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Triton and the Kill Web:  
An Update on the Arrival  
of Triton into the Combat  
Force



August 2020

<b><u>WHAT IS TRITON’S CONTRIBUTION TO THE MARITIME KILL WEB?</u></b>	<b><u>3</u></b>
<b><u>SHAPING A WAY AHEAD FOR THE TRITON: ENABLING THE INTEGRATED DISTRIBUTED FORCE</u></b>	<b><u>8</u></b>
<b><u>VUP-19 AND THE COMING OF TRITON TO THE FLEET</u></b>	<b><u>10</u></b>
<b><u>THE ARRIVAL OF TRITON IN THE PACIFIC: NEW MANNED-UNMANNED TEAMING CAPABILITIES AND DELIVERING NEW C2/ISR CAPABILITIES</u></b>	<b><u>17</u></b>
<b><u>THE COMING OF TRITON TO THE ALLIED GLOBAL MARITIME DOMAIN AWARENESS ENTERPRISE: THE RAAF CASE</u></b>	<b><u>20</u></b>
<b><u>INDIAN OCEAN AIRPOWER: TRITON AND THE CHANGING OPERATIONAL CONTEXT FOR AUSTRALIA</u></b>	<b><u>23</u></b>
<b><u>NETWORK INTEGRATION TEST ENVIRONMENT FOR RAAF’S TRITONS</u></b>	<b><u>26</u></b>
<b><u>ADF UPS ITS TRITON BUY</u></b>	<b><u>26</u></b>

# What is Triton's Contribution to the Maritime Kill Web?

05/20/2020

By Robbin Laird

The US Navy has deployed Triton to Guam and has begun its operational history.

According to an article on *USNI News* by Gidget Fuentes published on [May 12, 2020](#), a pair of MQ-4C Tritons operating from Guam has been integrated into fleet operations and provide reach across the Indo-Pacific.

"The Navy is counting on the Triton, which can operate at greater than 50,000-foot altitudes and at the 2,000-mile-plus range, to provide an unmanned platform for persistent, maritime intelligence, surveillance, and reconnaissance capabilities and work alongside its manned fleet of reconnaissance and surveillance patrol aircraft.

"The Tritons with Unmanned Patrol Squadron 19 – the Navy's first unmanned aircraft squadron – arrived in Guam in late January to support CTF-72, which oversees the patrol, reconnaissance and surveillance force in the U.S. 7th Fleet region."

**But what exactly does the Triton provide for the interactive kill webs which shape evolving maritime combat capability?**

One answer was provided in the Fuentes article:

"The Triton can fly for more than 24-hours at a time, at altitudes higher than 10 miles, with an operational range of 8,200 nautical miles, according to manufacturer North Grumman. The Navy's program of record would field 68 aircraft."

An additional answer focuses on what the sensors onboard the aircraft can provide.

According to an article by Andrew McLaughlin published by [Australian Defence Business Review](#):

"The high-flying Triton can stay aloft for 28 hours and features advanced optical, radar and electronic sensors.

"It will complement the manned P-8A Poseidon, and replace the EP-3E electronic intelligence (ELINT) aircraft in US service. On Guam, the aircraft are currently under the command of the Commander of Task Force (CTF) 72."

These qualities of the platform are obviously important contributions but because the US Navy along with its sister services have moved beyond the platform centric kill chain to shaping interactive webs to guide the strike force, the key question then becomes somewhat different.

**What capabilities does the Triton bring to the crisis management and combat environments, and how does it work interactively within the spider webs which make up the kill web enabled force?**

A significant part of the answer rests in the recent interview which I did with [Rear Admiral Peter Garvin](#), head of the U.S. Navy's Maritime Patrol enterprise.

From the outset, the US Navy's work with industry has focused on building, operating and supporting a dyad to deliver the common operational picture driving the next round of anti-submarine warfare and maritime domain awareness.

This P-8 dyad with Triton delivers a new capability for the fleet.

This is manned-unmanned teaming being put into practice today, not in some distant combat future.

According to Rear Admiral Garvin: "We are taking full advantage of the leap forward in many sensors and communications technology to interoperate in ways that were previously impossible.

"Faced with a resurgent and challenging ASW threat, we have not given up on the old tool sets, but we are adding to them and weaving them into a new approach.

"We are clearly shifting from linear or sequential operational thinking into a broader understanding and implementation of a web of capabilities.

"In the past, when operating a P-3, you operated alone, you had to be the sensor and the shooter. To be clear, it remains necessary that every P-8 aircraft and crew be ready and able to complete the kill chain organically, but the fact of the matter is that is not the way it always has to be, nor is it the way that we're planning for it to have to be going forward.

"On any given mission, the P-8 could be the sensor and perhaps the allied submarine is the shooter. Or vice versa. Or maybe the destroyer is the one that happens to get the targeting solution and the helicopter is the one that actually drops the weapon.

"Sensor, shooter, communications node, or perhaps several at once, but each platform is all part of a kill web."

Another part of the answer comes from the [follow-on interview](#) which I had with Rear Admiral Garvin where we discussed how the dyad interacting with allies was a game changer in terms of building out a much larger canvas upon which the interactive kill webs could operate.

“We started with a discussion of the reach of the maritime patrol enterprise by focusing on a way to conceptualize the way ahead for shaping an integrated distributed force. If one conceptualizes the battlespace as layers of visuals placed one on the other, it becomes clear what is different in terms of leveraging the combat force within an interactive web.

“The first layer would be the operational geography of the battlespace.

“The second layer would be the threat elements most relevant to the blue force.

“The third layer in the case of a maritime patrol enterprise would be commercial maritime shipping traffic. Unlike air traffic, maritime traffic is very diverse, very large, and provides a key masking function for any adversary.

“The fourth layer would be the laydown of blue assets, including the geographic distribution of allied forces in the region or area of interest. The fifth layer would then be where the P-8 / Triton dyad operates.

“With such a schematic, it is quickly evident that if the U.S. Navy’s P-8 / Triton dyad is integratable with allied maritime patrol capabilities the reach of both the U.S. and allied interactive web capabilities is substantially enhanced.”

If we focus on what I referred to as the third layer, namely, the commercial maritime traffic, the Triton makes a unique contribution here.

With the height at which it operates, and with the sensors onboard, including the AIS tracking system, it provides a significant capability to prioritize those aspects of the maritime domain which need to be prioritized.

This is a major contribution even before we get to the question of what various specialized sensors can provide for other aspects of the maritime battlespace is enhanced by the connectivity built into the platform as well, in terms of an ability to deliver data over various wave forms.

As one Naval officer put it, the way to think about the maritime battlespace as the U.S. Navy evolves its capabilities is an ability to deliver a variety of kill webs which interactively can deliver domain situational awareness dominance.

