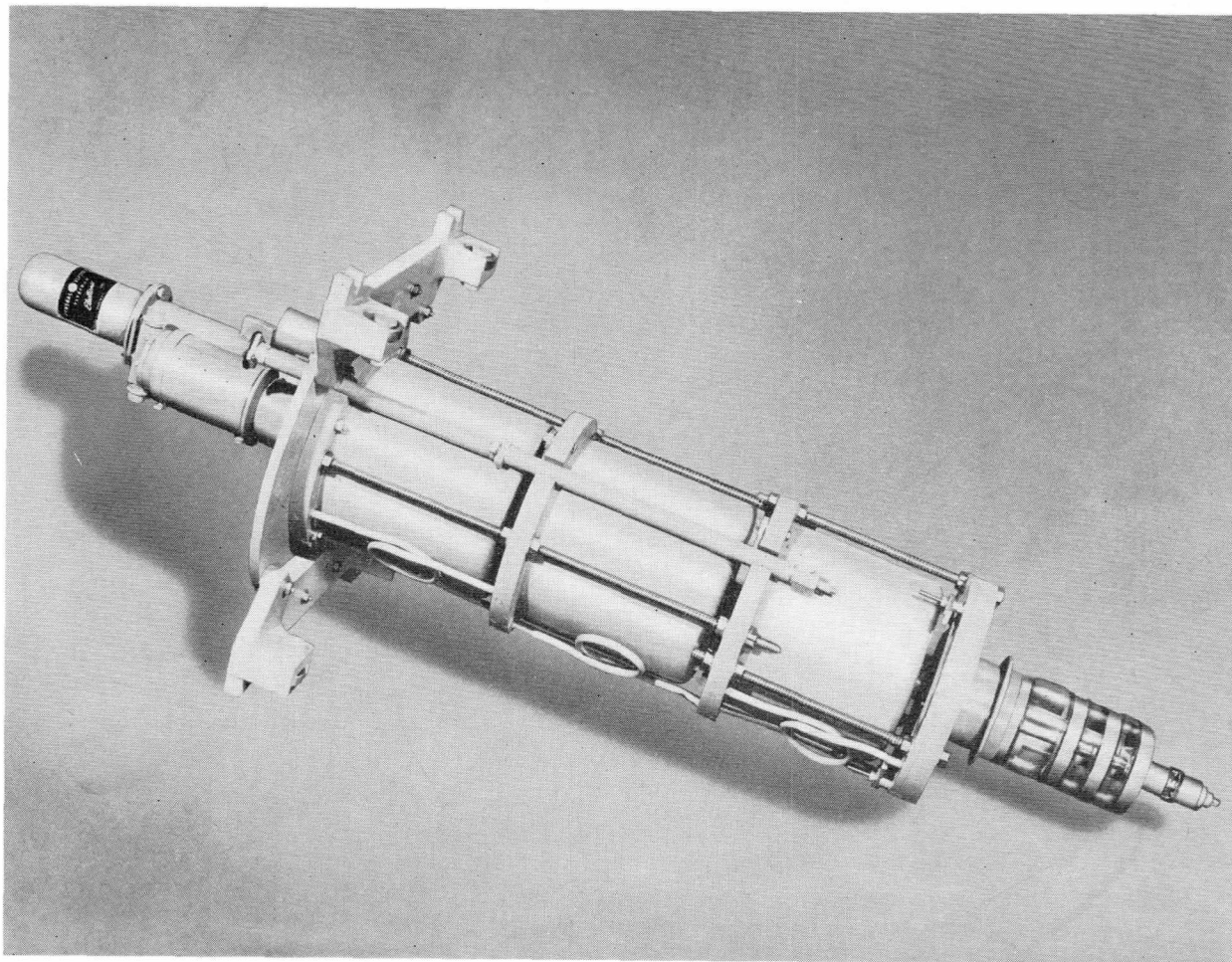




## KLYSTRON

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

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

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

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<br>Megacycles | Television Channel<br>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                |
| <b>Mechanical</b>                            |            |         |                        |
| 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

Synchronizing-Level Conditions Per Tube Unless Otherwise Specified

## Maximum Ratings, Absolute Values

|                               |     |     |              |
|-------------------------------|-----|-----|--------------|
| DC Beam Voltage               | 18  | Max | Kilovolts    |
| DC Beam Current $\pi$         | 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 Current $\pi$     | 2.75 |  | Amperes   |
| Driving Power**           |      |  |           |
| Synchronizing Level       | 25   |  | Watts     |
| Pedestal Level            | 12   |  | Watts     |
| Power Output              |      |  |           |
| Saturation Level $\Delta$ | 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 Current $\pi$         | 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 $\pi$ .....        | 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 gauss. 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.

