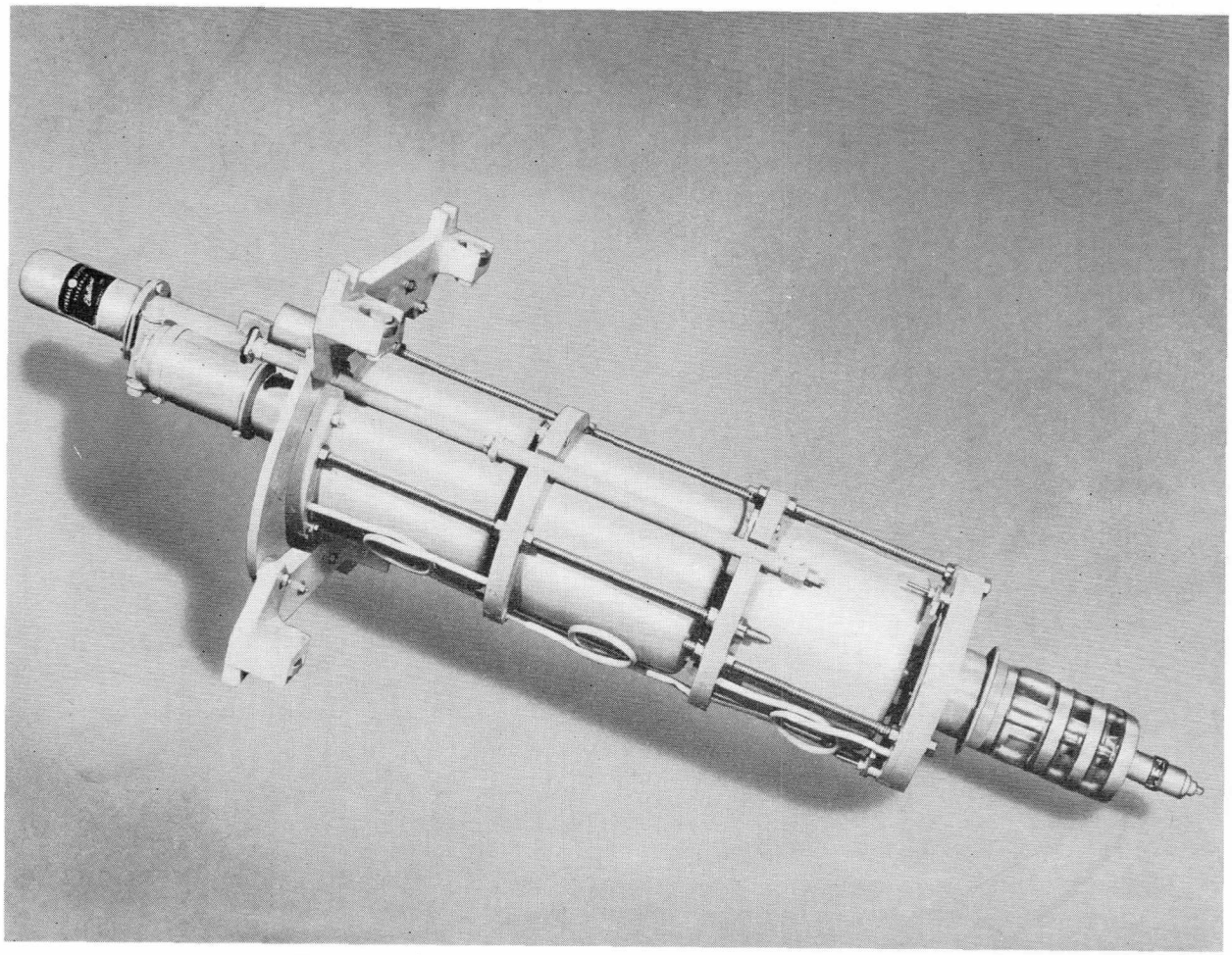


KLYSTRON

12-KILOWATT UHF TELEVISION OUTPUT
VISUAL-AMPLIFIER SERVICE
BROADBAND OPERATION

WATER- AND FORCED-AIR-COOLED
ELECTROMAGNETIC FOCUSING
GAIN IN EXCESS OF 200

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 minimum power gain of 200 in broadband visual-amplifier service. Broadband operation is obtained by tuning the input and output resonators to the visual carrier frequency and detuning the center resonator above visual carrier by an amount sufficient to give the desired breadth of response.

