DENON

Hi-Fi AM-FM Stereo Tuner

For EUROPEAN, U.S.A., & FRANCE MODELS

SERVICE MANUAL
MODEL TU-747
SOLID-STATE
AM-FM STEREO TUNER

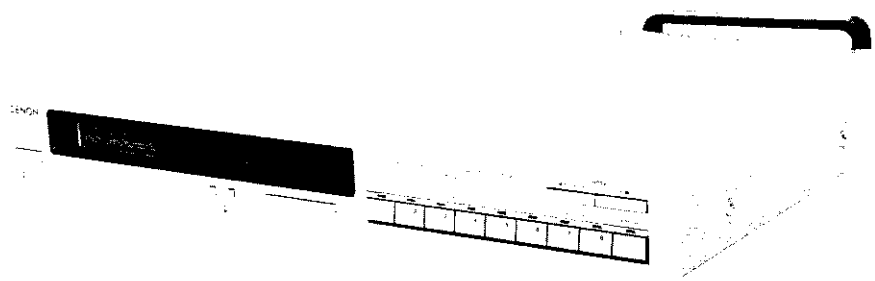


TABLE OF CONTENTS

NIPPON COLUMBIA CO., LTD.

DEC. 1983

SPECIFICATIONS

FM SECTION

Frequency Range:	87.5 ~ 108 MHz
Antenna:	75 ohm unbalanced
Usable Sensitivity:	1.0 μV (11.2 dBf)
S/N 50 dB Sensitivity:	Stereo: 23 μV (38.5 dBf) Monaural: 2.0 μV (17.2 dBf) The μV is at 75 ohm and 0 dBf at 10^{-15} W
Image Rejection:	80 dB
IF Rejection:	85 dB
Spurious Response Rejection:	80 dB
AM Suppression:	60 dB
Effective Selectivity:	70 dB (±400 kHz) (for Europe) 65 dB (±400 kHz) (for U.S.A.)
Capture Ratio:	1.0 dB
Frequency Response:	20 Hz to 15 kHz $^{+0.2}_{-1.5}$ dB
Signal-to-noise Ratio:	Monaural: 82 dB (for Europe) Monaural: 84 dB (for U.S.A.) Stereo: 78 dB (for Europe) Stereo: 80 dB (for U.S.A.)
Total Harmonic Distortion:	
Monaural	1 kHz 0.1% (at 100% modulation) (for Europe) 1 kHz 0.08% (at 100% modulation) (for U.S.A.)
Stereo	1 kHz 0.3% (at 90% modulation) (for Europe) 1 kHz 0.1% (at 90% modulation) (for U.S.A.)
Stereo Separation:	1 kHz 45 dB
Muting Level:	22 dB
Output Level (at 100% modulation):	0.6 V (75 kHz deviation)

AM SECTION (MW or LW)

MEDIUM WAVE

Frequency Range:	522 ~ 1611 kHz (for Europe) 520 ~ 1710 kHz (for U.S.A.)
Antenna Terminal:	Terminal Type, with Loop Antenna
Usable Sensitivity:	18 μV
Selectivity:	50 dB
Image Rejection:	45 dB
Signal-to-noise Ratio:	50 dB
Total Harmonic Distortion:	0.6%
Output Level (at 30% modulation):	0.2 V

or LONG WAVE

Frequency Range:	153 ~ 360 kHz
Usable Sensitivity:	40 μV
Selectivity:	50 dB
Image Rejection	60 dB
Signal-to-noise Ratio:	50 dB

OTHERS

Power Supply:	AC 120 V/60 Hz (for U.S.A. and Canada) AC 220 V/50 Hz (for Europe) AC 240 V/50 Hz (for England and Australia)
Power Consumption:	AC 8 W
Dimensions:	434 mm (17-3/32") W x 66 mm (2-19/32") H x 281 mm (11-2/32") D
Net Weight:	3.3 kg (7.28 lbs.)

Design and specifications are subject to change without prior notice.

NOTE: The following codes correspond to the appropriate models.
E2 for Europe, E3 for U.S.A., EC for Canada, EK for U.K., EA for Australia, and E1 Hong Kong & Singapore. This Service Manual is prepared based on E2.

FUNCTIONS OF PANEL CONTROLS

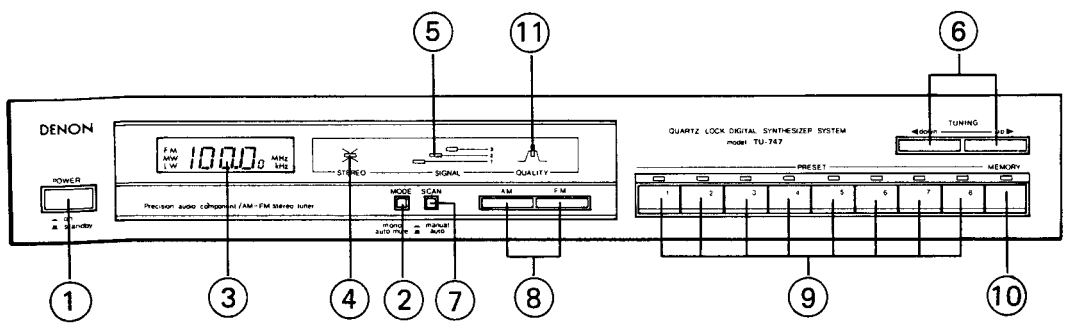


Fig. 1

① POWER (Power On/Standby Switch)
② MODE (Mode Switch)
auto/mute, mono
③ DIGITAL FREQUENCY INDICATOR
④ STEREO (Stereo Indicator)
⑤ SIGNAL (Signal-Strength Indicators)
⑥ TUNING (Tuning Buttons)
▶ up, ◀ down
⑦ SCAN (Tuning Mode Changeover Switch)
auto, manual
⑧ SELECT (Selector Buttons)
FM, AM
⑨ PRESET CHANNEL 1 to 8 (Preset Channel Buttons)
⑩ MEMORY (Memory Button)
⑪ QUALITY (Quality Indicator)

CONNECTIONS

ANTENNA INSTALLATION

- LEAD WIRE FM INDOOR ANTENNA

A lead wire indoor antenna can be used in a wood-frame house where broadcasting stations are located nearby and strong signals can be received. While receiving an FM program, extend the antenna. Orient for optimal reception and mount the antenna on the wall or ceiling.

* In general, FM indoor antenna might not consistently assure stable reception, due to environmental changes. In such case use an FM indoor antenna temporarily until an outdoor antenna is installed.

- FM OUTDOOR ANTENNA CONNECTION (Fig. 3)

Use 75-ohm coaxial cable, to connect the outdoor antenna and the tuner. The 75-ohm coaxial cable (3C–2V, 5C–2V) is preferable to obtain better performance of the tuner.

* Contact your local dealer for details on selection and installation of the FM outdoor antenna.

When connecting the coaxial cable to the antenna terminal using the DIN connector, please refer to the procedures in Fig. 3.

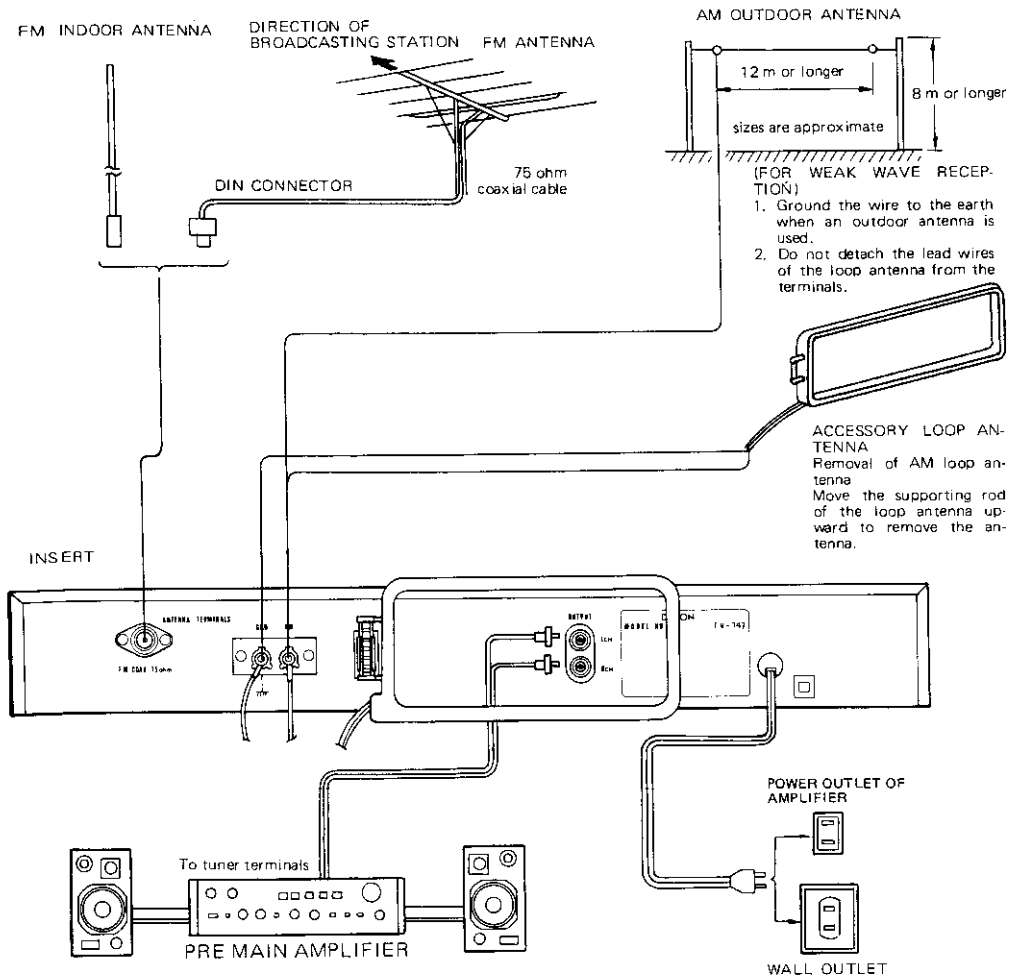


Fig. 2

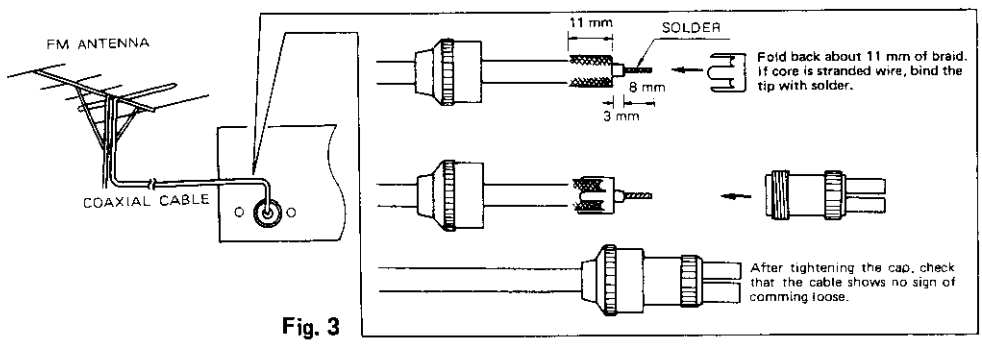


Fig. 3

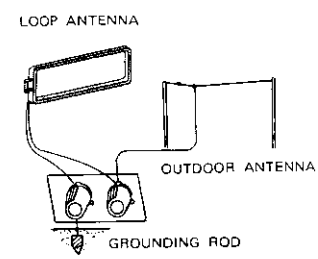


Fig. 4

- AM ANTENNA CONNECTION (Fig. 4)

  Since this model is provided with a high-perforamnce AM loop antenna at the back panel, this accessory antenna can effectively be used for optimal reception in places where broadcasting stations are located nearby and relatively strong signals are received with low noise.

  Orient the loop antenna horizontally for obtaining optimal reception.

  In places where strong, clear signals are not received due to the particular location and/or environmental conditions, connect a vinyl lead wire to the AM antenna terminals and hold it to the wall or lintel.

  In places where broadcasting stations are too far away and only weak signals are received, or where signals are blocked by obstacles, install an AM outdoor antenna.

  * Even if an AM outdoor antenna is installed, do not detach the AM loop antenna.

GROUNDING

If there is much noise during reception of a radio program, it is recommended that a grounding wire be used to ground the unit.

Connect a thick vinyl lead wire to the "GND" terminal, and wind the unconnected bare end around a metal water pipe, a grounding rod, or a grounded copper plate.

* Do not connect a grounding wire to a gas pipe in order to prevent explosion of fire.

BLOCK DIAGRAM

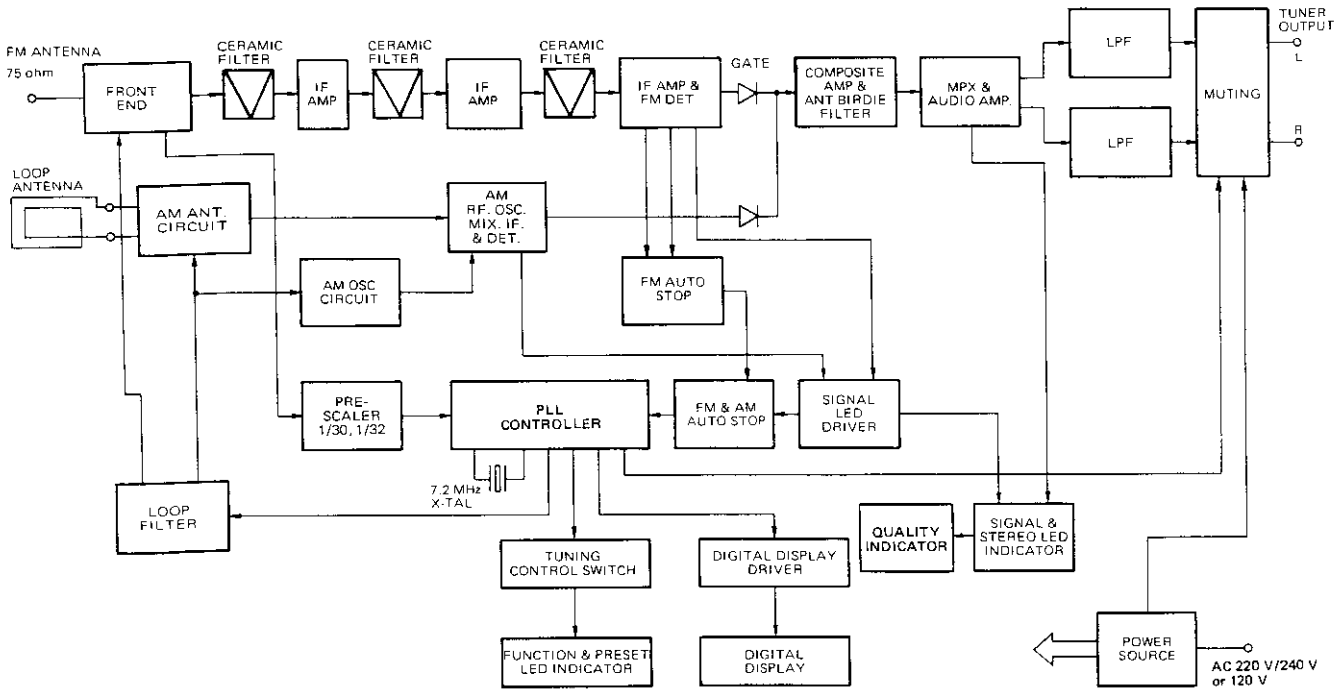


Fig. 5

REMOVAL OF EACH SECTION

1. How to remove the top cover (Fig. 6)

(1) Remove the four screws on both sides.
(2) Remove one black screw on the back panel.
(3) Raise the back of the top cover and remove it.

