DESCRIPTION AND RATING

KLYSTRON

GL-6237 GL-6238 GL-6239 GL-6240 GL-6241 GL-6242

Tube Type	Frequency Range Megacycles	Television Channel Coverage
GL-6237	470 - 530	14 - 23
GL-6238	530 - 590	24 - 33
GL-6239	590 - 656	34 - 44
GL-6240	656 - 728	45 - 56
GL-6241	728 - 806	57 - 69
GL-6242	806 - 890	70 - 83

These tubes are three-resonator tunable klystrons for use as radio-frequency amplifiers. They cover the UHF television band, 470 to 890 megacycles, and each type will provide 12 kilowatts of power output at synchronizing peak level with a power gain of approximately 200 in broadband visual-amplifier service. Broadband operation is obtained by stagger-tuning the input and output resonators on the low side of the center frequency and the center resonator on the high side.

The tubes have unipotential tantalum disk-type cathodes heated by bombardment, collectors capable of dissipating 51 kilowatts, and require electro-magnetic focusing of the electron beam. The cathode seals and the output seals are forced-air cooled; the drift tubes and the collectors are water cooled. There will be two basic resonator diameters for the six types.

PRELIMINARY TECHNICAL INFORMATION

GENERAL

Electrical

	Bogey	Maximum	
Heater Voltage *	6.3		Volts
Heater Starting Voltage	8		
Heater Current at 6.3 Volts	38		Amperes
Heater Current at 8 Volts	55		
Heater Starting Current		100	Amperes
Heater Cold Resistance	0.017		
Cathode Bombarder Voltage	2.4	3	Kilovolts
Cathode Bombarder Current	460	550	Milliamperes
Cathode Bombarder Input		1200	Watts
Cathode Heating Time †	3		Minutes
Magnetic Field, approximate range ‡	300 to 400		Gausses

Mechanical

Mounting Position - Vertical-Collector End Up		
Water Flow		
Collector	15 Min	Gallons per Minute
Pressure Drop at Rated Flow, approximate	65	Pounds per Square Inch
Drift Tubes	2 Min	Gallons per Minute
Pressure Drop at Rated Flow, approximate	65	Pounds per Square Inch
Water Pressure	80 Max	Pounds per Square Inch
Outlet Water Temperature	70 Max	C
Air Flow		
Cathode and Heater Seals	300 Min	Cubic Feet per Minute
Output Seals	15 Min	Cubic Feet per Minute
Glass Temperature	150 Max	C
Maximum Over-all Length, approximate	4 1/2 to 5	Feet
Maximum Over-all Diameter	21 1/2	Inches
Net Weight, approximate §	180 to 280	Pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Radio-frequency Amplifier - Broadband Television Service
Synchronizing-level conditions per tube unless otherwise specified

Maximum Ratings, Absolute Values		
D-c Beam Voltage	18 Max	Kilovolts
D-c Beam Current	3.25 Max	Amperes
Collector Dissipation	51 Max	Kilowatts
Drift Tube Collection Current	250 Max	Milliamperes
Driving Power	150 Max	Watts
Typical Operation - Bandwidth 6 Megacycles		
D-c Beam Voltage	17	Kilovolts
D-c Beam Current Δ	2.5 to 3	Amperes
Driving Power		
Synchronizing Level	60	Watts
Pedestal Level	33.7	Watts
Power Output		
Saturation Level π	15	Kilowatts
Synchronizing Level	12	Kilowatts
Pedestal Level	6.72	Kilowatts

* The bogey value is the approximate value of bombarder heater voltage required to furnish just sufficient bombarder current which with a bombarder voltage of 2400 volts maintains the main cathode at an operating temperature adequate to furnish a beam current of 3 amperes. To avoid excessively long cathode-heating time the heater voltage should be started at approximately 8 volts and gradually reduced to the normal operating value as the cathode reaches the proper operating temperature. Voltage stability of the heater and bombarder supplies is important to prevent fluctuation in beam current.

† Approximate time required to permit normal operation. Beam voltage may be applied earlier.

‡ The magnetic field required will vary with the type and the channel to which the tube is tuned. It ranges between 300 and 400 gausses. Three independently regulated electromagnets around the body assembly and one around the cathode structure are required for proper electron-beam focusing. Details regarding the design and positioning of these magnets will be found in the Installation and Operation Instructions.

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Approximate Weights

GL-6237	280	Pounds
GL-6238	280	Pounds
GL-6239	280	Pounds
GL-6240	180	Pounds
GL-6241	180	Pounds
GL-6242	180	Pounds

Δ The amount of beam current for a given beam voltage and power output will be approximately 2.5 amperes for the GL-6237 and will range up to 3 amperes for the GL-6242 since efficiency decreases somewhat at the higher frequencies.

π Saturation power level is the maximum radio-frequency power level which the tube will deliver for a given beam input power. Under operating conditions for a 15-kilowatt saturation level, the power output versus driving power characteristic is linear enough to permit application in video television up to a 12-kilowatt synchronizing peak level with a moderate amount of synchronizing peak pre-emphasis in the driver stage.

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