The tubes have unipotential tantalum disk-type cathodes heated by bombardment, collectors capable of dissipating 51 kilowatts, and require electromagnetic 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 are two basic resonator diameters for the six types.

Tube Type	Frequency Range Megacycles	Television Channel Coverage
GL-6237	470–530	14–23
GL-6238	530–584	24–32
GL-6239	584–656	33–44
GL-6240	656–722	45–55
GL-6241	722–806	56–69
GL-6242	806–890	70–83

GENERAL ELECTRIC

Supersedes ET-T1116 dated 10-55

TECHNICAL INFORMATION

GENERAL

Electrical	**Bogey**	**Maximum**	
Heater Voltage*	5.5	....	Volts
Heater Starting Voltage	8	....	Volts
Heater Current at 5.5 Volts	35	....	Amperes
Heater Current at 8 Volts	55	....	Amperes
Heater Starting Current	....	100	Amperes
Heater Cold Resistance	0.017	....	Ohms
Cathode Bombarder Voltage	....	3	Kilovolts
Cathode Bombarder Current	....	550	Milliamperes
Cathode Bombarder Input†	....	1500	Watts
Cathode Heating Time‡	3	....	Minutes
Magnetic Field, approximate range§	300 to 500	....	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	4½ to 5		Feet
Maximum Over-All Diameter	21½		Inches
Net Weight, approximate//	180 to 280		Pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

RADIO-FREQUENCY AMPLIFIER—BROADBAND TELEVISION SERVICE

Synch-onizing-Level Conditions Per Tube Unless Otherwise Specified

Maximum Ratings, Absolute Values

DC Beam Voltage	18	Max	Kilovolts
DC Beam Currentπ	3	Max	Amperes
Beam Input	51	Max	Kilowatts
Collector Dissipation	51	Max	Kilowatts
Drift Tube Collection Current	250	Max	Milliamperes
Driving Power	150	Max	Watts

Typical Operation—Bandwidth 6 Megacycles

DC Beam Voltage	17.5	Kilovolts
DC Beam Currentπ	2.75	Amperes
Driving Power**		
Synchronizing Level	25	Watts
Pedestal Level	12	Watts
Power Output		
Saturation Level△	15	Kilowatts
Synchronizing Level	12	Kilowatts
Pedestal Level	6.75	Kilowatts

RADIO-FREQUENCY AMPLIFIER—FREQUENCY MODULATION OR TELEVISION SERVICE

Key-Down Conditions per Tube Without Amplitude Modulation

Maximum Ratings, Absolute Values

DC Beam Voltage	18	Max	Kilovolts
DC Beam Currentπ	3	Max	Amperes
Beam Input	51	Max	Kilowatts
Collector Dissipation	51	Max	Kilowatts
Drift Tube Collection Current	250	Max	Milliamperes
Driving Power	150	Max	Watts
Power Output	12	Max	Kilowatts

TECHNICAL INFORMATION (CONT'D)

RADIO-FREQUENCY AMPLIFIER—FREQUENCY MODULATION OR TELEVISION SERVICE (CONT'D)

Key-Down Conditions Per Tube Without Amplitude Modulation

Typical Operation

DC Beam Voltage	17	14	Kilovolts
DC Beam Current π	2.3	1.8	Amperes
Drift Tube Collection Current	150	100	Milliamperes
Driving Power**	10	6	Watts
Power Output	12	7	Kilowatts

* The bogey value is the approximate value of heater voltage required to furnish just sufficient bombarder current which with a bombarder voltage of 2500 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 may be started at approximately 8 volts and gradually reduced to the normal operating value as the cathode reaches the proper operating temperature. Automatic regulation of the heater supply is required to maintain stable cathode temperature and beam current. Specific recommendations regarding the regulating circuit will be found in the Installation and Operation Instructions.

