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## U.S. and Allied Global Maritime Patrol Enterprise



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# The Maritime Patrol Enterprise: Shaping a Kill Web Future

05/05/2020

By Robbin Laird

I have had a chance to visit with Rear Admiral Garvin and his team in Norfolk last Fall and earlier this year.

We discussed the evolving approach to theater ASW in those discussions along with the evolving approach to training and shaping an effective distributed maritime force.

**We continued our discussion during a phone interview on April 30, 2020 and focused on the evolving capabilities of the Maritime Patrol Enterprise and its intersection with the distributed maritime force and a kill web concept of operations.**

Rear Admiral Garvin leads the U.S. Navy's global maritime patrol and reconnaissance enterprise.

This means that he trains, certifies and deploys the U.S. Navy's Maritime Patrol and Reconnaissance Forces worldwide in support of theater Fleet and Combatant Commanders. This global oversight provides him a unique opportunity to focus on the entire scope of maritime operations, rather than focused narrowly upon one particular theater.

A 1989 US Naval Academy graduate, he witnessed the last 30 plus years of change in the political/military environment as a P-3 pilot. This meant as well that he was entering the force coincident with the perceived sunseting of the Soviet Naval threat and transition to a new era of maritime patrol operations.

He began his deployed operational experience at Keflavik, Iceland as part of the US and NATO ASW force prosecuting former Soviet, now Russian submarines. Contrast this with his last operational deployment focused almost entirely on over land ISR contribution to CENTCOM forces.

Despite the decades-long increase in overland ISR and combat focused missions, the Navy did not abandon its key ASW mission set.

During my first discussion with a naval officer in 2011 about the coming P-3 to P-8/Triton transition, the Navy's attention was focused squarely on delivering a new 21<sup>st</sup> century capability to effectively meet a growing ASW threat, and to do so via the kind of manned-unmanned teaming which the P-8/Triton dyad demands.

In that 2011 discussion with then [Commander Jake Johansson](#), he highlighted how he thought P-8 would change the approach.

*The P-8 gives you a range of capabilities that could be flexibly used in different ways. They will allow you the ability to fly from different bases farther from the fight. The ability to reach more distant operational areas may impact our onstation time but the increased reliability of the aircraft and the inflight refueling capability will ultimately result in a force with increased responsiveness as well as more capability and flexibility for Combatant Commanders.*

*We can protect our P-8 fleet a little bit better by having a little bit of distance between us and the fight as well. We will also be able to rapidly get into theater or into that area of responsibility that we need to be in, do our business and come back.*

CDR Johansson then highlighted the potential synergy between BAMS, which has evolved into Triton, and the P-8 for the ASW mission sets.

*I call them remotely-piloted, because it takes a lot of people to operate these systems. We moved to the family of systems (BAMS and P-8) because we felt that we could move some of the persistent ISR capabilities to a more capable platform, BAMS. BAMS long dwell time can provide the persistence necessary more efficiently than a rotation of P-8 24/7/365. Also, if we used P-8 to do that we would have to increase squadron manpower to give them the necessary crews to fly 24/7 MDA in addition to the ASW/ASUW missions.*

*We hope to have 5 orbits flying 24/7/365 to cover the maritime picture were required. The great thing about BAMS and P-8 is that they can work together to meet the COCOMS requirements. BAMS can provide the persistence and the P-8 can be used to conduct the specialized skill-sets that the BAMS cannot. BAMS can provide you the maritime picture while the P-8 either responds to BAMS intelligence or conducts ASW/ASUW.*

*This Family of Systems concept can become quite a lethal combination if we employ it correctly.*

That was in 2011; now in 2020, I am talking with Rear Admiral Garvin and although the language has evolved somewhat, the operational experience being gained with P-8 and the coming of Triton certainly validates CDR Johansson's forecast.

**Question: In a way the approach we took with our allies to defend the GIUK, which included SOSUS, manned aircraft, and combat ships of various types, is being morphed today into a 360-degree manned-unmanned teaming tracking and kill web.**

**Is that a fair way to put it?**

Rear Admiral Garvin: It is. We are following a similar mission construct working with our allies but the thinking and modality has advanced significantly.

"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.”

**Question: The P-8 and the Triton are clearly a dyad, a point often overlooked.**

**How should we view the dyadic nature of the two platforms?**

Rear Admiral Garvin: There are several ways to look at this.

The first is to understand that both platforms are obviously software driven and are modernized through spiral development.

We focus on spiral development of the dyad in common, not just in terms of them as separate platforms. It is about interactive spiral development to deliver the desired combat effect.

“Another key element of teaming is that during the course of their career, the operators of P-8 and Triton have the opportunity to rotate between the platforms.

“This gives them an innate understanding of the mission set and each platform’s capabilities. They, better than anyone, will know what the dyad can deliver, up to an including a high level of platform-to-platform interaction. The goal is to be able to steer the sensors or use the sensor data from a Triton inside the P-8 itself.

“The idea of P-8 and Triton operators working closely together has proved to be quite prescient.

“Our first Triton squadron, VUP-19 is down in Jacksonville, Florida under Commander, Patrol and Reconnaissance Wing 11. And when we build out the full complement of Tritons, we’ll have VUP-11 flying out of Wing 10 in Whidbey Island, Washington. Triton aircrew literally work down the hall and across the street from their P-8 brothers and sisters.

“The Maritime Patrol and Reconnaissance aviator of the future will be well versed in the synergy inherent in both manned and unmanned platforms.

“The unblinking stare of a Triton enhances the Fleet Commander’s MDA and understanding of an adversary’s pattern-of-life by observing their movements in the optical and electromagnetic spectrum.

“Moreover, Triton serves as a force multiplier and enabler for the P-8. Early in Triton program development, we embraced manned and unmanned teaming and saw it as a way to expand our reach and effectiveness in the maritime domain.

“One key software capability which empowers integration is Minotaur.

“The Minotaur Track Management and Mission Management system was developed in conjunction with the Johns Hopkins University Applied Physics Laboratory. Minotaur was designed to integrate sensors and data into a comprehensive picture which allows multiple aircraft and vessels to share networked information.

“It is basically a data fusion engine and like many software capabilities these days, doesn’t physically have to present on a platform to be of use.

“These capabilities ride on a Minotaur web where, if you are on the right network, you can access data from whatever terminal you happen to be on.

**Question: With such an approach to integratability, then this allows the fleet to be able to collaborate with one another without each platform having to be topped up with organic generators of data and to have to maximize the sensor-shooter balance on a particular platform.**

**This then must provide flexibility as well when flying a dyad rather than a single aircraft to work a broad range mission like ASW?**

Rear Admiral Garvin: It does.

It also provides for resiliency through multiple sensor points in the kill web empowering multiple kill points on that web.

“This begs the question, how much resiliency do you want to build in? Do you need several platforms that carry the actual data engine, with the rest of the force simply having access to data produced by the data fusion engine?

“It becomes a question of cost-benefit and how much resilience do you want to build into each individual platform.

**Question: In other words, the new approach allows for a differentiated but integrated approach to system development across the force seen as interactive platforms?**

Rear Admiral Garvin: I think of it this way, rather than taking an evolutionary or iterative approach, what this allows for is a step change approach.

*“We’re thinking beyond just the iterative.”*

This discussion with Rear Admiral Garvin drives home a key point for me that the MPA dyad operates in a way that is not simply a U.S. Navy capability for a narrowly confined ASW mission sets.

The USAF is clearly concerned with the maritime threat to their air bases and needs to ensure that a joint capability is available to degrade that threat as rapidly as possible to ensure that the USAF has as robust an airpower capability as possible.

Certainly, the B-21 is being built in a way that would optimize its air-maritime role. And clearly a core bomber capability is to get to an area of interest rapidly and to deliver a customized strike package.

Hence, for me the new MPA approach is a key part of the evolving USAF approach to future capabilities as well.

*The color of the uniform perhaps belies how joint a kill web approach to platforms really is.*

## **Extending the Reach of the Kill Web: The US Navy Works with Allies on the Maritime Patrol Enterprise**

**05/13/2020**

By Robbin Laird

**In effect, what we see coming in the Pacific and in the Atlantic are interactive sensor webs that extend the reach of core platforms and their onboard sensors.**

The fusing of multiple sensors via a common interactive self-healing web enhances the ability of the entire force, including key partners and allies, to cooperatively engage enemy targets in a time of conflict.

Interactive webs can be used for a wide range of purposes throughout the spectrum of conflict and are a key foundation for full spectrum crisis management. To play their critical role when it comes to strike, whether kinetic or non-kinetic, this final layer of the web needs to have the highest standards of protection possible.

As one analyst has put it: “The kill part of the web is crucial.

“However, there are many scenarios where the same web is needed, but for other purposes.



“The point is that the “web” facilitates alignment of sensing, C2, and actionable outcomes (i.e. – shooters of various types).”

The interactive webs enhance the reach of any platform within a task force and thus create synergy amongst non-contiguous assets that are combined against a specific threat.

**Interactive webs also provide redundancy and depth for distributed operations and inherent resiliency and survivability that a convergent combat force simply will not have.**

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.**

It is also obvious that if key allies are not engaged then there are holes in the web structure which will either simply be gaps or need to be filled by other means.

In simple terms, it is clear that the United States and its allies must operate within a convergent set of interactive webs to shape a shared and actionable common operating picture.

**The results will significantly empower a combined strike force and, even more importantly, inform decision makers about how to prioritize targets in a fluid combat situation.**

**There is a particular and often intellectually neglected part of this problem—the existence of offensive nuclear capability.**

As an example, in the Pacific there are three nuclear powers. Nuclear deterrence is woven throughout any considerations of conventional operations, so there is a clear need to add a strategic overlay of the battlespace, which considers potential consequences and focuses on making the right target



decisions in a fluid battlespace. This “wildcard” should give pause to those who tout AI enabled kill chains.

Decision makers need to step back and consider that while more rapid destruction of targets is important, it must be guided by both tactical and strategic decisions with due regard not just to combat but political effects as well in full spectrum crisis management. Having men in the loop in airborne systems, like the MPRF can certainly contribute to target discrimination efforts.

We also considered the specific challenges of the US Navy working with allies in the maritime patrol enterprise.

For obvious reasons, we first focused on those allies who have already joined the P-8 / Triton dyad effort.

We then discussed those allies who had not done so but are key partners in working interactive webs with the United States. Prior to highlighting that discussion, let me review who the P-8 / Triton partners are to date.

Australia is the only U.S. ally pursuing both the P-8 and the Triton. As a cooperative partner, similar to the F-35, they participated in the development of P-8A and Triton capabilities from the ground up with the USN.

The British have made a very welcome reentry into the Maritime Patrol and Reconnaissance arena with the P-8 as well.

During recent visits to RAF Lossiemouth, I saw the program being stood up in Scotland, and they were doing it in such a way that other P-8 partners would be supported as well.

At Lossiemouth I discussed the new infrastructure with key RAF officials responsible for the effort, and that interview will be published later but the key role of standing up new infrastructure to support this effort is crucial to handle the new data rich airplanes, as well as the work with allies in operating the assets.

Having visited Norway earlier this year and having discussed among other things, the coming of the P-8 and the F-35 in Norway, it is clear that what happens on the other side of the North Sea (i.e., the UK) is of keen interest to Norway.

And talking with the RAF and Royal Navy, the changes in Norway are also part of broader UK considerations when it comes to the reshaping of NATO defense capabilities in a dynamic region. The changes on the UK side of the North Sea are experiencing the standup of a P-8 base at Lossie, which will integrate with US P-8 operations from Iceland and with those of Norway as well.

In effect, a Maritime Domain Awareness highway or belt is being constructed from the UK through to Norway.

A key challenge will be establishing ways to share data and enable rapid decision-making in a region where the Russians are modernizing forces and expanded reach into the Arctic.

The Pacific partnership is being expanded as well with the addition of South Korea.

In 2018, the South Korean government announced that would purchase six of the aircraft. They are thereby joining India, which has its own systems configured on the aircraft. India first P-8I squadron was stood up at Rajali in November 2015.

The Indian Navy operates its entire fleet of eight P-8I maritime patrol aircraft from Rajali and the Indian government announced last year that they intended to buy 10 additional P-8s.

**With regard to the P-8 / Triton partners, Rear Admiral Garvin highlighted the opportunities for co-learning, which are generated from common training that occurs at VP-30 and the Maritime Patrol and Reconnaissance Weapons School at NAS Jacksonville, FL.**

He highlighted the famous quote, “You cannot surge trust.”

The working relationships built during high-end tactical training carry over into operations whereby a global community of operators can share operational experience and enrich development of the enterprise.

“My first international visit upon taking command was to Australia, leadership there referred to our working relationship as “mateship.”

“This term accurately describes the collaborative nature of our partnership and demonstrates its importance to ourselves and the rest of the world.”

“We have built similar relationships on varying scales, all around the world.

“These relationships serve as force multipliers, which opens the door to cooperatively leverage technology to deliver networked sensors and a shared understanding of the decisions and options we share across the extended battlespace.”

“Our allies understand the fundamental nature of their region better than we do.

“If you have properly maintained these important working relationships, both interpersonal and technological, then you will have access to the cultural knowledge and human geography that might otherwise would not be available to you.

“We become stronger interactively with our allies by sharing domain knowledge to operate across a wider geographical area.”

“In effect, we are shaping kill web “matesmanship.”

“We clearly have closer relationships with some allies than with others, which shapes policy and data sharing. However, the technology is now out there which can allow us, within the right policy framework, to provide data at appropriate security levels much more rapidly than in the past.

“Our policy frameworks simply need to catch up with our technologies.”

“History has shown us that it is infinitely more difficult to sort out our working relationships in times of intense conflict.

“Those partnerships need to be nurtured and exercised now to help shape our interactive webs into a truly effective strike force over the extended battlespace.”

