

L-Band Pencil-Tube Oscillator-Amplifier

1090 Mc/s

500 W PEAK

These Units^d are Designed to Implement New Airborne Transponder Systems

ELECTRICAL

Heater, for Unipotential Cathode

Voltage (AC or DC)	6.3 ± 10%	V
Current at 6.3 V (Total)	0.66 max	A
Frequency	1090	Mc/s

RF Coaxial Output

Terminal	Sealectro No. 50-047-0129	
Characteristic impedance (approx.)	50	Ω
Output VSWR	1.5:1	
All phase angles		

MECHANICAL

Operating Position	Any
Dimensions and Terminal Connections	See <i>Dimensional Outlines</i>
Weight (Approx.)	7 oz

ENVIRONMENTAL

The units will remain stable within ±2.5 Mc/s in frequency and ±3 dB in peak power output (from nominal conditions) under any combination of the following conditions:

Vibration	Curve IV of MIL-E-5400 and Curve IV MIL-T-5422E	
Shock	15	g
Ambient Temperature	-54 to 95	°C
Altitude	30000	ft
Output VSWR	1.5:1	
All phase angles		
Plate and Heater Voltage Variation	±10	%
Duty Factor	0.01	

GRID-PULSED OSCILLATOR—CLASS C

Absolute-Maximum Ratings

For a maximum "ON" time^a of 12.5^b microseconds
in any 2500-microsecond interval

DC Plate Voltage	1100	V
Each unit		
Peak Oscillator Grid Current	0.5	A
Peak Amplifier Cathode Current	2	A
Peak Plate Current		
Oscillator	0.7	A
Amplifier	1.5	A
Plate Dissipation	18	W
Total		
Peak Heater-Cathode Voltage		
Heater negative with respect to cathode	60	V
Heater positive with respect to cathode	60	V



TYPICAL OPERATION

With Rectangular Wave Shape in Grid-Drive Circuit at 1090 Mc/s

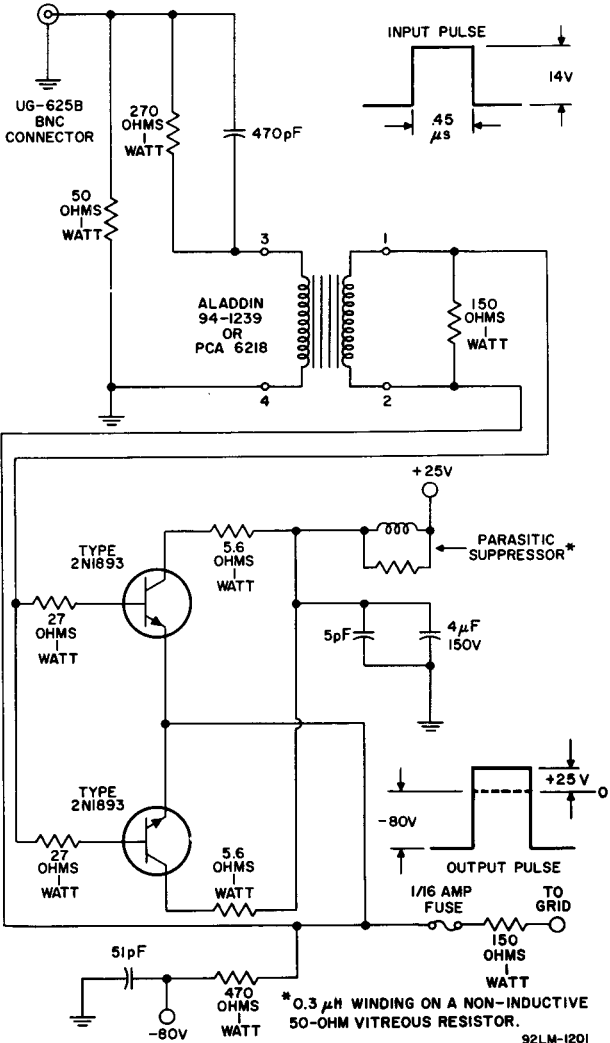
With duty factor^c of 0.01 and pulse duration of
0.45 microsecond

DC Plate Voltage.	1000	V
Each unit		
Oscillator Grid Bias.	-80	V
Amplifier Cathode Bias.	25	V
DC Plate Current.	20	mA
Total		
Useful Power Output	500	W
At peak of pulse		

- ^a "ON" time is defined as the sum of the duration of all individual pulses which occur during the indicated interval. *Pulse duration* is defined as the time interval between the two points on the pulse at which the instantaneous value is 70% of the peak power value. The *peak value* is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.
- ^b This value is for continuous pulsing. The "ON" time can be 25 microseconds when the units are operated 10 minutes per hour.
- ^c Duty factor is the product of pulse duration and repetition rate. For variable pulse durations and pulse repetition rates, the duty factor is defined as the ratio of the time "ON" to total elapsed time in any 2500-microsecond interval.
- ^d The ruggedized oscillator-amplifier combination is built to satisfy all AIMS/FAA (Army Integrated Meteorological Systems) requirements.

