The ACE of the Future: Yuma and Beyond

THE FUTURE OF POWER PROJECTION

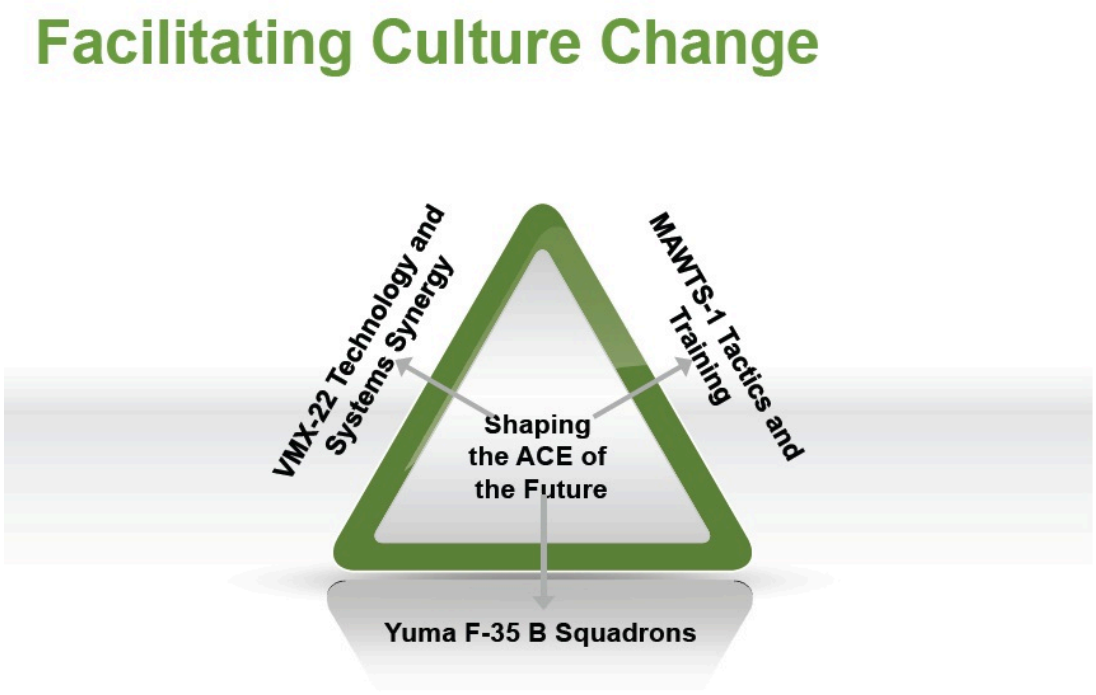
SHAPING CON-OPS FOR THE NEW AVIATION ASSETS

THE ACE OF THE FUTURE: YUMA AND BEYOND

Introduction

The Marines have stood up their first squadron of F-35 Bs at MCAS Yuma.

But the Marine Corps approach to the aircraft is built on recognition that in addition to its role as a strike aircraft, it has C2 and Information Warfare capabilities, which will make it a central piece to the ACE or Aviation Combat Element of the MAGTF.



To shape the approach, to determine the evolution of the aircraft is firmly rooted in a triangular approach taking shape at Yuma.

Two squadrons will be established and are the operators. MAWTS-1 will develop tactics and training for the F-35 B in conjunction with the other aviation elements for the ACE. And VMX-22 will focus on the technologies and systems of the platforms making up the evolving ACE for the MAGTF.

The colocation of VMX-22, the F-35 squadrons and MAWTs will facilitate the kind of culture change which the F-35 enables for the MAGTF. Credit Image: SLD

As Michael Orr, the CO of the squadron underscored, "we are testing all USMC platforms working together in developing Marine aviation capabilities. We are not just testing individual platforms. This is especially crucial when you have dynamic, transformational platforms such as the Osprey and the F-35."

This special report focuses upon the process of setting up such an innovative combat development approach and using it to inform deployments to the Pacific. Notably, interviews with the 7th USAF Commander in South Korea, Lt. General Robling, MarForPac, and with members of the team shaping the new USS America class ship to be home ported in the Pacific and carrying the new combat capabilities are included to underscore how these capabilities might be used.

It also reaches back to the F-35 training center at Eglin where the pilots and maintainers are being trained for Yuma among other locations for the joint and coalition partners.

But the story really starts with the evolution of the Osprey. And so we start with a look at the Osprey at 5.

Osprey at Five: Looking Forward to the Future

8/31/12 by Robbin Laird

This September, the Osprey will reach a 5-year mark in its operational deployment history.

In September 2007, the Osprey was deployed for the first time to Iraq. The USMC Commandant Conway and Deputy Commandant of Aviation Castellaw announced and made the decision to deploy the Osprey into combat although virtually all public commentators thought this was too early for an "untested" airplane, as one critic put it.

The plane has not only done well, but in 5 short years has demonstrated its capability to have not only a significant impact on combat but t0 re-shape thinking about concepts of operations.

In this piece, I would like to reflect back on these 5 years, not just to grasp lessons learned, but glimmers of where the plane, and the USN-USMC team might well be able to move into the future.

The story of the evolution of the con-ops surrounding the plane provides a solid foundation for innovation and transformation of concepts of operations for the USN-USMC team, if boldness overcomes timidity.

In this regard, it is important to go back to the founders of the modern U.S. Navy who understood that one builds strategy around what is coming, not where one has been. One builds on F-35s and Ospreys, not F-18s and CH-46s.

As noted in an earlier piece on *AOL Defense*:

In 1924 a very accomplished Admiral grasped that action/reaction vision for the future

The President of the Naval War College overseeing these discussions (studying the complexities of British and German Fleet tactics during the Battle of Jutland in WWI) was none other than Admiral William S. Sims, who had already influenced King's and Bill Halsey's development of destroyer techniques, not to mention the convoy system. When Sims spread his war games fleet across the plotting board, he introduced aircraft carriers to the mix–even though Lexington and Saratoga were still months away from commissioning-and he argued that the aircraft carrier would replace the battleship as the navy's capital ship. The reason was that carriers presented a 360-degree range of firepower via their aircraft that far outdistanced the radius of a battleships' guns.

Sim's fixation with a widening circle of projected power may have influenced Nimitz's fellow classmate-both at Annapolis and now at the Naval War College-Commander Roscoe C MacFall when he took his turn at the plotting board. Rather than placing his ships in long lines, MacFall arrayed his fleet in concentric circles around his capital ships-admittedly still battleships. The tactical advantage was that with a common pivot point in the center of the circle, all ships could turn together and remain in formation.

(Page 131 The Admirals by Walter R. Borneman, May 2012)"

Each year for the past 4 years, I have driven down to New River Air Station and interviewed pilots and logisticians for the Osprey.

As a result, I have had the opportunity to hear from the operators what they are doing and what they have learned during this roll-out period. This year was no different and I had the opportunity to sit down with three experienced pilots and leaders in what is called the "Osprey Nation," or the growing group of young aviators and maintainers who form the nucleus of the future of the USMC and of power projection.

We can start first with the decision of USMC leaders to deploy the plane to Iraq.

This deployment was itself part of the "testing" process. What is often overlooked is that testing is really done by pilots and maintainers in combat, not by technicians in white coats or statisticians at the GAO. There was clear concern expressed to me by Marine Corps Aviators that the deployment to Iraq would prove challenging, and its was. But it was also evidence of the role of leadership in making the hard decisions to role out needed capabilities and let the users define the direction of a program, not the program managers.

The deployments have been on land – Iraq and Afghanistan – as well as at sea. The plane and its crews have been tested in combat and in real world operations.

What we have seen is that the plane started with "training wheels on" its deployments, and those wheels not only have been thrown off, but as time in combat has gone up, the Marines as well as the Combatant Commanders have begun to understand what a transformational platform can do when connected with other capabilities and assets.

An Osprey involved in an exercise aboard the HMS Illustrious in 2007 prior to deployment to Iraq. Credit Photo: SLD

The plane started in Iraq built around a famous diagram showing the speed and range of the aircraft in covering Iraq. As one Marine commented: "The MV-22 in the AO was like turning the size of the state of Texas into the size of Rhode Island."

It was the only "helicopter" that could completely cover Iraqi territory. And in this role, the testing of support as well as operational capabilities was somewhat limited as Marines tested out capabilities and dealt with operational

challenges. The plane was largely used for passenger and cargo transport in support operations in difficult terrain and operating conditions.

It was used for assault operations from the beginning but over time, the role would expand as the support structure matured, readiness rates grew and airplane availability become increasingly robust.

From the beginning the aircraft impressed and foreshadowed later developments. As General Walsh, now Deputy Commanding General
Marine Corps Combat Development Command noted in an interview at the Cherry Point Air Station in 2009 after a year in Iraq that with the withdrawal of US forces from Iraq there was a roll up of forward operating bases.

This meant that the remaining forces had to cover more ground and to provide protection at greater distance.

Enter the Osprey, which did not require FOBs to provide lift and support to forward deployed forces.

Indeed, General Walsh underscored that as the US forces withdraw, there was demand for more - not less - airpower.

This happened on several levels.

On one level, this was due to the drawdown of the number of combat posts, which supported operations in Iraq. American forces continued to work with Iraqi forces but now had to commute from distance to do their work, rather than being in close proximity to combat posts. This meant that airpower had to provide regular support to the transit of US forces working with Iraqis. "At one point we had 140 combat posts; while we were there we went from 36 to 4 combat posts; so air was relied on more frequently for convoy protection. As we drew down combat posts and associated capabilities, air was relied on for capabilities which had earlier been largely provided by the ground forces."

On another level, this was due to the need to protect the convoys moving equipment out of Iraq. ""As you close down and do retrograde, you have to move further out in road miles and that requires air support."

In addition, transport needs to move support elements to work with Iraqis increased demands for air transport. "We were increasingly asked to provide support for partnering operations."

Passengers board an MV-22 Osprey before a flight June 3. Marine Medium Tiltrotor Squadron 162 transports troops and civilians day and night in support of Operation Iraqi Freedom. June 3, 2008. Credit: USMC 3rd MAW

Iraq was the beginning and a consciousness raiser for troops and commanders.

One story told to me in 2010 by a battle-hardened Marine was as follows:

Major Lee York: We took some soldiers out to the West of Iraq. The crew chief comes up to us and tells us that the guys won't get out of the plane. We're like, what are you talking about? They said we're not there yet. And we said, "What are you talking about?" He then said, "The last time we did this flight it took an hour and a half. We've only been in the plane for 40 minutes so we can't be there yet."

"The last time we did this flight it took an hour and a half. We've only been in the plane for 40 minutes so we can't be there yet."

We told him to tell the Marines that "we were cruising at 230 rather than at 120 so we were there. I swear we're here, you know, we're not going to send him somewhere where he is not supposed to be."

Next on the agenda was the beginning of deployments to Afghanistan, which of course continue.

The Afghan phase of deployments has seen the aircraft and its operator's transition to more assault combat operations over time, to the point where the latest Osprey squadron just came back from Afghanistan with record setting assault operations for the Osprey.

Osprey Operations in Afghanistan in Challenging Conditions, 2009 (Credit: USMC)

A metric to measure the transition can be seen in the number of named operations the Osprey squadron participated in in Afghanistan. Over time, the Osprey squadrons have significantly increased their involvement in what the military calls Named Operations, and these operations are air assault operations in support of U.S. and coalition forces. The latest squadron VMM-365 (the Blue Knights) conducted nearly 200 named operations, which was a 20-fold increase over the squadron which preceded it in Afghanistan.

