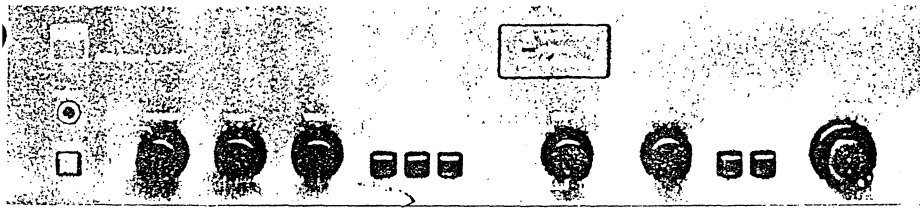


# SERVICE MANUAL

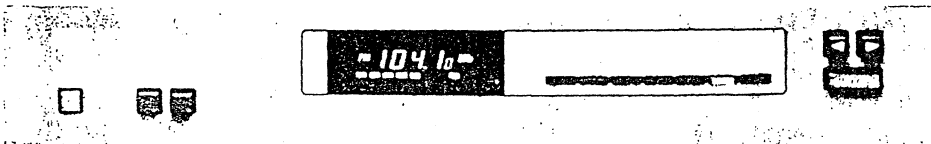


MODELS

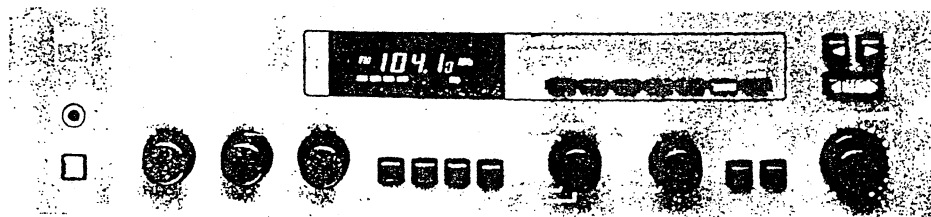
**2150**



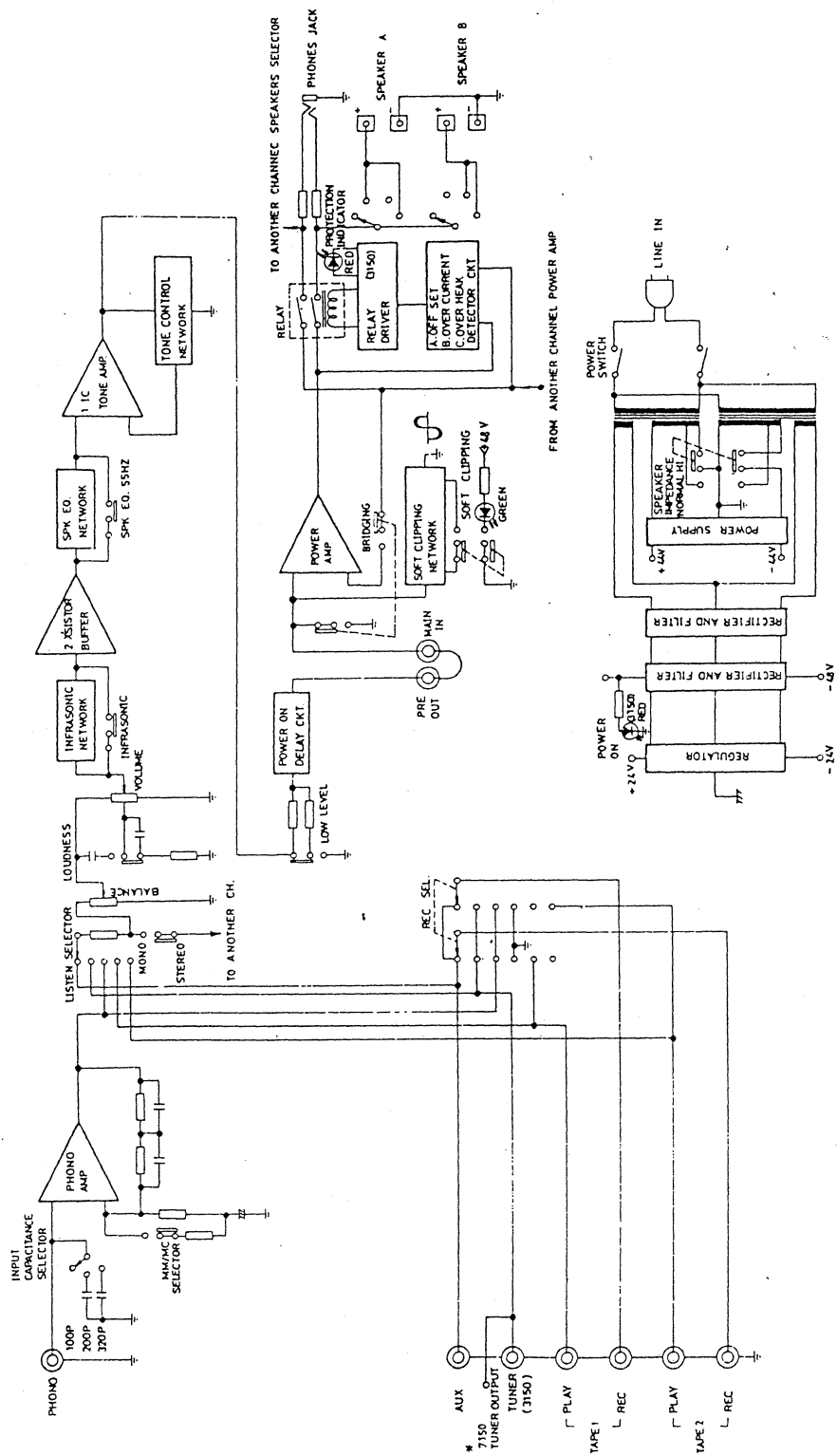
**3150**



**4150**



**7150**



# 2150/3150/4150/7150 ALIGNMENT PROCEDURE

## 2150 ADJUSTMENT

### DC OFF-SET ALIGNMENT

1. Set on the power for 5 minutes pre-heating.
2. For L (R) channel alignment: Connect probe of DC millivolt-meter to L (R) channel speaker terminals, then adjust VR-601 (VR-602) till the reading are closed to 0mV.

### IDLE CURRENT ALIGNMENT

1. Turn VR-603 to fully clockwise position and VR-604 to fully counter-clockwise position.
2. Set on the power for 5 minutes pre-heating.
3. Remove the load in speaker terminals.
4. Connect one probe of DC millivolt-meter to L (R) channel speaker terminal "+", the other to point TP1 (TP2) on main PCB foiling side, adjust VR-603 (VR-604) till the reading is between 4.4mv and 11mv.

## 3150/7150 (AUDIO) ALIGNMENT

### DC OFF-SET ALIGNMENT

1. Set on the power for 5 minutes pre-heating.
2. Set volume control to minimum position and speaker selector switch to "A+B" position.
3. For L (R) channel alignment: Connect probe of DC millivolt-meter to L (R) channel speaker terminals, then adjust VR-601 (VR-602) till the reading are closed to 0mV.

### IDLE CURRENT ALIGNMENT

1. Turn VR-603 to fully clockwise position and VR-604 to fully counter-clockwise position.
2. Set on the power for 5 minutes pre-heating.
3. Set volume control to minimum position and speaker selector switch to "A+B" position.
4. Remove the load on speaker terminals.
5. Connect one probe of DC millivolt-meter to L (R) channel speaker terminal "+", the other to point TP1 (TP2) on main PCB. Foiling side, adjust VR-603 (VR-604) till the reading is between 4.4mV and 11mV.

## 4150/7150 (TUNER) ALIGNMENT

1. FM MPX ALIGNMENT
  - a. Selector Switch in FM position
  - b. AC Line Voltage at Rated Voltage
  - c. Monitor OUTPUT at record OUTPUT
  - d. FM SG is external modulated by stereo SG and connected to FM 300 OHM antenna terminal on the rear panel through FM dummy antenna.

