5ZP16

FLYING-SPOT CATHODE-RAY TUBE

HIGH RESOLUTION CAPABILITY — ALUMINIZED SCREEN
ELECTROSTATIC FOCUS — MAGNETIC DEFLECTION

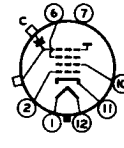
For use as scanner in high-quality flying-spot video-signal generators

DATA

General:

Heater, for Unipotential Cathode:	
Voltage	6.3 ac or dc volts
Current	0.6 ± 10% amp
Direct Interelectrode Capacitances:	
Grid No.1 to all other electrodes	8 μμf
Cathode to all other electrodes	5 μμf
External conductive neck coating to ultor	{500 max. μμf {100 min. μμf
Faceplate, Flat	Clear Glass
Phosphor (For Curves, see front of this Section)	P16 Aluminized
Fluorescence—	
Visible radiation	Violet
Invisible radiation	Near Ultraviolet
Phosphorescence—	
Persistence of visible radiation	Very Short
Persistence of invisible radiation	Very Short
Focusing Method	Electrostatic
Deflection Method	Magnetic
Deflection Angle (Approx.)	40°
Tube Dimensions:	
Overall length	14-3/8" ± 3/8"
Greatest diameter of bulb	5" ± 1/8"
Minimum Useful Screen Diameter	4-1/4"
Weight (Approx.)	1-1/2 lbs
Operating Position	Any
Cap	Recessed Small Cavity (JETEC No.J1-21)
Socket	*See Operating Considerations*
Base	Small-Shell Duodecal 7-Pin (JETEC No.B7-51)
Basing Designation for BOTTOM VIEW	12C

Pin 1 – Heater
Pin 2 – Grid No.1
Pin 6 – Grid No.3
Pin 7 – Internal Connection— Do Not Use
Pin 10 – Grid No.2
Pin 11 – Cathode



Pin 12 – Heater
Cap – Ultor (Grid No.4, Collector)
C – External Conductive Neck Coating

Maximum Ratings, *Design-Center Values:*

ULTOR VOLTAGE	27000 max. volts
GRID-No.3 VOLTAGE	7000 max. volts
GRID-No.2 VOLTAGE	350 max. volts

← Indicates a change.

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

5ZP16

FLYING-SPOT CATHODE-RAY TUBE

GRID-No.1 VOLTAGE:		
Negative bias value.	150 max.	volts
Positive bias value.	0 max.	volts
Positive peak value.	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode:		
During equipment warm-up period not exceeding 15 seconds	410 max.	volts
After equipment warm-up period	150 max.	volts
Heater positive with respect to cathode.	150 max.	volts

→ Equipment Design Ranges:

For any ultor voltage (E_{c_4}) between 20000 and 27000 volts*

Grid-No.3 Voltage for focus with ultor current of 25 μa or less.	20.5% to 26.5% of E_{c_4}	volts
Grid-No.2 Voltage for visual extinction of undeflected focused spot when circuit design utilizes fixed grid-No.1 voltage.	2 to 5 times E_{c_1}	volts
Grid-No.1 Voltage for visual extinction of undeflected focused spot when circuit design utilizes fixed grid-No.2 voltage.	-20% to -50% of E_{c_2}	volts
Grid-No.2 Current.	-15 to +15	μa

→ Examples of Use of Design Ranges:

For ultor voltage of	*20000*	*27000*	*volts*
Grid-No.3 Voltage for focus with ultor current as indicated.	4100 to 5300	5500 to 7100	volts
Grid-No.2 Voltage for visual extinction of undeflected focused spot when circuit design utilizes fixed grid-No.1 voltage of -70 volts.	140 to 350	140 to 350	volts
Grid-No.1 Voltage for visual extinction of undeflected focused spot when circuit design utilizes fixed grid-No.2 voltage of 200 volts.	-40 to -100	-40 to -100	volts
Ultor Current.	25	15	μa

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	1.5 max.	megohms

* Brilliance and definition decrease with decreasing ultor voltage. In general, the ultor voltage should not be less than 20,000 volts.

→ Indicates a change.

5ZP16

FLYING-SPOT CATHODE-RAY TUBE

OPERATING CONSIDERATIONS

X-Ray Warning. X-ray radiation is produced at the face of the 5ZP16 when it is operated at its normal ultor voltage. These rays can constitute a health hazard unless the tube is adequately shielded for X-ray radiation. Although relatively simple shielding should prove adequate, make sure that it provides the required protection against personal injury.

The *base pins* of the 5ZP16 fit the Duodecal 12-contact socket. The socket contacts corresponding to the vacant pin positions (pin positions 3,4,5,8, and 9) should be removed in order to provide the maximum insulation for the high-voltage pins 6 and 7. The socket should be made of high-grade, arc-resistant, insulating material and should preferably be designed with baffles.

Resolution of better than 1000 lines at the center of the reproduced picture can be produced by the 5ZP16 when it is operated with 27,000 volts on the ultor. At lower ultor voltages, the resolution capability decreases. To obtain high resolution in the horizontal direction, it is necessary to use a video amplifier having a bandwidth of about 20 megacycles.

The *ultraviolet output* of the 5ZP16 is a linear function of the ultor current. For any particular value of ultor current, the ultraviolet output is approximately 50 per cent higher when the 5ZP16 is operated with 27,000 volts on the ultor than when operated with 20,000 volts.