In the words of the head of 2nd Marine Air Wing – Major General Glen Walters — upon his return from Afghanistan:

The Ospreys had their normal fair share of general support, resupplies, etc. But we started accelerating their use as my time there went on, and used them for both the conventional and Special Forces operations.

The beauty of the speed of the Osprey is that you can get the Special Operations forces where they need to be and to augment what the conventional forces were doing and thereby take pressure off of the conventional forces. And with the SAME assets, you could make multiple trips or make multiple hits, which allowed us to shape what the Taliban was trying to do.

The Taliban has a very rudimentary but effective early warning system for counter-air. They spaced guys around their area of interest, their headquarters, etc. Then they would call in on cell or satellite phones to chat or track. It was very easy for them to track. They had names for our aircraft, like the CH-53s, which they called "Fat Cows."

But they did not talk much about the Osprey because they were so quick and lethal.

And because of its speed and range, you did not have to come on the axis that would expect. You could go around, or behind them and then zip in. We also started expanding our night operations with the Osprey. We rigged up a V-22 for battlefield illumination.

A lot of these mission sets were never designed into the V-22 but you put it into the field and configure it to do the various missions required. And we have new software for the Ospreys in Afghanistan where you can pick your approach, angle, approach speed and let the aircraft do it all. That is a huge safety gain.

The start of this transition to a tip of the spear air assault capability was seen at the beginning of the Osprey's deployment in Afghanistan.

In a phone interview, which I conducted with the Osprey squadron commander in early February 2010, the evolving role was evident.

According to Lt. Col. Bianca, the Osprey squadron commander:

Here is something that no one ever thinks about until one gets here. It is one thing for me to do an assault support mission where I insert troops to a location. It is quite another to talk about distributed operations.

In other words, if I am here at this airport, the troops I have to move are way over there, and the place I got to get them to is way over that way and if you want to do this in one cycle of darkness, you are going to have to put some speed on it, or you are going to have to make this a two-day evolution to move the troops here, and then get them there, so that you can do the mission.

You cannot lose sight of that either. So, even if it was to be characterized very placidly as "ferrying" of troops, there is that speed component. Football is a game of inches: combat is a game of minutes or even seconds, and that can matter.

From the distributed angle, never forget that the troops just get on the airplane here at Camp Leatherneck: they are not here at Camp Leatherneck; they are always somewhere else.

We have to go there first and then, move them to wherever the operation is going to go. And whatever one's characterization of the operation – whether it is an assault or a town meeting -, it is time-urgent mobility.

We are moving folks to places in this country that you just cannot get to in a timely manner any other way. You simply cannot. You cannot get in a car and drive there. You can get in a helicopter and fly there, but that is going to take you two and a half or

three hours. Your only option is to get into a V-22, because "I got to get to that corner in the open world, - no roads, nothing there -, we got to go do it", and that, then, becomes our mission.

See also:

http://www.sldinfo.com/mv-22-in-afghanistan/

http://www.sldinfo.com/vmm-261-inserts-troops-into-marjah/

Next up, was the challenge of understanding what the Osprey brought to the fight seen from the perspective of the USN-USMC team.

The plane was clearly not a rotorcraft; it was not a replacement for the CH-46.

But it took a while for the concepts of operations to change and commanders to understand fully that they did not have to operate in a fairly constricted operational box of a couple of hundred miles for the ARG-MEU and could think about a 1,000 plus operational area.

As one Marine described the transition and the challenge to adapting to what the Osprey can do with fast jets:

The speed and range of the aircraft is a game changer. But it's the endurance of the aircraft itself. Basically you might say once it's flying, it's flying. And we had a lot of missions that required flight time above six hours, which is very taxing for the jet guys and for us, it is as well, but maybe not so bad because we can trade off in the cockpit. The fact is that you can have airborne assets, both as a package as well as a trap for sensitive site exploitations, being airborne all at the same time for hours at a time to respond to something that happens in the AOR. It will give you the maximum flexibility for response time down to something like thirty minutes, depending on where it is. And then sanitize the scene from there and then everybody returns home. It's a capability that I'm not going to say it's been overlooked but it just hasn't been utilized like that.

We just didn't really have that capability before, especially on much longer ranges and in sort of response time. So by marrying those two, the fixed-wing aviation asset we can do operations differently. We could neutralize a target and then you can immediately have a strike team insert to confirm that whatever happen, happened, give whatever materials they need, get back on an aircraft and leave in under thirty minutes in any location that we're operating on a 600-mile ring. This is just so amazing for me.

Enter Libya and linking the Osprey to the USN-USMC Gator navy opened up a whole new capability.

The Osprey Landing on the French Warship Tonnere (Credit: French Navy, http://www.sldinfo.com/us-marines-aboard-the-french-warship-fns-tonnerre/)

The Gator navy began its transition from Greyhound Bus to a new strike force capability.

The ability to link seamlessly support services ashore with the deployed fleet via the Osprey allowed the Harriers aboard the USS Kearsarge to increase their sortie rates dramatically. By providing a whole new speed and range enablement of the strike fleet aboard a large deck amphibious ship, the future was being re-defined by the Osprey.

As Lt. Col. Boniface, commanding officer of VMM 266, but the Osprey leader in Operation Odyssey Dawn, argued:

A complete transformation to how we are doing business has been involved by operating the Osprey. In order for the USS Kearsarge, the ARG and the 26th MEU to stay in their operational box during Operation ODESSEY DAWN, and enable the Harriers to continue their strike mission, we were reliant on other assets to supply us. For many supply items, the Osprey provided the logistical link to allow the ARG to stay on station and not have to move towards at sea re-supply points and meet re-supply ships.

Without the Osprey you would have to pull the USS Kearsarge out of its operational box and send it somewhere where it can get close enough to land or get close enough to resupply ships to actually do the replenishment at sea. Or you would be forced to remain where you are at and increase the time you're going to wait for this part by three, four days or even a week.

The ARG ships are only moving at 14-15 knots. At best, let's just say they move an average of 13 knots per hour, and add that up for the 300 miles that you have to sail. Now you're looking at least a day to get the needed folks, parts or equipment and then the transit time back to the operational box. The V22 will do that in a couple hours and allow the ARG/MEU to keep executing its mission.

And now fast forward to Bold Alligator 2012, the largest amphibious exercise held since 1996.

A major difference from 1996 to 2012 was the appearance of the Osprey. Indeed, the existence, deployment and appearance of the Osprey changed the entire approach to thinking about amphibious assault.

An MV-22 Osprey lands on the flight deck of the amphibious assault ship USS Kearsarge (LHD 3) to receive and transport troops during the amphibious assault phase of Bold Alligator 2012. Credit: USN

While observors stood on the beach waiting for the assault, Ospreys were already part of taking an "enemy" fort deep in the terrain. And not only that but one of the Ospreys deployed from a supply ship!

Prior to commenting on where the dynamics of change may move forward in the near to mid-term, it should be noted the path whereby innovation has occurred. It takes time, as one Marine told me. The Marines built up over this 5 year period a significant and growing number of member of the "Osprey Nation" and these folks then generated further capacity to learn and change. Not Inside the Beltway but on the battlefield.

Moving forward, using a term I used in the Bold Alligator piece, we can see glimpses of the future, which could lead to a cascading of change in operational approaches and capabilities if leadership will allow.

I would mention three prospects for change.

First will be the impact of the "self-deployment" capability of the Osprey. The Osprey is able to with tanking fly directly to the area of operation. Try doing that with a helicopter. In fact, self-deployment is now being used in bringing Ospreys back from Afghanistan and used regularly in exercises.

Ospreys Landing at Camp Bastion After "Self-Deploying" Off of Amphib (Credit: USMC)

Self-deployment means that there is a possibility of rethinking how the seabase can work with land-based air.

Ospreys can move with the fleet, but be reinforced from land based Ospreys in plussing up air assault capabilities.

Second is the impact of a new system like the Osprey on removing problems, which threaten our warriors. There is a significant dimension to combat, which can refer to problems avoided because of the performance and reliability of the new systems. The Osprey has avoided strikes, which would have taken down CH-46s whether from manpads, RPGs or other weapons fire. The Ospreys have proven robust in combat, where aircraft damaged by ground fire have used their digital management systems and redundant systems to self correct and like the Timex watch ad, keep on ticking.

Old equipment is just that and puts warriors in harms way. I don't see the Inside the Beltway people flying Caravelles but that is what we are asking our warriors to do way too often.

Third, the coming of the F-35B to the fleet coupled with the Osprey is a significant game changer. It will lead in the words of Lt. Col. Boniface, to a "Tsunami of Change."

I sort of think of it like a game of chess. I think of a traditional or legacy ARG-MEU as being able to move a pawn one space at a time towards the enemy. If you have ever played chess it sometimes take a while to engage your opponent. We now have the ability to move a knight, bishop, or rook off of this same chess board and attack 180 degrees towards the rear of our enemy. We can go directly after the king. Yes, it's not really fair, but I like that fact. The speed, range, and don't forget the reliability of the MV-22 allows me to do this.

We talk about staying ahead of the bow wave.

Well there is a tsunami of change coming when we talk about the ability to fight an enemy and to support Marines ashore.

We can increase our area of operations (AOR) exponentially because we can spread out our ships; now we have an aviation connector that can move Marines a tremendous amount of distance and in a very short amount of time. We can also use this capability to leverage our other aviation assets like our AV8-Bs, CH-53's, AH-1Ws and UH-1Ys to support the MAGTF and ultimately damage the enemy's will to fight. Let's not just move 50-100 miles ashore, but let's move 200-500 miles ashore, and do it at an increased speed, range and lethality.

The USMC in Transition: The Impact of Yuma

12/5/12 *Second Line of Defense* has provided significant coverage of the Osprey and the F-35B and their impact on the evolution of the USMC and of the role of air systems in the evolution of combat operations.

Surprisingly, or perhaps not so, there was little national press presence at the arrival of the F-35 at Marine Corps Air Station Yuma this month.

With all the words written about the F-35, it is interesting to note as the plane becomes an operational reality, there are very few words about that phenomenon.

For the Marines, the linkage of the F-35 with the Osprey and other air and ground elements is re-shaping their basic approach and combat power of the MAGTF.

In a discussion with the former Deputy Commandant of Aviation, Lieutenant General George Trautman, this evolution was discussed. It is important to note that several years prior to the recent Yuma events, the USMC leadership had set in motion ways to leverage the new technologies.

In other words, leadership matters in shaping the Cultural Revolution associated with the Osprey and the F-35.

The revolution is not concomitant with simply buying and introducing new technologies or platforms but is rooted in changing operational behavior and thinking, which the new technologies allow.

And reciprocally, such changed behavior will shape the evolution of the platforms and technologies.

This will be especially true of a software upgradeable aircraft like the F-35.

SLD: You attended the Yuma ceremonies. What did they mean to you?

Trautman: The Marine Corps has been looking forward to the arrival of the F-35B since the mid-1990's. We are talking about many years of a vision that hasn't quite come to full fruition yet, but certainly the standup of the first operational squadron is a significant milestone for Marine aviation.

For me, it was incredibly gratifying to be on the MCAS Yuma flight line when we flew in the first two F-35B's. As you recall, it was just two years ago that the program was under constant attack by those who didn't quite grasp that the typical challenges of engineering in the early stages of a developmental program have to be dealt with through patience and quiet resolve.

The fact that the Commandant was there, along with Senator McCain and the Under Secretary of the Navy, made the ceremony special. Although there are still challenges ahead, each of the speakers noted that the program is now on solid footing and they expressed optimism about the way ahead.

