

Section 6

# PEO LS PROGRAMS

## Advanced Technology Investment Plan

Section 6.5 PEO LS Program

### GROUND/AIR TASK ORIENTED RADAR



**Program Background**

Ground/Air Task Oriented Radar (G/ATOR) is a three-dimensional short-to-medium-range tactical radar that is designed to detect, identify, and track low level cruise missiles, manned aircraft, and UAVs as well as rockets, mortars, and artillery fire. G/ATOR capabilities include the ability to track hostile UAVs, assist in air traffic control, serve as a fire control system, support ground-based air defense, and detect rockets, artillery, and mortars in order to direct the counter fire.

Developed by prime contractor Northrop Grumman Electronic Systems in Baltimore, Md., G/ATOR will replace legacy radar systems to perform air surveillance, cue air defense weapons, determine hostile indirect firing locations, and provide data to air traffic controllers.

**Program Status**

In July 2012 Northrop Grumman delivered the AN/TPS-80 G/ATOR system to Surface Combat Systems Center Wallops Island for Developmental Testing (DT). The successful DT and the Operational Assessment for G/ATOR were completed in Yuma, Arizona, in 2013.

The AN/TPS-80 G/ATOR system received a successful Milestone C on 24 January 2014 from the Assistant Secretary of the Navy (Research, Development and Acquisition) for low-rate initial production, and initial production will begin in 2014.

**G/ATOR's Top Three Program Technology Issues:**

- Lowering Manufacturing Costs**

Technologies are needed that reduce manufacturing cost across multiple areas of production, including 1) air ducts that provide precise mounting and cooling of the Transmit/Receive (T/R) modules and array elements (the air duct is very time consuming to produce and assemble and thus is very expensive); 2) T/R module packaging, which requires expensive materials and hermetic sealing that reduces yield; and 3) Circulator Isolator Resistor Filter boards,

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Part One

PEO LS consists of seven program offices overseeing 19 programs. The following sections discuss the Advanced Technology Investment Plans for each of the pertinent PEO LS programs. Each selected program has a dedicated section that is described in three parts listed below. The goal is to use all S&T venues to leverage resources for PEO LS programs to close warfighter gaps and solve program technology needs.

**Part One** describes the program's background, status, and Top Technical Issues.

**Part Two** describes the program's quad chart, which addresses the program's fundamental information and characteristics, i.e., specific information, including a detailed program description, status, and schedule.

ACAT 1C/Production & Deployment

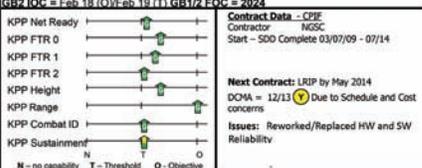
### GATOR

**Description:** G/ATOR is a 3D, short/medium range multi-role radar designed to detect unmanned aerial systems, cruise missiles, air breathing targets, rockets, artillery and mortars. The system satisfies expeditionary needs across the MAGTF and replaces five legacy radar systems with a single MAGTF solution.

MS C = 24 Jan 14 Qty = 45  
 GB1 IOC = Feb 17 (O)/Feb 18 (T)  
 GB2 IOC = Feb 18 (O)/Feb 19 (T) GB1/2 FOC = 2024

Contract Data - CPIC  
 Contractor: NGSC  
 Start - SDD Complete 03/07/09 - 07/14

Next Contract: LRP by May 2014  
 DCMA = 12/13 (Y) Due to Schedule and Cost concerns  
 Issues: Reworked/Replaced HW and SW Reliability

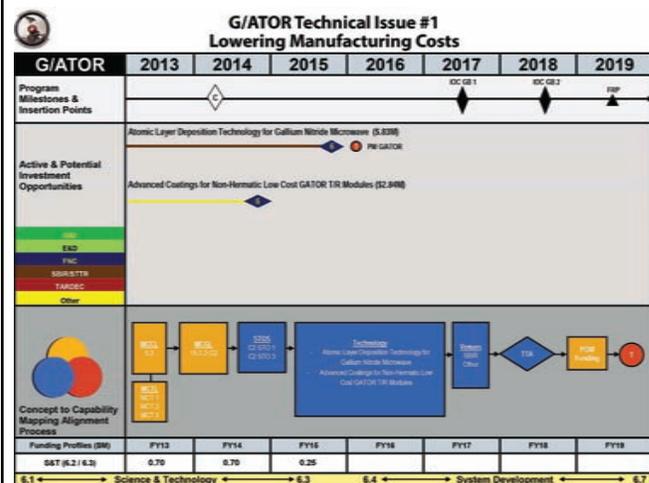


PROGRAM	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	(% Complete)
Milestones & Phases																	
Reviews																	
Test Events																	
Contract Events																	
PS % Quantities																	30

Part Two

### G/ATOR Technical Issue #1 Lowering Manufacturing Costs

G/ATOR	2013	2014	2015	2016	2017	2018	2019
Program Milestones & Insertion Points					IOC GB1	IOC GB2	FOP
Active & Potential Investment Opportunities							
Atomic Layer Deposition Technology for Gallium Nitride Microspheres (\$5,838)							
Advanced Coatings for Non-Hermetic Low Cost GATOR T/R Modules (\$2,948)							
Concept to Capability Mapping Alignment Process							
Funding Profiles (\$M)							
S&T (#.2 / #.3)							



6.1 ← Science & Technology → 6.2 → 6.3 → 6.4 → System Development → 6.7

Part Three

**Part Three** illustrates the Top Technical Issue by breaking down each topic individually and aligning it from the original concept to the capability it will provide. As shown in Figure 6-1, on the following page, each chart is divided into the following four sections:

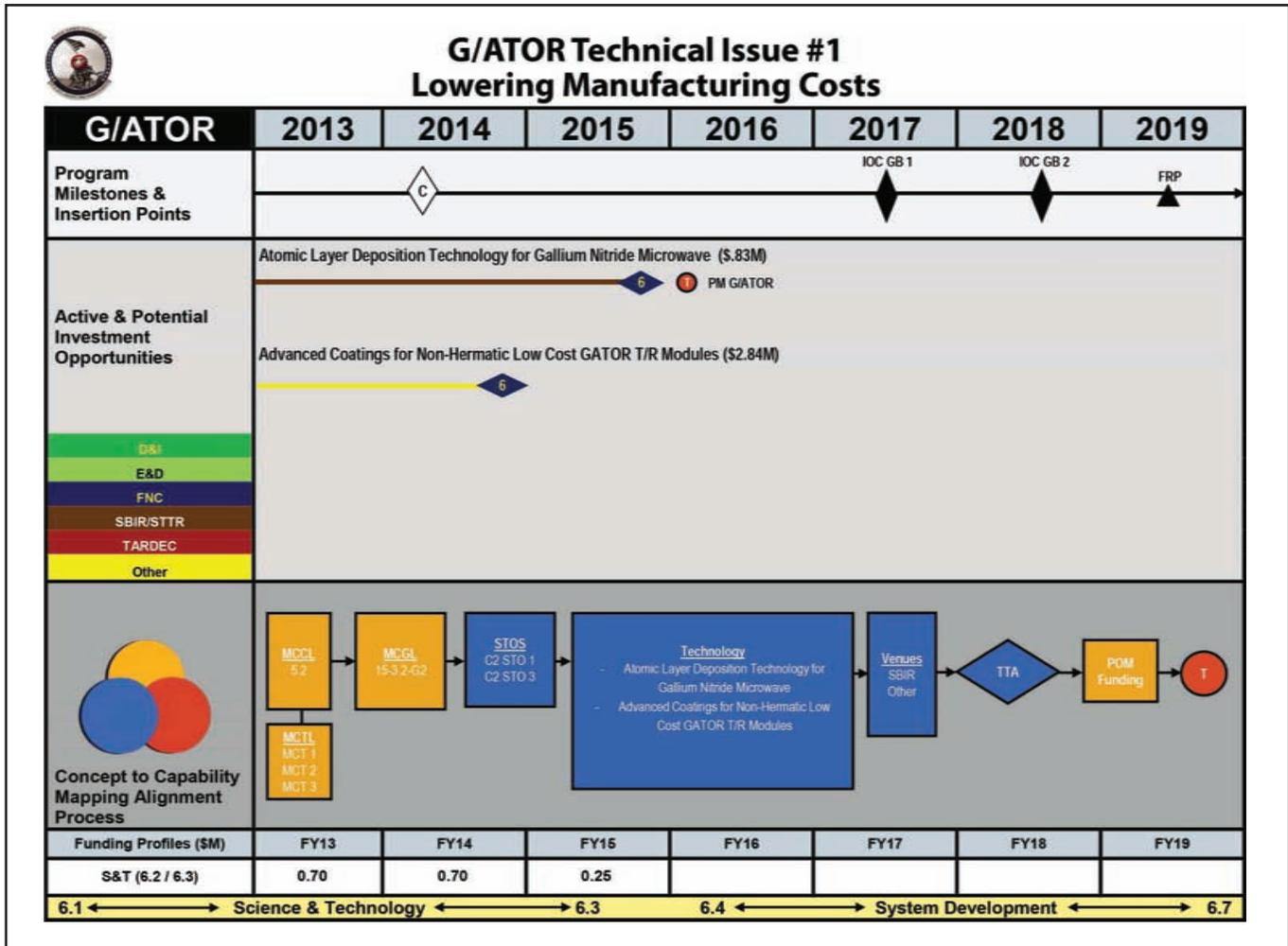


Figure 6-1. G/ATOR Technical Issue #1 Chart

**Row one** identifies the program’s major milestones.

**Row two** displays S&T initiatives that are targeted to solve the technology issue.

**T** The red circle with a T in the center is used at the end of a project to identify initiatives being targeted for transition.

**◆** The dark blue diamond with a yellow number in the center depicts the expected Technology Readiness Levels (TRL) at the beginning and end of projects. TRLs are used to measure the maturity level of the S&T activities and initiatives.

TRL 1 – Basic principles observed and reported.

TRL 2 – Technology concepts or applications (or both) formulated.

TRL 3 – Analytical and experimental critical function or characteristic proof-of-concept.

TRL 4 – Component or breadboard validation in a laboratory environment.

TRL 5 – Component or breadboard validation in a relevant environment.

TRL 6 – System/subsystem model or prototype demonstration in a relevant environment.

TRL 7 – System prototype demonstration in an operational environment.

The color key on the far left side of the chart identifies the six different types of S&T venues.

**Discovery and Invention (D&I)** programs consist of basic and early applied research.

**Exploitation and Development (E&D)** focuses on incorporating research into systems in preparation for inclusion into acquisition programs.

**Future Naval Capabilities (FNC)** provide the best technology solutions to formally defined capability gaps and usually leverage past D&I and E&D successes.

**SBIR/STTR** are comprised of programs that are focused on small business innovation.

**Tank Automotive Research, Development and Engineering Center (TARDEC)**, located in Warren, Michigan, is the U.S. Armed Forces' research and development facility for advanced technology in ground systems. It is part of the Research, Development and Engineering Command (RDECOM), a major subordinate command of the United States Army Materiel Command. Current technology focus areas include Ground Vehicle Power and Mobility (GVPM), Ground System Survivability, and Force Protection Technology, among others.

**Other** is a variety of other investment types, including projects involving the Office of the Secretary of Defense; initiatives that are sponsored by the program office, such as Phase "A" studies and congressional "plus ups"; and all those not otherwise covered. See the Appendix for a detailed list of applicable S&T venues.

**Row three** traces the issue from the originating Marine Corps Capabilities List (MCCL), through the identified gap via the Marine Corps Gap List (MCGL), to the STO that are identified in the Marine Corps S&T Strategic Plan, and other S&T venues that

address the technical issue to illustrate the transition of technology to the Program of Record.

The mapping alignment process traces the technology issue/S&T initiative from the required capability to the transitioned technology. Using G/ATOR Technical Issue #1, Lowering Manufacturing Costs as an example, MCL 5.2 (Achieve Situational Awareness) identifies the capability that is associated with the technical issue. Applicable tasks identified from the Marine Corps Task List (MCTL) are MCT 1 (Deploy Forces/Conduct Maneuver), MCT 2 (Develop Intelligence), and MCT 3 (Employ Firepower). MCGL 15-3.2 G-2 (Engage Targets with Appropriate Weapons) identifies the gap. C2 STO-1 (converged service networks with assured, robust communications linking all echelons of the MAGTF) and C2 STO-3 (improved situational awareness for warfighters at all echelons) identifies the applicable STO. The issues are then traced through potential technologies and venues to the funded transition of that advanced technology capability

The bottom three rows describe the funding profile associated with the S&T initiatives for each listed year.

In summary, the fifth edition of the Advanced Technology Investment Plan captures the active S&T initiatives that are currently being pursued by the program office and that are aligned to high priority technical issues and capability gaps in order to "Focus the Future Faster" by delivering gap-closing capabilities to the warfighter.