14ATP4

KINESCOPE

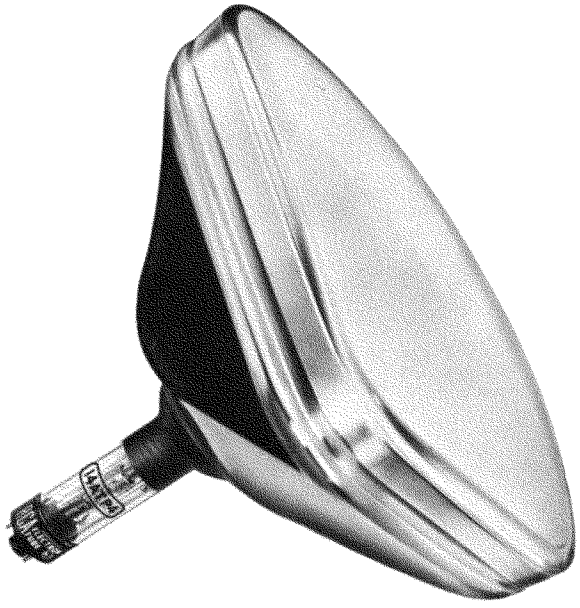
Low-Voltage Electrostatic Focus
Magnetic Deflection

Aluminized Screen
Short-Neck 90°-Deflection Type
Requires No Ion-Trap Magnet

12-1/16" x 9-1/2" Screen
14-1/8" Max. Bulb Diagonal
13-1/2" Max. Length

TENTATIVE DATA

RCA-14ATP4 is a very short, directly viewed rectangular, glass picture tube of the low-voltage electrostatic-focus and magnetic-deflection type. It has a spherical Filterglass faceplate, an aluminized screen 12-1/16" x 9-1/2" with slightly curved sides and rounded corners and a minimum projected screen area of 104 square inches.



The 14ATP4 utilizes an 8.4-volt, 450-milliampere heater having a controlled warm-up time to insure dependable performance in television receivers employing a series heater-string arrangement.

Employing wide-angle (90°) deflection, the 14ATP4 has a very short length—a length approximately 3 inches shorter than a type having the same size faceplate and 70° deflection.

The 14ATP4 utilizes an electron gun of the "straight" type designed to minimize deflection distortion. This gun permits a short neck—only 5-1/2" long, and eliminates the need for an ion-trap magnet.

Another design feature of the 14ATP4 is an external conductive bulb coating which with the internal conductive coating forms a supplementary filter capacitor.

DATA

General:

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	8.4	volts
Current	0.45	amp
Warm-Up Time (Average)	11	seconds
Heater warm-up time is defined as the time required in the test circuit shown in Fig.1 for the voltage (E) across the heater terminals to increase from zero to 6.7 volts.		
Direct Interelectrode Capacitances:		
Grid No.1 to all other electrodes	6	μμf
Cathode to all other electrodes	5	μμf
External conductive coating to ultor●	1000 max. 500 min.	μμf μμf
Faceplate, Spherical	Filterglass	
Light transmission (Approx.)	78%	
Phosphor	P4—Sulfide Type	
Fluorescence	White	
Phosphorescence	White	
Persistence	Short	
Focusing Method	Electrostatic	
Deflection Method	Magnetic	
Deflection Angles (Approx.):		
Diagonal	90°	
Horizontal	85°	
Vertical	68°	
Tube Dimensions:		
Overall length	13-3/16" ± 5/16"	
Greatest width	13-1/16" ± 1/8"	
Greatest height	10-9/16" ± 1/8"	
Diagonal	14" ± 1/8"	
Neck length	5-1/2" ± 3/16"	
Screen Dimensions (Minimum):		
Greatest width	12-1/16"	
Greatest height	9-1/2"	
Diagonal	13"	
Projected area	104 sq. in.	
Cap	Recessed Small Cavity (JETEC No.J1-21)	
Bulb	J112 (90°)	
Base	Small-Shell Duodecal 6-Pin (JETEC No.B6-63)	
Weight (Approx.)	8.5 lbs	
Mounting Position	Any	

GRID-DRIVE▲ SERVICE

Unless otherwise specified, voltage values are positive with respect to cathode

Maximum Ratings, *Design-Center Values:*

ULTOR● VOLTAGE	14000 max. 8000 min.	volts volts
GRID-No.4 VOLTAGE:		
Positive value	1000 max.	volts
Negative value	500 max.	volts