**For Rear Admiral Garvin, working with partner and allied maritime patrol partners is crucial, even when those close partners are operating different platforms.**

For example, Japan indigenously developed their own replacement aircraft for its legacy P-3s. He highlighted the healthy sharing arrangements the U.S. Navy has with the Japanese Maritime Self-Defense Force in the MDA area.

Similarly, we enjoy a very close relationship with Canada, who operates a significantly modernized P-3, the CP-140 Aurora. He noted that the aperture for increased cooperation with India was opening up as well, a process which he clearly welcomed.

As Rear Admiral Garvin put it: “Put simply, the idea of partners and allies sharing in the web you describe must have, at its core, that underlying, underpinning relationship built upon trust.

“Sometimes buying the same kit does make it easier. But without that relationship it doesn’t matter if you bought the exact same kit.”

## **The Transformation of the Maritime Patrol “Aircraft” Enterprise: The Perspective of Rear Admiral Peter Garvin**

**12/20/2019**

By Robbin Laird

Recently, I had the opportunity to visit with Rear Admiral Pete Garvin in his office in Norfolk Virginia to discuss the way ahead with the US Navy’s Patrol and Reconnaissance Force (MPRF).

Commander Patrol and Reconnaissance Group / Commander Patrol and Reconnaissance Group Pacific (CPRG/CPRG-PAC) provides oversight to more than 7,000 men and women on both coasts operating the U.S. Navy’s maritime patrol aircraft including the P-8A “Poseidon”, P-3C “Orion”, EP-3 “Aries II” and MQ-4C “Triton” unmanned aircraft system.

The MPRF is organized into two Patrol and Reconnaissance Wings at NAS Jacksonville, Florida, and NAS Whidbey Island, Washington including 14 Patrol and Reconnaissance squadrons, one Fleet Replacement Squadron (FRS) and over 45 subordinate commands. The MPRF is the Navy's premier provider for airborne Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW), and maritime Intelligence, Surveillance, and Reconnaissance (ISR) operations.

We discussed the force transformation currently underway as the foundation for further innovation moving into the future for the maritime force in its global operations. The P-8A and MQ-4C are not simply replacement platforms for the P-3 and EP-3. The change is as dramatic as the Marines going from the CH-46 to an Osprey which could only be described as a process of transformation rather than a transition from older to newer platforms.

It is not simply that these are different platforms, but the question of how to title the article suggests the dynamics of change. These are not merely maritime patrol aircraft but rather a synergistic 'Family of Systems' empowering global maritime domain awareness and the joint strike enterprise.

Most importantly, while the P-8A is a capable engagement platform in its own right, the information generated by the P-8A/MQ-4C dyad empowers and enhances the organic ASW strike capability on the P-8.

Moreover, the entirety of Department of Defense's strike capability is enhanced against adversarial multi-domain forces.

We hear a lot about the coming of Artificial Intelligence and new sensors to the combat force, but the P-8A and MQ-4C are bringing these capabilities to the force today. With pre-mission planning and post-mission product dissemination supported by a dedicated "TacMobile" ground element, these platforms comprise a solid foundation for the new MDA enterprise. Working together, the weapon systems will deliver decisive information to the right place at the right time to empower the multi-domain combat force. These systems are designed to be quickly software upgradeable and evolve over time as combat performance, and contact with the adversary, provide significant real-world feedback.

Although these are US Naval platforms, they are designed to connect with the larger C2/ISR infrastructure, changing the capabilities and operations of the entire U.S. and allied combat forces.

With [core allies](#) buying P-8 and MQ-4C, this force is truly global.

My visits to Norway, the United Kingdom, and Australia have provided significant opportunities to discuss with those nations, how they are engaged with the United States in recrafting the MDA and strike enterprise.

# F-35 and P-8/Triton Belts

## F-35 and P-8/Triton Force

Integration of RAF Lakenheath and RAF Marham Provides Unique Impacts and Advantages.

"I see there is great potential for two countries to develop in concert, side-by-side, and to set, set the model for joint operations.

"As we get this right, we can bring in the Danes, the Norwegians and Dutch who are close in geography and the Israelis and Italians as well to shape the evolving joint operational culture and approach.

"Before you know it, you've got eight countries flying this airplane seamlessly integrated because of the work that Lakenheath and Marham are doing in the 20 nautical mile radius of the two bases."

- P-8: Lossie, Iceland, Norway



These platforms provide significant situational awareness for a task force, and can operate in effect as combat clouds for a tailored task force operating across the spectrum of conflict.

At the [International Fighter Conference 2019](#), there was significant discussion of the coming of manned and unmanned teaming. There were no naval aviators at the conference but if they had been present, they would have told the conference that the U.S. Navy is already working and improving manned/unmanned teaming concepts and doctrine.

With the coming of Triton, a completely new approach is being shaped on how to operate, and leverage the data and systems onboard the manned and unmanned air systems joined at the hip, namely, the P-8 and the Triton.

There is an obvious return to the anti-submarine mission by the U.S. and allied navies with the growing capabilities of the 21<sup>st</sup> century authoritarian powers.

However, as adversary submarines evolve, and their impact on warfare becomes even more pronounced, ASW can no longer be considered as a narrow warfighting specialty.

This is reflected in Rear Admiral Garvin's virtuous circle with regard to what he expects from his command, namely, professionalism, agility and lethality.

The professionalism which defines and underpins the force is, in part, about driving the force in new innovative directions. To think and operate differently in the face of an evolving threat. Operational and tactical agility is critical to ensure that the force can deliver the significant combat effect expected from a 21<sup>st</sup> century maritime reconnaissance and strike force. Finally, it is necessary but insufficient to be able to find and fix an adversary.

The ability to finish must be realized lest we resign ourselves to be mere observers of a problem.

The Australians consider the P-8/Triton force to be part of their fifth-generation transition in that the information being processed and worked by the machines in the dyad and the analysts onboard or ashore is informing assets across the enterprise with regard to threats and resolutions required by the entire combat force.

It is not simply about organic capabilities.

The P-3 flew alone and unafraid; the dyad is flying as part of a wider networked enterprise, and one which can be tailored to a threat, or an area of interest, and can operate as a combat cloud empowering a tailored force designed to achieve the desired combat effects.

The information generated by the 'Family of Systems' can be used with the gray zone forces such as the USCG cutters or the new Australian Offshore Patrol Vessels. The P-8/Triton dyad is a key enabler of full spectrum crisis management operations, which require the kind of force transformation which the P-8/Triton is a key part of delivering the U.S. and core allies.

A key consideration is the growing importance of what one might call "proactive ISR."

It is crucial to study the operational environment and to map anomalies; this provides a powerful baseline from which to prepare future operations, which require force packages that can deliver the desired kinetic or non-kinetic effect.

Moreover, an unambiguous understanding of the environment, including pattern of life and timely recognition of changes in those patterns, serves to inform decision makers earlier and perhaps seek solutions short of kinetic.

This is not about collecting more data for the intelligence community back in the United States; it is about generating operational domain knowledge that can be leveraged rapidly in a crisis and to shape the kind of C2 capabilities which are required in combat at the speed of light.

Historically, a presence force is about what is organically included within that presence force; today we are looking at combat reach or scalability of force.

Faced with limited resources, it is necessary for planners to exercise economy of force by tailoring distributed forces to a specific area of interest for as long as required.



The presence force however small needs to be integrated not just in terms of itself but also in its ability to operate via common C2 or ISR connectors with both allied and U.S. forces. This enhanced capability needs to be forward deployed in order to provide enhanced MDA, lethality and effectiveness appropriate to achieve the desired political/military outcome.

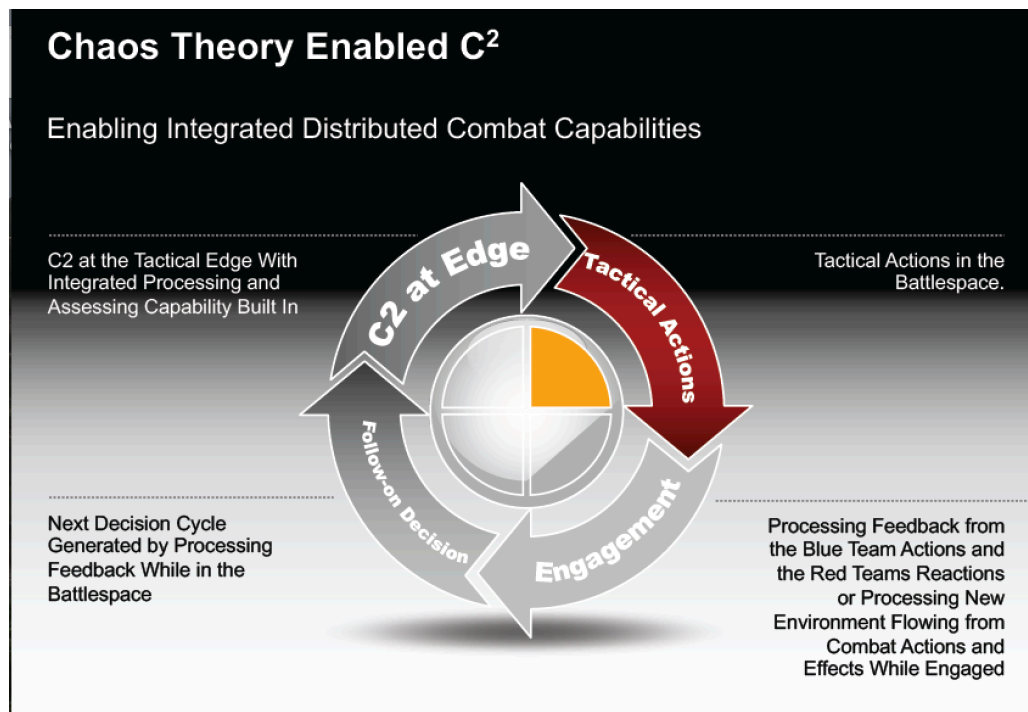
Success rests on a significant rework of C2 networks to allow a distributed force the flexibility to operate not just within a limited geographical area, but reach beyond the geographical boundaries of what the organic presence force is capable of doing by itself.

This is about shaping force domain knowledge well in advance of and in anticipation of events.

**This is not classic deterrence – it is pre-crisis and crisis engagement.**

This new approach can be expressed in terms of a kill web, that is a U.S. and allied force so scalable and responsive that if an ally executes a presence mission and is threatened by a ramp up of force from a Russia or China, that that presence force can reach back to relevant allies as well as their own force structure in a timely and effective manner.

**For this approach to work, there is a clear need for a different kind of C2 and ISR infrastructure to enable the shift in concepts of operations. Indeed, when describing C2 and ISR or various mutations like C4ISR, the early notions of C2 and ISR seen in both air-land battle and in joint support to the land wars, tend to be extended into the discussions of the C2 and ISR infrastructure for the kill web or for force building of the integrated distributed force.**



The P-8/Triton dyad lays a solid foundation for the wide range of innovations we can expect as the integrated distributed force evolves: expanded use of artificial intelligence, acceleration of the speed for software upgradeability, achieving transient combat advantage from more rapid rewriting of



software code, an enhanced ability to leverage the weapons enterprise operating from a wide variety of air, ground, and naval platforms (off-boarding), and an ability to expand the capabilities of manned-unmanned teaming as autonomous maritime systems become key elements of the maritime force in the years to come.

**In short, the Maritime Patrol and Reconnaissance Force is not simply transitioning, it is transforming.**

It is delivering significant new capabilities now, and laying a solid foundation for the future. It is empowering what the Aussies would call a fifth-generation multi-domain combat force.

**You can either live in the past and lose ground; or you can lean forward and build out the foundation for the integrated distributed force.**

### *Rear Admiral Peter Garvin Biography*

Rear Adm. Pete Garvin graduated with merit from the United States Naval Academy in 1989 with a Bachelor of Science in Aerospace Engineering (Astronautics). He is also a 2005 graduate of the National War College, with a Master of Science in National Security Strategy and a 2015 alumnus of the Massachusetts Institute of Technology Seminar XXI.

His operational assignments include service with the “Pelicans” of Patrol Squadron (VP) 45, where he was the 1995 Association of Naval Aviation Pilot of the Year; department head with the “Mad Foxes” of VP-5; navigator aboard USS Kearsarge (LHD 3), where he served as flag navigator for the embarked Amphibious Squadron (PHIBRON) 6; executive and 59th commanding officer of the “Fighting Tigers” of VP-8; and commander of Patrol and Reconnaissance Wing (CPRW) 10.

His shore assignments include flag lieutenant to Commander, Patrol Wings Atlantic (CPWL), Commander, Task Force (CTF) 84; instructor pilot at the P-3 fleet replacement squadron, VP-30; Washington placement officer at the Bureau of Naval Personnel (PERS 441); executive officer for the director, Operational Plans and Joint Force Development Directorate (J-7), Joint Staff; federal executive fellow at the Council on Foreign Relations (CFR); undersea warfare branch head in the assessments division (N81) and deputy director, unmanned warfare systems (N99) on the Office of the Chief of Naval Operations staff; and executive assistant to the vice chairman, Joint Chiefs of Staff.

Most recently, he served as the 22nd commander of Navy Recruiting Command. Garvin assumed the duties of Commander, Patrol and Reconnaissance Group July 23, 2018.

His decorations include the Defense Superior Service Medal, Legion of Merit (three awards), Defense Meritorious Service Medal, Meritorious Service Medal (two awards), Air Medal (two strike/flight) and various personal, unit and campaign decorations.

## **Development, Training and Learning: Shaping the Skill Sets for the 21st Century Fight**

**02/23/2020**

By Robbin Laird

The strategic shift from the land wars of the past two decades to preparing for the high-end fight is having a significant effect on the dynamics of change affecting the very nature of the C2 and ISR needed for operations in the contested battlespace.

