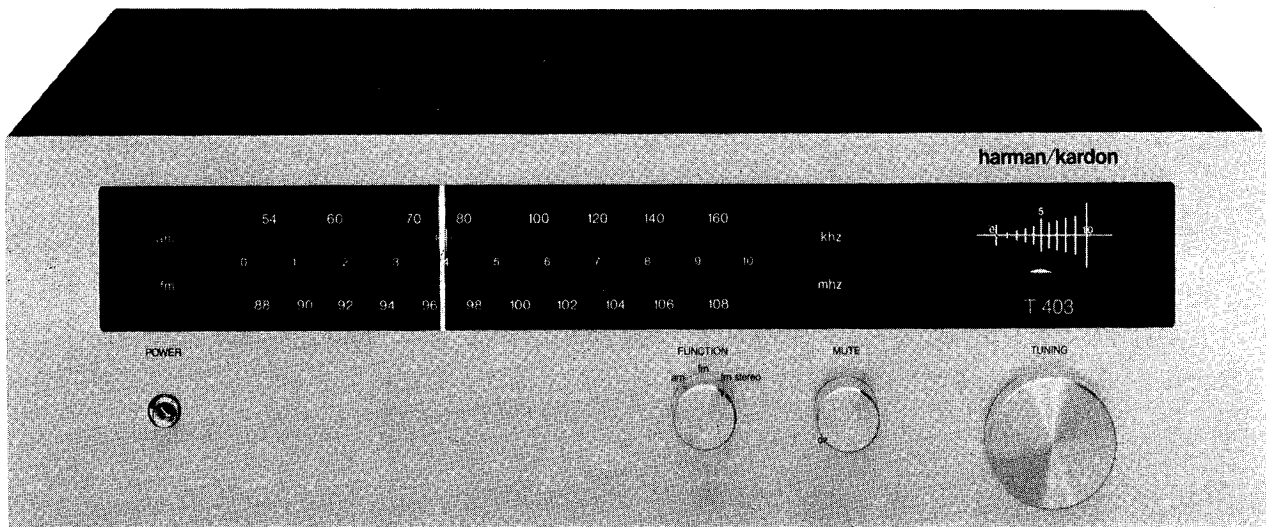


# The Harman/Kardon Model T403

## AM/FM/Stereo FM Solid State Tuner

# Technical Manual



**harman/kardon**

## PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacement for output and driver transistors, if necessary, must be made from the same beta groups as the original type.
4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.
7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

## ALIGNMENT PROCEDURES

### AM ALIGNMENT PROCEDURE

**INSTRUMENTS:** AM Signal Generator modulated with 400Hz at 30%.  
VTVM and Oscilloscope.

**NOTE:** Set Function Selector switch to AM position.  
Connect signal source to a placed to radiate signal into AM Antenna  
Loop Stick (L2).

Step	SIGNAL SOURCE	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1	455kHz AM Mod.	VTVM and Oscilloscope to R269	Tuning gang open	T251	Maximum reading on VTVM and undistorted pattern on Oscilloscope
2				T252	
3				T253	
4	Repeat Steps 1 through 3 for best sensitivity.				
5	600kHz AM Mod.	Same as above	600kHz	L252	Maximum output
6	1600kHz AM Mod.	Same as above	1600kHz	TC251	Same as above
7	Repeat Steps 5 and 6 for best dial accuracy.				
8	600kHz AM Mod.	Same as above	600kHz	L2	Same as above
9	1600kHz AM Mod.	Same as above	1600kHz	TC252	Same as above
10	Repeat Steps 8 and 9 for best sensitivity.				

### TUNING METER ALIGNMENT PROCEDURE

**INSTRUMENT:** FM Signal Generator.

**NOTE:** Set Function Selector switch to FM position.  
Connect signal source to FM Antenna Terminal.

Step	SIGNAL SOURCE	DIAL SETTING	ADJUST	ADJUST FOR
1	98MHz 1mV (60dB)	98MHz	VR201	Maximum needle deflection Tuning Meter
2	Same as above	Same as above	VR202	To indicate 95% on Tuning Meter

### AM OUTPUT LEVEL ALIGNMENT PROCEDURE

**INSTRUMENTS:** AM Signal Generator modulated with 400Hz at 30%.  
VTVM.

**NOTE:** Set Function Selector switch to AM position.  
Connect signal source to a placed to radiate signal into AM Antenna  
Loop Stick (L2).

SIGNAL SOURCE	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1000kHz 5mV/m (74dB)	VTVM to Fixed Output Jack	1000kHz	VR101	0.6V

### FM ALIGNMENT PROCEDURE

**INSTRUMENTS:** FM Signal Generator modulated with 400Hz at 75kHz.  
VTVM and Oscilloscope.

**NOTE:** Set Function Selector switch to FM position.  
Connect signal source to FM Antenna Terminal.

Step	SIGNAL SOURCE	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1		Oscilloscope to R226	Tuning gang closed	T202 Top	Zero Volt DC
2		Same as above	Same as above	T202 Bottom	Maximum noise
3		Same as above	Same as above	T201 top and bottom	Same as above
4	Repeat Steps 1 through 3 until no further improvement is noticed.				
5	88MHz FM Mod.	VTVM and Oscilloscope to Fixed Output Jack	88MHz	L201	Maximum output
6	108MHz FM Mod.	Same as above	108MHz	TC201	Same as above
7	Repeat Steps 5 and 6 for best dial accuracy.				
8	90MHz FM Mod.	Same as above	90MHz	L202 T203	Same as above
9	106MHz FM Mod.	Same as above	106MHz	TC202 TC203	Same as above
10	Repeat Steps 8 and 9 for best sensitivity.				

### FM STEREO INDICATOR LAMP ALIGNMENT PROCEDURE

**INSTRUMENT:** FM Stereo Simulator.

**NOTE:** Set Function Selector switch to FM STEREO position.  
Connect signal source to FM Antenna Terminal.  
Set Main signal OFF and Pilot signal (10%) ON of FM Stereo Simulator.  
Set VR302 fully clockwise.

Step	SIGNAL SOURCE	DIAL SETTING	ADJUST	ADJUST FOR
1	98MHz 25 $\mu$ V (34dB)	98MHz	VR302	Turn VR302 counterclockwise until FM Stereo Indicator Lamp just goes ON
2	To raise the signal source by 1dB and confirm that FM Stereo Indicator Lamp lights at this position.			

### MPX ALIGNMENT PROCEDURE

**INSTRUMENT:** Frequency Counter.

**NOTE:** Set Function Selector switch to FM STEREO position.  
Set Muting switch to ON position.

CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
Frequency Counter to LP205	Quiet Point	VR301	19kHz $\pm$ 50Hz

## ALIGNMENT PROCEDURES

### AM ALIGNMENT PROCEDURE

**INSTRUMENTS:** AM Signal Generator modulated with 400Hz at 30%.  
VTVM and Oscilloscope.

**NOTE:** Set Function Selector switch to AM position.  
Connect signal source to a placed to radiate signal into AM Antenna  
Loop Stick (L2).

Step	SIGNAL SOURCE	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1	455kHz AM Mod.	VTVM and Oscilloscope to R269	Tuning gang open	T251	Maximum reading on VTVM and undistorted pattern on Oscilloscope
2				T252	
3				T253	
4	Repeat Steps 1 through 3 for best sensitivity.				
5	600kHz AM Mod.	Same as above	600kHz	L252	Maximum output
6	1600kHz AM Mod.	Same as above	1600kHz	TC251	Same as above
7	Repeat Steps 5 and 6 for best dial accuracy.				
8	600kHz AM Mod.	Same as above	600kHz	L2	Same as above
9	1600kHz AM Mod.	Same as above	1600kHz	TC252	Same as above
10	Repeat Steps 8 and 9 for best sensitivity.				

### TUNING METER ALIGNMENT PROCEDURE

**INSTRUMENT:** FM Signal Generator.

**NOTE:** Set Function Selector switch to FM position.  
Connect signal source to FM Antenna Terminal.

Step	SIGNAL SOURCE	DIAL SETTING	ADJUST	ADJUST FOR
1	98MHz 1mV (60dB)	98MHz	VR201	Maximum needle deflection Tuning Meter
2	Same as above	Same as above	VR202	To indicate 95% on Tuning Meter

### AM OUTPUT LEVEL ALIGNMENT PROCEDURE

**INSTRUMENTS:** AM Signal Generator modulated with 400Hz at 30%.  
VTVM.

**NOTE:** Set Function Selector switch to AM position.  
Connect signal source to a placed to radiate signal into AM Antenna  
Loop Stick (L2).

SIGNAL SOURCE	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1000kHz 5mV/m (74dB)	VTVM to Fixed Output Jack	1000kHz	VR101	0.6V

### FM ALIGNMENT PROCEDURE

**INSTRUMENTS:** FM Signal Generator modulated with 400Hz at 75kHz.  
VTVM and Oscilloscope.

**NOTE:** Set Function Selector switch to FM position.  
Connect signal source to FM Antenna Terminal.

Step	SIGNAL SOURCE	CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
1		Oscilloscope to R226	Tuning gang closed	T202 Top	Zero Volt DC
2		Same as above	Same as above	T202 Bottom	Maximum noise
3		Same as above	Same as above	T201 top and bottom	Same as above
4	Repeat Steps 1 through 3 until no further improvement is noticed.				
5	88MHz FM Mod.	VTVM and Oscilloscope to Fixed Output Jack	88MHz	L201	Maximum output
6	108MHz FM Mod.	Same as above	108MHz	TC201	Same as above
7	Repeat Steps 5 and 6 for best dial accuracy.				
8	90MHz FM Mod.	Same as above	90MHz	L202 T203	Same as above
9	106MHz FM Mod.	Same as above	106MHz	TC202 TC203	Same as above
10	Repeat Steps 8 and 9 for best sensitivity.				

### FM STEREO INDICATOR LAMP ALIGNMENT PROCEDURE

**INSTRUMENT:** FM Stereo Simulator.

**NOTE:** Set Function Selector switch to FM STEREO position.  
Connect signal source to FM Antenna Terminal.  
Set Main signal OFF and Pilot signal (10%) ON of FM Stereo Simulator.  
Set VR302 fully clockwise.

Step	SIGNAL SOURCE	DIAL SETTING	ADJUST	ADJUST FOR
1	98MHz 25 $\mu$ V (34dB)	98MHz	VR302	Turn VR302 counterclockwise until FM Stereo Indicator Lamp just goes ON
2	To raise the signal source by 1dB and confirm that FM Stereo Indicator Lamp lights at this position.			

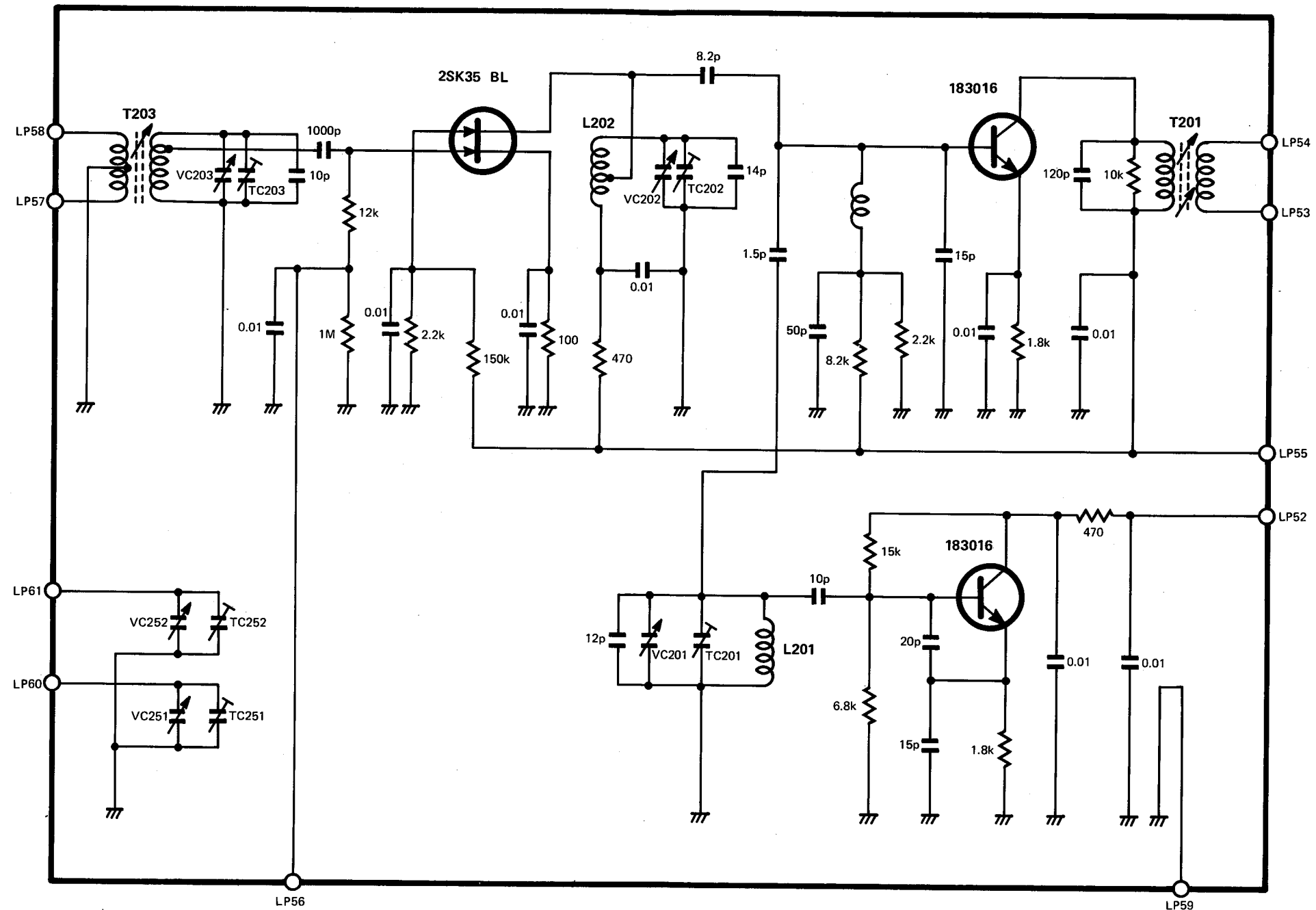
### MPX ALIGNMENT PROCEDURE

**INSTRUMENT:** Frequency Counter.

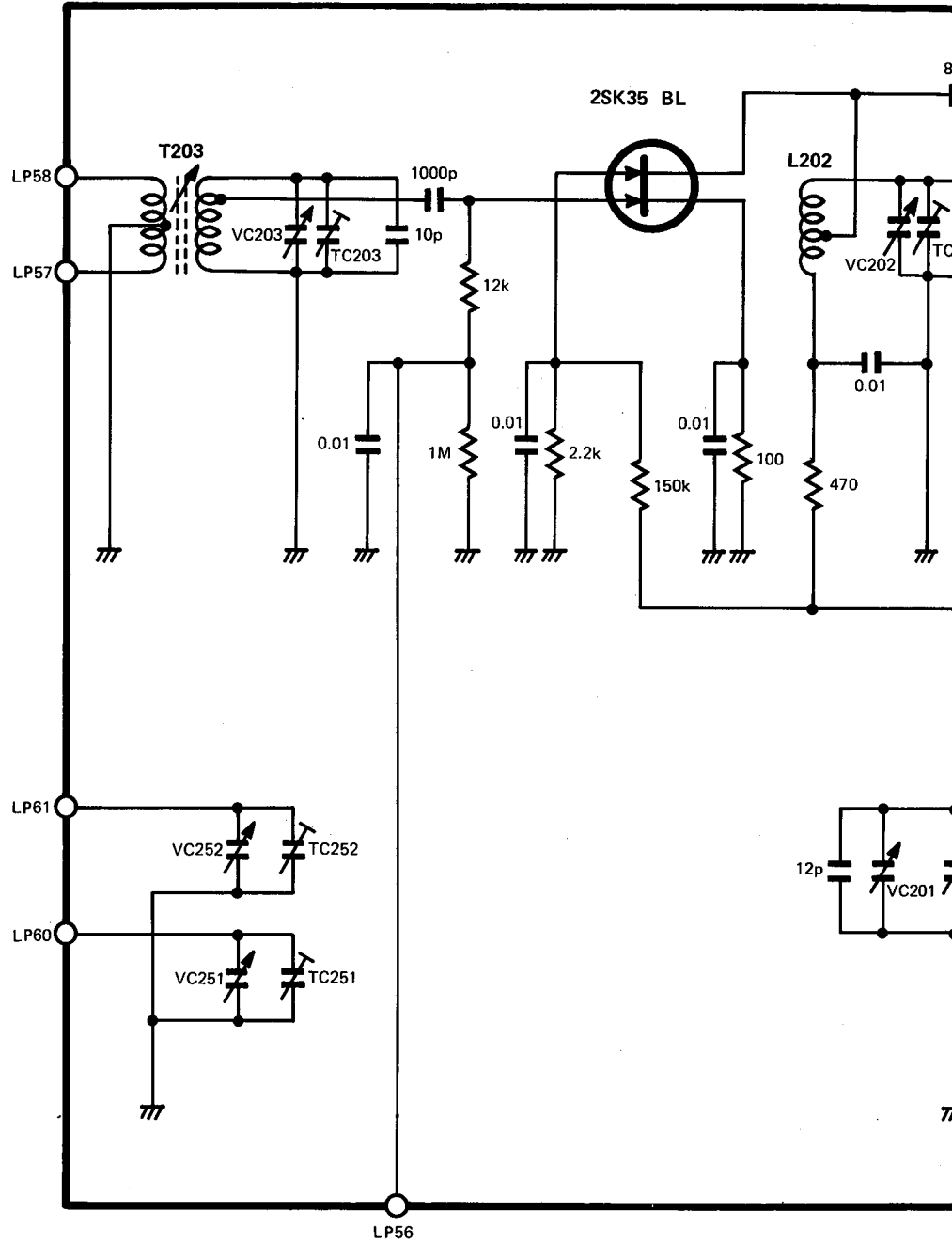
**NOTE:** Set Function Selector switch to FM STEREO position.  
Set Muting switch to ON position.