Frankly, the success we have had is not surprising to me. There wasn't a day in my tenure as the Deputy Commadant for Aviation that I didn't believe that we would arrive at the place that we are today. That optimism came from the fact that this is the right thing to do for our Marine Corps and the right thing to do for our nation.

As I sat on the flight line and looked around me, I saw that we had all the right people in the audience. We had operators. We had planners who think about future tactics. We had engineers. We had people from the systems command, the material command and the test community. We had all of the key leaders from industry. And, we also had the people who were responsible for the incredible infrastructure that has been built at MCAS Yuma over the past few years to accommodate 5th generation operations.

A sign on the F-35 B with a double meaning. Shot November 2012. Lockheed Martin Fort Worth Texas Photo by Angel DelCueto

So, we had all the pieces of the puzzle that have been responsible for delivering the world's finest strike fighter to the United States Marine Corps. It was certainly a fitting occasion for celebration. We're now on the cusp of setting the course for the next 50 to 75 years of fixed wing tactical aviation for the Marine Corps and it's full steam ahead.

I expect the innovation and determination of the operators to exponentially increase the pace at which this airplane now starts to evolve.

SLD: I would like to highlight something I find very innovative by the Marines, which was set in motion during your time as DCA. You are not just going to have a couple squadrons at Yuma. You've got the intersection with MAWTS and also the Marines are moving VMX-22 from New River.

In other words, the Marines have collocated three key elements to drive real world combat innovation associated with the aircraft.

Could you talk a little bit about the thinking that went behind setting that up and what your hopes are about that kind of collocation driving innovation?

Trautman: As I look back to the summer of 2007 when I became the Deputy Commandant for Aviation, I marvel at the prescient decisions that our F-35B planners made in the run up to our first operational squadron.

As you recall from previous conversations, one of the smarter things that we did is we took Lieutenant Colonel Chip Berke and we assigned him to an F-22 squadron at the invitation of the Air Force Chief of Staff. We put Chip there for almost three years and then we moved him down to take command of our first F-35 replacement training squadron, VMFAT-501. His experience with 5th generation operations in the F-22 informed us that the F-35 was going to require a significant adjustment in the way we train and fight our tactical fixed wing aircraft.

We knew from the beginning that we needed to focus intently on what it would take to ensure success when our first operational F-35 squadrons began to receive this game changing technology.

Of course, we handpicked the first operational squadron's new commander along with his initial cadre of aviators, some of whom who had previous experience with F-35 operations in VMFAT-501, in order to ensure we had extremely talented individuals manning VMFA-121.

But, a key component of our decision to start out in Yuma was driven by the fact Marine Aviation Weapons and Tactic Squadron One, the world's premier organization for the development and employment of aviation weapons and tactics, is co-located on that base. MAWTS-1 is staffed with individuals of superior aeronautical and tactical expertise who are subject matter experts in every element of the Marine air/ground task force.

In my view, some of the greatest minds in modern aviation reside in that squadron. The commander is one of the best thinkers at the colonel level in the Corps today and his team has been charged by the current Deputy Commandant for Aviation to work with VMFA-121 to speed the development of future tactics and standardization in the F-35.

These two squadrons, operating side-by-side at MCAS Yuma, are going to reap incredible dividends for Marine aviation.

But, the innovative approach to posturing F-35 for success didn't stop there. The Marine Corps also decided to take VMX-22, our only Operational Test and Evaluation Squadron, which had previously focused solely on the V-22, and expand its operational test portfolio to include the F-35B at MCAS Yuma.

With an F/A-18 pilot now commanding the squadron, the knowledge and lessons learned in operational test of the F-35B will inform the MAWTS-1 and VMFA-121 tactical planners as they stay focus on minimizing risk and maximizing performance of the F-35B in support of the Marine Air Ground Task Force.

With squadron operators, tactical innovators and operational testers all working toward the same desired end state at MCAS Yuma, this is going to be an example of a case where the sum is greater than the collection of its parts. We just

have to watch with a little bit of patience over the next year or two and I think you'll see that we'll reap the benefits of this decision far more than we would have if these organizations were operating at disparate geographic locations.

SLD: How will this kind of cross cutting innovation among the squadron, MAWTS and VMX-22 shape change?

Trautman: Twice a year in Yuma, Marine Aviation Weapons and Tactic Squadron One conducts a large-scale exercise with every element of Marine aviation supported by joint aviation assets gathered together for six weeks of training in the desert. That opportunity alone is going to provide VMFA-121 a chance to work side-by-side with all of the Corps' newest aviation technologies, with the V-22 Osprey being the premier new technology, but also the UH-1 Yankee, the AH-1 Zulu, the KC-130J and our new aviation command and control system.

All these operational elements will periodically operate from Yuma with ready access to ranges located just north and east of the air base.

Your premise that we don't know what we don't know about this game changer called "fifth generation" is right on the mark. When young aviators, young maintainers, and young logisticians start to operate F-35 with the other elements of the MAGTF, we're going to experience exactly what we experienced with the V-22 when they first got their hands on the Osprey. There will be an exponential increase in the innovation and thinking and utilization of these platforms in ways that the initial planners who set the program's course never thought of before.

In fact, I anticipate F-35 sparking a 5th generation intellectual engine at Yuma that will exceed all expectations.

An added benefit, of course, will occur when the Air Force stands up their F-35 squadrons at nearby Luke Air Force Base and we both start to operate F-35's on the ranges at Nellis. I'll make a prediction — three years from now, no one is going to want to be caught dead or alive operating a legacy jet in battle space dominated by the F-35 Lightening II.

When I look at Marine Aviation, I'm extremely pleased with where we are today.

The V-22 Osprey does things that no airplane in the history of mankind has ever been able to do with regard to range, speed, maneuverability, and aircraft survivability — all combined with the ability to still conduct vertical landings in the objective area. The F-35B, a short takeoff and vertical landing machine with low observable characteristics, is a flying sensor that can do everything that we need it to do in ways that are simply going to change the game.

Having those two platforms side-by-side while the rest Marine aviation forms a complementary role and determining how all the pieces of aviation fit together is going to be a challenge, but its the kind of challenge that I think all Marines relish and embrace.

This is what professional aviators do.

This is what Marines do. It's what warriors in the other services do as well and, with V-22 and F-35, we are definitely providing the tools our Marines need to move these capabilities into the next century.

General Amos on the Standing Up of the F-35 Squadron at Yuma

11/20/12 The Marines have stood up their first squadron of F-35 Bs at MCAS Yuma.

But the Marine Corps approach to the aircraft is built on recognition that it is a C2 and Information Warfare aircraft, which will be a central piece to the ACE or Aviation Combat Element of the MAGTF.

To shape the approach, to determine the evolution of the aircraft is firmly rooted in a triangular approach taking shape at Yuma.

Two squadrons will be established and are the operators. MAWTS-1 will develop tactics and training for the F-35 B in conjunction with the other aviation elements for the ACE.

And VMX-22 will focus on the technologies and systems of the platforms making up the evolving ACE for the MAGTF.

During the re-designation ceremony, General Amos, the USMC Commandant, highlighted the nature of change and the role of the F-35 in this process.

The F-35B is the future of Marine tactical fixed wing aviation. As many of you know, today the F-35 begins replacing three models of tactical jets the Marine Corps currently operates. In fact, VMFA(AW)-121 gave up their F/A-18D Hornets just a short three months ago after returning from a highly successful WESTPAC deployment.

The F-35 will replace our Hornets, our AV-8B Harrier attack aircraft and our EA-6B electronic warfare aircraft.

Replacing so many different platforms with a single, multi-capable aircraft represents a new way of operating and thinking. This jet possesses "eye-watering" capabilities.

The things it can do are most impressive to a couple of old F-4 Phantom guys like General John Hudson… and myself. Unfortunately, I can't talk about most of those capabilities here!!

But, suffice it to say this is not your father's fighter!

VMFA-121 is at the forefront of one of the most significant transition periods in the 100- year history of Marine Aviation, as we replace nearly every aircraft in the Corps between 2005 and 2025.

Certainly, it is the most significant transition in quite some time, maybe since the introduction of the helicopter to our forces in the post World War II 1940s. But, being on the forefront is not new to this squadron, the "Green Knights" have been a storied squadron since they were established just months before the attack on Pearl Harbor…..

I noted earlier that having F-35Bs in Yuma shows tangible progress in this vitally important aircraft program.

There is additional progress all over our Corps today regarding fielding the F35B. I call your attention to the 7 F-35Bs currently at NAS Patuxent River, Maryland, conducting flight test activities, the 11 F-35Bs now at our training squadron, VMFAT-501, at Eglin AFB, Florida and the 2 United Kingdom F-35Bs that have joined 501 and have also begun training there.

We are making strides in every aspect of this program. Aircraft are being produced tested and flown, pilots are being trained in the air and in the simulators and aircraft mechanics and technicians are learning to ply their trade on this magnificent jet. Yuma will eventually have five operational squadrons, and be responsible for operational evaluation of the F35B. MCAS Yuma will continue to be a busy base.

The F-35 Squadron at Yuma: The Next Phase Begins

11/18/12 by Robbin Laird and Ed Timperlake

Dateline: Yuma, Arizona

Later this month the first 2 F-35 Bravos are arriving at Marine Corps Air Station (MCAS) Yuma.

As the future home of five F-35 JSF operational squadrons of 16 aircraft each and one operational test and evaluation squadron of eight aircraft totaling 88 aircraft, these squadrons will replace Yuma's four existing squadrons consisting of 56 AV-8B Harriers.

By early next year, the full complement of 16 F-35 Bs will have arrived. For the USMC, this is the beginning of the next 100 years of Naval Aviation.

It is also the ultimate response to the terrorists who blew up 1/10 of the Harrier force.

The USMC will give them back and powerhouse combination of the Harrier, the F-18 and the Prowler with new C2 and Information Warfare capabilities.

Here they are following the model of the Osprey roll out.

Once the aircraft was ready to fly and to be part of a training effort, the Marines began to use it.

From the left, Commandant of the Marine Corps General James F. Amos, U.S. Senator John McCain (Az.) and Marine Fighter Attack Squadron 121 Commanding Officer Lt. Col. Jeffrey Scott stand near an F-35B at Marine Corp Air Station Yuma, Ariz. after the squadron's re-designation ceremony Nov. 20. Credit: Lockheed Martin

They understood that the capabilities of the aircraft would be rolled out over time, and further aspects of that capability evolved over time. They also understood with the Osprey that determining how best to use the aircraft and how those operations which affect overall Marine Corps operations had to be determined in practice, not in an abstract, linear evaluation process.

This is why the Osprey at the 5 year deployment mark is essentially seen as a different aircraft in terms of how the Marines can and do use the aircraft. They have also learned how the physical aspects of the platform affect operations, and, in turn, shape concepts of operations. Only with real world experience in Iraq, Afghanistan, off the Shores of Tripoli, or in exercises such as Bold Alligator 2012, would the evolution of the aircraft be shaped.

http://defense.aol.com/2012/08/23/the-osprey-after-five-years-leading-a-tsunami-of-change/

Although an even more significant addition to the Marine Corps and its con-ops, the F-35 Bravo is being approached in a similar manner.

As the baseline aircraft becomes capable of entering the training and squadron evaluation process, the Marines can then determine how best to evolve the core capabilities of the aircraft.

As "Turbo" Tomassetti, the Deputy 33rd Fighter Wing commander has put it,

"Once we have the basic aircraft flying and the core operational capabilities enabled, we need to shift from a block development process determined by engineers have an operators determination of next steps needed. This is especially true given the unique fleet qualities of forthcoming F-35 operations."

http://www.sldinfo.com/an-update-on-the-f-35-integrated-training-center-at-eglin-afb/

(For a look at the baseline F-35 aircraft see the following:

http://www.sldinfo.com/the-baseline-f-35/).