An ability to prevail in full spectrum crisis management is highlighting the shift to distributed operations but in such a way that the force is integrateable to achieve the mass necessary to prevail across the spectrum of operations.

**Much like the character of C2 and ISR is changing significantly, training is also seeing fundamental shifts as well.**

For the US Navy, training has always been important, and what is occurring in the wake of the changes in the national security strategy might appear to be a replication of what has gone down for the past twenty years; but it is not.

In fact, it is challenging to describe the nature of the shift with regard to training.

Much like the shifts in C2 and ISR which I have discussed with the Navy's Air Boss in a recent interview, the shifts in training are equally significant.

Indeed, when I visited San Diego last Fall, I had a chance to talk with Vice Admiral Miller about how one might conceptualize the nature of the shift in training for the US Navy.

In that [article](#), the discussion highlighted a number of the changes underway but the target goal was highlighted by the Air Boss as follows: *Training is now about shaping domain knowledge for the operational force to ensure that "we can be as good as we can be all of the time."*

With the focus on ensuring the capability of the distributed fleet to deliver the desired effects throughout the spectrum of conflict and crisis management, the goal is for the sailors, operators and leaders of the combat force to have the most appropriate skill sets available for the 21<sup>st</sup> century fight.

And with the introduction of new technologies into the fleet, ranging from the new capabilities being provided for the integrateable air wing, to the expanded capabilities of the surface fleet with the weapons revolution and the evolution of the maritime remote extenders, to the return to a priority role for ASW with the submarine fleet and the maritime reconnaissance assets working together to deliver enhanced capabilities to deter and to defeat adversarial subsurface assets, the dynamics of training change as well.

For example, with software upgradeable aircraft, the capabilities of the aviation assets you operated with on your last tour are likely to not be the same as you will deploy with in your next tour.

In a visit to Norfolk last Fall, [Rear Admiral Peter Garvin](#), Commander of the Maritime Patrol and Reconnaissance Group (MPRF), we discussed how he saw the training challenge evolving.

*There is an obvious return to the anti-submarine mission by the U.S. and allied navies with the growing capabilities of the 21st century authoritarian powers. However, as adversary submarines evolve, and their impact on warfare becomes even more pronounced, ASW can no longer be considered as a narrow warfighting specialty.*

*This is reflected in Rear Admiral Garvin's virtuous circle with regard to what he expects from his command, namely, professionalism, agility and lethality. The professionalism which defines and underpins the force is, in part, about driving the force in new innovative directions. To think and operate differently in the face of an evolving threat. Operational and tactical agility is critical to ensure that the force can deliver the significant combat effect expected from a 21st century maritime reconnaissance and strike force.*

*Finally, it is necessary but insufficient to be able to find and fix an adversary. The ability to finish must be realized lest we resign ourselves to be mere observers of a problem.*

*And it is not simply about organic capabilities on your platform. The P-3 flew alone and unafraid; the dyad is flying as part of a wider networked enterprise, and one which can be tailored to a threat, or an area of interest, and can operate as a combat cloud empowering a tailored force designed to achieve the desired combat effects.*

*The information generated by the 'Family of Systems' can be used with the gray zone forces such as the USCG cutters or the new Australian Offshore Patrol Vessels. The P-8/Triton dyad is a key enabler of full spectrum crisis management operations, which require the kind of force transformation which the P-8/Triton is a key part of delivering the U.S. and core allies.*

**How do you train your P-8 team to be to work with the gray zone assets to deliver the kind of crisis management effect you want and need?**

Clearly, the training mission is evolving to prepare for the high-end fight, and indeed, preparing to operate across the spectrum of crisis management.

**But how best to describe the kind of evolution training for the fleet is undergoing?**

To continue further throughout on how best to do so, I had the chance to visit Norfolk this month to discuss the focus and the challenges with three admirals who are key players in shaping a way ahead.

My host was Rear Admiral Peter Garvin, and he invited two other admirals as well to the discussion.

The first Rear Admiral John F. Meier, head of the Navy Warfare Development Command, with whom Ed Timperlake and I had met with when he was the [CO of the USS Gerald R. Ford](#).

The second was Rear Admiral Dan Cheever, Commander, Carrier Strike Group FOUR.

The day before Ed and I met with Rear Admiral Gregory Harris, the head of N-98, who introduced into our discussion a key hook into my discussions with the three admirals in Norfolk.

We were discussing the evolving role of Naval Aviation Warfighting Development Center at Fallon and the Admiral referred to Carrier Strike Group FOUR as a “mini” Fallon, which was, of course, suggestive of the dynamics of change within training.

We had a wide-ranging discussion about a number of issues, but I will focus here on our discussion about the dynamics of change revolved around the training concept or construct.

What I will identify are my take-aways from the conversation, which I am not going to attribute to any one admiral, or even suggest that there was a consensus on the points I will identify.

**What I am providing are key takeaways from my perspective of how the Navy is addressing the dynamics of training for the high end fight or in my terms, operating across the full spectrum of crisis management.**

For me, the ability to operate across the full spectrum of crisis management highlights the central contribution which the Navy-Marine Corps team delivers to the nation.

Operating from global sea-bases, with an ability to deliver a variety of lethal and non-lethal effects, from the insertion of Marines, to delivering strategic strike, from my perspective, in the era we have entered, the capabilities which the Navy-Marine Corps teams, indeed all of the sea services, including the Military Sealift Command and the US Coast Guard, provide essential capabilities for the direct defense of the nation.

One key challenge facing training is the nature of the 21<sup>st</sup> century authoritarian powers.

How will they fight?

How will their evolving technologies fit into their evolving concepts of operations?

What will most effectively deter or provide for escalation control against them?

There is no simple way to know this.

When I spent my time in the US government and in government think tanks, I did a great deal of work on thinking through how Soviet and Warsaw Pact forces might fight.

That was difficult enough, but now with the Chinese, Russians, and Iranians to mention three authoritarian regimes, it is a challenge to know how they will operate and how to train to deter, dissuade, or defeat them.

A second challenge is our own capabilities.

How will we perform in such engagements?

We can train to what we have in our combat inventory, we can seek to better integrate across joint and coalition forces, but what will prove to be the most decisive effect we can deliver against an adversary?

This means that those leading the training effort have to think through the scope of what the adversary can do and we can do, and to shape the targets of an evolving training approach.

And to do so within the context of dynamically changing technology, both in terms of new platforms, but the upgrading of those platforms, notably as software upgradeability becomes the norm across the force.

The aviation elements of the Marine Corps-Navy team clearly have been in advance of the surface fleet in terms of embracing software upgradeability, but this strategic shift is underway there as well.

The Admirals all emphasized the importance of the learning curve from operations informing training commands, and the training commands enabling more effective next cycle operations.

**In this sense training, was not simply replicating skill sets but combat learning reshaping skill sets as well.**

Clearly, the Admirals underscored that there was a sense of urgency about the training effort understood in these terms, and no sense of complacency whatsoever about the nature of the challenges the Navy faced in getting it right to deal with the various contingencies of the 21<sup>st</sup> century fight.

**The Navy has laid a solid foundation for working a way ahead and that is based on the forging of an effort to enhance the synergy and cross linkages among the various training commands to work to draw upon each community's capabilities more effectively.**

Specifically, NAWDC (Naval Air Warfare Development Center), SMWDC (Naval Surface and Mine Warfighting Development Center), UWDC (Undersea Warfare Development Center), NIWDC (Naval Information Warfare Development Center) and exercise and training commands, notably Carrier Strike Groups FOUR and FIFTEEN, are closely aligned and working through integrated operational approaches and capabilities.

When we visited Fallon in the past, we have seen the evolution not just in terms of naval integration (with surface warfare officers at Fallon) but the working relationships with Nellis (USAF) and MAWTS-1 (USMC).

And given the evolution of the USMC, the Navy teams with Marine Expeditionary Forces (MEFs), Marine Air Ground Task Force Training Command (MAGTAFTC), and Expeditionary Operations Training Group (EOTGs) in order to train the Navy and Marine Corps Team, notably with regard to the activities of CSG-4/15 for exercises.

Naval Warfare Development center is at the heart of Navy training for their all domain focus and efforts. NWDC is the key Warfare Development Center which bridges the tactical to the operational and even the strategic level.

The synergy across the training enterprise is at the heart of being able to deliver the integrated distributed force as a core warfighting capability to deal with evolving 21<sup>st</sup> century threats.

There are a number of key drivers of change as well which we discussed.

One key driver is the evolution of technology to allow for better capabilities to make decisions at the tactical edge.

A second is the challenge of speed, or the need to operate effectively in a combat environment in which combat speed is a key aspect, as opposed to slow war evidenced in the land wars.

**How to shape con ops that master C2 at the tactical edge, and rapid decision making in a fluid but high-speed combat environment?**

In a way, what we were discussing is a shift from training preparing for the next fight with relatively high confidence that the next one was symmetric with what we know to be a shift to proactive training.

**How to shape the skill sets for the fight which is evolving in terms of technologies and concepts of operations for both Red and Blue?**

In short, the Navy is in the throes of dealing with changes in the strategic environment and the evolving capabilities which the Navy-Marine Corps team can deploy in that environment.

And to do so requires opening the aperture on the combat learning available to the fleet through its training efforts.

Training across the Navy and the joint force is required to do so.

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

May 18, 2020

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.”

<https://news.usni.org/2020/05/12/navy-mq-4-triton-flying-operational-missions-from-guam>

### **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.”

<https://adbr.com.au/invaluable-triton-integrates-with-us-navy-7th-fleet-in-pacific/>

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 US 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.”

<https://sldinfo.com/2020/05/the-maritime-patrol-enterprise-shaping-a-kill-web-future/>

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.

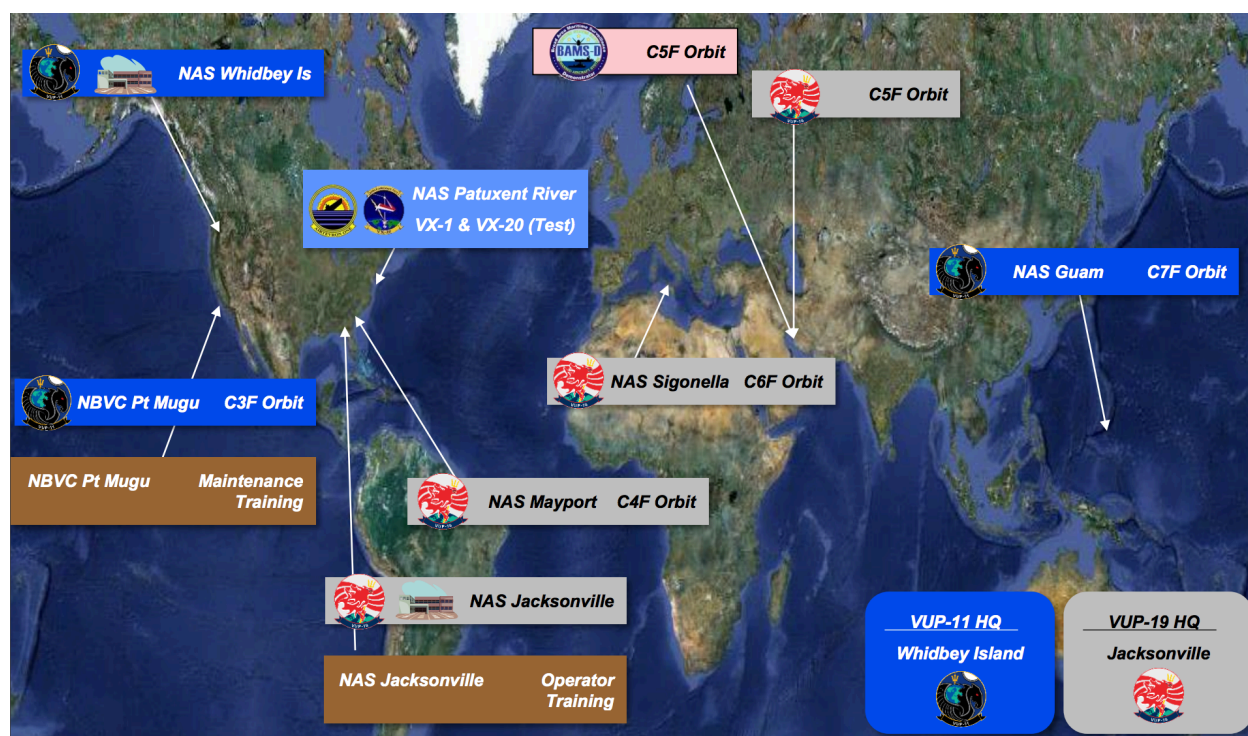
But for those advantages to be realized, appropriate training, and operational approaches need to be shaped, executed and evolved over time.

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, was a snapshot of a NAVAIR representation of the envisaged Orbit engagement of the Triton.



<https://news.usni.org/2018/04/10/navy-first-operational-mq-4c-tritons-will-deploy-guam-years-end>

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.

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

01/28/2020

“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.**

The quotes in this article 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.

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 in to 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.*



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 an 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.*

## **The Coming of the Maritime Domain Enterprise to Australia: The P-8/Triton dyad**

**07/11/2018**



The security of Australia's maritime borders will be significantly strengthened with another major military investment.

The Turnbull Government will invest \$1.4 billion and acquire the first of six MQ-4C Triton remotely piloted aircraft through a cooperative program with the United States Navy.

The Triton will complement the surveillance role of the P-8A Poseidon aircraft through sustained operations at long ranges as well as being able to undertake a range of intelligence, surveillance and reconnaissance tasks.

Together these aircraft will significantly enhance Australian anti-submarine warfare and maritime strike capability, as well as search and rescue capability.

According to a statement by the Australian Department of Defence dated June 26, 2018:

"This investment will protect our borders and make our region more secure. As part of this investment Australia will also enter into a \$200 million cooperative program with the United States Navy for the development, production and sustainment of the MQ-4C Triton. Australia's alliance with the US is our most important defence relationship, underpinned by strong cooperation in defence industry and capability development.

