

**TENTATIVE DATA**

**QUICK REFERENCE DATA**

Beam power tetrodes intended for use as r.f. power amplifiers in transmitters, oscillators and frequency multipliers at frequencies up to 2000Mc/s.

YL1101 is similar to YL1100 except for heater ratings.

YL1102 and YL1103 are conduction-cooled versions of YL1100 and YL1101 respectively.

|                     | Linear Amplifier<br>for<br>Television Service,<br>Class 'AB <sub>1</sub> ' | Telephony,<br>Anode and Screen<br>Grid Modulation<br>Class 'C' | Telegraphy<br>or F.M.<br>Telephony,<br>Class 'C' |      |      |
|---------------------|----------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------|------|------|
| f                   | 790                                                                        | 400                                                            | 400                                              | 1200 | Mc/s |
| P <sub>load</sub>   | 13                                                                         | 45                                                             | 80                                               | 40   | W    |
| f max.              | 1200                                                                       | 1200                                                           | 1200                                             |      | Mc/s |
| V <sub>a</sub> max. | 1000                                                                       | 800                                                            | 1000                                             |      | V    |
| p <sub>a</sub> max. | 115                                                                        | 75                                                             | 115                                              |      | W    |

Unless otherwise shown, data is applicable to all types

To be read in conjunction with

**GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES**

# TELEGRAPHY OR F.M. TELEPHONY, CLASS 'C'

## OPERATING CONDITIONS

|                           | Grid Drive |       | Cathode Drive |      |
|---------------------------|------------|-------|---------------|------|
| f                         | 400        | 1200  | 1200          | Mc/s |
| P <sub>out</sub>          | 90         | 45    | 45            | W    |
| P <sub>load</sub>         | 80         | 40    | 42*           | W    |
| $\eta_a$                  | 68         | 29    | 29            | %    |
| V <sub>a</sub>            | 900        | 900   | 900           | V    |
| I <sub>a</sub>            | 170        | 170   | 170           | mA   |
| V <sub>g2</sub>           | 300**      | 300** | 300           | V    |
| I <sub>g2</sub>           | 1.0        | 1.0   | 3.2           | mA   |
| -V <sub>g1</sub>          | 30         | 22    | 31            | V    |
| I <sub>g1</sub>           | 10         | 4.0   | 3.4           | mA   |
| P <sub>load(driver)</sub> | 3.0        | 5.0   | 8.0           | W    |
| P <sub>a</sub>            | 43         | 108   | 108           | W    |
| P <sub>g2</sub>           | 0.3        | 0.3   | 1.0           | W    |

\*Includes power transferred from driver stage.

\*\*Fixed supply or supply derived from the anode supply by means of a voltage divider.

# TELEPHONY, ANODE AND SCREEN-GRID MODULATION, CLASS 'C'

## OPERATING CONDITIONS (Carrier conditions for 100% modulation)

|                           |     |      |
|---------------------------|-----|------|
| f                         | 400 | Mc/s |
| P <sub>out</sub>          | 50  | W    |
| P <sub>load</sub>         | 45  | W    |
| $\eta_a$                  | 54  | %    |
| V <sub>a</sub>            | 700 | V    |
| I <sub>a</sub>            | 130 | mA   |
| V <sub>g2</sub>           | 250 | V    |
| I <sub>g2</sub>           | 10  | mA   |
| -V <sub>g1</sub>          | 50  | V    |
| I <sub>g1</sub>           | 10  | mA   |
| P <sub>load(driver)</sub> | 3.0 | W    |
| P <sub>a</sub>            | 41  | W    |
| P <sub>g2</sub>           | 2.5 | W    |

For 100% modulation

|                     |     |   |
|---------------------|-----|---|
| P <sub>mod</sub>    | 93  | W |
| v <sub>g2(pk)</sub> | 150 | V |

## LINEAR AMPLIFIER FOR TELEVISION SERVICE, CLASS 'AB<sub>1</sub>'

Sound and vision

OPERATING CONDITIONS for valve in common grid circuit

|                              |     |      |
|------------------------------|-----|------|
| f                            | 790 | Mc/s |
| Bandwidth (-1dB)             | 8.0 | Mc/s |
| $P_{load(pk)}$               | 13  | W    |
| *Intermodulation products    | -52 | dB   |
| $V_{a-g1}$                   | 800 | V    |
| $V_{g2-g1}$                  | 365 | V    |
| ** $V_{k-g1}$                | +15 | V    |
| $I_{a(o)}$                   | 125 | mA   |
| $I_{a(max.sig.)}$            | 152 | mA   |
| $I_{g2}$                     | 7.0 | mA   |
| $I_{g1}$                     | 0   | mA   |
| $\dagger P_{load(driver)pk}$ | 1.3 | W    |

\*The intermodulation product in the passband of the output signal is measured with reference to peak envelope output.

