



DOUBLE DIODE PENTODE

An indirectly heated double diode variable-mu pentode designed for use as detector, A.V.C. diode and R.F., I.F., or A.F. Amplifier in equipments with series heater chains. The diode sections are only suitable for A.M. detection.

PHYSICAL DETAILS.

Base	...	...	B9A—All Glass.
Max. Overall Length	...	...	67.5 mm. (2 $\frac{1}{2}$ in.).
Max. Seated Height	...	...	60.5 mm. (2 $\frac{3}{8}$ in.).
Max. Diameter	...	...	22.2 mm. ($\frac{7}{8}$ in.).
Mounting Position	...	...	Any.

BASE CONNECTIONS.

Pin 1—Screen Grid (g_2).	Pin 5—Heater.
Pin 2—Control Grid (g_1).	Pin 6—Pentode Anode.
Pin 3—Cathode.	Pin 7—Diode Anode 1.
Pin 4—Heater.	Pin 8—Diode Anode 2.
Pin 9—Suppressor Grid (g_3).	

HEATER.

Heater Current	...	...	0.1 Amp.
Heater Voltage	...	...	19.0 Volts.

RATINGS.

Pentode Section.

Max. H.T. Supply Voltage	...	550 volts.
Max. Anode Voltage	...	250 volts.
Max. Screen Voltage ($I_a < 4$ mA.)	...	250 volts.
Max. Screen Voltage ($I_a > 8$ mA.)	...	125 volts.
Max. Anode Dissipation	...	2.25 watts.
Max. Screen Dissipation	...	0.45 watts.
Max. Control Grid Voltage	...	
($g_1 = +0.3 \mu A.$)	...	-1.3 volts.
*Max. R_{g_1-k}	...	3 M Ω
Max. R_{g_3-k}	...	10 k Ω

Diode Sections.

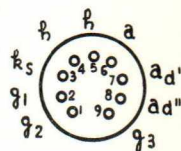
Peak Diode Anode Voltage	...	200 volts.
Max. Mean Diode Anode Current	...	0.8 mA.
Max. Peak Diode Anode Current	...	5.0 mA.

Max. Cathode Current	...	16.5 mA.
Max. V_{h-k}	...	100 volts.
Max. R_{h-k}	...	20 k Ω

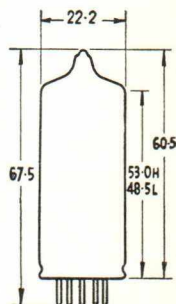
CHARACTERISTICS.

Pentode Section

Anode Voltage	...	100	200	volts.
Screen Voltage	...	100	100	volts.
Suppressor Grid Voltage	...	0	0	volts.
Grid Voltage	...	-2	-1.5	volts.
Anode Current	...	8.5	11.0	mA.
Screen Current	...	2.8	3.3	mA.
Mutual Conductance	...	3.5	4.5	mA/V.
Anode Impedance	...	300	600	k Ω
Inner μ	...	20	20	
Grid Voltage for $g_m = 120 \mu A/V$	...	-10	-20	volts.



Base
Connections
Underside View
of Base



Dimensions
shown are in
millimetres.



TYPICAL OPERATION.

As R.F. or I.F. Amplifier with Cathode bias.

$V_a = V_b$	...	...	...	100	170	200	volts.
V_{g3}	...	...	...	0	0	0	volts.
R_{g2}	...	...	...	0	21	30	k Ω
R_k	...	...	...	175	105	105	ohms.
V_{g1}	...	...	...	-2	-1.5	-1.5	volts.
I_a	...	...	...	8.5	11	11	mA.
I_{g2}	...	...	...	2.8	3.4	3.3	mA.
g_m	...	...	...	3.5	4.5	4.5	mA/V.
r_a	...	...	...	300	450	600	k Ω
R_{eq}	...	...	...	—	3.5	3.5	k Ω
$g_m (V_{g1} = -20)$	...	...	...	—	60	120	μ A/V.

As R.F. or I.F. Amplifier with Grid current bias.

