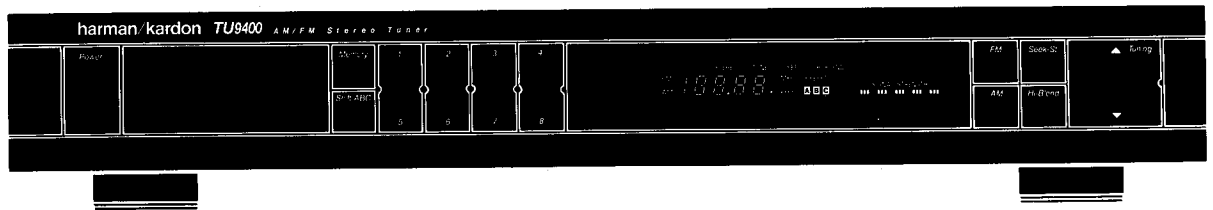


# The Harman Kardon Model TU9400 AM/FM STEREO TUNER

Manual 156A

## Technical Manual



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

- ⓔK : North America area model Black version
- ⓓ : International model
- ⓔB : International model Black version
- ⓔB : Australia model Black version

**harman/kardon**

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1112-3152156A9 P-079007 2000 Printed in Japan

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## SPECIFICATIONS

● FM SECTION	Nominal	Limit
Tuning Range	87.5 ~ 108.0MHz	
50dB Quieting Sensitivity	37.2dBf	≥ 41(48)dBf
Stereo		
Usable Sensitivity	11.7dBf	≥ 15(17)dBf
Mono	47dB	≥ 40(70)dB
Image Ratio	85dB	≥ 75(80)dB
IF Rejection	96dB	
Spurious Response Rejection	1.2dB	≥ 2dB
Capture Ratio at 65dBf	40dB	≥ 30(60)dB
Alternate Channel Selectivity	60dB	≥ 45dB
AM Rejection		
Signal to Noise Ratio	83dB	≥ 77(71)dB
Mono	75dB	≥ 69(63)dB
Stereo		
Total Harmonic Distortion (65dBf 1kHz Input)	0.09%	≤ 0.3%
Mono	0.07%	≤ 0.5%
Stereo		
Stereo Separation at 1kHz	58dB	≥ 40(35)dB

This figures in parenthesis ( ) in the FM section are specifications for the International model.

● AM SECTION	Nominal	Limit
Tuning Range		
North America area model	520 ~ 1,710kHz	
International and Australia models	531 ~ 1,602kHz	
Usable Sensitivity	17 $\mu$ Vm	
Selectivity	58dB	
Signal to Noise Ratio	53dB	≥ 47dB
Image Rejection	40dB	≥ 30dB
IF Rejection	66dB	≥ 50dB

● DIMENSIONS (W x H x D) 17-3/8" x 2-7/8" x 13-1/2"  
(442 x 73 x 342 mm)  
7.5 lbs. (3.4 kg)

## ● WEIGHT

## ● POWER SUPPLY

North America area model	AC120V, 60Hz
International and Australia models	AC220/240V, 50/60Hz

## ● POWER CONSUMPTION

North America area model	12W
International and Australia models	12W

These specifications are Service target specs.

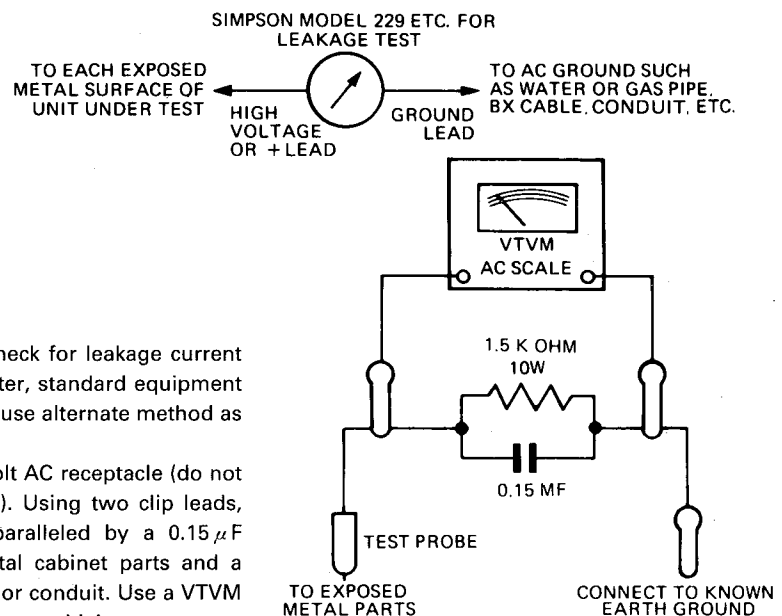
Specifications and components subject to change without notice. Overall performance will be maintained or improved.

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

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

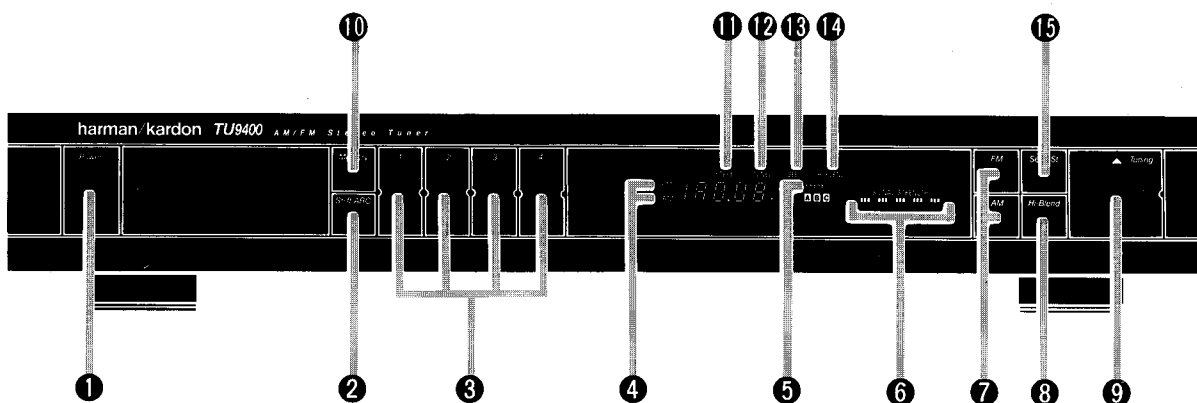
1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Replace all protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
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 AC line 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.

## CONTROLS AND DISPLAYS



### 1 Power Switch

Press to turn the unit on and off.

### 2 Shift ABC

Allows you to access 24 pre-selected stations using the 8 preset buttons.

### 3 Preset Buttons

Press to access pre-selected stations.

### 4 AM/FM Indicator

Indicates AM or FM band and frequency of the tuned station.

### 5 Preset Indicator

Flashes during period when a station can be entered into the memory.

### 6 Signal Strength

Number of segments illuminated shows signal strength. When tuning stations or positioning antennas, adjust so that maximum number of segments is illuminated.

### 7 FM/AM

Press to select FM or AM reception.

### 8 Hi-Blend

When tuned to a weak signal (in Seek-St mode), press on to improve sound quality.

### 9 Tuning

Press ▲ to tune to stations with higher frequencies; press ▼ for lower frequencies.

### 10 Memory

Press to set in memory a new preset station.

### 11 Stereo Indicator

Shows stereo broadcast is being received.

### 12 Tuned Indicator

Indicates station is properly tuned.

### 13 Seek Indicator

Shows Seek function is on.

### 14 Hi-Blend Indicator

Shows Hi-Blend function is on.

### 15 Seek-ST

Press on for Seek tuning in stereo, off for manual tuning in mono.

**DISASSEMBLY PROCEDURES (REFER TO PAGES 8 THROUGH 10)****1 CABINET TOP REMOVAL**

Remove 7 screws (A) and then remove the Cabinet Top (127).

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

1. Remove the Cabinet Top (127), referring to the previous step 1.
2. Disconnect the jumper leads (JL701 and JL702) from connectors (CN701A and CN702A).
3. Remove 5 screws (B) and then remove the Front Panel Ass'y (AA).

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

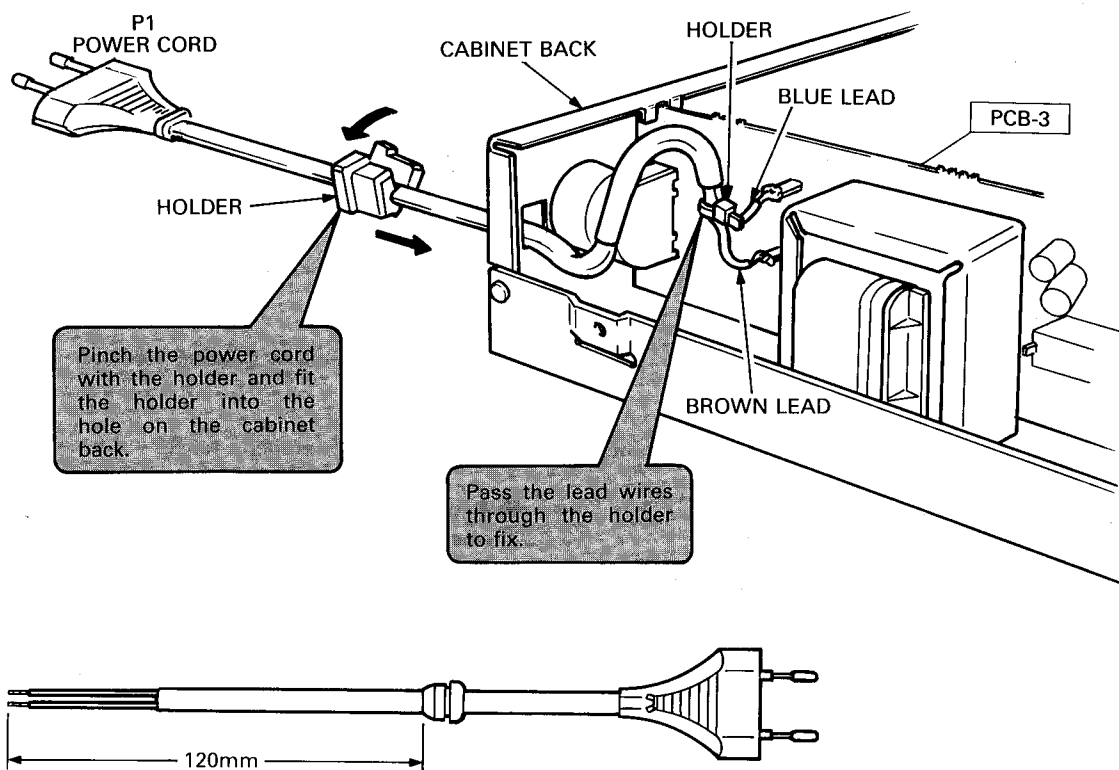
1. Remove the Front Panel Ass'y (AA), referring to the previous step 2.
2. Open the lid of connector (CN101) on the Main P.C. Board (PCB-1) and then disconnect the jumper lead (JL101).
3. Remove 8 screws (C) and then remove the Main P.C. Board (PCB-1).

**4 OTHER P.C. BOARDS REMOVAL**

1. Remove 4 screws (D), 2 screws (E) (North America area model only) and shaft (154) and then remove the Power Supply P.C. Board (PCB-3).  
If necessary, unsolder the lead wires connected to the PCB-3.
2. Remove 8 screws (F) and then remove the Front P.C. Board (PCB-2).

**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, 24 AND 25)**

**■ AM ADJUSTMENT**

Conditions: ● Press the "AM" switch.

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

※International and Australia models

Step	Alignment	Connection Equipments	Measurement Frequency	Station Display	Adjustment	For
1	IF	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Connect the VTVM and oscilloscope to the OUTPUT jacks.</li> </ul>	1400kHz ※1404kHz	1400kHz ※1404kHz	L251 L252	Maximum output level and symmetrical curve on scope.
2	Tracking		1400kHz ※1404kHz	1400kHz ※1404kHz	TC251	Maximum output.
3			600kHz ※603kHz	600kHz ※603kHz	T251	Maximum output.
4			Repeat steps 2 and 3 for optimum sensitivity.			
5	Signal indicator		1000kHz ※999kHz	1000kHz ※999kHz	VR251	Adjust so that the 5 SIGNAL STRENGTH indicator lights at 1000 μV/m input.

**■ FM ADJUSTMENT**

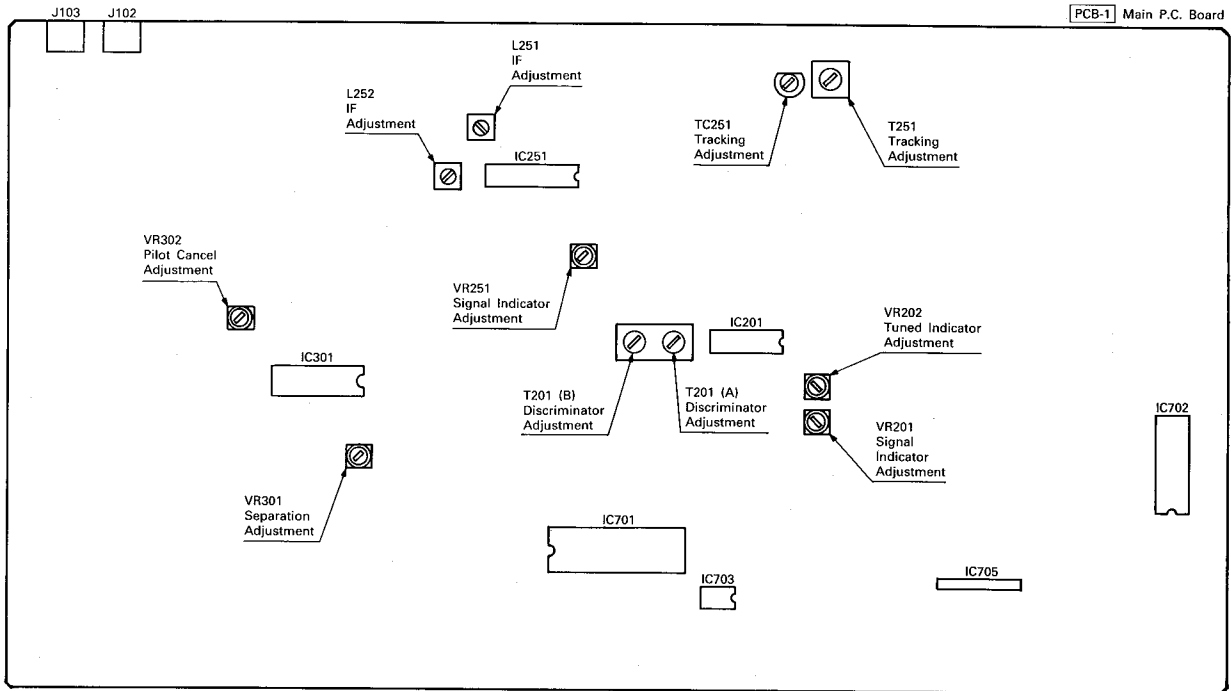
Conditions: ● Press the "FM" switch.

- Set the "Seek-St" switch to off (put out seek indicator) position.

	North America area model	International and Australia models
FM Signal Generator	1kHz, 100% modulation	1kHz, 40kHz modulation
Stereo Modulator	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	<ul style="list-style-type: none"> <li>• Connect the FM Signal Generator to FM 75Ω UNBAL Antenna terminal. [500 μV/75Ω (65dBf) input]</li> <li>International and Australia models: 1kHz, 40kHz mod.</li> <li>• Connect the Distortion meter and Oscilloscope to the OUTPUT jacks.</li> </ul>	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 98.1 MHz.
2			98.1MHz	98.1MHz	T201(B)	Minimum distortion.
3			Repeat steps 1 and 2 for optimum sensitivity.			
4	Tuned indicator		98.1MHz	98.1MHz	VR202	Adjust so that the TUNED indicator lights at 9 μV/75 Ω (30dBf) input.(32 μV/75 Ω input for International and Australia models.)

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 75Ω UNBAL Antenna terminal. [500 μV/75Ω (65dBf) input] (International and Australia models: 1kHz, 40kHz mod.)</li> <li>Connect the Distortion meter and Oscilloscope to the OUTPUT jacks.</li> </ul>	98.1MHz	98.1MHz	VR201	Adjust so that the 5 SIGNAL STRENGTH indicator lights at 280 μV/75Ω (60dBf) input.
6	Pilot cancel	<ul style="list-style-type: none"> <li>Connect the Stereo Modulator to FM signal Generator.</li> <li>Connect FM signal Generator to FM 75Ω UNBAL Antenna terminal.</li> <li>Connect the VTVM and Oscilloscope to the OUTPUT jacks.</li> </ul>	98.1MHz	98.1MHz	VR302	Minimum output level and symmetrical curve on scope.
7	Separation		98.1MHz	98.1MHz	VR301	Adjust so that the left channel output becomes minimum when only the right channel of the Stereo Modulator is modulated.
					VR301	Adjust so that the right channel output becomes minimum when only the left channel of the Stereo Modulator is modulated.



Alignment Point Location

**CIRCUIT DESCRIPTION**

**● FM TUNER SECTION**

The signal which has entered through the antenna is high-frequency amplified in front end 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, CF202, Q202 and CF203 and fed to pin 1 of IC201. In IC201, the signal is transmitted through the IF amplifier in six steps, detected in the quadrature detector and after going through the AF muting amplifier it is sent to pin 6. Then it is fed to pin 24 of IC301. In IC301, the pilot signal is detected and a 38kHz signal is produced. The stereo signal is demodulated by the 38kHz signal and sent to pin 18 (left channel) and pin 20 (right channel).

**● AM TUNER SECTION**

The signal which has entered through the antenna is transmitted through the tuning circuit consisting of T251 and TC251, also fed to pin 3 of IC251. In IC251, it undergoes high-frequency amplification, local oscillation, mixing, intermediate frequency amplification and detection, and then output from pin 13. This signal is fed to pin 23 of IC301.

**● MUTING CIRCUIT**

If FM is received out of tuning or in a very weak field intensity, pin 12 of IC201 becomes high level. Then this is supplied to the base of Q707, whereby Q745 turn ON. As a result, Q311 (L ch) and Q312 (R ch) also turn ON to mute the output.

**● SYNTHESIZER SECTION**

**• FM**  
The local oscillation output signal is fed from the front end unit FE101 to pin 21 of the prescaler IC702 and after being frequency divided into 15 or 16, it is fed to IC701. In IC701, the standard frequency is oscillated by the crystal oscillator, compared with the divided local oscillation output signal, it is fed to IC702 and output to pin 17. This voltage is level converted at Q701 and Q702, and fed to the varicap diode in the front end unit.

**• AM**  
The local oscillation output signal is fed from pin 20 of IC702 to pin 19 of the prescaler IC702. In IC702, the standard frequency is oscillated by the crystal oscillator, compared with the local oscillation output signal, it is fed to IC702 and output to pin 17.

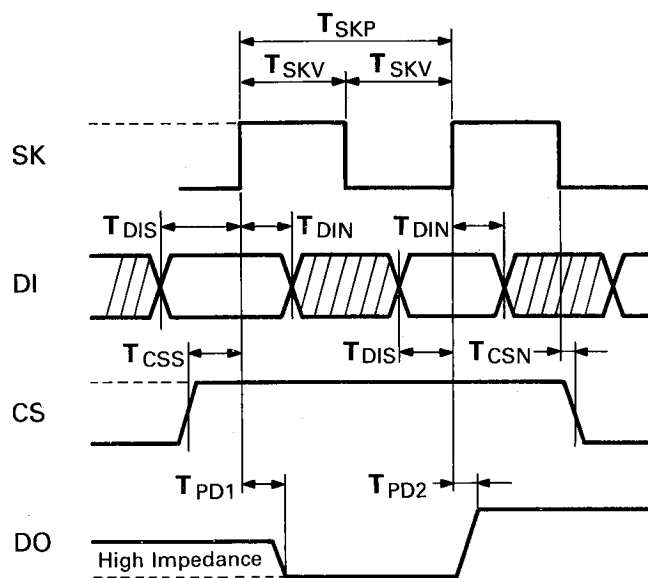
**● INDICATOR SECTION**

**• Frequency display**  
The serial data sent out of pin 35 of the digital synthesizer tuning system micro controller IC701 is fed to pin 29 of IC706, where the data is decoded to provide a signal which turns ON the indicator.

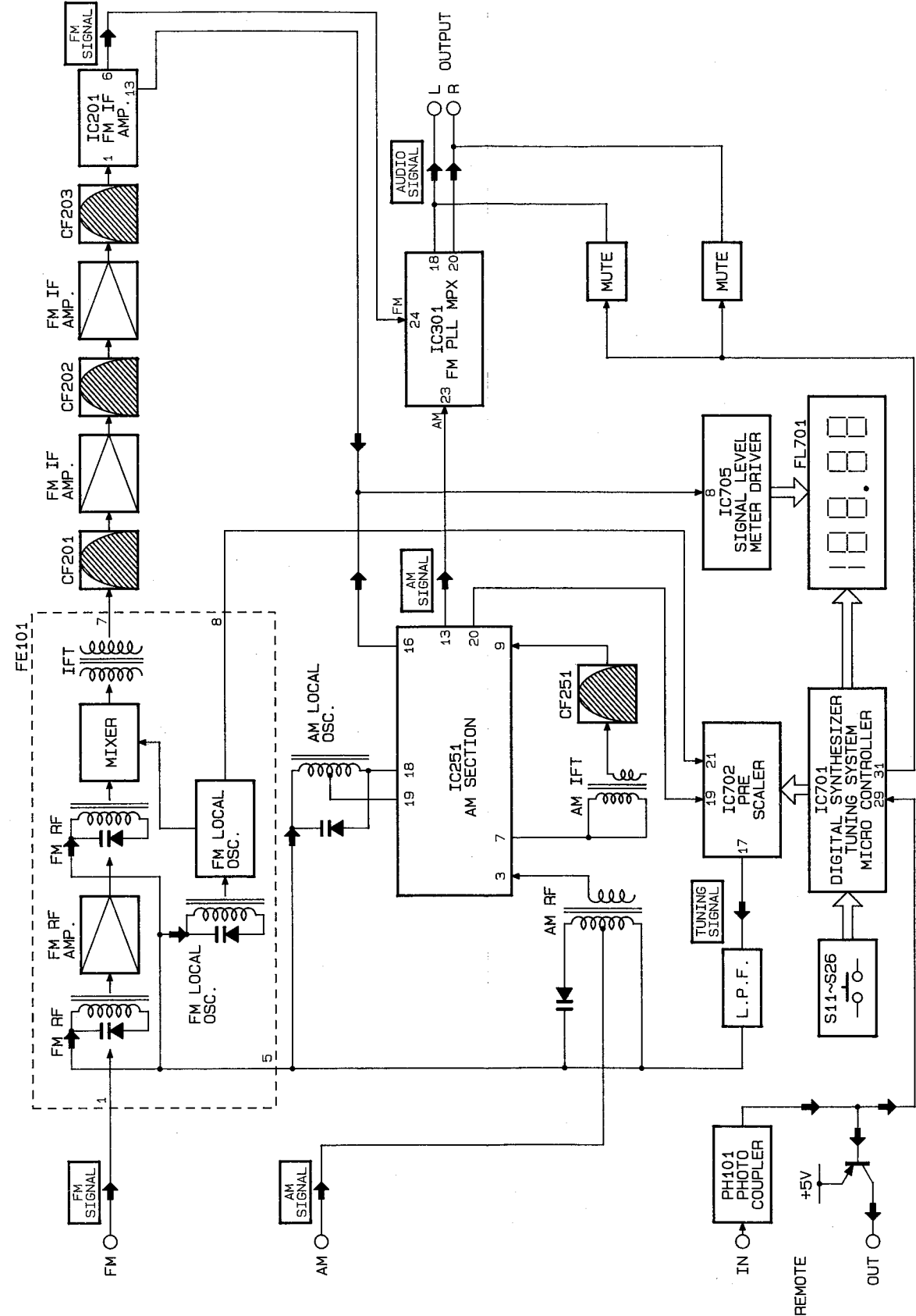
**• Signal strength**  
The voltage corresponding to the signal level is output from pin 13 of IC201 (for FM) and pin 16 of IC251 (for AM), fed to pin 8 of the level comparator IC705. Then it is further sent through Exclusive OR Q731, Q732, Q733, Q734 and Q735 to the indicator, whereby the signal strength segments 1 to 5 light according to the signal level.