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

$\dagger$ The driver signal consists of three independent r.f. signal voltages.

|                      |        |                                                                           |
|----------------------|--------|---------------------------------------------------------------------------|
| i.e. Picture carrier | - 8dB  | } with respect to the sum<br>signal amplitude of the<br>composite signal. |
| Sideband signal      | - 17dB |                                                                           |
| Sound carrier        | - 7dB  |                                                                           |

## CATHODE

Indirectly heated, a.c. or d.c., oxide coated.

|                        | YL1100<br>YL1102 | YL1101<br>YL1103 |   |
|------------------------|------------------|------------------|---|
| $V_h$                  | 26.5             | 6.3              | V |
| $I_h$                  | 0.52             | 2.1              | A |
| $t_{h-k} \text{ min.}$ | 60               | 60               | s |

The heater voltage must be reduced depending on the operating conditions and the frequency

# RATINGS (ABSOLUTE MAXIMUM SYSTEM)

|                        | Television<br>Class 'AB <sub>1</sub> ' | Telegraphy<br>Class 'C' | Telephony<br>Class 'C' |      |
|------------------------|----------------------------------------|-------------------------|------------------------|------|
| f max.                 | 1200                                   | 1200                    | 1200                   | Mc/s |
| V <sub>a</sub> max.    | 1000                                   | 1000                    | 800                    | V    |
| V <sub>g2</sub> max.   | 300                                    | 300                     | 300                    | V    |
| -V <sub>g1</sub> max.  | 100                                    | 100                     | 100                    | V    |
| I <sub>a</sub> max.    | 180                                    | 180                     | 150                    | mA   |
| p <sub>a</sub> max.    | 115                                    | 115                     | 75                     | W    |
| p <sub>g2</sub> max.   | 4.5                                    | 4.5                     | 3.0                    | W    |
| I <sub>g1</sub> max.   | -                                      | 30                      | 30                     | mA   |
| R <sub>g1-k</sub> max. | 30                                     | 30                      | 30                     | kΩ   |

## CAPACITANCES

|                                |        |    |
|--------------------------------|--------|----|
| <sup>c</sup> <sub>a-g1</sub>   | <0.065 | pF |
| <sup>c</sup> <sub>g1-k+h</sub> | 14     | pF |
| <sup>c</sup> <sub>a-k+h</sub>  | <0.015 | pF |
| <sup>c</sup> <sub>g2-g1</sub>  | 19     | pF |
| <sup>c</sup> <sub>a-g2</sub>   | 4.4    | pF |
| <sup>c</sup> <sub>g2-k+h</sub> | <0.4   | pF |

## CHARACTERISTICS (measured at V<sub>a</sub> = 1.0kV, V<sub>g2</sub> = 250V, I<sub>a</sub> = 100mA)

|                    |    |      |
|--------------------|----|------|
| g <sub>m</sub>     | 16 | mA/V |
| μ <sub>g1-g2</sub> | 18 |      |

## MOUNTING POSITION

Any

## COOLING

YL1100 and YL1101 - Forced-air cooling for radiator and seals.  
YL1102 and YL1103 - Heat sink cooling.

|                                            |     |    |
|--------------------------------------------|-----|----|
| Maximum temperature of anode and all seals | 250 | °C |
|--------------------------------------------|-----|----|

