

V.H.F. BEAM POWER TETRODE

YLI 150

TENTATIVE DATA

QUICK REFERENCE DATA

Radiation and convection cooled beam power tetrode intended for use as a linear v.h.f. amplifier for s.s.b., Class 'C' v.h.f. amplifier or l.f. Class 'AB' amplifier or modulator.

| | Class 'AB' Amplifier or Modulator | Class 'B' Linear Amplifier for S.S.B. | Class 'C' Telegraphy or F.M. Telephony | |
|---------------------|--|--|---|------|
| f | - | 30 60 | 30 | Mc/s |
| P _{out} | 2 x 100 | *120 *109 | 150 | W |
| f max. | - | 60 | 60 | Mc/s |
| V _a max. | 750 | 750 | 750 | V |
| p _a max. | 75 | 75 | 75 | W |

*P.E. P_{out}

To be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES.

CLASS 'B' LINEAR AMPLIFIER FOR SINGLE SIDEBAND OPERATION

Maximum operating conditions

| | | | |
|----------------------------|-------------|-------------|----|
| f | 30 | Mc/s | |
| P. E. P _{out} | 120 | W | |
| P. E. P _{load} | 110 | W | |
| **d ₃ | 30 | dB | |
| **d ₅ | 40 | dB | |
| V _a | 600 | V | |
| V _{g2} | 250 | V | |
| ***-V _{g1} | 55 | V | |
| I _{a(o)} | 100 | mA | |
| I _{g2(o)} | 3.0 | mA | |
| | Single tone | Double tone | |
| I _a | 328 | 221 | mA |
| I _{g2} | 27.5 | 15 | mA |
| I _{g1} | 0 | 0 | mA |
| v _{in(pk)} | 40 | 40 | V |
| P _{load (driver)} | 1.0 | 1.0 | W |
| P _a | 77 | 73 | W |
| η_a | 61 | 45 | % |

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| | | | |
|--------------------|-------------|-------------|----|
| f | 60 | Mc/s | |
| P. E. P_{out} | 109 | W | |
| P. E. P_{load} | 100 | W | |
| ** d_3 | 30 | dB | |
| ** d_5 | 40 | dB | |
| V_a | 600 | V | |
| V_{g2} | 250 | V | |
| ***- V_{g1} | 50 | V | |
| $I_{a(o)}$ | 100 | mA | |
| $I_{g2(o)}$ | 3.0 | mA | |
| | Single tone | Double tone | |
| I_a | 325 | 220 | mA |
| I_{g2} | 28 | 14 | mA |
| I_{g1} | 0.5 | 0.1 | mA |
| $v_{in(pk)}$ | 50 | 50 | V |
| $P_{load(driver)}$ | 1.0 | 1.0 | W |
| p_a | 75 | 72 | W |
| η_a | 51 | 38 | % |

**Maximum values encountered at any level of drive voltage referred to the amplitude of either of the two tones at that level. Third and fifth order intermodulation products.

***Adjust to give stated value of $I_{a(o)}$

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Maximum operating conditions

| | | |
|--------------------|-----|------|
| f | 30 | Mc/s |
| P_{out} | 150 | W |
| P_{load} | 120 | W |
| η_a | 76 | % |
| V_a | 600 | V |
| I_a | 330 | mA |
| V_{g2} | 250 | V |
| I_{g2} | 28 | mA |
| $-V_{g1}$ | 90 | V |
| I_{g1} | 0 | mA |
| $P_{load(driver)}$ | 1.0 | W |
| p_a | 48 | W |
| p_{g2} | 7.0 | W |

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CLASS 'AB' AUDIO AMPLIFIER OR MODULATOR

Maximum operating conditions for two valves in push-pull

| | | |
|--------------------------|----------------|------------|
| P_{out} | 200 | W |
| $\dagger D_{tot}$ | ≤ 2 | % |
| R_{a-a} | 2.8 | k Ω |
| V_a | 600 | V |
| V_{g2} | 250 | V |
| $\dagger\dagger -V_{g1}$ | 50 | V |
| $I_{a(o)}$ | 2×100 | mA |
| $I_{g2(o)}$ | 2×3.0 | mA |
| I_a (max. sig.) | 2×260 | mA |
| I_{g2} (max. sig.) | 2×24 | mA |
| I_{g1} | 0 | mA |
| $V_{in(g1-g1)}$ r. m. s. | 100 | V |
| P_a | 2×56 | W |
| η_a | 64 | % |

\dagger Total distortion encountered at maximum output.

