

# HEPTODE FREQUENCY CHANGER

# DK92

Miniature heptode, primarily intended as frequency changer in battery-operated receivers, and suitable for a.v.c. It combines a high conversion conductance for this type of valve with a low oscillator drive voltage.

## FILAMENT

Suitable for series or parallel operation, d.c. only

|       | Series | Parallel | V  |
|-------|--------|----------|----|
| $V_f$ | 1.3    | 1.4      |    |
| $I_f$ | 48     | 50       | mA |

## CAPACITANCES

|               |       |     |
|---------------|-------|-----|
| $C_a$ -all    | 8.5   | pF  |
| $C_{g3}$ -all | 7.5   | pF  |
| $C_{g2}$ -all | 5.0   | pF  |
| $C_{g1}$ -all | 4.0   | pF  |
| $C_a$ -g3     | < 400 | mpF |
| $C_{g2}$ -g3  | 1.6   | pF  |
| $C_{g1}$ -g3  | < 200 | mpF |
| $C_{g1}$ -g2  | 3.0   | pF  |

## OPERATING CONDITIONS

|                                          |      |            |
|------------------------------------------|------|------------|
| $V_a = V_b$                              | 85   | V          |
| $V_{g3}$                                 | 0    | V          |
| $R_{g4}$                                 | 180  | k $\Omega$ |
| $R_{g2}$                                 | 33   | k $\Omega$ |
| $R_{g1-f+}$                              | 27   | k $\Omega$ |
| $V_{g4}$ (approx.)                       | 60   | V          |
| $V_{g2}$ (approx.)                       | 30   | V          |
| $V_{g1(r.m.s.)}$                         | 4.0  | V          |
| $I_k$                                    | 2.55 | mA         |
| $I_a$                                    | 700  | $\mu$ A    |
| $I_{g4}$                                 | 150  | $\mu$ A    |
| $I_{g2}$                                 | 1.6  | mA         |
| * $I_{g1}$                               | 100  | $\mu$ A    |
| $g_c$                                    | 325  | $\mu$ A/V  |
| $r_a$                                    | 650  | k $\Omega$ |
| $V_{g3}$ (for 100:1 reduction in $g_c$ ) | -6.0 | V          |

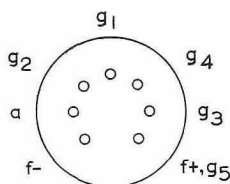
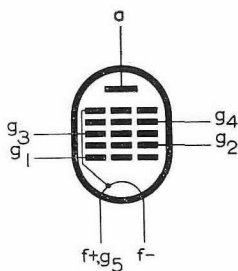
\*Optimum value. In a typical circuit,  $I_{g1}$  should be between 50 $\mu$ A and 250 $\mu$ A.

## Oscillator Section (with $g_1$ connected to f+)

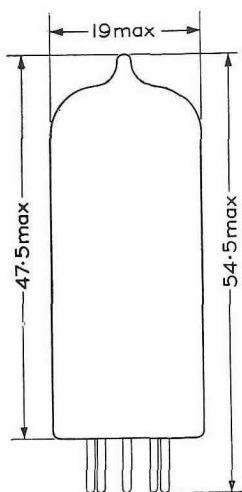
|                |     |           |
|----------------|-----|-----------|
| $V_a$          | 85  | V         |
| $V_{g4}$       | 60  | V         |
| $V_{g3}$       | 0   | V         |
| $V_{g2}$       | 30  | V         |
| $I_{g2}$       | 2.5 | mA        |
| $g_m(g_1-g_2)$ | 900 | $\mu$ A/V |
| $\mu_{g1-g2}$  | 7.5 |           |

### LIMITING VALUES

|                       |     |            |
|-----------------------|-----|------------|
| $V_b$ max. (absolute) | 140 | V          |
| $V_b$ max.            | 120 | V          |
| $V_a$ max.            | 90  | V          |
| $V_{g4}$ max.         | 90  | V          |
| $V_{g2}$ max.         | 60  | V          |
| $I_k$ max.            | 4.0 | mA         |
| $R_{g3-f}$ max.       | 3.0 | M $\Omega$ |
| $R_{g1-f}$ max.       | 35  | k $\Omega$ |