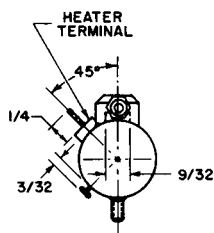
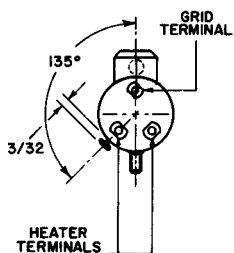
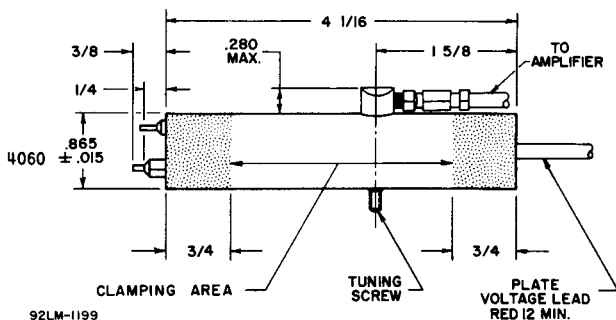


RECOMMENDED GRID-PULSE AMPLIFIER (MODULATOR)



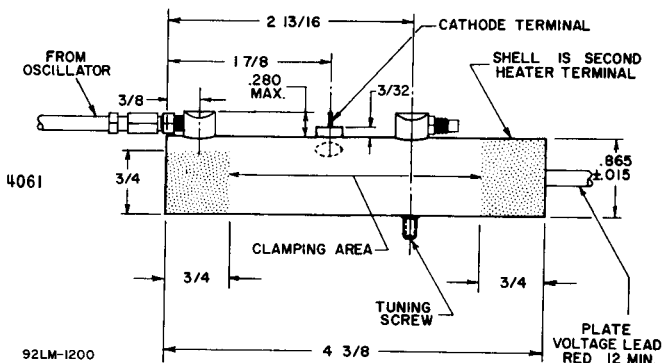
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DIMENSIONAL OUTLINES



4060
LEFT SIDE VIEW

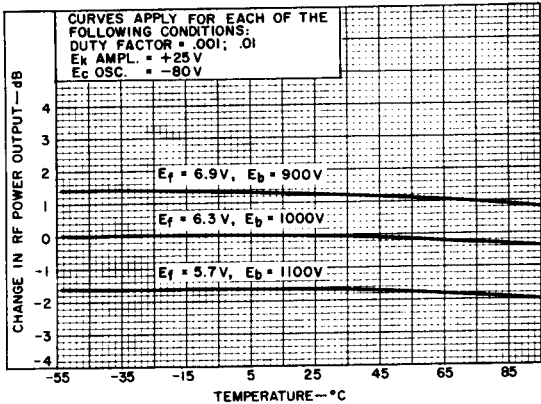
4061
LEFT SIDE VIEW



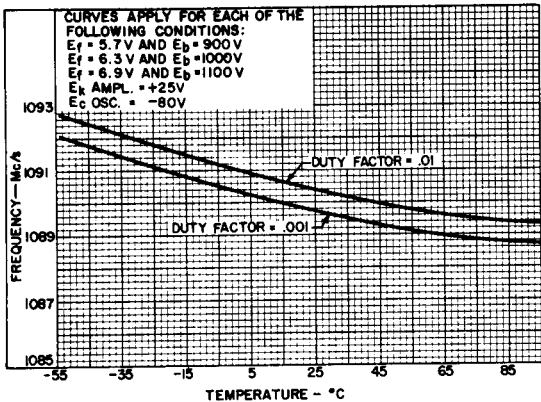
DIMENSIONS IN INCHES

These units are supplied without the mounting brackets; they are also available with brackets upon request.