This means in effect that C2 is moving in an interactive fashion in two directions – C2 at the tactical edge and C2 at the numbered fleet level to dynamically structure and task evolving task forces.

Another way to understand how the Triton contributes uniquely to the evolving kill web approach is an aspect of its unique networking capabilities.

According to Rob Zmarzlak, chief engineer, Triton program, Northrop Grumman: “The platform with its wave forms can reach back to the intelligence community and to the tactical users independently. We can send information to both the fleet and to the intelligence community.”

In the discussion with Zmarzlak, he highlighted the importance of focus on how the Triton operates as well as a key way to understand its contribution to the maritime kill web.

This part of the discussion then got at the most overlooked impact of Triton on the evolution of air-maritime forces (do not forget how important Triton will become to targeting in the Pacific for the USAF as it engages in maritime strike operations as well).

For full value to be derived from the Triton fleet, a kill web mentality will have to replace what has been a sortie generation mentality for the carrier fleet.

**It is about building in an orbit-enabled concept of operations, rather than thinking of the aircraft in sortie-generation concepts of operations.**

What this means is that for the Navy to get full value out of its Triton force it needs to think significantly beyond a dyad approach.

It means embracing what a high altitude remotely piloted vehicle with a sensor package which can help build a common operational picture generated by orbits can provide for a kill web strike force, which may well operate within a sortie-generated concept of operations, which the orbiting high altitude asset will provide.

With a four ship 24/7 coverage of the area where you will operate or wish to operate, the Triton can provide domain knowledge crucial to informing both the threat and opportunity calculus in an area of operations.

**And because the orbit is not about sorting into a specific area, one can sort through where the best advantages might lie for the projection of force without tipping your hand by having to fly to a specific tactical area.**

This is a work in progress, but it is a new capability which if fully embraced provides significant warfighting advantages to the United States and its allies.

**But for those advantages to be realized, appropriate training, and operational approaches need to be shaped, executed and evolved over time.**

In an article by Sam LaGrone of *USNI News* published on [April 10, 2018](#), “the pair of 131-ft wingspan UAVs built by Northrop Grumman for intelligence, surveillance and reconnaissance missions will deploy with an early set of capabilities designed for maritime ISR and will grow to include a signals intelligence function in 2021, Triton program manager Capt. Dan Mackin said in a briefing at the Navy League’s Sea Air Space 2018 exposition.”

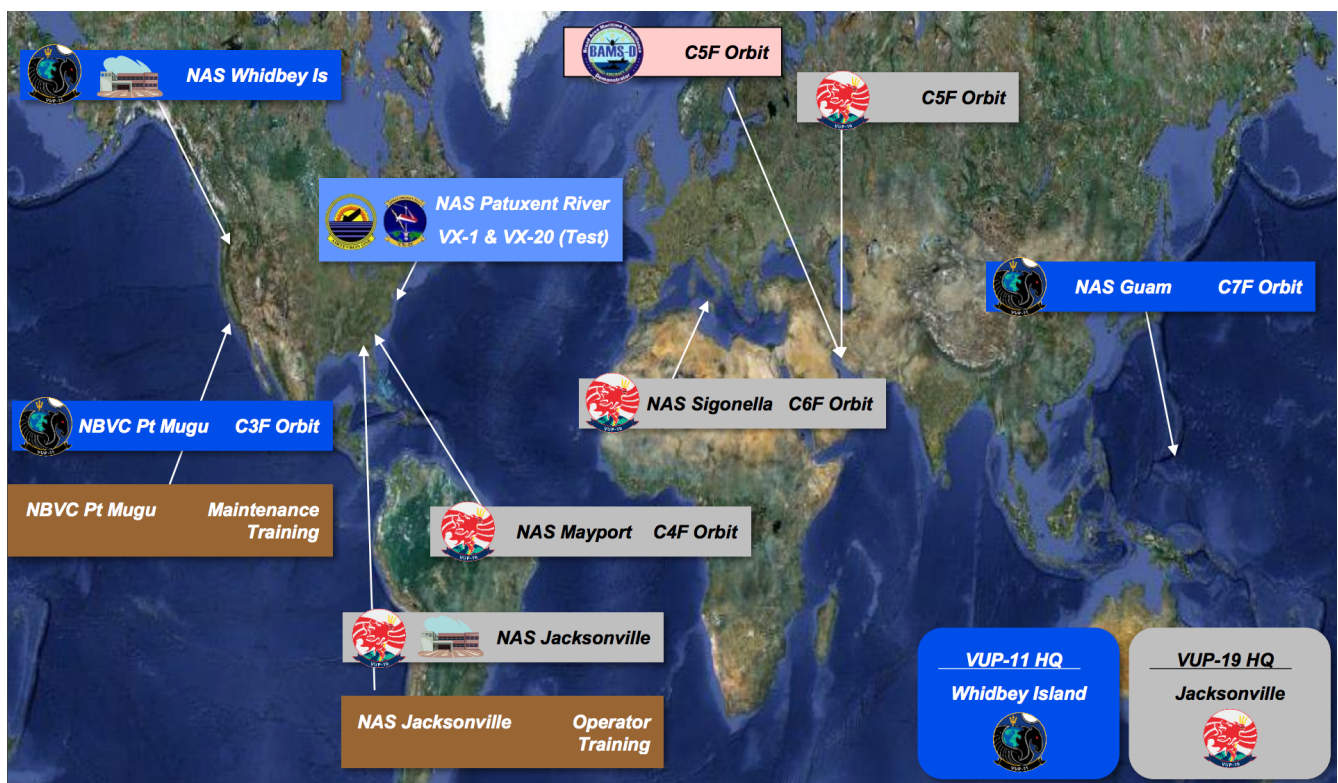
“Part of the IOC process will include adding a top secret “multi-intelligence” function to 1 Triton that will eventually replace the Navy’s Lockheed Martin EP-3E Aries II manned signals intelligence platforms. Congress mandated the Navy retire the EP-3E Aries II only after it had found a way to field a similar capability.

“Eventually, the Triton program will consist of five four-aircraft orbits around the world. The operators will reside in the two main bases at Mayport and Whidbey Island.

“The system is made up of an aircraft and a main operating base where the warfighter starts taking that data over wideband SATCOM link you start assimilating that data, put that data together to understand the [maritime picture],” Mackin said.

“The Navy will have five operating bases where the aircraft will be maintained, launched and recovered. The forward bases will be at Naval Air Station Sigonella, Italy; an unspecified location in the Middle East; Naval Air Station Guam; Mayport; and Point Mugu.”

In that article, there was a snapshot of a NAVAIR representation of the envisaged Orbit engagement of the Triton.



In short, one cannot describe Triton simply in platform terms, which would miss a lot because it was designed from the ground up to be part of a wider force construct.

It can be described in terms of how it works interactively with its brother, the P-8, to empower ASW operations. It can also be described in terms of its transformational qualities by grasping how orbit CONOPS contribute to shaping the maritime kill web.

