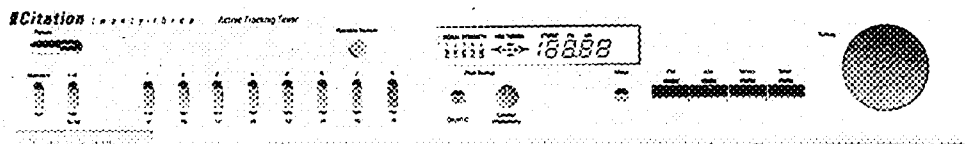


# The Harman Kardon Model Citation23

Manual 114A

## DIGITAL SYNTHESIZED QUARTZ-LOCK TUNER

# Technical Manual



The following marks found in the parts list of this manual identify the models as follows.

- UA** : North America area model
- G** : General model
- N** : Japan model

Citation23

**harman/kardon**

240 Crossways Park West, Woodbury, N.Y. 11797  
1112-3152114A8 P-088706 1500 Printed in Japan

**SPECIFICATIONS**

	Nominal	Limit
<b>● FM SECTION</b>		
Turning Range	87.5 ~ 108.0MHz	
50dB Quieting Sensitivity		
Mono normal	15.2dBf	≧ 18(23)dBf
Mono Hi-Q	20.2dBf	≧ 23(28)dBf
Stereo	73dBf	≧ 40(45)dBf
Usable Sensitivity	10.7dBf	≧ 15dBf
Image Ratio	76dBf	≧ 65dB
IF Rejection	91dB	≧ 80dB
Spurious Response Rejection	117dB	≧ 100dB
Capture Ratio	0.75dB	≧ 2.0dB
Alternate Channel Selectivity	76dB	≧ 60dB
AM Rejection	65dB	≧ 45dB
Signal to Noise Ratio		
Mono	84dB	≧ 78(72)dB
Stereo	75dB	≧ 70(64)dB
Total Harmonic Distortion		
Mono	0.07%	≧ 0.15%
Stereo	0.08%	≧ 0.3%
Stereo Separation at 1kHz	59dB	≧ 45(40)dB
Output Level (Stereo)	950(580)mV	

This figures in parentheses ( ) in the FM section are specifications for the General model.

	Nominal	Limit
<b>● AM SECTION</b>		
Tuning Range	520 ~ 1,710kHz	
Usable Sensitivity		
External Antenna	12 $\mu$ V/m	≧ 20 $\mu$ V/m
Loop Antenna	320 $\mu$ V/m	≧ 450 $\mu$ V/m
Selectivity	61dB	≧ 45dB
Signal to Noise Ratio	55dB	≧ 48dB
Image Rejection	48dB	≧ 38dB
IF Rejection	67dB	≧ 50dB
<b>● DIMENSIONS (W x H x D)</b>		
	17-3/8" x 2-3/4" x 14-5/8"	(443 x 70 x 391mm)
<b>● WEIGHT</b>		
	15lbs.(6.8kg)	
<b>● POWER SUPPLIES</b>		
North America area	AC 120V, 60Hz	
General model	AC 220/240V, 50/60Hz	
Japan medel	AC 100V, 50/60Hz	
<b>● POWER CONSUMPTION</b>		
	16W	

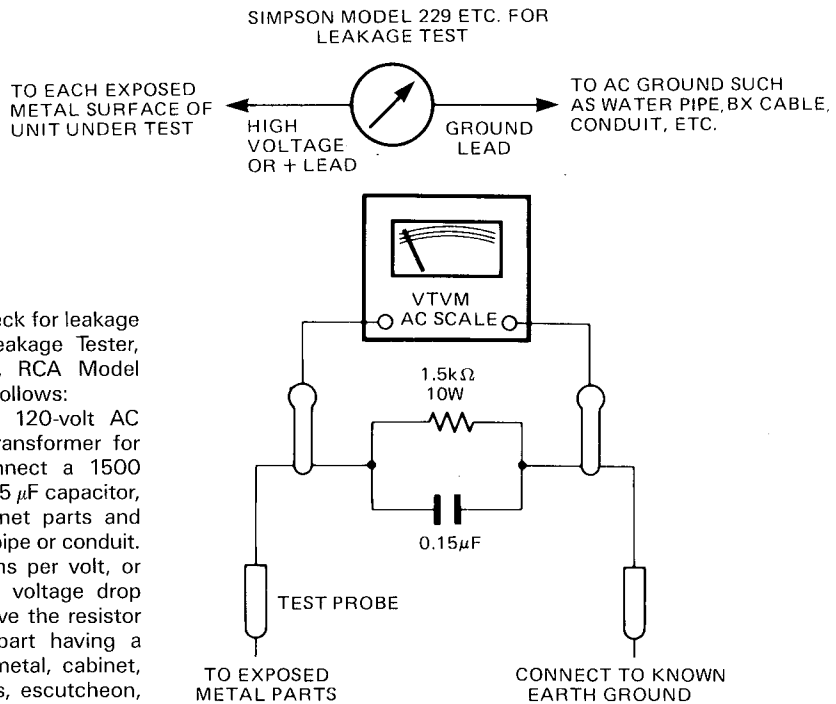
This specification is the target of servicing. But, there is a case that the specification is not applicable to the measurement condition and instrument.

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

**LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A.)**

Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. which were removed for servicing are properly reinstalled.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows:  
 Plug the power cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 Ohm, 10-watt resistor paralleled by a 0.15  $\mu$ F capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)  
 A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.



## DISASSEMBLY PROCEDURES (REFER TO PAGES 7 THROUGH 10)

### 1 CABINET TOP REMOVAL

Remove 6 screws (A) and then remove the Cabinet Top (131).

### 2 FRONT PANEL ASS'Y (AA) REMOVAL

1. Remove the Cabinet Top (131), referring to the previous step 1.
2. Remove 7 screws (B) and then remove the Front Panel Ass'y (AA).

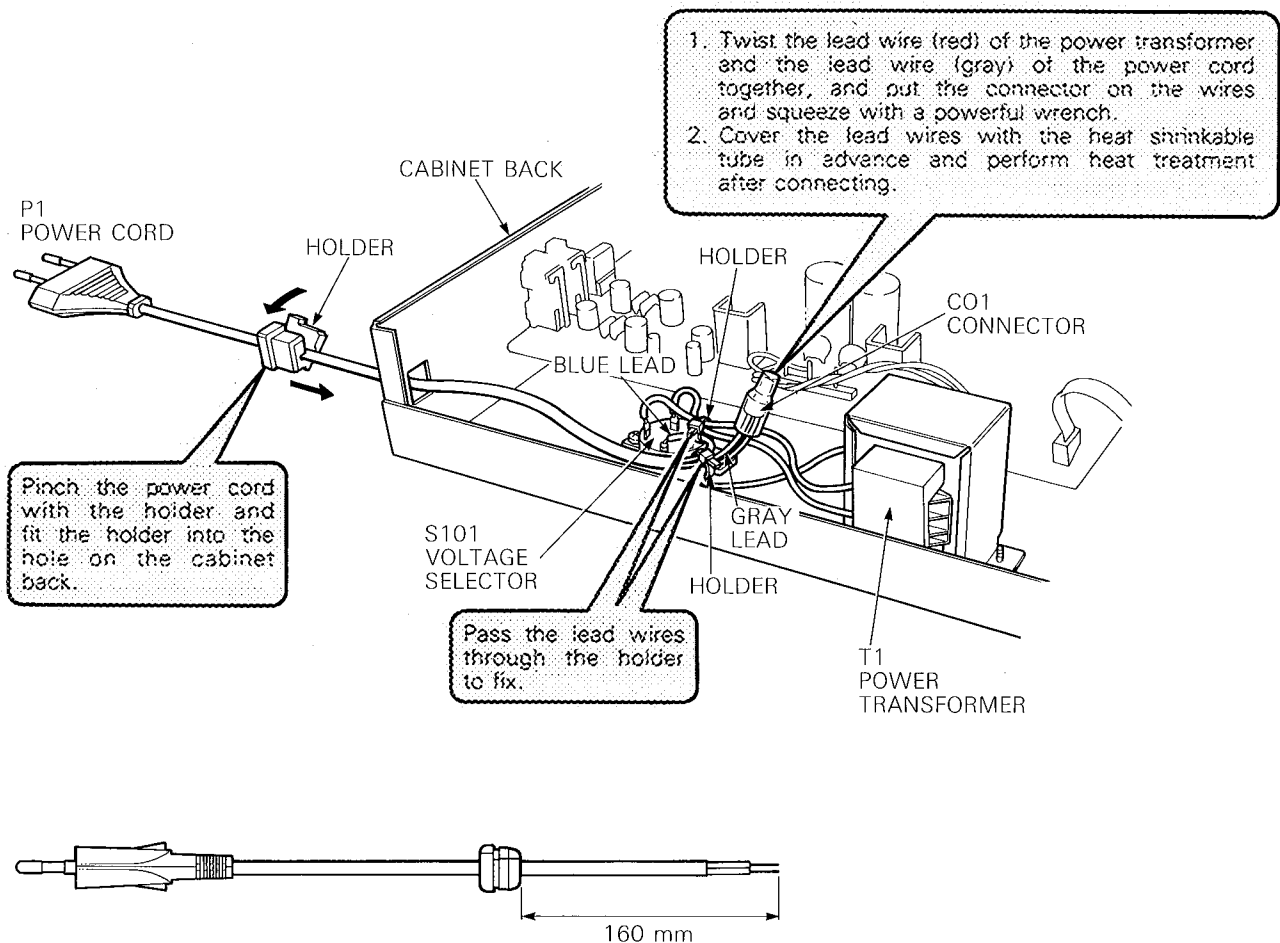
### 3 MAIN P.C.BOARD (PCB-1) REMOVAL

1. Remove the Front Panel Ass'y (AA), referring to the previous step 2.
2. Open the lid of connectors (CN5, CN6 and CN7) on the Main P.C.Board (PCB-1) and then disconnect the lead wires.

3. Remove 2 screws (C) and then remove the Display P.C.Board (PCB-2).
4. Open the lid of connector (CN1, CN2, CN3, CN4 and CN9) on the Main P.C.Board (PCB-1) and then disconnect the lead wires.
5. Disconnect the connector (CN10) on the Main P.C.Board (PCB-1).
6. Remove 9 screws (D) and 2 hexagon nut (E) and then remove the Main P.C.Board (PCB-1).  
If necessary, unsolder the lead wires connected to the PCB-1.

## POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the procedure below to replace the part with the standard supply parts.



**ALIGNMENT PROCEDURES (REFER TO PAGES 11, 12, 22, 23, 24 AND 25)**

■ **STANDARD FREQUENCY CHECK**

Conditions : ● Press the "FM" switch.

Step	Connection Equipments	Station Display	For
1	● Connect the Frequency Counter to TP1(+) and ground.	98.3MHz	109MHz ± 2kHz

■ **AM ADJUSTMENT**

Conditions : ● Press the "AM" switch.

● Standard modulation of the AM signal Generator is 400Hz at 30%.

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
1	Tuning voltage check	● Connect the DC Voltmeter to TP2(+) and ground(-).		520kHz		1.5V ± 0.5V
2				1710kHz		20V ± 5V
3	IF	● Connect the AM Test Loop Antenna cable into the output jack of AM Signal Generator. Place AM Test Loop Antenna close enough to couple signal into the AM Loop Antenna. ● Connect the VTVM and oscilloscope to the OUTPUT jacks.	1400kHz	1400kHz	T251 T252	Maximum output level and symmetrical curve on scope.
4	Tracking		1400kHz	1400kHz	TC251	Maximum output.
5			600kHz	600kHz	L251	Maximum output.
6			Repeat steps 4 and 5 for optimum sensitivity.			
7	Meter		1000kHz	1000kHz	VR257	Adjust so that the 5 SIGNAL STRENGTH indicator lights at 54dB $\mu$ V/m input. And then, confirm the TUNED indicator lights.

■ **FM ADJUSTMENT**

Conditions : ● After the POWER switch is pushed on, wait for 5 minutes before adjusting so that the most stable operation is obtained.

- Press the "FM" switch.
- Press the "Mute" switch to the off (button in) position.

	North America area model	General model
<b>FM Signal Generator</b>	1kHz, 100% modulation	1kHz, 53% modulation
<b>Stereo Modulator</b>	L + R = 45.5%, L - R = 45.5%, 19kHz = 9%	L + R = 22.5%, L - R = 22.5%, 19kHz = 8%

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
1	Discriminator	● Connect the FM Signal Generator to FM 300 $\Omega$ BAL Antenna terminals through the 300 $\Omega$ balanced dummy. (1mV input) ● Connect the Distortion meter and Oscilloscope to the OUTPUT jacks.	98.1MHz ± 30 ~ 40kHz	98.1MHz	T201(A)	Adjust so that the TUNED indicator lights in the same range on both plus (+) and minus (-) sides of 98.1MHz.
2			98.1MHz	98.1MHz	T201(B)	Minimum distortion.
3			Repeat steps 1 and 2 for optimum sensitivity.			
4	Tuned indicator				VR201	Adjust so that the TUNED indicator lights at 10 $\mu$ V input.