**• Tuning**  
When broadcast is received, pin 12 of IC201 becomes low level. Then Q717 turn OFF and "TUNED" segment turn ON.

**TIMING CHART IC703 (AK93C46)**



**BLOCK DIAGRAM**



## CIRCUIT DESCRIPTION

### ● FM TUNER SECTION

The signal which has entered through the antenna is high-frequency amplified in front end 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, CF202, Q202 and CF203 and fed to pin 1 of IC201. In IC201, the signal is transmitted through the IF amplifier in six steps, detected in the quadrature detector and after going through the AF muting amplifier it is sent to pin 6. Then it is fed to pin 24 of IC301. In IC301, the pilot signal is detected and a 38kHz signal is produced. The stereo signal is demodulated by the 38kHz signal and sent to pin 18 (left channel) and pin 20 (right channel).

### ● AM TUNER SECTION

The signal which has entered through the antenna is transmitted through the tuning circuit consisting of T251 and TC251, also fed to pin 3 of IC251. In IC251, it undergoes high-frequency amplification, local oscillation, mixing, intermediate frequency amplification and detection, and then output from pin 13. This signal is fed to pin 23 of IC301.

### ● MUTING CIRCUIT

If FM is received out of tuning or in a very weak field intensity, pin 12 of IC201 becomes high level. Then this is supplied to the base of Q707, whereby Q745 turn ON. As a result, Q311 (L ch) and Q312 (R ch) also turn ON to mute the output.

### ● SYNTHESIZER SECTION

#### • FM

The local oscillation output signal is fed from the front end unit FE101 to pin 21 of the prescaler IC702 and after being frequency divided into 15 or 16, it is fed to IC701. In IC701, the standard frequency is oscillated by the crystal oscillator, compared with the divided local oscillation output signal, it is fed to IC702 and output to pin 17. This voltage is level converted at Q701 and Q702, and fed to the varicap diode in the front end unit.

#### • AM

The local oscillation output signal is fed from pin 20 of IC251 to pin 19 of the prescaler IC702. In IC702, the standard frequency is oscillated by the crystal oscillator, compared with the local oscillation output signal, it is fed to IC702 and output to pin 17.

### ● INDICATOR SECTION

#### • Frequency display

The serial data sent out of pin 35 of the digital synthesizer tuning system micro controller IC701 is fed to pin 29 of IC706, where the data is decoded to provide a signal which turns ON the indicator.

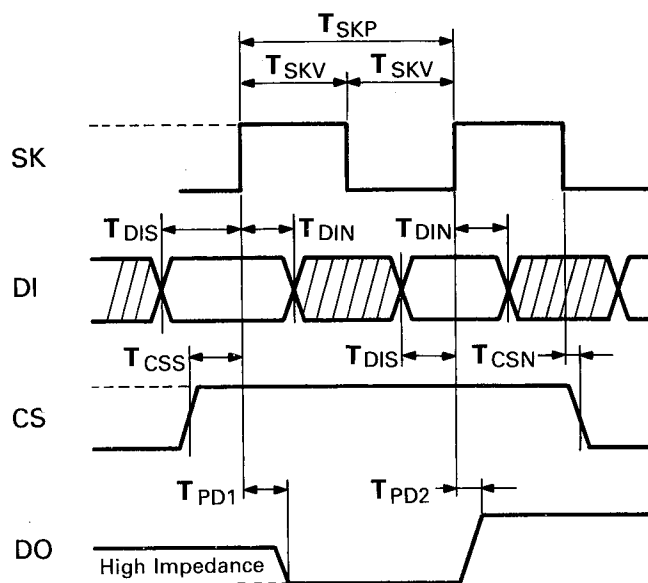
#### • Signal strength

The voltage corresponding to the signal level is output from pin 13 of IC201 (for FM) and pin 16 of IC251 (for AM), fed to pin 8 of the level comparator IC705. Then it is further sent through Exclusive OR Q731, Q732, Q733, Q734 and Q735 to the indicator, whereby the signal strength segments 1 to 5 light according to the signal level.

#### • Tuning

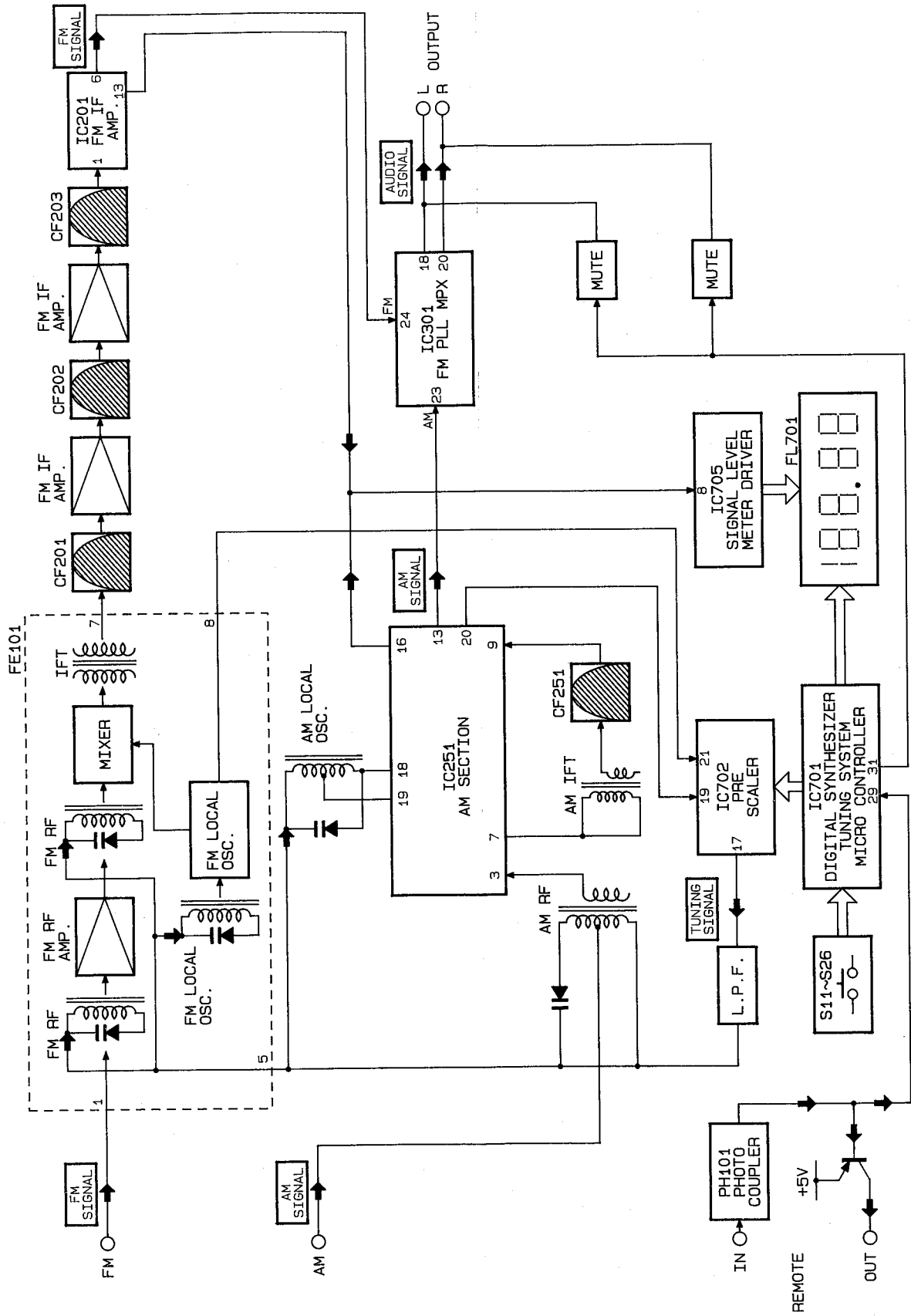
When broadcast is received, pin 12 of IC201 becomes low level. Then Q717 turn OFF and "TUNED" segment turn ON.

## TIMING CHART IC703 (AK93C46)

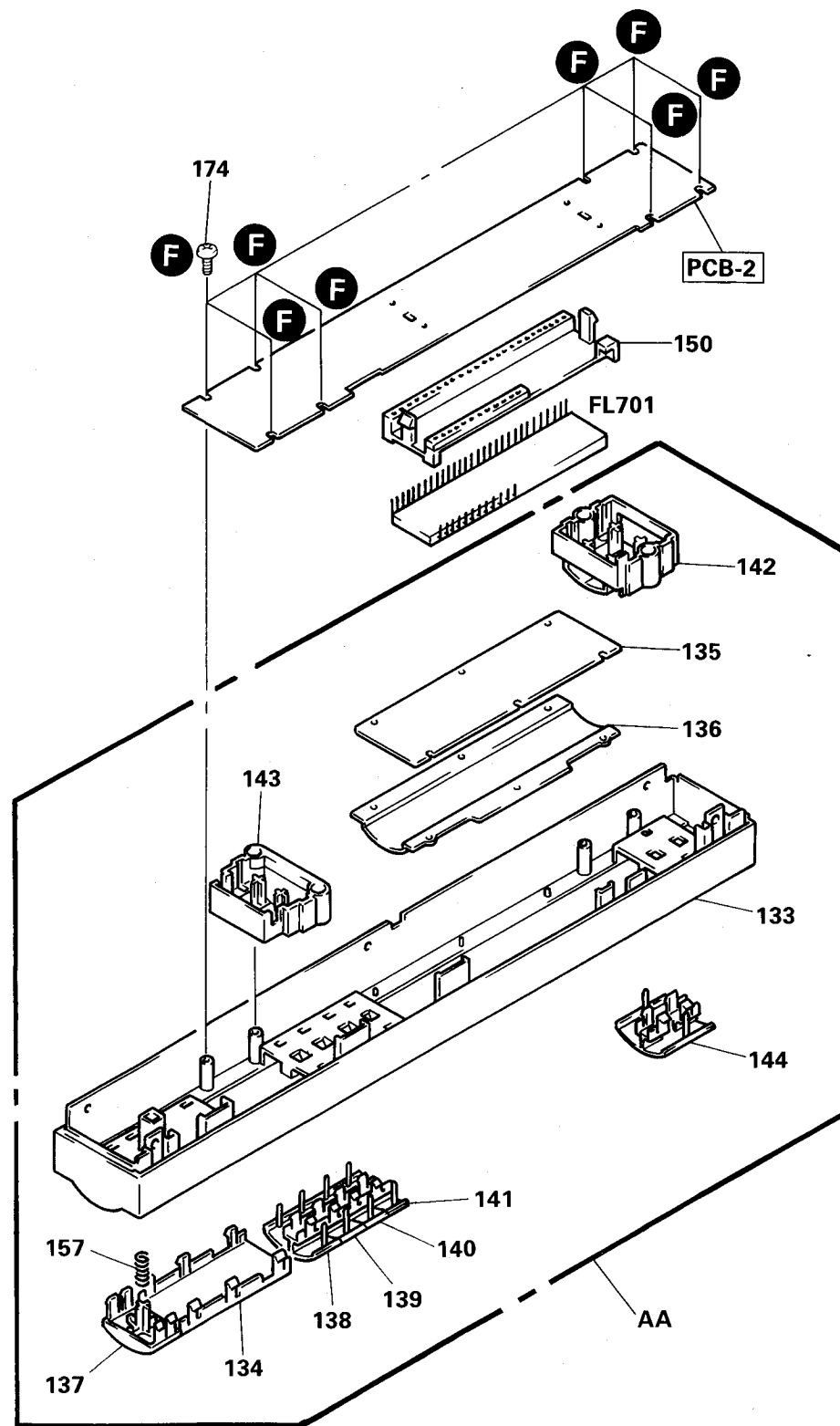




BLOCK DIAGRAM



**GENERAL UNIT  
EXPLODED VIEW (FRONT PANEL)**



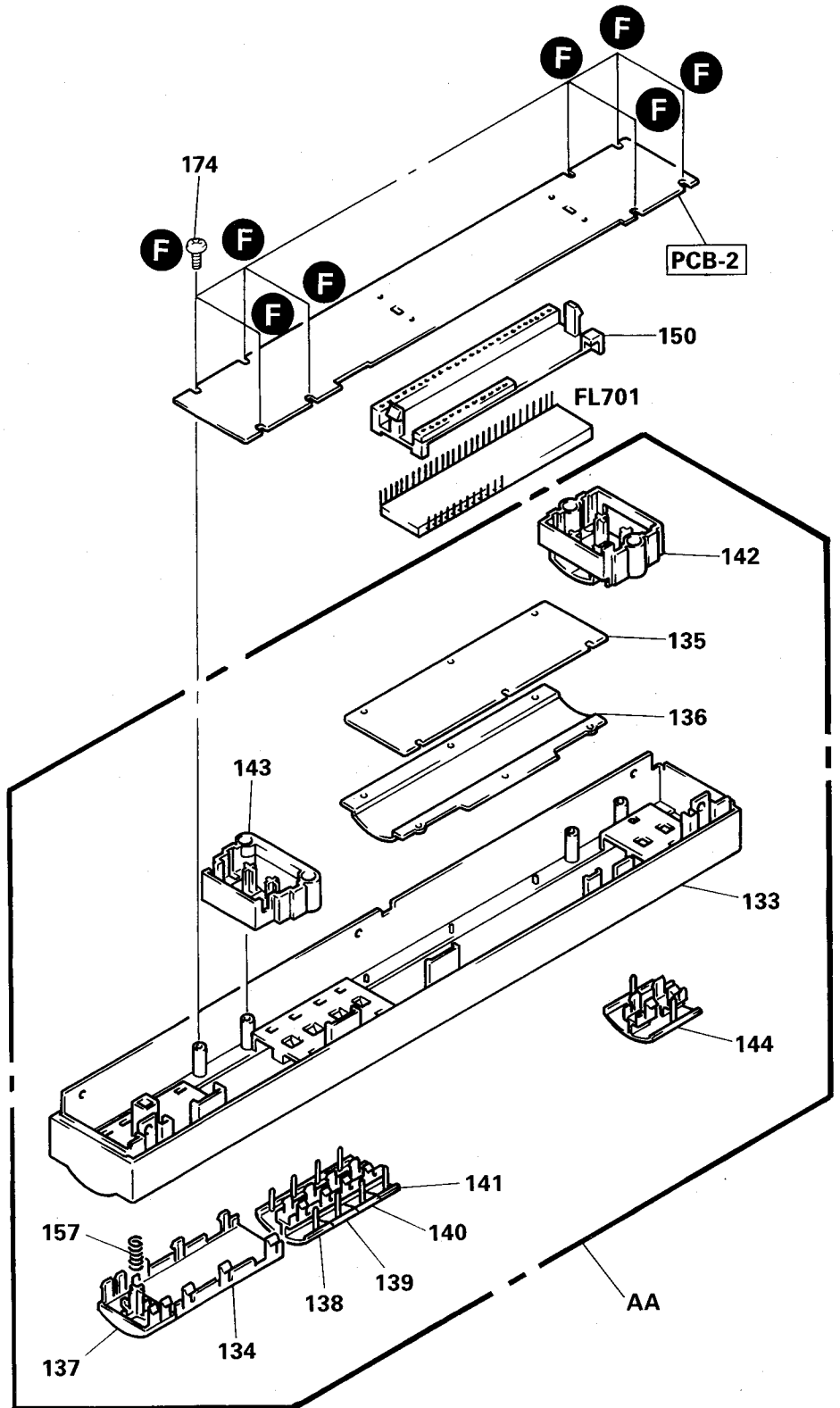
**PARTS LIST**

Ref. No.	Part No.	Description
AA	A442-TU9400B	FRONT PANEL ASSY BK IB BB
AA	A442-TU9400A	FRONT PANEL ASSY I
133	1442-24502	PANEL BK IB BB
133	1442-24501	PANEL I
134	1442-24702	PANEL BK IB BB
134	1442-24701	PANEL I
135	1511-19804	PLATE
136	1532-17504	WINDOW
137	1662-52001	PUSH BUTTON, POWER BK IB BB
137	1662-52003	PUSH BUTTON, POWER I
138	1662-58605	PUSH BUTTON, PRESET 1/5 BK IB BB
138	1662-58601	PUSH BUTTON, PRESET 1/5 I
139	1662-58606	PUSH BUTTON, PRESET 2/6 BK IB BB
139	1662-58602	PUSH BUTTON, PRESET 2/6 I
140	1662-58607	PUSH BUTTON, PRESET 3/7 BK IB BB
140	1662-58603	PUSH BUTTON, PRESET 3/7 I
141	1662-58608	PUSH BUTTON, PRESET 4/8 BK IB BB
141	1662-58604	PUSH BUTTON, PRESET 4/8 I
142	1662-58702	PUSH BUTTON, FM, AM, SEEK-ST, HI-BLEND BK IB BB
142	1662-58701	PUSH BUTTON, FM, AM, SEEK-ST, HI-BLEND I
143	1662-59002	PUSH BUTTON, MEMORY, SHIFT ABC BK IB BB
143	1662-59001	PUSH BUTTON, MEMORY, SHIFT ABC I
144	1662-58902	PUSH BUTTON, TUNING BK IB BB
144	1662-58901	PUSH BUTTON, TUNING I
150	2240-7372	HOLDER
157	2651-2101734	SPRING
174	2347-R0126082	SCREW (2.6 x 8mm) (x 8)

GENERAL UNIT  
EXPLODED VIEW (FRONT PANEL)

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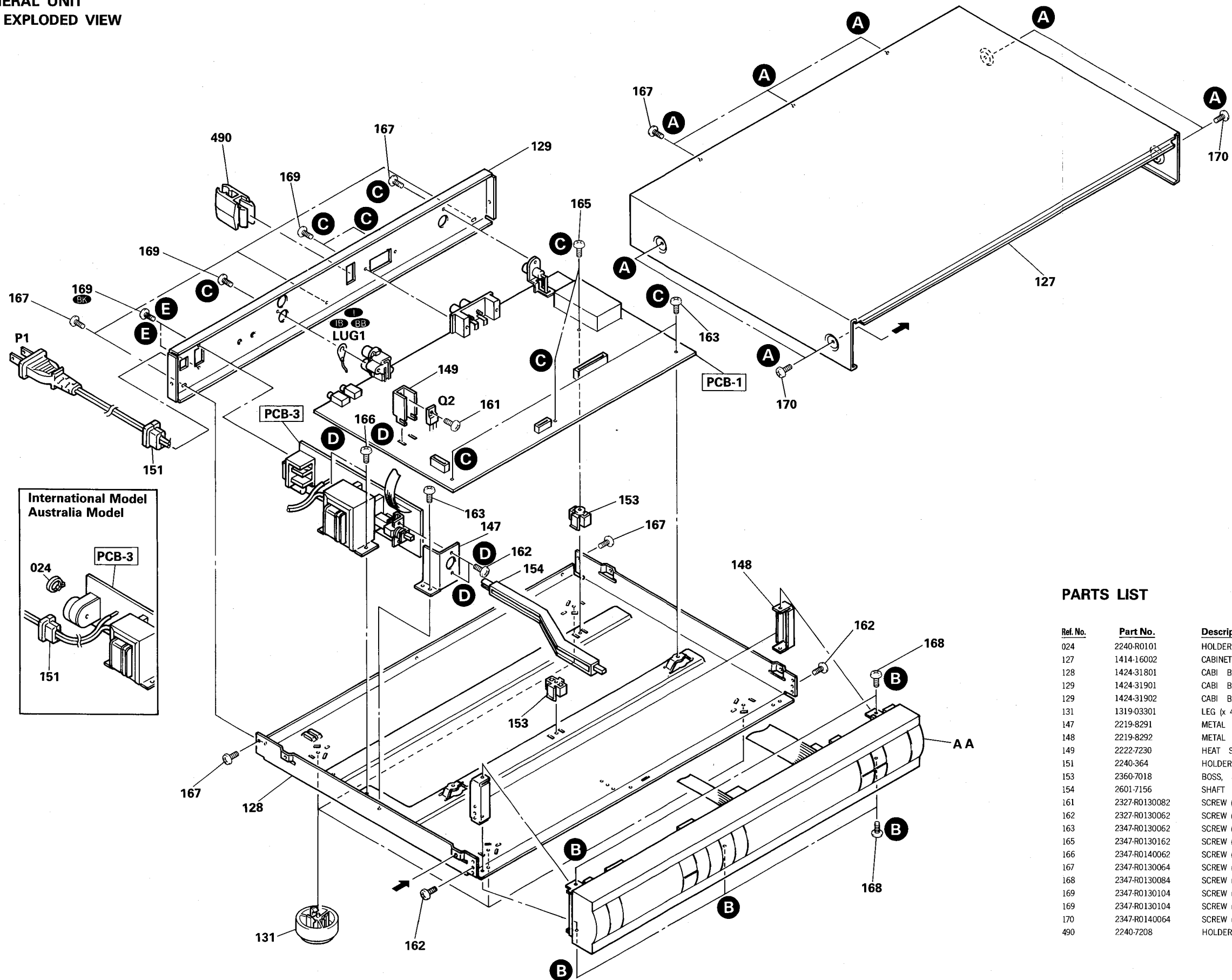
A B C D E



## PARTS LIST

Ref. No.	Part No.	Description
AA	A442-TU9400B	FRONT PANEL ASS'Y BK IB BB
AA	A442-TU9400A	FRONT PANEL ASS'Y I
133	1442-24502	PANEL BK IB BB
133	1442-24501	PANEL I
134	1442-24702	PANEL BK IB BB
134	1442-24701	PANEL I
135	1511-19804	PLATE
136	1532-17504	WINDOW
137	1662-52001	PUSH BUTTON, POWER BK IB BB
137	1662-52003	PUSH BUTTON, POWER I
138	1662-58605	PUSH BUTTON, PRESET 1/5 BK IB BB
138	1662-58601	PUSH BUTTON, PRESET 1/5 I
139	1662-58606	PUSH BUTTON, PRESET 2/6 BK IB BB
139	1662-58602	PUSH BUTTON, PRESET 2/6 I
140	1662-58607	PUSH BUTTON, PRESET 3/7 BK IB BB
140	1662-58603	PUSH BUTTON, PRESET 3/7 I
141	1662-58608	PUSH BUTTON, PRESET 4/8 BK IB BB
141	1662-58604	PUSH BUTTON, PRESET 4/8 I
142	1662-58702	PUSH BUTTON, FM, AM, SEEK-ST, HI-BLEND BK IB BB
142	1662-58701	PUSH BUTTON, FM, AM, SEEK-ST, HI-BLEND I
143	1662-59002	PUSH BUTTON, MEMORY, SHIFT ABC BK IB BB
143	1662-59001	PUSH BUTTON, MEMORY, SHIFT ABC I
144	1662-58902	PUSH BUTTON, TUNING BK IB BB
144	1662-58901	PUSH BUTTON, TUNING I
150	2240-7372	HOLDER
157	2651-2101734	SPRING
174	2347-R0126082	SCREW (2.6 x 8mm) (x 8)

