RAYTHEON

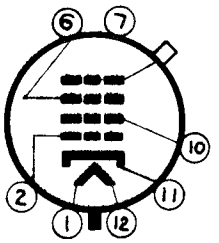
TECHNICAL INFORMATION

CATHODE RAY TUBE

Excellence in Electronics

TYPE 5ZP16

The 5ZP16 is a 5" diameter magnetic deflection and electrostatic focus cathode ray tube, designed for use as a flying spot scanner in high quality video signal generator. Such a generator produces not only a repetitive picture signal, like that produced by a monoscope, but also has the advantages of permitting change of picture or pattern at will, and of producing the picture with the halftone fidelity of photographic film. The 5ZP16 features a metallized screen with a spectral energy characteristic with peak in the near ultraviolet region. The faceplate has an optical quality and flatness that will not limit the performances of a high quality objective lens to produce maximum signal resolution. The tube also features a non browning faceplate. The gun is of a high resolution type. An external conductive coating on the neck, when grounded, prevents corona between neck and yoke, also an external insulator coating on the bulb cone minimizes sparking over the surface of the glass under conditions of high humidity.



BOTTOM VIEW

12C

MECHANICAL DATA

BASE: Small Shell Duodecal 7-Pin

CAP: Recessed Small Cavity

TERMINAL CONNECTIONS:

Pin 1 Heater	Pin 10 Grid #2
Pin 2 Grid #1	Pin 11 Cathode
Pin 6 Focus, Grid #3	Pin 12 Heater
Pin 7 Internal Connection	Cap Grid #4, Anode

GENERAL DATA

Phosphor	#16
Fluorescence	Violet & near ultra-violet
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Persistence	Extremely short
Focusing method	Electrostatic
Deflecting method	Magnetic
Deflecting angle	40^0

ELECTRICAL DATA

DIRECT INTERELECTRODE CAPACITANCES ($\mu\mu$fds.) (approx.)

Grid #1 to all other electrodes	5
Cathode to all other electrodes	8
External conductive neck coating to anode	500 max. 100 min

DESIGN CENTER MAXIMUM RATINGS:

Heater Current	0.6± 10 % amps.
Accelerator voltage	27,000 volts DC
Focusing electrode	7,000 volts DC
Grid #2 voltage	350 volts DC
Grid #1 voltage:	
Negative-bias value	150 volts DC
Positive-bias value	0 volts DC
Positive-peak value	2 volts
Peak heater-cathode voltage:	
Heater negative with respect to cathode	150 volts
Heater positive with respect to cathode	150 volts

CHARACTERISTICS AND TYPICAL OPERATION:

Heater Voltage	6.3	6.3 volts
Accelerator Voltage (Note 1)	20,000	27,000 volts DC
Focusing electrode voltage (Note 2)	4700± 12%	6300± 12% volts DC
Grid #2 Voltage (Note #3)	200	200 volts DC
Grid #1 Voltage (Note #4)	-70	-70 volts DC
Accelerator current	25	15 μA
Max. Focusing Electrode Current (Note 2)	75	25 μA
Grid #2 Current range	-15 to -15	-15 to -15 μA
Maximum Circuit Values		1.5 max. meg.

Tentative Data

inted in U.S.A.

ELECTRICAL DATA (Cont'd.)

NOTES:

1. For best operation the accelerator voltage should not be less than 20,000 volts. At lower voltages, a decrease in brilliance and definition will occur.
2. For an accelerator current as indicated.
3. Subject to variation ±40% when grid No. 1 voltage is desired at the average cut-off value of −70 volts.
4. Visual extinction of undeflected focused spot can vary ±40% when G2 voltage is maintained at 200 volts.