While the squadron is being established at Yuma, the USAF will begin taking planes at Hill Air Force Base and starting to put together their first F-35 squadrons.

And during all of this training at Eglin, and further evaluations at Edwards AFB and Pax River Naval Air Station will continue.

This process underscores a basic reality of the F-35 as a combat system.

Rather than looking at the evolution of the program in Block steps, it is better to understand it in terms of operational clusters.

To date, the software and systems of the F-35 to fly the aircraft have been steadily put in place.

1. Then the core combat systems are being plugged into the software upgradeable aircraft.

2. The weapons are being certified at Edwards AFB to add strike and defense capabilities to the aircraft.

3. Then the aircraft is ready to deploy.

4. After initial deployments, the aircraft will evolve as operators determine best approaches to getting incremental yet significant combat value out of the aircraft.

And this is why the collocation of the squadron with MAWTS is so crucial.

MAWTS is where the Marines develop tactics and training for the various aviation assets working with overall Marine Corps operations. With the Marines integrating aviation into overall operations is the core operational reality. At MAWTS, the Marines shape their approach to innovation as they move forward, notably with new systems, or newly configured systems.

The squadron at Yuma will shake down the aircraft and get it operational.

First Flight of BF-21, USMC Tail VK-01, Yuma F-35, Pilot Billie Flynn, October 24, 2012. Credit; Lockheed Martin

As they do so, the pilots using the plane will work closely with MAWTS in shaping the new tactics and training associated with the aircraft. Because this aircraft is a bundle of Harrier, Prowler, and F-18 capabilities with its own revolutionary foundation to doing air operations, the impact of using the aircraft will be central to the evolution of tactics and training.

Notably, Prowler pilots have been added to the MAWTS team in preparing for the F-35. As one MAWTS instructor put it: "Prowler pilots are information warriors and this is a core element of what the F-35 is all about."

With MAWTS working closely with the squadron, the development of tactics and training WHICH ARE AN INHERENT PART OF DEVELOPMENT for the plane, the squadron and the program, will be a center bull effort.

(For our earlier report on MAWTS and the F-35 see the following:

http://www.sldinfo.com/preparing-for-the-f-35b-transition-mawts-re-shapes-its-curriculum/).

And this will be significant as the squadron moves out. Already, the deployment of the Yuma squadron to Japan is envisaged.

And in an interview with the 7th USAF commander, the significant role which the F-35Bs can play in his mission in the defense of South Korea and to provide for greater US combat capability in the region have been underscored.

Lt. General Jan-Marc Jouas emphasized the important role which these USMC F-35s will bring to his operations.

U.S. overseas basing decisions are not yet determined; however, any deployment of F-35s to the Korean peninsula will clearly modify the template, including the Marine Corps F-35B.

The Seventh Air Force relationship with the Marine Corps is the best I've ever seen. Their aircraft will be dedicated to the Marine Air Ground Task Force (MAGTF) at some point, but before then, they will be used as part of our air campaign to the greatest effect that we can deliver.

The F-35A, B, and C will give us greater flexibility, and greater options in terms of where and how we can operate.

We will integrate the F-35 with F-16s, F-15Ks, F-15Es, F-22s, and other airplanes in a way that will enhance and increase everybody's capability, much in the same way that we currently see the F-22 and the F-15 integrating and increasing their capabilities. Our targeting, and the effects that we will seek, will be adjusted by the fact that we have F-35s.

In other words, the F-35 is a key asset in shaping the "Pivot to the Pacific." It is a lynchpin program in a lynchpin strategy.

http://www.sldinfo.com/the-f-35-and-pacific-strategy-shaping-a-core-lynchpin/

In addition, the USS America will be home ported in San Diego and empowered with up to 23 F-35Bs on its decks, dependent upon the mission configuration of aircraft on its deck.

As Captain Hall, the prospective commander of the USS America recently underscored:

We are a large deck amphibious ship, just as the Kearsarge. But we are an aviation-centric large deck amphibious ship and we've been designed specifically without a well deck so we can support the USMC's next generation of aircraft.

We can get out there with a much larger hanger bay with two high-hat areas to support maintenance on the much larger MV-22s. The maintenance requirements for the F-35 are met and we have the capability to expand when required for future development. With our added fuel, ordnance, maintenance capability, supply and support capacity, we can sustain the aviation capability much longer on station.

http://www.sldinfo.com/captain-hall-discusses-the-uss-america-looking-towards-the-future/

And as Major General Walsh emphasized, the F-35s flying off of the deck of the USS America is not just a generational leap but a quantum leap.

When I went from flying F-4s to F-18s that was a shift. With the F-35 it is a leap of multiple generations all at once.

It's more of exponential curve than we did when we went from third generation to fourth generation.

It will be bringing electronic attack and C5ISR to the USS America as a presence asset. This will be revolutionary.

http://www.sldinfo.com/the-impact-of-the-uss-america-on-usmc-operations-a-magtf-on-steroids/

Putting the new aviation assets together with the new ship will create the possibility of having a "MAGTF on steroids".

The infrastructure associated with the F-35 is significant as well.

The two new F-35 hangars as seen from across the civilian air field on the level of the military club in Yuma Arizona. Credit Photo: SLD

New hangars and maintenance systems are being stood up together.

And the experience at Yuma and the USAF at Hill be replicated throughout the global fleet of F-35s. A core advantage of the aircraft is that as a global fleet its support structure has significant commonality which allows for cost savings, and more effective collaboration among the services and the allies.

This next year already the Britis and Dutch will be at Eglin AFB for training.

And the Aussies, the Japanese, Italians and Norwegians are already on board in procuring the aircraft.

Getting that common experience from the initial squadrons will be a core element of deploying the aircraft and shaping the combat capabilities of the forces using that aircraft.

As Lt.General Robling, the highest ranking Marine in the Pacific has put it: the challenge facing the USN-USMC team in the Pacific is persistent presence. And the F-35 operating on the joint and coalition level will be essential to the way ahead in executing such presence.

How can the allied F-35s work with yours to shape a new Pacific capability?

Lt. General Robling: *In two ways.*

First, we would have common or like support structures. This will increase are forward readiness posture by being able to fix and maintain aircraft that are deployed vice send them back to the states for repair or reach back to the US for parts. The more allies who buy the aircraft the more spread out that support structure would be.

Second, the capability of the aircraft as a C5ISR platform will allow significant sharing information sharing and fusion to more of our partners who are able to receive and use the information. This increases our persistent presence capability. The aircraft will help fill in capability gaps or seams between us and our partnering countries and in the end, help build or increase their own capacity.

Another key element for squadron experience is working through how best to maintain the aircraft and provide for optimal sortie generation rates.

One of the two new F-35 hangars at Yuma up close. Credit: SLD

As Lou Kratz, a key DOD player in the sustainment world and now with Lockheed Martin has underscored,

"As we reach the 200,000 operational mark with the use of the various maintenance systems, the services and the allies will be able to determine best practices and approaches in terms of manning and in terms of leveraging the common IT system underlying F-35 maintainability."

http://www.sldinfo.com/the-strategic-impact-of-the-global-sustainment-approach-of-the-f-35/

The F-35B squadron at Yuma in November 2012 begins the process.

And cumulative US and allied experiences will build out the development process the aircraft and the fleet in action. It is the beginning of the next phase of the F-35 program, equivalent to what the USMC did 5 years ago in Iraq with the Osprey.

The future does not belong to the timid, but to those whose lives depend on getting 21st century capabilities into the combat force. Enhanced persistent presence for a 21st century strategy rolls out one F-35 squadron at a time.

See also the following:

http://www.sldinfo.com/hangar-80-at-yuma-air-station-a-building-block-for-f-35-global-presence/

http://www.sldinfo.com/yuma-air-station-prepares-for-the-f-35-coming-november-20th/

A good way to look at the impact of the Yuma squadron on the future can be seen in our piece *in Joint Forces Quarterly* on The F-35 and the Future of Power Projection.

http://www.ndu.edu/press/the-f-35.html

MAWTS and the Yuma F-35 Squadron: Evolving Capability into Operational Reality

11/29/12 *Second Line of Defense* visited MAWTS during the second week of November 2012.

We did so knowing that the Marine Corps is focusing on the concurrent development of tactics and training with operations.

In part, that is why the F-35 Bravo is being stood up at MCAS Yuma, the home of MAWTS.

We visited MAWTS last year to discuss the evolution of training and tactics associated with the V-22 as well as the F-35.

http://www.sldinfo.com/preparing-for-the-f-35b-transition-mawts-re-shapes-its-curriculum/

MAWTS is where the Marines develop tactics and training for the various aviation assets working with overall Marine Corps operations. With the Marines integrating aviation into overall operations is the core operational reality. At MAWTS, the Marines shape their approach to innovation as they move forward, notably with new systems, or newly configured systems.

The squadron at Yuma will shake down the aircraft and get it operational.

As they do so, the pilots using the plane will work closely with MAWTS in shaping the new tactics and training associated with the aircraft. Because this aircraft is a bundle of Harrier, Prowler, and F-18 capabilities with its own revolutionary foundation to doing air operations, the impact of using the aircraft will be central to the evolution of tactics and training.

Notably, Prowler pilots have been added to the MAWTS team in preparing for the F-35. As one MAWTS instructor put it: "Prowler pilots are information warriors and this is a core element of what the F-35 is all about."

With MAWTS working closely with the squadron, the development of tactics and training WHICH ARE AN INHERENT PART OF DEVELOPMENT for the plane, the squadron and the program, will be a center bull effort.

And this will be significant as the squadron moves out.

In a discussion with Clint "Boo Boo" Weber, the head of tac air at MAWTS, we discussed the Marine Corps approach. Weber is Tac Air Department head at MAWTS, which means he works with all the fixed wing aircraft used by the USMC, which would include F-18s, Harriers, EA-6Bs, KC-130s and UASs.

SLD: How does MAWTS look at the deployment of F-35s at Yuma?

Weber: We anticipate IOC next year. I think we're on time to do that. There's some indicators that in some ways we may be even be a little bit ahead of where we thought we were going to be about 12 months ago.

Obviously, that's cautiously optimistic, but we're certainly on timeframe for IOC and we believe that the first deployment to Japan will occur in accordance with that timeline as well.

VMFA-121, the Green Knights has stood up already, but will receive its first aircraft on November 20th. And we'll continue to receive aircraft at a substantial rate such that they should be fully stood up by next spring with 16 total airplanes.

SLD: What will be the approach of MAWTS to the operational squadron?

Weber: We're hopeful that by having the squadron right out here at Yuma next to our weapons school, Marine/Aviation Weapons and Tactics Squadron 1 that we can work on concurrent tactical and operational development. And we are part of the conversation on concurrent developmental tests and operational tests at Pax River and Edwards and Eglin and then at China Lake.

But as that goes on concurrently, we are flying and developing tactics for current software and current capability with fleet aircraft with the aid of MAWTS-1 instructors here.

For us to be right next to them, that's going to be extremely important when we start talking about tactics evaluation for that squadron that deploys in the next two years.

SLD: Talk about the impacts, which you see from the F-35 on Marine Corps tactics and training?

Weber: that's really a key point.

What I see as really our primary responsibility here is we start taking a look at initial tactics evaluation or development of tactics.

In the Marine Corps, we're looking to IOC this airplane get it airborne in numbers with its current capability in an environment where we can start to work it into the game plan. Without using the aircraft, it is impossible to develop the aircraft into its operational capabilities and determine its overall impacts on Marine Corps operations.