GENERAL UNIT  
EXPLODED VIEW

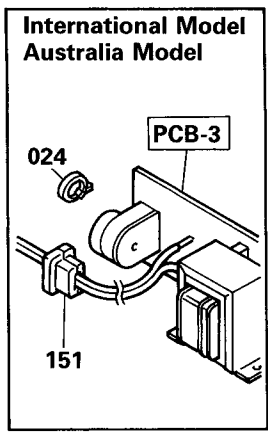
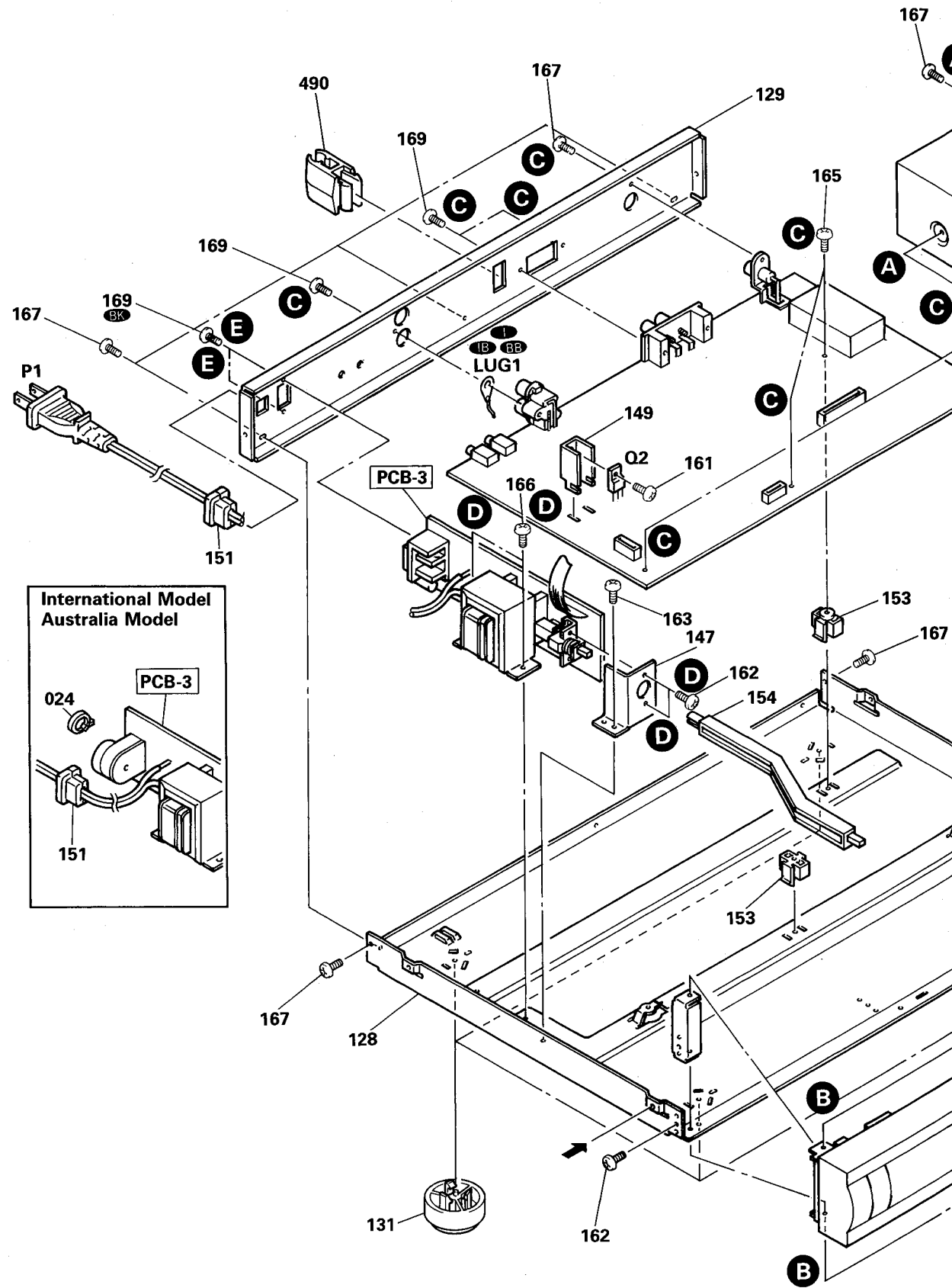


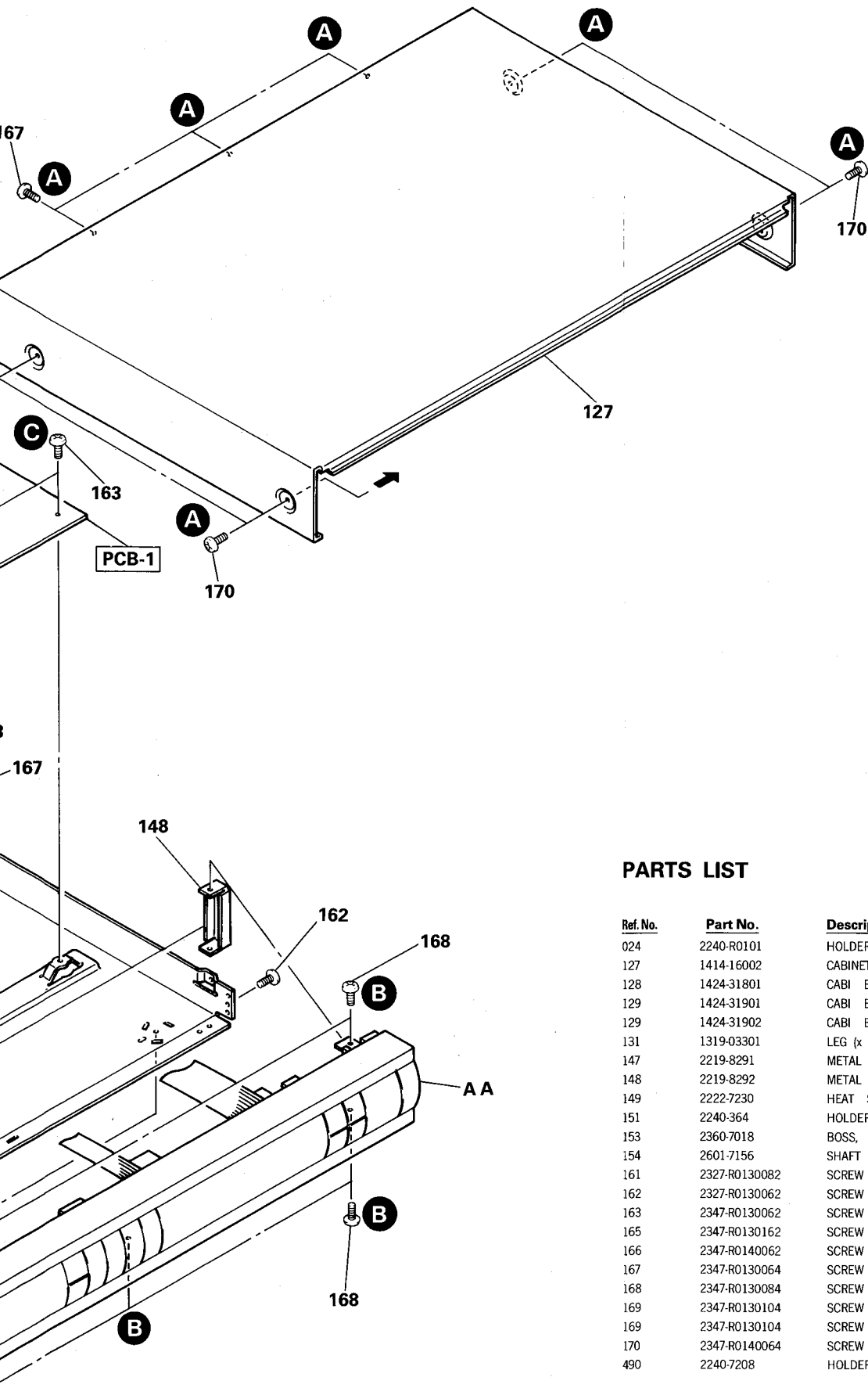
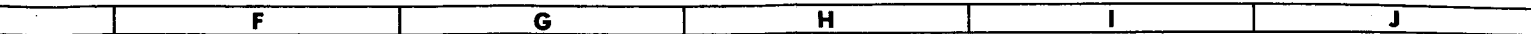
PARTS LIST

Ref. No.	Part No.	Description
024	2240-R0101	HOLDER (T IB BB)
127	1414-16002	CABINET
128	1424-31801	CABI BACK
129	1424-31901	CABI BACK (BK)
129	1424-31902	CABI BACK (T IB BB)
131	1319-03301	LEG (x 4)
147	2219-8291	METAL FITTING
148	2219-8292	METAL FITTING (x 2)
149	2222-7230	HEAT SINK
151	2240-364	HOLDER
153	2360-7018	BOSS, SPE (x 2)
154	2601-7156	SHAFT
161	2327-R0130082	SCREW (3 x 8mm)
162	2327-R0130062	SCREW (3 x 6mm) (x 4)
163	2347-R0130062	SCREW (3 x 6mm) (x 3)
165	2347-R0130162	SCREW (3 x 16mm) (x 2)
166	2347-R0140062	SCREW (4 x 6mm) (x 2)
167	2347-R0130064	SCREW (3 x 6mm) (x 9)
168	2347-R0130084	SCREW (3 x 8mm) (x 5)
169	2347-R0130104	SCREW (3 x 10mm) (x 5) (BK)
169	2347-R0130104	SCREW (3 x 10mm) (x 3) (T IB BB)
170	2347-R0140064	SCREW (4 x 6mm) (x 4)
490	2240-7208	HOLDER

**GENERAL UNIT  
EXPLODED VIEW**

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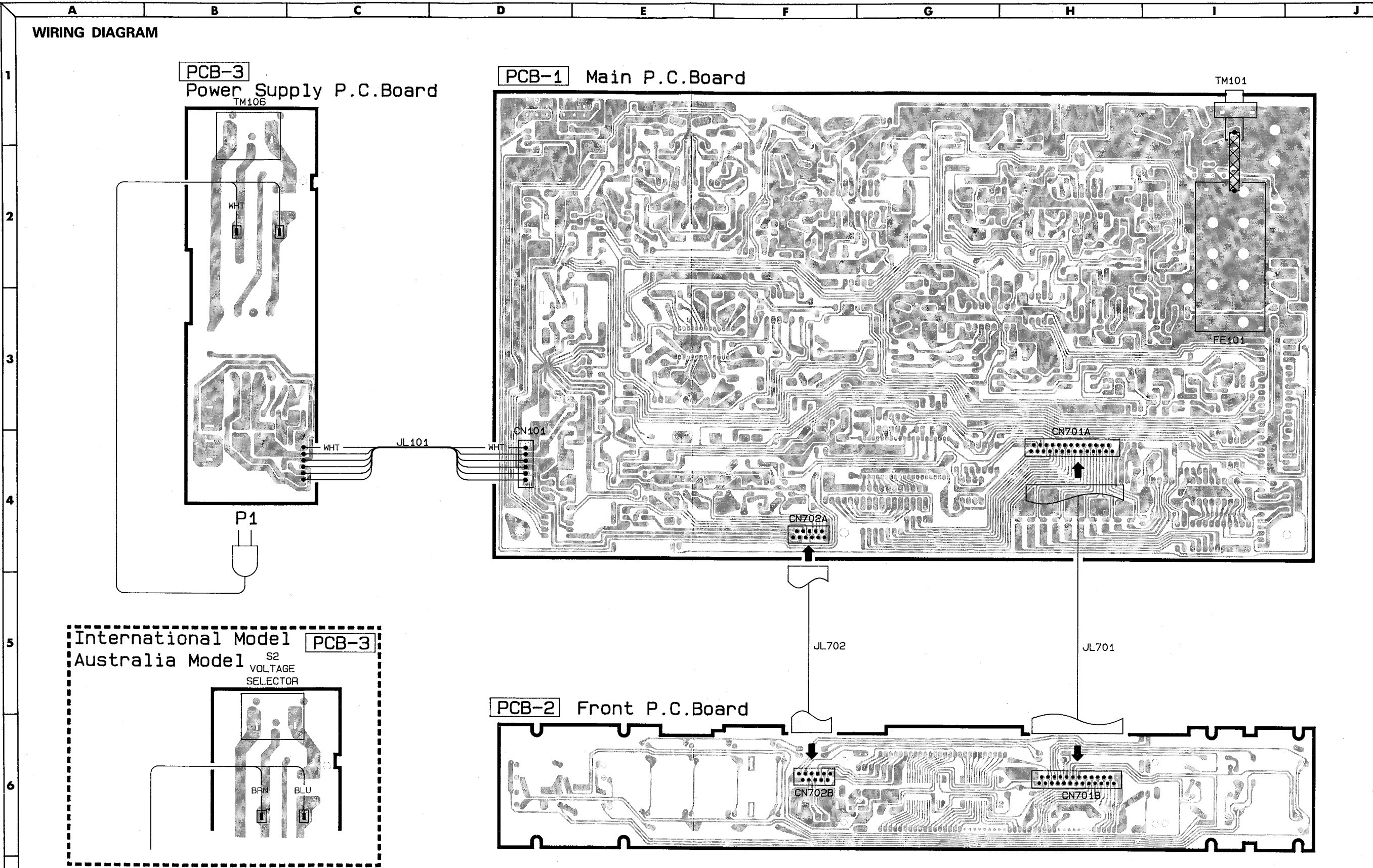




**PARTS LIST**

Ref. No.	Part No.	Description
024	2240-R0101	HOLDER I IB BB
127	1414-16002	CABINET
128	1424-31801	CABI BACK
129	1424-31901	CABI BACK BK
129	1424-31902	CABI BACK I IB BB
131	1319-03301	LEG (x 4)
147	2219-8291	METAL FITTING
148	2219-8292	METAL FITTING (x 2)
149	2222-7230	HEAT SINK
151	2240-364	HOLDER
153	2360-7018	BOSS, SPE (x 2)
154	2601-7156	SHAFT
161	2327-R0130082	SCREW (3 x 8mm)
162	2327-R0130062	SCREW (3 x 6mm) (x 4)
163	2347-R0130062	SCREW (3 x 6mm) (x 3)
165	2347-R0130162	SCREW (3 x 16mm) (x 2)
166	2347-R0140062	SCREW (4 x 6mm) (x 2)
167	2347-R0130064	SCREW (3 x 6mm) (x 9)
168	2347-R0130084	SCREW (3 x 8mm) (x 5)
169	2347-R0130104	SCREW (3 x 10mm) (x 5) BK
169	2347-R0130104	SCREW (3 x 10mm) (x 3) I IB BB
170	2347-R0140064	SCREW (4 x 6mm) (x 4)
490	2240-7208	HOLDER

WIRING DIAGRAM

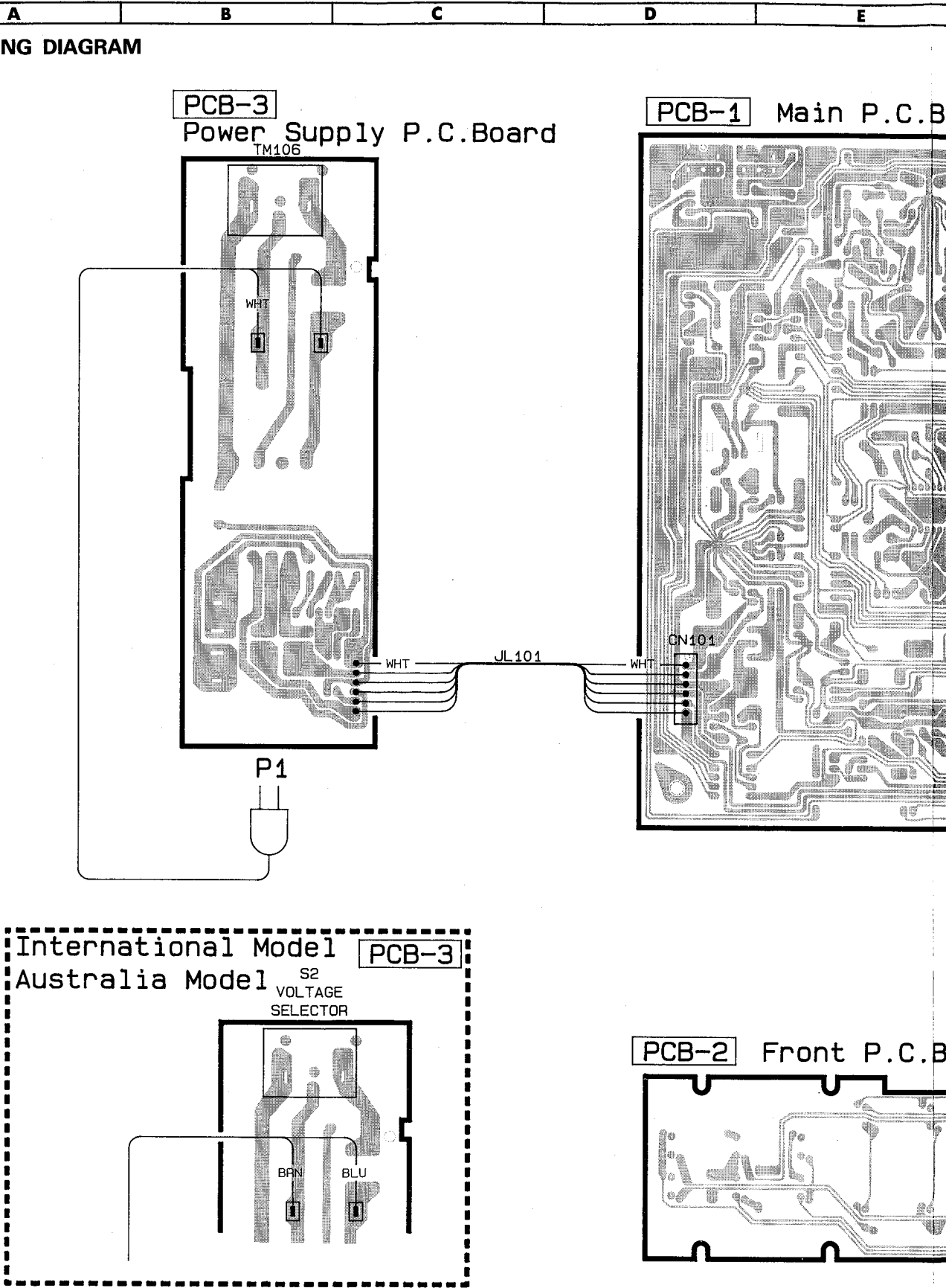


WIRE COLOR ABBREVIATIONS  
 RED: Red      YEL: Yellow  
 ORG: Orange    PUP: Purple  
 BLU: Blue      PIK: Pink  
 WHT: White     GRY: Gray  
 GRN: Green     BRN: Brown  
 BLK: Black



WIRING DIAGRAM

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WIRE COLOR ABBREVIATIONS

- |             |             |
|-------------|-------------|
| RED: Red    | YEL: Yellow |
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| BLK: Black  |             |

F

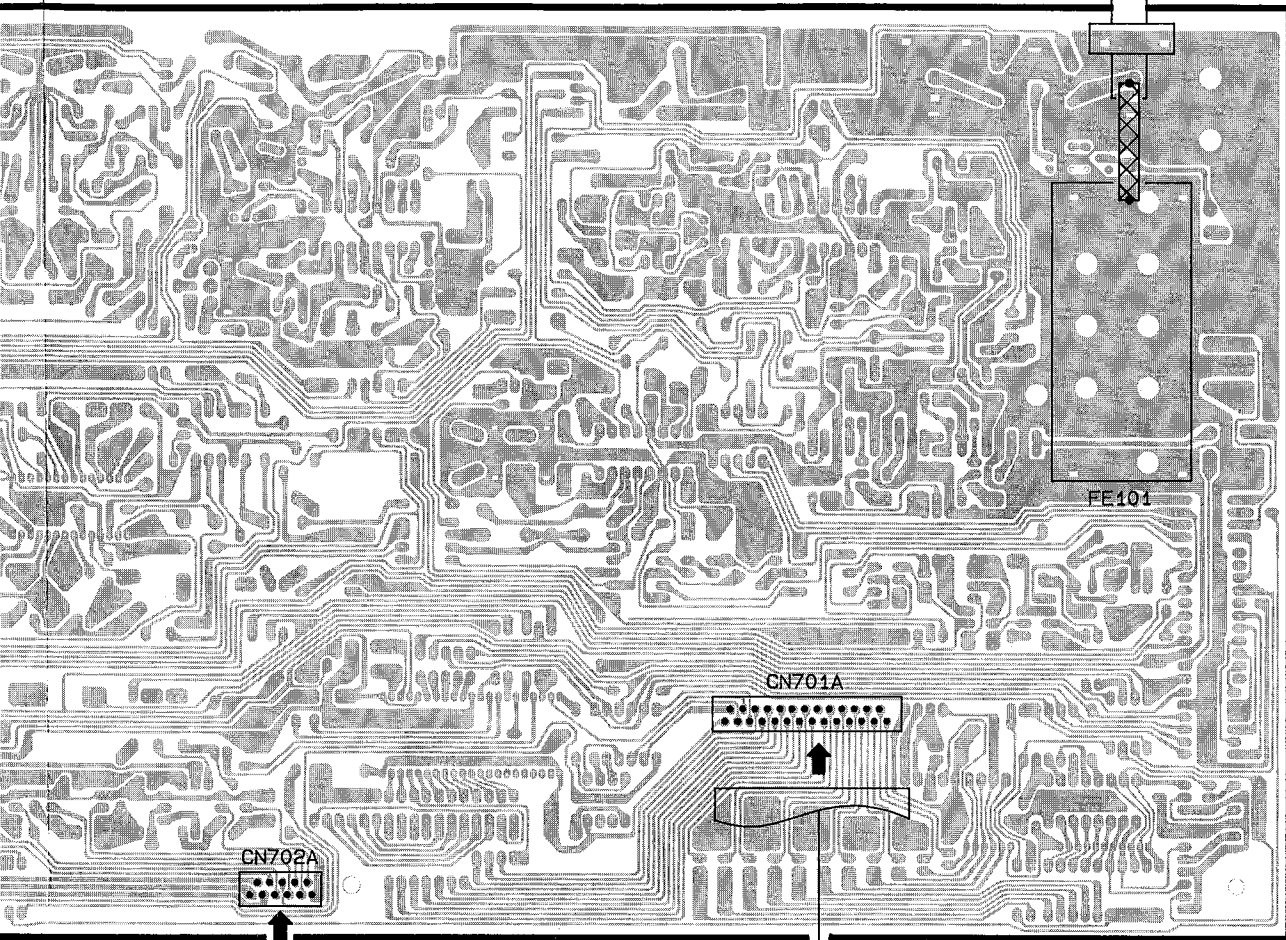
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C. Board