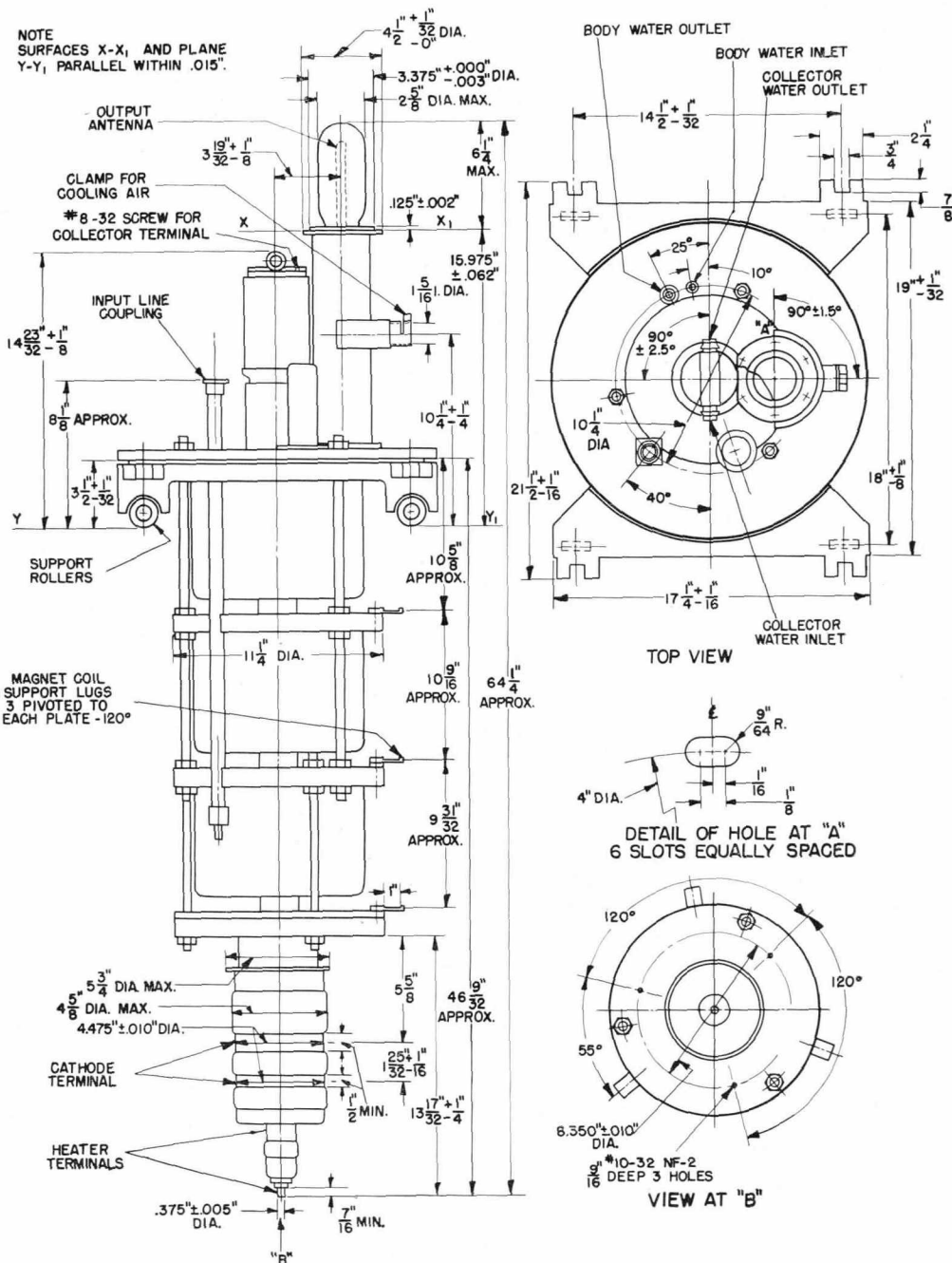
## // Approximate Weights

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