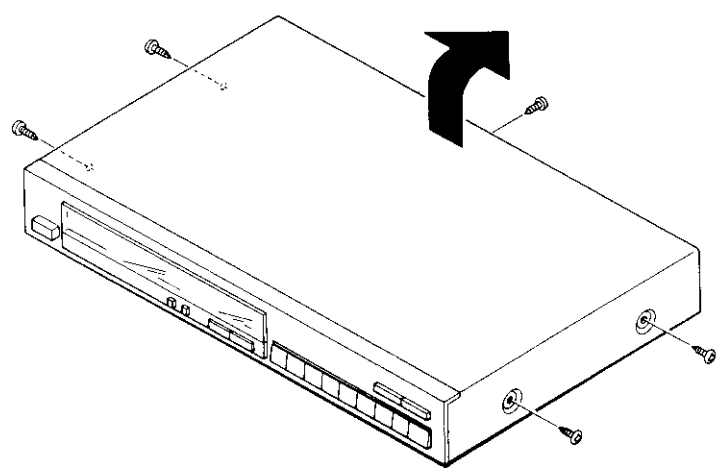


Fig. 6

2. **How to remove the FRONT PANEL (Fig. 7)**
   (1) Remove the three screws on the down side.
   (2) Remove screws from both sides to release the chassis.
   (3) Raise the FRONT PANEL and remove it.

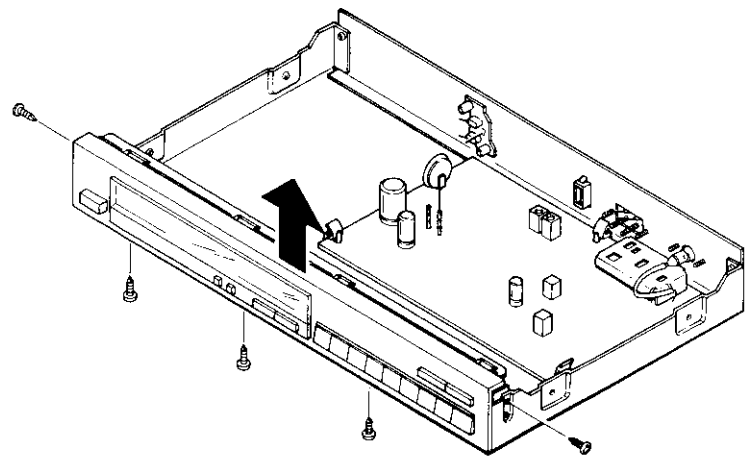


Fig. 7

3. **How to remove the DISPLAY UNIT (Fig. 8)**
   (1) Loosen the seven clamps fixing the main unit and by pull the clamps toward you.
   Be sure not to break the clamps.

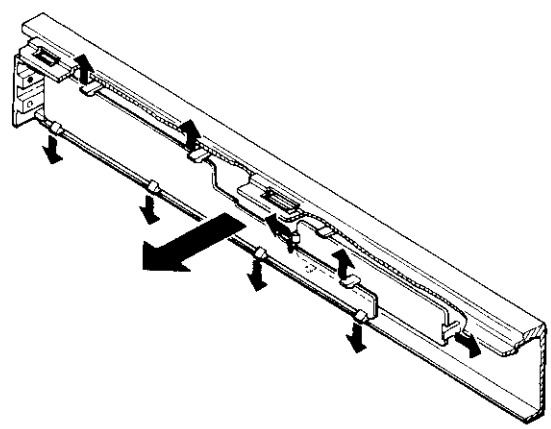


Fig. 8

4. **How to remove the TUNER UNIT (Fig. 9)**
   (1) Unpulling the connector for the FM antenna lead.
   (2) Bend the three outside PWB holders, raise the PWB and remove the TUNER UNIT.

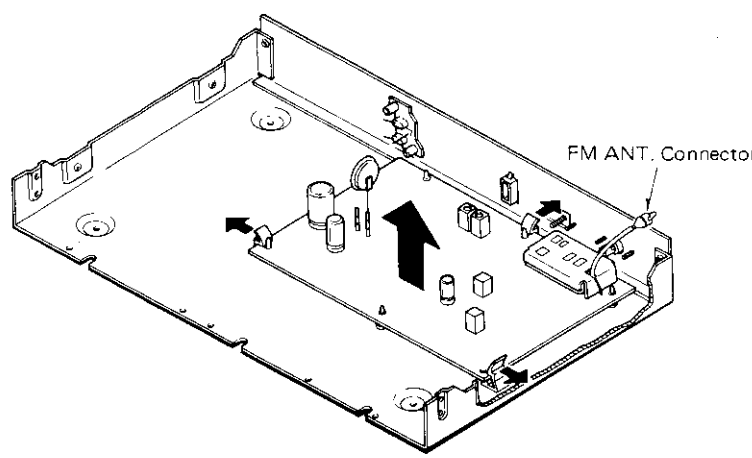


Fig. 9

METHOD OF ADJUSTMENTS

When making adjustments, be sure the power supply is at the rated voltage and the room air is in normal conditions with respect to temperature and humidity.

INSTRUMENT HOOK-UP DIAGRAM

FM

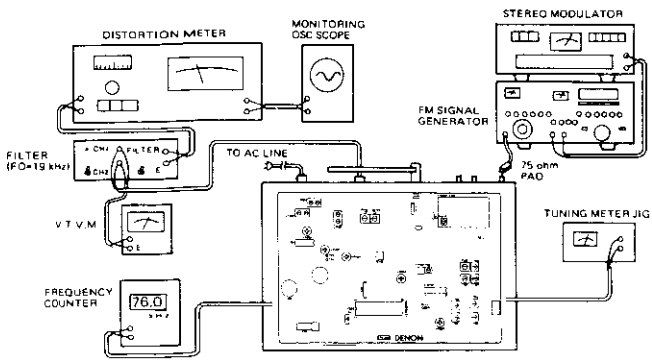


Fig. 10

AM

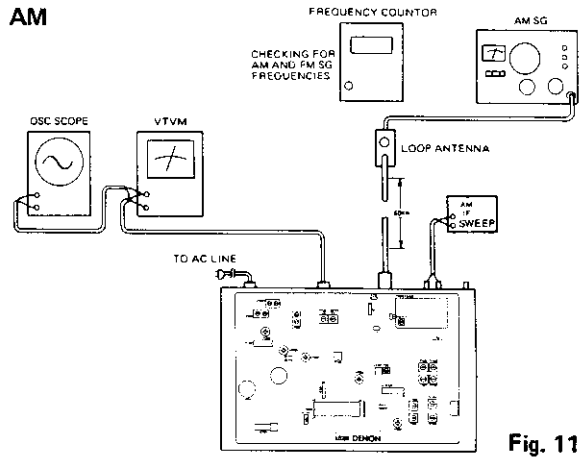


Fig. 11

INSTRUMENT CONNECTIONS AND SETTING

- **Preparation**

1. **Connection of Measuring Equipment**

FM

(1) Supply a signal having a frequency of 1 kHz from a low frequency signal generator to a stereo modulator, the modulated output of which is in turn supplied to an FM signal generator. Connect the output end of the FM signal generator to the antenna terminal (75 ohm) of the unit. Set the stereo modulator to the following conditions:

L + R: 67.5 kHz deviation 1 kHz (antenna input level: 60 dB/μV)

Pilot: 7.5 kHz deviation

(2) Connect a filter jig of 19 kHz to the output terminal L of the unit. Then, connect the output of the filter jig to a distortion meter, the output of which is in turn connected to an oscilloscope for monitoring.

(3) Connect tuning jigs to TP. 1 and 2.

(4) Connect frequency counters to TP. 3 and 4 (GND).

AM

(1) Connect a low-frequency signal generator, apply 400 Hz to the AM signal generator.
The AM signal generator should be set as follows:

Modulation: 30%

(Antenna input signal level: about 80 dB/m).

2. **Setting of Switches of the Unit**

- MODE: auto/mute
- SCAN: auto
- SELECT: FM

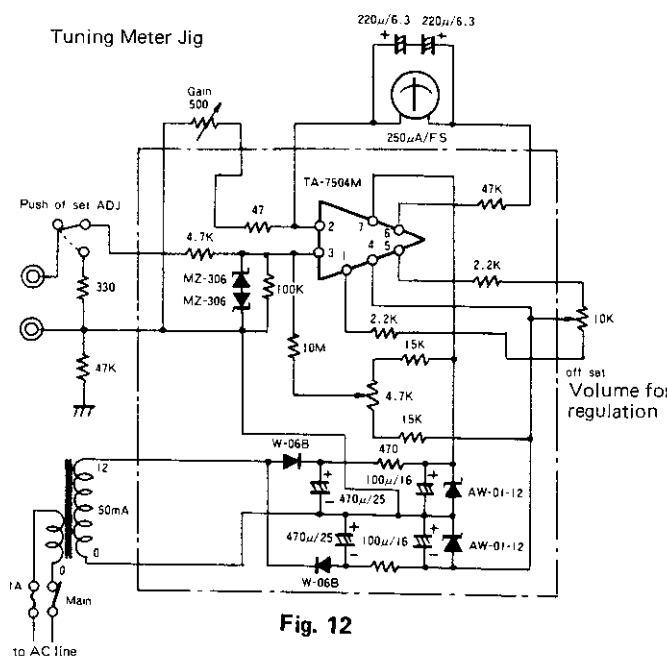


Fig. 12

FM/MPX ALIGNMENT (Fig. 10)

Step	Alignment Item	Tuning Frequency Setting	Input					Output		Adjustment		Remarks
			Type	Frequency	Input Level	Modulation	Coupling	Type	Connect to	Points	Adjust to	
1	76 kHz	98 MHz	FM Standard Signal Generator Mono.	98 MHz	60 dBμ	1 kHz 75 kHz Dev.	Antenna Terminal	Frequency Counter	T.P. 3 T.P. 4 (GND)	VR 201	76 kHz ± 50 Hz	Function: FM Mode: Auto
2	Tuning Center	98 MHz	FM SSG, Mono	98 MHz	60 dBμ	None	Antenna Terminal	Center Meter	T.P. 1, 2	T-1	Center of Tuning Meter	Function: FM Mode: Auto
3	Distortion (Mono)	98 MHz	FM SSG, Mono	98 MHz	60 dBμ	1 kHz 75 kHz Dev.	Antenna Terminal	Distortion Meter	Output Terminal (L)	T-2	Minimum Distortion	Function: FM Mode: Auto
4	Distortion (Stereo)	98 MHz	FM SSG Stereo (L)	98 MHz	60 dBμ	Main: 1 kHz L-ch 67.5 kHz Dev. Pilot: 7.5 kHz Dev.	Antenna Terminal	Distortion Meter	Output Terminal (L)	IFT on Front End	Minimum Distortion	Function: FM Mode: Auto
5	Noise Center & Distortion	Repeat 2, 3 and 4 to obtain minimum distortion and same time indicating of center meter at center condition.										
6	Separation	98 MHz	FM SSG Stereo (L), (R)	98 MHz	60 dBμ	Main: 1 kHz L-ch 67.5 kHz Dev. Pilot: 7.5 kHz	Antenna Terminal	Audio V.T.V.M.	Output Terminal (L), (R)	VR 202	Maximum Separation	Function: FM Mode: Auto
7	Signal LED	98 MHz	FM SSG, Mono	98 MHz	Muting Level (about 16 dBμ)	1 kHz 75 kHz Dev.	Antenna Terminal	–	–	VR 902	To light-up 1st Signal LED	Function: FM Mode: Auto

AM ALIGNMENT (Indicated in ( ) For LW) (Fig. 11)

1	AM IF	–	AM IF Sweep	–	Input Level is not over to works A.G.C.	–	AM Antenna Terminal	Oscilloscope	R511	T501	Maximum Height and Best Symmetry Curve	Function: AM Center of Wave Form: 450 kHz
2	Receiving Band Alignment	522 kHz 520 kHz (E3 & EC) (153 kHz)	AM SSG	522 kHz 520 kHz (E3 & EC) (153 kHz)	Input Level is not over to works A.G.C.	400 Hz 30%	Loop Antenna	Electric DC Voltmeter	J-62 (Jumper Wire)	T-503	1.2V ± 20 mV	Function: AM (LW)
		1611 kHz 1710 kHz (E3 & EC) (360 kHz)	AM SSG	1611 kHz 1710 kHz (E3 & EC) (360 kHz)	Input Level is not over to works A.G.C.	400 Hz 30%	Loop Antenna	Electric DC Voltmeter	J-62 (Jumper Wire)	TC-503	8.0V ± 20 mV	Function: AM (LW)
3	Tracking Alignment	603 kHz 600 kHz (E3 & EC) (173 kHz)	AM SSG	603 kHz 600 kHz (E3 & EC) (173 kHz)	Input Level is not over to works A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	T-502	Maximum Output	Function: AM (LW)
		1404 kHz 1400 kHz (E3 & EC) (308 kHz)	AM SSG	1404 kHz 1400 kHz (E3 & EC) (308 kHz)	Input Level is not over to works A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	TC-502	Maximum Output	Function: AM (LW)
4	Signal LED	999 kHz 1000 kHz (E3 & EC) (254 kHz)	AM SSG	999 kHz 1000 kHz (E3 & EC) (254 kHz)	55 dB/m (63 dB/m)	400 Hz 30%	Loop Antenna	–	–	VR-901	To Light-up 1st Signal LED	Function: AM (LW)