"This cooperative program will strengthen our ability to develop advanced capability and conduct joint military operations. As part of the initial \$1.4 billion investment in the Triton system, the Government will invest \$364 million on new facilities at RAAF Base Edinburgh and RAAF Base Tindal, as well as the necessary ground control systems, support and training required to implement a project of this nature.

"The project is expected to create about 70 jobs across South Australia and the Northern Territory. Northrop Grumman as supplier of the Triton will play a lead role in delivering the capability in Australia.

"This investment follows Northrop's commitment to a \$50 million advanced Electronic Sustainment Centre of Excellence at the new Western Sydney Airport. Australia has already taken delivery of seven Poseidon aircraft and achieved Initial Operational Capability earlier this year.

"The full fleet of 12 Poseidon aircraft is expected to be delivered and in operation by 2022. The first of the Triton aircraft is expected to be introduced into service in mid-2023 with all six aircraft planned to be delivered and in operation by late 2025, based at RAAF Base, Edinburgh in South Australia.

"The Orion fleet has performed exceptionally on operations throughout its distinguished service, and the last of these aircraft will be over 40 years old when they are withdrawn from service in 2023."

**In an article published with our partner [Australian Defence Business Review](#) on June 26, 2018. Andrew McLaughlin focused on the Triton acquisition.**

*Prime Minister Malcolm Turnbull, Defence Minister Marise Payne, and Minister for Defence Industry Christopher Pyne have announced that Australia will buy six Northrop Grumman MQ-4C Triton maritime unmanned aerial systems (MUAS).*

*The long-running project AIR 7000 Phase 1B requirement for an MUAS capability was reportedly approved by the National Security Committee (NSC) of Cabinet on June 19, and came just two weeks after the US Navy's [first two Tritons entered service](#) at NAS Point Mugu in California and are preparing to commence an early operational capability (EOC) from Guam later this year.*

*The initial \$1.4 billion program cost will cover the first of the six planned aircraft, and will include \$364 million for the construction of new operational and support facilities at RAAF bases Edinburgh near Adelaide and Tindal in the Northern Territory, and an initial ground support equipment, training and spares package.*

*It also includes a \$200 million investment in the US Navy-led Triton co-operative development program which will give Australia a seat at the table for future capability enhancements for the Triton, including the 'Multi-INT' signals intelligence package.*

*Australia has long-held an interest in acquiring an MUAS to work in conjunction with the Boeing P-8A Poseidon, 12 of a projected 15 which have been ordered under Project AIR 7000 Phase 2.*

*The 1987 White Paper stated a requirement for a "manifest capability" to conduct surveillance of Australia's vast sea and air approaches, a capability which must provide the means to detect, identify and if necessary respond to sea and air activity in our sovereign air and sea space.*

*As technology improved, the 1994 White Paper noted that a promising area of investigation is the use of unmanned aerial vehicles for surveillance of land and maritime environments. That ISR capability finally seemed within reach when Global Hawk was developed by Ryan Aeronautical, now part of Northrop Grumman, to meet a US Air Force requirement for broad area overland surveillance to initially complement and eventually replace the manned Lockheed U-2.*

*The first of more than 40 Global Hawks flew in February 1998, and a number of early Advanced Concept Technology Demonstration (ACTD) systems were pressed into operational service in 2001 immediately following the 9/11 attacks on the US.*

*Global Hawk's ability to fly intercontinental distances was amply demonstrated in April 2001 when an ACTD – temporarily dubbed Southern Cross II to honour the first Pacific crossing in 1928 – flew non-stop from Edwards AFB in California to RAAF Edinburgh, covering the 13,219 kilometres in 22-hours. That was the first pilotless aircraft to cross the Pacific, and a world record for absolute distance flown by a UAV.*

*In July 2006 the Howard government gave First Pass approval for participation in the cooperative development of a maritime Global Hawk with the US Navy, and in 2008, a 'navalised' Global Hawk won the US Navy Broad Area Maritime Surveillance (BAMS) requirement.*

The Triton differs from the RQ-4B Global Hawk by having a stiffer wing, leading edge and engine intake de-icing, lightning and bird-strike protection, and the AN/ZPY-3 Multi-Function Active Sensor (MFAS). Later enhancements will see a combined air-to-air sense-and-avoid/weather radar sensor added for operations in controlled airspace, and the Multi-INT sensor package.



The Rudd government's 2009 Defence White Paper made the key commitments towards achieving a mixed fleet of manned and unmanned maritime patrol aircraft – eight manned aircraft and up to seven large, high altitude, long endurance (HALE) UAVs. But later that same year the government reversed course and instead deferred its involvement in BAMS, citing financial and manning pressures on the RAAF as it transitioned from the AP-3C to the P-8A.

The government confirmed its interest in acquiring the Triton by [announcing in May 2013](#) that it had issued a Letter of Request (LOR) seeking further information from the US. A ministerial statement said the LOR would give Australia access to detailed information on the US Navy's Triton, but emphasised that the release of an LOR had not yet committed Australia to purchasing the system.

[In early 2014](#) the then new Abbott government gave the First Pass approval to acquire Triton, but the long-term schedule for the program remained somewhat ambiguous. Meanwhile, the 2013 Defence White Paper had committed to eight Boeing P-8A Poseidons, the first of which arrived in November 2016.

The most recent Defence White Paper [published in early 2016](#) upped the number of P-8As from eight to 12 plus three more options. The 2016 document also confirmed the acquisition of seven MQ-4C Tritons.

Triton can fly at altitudes above 50,000 feet and has an endurance of more than 24 hours. From RAAF Tindal, a single Triton mission can cover well up into the South China Sea or all of the resource-rich Northwest Shelf area out to the Cocos Islands and beyond. From RAAF Edinburgh, a Triton can reach and cover most of Australia's Antarctic coastal area of interest in a single mission.

*Follow-on announcements for the contract and production of the remaining five systems, and the preferred in-service sustainment provider are expected to follow by mid-2019.*

*The first RAAF system is scheduled to be delivered in mid-2023, initial operating capability (IOC) is planned to follow 12 months later, and a fully operational capability (FOC) of all six systems is scheduled for mid-2025.*

*Max Blenkin contributed to this article.*

## **Standing up the P-8/Triton Maritime Domain Strike Enterprise in Australia: Visiting RAAF Edinburgh**

**04/28/2017**

By Robbin Laird

During my latest visit to Australia, I had a chance to visit South Australia and RAAF Edinburgh, which is near Adelaide.

At Adelaide, the Australian Navy will be building its new submarines and at RAAF Edinburgh the Aussies are standing up the other key element of their 21<sup>st</sup> century ASW capabilities, namely, the core P-8/Triton base.

I visited RAF Lossiemouth where the Brits are standing up their P-8 base and both the Aussies and the Brits are building 21<sup>st</sup> century infrastructure to support their new fleets of aircraft.

And certainly there will be cross learning between the two air forces as both face similar and large operating areas working with the USN and other ASW partners.

Australia is a cooperative partner in the P-8, somewhat similar to an F-35 partnership so are developing capabilities from the ground up with the USN.

And because they are a cooperative partner, FMS buyers will pay a fee to both the USN and the RAAF.

**At Lossiemouth I discussed the new infrastructure with key RAF officials responsible for the effort, and that interview will be published later but the key role of standing up new infrastructure to support this effort is crucial to handle the new data rich airplanes, as well as the work with allies in operating the assets.**

Having visited Norway earlier this year and having discussed among other things, the coming of the P-8 and the F-35 in Norway, it is clear that what happens on the other side of the North Sea (i.e., the UK) is of keen interest to Norway.

And talking with the RAF and Royal Navy, the changes in Norway are also part of broader UK considerations when it comes to the reshaping of NATO defense capabilities in a dynamic region.

The changes on the UK side of the North Sea are experiencing the standup of a P-8 base at Lossie, which will integrate with US P-8 operations from Iceland and with those of Norway as well.

**In effect, a Maritime Domain Awareness highway or belt is being constructed from the UK through to Norway.**

A key challenge will be establishing ways to share data and enable rapid decision-making in a region where the Russians are modernizing forces and expanded reach into the Arctic.

What was clear from discussions at Lossie is that the infrastructure is being built from the ground up with broader considerations in mind, which I am calling, building a 21st century MDA highway.

To the South, at Marham and Lakenheath, the UK and the US are shaping would clearly be an integrated operational capability reaching to Norway, Denmark and the Netherlands.

**Flying the same ISR/C2/strike aircraft, the challenge will be similar to what will be seen in crafting the MDA highway as well – how best to share combat data in a fluid situation demanding timely and effective decision-making?**

The UK is clearly a key player in shaping the way ahead on both, investing in platforms, infrastructure and training a new generation of operators and maintainers as well.

In this sense, the UK-US-Norwegian-Danish-Dutch interoperability will be a foundation for shaping 21st century security in the region.

**It is as much about the US learning with the allies as the allies learning from the United States.**

And at the heart of this learning process are the solid working relationships among the professional military in working towards innovative concepts of operations.

**This is a work in progress that requires infrastructure, platforms, training and openness in shaping evolving working relationships.**

The RAF is building capacity in its P-8 hangers for visiting aircraft such as the RAAF, the USN, or the Norwegian Air Force to train and operate from Lossiemouth.

The Australians are building a very interesting structure to support their P-8s and Tritons.

The graphic below shows the overall facility being constructed at RAAF Edinburgh.





The P-8 and Triton integrated facility being built at RAAF Edinburgh, near Adelaide in South Australia. Credit: Australian Ministry of Defence

**At the heart of the enterprise is a large facility where Triton and P-8 operators have separate spaces, but they are joined by a unified operations centre.**

It is a walk through area, which means that cross learning between the two platforms will be highlighted.

**This is especially important as the two platforms are software upgradeable and the Aussies might well wish to modify the mission systems of both platforms to meet evolving Australian requirements.**

I had a chance to discuss the standup of the facility with Wing Commander Mick Durant, Officer Temporary Commanding 92 Wing, Wing Commander David Titheridge, Commanding Officer 11 Squadron and Wing Commander Gary Lewis, , Deputy Director P-8 and Triton Transition.

**Question: Obviously, you are working with the USN in standing up these two platforms. Could you describe that working relationship?**

Answer: We've got an incredibly tight connection with the USN at the moment.

In fact, they're doing all of our initial transition training.

So they're taking our current P-3 aviators and converting them to P-8 in Jacksonville through the VP-30 training system.

**There's an enduring connection, which everybody's going to benefit from in the long run.**

We are P-3 operators and you need to realize that we developed indigenously a significant set of upgrades on our AP-3Cs that are not on the US P-3Cs.

In fact, some of these upgrades provided functionality in sensors that are similar to what we have so far on the P-8.

But the operating concept of the two airplanes is very different and we are working the transition from the P-3 to the P-8 which is a networked asset both benefiting from other networks and contributing to them as well as a core operational capability and approach.

The changes that are coming are very exciting.

So we're moving from an aircraft, which we've pretty much maximized, to a new one which is called P-8, for a reason.

**This is an A model aircraft. So with an A model aircraft comes to the ability to grow.**

And we're going to a new world with a starting point, which allows us to grow.

The capacity to integrate, innovate, and talk to our allies and our own services is a quantum leap in what we've had in the past and it will allow us to be able to do our roles differently.

**Shaping that change is one of the key missions that we've got.**

We are going to innovate and think out of the box compared to P-3 tactics and concepts of operations.

**Question: You fly the Wedgetail and the P-8.**

**Even though the systems are different, there must be some cross learning opportunities?**

Answer: There are.

We can start with the 737 aspects of operating both aircraft and the maintenance opportunities and challenges.

And we do train the electronic system operators on the Wedgetail.

And as we stand up we can connect the simulators as well to shape a broader approach to the capabilities the three aircraft can deliver, namely Wedgetail, P-8 and Triton.

**There are many opportunities regarding the synergies between the E-7A and the P-8A that we are yet to explore.**

**Question: With an aircraft with a broader span of capability, there is the challenge of the demand side.**

**What about the challenge of meeting the needs of a broader set of customers?**



Question: The MPA is a very flexible platform and has been in high demand by many customers.

That is both an opportunity and a challenge.

What it means is that we will have to prioritize the missions and the customer base for the new systems and capabilities.

We have a large, expansive ocean that we need to patrol around Australia, a large region of interest and we have a small number of assets.

Tasking prioritization, discipline associated with that and getting that right so that we can maximize all those opportunities is key.

With the P-8, and family of systems with the Triton, we can deliver capabilities to many more customers at varying levels, ranging from the strategic to the operational tactical level.

**Balancing that demand and getting it right is going to be challenging.**

It's a bonus, it's a fantastic opportunity, but at the same time we can't do everything for everyone all the time.

That said, we have directed levels of capability that we will be able to meet.

**Question: Let us talk about the way ahead and the advantages of being on the ground floor of the P-8 program.**

**How do you see those advantages?**

Answer: In some ways, it is like having a two nation F-35 program.

**Because we are a cooperative partner we have a stake and say in the evolution of the aircraft.**

And this is particularly important because the aircraft is software upgradeable.

This allows us working with the USN to drive the innovation of the aircraft and its systems going forward.

We've been allowed to grow and develop our requirements collectively.

**We think this is very far sighted by the USN as well.**

I think we've got the ability to influence the USN, and the USN have had the ability to influence us in many of the ways that we do things.

We will be doing things differently going forward.

It is an interactive learning process that we are setting up and it is foundational in character.

Let's look at what we're actually generating at the moment.

**We're generating generation's worth of relationship building, and networking between the communities.**

We are doing that over an extended period of time.

For about three years we have been embedding people within the USN's organization.

There are friendships that are being forged, and those relationships are going to take that growth path for collaboration forward for generations to come.