OPERATING NOTES

1. To prevent the formation of corona between the neck and the yoke which may cause breakdown of the glass neck and/or yoke insulation, the external conductive coating must be grounded. This may be accomplished by fastening a flexible metal band at least 1/4" wide securely around the coated portion of the neck with sufficient tension to insure good electrical contact, but not so tight as to set up glass strains in the neck. Care should be exercised in connecting the band that the coating is not scratched or damaged in any way.
2. The yoke insulation must be adequate for operation of the yoke against the external grounded coating. It is recommended that a high-voltage insulating sleeve be placed between the deflection yoke and the grounded coating on the neck (available on request). The resistance of the coating is high enough that damping of the yoke deflecting energy is negligible.
3. Adequate clearance between the bulb body and all grounded portions of associated equipment and tube supports must be maintained to prevent corona and arc-over. Sharp points or irregularities on grounded surfaces around the tube and support must be advoided.
4. Before touching the tube or high voltage circuits, be sure the power supply is turned off, all high voltage capacitors grounded, and the static charge on the face and sides of the tube discharged by means of a wand connected to the ground.
5. Care should be taken to keep the tube and high voltage supply as free as possible from dust. The deposition of dust is accelerated by the high voltages used and will cause a decrease in light output from the face of the tube as well as a reduction of insulative qualities of the tube and associated circuits and equipment.
6. A neon or gas discharge protective circuit, not to break down below 100 volts, should be connected between the grid and cathode with leads as short as possible. Two (2) NE-48's (or equivalent), connected in series, are recommended. This is required because equipment arc-overs produce secondary discharges in the tube circuits which, if not protected, will cause loss of cathode emission.
7. The tube must be adequately shielded for X-ray radiation to protect personnel. These X-rays are generated when the tube is operated at its normal accelerating potential and can constitute a health hazard.
8. In the event of scan failure, in either one or both directions, serious damage to the tube may result due to concentration of the beam in one spot. Adequate precautions in circuitry should be taken to remove the high voltage and extinguish the beam immediately when this occurs.

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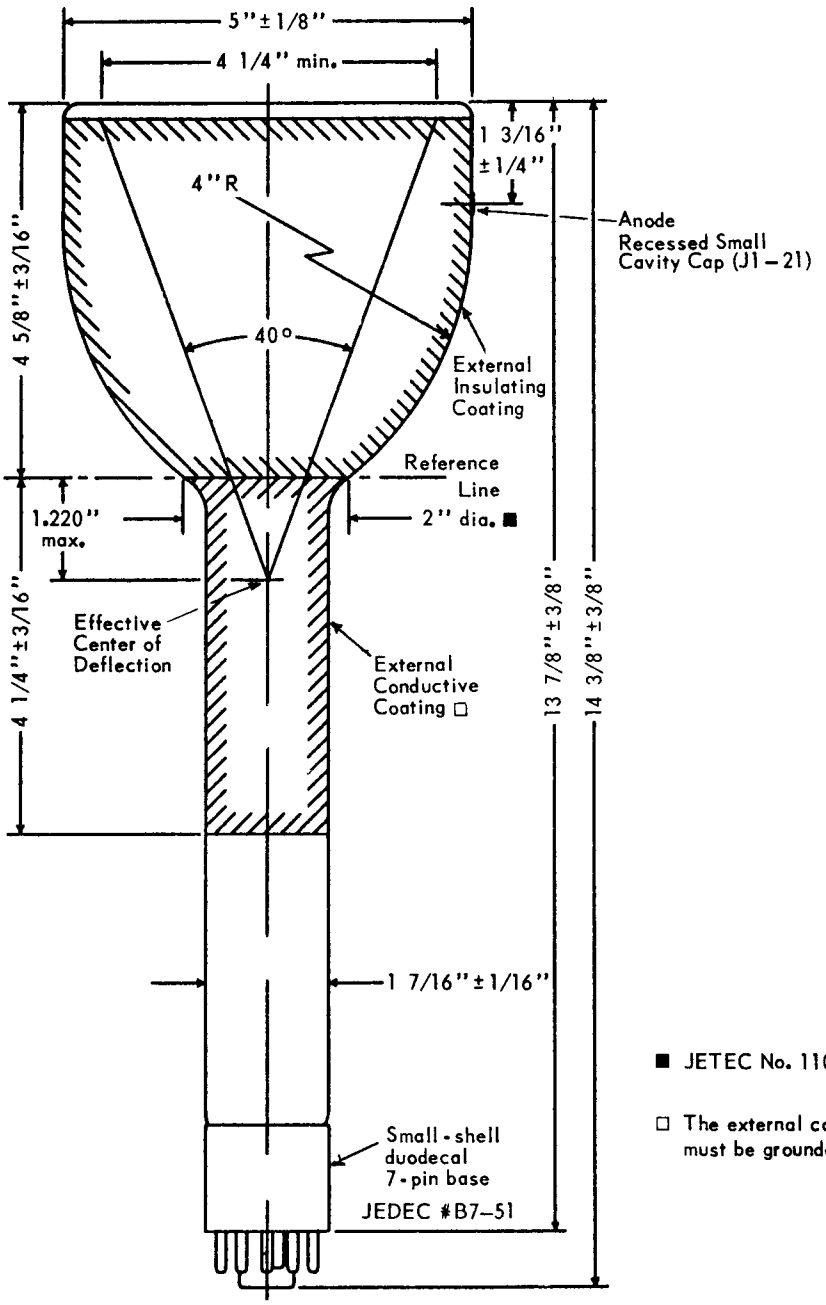

■ JETEC No. 110 Gauge.