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
5	Signal indicator	<ul style="list-style-type: none"> <li>Connect the FM Signal Generator to FM 300Ω BAL Antenna terminals through the 300Ω balanced dummy. (1mV input)</li> <li>Connect the Distortion meter and Oscilloscope to the OUTPUT jacks.</li> </ul>			VR202	Adjust so that the 3 SIGNAL STRENGTH indicator lights at 30μV input.
6					VR203	Set the hi-select mode. Adjust so that the 3 SIGNAL STRENGTH indicator lights at 40μV input.
7			Confirm that the 5 SIGNAL STRENGTH indicator lights at 10mV input. This confirmation should be done at each tuning mode.			
8	Hi-select	<ul style="list-style-type: none"> <li>Connect the Stereo Modulator to FM Signal Generator. Connect FM Signal Generator to FM 300Ω BAL Antenna terminal through the 300Ω balanced dummy.</li> <li>Connect the Oscilloscope to the OUTPUT jacks.</li> </ul>	98.1MHz	98.1MHz	L203 TC201	With the Fine Tune set to its center position, adjust L203 so that the upper and lower parts of the waveform are symmetrical and TC201 so as to obtain the waveform immediately before clipping. Check to ensure that the indicator - < lights when the Fine Tune is turned counterclockwise and > + lights when it is turned clockwise.
9	MPX free run	<ul style="list-style-type: none"> <li>Connect the Stereo Modulator to FM Signal Generator. Connect FM Signal Generator to FM 300Ω BAL Antenna terminal through the 300Ω balanced dummy.</li> <li>Connect the Frequency Counter to TP3(+) and ground(-).</li> <li>Connect the VTVM and oscilloscope to the OUTPUT jacks.</li> </ul>	98.1MHz (unmodulation)	98.1MHz	VR302	19.00kHz ± 0.02kHz
10	Stereo threshold		98.1MHz	98.1MHz	VR302	Adjust so that the STEREO indicator lights at 30μV ± 2dB input.
11	Sub-carrier		98.1MHz	98.1MHz	VR303 LPF301	Minimum output at 19kHz pilot signal only by Stereo Modulator.
12	Separation					VR301
		98.1MHz	98.1MHz		VR301	Adjust so that the right channel output becomes minimum when only the left channel of the Stereo Modulator is modulated.

## CIRCUIT DESCRIPTION

### ● FM TUNER SECTION

The signal which has entered through the antenna is high-frequency amplified in the front end unit FE101, mixed with the output of the local oscillator and converted into the 10.7MHz intermediate frequency.

The 10.7MHz signal is amplified in the intermediate frequency amplifying section which consists of CF201, Q201, Q202, CF202, Q203, Q204 and CF203 and fed to 1 pin of IC201. In IC201, the signal is transmitted through the IF amplifier in six steps, detected in the quadrature and after going through the AF amplifier it is output from 6 pin.

Then it is fed through Q309 to 2 pin of IC301. In IC301, the pilot signal is detected out of the signal which has been fed and 38kHz signal is produced. The stereo signal is demodulated by that 38kHz signal and output from 4 pin for the left channel and from 7 pin for the right channel to be fed to the amplifier.

### ● ACTIVE TRACKING CIRCUIT

To reduce interference from strong FM stations, the Hi Q mode can be selected. In the Hi Q mode, the 10.7MHz IF signal from the emitter of Q203 is emitter-coupled into Q205. This signal then passes through CF204, Q207 and CF205 into pin 1 of IC202. In IC202, the phase of this signal is compared with the phase of the VCO signal generated by Q206, varicap diode D203 and L203.

The phase comparison is made between pin 1 and pin 9 of IC202. The output of the phase comparator (pin 7 of IC202) is again fed to the base of the external LPF transistor Q210.

The phase compared 10.7MHz signal at L203 is fed into pin 1 of IC201 through C238, D202 and C208.

When the FINE TUNE front panel control setting is changed, the DC bias voltage of varicap diode D203 changes and the center frequency of the Q206 VCO is varied. By means of this system, interference from other FM stations can be reduced or eliminated.

### ● AM TUNER SECTION

The signal which has entered through the antenna is transmitted through the tuning circuit consisting of L251 and TC251, also through Q251 and fed to 3 pin of IC251. In IC251, it undergoes high-frequency amplification, local oscillation, mixing, intermediate frequency amplification and detection, and then output from 13 pin. This signal is turned ON and OFF at Q252 according to the signal from the input selector and fed through Q309 to IC301.

### ● MUTING CIRCUIT

If FM is received out of tuning or in a very weak field intensity, 12 pin of IC201 becomes high level. Then this is supplied to the base of Q11 through NOR GATE IC354, whereby Q11 and Q10 turn ON. As a result, Q305 (L ch) and Q306 (R ch) also turn ON to mute the output.

### ● TUNING KNOB CIRCUIT

When the tuning knob is turned, the disc with black and white stripe pattern turns as they are interlocked. Then the signal is fed through each of the active type photo-sensors (PH801 for UP, PH802 for DOWN) as a pulse signal to the turning direction detecting circuit consisting of IC801, IC802 and IC803. When the tuning knob is turned UP, the signal is fed through Q813 to 9 pin of the digital tuning IC, IC702, which thereby starts scanning in the UP direction. When tuned DOWN, the signal is fed through Q814 to 10 pin of IC702 to start scanning in the DOWN direction.

### ● SYNTHESIZER SECTION

#### ● FM

The local oscillation output is fed from the front end unit FE101 to 5 pin of the prescaler: IC701 and after being frequency divided into 30 or 32, it is fed to 37 pin of the PLL synthesizer IC702. In IC702, the standard frequency is oscillated by the crystal oscillator, compared with the divided local oscillation output signal and output to 35 pin.

This voltage is level converted at Q701, Q702 and Q703, and fed to the varicap diode in the front end unit.

#### ● AM

The local oscillation output signal is fed from 20 pin of IC251 to 39 pin of the PLL synthesizer IC702. In IC702, the standard frequency is oscillated by the crystal oscillator, compared with the local oscillation output signal and output to 35 pin.

### ● INDICATOR SECTION

#### ● Frequency display

The serial data sent out of 27 pin of the PLL synthesizer IC702 is fed to 2 pin of the frequency indicating driver IC751, where the data is decoded to provide a signal which turns ON the indicator.

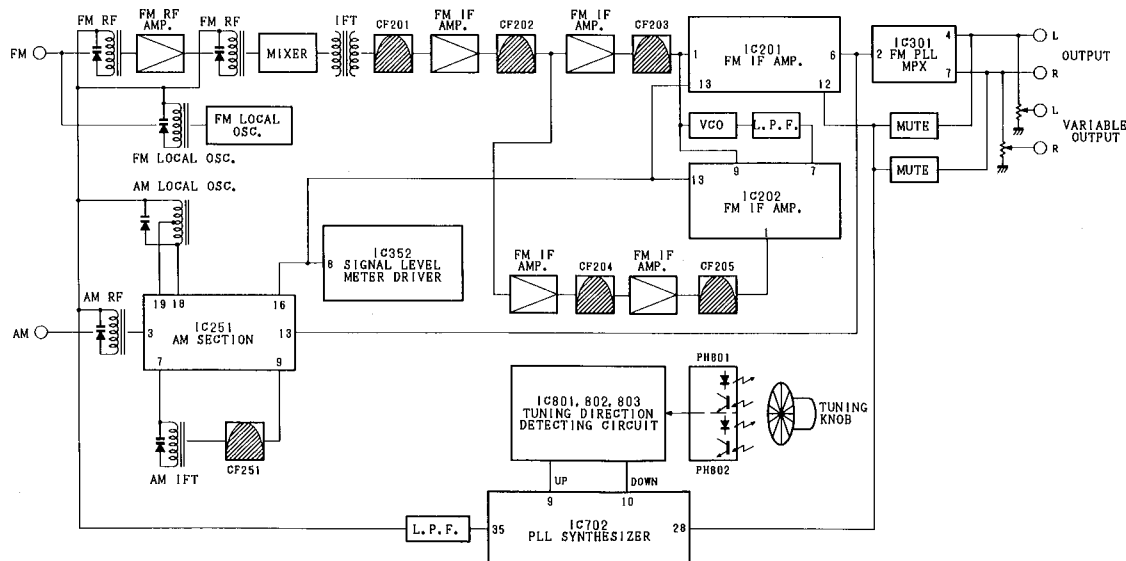
#### ● Signal strength

The voltage corresponding to the signal level is output from 13 pin of IC201 (for FM) and 16 pin of IC251 (for AM), transmitted through the buffer amplifier IC351 and fed to 8 pin of the level comparator IC352. Then it is further sent through Exclusive OR IC753 and IC754 to the indicator, whereby the signal strength segments 1 to 5 light according to the signal level.

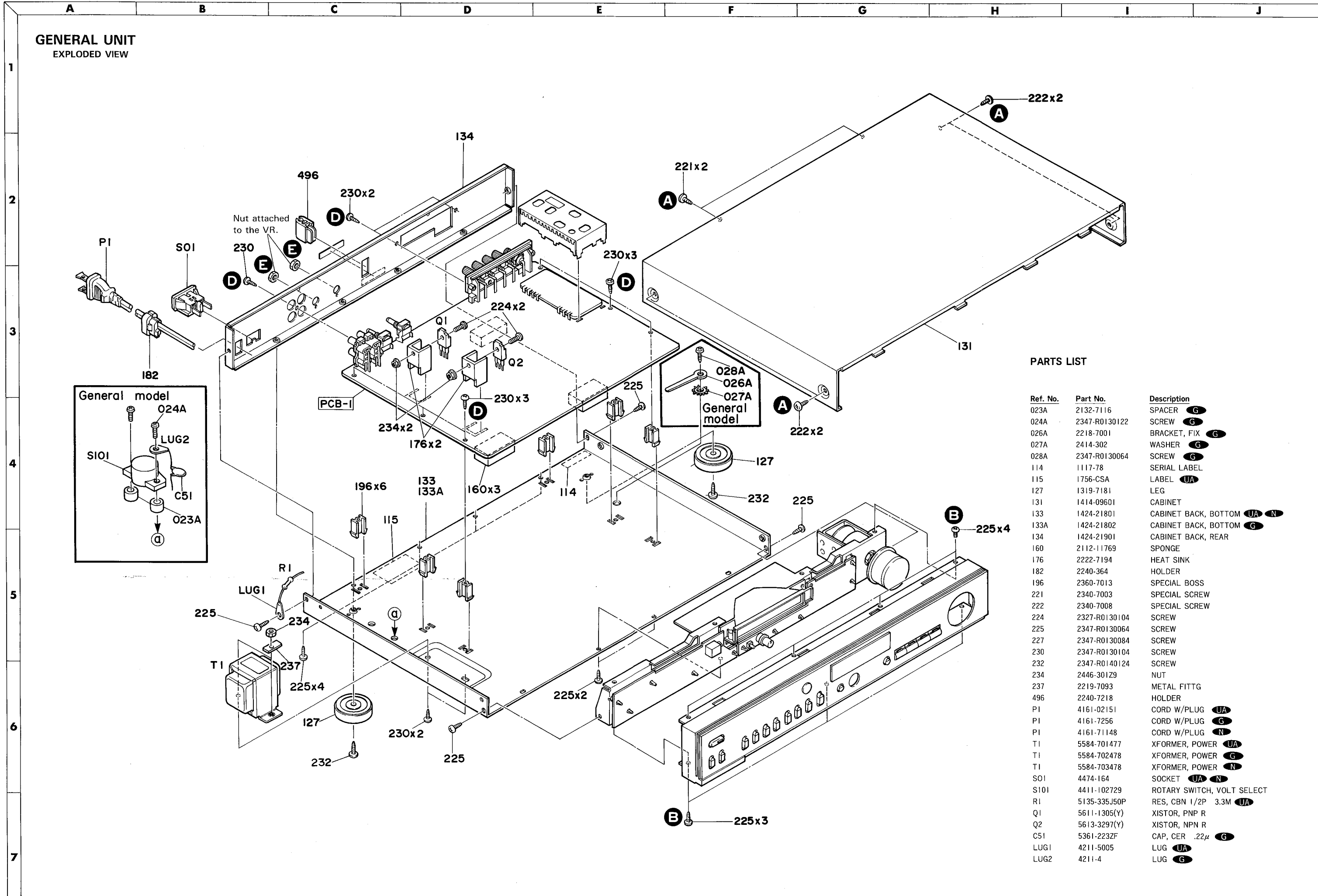
#### ● Tuning

When tuning, the output of 7 pin of IC202 is fed to the comparator IC353 where operation is identified among tuning, + scan and - scan. The output is sent through Exclusive OR IC754 and IC755 to the indicator, whereby the fine tuning segment of the indicator lights according to the tuning direction.