$\dagger\dagger$ Adjust to give the stated value of $I_{a(o)}$.

ABSOLUTE MAXIMUM RATINGS

| | | |
|-----------------|-----|------------|
| V_a max. | 750 | V |
| V_{g2} max. | 300 | V |
| $-V_{g1}$ max. | 100 | V |
| I_k max. | 360 | mA |
| p_a max. | 75 | W |
| p_{g2} max. | 7.5 | W |
| I_{g1} max. | 10 | mA |
| R_{g1-k} max. | 10 | k Ω |
| V_{h-k} max. | 100 | V |

CATHODE

Indirectly heated, oxide coated

| | Parallel | Series | |
|-------|----------|--------|---|
| V_h | 6.3 | 12.6 | V |
| I_h | 2.6 | 1.3 | A |

CAPACITANCES

| | | |
|------------|------|----|
| c_{out} | 10.7 | pF |
| c_{in} | 22 | pF |
| c_{a-g1} | 0.2 | pF |

CHARACTERISTICS (measured at $V_a = 600V$, $V_{g2} = 250V$ and $I_a = 100mA$)

| | | |
|---------------|-----|------|
| g_m | 35 | mA/V |
| μ_{g1-g2} | 4.7 | |

MOUNTING POSITION

Vertical or horizontal with plane of anodes vertical.

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COOLING

Radiation and convection

Maximum temperatures

| | | |
|----------------|-----|----|
| Bulb | 350 | °C |
| Anode seal | 220 | °C |
| Base pin seals | 180 | °C |

PHYSICAL DATA

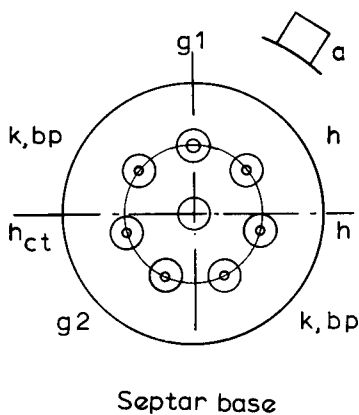
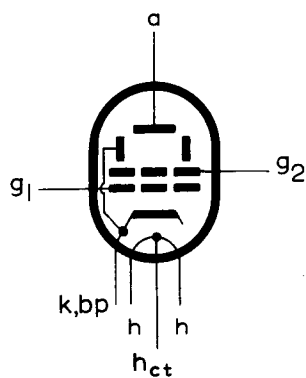
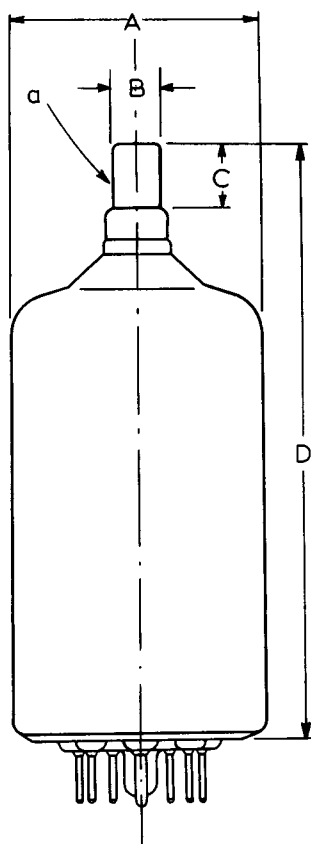
| | | |
|-----------------|-----|-----|
| Weight of valve | oz | g |
| | 3.9 | 110 |