CN702A

CN701A

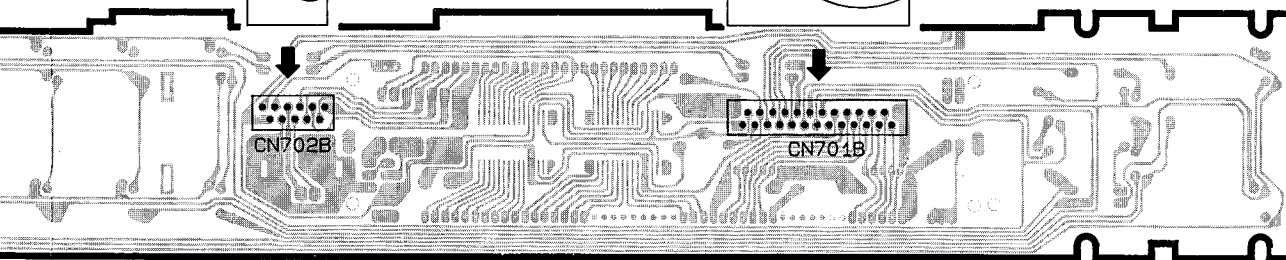
FE101

TM101

JL702

JL701

C. Board



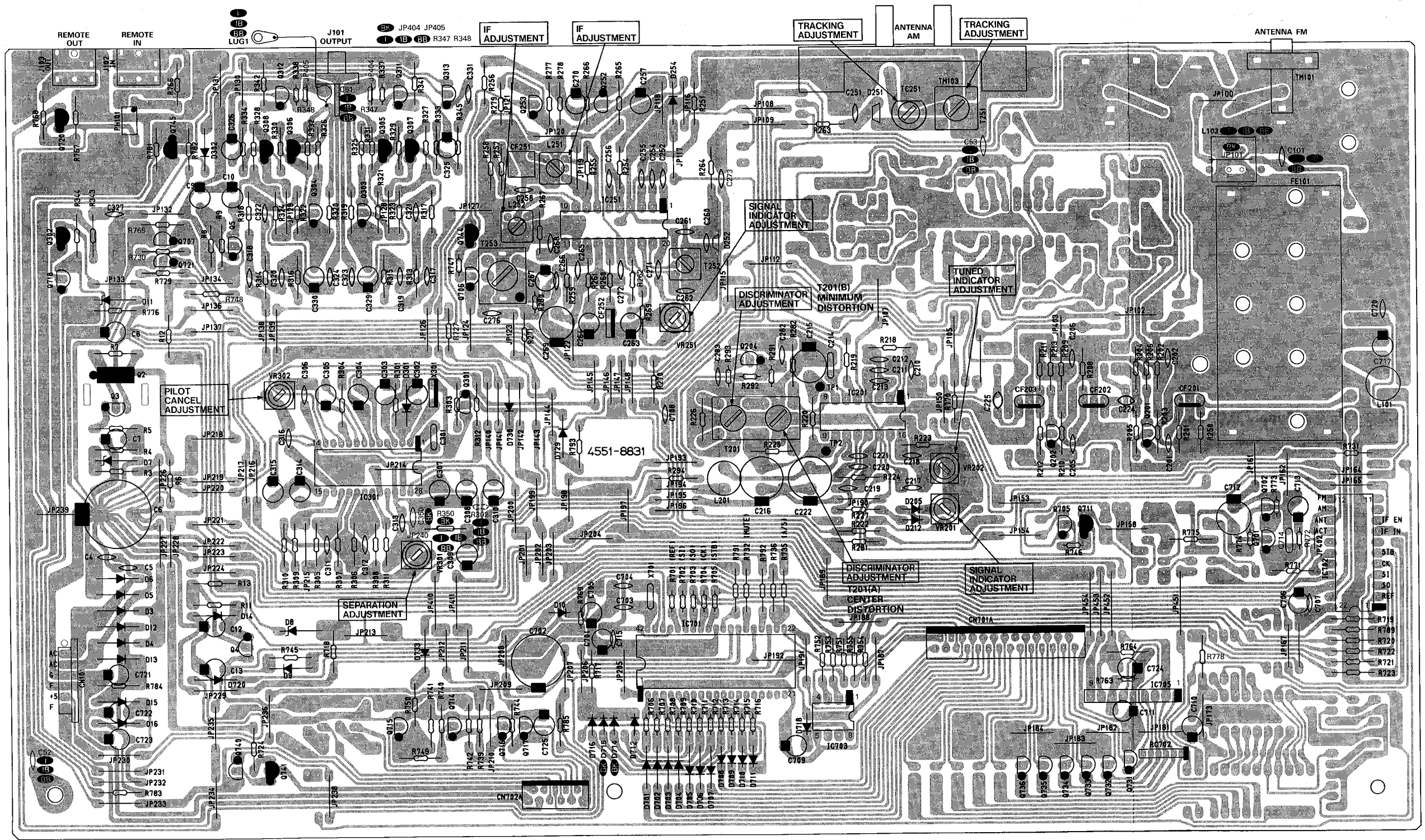
CN702B

CN701B

P.C. BOARDS

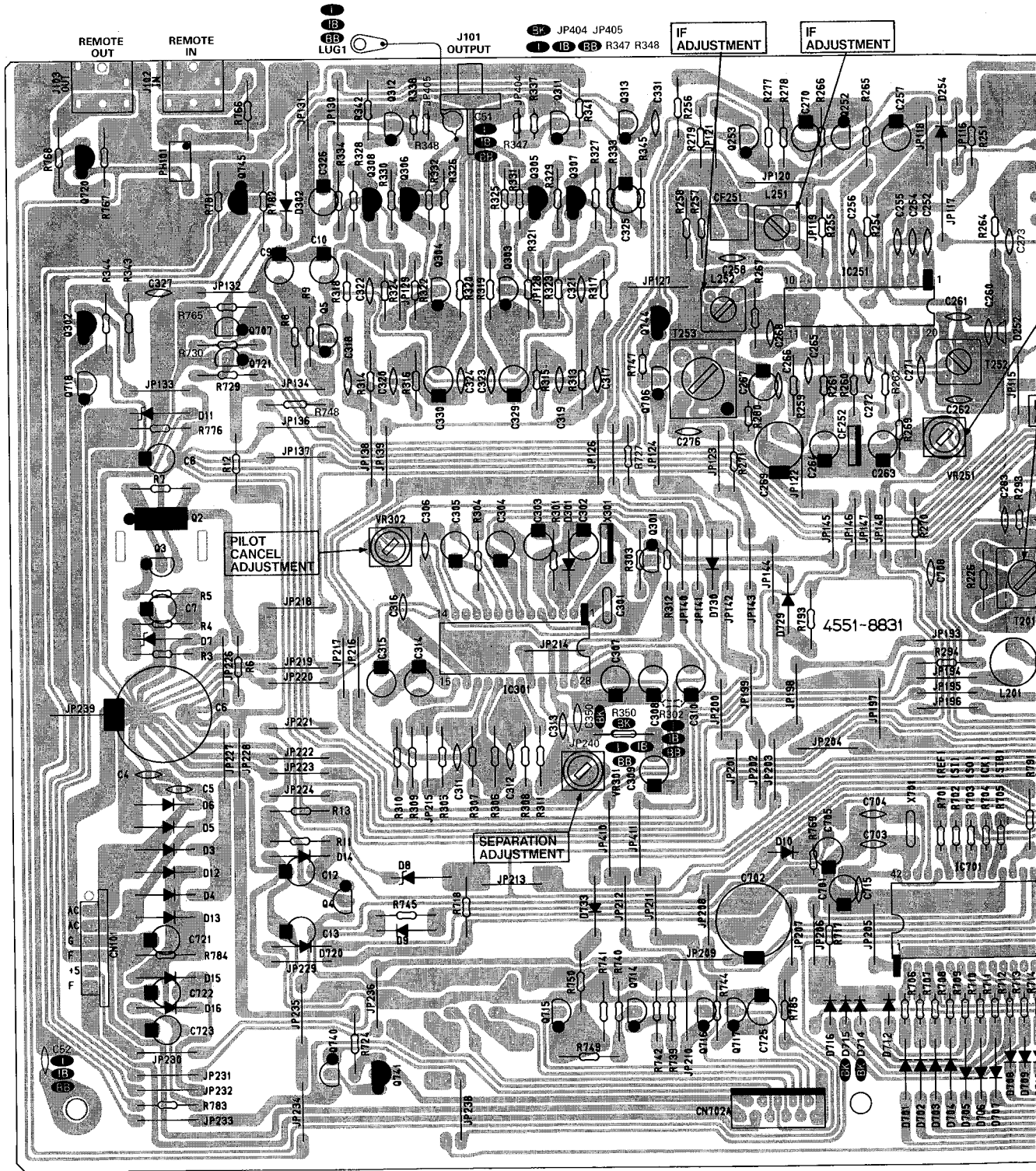
PCB-1 Main P.C. Board

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P.C. BOARDS

PCB-1 Main P.C. Board



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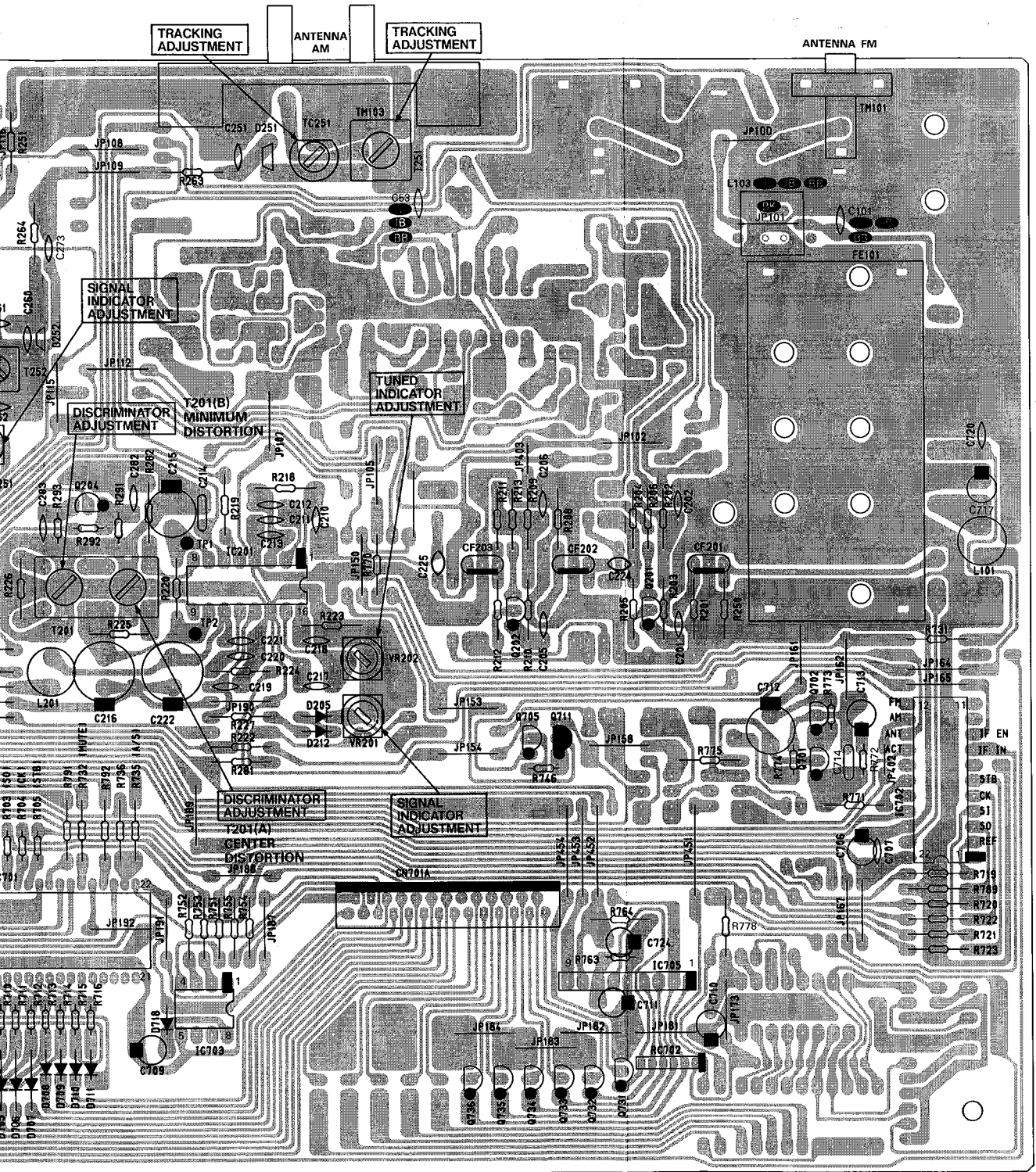
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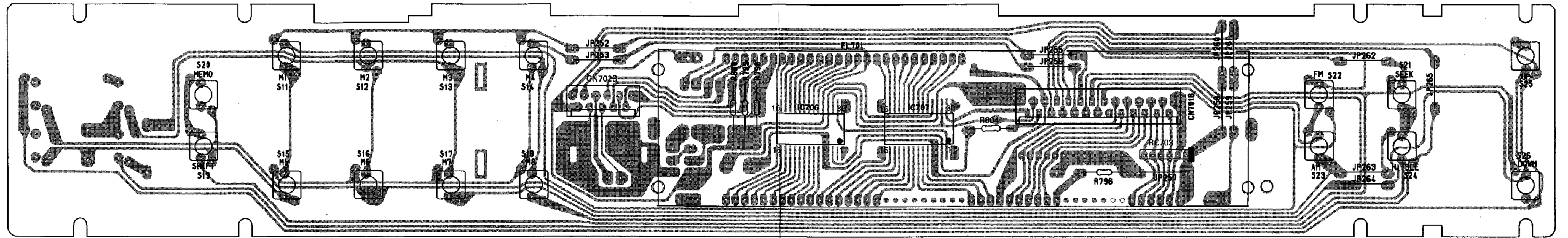
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J

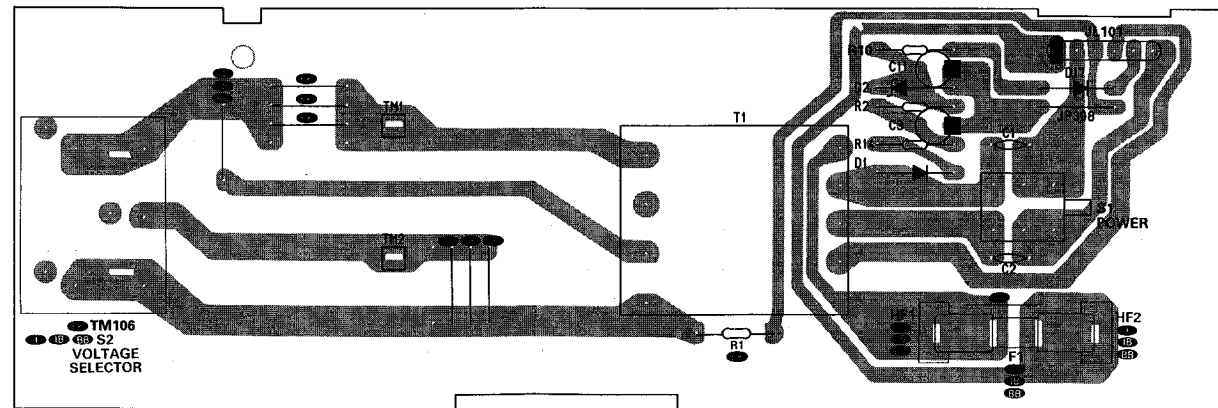


P.C. BOARDS

PCB-2 Front P.C. Board

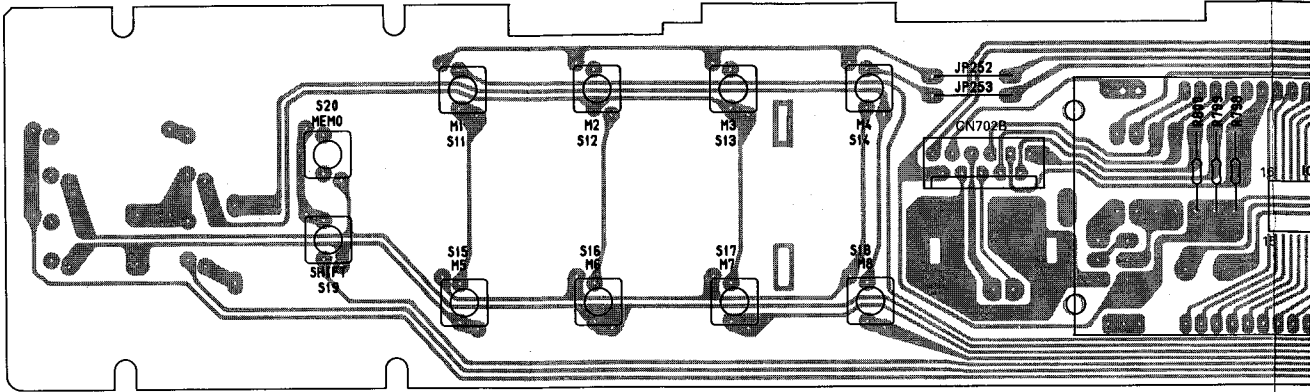


PCB-3 Power Supply P.C. Board

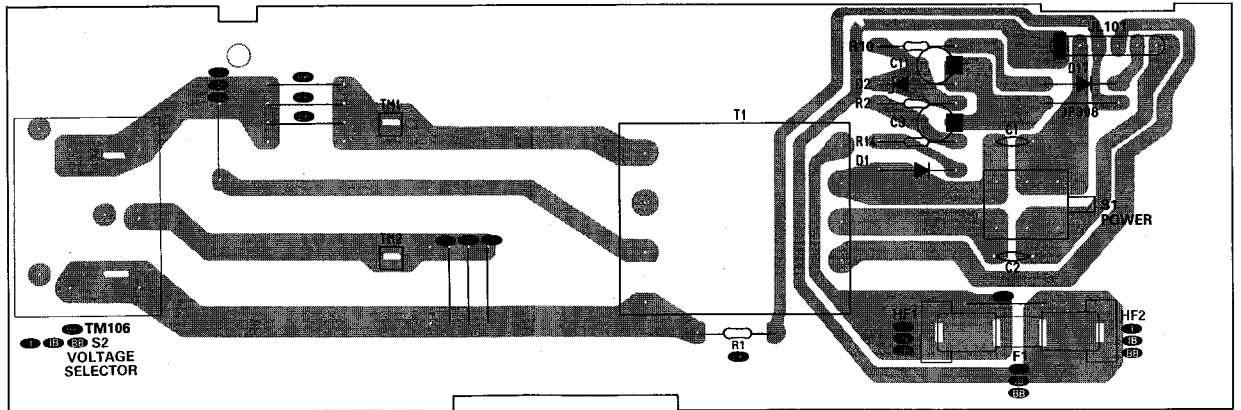


P.C. BOARDS

PCB-2 Front P.C. Board



PCB-3 Power Supply P.C. Board



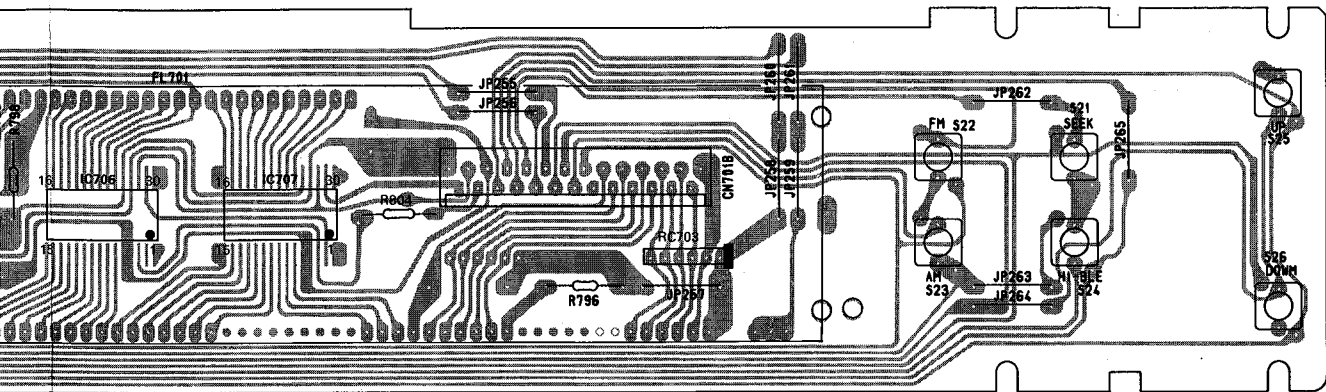
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## ELECTRICAL PARTS LIST