When you can ring up the bloke that you did such and such with, have a conversation, and take the effort forward because of that connection.

That is a not well recognized but significant benefit through the collaborative program that we're working at the moment.

**We are shaping integration from the ground up.**

And we are doing so with the Australian Defence Force overall.

A number of exercises and training opportunities are designed to have all the three services integrated and working in the same complex battle space.

We're reworking the way we do business internally, let alone as a collective, or collaborative process.

It's a great opportunity with the new capabilities we've got to actually empower our forces for integration at all levels.

**Question: With the focus for the past decade upon land wars, ASW skill sets have clearly atrophied for the key allied navies.**

**How have you dealt with this?**

Answer: It is a challenge.

We've had to work hard to make sure that our skills did not atrophy to the point where we didn't have that capability.

And we've done that.

And we've done it on the AP-3C in time to move to the P-8 and take on all these new ways of doing business.

**So I think we arrested that just in time, but it was a real risk that we faced as well.**

Some can look at the new P-8/Triton dyad as delivering significant ISR and C2 capabilities into the battlespace and it will.

**But we cannot forget our core mission – which is ASW or as you have described it Maritime Domain Awareness strike capabilities.**

We're the only capability that does independent long range maritime strike.

That's the thing we need to work hard to maintain.

We need to make sure that we meet our preparedness requirements to provide long range ASW, and ASUW and those missions are key to the way we train, and do business.

## **The UK and Norway Shape Enhanced Cooperation for ASW Operations in the North Atlantic**

**08/17/2019**

By Robbin Laird

Recently, both the [UK Ministry of Defence](#) and [Norwegian Ministry of Defence](#) websites highlighted the meeting between the UK Minister of Defence and the Norwegian States Security of Defence held at RAF Lossiemouth in August 2019.

*Defence Minister Anne-Marie Trevelyan hosted Norwegian State Secretary Tone Skogen to discuss NATO and the UK's role in the North Atlantic.*

*The UK is investing £3 billion in nine new Boeing Poseidon P-8A maritime patrol aircraft, with Norway committing to a further five. The aircraft are sophisticated submarine-hunters designed to scout complex undersea threats.*

*The aircraft will work together, and with NATO allies, to combat a range of intensifying threats in the North Atlantic, including increased hostile submarine activity.*

*Defence Minister Anne-Marie Trevelyan said:*

*“The UK’s maritime patrol aircraft programme demonstrates our ongoing commitment to working with international allies in the North Atlantic, strengthening our alliances with valued partners such as Norway.*

*“Our two nations share basing facilities, undergo cold weather training together and patrol the seas and skies side-by-side allowing us to successfully face down the growing threats from adversaries in the North Atlantic region.”*

*During the visit, the defence ministers experienced a demonstration flight in a US Navy Poseidon P-8A aircraft.*

*Norwegian State Secretary Tone Skogen said:*

*“The UK and Norway have a long history of cooperation on maritime surveillance and operations. This close relationship will only improve now that we will operate the same type of MPA, the P-8 Poseidon. UK and Norwegian priorities are aligned in the North Atlantic, and we look forward to a close and integrated partnership in meeting common challenges within the realm of maritime security.”*

*The entire nine-strong UK Poseidon P-8A fleet will be based at RAF Lossiemouth. The first aircraft has been built and has just completed its first test flight. It will be handed over to the RAF in the United States later this year and arrive in Scotland early in 2020.*

*Last year, the station broke ground on construction of a £132 million strategic facility for the new fleet, to be completed in 2020. The new facility is being constructed by Elgin-based Robertson Northern and will comprise a tactical operations centre, an operational conversion unit, squadron accommodation, training and simulation facilities and a three-bay aircraft hangar.*

*When all of these developments are complete there will be 470 additional service personnel based at RAF Lossiemouth, taking the total number of people employed there to 2,200.*

*RAF Lossiemouth is one of the most important air stations in the UK: it is already home to four RAF Typhoon squadrons – half of the RAF Typhoon Force – which conducts air policing work to protect the UK’s airspace from unwanted intrusion, and also on behalf of NATO in Eastern Europe to reassure allies.*

*The UK’s NATO commitments also include sending four RAF Typhoons to conduct air policing in Icelandic skies for the first time later this year. Such operations allow the RAF to develop valuable skills in new and challenging environments, as well as working closely with allies to protect Euro Atlantic security.*

*Earlier this month, RAF Typhoons benefitted from a £350 million contract with Rolls-Royce to support the maintenance of their EJ200 engines up to 2024.*

**We have highlighted the significance of allied cooperation in shaping new capabilities during the strategic shift back to direct defense of Europe over the past few years, and are focusing on this shift in our new book to be published next year.**

The ASW piece is especially significant but also is being built differently from the time of the Cold War.

## **Allies and 21st Century Weapons: The Maritime Domain Strike Enterprise**

07/19/2017

Recently, the UK, Norway and the US signed an [agreement](#) to work together on ASW in the North Atlantic, which will leverage the joint acquisition of the P-8 aircraft.

**This agreement and the evolution of the aircraft is yet another example of the US and its allies standing up at the same time an evolving defense capability in which allies are clearly key partners in shaping the evolution of a core combat capability.**

To lay down a foundation for a 21st century approach, the US Navy is pairing its P-8s with a new large unmanned aircraft, and working an integrated approach between the two. In a very narrow sense, the P-8 and Triton are “replacing” the P-3.

But the additional ISR and C2 enterprise being put in place to operate the combined P-8 and Triton capability is a much broader capability than the classic P-3. Much like the Osprey transformed the USMC prior to flying the F-35, the P-8/Triton team is doing the same for the US Navy as the F-35 comes to the carrier air wing.

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 are moving between the Triton and P-8.

**The P-8s is part of a cluster of airplanes which have emerged defining the way ahead for combat airpower which are software upgradeable: the Australian Wedgetail, the global F-35, and the Advanced Hawkeye, all have the same dynamic modernization potential to which will be involved in all combat challenges of maritime operations.**

It is about shaping a combat learning cycle in which software can be upgraded as the user groups shape real time what core needs they see to rapidly deal with the reactive enemy.

All military technology is relative to a reactive enemy.

As Ed Timperlake has noted “It is about the arsenal of democracy shifting from an industrial production line to a clean room and a computer lab as key shapers of competitive advantage.”

<https://sldinfo.com/the-arrival-of-a-maritime-domain-awareness-strike-capability-the-impact-of-the-p-8triton-dyad/>

**And from the ground up, the US Navy is doing this with the Brits, the Australians, and soon the Norwegians will join into the effort.**

Canada is a key player in the North Atlantic ASW effort.

There is a great deal of respect by the Brits, the Australians and Norwegians for the professionalism and competence of the Canadian ASW forces.

But there is concern with the level of funding effort which the Canadian government makes to this effort and to the uncertainty about the Canadian modernization path.

Much like the F-35 pilots and maintainers for allies are being trained initially in the United States and then standing up national capabilities, the same is happening with the P-8/Triton allies whereby the Brits and Australians are training at Jax Navy and this will most certainly happen with the Norwegians as well.

In fact, recently an RAF pilot has gone beyond 1,000 flight hours on the P-8 at Jax Navy.

And the allies are doing training for the entire P-8 force as well.

The Australians are buying the P-8 and the Triton and the Brits and Norwegians the P-8s but will work with the US Navy as it operates its Tritons in the North Atlantic area of interests.

These allies are working key geographical territory essential to both themselves and the United States, so shared domain knowledge and operational experience in the South Pacific and the North Atlantic is of obvious significance for warfighting and deterrence.

**And given the relatively small size of the allied forces, they will push the multi-mission capabilities of the aircraft even further than the United States will do and as they do so the U.S. can take those lessons as well.**

There is already a case in point.

The Australians as a cooperative partner wanted the P-8 modified to do search and rescue something that the US Navy did not build into its P-8s. But now that capability comes with the aircraft, something that was very much a requirement for the Norwegians as well.

And the US Navy is finding this “add-on” as something of significance for the US as well.

I have visited the Australian and British bases where the P-8s and, in the case of the Aussies, the Triton is being stood up. And I have talked with the Norwegians during my visit in February about their thinking with regard to the coming MDA enterprise.

It is clear from these discussions, that they see an F-35 like working relationship being essential to shaping a common operational enterprise where shared data and decision making enhance the viability of the various nation's defense and security efforts.

During my visit to RAAF Edinburgh, which is near Adelaide in South Australia where the Aussies will build their new submarines, I had a chance to discuss the standup of the base and to look at the facilities being built there.

As with the F-35, new facilities need to be built to support a 21st century combat aircraft where data, and decision-making tools are rich and embedded into the aircraft operations.

**At the heart of the enterprise is a large facility where Triton and P-8 operators have separate spaces but they are joined by a unified operations center.**

It is a walk through area, which means that cross learning between the two platforms will be highlighted.

This is especially important as the two platforms are software upgradeable and the Aussies might well wish to modify the mission systems of both platforms to meet evolving Australian requirements.

And in discussions with senior RAAF personnel, the advantage of working with the US Navy and other partners from the ground up on the program was highlighted.

"In some ways, it is like having a two nation F-35 program. Because we are a cooperative partner, we have a stake and say in the evolution of the aircraft.

"And this is particularly important because the aircraft is software upgradeable.

"This allows us working with the USN to drive the innovation of the aircraft and its systems going forward."

"We've been allowed to grow and develop our requirements collectively. We think this is very far sighted by the USN as well. I think we've got the ability to influence the USN, and the USN have had the ability to influence us in many of the ways that we do things."

"We will be doing things differently going forward. It is an interactive learning process that we are setting up and it is foundational in character. We're generating generation's worth of relationship building, and networking between the communities. We are doing that over an extended period of time."

"For about three years we have been embedding people within the USN's organization. There are friendships that are being forged, and those relationships are going to take that growth path for collaboration forward for generations to come.



“When you can ring up the bloke that you did such and such with, have a conversation, and take the effort forward because of that connection. That is a not well recognized but significant benefit through the collaborative program that we’re working at the moment.”

“We are shaping integration from the ground up. And we are doing so with the Australian Defence Force overall.”

### **I visited RAF Lossiemouth as well where the Brits are standing up their P-8 base.**

With the sun setting of the Nimrod, the RAF kept their skill sets alive by taking Nimrod operators and putting them onboard planes flying in NATO exercises, most notably the Joint Warrior exercises run from the UK.

This has been a challenge obviously to key skill sets alive with no airplane of your own, but the US and allied navies worked collectively as the bridge until the Brits get the new aircraft.

And the base being built at Lossiemouth will house not only UK aircraft, but allow Norwegians to train, and the US to operate as well.

### **Indeed, what was clear from discussions at Lossie is that the infrastructure is being built from the ground up with broader considerations in mind, notably in effect building a 21st century MDA highway.**

The RAF is building capacity in its P-8 hangers for visiting aircraft such as the RAAF, the USN, or the Norwegian Air Force to train and operate from Lossiemouth. In many ways, the thinking is similar to how building the F-35 enterprise out from the UK to Northern Europe is being shaped as well.

In effect, an MDA highway being built from Lossie and the F-35 reach from the UK to Northern Europe are about shaping common, convergent capabilities that will allow for expanded joint and combined operational capabilities.

### **At this is not an add on but built from the ground up.**

Flying the same ISR/C2/strike aircraft, will pose a central challenge with regard to how best to share combat data in a fluid situation demanding timely and effective decision-making?

The UK is clearly a key player in shaping the way ahead on both the P-8 and F-35 enterprises, not just by investing in both platforms, but building the infrastructure and training a new generation of operators and maintainers as well.

At the heart of this learning process are the solid working relationships among the professional military in working towards innovative concepts of operations.

### **This is a work in progress that requires infrastructure, platforms, training and openness in shaping evolving working relationships.**

Having visited Norway earlier this year and having discussed among other things, the coming of the P-8 and the F-35 in Norway, it is clear that what happens on the other side of the North Sea (i.e., the UK) is of keen interest to Norway.

And talking with the RAF and Royal Navy, the changes in Norway are also part of broader UK considerations when it comes to the reshaping of NATO defense capabilities in a dynamic region.

**In my interview with the new Chief of Staff of the Norwegian Air Force, Major General Skinnarland, she underscored how important she saw the collaborative from the ground up approach of operating new systems together.**

Referring to the F-35, she argued that “With the UK, the US, the Danes and the Dutch operating the same combat aircraft, there are clear opportunities to shape new common operational capabilities...

“And with the P-8s operating from the UK, Iceland, and Norway can shape a maritime domain awareness data capability which can inform our forces effectively as well but again, this requires work to share the data and to shape common concepts of operations.

“A key will be to exercise often and effectively together. To shape effective concepts of operations will require bringing the new equipment, and the people together to share experience and to shape a common way ahead.”

**In effect, a Maritime Domain Awareness highway or belt is being constructed from the UK through to Norway.**

A key challenge will be establishing ways to share data and enable rapid decision-making in a region where the Russians are modernizing forces and expanded reach into the Arctic.

Obviously a crucial missing in action player in this scheme is Canada. And in my discussions with Commonwealth members and Northern Europeans there is clear concern for disappearing Canadian capabilities.

Perhaps one way to enhance modernization of Canadian forces along with the Brits and the Norwegians would be to shape a joint buy with the UK and Norway to procure a set of Tritons in common and work common data sharing arrangements.

Or perhaps a model to sell data rather than buy aircraft might be considered as well which has been the model whereby Scan Eagle has operated with the USMC.