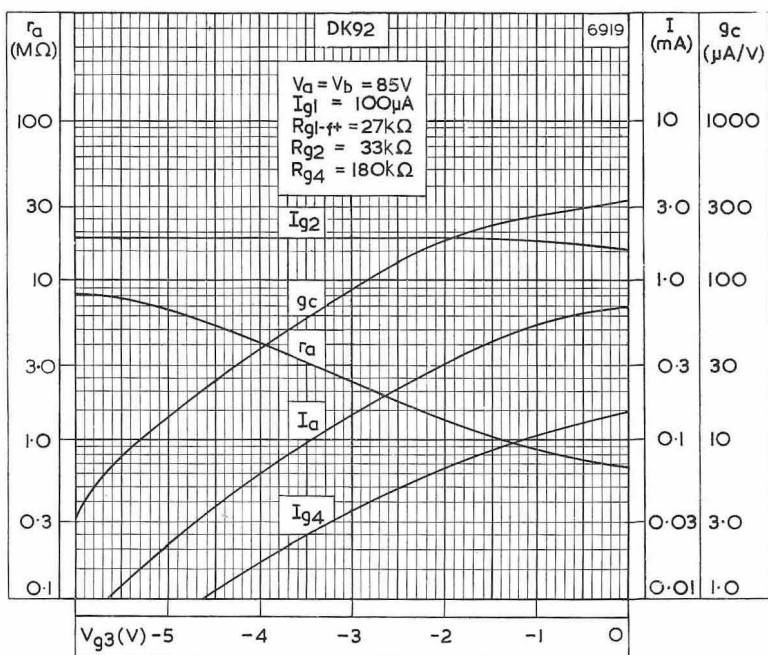


B7G Base

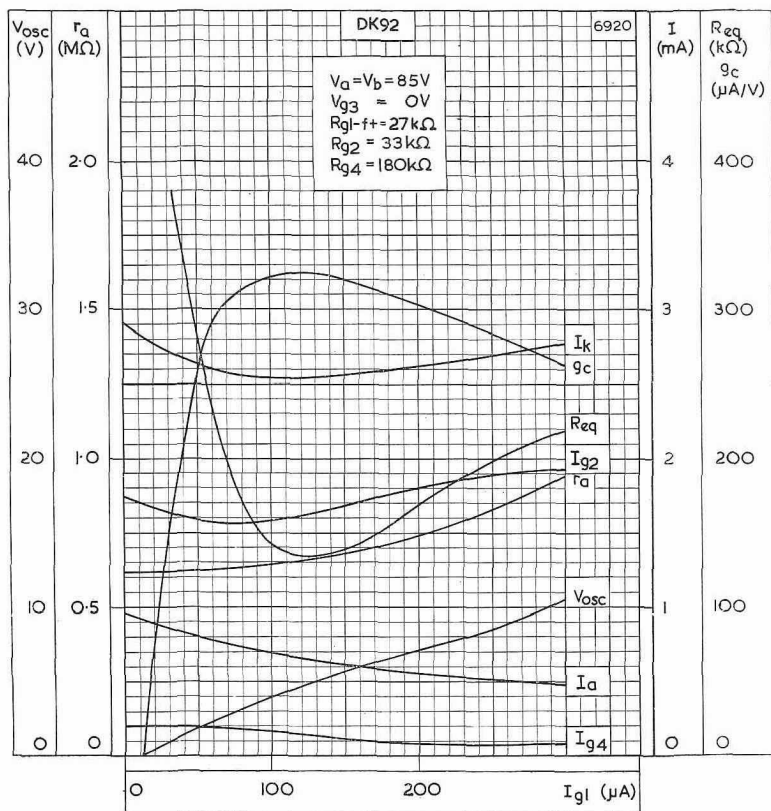


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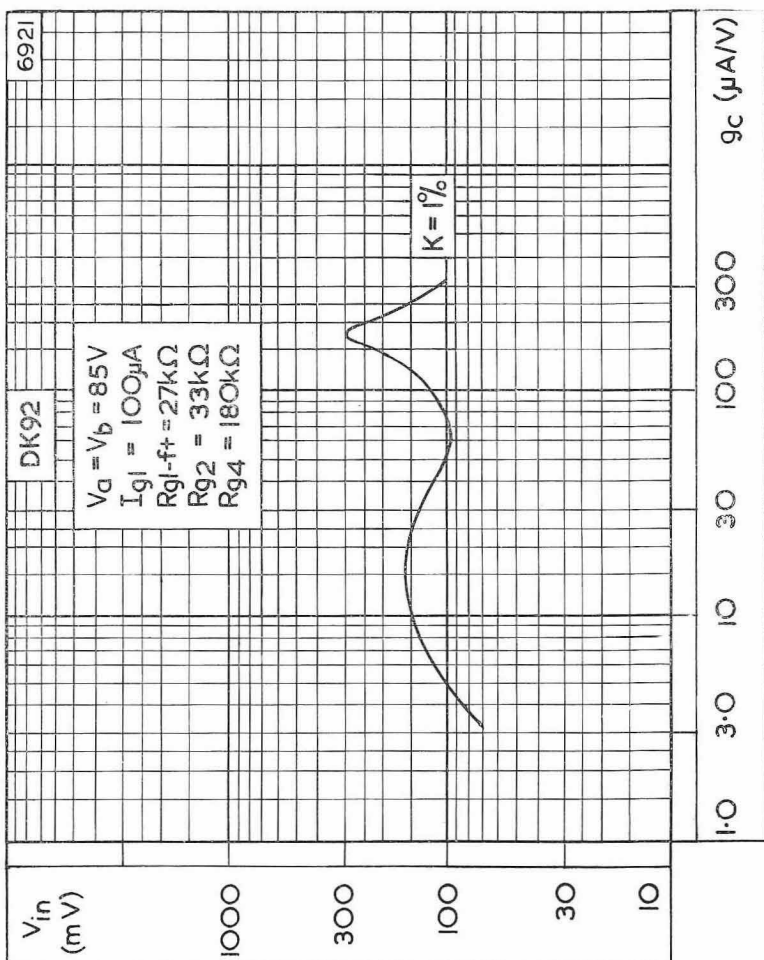
All dimensions in mm