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GRID-No.2 VOLTAGE.	500 max.	volts
GRID-No.1 VOLTAGE:		
Negative peak value.	200 max.	volts
Negative bias value.	140 max.	volts
Positive bias value.	0 max.	volts
Positive peak value.	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

Equipment Design Ranges:

With ultor voltage (E_{c_5k}) between 8000 and 14000 volts and grid-No.2 voltage (E_{c_2k}) between 200 and 500 volts

Grid-No.4 Voltage for Focus§	0 to +400	volts
Grid-No.1 Voltage (E_{c_1k}) for Visual Extinction of Focused Raster. . .	See *Raster-Cutoff-Range Chart* for Grid-Drive Service	
Grid-No.1 Video Drive from Raster Cutoff (Black Level):		
White-level value (Peak positive). . . .	Same value as determined for E_{c_1k} except video drive is a positive voltage	
Grid-No.4 Current.	−25 to +25	μamp
Grid-No.2 Current.	−15 to +15	μamp
Field Strength of Adjustable Centering Magnet*. . . .	0 to 8	gausses

Examples of Use of Design Ranges:

With ultor voltage of	*10000*	*14000*	*volts*
and grid-No.2 voltage of	*300*	*400*	*volts*
Grid-No.4 Voltage for Focus.	0 to +400	0 to +400	volts
Grid-No.1 Voltage for Visual Extinction of Focused Raster. . .	−25 to −69	−31 to −90	volts
Grid-No.1 Video Drive from Raster Cutoff (Black Level):			
White-level value. . . .	25 to 69	31 to 90	volts

Maximum Circuit Values:

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

CATHODE-DRIVE■ SERVICE

Unless otherwise specified, voltage values are positive with respect to grid No.1

Maximum Ratings, *Design-Center Values:*

ULTOR●-TO-GRID-No.1 VOLTAGE.	14000 max. 8000 min.	volts volts
GRID-No.4-TO-GRID-No.1 VOLTAGE:		
Positive value	1000 max.	volts
Negative value	500 max.	volts
GRID-No.2-TO-GRID-No.1 VOLTAGE . . .	640 max.	volts
GRID-No.2-TO-CATHODE VOLTAGE	500 max.	volts
CATHODE-TO-GRID-No.1 VOLTAGE:		
Positive peak value.	200 max.	volts
Positive bias value.	140 max.	volts
Negative bias value.	0 max.	volts
Negative peak value.	2 max.	volts
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	180 max.	volts
Heater positive with respect to cathode	180 max.	volts

Equipment Design Ranges:

With any ultor-to-grid-No.1 voltage ($E_{c_5g_1}$) between 8000 and 14000 volts and grid-No.2-to-grid-No.1 voltage ($E_{c_2g_1}$) between 225 and 640 volts

Grid-No.4-to-Grid-No.1 Voltage for Focus§. . .	0 to +400	volts
Cathode-to-Grid-No.1 Voltage (E_{kg_1}) for Visual Extinction of Focused Raster . . .	See *Raster-Cutoff-Range Chart* for Cathode-Drive Service	
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):		
White-level value . . .	Same value as determined for E_{kg_1} except video drive is a negative voltage	
Grid-No.4 Current	−25 to +25	μamp
Grid-No.2 Current	−15 to +15	μamp
Field Strength of Adjustable Centering Magnet*	0 to 8	gausses

Examples of Use of Design Ranges:

With ultor-to-grid-No.1 voltage of	*10000*	*14000*	*volts*
and grid-No.2-to-grid-No.1 voltage of	*300*	*400*	*volts*
Grid-No.4-to-Grid-No.1 Voltage for Focus	0 to +400	0 to +400	volts
Cathode-to-Grid-No.1 Voltage for Visual Extinction of Focused Raster. . . .	25 to 58	31 to 75	volts
Cathode-to-Grid-No.1 Video Drive from Raster Cutoff (Black Level):			
White-level value . . .	−25 to −58	−31 to −75	volts

Maximum Circuit Values:

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

● The "ultor" in a cathode-ray tube is the electrode to which is applied the highest dc voltage for accelerating the electrons in the beam prior to its deflection. In the 14ATP4, the ultor function is performed by grid No.5. Since grid No.5, grid No.3, and collector are connected together within the 14ATP4, they are collectively referred to simply as "ultor" for convenience in presenting data and curves.

▲ Grid drive is the operating condition in which the video signal varies the grid-No.1 potential with respect to cathode.