ETC0643J TUNER UNIT ALIGNMENT POINTS

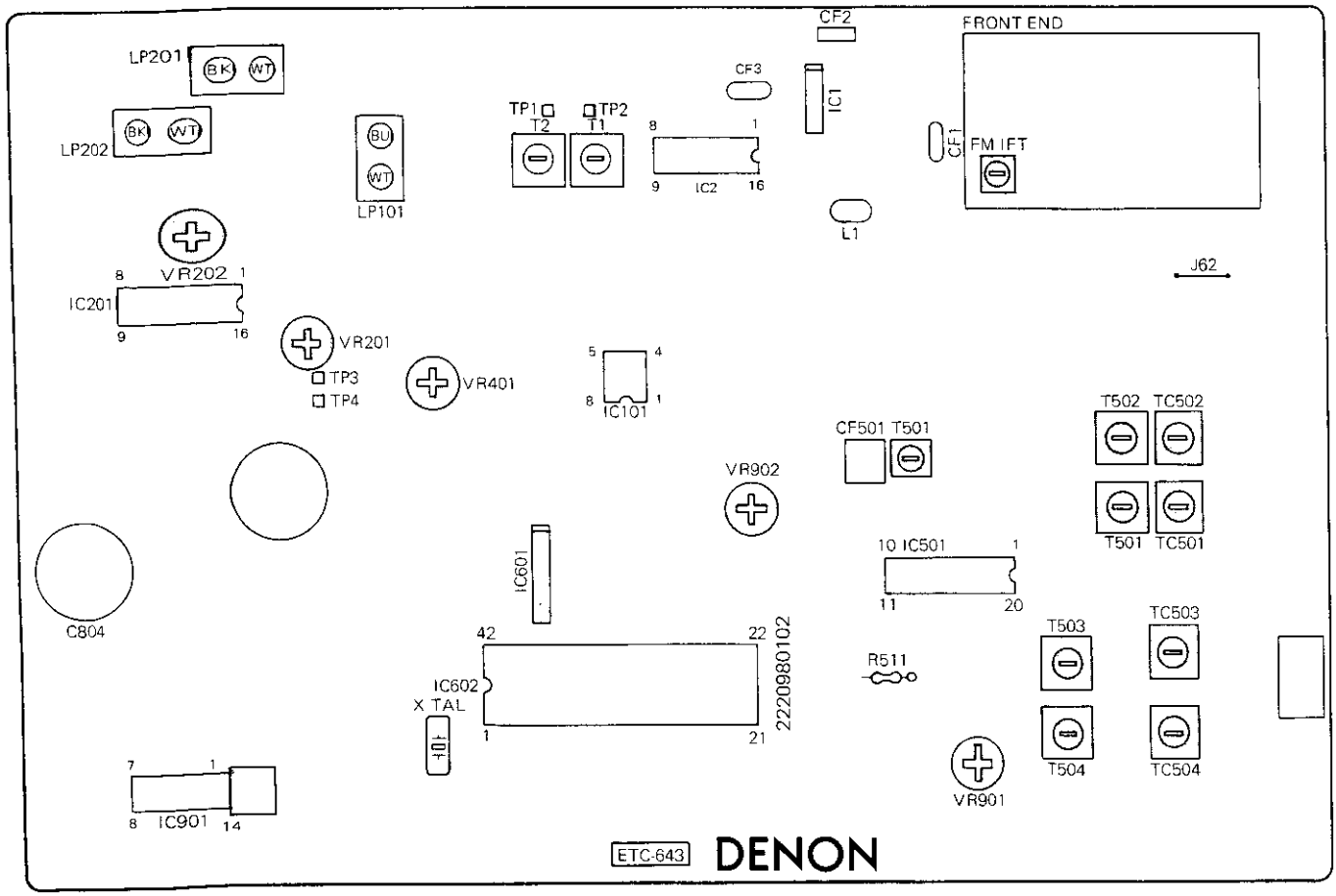
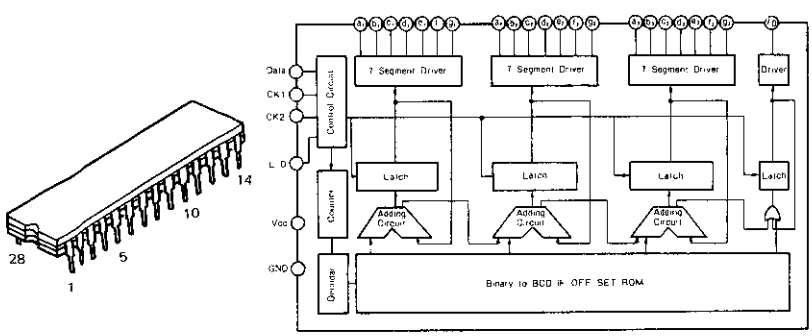


Fig. 13

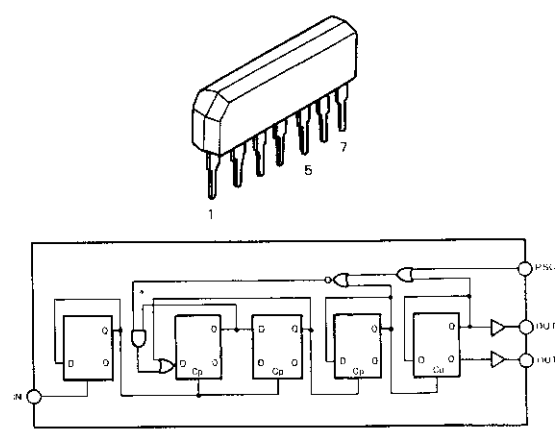
SEMICONDUCTORS

- **IC's**

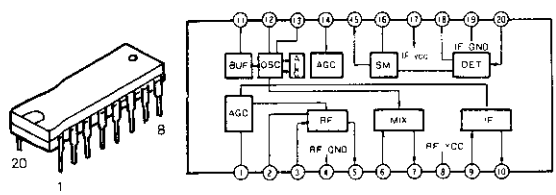
TD6301AP (Toshiba)



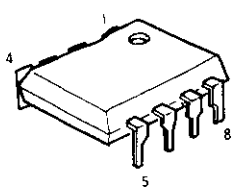
TD6104P (Toshiba)



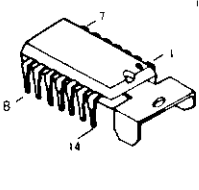
LA1245 (Sanyo)

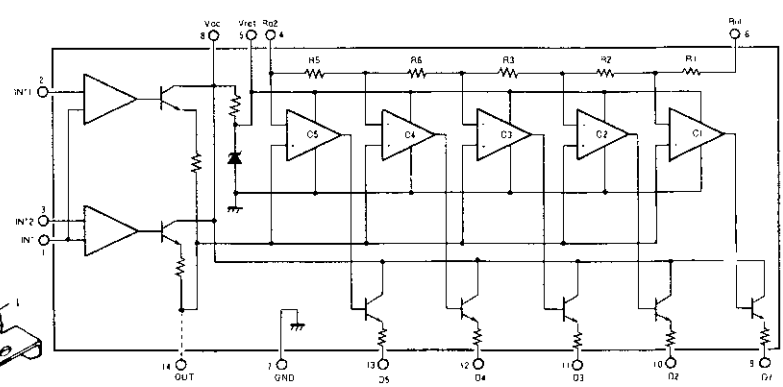


NJM4558D (JRC)

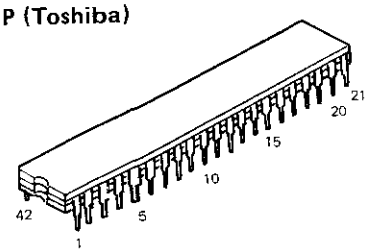


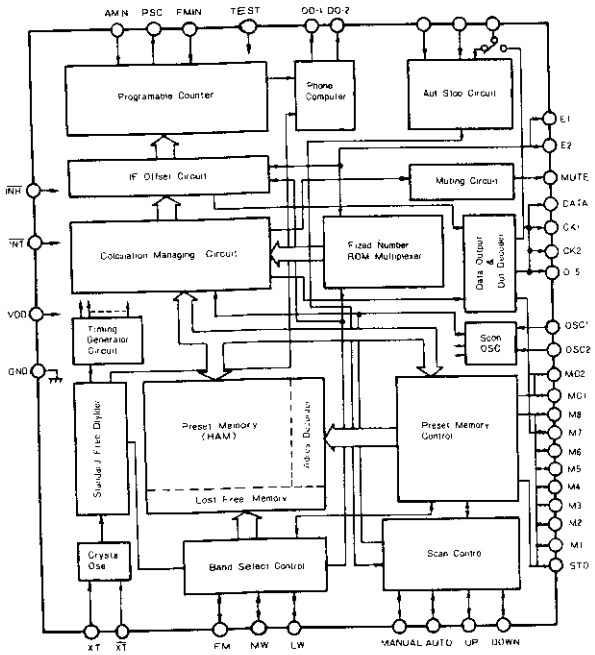
LB1426 (Sanyo)



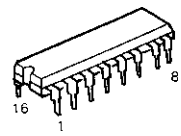


TC9147P (Toshiba)

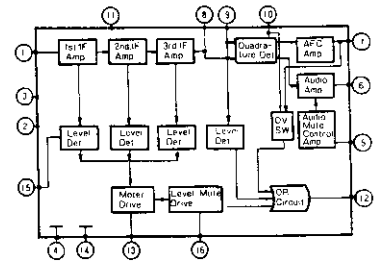




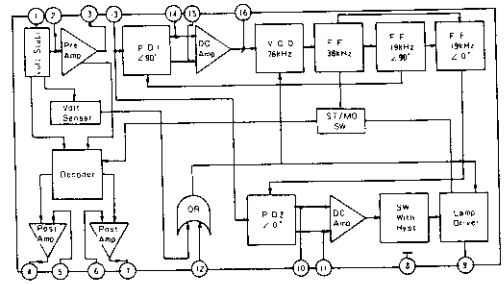
HA11225
HA12016
(Hitachi)



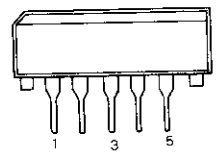
HA11225

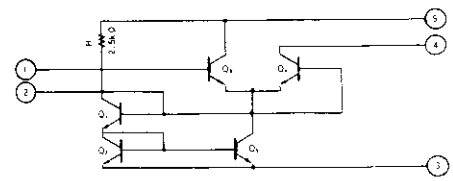


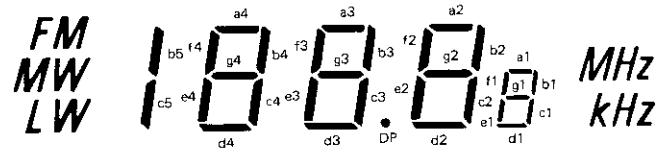
HA12016



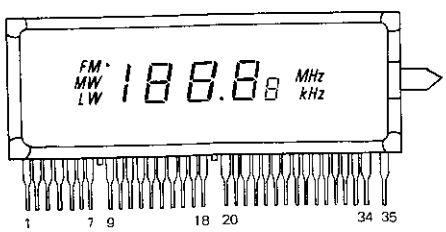
TA7060AP (Toshiba)







FIP7A8S (NEC)

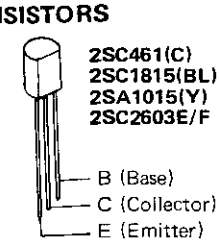


Connecting electrodes

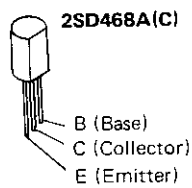
Number of terminal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Connecting electrode	F	P(b_5, c_5)	P(a_4)	P(f_4)	P(e_4)	P(d_4)	P(c_4)	N.P	P(g_4)	P(b_4)	P(a_3)	P(f_3)	P(e_3)	P(d_3)	P(c_3)	P(g_3)	P(b_3)	P(a_2)
Number of terminal	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Connecting electrode	N.P	P(f_2)	P(e_2)	P(d_2)	P(c_2)	P(g_2)	P(b_2)	P	P(b_1, e_1)	P(g_1)	P(kHz)	P(MHz)	P	P(FMc, DP d_1, a_1, f_1, j)	P(MW)	P(LW)	G	G	F

• TRANSISTORS

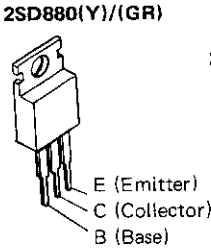
2SC461(C)
2SC1815(BL)
2SA1015(Y)
2SC2603E/F



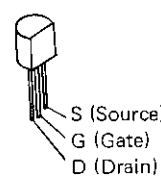
2SD468A(C)



2SD880(Y)/(GR)

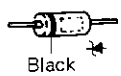


(FET)
2SK163(M)

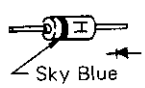


• DIODES, LEDS

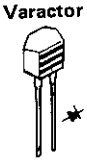
HZ6-B2
HZ15-2



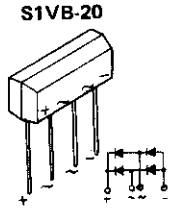
1S2076



SVC321SP-D2
Varactor

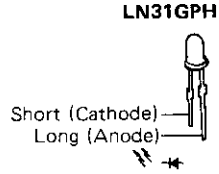


S1VB-20

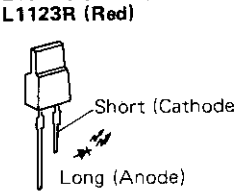


(LED)

SEL1110W (White/Red)
LN31GPHL (Green)

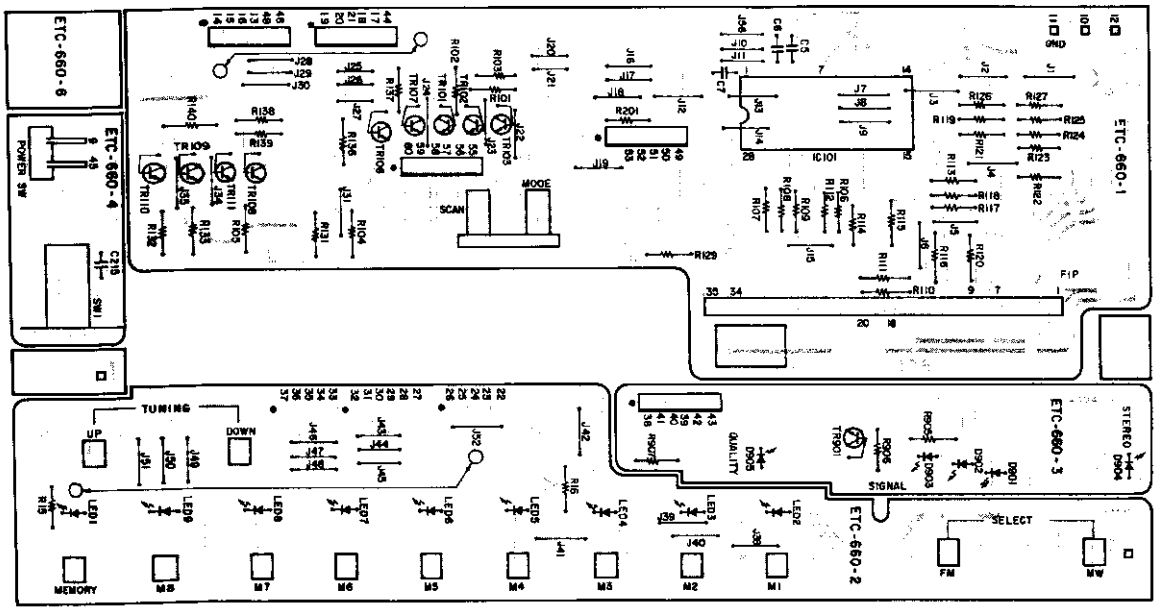


SEL1323G (Green)
SEL1123R (Red)