SECTION	Step	FM SG	Stereo Sg	Dial Setting	Indicator	Adjustment	Adjust For
MPX Pilot	1	98 MHz 0% Modulation	—	98 MHz	Connect frequency Counter To Pin TP1	VR201	76 kHz±50 Hz
	2	98 MHz	10% 19 kHz 90% L+R	98 MHz	—	VR201	Stereo LED Light

SECTION	Step	FM SG	Stereo Sg	Dial Setting	Indicator	Adjustment	Adjust For
	3	Repeat Step 1 and Step 2					
	4	IF there is an excessive difference between leak-free effect of both channels, slightly adjust VR202 So that the levels of signal leakage of both channels are equal.					
Stereo 50 dB quieting		98 MHz SG OUTPUT Level 30uV	10% 19 kHz pilot.0% L+R, L-R.	98 MHz	V.T.V.M or Oscilloscope	VR102	Just minimum OUTPUT

2. FM ALIGNMENT
  - a. Selector Switch in FM position
  - b. AC Line Voltage at Rated Voltage
  - c. Monitor OUTPUT at record OUTPUT

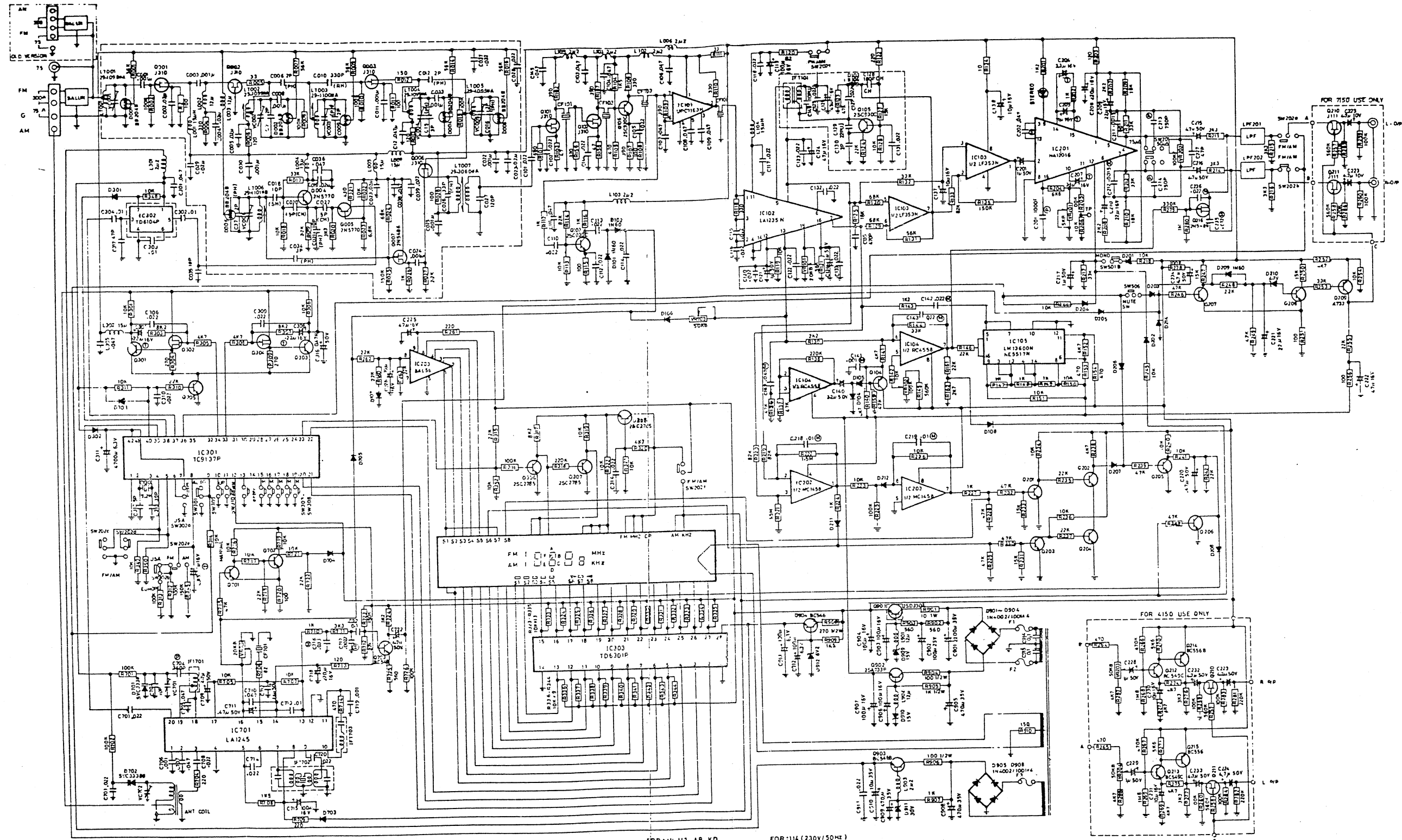
SECTION	FM SG			Dial Setting	Indicator	Adjustmer:	Adjust for
	Connection	Carrier	Mod.				
FM IF	—	—	—	point of non-interference	Digital Voltage Meter	IFT 101	to pin TP3 Voltage 0V
FM RF	Connect to FM 300 OHM antenna on the rear panel through FM Dummy Antenna.	90 MHz	100% Mod 400 Hz	90 MHz	Digital Voltage Meter	LT 606	Tuning Voltage 4.3v ±0.1v
		106MHz		106MHz		VC006	Tuning Voltage 18.7v±0.2v
		Repeat Step 1 and Step 2					
FM Sens		90 MHz	100% Mod	90 MHz	V.T.V.M Oscilloscope	LT001 to LT005	Maximum OUTPUT
		106MHz	400 Hz	106 MHz		VC001 to VT005	
		98 MHz		98 MHz		LT007	
Repeat Step 1.2 and Step 3							
FM Mute		Muting Push Switch "ON" Adjust attenuator of FM SG for Antenna Input 14dB					
		98 MHz	100% Mod 400 Hz	98 MHz	V.T.V.M Oscilloscope	VR 101	OUTPUT just disappear
		Increase FM SG OUTPUT 4dB more to get fully audio OUTPUT IF fully audio OUTPUT cannot get, repeat Step 1.2.3					

