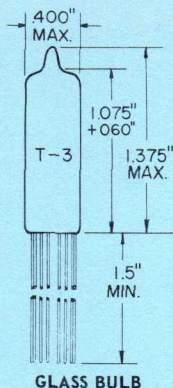


## TUNG-SOL

## TRIODE

## SUBMINIATURE TYPE



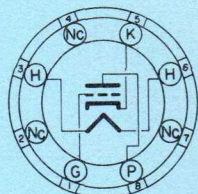
COATED UNIPOTENTIAL CATHODE

HEATER

6.3±5% VOLTS 0.15 AMP.

AC OR DC

ANY MOUNTING POSITION



**BOTTOM VIEW**  
SUBMINIATURE BUT TON  
8 LEAD BASE

8DK

THE 5718 IS A SUBMINIATURE MEDIUM-MU TRIODE DESIGNED FOR USE AS A HIGH FREQUENCY OSCILLATOR OR AS A GENERAL-PURPOSE AMPLIFIER. A POWER OUTPUT OF APPROXIMATELY 0.9 WATT CAN BE OBTAINED AT A FREQUENCY OF 500 MEGACYCLES

## DIRECT INTERELECTRODE CAPACITANCES

|               | WITH<br>SHIELD <sup>A</sup> | WITHOUT<br>SHIELD |     |
|---------------|-----------------------------|-------------------|-----|
| GRID TO PLATE | 1.3                         | 1.4               | μμf |
| INPUT         | 2.4                         | 2.2               | μμf |
| OUTPUT        | 2.4                         | 0.7               | μμf |

<sup>A</sup> WITH EXTERNAL SHIELD OF 0.405 INCH INSIDE DIAMETER CONNECTED TO CATHODE

## RATINGS

## ABSOLUTE MAXIMUM VALUES

|                                           |        |       |
|-------------------------------------------|--------|-------|
| HEATER VOLTAGE                            | 6.3±5% | VOLTS |
| MAXIMUM PLATE VOLTAGE                     | 165    | VOLTS |
| MAXIMUM NEGATIVE DC GRID VOLTAGE          | 55     | VOLTS |
| MAXIMUM PLATE DISSIPATION                 | 0.9    | WATTS |
| MAXIMUM DC PLATE CURRENT                  | 22     | MA.   |
| MAXIMUM DC GRID CURRENT                   | 5.5    | MA.   |
| MAXIMUM HEATER-CATHODE VOLTAGE:           |        |       |
| HEATER POSITIVE WITH RESPECT TO CATHODE   | 200    | VOLTS |
| HEATER NEGATIVE WITH RESPECT TO CATHODE   | 200    | VOLTS |
| MAXIMUM BULB TEMPERATURE AT HOTTEST POINT | 220    | C     |

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## TUNG-SOL

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## TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A<sub>1</sub> AMPLIFIER

|                                          |        |       |
|------------------------------------------|--------|-------|
| HEATER VOLTAGE                           | 6.3±5% | VOLTS |
| HEATER CURRENT                           | 0.15   | AMP.  |
| PLATE VOLTAGE                            | 100    | VOLTS |
| CATHODE-BIAS RESISTOR                    | 150    | OHMS  |
| AMPLIFICATION FACTOR                     | 27     |       |
| PLATE RESISTANCE (APPROX.)               | 4650   | OHMS  |
| TRANSCONDUCTANCE                         | 5800   | μMHOS |
| PLATE CURRENT                            | 8.5    | MA.   |
| GRID VOLTAGE (APPROX.) $I_b = 10$ μAMPS. | -7     | VOLTS |

## UHF OSCILLATOR

|                        |     |          |
|------------------------|-----|----------|
| PLATE VOLTAGE          | 150 | VOLTS    |
| PLATE CURRENT          | 20  | MA.      |
| FREQUENCY              | 500 | MEGACYC. |
| POWER OUTPUT (APPROX.) | 0.9 | WATTS    |