ACCESSORIES

| | |
|-----------------|-------|
| Socket | 40202 |
| Anode connector | 40624 |

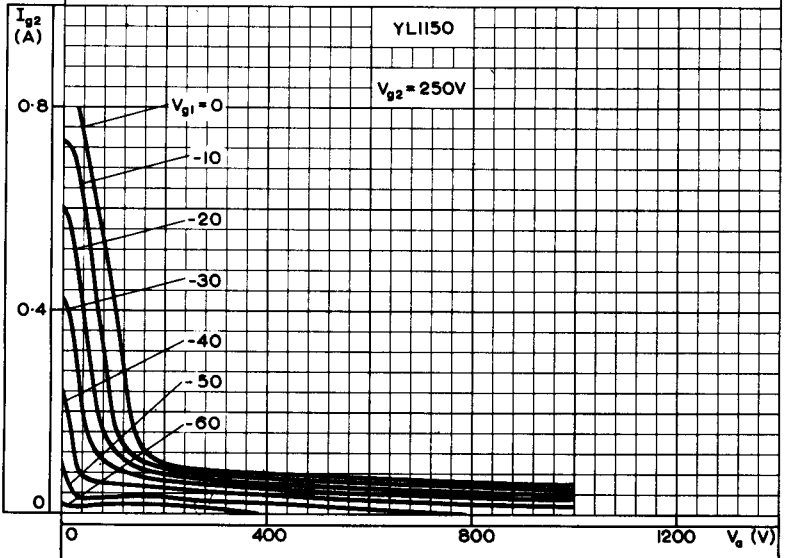
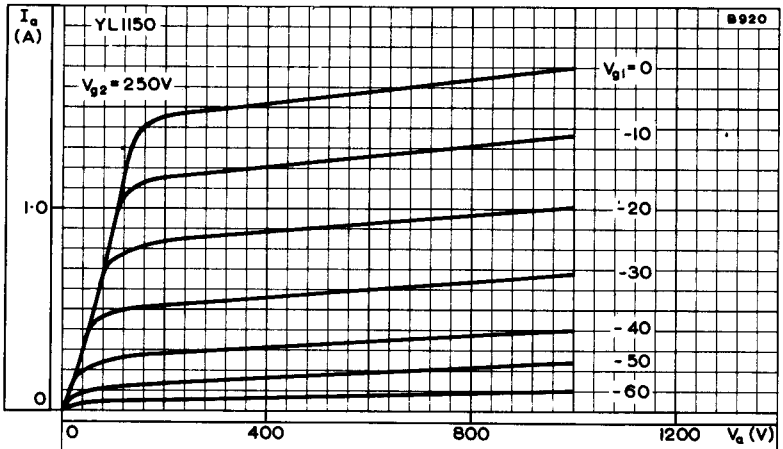
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| Dimensions | | |
|------------|--------|-------------|
| | Inches | Millimetres |
| A | 2.047 | 52 max |
| B | 0.358 | 9.1 |
| C | 0.472 | 12 min |
| D | 4.646 | 120 |



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ANODE AND SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER $V_{g2} = 250V$

TENTATIVE DATA

| QUICK REFERENCE DATA | | | |
|---|---|--|------|
| Beam power tetrode primarily intended for use as a linear v.h.f. amplifier in single sideband transmitters. | | | |
| | Linear Amplifier for S.S.B. Operation, Class 'AB' | A.F. Amplifier and Modulator, Class 'AB' | |
| f | 30 | - | Mc/s |
| P_{out} | 124 (P.E.P.) | 2 x 100 | W |
| $f_{max.}$ | 60 | - | Mc/s |
| $V_a_{max.}$ | 750 | 750 | V |
| $p_a_{max.}$ | 75 | 75 | W |

To be read in conjunction with
GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

AUDIO AMPLIFIER AND MODULATOR, CLASS 'AB' (Two valves in push-pull)

