

# NAVY Transition Assistance Program

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# N07-007 - Auriga Measurement Systems LLC

## Solid-State High-Efficiency Radar Transmit Module

### NEED & CUSTOMER REQUIREMENT

**Need:** High-efficiency radar transmitter to reduce the weight, fuel consumption, and operating cost of Unmanned Aerial Systems (UASs)

**Value to the Warfighter:** With Power Added Efficiency (PAE) increased, the power amplifier module size, weight and power requirements are reduced; the UAS benefits with greater range, altitude and flight time. With less heat being generated, the requirements of the cooling system are reduced or eliminated, further reducing the weight of the UAS.

This new reliable solid-state technology offers greater up-time and life-time versus more traditional traveling-wave tubes (TWTs) configurations. TWTs require extremely high voltages, which require continual maintenance and more frequent replacement due to their inherent fragility under typical military operating conditions.

**Operational Gap:** Efficiency increase of 30 - 40% over current radar transmitters with greater reliability for UASs

**Customer Specifications:** Frequency range: 406 to 450 MHz, output power: 400 W, Power Added Efficiency (PAE): 75%, gain: 16 dB

**Technology Description:** Gallium Nitride (GaN) High Electron Mobility Transistor (HEMT) on Silicon Carbide (SiC) for high voltage operation and high power density, class F design for high efficiency

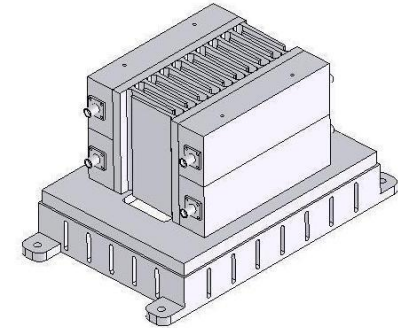
### SPONSORSHIP of original SBIR/STTR Topic

**SYSCOM:** NAVAIR

**Transition Target:** PMA-262  
Persistent Maritime Unmanned Aircraft Systems

**Original Sponsoring Program:** JSF

**TPOC Phone Number:**  
301-342-9094



1 kW Radar Transmit Module  
(Capable of being combined for higher power)

### TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
80 W prototype	3	Low	Pout > 100 W, PAE=58%	11/5/2007
400 W module design	4	Moderate	Pout > 400 W, PAE > 70%	10/7/2008
400 W module demonstration	5	Moderate	Pout > 400 W, PAE > 70%, Gain>40dB	2/24/2010
800 W module demonstration	6	Moderate	Pout > 800 W, PAE > 70%, Gain>40dB	2/24/2011

**Open contract:** N68335-09-C-0055 ending 2/23/2011

### TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

**Other Potential Applications:**

All UASs that require high-powered transmit modules for radar and/or communications

Mounted ground mobile units would also benefit from this technology

With slight modification in frequency and power, mounted units for JTRS, JCREW, MUOS, and Next Generation Jammer (NGJ) would benefit from this technology

**Business Model:**

Auriga will sell modules to Prime contractors, i.e. Raytheon, who will integrate the module into their radar system which is integrated into a UAS, i.e. the N-G X-47.

**Objective:**

Align our technology with Primes (system integrators) who require high-powered, high-efficiency power amplifier modules for their radar and/or communications systems. Target companies may be selling directly to the DoD or indirectly through other primes, tier 1 or tier 2 organizations.