## BLOCK DIAGRAM



**GENERAL UNIT**  
EXPLODED VIEW



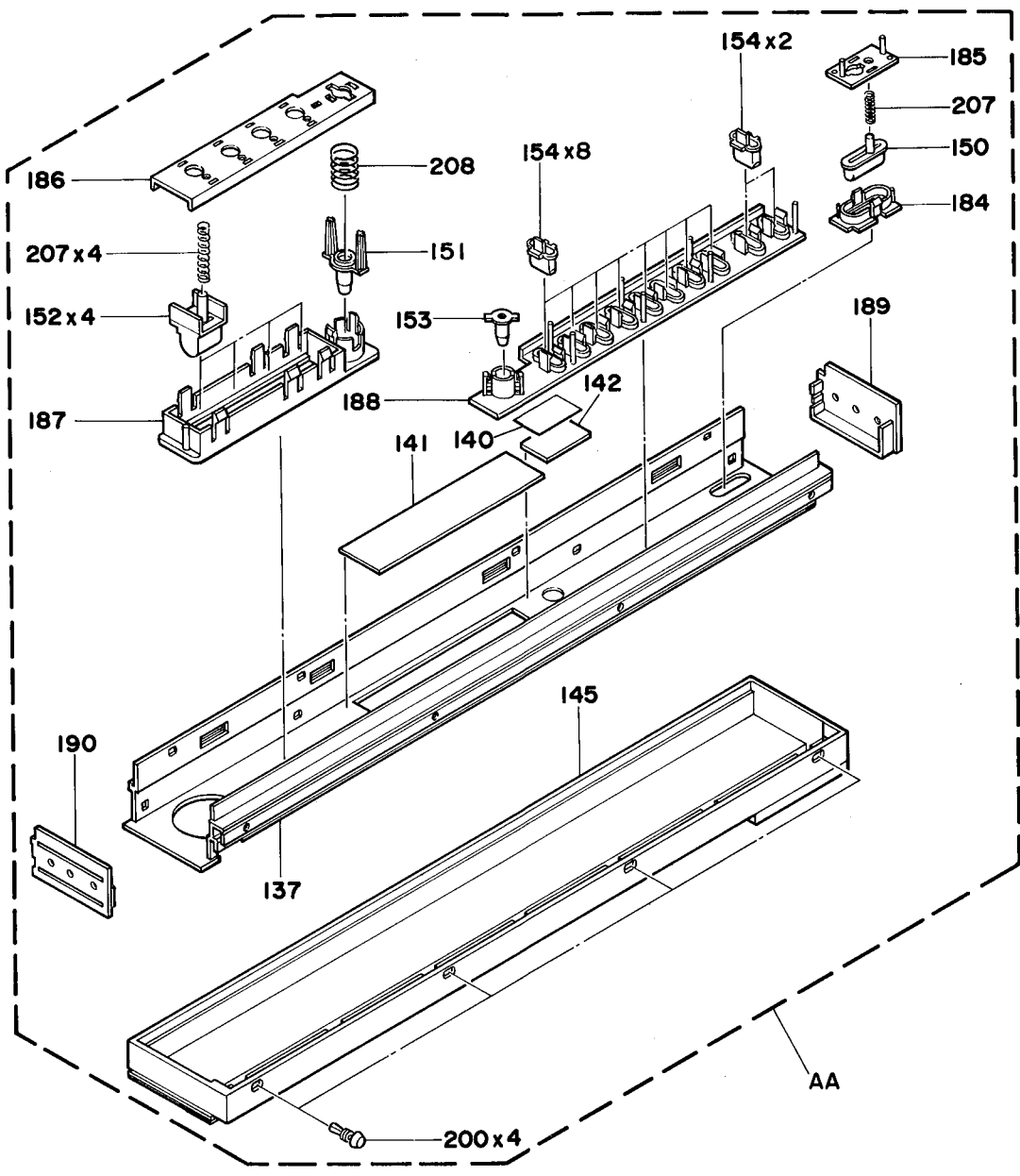
**PARTS LIST**

Ref. No.	Part No.	Description
023A	2132-7116	SPACER (G)
024A	2347-R0130122	SCREW (G)
026A	2218-7001	BRACKET, FIX (G)
027A	2414-302	WASHER (G)
028A	2347-R0130064	SCREW (G)
114	1117-78	SERIAL LABEL
115	1756-CSA	LABEL (UA)
127	1319-7181	LEG
131	1414-09601	CABINET
133	1424-21801	CABINET BACK, BOTTOM (UA) (N)
133A	1424-21802	CABINET BACK, BOTTOM (G)
134	1424-21901	CABINET BACK, REAR
160	2112-11769	SPONGE
176	2222-7194	HEAT SINK
182	2240-364	HOLDER
196	2360-7013	SPECIAL BOSS
221	2340-7003	SPECIAL SCREW
222	2340-7008	SPECIAL SCREW
224	2327-R0130104	SCREW
225	2347-R0130064	SCREW
227	2347-R0130084	SCREW
230	2347-R0130104	SCREW
232	2347-R0140124	SCREW
234	2446-30129	NUT
237	2219-7093	METAL FITTG
496	2240-7218	HOLDER
P1	4161-02151	CORD W/PLUG (UA)
P1	4161-7256	CORD W/PLUG (G)
P1	4161-71148	CORD W/PLUG (N)
T1	5584-701477	XFORMER, POWER (UA)
T1	5584-702478	XFORMER, POWER (G)
T1	5584-703478	XFORMER, POWER (N)
S01	4474-164	SOCKET (UA) (N)
S101	4411-102729	ROTARY SWITCH, VOLT SELECT
R1	5135-335J50P	RES, CBN 1/2P 3.3M (UA)
Q1	5611-1305(Y)	XISTOR, PNP R
Q2	5613-3297(Y)	XISTOR, NPN R
C51	5361-223ZF	CAP, CER .22μ (G)
LUG1	4211-5005	LUG (UA)
LUG2	4211-4	LUG (G)

A B C D E

**GENERAL UNIT**  
EXPLODED VIEW (FRONT PANEL ASS'Y)

1  
2  
3  
4  
5



**PARTS LIST**

6  
7

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
AA	A443-H199A	FRONT PANEL ASS'Y	184	2240-7290	HOLDER
137	1443-10801	PANEL	185	2240-7291	HOLDER
140	1511-11701	PLATE	186	2240-7294	HOLDER
141	1531-10201	WINDOW	187	2240-7295	HOLDER
142	1532-14501	WINDOW	188	2240-7296	HOLDER
145	1562-05601	FRAME	189	2240-7297	HOLDER
150	1662-30401	PUSH BUTTON	190	2240-7298	HOLDER
151	1662-30701	PUSH BUTTON	200	2459-3006511	PLASTIC RIVET
152	1662-30801	PUSH BUTTON	207	2651-2101727	SPRING
153	1662-30901	PUSH BUTTON	208	2651-2101710	SPRING
154	1662-31101	PUSH BUTTON			



A

B

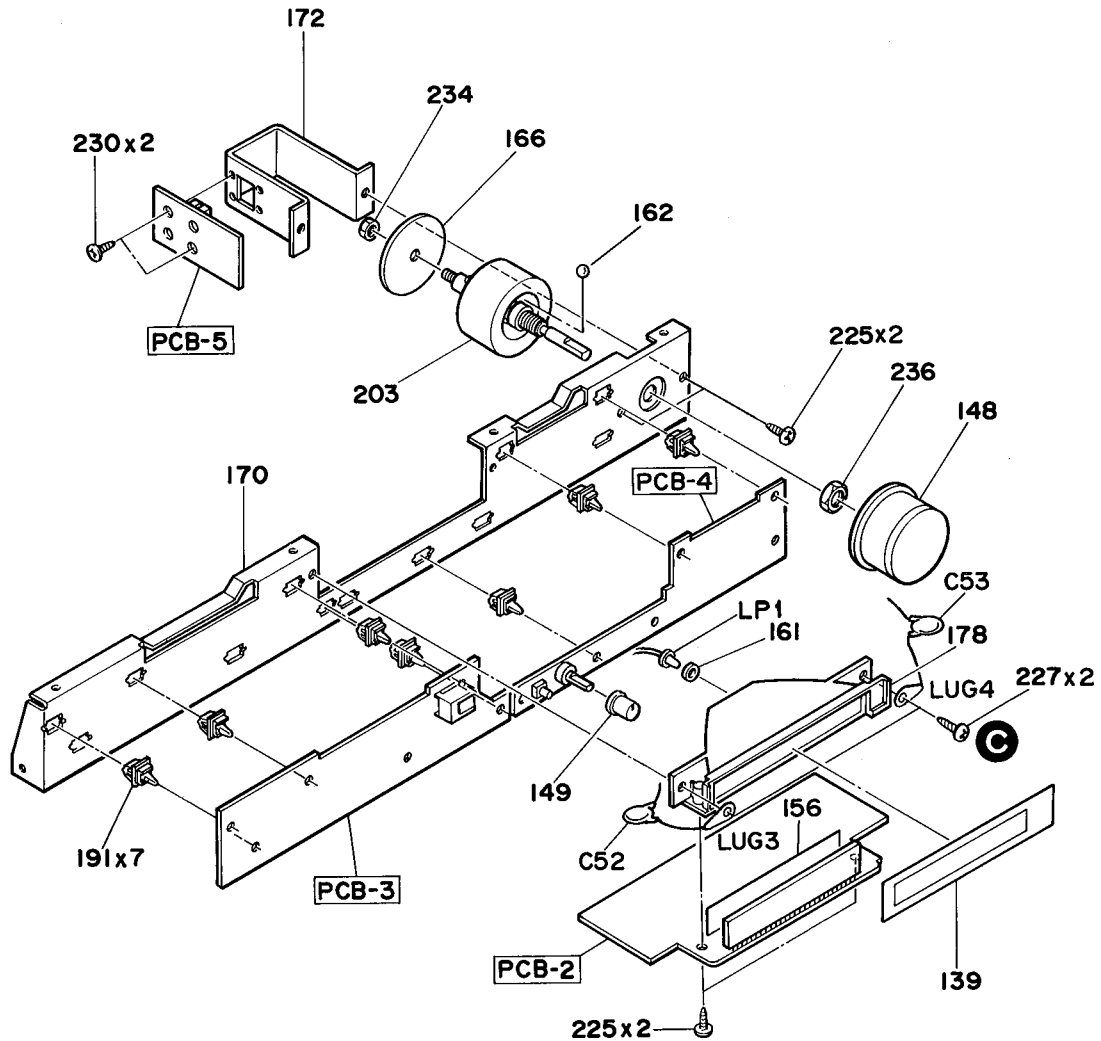
C

D

E

## GENERAL UNIT

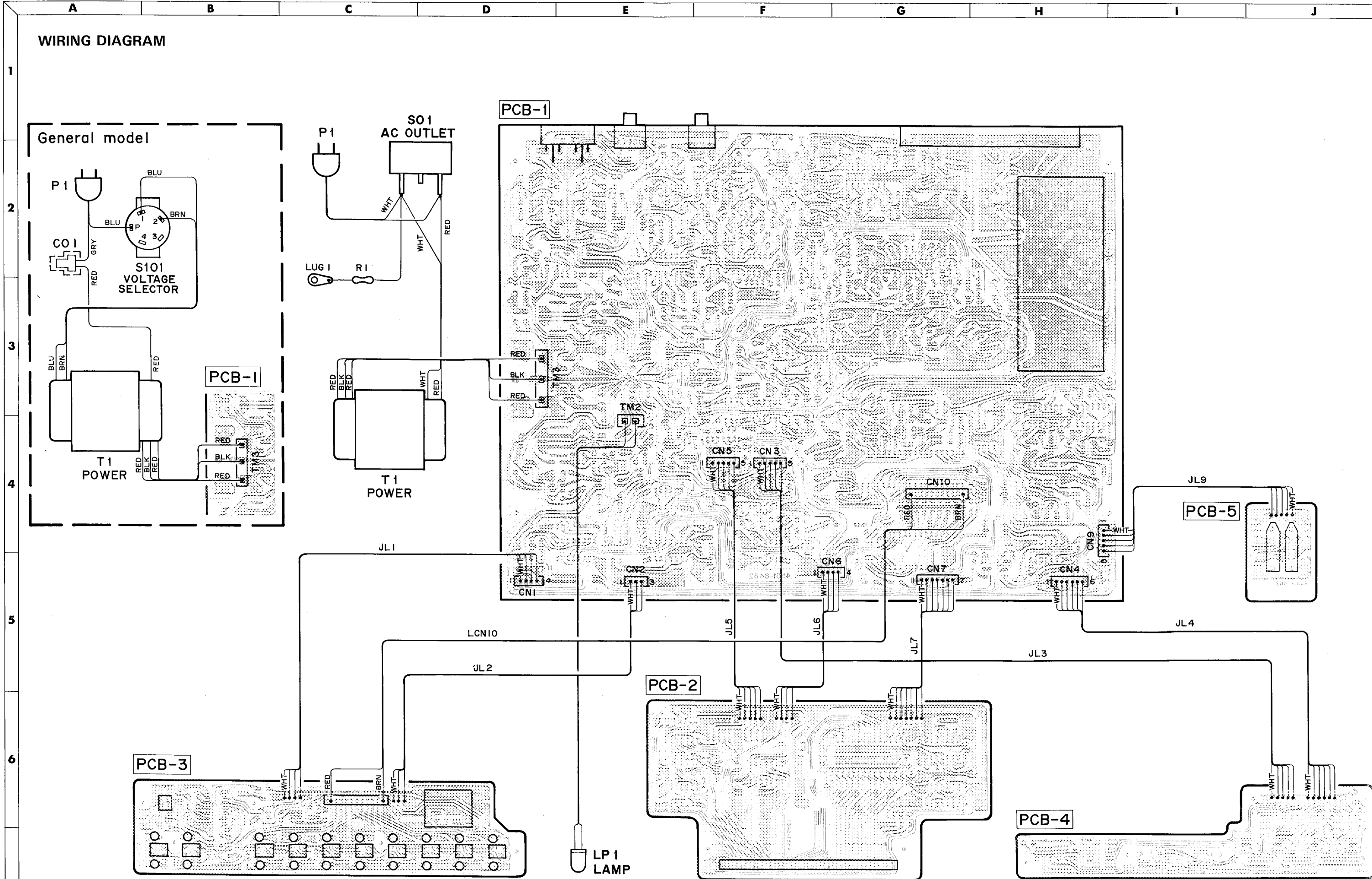
EXPLODED VIEW (FRONT CHASSIS)



## PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
139	1511-10401	PLATE	203	2602-007121	TUNING SHAFT
148	1630-03502	ROTARY KNOB	225	2347-R0130064	SCREW
149	1632-16201	ROTARY KNOB	227	2347-R0130084	SCREW
156	1731-00601	INDICATOR	230	2347-R0130104	SCREW
161	2114-01306	BUSHING	234	2446-30129	NUT
162	2114-01288	BUSHING	236	2447-10227	NUT
166	2133-7026	PROTECTOR	LP1	5731-1402020	LAMP
170	2211-7287	CHASSIS	LUG3	4211-4	LUG <b>G</b>
172	2219-8148	METAL FITTG	LUG4	4211-4	LUG <b>G</b>
178	2223-7056	REFLECTOR	C52	5361-2238F	CAP, CER .022 $\mu$ <b>G</b>
191	2240-7307	HOLDER	C53	5361-2238F	CAP, CER .022 $\mu$ <b>G</b>