OPERATING CONDITIONS

| | | |
|-----------------------|---------|-----|
| P_{out} | 200 | W |
| * D_{tot} | ≤ 2 | % |
| R_{a-a} | 2.8 | kΩ |
| V_a | 600 | V |
| V_{g2} | 250 | V |
| ** $-V_{g1}$ | 50 | V |
| $I_{a(o)}$ | 2 x 100 | mA |
| $I_{g2(o)}$ | 2 x 3.0 | mA |
| $I_a(max. sig.)$ | 2 x 260 | mA |
| $I_{g2(max. sig.)}$ | 2 x 24 | mA |
| I_{g1} | 0 | mA |
| $V_{in(g1-g1)r.m.s.}$ | 71 | V ← |
| P_a | 2 x 56 | W |
| P_{g2} | 2 x 6.0 | W ← |
| η_a | 64 | % |

*Total distortion encountered at maximum output.

**Adjust to give the desired value of $I_{a(o)}$.

LINEAR AMPLIFIER FOR SINGLE SIDEBAND OPERATION, CLASS 'AB'

OPERATING CONDITIONS

| | | | |
|---------------------------|-------------|-------------|----|
| f | 30 | Mc/s | |
| P. E. P _{out} | 124 | W | |
| P. E. P _{load} | 110 | W | |
| *d ₃ | 33 | dB | |
| *d ₅ | 40 | dB | |
| V _a | 600 | V | |
| V _{g2} | 250 | V | |
| ** -V _{g1} | 50 | V | |
| I _{a(o)} | 100 | mA | |
| I _{g2(o)} | 3.0 | mA | |
| | Single Tone | Double Tone | |
| I _a | 325 | 220 | mA |
| I _{g2} | 22 | 12 | mA |
| I _{g1} | 0 | 0 | mA |
| v _{in(pk)} | 50 | 50 | V |
| P _{load(driver)} | 2.0 | 2.0 | W |
| P _g | 71 | 70 | W |
| P _{g2} | 7.0 | 3.5 | W |
| η _a | 57 | 42 | % |

*Third and fifth order intermodulation products. Maximum values encountered at any level of drive voltage referred to the amplitude of either of the two tones at that level.

Relative to the peak envelope power these figures will be increased by 6dB.

**Adjust to give the desired value of I_{a(o)}.

CATHODE

Indirectly heated, oxide coated

| | Parallel | Series | |
|-----------------------|----------|--------|-----|
| V _h | 6.3 | 12.6 | V |
| I _h | 1.62 | 0.81 | A ← |
| t _{h-k} min. | 30 | | s ← |

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RATINGS (ABSOLUTE MAXIMUM SYSTEM)

| | S.S.B. Class 'AB' | A.F. Amplifier Class 'AB' | |
|------------------------|----------------------|------------------------------|------|
| f max. | 60 | - | Mc/s |
| V _a max. | 750 | 750 | V |
| V _{g2} max. | 300 | 300 | V |
| -V _{g1} max. | 100 | 100 | V |
| I _a max. | 350 | 350 | mA |
| p _a max. | 75 | 75 | W |
| p _{g2} max. | 7.5 | 7.5 | W |
| I _{g1} max. | 10 | 10 | mA |
| p _{g1} max. | 0.5 | 0.5 | W |
| R _{g1-k} max. | 10 | 10 | kΩ |

CAPACITANCES

| | | |
|-------------------|------|----|
| c _{a-g1} | 0.2 | pF |
| c _{out} | 10.7 | pF |
| c _{in} | 22 | pF |

CHARACTERISTICS

| | | |
|--|-----|--------|
| g _m (at V _a = 600V, V _{g2} = 250V, I _a = 100mA) | 10 | mA/V ← |
| μ _{g1-g2} (at V _a = 600V, V _{g2} = 250V, I _a = 0.1A) | 4.7 | |

MOUNTING POSITION

Any

COOLING

Radiation and convection cooling

Maximum temperatures

| | | |
|---------------|-----|----|
| Bulb | 350 | °C |
| Base pin seal | 180 | °C |
| Anode seal | 220 | °C |