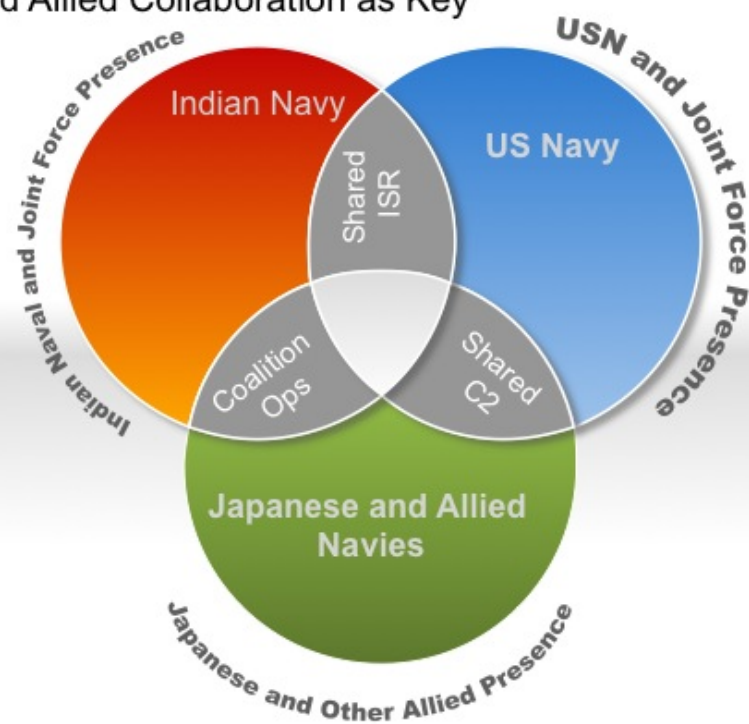
As the COS of the Norwegian Air Force put the challenge:

“We should plug and play in terms of our new capabilities; but that will not happen by itself, by simply adding new equipment.

“It will be hard work.”

# Indian and Pacific Ocean Security

Indian, U.S. and Allied Collaboration as Key



**And that will include the possibility of an expanded relationship with [India](#) as well.**

The Indians have purchased P-8s as well but have put unique systems on the aircraft to do many of the missions.

There is an inherent potential for India to work with the other P-8 partners as well but full cooperation will require reaching a number of data sharing agreements with the other P-8 partners.

**In effect, the P-8 will be part of the evolving naval collaborative framework between the Indians and the U.S. as well as with other allies.**

What makes the P-8 an especially interesting platform is that it is a shared platform between India and the U.S. with others (such as Australia) likely to join in and this sharing of a platform can provide a tool for enhancing collaboration in the daunting task of shaping effective ISR for 21st century maritime missions.

The opportunity is inherent in the technology; the challenge will be to shape the collaborative approach and shared concepts of operations.

The threats require nothing less.

# The Strategic Shift: Recovering and Building Out ASW Skill Sets

07/04/2018

As the land wars dominated the past 15 years, a number of key skill sets atrophied or certainly were drawn down.

A core one was clearly anti-submarine warfare skill sets.

As the defense of Northern Europe returns as a direct challenge to core NATO nations, recovering and building maritime domain awareness capabilities and the skill sets to prosecute threats is being highlighted as a key task in dealing with the new threat environment.

Currently, NATO is engaged in Dynamic Mongoose 2018 which is the second annual NATO-led maritime Anti-Submarine Warfare interoperability exercise and Norway is the host nation.



After Dynamic Manta, conducted in the Mediterranean, Mongoose is conducted off the coast of Norway and is scheduled for June 25 to July 6, 2018.

Naval forces from Canada, Denmark, France, Germany, the Netherlands, Norway, Spain, Turkey, the United Kingdom and the United States are participating in the NATO Allied Maritime Command-led exercise Dynamic Mongoose 2018.

According to NATO, the drill will be joined by two submarines, 7 surface warships and three maritime patrol aircraft. Dutch Navy frigate HNLMS Van Speijk, Spanish frigate ESPS Álvaro de Bazán and US destroyer USS Bainbridge are among the known participating units.

“This valuable training opportunity will allow us, in conjunction with our NATO allies and partners, to enhance our ASW capabilities, improve interoperability and ultimately strengthen the alliances that bind our nations together in mutual commitment to regional security,” said Cmdr. Chad R. Donnelly, commanding officer of Patrol Squadron (VP) 10, a US Navy maritime patrol squadron participating in the exercise.

The aim of this exercise is to provide all participants with complex and challenging warfare training to enhance their interoperability and proficiency in anti-submarine and anti-surface warfare skills.

<https://mc.nato.int/dmon18.aspx>

<https://navaltoday.com/2018/06/26/nato-asw-drill-dynamic-mongoose-gets-underway-off-norway/>

<https://news.usni.org/2018/07/03/nato-allies-partner-high-end-anti-submarine-warfare-exercise>

Recently, Adm. James Foggo, commander of U.S. Naval Forces Europe and Africa, highlighted the growing challenge which the presence and growth of the Russian submarine force posed to the US and its allies.

According to comments cited by [Stars and Stripes](#):

*Foggo said he's impressed with the missile-launching ability of Russian submarines, such as the Kilo-class boats deployed to the Mediterranean and the Black Sea. These diesel-electric submarines carry as many as 18 torpedoes and eight surface-to-air missiles.*

*Some Russian submarine missiles have the range to reach any European capital, Foggo said.*

*So I think it's important for us to have the situational awareness of where those platforms are operating at all times,” Foggo said. “We have seen the caliber of missile launches from their platforms into targets in Syria. (It) is a very capable weapon system.”*

# Canada and North Atlantic Defense: The Modernization of the CP-140

10/20/2017

By Robbin Laird and Murielle Delaporte

As the NATO allies focus on new threats and those posed by historic competitors, the need to reinforce North Atlantic defense is coming back into focus. As the former head of NORAD, Admiral Gortney, put it in an interview shortly before his departure:

*Put in simple terms, we need to shape a more integrated air and maritime force that can operate to defend the maritime and air approaches to North America as well as North America itself.*

*We can look at the evolving threat as a ten o'clock and a two o'clock fight, because they originate from the ten and two.*

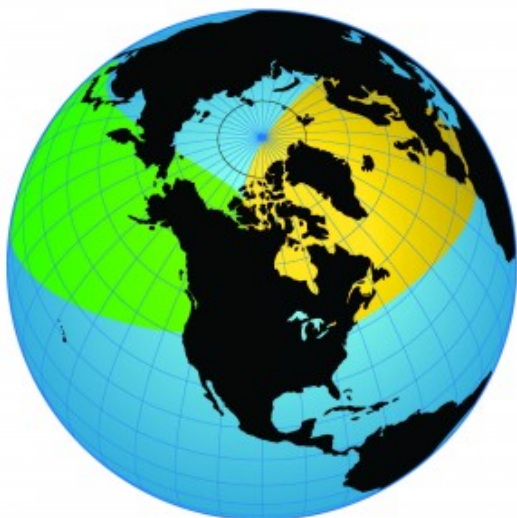
*And the ten o'clock fight is primarily right now an aviation fight.*

*They're moving capability there, but it's nothing like what they have at the two o'clock fight.*

*The two o'clock fight is more of a maritime fight.*

*And he underscored the importance of Canada in shaping capabilities to work the challenges.*

*For 58 years, we have had a bi-national command, NORAD. The current government faces a set of tough problems, not the least of which due to past governments not addressing re-capitalization.*





**This is a notional rendering of the 10 and 2 O'Clock challenge. It is credited to Second Line of Defense and not in any way an official rendering by any agency of the US government. It is meant for illustration purposes only. Credit: Second Line of Defense**

*Clearly, what they need to do is to recapitalize their air and maritime force, and preferably one that can work together from the ground up as an integrated force.*

*I think NORAD needs to become a multi-domain command, and their forces could flow into that command and out of that command as a key enabler.*

<https://sldinfo.com/north-american-defense-and-the-evolving-strategic-environment-admiral-gortney-focuses-on-the-need-to-defend-north-america-at-the-ten-and-two-oclock-positions/>

The current chief of staff of the Royal Canadian Air Force, Lt. General Hood, provided his perspective on the Canadian contribution to the challenges posed by Admiral Gortney, Lt. General Hood highlighted in a recent interview that a key element of how Canada was shaping its approach to working the challenges and working with allies was the modernization of their P-3, namely the Aurora CP-140.

While the UK, Norway, and the US Navy were adding new platforms, namely, the P-8 and in the case of the US Navy the Triton, the Canadian Air Force was focused on the modernization of the brain of the P-3, and shaping a new workflow within the aircraft as the 21<sup>st</sup> century maritime domain awareness and strike enterprise evolves in the North Atlantic.

*"Out of all the NATO ASW platforms in there," says LGen Hood, "the most effective one has been our CP-140. I am exceptionally proud of our ASW capability, and when I couple it with the new advanced capability on our upgraded frigates, I see us a backbone of NATO's ASW capability."*



RCAF Commander LGen Michael Hood (Photo: Sgt Paz Quillé, RCAF PA Imagery)

*Over the decade ahead, as the maritime domain awareness and strike enterprise is reworked with the coming of the P-8 and the Triton (among other assets) Canada will add an unmanned capability, continue upgrading the CP-140, and work closely with allies in reshaping the maritime domain awareness and strike networks. New satellite sensor and communications systems will also be added.*

*According to LGen Hood, this will allow the RCAF to leverage developments in the next decade to determine what needs to be put on their replacement manned air platform and to determine which air*



*platform that would be. "The government's new defence policy lays out a 20-year funding line that recapitalizes our air force."*

*He acknowledges that the eventual replacement of the CP-140 is funded in that policy but explains that this is not a near term need. "We have better capability from an ASW perspective in the CP-140 than comes off the line presently in the P-8. We have just gone through a Block III upgrade that has completely modernized the ASW capability as well as adding an overland ISR piece. We have replaced the wings on many major empennage [tail assembly] points and the goal is to get our CP-140 out to about 2032 when we're going to replace it with another platform."*

*He notes that next year, the CP-140s will receive a Block IV upgrade which will include new infrared counter measures, a tactical data link 16 to complement link 11 and full motion video, imagery, email, chat, and VOIP.*

<http://defence.frontline.online/article/2017/4/8102-Maritime-Threats-to-the-North-Atlantic>

Recently, we had a chance to visit 14 Wing at Greenwood, located in Nova Scotia.

During our visit on September 19, 2017 we spent a full day on the base flying on the Aurora, being briefed on the evolving approaches to training for ASW and other operations, and discussing the way ahead with Lt. Col. Bruno Baker, Deputy Commander of the Wing.

Lt. Col. Baker recently was the commanding officer of the training squadron as well which provided him with a unique knowledge set about the modernization and operational approach of the Aurora and working with allies. He has been a P-3 operator during his entire service in the Air Force

### **Question: Why is it the CP-140 and not the P-3?**

Lt. Col. Baker: "Canada purchased empty P-3 Orion airframes and added to it the best anti-submarine warfare suite of the day which was found in the S-3 Viking and have modernized from that hybrid forward.

"We were one of the leading nations in ASW, unquestionably, in the 1980s because we had the best equipment with the best airframe, put together.

"The plane has undergone a life extension program.

"The plane was stripped down to become a virtual tube and the new wings and tails were installed which overall gives us 15 more years of operational life in the airframe.

"Throughout the Alliance, there was not much appetite to invest in ASW once the cold war was over.

"We tended to run in place.

"To move forward, we have focused on the Aurora Incremental Modernization Program or AIMP.

“Block One is considered the original airplane.

“In Block 2 we focused on a cockpit-centric modernization. We added flight management systems, gps and much more to facilitate modernization in terms of operating the aircraft.

“But it didn’t change anything in our operational capabilities.

“In other words, Block 2 were front end upgrades.

“We did add a new capability in the course of modernization not tied to any particular block, namely the MX-20 EO IR camera that was a significant upgrade to enhance our capabilities for persistent surveillance.

“The addition of this capability caused a shift in our mission sets to add providing support to overland operations.

**We are the main ISR operating asset for the RCAF and as such have operated for some time in this role in the Middle East.”**

**Question: What changes did Block 3 bring?**

Lt. Col. Baker: “This was the game changer for the Aurora operationally.

Block Three brought basically all new capabilities in the tactical side of the airplane for ASW, communications, and just a new way to look at things.

**“The capability enhancements were such that we gave a new designator to the airplane.**

“Block Three modified airplanes are referred to as the CP-140M.

“Improvements were made in all areas, but the biggest change was in the acoustic sensing area.

“We added new computer and sensing capabilities.

**“The technology onboard –notably the display screens and the interchangeability of data displayed on those screens including in the cockpit — now allowed for a different workflow as the cockpit crew could now see the information being generated in the back end so that enhancing SA to all stations, including in the cockpit, provided a greater synergy and potential for new workflows throughout the airplane.**

“Block Three has also brought us an increased level of automation in the aircraft.

“So the sensors, as opposed to just spinning raw data that the operator needs to look at and analyze and make a decision what he’s looking at, there is a level of interpretation that is done by the systems

that is actually tailorable by the operators: how much they want, how much they want to look at, what do they want, what type of information.

“A lot of it’s much more visually intuitive, as well, as opposed to just looking at a gram dropping in front of you or lines on a gram and having to do the entire interpretation.

“There’s some visual representation of the information that the sensors are getting.

“For the younger generation of operators this really appeals to them. And they can process the information so much faster than the older generation. This is a shift in generations and approaches which will inform our way ahead as well.”

**Question: Somewhat similar or perhaps anticipating what is happening in the P-8?**

Lt. Col. Baker: Somewhat similar and allows us to share these workflow experiences and new approaches to SA with our allies as well.

**Question: MPAs are very flexible assets, and have been used widely in land operations, but this takes away from the ASW focus and skill sets. How has this challenge affected you?**

Lt. Col. Baker: We have been deployed in the Middle East since October of 2014.

“We’re it for ISR platform in Canada. We’re not an ideal platform, but we can do it.

“What I tell people is, it’s a little bit like taking a Ferrari to go grocery shopping. Sure you can do it. It’s not really what it’s designed for.