SLD: What are some of the impacts you see of the F-35B on Marine Corps operations?

Weber: The Commandant has emphasized the return to the sea. The Bravo is a centerpiece of the kind of at sea capability which is central to the Marines.

With more difficult environments to operate in, the F-35B is part of assuring of us of greater capability to operate in a variety of settings.

The Osprey is also a part of this, but the Bravo will not only support operations but be a hammer to knock open holes in difficult operational environments.It is also enables us to operate in a much wider range of environments.

The F-35B can operate off of a variety of surfaces — ships, airfields, highways and fields.

The Marines have specialized in setting up airfields where there aren't any. We think this is a core competence, which will be in high demand in the future.

For the U.S. Marine Corps, the F-35B gives us more flexibility on where we can fly it from, which is probably the most important part for us.

SLD: We noticed that you have a broad range of pilots feeding into the F-35. You have Harrier, F-18 and Prowler pilots, to name three. How is that going to shape the culture of the aircraft?

Weber: There's no doubt that initially when we start talking about the syllabus of the communities that are primarily going to feed into the JSF that you will see change.

You have the fighter attack syllabus and the attack syllabus for the F-18 community and then in the AV8 community. And you need that because you definitely need the pointy-nose guy out there. You're going to have a high-end platform, fifth generation aircraft that's going to have some capabilities that are unmatched.

And there's really only one type of individual that can take advantage of that. That's somebody from the fighter and/or the attack community.

But there's some other considerations as well when discussing the F-35.

It is a C2 and Information Warfare aircraft.

Our best operators in this world are from the Prowler community, and they are key to shaping the F-35 culture.

For the Marines, such integration is crucial.

We are naval officers, we are Marine Corps officers, but above all we are MAGTF officers.

Which means that once you become a bit more mature, you have to start thinking about not just airspace or battlefields but battle-space. In other words, it's important that the individual that's building the syllabus for the F-35 thinks about command-and-control.

Whether you call it cyberspace or information warfare or pushing the right pieces of information to the right places, the F-35 is a centerpiece for Marine Corps thinking about the future.

In other words, you don't want to put people in charge of training, creating training syllabi, or essentially, creating tactics that are thinking simply at the air operations level. You have to think about this holistically from the MAGTF perspective and not just operationally from the air or from the air for the air.

We have to think operationally from the air for all the other elements of the MAGTF.

The ground combat element, the logistics combat element, and then how that works into the joint arena as well are crucial when we think about tac air in the USMC and at MAWTS.

Leveraging the F-35: MAWTS Prepares the Pilot of the Future

11/25/12 *Second Line of Defense* visited MAWTS a week prior to the official ceremony welcoming planes for the new F-35 squadron at the Marine Air Station at Yuma Arizona.

We visited MAWTS last year to discuss the evolution of training and tactics associated with the V-22 as well as the F-35.

http://www.sldinfo.com/preparing-for-the-f-35b-transition-mawts-re-shapes-its-curriculum/

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With MAWTS working closely with the squadron, the development of tactics and training WHICH ARE AN INHERENT PART OF DEVELOPMENT for the plane, the squadron and the program, will be a center bull effort.

And this will be significant as the squadron moves out.

In a discussion with Clint "Boo Boo" Weber, the head of tac air at MAWTS, and with Captain Roger "Hazmat" Greenwood, the fit between the preparation of the aircraft for Marine Corps operations with the aviators was discussed.

SLD: Could you discuss the process of re-alignment of MAWTS personnel with the coming of the F-35?

Weber: When we discuss MAWTS-1 personnel to be involved with the JSF, we have to go back to when General Trautman was Deputy Commandant of Aviation. It was determined at that time that it was necessary to ensure that MOTS-1 was essentially at the forefront of operational test when it became appropriate.

And every DCA since that time has re-affirmed this approach. It has been felt that operational tests would be concurrent with tactics evaluation for the new jet.

As we have gone through this process we have tried to get the right guy for the right job. Hazmat brings significant background to MAWTS, which is crucial for where we are going. He has significant experience operating F-18s off of carriers and is a graduate of the USN's Fighter Weapons School. He was an instructor at Top Gun with regard to tactics and training. His experience in the joint environment and operating at sea is a key part of where we are going in the future.

After MAWTS, he will go to Edwards to work on weapons integration and fusion integration. His background and experience is crucial for this next assignment as well and of course he will feed that back to us here at MAWTS as well.

Greenwood: I think the operational experience with the Navy will be important as the Marines insert F-35s into the force.

The Marines are in an interesting spot, as we will have the plane first and can provide some insights into how the tactics and operational concepts will change with the plane.

We can provide inputs to our Navy brethren with regard to these developments. We will be leading forward on the impact of the F-35 transition for our sister services.

VMX-22 Comes to Yuma: The Third Leg of the Dynamic Development of the F-35B

12/9/12 The Marines have stood up their first squadron of F-35 Bs at MCAS Yuma.

But the Marine Corps approach to the aircraft is built on recognition that in addition to its role as a strike aircraft, it has C2 and Information Warfare capabilities, which will make it a central piece to the ACE or Aviation Combat Element of the MAGTF.

To shape the approach, to determine the evolution of the aircraft is firmly rooted in a triangular approach taking shape at Yuma.

Two squadrons will be established and are the operators. MAWTS-1 will develop tactics and training for the F-35 B in conjunction with the other aviation elements for the ACE. And VMX-22 will focus on the technologies and systems of the platforms making up the evolving ACE for the MAGTF.

The colocation of VMX-22, the F-35 squadrons and MAWTs will facilitate the kind of culture change which the F-35 enables for the MAGTF. Credit Image: SLD

As Michael Orr, the CO of the squadron underscored, "we are testing all USMC platforms working together in developing Marine aviation capabilities. We are not just testing individual platforms. This is especially crucial when you have dynamic, transformational platforms such as the Osprey and the F-35."

http://www.aviation.marines.mil/Leaders/tabid/490/Article/129309/colonel-michael-r-orr.aspx

In this interview, Orr describes the basic role of the squadron and its evolution as it transitions to Yuma. In a second interview, Orr discusses his thinking about how these platforms will cross link to shape the evolving ACE of the future.

SLD: Could you explain the role of the squadron?

Orr: I'm privileged to lead Marine Operational Test and Evaluation Squadron 22. We conduct operational testing on assigned USMC aircraft under the authority of the Commander, Operational Test and Evaluation Force and the direction of the Deputy Commandant, Aviation.

We used to be called Marine Tilt-Rotor Operational Test and Evaluation Squadron 22, and the name of the squadron and the number of the squadron should give away a little bit about its lineage. The squadron was created during the development of the V-22 Osprey program because of the services' emphasis on the successful operational evaluation of the V-22.

SLD: So the squadron was a crucial element of getting the V-22 out to Iraq and then on to Afghanistan?

Orr: Absolutely. In order to reach full rate production and get the aircraft to the deploying squadrons, the V-22 needed to pass its operational evaluation.

The Marine Corps' leadership at the time was not satisfied with the test structure that was in place and wanted to formally establish its own operational test and evaluation squadron.

This was a big step for the Marine Corps.

Major General Walters, at the time Colonel "Bluto" Walters, was the first CO. His task was to get the V-22 through its formal operational evaluation period and get it out to the hands of war fighter.

The squadron was remarkably successful in that role, built and trained the first cadre of operators and essentially laid the ground work for the V-22 to go on and be a very successful fleet aircraft.

SLD: Prior to this the Marines tested through a Navy structure?

Orr: For the most part we did. Operational testing was conducted by HMX-1 for assault support aircraft, VX-9 in China Lake for our fixed wing and H-1 aircraft, and VX-1 at Patuxent River for C-130s.

After the launch of the Osprey, the squadron's focus was on testing upgrades on the V-22 and on some new mission systems.

A lot of that changed under Lieutenant General Trautman, then Deputy Commandant of Aviation, when he made a decision a few years ago to expand the scope of the squadron to include not just the V-22 and the CH-53, but also the F-35B and future Marine Aviation platforms.

http://www.sldinfo.com/the-usmc-in-transition-the-impact-of-yuma/

I'm pretty sure that's why a fixed wing guy like me was chosen to head this new organization. I'm an F/A-18 driver by trade and I had trouble spelling the word "test."

I'm still learning a lot about the test mission, and I have tremendous respect for the professionals who know this business inside and out. My primary focus is to lead this squadron in its transformation from a tilt-rotor and rotorcraft squadron to an ACE or Aviation Combat Element-focused test and evaluation squadron for the MAGTF.

SLD: In effect what you're doing is you're taking the new aviation assets and you're figuring out how those aviation assets individually need to operate, operate as a fleet and then cross-link and obviously with a distinct eye to MAGTF operations because you're all MAGTF officers.

Orr: Developing this interoperability of aircraft and systems is where we will see revolutionary improvements in the capabilities of Marine aircraft. It is an exciting time to be involved in Marine Aviation as all these new platforms come online in the next few years.

How do we get the aircraft to work together? Who currently focuses on all the systems that are going to be required to achieve true interoperability?

Right now the squadron is located out of New River, North Carolina, which made sense when you were a tilt-rotor and rotorcraft-based test squadron, but we will be moving to Yuma in the next few years, which will be critical re-focusing our efforts on the entire MAGTF.

When we're in Yuma we're going to be set up right across the street from MAWTS 1, and we're very excited about this because this will give us the opportunity to have systems development work side-by-side with tactics development.

And if you can combine those two elements, you've got a very powerful tool that the Marine Corps can use to drive innovative change for the future.

SLD: And I would assume that although co-location has not happened yet, that you are already involved in the process?

Orr: We are. In addition to supporting the spring and the fall classes at MAWTS, we are working with their ADT+E group to test developing aircraft technologies. We have a 30 Marine detachment at Edwards to lay the groundwork for the joint testing of the F-35.

Our participation in F-35B testing has two focus areas — which complement each other to bring warfighting capability to the Combatant commanders as rapidly as possible.

Our first focus area is to fully participate and support the Joint Operational Test Team activities, which are we going to be centered out of Edwards AFB.

Our second focus area is to begin to tackle the MAGTF integration piece of the F-35.

SLD: So the colocation of the F-35 squadrons with MAWTS with VMX-22 is designed to facilitate the culture of change associated with the Osprey and the F-35?

Orr: It is. By bringing together the operators perspective from the fleet squadrons, the tactics and training focus of MAWTS-1, and the systems development focus of VMX-22, we create a powerful combination to drive innovation for MAGTF aviation.

We are still learning how the F-35 will reshape MAGTF operations so getting these three commands working together will help shape future concepts of operations and employment.

The F-35 and Driving MAGTF Innovation: No Platform Fights Alone

2012-12-12 In the first piece from our interview with Col. Michael Orr, VMX-22 squadron commander, we focused on the co-location of the F-35 squadrons, MAWTS and VMX-22 and its impact on innovation. In this second part, Col. Orr discusses some of the consequences of having such a process in place.

As Col. Michael Orr, the CO of the squadron underscored, "we are testing platforms working together in shaping capabilities. We are not just testing individual platforms. This is especially crucial when you have dynamic, transformational platforms such as the Osprey and the F-35."

http://www.aviation.marines.mil/Leaders/tabid/490/Article/129309/colonel-michael-r-orr.aspx

SLD: You are an F/A-18 pilot, but the Osprey and the F-35 could not be more different from an F/A-18. Your background mixed with the two new planes will be an interesting experience for you.

And your background will be important to understanding as well the changes, which can be and needed to be made.Col. Orr: You look at things differently when coming in from another community. I look at the way the airplanes perform together, or don't perform together and I see lots of room for improvement.