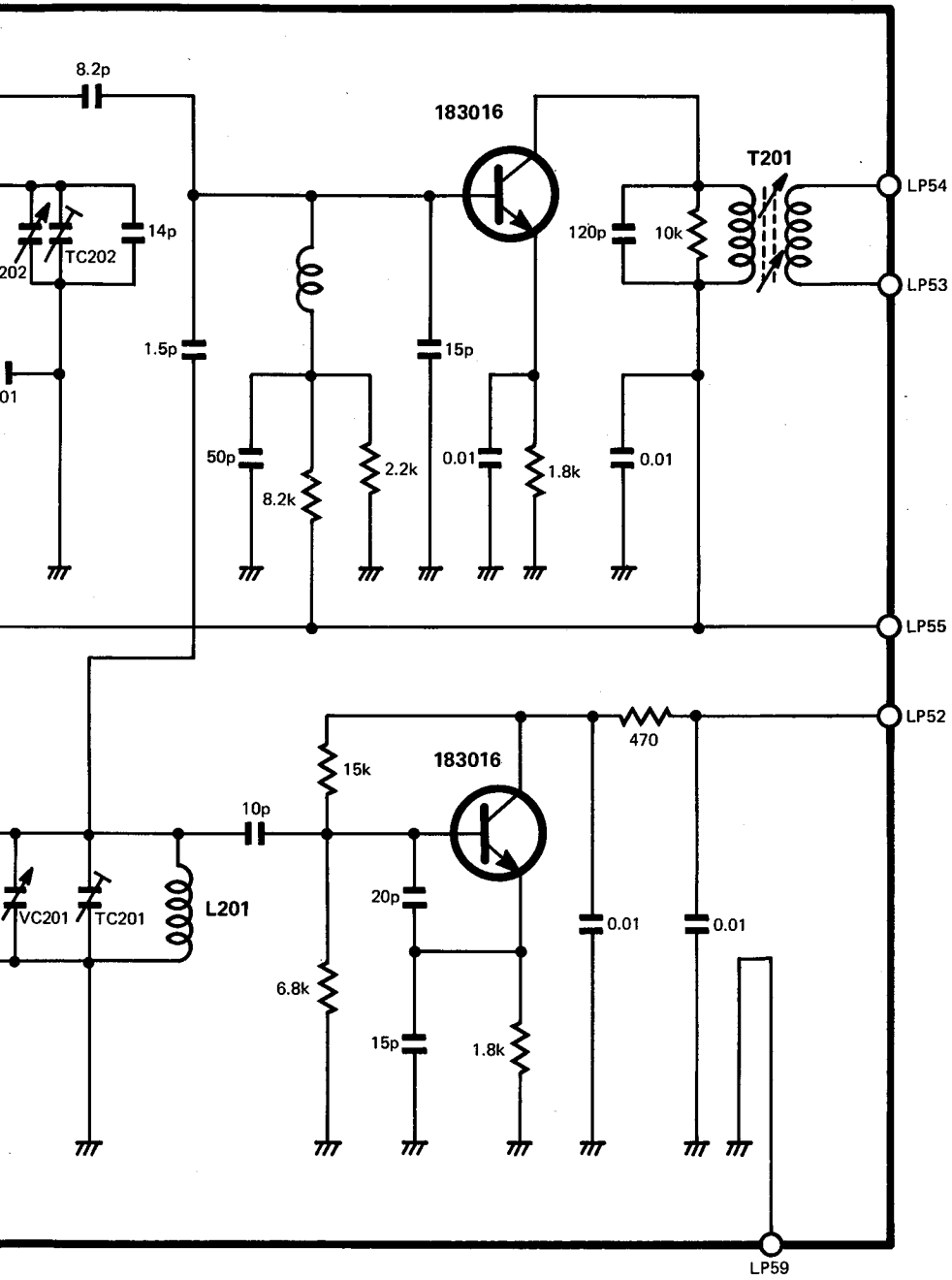
CONNECT OUTPUT METER TO	DIAL SETTING	ADJUST	ADJUST FOR
Frequency Counter to LP205	Quiet Point	VR301	19kHz $\pm$ 50Hz

