# TUNG-SOL

## CATHODE RAY

THE 21ATP4, 21ATP4A AND 21ATP4B ARE DIRECT VIEW PICTURE TUBES DESIGNED FOR USE IN TELEVISION APPLICATIONS. THEY ARE IDENTICAL EXCEPT FOR THE NON ALUMINIZED SCREEN ON THE 21ATP4B. THEIR COMMON FEATURES INCLUDE:

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

### ELECTRICAL DATA

| | | |
|---|---|---|
| FOCUSING METHOD | LOW VOLTAGE ELECTROSTATIC | |
| DEFLECTING METHOD | | MAGNETIC |
| DEFLECTION ANGLE (APPROX.): | | |
| HORIZONTAL | 85 | DEGREES |
| DIAGONAL | 90 | DEGREES |
| DIRECT INTERELECTRODE CAPACITANCES (APPROX.): | | |
| CATHODE TO ALL OTHER ELECTRODES | 5 | $\mu\mu f$ |
| GRID #1 TO ALL OTHER ELECTRODES | 6 | $\mu\mu f$ |
| MAXIMUM EXTERNAL CONDUCTIVE COATING TO ANODE[A] | 1 500 | $\mu\mu f$ |
| MINIMUM EXTERNAL CONDUCTIVE COATING TO ANODE[A] | 1 200 | $\mu\mu f$ |

[A] EXTERNAL CONDUCTIVE COATING MUST BE GROUNDED.

### OPTICAL DATA

| | | |
|---|---|---|
| PHOSPHOR NUMBER | ALUMINIZED | P-4 |
| FLUORESCENT COLOR | | WHITE |
| PHOSPHORESCENT COLOR | | WHITE |
| PERSISTENCE | | MEDIUM |
| FACEPLATE LIGHT 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 * | 18 000 | VOLTS |
| MAXIMUM DC GRID #4 VOLTAGE (FOCUSING ELECTRODE) | -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 | MEGOHMS |

* VALUE FOR 21ATP4A 20,000 VOLTS.

### TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

| | | |
|---|---|---|
| DC ANODE, GRID #3, GRID #5 VOLTAGE[B] | 16 000 | VOLTS |
| DC GRID #4 VOLTAGE[C] | -64 TO +350 | VOLTS |
| DC GRID #2 VOLTAGE | 300 | VOLTS |
| DC GRID #1 VOLTAGE[D] | -28 TO -72 | VOLTS |
| ION TRAP MAGNET FIELD STRENGTH (APPROX.) | 35 | GAUSSES |

[B] BRILLIANCE AND DEFINITION DECREASE WITH DECREASING ANODE VOLTAGE. IN GENERAL, THE ANODE VOLTAGE SHOULD NOT BE LESS THAN THIS VALUE.

[C] WITH THE COMBINED GRID #1 BIAS VOLTAGE AND VIDEO-SIGNAL VOLTAGE ADJUSTED TO GIVE AN ANODE CURRENT OF 100 MICROAMPERES ON A 19 1/8" X 15" PICTURE SIZE.

[D] VISUAL EXTINCTION OF FOCUSED RASTER.

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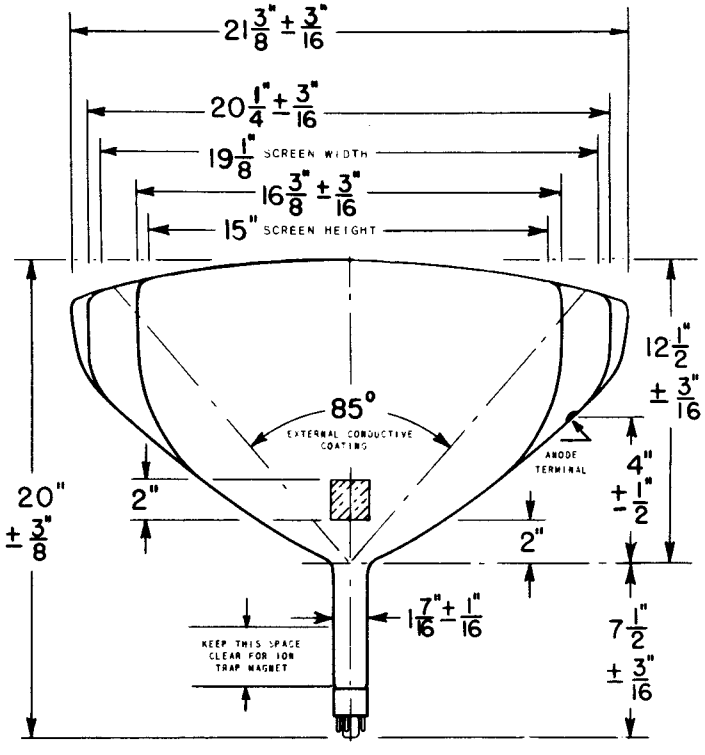
## MECHANICAL DATA

| | | |
|---|---|---|
| OVERALL LENGTH | 20 ± 3/8 | INCHES |
| GREATEST DIMENSIONS OF BULB: | | |
| DIAGONAL | 21 3/8 ± 3/16 | INCHES |
| WIDTH | 20 1/4 ± 3/16 | INCHES |
| HEIGHT | 16 3/8 ± 3/16 | INCHES |
| MINIMUM USEFUL SCREEN DIMENSIONS: | | |
| 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 |

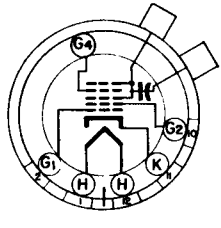
BULB CONTACT ALIGNMENT

J1-21 CONTACT ALIGNS WITH PIN POSITION #6 ± 30 DEGREES




## PIN CONNECTIONS

PIN 1 – HEATER
PIN 2 – GRID NO. 1
PIN 6 – GRID NO. 4
PIN 10 – GRID NO. 2
PIN 11 – CATHODE




BOTTOM VIEW

PIN 12 – HEATER
ANODE CAP:
GRID NO. 3
GRID NO. 5