8-729-900-61	TRANSISTOR DTA114ES

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description	
Q91	8-729-900-61	TRANSISTOR DTA114ES	R67	1-249-343-11	CARBON MELF 4.7K 5% 1/8W	
Q92	8-729-900-80	TRANSISTOR DTC114ES	R68	1-249-319-11	CARBON MELF 47 5% 1/8W	
Q111	8-729-202-67	TRANSISTOR 2SK246GR3	R70	1-249-353-11	CARBON MELF 33K 5% 1/8W	
Q112	8-729-201-84	TRANSISTOR 2SC3112-B	R71	1-249-353-11	CARBON MELF 33K 5% 1/8W	
Q113	8-729-202-67	TRANSISTOR 2SK246GR3	R72	1-249-340-11	CARBON MELF 2.7K 5% 1/8W	
Q114	8-729-201-84	TRANSISTOR 2SC3112-B	R73	1-249-340-11	CARBON MELF 2.7K 5% 1/8W	
Q701	8-729-900-89	TRANSISTOR DTC144ES	R74	1-249-343-11	CARBON MELF 4.7K 5% 1/8W	
Q702	8-729-900-89	TRANSISTOR DTC144ES	R76	1-249-353-11	CARBON MELF 33K 5% 1/8W	
Q703	8-729-900-80	TRANSISTOR DTC114ES	R77	1-249-353-11	CARBON MELF 33K 5% 1/8W	
R1	△.1-249-401-11	RES, CARBON (SMALL) 47	5% 1/4W F	R78	1-249-340-11	CARBON MELF 2.7K 5% 1/8W
R3	1-249-329-11	CARBON MELF 330	5% 1/8W	R79	1-249-359-11	CARBON MELF 100K 5% 1/8W
R4	1-249-329-11	CARBON MELF 330	5% 1/8W	R80	1-249-355-11	CARBON MELF 47K 5% 1/8W
R5	1-249-329-11	CARBON MELF 330	5% 1/8W	R81	1-249-338-11	CARBON MELF 1.8K 5% 1/8W
R6	1-249-350-11	CARBON MELF 18K	5% 1/8W	R82	1-249-343-11	CARBON MELF 4.7K 5% 1/8W
R7	1-249-329-11	CARBON MELF 330	5% 1/8W	R91	1-249-335-11	CARBON MELF 1K 5% 1/8W
R8	1-249-332-11	CARBON MELF 560	5% 1/8W	R92	1-249-335-11	CARBON MELF 1K 5% 1/8W
R9	1-249-352-11	CARBON MELF 27K	5% 1/8W	R93	1-249-335-11	CARBON MELF 1K 5% 1/8W
R21	△.1-249-404-00	RES, CARBON (SMALL) 82	5% 1/4W F	R94	1-249-335-11	CARBON MELF 1K 5% 1/8W
R22	1-249-351-11	CARBON MELF 22K	5% 1/8W	R95	1-249-347-11	CARBON MELF 10K 5% 1/8W
R23	1-249-335-11	CARBON MELF 1K	5% 1/8W	R96	1-249-335-11	CARBON MELF 1K 5% 1/8W
R24	1-249-340-11	CARBON MELF 2.7K	5% 1/8W	R97	1-249-347-11	CARBON MELF 10K 5% 1/8W
R25	1-249-346-11	CARBON MELF 8.2K	5% 1/8W	R98	1-249-343-11	CARBON MELF 4.7K 5% 1/8W
R26	1-249-350-11	CARBON MELF 18K	5% 1/8W	R99	1-249-335-11	CARBON MELF 1K 5% 1/8W
R27	1-249-423-11	RES, CARBON (SMALL) 3.3K	5% 1/4W	R100	1-249-335-11	CARBON MELF 1K 5% 1/8W
R28	1-249-347-11	CARBON MELF 10K	5% 1/8W	R101	△.1-249-401-11	RES, CARBON (SMALL) 47 5% 1/4W F
R30	1-249-331-11	CARBON MELF 470	5% 1/8W	R111	1-249-341-11	CARBON MELF 3.3K 5% 1/8W
R31	1-249-347-11	CARBON MELF 10K	5% 1/8W	R112	1-249-332-11	CARBON MELF 560 5% 1/8W
R32	1-249-347-11	CARBON MELF 10K	5% 1/8W	R113	1-249-335-11	CARBON MELF 1K 5% 1/8W
R33	1-249-437-11	RES, CARBON (SMALL) 47K	5% 1/4W	R114	1-249-328-11	CARBON MELF 270 5% 1/8W
R34	1-249-355-11	CARBON MELF 47K	5% 1/8W	R115	1-249-343-11	CARBON MELF 4.7K 5% 1/8W
R35	1-249-365-11	CARBON MELF 330K	5% 1/8W	R116	1-249-339-11	CARBON MELF 2.2K 5% 1/8W
R36	1-249-339-11	CARBON MELF 2.2K	5% 1/8W	R117	1-249-343-11	CARBON MELF 4.7K 5% 1/8W
R37	1-249-338-11	CARBON MELF 1.8K	5% 1/8W	R118	1-249-323-11	CARBON MELF 100 5% 1/8W
R38	1-249-365-11	CARBON MELF 330K	5% 1/8W	R119	△.1-249-405-11	RES, CARBON (SMALL) 100 5% 1/4W F
R39	1-249-339-11	CARBON MELF 2.2K	5% 1/8W	R120	1-249-353-11	CARBON MELF 33K 5% 1/8W
R40	1-249-338-11	CARBON MELF 1.8K	5% 1/8W	R121	1-249-332-11	CARBON MELF 560 5% 1/8W
R41	1-249-344-11	CARBON MELF 5.6K	5% 1/8W	R122	1-249-335-11	CARBON MELF 1K 5% 1/8W
R42	1-249-344-11	CARBON MELF 5.6K	5% 1/8W	R123	1-249-328-11	CARBON MELF 270 5% 1/8W
R43	△.1-249-409-11	RES, CARBON (SMALL) 220	5% 1/4W F	R124	1-249-347-11	CARBON MELF 10K 5% 1/8W
R61	1-249-347-11	CARBON MELF 10K	5% 1/8W	R125	1-249-339-11	CARBON MELF 2.2K 5% 1/8W
R62	1-249-347-11	CARBON MELF 10K	5% 1/8W	R126	1-249-343-11	CARBON MELF 4.7K 5% 1/8W
R63	1-249-331-11	CARBON MELF 470	5% 1/8W	R127	1-249-323-11	CARBON MELF 100 5% 1/8W
R64	1-249-354-11	CARBON MELF 39K	5% 1/8W	R701	1-249-405-11	CARBON 100 5% 1/4W
R65	1-249-359-11	CARBON MELF 100K	5% 1/8W	R702	1-249-438-11	CARBON 56K 5% 1/4W
R66	1-249-355-11	CARBON MELF 47K	5% 1/8W	R703	1-249-435-11	CARBON 33K 5% 1/4W