† If an unfiltered bombarder supply is used, an appropriate correction factor must be determined and applied to d-c meter readings in computing actual power.

‡ 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 500 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.

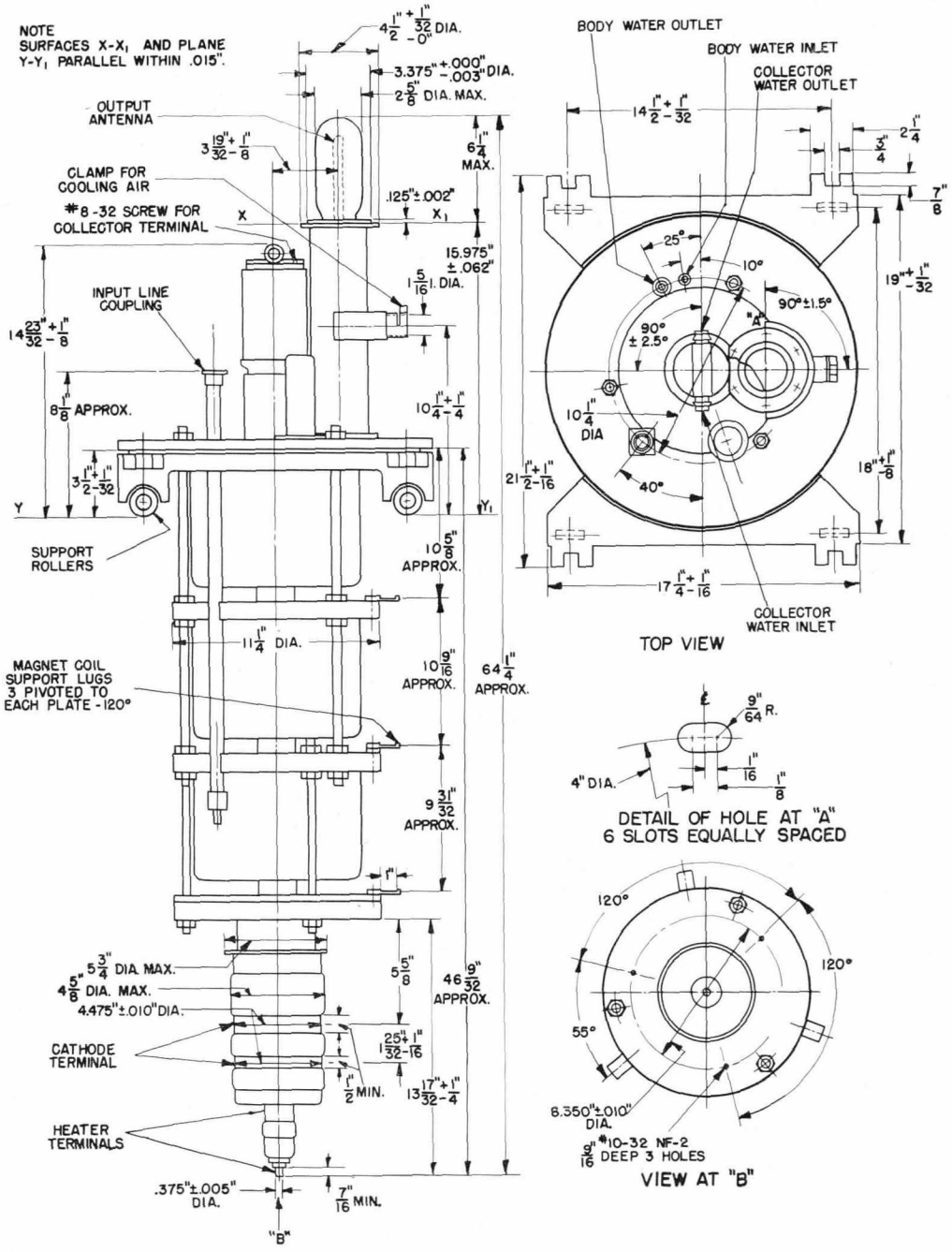
// **Approximate Weights**

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

π Includes both collector current and drift-tube collection current.