□ The external conductive coating must be grounded.

Reference line is determined by JEDEC 110 gauge.
Pin space #3 is to align with J1–21 contact ±10°.

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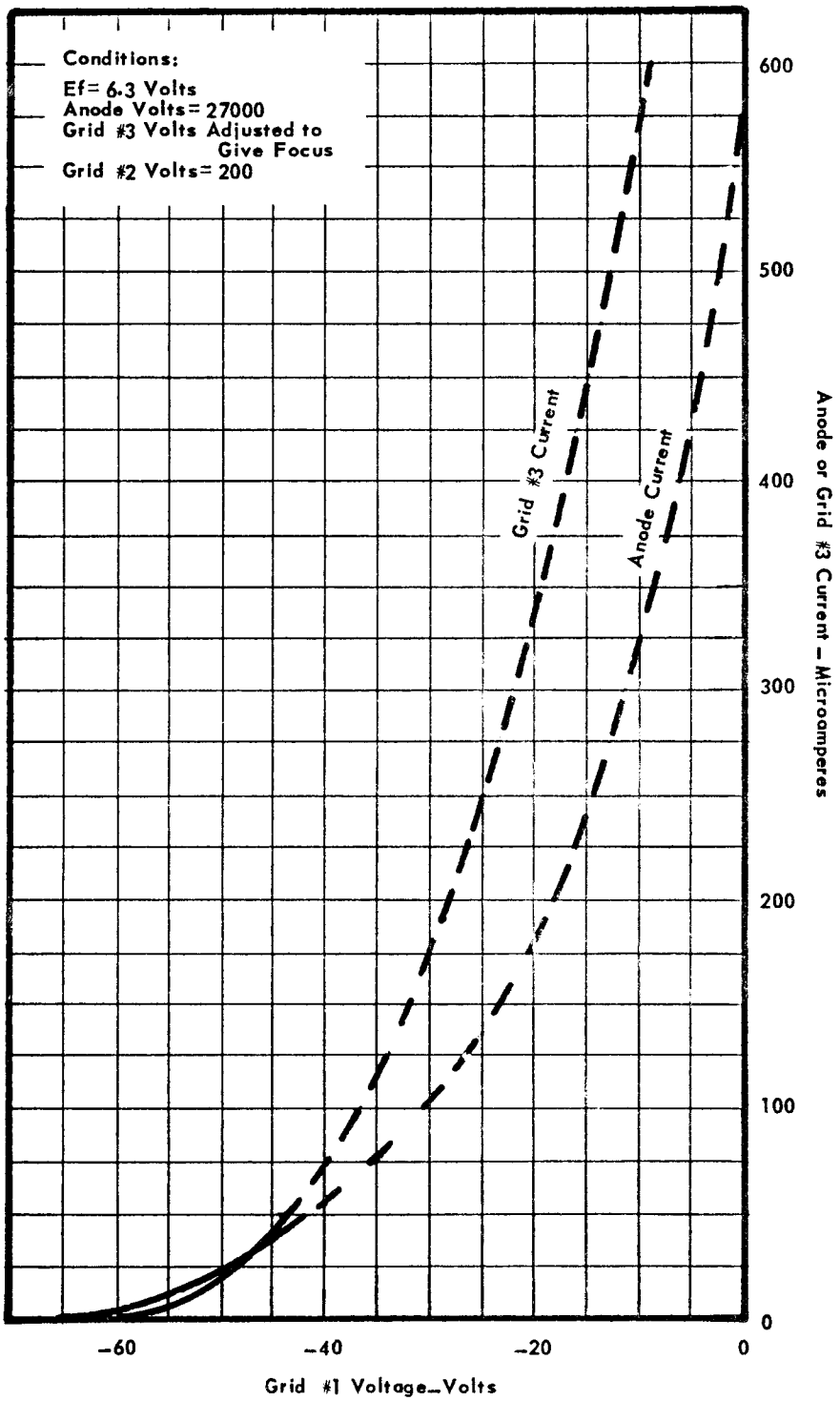
AVERAGE CHARACTERISTICS



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