Typical Change in Power Output vs. Temperature



Typical Output Frequency vs. Temperature



L-Band Pencil-Tube Oscillator-Amplifier

1090 MHz

500 W PEAK

These Units^a are Designed to Implement New Airborne Transponder Systems

ELECTRICAL

Heater, for Unipotential Cathode

Voltage (AC or DC)	6.3 ± 10%	V
Current at 6.3 volts (Total)	0.66 max	A
Frequency	1090	MHz
Tuning Range	±15	MHz

RF Coaxial Output

Terminal	Mates with female screw-type connector Sealectro No.50-007-0259, Micon No.1002, or equivalent	
Characteristic impedance (approx.)	50	Ω

Output VSWR 1.5:1

All phase angles

Change in Peak Power Output

During Modulation ^b	0.5 max	dB
Pulse Rise Time (10% to 90%)	0.05-0.10	μs
Pulse Decay Time (90% to 10%)	0.05-0.20	μs
RF Delay Time (measured at 50% of pulse amplitude)	0.25 max	μs
RF Jitter	0.01 max	μs

MECHANICAL

Operating Position	Any
Dimensions and Terminal Connections	See <i>Dimensional Outlines</i>
Weight (Approx.)	7 oz

ENVIRONMENTAL

The units will remain stable within ± 2.5 MHz in frequency and ± 3 dB in peak power output (from nominal conditions) under any combination of the following conditions:

Vibration^c

5 to 53 Hz	0.1 inch	DA
53 to 500 Hz	±15	g's
Shock	20	g's
Ambient Temperature	-54 to +125	°C
Altitude	30,000	ft
Output VSWR (All phase angles)	1.5:1	
Plate and Heater Voltage Variation	±10	%
Duty Factor (Long term)	0.01	

GRID-PULSED OSCILLATOR—CLASS C

Absolute-Maximum Ratings

For a maximum long-term duty factor^d of 0.01^e

DC Plate Voltage (Each Unit)	1100 max	V
Peak Oscillator Grid Current	0.5 max	A
Peak Amplifier Cathode Current	2.0 max	A
Peak Plate Current		
Oscillator	0.7 max	A
Amplifier	1.5 max	A
Plate Dissipation (Total)	18 max	W

← Indicates a change.



Peak Heater-Cathode Voltage

Heater negative with respect to cathode. . . .	60 max	V
Heater positive with respect to cathode. . . .	60 max	V

TYPICAL OPERATION

With Rectangular Wave Shape in Grid-Drive Circuit at 1090 MHz

*With duty factor of 0.01 and pulse duration of
0.45 microsecond*

DC Plate Voltage.	1000	V
Each unit		
Oscillator Grid Bias.	-80	V
Amplifier Cathode Bias.	+25	V
DC Plate Current.	20	mA
Total		
Useful Power Output	500	W
At peak of pulse		

^a The ruggedized oscillator-amplifier combination is built to satisfy all AIMS/FAA (Army Integrated Meteorological Systems) requirements.

^b With 56 pulses in 100 microsecond interval.

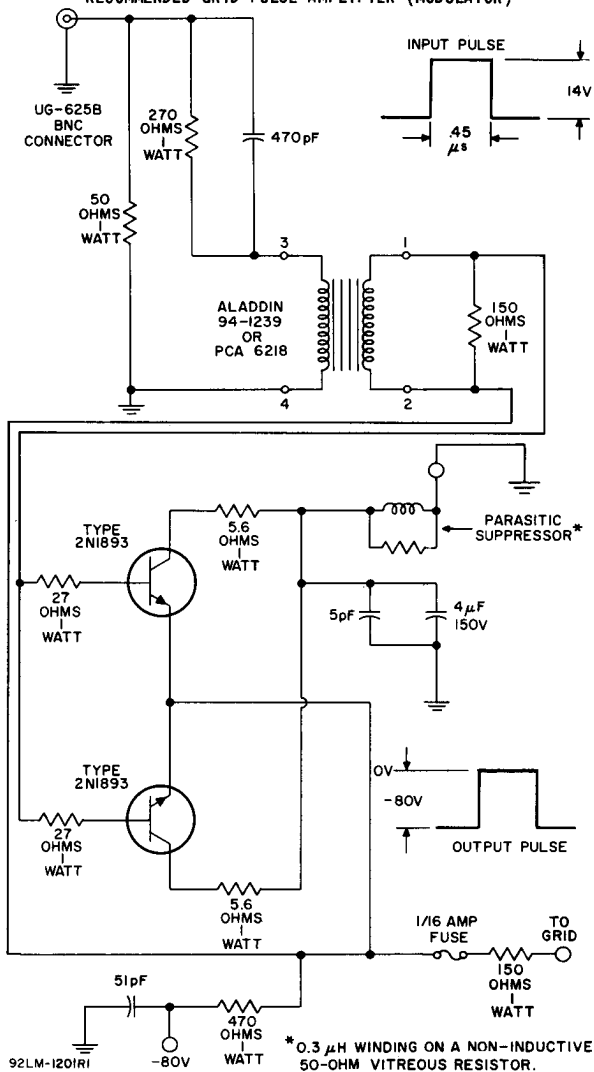
^c Tested per methods described in MIL-E-5400 and MIL-T-5422.