WIRING DIAGRAM

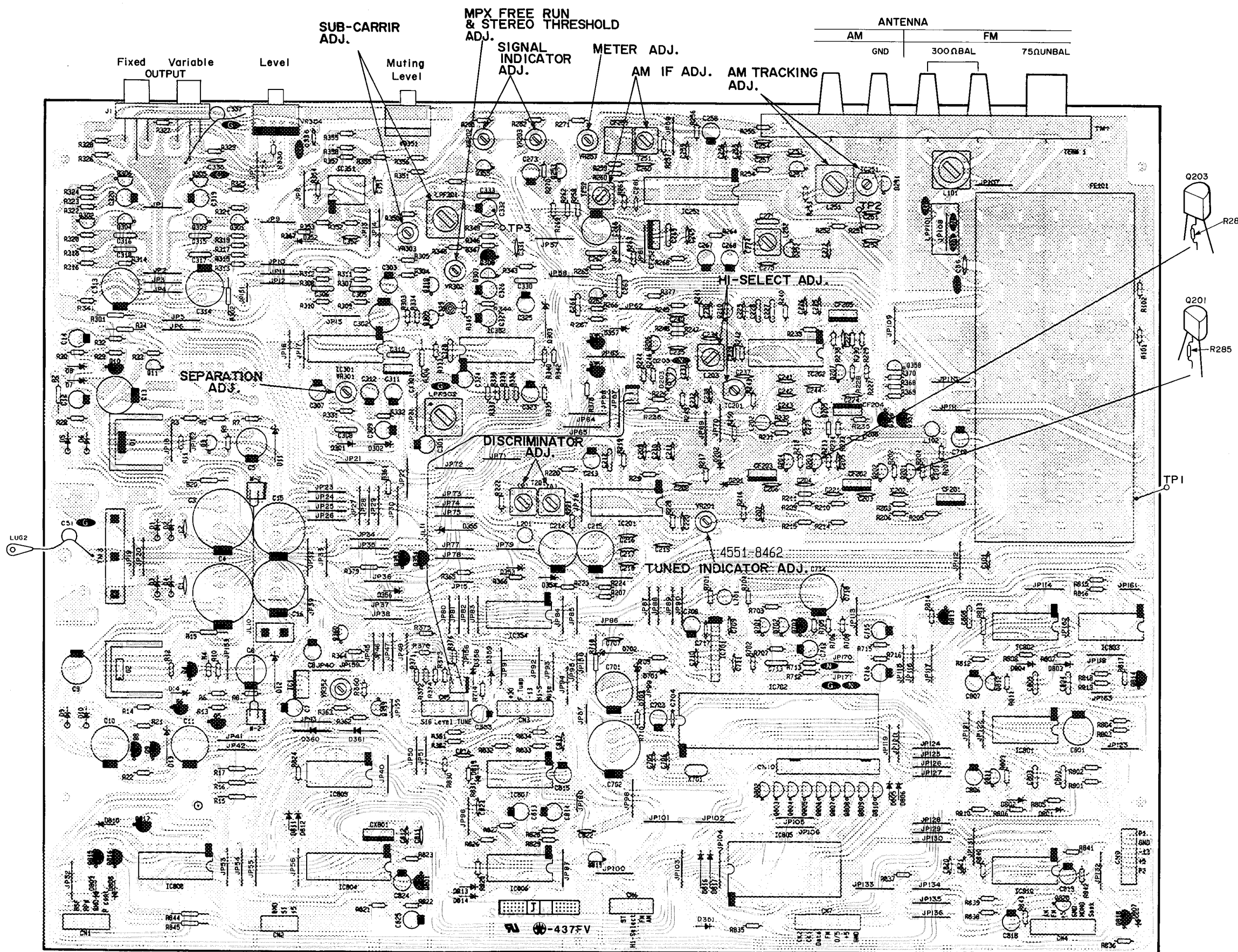


WIRE COLOR ABBREVIATIONS

Red	: RED	YEL	: Yellow
ORG	: Orange	PUP	: Purple
BLU	: Blue	PIK	: Pink
WHT	: White	GRY	: Gray
GRN	: Green	BRN	: Brown
BLK	: Black		

P. C. BOARDS

PCB-1 Main P. C. Board





ELECTRICAL PARTS LIST

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
<b>PCB-1 MAIN P. C. BOARD</b>							
<b>CAPACITORS</b>							
663	C1	5361-473ZF	CAP, CER .047μ	506	C258	5345-106C041	CAP, MINI ELE 10μ/16V
663	C2	5361-473ZF	CAP, CER .047μ	516	C259	5361-223ZF	CAP, CER .022μ
652	C3	5345-228D041	CAP, MINI ELE 2200μ/25V	516	C260	5361-223ZF	CAP, CER .022μ
652	C4	5345-228D041	CAP, MINI ELE 2200μ/25V	514	C261	5361-102KB	CAP, CER 1000p
657	C5	5345-107C041	CAP, MINI ELE 100μ/16V	511	C262	5354-103K1HM	CAP, MYL .01μ
657	C6	5345-107C041	CAP, MINI ELE 100μ/16V	510	C263	5354-104593	CAP, MYL .1μ
659	C7	5345-106D041	CAP, MINI ELE 10μ/25V	512	C264	5354-822K1HM	CAP, MYL 8200p <b>UA</b>
661	C8	5345-106C041	CAP, MINI ELE 10μ/16V	512A	C264	5354-562K1HM	CAP, MYL 5600p <b>G</b>
658	C9	5345-476F041	CAP, MINI ELE 47μ/50V	512B	C264	5354-562K1HM	CAP, MYL 5600p <b>N</b>
655	C10	5345-107F041	CAP, MINI ELE 100μ/50V	515	C265	5361-473ZF	CAP, CER .047μ
654	C11	5345-227E041	CAP, MINI ELE 220μ/35V	505	C266	5345-107C041	CAP, MINI ELE 100μ/16V
659	C12	5345-106D041	CAP, MINI ELE 10μ/25V	507	C267	5345-475D041	CAP, MINI ELE 4.7μ/25V
656	C13	5345-107D041	CAP, MINI ELE 100μ/25V	507	C268	5345-475D041	CAP, MINI ELE 4.7μ/25V
660	C14	5345-225F041	CAP, MINI ELE 2.2μ/50V	511	C269	5354-103K1HM	CAP, MYL .01μ
653	C15	5345-108C041	CAP, MINI ELE 1000μ/16V	515	C270	5361-473ZF	CAP, CER .047μ
653	C16	5345-108C041	CAP, MINI ELE 1000μ/16V	519	C271	5359-4315851	CAP, PPP 430p
044A	C56	5361-330KSL	CAP, CER 33p <b>G</b>	517	C272	5361-180JPH	CAP, CER 18p
408	C101	5361-150JCH	CAP, CER 15p	508	C273	5345-474F041	CAP, MINI ELE .47μ/50V
447	C201	5361-223ZF	CAP, CER .022μ	516	C274	5361-223ZF	CAP, CER .022μ
447	C202	5361-223ZF	CAP, CER .022μ	541	C275	5345-225F041	CAP, MINI ELE 2.2μ/50V
447	C203	5361-223ZF	CAP, CER .022μ	558	C301	5345-226C0952	CAP, MINI ELE 22μ/16V
447	C204	5361-223ZF	CAP, CER .022μ	564	C302	5345-107C041	CAP, MINI ELE 100μ/16V
447	C205	5361-223ZF	CAP, CER .022μ	558	C303	5345-226C0952	CAP, MINI ELE 22μ/16V
447	C206	5361-223ZF	CAP, CER .022μ	572	C305	5359-4715851	CAP, PPP 470p <b>UA</b>
447	C207	5361-223ZF	CAP, CER .022μ	049A	C305	5359-2715851	CAP, PPP 270p <b>G</b>
448	C208	5361-103ZF	CAP, CER .01μ	041B	C305	5359-3315851	CAP, PPP 330p <b>N</b>
447	C209	5361-223ZF	CAP, CER .022μ	572	C306	5359-4715851	CAP, PPP 470p <b>UA</b>
447	C210	5361-223ZF	CAP, CER .022μ	049A	C306	5359-2715851	CAP, PPP 270p <b>G</b>
447	C211	5361-223ZF	CAP, CER .022μ	041B	C306	5359-3315851	CAP, PPP 330p <b>N</b>
449	C212	5359-1015851	CAP, PPP 100p <b>UA N</b>	560	C307	5345-225F0952	CAP, MINI ELE 2.2μ/50V
449A	C212	5359-2215851	CAP, PPP 220p <b>G</b>	571	C308	5359-1015851	CAP, PPP 100p
444	C213	5345-105F041	CAP, MINI ELE 1μ/50V	559	C309	5345-106C0952	CAP, MINI ELE 10μ/16V
443	C214	5345-227C041	CAP, MINI ELE 220μ/16V	569	C310	5354-473K1HM	CAP, MYL .047μ
443	C215	5345-227C041	CAP, MINI ELE 220μ/16V	562	C311	5345-474F0952	CAP, MINI ELE .47μ/50V
446	C216	5361-473ZF	CAP, CER .047μ	563	C312	5345-224F0952	CAP, MINI ELE .22μ/50V
447	C217	5361-223ZF	CAP, CER .022μ	615	C313	5345-227C041	CAP, MINI ELE 220μ/16V
447	C218	5361-223ZF	CAP, CER .022μ	615	C314	5345-227C041	CAP, MINI ELE 220μ/16V
448	C219	5361-103ZF	CAP, CER .01μ	619	C315	5359-1525851	CAP, PPP 1500p
446	C220	5361-473ZF	CAP, CER .047μ	619	C316	5359-1525851	CAP, PPP 1500p
447	C221	5361-223ZF	CAP, CER .022μ	618	C317	5359-2725851	CAP, PPP 2700p
477	C222	5361-223ZF	CAP, CER .022μ	618	C318	5359-2725851	CAP, PPP 2700p
477	C223	5361-223ZF	CAP, CER .022μ	616	C319	5345-475F0952	CAP, MINI ELE 4.7μ/50V
478	C224	5361-103ZF	CAP, CER .01μ	616	C320	5345-475F0952	CAP, MINI ELE 4.7μ/50V
477	C225	5361-223ZF	CAP, CER .022μ	565	C323	5345-476C041	CAP, MINI ELE 47μ/16V
477	C226	5361-223ZF	CAP, CER .022μ	559	C324	5345-106C0952	CAP, MINI ELE 10μ/16V
479	C227	5359-1015851	CAP, PPP 100p	561	C325	5345-105F0952	CAP, MINI ELE 1μ/50V
479	C228	5359-1015851	CAP, PPP 100p	562	C326	5345-474F0952	CAP, MINI ELE .47μ/50V
476	C229	5361-473ZF	CAP, CER .047μ	563	C327	5345-224F0952	CAP, MINI ELE .22μ/50V
474	C230	5361-472KB	CAP, CER 4700p	569	C328	5354-473K1HM	CAP, MYL .047μ
471	C231	5361-223ZF	CAP, CER .022μ	568	C329	5355-102J1HS	CAP, STY 1000p
478	C232	5361-103ZF	CAP, CER .01μ	570	C330	5354-103K1HM	CAP, MYL .01μ
478	C233	5361-103ZF	CAP, CER .01μ	575	C331	5361-050DSL	CAP, CER 5p
472	C234	5361-220JRH	CAP, CER 22p	566	C332	5345-106C041	CAP, MINI ELE 10μ/16V
473	C235	5361-150JPH	CAP, CER 15p	572	C333	5359-4715851	CAP, PPP 470p <b>UA</b>
475	C237	5361-221KB	CAP, CER 220p	572A	C333	5359-4715851	CAP, PPP 470p <b>G</b>
478	C238	5361-103ZF	CAP, CER .01μ	572B	C333	5359-4715851	CAP, PPP 470p <b>N</b>
476	C239	5361-473ZF	CAP, CER .047μ	053A	C335	5361-101KB	CAP, CER 100p <b>G</b>
477	C240	5361-223ZF	CAP, CER .022μ	053A	C336	5361-101KB	CAP, CER 100p <b>G</b>
476	C241	5361-473ZF	CAP, CER .047μ	052A	C337	5361-103ZF	CAP, CER .01μ <b>G</b>
477	C242	5361-223ZF	CAP, CER .022μ	682	C351	5361-473ZF	CAP, CER .047μ
477	C243	5361-223ZF	CAP, CER .022μ	682	C352	5361-473ZF	CAP, CER .047μ
478	C244	5361-103ZF	CAP, CER .01μ	681	C353	5345-105F041	CAP, MINI ELE 1μ/50V
515	C251	5361-473ZF	CAP, CER .047μ	744	C701	5345-227B041	CAP, MINI ELE 220μ/10V
516	C252	5361-223ZF	CAP, CER .022μ	741	C702	5350-4730H651	CAP, SPE .047F
513	C253	5361-152KB	CAP, CER 1500p	742	C703	5343-2260653	CAP, TAN 22μ
516	C254	5361-223ZF	CAP, CER .022μ	751	C704	5361-103ZF	CAP, CER .01μ
514	C255	5361-102KB	CAP, CER 1000p	749	C705	5361-470JCH	CAP, CER 47p
515	C256	5361-473ZF	CAP, CER .047μ	749	C706	5361-470JCH	CAP, CER 47p
516	C257	5361-223ZF	CAP, CER .022μ	751	C707	5361-103ZF	CAP, CER .01μ
				745	C708	5345-476B041	CAP, MINI ELE 47μ/10V
				751	C709	5361-103ZF	CAP, CER .01μ
				752	C710	5361-102KB	CAP, CER 1000p

