

DU MONT

CATHODE-RAY TUBE

TYPE 7BCP-

The Du Mont Type 7BCP- is a 7 1/2-inch magnetic focus and deflection cathode-ray tube especially designed for use as the flying spot scanner in high quality color video-signal generators and photo recording. By using the appropriate pickup units, television signals may be obtained from transparencies as well as 16 mm and 35 mm motion picture film, both color and monochrome.

The 7BCP- features a metal-backed phosphor which essentially doubles the radiant energy of the electron spot over that obtainable with an unmetallized phosphor. The persistence of the phosphor is extremely short which minimizes trailing in the reproduced picture, giving a good signal-to-noise ratio and simplifying the phosphor correction circuits.

To further aid the reproduced picture, a grey glass is used for the faceplate which allows a 100:1 small area contrast range, whereas a clear faceplate allows only a 10:1 range. The faceplate has the additional feature of non-browning glass which prevents the glass from burning due to the high velocity electrons.

The faceplate of the 7BCP- is carefully manufactured to conform to a uniform standard of curvature and thickness and has an optical quality which will not limit the performance of a high-quality objective lens needed to provide maximum signal resolution.

To prevent moisture from condensing on the bulb body, thereby causing sparking over the surface of the glass under high humidity conditions, an external insulating coating is applied to the bulb body. An external conductive coating is applied to the neck to prevent corona between the yoke and the neck.

C A U T I O N: Before placing in operation, see OPERATING NOTES.

GENERAL CHARACTERISTICS

Electrical Data

Focusing Method	Magnetic	
Deflection Method	Magnetic	
Deflection Angle (Approx.) ^{1, 2}	45	Degrees
Direct Interelectrode Capacitances , Approx.		
Cathode to all other electrodes	5	μf
Grid No. 1 to all other electrodes	7	μf

Optical Data

Phosphor Number	15	24
Fluorescence	Blue-Green	Blue-Green
Persistence	Very Short	Very Short

TL-1216-3
12/24/59

Allen B. Du Mont Laboratories, Inc.
Clifton, New Jersey

from JEDEC release #2729, Feb. 15, 1960

TYPE 7BCP-

GENERAL CHARACTERISTICS (Optical Data) (Continued)

Faceplate		
Light Transmission at center, Approx.	66	Percent
Radius of Curvature ³	30	Inches

Mechanical Data

Overall Length	18 3/8 ± 1/4	Inches
Greatest Diameter of Bulb	7 1/2 ± 1/8	Inches
Minimum Useful Screen Diameter	6 3/4	Inches
Bulb Contact	J1-21	
Base	B7-51	
Basing	Special	
Bulb Contact Alignment		
J1-21 contact aligns with vacant Pin Position No. 3	± 10	Degrees

MAXIMUM RATINGS (DESIGN-MAXIMUM VALUES)

Heater Voltage	6.3	Volts
Heater Current at 6.3 Volts	0.6 ± 10%	Amperes
Accelerator Voltage	42,000	Max. Volts DC
Grid No. 2 Voltage	770	Max. Volts DC
Grid No. 1 Voltage		
Negative Bias Value	200	Max. Volts DC
Positive Bias Value	0	Max. Volts DC
Positive Peak Value	0	Max. Volts
Peak Heater to Cathode Voltage ⁴		
Heater negative with respect to cathode	180	Max. Volts
Heater positive with respect to cathode	180	Max. Volts
Maximum Cathode Current	400	Microamperes DC

TYPICAL OPERATING CONDITIONS -Monochrome Scanning

Accelerator Voltage	37,000	Volts DC
Grid No. 2 Voltage	350	Volts DC
Grid No. 2 Current	-25 to +25	Microamperes DC
Grid No. 1 Voltage ⁵	-40 to -87	Volts DC
Cathode Current	300	Microamperes DC

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TYPICAL OPERATING CONDITIONS (Continued)

Focusing Ampere Turns, Approx. ⁶
 Spot Position (Undelected)

735 Ampere Turns
 Within 15-mm radius circle

EQUIPMENT INFORMATION (Circuit Design Information)

Grid No. 1 Circuit Resistance
 Accelerator Circuit Series Resistance ⁷

1.5 Max. Megohms
 0.1 Min. Megohms

NOTES

1. With a raster size approximately 4 inches x 5.5 inches, the electron beam will be deflected through an angle of approximately 45 degrees.
2. To provide maximum corner resolution, the yoke design should be of the anastigmatic type (cosine function) which will minimize deflection defocusing. The deflection yoke should be designed so that the effective center of deflection of the beam is not more than 0.9 inch below the reference line.
3. For optimum results the objective lens should be of high quality. For 35 mm slides the following lenses or equivalents may be used depending upon the throw required: Summarit Leitz, 50 mm, fl.5; Wollensak, 75 mm, fl.9; Schneider, 180 mm, f3.5. For film scanning, the Du Mont Cinecon Unit is recommended.
4. Continuous operation at high heater to cathode voltage is not recommended.
5. Visual extinction of the undelected, focused spot.
6. The effective center of the focusing field should be approximately 2 3/4 inches below the reference line.
7. The accelerator power supply should contain some provision to limit the instantaneous short-circuit current to less than 500 milliamperes. It is recommended that the power supply be of the limited-peak-energy type.