^d Duty factor is the product of pulse duration and repetition rate. For variable pulse durations and pulse repetition rates, the duty factor is defined as the ratio of the time "ON" to total elapsed time in any 2500-microsecond interval. "ON" time is defined as the sum of the duration of all individual pulses which occur during the indicated interval. *Pulse duration* is defined as the time interval between the two points on the pulse at which the instantaneous value is 70% of the peak power value. The *peak value* is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.

^e This value is for continuous pulsing. The duty factor can be 0.25 for any interval up to 100 microseconds in length as long as the long-term duty factor does not exceed 0.01.

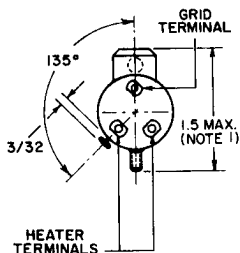
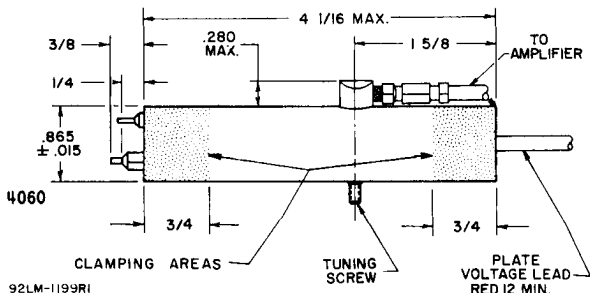


RECOMMENDED GRID-PULSE AMPLIFIER (MODULATOR)

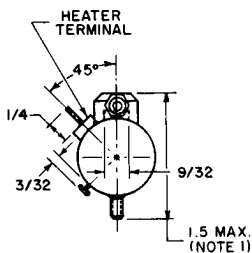


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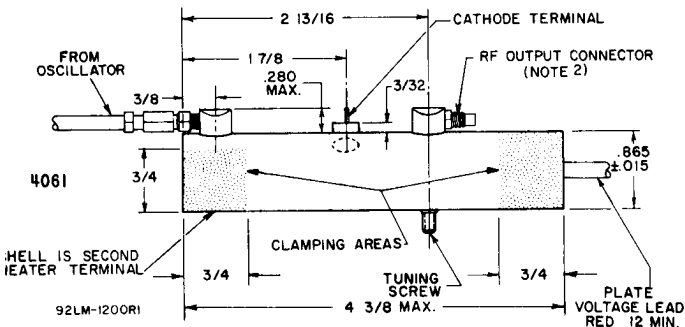
DIMENSIONAL OUTLINE (DIMENSIONS IN INCHES)



4060—LEFT SIDE VIEW



4061—LEFT SIDE VIEW

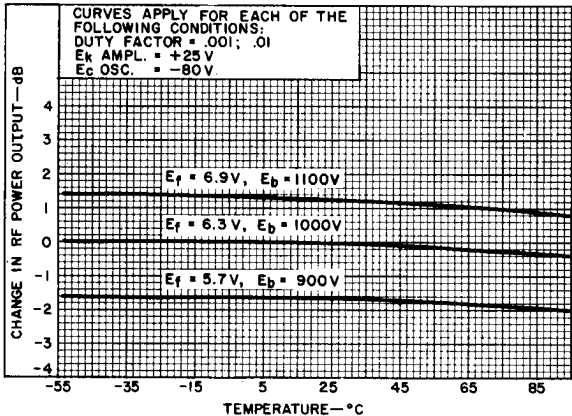


Note 1: When adjusted for operation at 1090 MHz.

Note 2: Mates with female screw-type connector Selectro No.50-007-0259, Micon No.1002, or equivalent.

These units are supplied without the mounting brackets; they are also available with brackets upon request.

Typical Change in Power Output vs. Temperature



Typical Output Frequency vs. Temperature