SCHEMATIC DIAGRAM – FRONT END



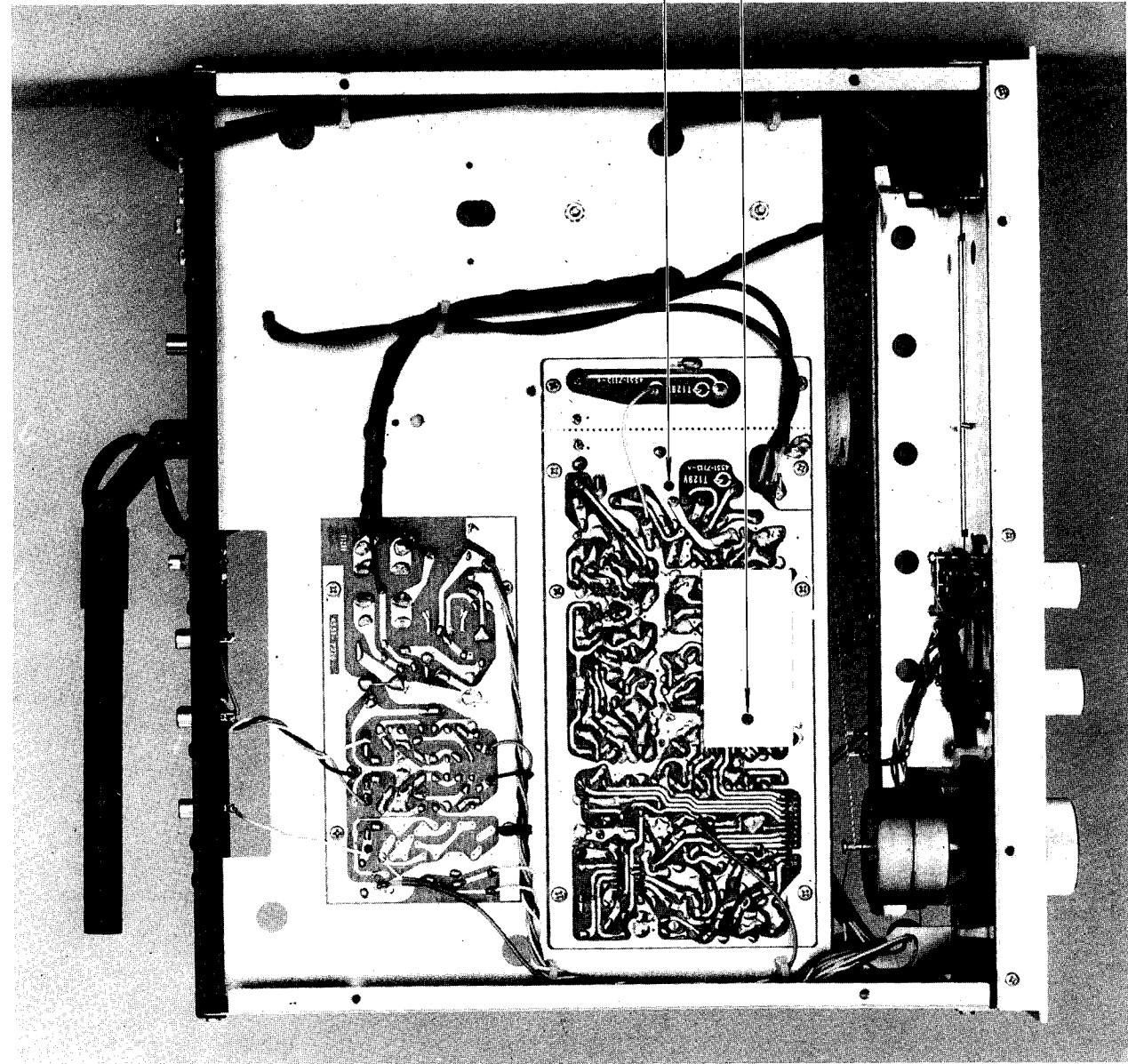
SCHEMATIC DIAGRAM – FRONT END



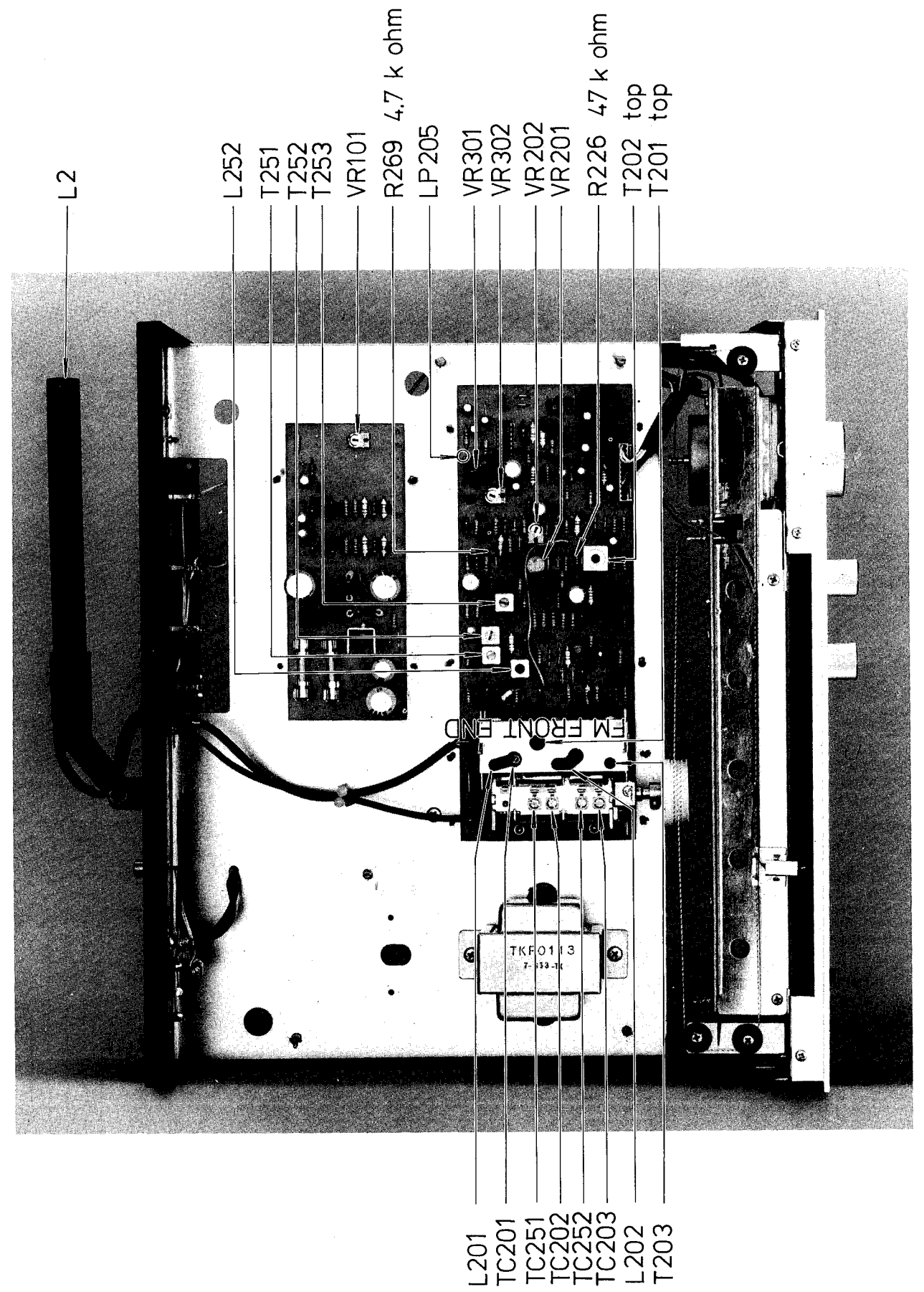




ALIGNMENT POINTS

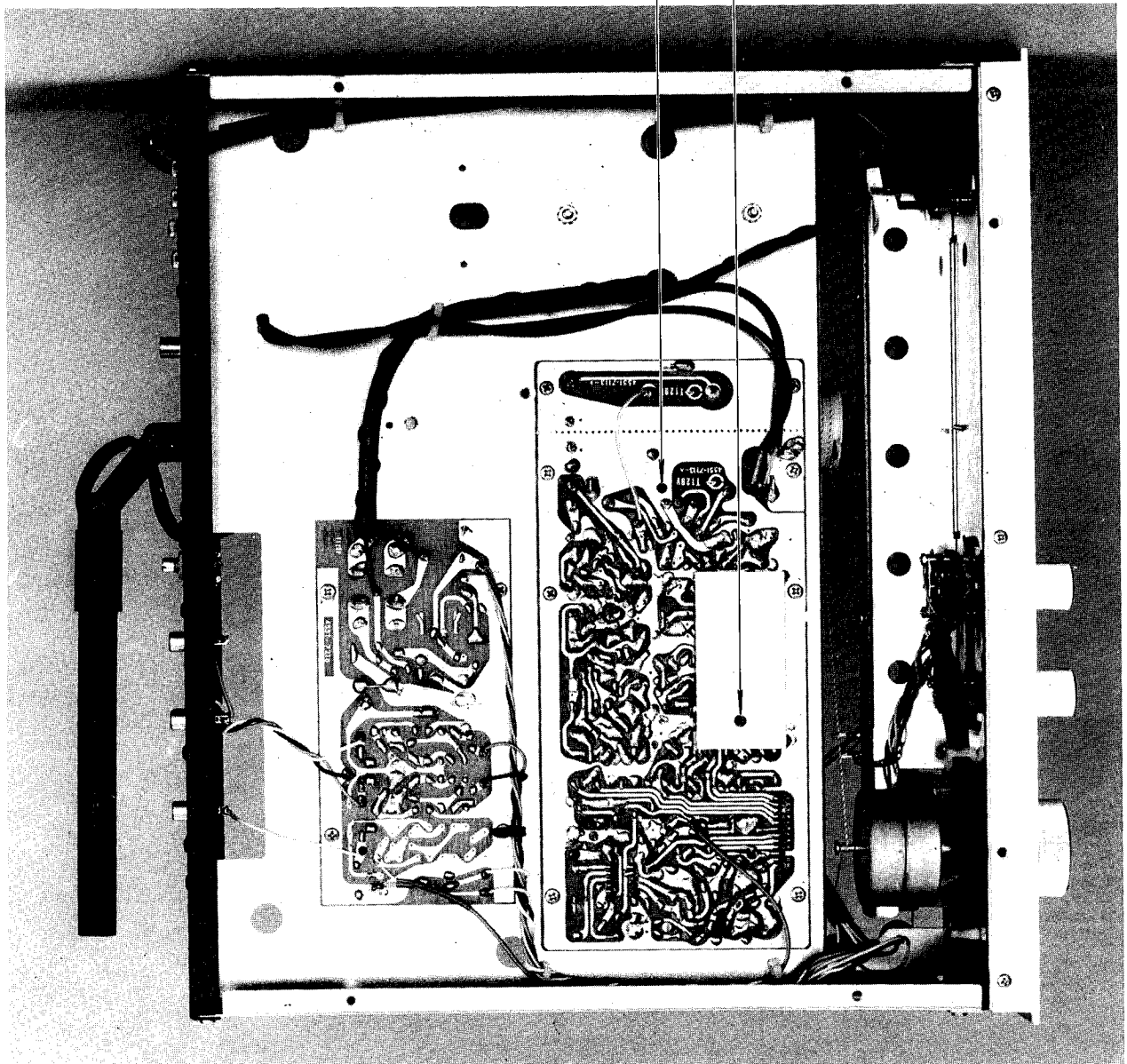


BOTTOM VIEW



TOP VIEW

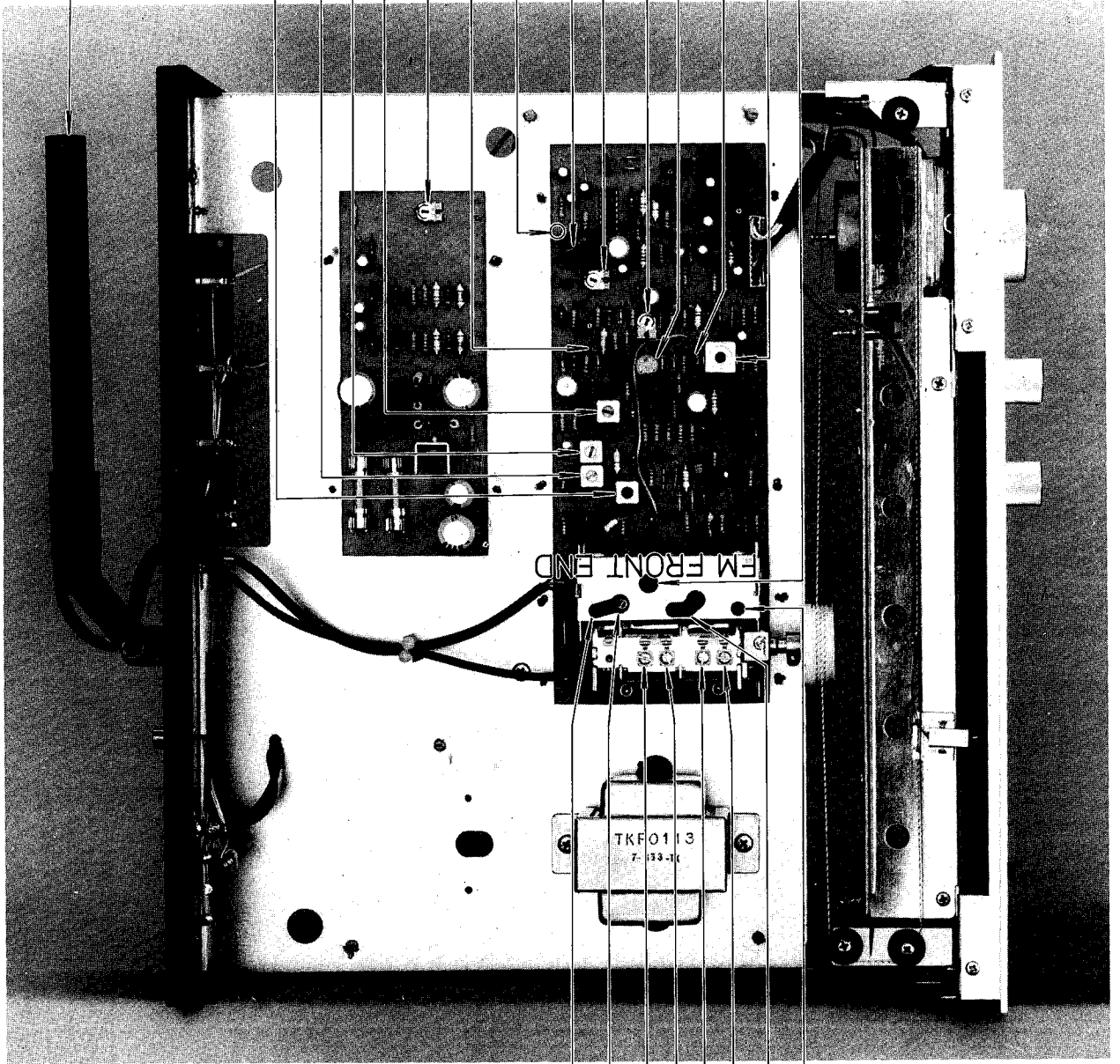
ALIGNMENT POINTS



T201 bottom

T202 bottom

BOTTOM VIEW



TOP VIEW

L2

L252

T251

T252

T253

VR101

R269 4.7 k ohm

LP 205

VR301

VR302

VR202

VR201

R226 47 k ohm

T202 top

T201 top

L201

TC201

TC251

TC202

TC252

TC203

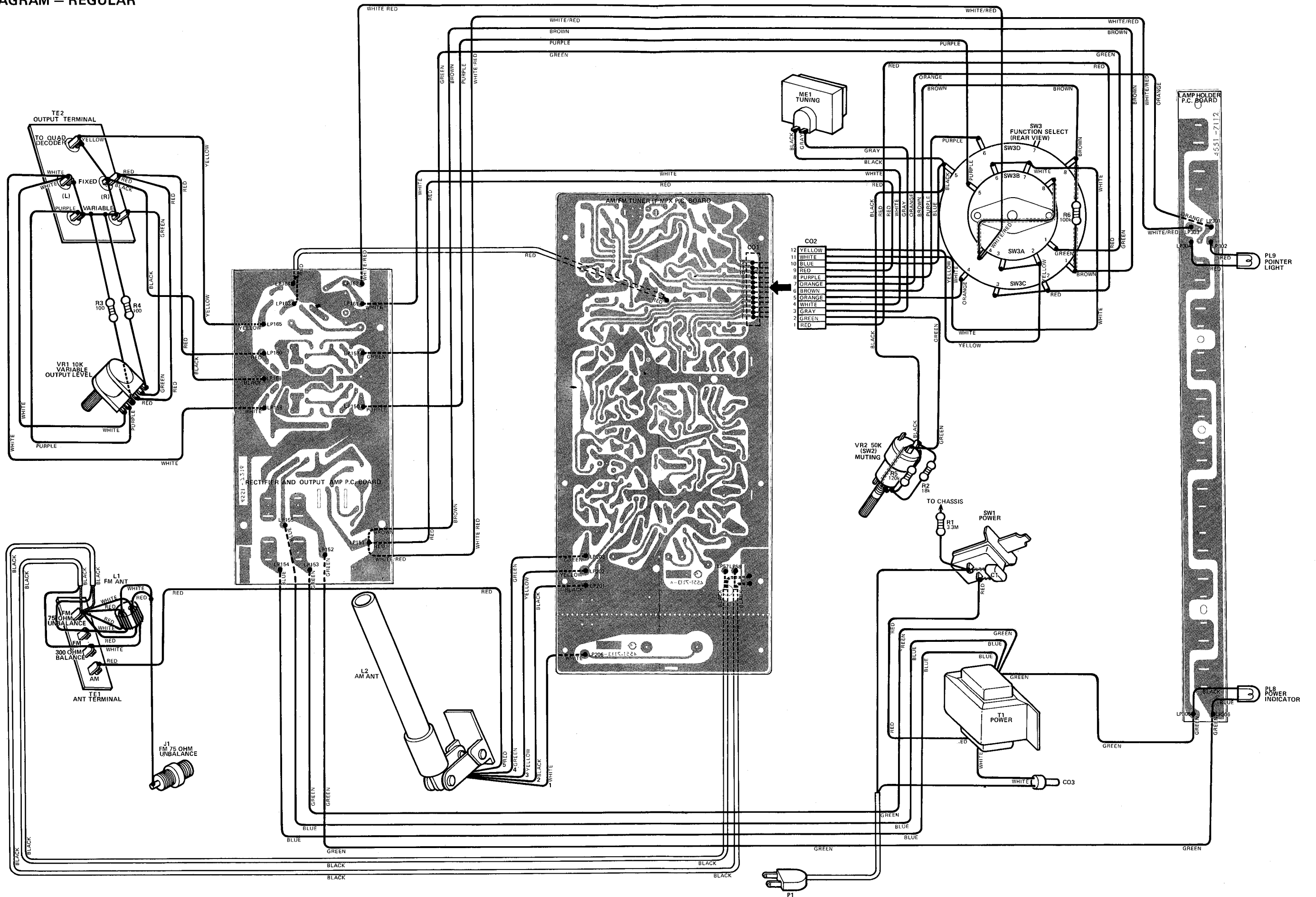
L202

T203

EM FRONT END

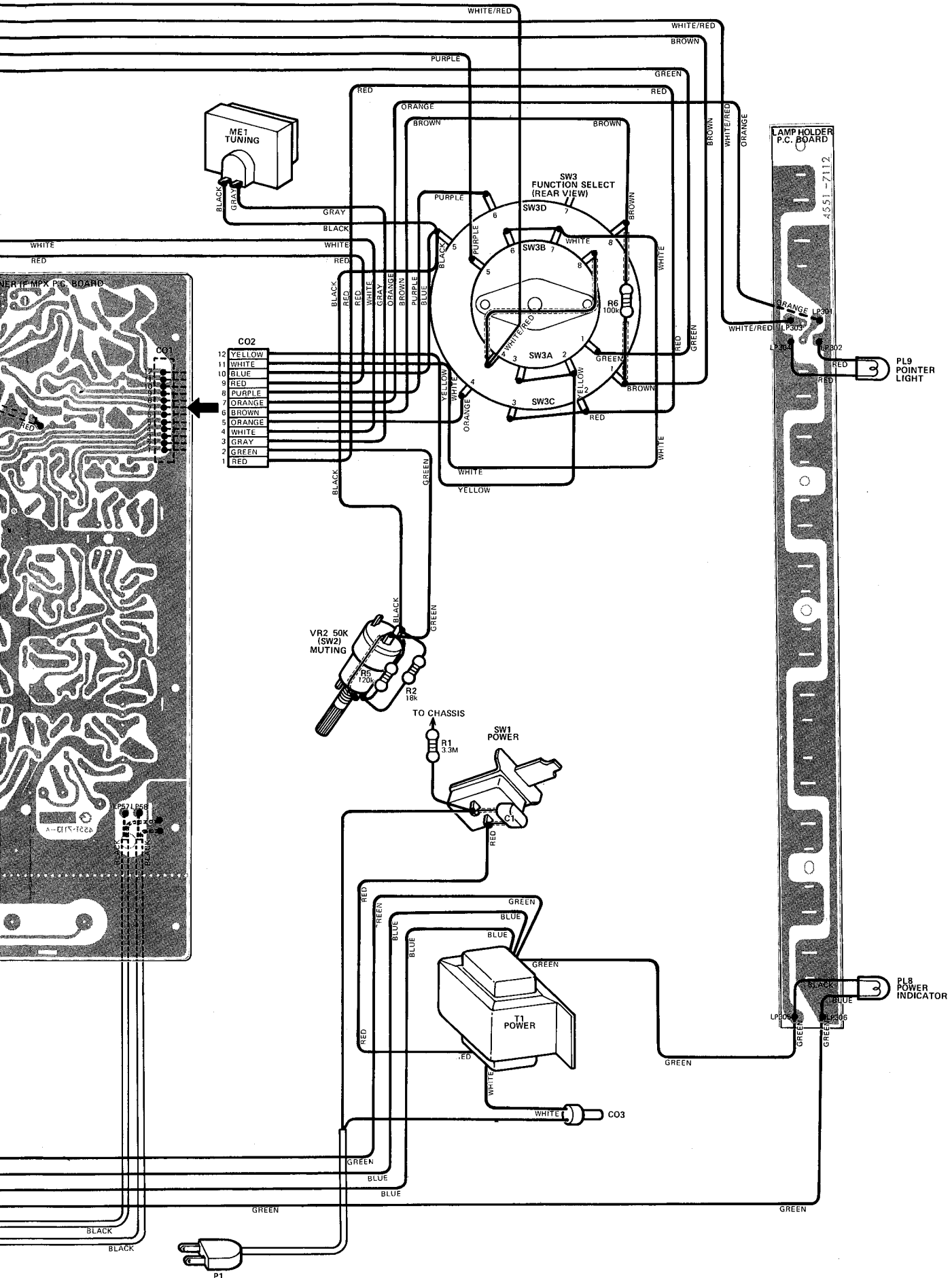
TKFO113  
7-133-10

WIRING DIAGRAM — REGULAR

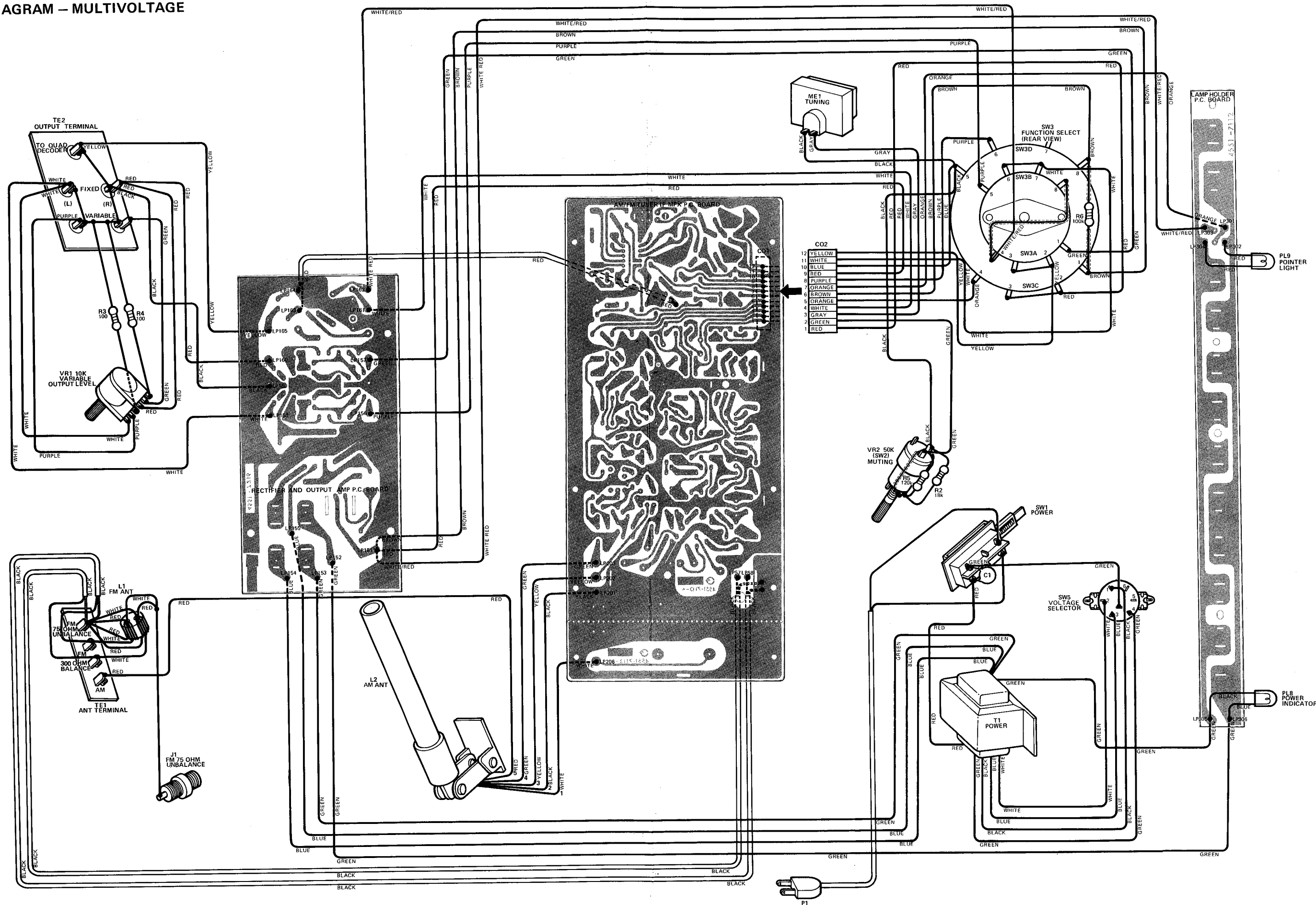






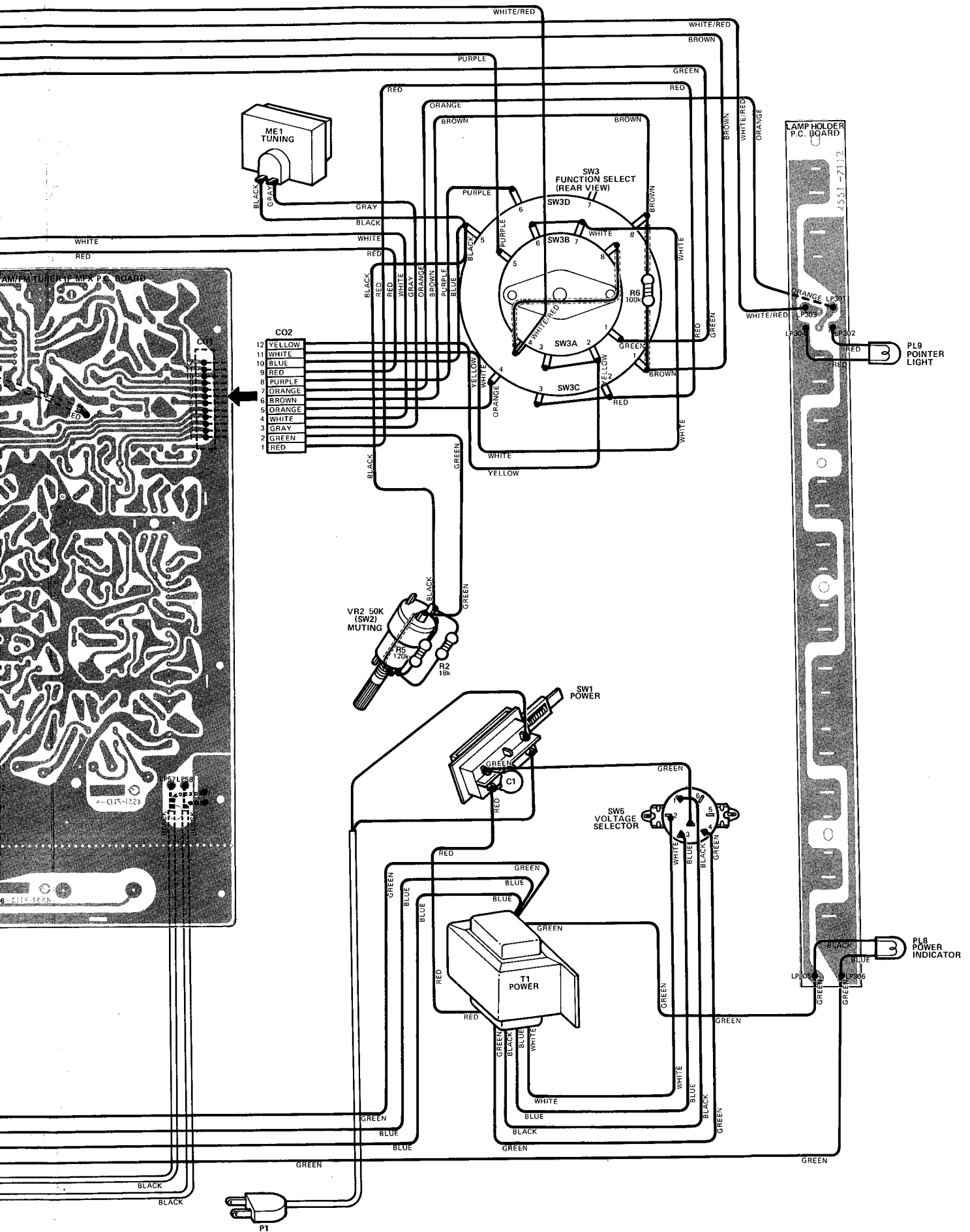


WIRING DIAGRAM – MULTIVOLTAGE









**SCHEMATIC NOTES AND VOLTAGES**

- NOTES:** Unless otherwise specified
1. All resistors are 1/4 watt, ±5%. Values are in ohms. K=1000 M=1000K
  2. All capacitance values are in UF unless noted otherwise. PF=UUF
  3. Function Selector switch (SW3) is in AM position.

**VOLTAGE CHART**

AC120V  
No Signal  
Chassis Ground

B1..... 24.50V  
B2..... 11.75V

**FM POSITION**

	base	emitter	collector
Q101	12.38V	11.75V	23.60V
Q151, 152	4.12V	3.60V	18.84V
Q153, 154	18.84V	19.49V	10.24V
Q201	0.81V	0.11V	6.57V
Q202	0V	5.93V	0.43V
	(gate)	(drain)	(source)
Q203	5.77V	5.07V	10.52V
Q204	5.74V	5.07V	8.02V
Q205	0.06V	0V	7.56V
(Muting ON)			
Q206	0.61V	0V	0.09V
(Muting ON)	7.56V	6.10V	6.11V
	5.42V	6.10V	6.08V
Q301	1.78V	1.14V	4.46V
Q302	0.62V	0V	0.01V
