from JEDEC release #4775,
Aug. 3, 1964

JEDEC Designation 8357

ABRIDGED DATA

Fixed Frequency Pulse Magnetron for use with ferrite isolator in airborne radars.

Frequency Range	9345 to 9405	Mc/s
Typical Peak Output Power	25	kW
Magnet		Integral
Output		No. 16 Waveguide
Coupler		UG-40A/U (Z830051)
Cooling (*See Note* 3)		Convection or Forced-air

GENERAL DATA

Electrical

Cathode		Indirectly Heated
Heater Voltage (*See Note* 1)	6·3	V
Heater Current	0·5	A
Heater Starting Current (Peak)	3·0	A Max
Cathode Heating Time (Minimum)		*See Note* 2

Mechanical

Overall Dimensions	5·375 × 4·468 × 3·562 inches	Max
	136·5 × 113·5 × 90·47 mm	Max
Net Weight	3¼ pounds (1·5 kg)	Approx
Mounting Position		Any
Connections		Flying Leads

The magnet of this valve is preset during manufacture to ensure correct operation; a permanent deterioration in the performance of the magnetron may result if any magnetic material is allowed to approach the magnet. English Electric Valve Company Limited should be consulted to verify that the design of any magnetic screening or supporting structure does not impair the operation of the valve.

The valve is vibration tested to ensure that it will withstand normal conditions of service.

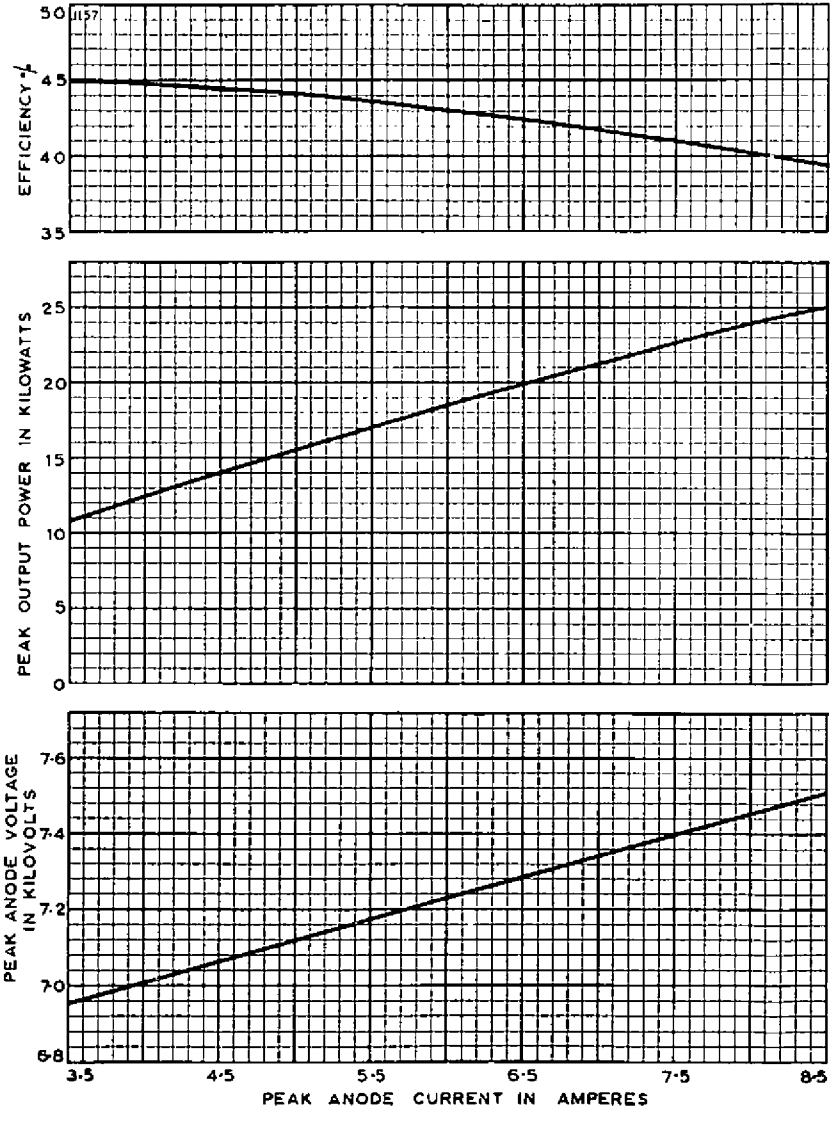
ENGLISH ELECTRIC VALVE CO. LTD.

CHELMSFORD
ENGLAND

Telephone:
Chelmsford 3491

ENGLISH ELECTRIC

PERFORMANCE CHART



ENGLISH ELECTRIC VALVE CO. LTD.