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
751	C711	5361-103ZF	CAP, CER .01 $\mu$	455	R216	5232-222J16P	RES, CBN 1/6P 2.2K
747	C712	5345-334F0951	CAP, MINI ELE .33 $\mu$ /50V	455	R217	5232-222J16P	RES, CBN 1/6P 2.2K
748	C713	5354-103KIHM	CAP, MYL .01 $\mu$	457	R218	5232-471J16P	RES, CBN 1/6P 470
743	C714	5345-107E041	CAP, MINI ELE 100 $\mu$ /35V	454	R219	5232-562J16P	RES, CBN 1/6P 5.6K
746	C715	5345-225F0952	CAP, MINI ELE 2.2 $\mu$ /50V	452	R220	5232-123J16P	RES, CBN 1/6P 12K
746	C716	5345-225F0952	CAP, MINI ELE 2.2 $\mu$ /50V	452A	R220	5232-223J16P	RES, CBN 1/6P 22K
749	C717	5361-470JCH	CAP, CER 47p	454	R221	5232-562J16P	RES, CBN 1/6P 5.6K
750	C718	5361-473ZF	CAP, CER .047 $\mu$	455	R222	5232-222J16P	RES, CBN 1/6P 2.2K
746	C719	5345-225F0952	CAP, MINI ELE 2.2 $\mu$ /50V	453	R223	5232-103J16P	RES, CBN 1/6P 10K
769	C801	5345-476B041	CAP, MINI ELE 47 $\mu$ /10V	453	R224	5232-103J16P	RES, CBN 1/6P 10K
772	C802	5354-103KIHM	CAP, MYL .01 $\mu$	450	R225	5232-563J16P	RES, CBN 1/6P 56K
772	C803	5354-103KIHM	CAP, MYL .01 $\mu$	483	R226	5232-223J16P	RES, CBN 1/6P 22K
772	C804	5354-103KIHM	CAP, MYL .01 $\mu$	487	R227	5232-102J16P	RES, CBN 1/6P 1K
772	C805	5354-103KIHM	CAP, MYL .01 $\mu$	480	R228	5232-154J16P	RES, CBN 1/6P 150K
770	C806	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V	489	R229	5232-331J16P	RES, CBN 1/6P 330
770	C807	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V	485	R230	5232-101J16P	RES, CBN 1/6P 100
771	C808	5354-333KIHM	CAP, MYL .033 $\mu$	482	R231	5232-473J16P	RES, CBN 1/6P 47K
807	C811	5361-101KB	CAP, CER 100p	482	R232	5232-473J16P	RES, CBN 1/6P 47K
807	C812	5361-101KB	CAP, CER 100p	489	R233	5232-331J16P	RES, CBN 1/6P 330
806	C813	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	490	R234	5232-2R2J16P	RES, CBN 1/6P 2.2
806	C814	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	489	R235	5232-331J16P	RES, CBN 1/6P 330
806	C815	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	539	R236	5135-104522	RES, CBN 1/2P 100K
808	C816	5361-103ZF	CAP, CER .01 $\mu$	488	R238	5232-330J16P	RES, CBN 1/6P 33
808	C817	5361-103ZF	CAP, CER .01 $\mu$	489	R239	5232-331J16P	RES, CBN 1/6P 330
805	C818	5345-226C041	CAP, MINI ELE 22 $\mu$ /16V	484	R240	5232-472J16P	RES, CBN 1/6P 4.7K
806	C819	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	487	R241	5232-102J16P	RES, CBN 1/6P 1K
808	C820	5361-103ZF	CAP, CER .01 $\mu$	483	R242	5232-223J16P	RES, CBN 1/6P 22K
808	C821	5361-103ZF	CAP, CER .01 $\mu$	487	R243	5232-102J16P	RES, CBN 1/6P 1K
808	C822	5361-103ZF	CAP, CER .01 $\mu$	484	R244	5232-472J16P	RES, CBN 1/6P 4.7K
808	C823	5361-103ZF	CAP, CER .01 $\mu$	487	R245	5232-102J16P	RES, CBN 1/6P 1K
804	C824	5345-476B041	CAP, MINI ELE 47 $\mu$ /10V	481	R246	5232-104J16P	RES, CBN 1/6P 100K
806	C825	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	489	R247	5232-331J16P	RES, CBN 1/6P 330
		<b>RESISTORS</b>		487	R248	5232-102J16P	RES, CBN 1/6P 1K
705	$\Delta$ R2	5102-2R2579	RES, FUSE 2.2	483	R249	5232-223J16P	RES, CBN 1/6P 22K
714	R3	5232-682J16P	RES, CBN 1/6P 6.8K	486	R250	5232-222J16P	RES, CBN 1/6P 2.2K
714	R4	5232-682J16P	RES, CBN 1/6P 6.8K	526	R251	5232-104J16P	RES, CBN 1/6P 100K
715	R5	5232-102J16P	RES, CBN 1/6P 1K	526	R252	5232-104J16P	RES, CBN 1/6P 100K
715	R6	5232-102J16P	RES, CBN 1/6P 1K	533	R253	5232-471J16P	RES, CBN 1/6P 470
719	R7	5232-220J16P	RES, CBN 1/6P 22	535	R254	5232-101J16P	RES, CBN 1/6P 100
719	R8	5232-220J16P	RES, CBN 1/6P 22	535	R255	5232-101J16P	RES, CBN 1/6P 100
720	R9	5232-100J16P	RES, CBN 1/6P 10	532	R256	5232-102J16P	RES, CBN 1/6P 1K
720	R10	5232-100J16P	RES, CBN 1/6P 10	527	R257	5232-683J16P	RES, CBN 1/6P 68K
716	R11	5232-331J16P	RES, CBN 1/6P 330	534	R258	5232-221J16P	RES, CBN 1/6P 220
716	R12	5232-331J16P	RES, CBN 1/6P 330	531	R259	5232-122J16P	RES, CBN 1/6P 1.2K
711	R13	5232-333J16P	RES, CBN 1/6P 33K	532	R260	5232-102J16P	RES, CBN 1/6P 1K
708	R14	5232-105J16P	RES, CBN 1/6P 1M	533	R261	5232-471J16P	RES, CBN 1/6P 470
706	$\Delta$ R15	5102-1804715	RES, FUSE 18	529	R262	5232-103J16P	RES, CBN 1/6P 10K
707	R16	5135-100522	RES, CBN 1/2P 10	529	R263	5232-103J16P	RES, CBN 1/6P 10K
707	R17	5135-100522	RES, CBN 1/2P 10	529	R264	5232-103J16P	RES, CBN 1/6P 10K
705	$\Delta$ R19	5102-2R2579	RES, FUSE 2.2	530	R265	5232-222J16P	RES, CBN 1/6P 2.2K
705	$\Delta$ R20	5102-2R2579	RES, FUSE 2.2	525	R266	5232-105J16P	RES, CBN 1/6P 1M
718	R21	5232-680J16P	RES, CBN 1/6P 68	529	R267	5232-103J16P	RES, CBN 1/6P 10K
712	R22	5232-223J16P	RES, CBN 1/6P 22K	536	R268	5232-820J16P	RES, CBN 1/6P 82
713	R28	5232-103J16P	RES, CBN 1/6P 10K	528	R269	5232-223J16P	RES, CBN 1/6P 22K
712	R29	5232-223J16P	RES, CBN 1/6P 22K	529	R270	5232-103J16P	RES, CBN 1/6P 10K
709	R30	5232-224J16P	RES, CBN 1/6P 220K	526	R271	5232-104J16P	RES, CBN 1/6P 100K
717	R32	5232-100J16P	RES, CBN 1/6P 10	526	R281	5232-104J16P	RES, CBN 1/6P 100K
710	R33	5232-473J16P	RES, CBN 1/6P 47K	526	R282	5232-104J16P	RES, CBN 1/6P 100K
724	R34	5134-224J25P	RES, CBN 1/4P 220K	054A	R285	5232-101J16P	RES, CBN 1/6P 100
411	R101	5232-473J16P	RES, CBN 1/6P 47K	054A	R286	5232-101J16P	RES, CBN 1/6P 100
410	R102	5232-104J16P	RES, CBN 1/6P 100K	621	$\Delta$ R301	5102-2204715	RES, FUSE 22
459	R201	5232-221J16P	RES, CBN 1/6P 220	621	$\Delta$ R302	5102-2204715	RES, FUSE 22
458	R202	5232-331J16P	RES, CBN 1/6P 330	595	R303	5232-104J16P	RES, CBN 1/6P 100K
458	R203	5232-331J16P	RES, CBN 1/6P 330	602	R304	5232-102J16P	RES, CBN 1/6P 1K
456	R204	5232-681J16P	RES, CBN 1/6P 680	602	R305	5232-102J16P	RES, CBN 1/6P 1K
451	R205	5232-473J16P	RES, CBN 1/6P 47K	607	$\Delta$ R306	5102-4R75715	RES, FUSE 4.7
451	R206	5232-473J16P	RES, CBN 1/6P 47K	594	R307	5232-154J16P	RES, CBN 1/6P 150K
460	R207	5232-223J16P	RES, CBN 1/6P 22K	594A	R307	5232-184J16P	RES, CBN 1/6P 180K
459	R208	5232-221J16P	RES, CBN 1/6P 220	594	R308	5232-154J16P	RES, CBN 1/6P 150K
451	R209	5232-473J16P	RES, CBN 1/6P 47K	594A	R308	5232-184J16P	RES, CBN 1/6P 180K
451	R210	5232-473J16P	RES, CBN 1/6P 47K	593	R309	5232-124J16P	RES, CBN 1/6P 120K
458	R211	5232-331J16P	RES, CBN 1/6P 330	593A	R309	5232-154J16P	RES, CBN 1/6P 150K
458	R212	5232-331J16P	RES, CBN 1/6P 330	593	R310	5232-124J16P	RES, CBN 1/6P 120K
456	R213	5232-681J16P	RES, CBN 1/6P 680	593A	R310	5232-154J16P	RES, CBN 1/6P 150K
451	R214	5232-473J16P	RES, CBN 1/6P 47K	601	R311	5232-222J16P	RES, CBN 1/6P 2.2K
451	R215	5232-473J16P	RES, CBN 1/6P 47K	601	R312	5232-222J16P	RES, CBN 1/6P 2.2K



Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
625	R313	5232-272J16P	RES, CBN 1/6P 2.7K	697	R382	5232-224J16P	RES, CBN 1/6P 220K <b>UA</b> <b>G</b>
625	R314	5232-272J16P	RES, CBN 1/6P 2.7K	697B	R382	5232-473J16P	RES, CBN 1/6P 47K <b>N</b>
625	R315	5232-272J16P	RES, CBN 1/6P 2.7K	759	R701	5232-102J16P	RES, CBN 1/6P 1K
625	R316	5232-272J16P	RES, CBN 1/6P 2.7K	755	R702	5232-103J16P	RES, CBN 1/6P 10K
626	R317	5232-222J16P	RES, CBN 1/6P 2.2K	757	R703	5232-472J16P	RES, CBN 1/6P 4.7K
626	R318	5232-222J16P	RES, CBN 1/6P 2.2K	759	R704	5232-102J16P	RES, CBN 1/6P 1K
628	R319	5232-101J16P	RES, CBN 1/6P 100 <b>UA</b> <b>N</b>	758	R705	5232-332J16P	RES, CBN 1/6P 3.3K
628A	R319	5232-101J16P	RES, CBN 1/6P 100 <b>G</b>	755	R706	5232-103J16P	RES, CBN 1/6P 10K
628	R320	5232-101J16P	RES, CBN 1/6P 100 <b>UA</b>	756	R707	5232-822J16P	RES, CBN 1/6P 8.2K
628A	R320	5232-101J16P	RES, CBN 1/6P 100 <b>G</b>	760	R708	5232-101J16P	RES, CBN 1/6P 100
627	R321	5232-102J16P	RES, CBN 1/6P 1K	759	R709	5232-102J16P	RES, CBN 1/6P 1K
627	R322	5232-102J16P	RES, CBN 1/6P 1K	759	R710	5232-102J16P	RES, CBN 1/6P 1K
624	R323	5232-472J16P	RES, CBN 1/6P 4.7K	755	R712	5232-103J16P	RES, CBN 1/6P 10K
624	R324	5232-472J16P	RES, CBN 1/6P 4.7K	755	R713	5232-103J16P	RES, CBN 1/6P 10K
623	R325	5232-103J16P	RES, CBN 1/6P 10K	755	R714	5232-103J16P	RES, CBN 1/6P 10K
623	R326	5232-103J16P	RES, CBN 1/6P 10K	753	R715	5232-333J16P	RES, CBN 1/6P 33K
628	R327	5232-101J16P	RES, CBN 1/6P 100 <b>UA</b> <b>N</b>	754	R716	5232-273J16P	RES, CBN 1/6P 27K
051A	R327	5232-102J16P	RES, CBN 1/6P 1K <b>G</b>	739	R718	5171-151593	RES, MTL IP 150
628	R328	5232-101J16P	RES, CBN 1/6P 100 <b>UA</b> <b>N</b>	778	R801	5232-473J16P	RES, CBN 1/6P 47K
051A	R328	5232-102J16P	RES, CBN 1/6P 1K <b>G</b>	775	R802	5232-105J16P	RES, CBN 1/6P 1M
628	R329	5232-101J16P	RES, CBN 1/6P 100 <b>UA</b> <b>N</b>	778	R803	5232-473J16P	RES, CBN 1/6P 47K
051A	R329	5232-102J16P	RES, CBN 1/6P 1K <b>G</b>	775	R804	5232-105J16P	RES, CBN 1/6P 1M
628	R330	5232-101J16P	RES, CBN 1/6P 100 <b>UA</b> <b>N</b>	777	R805	5232-334J16P	RES, CBN 1/6P 330K
051A	R330	5232-102J16P	RES, CBN 1/6P 1K <b>G</b>	777	R806	5232-334J16P	RES, CBN 1/6P 330K
597	R331	5232-103J16P	RES, CBN 1/6P 10K	777	R807	5232-334J16P	RES, CBN 1/6P 330K
599	R332	5232-472J16P	RES, CBN 1/6P 4.7K	777	R808	5232-334J16P	RES, CBN 1/6P 330K
605	R333	5232-101J16P	RES, CBN 1/6P 100	776	R809	5232-474J16P	RES, CBN 1/6P 470K
591	R334	5232-155J16P	RES, CBN 1/6P 1.5M	774	R810	5232-335J16P	RES, CBN 1/6P 3.3M
603	R335	5232-561J16P	RES, CBN 1/6P 560	776	R811	5232-474J16P	RES, CBN 1/6P 470K
601	R336	5232-222J16P	RES, CBN 1/6P 2.2K	774	R812	5232-335J16P	RES, CBN 1/6P 3.3M
599	R337	5232-472J16P	RES, CBN 1/6P 4.7K	780	R813	5135-104522	RES, CBN 1/2P 100K
599	R338	5232-472J16P	RES, CBN 1/6P 4.7K	779	R814	5232-103J16P	RES, CBN 1/6P 10K
597	R339	5232-103J16P	RES, CBN 1/6P 10K	779	R815	5232-103J16P	RES, CBN 1/6P 10K
597	R340	5232-103J16P	RES, CBN 1/6P 10K	779	R816	5232-103J16P	RES, CBN 1/6P 10K
622	R341	5232-104J16P	RES, CBN 1/6P 100K	779	R817	5232-103J16P	RES, CBN 1/6P 10K
605	R342	5232-101J16P	RES, CBN 1/6P 100	779	R818	5232-103J16P	RES, CBN 1/6P 10K
592	R343	5232-474J16P	RES, CBN 1/6P 470K	779	R819	5232-103J16P	RES, CBN 1/6P 10K
604	R344	5232-471J16P	RES, CBN 1/6P 470	817	R821	5232-470J16P	RES, CBN 1/6P 47
597	R345	5232-103J16P	RES, CBN 1/6P 10K	814	R822	5232-103J16P	RES, CBN 1/6P 10K
590	R346	5232-225J16P	RES, CBN 1/6P 2.2M	812	R823	5232-393J16P	RES, CBN 1/6P 39K
600	R347	5232-332J16P	RES, CBN 1/6P 3.3K	814	R824	5232-103J16P	RES, CBN 1/6P 10K
597	R348	5232-103J16P	RES, CBN 1/6P 10K	814	R825	5232-103J16P	RES, CBN 1/6P 10K
599	R349	5232-472J16P	RES, CBN 1/6P 4.7K	811	R826	5232-473J16P	RES, CBN 1/6P 47K
596	R350	5232-333J16P	RES, CBN 1/6P 33K	814	R827	5232-103J16P	RES, CBN 1/6P 10K
689	R351	5232-223J16P	RES, CBN 1/6P 22K	814	R828	5232-103J16P	RES, CBN 1/6P 10K
688	R352	5232-333J16P	RES, CBN 1/6P 33K	814	R829	5232-103J16P	RES, CBN 1/6P 10K
684	R353	5232-334J16P	RES, CBN 1/6P 330K	816	R830	5232-331J16P	RES, CBN 1/6P 330
683	R354	5232-225J16P	RES, CBN 1/6P 2.2M	811	R831	5232-473J16P	RES, CBN 1/6P 47K
687	R355	5232-563J16P	RES, CBN 1/6P 56K	810	R832	5232-105J16P	RES, CBN 1/6P 1M
689	R356	5232-223J16P	RES, CBN 1/6P 22K	814	R833	5232-103J16P	RES, CBN 1/6P 10K
688	R357	5232-333J16P	RES, CBN 1/6P 33K	815	R834	5232-102J16P	RES, CBN 1/6P 1K
685	R358	5232-154J16P	RES, CBN 1/6P 150K	817	R835	5232-470J16P	RES, CBN 1/6P 47
693	R359	5232-222J16P	RES, CBN 1/6P 2.2K	814	R836	5232-103J16P	RES, CBN 1/6P 10K
689	R360	5232-223J16P	RES, CBN 1/6P 22K	815	R837	5232-102J16P	RES, CBN 1/6P 1K
692	R361	5232-472J16P	RES, CBN 1/6P 4.7K	810	R838	5232-105J16P	RES, CBN 1/6P 1M
694	R362	5232-821J16P	RES, CBN 1/6P 820	815	R839	5232-102J16P	RES, CBN 1/6P 1K
695	R363	5232-101J16P	RES, CBN 1/6P 100	810	R840	5232-105J16P	RES, CBN 1/6P 1M
689	R364	5232-223J16P	RES, CBN 1/6P 22K	814	R841	5232-103J16P	RES, CBN 1/6P 10K
690	R365	5232-153J16P	RES, CBN 1/6P 15K	814	R842	5232-103J16P	RES, CBN 1/6P 10K
691	R366	5232-103J16P	RES, CBN 1/6P 10K	813	R843	5232-223J16P	RES, CBN 1/6P 22K
694	R367	5232-821J16P	RES, CBN 1/6P 820	819	R844	5135-331522	RES, CBN 1/2P 330
699	R368	5232-683J16P	RES, CBN 1/6P 68K	819	R845	5135-331522	RES, CBN 1/2P 330
700	R369	5232-684J16P	RES, CBN 1/6P 680K	<b>INTEGRATED CIRCUITS</b>			
692	R370	5232-472J16P	RES, CBN 1/6P 4.7K	646	IC1	5653-UPC78M05	IC, LINEAR
692	R371	5232-472J16P	RES, CBN 1/6P 4.7K	431	IC201	5652-LA1235	IC, MONO
686	R372	5232-104J16P	RES, CBN 1/6P 100K	461	IC202	5652-LA1235	IC, MONO
688	R373	5232-333J16P	RES, CBN 1/6P 33K	491	IC251	5652-LA1245	IC, MONO
687	R374	5232-563J16P	RES, CBN 1/6P 56K	551	IC301	5653-LA3410	IC, LINEAR
691	R375	5232-103J16P	RES, CBN 1/6P 10K	552	IC302	5653-BA1332	IC, LINEAR
691	R376	5232-103J16P	RES, CBN 1/6P 10K	671	IC351	5652-M5218P	IC, MONO
686	R377	5232-104J16P	RES, CBN 1/6P 100K	672	IC354	5654-TC4001BP	IC, DIGITAL
726	R378	5232-562J16P	RES, CBN 1/6P 5.6K	731	IC701	5654-TD6104P	IC, DIGITAL
698	R379	5135-222522	RES, CBN 1/2P 2.2K	732	IC702	5654-TC9147BP	IC, DIGITAL
691	R380	5232-103J16P	RES, CBN 1/6P 10K	763	IC801	5654-TC4069UB	IC, DIGITAL
696	R381	5232-683J16P	RES, CBN 1/6P 68K <b>UA</b> <b>G</b>	761	IC802	5654-TC4001BP	IC, DIGITAL
696B	R381	5232-224J16P	RES, CBN 1/6P 220K <b>N</b>	762	IC803	5654-TC4011BP	IC, DIGITAL





Ser. No.	Ref. No.	Part No.	Description
588	VR303	5101-2030193720K	RES, SEMI FIX
891	VR304	5112-5020121 5K	RES, V CBN 12
892	VR351	5112-5030122 50K	RES, V CBN 12
680	VR352	5101-5030193750K	RES, SEMI FIX
<b>MISCELLANEOUS</b>			
895	J1	4484-49	PIN JACK, 4P
736	X701	5691-00720022	CRYSTAL, OSC
437	CF201	5671-7119A	FILTER, CER S <b>UA N</b>
437A	CF201	5671-7141A	FILTER, CER S <b>G</b>
437	CF202	5671-7119A	FILTER, CER S <b>UA N</b>
048A	CF202	5671-7142A	FILTER, CER S <b>G</b>
437	CF203	5671-7119A	FILTER, CER S <b>UA N</b>
048A	CF203	5671-7142A	FILTER, CER S <b>G</b>
466	CF204	5671-0011A106	FILTER, CER S <b>UA N</b>
466A	CF204	5671-7141A	FILTER, CER S <b>G</b>
466	CF205	5671-0011A106	FILTER, CER S <b>UA N</b>
466A	CF205	5671-7141A	FILTER, CER S <b>G</b>
501	CF251	5671-7139G	FILTER, CER S
502	CF252	5671-7137C	FILTER, CER S
901	CN1	4443-040185	CONNECTOR
900	CN2	4443-030185	CONNECTOR
902	CN3	4443-050185	CONNECTOR
903	CN4	4443-060185	CONNECTOR
902	CN5	4443-050185	CONNECTOR
901	CN6	4443-040185	CONNECTOR
904	CN7	4443-070185	CONNECTOR
902	CN9	4443-050185	CONNECTOR
899	CN10	4443-117114	CONNECTOR
583	CX301	5693-CSB456F1	OSC, CER
796	CX801	5693-CSB455E	OSC, CER
401	FE101	6114-7139	FM TUNER <b>UA G</b>
401B	FE101	6114-7239	FM TUNER <b>N</b>
920	JL10	4242-0212028	JUMPER LEAD
921	JL11	4242-0214028	JUMPER LEAD
470	TC201	5371-93	TRIMMER, 1P
503	TC251	5371-93	TRIMMER, 1P
894	TM1	4214-154	TERMINAL <b>UA N</b>
894A	TM1	4215-58	TERMINAL BRD <b>G</b>
906	TM2	4214-11021	TERMINAL
907	TM3	4214-11033	TERMINAL
043A	LPF101	5214-78	LC COMPOSITE <b>G</b>
584	LPF301	5214-64	LC COMPOSITE
050A	LPF302	5214-86	LC COMPOSITE <b>G</b>

**PCB-2 DISPLAY P. C. BOARD**

<b>CAPACITORS</b>			
827	C355	5345-106C041	CAP, MINI ELE 10μ/16V
828	C751	5345-227B041	CAP, MINI ELE 220μ/10V
829	C752	5345-476B041	CAP, MINI ELE 47μ/10V
831	C753	5354-472K1HM	CAP, MYL 4700p
833	C754	5361-331KB	CAP, CER 330p
833	C755	5361-331KB	CAP, CER 330p
832	C756	5361-102KB	CAP, CER 1000p
832	C757	5361-102KB	CAP, CER 1000p
<b>RESISTORS</b>			
838	R391	5232-473J16P	RES, CBN 1/6P 47K
838	R392	5232-473J16P	RES, CBN 1/6P 47K
838	R393	5232-473J16P	RES, CBN 1/6P 47K
838	R394	5232-473J16P	RES, CBN 1/6P 47K
838	R395	5232-473J16P	RES, CBN 1/6P 47K
838	R396	5232-473J16P	RES, CBN 1/6P 47K
838	R397	5232-473J16P	RES, CBN 1/6P 47K
838	R398	5232-473J16P	RES, CBN 1/6P 47K
839	R399	5232-103J16P	RES, CBN 1/6P 10K
838	R751	5232-473J16P	RES, CBN 1/6P 47K
838	R752	5232-473J16P	RES, CBN 1/6P 47K
836	R753	5232-334J16P	RES, CBN 1/6P 330K
837	R754	5232-104J16P	RES, CBN 1/6P 100K
838	R755	5232-473J16P	RES, CBN 1/6P 47K
<b>INTEGRATED CIRCUITS</b>			
824	IC352	5652-BA6124	IC, MONO

Ser. No.	Ref. No.	Part No.	Description
825	IC353	5652-BA695	IC, MONO
821	IC751	5654-TD6301AP	IC, DIGITAL
822	IC752	5654-TC4001BP	IC, DIGITAL
823	IC753	5654-TC4030BP	IC, DIGITAL
823	IC754	5654-TC4030BP	IC, DIGITAL
823	IC755	5654-TC4030BP	IC, DIGITAL
823	IC756	5654-TC4030BP	IC, DIGITAL
<b>MISCELLANEOUS</b>			
834	CC751	5213-472Z0401	C COMPOSITE
915	JL5	4242-R0405121	JUMPER LEAD
914	JL6	4242-R0404800	JUMPER LEAD
919	JL7	4242-R0407600	JUMPER LEAD
835	RC751	5212-3	R COMPOSITE
835	RC752	5212-3	R COMPOSITE
835	RC753	5212-3	R COMPOSITE
881	LCD751	5791-CA8A9031	LCD

