

An AN/MPQ-4 Sentinel Radar, which can provide 360-degree detection of airborne threats, can be integrated into Patriot architecture to improve capability against off-axis threats. (Photo courtesy of U.S. Army Acquisition Support Center)



Wide azimuth defense

Adapting Patriot operations to counter multi-axis threats

By Capt. Paul Spikes

Forward - deployed Patriot forces in Central Command are faced with threats from multiple actors and, as a result, multiple directions. Gone are the days of defending against attacks from a single, known adversary; Patriot battalions must be prepared to defend against attacks from all directions. First Battalion, 43rd Air Defense Artillery Regiment has responded to this challenge by pushing the system to its maximum directional capability. They have created a roadmap for providing maximum firepower against any and all threats, and concepts they have developed are influencing planners throughout the area of responsibility.

The 1-43rd ADA deployed to CENTCOM in 2018 to an environment that was rapidly evolving into a much more dangerous situation than previous units had experienced. New enemy capabilities emerged that threatened U.S. and coalition forces from multiple directions. Battalion leadership and tacticians quickly realized the traditional Patriot configuration had to be adapted to be effective in this new threat environment. After numerous simulations and site surveys, the solution focused on three areas: (1) site configuration and equipment layout; (2) mutual Fires support; and (3) integration of additional sensors. With all three aspects pushed to

their limits, 1-43rd ADA has been able to provide maximum directional coverage without requiring an increase in system resources.

Site configuration and equipment layout

Through meticulous planning and simulations, 1-43rd ADA developed a site layout that ensured every enemy avenue of approach was defended redundantly, without sacrificing combat power against the primary threats. This was accomplished through a complete remodel of the traditional Patriot layout, which coincided with occupation of new fighting positions. With an eye on utilizing overlapping Fires and

