

TWTA RF Amplifiers Varian

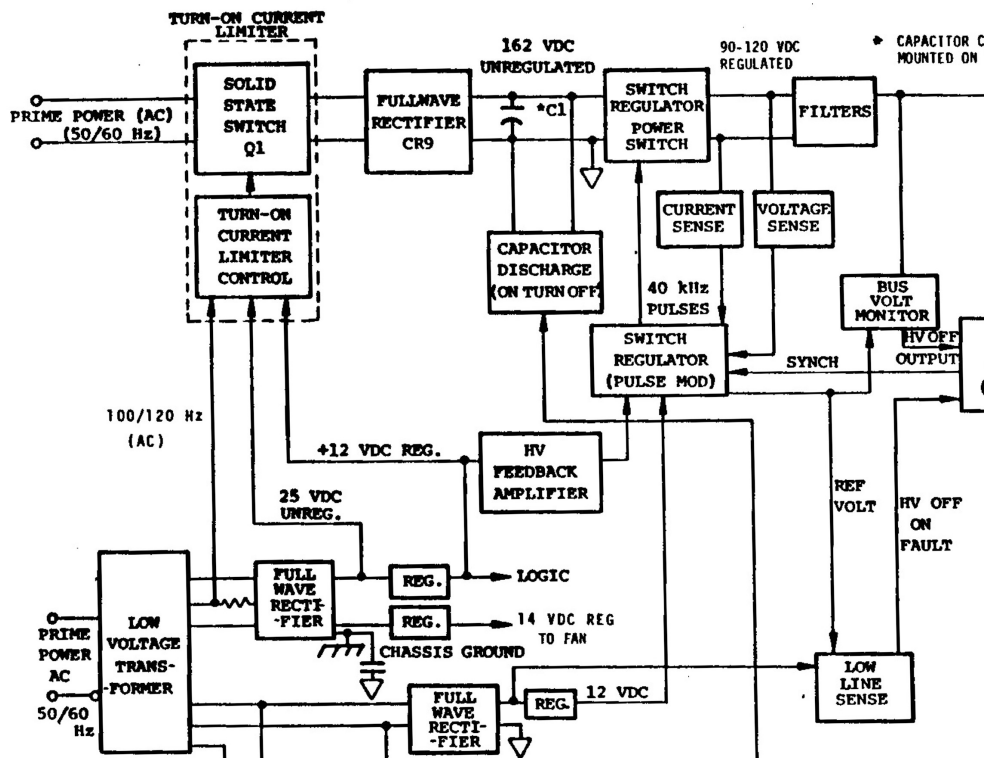
K-rack Varian TWT amplifiers were very popular units for GHz frequencies. These deliver an easy 40Watts although the official spec's were 20Watt.

I have seen various Ham's owning such a tube but failing documentation on the spec's or the powersupply. Particular the powersupply is a sophisticated part of the unit and worthwhile to study. It's a well designed unit, but need some explanation when failing. At least it's possible to test the powersupply without the high voltage part.

The K-rack is an universal powersupply rack, which can be configured with various TWT-tubes. An overview of the possible configurations is shown below.