PHYSICAL DATA

| | | |
|-----------------|-----|-----|
| | oz | g |
| Weight of valve | 3.9 | 110 |

ACCESSORIES

Socket

40202

Anode connector

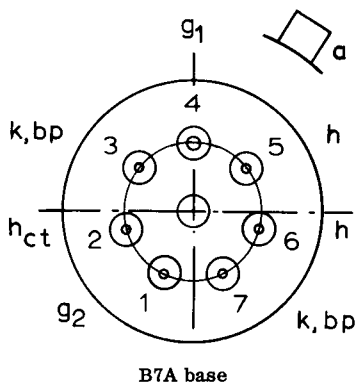
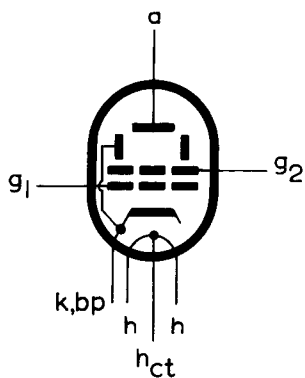
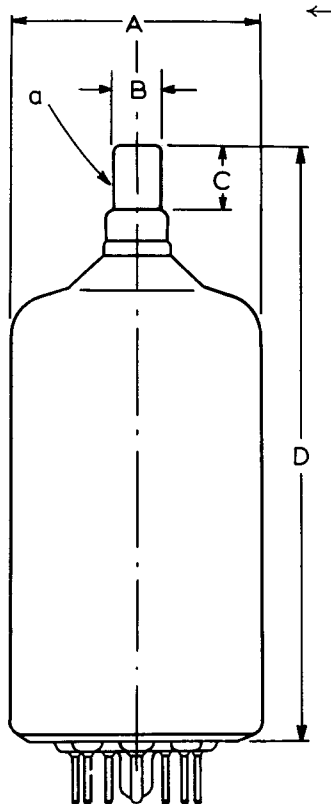
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DIMENSIONS

| | Inches | Millimetres |
|---|--------|-------------|
| A | 1.97 | 50 |
| B | 0.358 | 9.1 |
| C | 0.51 | 13 |
| D | 4.65 | 120 |

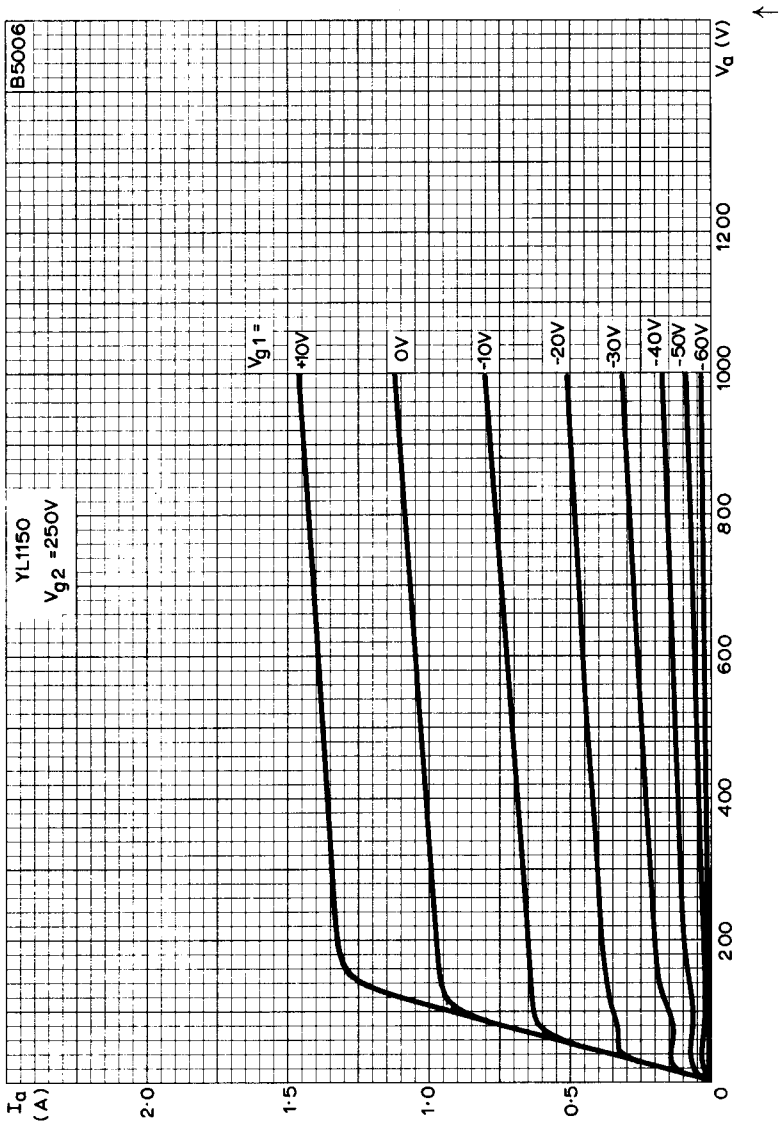
Inch dimensions derived from original millimetre dimensions.