PRINTED WIRING BOARD PATTERNS AND PARTS LIST

ETC0660J DISPLAY UNIT FOR E2

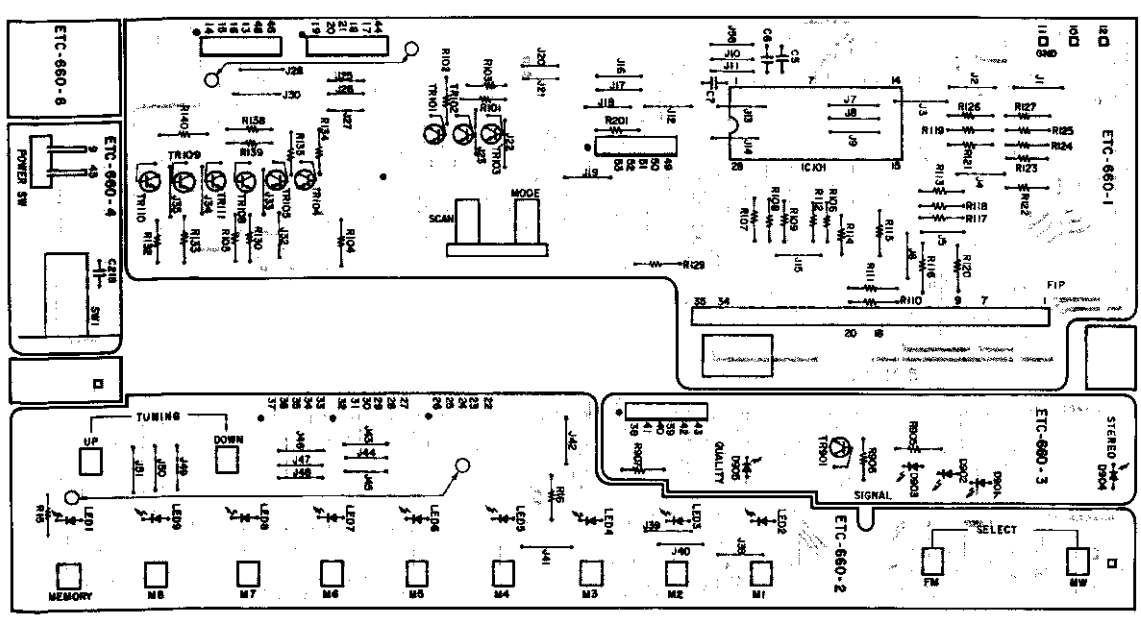


ETC0660J DISPLAY UNIT PARTS LIST FOR E2

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
IC101	2620453006	TD6301AP (Toshiba)	IC
TR101 ~103	2730198015	2SC1815 (BL)	Transistor
TR106 ~111	2730198015	2SC1815 (BL)	Transistor
TR301	2730198015	2SC1815 (BL)	Transistor
D001	3939165000	SEL1323G (Green)	LED
D002 ~009	3939165013	SEL1123R (Red)	LED
D901 ~903	3939239004	LN31GPHL (Green)	LED
D904	3939236007	SEL1110W (Red)	LED
D905	3939239004	LN31GPHL (Green)	LED
RESISTORS (not included Carbon Film ±5%, ¼W Type)			
CAPACITORS (not included Ceramic ±10%, 50V Type)			
C215	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic	

Ref. No.	Part No.	Part Name & Descriptions	
SWITCHES			
	2124407008	Tact Switch	Used 13
	2124456004	1P Push Switch	For Power
	2124460003	2P Push Switch	
OTHER PARTS			
	2221005002	P.W. Board	
	2050134908	Terminal Pin	Used 3
	2090008120	0.6 Jumper Wire	Used 49
	3934011007	F1P7A8S	
	2050185054	5P Wire Holder	Used 3
	2050185041	4P Wire Holder	
	2050185067	6P Wire Holder	Used 5

ETC0660K DISPLAY UNIT FOR EF

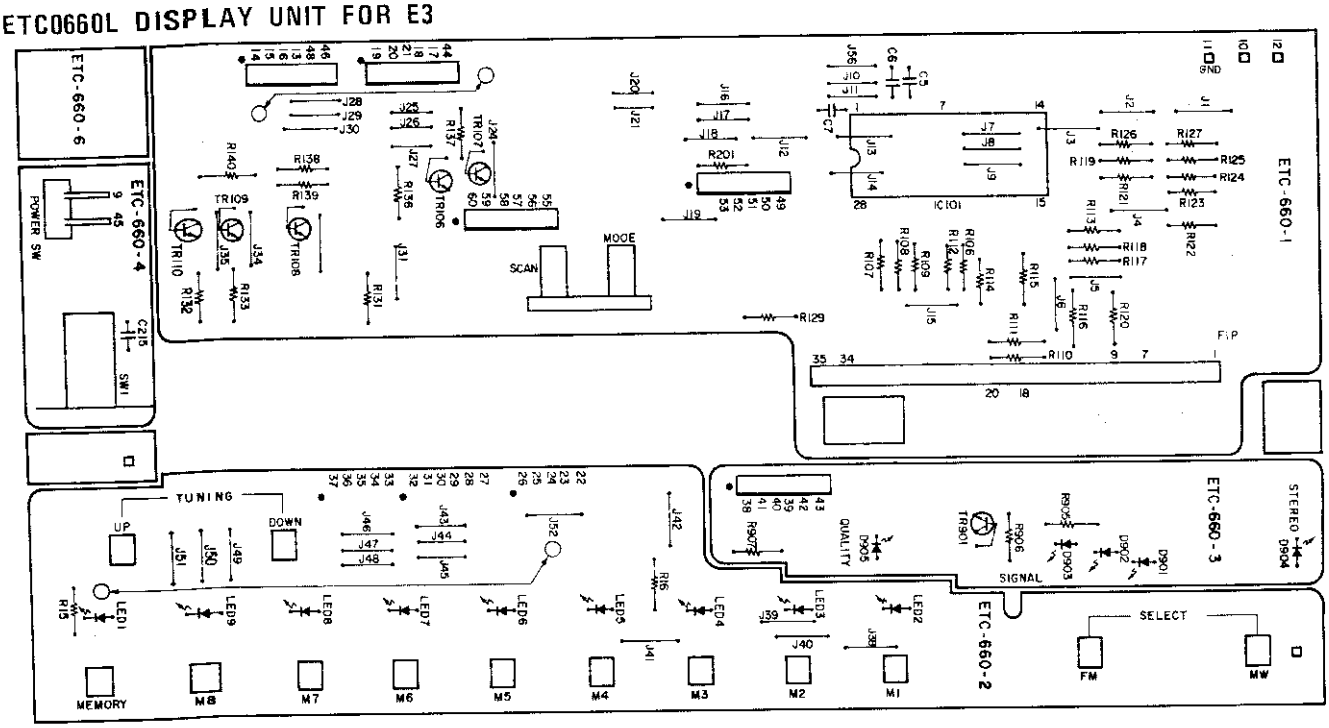


ETC0660K DISPLAY UNIT PARTS LIST FOR EF (same as ETC0660J except the followings)

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
TR104	2730198015	2SC1815 (BL) Transistor (Add.)
TR105	2730198015	2SC1815 (BL) Transistor (Add.)
TR106	2730198015	2SC1815 (BL) Transistor (Delete)
TR107	2730198015	2SC1815 (BL) Transistor (Delete)

Ref. No.	Part No.	Part Name & Descriptions
		RESISTORS
R131	2412116001	10kohm ±5% ¼W Carbon Film (Change)
R137	2412116001	10kohm ±5% ¼W Carbon Film (Change)

ETC0660L DISPLAY UNIT FOR E3

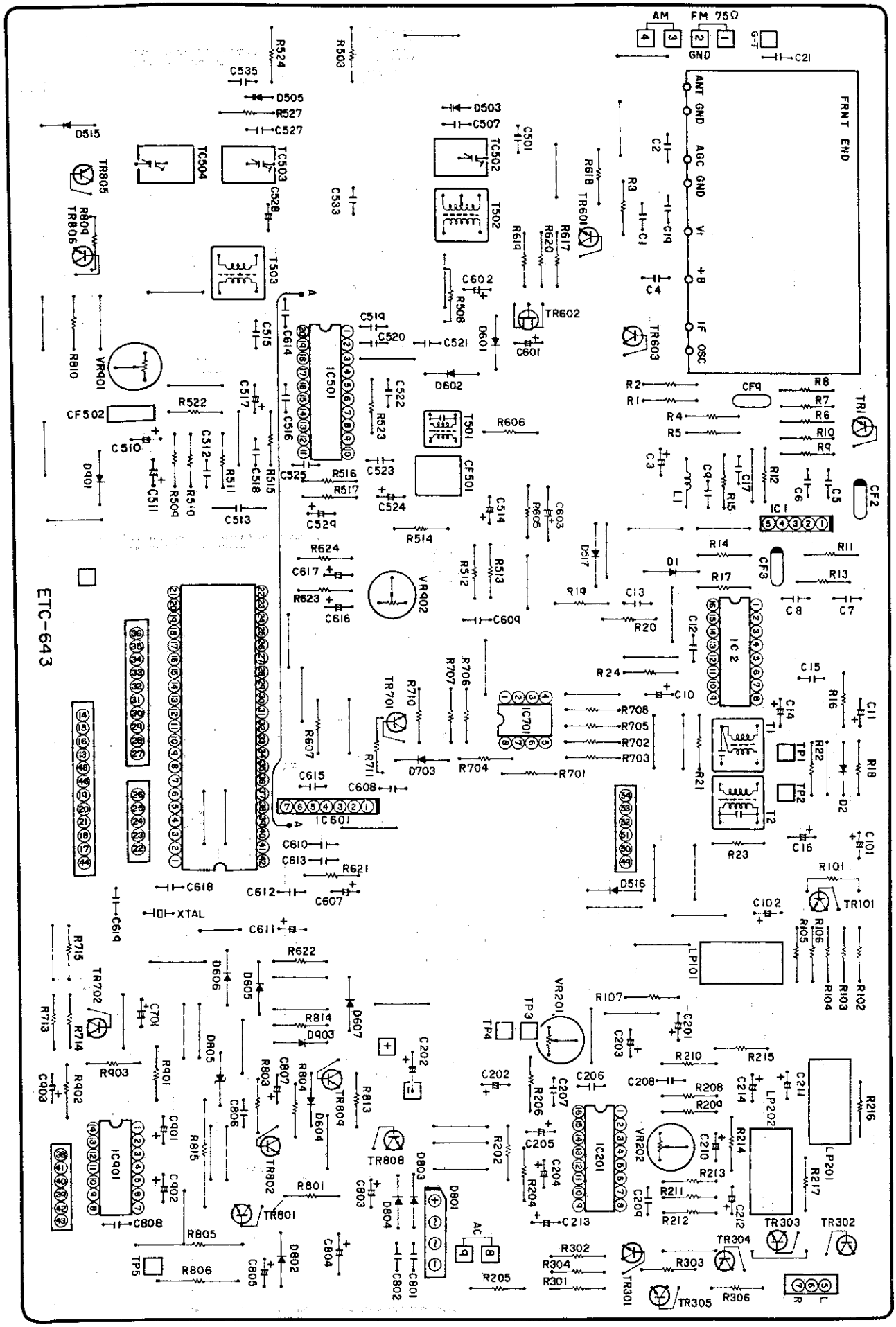


ETC0660L DISPLAY UNIT PARTS LIST FOR E3 (same as ETC0660J except the followings)

Ref. No.	Part No.	Part Name & Descriptions	
		SEMICONDUCTORS	
D101~103	2730198015	2SC1815(BL) Transistor	(Delete)
D111	2730198015	2SC1815(BL) Transistor	(Delete)
		RESISTORS	
R101~105	2412116001	10kohm ±5% ¼W Carbon	(Delete)
		OTHER PART	
	3934011010	FIP7B8S	(Change)