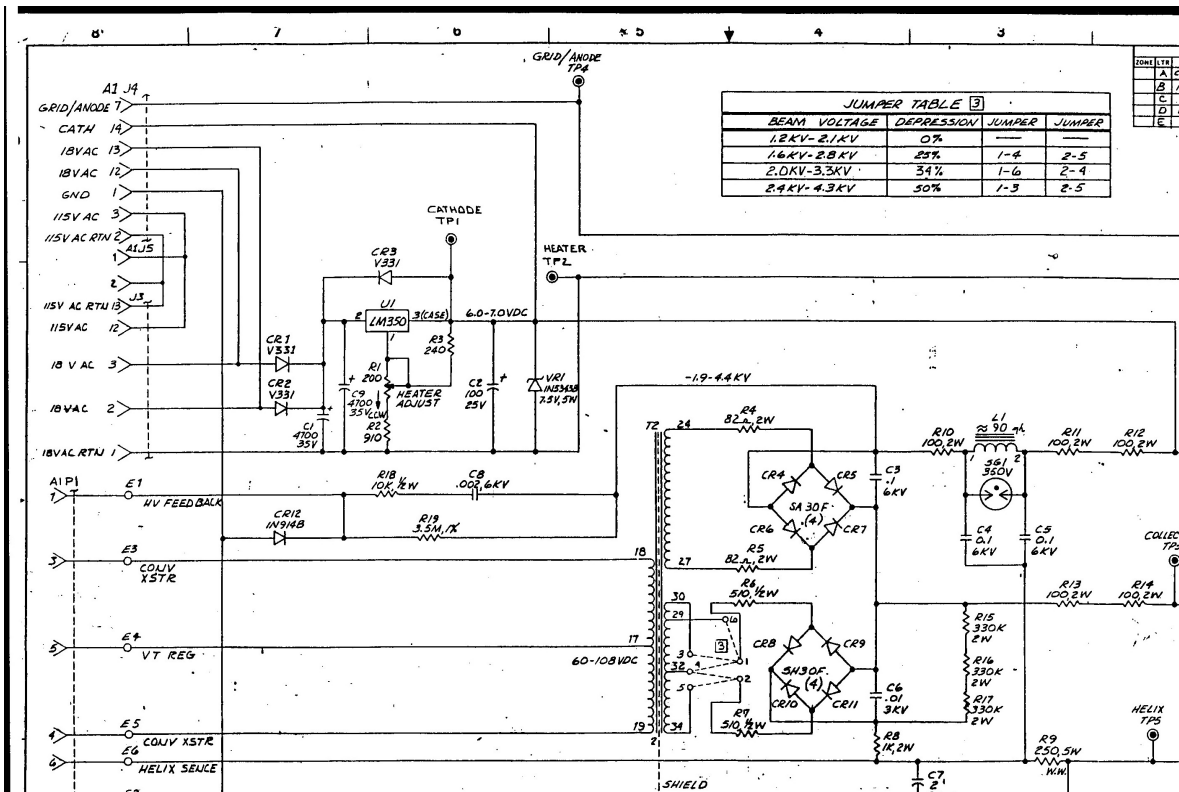
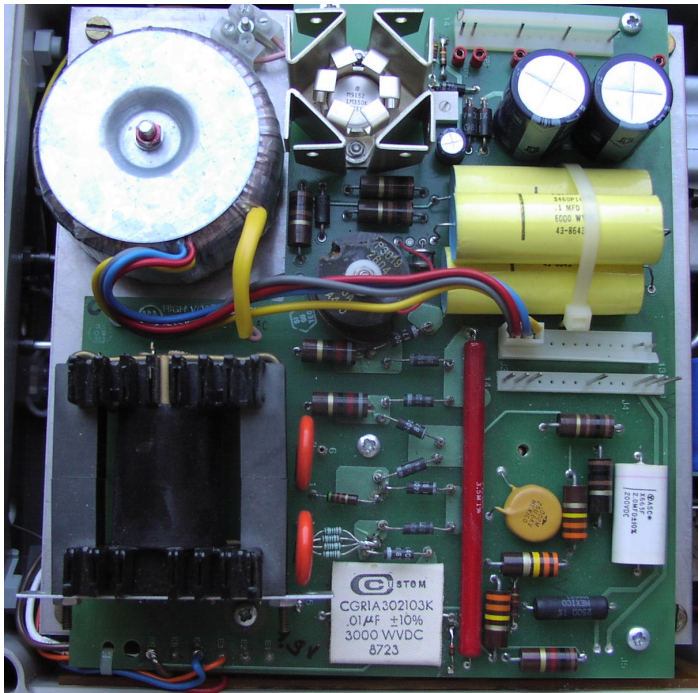
JUMPER TABLE				TABLE 1-1				
TWT TYPE	HELIX VOLTAGE ADJUSTMENT RANGE	COLL VOLTAGE	JUMPERS LOC/ JUMPER	LIST OF AVAILABLE TUBE TYPES and THE ASSOCIATED TWTA MODEL NUMBER				
VTL-6140B1	1.2 - 2.9 kV	99% of Helix	None	VZS-6950K7	VTS-6055A1	10	2.0 - 4.0	N GA
VTS-6150B1	Helix		None	VZH-6970K7	VTH-6079H1	10	4.0 - 10.0	
VTS-6150J1			None	VZX-6980K8	VTX-6089H3	10	8.0 - 12.4	
VTU-6090H1			None		VTU-6195C2			
VTU-6090A1			None		VTU-6195R1			
VTS-6055A1	1.6 - .0 kV	65% of Helix	1 to 3	VZL-6941K7	VTL-6140B1	20	1.0 - 2.0	
VTH-6079H1	Helix		1 to 3	VZS-6951K7	VTS-6150B1	20	2.0 - 4.0	
VTC-6166J1			1 to 3	VZS-6951K8	VTS-6150J1	20	2.0 - 4.0	
VTH-6079H6			1 to 3	VZC-6961K7	VTC-6166B1	20	4.0 - 8.0	
VTC-6166B1			1 to 3	VZC-6961K8	VTC-6166J1	20	4.0 - 8.0	
VTX-6089H3	2.0 - 3.6 kV	65% of Helix	1 to 3	VZC-6961K9	VTH-6079HX	20 *	4.0 - 8.0	
VTX-6186B1	2.4 - 4.3 kV	48% of Helix	1 to 3		VTH-6166B1			
VTM-6196B1			1 to 3	VZX-6981K7	VTX-6186B1	20	8.0 - 12.4	
					VTU-6195C2			
					VTU-6195R1			
				VZU-6991K7	VTU-6196B2	20	12.0- 18.0	