## CLASS A RESISTANCE - COUPLED AMPLIFIER

| LOW IMPEDANCE DRIVE (APPROXIMATELY 200 OHMS)   |          |                            |       |      |                             |       |      |                             |       |      |
|------------------------------------------------|----------|----------------------------|-------|------|-----------------------------|-------|------|-----------------------------|-------|------|
| $R_L$                                          | $R_{gf}$ | E <sub>bb</sub> = 90 VOLTS |       |      | E <sub>bb</sub> = 150 VOLTS |       |      | E <sub>bb</sub> = 225 VOLTS |       |      |
|                                                |          | $R_k$                      | $E_o$ | GAIN | $R_k$                       | $E_o$ | GAIN | $R_k$                       | $E_o$ | GAIN |
| 0.10                                           | 0.10     | 2100                       | 8.0   | 14   | 1800                        | 13    | 16   | 1600                        | 25    | 17   |
| 0.10                                           | 0.24     | 2700                       | 11    | 15   | 2300                        | 21    | 16   | 2100                        | 33    | 17   |
| 0.24                                           | 0.24     | 5600                       | 9.7   | 14   | 4700                        | 19    | 16   | 4600                        | 29    | 17   |
| 0.24                                           | 0.51     | 6900                       | 12    | 15   | 6400                        | 24    | 16   | 5800                        | 37    | 17   |
| 0.51                                           | 0.51     | 12000                      | 11    | 15   | 11000                       | 20    | 16   | 10000                       | 31    | 16   |
| 0.51                                           | 1.0      | 15000                      | 14    | 15   | 13000                       | 25    | 16   | 14000                       | 40    | 16   |
| HIGH IMPEDANCE DRIVE (APPROXIMATELY 100K OHMS) |          |                            |       |      |                             |       |      |                             |       |      |
| $R_L$                                          | $R_{gf}$ | E <sub>bb</sub> = 90 VOLTS |       |      | E <sub>bb</sub> = 150 VOLTS |       |      | E <sub>bb</sub> = 225 VOLTS |       |      |
|                                                |          | $R_k$                      | $E_o$ | GAIN | $R_k$                       | $E_o$ | GAIN | $R_k$                       | $E_o$ | GAIN |
| 0.10                                           | 0.10     | 2700                       | 10    | 14   | 2100                        | 19    | 16   | 1800                        | 30    | 17   |
| 0.10                                           | 0.24     | 3400                       | 13    | 15   | 2700                        | 25    | 16   | 2300                        | 38    | 17   |
| 0.24                                           | 0.24     | 6900                       | 12    | 14   | 5800                        | 22    | 16   | 5000                        | 34    | 17   |
| 0.24                                           | 0.51     | 8400                       | 14    | 15   | 7000                        | 27    | 16   | 6300                        | 41    | 17   |
| 0.51                                           | 0.51     | 13000                      | 13    | 15   | 12000                       | 24    | 16   | 11000                       | 37    | 16   |
| 0.51                                           | 1.0      | 17000                      | 16    | 15   | 16000                       | 29    | 16   | 15000                       | 45    | 16   |

1.  $E_o$  IS MAXIMUM RMS VOLTAGE OUTPUT FOR APPROXIMATELY 5% TOTAL HARMONIC DISTORTION.

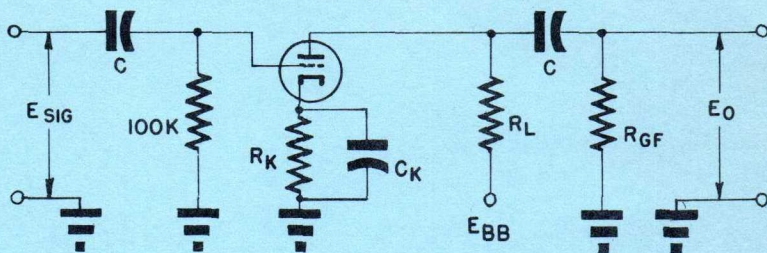
2. GAIN IS MEASURED FOR AN OUTPUT VOLTAGE OF TWO VOLTS RMS.

