# 11E15

## H.F. DOUBLE TETRODE

Indirectly heated

**TENTATIVE**

### GENERAL

The 11E15 is an internally neutralised h.f. double tetrode. It is intended for use as a push-pull amplifier or frequency trebler at frequencies up to 500 Mc/s.

### RATING§

| | | | | |
|---|---|---|---|---|
| Heater Voltage | $V_h$ | 12·6 | 6·3 | V |
| Heater Current | $I_h$ | 0·9 | 1·8 | A |
| Maximum Operating Frequency | $f_{(max)}$ | | 500 | Mc/s |
| Maximum Permissible Temperature of hottest part of bulb | | | 200 | °C |
| Maximum Permissible Temperature of the base pins | | | 180 | °C |

§All limiting values are Absolute, not Design Centres.

### RATING—Absolute values

As Class "C" r.f. push-pull power amplifier for c.w. telegraphy or f.m. telephony.

| | | | |
|---|---|---|---|
| Maximum Anode Voltage | $V_{a(max)}$ | 600* | V |
| Maximum Screen Grid Voltage | $V_{g2(max)}$ | 300 | V |
| Maximum Negative Control Grid Voltage | $V_{g1(max)}$ | −100 | V |
| Maximum Heater/Cathode Voltage | $V_{h\text{-}k(max)}$ | 100 | V |
| Maximum Anode Dissipation | $P_{a(max)}$ | 20† | W |
| Maximum Screen Grid Dissipation | $P_{g2(max)}$ | 3·5† | W |
| Maximum Control Grid Dissipation | $P_{g1(max)}$ | 1·0† | W |
| Maximum Peak Cathode Current | $i_{k(pk)max}$ | 700† | mA |
| Maximum Mean Cathode Current | $I_{k(av)max}$ | 120† | mA |
| Maximum Control Grid/Cathode Resistance (fixed bias) | $R_{g1\text{-}k(max)}$ | 50† | kΩ |

*Continued*



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| | | |
|---|---|---|
| Maximum Control Grid Cathode Resistance (automatic bias) | $R_{g1\text{-}k(max)}$ | 100† kΩ |
| Maximum Mean Control Grid Current | $I_{g1(av)max}$ | 5·0† mA |

* For natural cooling $V_{a(max)}$=600V up to 150 Mc/s but is limited to 280V at 500 Mc/s. For forced air cooling $V_{a(max)}$=600V up to 280 Mc/s but is limited to 500V at 500 Mc/s.

† Each section.

**RATING**—Absolute values

Class " B " a.f. power amplifier or modulator.

| | | | |
|---|---|---|---|
| Maximum Anode Voltage | $V_{a(max)}$ | 600 | V |
| Maximum Screen Grid Voltage | $V_{g2(max)}$ | 300 | V |
| Maximum Negative Control Grid Voltage | $V_{g1(max)}$ | −100 | V |
| Maximum Heater Cathode Voltage | $V_{h\text{-}k(max)}$ | 100 | V |
| Maximum Anode Dissipation | $P_{a(max)}$ | 20† | W |
| Maximum Screen Grid Dissipation | $P_{g2(max)}$ | 3·5† | W |
| Maximum Control Grid Dissipation | $P_{g1(max)}$ | 1·0† | W |
| Maximum Peak Cathode Current | $i_{k(pk)max}$ | 450† | mA |
| Maximum Mean Cathode Current | $I_{k(av)max}$ | 140† | mA |
| Maximum Control Grid Cathode Resistance (fixed bias) | $R_{g1\text{-}k(max)}$ | 50† | kΩ |
| Maximum Control Grid Cathode Resistance (automatic bias) | $R_{g1\text{-}k(max)}$ | 100† | kΩ |

† Each section.