What I'm very, very excited about is just a tremendous future for the V-22 Osprey in a role as as the cornerstone of the power projection capability of the aviation combat element of the future. I'm particularly interested in initiatives to increase the utility and lethality of the aircraft.

It's way, way more than a platform to haul Marines and equipment from one place to another. It can do that mission very, very well. It's proven it can do that in two combat theaters, and now it's time to think about what else this aircraft can do.

And when you start to think about roll on/roll off packages, for example, what you see what we're doing with the C-130 Harvest Hawk, it opens up a world of possibilities. Signals intelligence, electronic warfare, aerial refueling, are all the kind of things that you can do with the platform.

When you start to think about having that capability paired up with the F-35 on an L Class ship in the future, it's a very, very exciting time for Marine Aviation.

SLD: Clearly the Osprey is not as well connected to the rest of the force as it could be and the F-35 has C2 capabilities, so I would assume that a key part of what you are looking at is the dynamic growth over time in the ability of the ACE to work together in conjunction with the ground and sea elements?

Col. Orr: That is really the sweet spot of the innovation our unit we will be focusing on. My experience in the F/A-18 world has demonstrated what a robust link network can do to increase war fighting capability.

I think about bringing some of warfighting benefits that come from increased battlespace awareness to the entire aviation combat element, and not just the strike and fighter elements.

Think about what you can do if you have linked situational awareness, not just between individual aircraft of the ACE, but also of the supported ground component commander that's riding in your aircraft.

By using systems to increase the MAGTF commanders' situational awareness, we will see revolutionary improvements to the synergy across the MAGTF and Joint force.

For VMX-22, our vision is to be that organization that brings together all of those different pieces and parts of the ACE for the express purpose of driving new tactics, new concepts for employment, and information sharing for effective decision-making.

SLD: And your work at Yuma will be to facilitate putting the new assets into the hands of the MAGTF commanders as well as the Combatant commanders. It is not just testing for testing's sake!

Col. Orr: That is correct. The Marine Corps' desire to see these increased capabilities fielded successfully and as rapidly as possible is rooted in the reality that once you get more capable platforms and systems in the hands of Marines supporting Combatant commanders, our service will be in a much better position to perform our varied missions.

In the past, when we thought about system of systems, we limited our discussions to a particular aircraft platform, but we really need to expand that system of systems to think about the entire kill chain or decision-making chain, not just the individual platform.

The idea of bringing all of the MAGTF ACE platforms under one organization to do the testing is really the point. Standalone platform testing does not get you where you need to go to achieve that synergy.

How do we ensure that the game changing F-35 sensors work well with the existing technology that we have out there in the battle space?

With VMX-22 and MAWTS collocated, we can create a very symbiotic relationship where MAWTS gets a peak at the future technologies and helps develop tactics as VMX-22 tests emerging systems.

We've got an early start with our support to the F-35 development. Our pilots are participating in the software development process for the F-35 as well as providing the pilot warfighting perspective on the evolution of a software upgradeable plane.

SLD: How do you see the intersection of the three groups enhancing the innovation process?

Col. Orr: I think that one of the key advantages of bringing all the communities of the MAGTF ACE together under a single roof is that you start to really draw on the best practices and ideas from each platform.

We're all victims of our own experience,, but somewhere in each of our different communities, there are nuggets of genius that each of us can contribute.

We've got to be able to bring all those platforms together and in the right spaces with the right clearances that allow us to fully share information. I think it's going to be an exciting place to be.

I'm recognizing that I'm simply laying the building blocks and the groundwork for this future organization. It will take time to bring these different test activities together, and I will probably pass the football over to somebody else to take it across the end zone and score the winning touchdown.

I see this unit serving as a laboratory to develop best practices and yet still account for the complexity of the individual weapon systems that we're testing.

Beyond interoperability of systems, we will also be focusing on maintainability and supportability of the weapon platforms.

One obvious challenge is how to gain efficiency as we put together our composite maintenance and support teams.

An added benefit to a permanent composite squadron is the ability to develop best maintenance practices and then share those best practices with fleet units. As we think about the F-35 and some of the challenges it's going to bring from an aircraft maintenance perspective, we can focus on how to build a composite maintenance department for future fifth generation and legacy aircraft.

Hangar 80 at Yuma Air Station: A Building Block for F-35 Global Presence

10/5/12 In a discussion with Phil Klendworth, head of site activation for the F-35 at Lockheed Martin, we focused on the new infrastructure being built to house the F-35.

Site activation is an important part of any new program, especially so for the F-35 with its new hangers being built appropriately for an 5th generation electronic warfare combat aircraft.

When we visited Yuma Air Station last year, we talked with the team building the F-35 infrastructure there and saw the facilities starting to emerge for the first F-35 squadron, which is to be based at Yuma. The first hanger is now done at Yuma – Hanger 80 – and accepted by the USMC and the second will be done and accepted shortly.

During our visit to MAWTS, Second Line of Defense had an opportunity to talk to the SEABEE led construction team at Yuma Air Station. There was considerable enthusiasm in the team and progress was evident throughout the base.

Among the core elements for a new infrastructure being built at Yuma are the following: 2 Aircraft Maintenance Hangers, an Intermediate Maintenance Activity Facility, a Communications Infrastructure Upgrade, a Simulator Facility and a Utilities Infrastructure Upgrade.

There is considerable cross-fertilization among the various infrastructure construction efforts. An advantage of having a global common fleet is that as new infrastructure is crafted, a lesson learned process is generated whereby next iterations of an infrastructure roll out become progressively more productive and cost effective.

Hanger 80 waiting for the first-Yuma squadron F-35s. Credit Photo: Lockheed Martin

As one participant in the roundtable on Yuma construction underscored: "There is a branch in the USMC for lessons learned. And each of these guys here has put together point papers for lessons learned. We are in the process of disseminating our lessons learned through all of the services. This is the advantage of this being born joint. As we roll

out our first new hanger, we learned how to build these new secure facilities better. And we stay in constant dialogue with Eglin regarding their experience as well." Klendworth as the man in charge of site activation development for the F-35 was able to expand on our initial understanding and discuss the global approach for the program.Hanger 80 waiting for the first-Yuma squadron F-35s. Credit Photo: Lockheed Martin

SLD: Could you describe your background, your position and what you and your team do?

Klendworth: I'm a retired Marine. I spent 24 years in the Marine Corps. I started out as an enlisted maintainer. I did 11 years as an enlisted maintenance representative on various fixed and rotary wing platforms. At the 11 year service mark, I was selected as a Warrant Officer in the aircraft maintenance field and spent just over 12 years as a Warrant / Limited Duty Officer working with various Marine Corps aircraft that will all be replaced by the Joint Strike Fighter. I retired in June 2001 and came directly to work for Lockheed Martin on the Joint Strike Fighter Program in July of 2001 just prior to the down select.

I am currently the site activation lead for the Joint Strike Fighter Program in Fort Worth. I have an extended team of 20 subject matter experts in various disciplines that work with each US Service / Partner Country basing locations that the Joint Strike Fighters will be stationed at in the future. We have a site activation process that starts almost seven years prior to the planned aircraft's first arrival. In Yuma's case, we've been working with them since about 2006 getting their base up and ready to accept JSF.

SLD: Since Yuma will be the first operational F-35 base, could you describe the process and progress at Yuma?

Klendworth: In regards to Yuma, we initially did a site activation survey of that base back in 2008. During that Site Survey, we realized the infrastructure and facilities at Yuma were already 30 to 35 years old and being utilized at capacity. The JSF Team conducted a business case analysis and came to realization that it was more cost effective to not take any of the existing facilities out of service at this point and build new. The new construction will have all the JSF facility requirements incorporated to support 270 VDC electrical systems. The older facilities will be renovated or replaced when the AV-8 Harrier aircraft is retired.

During the Site Activation process we look for gaps and shortfalls in current design and develop a Site Specific Activation Plan that will improve maintenance efficiencies in the new or renovated facilities. The overall requirement is to effectively bed down the Joint Strike Fighter at Yuma.

We ensure we look at the total number of JSF squadrons they will support and we recommend a Long Range Plan that details the number and type of facilities they will require once they reach full JSF strength.

The primary facility we focused on was the maintenance hangar. The hangar will be configured with internal aircraft electrical power, cooling air and a secure Autonomic Logistics Information System (ALIS) infrastructure that is compatible with the JSF Air System to minimize the need for support equipment and stove piped computer systems. The ALIS infrastructure communicates across the base, Marine Corps and JSF Enterprise to manage the JSF Fleet.

The second facility we focused on was the aircraft simulator training facility that will house the JSF Full Mission Simulators. The FMS will provide realistic multi-aircraft tactical training to maintain pilot currency and minimize the number hours required in a real JSF. This saves operations and maintenance cost and reduces risk.

As part of the Site Activation process we also identify the appropriate staffing needed to support the JSF Squadron and meet pilot training throughput. The manpower includes maintainers to support on/off Aircraft tasks, training, and quality support functions.

Once the plan is formalized the Marine Corps identifies an engineering firm to work the final facility drawings. During this phase the JSF Team continues to provide subject matter experts to assist with design engineering and drawing inspections. The projects go through multiple reviews (30%, 60% and 90%) that culminate in a package that is ready for construction.

The first new JSF hangar (#80) is 100% complete and the Marine Corps has taken possession.

Team JSF is now outfitting this facility with the hardware and infrastructure that was defined in the site activation plan. The Marine Corps will build three additional hangars in the out years utilizing the same design which will help reduce cost in the future. The second hangar is at about 75% complete and the government will take possession of that facility at the end of 2012 giving the Marine Corps two operational squadron hangars available to start receiving JSF aircraft this year.

SLD: There is a generic problem in that the age of the infrastructure at some of these bases is quite old, so the new build facilities for the F-35 is necessary to support the future of military aviation in any case.

Klendworth: Very much so. Many of the JSF basing locations facilities are reaching their life expectancy and would require replacement with or without the new JSF.

Across the globe the JSF is being assigned to facilities that are extremely old.

And for those facilities to last the life of the JSF program there's going to have to be a replacement or refurbishment at some point in time and the majority of the services have elected to make some improvements up front so that they can capture all Life Cycle Cost opportunities and provide an integrated set of facility that is compatible with the 5th generation JSF.

We could've utilized the old facilities with large amounts of support equipment and work around but to meet the security requirements of the JSF there still would have to be significant facilities modifications. The Life Cycle Cost benefit analysis says it is better to invest at this point in time rather than put a band-aid on what I call a Sucking Chest Wound.

SLD: Because you are shaping a standard package for the worldwide basing for the F-35, there is a significant opportunity for cross-base learning and cost savings in the construction process as well.

Klendworth: Very true. We went into the JSF facilities at Eglin Air Force Base six months after they started operations and capture many lessons learned that we have no incorporated into our current designs. We were able to identify many improvements that we have incorporate that will save tax payers money, provide a proven design to our international partners and allow for common JSF facilities globally.

All JSF basing locations can take the lessons learned and build them into their design process.

And to even expound on that a little more, the Navy has a Unified Facility Code (UFC) that says, "We're going to take these common hangar designs and adapt them for other aircraft construction to minimize cost across the entire U.S. military service." They are looking to put together a joint service document that includes the JSF requirements and all the other aircraft requirements. This UFC design can be used at various basing locations and accommodate many types of aircraft at the minimum cost.

SLD: Could you discuss the advantage of getting a common design when you come to construction and how that saves money and increase efficiency realistically? What's the real advantage?

Klendworth: Savings and advantages are recognized in many different ways. Design packages take less time to build, the design inspection goes faster because the basic requirements are being electronically brought over and the construction cost can be lower when you have actual cost from like facilities to challenge with. For the squadron person he or she can walk into any JSF hangar and find common services (power, air, ALIS), shops and offices that are similar to their own facilities and operations.