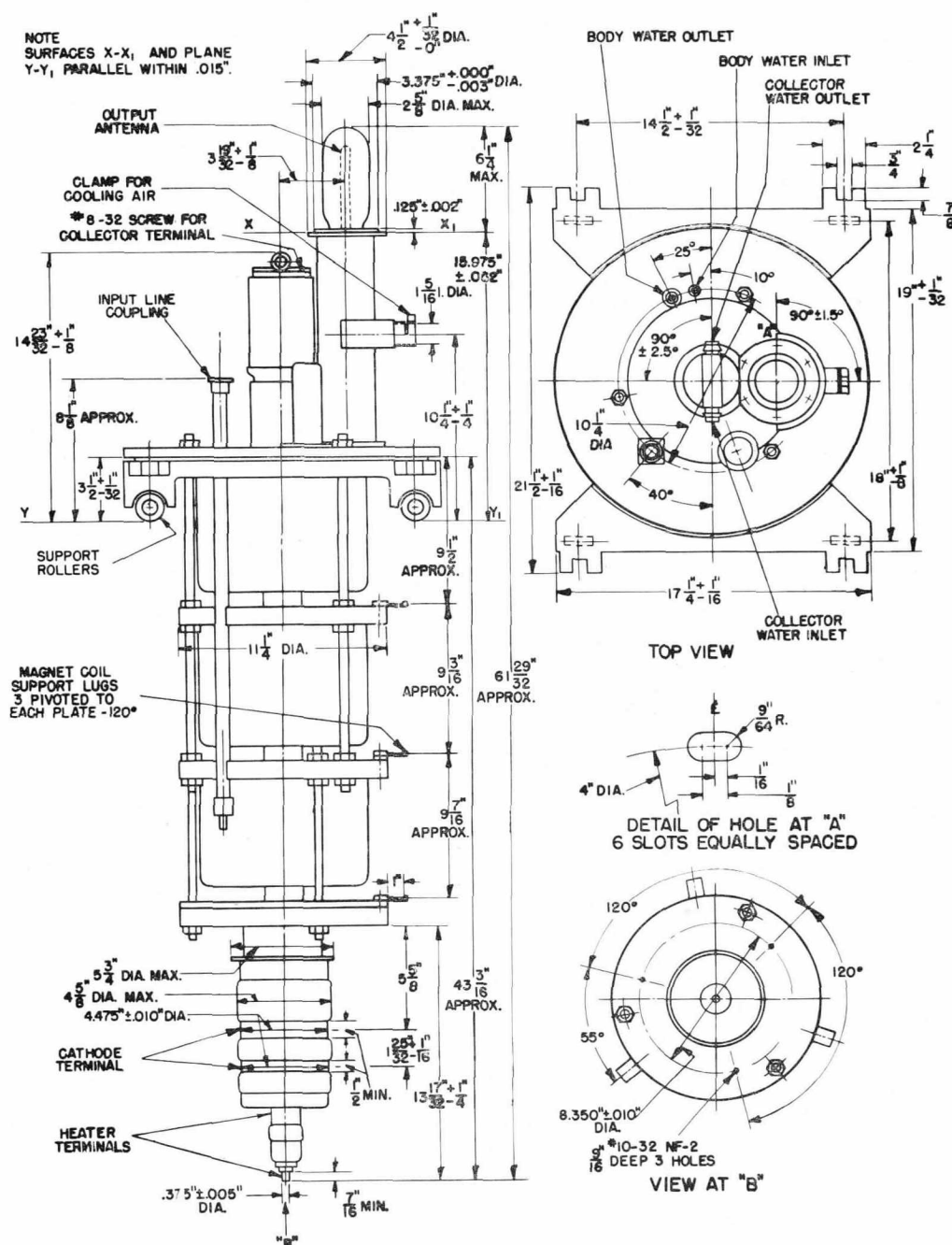
$\pi$  Includes both collector current and drift-tube collection current.

