

**DOUBLE TETRODES**

Double tetrodes for use as linear single side band amplifier.

The YL1071 is electrically identical to the YL1070 except for the heater, and has been designed to fit into heatsink cooling equipment.

| <b>QUICK REFERENCE DATA</b>                          |              |                   |              |                   |
|------------------------------------------------------|--------------|-------------------|--------------|-------------------|
| AB1 linear S.S.B. amplifier,<br>sections in parallel |              |                   |              |                   |
| Freq.<br>(Mc/s)                                      | C.C.S.       |                   | I.C.A.S.     |                   |
|                                                      | $V_a$<br>(V) | $W_{OPEP}$<br>(W) | $V_a$<br>(V) | $W_{OPEP}$<br>(W) |
| 7                                                    | 1000         | 141               | 1000         | 158               |

**HEATING:**

Indirect by A.C. or D.C.; parallel supply; oxide coated cathode

Pins 5-(1+7) 1-7

|                        |         |       |         |
|------------------------|---------|-------|---------|
| YL1070: Heater voltage | $V_f =$ | 6.3   | 12.6 V  |
| Heater current         | $I_f =$ | 1.8   | 0.9 A   |
| YL1071: Heater voltage | $V_f =$ | 13.25 | 26.5 V  |
| Heater current         | $I_f =$ | 0.866 | 0.433 A |

**CAPACITANCES** (each section)

|                                              |              |         |
|----------------------------------------------|--------------|---------|
| Anode to all other elements except grid No.1 | $C_a =$      | 3.15 pF |
| Grid No.1 to all other elements except anode | $C_{g_1} =$  | 10.6 pF |
| Anode to grid No.1                           | $C_{ag_1} <$ | 0.09 pF |

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## TYPICAL CHARACTERISTICS (each section)

Anode voltage

$V_a = 600 \text{ V}$

Grid No.2 voltage

$V_{g2} = 250 \text{ V}$

Anode current

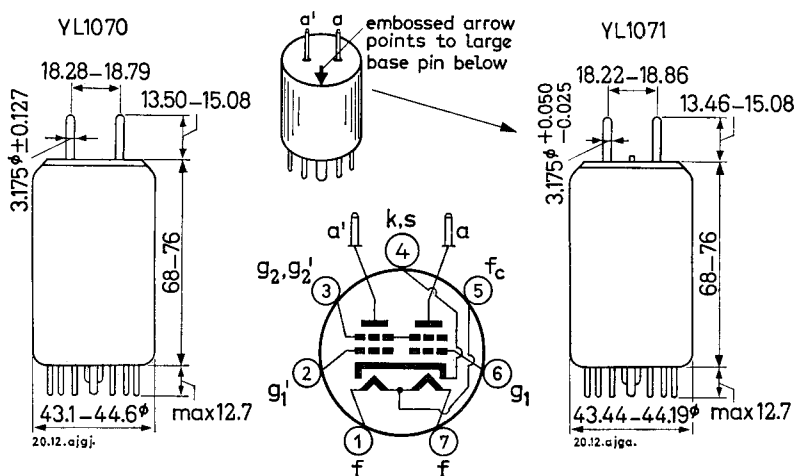
$I_a = 40 \text{ mA}$

Amplification factor of grid No.2  
with respect to grid No.1

$\mu_{g2g1} = 7$

## MECHANICAL DATA

Dimensions in mm



Base: Septar

Accessories: Anode connector clip 40681

Socket 40202

Mounting position: Vertical with base up or down  
Horizontal with anode pins in a horizontal plane

Net weight: 70 g

**COOLING:** Radiation and convection

When the tube is used at maximum permissible values it may be necessary to direct an air flow of approx. 0.6 m<sup>3</sup>/min to the bulb and to the anode seals. The YL1071 has a calibrated bulb held to close tolerances. This permits an accurate fit into heatsink cooling equipment.