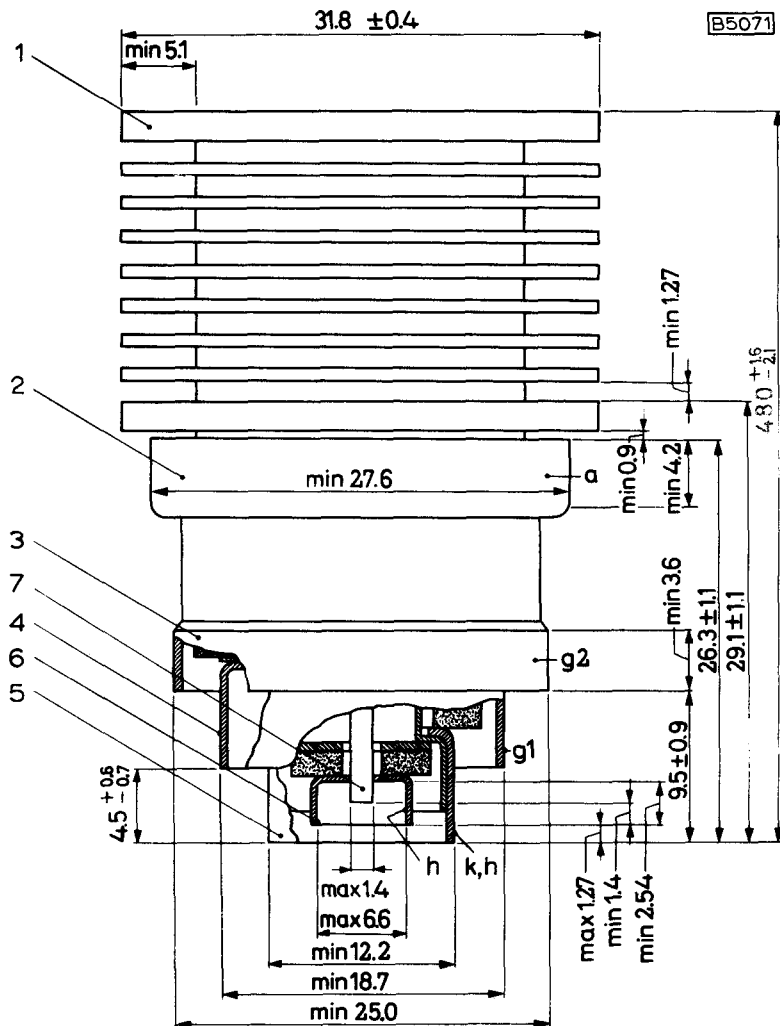
## PHYSICAL DATA

|                 |     |    |
|-----------------|-----|----|
|                 | oz  | g  |
| Weight of valve | 2.0 | 60 |

## U.H.F. BEAM POWER TETRODES

YLI100    YLI102  
YLI101    YLI103

### OUTLINE DRAWING OF YL1100 AND YL1101

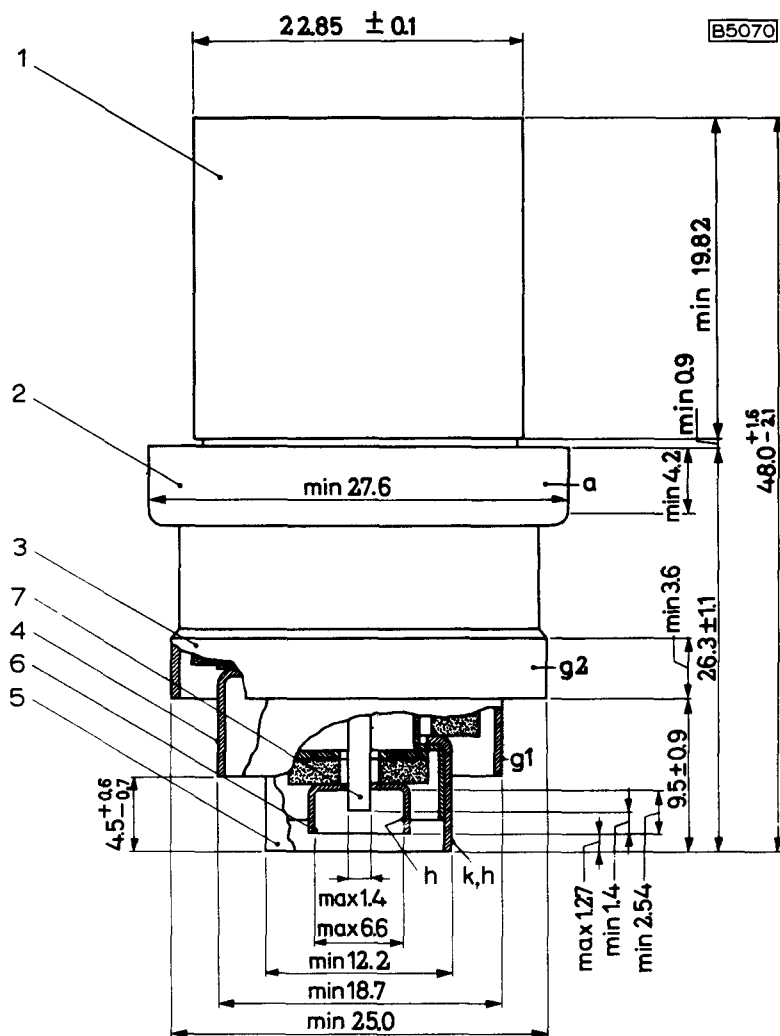


**Radiator and terminals lie inside or outside concentric cylinders:**

- |                   |              |                     |              |
|-------------------|--------------|---------------------|--------------|
| 1. Radiator       | i.d. 33.40mm | 5. Cathode terminal | i.d. 13.16mm |
| 2. Anode terminal | i.d. 28.40mm | 6. Heater terminals | o.d. 6.07mm  |
| 3. $g_2$ terminal | i.d. 25.86mm | 7. Heater terminals | i.d. 1.78mm  |
| 4. $g_1$ terminal | i.d. 19.38mm |                     |              |