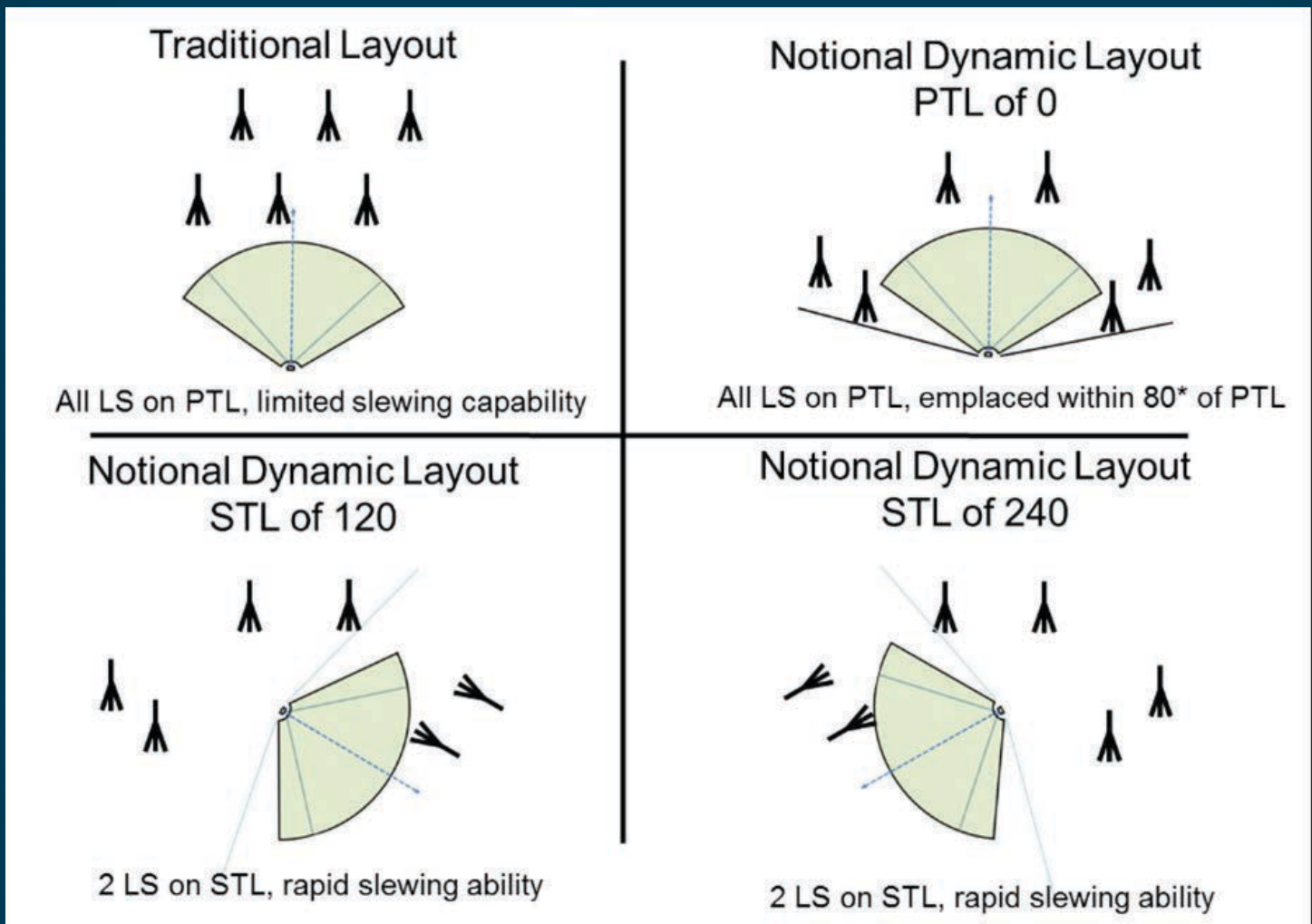


Figure 1. LS Emplacement Azimuths: A notional depiction of Patriot Launching Station layout options. When positioned within 80-degrees of the primary target line, the system can utilize the launcher's compliment of interceptors against an inbound threat. (Chief Warrant Officer 2 Ron Steeg/1-43rd ADA)

mutual support, “Cobra Strike” planners, led by Chief Warrant Officer 2 Ron Steeg and Sgt. 1st Class Jared Pointer, maximized the capabilities of the system with a revolutionary layout that takes advantage of Patriot’s inherent versatility. Through careful and detailed analysis of threat capabilities and likely methods of attack, dozens of configurations were tested with the goal of having the most interceptors available in every situation.

Mutual Fires support

A single Patriot site, with innovative system emplacement, can provide capability in numerous directions. When collocated with a second fire unit, capability continues to multiply, with full 360-degree sectored coverage

possible. Capabilities extend further than simply adding more target lines and a wider azimuth, however. Integrating the defense designs of both fire units into a single plan provides an opportunity to mass interceptors from both units against a single (i.e. most powerful/dangerous) threat while simultaneously covering against an off-azimuth avenue of approach. Here is another example of innovative site layout paying dividends: taking advantage of an adjacent unit’s launching stations, two units may be arrayed such that one can control the preponderance of the other’s launchers while the other guards against an alternate avenue of approach. If this avenue requires a much smaller number of interceptors to defend, that unit’s other launch-

ing stations can be used in the fight against the deadlier, numerically superior and/or more critical threat.

External sensor integration

Patriot operations are no different than any other: they cannot, and should not, happen in a bubble. True wide-azimuth capability cannot be effective without integration of external sensors to close down any gaps and seams that may exist in coverage. This may seem to be a moot point in so many combatant commands, where Patriot operates in fixed locations and is surrounded by a litany of joint and coalition sensors. Concern grows when faced with a return to large-scale ground combat operations, which would likely require Patriot units moving con-