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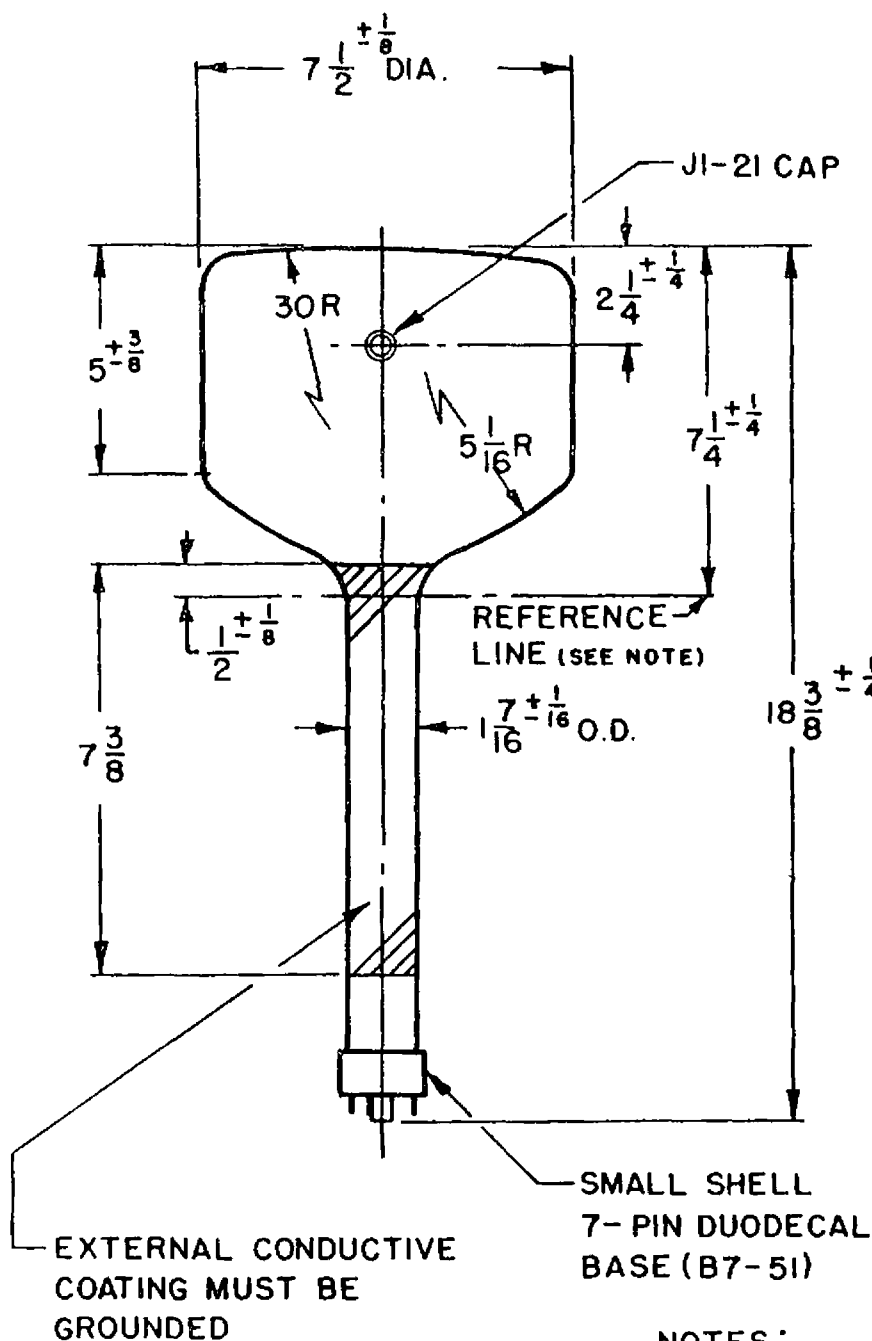
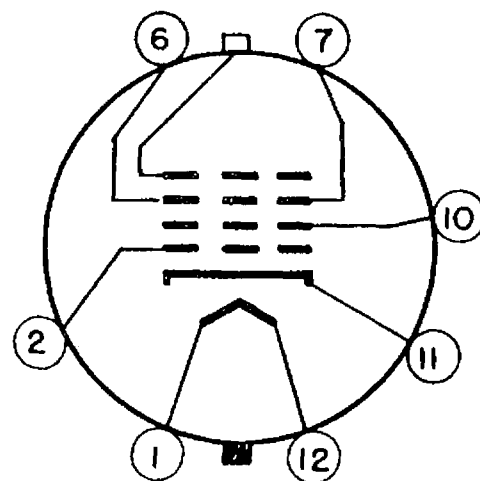
OPERATING NOTES

1. To prevent the formation of corona between tube neck and the yoke which may cause break-down 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 inch 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. 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 avoided.
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.
9. During operation the face of the 7BCP- tube must be air-cooled. With the air stream directed toward the face of the tube at an angle, approximately 50 cubic feet per minute will be required. The air should be filtered to prevent the deposition of dust or moisture (see Note 5.). To prevent damage to the tube the blower should start to operate automatically when the anode power supply is turned on.

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7 BCP-



BOTTOM VIEW

PIN NO	ELEMENT
1	HEATER
2	GRID NO.1
6	GRID NO.3 (GUARD RING)
7	GRID NO.3 (GUARD RING)
10	GRID NO.2
11	CATHODE
12	HEATER
CAP	ACCELERATOR

NOTES:

1. PINS NO. 6 & 7 SHOULD BE CONNECTED TO GROUND
2. WHEN TUBE NECK IS INSERTED THROUGH JEDEC G-112 GAUGE, REFERENCE LINE WILL BE DETERMINED BY POSITION WHERE GAUGE WILL REST ON FUNNEL