Q303	8.13V	8.76V	4.85V
Q304	8.15V	8.79V	4.77V

**AM POSITION**

	base	emitter	collector
Q251	1.87V	1.32V	10.87V
Q252	1.08V	0.55V	10.89V
Q253	1.15V	0.50V	10.94V
Q254	1.70V	1.02V	6.77V
Q255	2.38V	1.73V	4.17V

**IC201**

1	1.38V
2	1.38V
3	0V
4	8.79V
5	9.47V

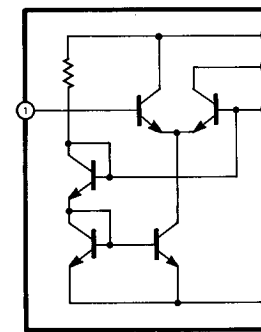
**IC202**

1	2.03V
2	2.03V
3	8.47V
4	0V
5	8.24V
6	2.04V
7	2.03V

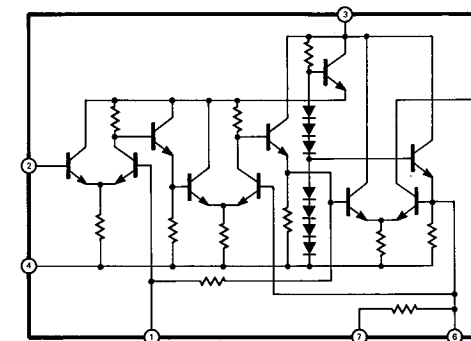
**IC301**

1	10.96V
2	3.80V
3	5.56V
4	8.15V
5	8.13V
6	11.76V
7	0V
8	0.11V
9	2.44V
10	1.64V
11	2.33V
12	2.51V
13	2.51V
14	3.01V

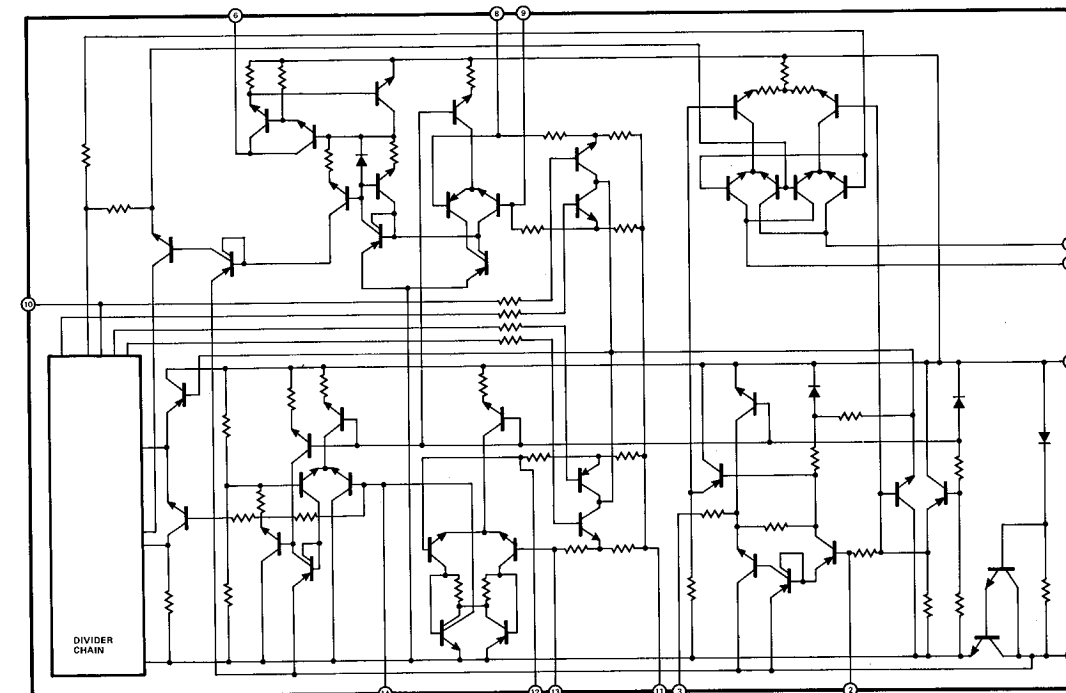
IC201



IC202



IC301



# SCHEMATIC NOTES AND VOLTAGES

- NOTES:** Unless otherwise specified
1. All resistors are 1/4 watt, ±5%. Values are in ohms. K=1000 M=1000K
  2. All capacitance values are in UF unless noted otherwise. PF=UUF
  3. Function Selector switch (SW3) is in AM position.

## VOLTAGE CHART

AC120V  
No Signal  
Chassis Ground

B1..... 24.50V  
B2..... 11.75V

### FM POSITION

	base	emitter	collector
Q101	12.38V	11.75V	23.60V
Q151, 152	4.12V	3.60V	18.84V
Q153, 154	18.84V	19.49V	10.24V
Q201	0.81V	0.11V	6.57V
Q202	0V	5.93V	0.43V
	(gate)	(drain)	(source)
Q203	5.77V	5.07V	10.52V
Q204	5.74V	5.07V	8.02V
Q205	0.06V	0V	7.56V
(Muting ON)			
	0.61V	0V	0.09V
Q206	7.56V	6.10V	6.11V
(Muting ON)			
	5.42V	6.10V	6.08V
Q301	1.78V	1.14V	4.46V
Q302	0.62V	0V	0.01V
Q303	8.13V	8.76V	4.85V
Q304	8.15V	8.79V	4.77V

### AM POSITION

	base	emitter	collector
Q251	1.87V	1.32V	10.87V
Q252	1.08V	0.55V	10.89V
Q253	1.15V	0.50V	10.94V
Q254	1.70V	1.02V	6.77V
Q255	2.38V	1.73V	4.17V