Underscanning over a protracted period should be avoided because an underscanned area of the screen will be burned and thus give diminished radiation when the raster is again scanned to full size and be slightly noticeable in the reproduced picture. Furthermore, it is inadvisable to permit a modulated stationary pattern to remain more than a few minutes on the face of the tube. If it remains for a longer time, the phosphor will be burned unevenly over the pattern area.

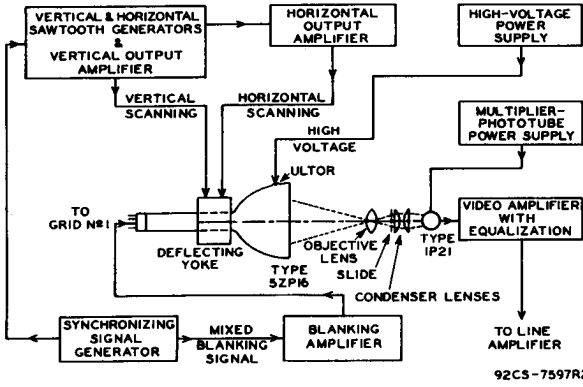
Never allow the beam to remain stationary, even momentarily, because the high peak energy in the beam will seriously damage the screen. Provision should be made to prevent such a possibility. Provision should also be made in equipment design to insure that the ultor voltage will drop as fast as the scanning current when the equipment is turned off; or to bias grid No.1 to beam-current cutoff when the equipment is turned off.

→ Indicates a change.

5ZP16

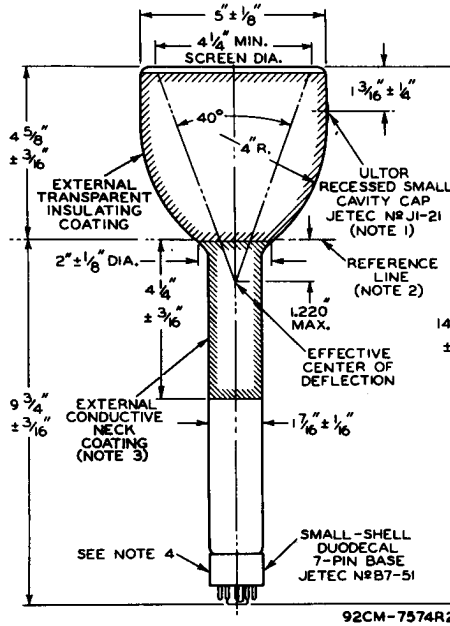
FLYING-SPOT CATHODE-RAY TUBE

BLOCK DIAGRAM OF FLYING-SPOT VIDEO-SIGNAL GENERATOR SYSTEM FOR SLIDE TRANSPARENCIES



5ZP16

FLYING-SPOT CATHODE-RAY TUBE



NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND VACANT PIN POSITION 3 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND ULTOR TERMINAL BY AN ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF ± 10°. THE ULTOR TERMINAL IS ON SAME SIDE AS VACANT PIN POSITION 3.

NOTE 2: WITH TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE JETEC No. 110 (SHOWN AT FRONT OF THIS SECTION) AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY INTERSECTION ON PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

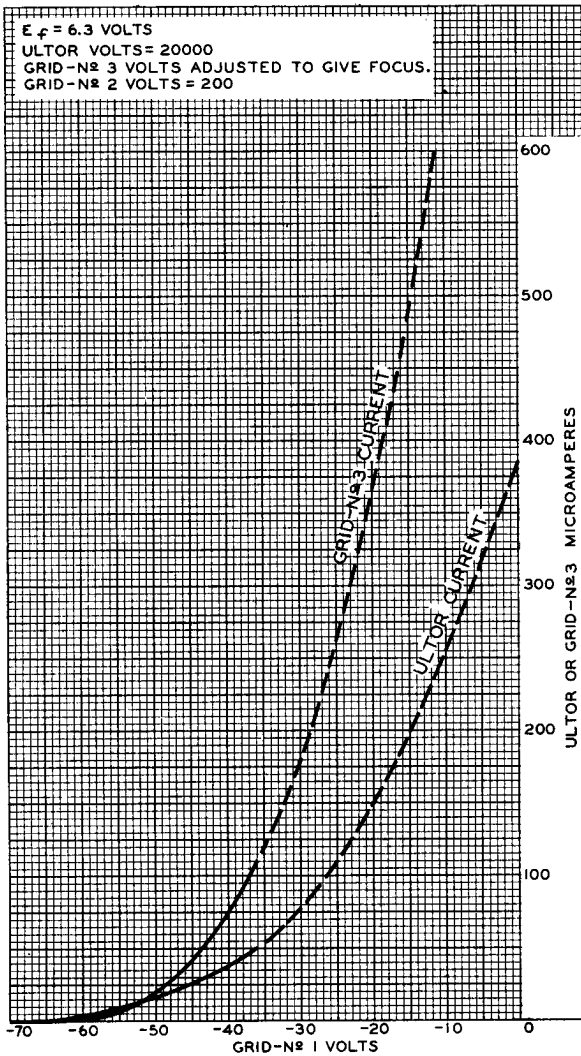
NOTE 3: EXTERNAL CONDUCTIVE NECK COATING MUST BE GROUNDED.

NOTE 4: ℄ OF BULB WILL NOT DEVIATE MORE THAN 2° IN ANY DIRECTION FROM THE PERPENDICULAR ERECTED AT THE CENTER OF THE BOTTOM OF THE BASE.

RCA

5ZP16

AVERAGE CHARACTERISTICS



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
92CM-7575RI

5ZP16

AVERAGE CHARACTERISTICS