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

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description
R704	1-249-429-11	CARBON	10K	5%	1/4W	S716	1-554-596-21	SWITCH, KEY BOARD (PRESET TUNING)
R705	1-249-433-11	CARBON	22K	5%	1/4W	S717	1-554-596-21	SWITCH, KEY BOARD (TIME/FREQUENCY)
R706	1-249-438-11	CARBON	56K	5%	1/4W	S718	1-554-596-21	SWITCH, KEY BOARD (TIMER/TUNER +)
R707	1-249-435-11	CARBON	33K	5%	1/4W	S719	1-554-596-21	SWITCH, KEY BOARD (TIMER/TUNER -)
R708	1-249-441-11	CARBON	100K	5%	1/4W	S720	1-554-596-21	SWITCH, KEY BOARD (CLOCK)
R709	1-249-429-11	CARBON	10K	5%	1/4W	S721	1-554-596-21	SWITCH, KEY BOARD (TIMER CONTROL)
R710	1-249-429-11	CARBON	10K	5%	1/4W	S722	1-554-596-21	SWITCH, KEY BOARD (TIMER SET)
R711	1-249-429-11	CARBON	10K	5%	1/4W	S723	1-554-596-21	SWITCH, KEY BOARD (SLEEP)
R712	1-249-429-11	CARBON	10K	5%	1/4W	T21	1-404-807-11	TRANSFORMER, DISCRIMINATOR
R713	1-249-429-11	CARBON	10K	5%	1/4W	T61	1-402-447-11	COIL (ANT SW1)
R714	1-249-429-11	CARBON	10K	5%	1/4W	T62	1-406-345-11	COIL (OSC SW1)
R715	1-249-429-11	CARBON	10K	5%	1/4W	T63	1-402-448-11	COIL (ANT SW2)
R716	1-249-429-11	CARBON	10K	5%	1/4W	T64	1-406-346-11	COIL (OSC SW2)
R717	1-249-423-11	CARBON	3.3K	5%	1/4W	TM1	1-536-708-00	TERMINAL BOARD, PUSH 4P (ANT)
R718	1-249-429-11	CARBON	10K	5%	1/4W	TP1	*1-560-060-00	PIN, CONNECTOR 2P
R719	1-249-429-11	CARBON	10K	5%	1/4W	X701	1-567-821-21	VIBRATOR, CRYSTAL (4.19MHz)
R720	1-249-429-11	CARBON	10K	5%	1/4W	XT91	1-577-126-11	VIBRATOR, CRYSTAL (7.2MHz)
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			
R728	1-249-417-11	CARBON	1K	5%	1/4W			
RB701	1-233-125-11	COMPOSITION CIRCUIT BLOCK(10KX4)						
RV21	1-238-013-11	RES, ADJ, CARBON 2.2K (FM STEREO SEPARATION)						
RV22	1-238-017-11	RES, ADJ, CARBON 22K (AM TUNED)						
RV23	1-238-017-11	RES, ADJ, CARBON 22K (FM TUNED)						
S701	1-554-596-21	SWITCH, KEY BOARD (1)						
S702	1-554-596-21	SWITCH, KEY BOARD (2)						
S703	1-554-596-21	SWITCH, KEY BOARD (3)						
S704	1-554-596-21	SWITCH, KEY BOARD (4)						
S705	1-554-596-21	SWITCH, KEY BOARD (5)						
S706	1-554-596-21	SWITCH, KEY BOARD (6)						
S707	1-554-596-21	SWITCH, KEY BOARD (7)						
S708	1-554-596-21	SWITCH, KEY BOARD (8)						
S709	1-554-596-21	SWITCH, KEY BOARD (9)						
S710	1-554-596-21	SWITCH, KEY BOARD (0)						
S711	1-554-596-21	SWITCH, KEY BOARD (STEREO MUTING)						
S712	1-554-596-21	SWITCH, KEY BOARD (MEMORY SCAN)						
S713	1-554-596-21	SWITCH, KEY BOARD (MEMORY NEXT)						
S714	1-554-596-21	SWITCH, KEY BOARD (SHIFT)						
S715	1-554-596-21	SWITCH, KEY BOARD (BAND)						