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>							
662	C4	5361-473ZF	CAP, CER .047 $\mu$	538	C314	5345-474F041	CAP, MINI ELE .47 $\mu$ /50V
662	C5	5361-473ZF	CAP, CER .047 $\mu$	538	C315	5345-474F041	CAP, MINI ELE .47 $\mu$ /50V
657	C6	5345-228D045	CAP, MINI ELE 2200 $\mu$ /25V	546	C316	5361-103M920	CAP, CER .01 $\mu$
655	C7	5345-107D041	CAP, MINI ELE 100 $\mu$ /25V	540	C317	5359-1525851	CAP, PPP 1500p
658	C8	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	540	C318	5359-1525851	CAP, PPP 1500p
658	C9	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	540	C319	5359-1525851	CAP, PPP 1500p
658	C10	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	540	C320	5359-1525851	CAP, PPP 1500p
658	C12	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	544	C321	5359-3025851	CAP, PPP 3000p
658	C13	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	544	C322	5359-3025851	CAP, PPP 3000p
048C	C51	5361-223ZF	CAP, CER .022 $\mu$ <b>I IB BB</b>	543	C323	5359-1025851	CAP, PPP 1000p
048C	C52	5361-223ZF	CAP, CER .022 $\mu$ <b>I IB BB</b>	543	C324	5359-1025851	CAP, PPP 1000p
048C	C53	5361-223ZF	CAP, CER .022 $\mu$ <b>I IB BB</b>	539	C325	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V
044C	C101	5361-180JCH	CAP, CER 18p <b>I IB BB</b>	539	C326	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V
047	C201	5361-223Z921	CAP, CER .022 $\mu$	549	C327	5361-223Z921	CAP, CER .022 $\mu$
417	C202	5361-223Z921	CAP, CER .022 $\mu$	539	C329	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V
417	C205	5361-223Z921	CAP, CER .022 $\mu$	539	C330	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V
417	C206	5361-223Z921	CAP, CER .022 $\mu$	549	C331	5361-223Z921	CAP, CER .022 $\mu$
417	C210	5361-223Z921	CAP, CER .022 $\mu$	548	C350	5361-391K918	CAP, CER 390p <b>BK</b>
417	C211	5361-223Z921	CAP, CER .022 $\mu$	601	C701	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V
417	C212	5361-223Z921	CAP, CER .022 $\mu$	602	C702	5350-S010Z473	CAP, SPE .047
417	C213	5361-223Z921	CAP, CER .022 $\mu$	607	C703	5361-300JCH	CAP, CER 30p
420	C214	5359-1015851	CAP, PPP 100p	607	C704	5361-300JCH	CAP, CER 30p
413	C215	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	599	C705	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V
414	C216	5345-227C041	CAP, MINI ELE 220 $\mu$ /16V	601	C706	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V
418	C217	5361-103M920	CAP, CER .01 $\mu$	609	C707	5361-102K918	CAP, CER 1000p
419	C218	5361-473ZF	CAP, CER .047 $\mu$	608	C708	5361-223Z921	CAP, CER .022 $\mu$
417	C219	5361-223Z921	CAP, CER .022 $\mu$	601	C709	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V
417	C220	5361-223Z921	CAP, CER .022 $\mu$	601	C710	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V
419	C221	5361-473ZF	CAP, CER .047 $\mu$	600	C711	5345-106F041	CAP, MINI ELE 10 $\mu$ /50V
414	C222	5345-227C041	CAP, MINI ELE 220 $\mu$ /16V	603	C712	5345-227C041	CAP, MINI ELE 220 $\mu$ /16V
417	C224	5361-223Z921	CAP, CER .022 $\mu$	604	C713	5345-684F0951	CAP, MINI ELE .68 $\mu$ /50V
417	C225	5361-223Z921	CAP, CER .022 $\mu$	605	C714	5354-473K1HM	CAP, MYL .047 $\mu$
483	C251	5361-473ZF	CAP, CER .047 $\mu$	608	C715	5361-223Z921	CAP, CER .022 $\mu$
482	C252	5361-102K918	CAP, CER 1000p	601	C717	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V
483	C254	5361-473ZF	CAP, CER .047 $\mu$	608	C720	5361-223Z921	CAP, CER .022 $\mu$
481	C255	5361-223Z921	CAP, CER .022 $\mu$	600	C721	5345-106F041	CAP, MINI ELE 10 $\mu$ /50V
481	C256	5361-223Z921	CAP, CER .022 $\mu$	610	C722	5345-107D041	CAP, MINI ELE 100 $\mu$ /25V
475	C257	5345-106F041	CAP, MINI ELE 10 $\mu$ /50V	606	C723	5345-475F041	CAP, MINI ELE 4.7 $\mu$ /50V
481	C258	5361-223Z921	CAP, CER .022 $\mu$	606	C724	5345-475F041	CAP, MINI ELE 4.7 $\mu$ /50V
485	C260	5361-180JPH	CAP, CER 18p	599	C725	5345-225F041	CAP, MINI ELE 2.2 $\mu$ /50V
487	C261	5359-4715851	CAP, PPP 470p	<b>RESISTORS</b>			
483	C262	5361-473ZF	CAP, CER .047 $\mu$	665	R3	5135-272522	RES, CBN 1/2P 2.7K
476	C263	5345-475F041	CAP, MINI ELE 4.7 $\mu$ /50V	666	R4	5135-101522	RES, CBN 1/2P 100
476	C264	5345-475F041	CAP, MINI ELE 4.7 $\mu$ /50V	666	R5	5135-101522	RES, CBN 1/2P 100
484	C265	5361-103M920	CAP, CER .01 $\mu$	670	$\Delta$ R6	5102-2R25116	RES, FUSE 2.2
480	C266	5361-472K918	CAP, CER 4700p	667	R7	5135-331522	RES, CBN 1/2P 330
479	C267	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	669	R8	5135-105522	RES, CBN 1/2P 1M
482	C268	5361-102K918	CAP, CER 1000p	668	R9	5135-102522	RES, CBN 1/2P 1K
477	C269	5345-107C041	CAP, MINI ELE 100 $\mu$ /16V	668	R11	5135-102522	RES, CBN 1/2P 1K
478	C270	5345-104F041	CAP, MINI ELE .1 $\mu$ /50V	635	$\Delta$ R12	5102-3304715	RES, FUSE 33
481	C271	5361-223Z921	CAP, CER .022 $\mu$	666	R13	5135-101522	RES, CBN 1/2P 100
483	C272	5361-473ZF	CAP, CER .047 $\mu$	423	R201	5135-391522	RES, CBN 1/2P 390
483	C273	5361-473ZF	CAP, CER .047 $\mu$	424	R202	5135-102522	RES, CBN 1/2P 1K
486	C276	5359-5115851	CAP, PPP 510p	425	R203	5135-154522	RES, CBN 1/2P 150K
416	C282	5361-223Z921	CAP, CER .022 $\mu$	423	R204	5135-391522	RES, CBN 1/2P 390
416	C283	5361-223Z921	CAP, CER .022 $\mu$	426	R205	5135-101522	RES, CBN 1/2P 100
545	C301	5354-473K1HM	CAP, MYL .047 $\mu$	427	R206	5135-150522	RES, CBN 1/2P 15
533	C302	5345-224F0951	CAP, MINI ELE .22 $\mu$ /50V	423	R208	5135-391522	RES, CBN 1/2P 390
534	C303	5345-474F0951	CAP, MINI ELE .47 $\mu$ /50V	424	R209	5135-102522	RES, CBN 1/2P 1K
535	C304	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	425	R210	5135-154522	RES, CBN 1/2P 150K
535	C305	5345-105F041	CAP, MINI ELE 1 $\mu$ /50V	423	R211	5135-391522	RES, CBN 1/2P 390
546	C306	5361-103M920	CAP, CER .01 $\mu$	426	R212	5135-101522	RES, CBN 1/2P 100
536	C307	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	429	R213	5135-220522	RES, CBN 1/2P 22
536	C308	5345-476D041	CAP, MINI ELE 47 $\mu$ /25V	431	R218	5135-331522	RES, CBN 1/2P 330
537	C309	5345-226D041	CAP, MINI ELE 22 $\mu$ /25V	430	R219	5135-562522	RES, CBN 1/2P 5.6K
537	C310	5345-226D041	CAP, MINI ELE 22 $\mu$ /25V	432	R220	5135-123522	RES, CBN 1/2P 12K <b>BK</b>
541	C311	5359-4715851	CAP, PPP 470p <b>BK</b>	432C	R220	5135-223522	RES, CBN 1/2P 22K <b>I IB BB</b>
541C	C311	5359-2715851	CAP, PPP 270p <b>I IB BB</b>	434	R222	5135-103522	RES, CBN 1/2P 10K
541	C312	5359-4715851	CAP, PPP 470p <b>BK</b>	435	R223	5135-683522	RES, CBN 1/2P 68K
541C	C312	5359-2715851	CAP, PPP 270p <b>I IB BB</b>	436	R224	5135-223522	RES, CBN 1/2P 22K
542	C313	5359-3915851	CAP, PPP 390p	438	R225	5135-472522	RES, CBN 1/2P 4.7K
				428	R226	5135-222522	RES, CBN 1/2P 2.2K
				434	R227	5135-103522	RES, CBN 1/2P 10K
				431	R250	5135-331522	RES, CBN 1/2P 330

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
503	R251	5135-471522	RES, CBN 1/2P 470	612	R702	5232-222J16P	RES, CBN 1/6P 2.2K
492	R254	5135-182522	RES, CBN 1/2P 1.8K	612	R703	5232-222J16P	RES, CBN 1/6P 2.2K
496	R255	5135-683522	RES, CBN 1/2P 68K	612	R704	5232-222J16P	RES, CBN 1/6P 2.2K
497	R256	5135-223522	RES, CBN 1/2P 22K	612	R705	5232-222J16P	RES, CBN 1/6P 2.2K
498	R257	5135-122522	RES, CBN 1/2P 1.2K	612	R706	5232-222J16P	RES, CBN 1/6P 2.2K
495	R258	5135-102522	RES, CBN 1/2P 1K	612	R707	5232-222J16P	RES, CBN 1/6P 2.2K
499	R259	5135-272522	RES, CBN 1/2P 2.7K	612	R708	5232-222J16P	RES, CBN 1/6P 2.2K
500	R260	5135-820522	RES, CBN 1/2P 82	612	R709	5232-222J16P	RES, CBN 1/6P 2.2K
501	R261	5135-103522	RES, CBN 1/2P 10K	612	R710	5232-222J16P	RES, CBN 1/6P 2.2K
501	R262	5135-103522	RES, CBN 1/2P 10K	612	R711	5232-222J16P	RES, CBN 1/6P 2.2K
502	R263	5135-104522	RES, CBN 1/2P 100K	612	R712	5232-222J16P	RES, CBN 1/6P 2.2K
502	R264	5135-104522	RES, CBN 1/2P 100K	612	R713	5232-222J16P	RES, CBN 1/6P 2.2K
497	R265	5135-223522	RES, CBN 1/2P 22K	612	R714	5232-222J16P	RES, CBN 1/6P 2.2K
504	R266	5135-473522	RES, CBN 1/2P 47K	612	R715	5232-222J16P	RES, CBN 1/6P 2.2K
503	R267	5135-471522	RES, CBN 1/2P 470	612	R716	5232-222J16P	RES, CBN 1/6P 2.2K
493	R269	5135-103522	RES, CBN 1/2P 10K	621	R717	5135-104522	RES, CBN 1/2P 100K
502	R270	5135-104522	RES, CBN 1/2P 100K	622	R718	5135-102522	RES, CBN 1/2P 1K
504	R271	5135-473522	RES, CBN 1/2P 47K	623	R719	5135-472522	RES, CBN 1/2P 4.7K
504	R277	5135-473522	RES, CBN 1/2P 47K	624	R720	5135-222522	RES, CBN 1/2P 2.2K
497	R278	5135-223522	RES, CBN 1/2P 22K	624	R721	5135-222522	RES, CBN 1/2P 2.2K
505	R279	5135-822522	RES, CBN 1/2P 8.2K	624	R722	5135-222522	RES, CBN 1/2P 2.2K
491	R280	5232-223J16P	RES, CBN 1/6P 22K	624	R723	5135-222522	RES, CBN 1/2P 2.2K
439	R281	5135-104522	RES, CBN 1/2P 100K	636	R724	5171-S010J470	RES, MTL 1P 47
438	R282	5135-103522	RES, CBN 1/2P 10K	625	R727	5135-103522	RES, CBN 1/2P 10K
441	R291	5232-154J16P	RES, CBN 1/6P 150K	625	R729	5135-103522	RES, CBN 1/2P 10K
442	R292	5232-154J16P	RES, CBN 1/6P 150K	625	R730	5135-103522	RES, CBN 1/2P 10K
443	R293	5232-102J16P	RES, CBN 1/6P 1K	622	R731	5135-102522	RES, CBN 1/2P 1K
438	R294	5135-472522	RES, CBN 1/2P 4.7K	622	R732	5135-102522	RES, CBN 1/2P 1K
551	R301	5135-472522	RES, CBN 1/2P 4.7K	628	R735	5135-100522	RES, CBN 1/2P 10
050C	R302	5232-473J16P	RES, CBN 1/6P 47K <b>I IB BB</b>	626	R736	5135-473522	RES, CBN 1/2P 47K
552	R303	5135-103522	RES, CBN 1/2P 10K	625	R739	5135-103522	RES, CBN 1/2P 10K
552	R304	5135-103522	RES, CBN 1/2P 10K	626	R740	5135-473522	RES, CBN 1/2P 47K
553	R305	5135-154522	RES, CBN 1/2P 150K <b>BK</b>	626	R741	5135-473522	RES, CBN 1/2P 47K
553C	R305	5135-184522	RES, CBN 1/2P 180K <b>I IB BB</b>	620	R742	5135-223522	RES, CBN 1/2P 22K
553	R306	5135-154522	RES, CBN 1/2P 150K <b>BK</b>	625	R744	5135-103522	RES, CBN 1/2P 10K
553C	R306	5135-184522	RES, CBN 1/2P 180K <b>I IB BB</b>	621	R745	5135-104522	RES, CBN 1/2P 100K
554	R307	5135-124522	RES, CBN 1/2P 120K	619	R746	5232-273J16P	RES, CBN 1/6P 27K
554	R308	5135-124522	RES, CBN 1/2P 120K	619	R747	5232-273J16P	RES, CBN 1/6P 27K
555	R309	5135-222522	RES, CBN 1/2P 2.2K	620	R748	5135-223522	RES, CBN 1/2P 2.2K
555	R310	5135-222522	RES, CBN 1/2P 2.2K	620	R749	5135-223522	RES, CBN 1/2P 2.2K
552	R311	5135-103522	RES, CBN 1/2P 10K	620	R750	5135-223522	RES, CBN 1/2P 2.2K
552	R312	5135-103522	RES, CBN 1/2P 10K	627	R751	5135-222522	RES, CBN 1/2P 2.2K
556	R313	5135-272522	RES, CBN 1/2P 2.7K	627	R752	5135-222522	RES, CBN 1/2P 2.2K
556	R314	5135-272522	RES, CBN 1/2P 2.7K	627	R753	5135-222522	RES, CBN 1/2P 2.2K
556	R315	5135-272522	RES, CBN 1/2P 2.7K	627	R754	5135-222522	RES, CBN 1/2P 2.2K
556	R316	5135-272522	RES, CBN 1/2P 2.7K	627	R755	5135-222522	RES, CBN 1/2P 2.2K
566	R317	5135-132522	RES, CBN 1/2P 1.3K	613	R763	5232-103J16P	RES, CBN 1/6P 10K
566	R318	5135-132522	RES, CBN 1/2P 1.3K	634	R764	5135-333522	RES, CBN 1/2P 33K
554	R319	5135-124522	RES, CBN 1/2P 120K	626	R765	5135-473522	RES, CBN 1/2P 47K
554	R320	5135-124522	RES, CBN 1/2P 120K	633	R766	5135-271522	RES, CBN 1/2P 270
558	R321	5135-224522	RES, CBN 1/2P 220K	626	R767	5135-473522	RES, CBN 1/2P 47K
558	R322	5135-224522	RES, CBN 1/2P 220K	630	R768	5135-470522	RES, CBN 1/2P 47
559	R323	5135-182522	RES, CBN 1/2P 1.8K	614	R769	5232-102J16P	RES, CBN 1/6P 1K
559	R324	5135-182522	RES, CBN 1/2P 1.8K	622	R770	5135-102522	RES, CBN 1/2P 1K
560	R325	5135-470522	RES, CBN 1/2P 47	625	R771	5135-103522	RES, CBN 1/2P 10K
560	R326	5135-470522	RES, CBN 1/2P 47	612	R772	5232-222J16P	RES, CBN 1/6P 2.2K
561	R327	5135-121522	RES, CBN 1/2P 120	615	R773	5232-473J16P	RES, CBN 1/6P 47K
561	R328	5135-121522	RES, CBN 1/2P 120	615	R774	5232-473J16P	RES, CBN 1/6P 47K
556	R329	5135-272522	RES, CBN 1/2P 2.7K	622	R775	5135-102522	RES, CBN 1/2P 1K
556	R330	5135-272522	RES, CBN 1/2P 2.7K	622	R776	5135-102522	RES, CBN 1/2P 1K
563	R331	5135-242522	RES, CBN 1/2P 2.4K	618	R778	5135-101522	RES, CBN 1/2P 100
563	R332	5135-242522	RES, CBN 1/2P 2.4K	620	R781	5135-223522	RES, CBN 1/2P 22K
562	R333	5135-152522	RES, CBN 1/2P 1.5K	625	R782	5135-103522	RES, CBN 1/2P 10K
562	R334	5135-152522	RES, CBN 1/2P 1.5K	626	R783	5135-473522	RES, CBN 1/2P 47K
569	R337	5232-103J16P	RES, CBN 1/6P 10K	632	R784	5135-562522	RES, CBN 1/2P 5.6K
569	R338	5232-103J16P	RES, CBN 1/6P 10K	622	R785	5135-102522	RES, CBN 1/2P 1K
552	R341	5135-103522	RES, CBN 1/2P 10K	631	R789	5135-332522	RES, CBN 1/2P 3.3K
552	R342	5135-103522	RES, CBN 1/2P 10K	622	R791	5135-102522	RES, CBN 1/2P 1K
564	R343	5135-104522	RES, CBN 1/2P 100K	622	R792	5135-102522	RES, CBN 1/2P 1K
565	R344	5135-105522	RES, CBN 1/2P 1M	625	R793	5135-103522	RES, CBN 1/2P 10K
557	R345	5135-122522	RES, CBN 1/2P 1.2K				
045C	R347	5232-102J16P	RES, CBN 1/6P 1K <b>I IB BB</b>				
045C	R348	5232-102J16P	RES, CBN 1/6P 1K <b>I IB BB</b>	404	IC201	5652-LA1235	IC, MONO
568	R350	5135-102522	RES, CBN 1/2P 1K <b>BK</b>	461	IC251	5652-LA1245	IC, MONO
611	R701	5232-472J16P	RES, CBN 1/6P 4.7K	521	IC301	5653-LA3450	IC, LINEAR

## INTEGRATED CIRCUITS

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
581	IC701	5654-T9301-20	IC, DIGITAL	593	D705	5631-1S2473	DIODE, DET
582	IC702	5654-TC9227P	IC, DIGITAL	593	D706	5631-1S2473	DIODE, DET
583	IC703	5654-AK93C46	IC, DIGITAL	593	D707	5631-1S2473	DIODE, DET
586	IC705	5652-BA6124	IC, MONO	594	D708	5631-1SS133	DIODE, DET
<b>TRANSISTORS</b>				594	D709	5631-1SS133	DIODE, DET
644	Q2	5612-1375	XISTOR, PNP A	594	D710	5631-1SS133	DIODE, DET
643	Q3	5613-2320(F)	XISTOR, NPN R	594	D711	5631-1SS133	DIODE, DET
641	Q4	5614-667(C)	XISTOR, NPN A	594	D712	5631-1SS133	DIODE, DET
641	Q5	5614-667(C)	XISTOR, NPN A	594	D714	5631-1SS133	DIODE, DET <b>BK</b>
406	Q201	5613-2058(N)	XISTOR, NPN R	594	D715	5631-1SS133	DIODE, DET <b>BK</b>
406	Q202	5613-2058(N)	XISTOR, NPN R	594	D716	5631-1SS133	DIODE, DET
405	Q204	5613-2320(F)	XISTOR, NPN R	594	D718	5631-1SS133	DIODE, DET
462	Q252	5613-2320(F)	XISTOR, NPN R	593	D720	5631-1S2473	DIODE, DET
462	Q253	5613-2320(F)	XISTOR, NPN R	593	D729	5631-1S2473	DIODE, DET
524	Q301	5613-RN1203	XISTOR, NPN R	593	D730	5631-1S2473	DIODE, DET
525	Q302	5611-RN2203	XISTOR, PNP R	593	D733	5631-1S2473	DIODE, DET
526	Q303	5613-2320(F)	XISTOR, NPN R	<b>CONTROLS</b>			
526	Q304	5613-2320(F)	XISTOR, NPN R	407	VR201	5101-50301934	RES, SEMI FIX 50K
527	Q305	5611-999(F)	XISTOR, PNP R	408	VR202	5101-20301934	RES, SEMI FIX 20K
527	Q306	5611-999(F)	XISTOR, PNP R	474	VR251	5101-50301934	RES, SEMI FIX 50K
527	Q307	5611-999(F)	XISTOR, PNP R	531	VR301	5101-10401934	RES, SEMI FIX 100K
527	Q308	5611-999(F)	XISTOR, PNP R	532	VR302	5101-50301934	RES, SEMI FIX 50K
523	Q311	5614-1450(T)	XISTOR, NPN A	<b>COILS</b>			
523	Q312	5614-1450(T)	XISTOR, NPN A	402	L101	5995-2R2J107	COIL W/CORE
528	Q313	5616-2SK381(D) OR (E)	FET, N-CH	043C	L103	5214-78	LC COMPOSITE <b>I IB BB</b>
587	Q701	5613-2240(BL)	XISTOR, NPN R	402	L201	5995-2R2J107	COIL W/CORE
588	Q702	5613-2320(F)	XISTOR, NPN R	469	L251	5552-70113	IFT, AM 7
589	Q705	5613-RN1203	XISTOR, NPN R	470	L252	5932-70123	COIL CASE, 7
589	Q706	5613-RN1203	XISTOR, NPN R	<b>TRANSFORMERS</b>			
588	Q707	5613-2320(F)	XISTOR, NPN R	410	T201	5573-10101	DISCRI 10
591	Q711	5611-RN2203	XISTOR, PNP R	467	T251	5933-S0102	COIL CASE, 10
589	Q714	5613-RN1203	XISTOR, NPN R	468	T252	5922-00512	OSC COIL, 7
588	Q715	5613-2320(F)	XISTOR, NPN R	466	T253	5933-S1601	COIL CASE, 10 <b>BK</b>
589	Q716	5613-RN1203	XISTOR, NPN R	466C	T253	5933-S1602	COIL CASE, 10 <b>I IB BB</b>
589	Q717	5613-RN1203	XISTOR, NPN R	<b>MISCELLANEOUS</b>			
589	Q718	5613-RN1203	XISTOR, NPN R	677	J101	4482-0133	PIN JACK, 2P
591	Q720	5611-RN2203	XISTOR, PNP R	678	J102	4451-00184	JACK, 1P
589	Q721	5613-RN1203	XISTOR, NPN R	678	J103	4451-00184	JACK, 1P
589	Q731	5613-RN1203	XISTOR, NPN R	530	X301	5693-CSB456F1	OSC, CER
589	Q732	5613-RN1203	XISTOR, NPN R	595	X701	5691-00720027	XTAL, OSC
589	Q733	5613-RN1203	XISTOR, NPN R	409	CF201	5671-7119A	FILTER, CER S <b>BK</b>
589	Q734	5613-RN1203	XISTOR, NPN R	409C	CF201	5671-7141A	FILTER, CER S <b>I IB BB</b>
589	Q735	5613-RN1203	XISTOR, NPN R	409	CF202	5671-7119A	FILTER, CER S <b>BK</b>
589	Q736	5613-RN1203	XISTOR, NPN R	042C	CF202	5671-2036GKA	FILTER, CER S <b>I IB BB</b>
589	Q740	5613-RN1203	XISTOR, NPN R	409	CF203	5671-7119A	FILTER, CER <b>BK</b>
591	Q741	5611-RN2203	XISTOR, PNP R	042C	CF203	5671-2036GKA	FILTER, CER <b>I IB BB</b>
591	Q744	5611-RN2203	XISTOR, PNP R	471	CF251	5671-0161D451	FILTER, CER S
590	Q745	5611-999(F)	XISTOR, PNP R	472	CF252	5671-7137C	FILTER, CER S
<b>DIODES</b>				676	CN101	4443-060185	CONNECTOR
645	D3	5632-S5566B	DIODE, RECT	679	CN701A	4443-05501027	CONNECTOR
645	D4	5632-S5566B	DIODE, RECT	681	CN702A	4443-05501011	CONNECTOR
645	D5	5632-S5566B	DIODE, RECT	401	FE101	6114-00401	FM TUNER <b>BK</b>
645	D6	5632-S5566B	DIODE, RECT	401C	FE101	6114-00402	FM TUNER <b>I IB BB</b>
648	D7	5635-HZ12C2L	DIODE, ZENER	637	JL701	4242-S0327201	JUMPER LEAD
649	D8	5635-HZ9A1L	DIODE, ZENER	638	JL702	4242-S0311171	JUMPER LEAD
650	D9	5631-1S2473	DIODE, DET	049C	LUG1	4211-4	LUG <b>I IB BB</b>
651	D10	5631-1SS133	DIODE, DET	660	PH101	5624-0N3161	PHOTO COUPLER
652	D11	5635-HZ3B-2	DIODE, ZENER	597	RC702	5212-103J0503	R COMPOSITE
645	D12	5632-S5566B	DIODE, RECT	473	TC251	5371-93	TRIMMER, 1P
645	D13	5632-S5566B	DIODE, RECT	689	TM101	4214-166	TERMINAL <b>BK</b>
653	D14	5635-HZ6C2L	DIODE, ZENER	689C	TM101	4214-167	TERMINAL <b>I IB BB</b>
650	D15	5631-1S2473	DIODE, DET	690	TM103	4214-229	TERMINAL
650	D16	5631-1S2473	DIODE, DET	<b>PCB-2 FRONT P.C. BOARD</b>			
411	D205	5631-1SS133	DIODE, DET	<b>RESISTORS</b>			
411	D212	5631-1SS133	DIODE, DET	629	R796	5135-152522	RES. CBN 1/4P 1.5K
465	D251	5633-1SV149	DIODE, CAP	616	R798	5135-472522	RES. CBN 1/2P 4.7K
465	D252	5633-1SV149	DIODE, CAP	616	R799	5135-472522	RES. CBN 1/2P 4.7K
464	D254	5631-1S2473	DIODE, DET	616	R800	5135-472522	RES. CBN 1/2P 4.7K
529	D301	5631-1S2473	DIODE, DET	617	R804	5135-153522	RES. CBN 1/2P 15K
529	D302	5631-1S2473	DIODE, DET				
593	D701	5631-1S2473	DIODE, DET				
593	D702	5631-1S2473	DIODE, DET				
593	D703	5631-1S2473	DIODE, DET				
593	D704	5631-1S2473	DIODE, DET				