**Bottom-line: Triton provides a key way ahead for enhanced crisis management and combat capabilities for the joint and coalition force.**



# Shaping a Way Ahead for the Triton: Enabling the Integrated Distributed Force

07/22/2020

By Robbin Laird

During my recent visit to Jax Navy, I had a chance to talk with several members of the maritime reconnaissance patrol community about Triton.

A particularly insightful discussion was with Joseph Opp, currently the Northrop Grumman Director/Site Lead for Triton at Jacksonville Navy Air Station, who has served in this capacity for the past three years.

Previously Opp served for thirty years in the US Navy and has been involved while in the service for many years with the maritime reconnaissance patrol community.

In this capacity, he has been in Jacksonville for some time, first with VP-30 and now with Northrop Grumman.

Clearly, the US Navy has worked the relationships between Triton and P-8 to provide a comprehensive ISR/Strike solution set.

Triton can provide the long-haul wide-angle view of the battlespace with P-8 and its organic and third-party targeting capabilities playing the focused targeting role.

To work coordinated operations, the Triton and P-8 crews need to understand from the ground up how each platform works independently and together, to shape an integrateable sensor-striker system.

**The Triton can have the dwell time to identify a much wider range of targets than P-8; which then enables P-8 to focus their operation on high priority targets.**

I would also add, that in the kind of extended battlespace which has and will emerge, knowing where critical choke points are with regard to an adversary's system or force becomes a priority task.

An integrateable Triton and P-8 working together can provide significantly greater capability to deliver this outcome, rather than simply operating separately.

By having crews which have operated on the P-8 as well as the Triton, they share an ability to do the kind of ISR appropriate for dynamic targeting.

**By working on one platform, then on the other, it is not so much cross-learning as shaping and integrated knowledge base and skill sets to operate in the ASW kill web.**



Triton can inform the P-8 before it takes off about the threats in the extended battlespace which then the P-8 can prioritize.

Opp noted progress that is being made with regard to software onboard the Triton. He noted that the program is continuing to work on new workload software for the Triton operators.

**With the amount of surface targets on the ocean today in certain regions of the world, this new software can work with AIS data and other systems to help the operators identify threats to be further studied, evaluated and potentially targeted.**

This is akin to the mission systems library onboard the F-35s but this mission library is prioritizing maritime threats.

And of course, such threats are crucial for both the US Navy and the US Air Force to deal with, as significant threats to the USAF in the Pacific come from the sea.

As I mentioned in [an earlier article](#), the Triton as an orbital concept of operations airplane is challenging the data management systems which the US Navy currently operates.

**There clearly needs to be progress on the data infrastructure side to better handle real time data and to deliver it the combat edge to support operations which increasingly face the challenge of [fighting at the speed of light](#).**

There is some confusion with regard to EP-3 and Triton. There are those who see Triton as replacing EP-3. Some of the core capabilities of the EP-3 are clearly being brought to the Triton platform, but that platform has a wider range of vision and activities than the EP-3.

**In my view, the Triton/P-8 dyad poses a significant challenge to reworking the C2/ISR enabled force.**

On the one hand, decisions can be pushed to the tactical edge.

On the other hand, at the fleet command level decisions need to be made rapidly at the strategic level, whereby determinations of what combination of force is appropriate to the crisis at hand, and how best to aggregate that force effectively?

Triton certainly can be a contributor to fleet wide decision making and at the same time channeling P-8s and other ASW assets (such as the Romeo helicopter) to focus their capabilities on the core targets in the extended battlespace.

But there is another challenge facing both industry and the Navy: how to maximize the advantages generated by an orbit concept of operations set of platforms versus a sortie generated set of platforms?

**Triton does the first; P-8 does the second; and the US Navy's legacy is only the second.**

It is early days for sorting out how to get the number of aircraft up to do the kind of orbital concepts of operations for which Triton was designed.

**But without enhancing the data management network side of the challenge, the ability to leverage the data generated by Triton will not be maximized.**

Triton like F-35 is not being used in terms of storage of data coming off of the aircraft, which makes little sense if the ISR/C2 side of the force will indeed drive the way ahead for the combat force.

The data backbone which was assumed to arrive with Triton is not yet there.

And, in my view, if we move towards LEO constellations to work with Triton to add yet another kill web layer, if the backbone infrastructure is not in place, we will have technology deployed without a solution to how to capitalize on that technology for the evolving combat force.

There are significant opportunities to make use of the post-mission data which F-35s and Tritons can deliver.

But an opportunity without a solution is not a capability for the operational force.

The opportunity is clearly there and provided by the new data rich combat assets.

## VUP-19 and the Coming of Triton to the Fleet

**07/05/2020**

As I have argued earlier, the Triton is bringing a whole new layer to the kill web for fleet operations.

Operating at high altitude, the Triton is delivering area wide ISR data for dynamic targeting.

**Indeed, one way to look at the way ahead for the integrated distributed force is to understand that new platforms are providing interactive ISR and C2 layers for a kill web approach for dynamic targeting.**

Ed Timperlake and I argued in a *Space News* story published in 2012, that the global fleet of F-35s would provide a significant ISR/C2 layer for the joint and coalition force, which provided redundancy for the space force as well.

*The ability of the deployed F-35s — again owned by allies as well as U.S. forces — presents a diversified and honeycombed presence and scalable force. This baseline force is significantly enhanced by reachback to space assets, but the space assets now receive redundancy by being complemented as well by a deployed fleet of flying combat systems. This joint capability means that the value of space-based targets goes down to the Chinese or whomever, and diversification provides significant enhancement of deterrence as well.*

*In short, in rethinking the way ahead with regard to military space — notably in a period of financial stringency — getting best value out of your entire warfighting enterprise is highlighted. Reorganizing the space enterprise within an overall C5ISR approach enabled by a honeycombed fleet of F-35s is a strategic opportunity of the first order.*

The Triton provides another layer for a kill web-enabled force able to operate with redundancy and resiliency.

But to do so, much like learning how to use a data rich aircraft like the F-35, requires technological changes, data management changes, and cultural changes to leverage what the technology provides.

Just having the technology is clearly not enough; training and cultural change are crucial to weave what the new technology COULD do into what the force CAN do.

Clearly, the US Navy is working these challenges.

In 2013, the first Triton squadron was established.