CHELMSFORD
ENGLAND

Telephone:
Chelmsford 3491

ENGLISH ELECTRIC

MAXIMUM AND MINIMUM RATINGS

(Absolute Values)

The maximum pulse length and peak current ratings may be used simultaneously; all other ratings cannot necessarily be used simultaneously, and no individual rating should be exceeded.

	Min	*Max*	
Heater Voltage (*See Note* 1)	5·7	6·9	V
Heater Starting Current (Peak)	—	3·0	A
Anode Voltage (Peak)	6·0	8·0	kV
Anode Current (Peak)	3·5	8·5	A
Input Power (Peak)	21	68	kW
Input Power (Mean)	—	80	W
Duty Cycle	—	0·0025	
Pulse Length	—	2·5	μsec
Rate of Rise of Voltage Pulse (*See Note* 4)	—	100	kV/μsec
Anode Temperature (*See Note* 3)	—	120	°C
Frequency Change with Anode Temperature Change (after warming)	—	−0·25	Mc/s/°C
Altitude:			
Output System (*See Note* 5)	—	40 000	feet
	—	12·2	km
Input Terminals	—	60 000	feet
	—	18·3	km
V.S.W.R. at the output coupler	—	1·25 : 1	

TYPICAL OPERATION

Operational Conditions		
Heater Voltage	6·3	V
Anode Current (Peak)	8·5	A
Pulse Length	2·2	μsec
Pulse Repetition Rate	400	p.p.s.
Typical Performance		
Anode Voltage (Peak)	7·5	kV
Output Power (Peak)	25	kW
Output Power (Mean)	22	W

ENGLISH ELECTRIC VALVE CO. LTD.

CHELMSFORD
ENGLAND

Telephone:
Chelmsford 3491

ENGLISH ELECTRIC

TEST CONDITIONS AND LIMITS

The valve is tested to comply with the following electrical specification.

Test Conditions

Heater Voltage (for test)	6·3	V
Anode Current (Mean)	8·5	mA
Duty Cycle	0·001	
Pulse Length (*See Note* 6)	2·5	μsec
V.S.W.R. at the output coupler (Maximum)	1·15 : 1	
Rate of Rise of Voltage Pulse (*See Note* 4)	100	kV/μsec

Limits

	Min	*Max*	
Heater Current (*See Note* 7)	0·43	0·60	A
Anode Voltage (Peak)	7·0	8·0	kV
Output Power (Mean)	23	—	W
Frequency (*See Note* 8)	9345	9405	Mc/s
R.F. Bandwidth at ½ Power (*See Note* 9)	—	1·0	Mc/s
Frequency Pulling (V.S.W.R. not less than 1·5 : 1)	—	25	Mc/s
Stability (*See Note* 10)	—	0·25	%

LIFE TEST

The quality of all production is monitored by the random selection of valves which are then life-tested under the oscillation conditions given above. If the valve is to be run continuously under different conditions, English Electric Valve Company Ltd. should be consulted to verify that the life of the valve will not be impaired.

END OF LIFE CRITERIA

(under Test Conditions above)

Output Power (Mean)	18·5	W Min
R.F. Bandwidth at ½ Power	1·5	Mc/s Max
Frequency: Must be within Test Limits above		
Stability (*See Note* 10)	1·0	% Max

ENGLISH ELECTRIC VALVE CO. LTD.

CHELMSFORD
ENGLAND

Telephone:
Chelmsford 3491

ENGLISH ELECTRIC

NOTES

1. With no anode input power.

   The heater voltage may have to be reduced during operation if the mean input power exceeds 40 watts. The reduction should be confirmed with English Electric Valve Company Ltd.

   The valve heater shall be protected against arcing by the use of a minimum capacitance of 4000pF shunted across the heater directly at the input terminals; in some cases a capacitance as high as 2μF may be necessary depending on the equipment design.

2. The minimum cathode heating time for ambient temperatures above −55°C is 20 seconds from the heater voltage reaching 5·7 volts. If the valve has been stored for six months or more without h.t. being applied, a longer initial cathode heating time may be required.

3. Convection cooling is usually adequate but at high ambient temperatures and in confined surroundings a degree of forced-air cooling may be necessary.

4. The rate of rise of voltage is the slope of the steepest tangent to the leading edge of the voltage pulse above 80% amplitude. Any capacitance used in the viewing system must not exceed 6·0pF.

5. This rating applies when the magnetron is operated at the maximum input power and pulse length into a mismatched load of V.S.W.R. 1·25 : 1 at the worst phase for breakdown, via a coupler UG-40A/U of standard manufacture.