Ref. No.	Part No.	Part Name & Descriptions

ETC0643J TUNER UNIT FOR E2

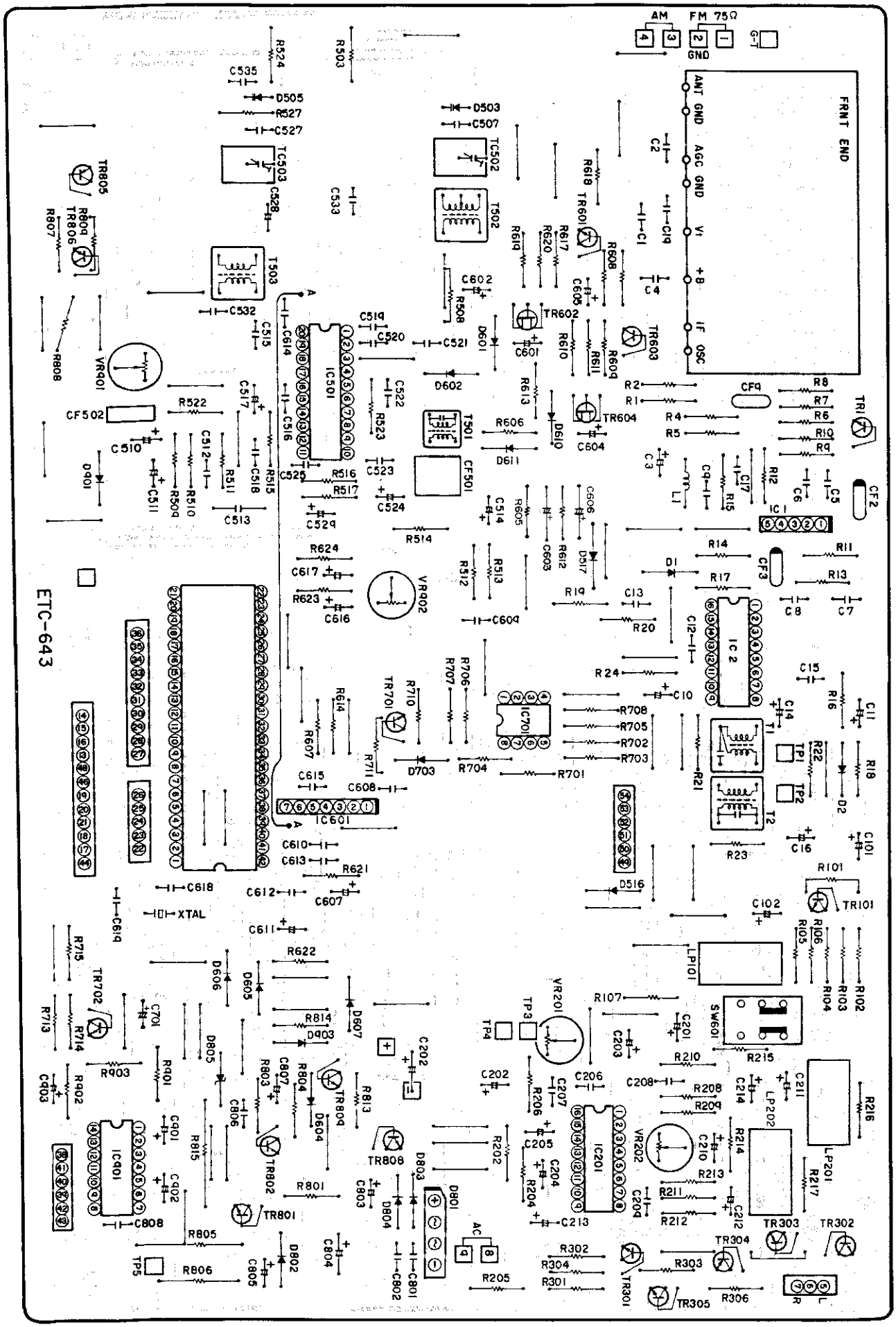


ETC0643J TUNER UNIT PARTS LIST FOR E2

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
IC001	2630099007	TA7060AP (Toshiba)	IC
IC002	2630083000	HA11225 (Hitachi)	IC
IC201	2630123009	HA12016 (Hitachi)	IC
IC501	2630145000	LA1245 (Sanyo)	IC
IC601	2630232000	TD6104P (Toshiba)	IC
IC602	2620452007	TD9147P (Toshiba)	IC
IC701	2630081002	NJM4558D (JRC)	IC
IC901	2630095001	LB1426 (Sanyo)	IC
TR001	2730025023	2SC461 (C)	Transistor
TR101	2730198015	2SC1815 (BL)	Transistor
TR301 ~303	2730198015	2SC1815 (BL)	Transistor
TR304	2710102005	2SA1015 (Y)	Transistor
TR305	2730198015	2SC1815 (BL)	Transistor
TR601	2730198015	2SC1815 (BL)	Transistor
TR602	2750020008	2SK163 (M)	FET
TR701 ~702	2730198015	2SC1815 (BL)	Transistor
TR801	2740065002	2SD880 (Y)	Transistor
TR802	2740046005	2SD468A (C)	Transistor
TR805	2710102005	2SA1015 (Y)	Transistor
TR806	2730198015	2SC1815 (BL)	Transistor
TR808	2710102005	2SA1015 (Y)	Transistor
TR809	2730198015	2SC1815 (BL)	Transistor
D001 ~002	2760049008	1S2076	Diode
D503	2760302004	SVC321SP-D2	Varactor
D505	2760302004	SVC321SP-D2	Varactor
D516 ~517	2760049008	1S2076	Diode
D601 ~602	2760049008	1S2076	Diode
D604 ~607	2760049008	1S2076	Diode
D703	2760049008	1S2076	Diode
D801	2760234004	S1VB-20	Diode
D802	2760253001	HZ15-2	Zener
D803 ~804	2760049008	1S2076	Diode
D005	2760173039	HZ6-B2	Zener
D901	2760049008	1S2076	Diode
D903	2760049008	1S2076	Diode
RESISTORS (not included Carbon Film ±5%, ¼W Type)			
VR201	EP-5462H9	Solid VR	2.2kohm
VR202	EP-5462H21	Solid VR	220kohm
VR901 ~902	EP-5462H15	Solid VR	22kohm
R803	**2440087021**	**120ohm ±5% 2W Metal Oxide (NB)**	
R806	**2440036027**	**390ohm ±5% 1W Metal Oxide (NB)**	
R815	**2440092029**	**330ohm ±5% 2W Metal Oxide (NB)**	
CAPACITORS (not included Ceramic ±5, 10%, 50V Type)			
TC502 ~503	2130022008	Trimmer Condencer	
C001	2551138005	0.033μF ±5% 50V Plastic Film	
C002	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic	
C003	2544132003	10μF 16V Electrolytic	
C004 ~009	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic	
C010 ~011	2544132005	10μF 16V Electrolytic	
C012 ~013	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic	
C014	2544145005	0.47μF 50V Electrolytic	
C016	2544136001	100μF 16V Electrolytic	
C017	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic	
C018	2531025002	0.022μF $\pm^{80}_{20}$% 50V Ceramic	
C019	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic	
C101 ~102	2544108002	3.3μF 50V Electrolytic	
C201	2544148002	3.3μF 50V Electrolytic	
C202	2544146004	1μF 50V Electrolytic	
C203	2544163029	470μF ±20% 16V Electrolytic	
C204	2544148002	3.3μF 50V Electrolytic	
C205	2544146004	1μF 50V Electrolytic	
C206	2551080001	0.047μF ±10% 50V Plastic Film	
C207	2556160007	0.001μF ±5% 50V Plastic Film	

Ref. No.	Part No.	Part Name & Descriptions
C208 ~209	2551120013	0.0012μF ±5% 50V Plastic Film
C210	2544133004	22μF 16V Electrolytic
C211 ~213	2544148002	3.3μF 50V Electrolytic
C214	2544133004	22μF 16V Electrolytic
C501	2531025002	0.022μF $\pm^{80}_{20}$% 50V Ceramic
C510	2544132005	10μF 16V Electrolytic
C511	2544145005	0.47μF 50V Electrolytic
C512	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C513	2551082009	0.068μF ±10% 50V Plastic Film
C514	2544136001	100μF 16V Electrolytic
C515 ~516	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C517	2544146004	1μF 50V Electrolytic
C518 ~523	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C524	2544132005	10μF 16V Electrolytic
C525	2551064001	0.0022μF ±10% 50V Plastic Film
C528	2556160094	390PF ±5% 50V Plastic Film
C529	2544136001	100μF 16V Electrolytic
C533	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C535	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C601	2541016001	4.7μF ±20% 16V Tantal
C602	2544136001	100μF 16V Electrolytic
C603	2544043000	0.47μF 50V Electrolytic
C607	2544129005	47μF 10V Electrolytic
C608 ~610	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C611	2544006005	470μF 6.3V Electrolytic
C612 ~615	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C616 ~617	2544147003	2.2μF 50V Electrolytic
C701	2544132005	10μF 16V Electrolytic
C801 ~802	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C803	2544145005	0.47μF 50V Electrolytic
C804	2544080005	1000μF ±20% 25V Electrolytic
C805	2544132005	10μF 16V Electrolytic
C806	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C807	2544163003	220μF ±20% 16V Electrolytic
C808	2531024003	0.01μF $\pm^{80}_{20}$% 50V Ceramic
C901	2544147003	2.2μF 50V Electrolytic
C902	2544132005	10μF 16V Electrolytic
C903	2544148002	3.3μF 50V Electrolytic
COIL TRANS.		
T001	2312026000	FM IF Det (A)
T002	2312027009	FM IF Det (B)
T501	2310056001	AM IFT
T502	2311061008	MW Ant Trans
T503	2311076103	MW OSC Coil
LP101	2320056004	Anti Birdie Filter
LP201 ~202	2320041006	Low Pass Filter
L001	TRT0565H1	Inductor 2.2μH
CF001	2610038004	FM Ceramic Filter 10.7 MA8
CF002 ~003	2610023006	FM Ceramic Filter SFE107MHZA
CF501	2610034008	AM Ceramic Filter SEP450H
CF502	2610031001	AM Ceramic Filter BFU450C4
CF601	3990008038	X-tal (7.2MHz)
OTHER PARTS		
	2220980005	P.W. Board
	2050134908	Terminal Pin Used 14
	2090008120	0.6 Jumper Wire Used 57
	2050133051	5PNH Connector Base
	2050133064	6P Connector Base Used 2
	2050167027	12P Connector Base Used 2
	2160048007	Front End
	2050185038	3P Wire Holder

ETC0643K TUNER UNIT FOR EF



ETC0643K TUNER UNIT PARTS LIST FOR EF (same as ETC0643J except the followings)

Ref. No.	Part No.	Part Name & Descriptions	
		SEMICONDUCTORS	
TR603	2730198015	2SC1815 (BL) Transistor	(Add.)
TR604	2750020008	2SK163 (M) FET	(Add.)
D610	2760049008	1S2076 Diode	(Add.)
D611	2760049008	1S2076 Diode	(Add.)
		CAPACITORS	
C501	2531025002	0.022μF $^{+80}_{-20}$% 50V Ceramic	(Delete)
C528	2556155904	150PF ±5% 50V Plastic Film	(Change)
C533	2531026001	0.047μF $^{+80}_{-20}$% 50V Ceramic	(Change)
C601	2541027003	0.47μF ±2% 35V Tantal	(Change)

Ref. No.	Part No.	Part Name & Descriptions	
C604	2541016001	4.7μF ±20% 16V Tantal	(Add.)
C605	2544	100μF 16V Electrolytic	(Add.)
C606	2544145005	0.47μF 50V Electrolytic	(Add.)
		COIL, TRANS	
T502	2312049003	LW Ant. Trans	(Change)
T503	2311077005	LW OSC Coil	(Change)
		OTHER PARTS	
	2090008120	Jumper Wire Used 58	(Change)

ETC0643L TUNER UNIT PARTS LIST FOR E3 (same as ETC0643J except the followings)

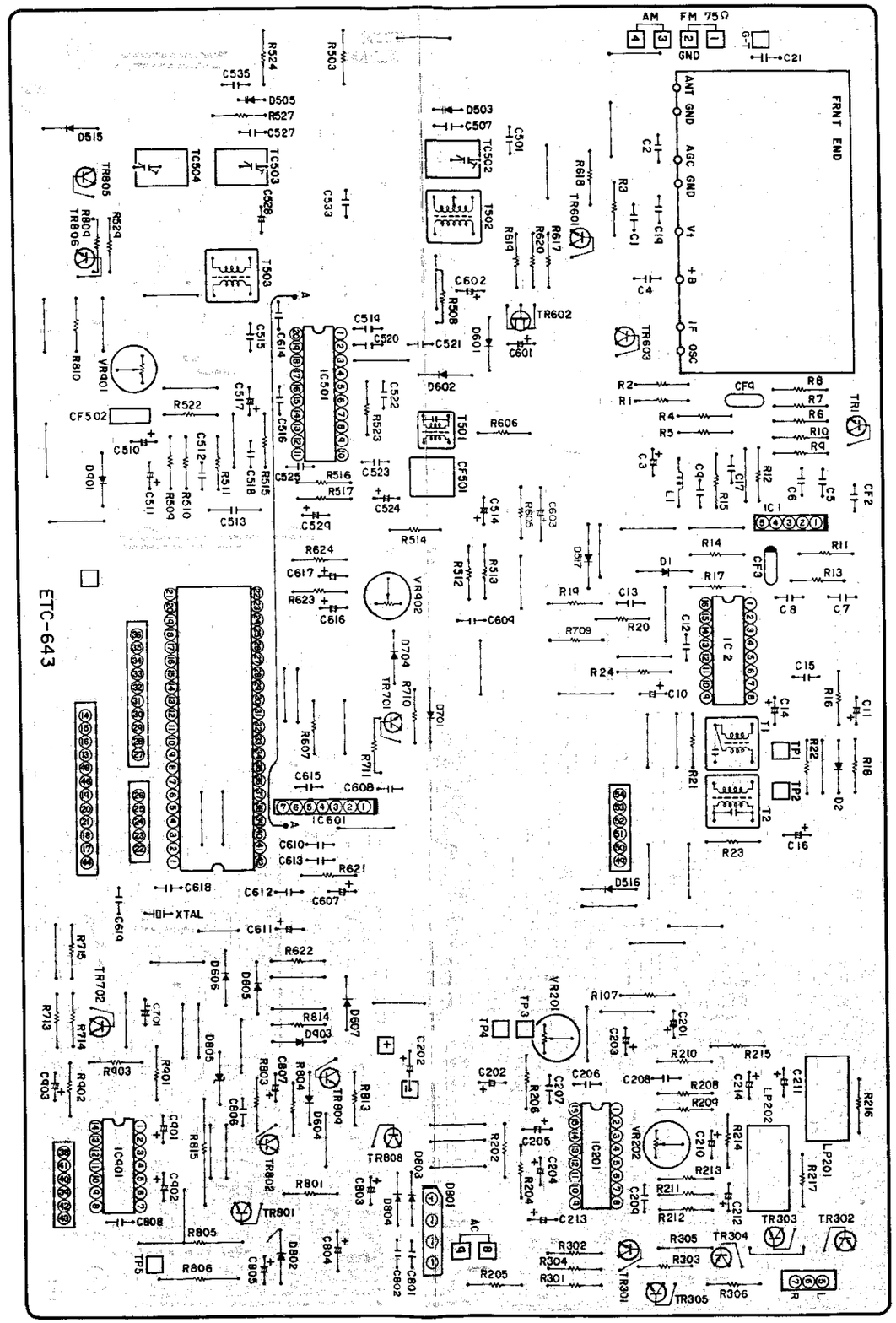
Ref. No.	Part No.	Part Name & Descriptions		
		SEMICONDUCTORS		
D701	2760049008	1S2076	Diode	(Add)
D704	2760049008	1S2076	Diode	(Add)
		RESISTORS		
R014	2412102002	2.7kohm	±5% ¼W Carbon Film	(Change)
R101	2412140006	100kohm	±5% ¼W Carbon Film	(Delete)
R102	2412134009	56kohm	±5% ¼W Carbon Film	(Delete)
R103	2412150009	270kohm	±5% ¼W Carbon Film	(Delete)
R104	2412104000	3.3kohm	±5% ¼W Carbon Film	(Delete)
R105	2412116001	10kohm	±5% ¼W Carbon Film	(Delete)
R106	2412092002	1kohm	±5% ¼W Carbon Film	(Delete)
R107	2412140006	100kohm	±5% ¼W Carbon Film	(Add)
R701	2412144002	150kohm	±5% ¼W Carbon Film	(Delete)
R702	2412092002	1kohm	±5% ¼W Carbon Film	(Delete)
R703	2412124006	22kohm	±5% ¼W Carbon Film	(Delete)
R704	2412116001	10kohm	±5% ½W Carbon Film	(Delete)
R705	2412124006	22kohm	±5% ¼W Carbon Film	(Delete)
R706	2412116001	10kohm	±5% ¼W Carbon Film	(Delete)
R707	2412104000	3.3kohm	±5% ¼W Carbon Film	(Delete)
R708	2412143003	130kohm	±5% ¼W Carbon Film	(Delete)
R709	2412118009	12kohm	±5% ¼W Carbon Film	(Add)
		CAPACITORS		
C208	2551120039	0.0018μF	±5% 50V Plastic Film	(Change)
C209	2551120039	0.0018μF	±5% 50V Plastic Film	(Change)
C527	2533600001	7PF	±0.5PF 50V Ceramic	(Change)

Ref. No.	Part No.	Part Name & Descriptions	
		COIL, TRANS	
LP101	2320056004	Anti Birdie Filter	(Delete)
		OTHER PART	
	2160052006	Front End	(Change)