“And there is the challenge of keeping the ASW skill sets fresh as well.

“The skill sets are different. With regard to the ISR overland role, we are providing information for someone else to make the targeting decision.

“With regard to ASW, you are multi-mission and putting yourself in the position to either make the targeting decision or executing it.

“Clearly, the first is different from the second and the second more demanding.

**Question: In your ISR role, you are operating somewhat like a manned drone; but with ASW you are a C2, ISR, strike platform.**

**These are very different skill sets.**

**This must pose a challenge for training as well?**

Lt. Col. Baker: "It does and we are facing manpower shortages as well in our area of competence.

"We need to wring out the capabilities we already have in Block 3.

**"We haven't been able to develop the best way to tactically employ those new toys we got in ASW in part because of the focus on overland ISR.**

"The Block Three airplane is still being operated as a Block Two because we haven't had a chance to really develop the new tactics, which would allow us to exploit it to its full potential."

**Question: When you deploy an Aurora, how many people are involved in supporting the deployment?**

Lt. Col. Baker: "If we deploy two crews, two airplanes that is roughly eighty people. That's once you add the maintenance and the staff to run what we call a detachment."

**Question: There is a new framework underway, which the US Navy calls the kill web, in which the ability to reachback to various assets in the coalition allows one to enhance the reach in terms of the effect of one's platform. It is also about the evolving sensor-shooter relationship in the distributed environment. What is your sense of this change and how it affects the RCAF?**

Lt. Col. Baker: "We will always operate in a coalition or allied environment where you need to have those efficiencies by being able to integrate fully with each other.

"And we seek to maximize synergy.

"The older ASW approach was to operate alone and unafraid. The anti-submarine warfare platform was a fire-and-forget platform. You were given a mission, you took off, comms silent, did your job, and come back after eight hours.

"That is not the emerging approach.

"We have reachback, and we have command and control that is much more involved in operational and tactical operations.

"We need to reassess the ASW approach going forward and to shape an approach that is more capable of leveraging reachback but ensuring the proper C2 to get the job done where the impact of our systems can be greatest in terms of impact on a threat.

"And the introduction of new UAVs, like the Triton, could become a game changer as well.

"Is the next approach to park UAVs to monitor a wide, wide area and your manned platform becomes a sonobuoy carrier where it goes and lays barriers and then it leaves?

"Does the manned platform become the shooter in a broad UAV enabled sensor grid?

"The position that Canada is in might be an interesting one where for the next few decades, technology will develop, processes will develop, and platforms will evolve.

"Because our commitment to a new platform is a decade away, we might be able to position ourselves with the best solution that is emerging for us."

**Question: Does Block IV enable some of the changes we have been discussing?**

Lt. Col. Baker: "It does.

"Block IV is focused on hardware changes, which allow for continuous software upgrades and software changes which allow for software upgradeability.

"And will include some changes to communication systems as well which allow for changes in how the plane can work with others in the battlespace.

"In fact, with Block IV, the CP-140 will become its own Local Area Network which brings an interesting question from a maintenance perspective.

"Who maintains our software?

"We can't just think of aircraft technicians as being propeller specialists, or engine specialists or airframe specialists.

"We now also need to have IT specialists to fix our airplanes.

**"The question then becomes: do we train IT technicians to become aviation technicians or do we take airworthiness indoctrinated technicians to become IT specialists?"**

"Canada opted to go with the latter.

"The first Block IV configured Aurora will come to Greenwood next year. It will come to the 415 Squadron here, which is our force development squadron.

"Clearly, the days of the CP-140 are counted. But the technology development is still going on, because the lessons learned from the new technology development will be applied to the next platform.

"The government is not going to invest a whole lot of money in the platform anymore, but they will keep investing in the technology, in the war-fighting capability of the CP-140."

**Question: In your training capacity, how do you see the changes for the younger generation coming into the service?**

Lt. Col. Baker: “Many of the new personnel coming in off the street are being trained over a period of only a couple of years and then being put directly into operational experiences. When I became an Aurora pilot, I was one of the younger (in service) pilots because I had served for five years. The norm in those days was more around 7 years of service. That meant that pilots had had 5-7 years to be molded in the military norms.

“This is changing now as new entrants gain operational experience much faster. And we are working to change our training methods as well from being based on printed manuals to more intuitive computer based learning.

“We have very high capability simulation on the operational side that has been used to great effect to prepare our crews to deploy. That’s the only reason we can graduate them and send them in theater immediately, is because of the quality of the simulation we have.

“By involving the younger generation early in operations, we are highlighting their intuitive learning skills as well. With the shortages of human resources that we have now, it means that for many of them, they graduate from the OTU, they’re full crew members, and go to their operational squadron, and the first thing they do is get ready to deploy and deploy immediately after. And they are performing brilliantly well.

“For example, I have the case of a pilot, where I signed his logbook as graduating being an Aurora co-pilot in my role as the training squadron commander, and my congratulations, left a little note in his log book.

“Then I deployed to Operation IMPACT where I saw him a couple weeks later. He’s deploying, and the first flight he does is with me in theater. There’s a guy that I just graduated a few weeks before, now he’s flying with me in a no-duff theater of war. That’s pretty special.”

### **Editor’s Note: The Royal Canadian Air Force describes 14th Wing as follows:**

*Nestled in the heart of Nova Scotia’s beautiful Annapolis Valley rests 14 Wing Greenwood, the largest air base on the East Coast. Aurora crews conduct sovereignty and surveillance missions over the Atlantic Ocean routinely, while search and rescue capabilities are maintained 365 days of the year.*

*In 1942, CFB Greenwood was established as Royal Air Force Station as part of the British Commonwealth Air Training Plan (BCATP). The BCATP was a plan to expand all Commonwealth air forces. In keeping with this objective, Greenwood was used as a training base during WWII, and before the end of the war, produced operational forces.*

*Today, 14 Wing is home to three operational Squadrons. CP-140 Aurora Long Range patrol Aircraft are flown by 405 Long Range Patrol Squadron. 404 Long Range Patrol & Training Squadron, which operates both the Aurora flight deck and tactical simulators, also uses the long range patrol Aurora for operational and training purposes. 413 Transport and Rescue Squadron is responsible for search and rescue throughout Atlantic Canada and eastern parts of Quebec.*

*The Squadron members carry out their missions with both CC-130 Hercules Aircraft and CH-149 Cormorant Helicopters. In addition to its diversified operations, 14 Wing Greenwood is home to 14 Air Maintenance Squadron, responsible to maintain the entire CP-140 Aurora fleet operated here in Greenwood. The Wing has a large recreational facility (including a pool and an arena) and is home to hundreds of Air cadets every summer.*

*14 Wing is located at Canadian Forces Base Greenwood.*

<http://www.rcf-arc.forces.gc.ca/en/14-wing/index.page>

# **Evolving the Maritime Domain Awareness Strike Enterprise: An Interview with the Commander of Patrol and Reconnaissance Wing 11**

06/08/2016

By Robbin Laird and Ed Timperlake

The U.S. and its core allies are transforming systems, which tend to operate separately but then networked to gain greater synergy to ones which are “” from the ground up into a seamless offensive-defensive enterprise.

*In our book on the rebuilding of American military power in the context of shaping a new Pacific strategy, we highlighted the significance of shaping a new template for the synergy between defense and offense.*

*With the new multi-mission systems – 5th generation aircraft and Aegis for example – the key is presence and integration able to support strike or defense in a single operational presence capability. Now the adversary cannot be certain that you are simply putting down a marker.*

*This is what former Air Force Secretary Michael Wynne calls the attack and defense enterprise.*

*The strategic thrust of integrating modern systems is to create an a grid that can operate in an area as a seamless whole, able to strike or defend simultaneously. This is enabled by the evolution of C5ISR (Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance), and it is why Wynne has underscored for more than a decade that fifth generation aircraft are not merely replacements for existing tactical systems but a whole new approach to integrating defense and offense.....*

*By shaping a C5ISR system inextricably intertwined with platforms and assets, which can honeycomb an area of operation, an attack and defense enterprise can operate to deter aggressors and adversaries or to conduct successful military operations.*

**It is clear when you visit P-8/Triton Patrol and Reconnaissance Wing ELEVEN that the Navy is building their new maritime domain awareness capabilities from the ground up as a seamless module in a broader strike and defense enterprise.**



When we visited Jax Navy recently, we started our two-day visit with a discussion with Captain Anthony Corapi, the Wing Commander (his bio is found at the end of the article).

He has six squadrons all of which have transitioned to P-8 and are in the process of integrating a Triton Squadron into the Wing. He is merging P-8 with Triton into a new approach to providing strike enabled Maritime Domain Awareness (MDA) or MDA enabled strike, whichever way the flow needs to go.

In our discussion with Captain Corapi, he discovered how the evolution of the P-8/Triton dyad was subsuming within it several of the earlier capabilities flown by the US Navy to do ASW but was doing so from the standpoint of creating a whole new digital capability, one which could be seamlessly integrated with the air and maritime forces.

It is not just a Navy asset; it is a joint and combined warfighting capability, both informed by and informing the entire force operating in the extended battlespace.

It is also clear that the US Navy by deploying the P-8/Triton prior to the F-35 is coming at the redesign of airpower for the fleet from the perspective generated by the P-8/Triton “internationally” oriented approach as well.

The P-3 community is one of the most internationally oriented of any in the US Navy; it is clear that this tradition is crucial to the P-8/Triton rollout and operation as well.

**We started by simply discussing the point that the P-8 really is not a P-3 replacement.**

“As I transitioned and learned how to fly the P8, I was still using like a P3.

It’s hard to break 3000 plus hours of flying in a P3 and looking at it as something radically different.

**I’ve had to even teach myself that this is not a P3 replacement.**

What struck me the most when I got on board the aircraft for the first couple of flights is how it is so integrated into a network. For years the P3 was alone and unafraid.

It was really good at doing it. It had some good sensors at the time, but it’s ability to be networked was very, very minimal.”

**And change is coming rapidly as many of the crews of the P-8 have never operated on a P-3.**

“This airplane is completely different. It is much more automated, so much more. Everything is just set up so much different in the cockpit, just in particular.

We’re finding that the aircrews are making that leap with really no issue.

Because there’s so many young aviators now that have never seen a P3 and they’re innovating from the ground up, they’re learning how to fight the airplane in a completely different way.”

Much like the discussion of [Lt. General Davis](#) about the F-35 as a plane for the I-Pad generation, Captain Carapi talked about how innovation was operating in the Wing.

“In my opinion, if you want innovation to really happen you got to just let it go.

You can't hold onto it.

If you hold onto it and you try to mandate innovation, you will not innovate.

These young crews, do not know what they don't know.

They are not unlearning P-3 behavior; they are shaping new behavior appropriate to the digital age."

**The combat learning cycle undergone by the P-8 Wing and by the coming Triton squadrons is convergent with the software upgradeable nature of the new air systems.**

All of the squadrons in the Wing are the baseline P-8.

Soon these baseline aircraft will be upgraded to Increment 3.

Increment 3 will enhance the networking and communications capability of the aircraft.

**But the core point is that even the baseline aircraft is better than and different from the P-3 from the ground up and the crews are learning the skill sets for a P-8, rather than staying within the boundaries of what a P-3 can do and how it operates.**

"From the beginning, the newbies are learning P-8. Now you have a generation of aviators that have never been inside of a P-3.

Actually, I try to make them go onboard every once in a while to give them some appreciation and say, 'This is where you came from. This is your heritage.'

But they're learning to take this airplane in directions that wasn't even really intended to go.

I think you guys understand the acquisition strategy of the P8.

In 2005 we snapped a chalk line and we said, 'Technology, as it exists today, is what goes in this airplane.'

We'll do the spiral upgrades later.

It was a brilliant move."

**He provided an example of how they operate differently.**

When an operator on the P-8 sees anomalies but is not certain of what they are, the photo can be sent back at the speed of light for input.

"For example, on an ASW mission an acoustic operator looking at his displays as he's tracking a submarine, and he sees a line and he's not really sure what it is.

He wasn't briefed on that frequency. He takes a snap picture of it on his screen,

He sends it back to operators tactical operations center. He says, “Hey, I need you to take a look at this line. I wasn’t briefed on it. I’m not sure if it’s contact or was it something else? What is it?”

Then they’re able to go do some more in-depth research because they’re on the beach, he’s flying. They figure out it’s non-contact. And they go back to the operator and say, “It’s non-contact. Disregard.”

We asked him to provide more detail with regard to the Increment 3 Upgrades.

“We will have access to wideband sat communications which will give us a bigger data pipe and over the horizon reach. We will have the ability to push our communications over the horizon.”

Even though the networking is getting better, they are training to operate in the electronic magnetic warfare maneuver space.

The crews are being trained to execute commanders or mission intent and not have to rely on networks to execute their missions.

**In other words, they are training from the ground up to operate in denied communications space.**

*The dark side of being so networked is you get very used to it. You get very comfortable with the fact that I can talk to anybody, on any network, whenever I want.*

*You may not be able to.*

*Not just because it’s denied, but also, too, for protection. In electronic maneuver warfare, you want to keep the enemy guessing as to exactly where you are.*

*We’re starting to go back to the future and teach these kids what it’s like to take commander’s intent and go out and execute with very little guidance.*

*I’m getting my crews used to the fact where I’ll give them commander’s intent, I’ll give them a pretty good brief, and then I’ll turn everything off.*

*I’ll say, “Go. Go and operate.*

*You have commander’s intent.”*

*I want to see them think.*

What is also at stake is the ability to operate in a passive sensing environment which can operate as a key force multiplier as well.<sup>1</sup>

Clearly, the ability to network with space assets is a force multiplier, but what can be missed is that the P-8/Triton, F-35, Advanced Hawkeye airborne network can provide a powerful alternative in the case of disruption of space networks.