**Approximate driving power required at the input terminals of the klystron. Additional driving power should be provided to take care of circuit losses and any isolating attenuation used between driver and klystron.

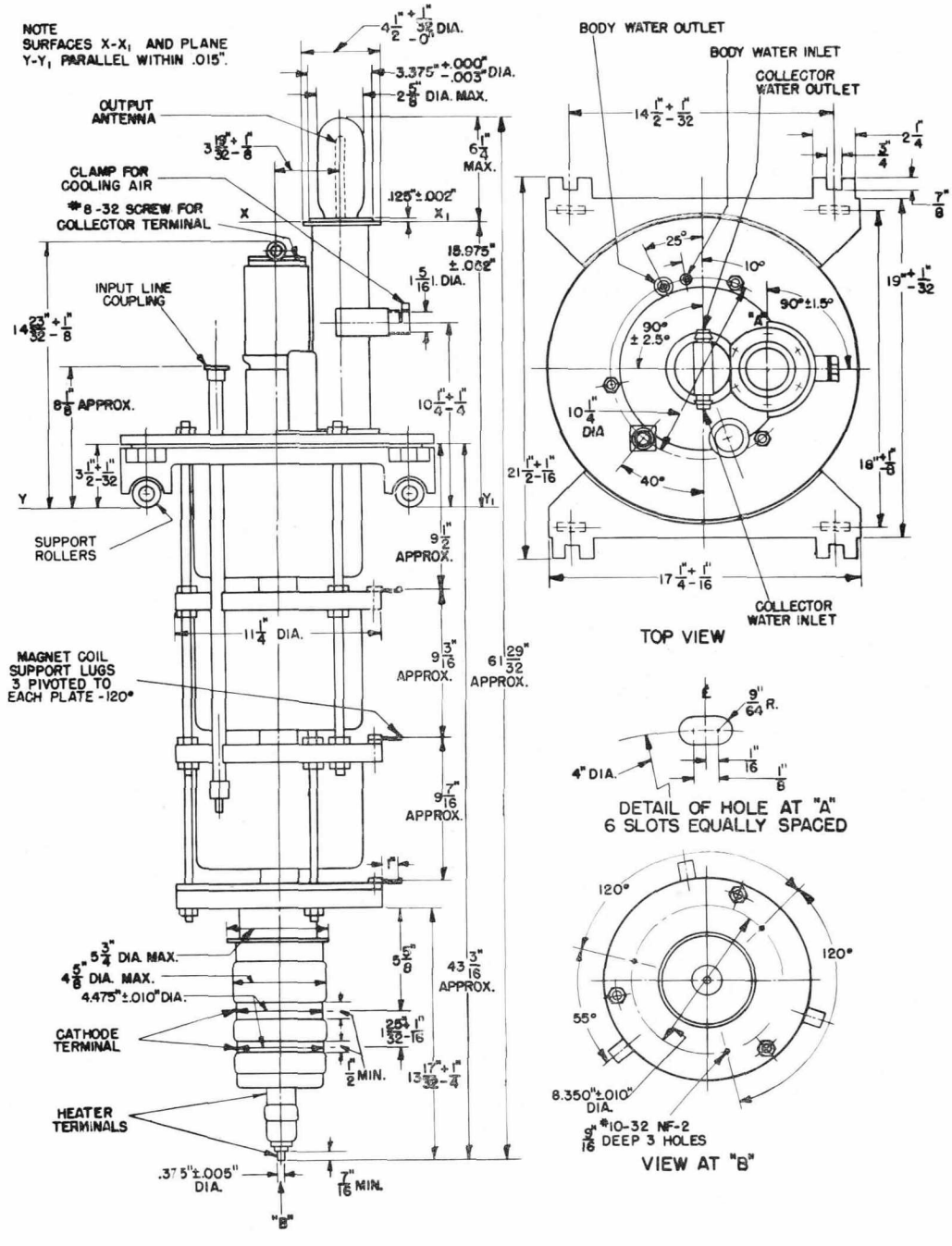
△Saturation power level is the maximum radio-frequency power level which the tube will deliver for a given beam input power. Under operating conditions for a 15-kilowatt saturation level, the power-output versus driving-power characteristic is linear enough to permit application in video television up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