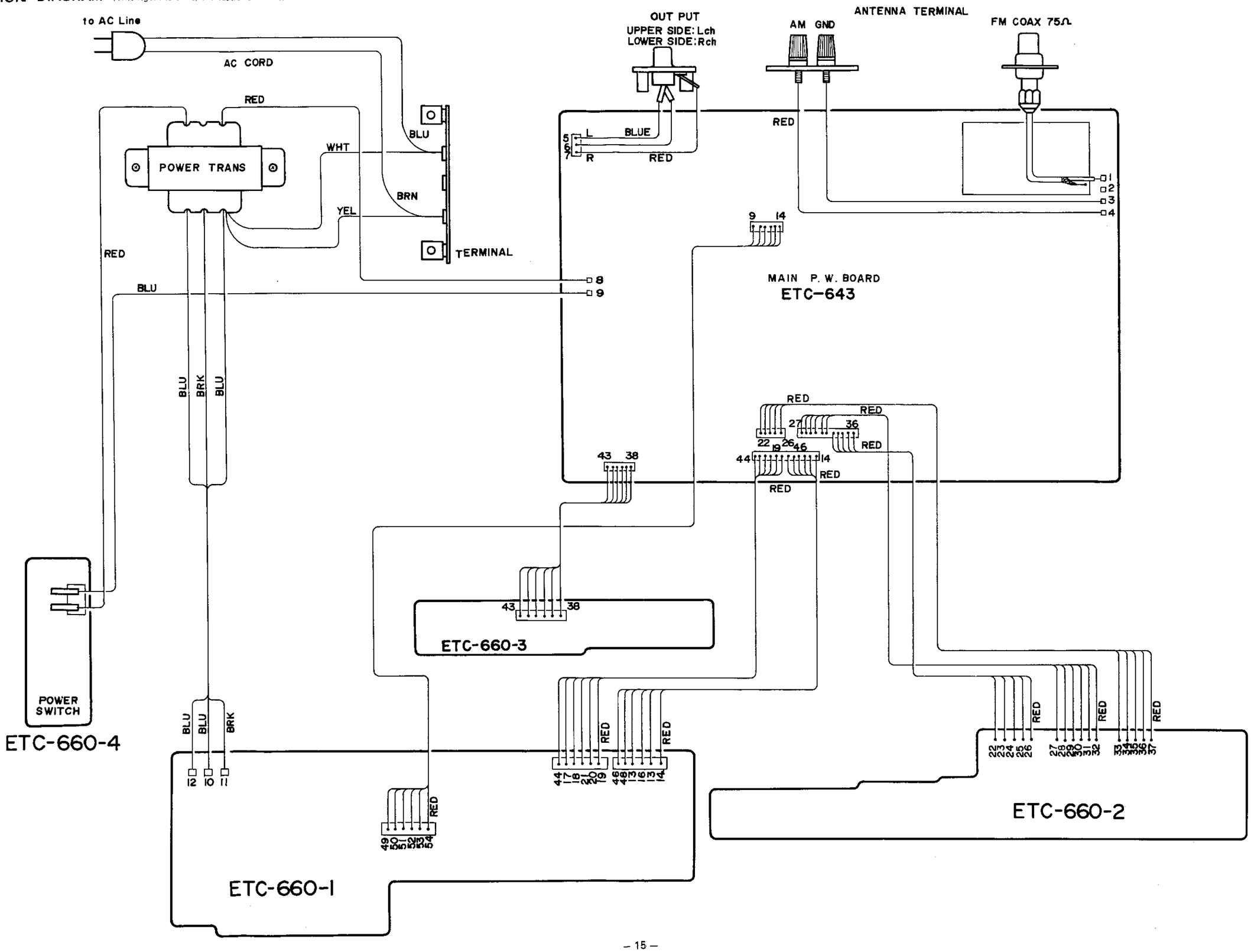
CAUTION

When operated in LW reception after replacing the memory power backup battery, 522 kHz is displayed.
This is because the PLL IC has a memory backup circuit designed to work at 522 kHz when the potential falls to 0.
In such a case press the AM selector switch and register the previously loaded data in the memory upon confirming that the LW frequency of the FLD is displayed.
Data de-registration will not occur as above until the next replacement of the battery (upto five years)

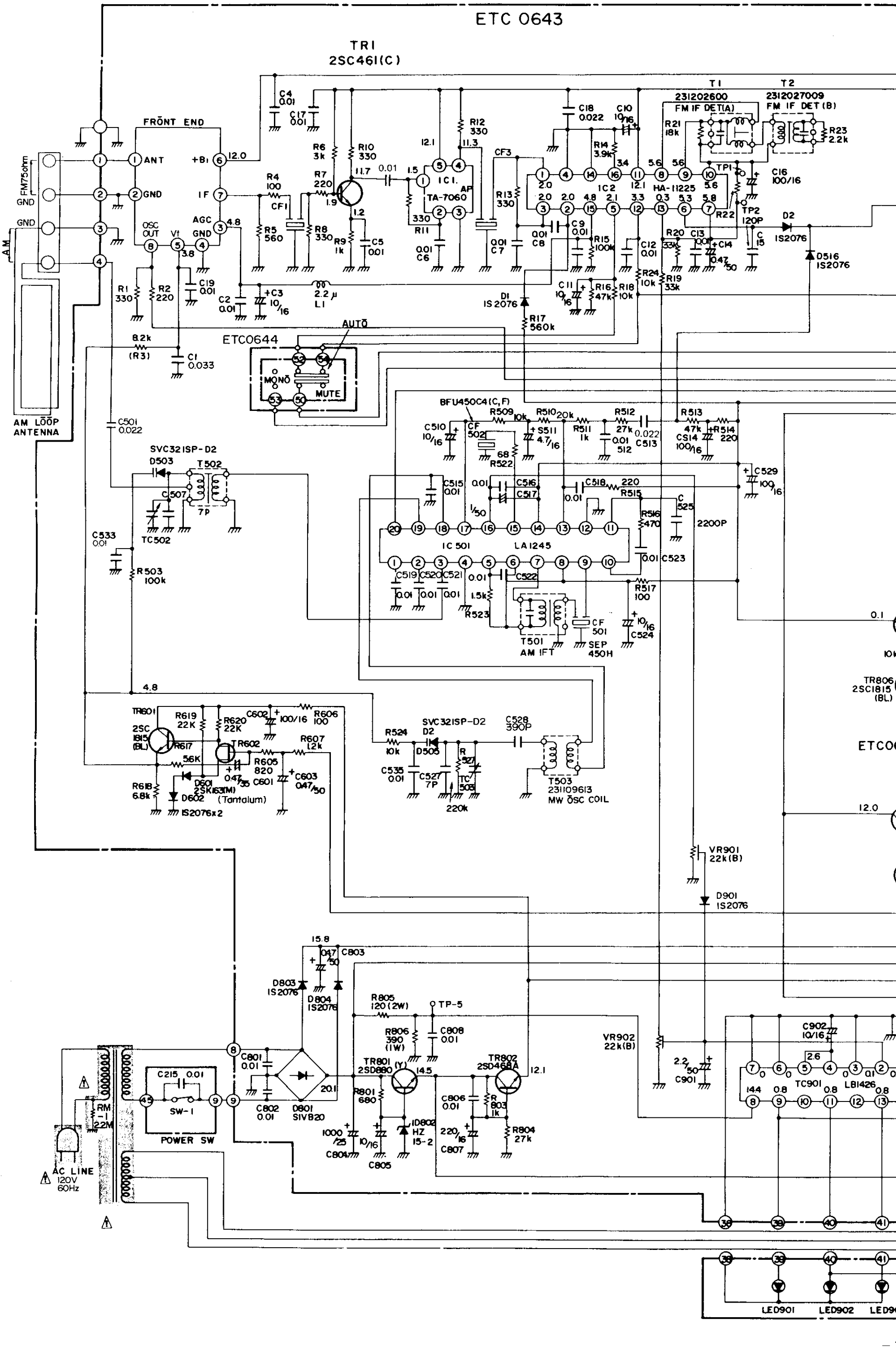
ETC0643L TUNER UNIT FOR E3



CONNECTION DIAGRAM (This figure is the specifications of E2.)



WIRING DIAGRAM FOR E3

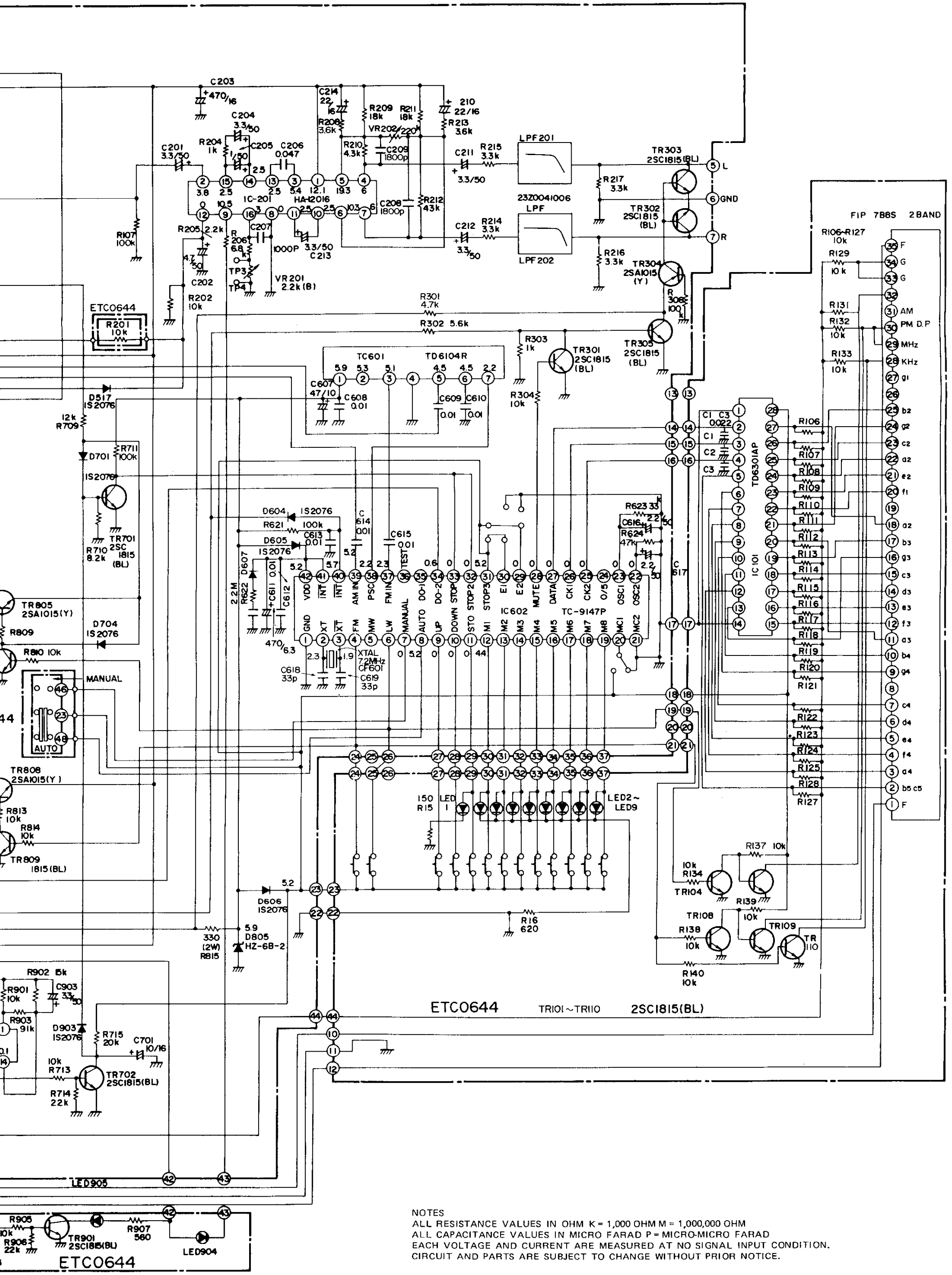


⚠ Means importa
when necessary, by a
by the manufacturer.

T1 231202600 FM IF DET(A)
T2 2312027009 FM IF DET(B)
IC2 HA-11225
IC-201 HA-12016
TC601 TD6104R
IC602 TC-9147P
TC901 LB1426
ETC0644
TR101~TR110 2SC1815(BL)
LPF201
LPF 2320041006
LPF202
XTAL 7.2MHz CF601
LED1 150 R15
LED2~LED9
LED901 LED902 LED903 LED904 LED905

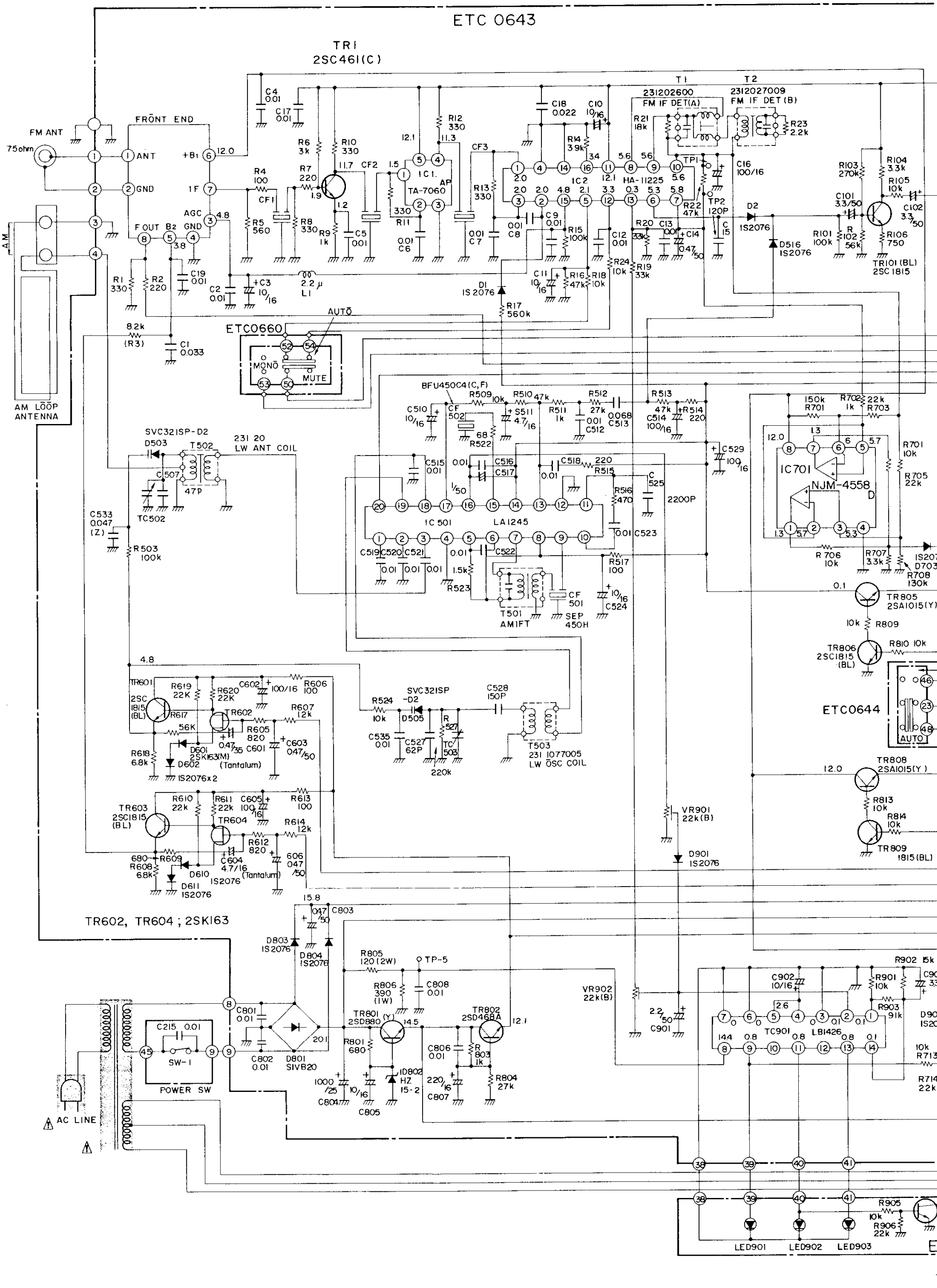
NOTES
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-M
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SI
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT

⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NOTES
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WIRING DIAGRAM FOR EF