The powerprocessor part of the K-rack is shown below.

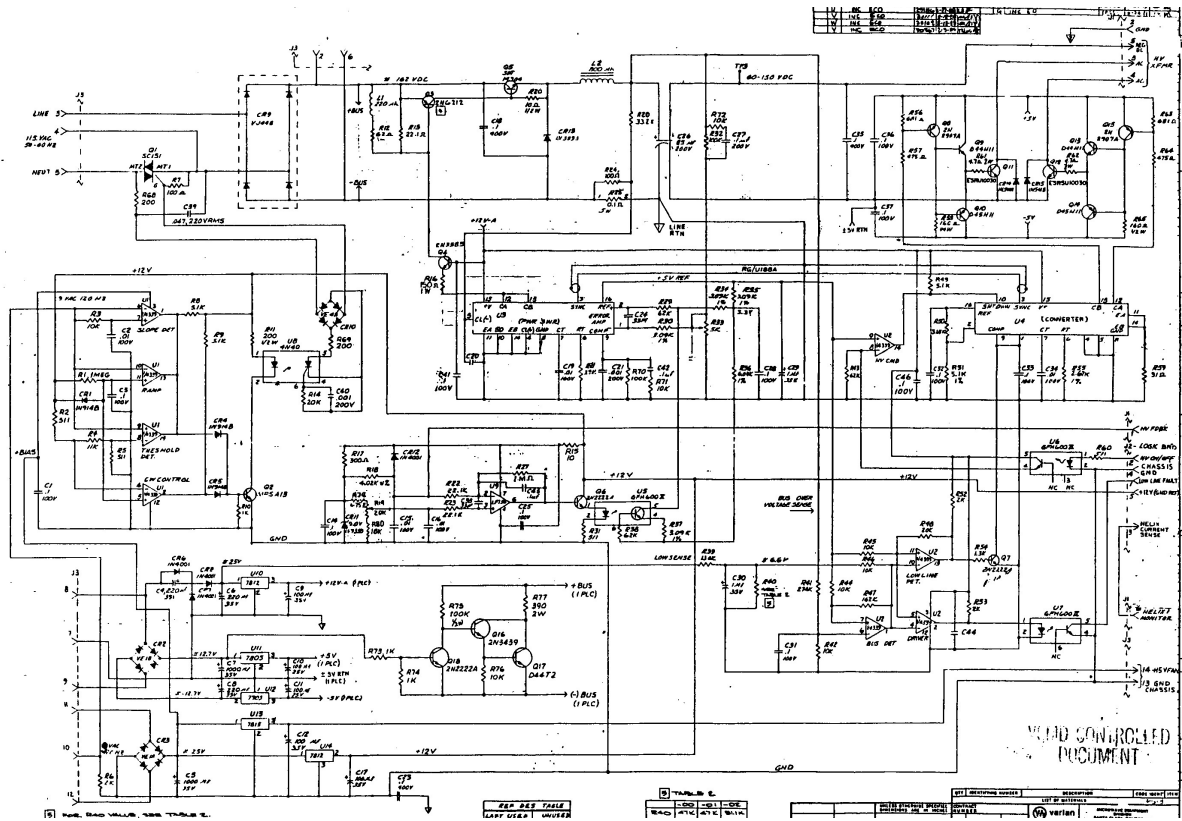


Depending on the TWT-tube installed the High Voltage section needs to be strapped accordingly the table information.

Below the topview of the High Voltage PCB and diagram



The powerprocessor section of the powersupply is a quite complex system as shown in below diagrams. The complete description can be found in the Varian-TWTA-PSU document. With the help of this document it will be more easier to understand the function and how to repair such board.



Powersupply section.

The fault logic section is shown below.