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## TEMPERATURE LIMITS (Absolute limits)

Temperature of bulb and all seals max. 250 °C

## R.F. CLASS C TELEGRAPHY AND F.M. TELEPHONY

### LIMITING VALUES (Absolute limits) (each section)

| Frequency                  | f         | up to 60   | up to 175 | Mc/s |
|----------------------------|-----------|------------|-----------|------|
| Anode voltage              | $V_a$     | = max. 850 | max. 750  | V    |
| Anode input power          | $W_{ia}$  | = max. 90  | max. 75   | W    |
| Anode dissipation          | $W_a$     | = max. 30  | max. 30   | W    |
| Anode current              | $I_a$     | = max. 110 | max. 110  | mA   |
| Grid No.2 voltage          | $V_{g2}$  | = max. 300 | max. 300  | V    |
| Grid No.2 dissipation      | $W_{g2}$  | = max. 7   | max. 7    | W    |
| Negative grid No.1 voltage | $-V_{g1}$ | = max. 175 | max. 175  | V    |
| Grid No.1 current          | $I_{g1}$  | = max. 5   | max. 5    | mA   |
| Cathode to heater voltage  | $V_{kf}$  | = max. 100 | max. 100  | V    |

## R. F. CLASS AB1 LINEAR S. S. B. AMPLIFIER suppressed carrier

### LIMITING VALUES (Absolute limits) (each section)

| Frequency                  | f         | up to 60    | Mc/s        |
|----------------------------|-----------|-------------|-------------|
|                            |           | C.C.S.      | I.C.A.S.    |
| Anode voltage              | $V_a$     | = max. 1000 | max. 1000 V |
| Anode input power          | $W_{ia}$  | = max. 100  | max. 110 W  |
| Anode dissipation          | $W_a$     | = max. 30   | max. 34 W   |
| Anode current              | $I_a$     | = max. 110  | max. 110 mA |
| Grid No.2 voltage          | $V_{g2}$  | = max. 360  | max. 360 V  |
| Grid No.2 dissipation      | $W_{g2}$  | = max. 3.5  | max. 4 W    |
| Negative grid No.1 voltage | $-V_{g1}$ | = max. 175  | max. 175 V  |
| Grid No.1 current          | $I_{g1}$  | = max. 5    | max. 5 mA   |
| Cathode to heater voltage  | $V_{kf}$  | = max. 100  | max. 100 V  |

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## OPERATING CONDITIONS (two sections in parallel)

Table A

|                                   |                 |   | C.C.S.         |                |                        |
|-----------------------------------|-----------------|---|----------------|----------------|------------------------|
| Frequency                         | $f$             | = | 7              |                | Mc/s                   |
| Anode voltage                     | $V_a$           | = | 1000           |                | V                      |
| Grid No.2 voltage                 | $V_{g_2}$       | = | 250            |                | V                      |
| Grid No.1 voltage                 | $V_{g_1}$       | = | -34            |                | V <sup>1)</sup>        |
| Load resistance                   | $R_{a\sim}$     | = | 3100           |                | $\Omega$               |
|                                   |                 |   |                |                |                        |
|                                   |                 |   | zero<br>signal | single<br>tone | two<br>tone            |
| Peak grid No.1 driving<br>voltage | $V_{g_1\sim p}$ | = | 0              | 34             | 34 V                   |
| Anode current                     | $I_{a+a'}$      | = | 50             | 195            | 131 mA                 |
| Grid No.2 current                 | $I_{g_2+g_2'}$  | = | 1.2            | 26             | 11.5 mA                |
| Grid No.1 current                 | $I_{g_1+g_1'}$  | = | 0              | 0.01           | 0.01 mA                |
| Anode input power                 | $W_{ia+a'}$     | = | 50             | 195            | 131 W                  |
| Anode dissipation                 | $W_{a+a'}$      | = | 50             | 54             | 61 W                   |
| Output power                      | $W_o$           | = | -              | 141            | 141 <sup>2)</sup> W    |
| Intermodulation distortion        |                 |   |                |                |                        |
| of the third order                | $d_{i_3}$       | = | -              | -              | < -30 dB <sup>3)</sup> |
| of the fifth order                | $d_{i_5}$       | = | -              | -              | < -45 dB <sup>3)</sup> |

<sup>1)</sup> Adjust to obtain the stated zero signal anode current.

