



TRIODE PENTODE

An indirectly heated triode-pentode with separate cathodes primarily designed for use as a combined audio voltage amplifier and output valve.

PHYSICAL DETAILS.

Base	...	...	...	B9A—Noval.
Max. Overall Length	...	...	...	56 mm. ($2\frac{1}{2}$ in.).
Max. Seated Height	...	...	...	49 mm. ($1\frac{1}{2}$ in.).
Max. Diameter	...	...	...	22.2 mm. ($\frac{7}{8}$ in.).
Mounting Position	...	...	...	Any

BASE CONNECTIONS.

Pin 1—Triode Anode.	Pin 6—Pentode Anode.
Pin 2—Triode Grid.	Pin 7—Pentode Cathode.
Pin 3—Triode Cathode.	Suppressor Grid.
Pin 4—Heater.	Pin 8—Pentode Screen Grid.
Pin 5—Heater.	Pin 9—Pentode Control Grid.

HEATER.

Heater Voltage	...	...	...	6.3 volts.
Heater Current	...	...	...	0.6 amps.

RATINGS.

PENTODE SECTION.

Max. H.T. Supply Voltage	...	...	...	550 volts.
Max. Anode Voltage	...	...	...	250 volts.
Max. Screen Voltage	...	...	...	250 volts.
Max. Anode Dissipation	...	...	...	5.4 watts.
Max. Screen Grid Dissipation	...	...	...	1.2 watts.
Max. Screen Grid Dissipation (Audio)	...	...	...	2.4 watts.
Max. Cathode Current	...	...	...	45 mA.
Max. R_{g1-k} (fixed bias)	...	...	...	250 k Ω
(cathode bias)...	...	...	...	500 k Ω
Max. V_{h-k} (heater negative)	...	...	...	250 volts.
Max. V_{h-k} (heater positive)	...	...	...	100 volts.

TRIODE SECTION.

Max. Anode Supply Voltage	...	...	...	550 volts.
Max. Anode Voltage	...	...	...	250 volts.
Max. Anode Dissipation	...	...	...	3.5 watts.
Max. Cathode Current	...	...	...	15 mA.
Max. R_{g1-k} (Fixed bias)	...	...	...	1 M Ω
(Cathode bias)	...	...	...	3 M Ω
(Grid current bias)	...	...	...	22 M Ω
Max. V_{h-k}	...	...	...	250 volts.
Max. V_{h-k}	...	...	...	100 volts.

CHARACTERISTICS.

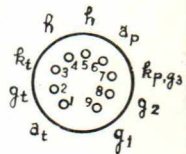
PENTODE SECTION.

Anode Voltage	...	...	...	170	200	volts.
Screen Voltage	...	...	...	170	200	volts.
Suppressor Grid Voltage	...	...	...	0	0	volts.
Control Grid Voltage	...	...	...	-9.5	-13	volts.
Anode Current	...	...	...	30	27	mA.
Screen Current	...	...	...	5.0	4.4	mA.
Mutual Conductance	...	...	...	5.5	5.0	mA/V.
Anode Impedance	...	...	...	53	65	k Ω
Inner μ	...	...	...	10	10	

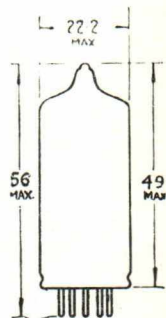
TRIODE SECTION.

Anode Voltage	...	...	...	170	200	volts.
Grid Voltage	...	...	...	-1.5	-1.5	volts.
Anode Current	...	...	...	1.6	2.4	mA.
Mutual Conductance	...	...	...	2.1	2.5	mA/V.
Anode Impedance	...	...	...	40	34	k Ω
Amplification Factor	...	...	...	82	84	

ECL83



Base Connections
Underside View
of Base



All dimensions
shown are in
millimetres
(max.).



TYPICAL OPERATION.

PENTODE SECTION.

As Audio Output Valve (Class A).

Anode Voltage	...	...	170	200	volts.
Screen Grid Voltage	...	...	170	200	volts.
Suppressor Grid Voltage	...	...	0	0	volts.
Control Grid Voltage	...	...	-9.5	-13	volts.
Anode Current (no sig.)	...	...	30	27	mA.
Screen Grid Current (no sig.)	...	...	5.0	4.4	mA.
Anode Load	...	...	5.5	7.5	k Ω
Input Voltage	...	...	5.0	5.2	volts (rms.)
*Power Output	...	...	2.2	2.5	watts.

