



# ELECTRON TUBE DIVISION

CLIFTON, NEW JERSEY

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

**F-2509  
BACKWARD WAVE  
OSCILLATOR**

## TENTATIVE

### GENERAL

The F-2509 is a voltage-tunable, wide-band oscillator with a minimum output power of 100 milliwatts over its rated operating frequency range. This permanent magnet focused, highly stable device finds applications as a swept signal source in signal generators; master oscillator for frequency diversity transmitters; or typically as a local oscillator in radar or ECM receivers. The tube features a bifilar helix contained in a rugged envelope of simple mechanical design thus providing a highly reliable, compact unit. No cooling is required when the environment is below +60°C ambient temperature.

### ELECTRICAL

	TYPICAL	ABSOLUTE	UNITS		TYPICAL	ABSOLUTE	UNITS
Frequency	2.0 - 4.0	Note 1	Gcs	*Grid Voltage for no			
Power Output	100 - 250	100 min.	mw	Oscillation (RF			
Power Output				Cutoff) (with respect			
Variation	5	6 max.	db	to Cathode)	-11	-30 max.	Volts
Fine Grain Variation,				*Collector Voltage			
Note 2	+1.0	+1.5 max.	db/200 mc	(with respect to			
VSWR	2.0:1	2.5:1	-	Helix)	+100	+150 max.	Volts
Output Impedance	50	50	Ohms	Capacitance, Cathode			
Heater Voltage	6.3	6.0 min./6.6 max.	Volts	to all Electrodes	42	50 max.	μμfd.
Heater Current	.96	1.2 max.	Amps	Capacitance, Grid to			
Anode Voltage (with				all Electrodes	30	45 max.	μμfd.
respect to Cathode)	106	250 max.	Volts	Capacitance, Helix			
Anode Current	0.15	1.0 max.	Ma	to all other			
Cathode Current	10.4	15 max.	Ma	Electrodes and			
*Helix Voltage	Zero	Zero	Volts	Capsule	210	300 max.	μμfd.
Helix Current	1.9	3.0 max.	Ma	Spurious Output			
*Cathode Voltage				below Signal	50	40 min.	db
(with respect							
to Helix)	-300 to -1800	-200 to -2100	Volts				

\*The above data shows tube operation with the helix at ground potential (Zero volts). If desired as an alternate, any one of the asterisked elements may be operated at ground potential provided the other electrode potentials are set at the appropriate relative levels.

NOTE 1 The F-2509 will operate over the frequency range of 1.98 to 4.04 Gcs. with a 3 db reduction in the rated minimum output power.

NOTE 2 This value is determined by selecting the 200 mc region of the frequency range which has the greatest differences in power output. The difference between these power levels is divided by two and the plus or minus sign is affixed to denote the difference from an average power level.

### MECHANICAL

Package Length	11.40	11.45 max.	Inches	Output Cable Length			
Package Diameter	3.00	3.02 max.	Inches	(to end of Type			
Package Weight	14 lbs-4 oz.	14.5 max.	Pounds	"N" Connector)	15	14 min/16 max.	Inches
Power Cable Length							
(to end of Win-							
chester PM6P							
Connector)	12	11 min/13 max.	Inches				

Additional information for specific applications can be obtained from the

Electron Tube Applications Section  
ITT Electron Tube Division  
Post Office Box 104  
Clifton, New Jersey