\*\* 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.

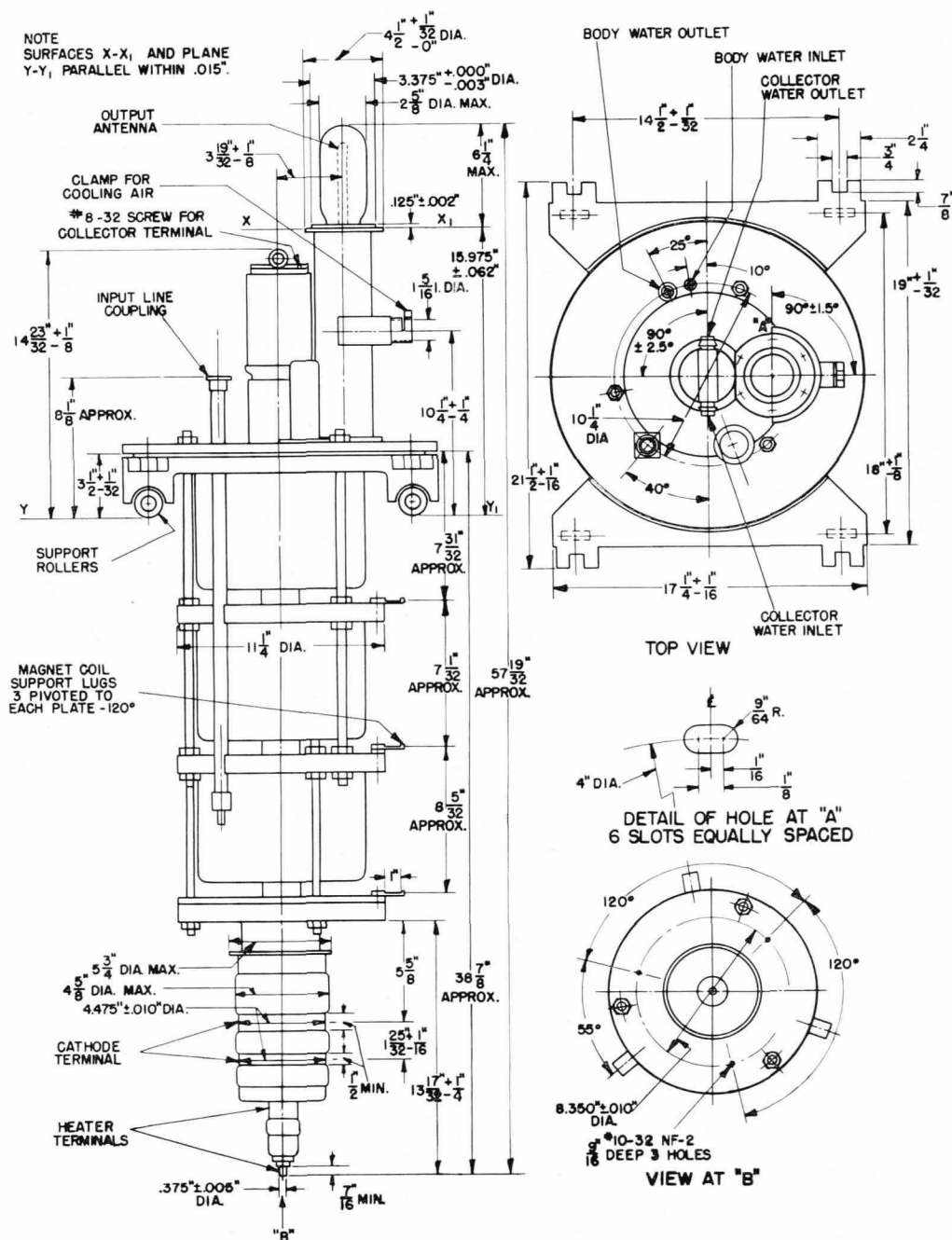
△ Saturation power level is the maximum radio-frequency power level which the tube will deliver for a given beam input power. Under operating conditions for a 15-kilowatt saturation level, the power-output versus driving-power characteristic is linear enough to permit application in video television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



