

## TUNG-SOL

## CATHODE RAY

THE 21ALP4, 21ALP4A, AND 21ALP4B ARE DIRECT VIEW PICTURE TUBES DESIGNED FOR USE IN TELEVISION APPLICATIONS. THEY ARE IDENTICAL EXCEPT THAT THE 21ALP4A AND 21ALP4B HAVE METAL-BACKED SCREENS. THE 21ALP4B ALSO HAS AN INCREASED ANODE VOLTAGE. THEIR COMMON FEATURES INCLUDE:

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

## ELECTRICAL DATA

FOCUSING METHOD		LOW VOLTAGE ELECTROSTATIC
DEFLECTING METHOD		MAGNETIC
DEFLECTION ANGLE (APPROX.):		
HORIZONTAL	85	DEGREES
VERTICAL	68	DEGREES
DIAGONAL	90	DEGREES
DIRECT INTERELECTRODE CAPACITANCES (APPROX.):		
CATHODE TO ALL OTHER ELECTRODES	5	μμf
GRID #1 TO ALL OTHER ELECTRODES	6	μμf
MAXIMUM EXTERNAL CONDUCTIVE COATING TO ANODE <sup>A</sup>	750	μμf
MINIMUM EXTERNAL CONDUCTIVE COATING TO ANODE <sup>A</sup>	500	μμf

## OPTICAL DATA

PHOSPHOR NUMBER	SULFIDE TYPE	P-4
FLUORESCENT COLOR		WHITE
PHOSPHORESCENT COLOR		WHITE
PERSISTENCE		SHORT
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	75	PERCENT

## RATINGS

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM

HEATER VOLTAGE		6.3	VOLTS
HEATER CURRENT		0.6	AMP.
MAXIMUM DC ANODE, GRID #3, GRID #5, VOLTAGE <sup>B</sup>	21ALP4B ONLY 20 000	18 000	VOLTS
MAXIMUM DC GRID #4 VOLTAGE <sup>C</sup>		-500 TO +1000	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>B</sup>		14 000	VOLTS
DC GRID #4 VOLTAGE <sup>D</sup>		-55 TO +300	VOLTS
DC GRID #2 VOLTAGE		300	VOLTS
DC GRID #1 VOLTAGE <sup>E</sup>		-28 TO -72	VOLTS
DC ION TRAP MAGNET (RATED STRENGTH)		40	GAUSSSES

<sup>A</sup>EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

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

<sup>C</sup>THIS VALUE APPLIES WHERE AN AC VOLTAGE IS PROVIDED FOR DYNAMIC FOCUSING.

<sup>D</sup>WITH ANODE CURRENT OF 100 μAMP.

<sup>E</sup>VISUAL EXTINGUISHMENT OF FOCUSED RASTER.

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.

CONTINUED ON FOLLOWING PAGE

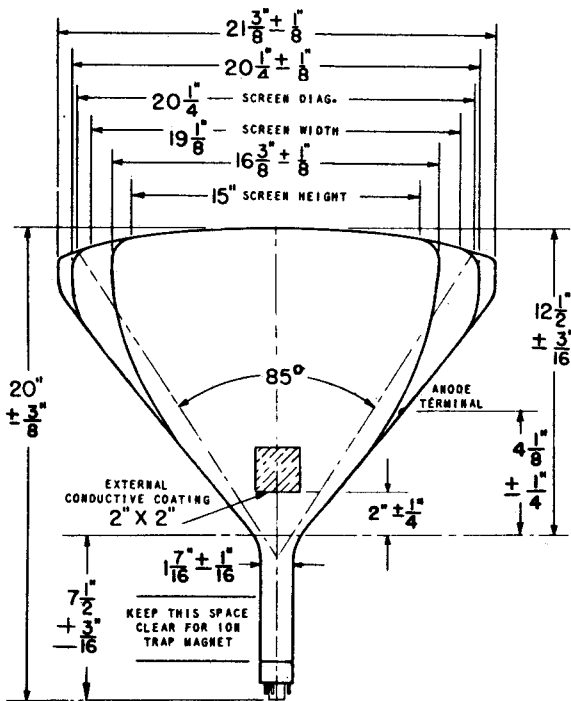
\* INDICATES AN ADDITION.

**TUNG-SOL**

CONTINUED FROM PRECEDING PAGE

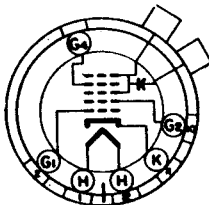
**MECHANICAL DATA**

OVERALL LENGTH	$20 \pm \frac{3}{8}$	INCHES
GREATEST DIMENSIONS OF BULB:		
DIAGONAL	$21 \frac{3}{8} \pm \frac{1}{8}$	INCHES
WIDTH	$20 \frac{1}{4} \pm \frac{1}{8}$	INCHES
HEIGHT	$16 \frac{3}{8} \pm \frac{1}{8}$	INCHES
MINIMUM USEFUL SCREEN DIMENSIONS:		
DIAGONAL	$20 \frac{1}{4}$	INCHES
WIDTH	$19 \frac{1}{8}$	INCHES
HEIGHT	$15$	INCHES
BULB CONTACT	RECESSED SMALL CAVITY CAP	J1-21
BASE	SMALL SHELL DUODECAL 6 PIN	86-63
BASING		12L
BULB CONTACT ALIGNMENT		
J1-21 CONTACT ALIGNS WITH PIN POSITION #6 $\pm$ 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 NO. 3
- GRID NO. 5
- COLLECTOR

BOTTOM VIEW

THE SOCKET SHOULD NOT BE MOUNTED RIGIDLY BUT IT SHOULD BE ALLOWED TO MOVE FREELY AND IT SHOULD HAVE FLEXIBLE LEADS.

→ INDICATES A CHANGE.