According to the [US Navy](#):

*Unmanned Patrol Squadron ONE NINE (VUP-19) was established on October 1st 2013 and was later commissioned on October 28th 2016. As the United States Navy's first unmanned maritime patrol squadron, VUP-19 is a team of more than 500 active duty, reserve, and civilian personnel which draws its lineage from and honors the rich history of Patrol Squadron ONE NINE (VP-19) "Big Red."*

*Established in July of 1946 as VP-907 and re-designated as VP-871 in February 1950, VP-19 finally came to be in February of 1953 and carried that name for 38 years of honorable service. In 1951, the sailors of VP-871 were called upon to participate in the Korean War and it was during this time that the squadron earned its nickname "Big Red" for their role in night interdiction missions, dropping red night illumination flares to support allied air and ground units.*

*As VP-19, "Big Red" participated in the Vietnam War as well as Operation DESERT STORM along with deployments to Japan, Guam, Alaska, Thailand, Vietnam, the Philippines, Saudi Arabia, and countless detachments around the world. VP-19 was disestablished in August 1991, having operated the PV-2, PBV-5A/6A, P4Y-2/2S, P2V-2/3/5/7, and P-3A/B/C maritime patrol aircraft as well as earning four Navy Unit Commendations, seven Meritorious Unit Commendations, and two Battle Efficiency "E" Awards over its 45 years of distinguished service.*

*Homeported at Naval Air Station Jacksonville, Florida with a permanent detachment to Naval Air Station Point Mugu, California, and multiple, globally-dispersed detachment sites, VUP-19 will continue VP-19's storied legacy and dedication to the defense of the United States by launching the US Navy's newest Intelligence, Surveillance, and Reconnaissance Maritime Patrol asset, the MQ-4C Triton, to the fleet.*

*The Mission of Unmanned Patrol Squadron ONE NINE is the sustained, successful deployment of the MQ-4C Triton in support of Combatant and Fleet Commanders.*

When Ed Timperlake and I visited Jax Navy in 2016, we learned that the US Navy was taking a very different course than the US Air Force to working the training and operations for the Triton fleet, than the USAF has done with its remotely piloted aircraft.

We wrote in [2016](#):

*The team at Navy Jax is building a common Maritime Domain Awareness and Maritime Combat Culture and treats the platforms as partner applications of the evolving combat theory. The partnership is both technology synergistic and also aircrew moving between the Triton and P-8. The P-8 pilot and mission crews, after deploying with the fleet globally can volunteer to do shore duty flying Tritons.*

*The number of personnel to fly initially the Tritons is more than 500 navy personnel so this is hardly an unmanned aircraft. Hence, inside a technological family of systems there is also an interchangeable family of combat crews.*

*With the P-8 crews operating at different altitudes from the Triton, around 50K, and having operational experience with each platform, they will be able to gain mastery of both a wide scale ocean ISR and focused ASW in direct partnership with the surface navy from Carrier Strike Groups, ARG/MEUs to independent operations for both undersea and sea surface rather than simply mastering a single platform.*

*This is a visionary foundation for the evolution of the software upgradeable platforms they are flying as well as responding to technological advances to work the proper balance by manned crews and remotes.*

**During my visit to Jax Navy the week of June 14, 2020, I got a number of updates on the progress and challenges facing integrating Triton into the fleet.**

One of those updates was provided by VUP-19. I met with Lt. Samantha (Thompson) Johnson who transitioned from serving as a P-3 pilot to becoming a Triton air vehicle operator and a weapons and tactics instructor at the Maritime Patrol and Reconnaissance Weapons School in Jacksonville.

I also met with LCDR Grant Coddington, the Intelligence Officer for the Squadron.

Rather than quoting either officer directly, I will indicate a number of takeaways I formed from the discussion and will not hold either officer responsible for any errors on my part in my learning process.



The first takeaway, one which was reinforced by other discussions during the visit, was that the Triton operation much like the first few years of P-8 operation, is in its “wheels phase.” There is much to learn about the aircraft, its operations, and the data management challenges being posed by the aircraft as well.

The second takeaway is that the learning process has clarified key aspects of the operational cycle for a Triton orbit. Typically, the squadron operates with five members on a shift: two AVOS or air vehicle operators, two MPOs or Mission Payload Operators and one TACCO or Tactical Coordinator.

The third takeaway was that the personnel coming into Triton and “learning to Triton” come from the manned collection platform side of the house, P-3, P-8 or EP-3.

The fourth takeaway is that unlike Global Hawk, which has its own dedicated pipe to deliver data, the Triton is working through the Navy’s mission data collection systems. This creates challenges in terms of how to best handle the data and how best to ensure it gets delivered to the right place at the right time.

The fifth takeaway is that as software upgradeable aircraft, one paired with the P-8, the Triton is a work in progress. And with a clear focus on informing dynamic targeting, the Triton community is clearly looking forward to coming of the next major upgrade to the mission payload on the aircraft, namely, a multi-INT capability.

The sixth takeaway is that there is clearly a cultural learning process as well. The MPA community has operated throughout its history based on a concept of operations driven by air sortie operations. The Triton is based on a multi-airplane orbit concept of operations which yields a very different data stream than one gets from an air sortied aircraft. And it is one which is layered between what the space systems deliver and what the sortied air collection platforms can deliver.



The seventh takeaway is that the flying side of the house is a work in progress. Notably, with the weather challenges in the Pacific, learning how to manage weather avoidance for a remotely piloted aircraft is a work in progress.

The eighth takeaway is that the Triton in common with other software upgradeable platforms faces the challenge of concurrency between simulators and operational platforms. The operational platform gets and upgrade earlier than the simulators, but the time lag is greater than it should be to close the concurrency gap as efficaciously as possible.

The ninth takeaway is that the Triton community is starting to build some experiential depth, the kind of depth crucial for the knowledge revolution which the Triton can bring to the fleet. And given that the Triton is engaged in tasking, collecting, processing, exploitation and dissemination of information in real time, learning how to do this for the fleet is a crucial challenge facing the future of a kill web enabled force.

And looking forward, as the Triton gains multi-INT capabilities, it will become a more effective platform to contribute to the collaborative effort where multiple sensors can be cross-referenced to provide greater fidelity on targeting, and notably when it comes to smaller vessels of interest as well.