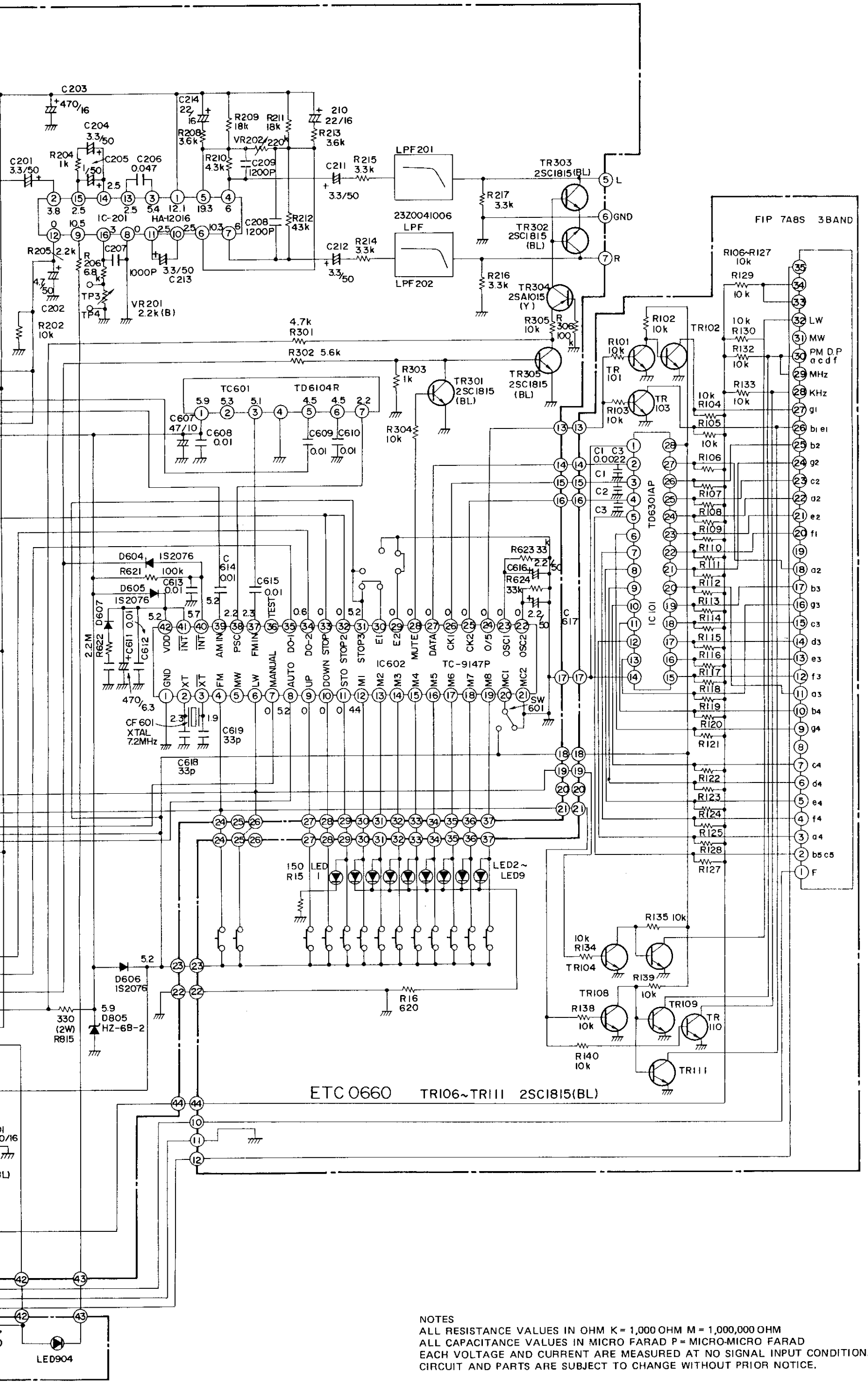


⚠ Mear
when necessa
by the manuf

T1 231202600 FM IF DET(A)
T2 2312027009 FM IF DET(B)
IC-201 HA-12016
IC602 TC-9147P
IC701 NJM-4558 D
TC601 TD6104R
LBI426
ETC 0660
ETC0644
LPF101 2320056004 ANTI BIRDIE FILTER
LPF201 23Z0041006 LPF
LPF202
TR303 2SC1815(BL)
TR302 2SC1815 (BL)
TR304 2SA1015 (Y)
TR305 2SC1815 (BL)
TR301 2SC1815 (BL)
TR701 2SC 1815 (BL)
TR702 2SC1815(BL)
TR805 2SA1015(Y)
TR806 2SC1815 (BL)
TR808 2SA1015(Y)
TR809 1815(BL)
TR901 2SC1815(BL)
TRI01 (BL) 2SC 1815
TRI04
TRI08
TRI06~TRI11 2SC1815(BL)
D517 IS2076
D516 IS2076
D703 IS2076
D604 IS2076
D605 IS2076
D606 IS2076
D607
D901 IS2076
D903 IS2076
D805 HZ-6B-2
CF601 XTAL 7.2MHz
SW 601
MANUAL
AUTO
LED1
LED2~LED9
LED901
LED902
LED903
LED904
LED905

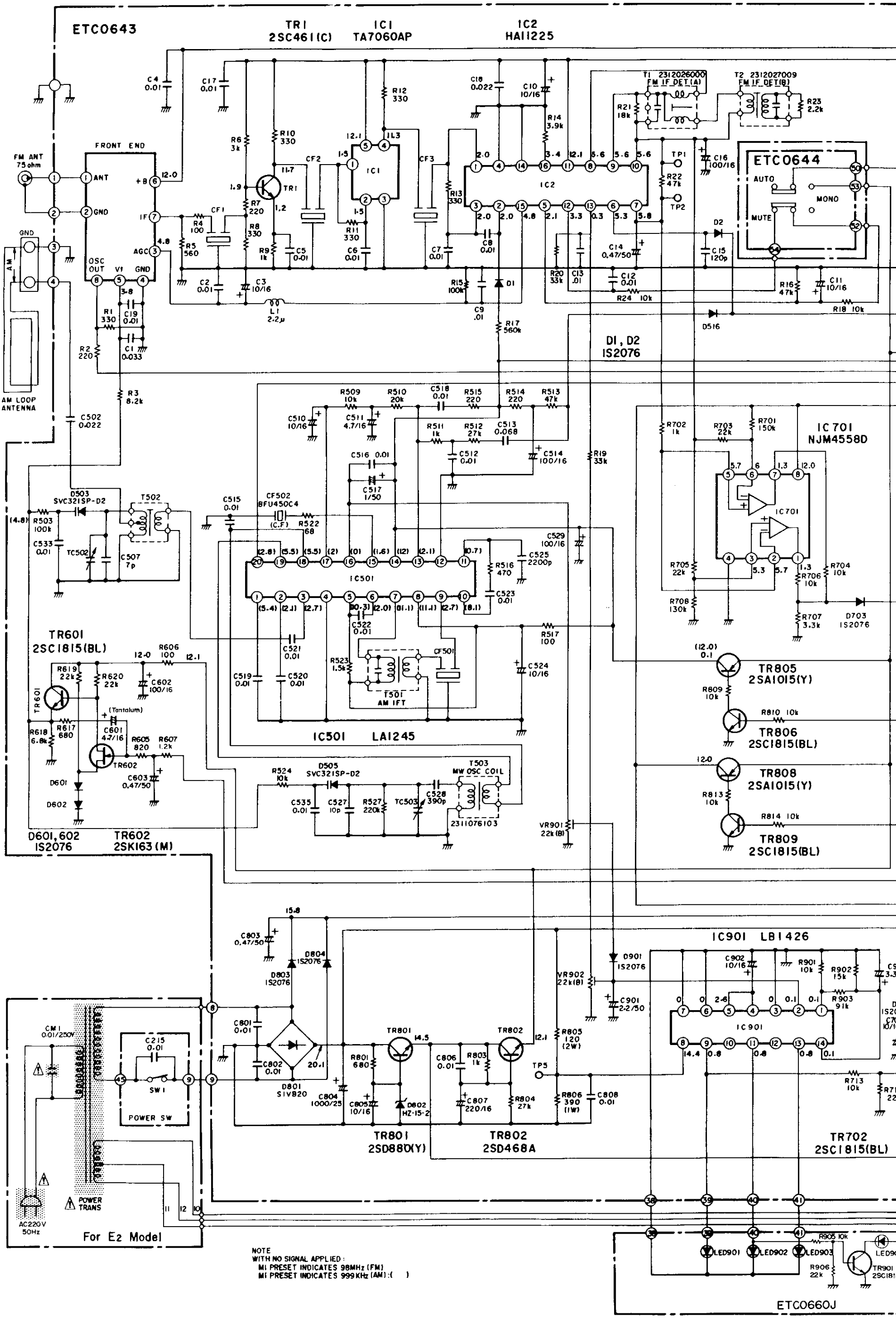
NOTES
ALL RESISTANCE VALUES IN OHM K
ALL CAPACITANCE VALUES IN MICR
EACH VOLTAGE AND CURRENT ARE
CIRCUIT AND PARTS ARE SUBJECT T

⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NOTES
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WIRING DIAGRAM FOR E2



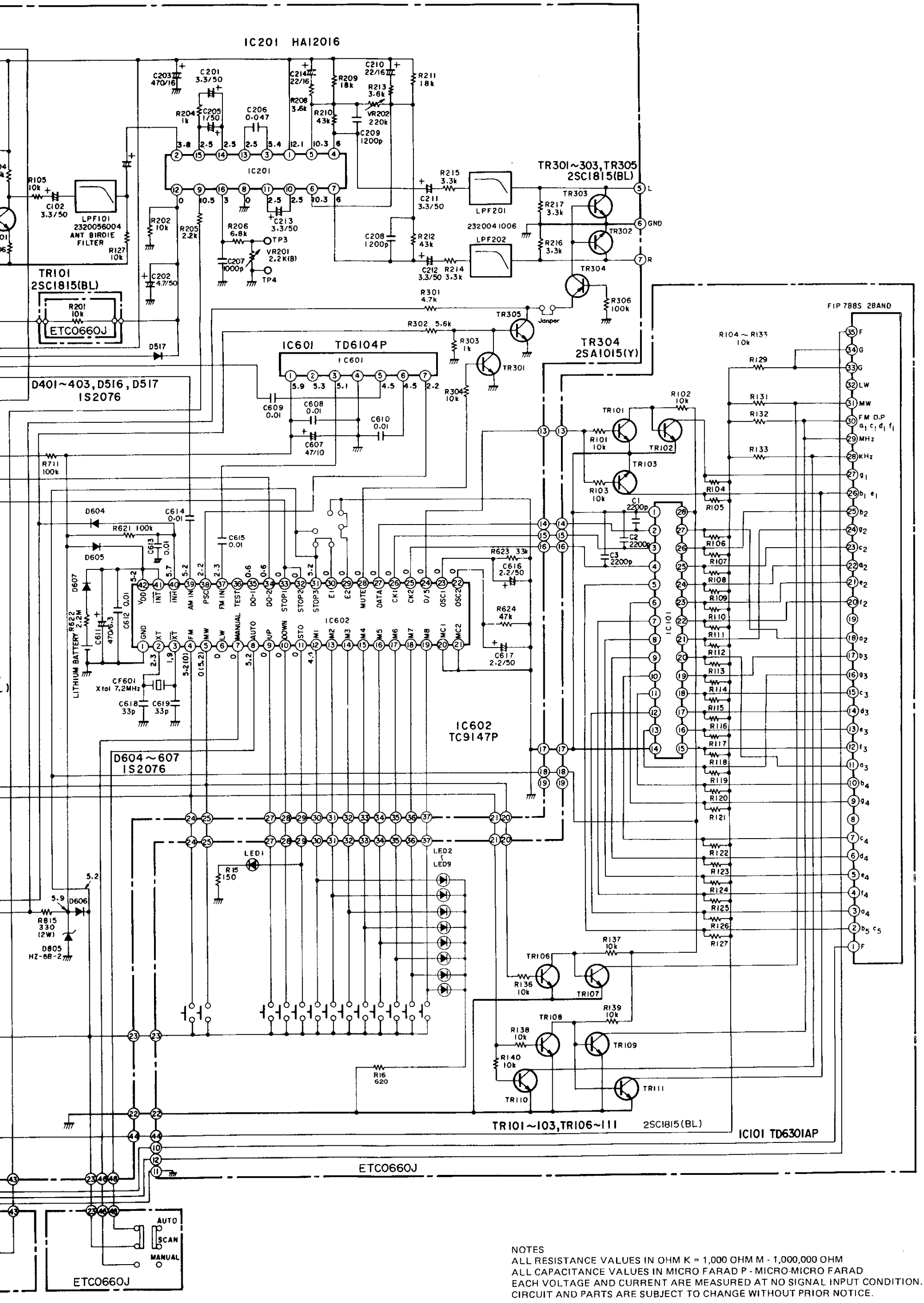
⚠ Me
when nece
by the man

IC201 HAI2016

T1 2312026000 FM IF DET(A)
T2 2312027009 FM IF DET(B)
ETC0644
AUTO
MONO
MUTE
LPF101 2320056004 ANT BIRDIE FILTER
TR101 2SC1815(BL)
ETC0660J
D1, D2 1S2076
D516
D517
D401~403, D516, D517 1S2076
IC601 TD6104P
IC701 NJM4558D
TR701 2SC1815 (BL)
TR805 2SA1015(Y)
TR806 2SC1815(BL)
TR808 2SA1015(Y)
TR809 2SC1815(BL)
D604
D605
D607
LITHIUM BATTERY
CF601 Xtal 7.2MHz
IC602 TC9147P
D604~607 1S2076
LED1
LED2 ~ LED9
IC901 LB1426
D901 1S2076
D903 1S2076
TR702 2SC1815(BL)
D606
D805 HZ-68-2
LED901
LED902
LED903
LED905
LED904
TR901 2SC1815(BL)
R905 10k
R907 560
R906 22k
AUTO
SCAN
MANUAL
TR301~303, TR305 2SC1815(BL)
LPF201
LPF202
232004 1006
TR304 2SA1015(Y)
Jumper
TR101~103, TR106~111
2SC1815(BL)