3.  $R_k$  IS IN OHMS;  $R_L$  AND  $R_{gf}$  ARE IN MEGOHMS.4. COUPLING CAPACITORS (C) SHOULD BE SELECTED TO GIVE DESIRED FREQUENCY RESPONSE.  $R_k$  SHOULD BE ADEQUATELY BY-PASSED.

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## TUNG-SOL

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## CHARACTERISTICS LIMITS

|                                                                                                                                                                                                                                     |                    | MIN  | MAX  |                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|------|--------------------|
| HEATER CURRENT:                                                                                                                                                                                                                     |                    |      |      |                    |
| E <sub>f</sub> = 6.3 VOLTS                                                                                                                                                                                                          | INITIAL            | 140  | 160  | MA.                |
|                                                                                                                                                                                                                                     | 500 HR.            | 138  | 164  | MA.                |
| PLATE CURRENT                                                                                                                                                                                                                       |                    |      |      |                    |
| E <sub>f</sub> = 6.3 V., E <sub>b</sub> = 100 V., R <sub>k</sub> = 150 OHMS<br>(BY-PASSED)                                                                                                                                          | INITIAL            | 6.0  | 11   | MA.                |
| TRANSCONDUCTANCE CHANGE WITH<br>HEATER VOLTAGE<br>DIFFERENCE BETWEEN TRANSCONDUCTANCE<br>(1) AND TRANSCONDUCTANCE AT E <sub>f</sub> = 5.7 VOLTS<br>(OTHER CONDITIONS THE SAME) EXPRESSED AS A<br>PERCENTAGE OF TRANSCONDUCTANCE (1) | INITIAL<br>500 HR. | ---  | 10   | PERCENT<br>PERCENT |
| TRANSCONDUCTANCE (1)                                                                                                                                                                                                                |                    |      |      |                    |
| E <sub>f</sub> = 6.3 V., E <sub>b</sub> = 100 V., R <sub>k</sub> = 150 OHMS<br>(BY-PASSED)                                                                                                                                          | INITIAL            | 4800 | 6800 | μMHOS              |
| TRANSCONDUCTANCE CHANGE WITH OPERATION<br>DIFFERENCE BETWEEN TRANSCONDUCTANCE<br>(1) INITIALLY AND AFTER OPERATION<br>EXPRESSED AS A PERCENTAGE OF<br>INITIAL VALUE                                                                 | 500-HR.            | ---  | 20   | PERCENT            |
| AVERAGE TRANSCONDUCTANCE CHANGE<br>WITH OPERATION:                                                                                                                                                                                  |                    |      |      |                    |
| AVERAGE OF VALUES FOR 'TRANS-<br>CONDUCTANCE CHANGE WITH OPERATION'                                                                                                                                                                 | 500-HR             | ---  | 15   | PERCENT            |
| AMPLIFICATION FACTOR:                                                                                                                                                                                                               |                    |      |      |                    |
| E <sub>f</sub> = 6.3 V., E <sub>b</sub> = 100 V., R <sub>k</sub> = 150 OHMS<br>(BY-PASSED)                                                                                                                                          | INITIAL            | 23   | 31   |                    |
| PLATE CURRENT CUTOFF (1):                                                                                                                                                                                                           |                    |      |      |                    |
| E <sub>f</sub> = 6.3 V., E <sub>b</sub> = 100 V., E <sub>c</sub> = -7.0 VOLTS                                                                                                                                                       | INITIAL            | ---  | 100  | μAMPS              |
| PLATE CURRENT CUTOFF (2)                                                                                                                                                                                                            |                    |      |      |                    |
| E <sub>f</sub> = 6.3 V., E <sub>b</sub> = 100 V., E <sub>c</sub> = -4.0 VOLTS                                                                                                                                                       | INITIAL            | 20   | ---  | μAMPS.             |
| RF POWER OUTPUT:                                                                                                                                                                                                                    |                    |      |      |                    |
| E <sub>f</sub> = 6.3 V., E <sub>b</sub> = 150 V., F = 500 mc,<br>R <sub>g</sub> ADJUSTED FOR I <sub>b</sub> = 20 ma d-c                                                                                                             | INITIAL            | 600  | ---  | MW.                |

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## TUNG-SOL

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## CHARACTERISTICS LIMITS - cont'd.

## INTERELECTRODE CAPACITANCES:

|                        |         |     |     |                  |
|------------------------|---------|-----|-----|------------------|
| GRID TO PLATE (G TO P) | INITIAL | 1.1 | 1.8 | $\mu\mu\text{f}$ |
| INPUT (G TO K+H)       | INITIAL | 1.6 | 2.8 | $\mu\mu\text{f}$ |
| OUTPUT (P TO K+H)      | INITIAL | 0.5 | 0.9 | $\mu\mu\text{f}$ |

(MEASURED WITHOUT EXTERNAL SHIELD)

## NEGATIVE GRID CURRENT:

|                                                                                                                     |         |     |     |                   |
|---------------------------------------------------------------------------------------------------------------------|---------|-----|-----|-------------------|
| $E_f = 6.3 \text{ V.}$ , $E_b = 150 \text{ V.}$ , $R_k = 380 \text{ OHMS}$<br>(BY-PASSED), $R_g = 1.0 \text{ MEG.}$ | INITIAL | --- | 0.4 | $\mu\text{AMPS.}$ |
|                                                                                                                     | 500 HR. | --- | 0.6 | $\mu\text{AMPS.}$ |

## HEATER-CATHODE LEAKAGE CURRENT:

|                                                                                                    |         |     |    |                   |
|----------------------------------------------------------------------------------------------------|---------|-----|----|-------------------|
| $E_f = 6.3 \text{ V.}$ , $E_{hk} = 100 \text{ V.}$ ,<br>HEATER POSITIVE WITH RESPECT<br>TO CATHODE | INITIAL | --- | 5  | $\mu\text{AMPS.}$ |
|                                                                                                    | 500 HR. | --- | 10 | $\mu\text{AMPS.}$ |

HEATER NEGATIVE WITH RESPECT  
TO CATHODE

|         |     |    |                   |
|---------|-----|----|-------------------|
| INITIAL | --- | 5  | $\mu\text{AMPS.}$ |
| 500 HR. | --- | 10 | $\mu\text{AMPS.}$ |

## INTERELECTRODE LEAKAGE RESISTANCE:

$E_f = 6.3 \text{ V}$  POLARITY OF APPLIED DC  
INTERELECTRODE VOLTAGE IS SUCH  
THAT NO CATHODE EMISSION RESULTS:

|                              |         |     |     |         |
|------------------------------|---------|-----|-----|---------|
| GRID TO ALL AT 100 VOLTS DC  | INITIAL | 100 | --- | MEGOHMS |
|                              | 500 HR. | 50  | --- | MEGOHMS |
| PLATE TO ALL AT 300 VOLTS DC | INITIAL | 100 | --- | MEGOHMS |
|                              | 500 HR. | 50  | --- | MEGOHMS |

## VIBRATIONAL NOISE OUTPUT VOLTAGE, RMS

|                                                                                                                                                                         |         |     |    |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|----|--------|
| $E_f = 6.3 \text{ V.}$ , $E_{bb} = 100 \text{ V.}$ , $R_k = 150 \text{ OHMS}$<br>(BY-PASSED), $R_L = 10,000 \text{ OHMS}$ ,<br>VIBRATIONAL ACCELERATION = 15 G AT 40cps | INITIAL | --- | 25 | MILLIV |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|----|--------|