As Audio Amplifier (2 valves in Class AB push pull).

Anode Voltage	...	...	170	200	volts.
Screen Grid Voltage	...	...	170	200	volts.
Suppressor Grid Voltage	...	...	0	0	volts.
† Cathode Bias Resistor	...	...	180	220	ohms
Anode Current (Zero signal)	...	...	2 × 24	2 × 25	mA.
Anode Current (Max. signal)	...	...	2 × 27	2 × 29	mA.
Screen Grid Current (Zero signal)	...	...	2 × 3.8	2 × 3.9	mA.
Screen Current (Max. signal)	...	...	2 × 6.3	2 × 8.5	mA.
Input Voltage ($V_{in} g_1 - g_1$)	...	...	17	23.5	volts (rms.)
Optimum Load (Anode to Anode)	...	...	6.5	7.5	k Ω
Power Output	...	...	5.0	7.2	watts.
Total Distortion	...	...	3.6	4.2	%

TRIODE SECTION.

As A.F. Voltage Amplifier.

Anode Supply Voltage	...	...	170	200	volts.
Anode Load	...	...	100	100	k Ω
Cathode Bias Resistor	...	...	1.8	2.2	k Ω
Anode Current	...	...	0.65	0.7	mA.
Stage Gain	...	...	49	47	
† Output Voltage	...	...	15.3	17.7	volts (rms.)
Grid Resistor (following valve)	...	...	330	330	k Ω

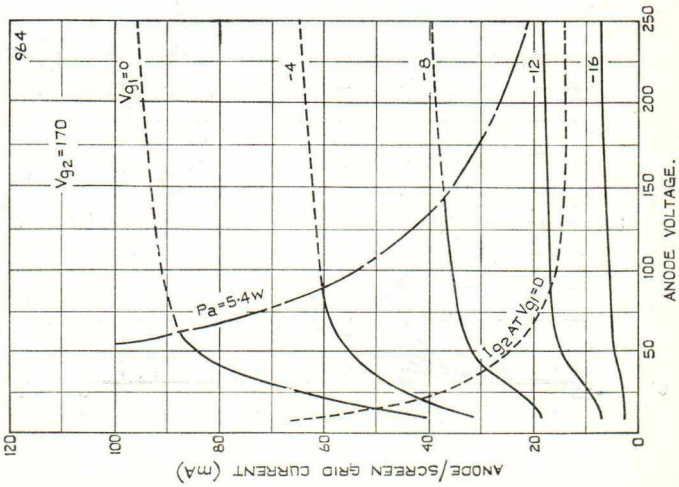
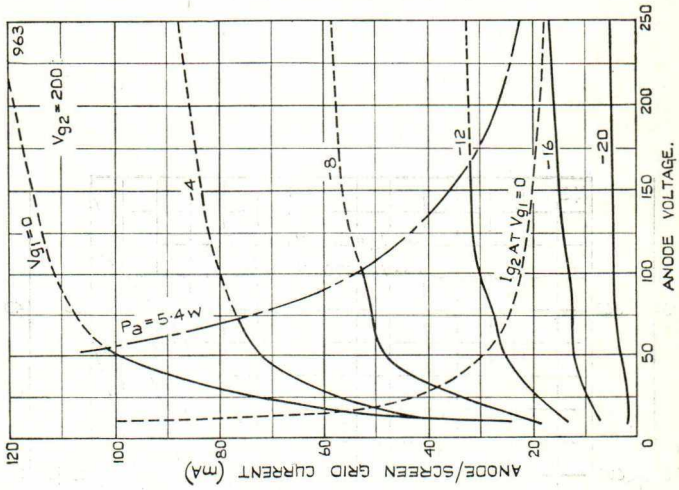
CAPACITANCES.

	Pentode.	Triode.
C_{in}	5.7	2.3 pF.
C_{out}	4.7	0.3 pF.
C_{a-g}	<0.2	1.5 pF.
C_{g-h}	<0.45	pF.
C_{gt-ap}	<0.05	pF.
C_{at-ap}	<1.6	pF.
C_{at-gp}	<0.15	pF.
C_{gt-gp}	<0.03	pF.

*Total Distortion of 10%.

† Common Bias Resistor.

‡ Output Voltage measured for total harmonic distortion of 5%.



Typical Anode/Screen Grid Current and Anode Voltage Characteristics

TYPICAL ANODE CURRENT, SCREEN GRID CURRENT,
MUTUAL CONDUCTANCE and ANODE IMPEDANCE
and CONTROL GRID VOLTAGE