All dimensions in mm

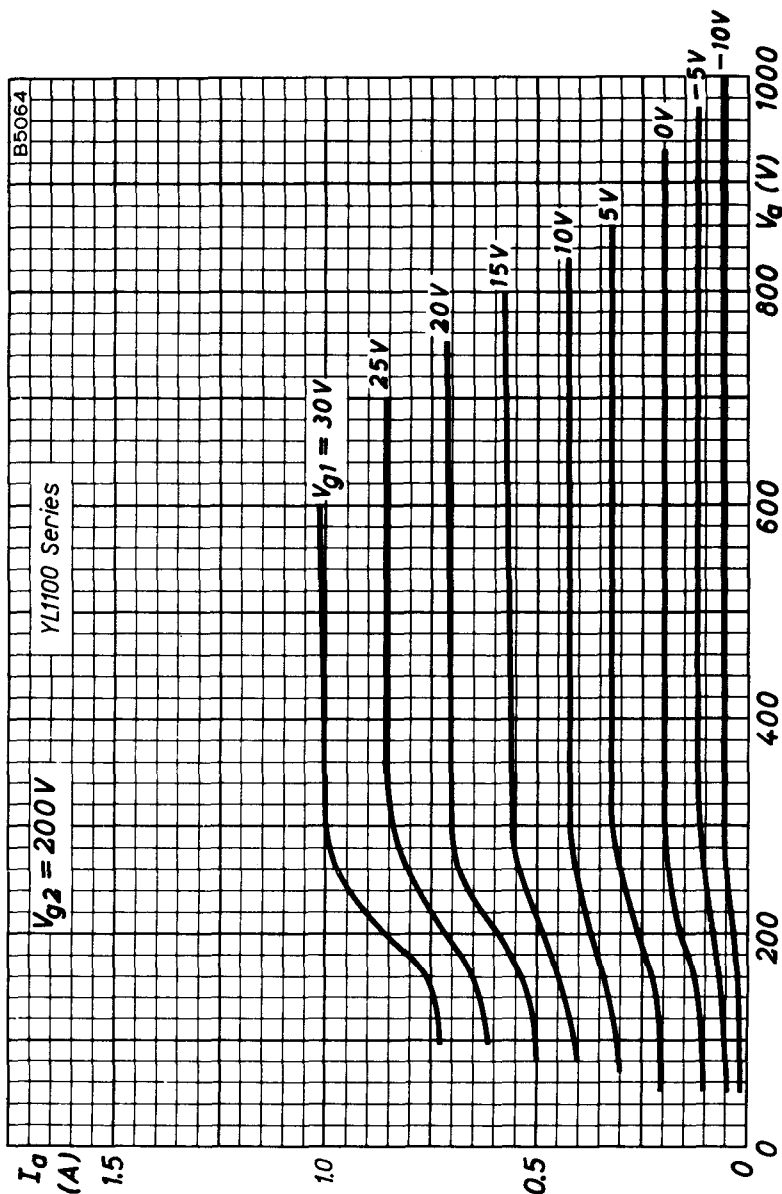
# OUTLINE DRAWING OF YL1102 AND YL1103



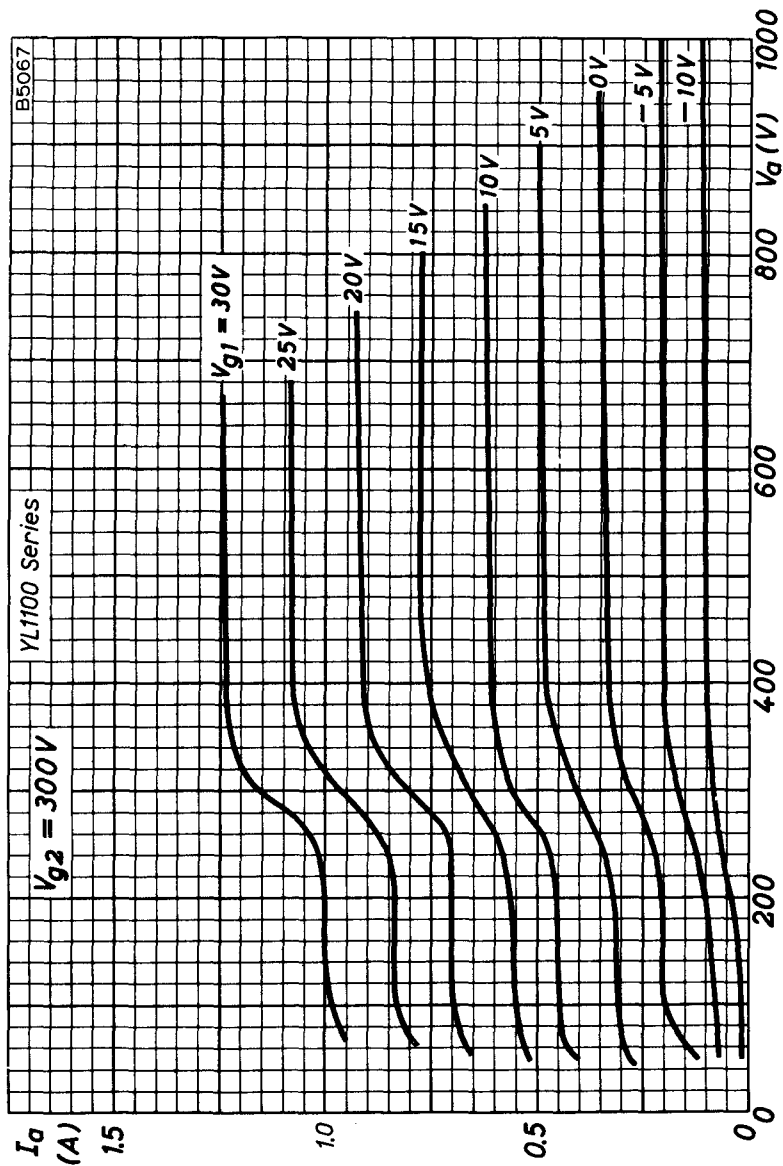
Cooling cylinder and terminals lie inside or outside concentric cylinders:

- |                     |              |                     |              |
|---------------------|--------------|---------------------|--------------|
| 1. Cooling cylinder | i.d. 24.15mm | 5. Cathode terminal | i.d. 13.16mm |