It also allows for industry to compete on JSF projects across the United States much easier and capitalize on economy of scale.

Having a basic design makes it easy to estimate around the country and globe because there is standard labor and material cost factor that can be applied based on regional areas to give you a rough order of magnitude cost estimate for long range financial budget planning.

SLD: Have you already seen cost savings from the replication process?

Klendworth: It has already been realized at Yuma.

The cost estimate for the second hangar was less than the first. The span time to construct has been reduced significantly and we have been able to capture functionality improvements from the Lesson Learned database in the second hangar design.

SLD: My understanding is that a lot of the legacy equipment used in a hanger to support an aircraft has been eliminated by the F-35. Is that correct?

Klendworth: That has been the JSF approach. It's more cost effective to put permanent installed systems that are support three or four stations compared to having three or four replicated sets of support equipment in a hangar.

SLD: The next USMC F-35 facility will be built on the East Coast, at Beaufort Air Station. Have you seen cross learning between Yuma and Beaufort?

Klendworth: The facility infrastructure at Beaufort is very similar to the construction of the facilities in Yuma. The hangar that is being constructed at Beaufort right now has a mission planning area that is very similar to Yuma and other basing locations.

We took the basic common solution set for Yuma, laid it into Beaufort and we're also laying it into a third location for the Marine Corps.

In general, we've established the core knowledge base for building the infrastructure and we are exchanging that information with our government counterparts at the Joint Program Office and so we have a collaborative team of both government and contractor personnel that take these designs and advertise and implement them at multiple basing locations throughout the world.

We currently have 22 different basing locations spread throughout the world that are using the basic core set of designs for hangars, training facilities, and off aircraft shop type of support.

The Intersection and Impacts of Yuma Innovation for the Future ACE

The dynamics of change being unleashed at Yuma are clearly not simply confined to the F-35 squadron(s) at Yuma. They are the lead element in a dynamic innovation process which could provide for a significant boost to relevant combat capability for 21st century operations.

In this section, we address two broad dynamics of change with which the evolution of the ACE is associated. The first is re-defining what an Amphibious Ready Group can do; and the second is the contribution which the new ACE can provide to the evolution of American Pacific Strategy. The first is addressed via a look at the new USS America Class ship and the second is viewed through the optic of two interviews from Commanders in the Pacific, one with the 7th USAF Commander and the second with the Commander of MarForPac.

Finally, a look at the maintenance and pilot training unfolding at Eglin AFB with an update with the Deputy Wing Commander, Col. "Turbo" Tomassetti as well as a discussion by one of the leaders of the maintenance revolutions, Col. Sampsel with Secretary Mike Wynne identifies the path of change embraced at Eglin which interacts well with the approach at Eglin. They are two parts of the same effort.

It is Not Just a New Ship: It is the Launch Point for a New Era

10/30/12 by Robbin Laird

It is not often that a new ship of the line is christened. And when it is, thoughts of how it might be used, where it might operate and how it might make new naval history are part of the excitement.

This was clearly evident at the christening of the USS America, the fourth ship of that name, in Pascagoula, Mississippi on October 20th.

This ship is not only the lead ship in a new class but will integrate the newest aviation of the USMC-USN team aboard a single operational platform at sea.

It will operate F-35Bs, Ospreys and CH-53Ks in the years to come. And the first ship will operate out of San Diego, and be part of the Pacific century.

It also is a representative of the contribution of the Gulf Coast to American military capability. The Ingalls shipyard is the heart of USN shipbuilding, now and has been for many years.

Not far away, F-35 Bravos are being prepared for action in Eglin AFB. And in a confluence of events, two new F-35Bs landed at Eglin – one British and one USMC – the day before the christening.

Although called an LHA, it is not. Rather than being a Landing Helicopter Assault ship, it is flagship for 21st century operations. And these operations will be shaped by the need to operate at greater distance, and to strike with aircraft with significantly greater capability than the aircraft they are replacing.

The Osprey and the F-35 Bravo can operate at greater distance, speed and lethality than what they are replacing. The 360-degree aircraft – the F-35B – will provide along with its sister assets a change as big as that for which Admiral Sims and Admiral Halsey planned for with the introduction of the original aircraft carriers prior to World War II.

http://defense.aol.com/2012/07/16/what-the-cno-was-really-saying-about-the-future-force/

Indeed, this ship is the size of the US aircraft carriers operating at the end of WW II. And as the ship's sponsor – Lynne Pace, the wife of the former Chairman of the Joint Chiefs – put it to the veterans of the last USS America – a large deck carrier:

"I know you (the crew of the former USS America) would love the name to go to an aircraft carrier, but this ship is mini-aircraft carrier."

The ship is optimized to operate the new aviation assets. In an exclusive interview with the ship's captain, a Tom Selleck look alike, Captain Robert Hall, Jr., underscored the change:

We are aviation centric large deck amphibious ship designed without a well deck but operate in a fleet, which can deliver amphibious vehicles. The ship has been designed to support this next generation of aircraft, which is larger and also we need to support greater sortie generation rates of which the F-35 is capable. The ship has been designed to have space to perform maintenance for the aircraft and to provide for extra fuel to support aviation. We will have room for much greater amount of ordinance and storage of parts as well.

The ship and its aviation capabilities will provide the joint force commander with a powerful new tool.

And for those missing the well deck, it is useful to go back to lessons learned at the big Bold Alligator 2012 exercise. In a prelude to the USS America, the USN-USMC team operated 16 harriers off of a large deck amphib. This is not a normal con-ops for the ship, but in anticipation of where they are going with the USS America, they exercised the option.

What did they find?

You can launch vehicles close to shore or launch your combat aircraft, which requires launching at greater distance from the shore. The point is clear: when you have platforms and weapons able to operate at much greater distance, that is what you want to do. And because DOD has decided the USMC can not have the amphibious vehicles able to be launched at much greater distance, they will have to use other ships to launch such vehicles.

Although interesting in itself, the USS America is not an in itself asset. It is part of a global process of change on several dimensions.

First, the ship is part of a broader allied effort. Allies are building ships of similar types and purposes and various other ships, which can work well with the USS America class. The Queen Elizabeth class and Giuseppe Garibaldi (551) will operate F-35 Bs and are similarly sized to the America.

Other sea based platforms such as the Australians are building or the Spanish or French operate are important as well. The French Mistral is being looked at a platform on which the Osprey could land as well.

Second, the USS Ford is being developed synergistically with the USS America class. According to NAVSEA officers and designers, the workflow for the USS America involving the F-35 is being discussed regularly with the Ford offi-

cers and designers. There is a cross-fertilization going on between the two new large aircraft surface assets as significant as when Sims and Halsey rethought the battleship navy moving to the carrier navy.

Third, the C5ISR aboard the USS America and USS Ford are radically different from legacy ships. And as the F-35 as a core F5ISR or Tron Warfare asset is deployed the synergy between shipboard C5ISR and airborne C5ISR will be radially rethought. And this will affect as well what the Brits and Italians will do moving forward.

As the Vice-CNO Admiral Mark Ferguson, a surface warrior, underscored at the christening: "When America joins the fleet, we'll be a stronger, more flexible, and a better Marine Corps team. We need this ship."

The USS Enterprise: The End of an Era and the USS America Opens a New One

12/2/12 by Robbin Laird

The ceremony to declare the USS Enterprise inactive was held yesterday.

After a glorious career, and after shaping many innovations in Naval history, the USS Enterprise enters into history.

It is an end of an era, but a new one is dawning in US maritime history.

The christening of the USS America earlier this year was the other event, which correlated with the retirement of the USS Enterprise, provided the twin pillars of the future.

Eventually, the USS Ford will "replace" the USS Enterprise.

But it is an entirely new ship which when combined with kinds of assets already planned for the USS America can shape the next revolution in US maritime operations.

If the Ford were to be equipped as if it was the USS Enterprise, the entire point of the historic transition would be lost.

As I wrote earlier about the USS America:

It is not often that a new ship of the line is christened. And when it is, thoughts of how it might be used, where it might operate and how it might make new naval history are part of the excitement.

This was clearly evident at the christening of the USS America, the fourth ship of that name, in Pascagoula, Mississippi on October 20th.

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Not far away, F-35 Bravos are being prepared for action in Eglin AFB. And in a confluence of events, two new F-35Bs landed at Eglin – one British and one USMC – the day before the christening.

Although called an LHA, it is not. Rather than being a Landing Helicopter Assault ship, it is flagship for 21st century operations. And these operations will be shaped by the need to operate at greater distance, and to strike with aircraft with significantly greater capability than the aircraft they are replacing.

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http://defense.aol.com/2012/07/16/what-the-cno-was-really-saying-about-the-future-force/

The future will deploy soon, and rethinking its impact on the fleet and re-shaping the entire concepts of operations for the Pacific century is upon us.

http://www.sldinfo.com/special-report-on-crafting-a-new-pacific-strategy/

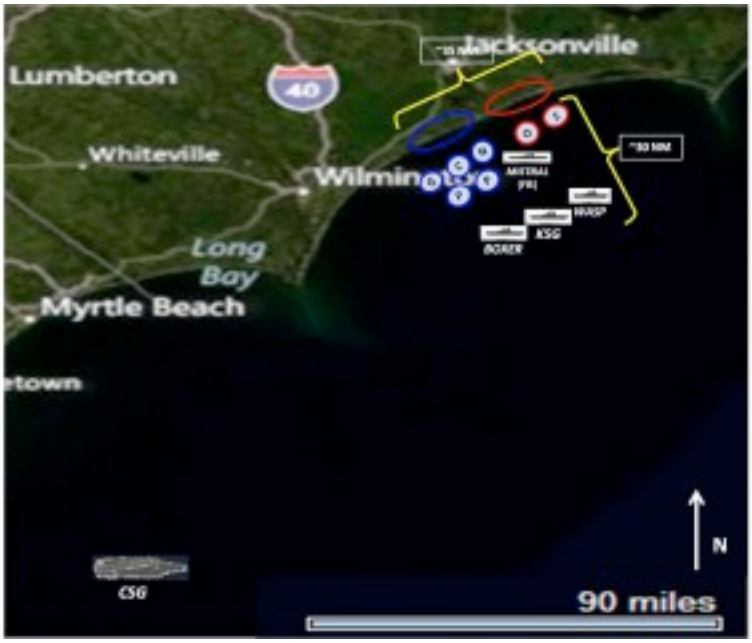
And the good news is that many of our allies are joining us in this approach in other parts of the world, notably the Italians and the Brits are adding F-35Bs to their warships and may well add Ospreys in the future.

http://www.sldinfo.com/the-italian-f-35-faco-a-key-asset-in-the-global-f-35-support-system/

Ironically, the USS Enterprise, in its final tour, participated in the transition as a key element participating in Bold Alligator 2012.

As the Enterprise moved away from the assault phase, the large deck amphibious ships played the direct air assault role presaging an element of the historical transition.

http://www.sldinfo.com/re-thinking-maneuver-warfare-from-the-sea/



The USS Enterprise on "D" Day in the Bold Alligator 2012. Credit: 2nd ESG

Captain Hall Discusses the USS America: Looking Towards the Future

11/3/12 *Second Line of Defense* visited the Ingalls shipyard in Pascagoula, Mississippi for the christening of the USS America. During the visit, we had a chance to talk with Captain Robert Hall, Jr., the prospective commanding officer of the ship. We were able to follow up that discussion with a longer interview.