**Editor's Note: Below are a number of Triton stories which provide further information with regard to VUP-19 as well.**

### **U.S. Navy's Triton Unmanned Aircraft System Arrives in 7th Fleet**

[January 27, 2020](#)

*PEARL HARBOR, Hawaii – The Navy's first MQ-4C Triton unmanned aircraft systems (UAS) have arrived in Guam for their initial deployment in the Pacific theater.*

*Unmanned Patrol Squadron (VUP) 19, the first Triton UAS squadron, will operate and maintain two aircraft as part of an early operational capability (EOC) to further develop the concept of operations and fleet learning associated with operating a high-altitude, long-endurance system in the maritime domain.*

*The Tritons forward-deployed to Guam, both of which have arrived at Andersen Air Force base as of Jan. 26, will fall under Commander, Task Force (CTF) 72, lead for patrol, reconnaissance and surveillance forces in 7th Fleet.*

*"The introduction of MQ-4C Triton to the Seventh Fleet area of operations expands the reach of the U.S. Navy's maritime patrol and reconnaissance force in the Western Pacific," said Capt. Matt Rutherford, commander of CTF-72. "Coupling the capabilities of the MQ-4C with the proven performance of P-8, P-3 and EP-3 will enable improved maritime domain awareness in support of regional and national security objectives."*

*The Navy's Persistent Maritime UAS program office at Patuxent River, managed by Capt. Dan Mackin, and industry partner Northrop Grumman, worked closely with VUP-19 in preparation for EOC. Prior to flying the aircraft to Guam, the team completed extensive operational test and unit level training.*

*"This significant milestone marks the culmination of years of hard work by the joint team to prepare Triton for overseas operations," said Mackin. "The fielding of the Navy's premier unmanned aircraft system and its additive, persistent, multi-sensor data collection and real-time dissemination capability will revolutionize the way maritime intelligence, surveillance and reconnaissance is performed."*

*The MQ-4C Triton will conduct intelligence, surveillance and reconnaissance missions that will complement the P-8A Poseidon and will bring increased persistence, capability, and capacity through its multi-sensor mission payload.*

*"The inaugural deployment of Triton UAS brings enhanced capabilities and a broad increase in Maritime Domain Awareness to our forward Fleet commanders," said Rear Adm. Peter Garvin, commander, Patrol and Reconnaissance Group. "VUP-19, the Navy's first dedicated UAS squadron supported by an outstanding NAVAIR and industry team, is superbly trained and ready to provide the persistent ISR coverage the Navy needs."*

*Initial operational capability will include four air vehicles with capacity to support 24/7 operations.*

### **Jacksonville-Based Unmanned Patrol Squadron Changes Commanders**

From Commander, Naval Air Force Atlantic Public Affairs

[April 30, 2020](#)

*Jacksonville, Florida (NNS) — The commanding officer of the Navy's Unmanned Patrol Squadron (VUP) 19, transferred leadership during the time-honored change of command ceremony, April 30 aboard Naval Air Station (NAS) Jacksonville.*

*The time-honored tradition of the change of command traces its origins back to long before the United States became a nation. It serves as an in-person handoff from one commander to another in a show of unity, good order and coordination in front of those under the command.*

*Cmdr. Kim DaCosta-Azar, a native of Tarrytown, New York, turned over responsibility to Cmdr. Michael Minervini, a native of Chicago, after two years of leading the command of more than 500 Sailors.*

*DaCosta-Azar served a unique role by leading a geographically dispersed command in NAS Jacksonville and detachment sites in Andersen Air Base, Guam and Naval Base Ventura County Point Mugu, California. Her leadership contributed to the squadron's first certification for deployment. Additionally, she is responsible for the operations of the Broad Area Maritime Surveillance Demonstrator (BAMS-D), the predecessor to the MQ-4C Triton Unmanned Air System (UAS).*

*According to DaCosta-Azar, the past two years has been about building a foundation for the Navy's very first MQ-4C squadron. During this time VUP-19 accomplished many milestones to include the*



*establishment of the following positions: Air Vehicle Operators (AVO), Tactical Coordinators (TACCO), Mission Payload Operators (MPO), and Triton maintainers in support of fleet operations.*

*DaCosta-Azar added that flying Triton is very different, “while the basics of the piloting are the same, there is a complexity that comes with fly unmanned aircraft.” Nearly 100 AVOs and MPOs have qualified under her command.*

*“The people are what make Triton successful, my personnel do extraordinary things with challenging resources, because this is not your typical aerial platform,” said DaCosta-Azar. “I cannot express in words how proud I am of the Big Red Team. We are charting a new course in Naval Aviation. There has been a lot of discovery learning, but all of the Sailors of VUP-19 have answered the call at every turn to show up on station. We have arrived and I look forward to seeing what they will accomplish in the future under Commander Minervini’s leadership.”*

*DaCosta-Azar led her team Sailors through the first-ever operational readiness evaluation for Triton, executing over 300 flight hours of two MQ-4C aircraft, and established permanent presence for the unmanned system in the U.S. 7th Fleet area of responsibility.*

*Following her assignment at VUP-19, DaCosta-Azar will report to the U.S. State Department to work for the Bureau of International Security and Nonproliferation in the Office of Counter Proliferation Initiatives.*

*Minervini praised his predecessor for her sound leadership and impact she had on the community.*

*“Skipper DaCosta-Azar transformed both VUP-19 and the future of the MQ-4C Triton,” said Minervini. “Doubtlessly, her leadership proved critical in laying the foundation for Unmanned Aerial Systems as a new problem-set for America’s enemies and a boon to Naval Aviation.”*

*VUP-19 was established on Oct. 1, 2013 and commissioned three years later as the U.S. Navy’s first unmanned maritime patrol squadron, VUP-19 draws its lineage from and honors the rich history of Patrol Squadron (VP-19) “Big Red” legacy. The squadron reports to Commander, Patrol and Reconnaissance Wing (CPRW) 11, which is also based aboard NAS Jacksonville. The mission of VUP-19 is the sustained deployment of the MQ-4C Triton in support of Combatant Commanders around the globe.*

## **Navy MQ-4 Triton Flying Operational Missions From Guam**

By Gidget Fuentes

USNI News

[May 12, 2020](#)

*Almost three months after arriving in Guam, a pair of MQ-4C Triton autonomous, unmanned aircraft have integrated into fleet operations and training flights and stretched the Navy’s maritime domain awareness across the Indo-Pacific, according to the Navy.*

*The Navy is counting on the Triton, which can operate at greater than 50,000-foot altitudes and at the 2,000-mile-plus range, to provide an unmanned platform for persistent, maritime intelligence, surveillance, and reconnaissance capabilities and work alongside its manned fleet of reconnaissance and surveillance patrol aircraft. The Tritons with Unmanned Patrol Squadron 19 – the Navy’s first unmanned aircraft squadron – arrived in Guam in late January to support CTF-72, which oversees the patrol, reconnaissance and surveillance force in the U.S. 7th Fleet region.*

*“Bringing Triton forward creates a complex problem set for our adversaries,” Cmdr. Michael Minervini, VUP-19’s commanding officer, said in a statement.*

*“Our ability to provide persistent ISR to fleet and combatant commanders is unmatched in naval aviation.”*

*Along with supporting current operations for several Indo-Pacific-based task forces, one Triton drone recently joined in a “close formation” taxiing along with more than a dozen manned aircraft prior to takeoff at Anderson Air Force Base, Commander Task Force 72 officials said.*

*The radar and sensors-packed Triton drones have been operating from Anderson AFB to provide, according to the Navy, an “early operational capability (EOC) to further develop the concept of operations and fleet learning associated with operating a high-altitude, long-endurance system in the maritime domain.” Tritons’ onboard sensors and radar can track ships at sea, match tracks with automated identification systems and relay that information to shore-side bases or nearby aircraft, for example.*

*While the Tritons fly from Guam, the “Big Red” squadron of 300 personnel isn’t based in Guam.*

*A group of VUP-19 aircrew and maintainers are forward-deployed to Guam, but squadron officials and mission operators are based at VUP-19’s home at Naval Air Station Jacksonville, Fla., and a permanent detachment including maintenance personnel reside at NAS Point Mugu, Calif.*

## **The Arrival of Triton in the Pacific: New Manned-Unmanned Teaming Capabilities and Delivering new C2/ISR capabilities**

**01/28/2020**

The first two MQ-4C Triton unmanned aircraft arrived in Guam over the past weekend.