OUTLINE GL-6237

N 20603AZ

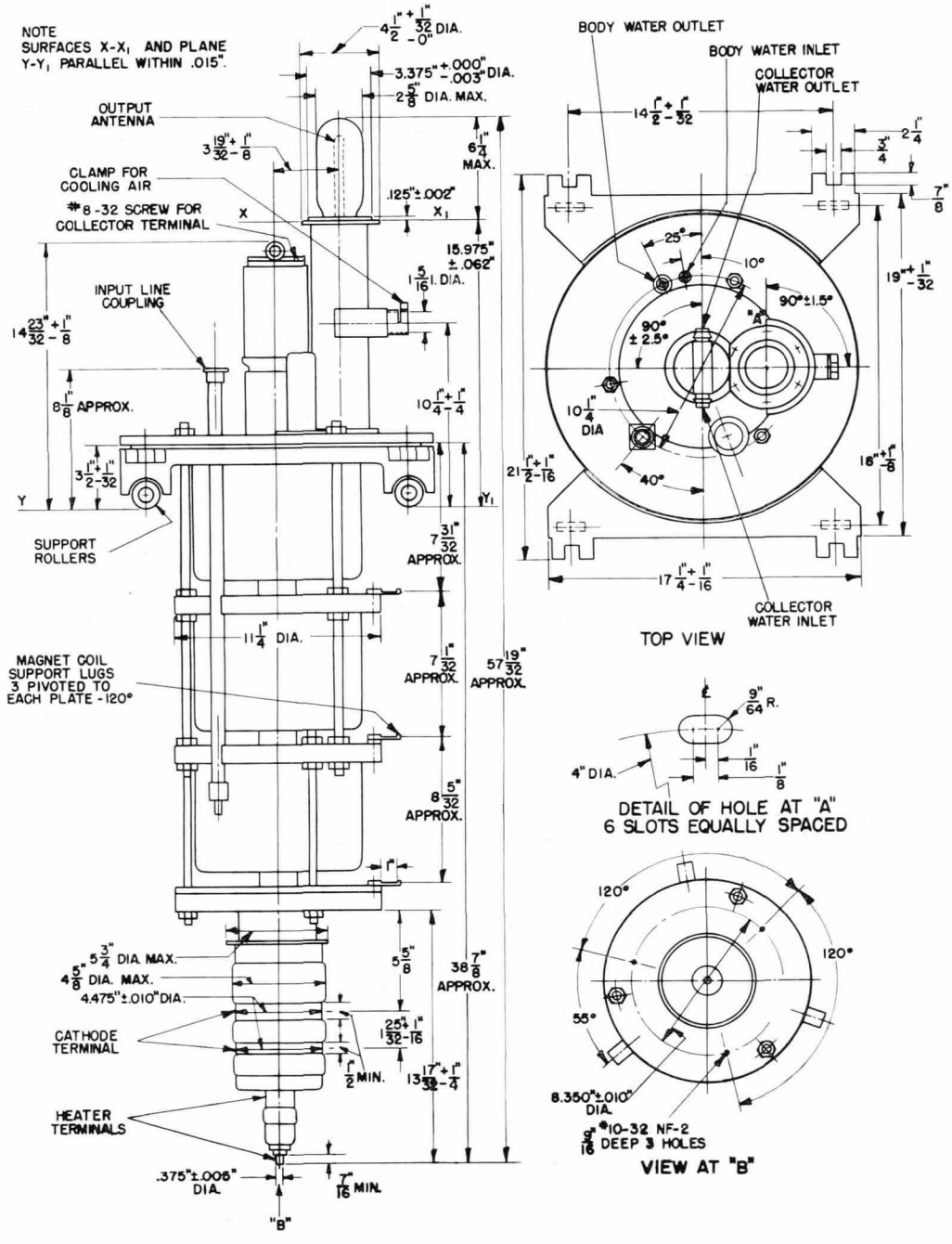
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OUTLINE GL-6238