§ The grid-No.4 voltage or grid-No.4-to-grid-No.1 voltage required for focus of any individual tube is independent of ultor current and will remain essentially constant for values of ultor voltage (or ultor-to-grid-No.1 voltage) or grid-No.2 voltage (or grid-No.2-to-grid-No.1 voltage) within design ranges shown for these items.

* Distance from *Reference Line* for suitable PM centering magnet should not exceed 2-1/4". Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having 1/4-inch radius concentric with the center of the tube face. It is to be noted that the earth's magnetic field can cause as much as 7/16-inch deflection of the spot from the center of the tube face.

■ Cathode drive is the operating condition in which the video signal varies the cathode potential with respect to grid No.1 and the other electrodes.

OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in equipment designed so that these maximum ratings will not be exceeded when the equipment is operated from ac or dc power-line supplies whose normal voltage including normal variations falls within ± 10 per cent of line-center voltage value of 117 volts.

In television receivers employing series-heater strings, a resistor in series with the

string of tubes will minimize voltage surges across any individual tube during starting. The resistor should preferably have a negative temperature characteristic.

When operated at or below the maximum ratings shown in the tabulated data, the 14ATP4 does not produce any harmful X-ray radiation. All types of picture tubes may be operated at voltages (if ratings permit) up to 16 kilovolts (absolute value) without personal injury on prolonged exposure at close range. Above 16 kilovolts, special shielding precautions for X-ray radiation may be necessary.

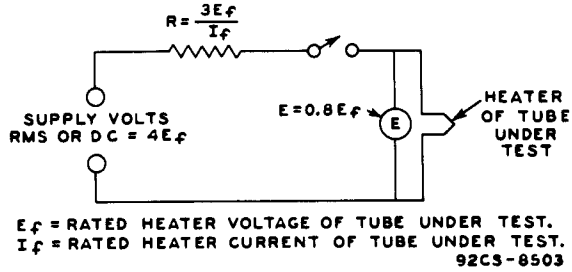


Fig. 1 - Test Circuit for Determining Heater Warm-Up Time.

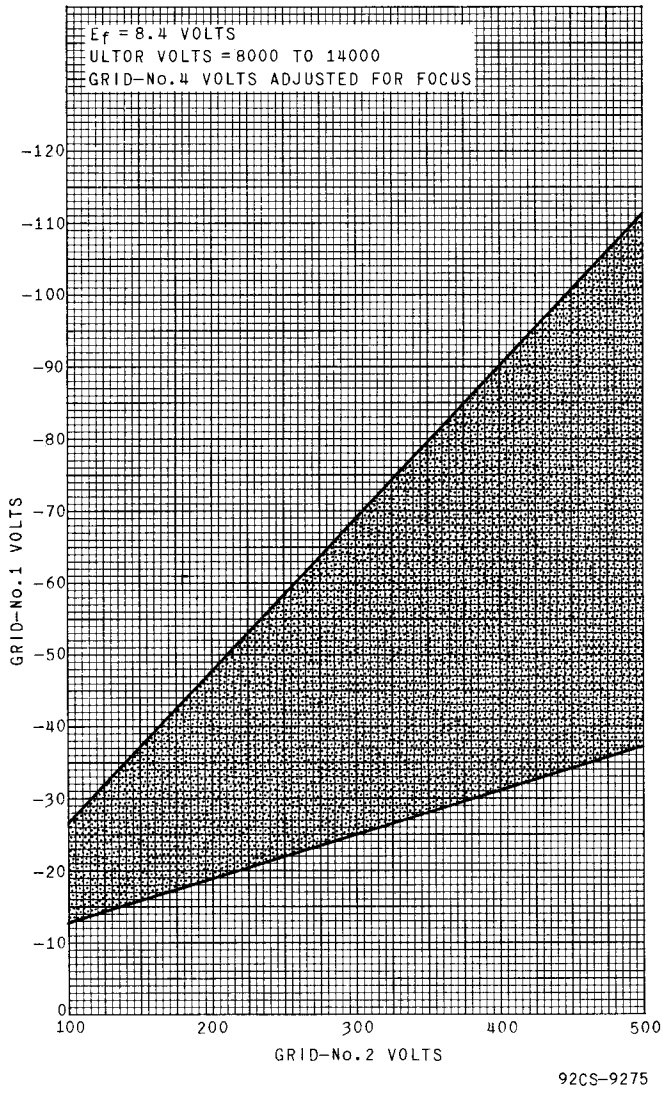


Fig. 2 - Raster-Cutoff Range for Type 14ATP4 in Grid-Drive Service.