### IC201

1	1.38V
2	1.38V
3	0V
4	8.79V
5	9.47V

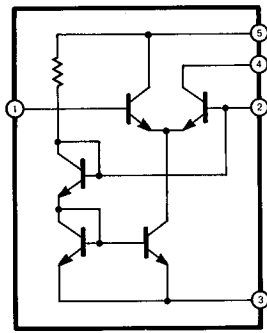
### IC202

1	2.03V
2	2.03V
3	8.47V
4	0V
5	8.24V
6	2.04V
7	2.03V

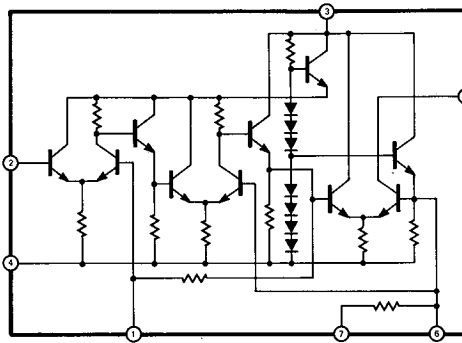
### IC301

1	10.96V
2	3.80V
3	5.56V
4	8.15V
5	8.13V
6	11.76V
7	0V
8	0.11V
9	2.44V
10	1.64V
11	2.33V
12	2.51V
13	2.51V
14	3.01V

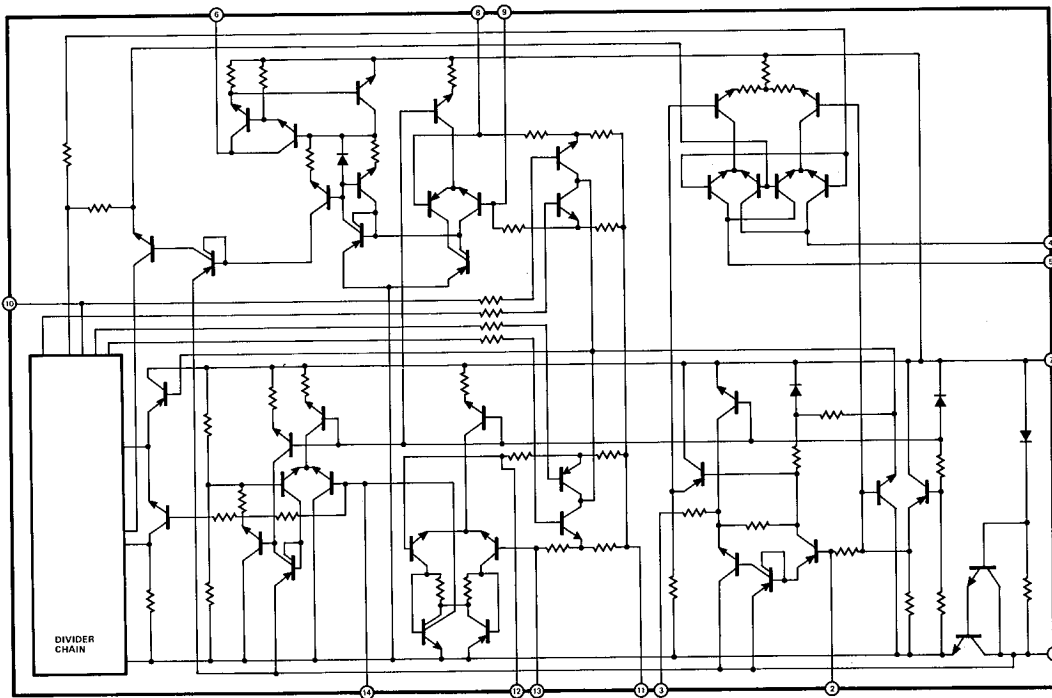
IC201



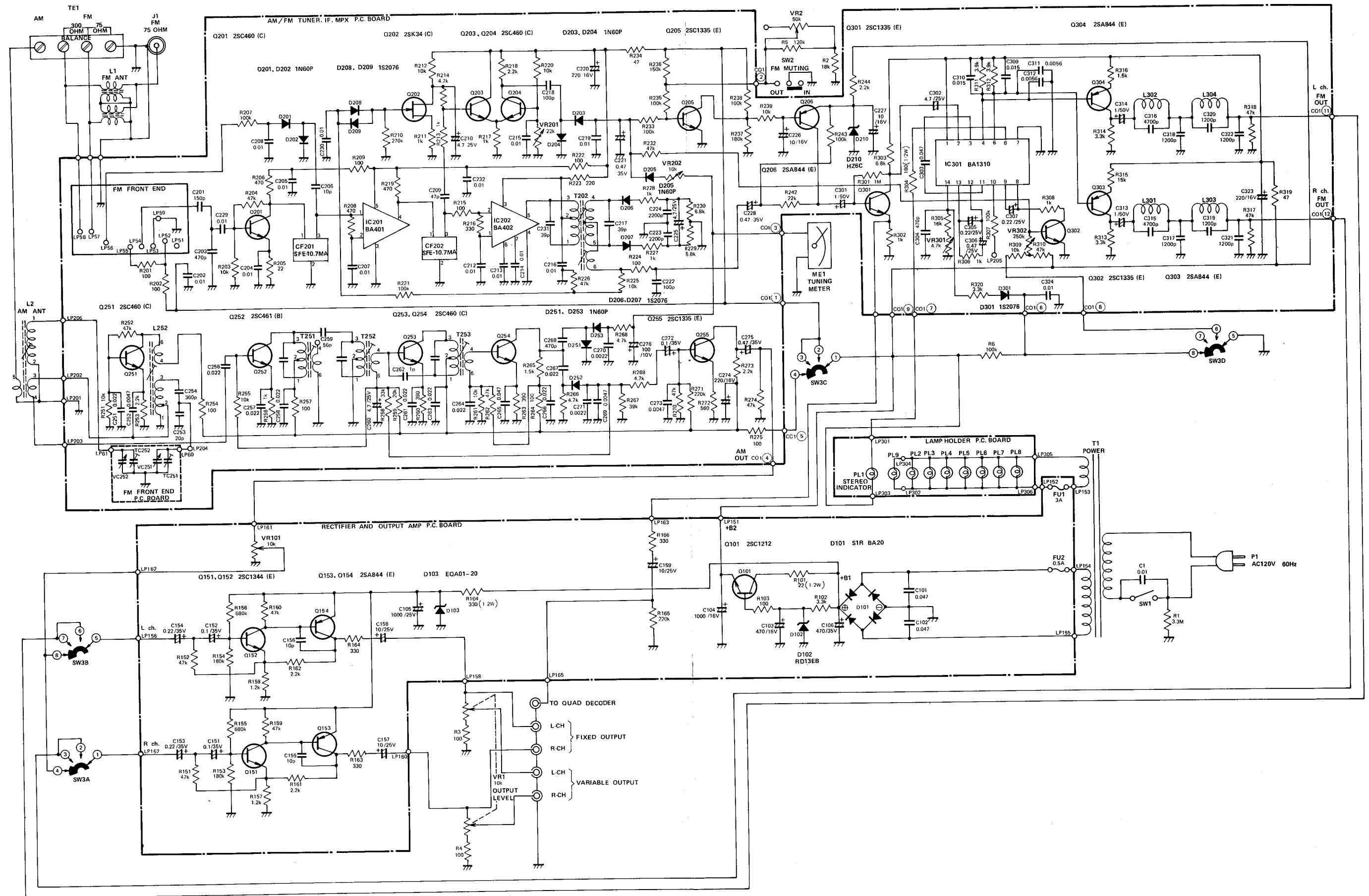
IC202



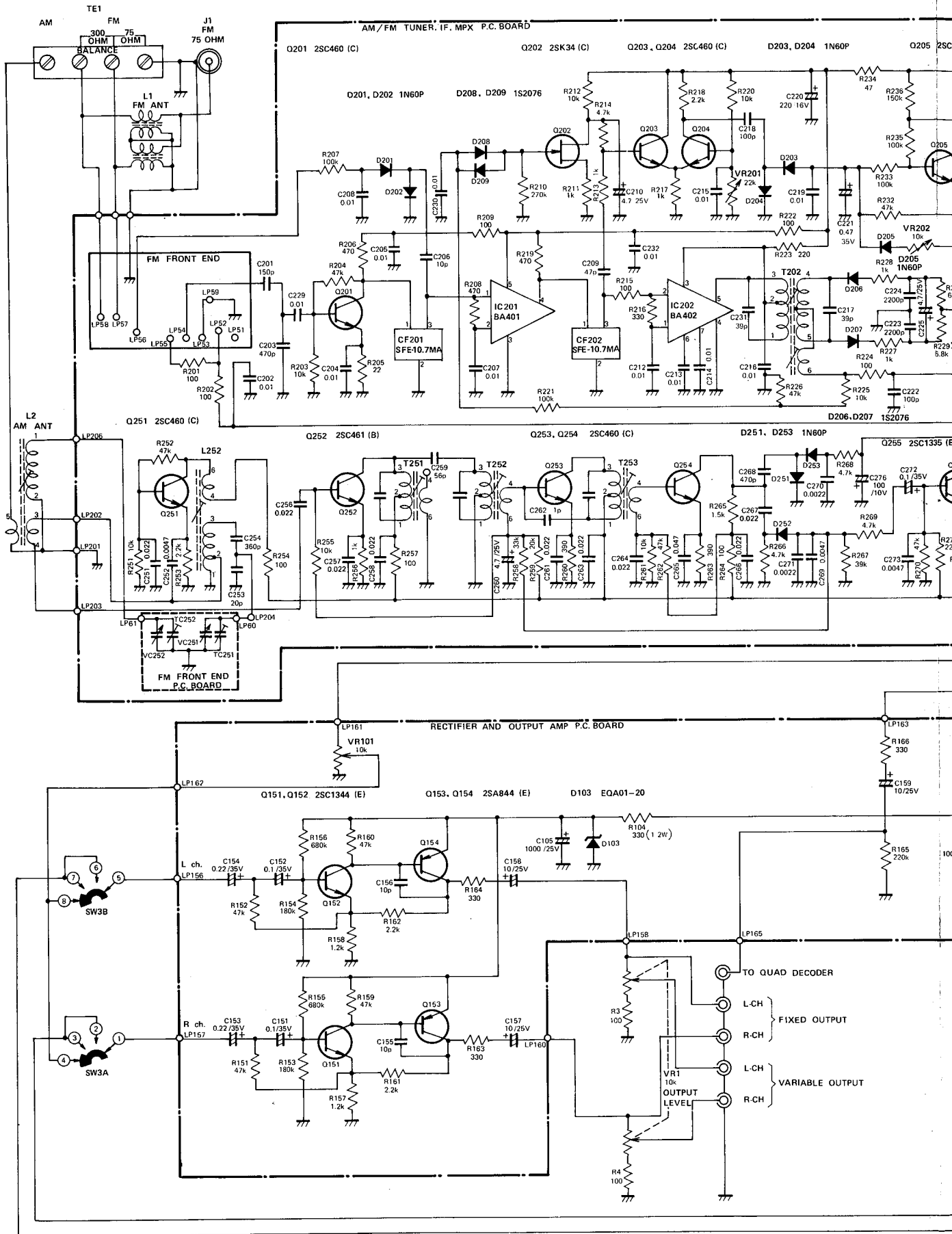
IC301

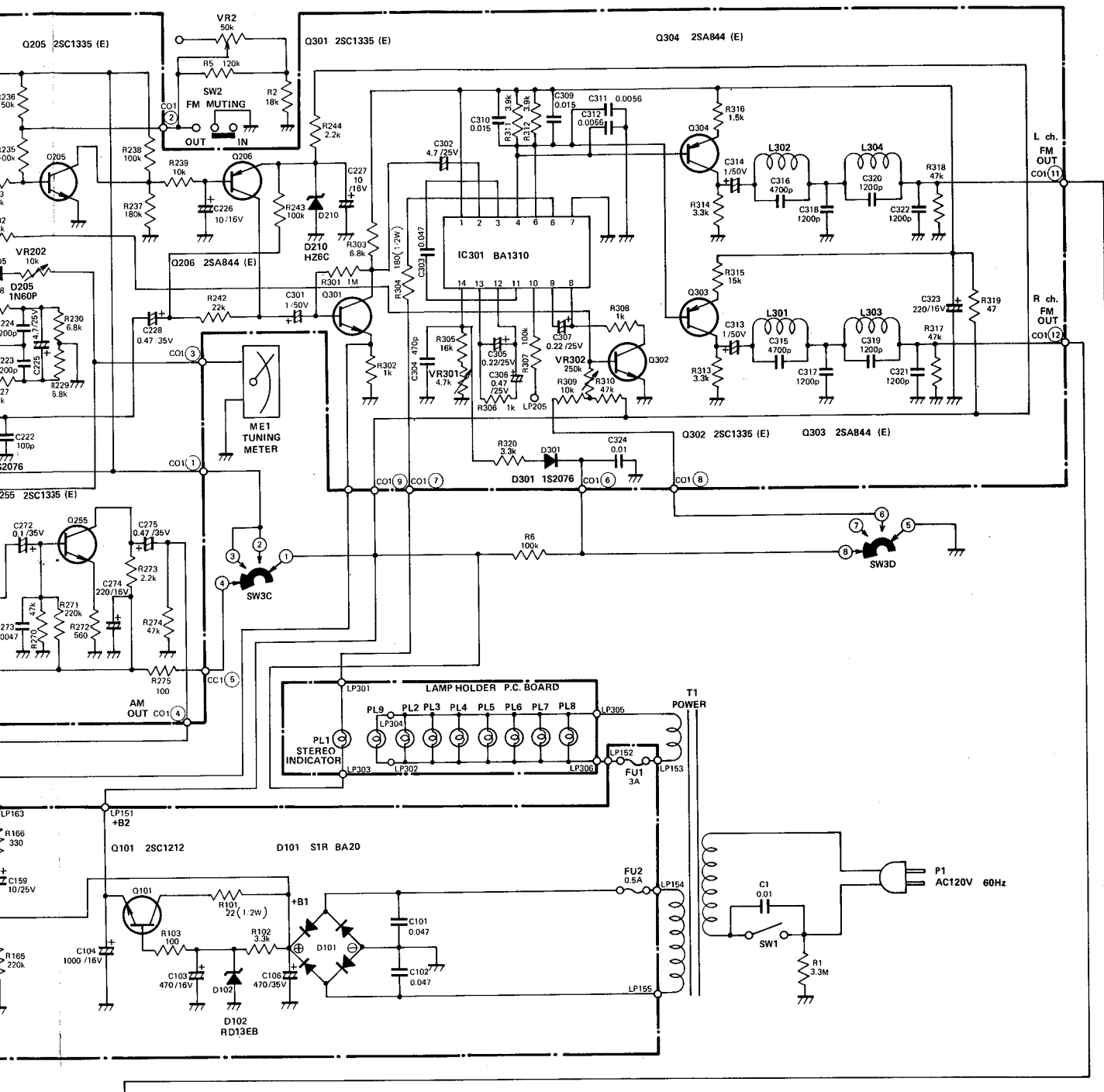


**SCHEMATIC DIAGRAM – REGULAR – MODEL T403**

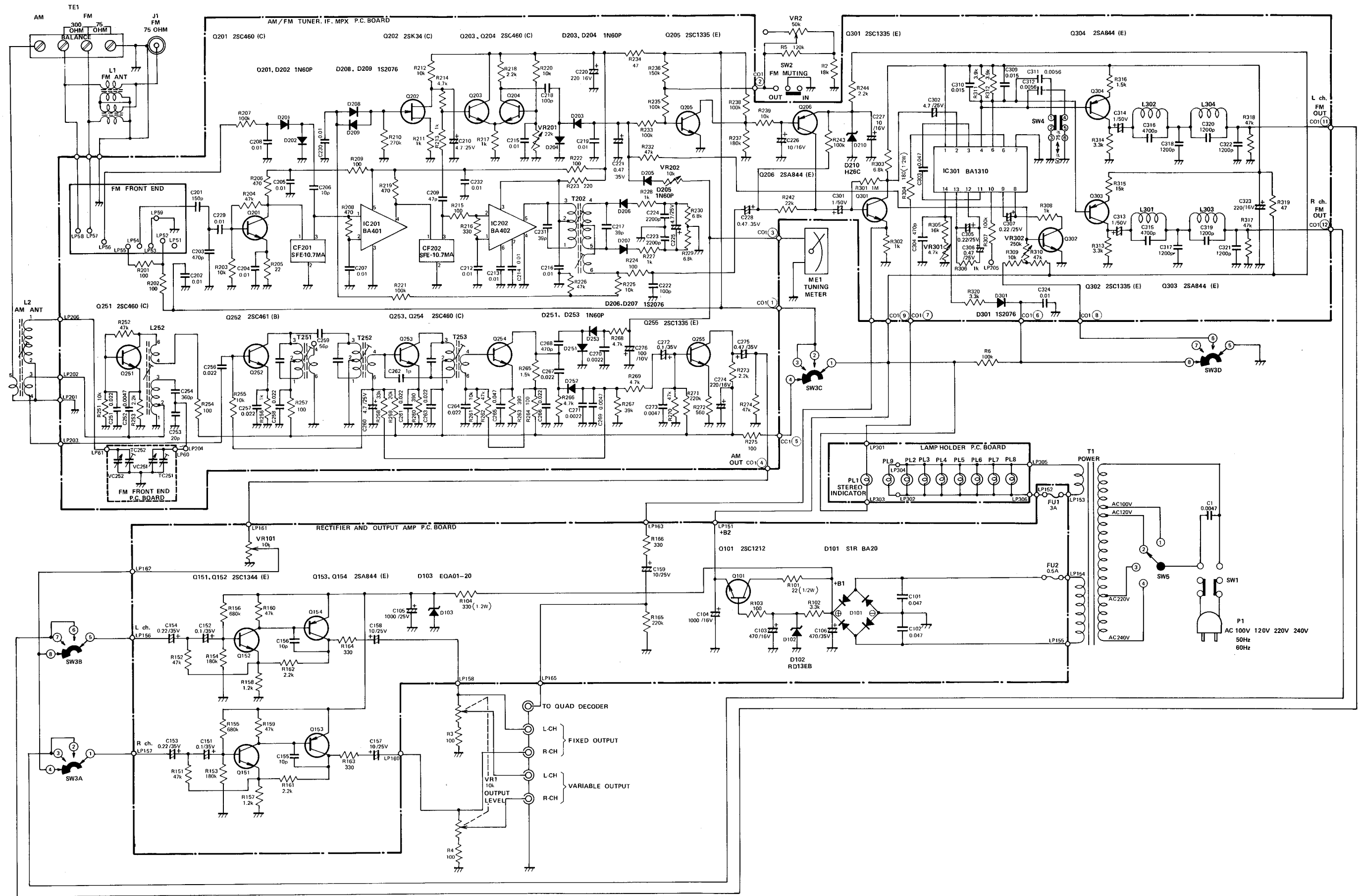


# SCHEMATIC DIAGRAM – REGULAR – MODEL T403



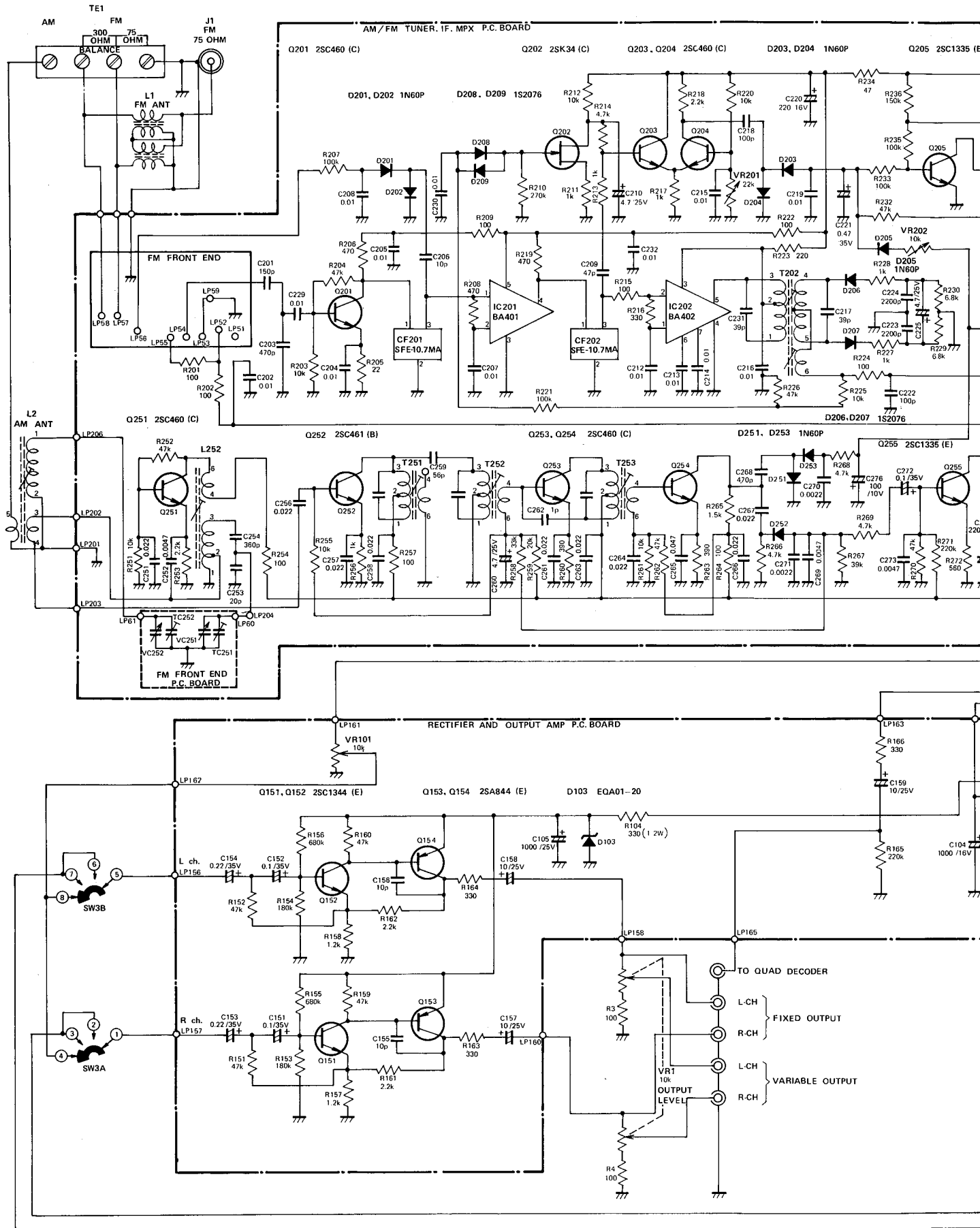


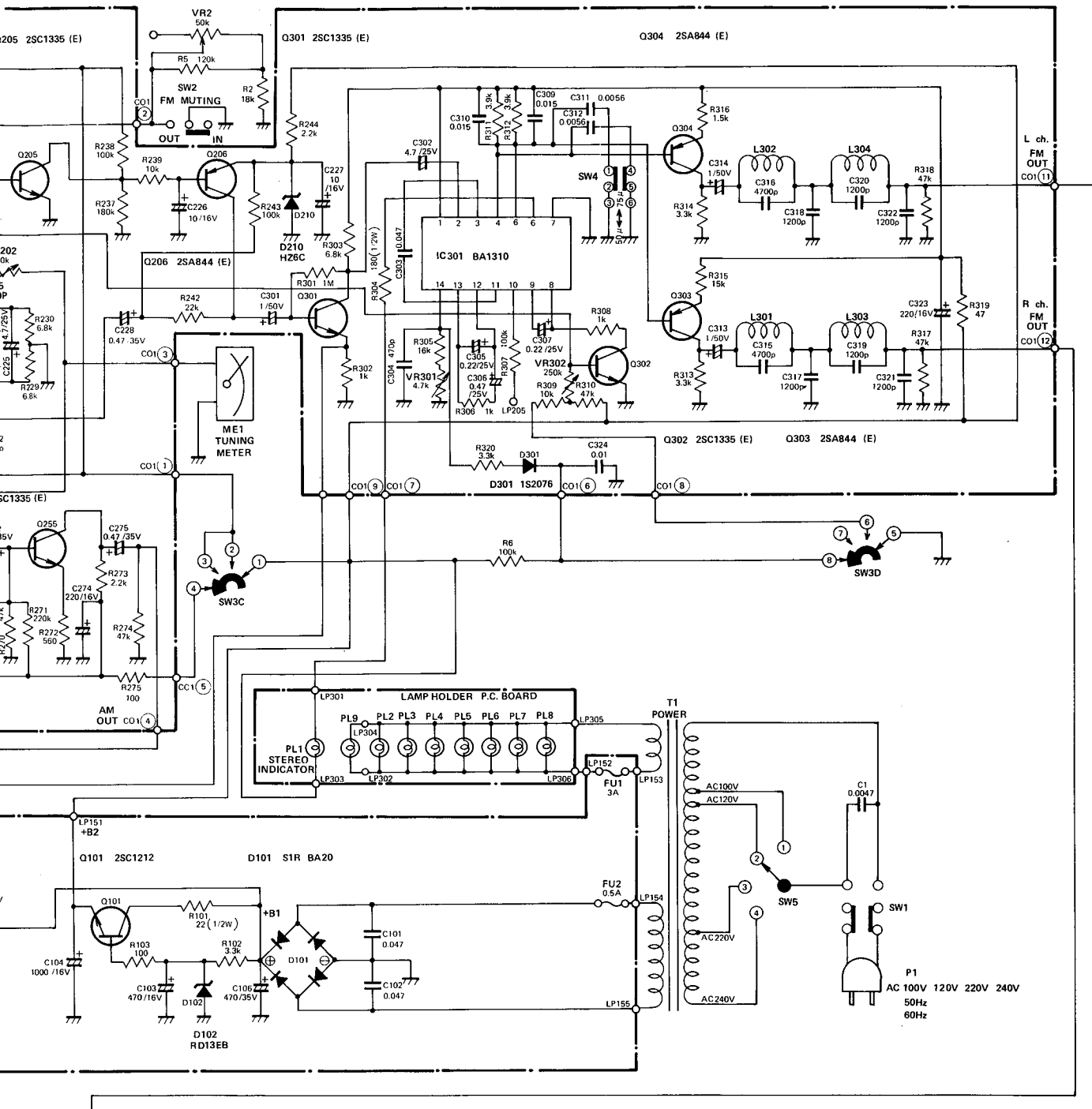
**SCHEMATIC DIAGRAM – MULTIVOLTAGE – MODEL T403**