**PCB-3 PRESET MEMORY P. C. BOARD**

<b>CAPACITORS</b>			
859	C721	5345-105F041	CAP, MINI ELE 1μ/50V
859	C722	5345-105F041	CAP, MINI ELE 1μ/50V
860	C723	5361-103ZF	CAP, CER .01μ
860	C724	5361-103ZF	CAP, CER .01μ
858	C731	5345-474F041	CAP, MINI ELE .47μ/50V
858	C732	5345-474F041	CAP, MINI ELE .47μ/50V
<b>RESISTORS</b>			
866	R721	5232-151J16P	RES, CBN 1/6P 150
865	R722	5232-181J16P	RES, CBN 1/6P 180
866	R723	5232-151J16P	RES, CBN 1/6P 150
866	R724	5232-151J16P	RES, CBN 1/6P 150
866	R725	5232-151J16P	RES, CBN 1/6P 150
866	R726	5232-151J16P	RES, CBN 1/6P 150
865	R727	5232-181J16P	RES, CBN 1/6P 180
866	R728	5232-151J16P	RES, CBN 1/6P 150
865	R729	5232-181J16P	RES, CBN 1/6P 180
863	R730	5232-103J16P	RES, CBN 1/6P 10K
862	R731	5232-105J16P	RES, CBN 1/6P 1M
862	R732	5232-105J16P	RES, CBN 1/6P 1M
864	R733	5232-102J16P	RES, CBN 1/6P 1K
863	R734	5232-103J16P	RES, CBN 1/6P 10K
863	R735	5232-103J16P	RES, CBN 1/6P 10K
863	R736	5232-103J16P	RES, CBN 1/6P 10K
863	R881	5232-103J16P	RES, CBN 1/6P 10K
<b>INTEGRATED CIRCUITS</b>			
851	IC721	5654-TC4013BP	IC, DIGITAL
<b>TRANSISTORS</b>			
852	Q721	5613-2603(F)or(E)	XISTOR, NPN R
853	Q722	5611-RN2203	XISTOR, PNP R
852	Q723	5613-2603(F)or(E)	XISTOR, NPN R
852	Q724	5613-2603(F)or(E)	XISTOR, NPN R
<b>DIODES</b>			
855	D721	5637-GL4EG8	LED
855	D722	5637-GL4EG8	LED
855	D723	5637-GL4EG8	LED
855	D724	5637-GL4EG8	LED
855	D725	5637-GL4EG8	LED
855	D726	5637-GL4EG8	LED
855	D727	5637-GL4EG8	LED
855	D728	5637-GL4EG8	LED
855	D729	5637-GL4EG8	LED
855	D730	5637-GL4EG8	LED
855	D731	5637-GL4EG8	LED
855	D732	5637-GL4EG8	LED
855	D733	5637-GL4EG8	LED
855	D734	5637-GL4EG8	LED
855	D735	5637-GL4EG8	LED
855	D736	5637-GL4EG8	LED
855	D737	5637-GL4EG8	LED
855	D738	5637-GL4EG8	LED
855	D739	5637-GL4EG8	LED
855	D740	5637-GL4EG8	LED
854	D741	5637-GL5NG10	LED

Ser. No.	Ref. No.	Part No.	Description
856	D742	5631-ISS133	DIODE, DET
856	D743	5631-ISS133	DIODE, DET
856	D744	5631-ISS133	DIODE, DET
<b>MISCELLANEOUS</b>			
884	S1	4431-A027192	SWITCH, PUSH
885	S2	4431-A017169	SWITCH, PUSH
885	S3	4431-A017169	SWITCH, PUSH
885	S4	4431-A017169	SWITCH, PUSH
885	S5	4431-A017169	SWITCH, PUSH
885	S6	4431-A017169	SWITCH, PUSH
885	S7	4431-A017169	SWITCH, PUSH
885	S8	4431-A017169	SWITCH, PUSH
885	S9	4431-A017169	SWITCH, PUSH
885	S10	4431-A017169	SWITCH, PUSH
885	S11	4431-A017169	SWITCH, PUSH
913	JL1	4242-R0404141	JUMPER LEAD
912	JL2	4242-R0403141	JUMPER LEAD
911	LCN10	4163-71096	CONNECTOR W/W
868	RCV721	6143-00101	RECEIVE UNIT

**PCB-4 CONTROL SWITCHES P. C. BOARD**

<b>CAPACITORS</b>			
844	C725	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V
845	C726	5345-334F041	CAP, MINI ELE .33 $\mu$ /50V
845	C727	5345-334F041	CAP, MINI ELE .33 $\mu$ /50V
845	C728	5345-334F041	CAP, MINI ELE .33 $\mu$ /50V

<b>RESISTORS</b>			
846	R737	5232-472J16P	RES, CBN 1/6P 4.7K
846	R738	5232-472J16P	RES, CBN 1/6P 4.7K
850	R739	5232-100J16P	RES, CBN 1/6P 10
847	R740	5232-152J16P	RES, CBN 1/6P 1.5K
846	R741	5232-472J16P	RES, CBN 1/6P 4.7K
849	R742	5232-221J16P	RES, CBN 1/6P 220
849	R743	5232-221J16P	RES, CBN 1/6P 220
849	R744	5232-221J16P	RES, CBN 1/6P 220
849	R745	5232-221J16P	RES, CBN 1/6P 220
849	R746	5232-221J16P	RES, CBN 1/6P 220
846	R747	5232-472J16P	RES, CBN 1/6P 4.7K
847	R748	5232-152J16P	RES, CBN 1/6P 1.5K
846	R749	5232-472J16P	RES, CBN 1/6P 4.7K
847	R750	5232-152J16P	RES, CBN 1/6P 1.5K
848	R861	5232-331J16P	RES, CBN 1/6P 330

<b>TRANSISTORS</b>			
841	Q725	5613-2603(F)or(E)	XISTOR, NPN R
842	Q726	5613-RN1203	XISTOR, NPN R
842	Q727	5613-RN1203	XISTOR, NPN R
841	Q728	5613-2603(F)or(E)	XISTOR, NPN R
841	Q729	5613-2603(F)or(E)	XISTOR, NPN R

<b>DIODES</b>			
843	D745	5637-GL5NG10	LED
843	D746	5637-GL5NG10	LED
843	D747	5637-GL5NG10	LED
843	D748	5637-GL5NG10	LED
843	D749	5637-GL5NG10	LED

<b>CONTROLS</b>			
889	VR356	5112-1030324 10K	RES, V CBN 12

<b>MISCELLANEOUS</b>			
887	S12	4431-A017240	SWITCH, PUSH
886	S13	4431-A017169	SWITCH, PUSH
886	S14	4431-A017169	SWITCH, PUSH
886	S15	4431-A017169	SWITCH, PUSH
886	S16	4431-A017169	SWITCH, PUSH
886	S17	4431-A017169	SWITCH, PUSH
917	JL3	4242-R0405301	JUMPER LEAD
918	JL4	4242-R0406141	JUMPER LEAD

**PCB-5 TUNING P. C. BOARD**

<b>RESISTORS</b>			
783	R851	5135-681522	RES, CBN 1/2P 680
783	R852	5135-681522	RES, CBN 1/2P 680

Ser. No.	Ref. No.	Part No.	Description
784	R853	5232-152J16P	RES, CBN 1/6P 1.5K
784	R854	5232-152J16P	RES, CBN 1/6P 1.5K
<b>MISCELLANEOUS</b>			
916	JL9	4242-R0405101	JUMPER LEAD
782	PH801	5624-GP1S01	PHOTO COUPLER
782	PH802	5624-GP1S01	PHOTO COUPLER
<b>CHASSIS MISCELLANEOUS</b>			
896	$\Delta$ PI	4161-02151	CORD W/PLUG <b>UA</b>
896A	$\Delta$ PI	4161-7256	CORD W/PLUG <b>G</b>
896B	$\Delta$ PI	4161-71148	CORD W/PLUG <b>N</b>
701	$\Delta$ TI	5584-701477	XFORMER, POWER <b>UA</b>
701A	$\Delta$ TI	5584-702478	XFORMER, POWER <b>G</b>
701B	$\Delta$ TI	5584-703478	XFORMER, POWER <b>N</b>
897	$\Delta$ S01	4474-164	SOCKET <b>UA</b> <b>N</b>
041A	C51	5361-223ZF	CAP, CER .022 $\mu$ <b>G</b>
041A	C52	5361-223ZF	CAP, CER .022 $\mu$ <b>G</b>
041A	C53	5361-223ZF	CAP, CER .022 $\mu$ <b>G</b>
703	$\Delta$ RI	5135-335J50P	RES, CBN 1/2P 3.3M <b>UA</b>
882	LPI	5731-1402020	LAMP
704	LUG1	4211-5005	LUG <b>UA</b>
042A	LUG2	4211-4	LUG <b>G</b>
042A	LUG3	4211-4	LUG <b>G</b>
042A	LUG4	4211-4	LUG <b>G</b>
045A	$\Delta$ S101	4411-102729	ROTARY SWITCH, VOLT SELECT <b>G</b>
046A	$\Delta$ CO1	4443-712	CONNECTOR <b>G</b>


**PACKAGE PARTS LIST**

021A	1756-07901	LABEL, 220V/50Hz <b>G</b>
021B	1756-03113	LABEL, N <b>N</b>
022A	1756-03108	LABEL, G <b>G</b>
025A	1119-0135	ATTACH SHEET, FTZ CAUTION <b>G</b>
105	1111-J90195	OWNER GUIDE, UL <b>U</b>
105A	1111-J30235	OWNER GUIDE <b>G</b>
106	1111-J30259	OWNER GUIDE, OG <b>U</b>
106A	1111-J30260	OWNER GUIDE, OG <b>G</b>
106B	1111-J2036	OWNER GUIDE, OG <b>N</b>
107	1113-717005	OWNER CARD, REPLY CARD <b>U</b>
107B	1113-OC	OWNER CARD, REPLY CARD <b>N</b>
108	1119-057	ATTACH SHEET, WARRANTY <b>U</b>
108B	1119-GC	ATTACH SHEET, WARRANTY <b>N</b>
109	1119-0137	ATTACH SHEET, SERVICE GUIDE <b>U</b>
110	1241-C12732	POLYETHYLENE BAG, OG
111	1241-C1216	POLYETHYLENE BAG, ACCESSORY
112	1241-R0120300	POLYETHYLENE BAG, AM ANT
120	1221-717200	CARTON BOX
121	1222-7311	CUSHION, R
122	1222-7312	CUSHION, L
123	1223-11729	SOFT SHEET, SET
124	1241-C1491	POLYETHYLENE BAG, SET

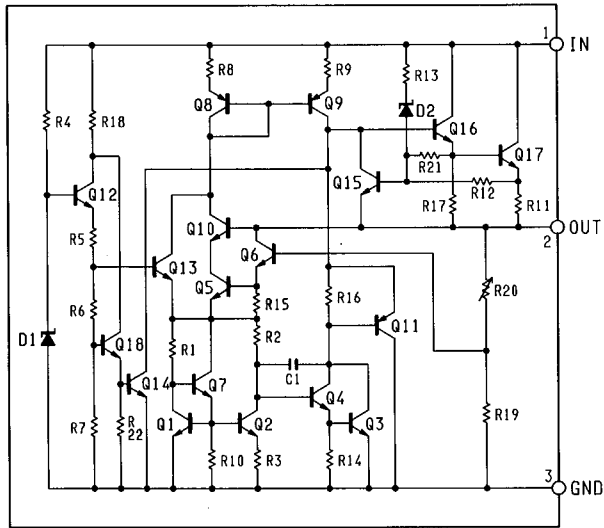
**ABBREVIATIONS IN PARTS LIST**

<b>CAPACITORS</b>	<b>RESISTORS</b>
CAP, MINI ELE	: Electrolytic
CAP, CER	: Ceramic
CAP, PPP	: Polypropylene
CAP, MYL	: Mylar
CAP, MCA	: Mica
CAP, MINI BP	: Bipolar
CAP, ELE BP	: Electrolytic Bipolar
CAP, STY	: Polystyrene Film
CAP, SPE	: Special
CAP, TAN	: Tantalum
470 $\mu$	: 470 $\mu$ F
6800p	: 6800pF
.047 $\mu$	: 0.047 $\mu$ F
RES, CBN 1/6P	: Carbon 1/6W
RES, FUSE	: Fuse
RES, CEM 5P	: Cement 5W
RES, MTL IP	: Metal 1W
	2.2K : 2.2k $\Omega$
	220 : 220 $\Omega$
<b>TRANSISTORS</b>	
XISTOR	: Transistor
FET	: Field Effect Transistor
<b>CONTROLS</b>	
RES, V CBN	: Variable Carbon Resistor
RES, SEMI FIX	: Semi-fixed Resistor