N-20604AZ

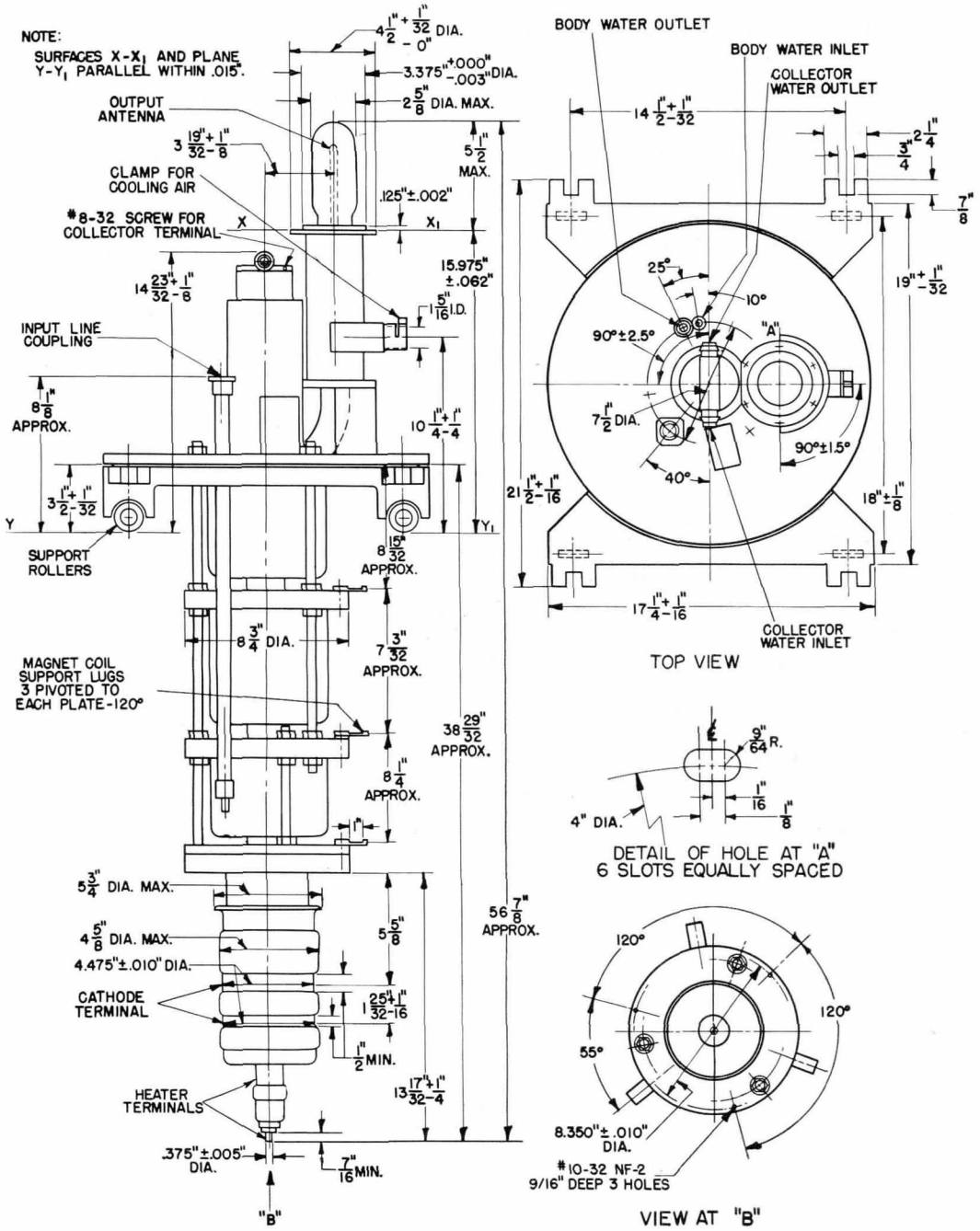
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OUTLINE GL-6239