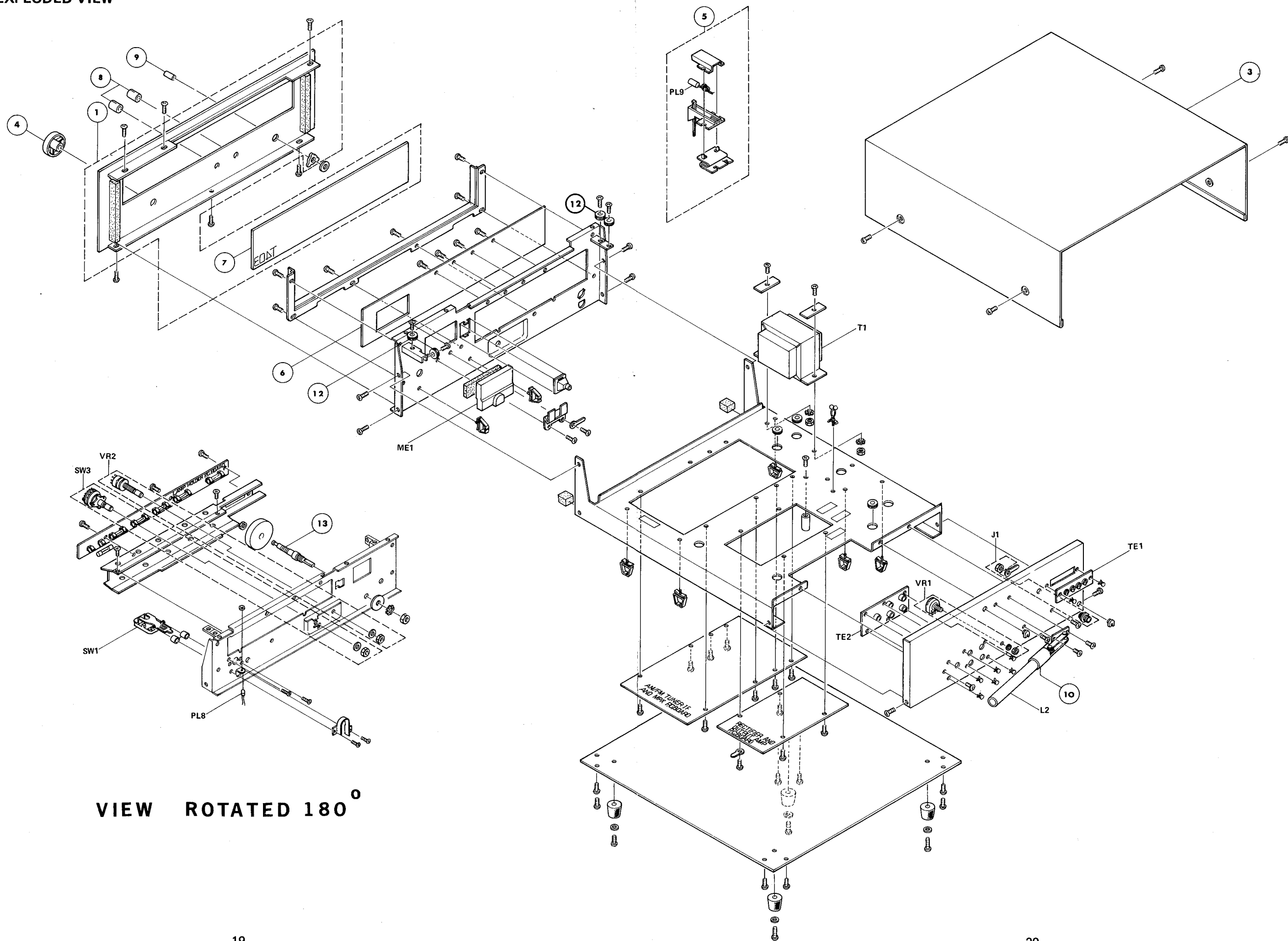


# SCHEMATIC DIAGRAM – MULTIVOLTAGE – MODEL T403



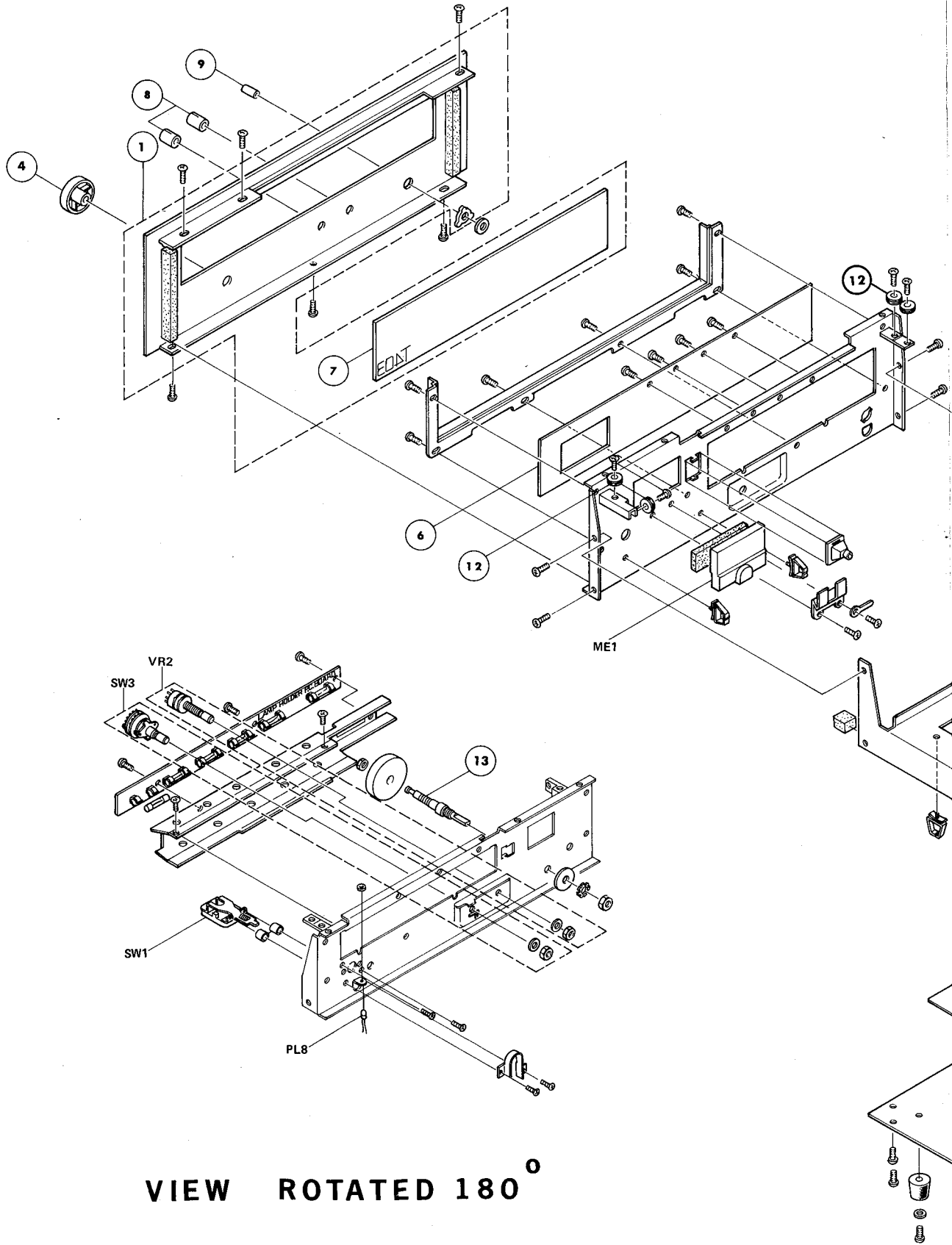


GENERAL UNIT EXPLODED VIEW

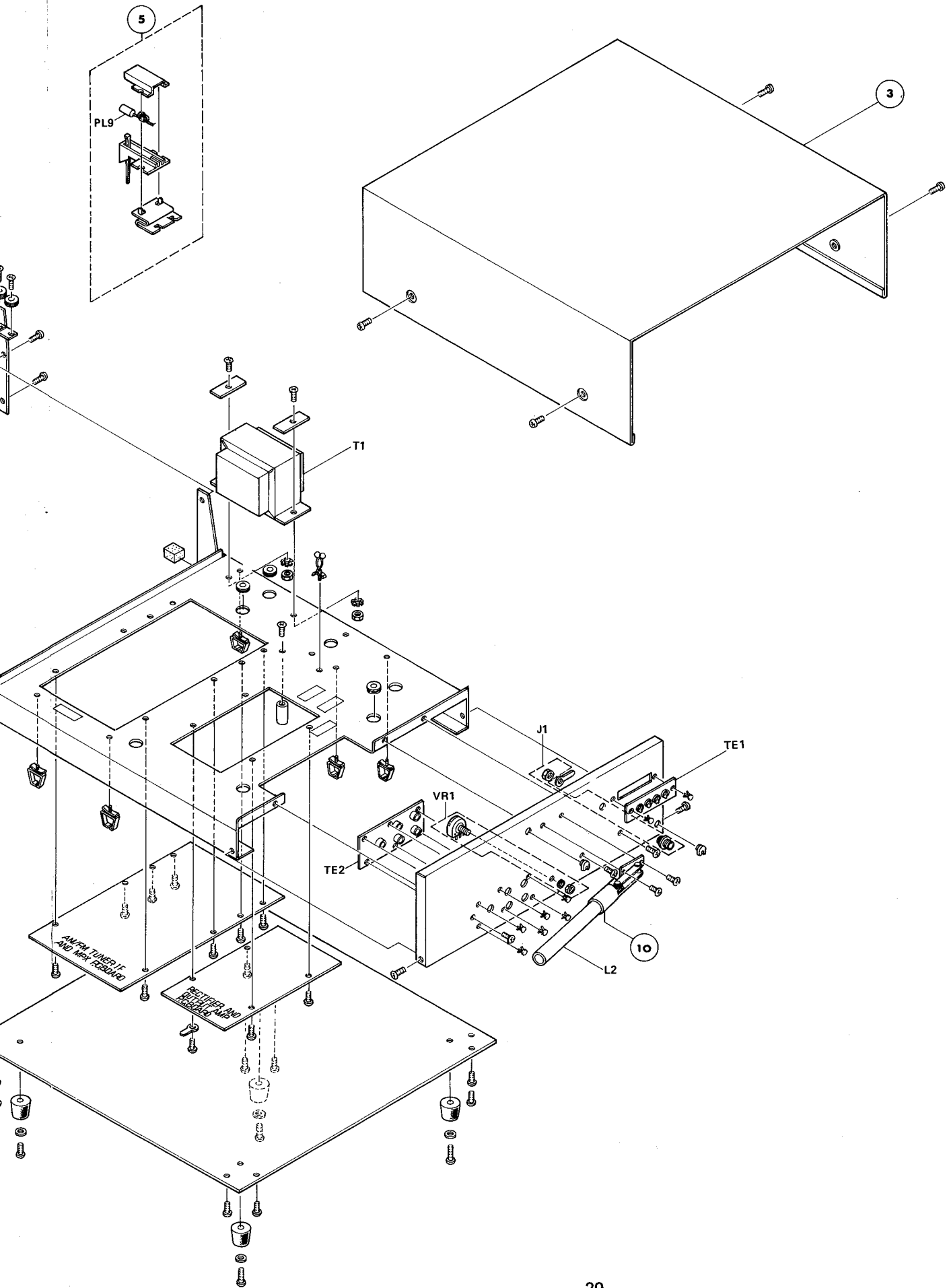


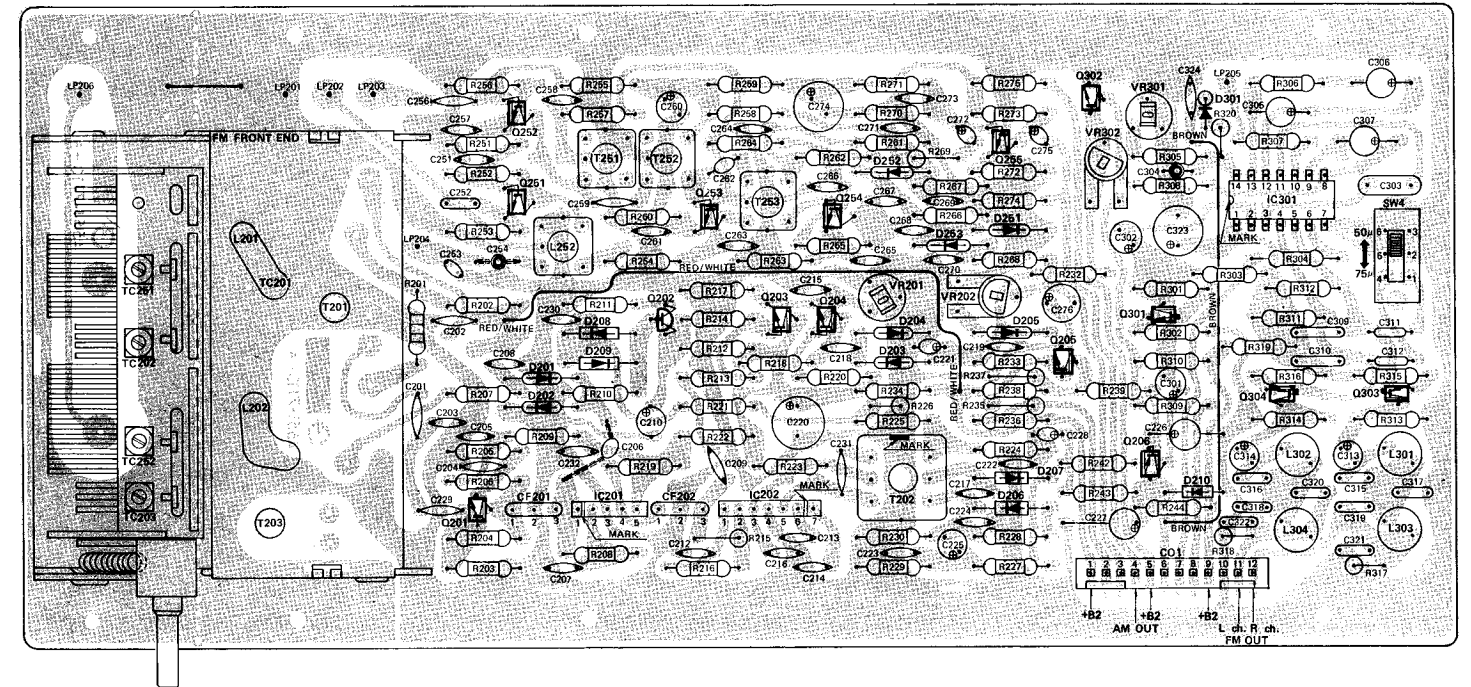
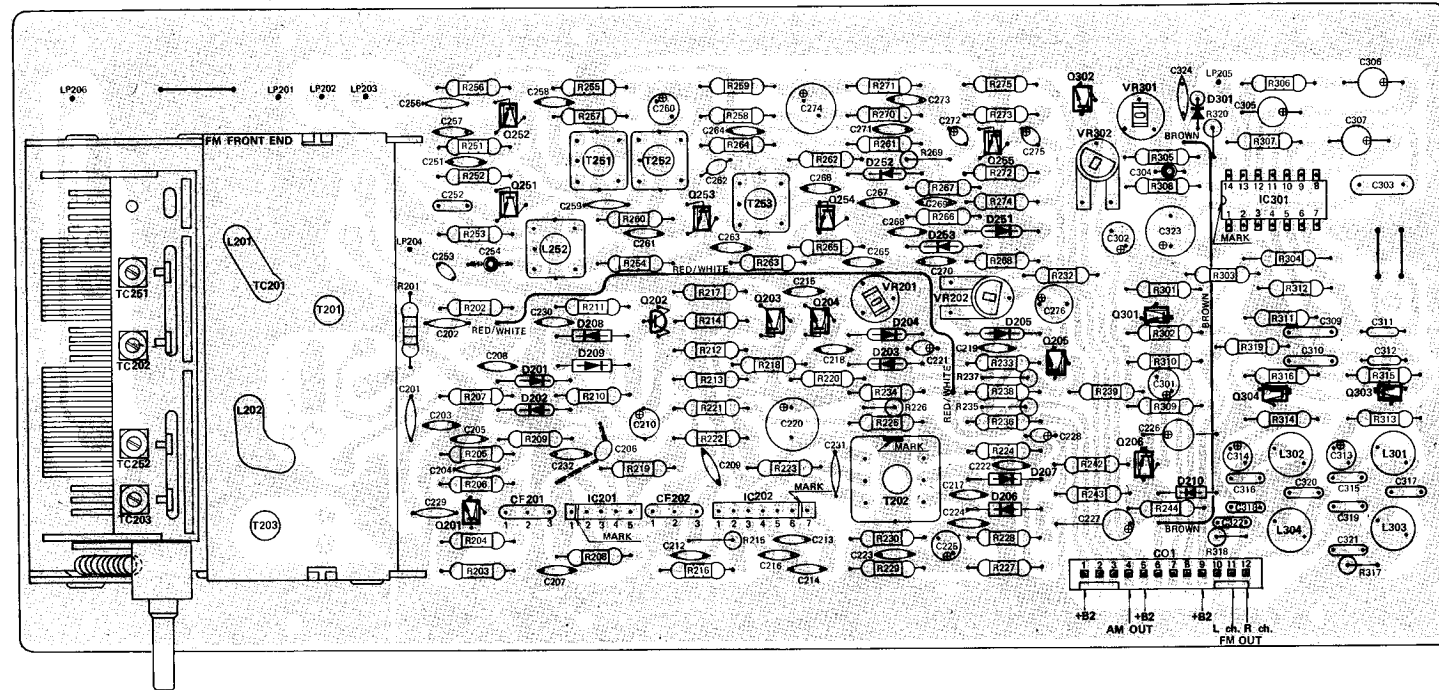
VIEW ROTATED 180°