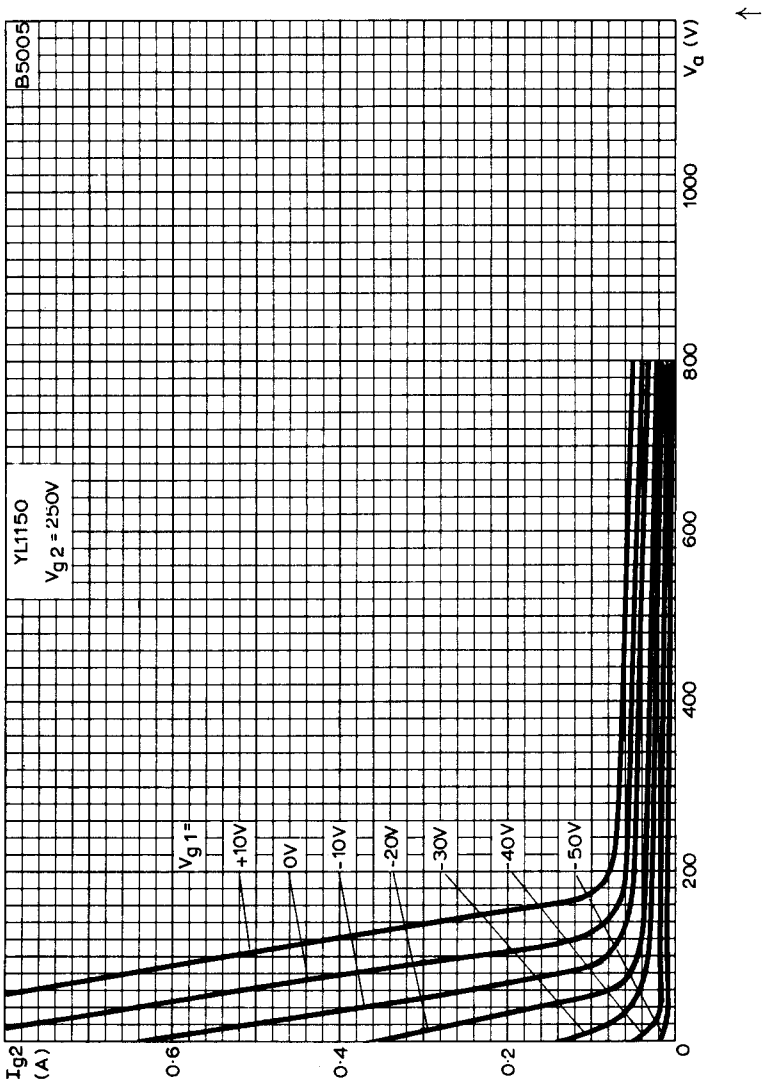
B7A base

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ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH
CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 250V$



SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 250V$