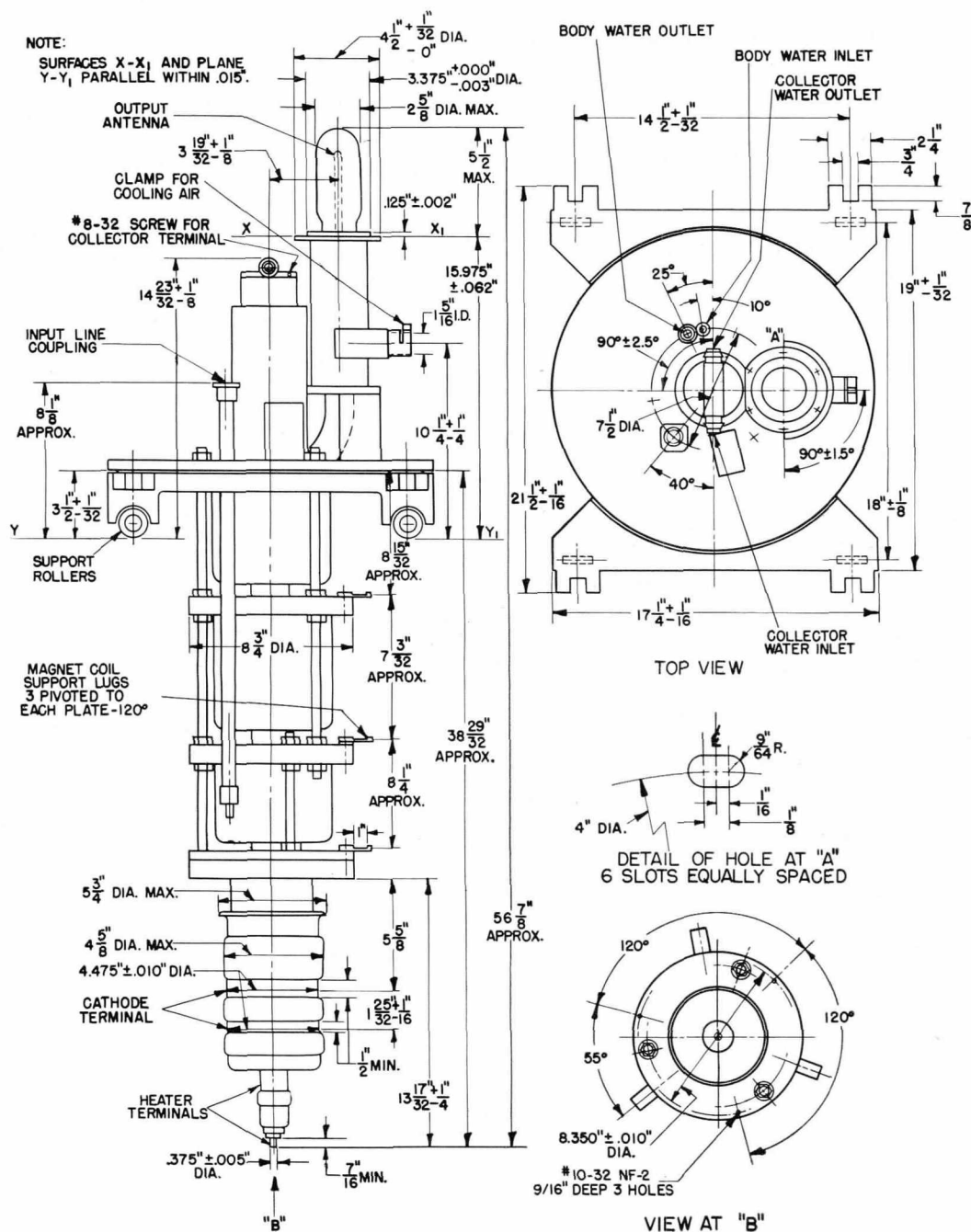
OUTLINE GL-6237



OUTLINE GL-6238



OUTLINE GL-6239



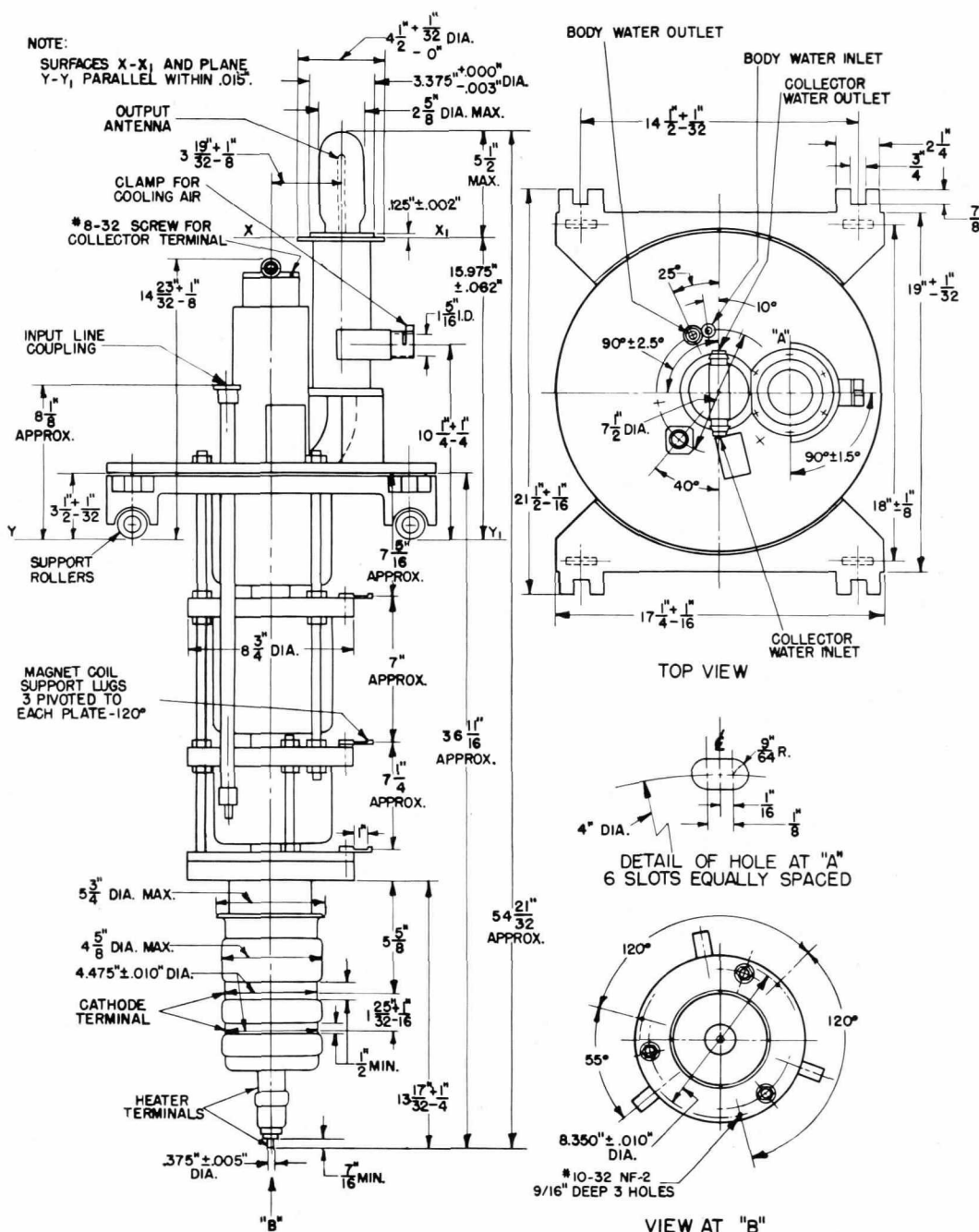
OUTLINE GL-6240

# GL-6237-GL-6242

ET-T1116A

PAGE 8

5-59



OUTLINE GL-6241



ELECTRONIC COMPONENTS DIVISION  
**GENERAL  ELECTRIC**  
Schenectady 5, N. Y.