| 2. Anode terminal   | i.d. 28.40mm | 6. Heater terminals | o.d. 6.07mm  |
| 3. $g_2$ terminal   | i.d. 25.86mm | 7. Heater terminals | i.d. 1.78mm  |
| 4. $g_1$ terminal   | i.d. 19.38mm |                     |              |

All dimensions in mm



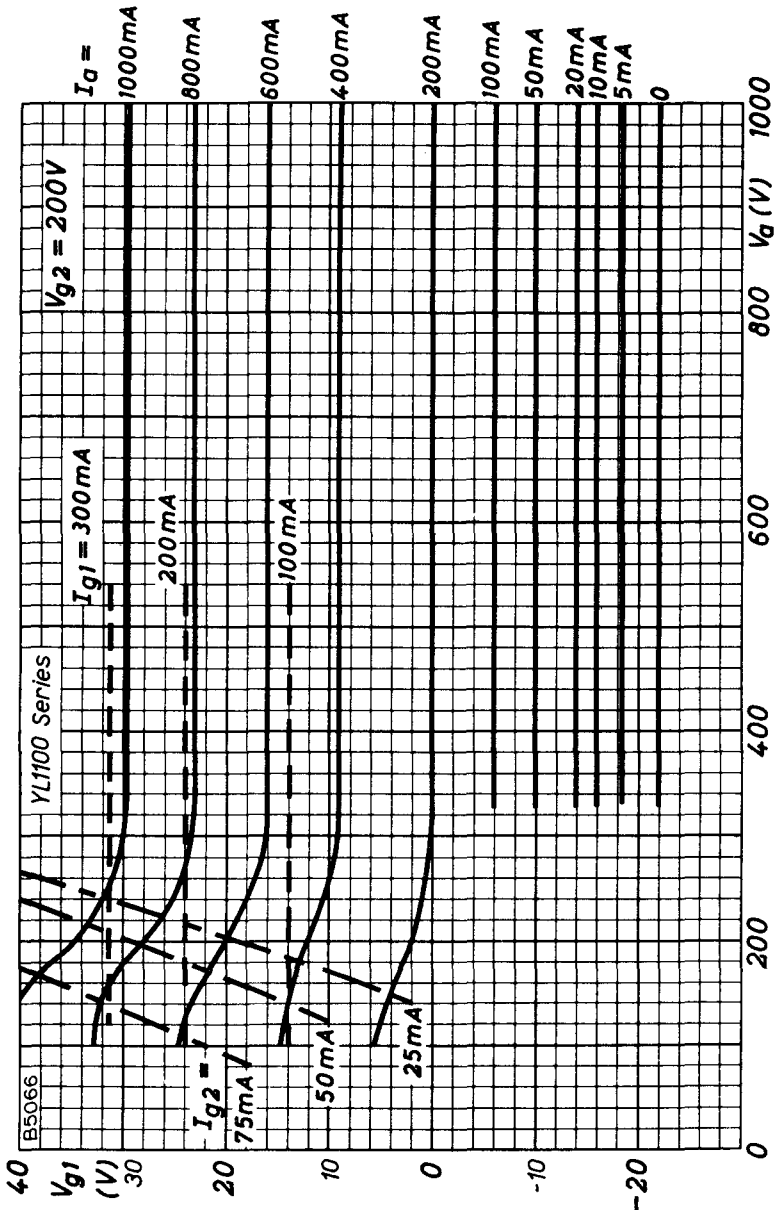
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH  
CONTROL-GRID VOLTAGE AS PARAMETER.  $V_{g2} = 200V$