<sup>2)</sup> Peak envelope power value.

<sup>3)</sup> Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

## OPERATING CONDITIONS (two sections in parallel) (continued)

Table B

|                                   |                   |   |                |                |                   |                  |
|-----------------------------------|-------------------|---|----------------|----------------|-------------------|------------------|
| Frequency                         | $f$               | = | 7              |                |                   | Mc/s             |
| Anode voltage                     | $V_a$             | = | 800            |                |                   | V                |
| Grid No.2 voltage                 | $V_{g_2}$         | = | 250            |                |                   | V                |
| Grid No.1 voltage                 | $V_{g_1}$         | = | -34            |                |                   | V <sup>1)</sup>  |
| Load resistance                   | $R_a$             | = | 2300           |                |                   | $\Omega$         |
|                                   |                   |   | zero<br>signal | single<br>tone | two<br>tone       |                  |
| Peak grid No.1 driving<br>voltage | $V_{g_{1\sim p}}$ | = | 0              | 34             | 34                | V                |
| Anode current                     | $I_{a+a'}$        | = | 50             | 197            | 130               | mA               |
| Grid No.2 current                 | $I_{g_2+g_2'}$    | = | 1.2            | 26             | 12.5              | mA               |
| Grid No.1 current                 | $I_{g_1+g_1'}$    | = | 0              | 0.01           | 0                 | mA               |
| Anode input power                 | $W_{ia+a'}$       | = | 40             | 158            | 104               | W                |
| Anode dissipation                 | $W_{a+a'}$        | = | 40             | 46             | 43                | W                |
| Output power                      | $W_o$             | = | -              | 112            | 112 <sup>2)</sup> | W                |
| Intermodulation distortion        |                   |   |                |                |                   |                  |
| of the third order                | $d_{i_3}$         | = | -              | -              | < -30             | dB <sup>3)</sup> |
| of the fifth order                | $d_{i_5}$         | = | -              | -              | < -45             | dB <sup>3)</sup> |

<sup>1)</sup> Adjust to obtain the stated zero signal anode current.

<sup>2)</sup> Peak envelope power value

<sup>3)</sup> Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

## OPERATING CONDITIONS (two sections in parallel) (continued)

| Table C                           |                     | C.C.S. |                                                                                                        |      |                        |
|-----------------------------------|---------------------|--------|--------------------------------------------------------------------------------------------------------|------|------------------------|
| Frequency                         | f                   | =      | 7                                                                                                      |      | Mc/s                   |
| Anode voltage                     | V <sub>a</sub>      | =      | 600                                                                                                    |      | V                      |
| Grid No.2 voltage                 | V <sub>g2</sub>     | =      | 250                                                                                                    |      | V                      |
| Grid No.1 voltage                 | V <sub>g1</sub>     | =      | -32.5                                                                                                  |      | V <sup>1)</sup>        |
| Load resistance                   | R <sub>a</sub>      | =      | 1410                                                                                                   |      | Ω                      |
|                                   |                     |        | <div> <div></div> <div>zero<br/>signal</div> <div>single<br/>tone</div> <div>two<br/>tone</div> </div> |      |                        |
| Peak grid No.1 driving<br>voltage | V <sub>g1~p</sub>   | =      | 0                                                                                                      | 32.5 | 32.5 V                 |
| Anode current                     | I <sub>a+a'</sub>   | =      | 60                                                                                                     | 212  | 144 mA                 |
| Grid No.2 current                 | I <sub>g2+g2'</sub> | =      | 1.9                                                                                                    | 25   | 13.5 mA                |
| Grid No.1 current                 | I <sub>g1+g1'</sub> | =      | 0                                                                                                      | 0.01 | 0 mA                   |
| Anode input power                 | W <sub>ia+a'</sub>  | =      | 36                                                                                                     | 127  | 86 W                   |
| Anode dissipation                 | W <sub>a+a'</sub>   | =      | 36                                                                                                     | 88   | 48 W                   |
| Output power                      | W <sub>o</sub>      | =      | —                                                                                                      | 76   | 76 <sup>2)</sup> W     |
| Intermodulation distortion        |                     |        |                                                                                                        |      |                        |
| of the third order                | d <sub>i3</sub>     | =      | —                                                                                                      | —    | < -30 dB <sup>3)</sup> |
| of the fifth order                | d <sub>i5</sub>     | =      | —                                                                                                      | —    | < -45 dB <sup>3)</sup> |

<sup>1)</sup> Adjust to obtain the stated zero signal anode current.