# GENERAL UNIT EXPLODED VIEW



VIEW ROTATED 180°





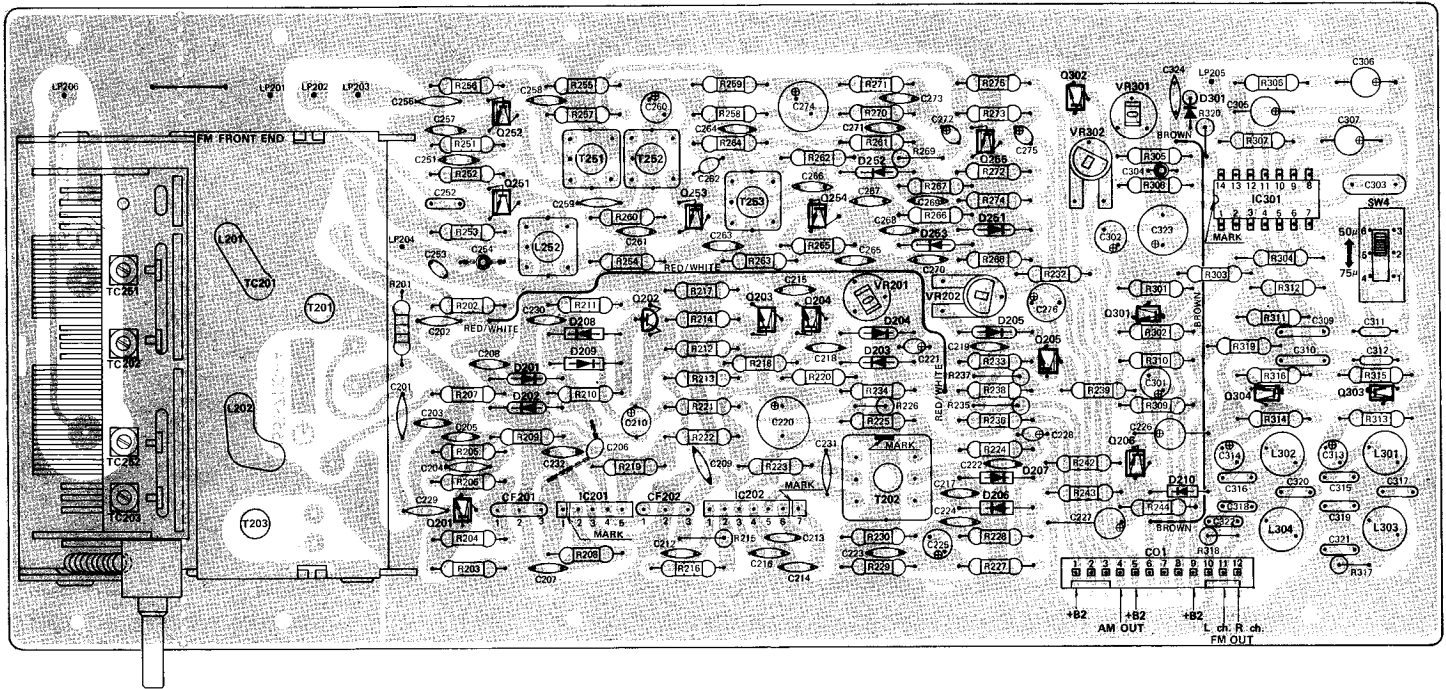
CIRCUIT REF.	H/K PART NO.	DESCRIPTION
Regulator	00133346	P.C. Board Assy.
Multivoltage	00133355	AM/FM Tuner, If, MPX
<b>RESISTORS</b>		
VR201	23531305	Variable Resistor, 22K Ohm
VR202	23530559	Variable Resistor, 10K Ohm
VR301	23530554	Variable Resistor, 4.7K Ohm
VR302	23530558	Variable Resistor, 250K Ohm
<b>TRANSISTORS</b>		
Q201, 203, 204	43029472*	Transistor, 2SC460(C) FM IF Amp, Differential Amp.
Q202	43031311*	F.E.T., 2SK34(C) Center Zero Research
Q205	43030569*	Transistor, 2SC1335(E) DC Amp.
Q206	43031312*	Transistor, 2SA844(E) Muting
Q251, 253, 254	43029472*	Transistor, 2SC460(C) AM OSC
Q252	43029471*	Transistor, 2SC461(B) AM Mix
Q255	43030569*	Transistor, 2SC1335(E) AM IF Amp.
Q301, 302	43030569*	Transistor, 2SC1335(E) Composite Signal Amp Mono-Stereo Switching
Q303, 304	43031312*	Transistor, 2SA844(E) MPX Output Amp.

CIRCUIT REF.	H/K PART NO.	DESCRIPTION
<b>INTEGRATED CIRCUIT</b>		
IC201	43031313*	Integrated Circuit, BA401 FM IF Amp.
IC202	43031314*	Integrated Circuit, BA402, FM IF Amp.
IC301	43130555*	Integrated Circuit, BA1310 MPX
<b>DIODES</b>		
D201, 202, 203, 204, 205, 251, 252, 253	41029290*	Diode, 1N60P
D206, 207, 208, 209	41030552*	Diode, 1S2076
D210	42031315*	Zener Diode, HZ6C
D301	41030552*	Switching Diode, 1S2076
<b>COILS AND TRANSFORMERS</b>		
L252	12031316	Coil, AM OSC
L301, 302, 303, 304	12031317	Coil, 19 KHZ, 38 KHZ Trap (15 mH)
T202	10131318	Transformer, Discriminator
T251, 252	10130556	Transformer, AM IF
T253	10130557	Transformer, AM IF

CIRCUIT REF.	H/K PART NO.	DESCRIPTION
<b>FILTER</b>		
CF201, 202	12030549	Ceramic Filter, FM IF (10.7 MHZ)
<b>MISCELLANEOUS</b>		
	00233326	FM Front End Connector (12 Pin)



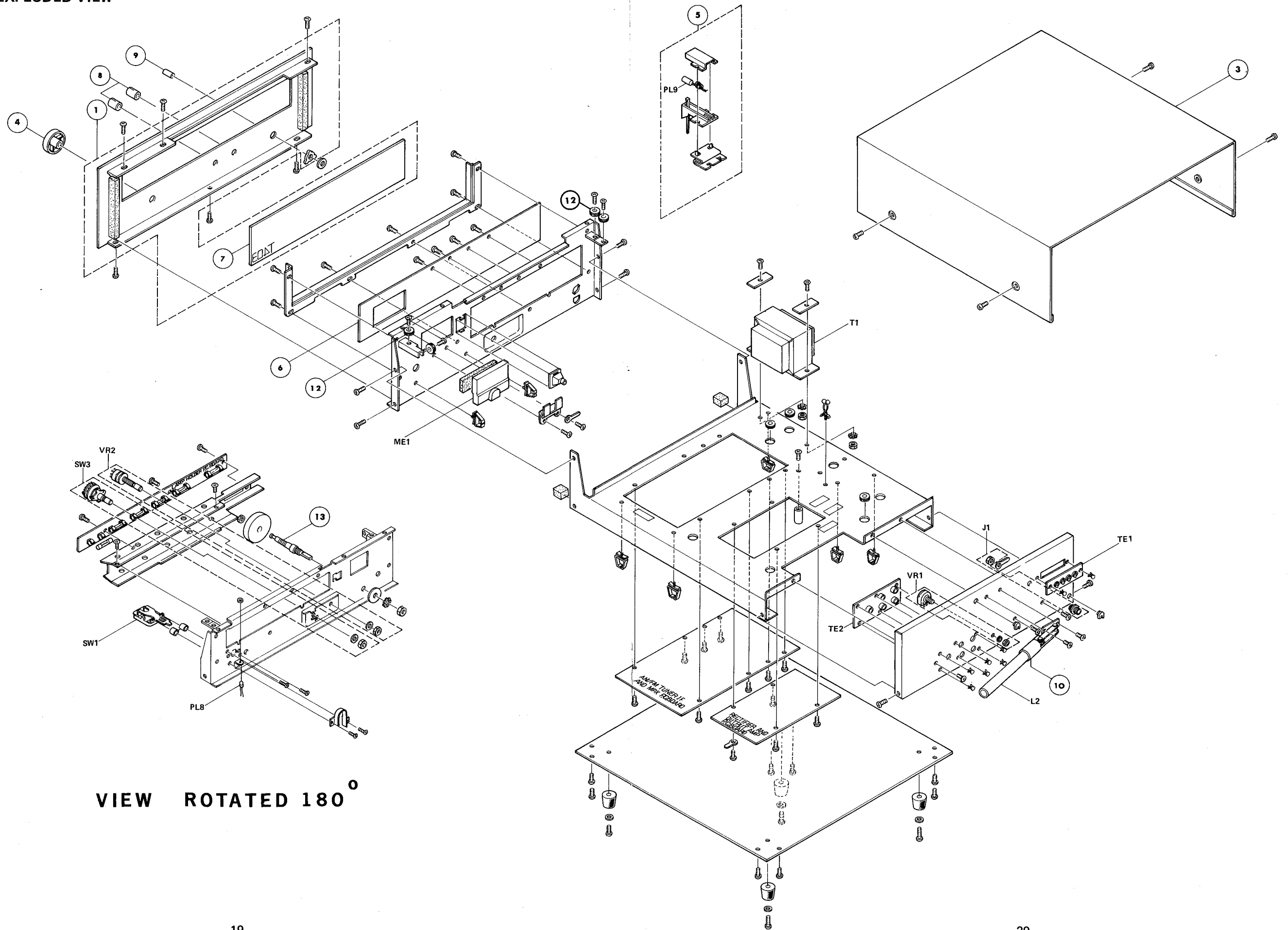
# AM/FM TUNER, IF, MPX P.C. BOARD – MULTIVOLTAGE



DESCRIPTION	CIRCUIT REF.	H/K PART NO.	DESCRIPTION
Integrated Circuit, BA401 FM IF Amp.	CF201, 202	12030549	Ceramic Filter, FM IF (10.7 MHZ)
Integrated Circuit, BA402, FM IF Amp.			
Integrated Circuit, BA1310 MPX			
Diode, 1N60P	MISCELLANEOUS	00233326	FM Front End Connector (12 Pin)
Diode, 1S2076			
Zener Diode, HZ6C			
Switching Diode, 1S2076			
Coil, AM OSC			
Coil, 19 KHZ, 38 KHZ			
Trap (15 mH)			
Transformer, Discriminator			
Transformer, AM IF			
Transformer, AM IF			

