Travelling-Wave Amplifier

Code: W7/1D (CV2358)

The W7/1D is a travelling-wave amplifier for use in the frequency range 3 530 to 4 620 Mc/s. It has a bandwidth of the order of 1 000 Mc/s which makes possible the amplification of signals of large bandwidth and operation over a wide frequency range without retuning.

ELECTRICAL DATA

Cathode

Indirectly-heated, oxide-coated		
Heater voltage	6.3	V
Nominal current	0.85	A
Minimum pre-heating time	120	sec

Characteristics

*Amplification (at Collector current 4 mA and Helix voltage† 1.45 kV)	24	db
Maximum output (at collector current 4 mA)	120	mW
Bandwidth, between 3 db power points, greater than	1 000	Mc/s
Operating frequency range	3 530–4 620	Mc/s

PHYSICAL DATA

Maximum overall length	350.8	mm
Maximum diameter of alignment ring	66.57	mm
Base	Special Octal	
Net weight	105	g
Mounting position	Unrestricted	

* The figure quoted for amplification is that obtained at small signal levels. At maximum output it is approximately 3 db lower.

† The helix voltage should be set within ± 10 volts of the optimum value for the valve.

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MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

S.H.F. Amplifier at 3 900 Mc/s

Maximum Ratings

Maximum direct second anode and helix voltage	1.6	kV
Maximum direct second anode and helix current	2	mA
Maximum direct cathode current	6	mA
Maximum direct first anode voltage	1.6	kV←
Maximum direct first anode current	250	μA
Maximum direct collector voltage	1.65	kV←

***Typical Operating Conditions**

†Direct second anode and helix voltage, nominal	1.45	kV
‡Direct collector voltage, nominal	1.5	kV←
§Direct collector current, adjusted by V_{a1}	4	mA
Direct first anode voltage, V_{a1}	0.85	kV
Amplification	24	db
Power output, approx.	150	mW
Input and output voltage standing wave ratio, 3 530–4 620 Mc/s, less than	2 to 1	

* This valve is designed to operate in a recommended circuit, the required focus coil current for which is 250 mA.

These operating conditions are obtained when using the recommended circuit.

† Adjusted to give optimum gain. The appropriate helix voltage for individual valves lies between 1.3 and 1.5 kV.

‡ The collector is operated at 50 volts positive with respect to the helix.

§ Recommended value. The first anode voltage necessary to give a collector current of 4 mA lies between 500 and 1 200 volts. The first anode draws negligible current and may be supplied from a potentiometer connected between the helix supply and cathode. During life, however, the optimum first anode voltage may rise to as much as 1 400 volts. It is recommended that to obtain best life the first anode voltage should be obtained from a circuit arranged to keep the collector current constant by variation of the first anode voltage supply.

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OPERATIONAL DATA

Amplification

As previously stated, an average valve will give a gain of 24 db at a collector current of 4 mA.

While variation of helix voltage will affect the gain, it will be maintained within 2 db of the maximum if the helix voltage is held within 50 volts of the optimum value.

CIRCUIT

Further information concerning the circuit and focus coil assembly may be obtained on application to Special Valve Sales Department, Standard Telephones and Cables Limited, Connaught House, 63, Aldwych, London, W.C.2.

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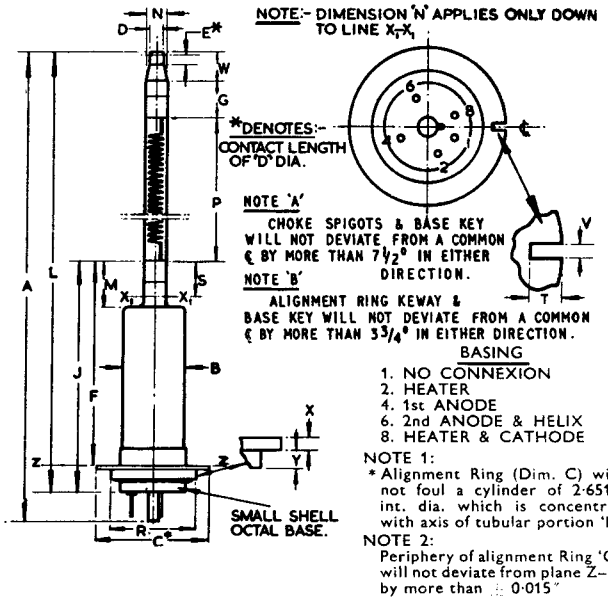

NOTE 1:
* Alignment Ring (Dim. C) will not foul a cylinder of 2·651″ int. dia. which is concentric with axis of tubular portion 'P'

NOTE 2:
Periphery of alignment Ring 'C' will not deviate from plane Z–Z by more than ± 0·015″

DIM	MILLIMETRES	INCHES	DIM	MILLIMETRES	INCHES
A	350·8 MAX.	13 13/16 MAX.	N	9·83 MAX.	0·387 MAX.
B	30·2 MAX.	1 3/16 MAX.	P	190·50 ± 0·51	7·500 ± 0·020
C	66·52 ± 0·05	2·619 ± 0·002	R	46 ± 0·8	1 13/32 ± 1/32
D	7·92 ± 0·05	0·312 ± 0·002	S	9·5 MIN.	3/8 MIN.
E	5·5 ± 1·6	7/32 ± 1/16	T	3·18 ± 0·25	0·125 ± 0·010
F	87·31 ± 0·38	3·437 ± 0·015	V	1·65 +0·25 −0·00	0·065 +0·010 −0·000
G	19·1 ± 2·4	3/4 ± 3/32			
J	104·8 ± 3·2	4 1/8 ± 1/8	W	14·3 ± 1·6	9/16 ± 1/16
L	336·6 MAX.	13 1/4 MAX.	X	4·75 ± 0·12	0·187 ± 0·005
M	20·6 ± 3·2	13/16 ± 1/8	Y	7·92 ± 0·25	0·312 ± 0·010

NOTE: BASIC FIGURES ARE INCHES.