$V_a = V_b$	...	...	...	...	170	200	volts.
V_{g3}	...	...	...	...	0	0	volts.
R_{g2}	...	...	...	...	27	47	k Ω
$\dagger V_{g1}$	...	...	...	...	0.5 $\dagger$	0.5 $\dagger$	volts.
I_a	...	...	...	...	11	9.5	mA.
I_{g2}	...	...	...	...	3.4	2.8	mA.
g_m	...	...	...	...	5.0	5.0	mA/V.
r_a	...	...	...	...	450	600	k Ω
R_{eq}	...	...	...	...	2.5	2.5	k Ω
$g_m (V_{g1} = -20)$	...	...	...	...	60	115	μ A/V.

MICROPHONY.

No special precautions against Microphony are required in circuits where the output valve produces an output of 50 mW. from an input voltage of less than 25 mV.

CAPACITANCES.

Pentode Section.

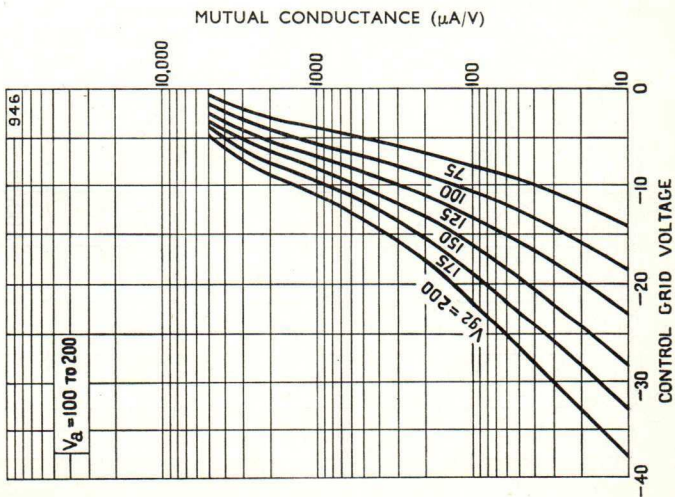
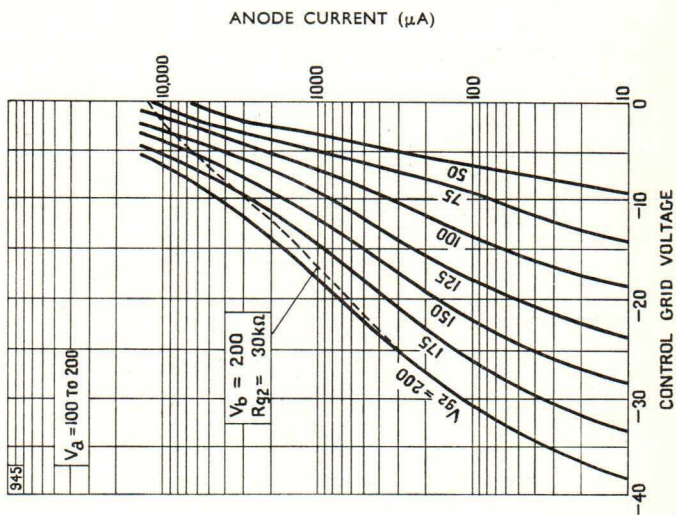
C_{in}	...	...	...	...	...	5.0	pF.
C_{out}	...	...	...	...	...	5.2	pF.
C_{a-g1}	...	...	...	...	...	<0.0025	pF.
C_{g1-h}	...	...	...	...	...	0.05	pF.

Diode Sections.

$C_{ad'-k} = C_{ad''-k}$	...	...	...	...	...	2.5	pF.
$C_{ad'-ad''}$	...	...	...	...	...	<0.25	pF.
$C_{ad'-h}$	...	...	...	...	...	<0.015	pF.
$C_{ad''-h}$	...	...	...	...	...	<0.003	pF.

$C_{ad'-g1}$	...	...	...	...	...	<0.0025	pF.
$C_{ad''-g1}$	...	...	...	...	...	<0.001	pF.
$C_{ad'-ap}$	...	...	...	...	...	<0.15	pF.
$C_{ad''-ap}$	...	...	...	...	...	<0.025	pF.

$\dagger$ This bias voltage is produced by the grid current through the grid resistor and the diode current. If attenuation occurs due to the high resistance of the grid cathode path, the negative bias should be increased to approx -1.5volts.



UBF89

Ferranti

SCREEN GRID CURRENT (mA)