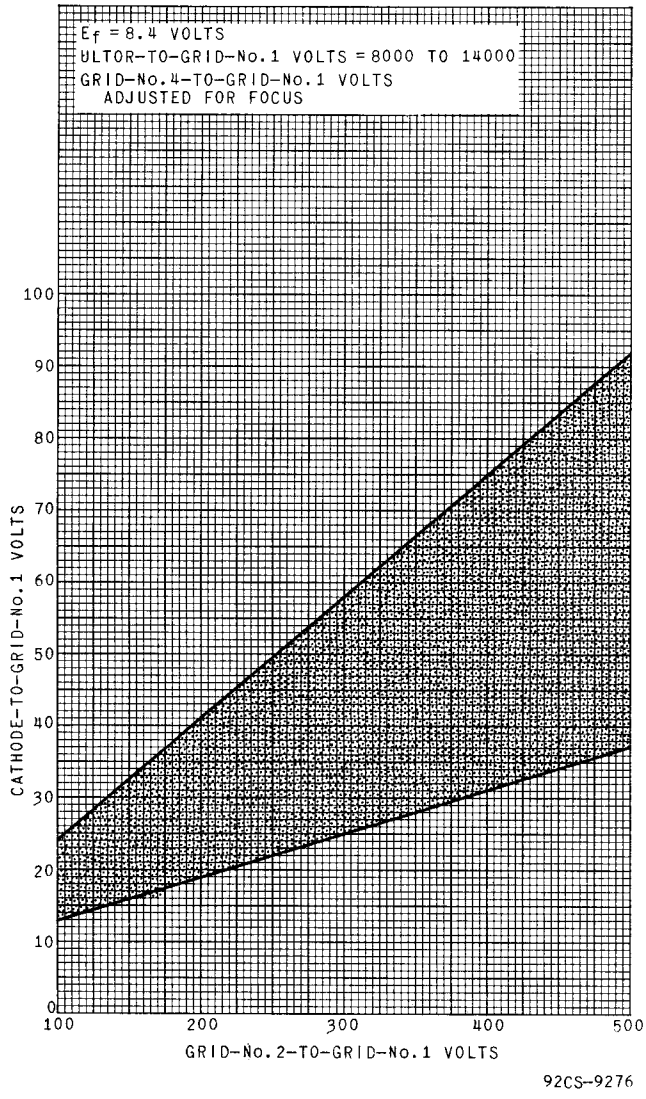


Fig. 3 - Raster-Cutoff Range for Type 14ATP4 in Cathode-Drive Service.

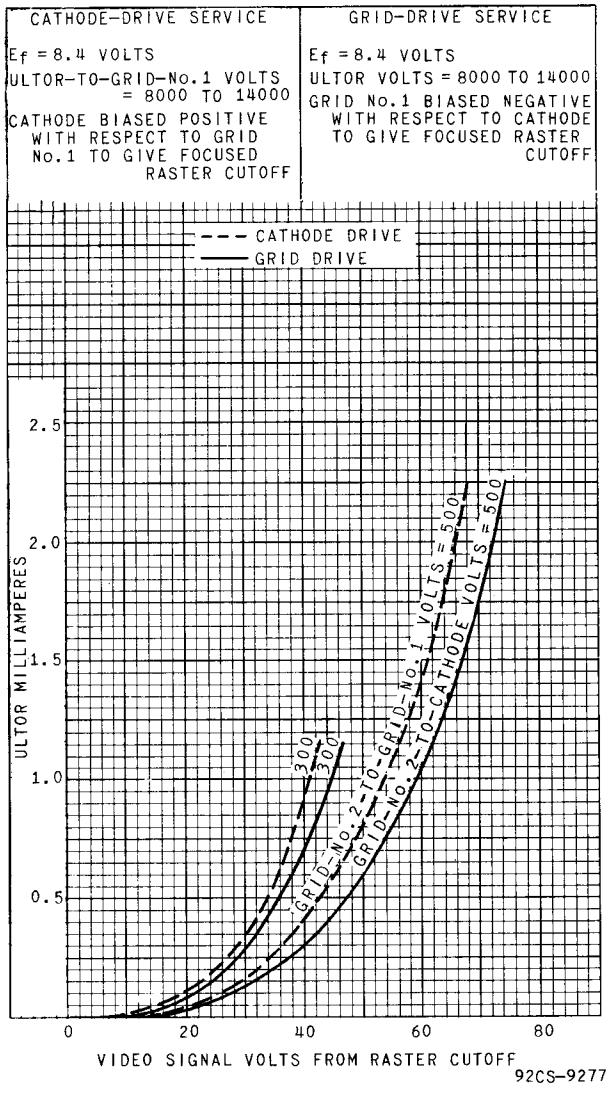


Fig. 4 – Average Drive Characteristics of Type 14ATP4.