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH  
CONTROL-GRID VOLTAGE AS PARAMETER,  $V_{g2} = 300V$

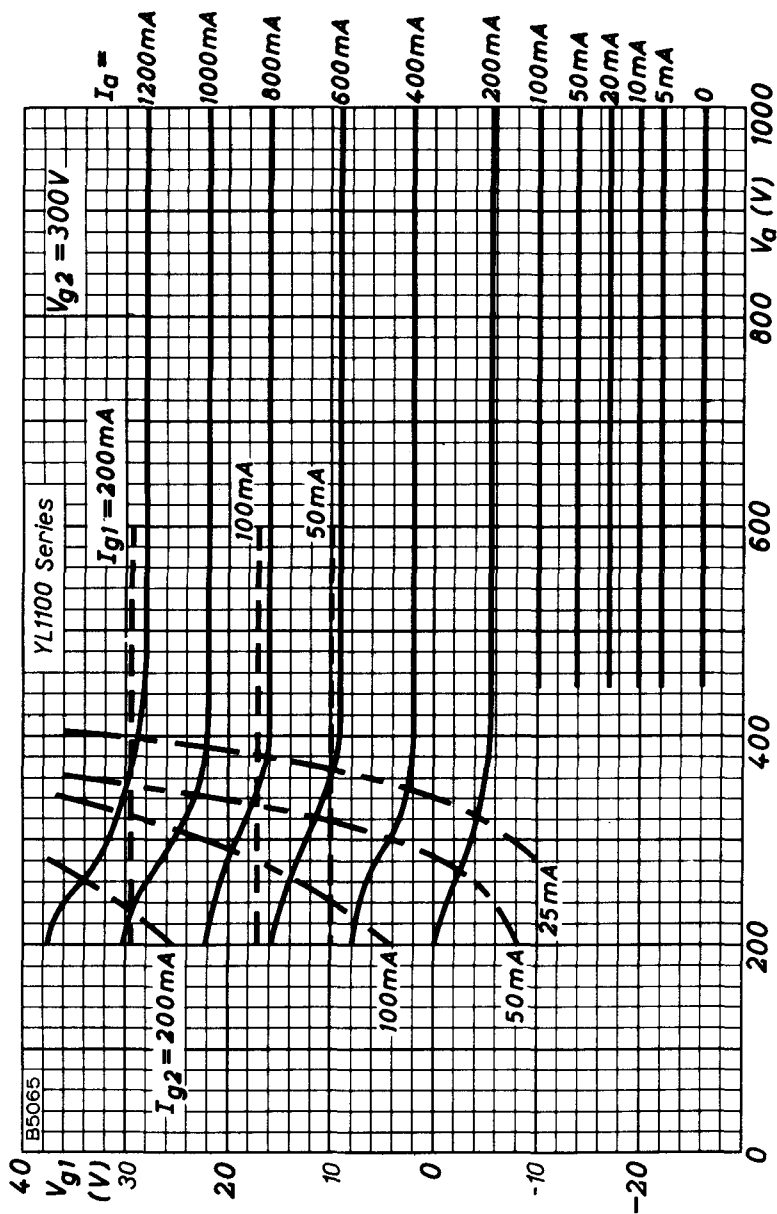
**U.H.F. BEAM  
POWER TETRODES**

**YL1100 YL1102  
YL1101 YL1103**