6. Tolerance ±10%.

7. Measured with heater voltage of 6·3V and no anode input power.

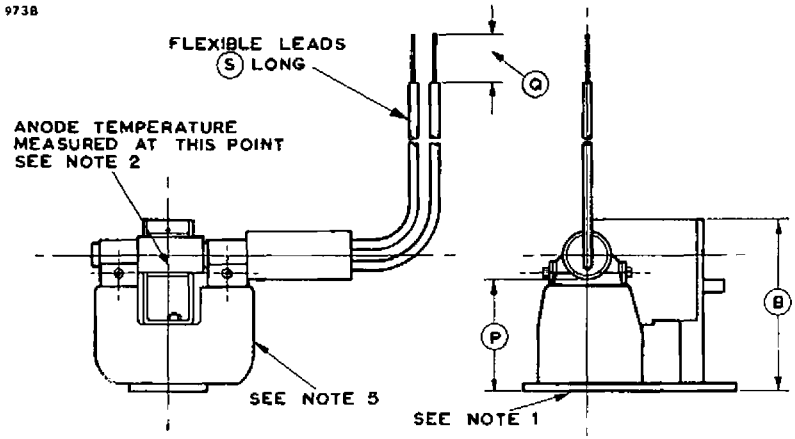
8. Temperature of anode block 40°±5°C, measured at the point indicated on the outline drawing.

9. The bandwidth in Mc/s is given by 2·5/pulse length in microseconds.

10. Pulses are defined as missing when the r.f. energy level is less than 70% of the normal energy level in the frequency range of 9345 to 9405Mc/s. Missing pulses are expressed as a percentage of the number of input pulses applied during any consecutive 5 minute interval of a 15 minute test period.

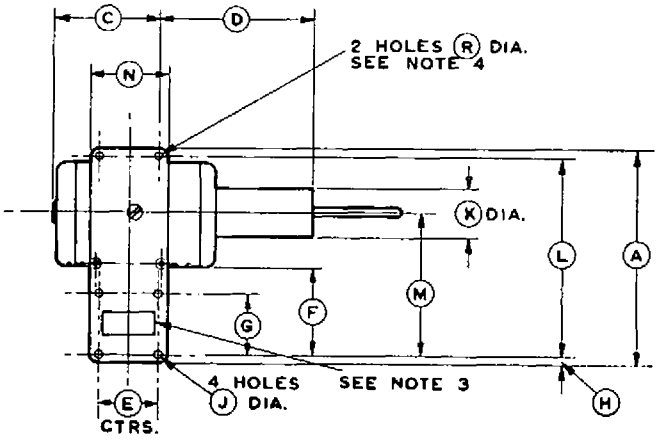
ENGLISH ELECTRIC

OUTLINE



COLOUR	ELEMENT
GREEN	HEATER
YELLOW	CATHODE & HEATER

Flexible Lead Connections



ENGLISH ELECTRIC VALVE CO. LTD.

CHELMSFORD
ENGLAND

Telephone:
Chelmsford 3491

ENGLISH ELECTRIC

NOTES FOR OUTLINE

1. With the valve resting on a plane surface, the flatness of the mounting plate will be such that a feeler gauge 0·015 inch (0·38mm) thick and 0·125 inch (3·18mm) wide will not enter more than 0·125 inch (3·18mm) at any point.
2. The anode temperature to be measured at this point which is on the centre-line of the anode and at 45° to the horizontal (approximately).
3. The position of the waveguide and fixing holes will be such that the valve operates into coupler type UG-40A/U.
4. The clearance between the centre line of these holes and the magnet will be 0·165 inch (4·19mm) minimum.
5. The north seeking pole of the magnet will be adjacent to the cathode leads.

OUTLINE DIMENSIONS

Ref.	Inches	Millimetres	Ref.	Inches	Millimetres
A	4·453±0·015	113·11±0·38	K	1·000 Max	25·40 Max
B	3·562 Max	90·47 Max	L	4·103±0·004	104·216±0·102
C	2·187 Max	55·55 Max	M	2·937±0·250	74·60±6·35
D	3·187 Max	80·95 Max	N	1·625±0·015	41·28±0·38
E	1·220±0·004	30·988±0·102	P	2·000 Min	50·80 Min
F	1·811 Min	46·00 Min	Q	0·500 Nom	12·70 Nom
G	1·280±0·004	32·512±0·102	R	0·175±0·003	4·445±0·076
H	0·172±0·015	4·37±0·38	S	6·0	152·4
J	0·169±0·003	4·293±0·076			

Millimetre dimensions have been derived from inches.

ENGLISH ELECTRIC VALVE CO. LTD.
CHELMSFORD
ENGLAND
Telephone:
Chelmsford 3491

Printed in England