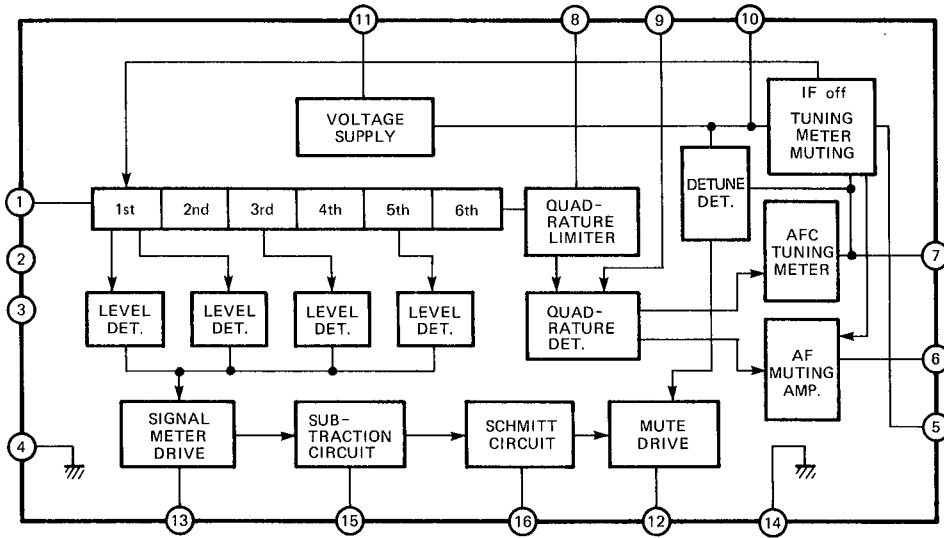
**NOTE**

 SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

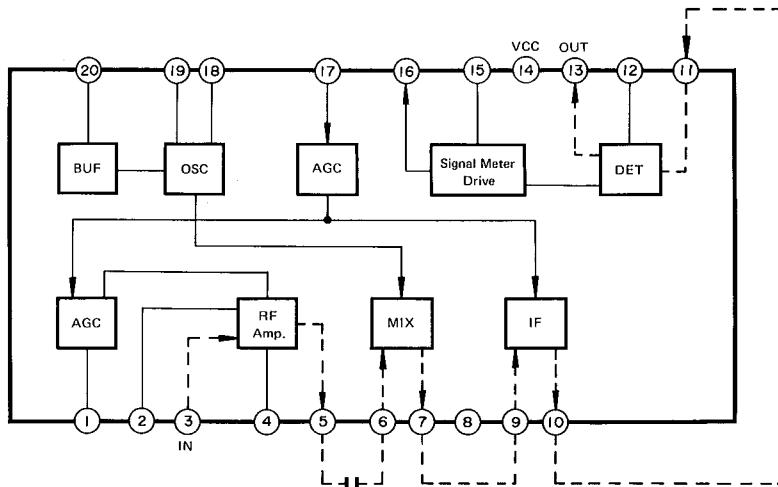
μPC78M05 : IC 1



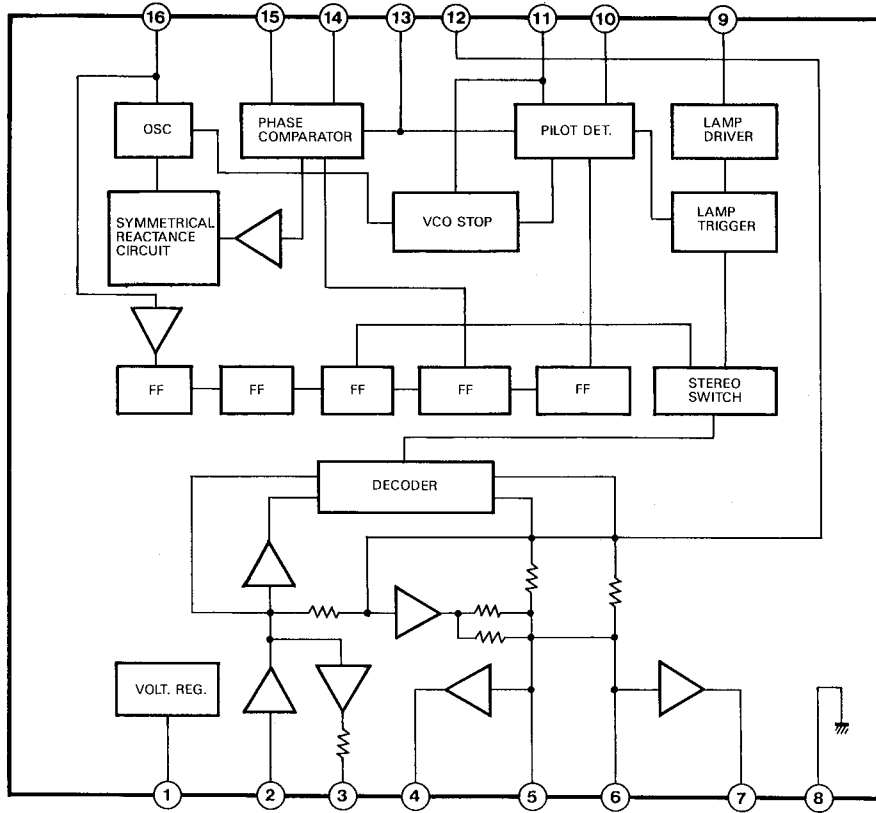
LA1235 : IC201,202



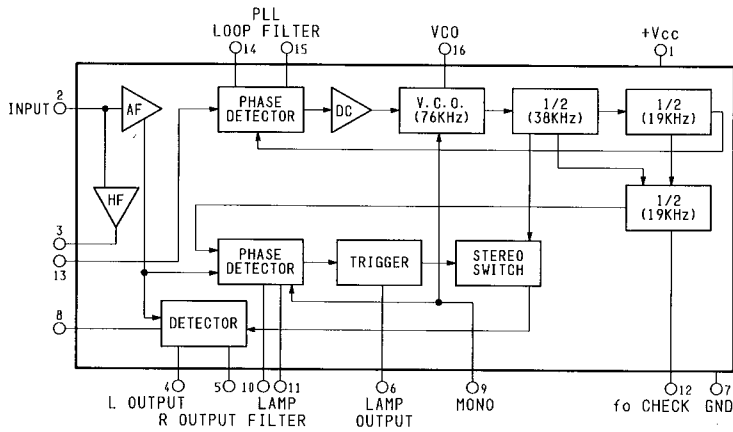
LA1245 : IC251



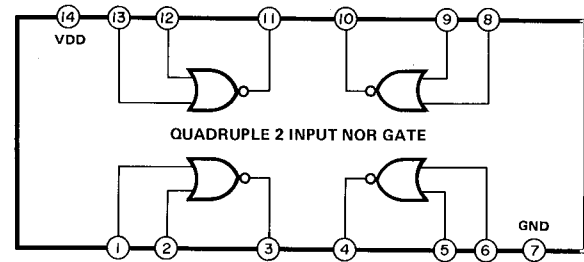
LA3410 : IC301



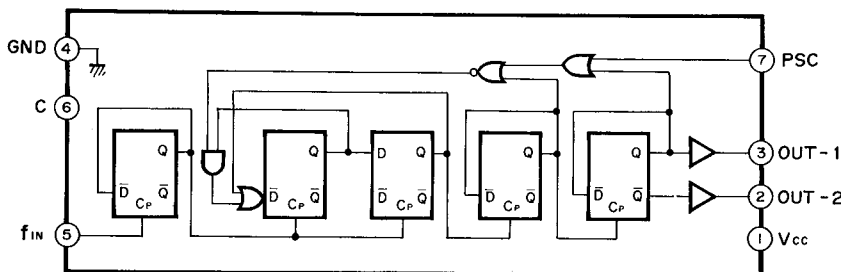
BA1332 : IC302



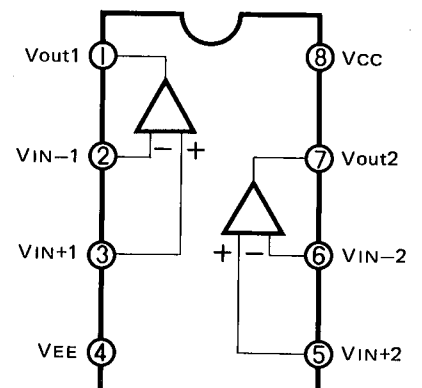
TC4001BP : IC354,802



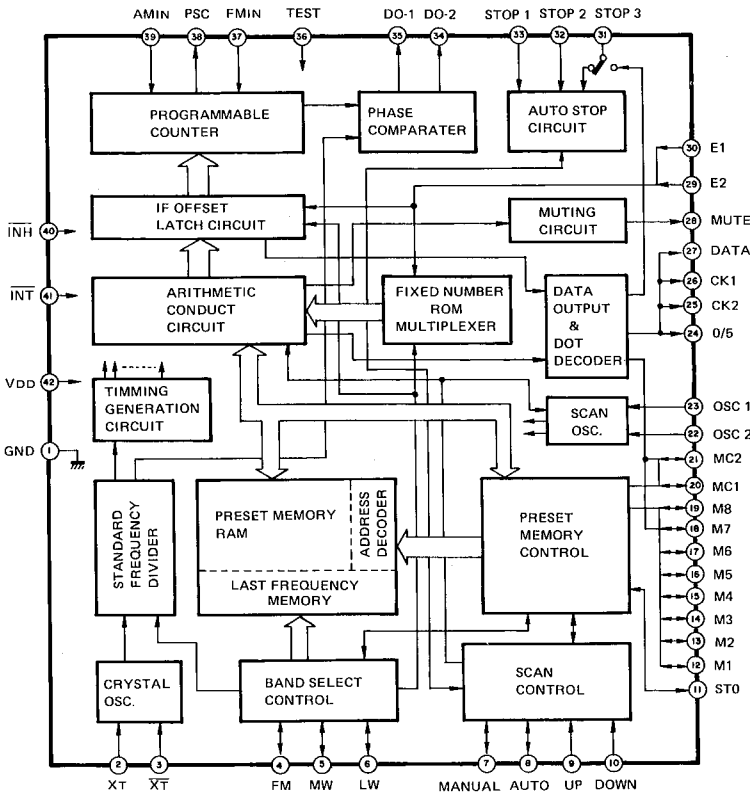
TD6104P : IC701



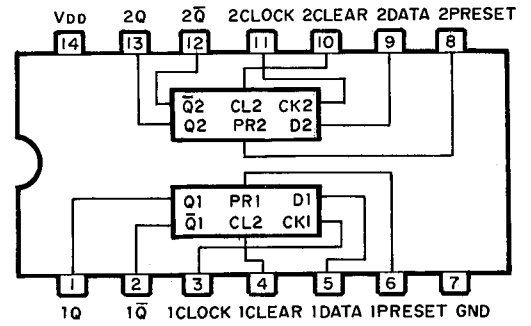
M5218P : IC351



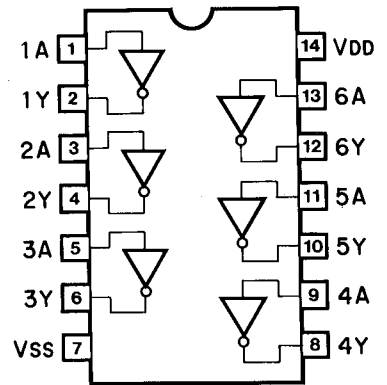
TC9147BP : IC702



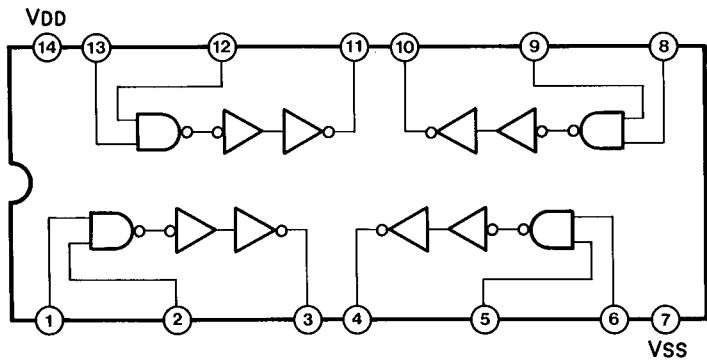
TC4013BP : IC721,807,810



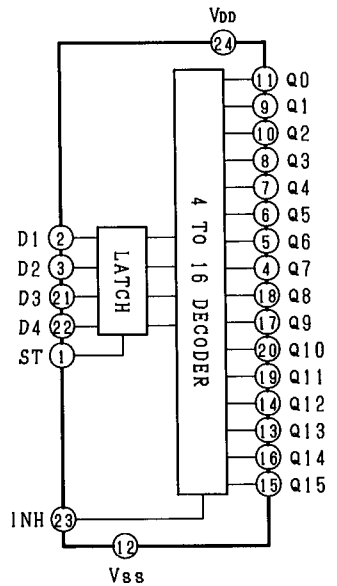
TC4069 $\mu$ BP : IC801



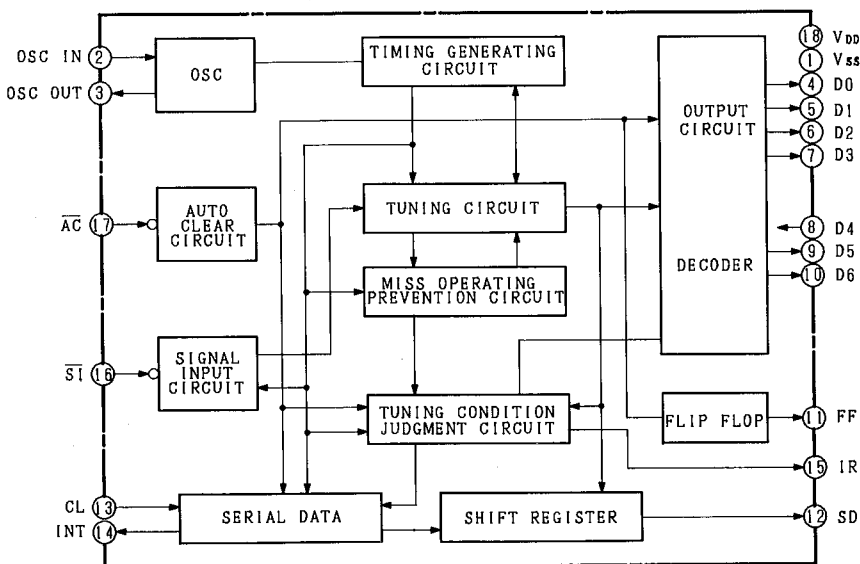
TC4011BP : IC803,806,809



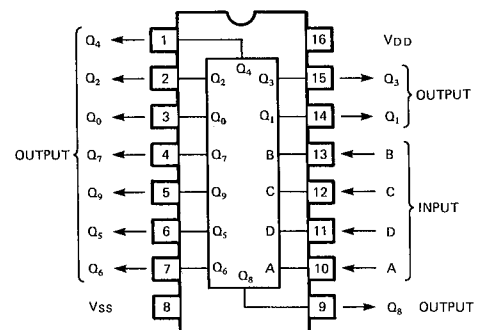
TC4514BP : IC805



M50117P : IC804



TC4028BP : IC808



**SCHEMATIC DIAGRAM**

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