

**TUNG-SOL**

**CATHODE RAY**

THE 20HP4, 20HP4A, 20HP4B, 20HP4C, AND 20HP4D ARE DIRECT VIEW PICTURE TUBES DESIGNED FOR TELEVISION APPLICATIONS. THEY ARE IDENTICAL WITH THE FOLLOWING EXCEPTIONS:

- 20HP4A & 20HP4D - EXTERNAL CONDUCTIVE COATINGS
- 20HP4C & 20HP4D - ALUMINIZED SCREENS
- 20HP4B - PROSTED FACEPLATE

THEIR COMMON FEATURES INCLUDE:

- SPHERICAL FACEPLATE
- GREY FILTER FACEPLATE
- EXTERNAL SINGLE FIELD ION TRAP
- LOW VOLTAGE ELECTROSTATIC FOCUS
- MAGNETIC DEFLECTION
- UNIPOTENTIAL CATHODE
- 12 3/4" X 17" RASTER SIZE
- RECTANGULAR GLASS CONSTRUCTION

**ELECTRICAL DATA**

FOCUSING METHOD	LOW VOLTAGE ELECTROSTATIC	
DEFLECTING METHOD	MAGNETIC	
DEFLECTION ANGLE (APPROX.):		
HORIZONTAL	66	DEGREES
DIAGONAL	70	DEGREES
DIRECT INTERELECTRODE CAPACITANCES (APPROX.):		
CATHODE TO ALL OTHER ELECTRODES	5	$\mu f$
GRID #1 TO ALL OTHER ELECTRODES	6	$\mu f$
20HP4A AND 20HP4D ONLY		
MAXIMUM EXTERNAL CONDUCTIVE COATING <sup>A</sup>	1 500	$\mu f$
MINIMUM EXTERNAL CONDUCTIVE COATING <sup>A</sup>	750	$\mu f$

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

**OPTICAL DATA**

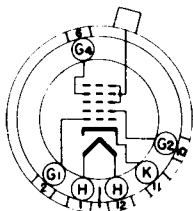
PHOSPHOR NUMBER	P4
FLUORESCENT COLOR	WHITE
PHOSPHORESCENT COLOR	WHITE
PERSISTENCE	MEDIUM
FACEPLATE LIGHT TRANSMISSION AT CENTER (APPROX.)	73 PERCENT

**MECHANICAL DATA**

OVERALL LENGTH	21 3/4 ± 3/8	INCHES
GREATEST DIMENSIONS OF BULB:		
DIAGONAL	20 3/32 ± 3/16	INCHES
WIDTH	18 11/16 ± 3/16	INCHES
HEIGHT	14 15/16 ± 3/16	INCHES
MINIMUM USEFUL SCREEN DIMENSIONS:		
WIDTH	17	INCHES
HEIGHT	12 3/4	INCHES
BULB CONTACT	RECESSED SMALL CAVITY CAP	J1-21
BASE	SMALL SHELL DUODECAL 6 PIN	B6-63
BASING	20HP4, 20HP4B AND 20HP4C	12M
	20HP4A AND 20HP4D	12L
BULB CONTACT ALIGNMENT		
J1-21 CONTACT ALIGNS WITH PIN POSITION #6 ± 30 DEGREES		

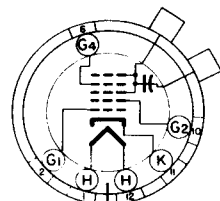
**PIN CONNECTIONS**

20HP4, 20HP4B & 20HP4C



BOTTOM VIEW

20HP4A & 20HP4D



BOTTOM VIEW

CONTINUED ON FOLLOWING PAGE

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**RATINGS**  
DESIGN CENTER VALUES

HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.6	AMP.
MAXIMUM DC ANODE VOLTAGE	16 000	VOLTS
MAXIMUM DC GRID #4 VOLTAGE (FOCUSING ELECTRODE)	-500 TO +1000	VOLTS
MAXIMUM GRID #2 VOLTAGE	500	VOLTS
MAXIMUM GRID #1 VOLTAGE:		
NEGATIVE-BIAS VALUE (DC)	125	VOLTS
POSITIVE-BIAS VALUE (DC)	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

**TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS**

DC ANODE VOLTAGE <sup>B</sup>	14 000	VOLTS
DC GRID #4 VOLTAGE <sup>C</sup>	-56 TO +310	VOLTS
DC GRID #2 VOLTAGE	300	VOLTS
DC GRID #1 VOLTAGE <sup>D</sup>	-28 TO -72	VOLTS
ION TRAP MAGNET FIELD STRENGTH (APPROX.)	30	GAUSSES

<sup>B</sup> BRILLIANCE AND DEFINITION DECREASE WITH DECREASING ANODE VOLTAGE. IN GENERAL, THE ANODE VOLTAGE SHOULD NOT BE LESS THAN THIS VALUE.

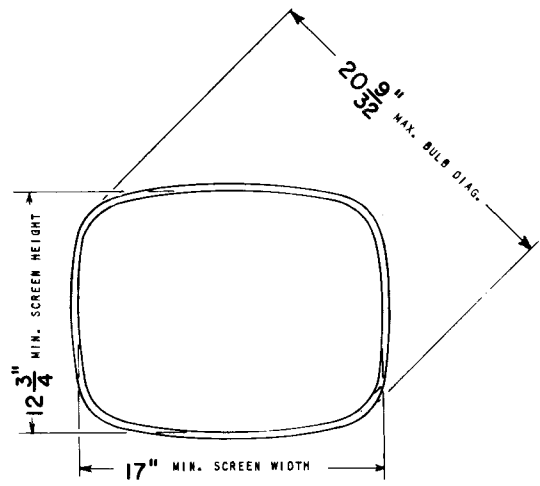
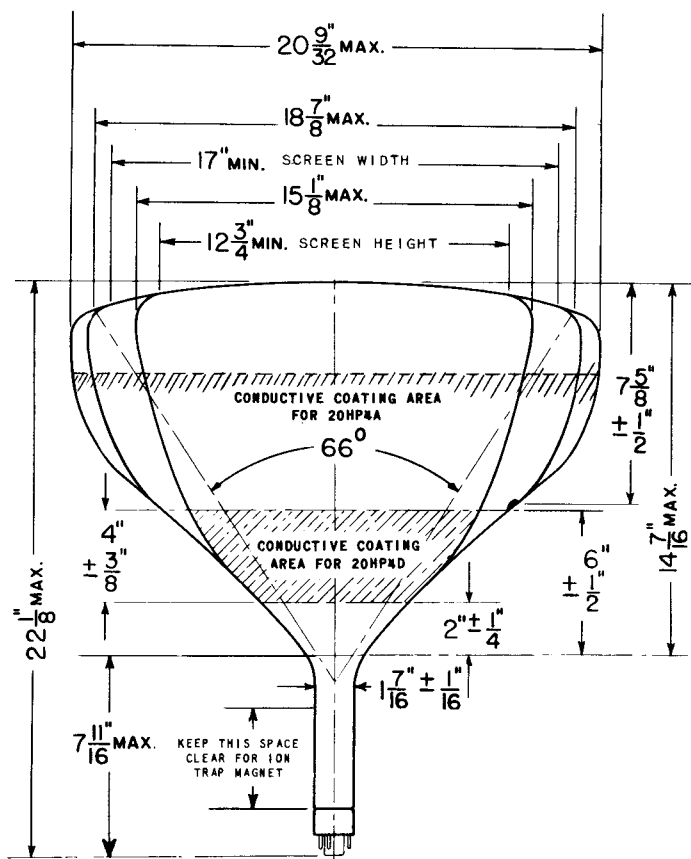
<sup>C</sup> WITH THE COMBINED GRID #1 BIAS VOLTAGE AND VIDEO-SIGNAL VOLTAGE ADJUSTED TO GIVE AN ANODE CURRENT OF 100 MICROAMPERES ON A 10 3/4" X 14 1/4" PICTURE SIZE.

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

**CIRCUIT VALUES**

MAXIMUM GRID #1 CIRCUIT RESISTANCE	1.5	MEGOHMS
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