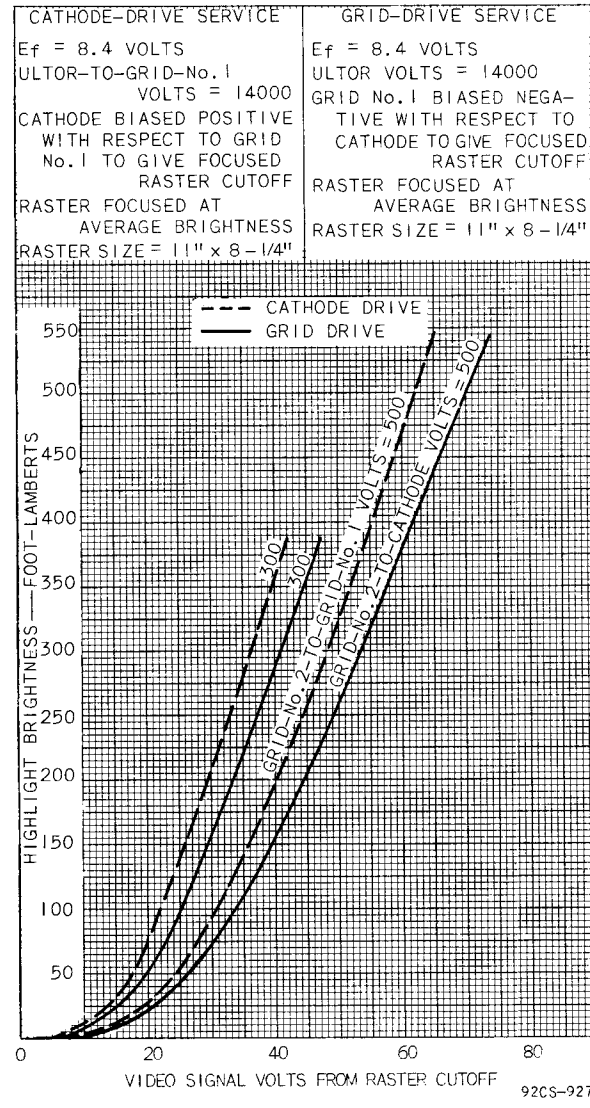
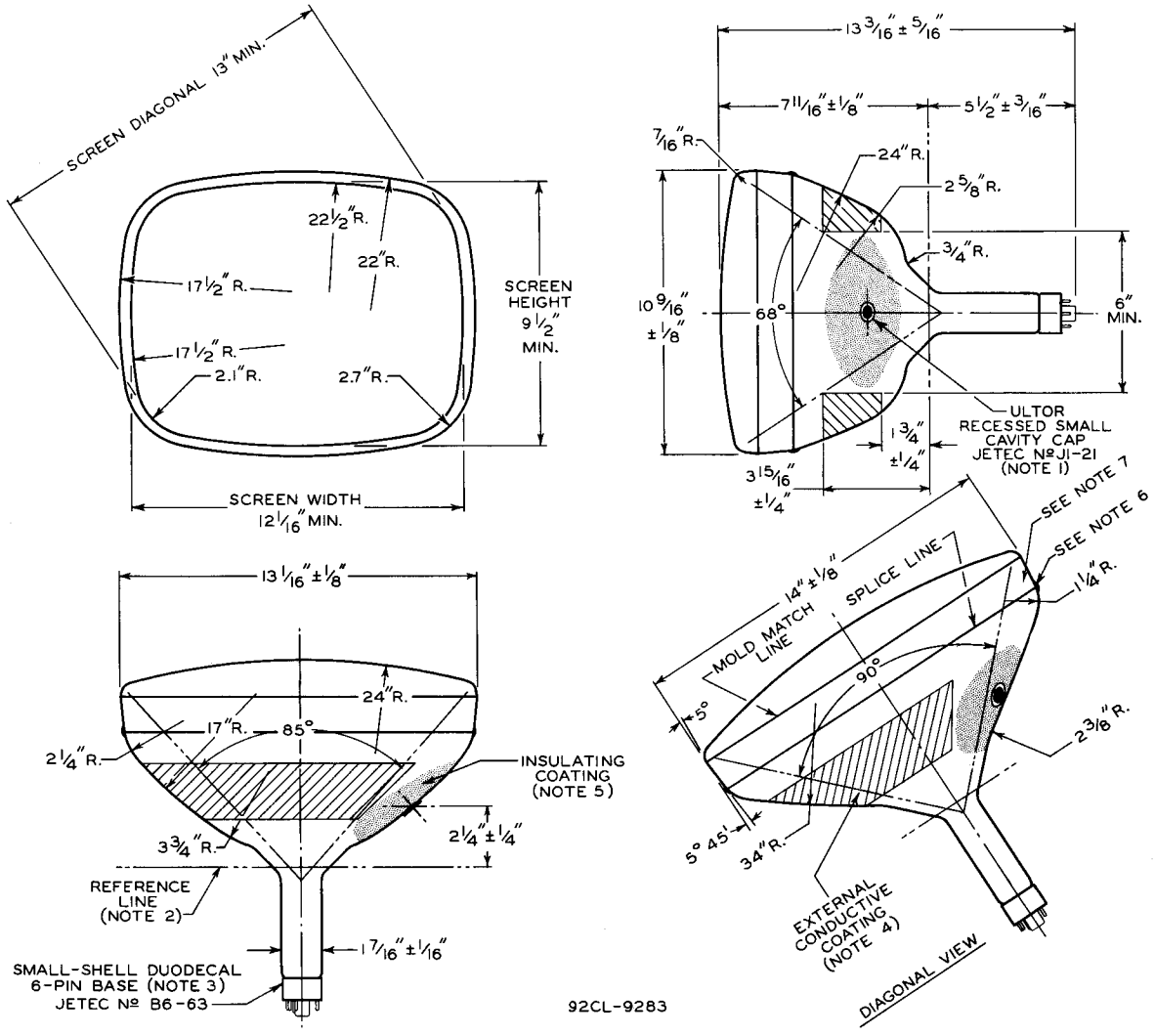