Ser. No. Ref. No. Part No. Description

**INTEGRATED CIRCUITS**

585 IC706 5654-TB2104F IC, DIGITAL  
 585 IC707 5654-TB2104F IC, DIGITAL

**MISCELLANEOUS**

672 S11 4437-00603 SWITCH, PU-TC  
 672 S12 4437-00603 SWITCH, PU-TC  
 672 S13 4437-00603 SWITCH, PU-TC  
 672 S14 4437-00603 SWITCH, PU-TC  
 672 S15 4437-00603 SWITCH, PU-TC  
 672 S16 4437-00603 SWITCH, PU-TC  
 672 S17 4437-00603 SWITCH, PU-TC  
 672 S18 4437-00603 SWITCH, PU-TC  
 674 S19 4437-00604 SWITCH, PU-TC  
 674 S20 4437-00604 SWITCH, PU-TC  
 674 S21 4437-00604 SWITCH, PU-TC  
 674 S22 4437-00604 SWITCH, PU-TC  
 674 S23 4437-00604 SWITCH, PU-TC  
 674 S24 4437-00604 SWITCH, PU-TC  
 672 S25 4437-00603 SWITCH, PU-TC  
 672 S26 4437-00603 SWITCH, PU-TC  
 680 CN701B 4443-05401027 CONNECTOR  
 682 CN702B 4443-05401011 CONNECTOR  
 686 FL701 5722-053 TUBE DISPLAY  
 598 RC703 5212-153J0503 R COMPOSITE

**PCB-3 POWER SUPPLY P.C. BOARD**

**CAPACITORS**

661 C1 5361-473ZF CAP, CER .047  $\mu$   
 661 C2 5361-473ZF CAP, CER .047  $\mu$   
 656 C3 5345-476D041 CAP, MINI ELE 47  $\mu$  /25V  
 656 C11 5345-476D041 CAP, MINI ELE 47  $\mu$  /25V

**RESISTORS**

663  $\Delta$ R1 5135-335522 RES, CBN 1/2P 3.3M **BK**  
 664 R2 5135-152522 RES, CBN 1/2P 1.5K  
 659 R10 5135-102522 RES, CBN 1/2P 1K  
 664 R14 5135-152522 RES, CBN 1/2P 1.5K

**DIODES**

646  $\Delta$ D1 5632-S5566B DIODE, RECT  
 647 D2 5635-HZ6C2L DIODE, ZENER  
 654 D17 5631-1S2473 DIODE, DET

**TRANSFORMERS**

671  $\Delta$ T1 5584-S7701 XFORMER, POWER **BK**  
 671C  $\Delta$ T1 5584-S7702 XFORMER, POWER **I IB BB**

**MISCELLANEOUS**

047C  $\Delta$ F1 5732-162030 FUSE **I IB BB**  
 673 S1 4431-S1003102 SWITCH, PUSH  
 041C  $\Delta$ S2 4411-1047111 SWITCH, ROTRY **I IB BB**  
 046C  $\Delta$ HF1 4472-0131 HOLDER, FUSE **I IB BB**  
 046C  $\Delta$ HF2 4472-0131 HOLDER, FUSE **I IB BB**  
 683 TM1 4214-122 TERMINAL  
 683 TM2 4214-122 TERMINAL  
 684  $\Delta$ TM106 4474-02701 SOCKET **BK**  
 675 JL101 4242-R0206800 JUMPER LEAD

Ser. No. Ref. No. Part No. Description

**ABBREVIATIONS IN PARTS LIST**

**CAPACITORS**

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  
 470  $\mu$  : 470  $\mu$  F  
 6800p : 6800pF  
 .047  $\mu$  : 0.047  $\mu$  F

**RESISTORS**

RES, CBN 1/6P : Carbon 1/6W  
 RES, FUSE : Fuse  
 RES, CEM 5P : Cement 5W  
 RES, MTL 1P : Metal 1W  
 2.2K : 2.2k $\Omega$   
 220 : 220 $\Omega$

**TRANSISTORS**

XISTOR : Transistor  
 FET : Field Effect Transistor

**CONTROLS**

RES, SEMI FIX : Semi-fixed Resistor

**CHASSIS MISCELLANEOUS PARTS LIST**

**MISCELLANEOUS**

489 L1 5911-235 ANT COIL, BC  
 687  $\Delta$ P1 4161-71151 CORD W/PLUG **BK**  
 687C  $\Delta$ P1 4161-7256 CORD W/PLUG **I IB**  
 687D  $\Delta$ P1 4161-04100 CORD W/PLUG **BB**  
 685 1398-015 ADAPTER, ANT **BK**  
 688 4161-71184 CORD W/PLUG, CONNECTION

**PACKAGE PARTS LIST**

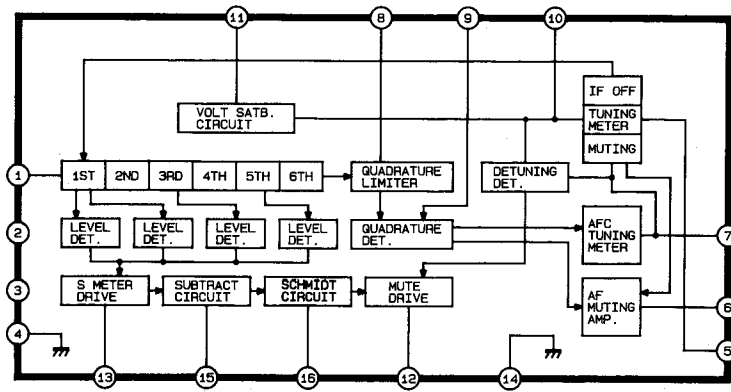
021C 1756-06303 LABEL **I IB BB**  
 022C 1756-03108 LABEL **I IB**  
 022D 1756-03111 LABEL **BB**  
 023C 1111-J30235 OWNER GUIDE, ADDENDUM **I IB BB**  
 024D 1111-J30319 OWNER GUIDE, ADDENDUM **BB**  
 025D 1756-08501 LABEL **BB**  
 111 1221-27701 CARTON BOX **I**  
 111A 1221-27702 CARTON BOX **BK IB BB**  
 113 1222-7363 CUSHION  
 114 1222-7364 CUSHION  
 115 1223-R01230055 SOFT SHEET  
 116 1241-R0123350 POLYETHYLENE BAG  
 117 1241-C1493 POLYETHYLENE BAG, SET  
 118 1111-J30321 OWNER GUIDE **BK**  
 118C 1111-J30322 OWNER GUIDE **I IB**  
 119 1241-R0115300 POLYETHYLENE BAG, ANT  
 120 1113-717004 OWNER CARD **BK**  
 121 1119-047 ATTACH SHEET, WARRANTY **BK**  
 122 1119-01201 ATTACH SHEET, SAFETY **BK**  
 123 1119-0137 ATTACH SHEET, SERVICE AGENCIES **BK**  
 695 1397-6 T FEEDER ANT **BK**  
 695C 1397-10 T FEEDER ANT **I IB BB**

**NOTE**

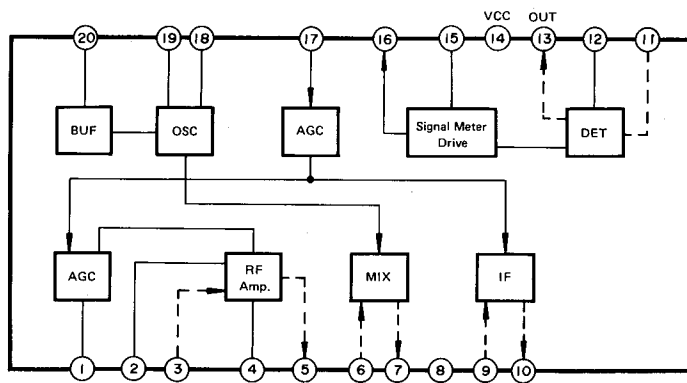


SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

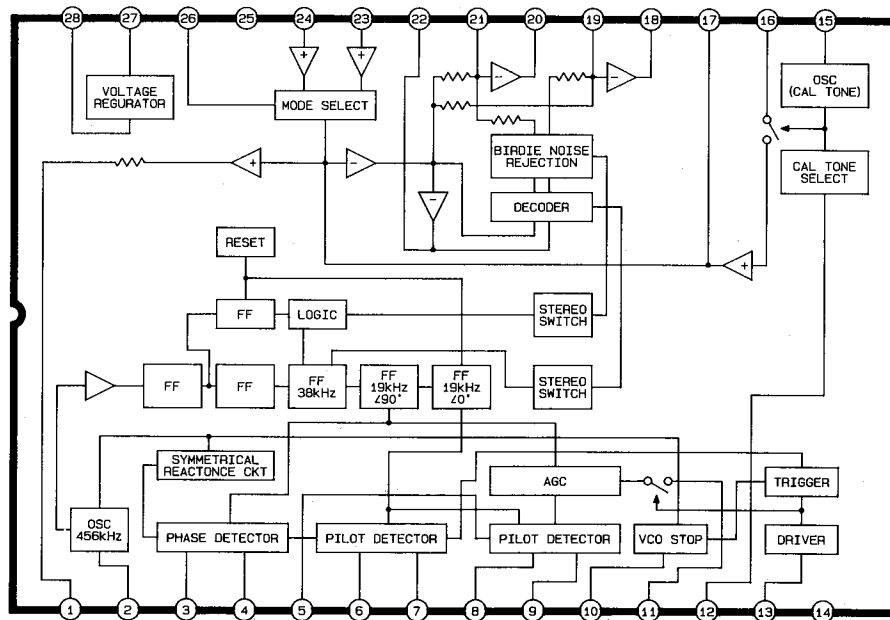
IC BLOCK DIAGRAM



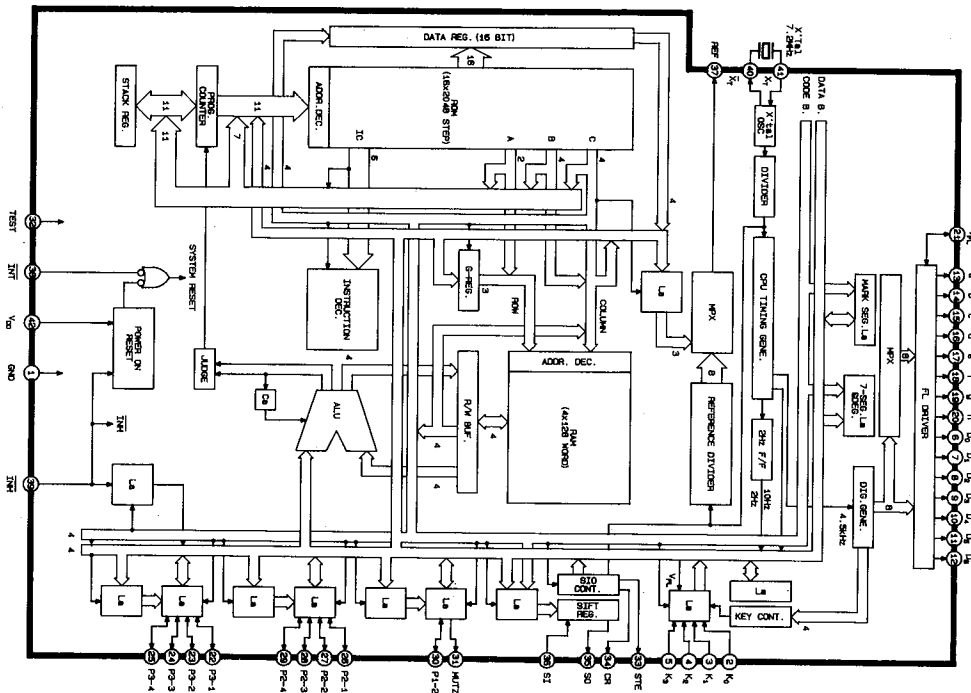
IC201 : LA1235  
FM IF Amp.



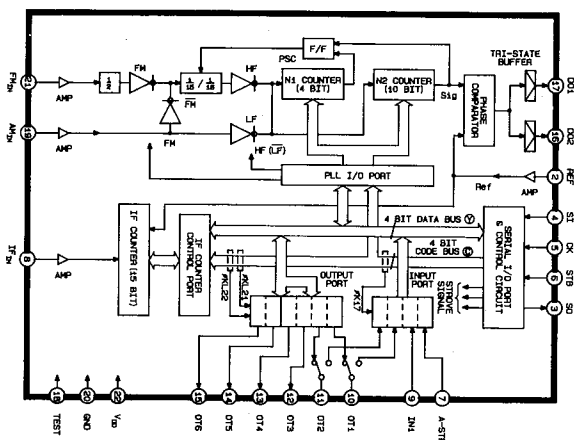
IC251 : LA1245  
AM Section



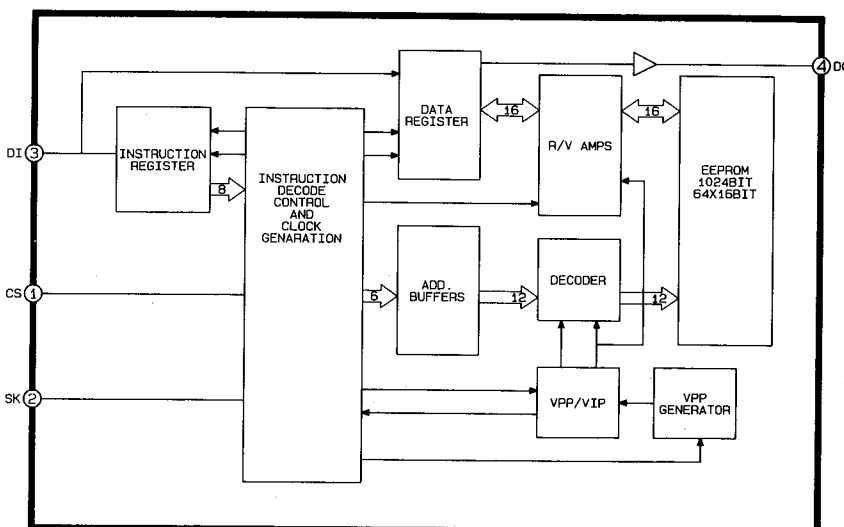
IC301 : LA3450  
FM PLL MPX



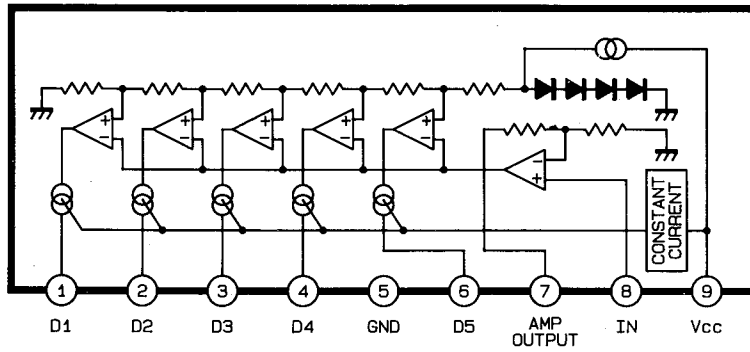
**IC701 : TC9301AN**  
**Digital Synthesizer**  
**Tuning System**  
**Micro Controller**



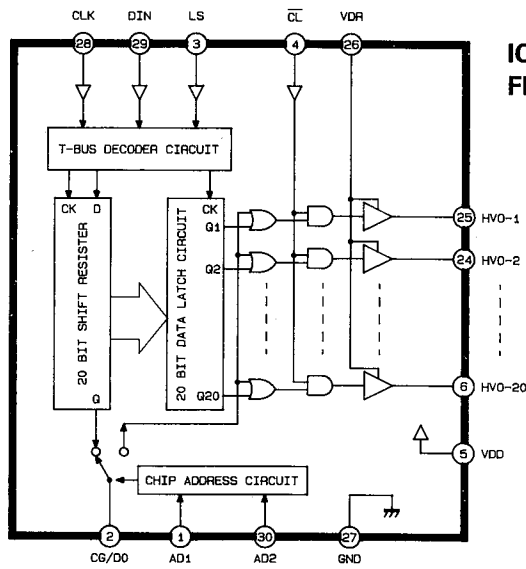
**IC702 : TC9227P**  
**Pre Scaler**



**IC703 : AK93C46**  
**EEP Rom**



**IC705 : BA6124  
Signal Strength  
Indicator Driver**



**IC706, 707 : TB2104F  
FL Tube Driver**

## IC TERMINAL FUNCTIONS

	Terminal number	Port name	Terminal code	I/O	Outline of functions
IC701	1	GND			Ground pin
	2	K0		I	4-bit key input port
	3	K1		I	4-bit key input port
	4	K2		I	4-bit key input port
	5	K3		I	4-bit key input port
	6	D0		O	Digit output
	7	D1		O	Digit output
	8	D2		O	Digit output
	9	D3		O	Digit output
	10	D4		O	Digit output
	11	D5		O	Digit output
	12	D6		O	Digit output
	13	a		O	Segment output
	14	b		O	Segment output
	15	c		O	Segment output
	16	d		O	Segment output
	17	e		O	Segment output
	18	f		O	Segment output
	19	g		O	Segment output
	20	h		O	Segment output
	21	-VFL		I	Negative power terminal (4-bit key input port, digit output, segment output)
	22	P3-1		I/O	4-bit I/O port (3)
	23	P3-2		I/O	4-bit I/O port (3)
	24	P3-3		I/O	4-bit I/O port (3)
	25	P3-4		I/O	4-bit I/O port (3)
	26	P2-1		I/O	4-bit I/O port (2)
	27	P2-2		I/O	4-bit I/O port (2)
	28	P2-3		I/O	4-bit I/O port (2)
	29	P2-4		I/O	4-bit I/O port (2)
	30	P1-2		I/O	1-bit I/O port (1)
	31	MUTE		O	1-bit muting signal output port
	32	TEST		I	Test mode control input terminal



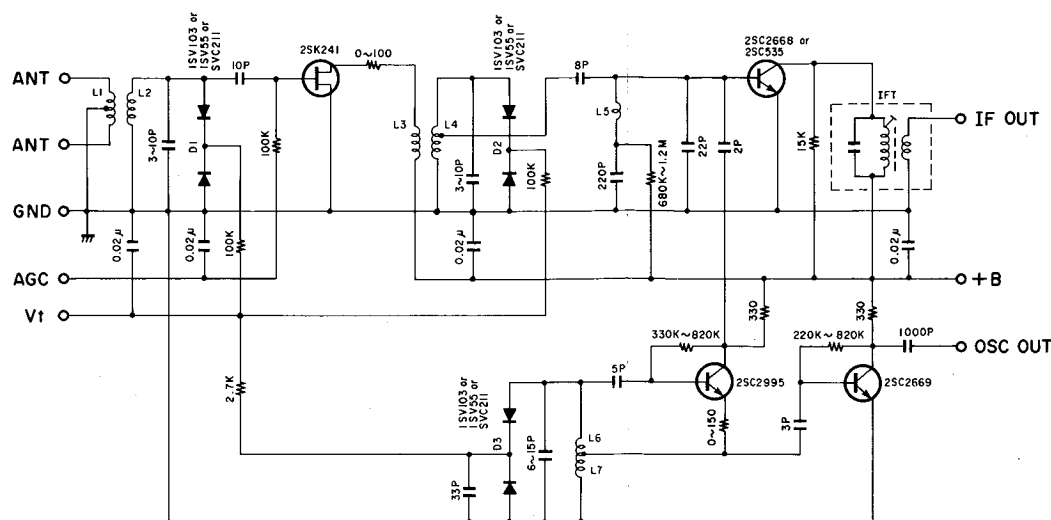
	Terminal number	Port name	Terminal code	I/O	Outline of functions
IC701	33	STB		O	Serial interface (strobe pulse output)
	34	CK		O	Serial interface (serial clock output)
	35	SO		O	Serial interface (serial data output)
	36	SI		I	Serial interface (serial data input)
	37	REF		O	Reference frequency signal output terminal
	38	$\overline{\text{INT}}$		I	Initialize input (system reset signal input terminal)
	39	$\overline{\text{INH}}$		I	Inhibit input (select signal input port of radio mode)
	40	$\overline{\text{XT}}$			Connect quartz oscillator
	41	XT			Connect quartz oscillator
	42	VDD		I	Power supply terminal
IC702	1	NC			Not connected
	2	REF		I	Reference frequency input
	3	SO		O	Serial I/O port (serial output)
	4	SI		I	Serial I/O port (serial input)
	5	CK		I	Serial I/O port (clock signal input)
	6	STB		I	Serial I/O port (strobe signal input)
	7	A-STP		I	Autostop signal input
	8	IFIN		I	IF signal input of IF counter detected autostop
	9	IN1		I	Input port
	10	OT1		O	Output port
	11	OT2		O	Output port
	12	OT3		O	Output port
	13	OT4		O	Output port
	14	OT5		O	Output port
	15	OT6		O	Output port
	16	DO2		O	Phase comparator output
	17	DO1		O	Phase comparator output
	18	TEST		I	Test mode control input
	19	AMIN		I	AM local oscillator (programmable counter input)
	20	GND			Ground pin
	21	FMIN		I	FM local oscillator (pre scaler input)
	22	VDD		I	5V $\pm$ 10% power supply terminal

	Terminal number	Port name	Terminal code	I/O	Outline of functions
IC703	1	CS		I	Serial interface (chip select)
	2	SK		I	Serial interface (serial data clock)
	3	DI		I	Serial interface (serial data input)
	4	DO		O	Serial interface (serial data output)
	5	GND			Ground pin
	6	NC			Not connected
	7	NC			Not connected
	8	VCC		I	Power supply terminal
IC706 IC707	1	AD1		I	Chip select • address set input
	2	CG/DO		I/O	Ramp test input and data output terminal
	3	LS		I	Serial data input terminal (strobe signal)
	4	$\overline{\text{CL}}$		I	Clear signal input terminal (driver off)
	5	VDD		I	Power supply terminal
	6	HVO-20		O	Driver output terminal
	7	HVO-19		O	Driver output terminal
	8	HVO-18		O	Driver output terminal
	9	HVO-17		O	Driver output terminal
	10	HVO-16		O	Driver output terminal
	11	HVO-15		O	Driver output terminal
	12	HVO-14		O	Driver output terminal
	13	HVO-13		O	Driver output terminal
	14	HVO-12		O	Driver output terminal
	15	HVO-11		O	Driver output terminal
	16	HVO-10		O	Driver output terminal
	17	HVO-9		O	Driver output terminal
	18	HVO-8		O	Driver output terminal
	19	HVO-7		O	Driver output terminal
	20	HVO-6		O	Driver output terminal
	21	HVO-5		O	Driver output terminal
	22	HVO-4		O	Driver output terminal
	23	HVO-3		O	Driver output terminal
	24	HVO-2		O	Driver output terminal

