

## TUNG-SOL

## CATHODE RAY

THE 21AUP4, 21AUP4A, AND 21AUP4B ARE DIRECT-VIEW PICTURE TUBES DESIGNED FOR TELEVISION APPLICATIONS. THEY ARE IDENTICAL EXCEPT FOR THE METAL BACKED SCREENS ON THE 21AUP4A AND 21AUP4B. THE 21AUP4B ALSO HAS AN INCREASED ANODE VOLTAGE. THEIR COMMON FEATURES INCLUDE:

MAGNETIC DEFLECTION	SPHERICAL FACEPLATE
UNIPOENTIAL CATHODE	GREY FILTER FACEPLATE
RECTANGULAR GLASS CONSTRUCTION	EXTERNAL CONDUCTIVE COATING
LOW VOLTAGE ELECTROSTATIC FOCUS	EXTERNAL SINGLE FIELD ION TRAP
15" X 19 1/8" RASTER SIZE	

## ELECTRICAL DATA

FOCUSING METHOD	LOW VOLTAGE	ELECTROSTATIC
DEFLECTING METHOD		MAGNETIC
DEFLECTION ANGLE (APPROX.):		
HORIZONTAL	67	DEGREES
VERTICAL	53	DEGREES
DIAGONAL	72	DEGREES
DIRECT INTERELECTRODE CAPACITANCES (APPROX.):		
CATHODE TO ALL OTHER ELECTRODES	5	μf
GRID #1 TO ALL OTHER ELECTRODES	6	μf
MAXIMUM EXTERNAL CONDUCTIVE COATING TO ANODE	750	μf
MINIMUM EXTERNAL CONDUCTIVE COATING TO ANODE	500	μf

## OPTICAL DATA

PHOSPHOR NUMBER	SULFIDE TYPE	P-4
FLUORESCENT COLOR		WHITE
PHOSPHORESCENT COLOR		WHITE
PERSISTENCE		SHORT
FACEPLATE TRANSMISSION AT CENTER (APPROX.)	71	PERCENT

## RATINGS

DESIGN CENTER VALUES

HEATER VOLTAGE		6.3	VOLTS
HEATER CURRENT		0.6	AMP.
MAXIMUM DC ANODE, GRID #3, GRID #5 VOLTAGE <sup>A</sup>	21AUP4B ONLY	20 000	18 000
MAXIMUM DC GRID #4 VOLTAGE:			
POSITIVE		1 000	VOLTS
NEGATIVE		500	VOLTS
MAXIMUM DC GRID #2 VOLTAGE		500	VOLTS
MAXIMUM GRID #1 VOLTAGE:			
DC NEGATIVE-BIAS VALUE		125	VOLTS
DC POSITIVE-BIAS VALUE		0	VOLTS
POSITIVE-PEAK VALUE		2	VOLTS
MAXIMUM DC PEAK HEATER-CATHODE VOLTAGE:			
HEATER NEGATIVE WITH RESPECT TO CATHODE			
DURING WARM-UP PERIOD NOT TO EXCEED 15 SECONDS		410	VOLTS
AFTER EQUIPMENT WARM-UP PERIOD		180	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE		180	VOLTS
MAXIMUM GRID #1 CIRCUIT RESISTANCE		1.5	MEG OHMS

## TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

DC ANODE, GRID #3, GRID #5 VOLTAGE <sup>A</sup>	18 000	VOLTS
DC GRID #4 VOLTAGE <sup>B</sup>	-72 TO 396	VOLTS
DC GRID #2 VOLTAGE	300	VOLTS
DC GRID #1 VOLTAGE <sup>C</sup>	-28 TO -72	VOLTS
DC ION TRAP MAGNET (RATED STRENGTH) <sup>D</sup>	46	GAUSSSES

<sup>A</sup> BRILLIANCE AND DEFINITION DECREASE WITH DECREASING ANODE VOLTAGE. IN GENERAL, THE ANODE VOLTAGE SHOULD NOT BE LESS THAN 14,000 VOLTS.