ELECTRODE CURRENTS, CONVERSION CONDUCTANCE AND ANODE  
IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE



ELECTRODE CURRENTS, CONVERSION CONDUCTANCE, ANODE  
IMPEDANCE, EQUIVALENT NOISE RESISTANCE AND OSCILLATOR  
VOLTAGE PLOTTED AGAINST OSCILLATOR-GRID CURRENT



CROSS MODULATION CURVE



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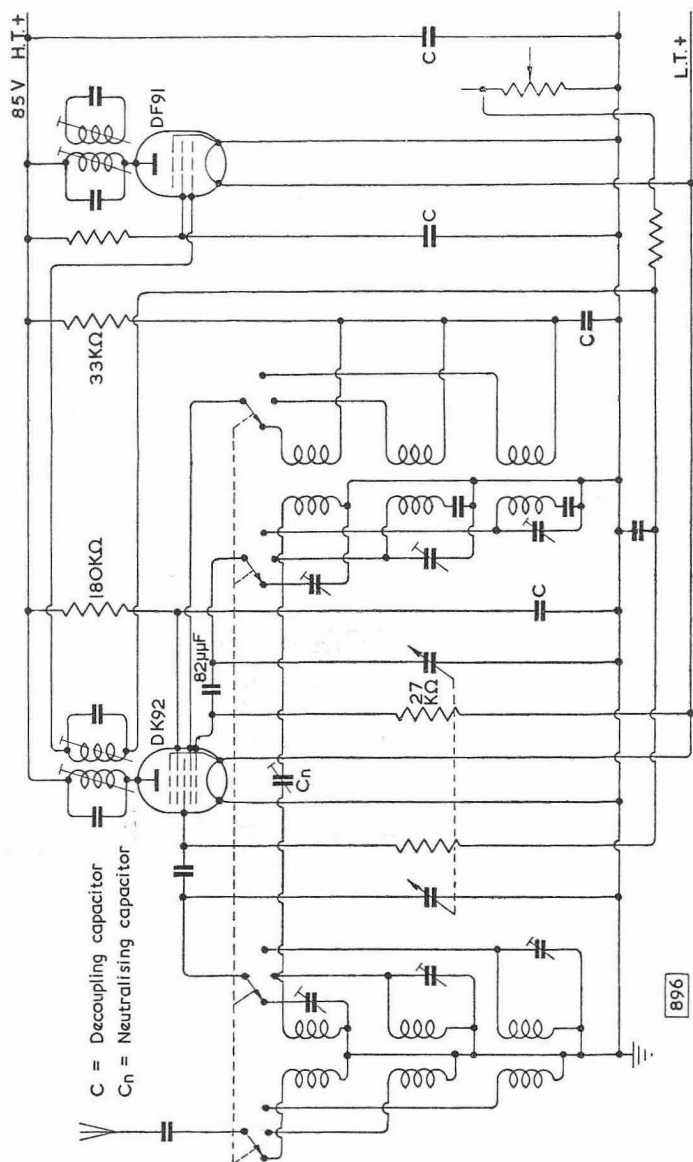
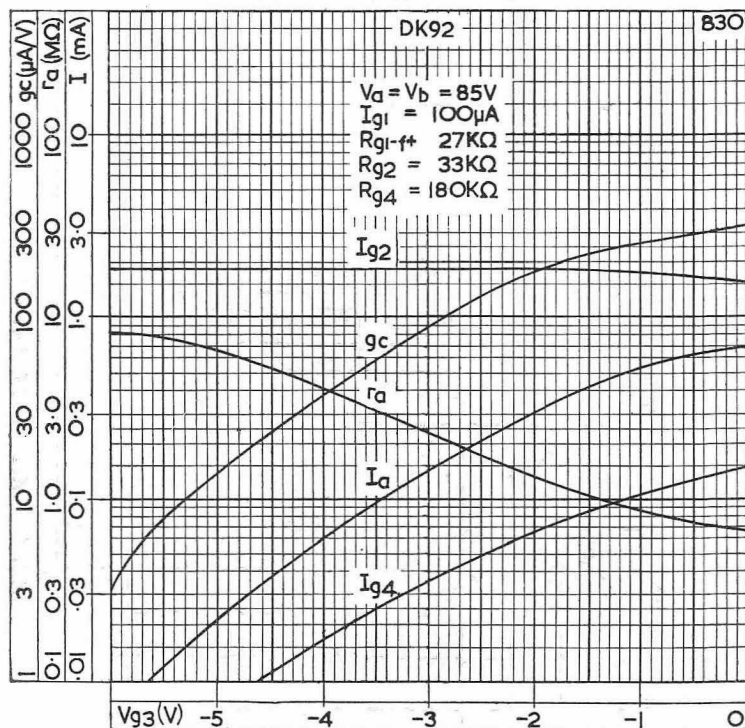


FIG. 1. DK92 AS FREQUENCY CHANGER

# DK92

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