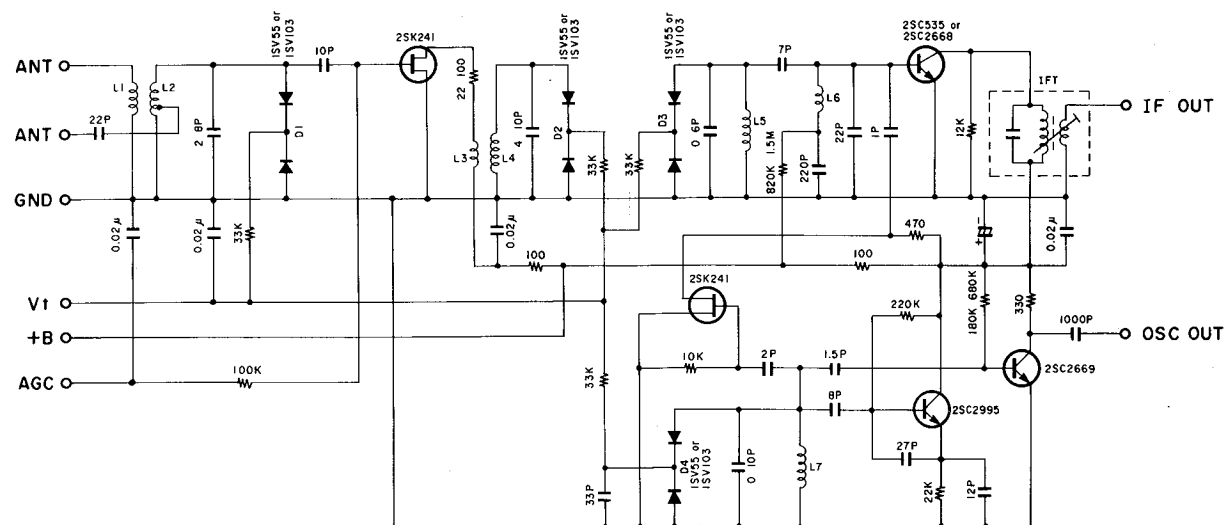
	Terminal number	Port name	Terminal code	I/O	Outline of functions
IC706	25	HVO-1		O	Driver output terminal
	26	VDR		I	Power supply terminal
	27	GND			Ground pin
IC707	28	CLK		I	Serial data input terminal (clock signal)
	29	DIN		I	Serial data input terminal (data)
	30	AD2		I	Chip select • address set input

**SCHEMATIC DIAGRAM (FM TUNER)**

● For North America area model



● For International and Australia models

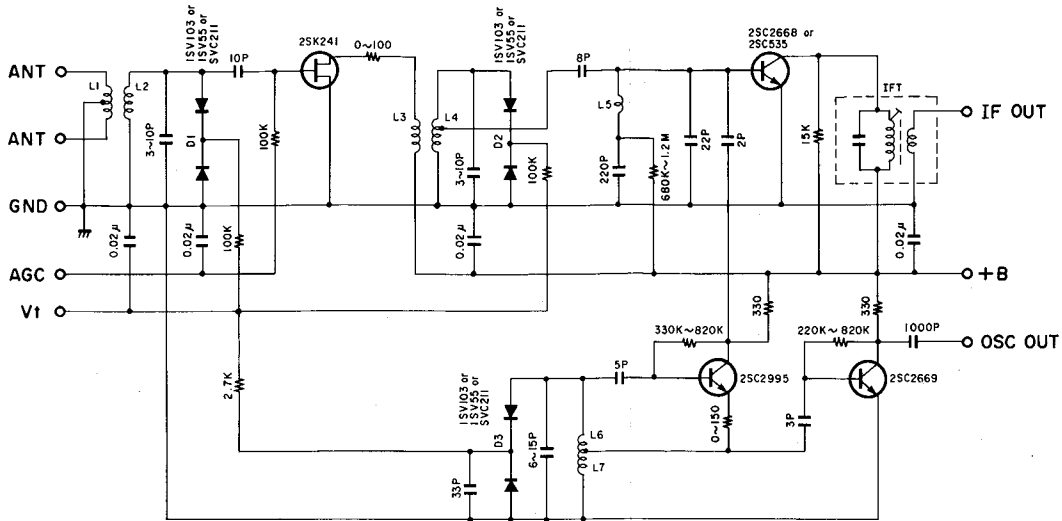


NOTE: Front End parts not available.  
Schematic diagram supplied for reference only.

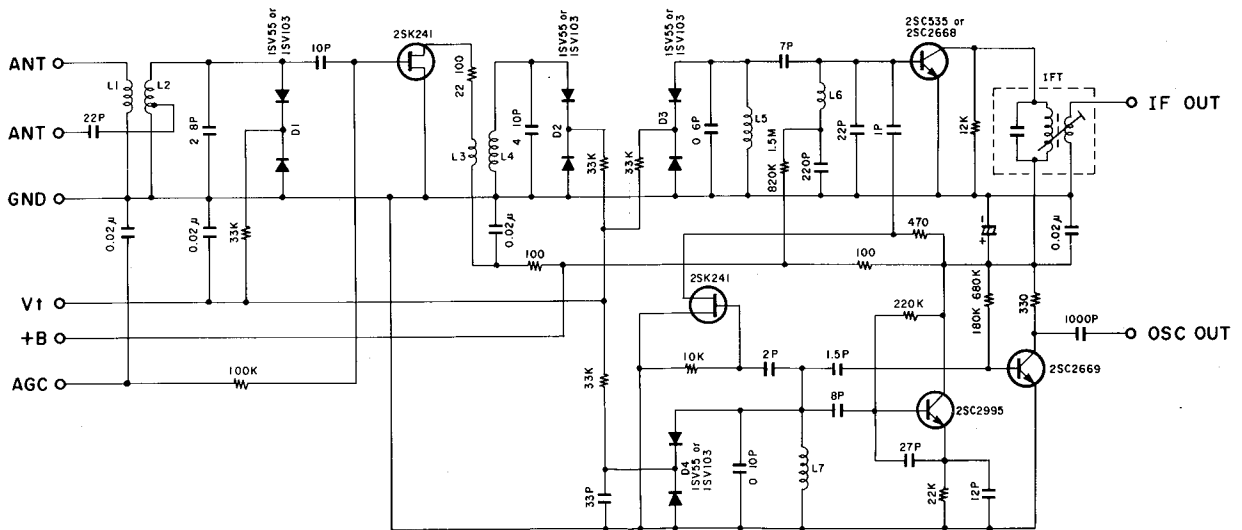
	Terminal number	Port name	Terminal code	I/O	Outline of functions
<b>IC706</b>	25	HVO-1		O	Driver output terminal
	26	VDR		I	Power supply terminal
	27	GND			Ground pin
<b>IC707</b>	28	CLK		I	Serial data input terminal (clock signal)
	29	DIN		I	Serial data input terminal (data)
	30	AD2		I	Chip select • address set input

**SCHEMATIC DIAGRAM  
(FM TUNER)**

● For North America area model



● For International and Australia models



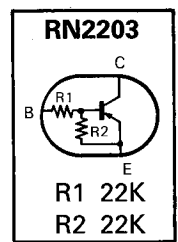
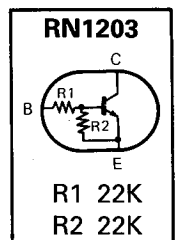
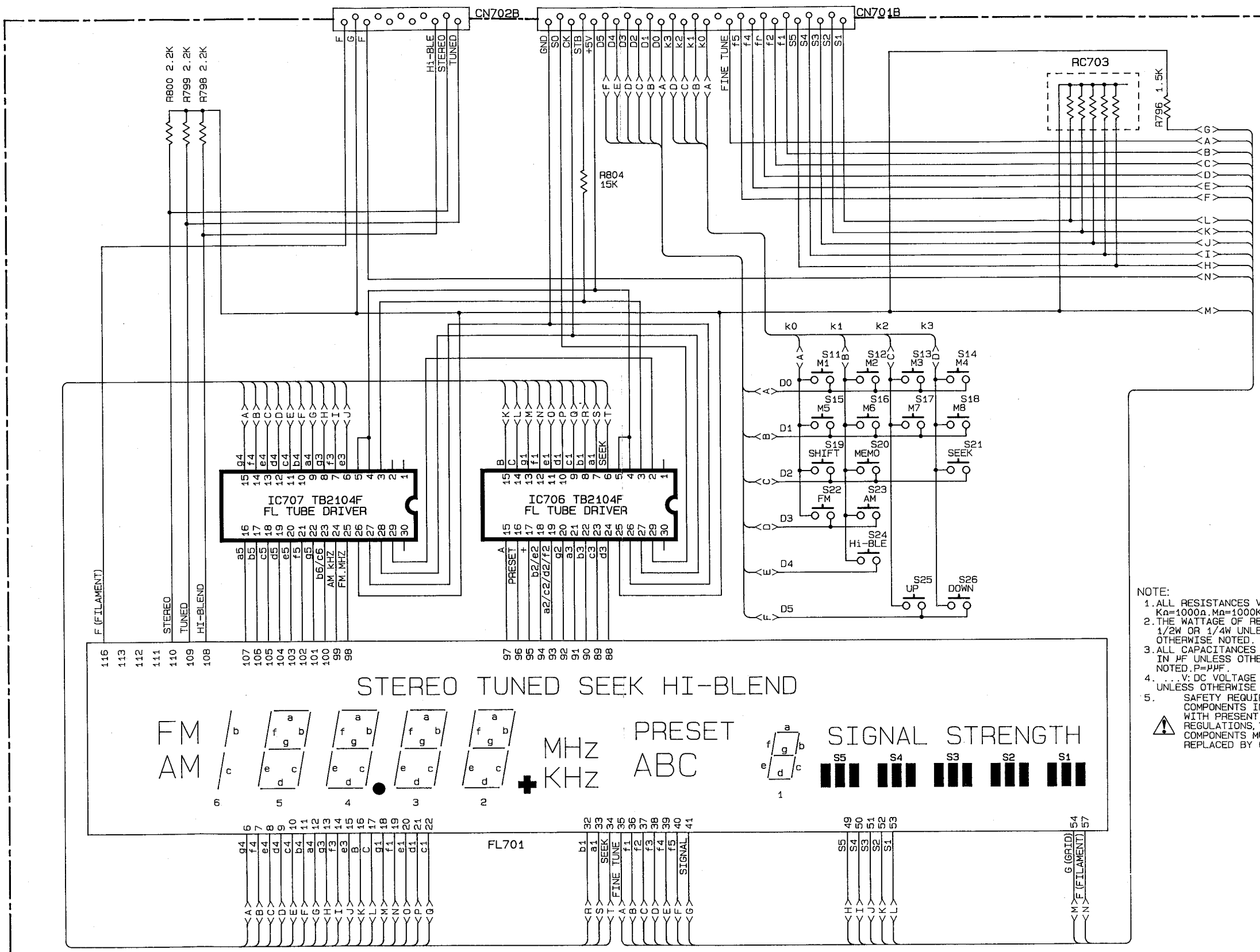
NOTE: Front End parts not available.  
Schematic diagram supplied for reference only.

SCHEMATIC DIAGRAM

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PCB-2

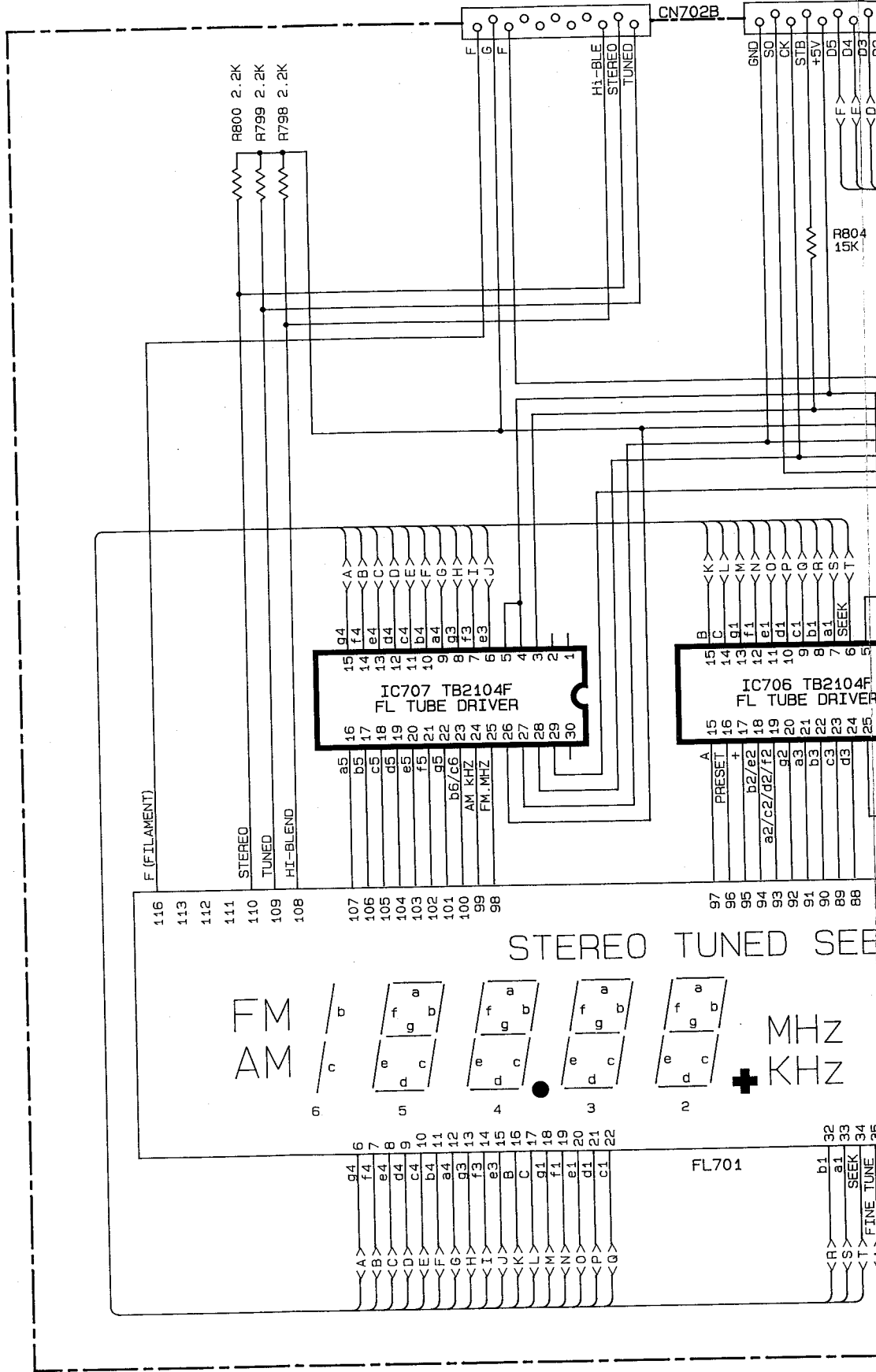
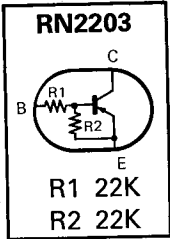
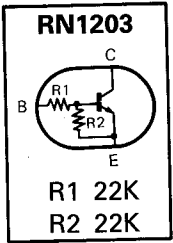


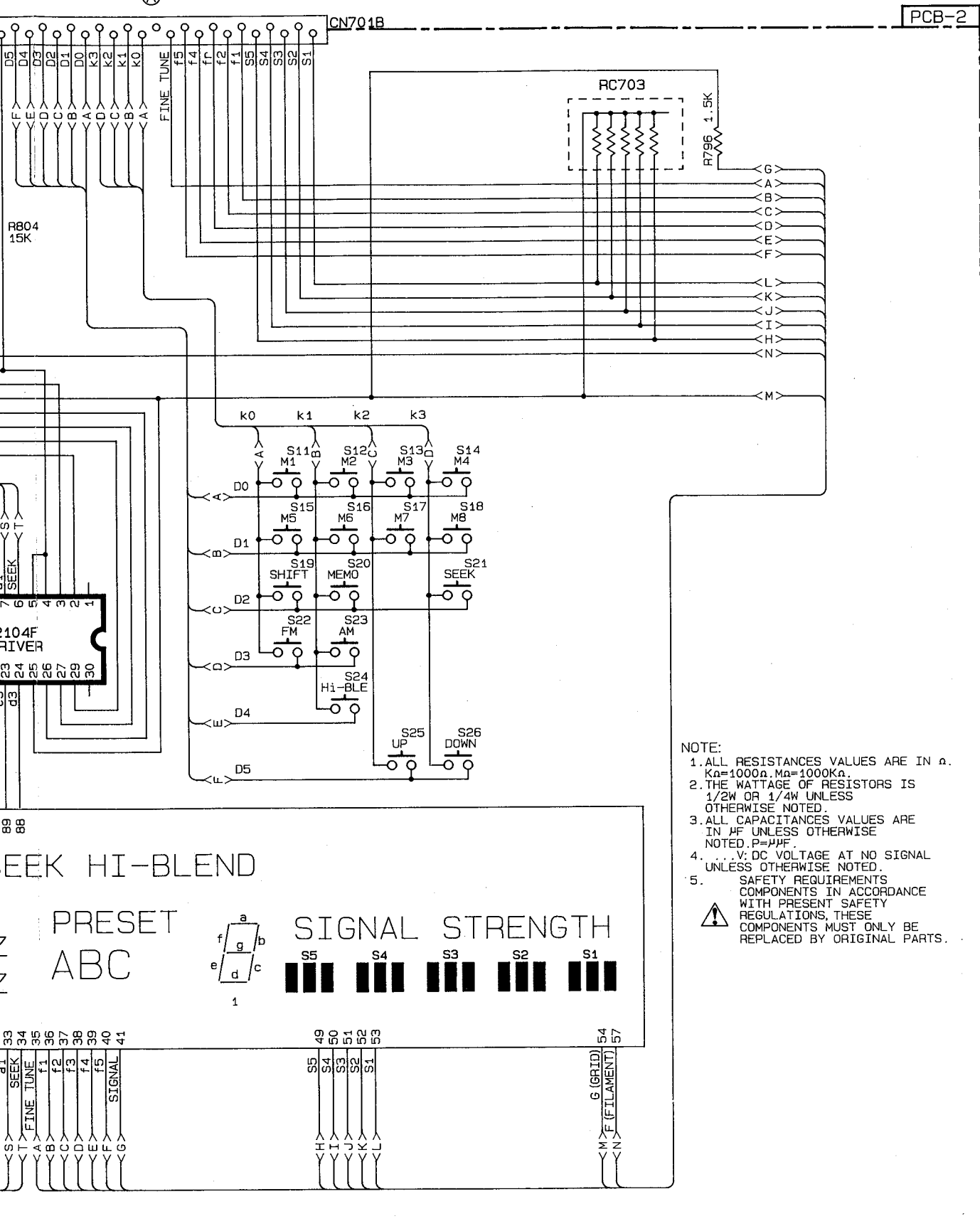
- NOTE:
1. ALL RESISTANCES VALUES ARE IN  $\Omega$ .  
 $K\Omega=1000\Omega$ ,  $M\Omega=1000K\Omega$
  2. THE WATTAGE OF RESISTORS IS 1/2W OR 1/4W UNLESS OTHERWISE NOTED.
  3. ALL CAPACITANCES VALUES ARE IN  $\mu F$  UNLESS OTHERWISE NOTED. P= $\mu P F$ .
  4. . . . V: DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
  5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM

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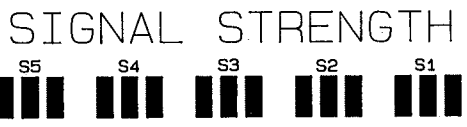
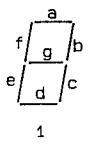
NOTE:

1. ALL RESISTANCES VALUES ARE IN  $\Omega$ .  
 $K\Omega=1000\Omega$ ,  $M\Omega=1000K\Omega$ .
2. THE WATTAGE OF RESISTORS IS 1/2W OR 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.  $P=\mu P F$ .
4. . . . V: DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.
5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.