<sup>2)</sup> Peak envelope power value.

<sup>3)</sup> Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

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## OPERATING CONDITIONS (two sections in parallel) (continued)

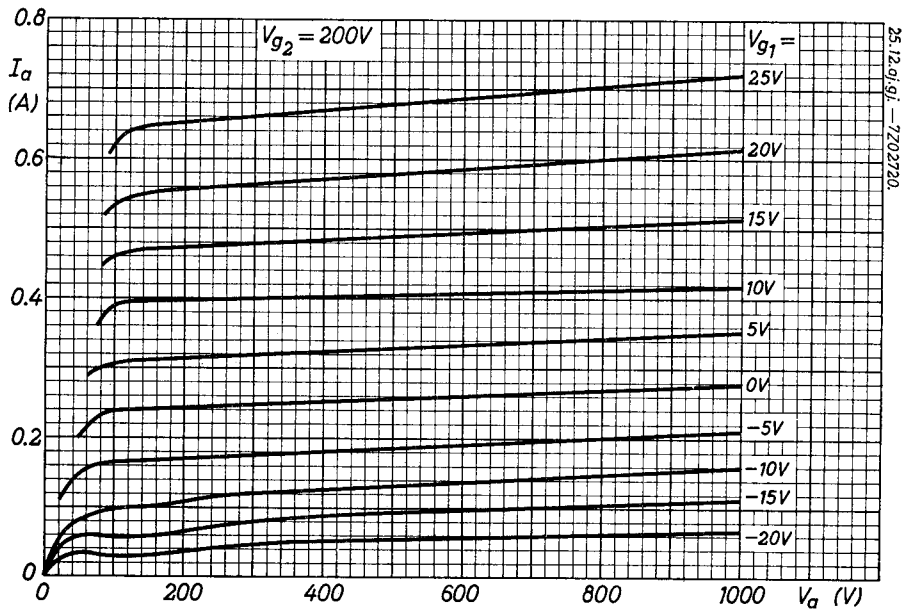
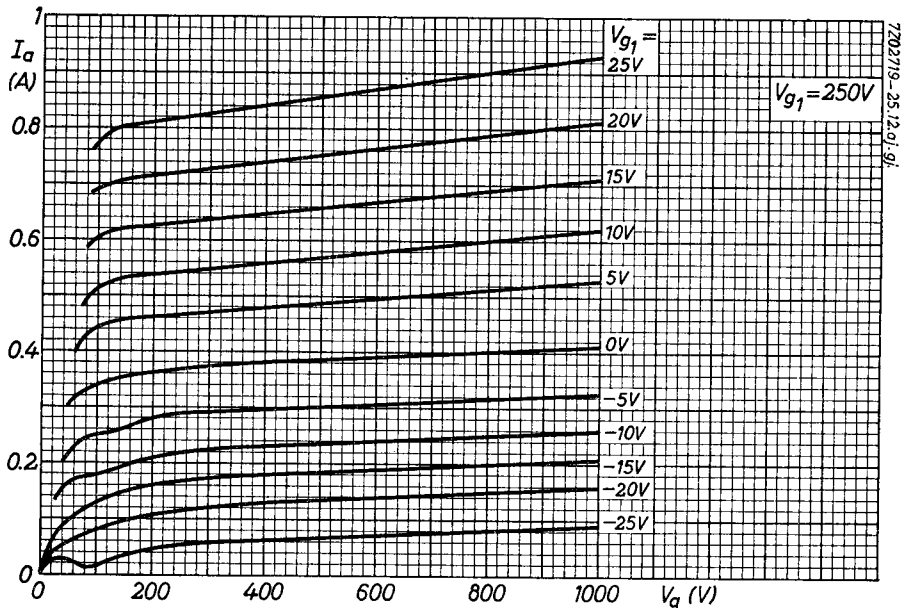
Table D