“The inaugural deployment of Triton UAS brings enhanced capabilities and a broad increase in maritime domain awareness to our forward fleet commanders,” Rear Adm. Peter Garvin, the commander of Patrol and Reconnaissance Group, said in a Navy statement.

“VUP-19, the Navy’s first dedicated UAS squadron supported by an outstanding NAVAIR (Naval Air Systems Command) and industry team, is superbly trained and ready to provide the persistent ISR coverage the Navy needs.”

“The introduction of MQ-4C Triton to the 7th Fleet area of operations expands the reach of the U.S. Navy’s maritime patrol and reconnaissance force in the Western Pacific,” Capt. Matt Rutherford, the commander of CTF-72, said in the statement.

“Coupling the capabilities of the MQ-4C with the proven performance of P-8, P-3 and EP-3 will enable improved maritime domain awareness in support of regional and national security objectives.”

“This significant milestone marks the culmination of years of hard work by the joint team to prepare Triton for overseas operations,” Capt. Dan Mackin, the manager of NAVAIR’s Persistent Maritime UAS program office, said in a statement. “The fielding of the Navy’s premier unmanned aircraft system and its additive, persistent, multi-sensor data collection and real-time dissemination capability will revolutionize the way maritime intelligence, surveillance and reconnaissance is performed.”<sup>1</sup>

[Andrew McLaughlin](#) of ADBR noted the event from the Australian perspective and added comments with regard to its importance for Pacific defense.

“The deployment of Triton to Guam brings the system a little closer to Australia and its maritime approaches. The RAAF [currently has two](#) MQ-4Cs on order of a [requirement for six systems](#), the first of which is expected to be delivered in 2023.

“RAAF Tritons will be home-based at RAAF Edinburgh near Adelaide, although air vehicles are expected to be forward deployed to RAAF Tindal in the Northern Territory to provide a ‘sixth orbit’ to neatly complement the five planned deployed locations for the US Navy Tritons. Apart from Guam and Point Mugu, the US Navy also plans to base Tritons at NAS Jacksonville in Florida, the Persian Gulf region, and Sigonella Air Base in Italy.”

We have visited the allied bases from which P-8 is being operated in both Europe and in Australia, and have visited Edinburgh where the data management system established there allows for a full blown focus on manned-unmanned teaming in the maritime domain awareness and ASW area.

**What can be missed is that this is a major step forward with regard to real world manned-unmanned teaming in a critical area of combat capability.**

As we noted in an article published on [9/27/19](#):

The Triton unmanned system is a key building block for 21st century maritime operations.

In effect, the Triton provides capabilities similar to a low-earth orbiting system which can serve directly the maritime task force commander.

Indeed, a key dimension of the coming of Triton is to ensure that intelligence communities not consider this their asset but ensure that it is considered an operational asset for the fleet, and as part

of the maritime domain awareness 360 degree capabilities for the fleet operating as three dimensional warriors.

After our visit to Jax Navy in 2016, we highlighted the importance of this aspect of the coming of Triton, or more accurately, of the coming of the P-8/Triton dyad to the maritime services.

*Another key advantage is shaping domain knowledge of the key geographical areas where the dyad will operate.*

*“The Poseidon operates from 15-30,000 feet normally; the Triton will operate at 50,000 feet and take a broader view.”*

*The world looks differently at each altitude but by rotating crews, a unique perspective is gained by operating at the different altitudes and with different operational approaches to gain knowledge dominance.”*

*This is an approach for a new generation which “wants choice in their careers, rather than being locked into a single platform.”*

*This is about crew resource management as well. It is about shaping, developing and deploying the right skill to the task.*

*But the capabilities of the dyad are so good in terms of richness and fidelity of information there is already a tug of war between the intelligence community and the operators.*

*In an era of distributed lethality or distributed operations in the extended battlespace, the decision makers in the fleet, need the information to inform time-constrained decisions.*

*The fleet commanders need to make timely decisions; the intelligence community wishes to collect information, first, and inform decision makers later. This structural division will simply not work in the era of distributed decision-making and distributed lethality.*

***The information-decision cycle has to change to adapt to the technology.***

*“We need an effective cross-domain solution.*

*The huge divide between intelligence and operations has to be closed.”*

***Their experience is suggestive that there is a broader need for a very robust discussion on real time actionable intelligence information.***

*US National Command Authority enforcement of Rules of Engagement (ROE) has had a “good and other” progression over time. The “good” is thoughtful ROEs can save lives from fratricide and friendly fire while still allowing direct and indirect fires to destroy the enemy.*

*The “other” is what we have quipped is the new OODA loop, an OO-L-DA loop in which L stands lag time in combat tempo for Legal review. But after Navy Jax we came away with concern for what yet again is a roles and mission discussion on the flow of strategic and tactical “Intelligence ROE”*

*If not addressed and debated early, a template of actionable intelligence information going directly into IC NRO/NSA/NGO and upper echelon commands to be analyzed and disseminated may inhibit combat effectiveness and the decisiveness need to prevail in the contested and extended battlespace.*

*Time sensitive intel is critical at lower level direct action combat commanders from the Squadron pilots, CAG and Strike Group Commanders. The ROE in the traditional IC formula of “up and out” may not be in harmony with ever evolving speed of light sensor shooter technological advances.*

## FOOTNOTES

1. These quotes were taken from an article by Ben Warner, *USNI News*, which was published on January 27, 2020.

[https://news.usni.org/2020/01/27/navys-first-mq-4c-triton-unmanned-aircraft-deploy-to-guam?utm\\_source=USNI+News&utm\\_campaign=bd030932c0-USNI+NEWS+DAILY&utm\\_medium=email&utm\\_term=0\\_0dd4a1450b-bd030932c0-230422265&mc\\_cid=bd030932c0&mc\\_eid=d5b4bb05ef](https://news.usni.org/2020/01/27/navys-first-mq-4c-triton-unmanned-aircraft-deploy-to-guam?utm_source=USNI+News&utm_campaign=bd030932c0-USNI+NEWS+DAILY&utm_medium=email&utm_term=0_0dd4a1450b-bd030932c0-230422265&mc_cid=bd030932c0&mc_eid=d5b4bb05ef)

# The Coming of Triton to the Allied Global Maritime Domain Awareness Enterprise: The RAAF Case

**09/17/2019**

The Triton unmanned system is a key building block for 21st century maritime operations.