SEEK HI-BLEND

PRESET  
ABC



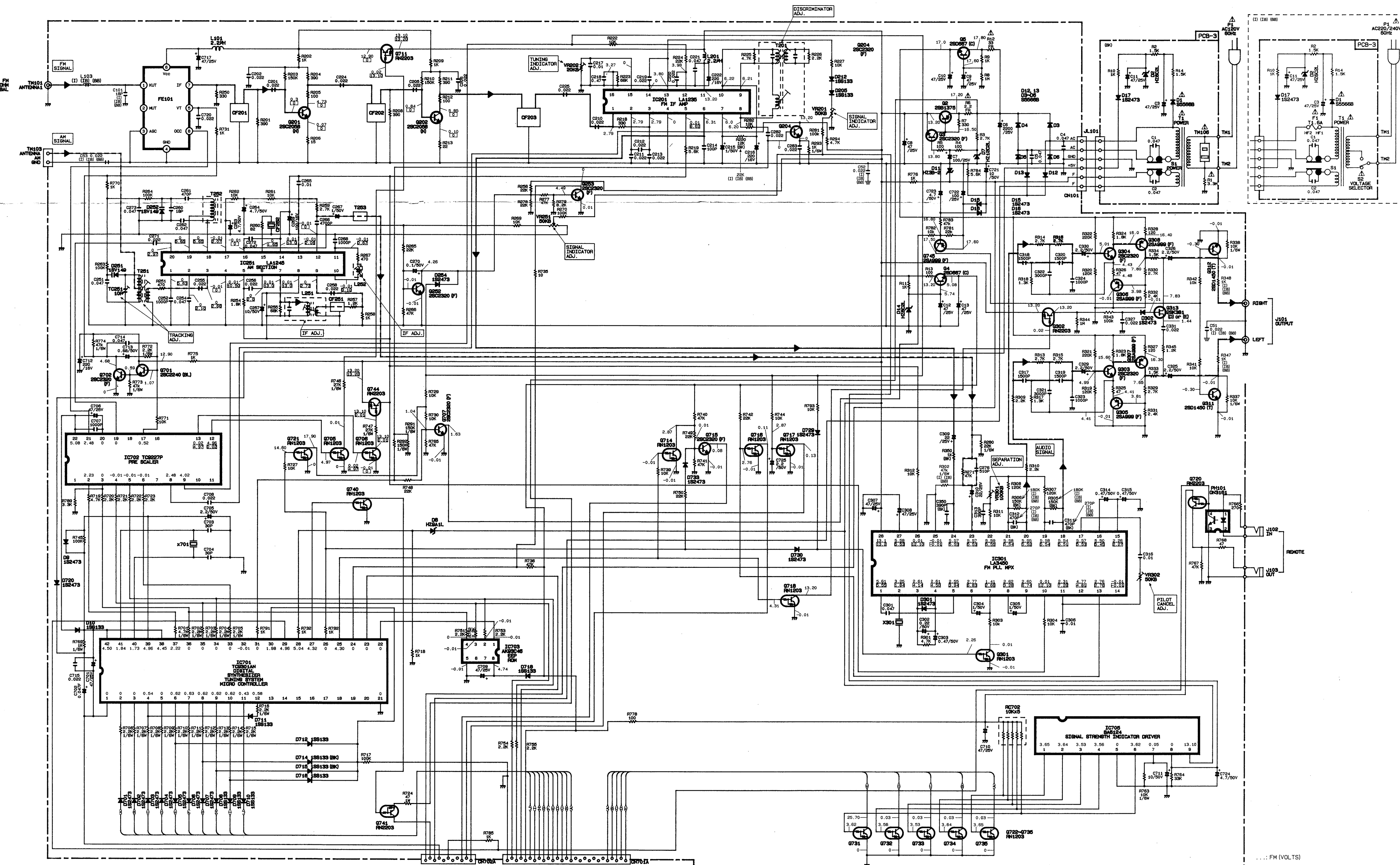
33  
34  
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36  
37  
38  
39  
40  
41  
SEEK  
FINE TUNE  
f1  
f2  
f3  
f4  
f5  
SIGNAL

49  
50  
51  
52  
53  
S5  
S4  
S3  
S2  
S1  
H  
I  
J  
K  
L

54  
57  
G (GRID)  
F (FILAMENT)  
N



SCHEMATIC DIAGRAM

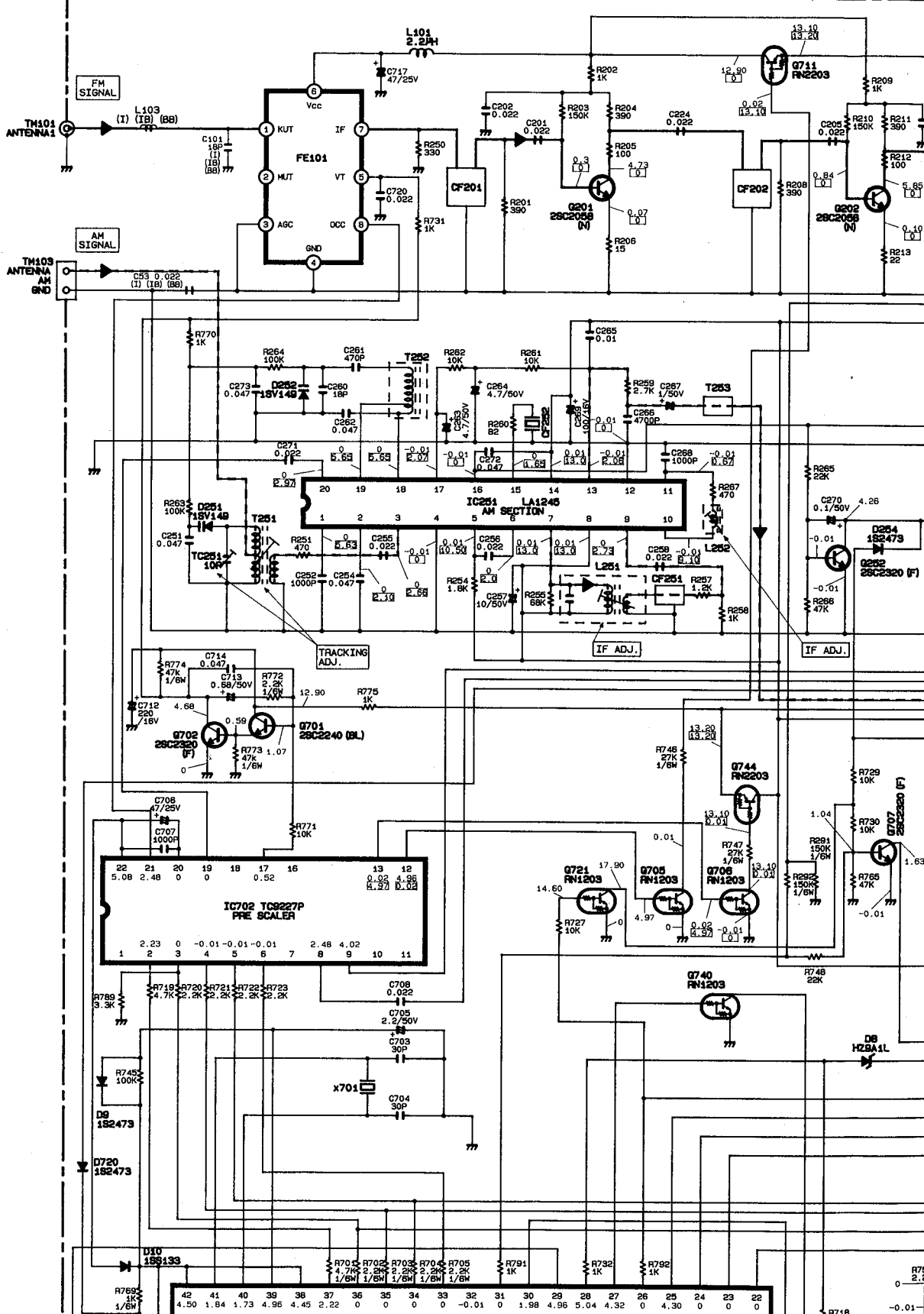


NOTE:  
 1. ALL RESISTANCE VALUES ARE IN  $\Omega$ ,  $K\Omega$ ,  $100K\Omega$ ,  $M\Omega$  UNLESS OTHERWISE NOTED.  
 2. THE WATTAGE OF RESISTORS IS 1/2W OR 1/4W UNLESS OTHERWISE NOTED.  
 3. ALL CAPACITANCE VALUES ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.  
 4. ... V DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.  
 5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS.  
 THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

... FM (VOLTS)  
 ... AM (VOLTS)

# SCHEMATIC DIAGRAM

1  
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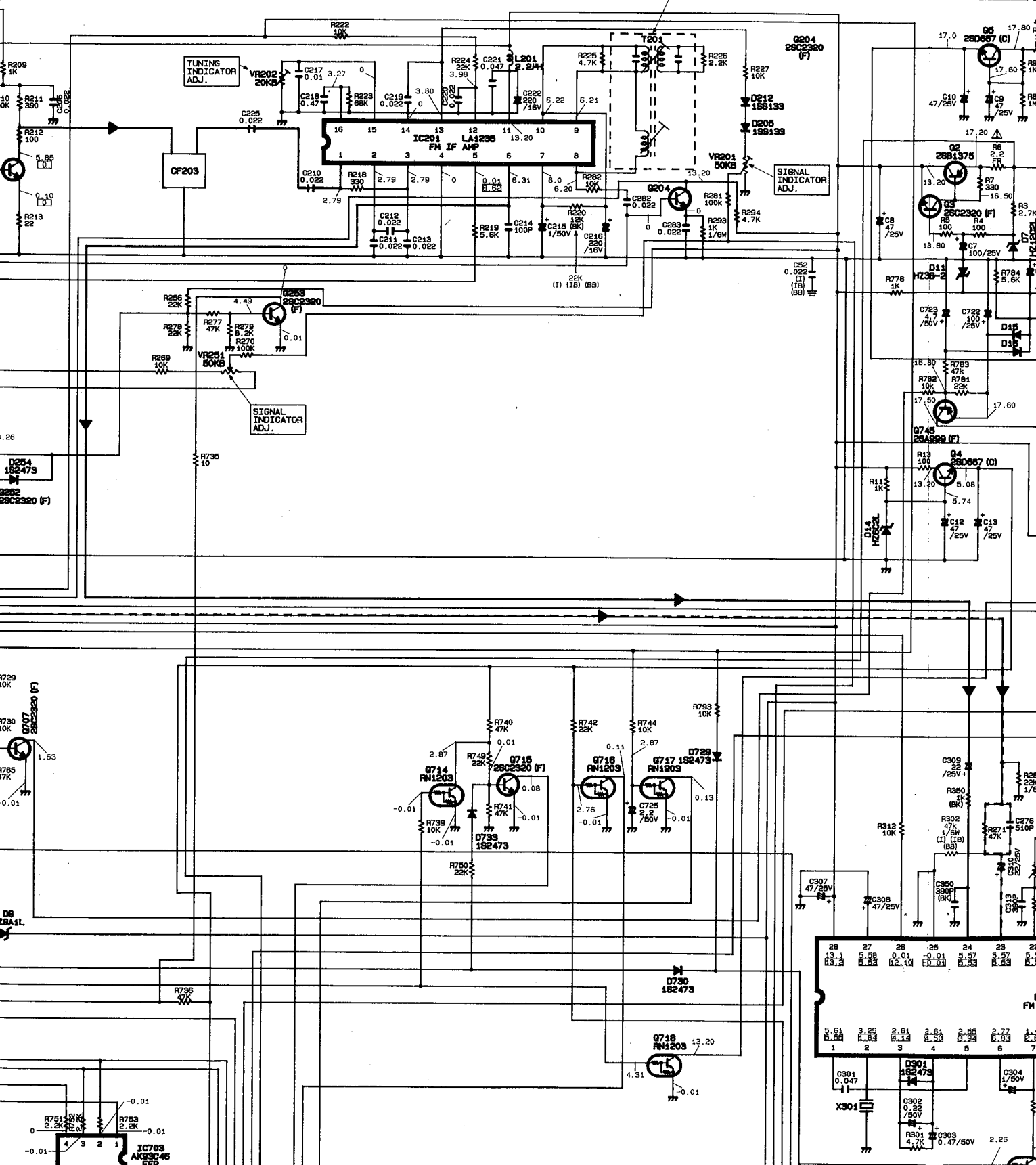


DISCRIMINATOR  
ADJ.

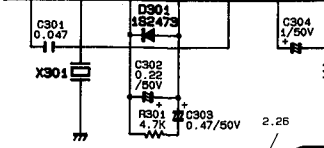
TUNING  
INDICATOR  
ADJ.

SIGNAL  
INDICATOR  
ADJ.

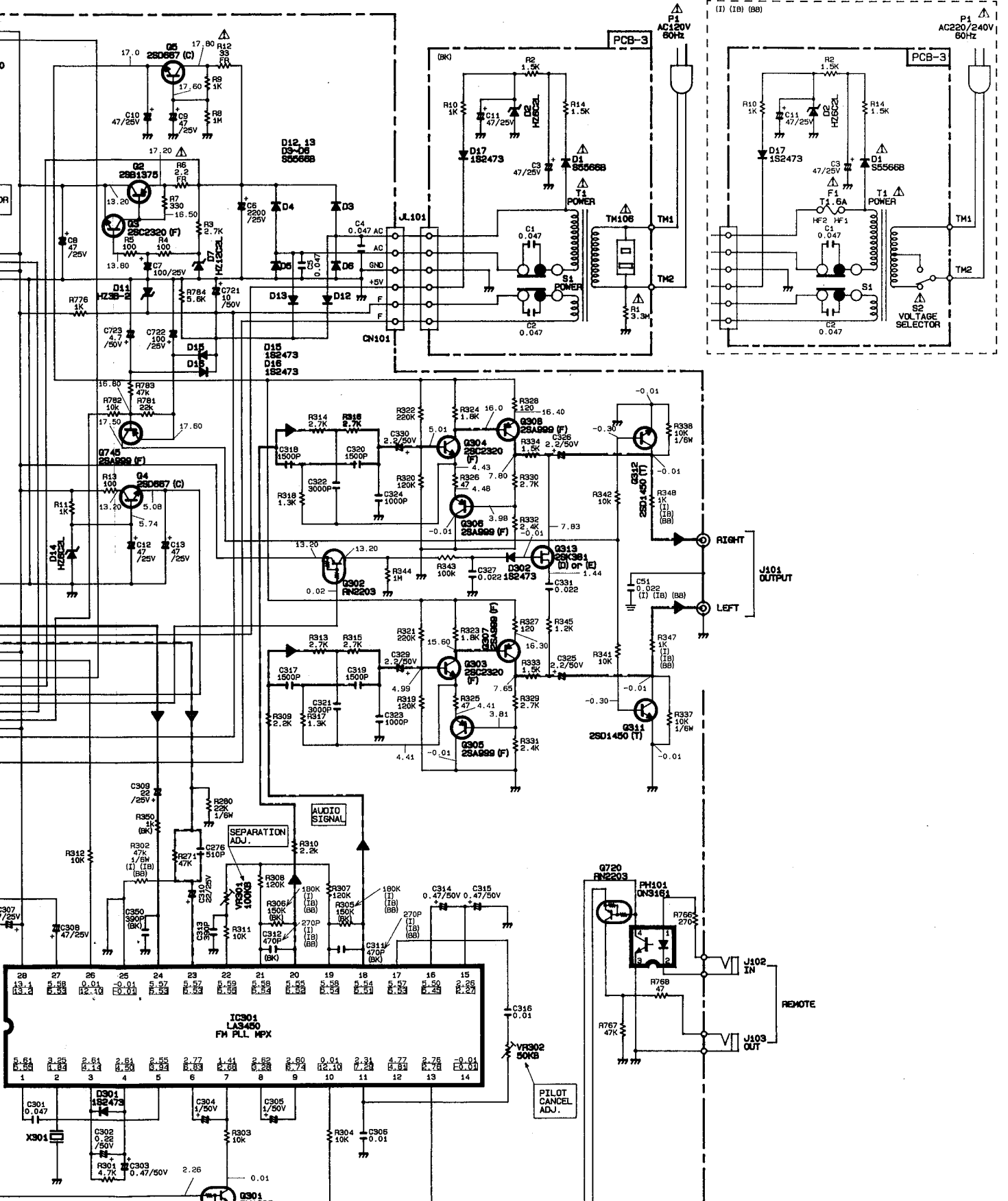
SIGNAL  
INDICATOR  
ADJ.



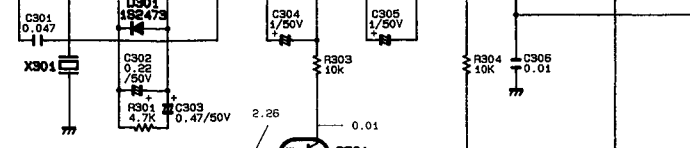
28	27	26	25	24	23	22
13.1	5.58	0.01	-0.01	5.57	5.57	5.57
13.2	5.53	12.10	13.01	5.53	5.53	5.53
1	2	3	4	5	6	7

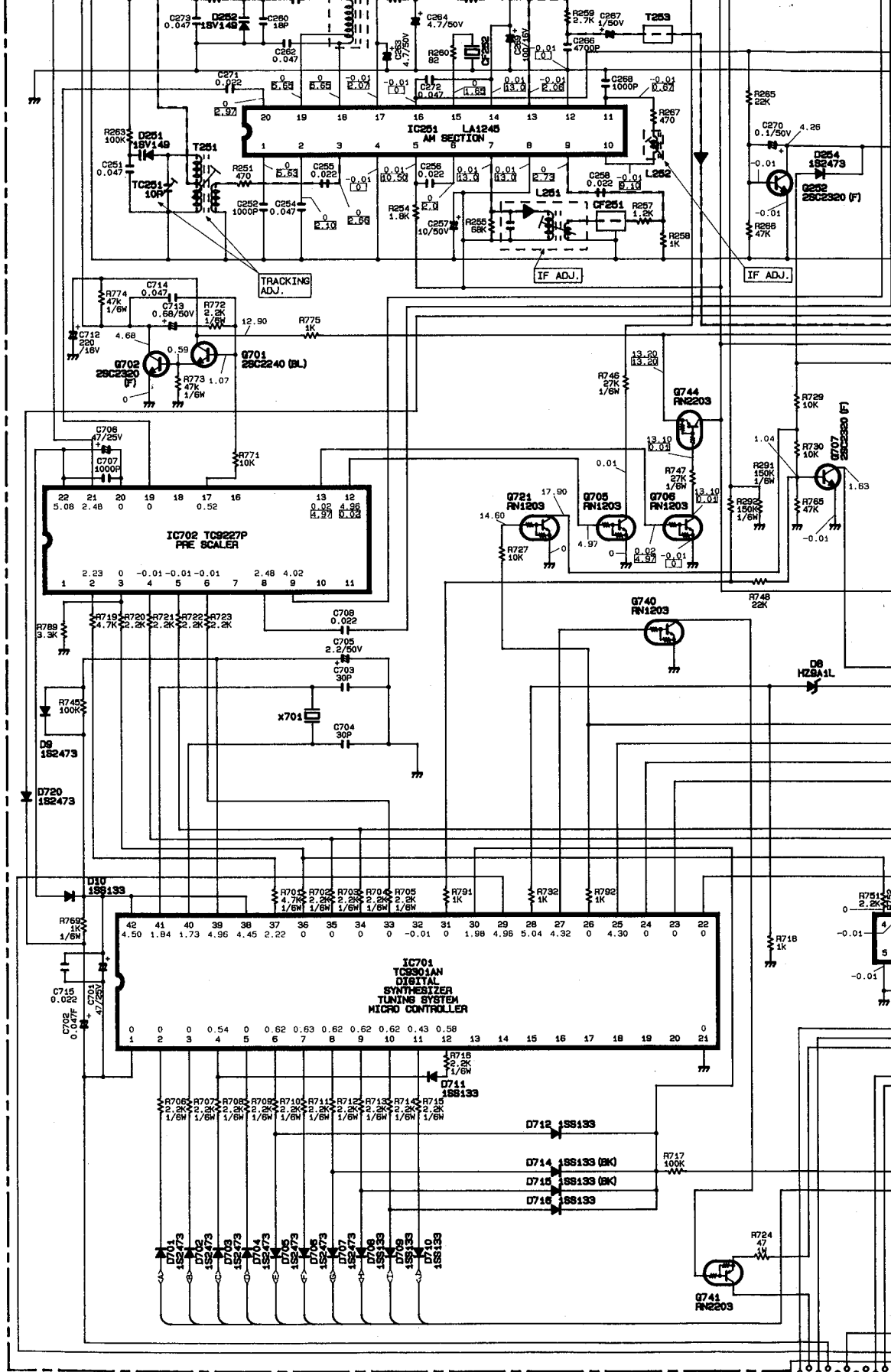


J K L M N

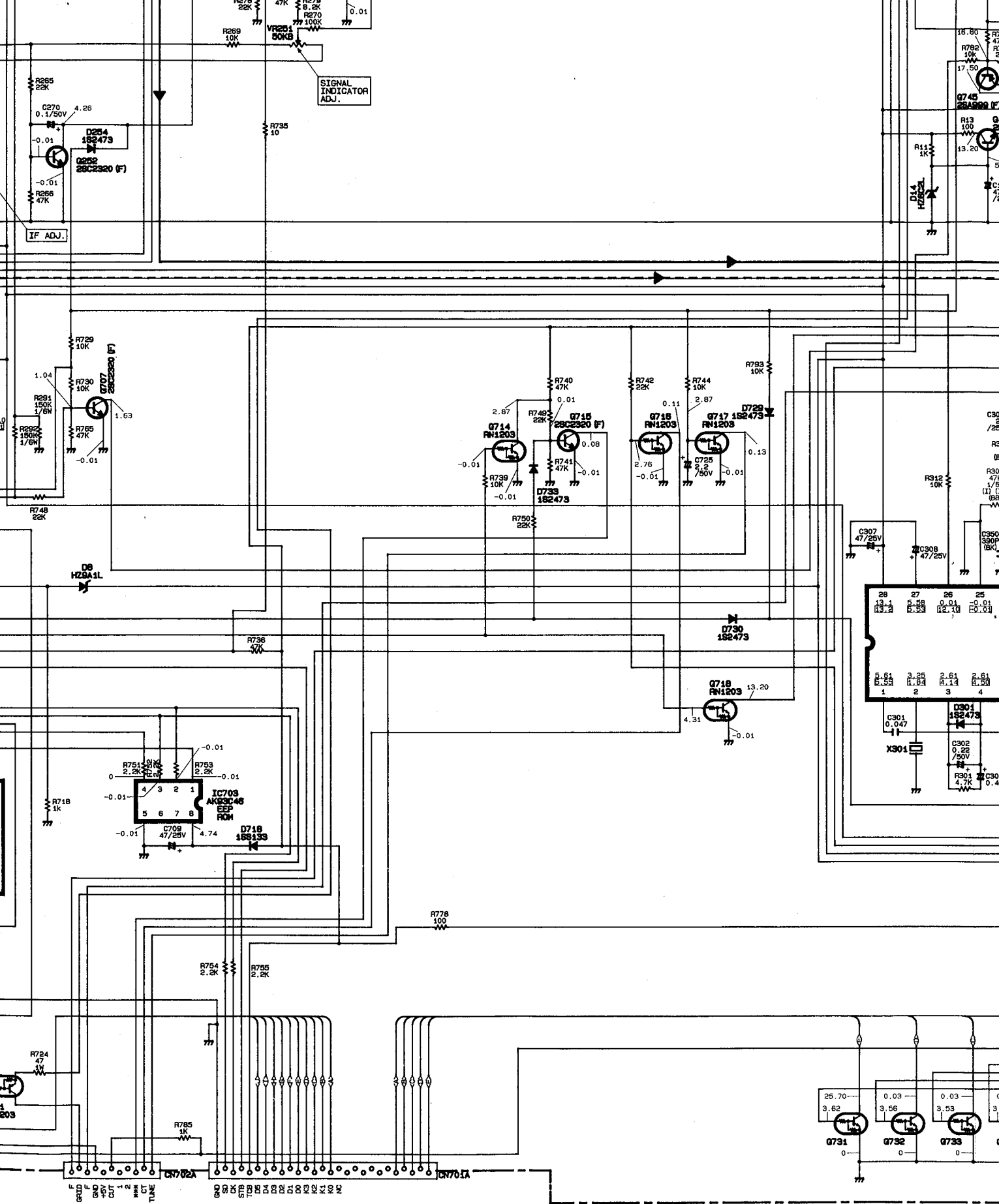


28	27	26	25	24	23	22	21	20	19	18	17	16	15		
13.1	8.58	12.13	0.01	0.01	0.52	0.57	0.55	2.77	1.41	2.85	2.80	0.01	4.77	3.75	0.01
1.55	1.55	1.13	2.51	2.55	2.52	2.77	0.28	0.74	0.21	0.21	4.81	2.78	0.01		
1	2	3	4	5	6	7	8	9	10	11	12	13	14		





NOTE:  
 1. ALL RESISTANCE VALUES ARE IN  $\Omega$ , K $\Omega$ =1000 $\Omega$ , M $\Omega$ =1000K $\Omega$ .  
 2. THE WATTAGE OF RESISTORS IS 1/2W OR 1/4W UNLESS OTHERWISE NOTED.  
 3. ALL CAPACITANCE VALUES ARE IN pF UNLESS OTHERWISE NOTED. P=100pF.  
 4. ... V: DC VOLTAGE AT NO SIGNAL UNLESS OTHERWISE NOTED.  
 5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS.  
 ⚠ THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.



SIGNAL INDICATOR ADJ.

IF ADJ.

D8 HZ8A1L

IC703 AK93046 EEPROM

28	27	26	25
13.1	5.58	0.01	-0.01
13.2	5.55	0.03	0.03

5.61	3.25	2.61	2.61
5.55	1.83	4.13	4.50
1	2	3	4