## GRID EMISSION CURRENT:

|                                                                                                         |         |     |     |                   |
|---------------------------------------------------------------------------------------------------------|---------|-----|-----|-------------------|
| $E_f = 7.5 \text{ V.}$ , $E_b = 100 \text{ V.}$ , $E_{cc} = -7.0 \text{ V.}$ , $R_g = 1.0 \text{ MEG.}$ | INITIAL | --- | 0.4 | $\mu\text{AMPS.}$ |
|---------------------------------------------------------------------------------------------------------|---------|-----|-----|-------------------|

THE INDICATED 500-HOUR VALUES ARE LIFE-TEST END POINTS FOR THE FOLLOWING CONDITIONS OF OPERATION:  $E_f = 6.3 \text{ VOLTS}$ ,  $E_b = 100 \text{ VOLTS}$ ,  $R_k = 150 \text{ OHMS}$ ,  $R_g = 1.0 \text{ MEG}$ ,  $E_{hk} = 200 \text{ VOLTS}$  WITH HEATER POSITIVE WITH RESPECT TO CATHODE, AND BULB TEMPERATURE = 220 C MINIMUM.

## SPECIAL TESTS AND RATINGS

## STABILITY LIFE TEST

STATISTICAL SAMPLE OPERATED FOR ONE HOUR TO EVALUATE AND CONTROL INITIAL VARIATIONS IN TRANSCONDUCTANCE.

## SURVIVAL RATE LIFE TEST

STATISTICAL SAMPLE OPERATED FOR ONE HUNDRED HOURS TO EVALUATE AND CONTROL EARLY-LIFE ELECTRICAL AND MECHANICAL INOPERATIVES.

## HEATER-CYCLING LIFE TEST

STATISTICAL SAMPLE OPERATED FOR 2000 CYCLES TO EVALUATE AND CONTROL HEATER-CATHODE DEFECTS. CONDITIONS OF TEST INCLUDE  $E_f = 7.0 \text{ VOLTS}$  CYCLED FOR ONE MINUTE ON AND FOUR MINUTES OFF,  $E_b = E_c = 0 \text{ VOLTS}$ , AND  $E_{hk} = 140 \text{ VOLTS RMS}$ .

## SHOCK RATING---450 G

STATISTICAL SAMPLE SUBJECTED TO FIVE IMPACT ACCELERATIONS OF 450 G IN EACH OF FOUR DIFFERENT POSITIONS. THE ACCELERATING FORCES ARE APPLIED BY THE NAVY-TYPE, HIGH IMPACT (FLYWEIGHT) SHOCK MACHINE FOR ELECTRONIC DEVICES OR ITS EQUIVALENT.

## TUNG-SOL

CONTINUED FROM PRECEDING PAGE

## SECIAL TESTS AND RATINGS - cont'd.

## FATIGUE RATING--2.5 G

STATISTICAL SAMPLE SUBJECTED TO VIBRATIONAL ACCELERATION OF 2.5 G FOR 32 HOURS MINIMUM IN EACH OF THREE DIFFERENT POSITIONS. THE SINUSOIDAL VIBRATION IS APPLIED AT A FIXED FREQUENCY BETWEEN 25 AND 60 CYCLES PER SECOND.

## ALTITUDE RATING--60,000 FEET

STATISTICAL SAMPLE SUBJECTED TO PRESSURE OF 55 MILLIMETERS OF MERCURY TO EVALUATE AND CONTROL ARCING AND CORONA.

## NOTE:

THE CONDITIONS FOR SOME OF THE INDICATED TESTS HAVE DELIBERATELY BEEN SELECTED TO AGGRAVATE TUBE FAILURES FOR TEST AND EVALUATION PURPOSES. IN NO SENSE SHOULD THESE CONDITIONS BE INTERPRETED AS SUITABLE CIRCUIT OPERATING CONDITIONS. IN THE DESIGN OF MILITARY EQUIPMENT EMPLOYING THIS TUBE, REFERENCE SHOULD BE MADE TO THE APPROPRIATE MIL-E-1 SPECIFICATION.