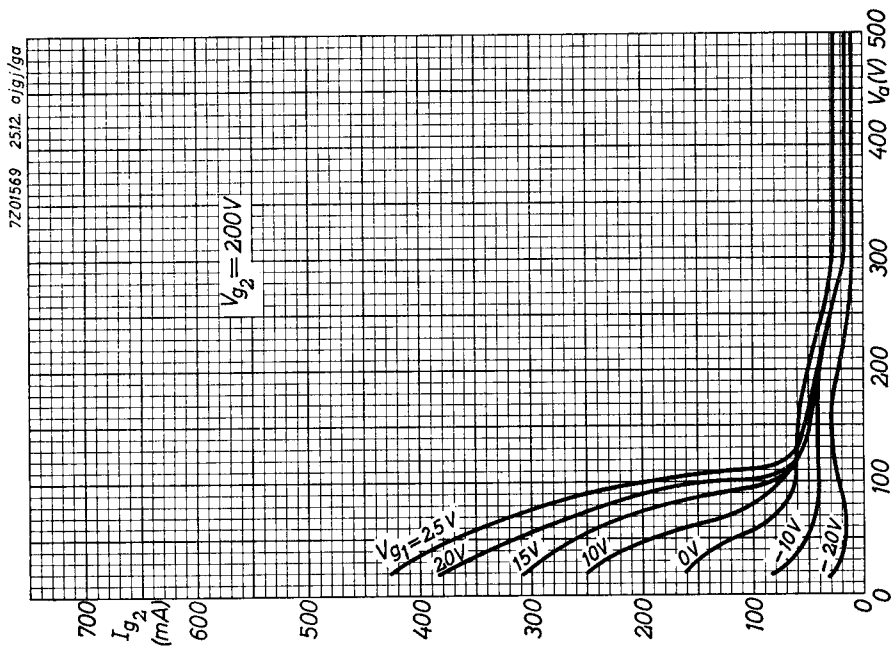
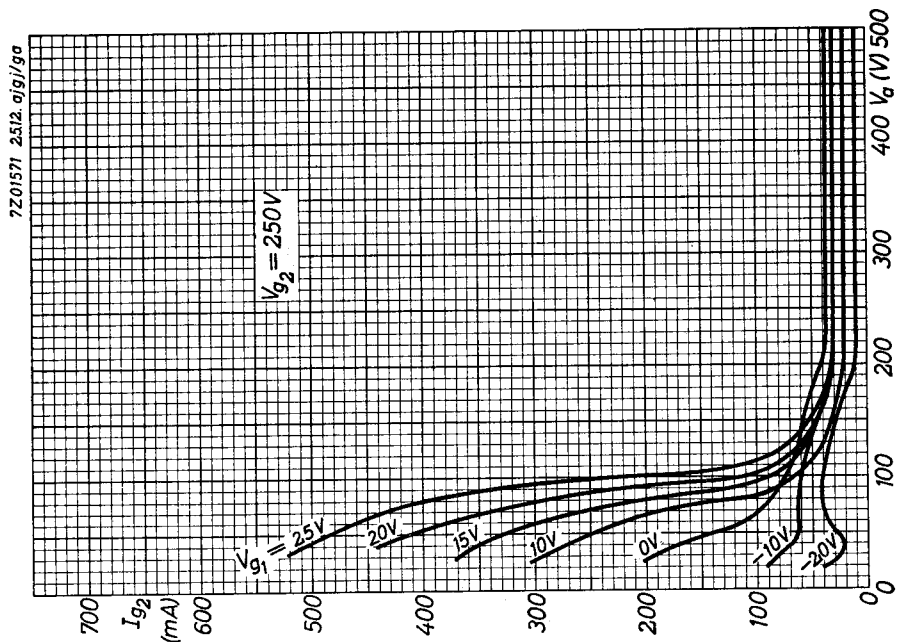
|                                |                   | I.C.A.S. |             |                          |
|--------------------------------|-------------------|----------|-------------|--------------------------|
| Frequency                      | $f$               | =        | 7           | Mc/s                     |
| Anode voltage                  | $V_a$             | =        | 1000        | V                        |
| Grid No.2 voltage              | $V_{g_2}$         | =        | 250         | V                        |
| Grid No.1 voltage              | $V_{g_1}$         | =        | -36         | V <sup>1)</sup>          |
| Load resistance                | $R_a$             | =        | 3000        | $\Omega$                 |
|                                |                   |          | zero signal | single tone              |
|                                |                   |          |             | two tone                 |
| Peak grid No.1 driving voltage | $V_{g_{1\sim p}}$ | =        | 0           | 36 V                     |
| Anode current                  | $I_{a+a'}$        | =        | 55          | 216 144 mA               |
| Grid No.2 current              | $I_{g_2+g_2'}$    | =        | 1           | 25 13 mA                 |
| Grid No.1 current              | $I_{g_1+g_1'}$    | =        | 0           | 0.05 0.02 mA             |
| Anode input power              | $W_{ia+a'}$       | =        | 55          | 216 144 W                |
| Anode dissipation              | $W_{a+a'}$        | =        | 55          | 58 65 W                  |
| Output power                   | $W_o$             | =        | -           | 158 158 <sup>2)</sup> W  |
| Intermodulation distortion     |                   |          |             |                          |
| of the third order             | $d_{i_3}$         | =        | -           | - < -30 dB <sup>3)</sup> |
| of the fifth order             | $d_{i_5}$         | =        | -           | - < -45 dB <sup>3)</sup> |