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**RATING**—Absolute values

As Class "C" r.f. power amplifier with anode and screen modulation (carrier condition for use with modulation factor 1).

| | | | |
|---|---|---|---|
| Maximum Anode Voltage | $V_{a(max)}$ | 600* | V |
| Maximum Screen Grid Voltage | $V_{g2(max)}$ | 300 | V |
| Maximum Negative Control Grid Voltage | $V_{g1(max)}$ | −175 | V |
| Maximum Heater/Cathode Voltage | $V_{h-k(max)}$ | 100 | V |
| Maximum Anode Dissipation | $P_{a(max)}$ | 14† | W |
| Maximum Screen Grid Dissipation | $P_{g2(max)}$ | 2·3† | W |
| Maximum Control Grid Dissipation | $P_{g1(max)}$ | 1·0† | W |
| Maximum Peak Cathode Current | $i_{k(pk)max}$ | 1·0† | A |
| Maximum Mean Cathode Current | $I_{k(av)max}$ | 120† | mA |
| Maximum Control Grid/Cathode Resistance (fixed bias) | $R_{g1-k(max)}$ | 50† | kΩ |
| Maximum Control Grid/Cathode Resistance (automatic bias) | $R_{g1-k(max)}$ | 100† | kΩ |
| Maximum Mean Control Grid Current | $I_{g1(av)max}$ | 5·0† | mA |

* For natural cooling $V_{a(max)}$=600V up to 150 Mc/s but is limited to 280V at 500 Mc/s. For forced air cooling $V_{a(max)}$=600V up to 250 Mc/s but is limited to 480V at 500 Mc/s.

† Each section.



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**RATING**—Absolute values

Frequency Trebler.

| | | | |
|---|---|---|---|
| Maximum Anode Voltage | $V_{a(max)}$ | 750 | V |
| Maximum Screen Grid Voltage | $V_{g2(max)}$ | 300 | V |
| Maximum Negative Control Grid Voltage | $V_{g1(max)}$ | −175 | V |
| Maximum Heater Cathode Voltage | $V_{h-k(max)}$ | 100 | V |
| Maximum Anode Dissipation | $P_{a(max)}$ | 20† | W |
| Maximum Screen Grid Dissipation | $P_{g2(max)}$ | 3·5† | W |
| Maximum Control Grid Dissipation | $P_{g1(max)}$ | 1·0† | W |
| Maximum Peak Cathode Current | $i_{k(pk)max}$ | 700† | mA |
| Maximum Mean Cathode Current | $I_{k(av)max}$ | 100† | mA |
| Maximum Control Grid Cathode Resistance (fixed bias) | $R_{g1-k(max)}$ | 50† | kΩ |
| Maximum Control Grid Cathode Resistance (automatic bias) | $R_{g1-k(max)}$ | 100† | kΩ |
| Maximum Mean Control Grid Current | $I_{g1(av)max}$ | 5·0† | mA |

† Each section

**INTER-ELECTRODE CAPACITANCES**

| | | | |
|---|---|---|---|
| Anode Grid 1*† | $c_{a-g1}$ | 0·06 | pF |
| Grid 1/All other electrodes† | $c_{g1-all}$ | 10·5 | pF |
| Anode/All other electrodes† | $c_{a-all}$ | 3·2 | pF |
| Input Capacitance‡ | $c_{in}$ | 6·7 | pF |
| Output Capacitance‡ | $c_{out}$ | 2·1 | pF |

* Internally neutralised for push pull operation.

† Each section.

‡ 2 sections in push pull.



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### CHARACTERISTICS

| | | |
|---|---|---|
| Mutual Conductance | $g_m$ | 4·5†‡ mA/V |
| Inner Amplification Factor | $\mu_{g1-g2}$ | 8·0†‡ |

† Each section.
‡At $V_a$=300V, $V_{g2}$=250V, $I_a$=30mA.

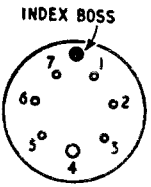
### DIMENSIONS

| | |
|---|---|
| Maximum Overall Length | 103 mm |
| Maximum Diameter | 47 mm |
| Maximum Seated Height | 91 mm |
| Approximate Net Weight | 2·3 ozs |

**MOUNTING POSITION**—Unrestricted, but when mounted horizontally anode pins should be in a horizontal plane.

**CAPS**—Wire 2 mm dia.

**BASE**—B7A




Viewed from free end of pins

### CONNECTIONS

| | | |
|---|---|---|
| Pin 1 | Heater | h |
| Pin 2 | Control Grid, Section 1 | g1′ |
| Pin 3 | Screen Grid | g2′g2″ |
| Pin 4 | Cathode, Beam Plates, Shield | k,bp,s |
| Pin 5 | Heater Centre Tap | $h_{ct}$ |
| Pin 6 | Control Grid, Section 2 | g1″ |
| Pin 7 | Heater | h |
| Cap No. 1 | Anode, Section 1 | a′ |
| Cap No. 2 | Anode, Section 2 | a″ |



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