## 3. AM ALIGNMENT

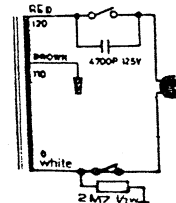
SECTION	AM SG			Dial Setting	Indicator	Adjustmer:	Adjust for
	Connection	Carrier	Mod.				
AM	Hot side of SG OUTPUT through	450kHz	30% Mod	450 kHz	V.T.V.M.	IFT 703	Maximum
AM Sens	Hot side of SG OUTPUT through a loop ANT radiate to AM ANT BAR vertically and keep 60cm distance.	600kHz	30% Mod 400Hz	600kHz	V.T.V.M or Oscilloscope	VC 701	Tuning Voltage 20.5V±0.2V
		1400kHz	30% Mod 400Hz	1400kHz		ANT BAR	Maximum OUTPUT
		Repeat Step 1 and Step 2					



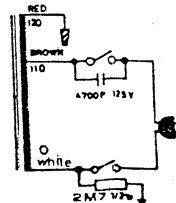
# 7150 TUNER / 4150 CIRCUIT DIAGRAM



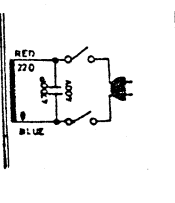
FOR: C1 (120V/60Hz)



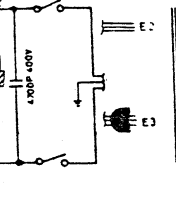
FOR: LC (110V/60Hz)



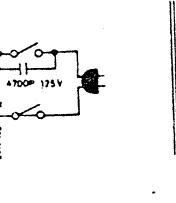
FOR: E1, ET (220V/50Hz)



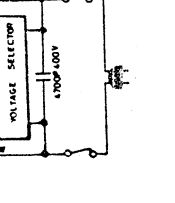
FOR: E2, E3 (240V/50Hz)



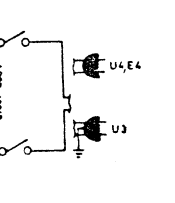
FOR: C2 (120V/60Hz)



FOR: U1, U2, AB, KD, (110, 120, 220 240V / 50, 60 Hz)