NOTES
ALL RESISTANCE VALUES IN O
ALL CAPACITANCE VALUES IN
EACH VOLTAGE AND CURRENT
CIRCUIT AND PARTS ARE SUBJE

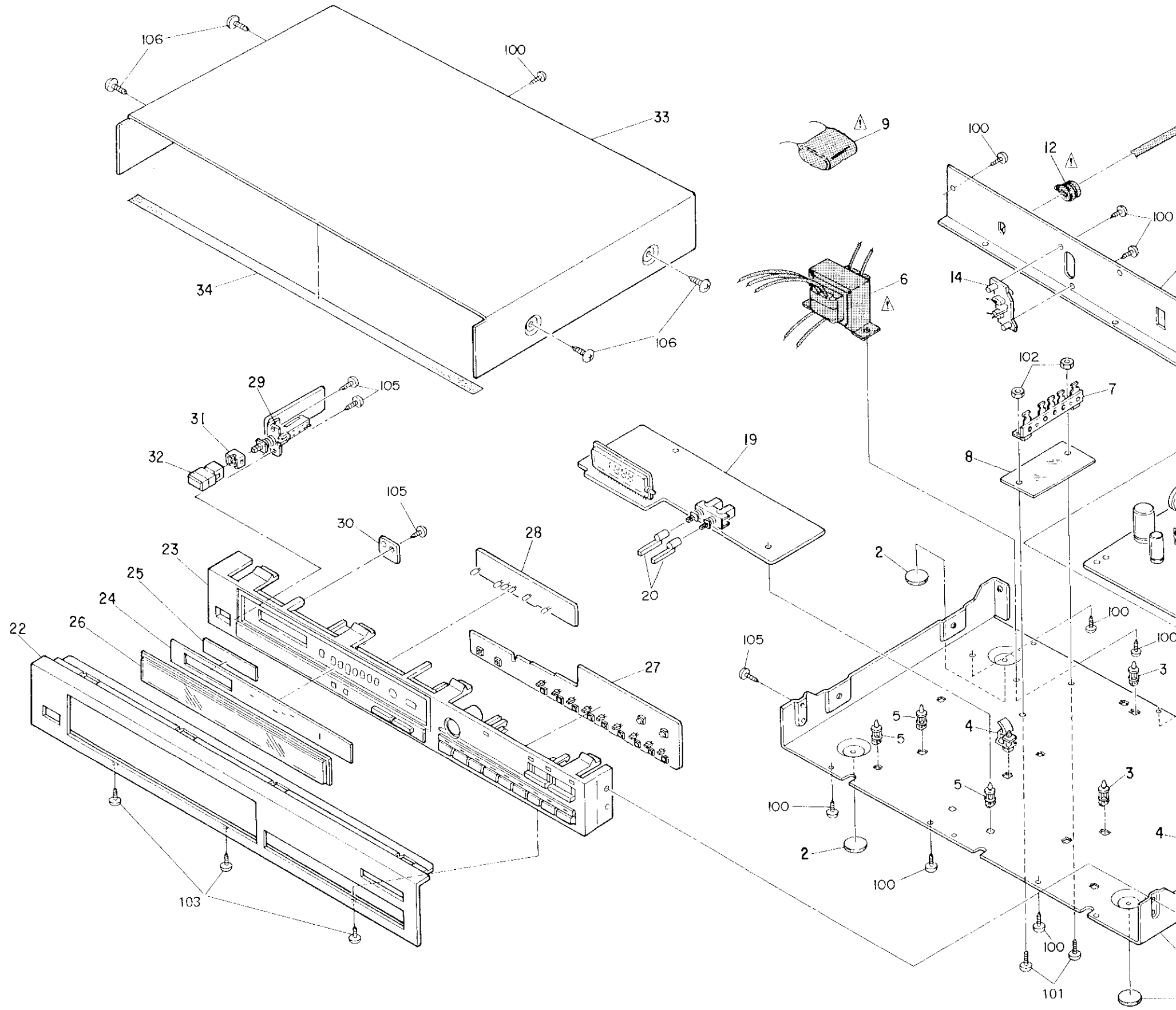
⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NOTES
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M - 1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD P - MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET

(This figure is the specifications of E2.)



EXPLODED VIEW OF CHASSIS AND CABINET PARTS LIST

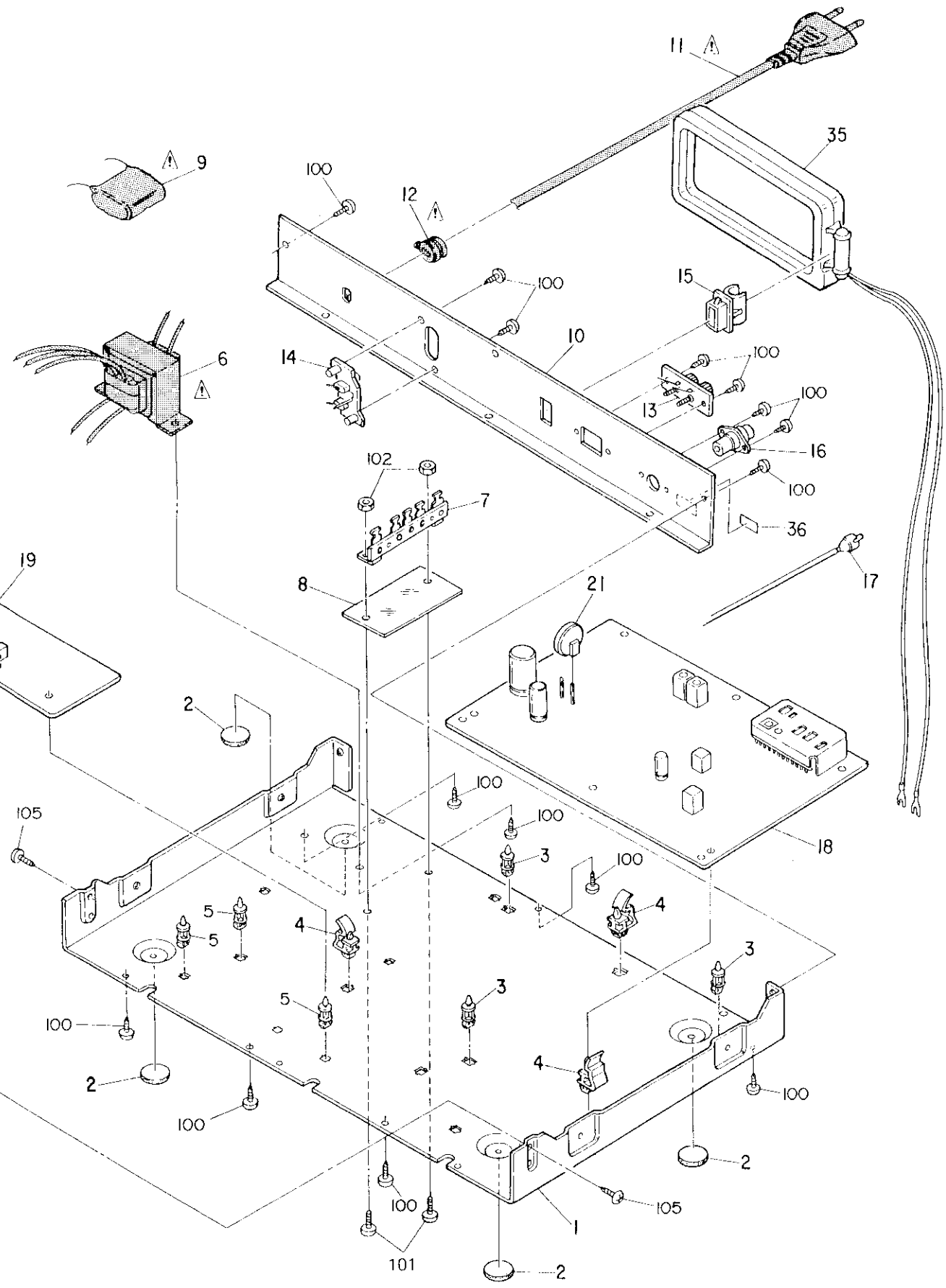
NOTE: 1. See addendum list below for the parts with asterisk (*) on the Ref. No. and the other parts not included in the list.
2. * Mark not included EXPLODED VIEW.
3. The list is prepaired based on E2.

Ref. No.	Part No.	Part Name & Descriptions
1	4110296276	Main Chassis
2	4610162004	Felt Pad
3	MD-4601	P.C.B. Support
4	4430299005	P.C.B. Holder
5	4430301003	P.C.B. Holder
⚠ * 6	2335432008	Power Trans
* 7	2050089008	7P W Terminal
* 8	4150088017	Insulating Sheet
⚠ * 9	2568023006	Metalized Cap. 0.01μF/250V
*10	1050574103	Back Panel
⚠ *11	2062002031	AC Cord
⚠ *12	4450020005	Cord Bush
13	2050165003	2P Terminal
14	2048016012	2P Connector Base
15	1460494006	Antenna Holder
*16	2050164004	Antenna Adaptor
*17	2030228009	Ant. Pin Cord
*18	ETC0643J	Tuner Unit
*19	ETC0660J1	Display Unit-1

Ref. No.	Part No.	Part Name & Descriptions
20	1130502105	Push Knob For Function
21	3940005007	Litium Battery
22	1441157100	Front Panel
23	1460636314	Inner Panel Ass'y
24	1430338008	Indicator Sheet
25	1430196101	Filter
26	1430337106	Window
27	ETC0660J2	Display Unit (LED)
28	ETC0660J3	Display Unit (SIGNAL)
29	ETC0660J5	Display Unit (P.SW)
30	ETC0660J6	Display Unit (FLD)
31	1140056007	Flexible Ring
32	1130501009	Push Knob Ass'y For Power
33	1020122200	Top Cover
34	1220064003	Spacer
35	2311060009	Loop Antenna
*36	5130716036	FTZ Label
*37	4450033005	Wire Clamp Band Used 5

Ref. No.	Part No.	Part Name & Descript
100	4770064107	Fixing Screw
101	4711304033	Pan Screw 3 x 8 (Black)
102	4756006008	Nut M3
103	4730303031	Tapping Screw (1) 3 x 6 (
104	--	--
105	4730304014	Tapping Screw (1) 3 x 8
106	4734801005	Tapping Screw (Trus) 4 x
PACKING & ACCESSORIES (not included EXPLODE		
a.	5050075006	Cabinet Cover
b.	5030285007	Cushion
c.	5010786238	Carton Case
d.	5050061007	Envelope
e.	5111172000	Inst. Manual
f.	2032101001	2P Connector Cord

⚠ ☐ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NIPPON COLUMBIA CO., LTD.
No. 14-14, 4-CHOME AKASAKA,
MINATO-KU, TOKYO 107, JAPAN
TEL: 03-584-8111
TLX: JAPANOLA J22591
CABLE: NIPPONCOLUMBIA TOKYO

sterisk (•) on the Ref. No. and the other parts not included in the list.

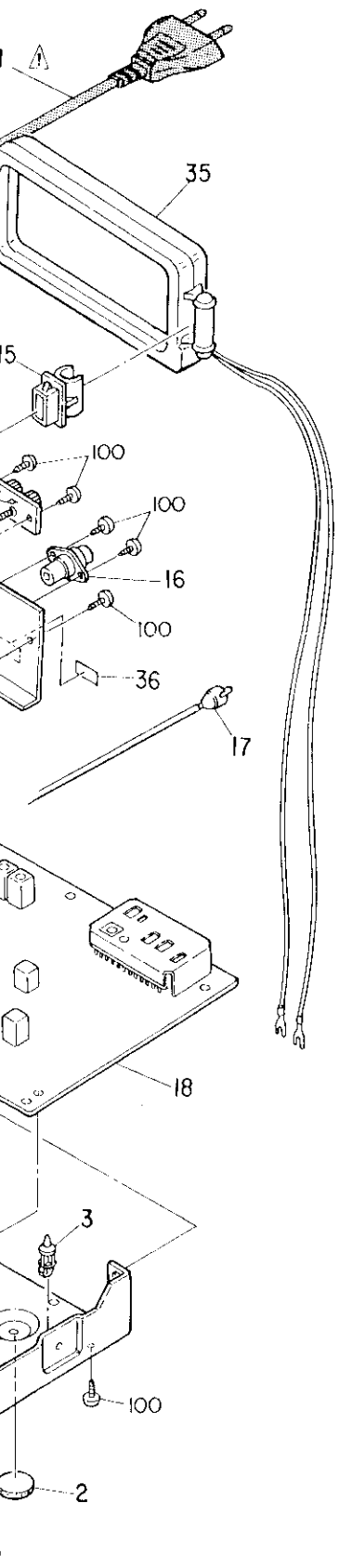
& Descriptions
Function
y
ED)
GNAL)
SW)
LD)
y For Power
d Used 5

Ref. No.	Part No.	Part Name & Descriptions
100	4770064107	Fixing Screw
101	4711304033	Pan Screw 3 x 8 (Black)
102	4756006008	Nut M3
103	4730303031	Tapping Screw (1) 3 x 6 (Black)
104	–	
105	4730304014	Tapping Screw (1) 3 x 8
106	4734801005	Tapping Screw (Trus) 4 x 8
PACKING & ACCESSORIES (not included EXPLODED VIEW)		
a.	5050075006	Cabinet Cover
b.	5030285007	Cushion
c.	5010786238	Carton Case
d.	5050061007	Envelope
e.	5111172000	Inst. Manual
f.	2032101001	2P Connector Cord

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.			
		Ef for France	E3 for U.S.A.	ED for U.K.	
⚠ 6	Power Trans	2335432008	2335458008		
7	NP.W Terminal	2050089008(7P)	2050050008(4P)		
8	Insulating Sheet	4150088017	–		
⚠ 9	Capacitor	–	–		
10	Back Panel	1050574103	1050595001		
⚠ 11	AC Cord	2062002031	2062019008		
⚠ 12	Cord Bush	4450020005	MD-3802		
16	Antenna Adaptor	2050164004	–		
17	Ant. Pin Cord	2030228009	–		
18	Tuner Unit	ETC0643K	ETC0643L		
19	Display Unit-1	ETC0660K1	ETC0660L1		
27	Display Unit (LED)	ETC0660K2	ETC0660L2		
28	Display Unit (SIGNAL)	ETC0660K3	ETC0660L3		
29	Display Unit (P.SW)	ETC0660K5	ETC0660L5		
30	Display Unit (F.L.D.)	ETC0660K6	ETC0660L6		
36	FTZ Label	–	–		
38	Carton Composit Resistor 2.2Mohm	–	2420073000		
39	Tooth Washer φ3	–	4753001051		
41	Serial No. Plate	–	5130675070		
42	Rivet	–	4770126016		
43	FCC Label	–	5130662070		
44	Dangerous Mark	–	5138266009		
a.	Carton Case	5010756238	5010979003		
g.	FM Ant. Ass'y	–	3950017014		
h.	Safety Instruction	–	5111041005		

ortant safety item, which must be replaced,
a part specified or meeting the specification



NIPPON COLUMBIA CO., LTD.
No. 14-14, 4-CHOME AKASAKA,
MINATO-KU, TOKYO 107, JAPAN
TEL: 03-584-8111
TLX: JAPANOLA J22591
CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.			
		Ef for France	E3 for U.S.A.	ED for U.K.	E1 for Hong Kong
⚠ 6	Power Trans	2335432008	2335458008		
7	NP.W Terminal	2050089008(7P)	2050050008(4P)		
8	Insulating Sheet	4150088017	—		
⚠ 9	Capacitor	—	—		
10	Back Panel	1050574103	1050595001		
⚠ 11	AC Cord	2062002031	2062019008		
⚠ 12	Cord Bush	4450020005	MD-3802		
16	Antenna Adaptor	2050164004	—		
17	Ant. Pin Cord	2030228009	—		
18	Tuner Unit	ETC0643K	ETC0643L		
19	Display Unit-1	ETC0660K1	ETC0660L1		
27	Display Unit (LED)	ETC0660K2	ETC0660L2		
28	Display Unit (SIGNAL)	ETC0660K3	ETC0660L3		
29	Display Unit (P.SW)	ETC0660K5	ETC0660L5		
30	Display Unit (F.L.D.)	ETC0660K6	ETC0660L6		
36	FTZ Label	—	—		
38	Carton Composit Resistor 2.2Mohm	—	2420073000		
39	Tooth Washer ϕ3	—	4753001051		
41	Serial No. Plate	—	5130675070		
42	Rivet	—	4770126016		
43	FCC Label	—	5130662070		
44	Dangerous Mark	—	5138266009		
a.	Carton Case	5010756238	5010979003		
g.	FM Ant. Ass'y	—	3950017014		
h.	Safety Instruction	—	5111041005		