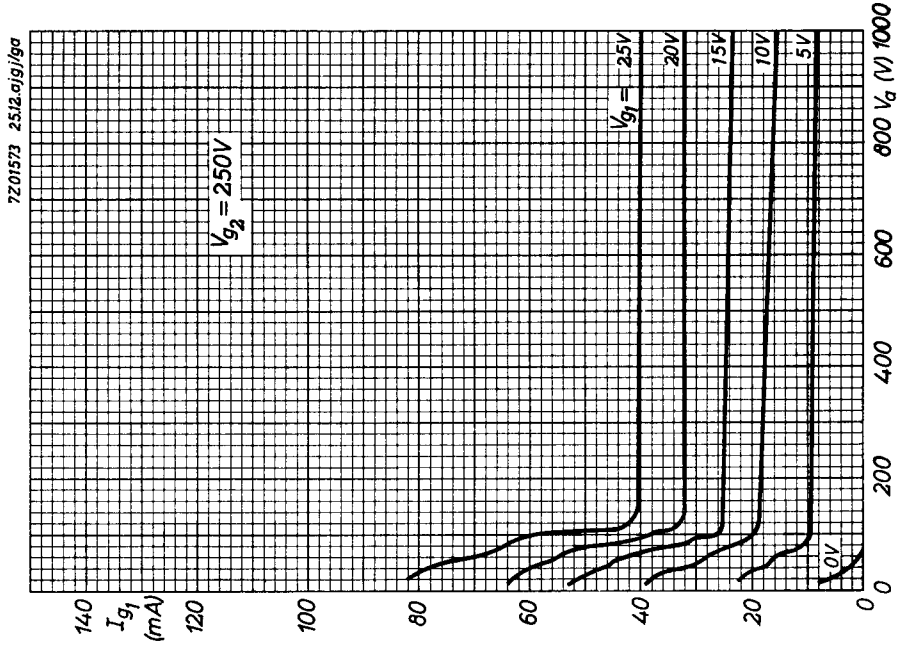
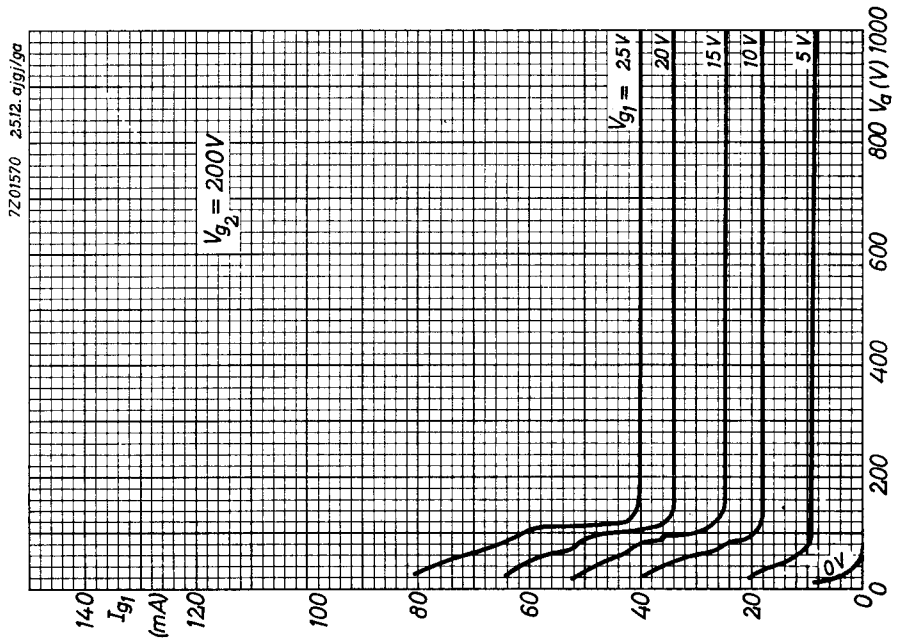
<sup>1)</sup> Adjust to obtain the stated zero signal anode current.