N-20605AZ

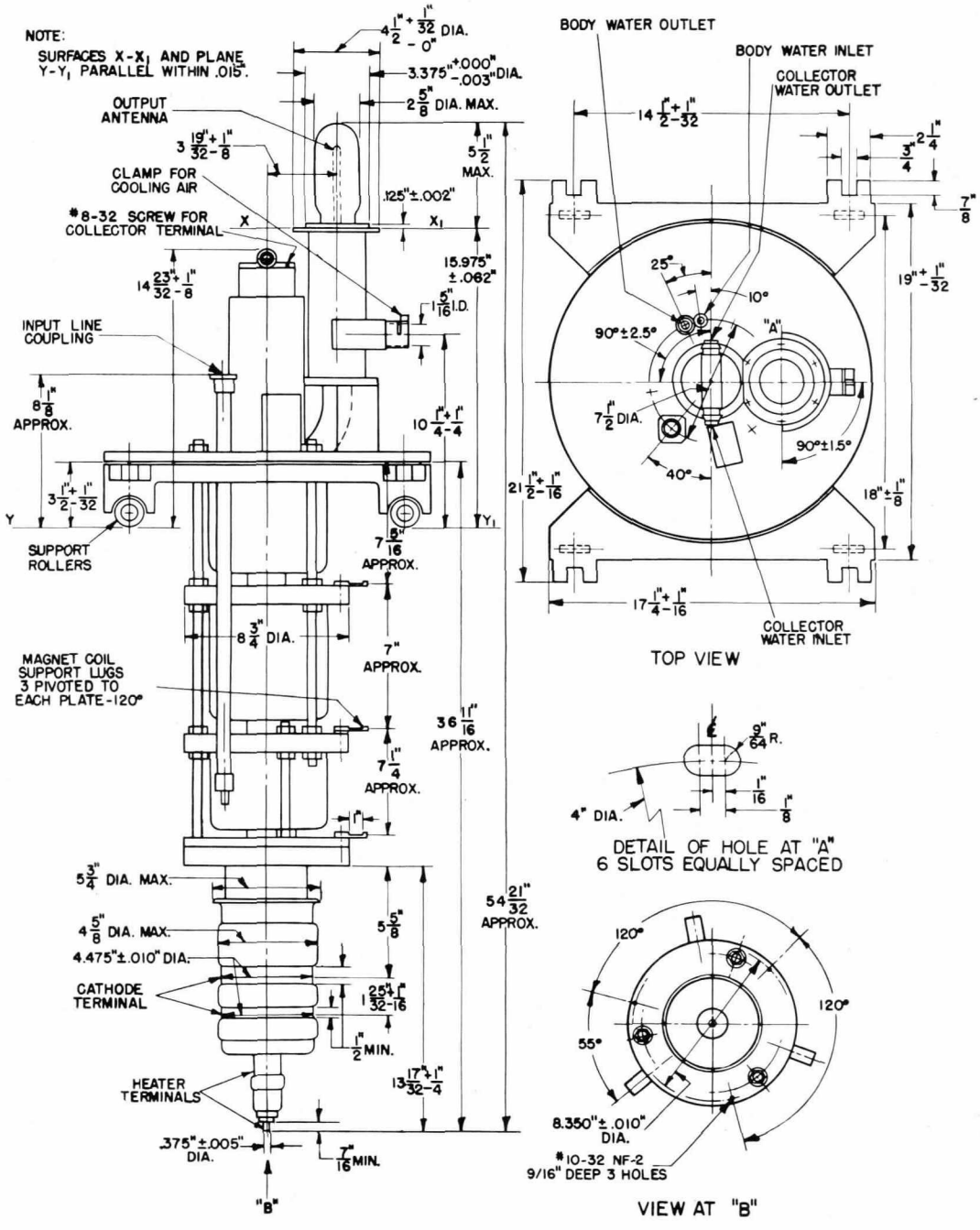
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OUTLINE GL-6240