Fig. 5 – Average Drive Characteristics of Type 14ATP4.

DIMENSIONAL OUTLINE



NOTE 1: THE PLANE THROUGH THE TUBE AXIS AND PIN No.6 MAY VARY FROM THE PLANE THROUGH THE TUBE AXIS AND BULB TERMINAL BY ANGULAR TOLERANCE (MEASURED ABOUT THE TUBE AXIS) OF ±30°. BULB TERMINAL IS ON SAME SIDE AS PIN No.6.

NOTE 2: WITH THE TUBE NECK INSERTED THROUGH FLARED END OF REFERENCE-LINE GAUGE (JETEC No.116) AND WITH TUBE SEATED IN GAUGE, THE REFERENCE LINE IS DETERMINED BY THE INTERSECTION OF THE PLANE CC' OF THE GAUGE WITH THE GLASS FUNNEL.

NOTE 3: SOCKET FOR THIS BASE SHOULD NOT BE RIGIDLY MOUNTED; IT SHOULD HAVE FLEXIBLE LEADS AND BE ALLOWED TO MOVE FREELY. BOTTOM CIRCUMFERENCE OF BASE SHELL WILL FALL WITHIN A CIRCLE CONCENTRIC WITH BULB AXIS AND HAVING A DIAMETER OF 2-3/4".

NOTE 4: EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

NOTE 5: TO CLEAN THIS AREA WIPE ONLY WITH SOFT DRY LINTLESS CLOTH.

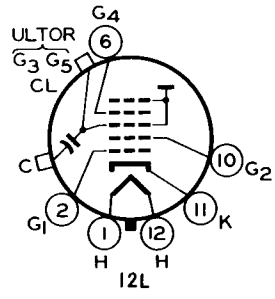
NOTE 6: BULGE AT SPLICE-LINE SEAL WILL NOT PROTRUDE BEYOND THE MAXIMUM INDICATED VALUE FOR ENVELOPE WIDTH, DIAGONAL, OR HEIGHT.

NOTE 7: UNDISTURBED AREA BETWEEN MOLD-MATCH LINE AND SPLICE LINE IS 3/4" MINIMUM. THIS SHOULD BE THE MAXIMUM WIDTH OF TUBE SUPPORT BAND.

SOCKET CONNECTIONS

Bottom View

PIN 1: HEATER
PIN 2: GRID No.1
PIN 6: GRID No.4
PIN 10: GRID No.2
PIN 11: CATHODE



PIN 12: HEATER
CAP: ULTOR (Grid No.3, Grid No.5, Collector)
C: EXTERNAL CONDUCTIVE COATING