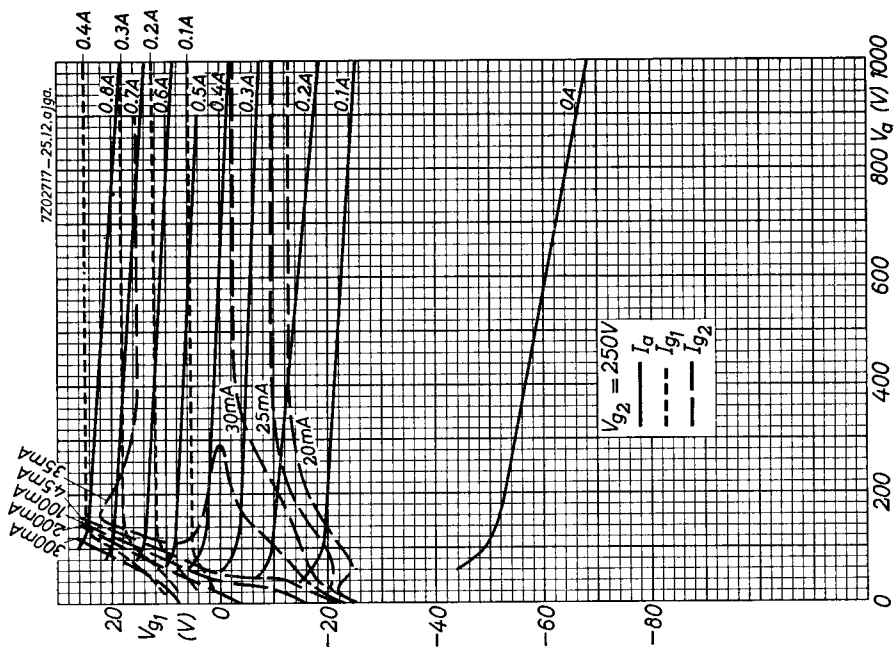
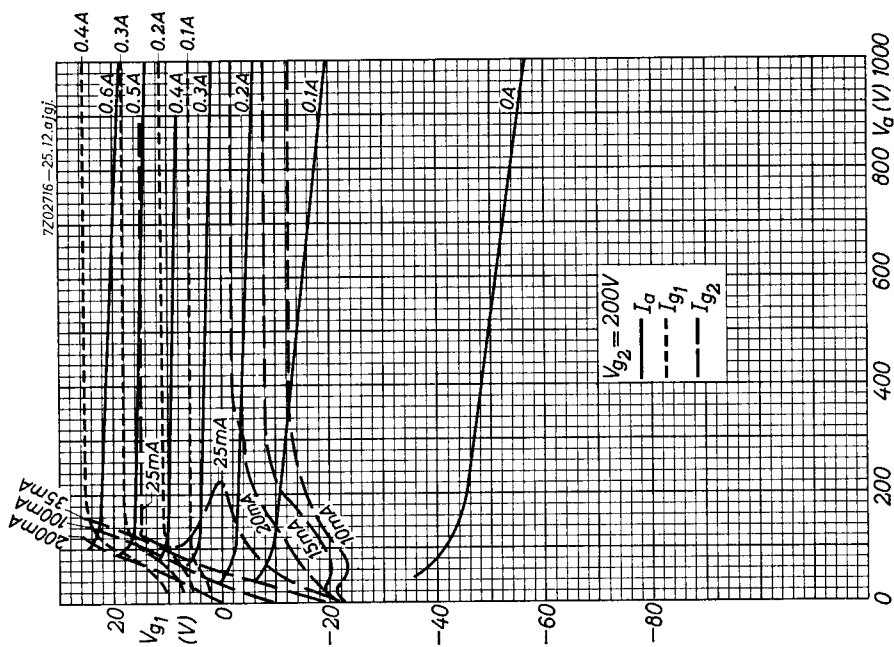
<sup>2)</sup> Peak envelope power value.