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Triton is part of the reshaping of the allied maritime domain awareness enterprise as well, with the Aussies operating the aircraft along with the US Navy in the Pacific region and with the prospects for European allies already scheduled to operate P-8s to either operate the aircraft or benefit from the US Navy's operations of the Triton in their theater of operations as well.

In a recent article by Andrew McLaughlin published on [August 28, 2019](#), the evolution of the US Navy-RAAF partnership was underscored.

*The co-operative development program between the RAAF and the US Navy to develop capabilities for the Northrop Grumman MQ-4C Triton unmanned maritime surveillance system is ramping up, with the placement of eight RAAF personnel with the program in the US.*

*The eight cooperative project personnel (CCP) have joined the program over the past 12 months following the signing of the agreement in 2018, and the Commonwealth's commitment to acquire up to six Tritons and associated mission control stations under the Triton development, production and sustainment cooperative program.*

*“This cooperative program aligns with [the US DoD's] objective to strengthen alliances that are crucial to our National Defense Strategy,” US Navy Triton program manager, Capt Dan Mackin said in a statement. “We are working together with our Australian counterparts to jointly define new capabilities that benefit both countries.”*

*RAAF flight test team member, SQNLDR Neale Thompson added, “It is an absolute privilege to fulfil this role, working with my US Navy colleagues to develop and test this new, unmanned platform. The dedication and ingenuity displayed by the system administrator team in this example epitomized the US Navy's genuine commitment to integrate their cooperative partners within the Triton program.”*

*SQNLDR Thompson is a former AP-3C tactical coordinator (TACCO) and is a graduate of US Naval Test Pilot School, and is the first international partner to operate the Triton. His responsibilities include managing mission systems during flight, and to perform the mission systems team-lead role at the integrated test team (ITT) where he manages specialised flight test engineers and project officers.*

*“This is the latest important milestone for our cooperative program, which allows our test team member to be fully involved in all facets of testing,” Australian National Deputy for the Triton program, WGCDR Troy Denley said. “The cooperative program continues to mature with all CPP embedded in key roles that will help ensure the success of the program for both nations. This is due in no small part to the dedication of Triton's international team.”*

To date, two MQ-4Cs [have been ordered](#) for the RAAF, with the first system due to be delivered in 2023.



# Indian Ocean Airpower: Triton and the Changing Operational Context for Australia

04/06/2020

By Peter Layton

For the RAAF, the Indian Ocean has traditionally been second in importance to the Pacific.

This reflects that Australia has long perceived the Indian Ocean as being stabilised by others, first the British and now the United States (US).

Over time, however, the United States may substantially reduce its presence in the Indian Ocean, concentrate on Pacific-facing China, and leave Indian Ocean stability to littoral states, particularly India.

**Accordingly, Australia and the RAAF may need to look afresh at the Indian Ocean.**

The control of the Indian Ocean was last seriously contested in the Second World War when intruding German and Japanese warships, and submarines sank considerable allied merchant shipping. In that conflict, the RAAF based small air-defence and maritime strike forces in Western Australia to protect against possible Japanese carrier raids and to undertake anti-submarine patrols. Late in the war, B-24 long-range bomber missions were flown from the Kimberley region against strategic targets in Java in support of the Borneo campaign.

In regional terms, today's small, well-equipped RAAF probably ranks about number three in the Indian Ocean, behind India and Saudi Arabia.

The latter two countries have quantitatively large, well-balanced air forces operating a range of modern and modernised combat aircraft while including in their national air power sizeable surface-to-air missile forces and limited numbers of surface-to-surface missile systems.

Moreover, in India's case, the air force is nuclear-capable and supported by an indigenous aircraft industry and aviation technology research base. While the Pakistan Air Force is also numerically larger than the RAAF, it operates many obsolescent aircraft, lacks comprehensive all-weather and night capabilities, and has notable electronic warfare and stand-off weapon deficiencies.

The RAAF's broad capability balance allows it to undertake independent national air operations although in higher-end conflict contingencies it would generally operate as part of a larger coalition.

Realistically, if such a coalition in the Indian Ocean were not with the US, it would probably be with India.

Yet, while Australia historically privileges military collaboration, India favours autonomy.

India's reticence in inviting Australia to the Malabar maritime exercise reflects its traditional strategic wariness. This may be changing with an early sign being greater interaction between the Indian Air Force (IAF) and the RAAF, including the 2018 deployment of Su-30s to Exercise Pitch Black in Darwin.

IAF participation is now likely each year and opens up the possibility of a reciprocal activity to further deepen ties. India has held several exercises with the Royal Air Force and the United States Air Force (USAF), Exercise Indradhanush and Exercise Cope India respectively.

The RAAF could perhaps participate with F/A-18F Super Hornets and a KC-30A tanker, mirroring Indian participation in Pitch Black.

Sending an E-7A Wedgetail airborne early warning and control (AEW&C) aircraft might also be appropriate.

**Closer to Australia, new options are opening up as the RAAF introduces the MQ-4 Triton remotely piloted aircraft.**

Operating from Cocos Keeling Islands, Christmas Island, RAAF Base Learmonth, or RAAF Base Curtin the Triton could remain on station undertaking high-altitude maritime surveillance in the Bay of Bengal or over the Sunda and Lombok Straits for periods of 12 hours or more. The exact patrol time depends on where the Tritons operate from.

In broad terms, when flying from mainland bases compared to island bases, the Tritons lose about eight hours of on-station time. Given the RAAF is only buying seven Tritons, maximising their Indian Ocean maritime surveillance effectiveness through developing island deployment, basing options seems sensible.

Under Defence Project 8129 the Cocos Keeling runway is being widened and strengthened to allow P-8 operations, but new facilities and infrastructure would be necessary to permit regular, on-going Triton flights.

This raises the issue of whether to invest in Cocos Keeling and/or Christmas Islands.

Geographically both have strengths and weaknesses, but low-lying Cocos Keeling will be more adversely impacted by climate change.

Developing appropriate infrastructure on the islands might also provide an opportunity to enhance Australia's relationship with India.

The Indian Navy's P-8Is could occasionally deploy there for short-term maritime surveillance operations, perhaps operating in conjunction with RAAF P-8As, thereby enhancing interoperability and helping to develop the Australia-India relationship.

India has little capability to surveil that part of the Indian Ocean and, in terms of India-China geostrategic regional competition, this is a noticeable gap.

Moving to the mainland, recent Defence white papers have judged the likelihood of attacks on Australia as low.

Nevertheless, there are geostrategic changes underway, and some argue risks to Australian security are increasing.

