

SPECIAL QUALITY PENTODE

E186F

Special quality high slope pentode for use as a wide band amplifier where stability of characteristics and long life are required.

This data should be read in conjunction with GENERAL NOTES—SPECIAL QUALITY VALVES which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

Suitable for parallel operation, a.c. or d.c.

V_h^1	6.3	V
I_h	320	mA

The maximum variation of heater current at $V_h = 6.3V$ is $\pm 20mA$.

CAPACITANCES² (shielded)

C_{a-g1} max.	30	mpF
C_{in}	7.6	pF
C_{out}	3.45	pF

CHARACTERISTICS³

V_a	180	V
V_{g3}	0	V
V_{g2}	150	V
V_{g1}	-1.25	V
I_a	13	mA
I_{g2}	3.3	mA
g_m	16.5	mA/V
μ_{g1-g2}	53	
r_a	100	k Ω
$-V_{g1}$ max. ($I_{g1} = +0.3\mu A$)	0.5	V

OPERATING CONDITIONS AS R.F. AMPLIFIER

V_{a-e}	180	190	V
V_{g3-k}	0	0	V
V_{g2-e}	150	160	V
V_{g1-e}	0	+9.0	V
R_k	100†	630	Ω
I_a	11.5	13	mA
I_{g2}	2.9	3.3	mA
g_m	15.9	16.5	mA/V
R_{eq} (r.f.)	—	330	Ω

†Recommended minimum value for $V_{g2-e} = 150V$.

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

Anode current	Average 13	Initial range 12.2 to 13.8	End of life* > 11.5	mA
$V_{a-e} = 190V$, $V_{g2-e} = 160V$, $V_{g1-e} = +9V$, $R_k = 630\Omega$				
Anode Current	—	< 0.8	—	mA
$V_{a-k} = 180V$, $V_{g2-k} = 150V$, $V_{g1} = -4.5V$				
Screen-grid current	3.3	2.9 to 3.7	—	mA
$V_{a-e} = 190V$, $V_{g2-e} = 160V$, $V_{g1-e} = +9V$, $R_k = 630\Omega$				
Mutual conductance	16.5	14.2 to 18.8	> 11	mA/V
$V_{a-e} = 190V$, $V_{g2-e} = 160V$, $V_{g1-e} = +9V$, $R_k = 630\Omega$				
Negative control-grid current	—	< 0.2	< 0.5	μA
$V_{a-e} = 190V$, $V_{g1-e} = +9V$, $V_{g2-e} = 160V$, $R_k = 630\Omega$, $R_{k1-k} = 100k\Omega$				
Insulation resistance	—	> 100	> 50	M Ω
anode to all other electrodes $V_{d.c.} 300V$				
grid to all other electrodes $V_{d.c.} 100V$	—	> 100	> 50	M Ω
Heater-cathode insulation (I_{h-k})	—	< 10	< 20	μA
$V_{h-k} = 100V$				
Heater current	320	300 to 340	300 to 340	mA
$V_h = 6.3V$				

*To allow for valve deterioration during life, circuits should be designed to function with a valve on which one or more of the characteristics have changed to the values stated.

SHOCK AND VIBRATION RATINGS

The E186F can withstand vibrations of 2.5g and 50c/s for 96 hours and is proof against impact accelerations of approximately 500g.

ABSOLUTE MAXIMUM RATINGS¹

$V_{a(b)}$ max.	400	V
V_a max.	210	V
p_a max.	3.0	W
$V_{g2(b)}$ max.	400	V
V_{g2} max.	175	V
p_{g2} max.	700	mW
$+V_{g1}$ max.	0	V
$-V_{g1}$ max.	50	V
$-v_{g1(pk)}$ max.	100	V
I_k max.	25	mA
R_{g1-k} max.	250	k Ω
V_{h-k} max.	60	V
R_{h-k} max.	20	k Ω
T_{bulb} max.	165	$^{\circ}$ C
V_h max.	6.6	V
V_h min.	6.0	V

OPERATING NOTES

1. Hum

The hum voltage referred to g_1 has a maximum value of 100 μ V and is measured with the centre tap of the heater winding earthed, a supply frequency of 50c/s (including 3% at 500c/s) and a linear band-pass characteristic under the following conditions:

V_h	6.3	V
V_b	207	V
V_{g3}	0	V
V_{g2-e}	150	V
R_a	2.0	k Ω
R_k	78	Ω
C_k	1000	μ F
R_{g1-k}	500	k Ω

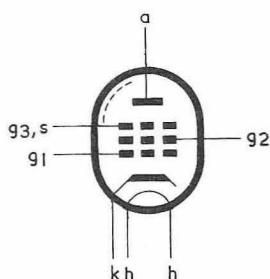
2. Microphony

The microphonic noise voltage measured at the anode has a maximum value of 500mV over the frequency range 50 to 2000c/s and has a maximum value of 200mV at a frequency of 50c/s measured under the following conditions:

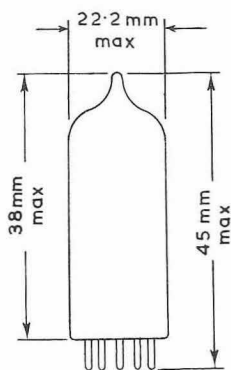
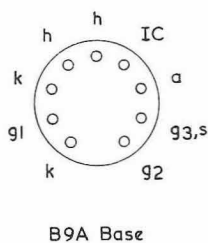
V_h	6.3	V
V_b	216	V
V_{g3}	0	V
V_{g2-e}	160	V
V_{g1-e}	+9.0	V
R_a	2.0	k Ω
R_k	630	Ω
peak acceleration	10	g

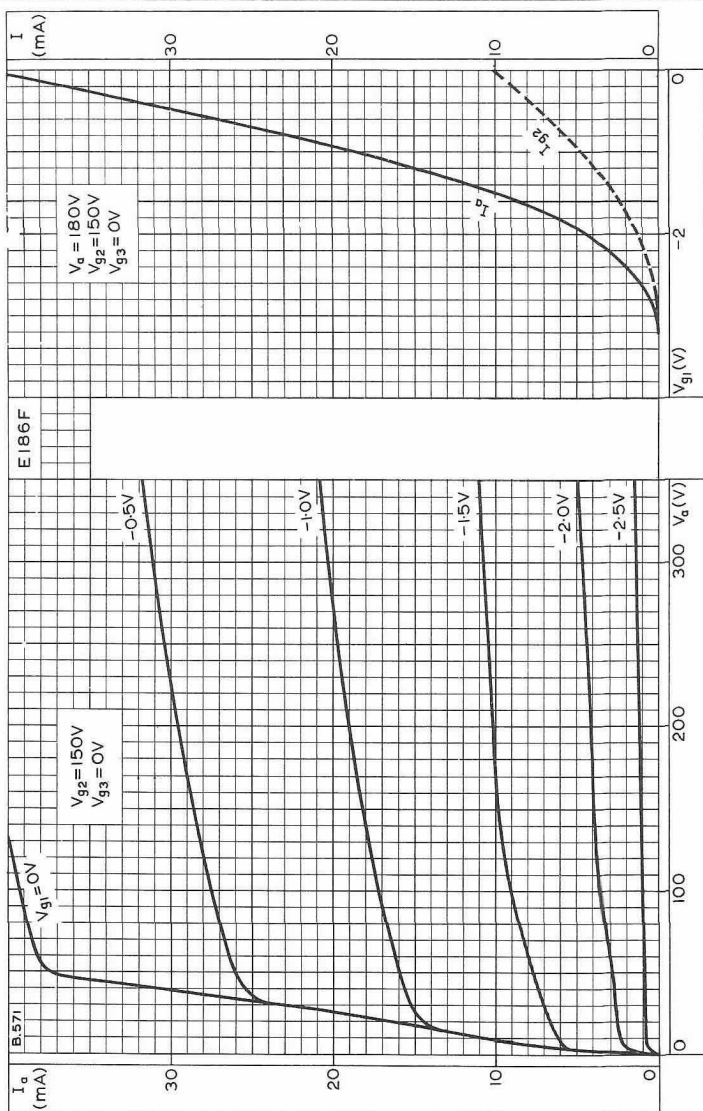
EI86F

SPECIAL QUALITY PENTODE



B 562





ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 150V$
 ANODE CURRENT AND SCREEN-GRID CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE