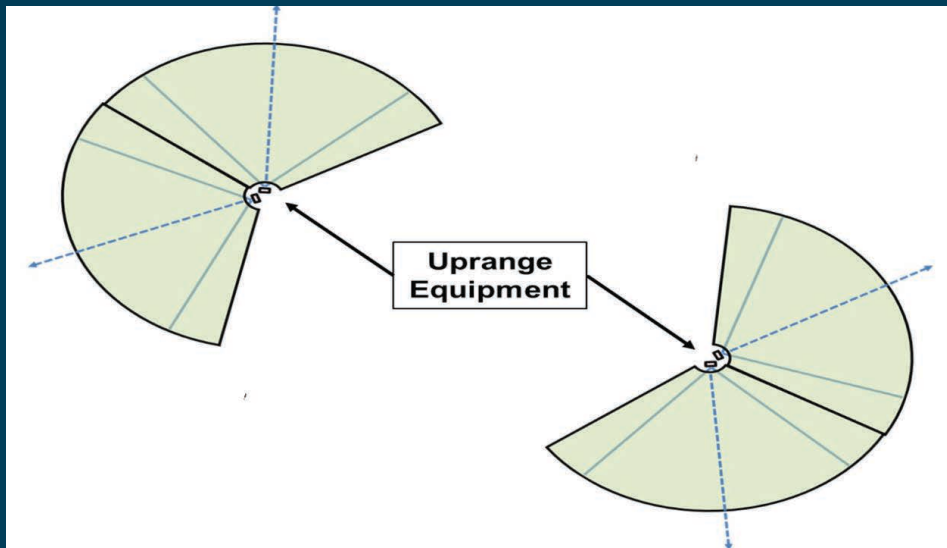


Figure 2. Mutually Supporting Fires: A notional depiction of two co-located Patriot firing batteries providing wide-azimuth defense. With proper planning, two fire units can provide sectored coverage against a threat from any azimuth. (Chief Warrant Officer 2 Ron Steeg/1-43rd ADA)

stantly, far away from the fixed sensors and robust communications architectures that provide such extensive early warning. It's been long assessed as necessary to improve the system in order to defeat 360-degree threats; the future Lower Tier Air and Missile Defense Sensor is projected to have continuous 360-degree coverage capability for this reason, but is still in the bidding phase and is over a year away from fielding.

The 1-43rd ADA's solution is to incorporate a Sentinel radar that can provide 360-degree coverage and can keep up with a unit on the move. Chief Warrant Officer 2 Travon Graves, 1-43rd ADA C2 systems integrator, developed the datalink architecture needed to integrate the Sentinel into the Patriot battalion mission command element. He said, "The Sentinel-Patriot integration is key to providing the all-axis early warning that makes our wide-azimuth design effective. Sentinel is the perfect system for this concept. It gives us the versatility and mobility needed in an uncertain operational environment, and is a perfect match for our systems."

Considerations

A site with this capability does

require additional planning and meticulous preparation. "One of our biggest challenges was to mitigate all the safety hazards," said Pointer. "Establishing radiation and back-blast hazard areas is simple if you are facing a single direction. Operating on multiple azimuths at multiple times requires a complete site redesign. Roads, support equipment and work/life support facilities need to be carefully planned in order to keep the site safe. It required a lot of analysis to execute correctly."

Once in place, the final step was to build a plan to train and certify crews to operate the system in this configuration. Crew certification verifications, a theater-specific gunnery evaluation, were modified to incorporate all additional tasks while ensuring all existing Patriot requirements were met and standards enforced. Capt. Dennis "Chip" Stanford, commander of Alpha Battery, 1-43rd ADA, has overseen the daily operations of the new site configuration. Despite a system layout that has never been attempted in theater, his Soldiers have proven to be up to the task.

"Once our new site layout was implemented, expeditionary combat support and hot crew personnel created never-before-at-

tempted tactics, techniques and procedures and standard operating procedures. Lieutenants and NCOs began to rewrite doctrine on a daily basis, refining how we exercised our new capabilities."

Way forward

The success of this new design has permeated throughout the branch. At the 32nd Army Air and Missile Defense Command Quarterly Tactics Review in January 2018, Brig. Gen. Clement Coward, commanding general, called on all CENTCOM Patriot units to consider threats from multiple azimuths and begin planning to counter them. The optimization of the Patriot layout by 1-43rd ADA to better defeat the evolving enemy situation has reinvigorated air and missile defense planning. As the U.S. returns to a national military strategy that focuses on great power competition with a near-peer competitor, predictability for future operations will be much less than the past 15 years.

"We won't be able to count on defending permanent assets, or, more importantly, defending against a fixed threat," said Maj. Daniel Goodwin, 1-43rd ADA operations officer in charge. "Now is the time to test the limits of the system and pass these lessons learned throughout the force."

By allowing planners to effectively detect and destroy threats from multiple azimuths, the Patriot system will prove to be an even more capable weapon system in any future conflict.

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