Prudence may dictate that these risks are managed just in case Australia's national security situation deteriorates sharply.

In such a scenario, air power might broaden from being maritime surveillance focussed as it is during peacetime, to also including air defence, strike, AEW&C, air-to-air refuelling, and air transport.

Accordingly, some upgrades are planned for the bare bases of Learmonth and Curtin.

At Learmonth, the runway will be strengthened and lengthened, and the fuel infrastructure upgraded to allow deployed KC-30A air-refuelling operations. At Curtin, the asphalt pavement will be resurfaced, and airfield lighting replaced. Both projects should be completed by mid-2022.

A few years on from then, facilities at both bases will be upgraded to allow deployed F-35 operations and maintenance.

The two bare bases may also have an increasing role in terms of supporting future coalition air operations, in particular USAF long-range bombers and their accompanying air-to-air refuelling aircraft.

In times of crisis, such aircraft flying from the bases could range as far as the northern South China Sea.

In times of peace, the bases offer additional training options that might augment the Australia-US Enhanced Air Cooperation program.

**While this program has focussed on RAAF bases Darwin and Tindal so far, as it develops further with longer and larger US Marine Corps and USAF deployments, it could potentially include air activities in the West, including short-term basing.**

In terms of national defence, the internationally significant North West Shelf gas fields are among the most exposed of Australia's major economic assets.

The gas fields are inherently vulnerable to damage, although their distance from possible threats provides them with some protection. Submarine attacks might be the most likely military threat, possibly countered by ADF anti-submarine warfare forces including RAAF P-8s deployed forward to Learmonth or Curtin. Less likely might be cruise missile attack, whether launched from hostile warships or long-range bombers.

Such operations might be defended against through operating F-35A, F/A-18F, E-7A, and KC-30A aircraft from Learmonth and Curtin.

There may also be concerns in times of high-end conflict about the liquified natural gas export tankers, especially those that supply Japan.

These might be best safeguarded by routing them southwards around Australia and east of Papua New Guinea. In lesser crises, tanker protection through the Indonesian archipelago using convoys would be possible, although economically undesirable as delaying ships to form convoys is costly.

Looking south, Australia has interests in Antarctica including with the Heard and McDonald Islands located in the extreme and remote Southern Indian Ocean. Fisheries exploitation is steadily increasing there, suggesting a new role for the Triton unmanned aircraft. Operating out of RAAF Base Pearce, the aircraft could spend several hours on patrol overhead the islands monitoring foreign fishing activities.

Given limited numbers, additional Tritons would need to be purchased if Southern Ocean fisheries surveillance developed into a major role. Pearce's facilities would also need further upgrading.

In terms of building multilateral cooperation across Indian Ocean states, the Indian Ocean Naval Symposium offers a possible model. Some 32 countries attend a seminar-style meeting every two years that involves the respective naval chiefs.

A comparable air symposium could be undertaken, perhaps initially focussing on areas of common interest such as flying safety, training, logistics and search and rescue, before later considering more difficult areas such as maritime surveillance information sharing.

In a more practical vein, many Indian Ocean air forces are quite small and have considerable trouble maintaining an indigenous aircrew training capability. From a financial perspective, it would be sensible to pool resources and undertake training at a single large facility.

Australia already has such a suitable training capability at RAAF Base Pearce, that, with expansion, could provide pilot training for many of the smaller Indian Ocean air forces. Indeed, Singapore already uses Pearce for its pilot training, having done so since 1993. While being cost-effective, such pooled training would also help build relationships between Indian Ocean countries.

**The Indian Ocean balance of power is changing and with it the importance of airpower.**

Air forces across the region are steadily evolving, becoming larger, more capable, and more consequential.

This has significant implications for Australia, the country with the longest coastline in the Indian Ocean.

Australian defence strategists and air power thinkers need to take note.

Dr Peter Layton is a Visiting Fellow at the Griffith Asia Institute, Griffith University, a Senior Correspondent with WA DEFENCE REVIEW, and the author of the book Grand Strategy.

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By Editor|March 22nd, 2020|Air Force, Australian Defence Force, Royal Australian Air Force|0 Comments

## Network Integration Test Environment for RAAF's Tritons

07/25/2020

By Australian Defence Business Review

Northrop Grumman has been awarded a contract by the ADF to build an MQ-4C Triton Network Integration Test Environment (NITE) at RAAF Base Edinburgh.

The NITE will be a key element in the development of the RAAF Triton capability prior to the delivery of the first ground control segment in 2022 and the first air vehicle entering service in 2023, and will support an estimated 75 jobs.

“The NITE will enable the RAAF to develop networks for test and engineering, as well as operations, ahead of Australia receiving its first Triton ground control stations and air vehicles,” Northrop Grumman Australia chief executive Chris Deeble said in a statement. “This is a significant milestone as the Australian Triton program continues to mature.”

The installation of the NITE will be conducted in three phases. The Northrop Grumman statement says it “will allow the RAAF to progress from basic continuity testing between distributed environments to advanced integration capability development environment via server farm, network storage and virtualisation.”

The NITE system will succeed the company-funded Australian mission systems trainer (Aus-MST) which has been used at Edinburgh since 2016 to support the development of the RAAF's maritime ISR requirements and initial Triton concepts of operation.

This article was published by ADBR on July 24, 2020.

## ADF Ups Its Triton Buy

06/26/2020

By AUVSI News

The Australian government will provide funding for an additional MQ-4C Triton aircraft and associated ground mission control stations from Northrop Grumman, bringing its current total commitment to three aircraft. Australia currently intends to purchase six aircraft.

A cooperative development program between the Royal Australian Air Force and the U.S. Navy, the MQ-4C Triton provides a round-the-clock maritime wide-area intelligence, surveillance and reconnaissance capability. With its ability to operate at altitudes exceeding 50,000 feet and cover more than two million square miles of ocean and littorals in a single flight, Triton provides what Northrop Grumman describes as “unprecedented awareness to operational commanders’ common operating pictures.”

“As a strategic partner in the cooperative development program, Australia is a critical part of Triton’s development and production,” says Doug Shaffer, vice president, Triton programs, Northrop Grumman.

“This game-changing system will boost Australia’s ISR capability and enable them to meet their surveillance needs to manage the world’s third largest exclusive economic zone.”

Australia has also committed funds for the main operating base at RAAF Edinburgh in South Australia that allows for a permanent control station. The country has also committed funds for a forward operating base at RAAF Tindal in the Northern Territory that enables the Triton system to be deployed to support Australian national security requirements.

With a program of record for 68 aircraft, the U.S. Navy is planning five operational Triton orbits across the world. As one of the United States’ key allies and a strategic partner in the Pacific, Australia would be able to provide a sixth.

<https://www.auvsi.org/industry-news/australian-government-provide-funding-additional-mq-4c-triton>