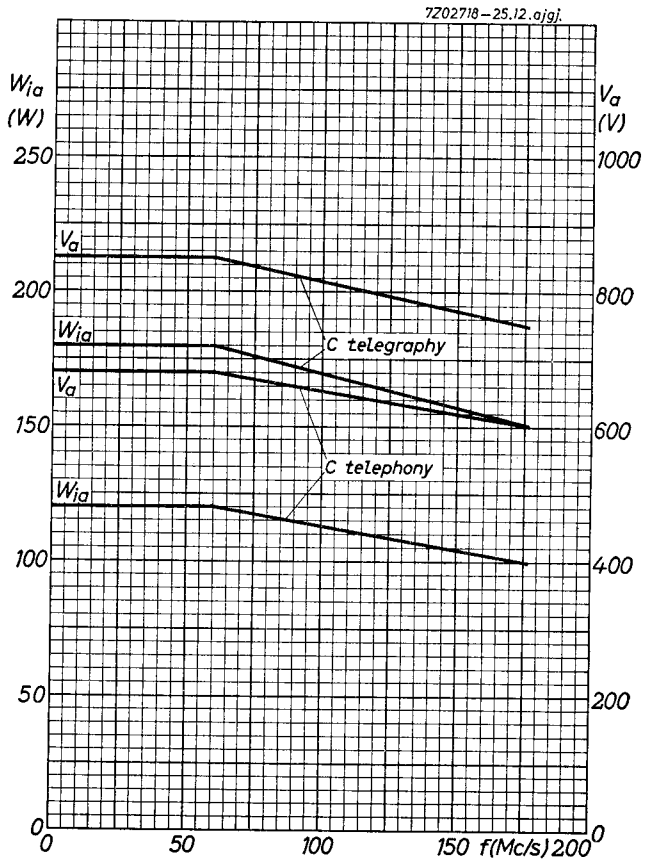
<sup>3)</sup> Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.











# PHILIPS

## Data handbook



**Electronic  
components  
and materials**

**YL1070 YL1071**

| <b>page</b> | <b>sheet</b> | <b>date</b> |
|-------------|--------------|-------------|
| 1           | 1            | 1965.01.01  |
| 2           | 2            | 1965.01.01  |
| 3           | 3            | 1965.01.01  |
| 4           | 4            | 1965.01.01  |
| 5           | 5            | 1965.01.01  |
| 6           | 6            | 1965.01.01  |
| 7           | 7            | 1965.01.01  |
| 8           | A            | 1965.01.01  |
| 9           | B            | 1965.01.01  |
| 10          | C            | 1965.01.01  |
| 11          | D            | 1965.01.01  |
| 12          | E            | 1965.01.01  |
| 13          | FP           | 2001.04.21  |