CONSTANT CURRENT CHARACTERISTICS.  $V_{g2} = 200V$

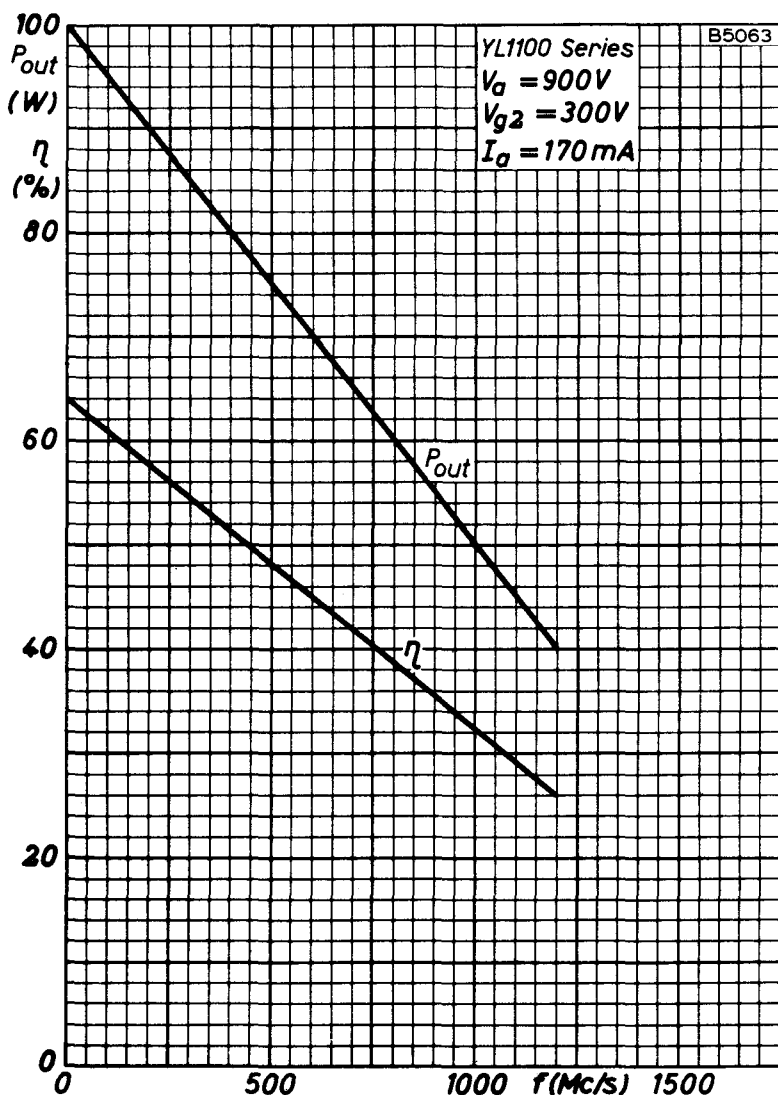




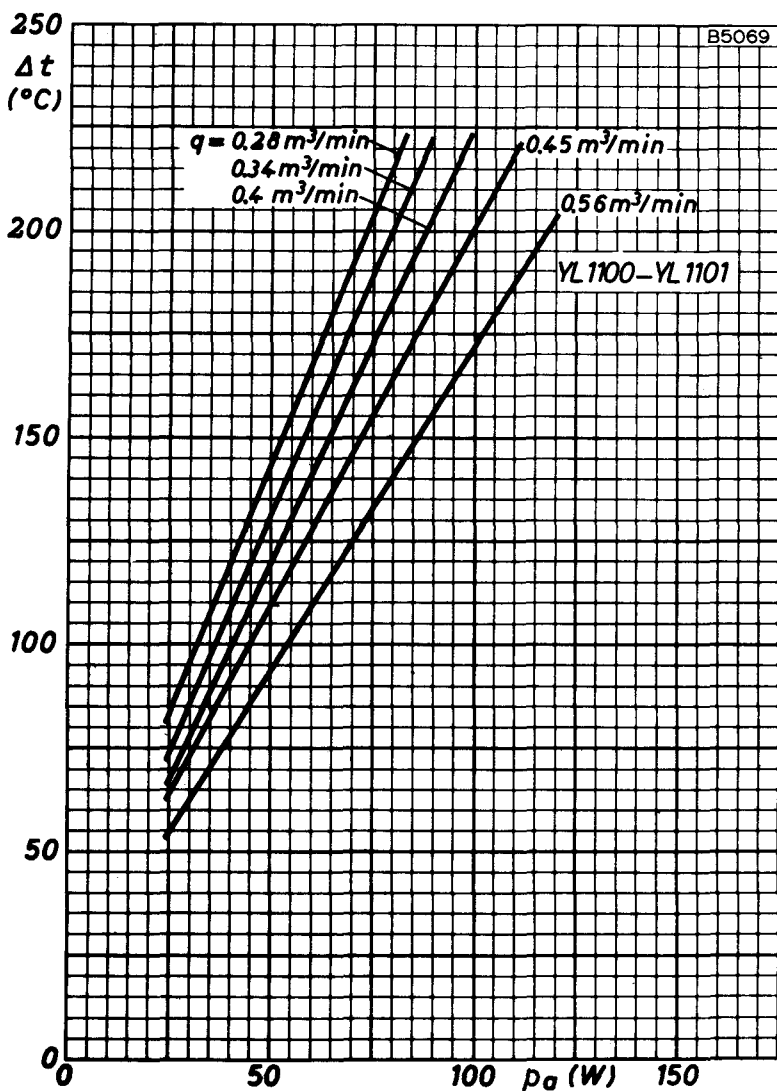
CONSTANT CURRENT CHARACTERISTICS,  $V_{g2} = 300V$