N-20601AZ

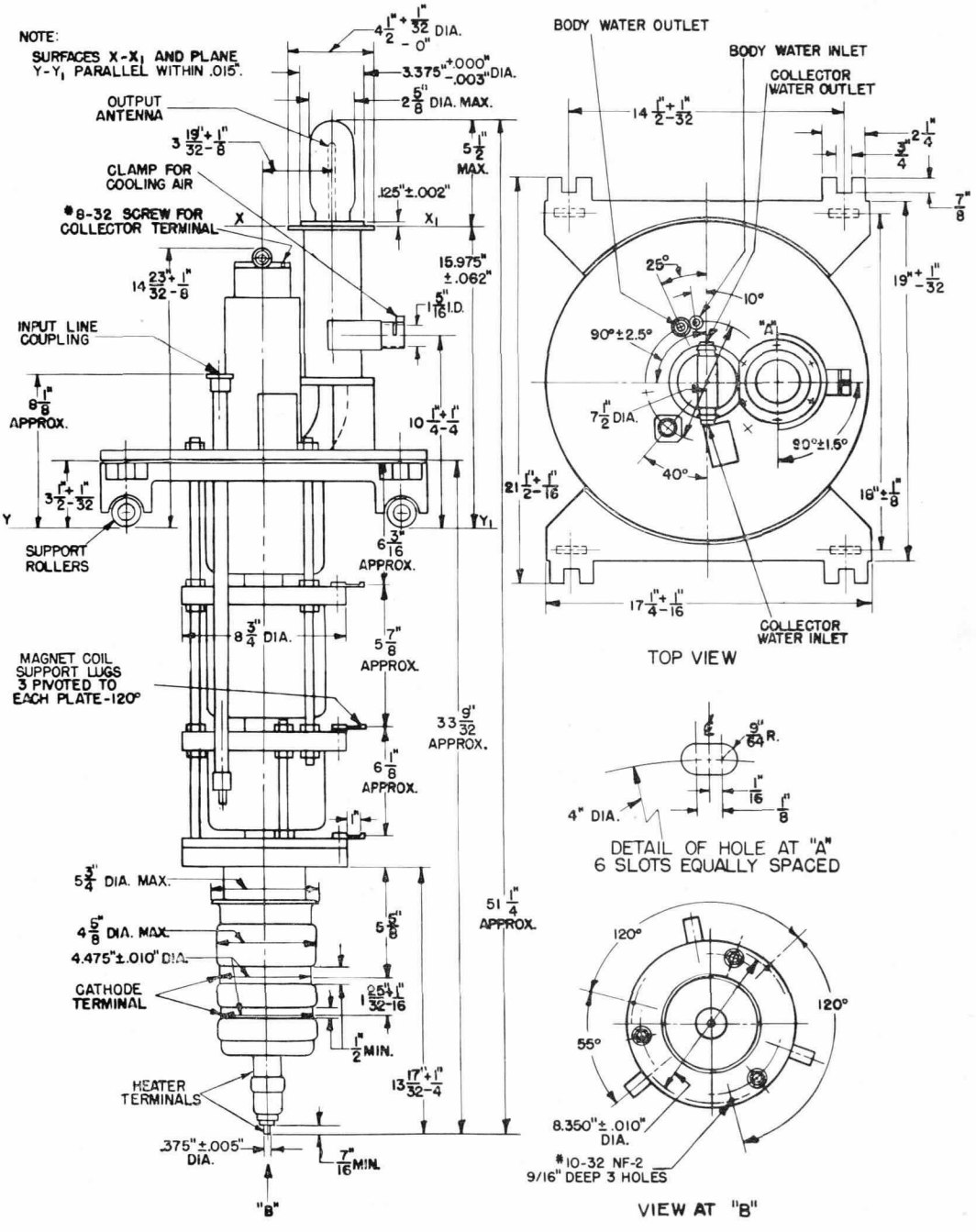
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OUTLINE GL-6241

N-20600AZ

3-27-59



OUTLINE GL-6242

ELECTRONIC COMPONENTS DIVISION

GENERAL ELECTRIC

Schenectady 5, N. Y.

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