<http://spacenews.com/shaping-redundant-response-us-military-space-capabilities/>

**The P-8s as a multinational aircraft also brings significant expanded MDA capabilities to the allied or coalition force.**

“If we are truly in a networked environment with the same type model series, built on the same backbone, with these airplanes are all talking to each other, we can have incredible situational awareness.

It’s better than it was back in the height of the Cold War where it was sector ASW. Then a submarine would come out over the North Atlantic, from the Kola Peninsula, and it was handed off from one sector to another to monitor.

Now we can integrate the common operational picture over extended range. It is the reach of the COP; Not simply the range of the individual P-3, flying alone and unafraid.

We can have a layered picture across from the North to the Central Atlantic.”

**Indeed, a key question is emerging as fifth generation capabilities come to the fleet along with the other key software enabled and networked assets: how does the air power transformation reshape what the surface fleet can do and can contribute to operations in the expanded battlespace?**

And this is not just about ORGANIC carrier airpower; it is about airpower both joint and coalition as well.

A key development will be to reshape the shooter-sensor relationship.

**Rather than focusing on what weapons are carried on the P-8, the focus can be upon sensing the target and distributing the strike function.**

“We will see this earliest in the ASW community as we task ASW helicopters to lay ordinance on targets.

It will take time to get used to doing that with fast jets or surface assets. But we will get there.”

No platform fights alone.

**With the P-8/Triton becoming a high value asset, fighter protection will be an important part of the operational experience of the evolving offensive-defensive enterprise as well.**

“The P-8 is becoming an organic asset of the strike group. It is part of its combat reach and integrated into their networks as well.”

Because Captain Corapi is in the process of integrating the first Triton Squadron into a P-8 Air Wing, we discussed how he saw the process of integrating P-8 with Triton as well.

**He highlighted two key points.**

First, the Triton will be operated by crews with P-8 experience and would represent their shore duty. Even though they will be in Jax they will operate the aircraft in the battlespace.

He saw this as important to shaping the career paths of young crewmen and officers who would not like to be stovepiped into an “unmanned career.”

“It’s the Starbucks generation; right. They all like choices. Truly, you have to embrace that mentality. If you look them into one career path, they’ll fight it. They don’t want that. They want to know they have choice. So far, that’s the feedback we’ve been given is, hey, just let us choose.”

Second, with the two systems, the various aspects of electronic warfare deployed earlier via various aircraft can be subsumed and evolved from the two platforms, notably working with the Advanced Hawkeyes and the F-35s.

The first two operational birds will be baseline aircraft, largely radar birds. They will go operational rather than going through IOT&E. After the baseline, the following birds will have ELINT capabilities built in.

And he reminded us that the Triton was an Remotely Piloted Vehicle, not an unmanned one.

When VUP 19 is full up and running, the program of record for VUP 19 is three orbits, and an orbit is 24/7 365 in an orbit; when it’s up and running it will have fifth fleet, sixth fleet, and then the homeland defense East Coast orbit,

That’s three orbits. The command will approach over 500 people. That’s a pretty big manned command. It just means that there’s no one flying it in the actual cockpit. It’s just flown from a box, but it is very much a manned platform.

## **Visiting Jacksonville Naval Air Station: The “Family of Systems” and Naval Air Transformation**

**05/30/2016**

By Robbin Laird and Ed Timperlake

On May 23 and 24, 2016, we visited Jacksonville Naval Air Station and spent time with the P-8 and Triton community which is shaping a common culture guiding the transformation of the ASW and ISR side of Naval Air. The acquisition term for the effort is a “family of systems” whereby the P-3 is being “replaced” by the P-8 and the Triton Remotely Piloted Aircraft.

But clearly the combined capability is a replacement of the P-3 in only one sense – executing the anti-submarine warfare function. But the additional ISR and C2 enterprise being put in place to operate the combined P-8 and Triton capability is a much broader capability than the classic P-3.

Much like the Osprey transformed the USMC prior to flying the F-35, the P-8/Triton team is doing the same for the US Navy prior to incorporating the F-35 within the carrier air wing.

In addition to the Wing Commander and his Deputy Commander, who were very generous with their time and sharing of important insights, we had the opportunity to interviews with various members of the VP-16 P-8 squadron from CO and XO to Pilots, NFOs and Air Crew members, along with the wing weapons and training officer, the Triton FIT team, and key members of the Integrated Training Center. Those interviews will be published over the next few weeks.

The P-8/Triton capability is part of what we have described as 21<sup>st</sup> century air combat systems: software upgradeable, fleet deployed, currently with a multinational coalition emerging peer partnership. Already the Indians, the Aussies and the British are or will be flying the P-8s and all are in discussions to build commonality from the stand-up of the P-8 Forward.

Software upgradeability provides for a lifetime of combat learning to be reflected in the rewriting of the software code and continually modernizing existing combat systems, while adding new capabilities over the operational life of the aircraft. Over time, fleet knowledge will allow the US Navy and its partners to understand how best to maintain and support the aircraft while operating the missions effectively in support of global operations.

Reflecting on the visit there are several takeaways from our discussions with Navy Jax which we will discuss more fully in the period ahead as we build out the interviews.

A key point is how the USN is approaching the P-8/Triton combat partnership, which is the integration of manned, and unmanned systems, or what are now commonly called “remotes”. The Navy looked at the USAF experience and intentionally decided to not build a the Triton “remote” operational combat team that is stovepiped away from their P-8 Squadrons.

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.

The second key point is that the Commanders of both P-8 aviator and the soon to be operational Triton community understand that for transformation to occur the surface fleet has to understand what they can do. This dynamic “cross-deck” actually air to ship exchange can totally reshape surface fleet operations. To accelerate this process, officers from the P-8 community are right now being assigned to surface ships to rework their joint concepts of operations.

Exercises are now in demonstration and operational con-ops to explain and real world demonstrate what the capabilities this new and exciting aspect of Naval Air can bring to the fleet. One example was a recent exercise with an ARG-MEU where the P-8 recently exercised with the amphibious fleet off of the Virginia Capes.

The third key point is that the software upgradeability aspect of the airplane has driven a very strong partnership with industry to be able to have an open-ended approach to modernization. On the aircraft maintenance and supply elements of having successful mission ready aircraft it is an important and focused work in progress both inside the Navy (including Supply Corps) and continuing an important relationship with industry, especially at the Tech Rep Squadron/Wing level.

The fourth point is how important P-8 and Triton software upgradeability is, including concurrent modification to trainer/simulators and rigorous quality assurance for the fidelity of the information in shaping the future of the enterprise. The P-8s is part of a cluster of airplanes which have emerged defining the way ahead for combat airpower which are software upgradeable: the Australian Wedgetail, the global F-35, and the Advanced Hawkeye, all have the same dynamic modernization potential to which will be involved in all combat challenges of maritime operations.

It is about shaping a combat learning cycle in which software can be upgraded as the user groups shape real time what core needs they see to rapidly deal with the reactive enemy. All military technology is relative to a reactive enemy. It is about the



arsenal of democracy shifting from an industrial production line to a clean room and a computer lab as key shapers of competitive advantage.

<https://sldinfo.com/secretary-hagel-and-the-opportunity-for-industrial-mobilization/>

The fifth point is about weaponization and its impact. We have focused for years on the need for a weapons revolution since the U.S. forces, and as core allies are building common platforms with the growth potential to operate new weapons as they come on line. The P-8 is flying with a weapon load out from the past, but as we move forward, the ability of the P-8 to manage off board weapons or organic weapons will be enabled.

For example, there is no reason a high speed cruise or hypersonic missile on the hard points of the P-8 could not be loaded and able to strike a significant enemy combat asset at great distance and speed. There might be a day in future combat when P-8s crews will receive a Navy Cross and Presidential Unit Citation for not only killing an enemy sub but also a P-8 crew sinking a significant enemy surface combatant.

In short, the P-8/Triton team are at the cutting edge of naval air transformation within the entire maritime combat enterprise. And the US Navy is not doing this alone, as core allies are part of the transformation from the ground up.

## The P-8 Coming to RAF Lossiemouth: Shaping the Infrastructure for UK and NATO Defense in the North Atlantic

**07/14/2016**

By Robbin Laird

The P-8, which is a Maritime Domain Awareness Strike capability, is coming to RAF Lossiemouth.

**This is part of the transition for the base becoming a 21<sup>st</sup> century air base positioned in the North of the United Kingdom and positioned in a key area for the defense of the United Kingdom and for NATO.**

With Putin firing 50 officers in the Baltic fleet, in part, for not being aggressive enough, one does not have to imagine how important managing tensions in this part of the world is going to be.

[RAF Lossiemouth](#) currently is a Typhoon and Tornado base, but with the Tornados to be phased out within the next few years, the Typhoons will be joined by the P-8s.

This provides the opportunity to integrate the Typhoons with P-8s with the F-35s, which will operate off shore from the new carriers or, in other words, shaping a kill web to protect the homeland and to anchor the defense of the Northern NATO countries.

**In effect, Lossie will train to support the formation and evolution of a 21st century combat force in which a multi-mission combat fleet of Typhoons will work with the maritime-focused but land-based capable maritime combat system which is the P-8, and which, in turn, will work with the multi-tasking flying combat system which is the F-35.**

According to an article by Ben Hendry in The Press and Journal published on July 13, 2016:

*The UK Government has purchased a fleet of nine P-8 Poseidon aircraft, each worth about £150million, which will be based at Lossiemouth.*

*And the Ministry of Defence (MoD) has entered a partnership with US aircraft manufacturer Boeing to create a £100million training centre at the Moray base.*

*More than 400 new personnel will be stationed at Lossiemouth to operate the aircraft, and 100 more will be recruited to serve in the support centre.*

*The estimated cost of developing the planes could reach £3billion over the next decade.....*

*As part of a historic agreement with the UK Government, Boeing has decided to create a £100million complex at RAF Lossiemouth, which it will use as its main training base for pilots across Europe.*

*The building is expected to open in 2019, in preparation for the first of the Poseidon craft arriving in 2020.*

*Yesterday, RAF Lossiemouth confirmed that high-ranking officers would spend the summer months mapping out how the huge facility will be sited in its grounds.*

[https://www.pressandjournal.co.uk/fp/news/moray/972801/boeing-boost-to-moray-finance/?utm\\_source=Sailthru&utm\\_medium=email&utm\\_campaign=PJ%20Daily%20Newsletter%202016-07-13&utm\\_term=Press%20and%20Journal%20-%20Newsletter](https://www.pressandjournal.co.uk/fp/news/moray/972801/boeing-boost-to-moray-finance/?utm_source=Sailthru&utm_medium=email&utm_campaign=PJ%20Daily%20Newsletter%202016-07-13&utm_term=Press%20and%20Journal%20-%20Newsletter)

The RAF has kept skill sets alive after the decision to retire the Nimrod Maritime Patrol Aircraft in 2011.

To do so, the MoD has set up a “seed corn” program to support skill sets without actually having a relevant UK plane.

**This is challenging, but NATO exercises have played their part.**

And the Joint Warrior exercises held at RAF Lossiemouth have been part of the solution whereby former Nimrod operators have been able to fly on allied planes to keep their skill sets current. But it is challenging to have cutting edge skill sets and fly on someone else’s plane episodically.

This will no longer be the case as the RAF trains its own personnel for the P-8 experience both in Jax Navy and then at RAF Lossiemouth.

The new training center at Lossie will be an important contributor for the effort as well.

**But these skill sets will be different from those shaped by the Nimrod experience.**

As Wing Commander Paul Froome OC XV(R) Squadron put it in an interview in April 2016 during a visit to RAF Lossiemouth:

“The P-8 is clearly not Nimrod.

“If we think that we’re going to take an old-fashioned air electronics operator, and use him in the same way on the P8, we’re missing a trick.

“We need to be developing the crews now to be maritime warfare operators, not electronic operators, and radar, and wet and dry, we need to be thinking bigger than that.

“If we don’t, then you end up making problems for your F-35, your Typhoon, your P8, your Reaper, your Son of Reaper.”

**And during that same visit, there was chance to discuss the coming of the P-8 to the RAF.**

The key RAF officer involved had met with a Navy Captain who had deployed with the P-8 to the Joint Warrior exercise.

During that meeting, the RAF officer highlighted that he was very impressed with the aircraft and very interested in the weapons hard points on the aircraft and their potential for operating in the North Atlantic.

It turns out that the USN Captain involved was none other than Captain Robinson, Deputy Commander, Patrol and Reconnaissance Wing ELEVEN, whom we interviewed later at Jax Navy and at the time remembered the exchange well and in his train and equip role was talking with the Brits about future infrastructure for support to the P-8.

Captain Robinson had worked earlier for Admiral Gortney who in our interview with him had highlighted the threats at the 10 and 2 O’Clock to North America, and when at Joint Warrior, Captain Robinson was operating in the 2’Oclock.

**There is a chance to shape a much broader interlocking defense system with the Northern European states, which after Brexit, might be even more important to UK defense thinking.**

Norway is interested as well in the P-8 which then create a significant interlocking force. For Norway, because the P-8 is not a P-3, they would benefit from seeing much deeper into the maritime space to protect their interests.

**With the P-8, unlike a Nimrod or a P-3, it is not just about flying to an area of interest and patrolling it.**

When you take off with the P-8 you link into the data network and are on station when you take off.

You are flying in the area of interest from the moment you take off from RAF Lossiemouth.

Another reason why RAF Lossiemouth may have been chosen is that it is home to a 24/7 Quick Reaction Alert Typhoon squadron and as such is positioned to operate the P-8 in a 24/7 manner as well.

**The Cover Photo: Officer Commanding No. 92 Wing, Royal Australian Air Force, Group Captain Darren Goldie, alongside the ATM-84J Harpoon loaded on the P-8A Poseidon at Marine Corps Base Hawaii, during RIMPAC 2018. Credit: Australian Department of Defence.**