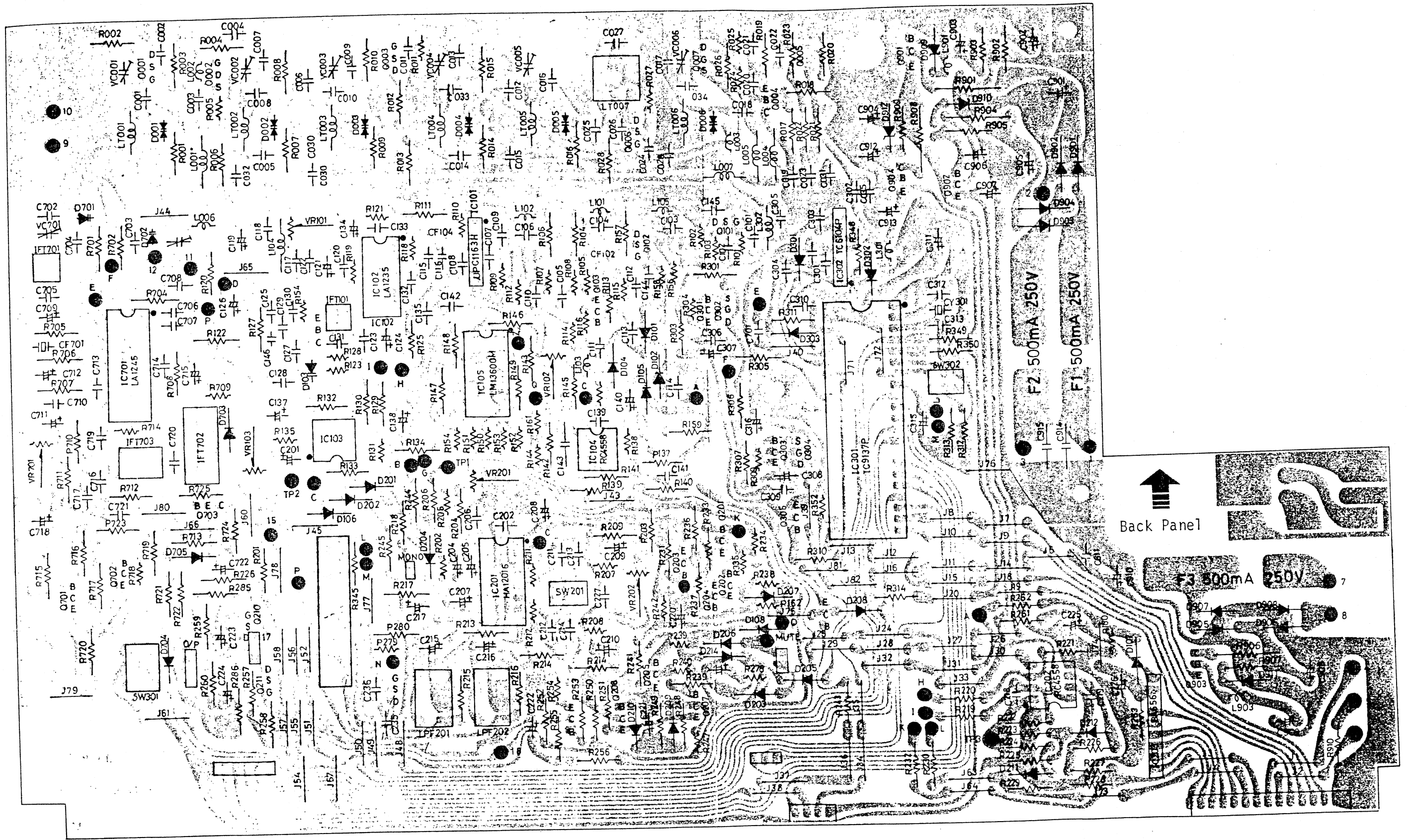


FOR: U4 (230V/50Hz) E4, U3 (220V/50Hz)



NOTE: ALL THE RESISTORS ARE 1/4 W CARBON FILM RESISTOR UNLESS OTHERWISE SPECIFIED.  
 2 ALL THE NPN TRANSISTORS ARE 75C11508 UNLESS OTHERWISE SPECIFIED.  
 3 ALL THE DIODES ARE 1N4148 UNLESS OTHERWISE SPECIFIED.  
 F1/F2/F3/F4 BAKING:  
 1 1500MA/350V FOR E1, E2, E3, E4, U2, U3, U4  
 2 300MA/250V FOR C1, C2, C3, AB, U1

# 7150 TUNER/4150 PCB PARTS LOCATION (BOTTOM VIEW)



# 3150 WIRING DIAGRAM

## PRIMARY SECTION