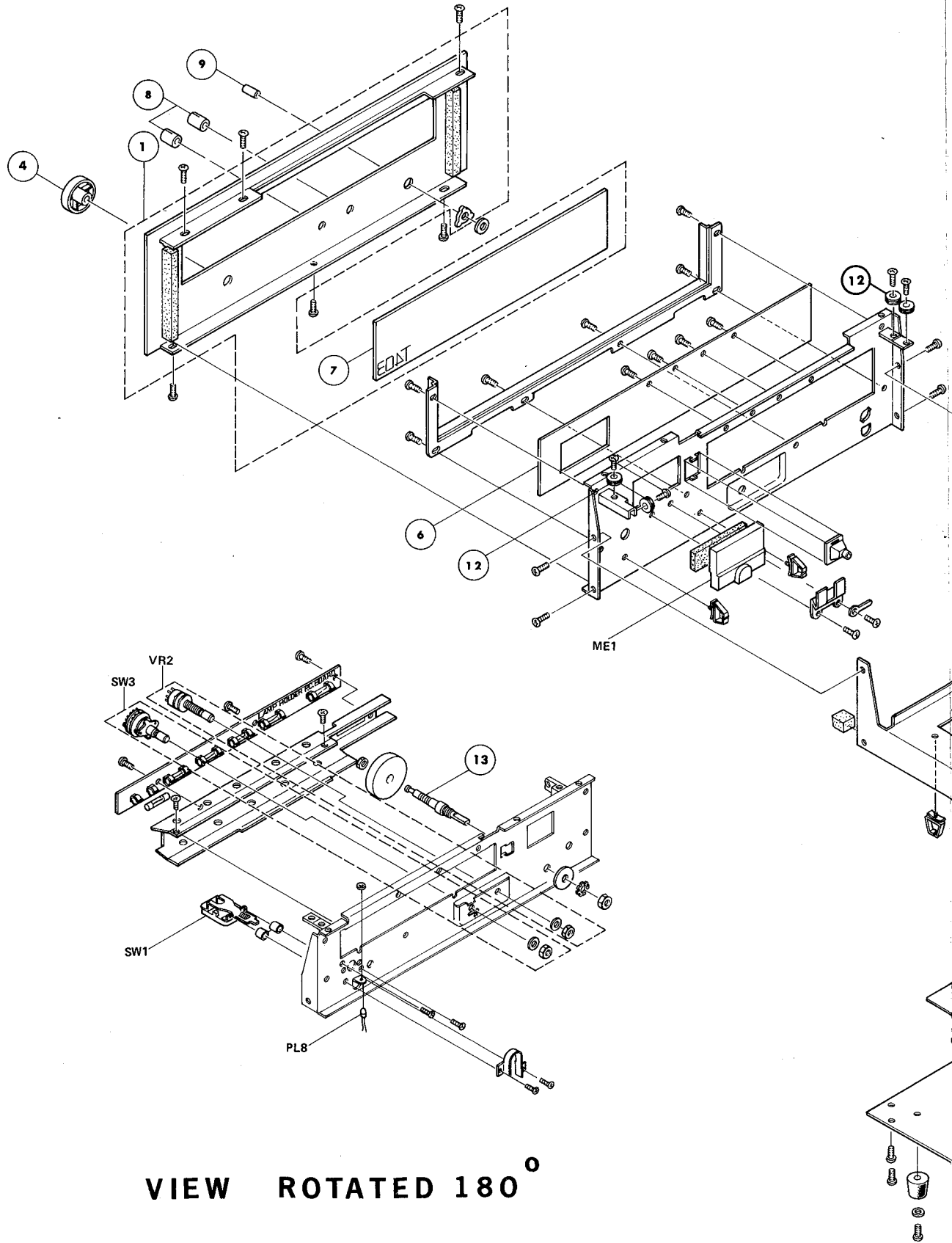


GENERAL UNIT EXPLODED VIEW

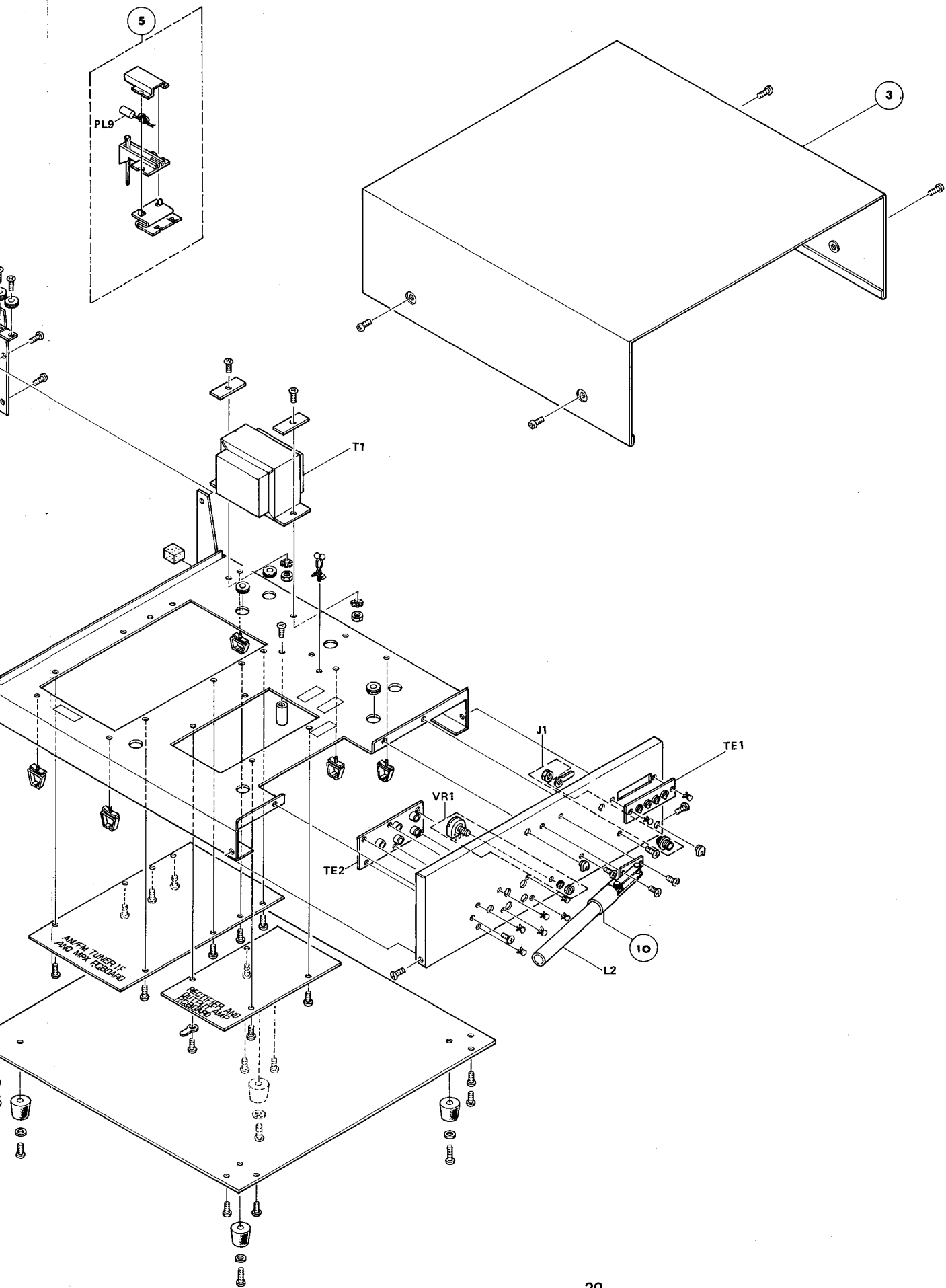


VIEW ROTATED 180°

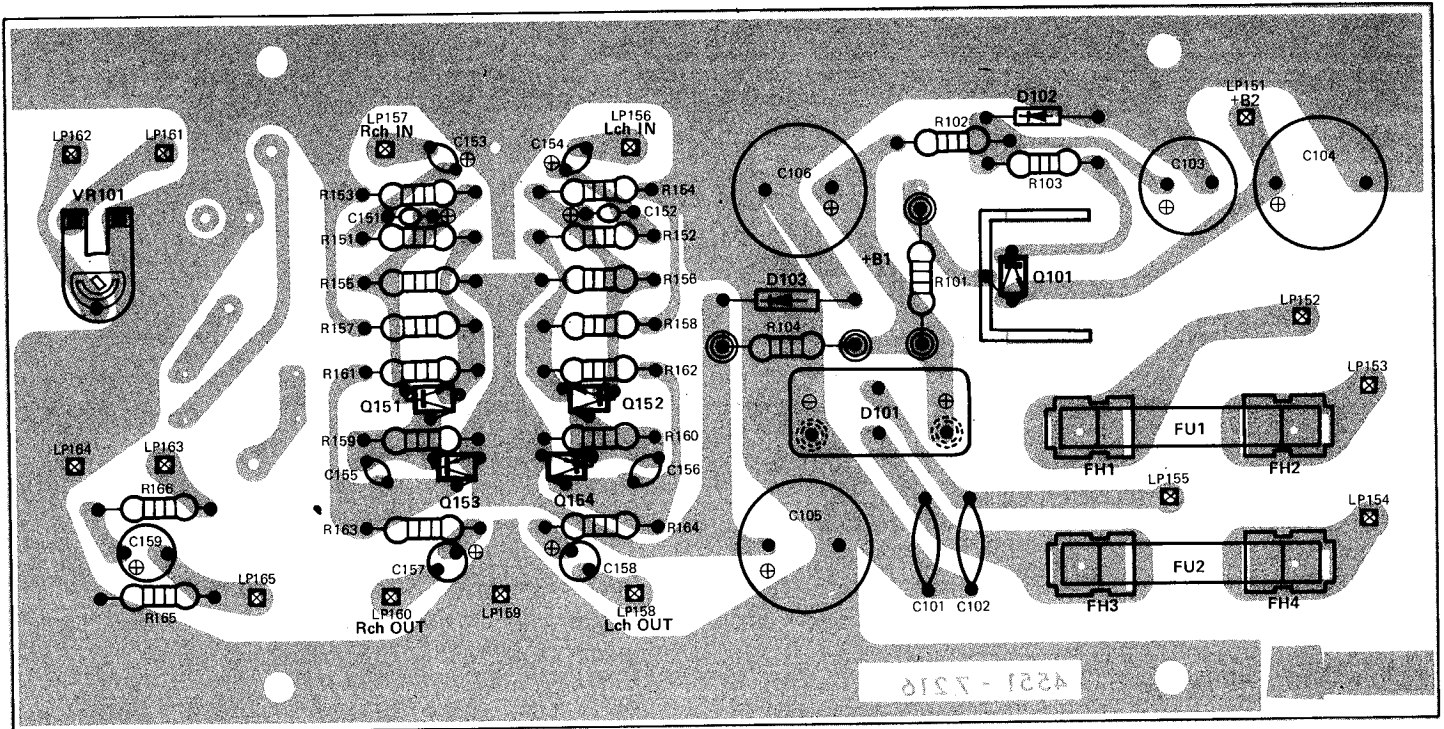
GENERAL UNIT EXPLODED VIEW



VIEW ROTATED 180°



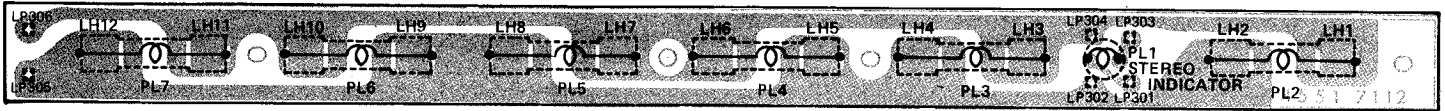
# RECTIFIER AND OUTPUT AMP P.C. BOARD



CIRCUIT REF.	H/K PART NO.	DESCRIPTION
	00133347	P.C. Board Assy. Rectifier and Output Amp
<b>RESISTOR</b>		
VR101	23530559	Variable Resistor 10K Ohm
<b>CAPACITORS</b>		
C104	31831472	1000UF + 50% - 10% 16V Electrolytic
C105	31832153	1000UF + 50% - 10% 25V Electrolytic
C106	31833300	470UF + 100% - 10% 35V Electrolytic
<b>TRANSISTORS</b>		
Q101	43031425*	Transistor, 2SC1212(C) Voltage Rectifier
Q151, 152	43028535*	Transistor, 2SC1344(E) Output Amp.
Q153, 154	43031312*	Transistor, 2SA844(E) Output Amp
<b>DIODES</b>		
D101	42131296*	Bridge Silicon, Rectifier S1R BA20
D102	42032760*	Zener Diode, RD13EB
D103	42033301*	Zener Diode, EQA-01-20
<b>MISCELLANEOUS</b>		
FU1	45031336*	Fuse, 3A
FU2	45031327*	Fuse, 0.5A
FH1, 2, 3, 4	65431463*	Fuse Holder

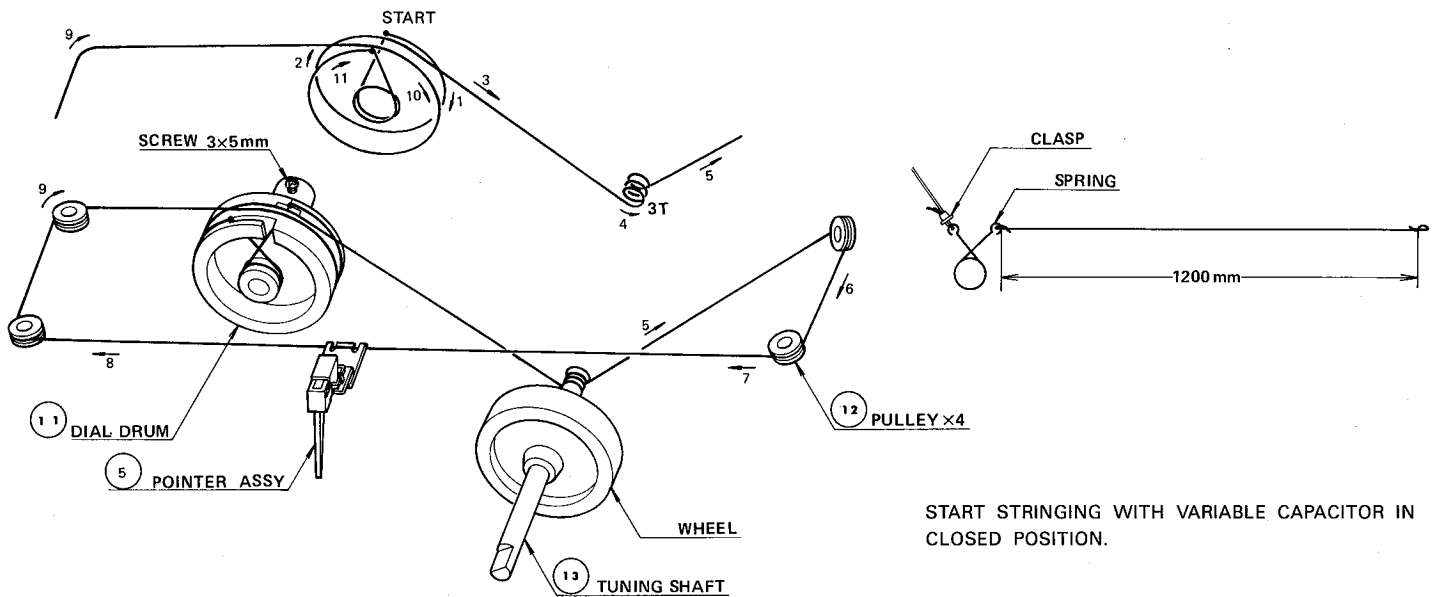
# LAMP HOLDER P.C. BOARD

VIEWED FROM  
CIRCUIT SIDE



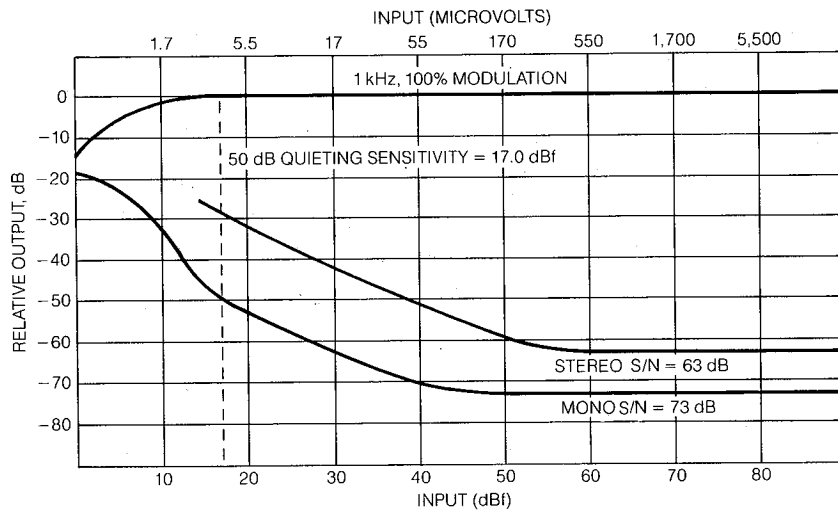
CIRCUIT REF.	H/K PART NO.	DESCRIPTION
	00133348	P.C. Board Assy
PL1	46531326*	Lamp Holder Stereo Indicator Lamp, 6.3V 40 mA
PL2, 3, 4, 5, 6, 7	46524956*	Dial Illuminator Lamp, 6.3V 250 mA

## DIAL CORD STRINGING



# SPECIFICATIONS

- Limiter Saturation:** less than 14.8dBf
- Multiplex Separation:** greater than 30dB
- Selectivity:** greater than 50dB
- Capture Ratio:** less than 2.0dB
- Audio Frequency Response:** 6Hz to 120kHz - 3dB
- Harmonic Distortion:** 0.5% mono  
0.7% stereo
- AM Rejection:** better than - 55dB
- Image Rejection:** better than - 45dB
- IF Rejection:** better than - 80dB
- Pilot Signal Rejection:** better than - 45dB
- De-emphasis:** 75 microseconds
- Mute Threshold:** 22.1 to 47.2dBf (variable)
- Mute Suppression:** better than - 60dB
- Audio Output:** fixed: 2.0 volts  
variable: 20 millivolts  
to 2.0 volts
- Dimensions:** 15¼" W x 15½" D x 5½" H  
(400 mm x 394 mm x 140 mm)
- Weight:** 15 lbs 6 oz (7.0 kg)



TYPICAL T403 QUIETING CURVES

## CHASSIS PARTS LIST

IDENT. NO.	REF. DES.	H/K PART NO.	DESCRIPTION
	L2	20531334	AM Ferrite Bar Antenna
	T1	10133349	Power Transformer RV
	VR1	21533295	Variable Resistor, 10K ohm, Output Level
	VR2	21533296	Variable Resistor, 50K ohm, FM Muting W/SW2
	SW1	25032117	Push Switch, Power
	SW3	24033297	Function Selector Switch
	ME1	12533325	Tuning Meter
	J1	65433298	FM External Antenna Jack
	TE1	65129519	AM/FM External Antenna Terminal
	TE2	65433299	Output Terminal
	PL8	46531331*	Power Indicator Lamp, 6.3V 50mA
	PL9	46531330*	Pointer Light, 6.3V 30mA
1		00233327	Front Panel Assembly
3		60133328	Cabinet Top Assembly
4		63233329	Knob Assembly, Tuning
5		00233330	Dial Pointer Assembly
6		61033331	Dial Panel
7		61033332	Clear Panel, Dial Panel
8		63231376	Knob, Function and Muting
9		63231378	Push Button, Power
10		61631380	AM Ferrite Bar Antenna Holder
11		60433333	Dial Drum
12		60433334	Pulley, Dial Cord
13		60433335	Tuning Shaft
<b>MULTIVOLTAGE</b>			
	SW1	25033336	Push Switch, Power
	SW5	24031338	Rotary Switch, Power Source Voltage Selector
	T1	10133337	Power Transformer MV
		63232869	Push Button, Power

**NOTE TO WARRANTY STATIONS:** Items marked by asterisk (\*) are recommended spare parts stock. Printed circuit board assembly numbers are shown for reference only. Harman/Kardon does not normally supply assembled printed circuit boards.

**NOTE:** To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman/Kardon, 55 Ames Court, Plainview, L.I., N.Y. 11803, Att: Parts Department.