<sup>B</sup> FOR FOCUS WITH ANODE CURRENT OF 100 μAMPS.

<sup>C</sup> VISUAL EXTINCTION OF FOCUSED RASTER.

<sup>D</sup> THE NON-UNIFORM MAGNETIC FIELD INHERENT IN THE DESIGN OF SOME EXTERNAL ION-TRAP MAGNETS USUALLY REQUIRES FOR OPTIMUM ADJUSTMENT THAT THE MAGNET SLUG BE LOCATED ON THE SAME SIDE OF THE TUBE NECK AS PIN 6.

INASMUCH AS THE TUBE RATING PERMITS OPERATION AT VOLTAGES AS HIGH AS 19.8 KILOVOLTS (ABSOLUTE VALUE), SHIELDING OF THE TUBE FOR X-RAY RADIATION MAY BE NEEDED WHEREVER THE OPERATING CONDITIONS INVOLVE VOLTAGE IN EXCESS OF 16 KILOVOLTS.

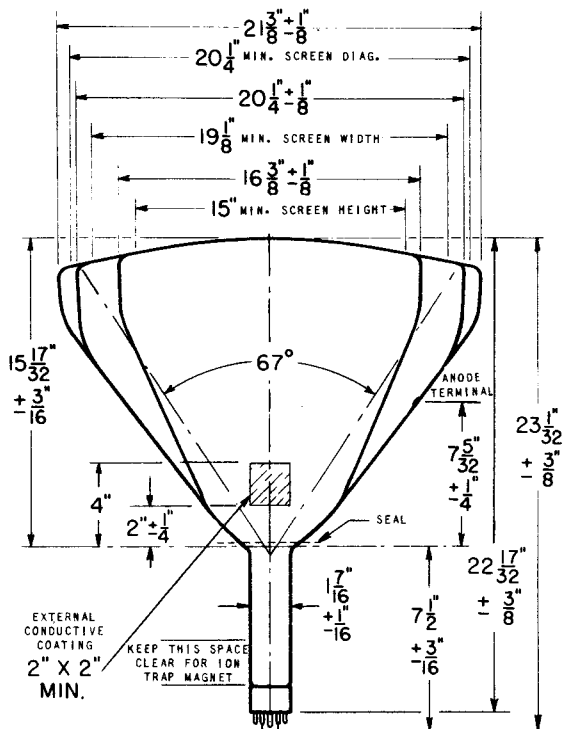
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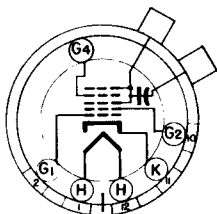
**MECHANICAL DATA**

OVERALL LENGTH	23 1/32 ± 3/8	INCHES
GREATEST DIMENSIONS OF BULB:		
DIAGONAL	21 1/2	INCHES
WIDTH	20 3/8	INCHES
HEIGHT	16 1/2	INCHES
MINIMUM USEFUL SCREEN DIMENSIONS:		
DIAGONAL	20 1/4	INCHES
WIDTH	19 1/8	INCHES
HEIGHT	15	INCHES
BULB CONTACT	RECESSED SMALL CAVITY CAP	J1-21
BASE	SMALL SHELL DUODECAL 6 PIN	B6-63
BASING		12L
BULB CONTACT ALIGNMENT		
J1-21 CONTACT ALIGNS WITH PIN POSITION #6 ± 30 DEGREES		



**PIN CONNECTIONS**

- PIN 1 - HEATER
- PIN 2 - GRID #1
- PIN 6 - GRID #4
- PIN 10 - GRID #2
- PIN 11 - CATHODE



- PIN 12 - HEATER
- ANODE CAP:
- GRID #3
- GRID #5
- COLLECTOR

**BOTTOM VIEW**

SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY.