THE 12DL8 IS A COMBINED TWIN-DIODE AND SPACE-CHARGE GRID TETRODE WITH INDEPENDENT UNIPOTENTIAL CATHODES IN THE 9-PIN MINIATURE CONSTRUCTION. THE DIODE SECTION IS INTENDED FOR USE AS DETECTOR AND THE TETRODE SECTION IS INTENDED FOR USE AS A POWER AMPLIFIER WHERE THE HEATER PLATE, AND SPACE-CHARGE GRID POTENTIALS ARE OBTAINED DIRECTLY FROM AN AUTOMOTIVE BATTERY.

DIRECT INTERELECTRODE CAPACITANCES

* #1 DIODE INPUT: (#1 Pd TO KD+H) 1.6 μf
* #2 DIODE INPUT: (#2 Pd TO KD+H) 1.6 μf
* #1 DIODE TO #2 DIODE (#1 Pd TO #2 Pd) 0.03 μf
* TETRODE INPUT: (G2 TO G1+K+H) 12 μf
* TETRODE OUTPUT: (P TO G1+K+H) 1.3 μf
* TETRODE GRID #2 TO PLATE 14 μf
* COUPLING: (#1 DIODE PLATE TO TETRODE GRID #2) (MAX.) 0.02 μf
* (#2 DIODE TO TETRODE GRID #2) (MAX.) 0.006 μf

RATINGS

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM

HEATER VOLTAGE 12.6 VOLTS
MAXIMUM TETRODE PLATE VOLTAGE 30 VOLTS
MAXIMUM POSITIVE TETRODE GRID #1 VOLTAGE (ABS. MAX.) 16 VOLTS
MAXIMUM NEGATIVE TETRODE GRID #2 VOLTAGE 20 VOLTS
MAXIMUM TETRODE GRID #2 CIRCUIT RESISTANCE 10 MEGOHMS
MAXIMUM AVERAGE DIODE CURRENT 5 MA.
MAXIMUM HEATER-CATHODE VOLTAGE ±30 VOLTS

* THIS TUBE IS INTENDED TO BE USED IN AUTOMOTIVE SERVICE FROM A NOMINAL 12 VOLT BATTERY SOURCE. THE HEATER IS THEREFORE DESIGNED TO OPERATE OVER THE 10.0 TO 15.9 VOLTAGE RANGE ENCOUNTERED IN THIS SERVICE. THE MAXIMUM RATINGS OF THE TUBE PROVIDE FOR AN ADEQUATE SAFETY FACTOR SUCH THAT THE TUBE WILL WITHSTAND THE WIDE VARIATION IN SUPPLY VOLTAGES.

CONTINUED ON FOLLOWING PAGE
### TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

**CLASS A₁ AMPLIFIER - SINGLE TUBE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEATER VOLTAGE</td>
<td>12.6 V</td>
</tr>
<tr>
<td>HEATER CURRENT</td>
<td>0.55 A</td>
</tr>
<tr>
<td>PLATE VOLTAGE</td>
<td>12.6 V</td>
</tr>
<tr>
<td>GRID #2 (CONTROL GRID) VOLTAGE^B</td>
<td>-0.5 V</td>
</tr>
<tr>
<td>GRID #1 (SPACE-CHARGE GRID) VOLTAGE</td>
<td>12.6 V</td>
</tr>
<tr>
<td>PLATE CURRENT</td>
<td>40 MA</td>
</tr>
<tr>
<td>GRID #1 (SPACE-CHARGE GRID) CURRENT</td>
<td>75 MA</td>
</tr>
<tr>
<td>PLATE RESISTANCE</td>
<td>480 Ω</td>
</tr>
<tr>
<td>AMPLIFICATION FACTOR^C</td>
<td>7.2 MΩ</td>
</tr>
<tr>
<td>TRANSCONDUCTANCE^C</td>
<td>15 kMΩ</td>
</tr>
</tbody>
</table>

**DIODE UNITS - TWO**

DIODE CURRENT WITH 10.0 VOLTS APPLIED (EACH DIODE) 3 MA.

### TYPICAL OPERATION

**CLASS A₁ AMPLIFIER - SINGLE TUBE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE VOLTAGE</td>
<td>12.6 V</td>
</tr>
<tr>
<td>GRID #2 (CONTROL GRID) VOLTAGE^D</td>
<td>-2.0 V</td>
</tr>
<tr>
<td>GRID #1 (SPACE-CHARGE GRID) VOLTAGE</td>
<td>12.6 V</td>
</tr>
<tr>
<td>PEAK AF GRID #2 VOLTAGE</td>
<td>2.5 V</td>
</tr>
<tr>
<td>AF SIGNAL SOURCE RESISTANCE</td>
<td>100k Ω</td>
</tr>
<tr>
<td>LOAD RESISTANCE</td>
<td>800 Ω</td>
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<tr>
<td>PLATE CURRENT</td>
<td>8.0 MA</td>
</tr>
<tr>
<td>GRID #1 (SPACE-CHARGE GRID) CURRENT</td>
<td>75 MA</td>
</tr>
<tr>
<td>POWER OUTPUT</td>
<td>40 kW</td>
</tr>
<tr>
<td>TOTAL HARMONIC DISTORTION (MAX.)</td>
<td>10 %</td>
</tr>
</tbody>
</table>

^B AVERAGE BIAS DEVELOPED ACROSS A 2.2 MEGÖHM RESISTOR.

^C FROM GRID #2 TO PLATE.

^D OBTAINED ACROSS A 2.2 MEGÖHM RESISTOR BY GRID #2 RECTIFICATION IN WHICH CASE THE ZERO SIGNAL PLATE CURRENT IS APPROXIMATELY 40 MA.
12DL8
Tetrode

$E_f = 12.6$ Volts
$E_{C2}$ (Control Grid) = 0 Volts

![Graph 1](image1.png)

$E_{C1} = +16$
$E_{C1} = +14$
$E_{C1} = +12$
$E_{C1} = +10$
$E_{C1} = +8$
$E_{C1} = +6$
$E_{C1} = +4$
$E_{C1} = +2$

12DL8
Tetrode

$E_f = 12.6$ Volts
$E_{C1}$ (Space Charge Grid) = +12.6 Volts

![Graph 2](image2.png)

$E_{C2} = 0$
$E_{C2} = -1$
$E_{C2} = -2$
$E_{C2} = -3$
$E_{C2} = -4$
$E_{C2} = -5$
$E_{C2} = -6$
$E_{C2} = -8$

Tung-Sol Electric Inc. Electron Tube Division Bloomfield, New Jersey, U.S.A. September 1, 1957 Plate #5075