# U.H.F. BEAM POWER TETRODES

YL1100 YL1102  
YL1101 YL1103

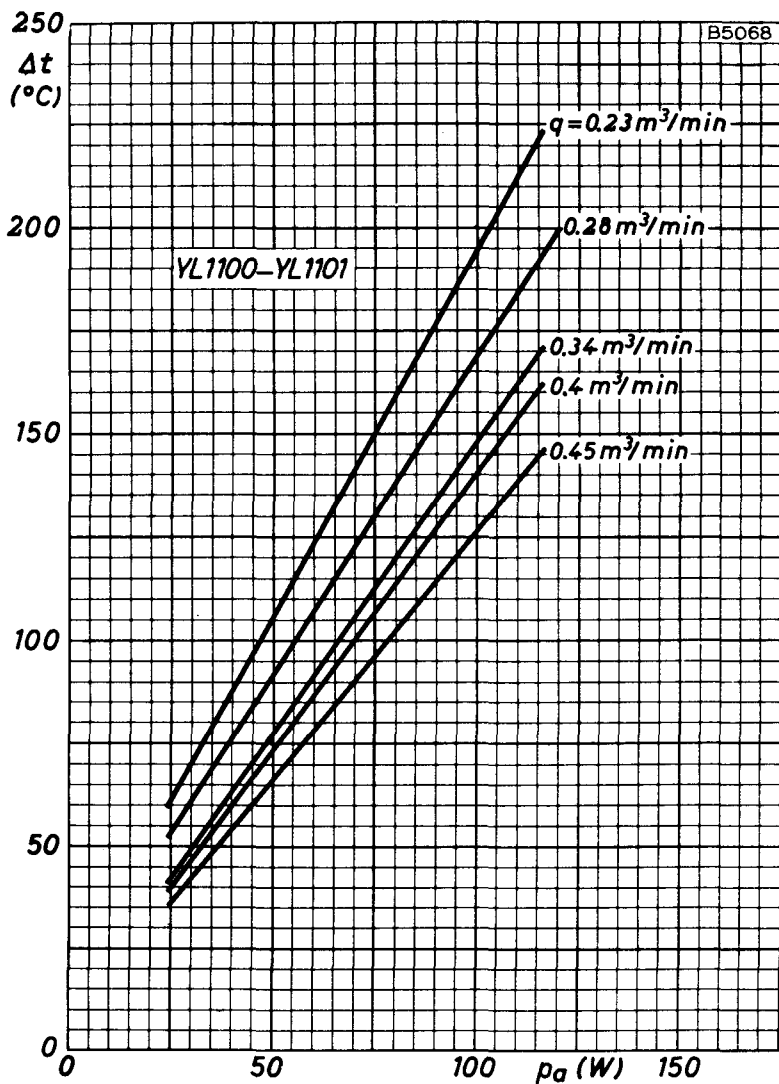


FREQUENCY CHARACTERISTICS FOR CLASS 'C' TELEGRAPHY  
 OPERATING CONDITIONS  $V_a = 900V$ ,  $V_{g2} = 300V$ ,  $I_a = 170mA$



Difference of temperature ( $\Delta t = t_{\text{anode terminal}} - t_{\text{incoming air}}$ ) plotted against anode dissipation with rate of air flow as parameter. Air duct of 25 x 38mm. Distance between air duct opening and radiator is 32mm.

(To convert cubic metres to cubic feet multiply by 35.31)



Difference of temperature ( $\Delta t = t_{\text{anode terminal}} - t_{\text{incoming air}}$ ) plotted against anode dissipation with rate of air flow as parameter. Radiator in air duct of 25 x 38mm.

(To convert cubic metres to cubic feet multiply by 35.31)