During the Christening of the USS America, the Commandant of the USMC, General Amos, turned to Captain Hall and noted that all of the older officers on the podium would love to have his job. And a large part of the reason for this is rather simple: this warship is bringing together three revolutions at once: the Osprey revolution with the F-35 "flying combat revolution" with a new generation of large deck amphibious ships.

And as the ship's sponsor put it succinctly to the crew of the former USS America: "I know you would love the name to go to an aircraft carrier, but this ship is a mini-aircraft carrier." And so the Captain is preparing the command approach for this mini-aircraft carrier.

The Captain is an experienced CRUDES officer. For those of us not raised in the USN, this means an officer with Cruiser-Destroyer surface fleet background. And for Navy folks he would be described as a "black shoe" as opposed to a "brown shoe." Again for those of us who have not served in the USN this refers coming from the surface ship community rather than the aviation community.

He has served as the chief engineer on a Spruance class destroyer and most recently was a Captain of a DDG. And in his last deployment with the DDG, he deployed with the USS Kearsarge as well in the Indian Ocean.

It is important to remember that Admiral Halsey, when he went into the hospital before the Battle of Midway recommended that his surface ship Commander (a "black shoe" in Navy parlance) Admiral Spruance take command of Task Force 16, the USS Enterprise and USS Hornet battle group. Admiral Nimitz CINCPAC, a submariner, accepted Halsey's recommendation. He leaned on the ability of Spruance to maneuver the ships, to attack and withdraw as a key element of operational dominance. We are seeing once again a merging of the communities.

SLD: How would you describe the USS America?

Captain Hall: The USS America is a warship. It's an amphibious class ship, but it's a warship like any other and so mixing the communities together brings some core strengths together. I'll have a lot of amphibious experience on the America with my crew and my expertise in the surface navy will help us to integrate much better as a team.

SLD: What are some of the core capabilities of the ship?

Captain Hall: We are a large deck amphibious ship, just as the Kearsarge. But we are an aviation-centric large deck amphibious ship and we've been designed specifically without a well deck so we can support the USMC's next generation of aircraft.

We can get out there with a much larger hanger bay with two high-hat areas to support maintenance on the much larger MV-22s. The maintenance requirements for the F-35 are met and we have the capability to expand when required for future development. With our added fuel, ordnance, maintenance capability, supply and support capacity, we can sustain the aviation capability much longer on station.

Captain Robert Hall, Jr., Prospective Commanding Officer of the USS America, and the Ship's Sponsor, Lynne Pace. Credit: SLD

SLD: And as the first ship deploying with the Ospreys and F-35s in combination you will shape a number of lessons learned important to the rest of the fleet.

Captain Hall: Without a doubt being first of its class and in full support of these next generation of aircraft is an important step. I think we'll be sharing lessons learned with every potential platform.

SLD: What is the process moving forward?

Captain Hall: The next few months, we're continuing the building process, and then diving into the test and trials phase. We are expecting the Builder's trials probably towards the end of July and then Acceptance trials approximately 8-10 weeks after that. Right now it's looking like early FY14 for ship custody transfer and certification. After that we commission and transfer to the fleet.

SLD: The ship is built to evolve over time with growth capabilities?

Captain Hall: We are configured to grow. We have excess space and six large generators onboard for power generation.

SLD: It must be exciting to be bringing together the new ship design, with the Ospreys and the F-35s into a new operational capability?

Captain Hall: It is. Matching the three together will provide the USN-USMC team with an incredibly versatile and potent force multiplier. Highlighting the awesome capabilities of America is something we need to do moving forward as we continue to fine-tune her concept of operations.

<u>An Historical Note:</u>

Admiral Spruance was one of the best Admirals to ever serve in US Navy.

From his chair aboard the flagship USS Enterprise, Spruance directed the fighting of Task Force 16, made up of the USS Enterprise, the USS Hornet and supporting vessels, large and small.

Prior to the Battle of Midway, Spruance commanded Cruiser Division 5, which belonged to the USS Enterprise's carrier group.

That's the role Spruance would probably have continued playing during the Battle of Midway had fate not stepped in and elevated him to the center seat of Task Force 16 aboard the USS Enterprise.

Adm. William Halsey was supposed to be in command of Task Force 16, but ended up confined to sickbay in Hawaii after developing a debilitating skin condition. Unable to direct the task force, Halsey picked Spruance as his replacement, seeing Spruance as a confidence-inspiring leader who had a canny knack for knowing when to take a gamble and when to exercise great caution.

History proves the correctness of Halsey's choice.

http://www.theussenterprise.com/raymond-ames-spruance.html

Comment by Captain Hall on our historical note:

Admiral Nimitz must have placed a great deal of trust in Admiral Halsey himself to take such a risk on his recommendation. I read that Admiral Halsey actually turned over command of a destroyer to Admiral Spruance many years before they worked together in the ENTERPRISE task force. I guess they must have known each other pretty well and I would imagine Admiral Spruance knew he could rely on the professionalism and carrier expertise of Admiral Halsey's staff that he would inherit. Besides the great story of the Midway battle itself, the circumstances surrounding all the decisions made before and during the battle provide some extraordinary examples of great leadership.

Ship Design and Innovation: Captain Mercer Discusses the USS America

11/6/12 The day prior to the christening of the future USS America (LHA 6), Second Line of Defense sat down with Captain Chris Mercer, USN, Amphibious Ships Program Manager to discuss the ship and the approach to building the ship.

The ship is a new class of Large Deck Amphibious Ships built to work with current and new USN-USMC aircraft, and re-shape how LHAs operate in the 21st century. Captain Mercer also discussed the synergy between efforts on this ship with the new class of large deck carriers, the Ford class.

SLD: How would you characterize the design shift from the WASP to the AMERICA?

Mercer: It is more aviation centric. So the Flight 0 LHA (R), the America class ships are a modified repeat of the Wasp class ships.

If you look at the size of the ship, the size of the flight deck, they are very similar, as is the island.

You'll see changes in the exhaust stack because of what we did down low in the ship for maintainability, sustainability and reduced total ownership cost.

But it is very much an aviation centric design. We essentially gave much more space to the aviation community, and included many of the cornerstone modifications required to support the joint strike fighter and MV22. We filled in the well deck volume that was used to bring the ground combat element to the beach via surface craft, with aviation support spaces: maintenance, fuel and weapons.

SLD: What is the optimal loading of the F-35 B?

Mercer: You could top end at 23 but it really depends on the footprint of all the logistics and support elements that's coming with the aircraft.

SLD: With these new assets, the ship can play a role beyond simply being a lead in an ARG-MEU and provide a flagship role of an Expeditionary Strike Group.

Mercer: That is true. It can be part of shaping a sea shield. It can be married up with an LPD and LSD and brings in other strike capabilities and surface combatants.

And in the absence of a large deck carrier, you could do a load out of MV22s, and joint strike fighters providing the air dominance that you might need in a combined ARG type of amphibious assault.

We saw some of this presaged in Afghanistan 10 years ago, when the Marines projected deep ashore. The MV-22s with the F-35s will provide a powerful tandem to provide such support.

Captain Chris Mercer, Program Manager USS America, Amphibious Warfare Program Office, during the SLD interview. Credit Photo: SLD

SLD: How are you working to shape synergy between the new aviation assets and the design of the ship?

Mercer: We have our partner design agents in Naval Air Systems Command (NAVAIR) who joined with us to design the ship specifically for that synergy of the MV22 and joint strike fighter through air ship integration work. That's how we arrived at the design that we have for the Flight 0 ships America and Tripoli, which is LHA-7.

SLD: What about the C5ISR enablement of the ship?

Mercer: We have a very large C5ISR suite in the ship, one of the largest afloat.

The Navy, by Naval Sea Systems Command, SPAWAR, and also NAVAIR, designs our spaces and together we look at what those requirements are, the bandwidth and the types of circuits.

All of those are directed through our requirements process to determine what we put on the ship, and that results in what we call a total C5ISR integrated package or an acronym we call TCIP.

That equipment is all procured and put together in mock-ups down in Charleston, South Carolina.

We energize it all, test it all, and then we bring that integrated package to the ship.

In terms of the additional C5ISR type of information that will be coming from the joint strike fighter, that work is still ongoing.

But inside the ship, we've got plenty of margins to bring in those C5ISR systems into our command and control spaces, and electronic suite spaces. Certainly plenty of footprint for the various types of antennas they might need.

We are excited to get the ship out and exercise it, and show those capabilities to the Navy and the Marine Corp. I think they'll be very pleased.

SLD: Even though you don't have a well deck, the America is part of a fleet and will support insertion of vehicles at the appropriate moment as well. It is part of fleet and must shape your thinking?

Mercer: Those are the lines along which we think as well. When we think about vehicle lift, we look at the whole fleet. We look at what an ARG can bring. Our ship does have a vehicle square albeit we'll lift that via airlift, and when you marry that up with an LPD and an LSD or even another ARG if you're doing multiple ARGs, there will be significant vehicle lift. And prepositioned squadrons, and the joint high-speed vessel, will all contribute to vehicle lift as well.

SLD: When one thinks about LCS, or JHSV or whatever assets we are going to put into the littoral, the aviation assets operating off this ship are crucial for a reach back function for the littoral forces. How does this affect thinking about the America?

Mercer: If you can vector in from wherever that air support is for those sorts of littoral operations, and certainly a ship like the future USS America will be there with those aviation assets, in that same area of operation to provide support and cover.

SLD: Could you discuss the propulsion plant on the ship, which is an important enhancement in efficiency for the operation of the large deck amphibs.

Mercer: In the late 1990s, early 2000s we embarked on a design to remove all the steam, go all electric, and put a hybrid propulsion plant in LHD-8 where we would provide a propulsion gas turbine engine to do your sprints and to go fast to your objective.

But most of the life of the ship is spent under 12 knots.

We have carried this experience forward to the future USS America. We put in two 5,000-horsepower electric motors, and geared those into the same gear set that the main gas turbine engines are geared into, and that's what we provide for propulsion.

In fact, most of the life of the ship, in design 75% of the life of the ship, will be on those electric motors. And we project most of its operational life underway will be with the auxiliary propulsion system.

The two-screw design inherent with this propulsion plant has advantages as well. If you wanted to do split plant operations and save fuel you can do that. If you want to go fast, you get both plants rolling full power ahead.

SLD: In shaping the configuration of the ship, obviously the workflow of the new aircraft will affect how the spaces are used on the ship. And you will do a lot of innovation as the ship starts to be used.

Mercer: We're working with our NAVAIR and Marine Corp Aviation stakeholders to define what those spaces are that they need. First, to load out all of their support equipment in stores, in avionic support and maintenance spaces, and all of their workshops, but then also to sit down and look at how everything flows through the ship.

The workflow of everything from shops, and cargo magazines, and movement of yellow gear and aircraft through the hangar will be crucial to the operation of the ship.

We also expanded the hangar, made the hangar larger on the future America compared to the Wasp class, and gave it two maintenance high hats with aviation maintenance bridge cranes in there, so there is a significant expansion of the aviation maintenance capabilities in the ship which will enhance operations as well.

SLD: I assume that your efforts here are informing similar efforts for the folks building the new large deck carrier, the USS Ford?

Mercer: It is. It's happening every day and with formal airship integrations, once a quarter to share all the things that we're learning as we are moving both our programs mutually forward.

SLD: Finally, how do the F-35 and V-22 affect the ship design?

Mercer: The airplane's bigger, the MV22 is larger than CH-46 by a fair amount; the F-35 is bigger than the Harrier.

Both have a bigger logistic footprint. The V-22 has unique maintenance requirements. We've got to open-up the airplane unfolded to be able to maintain it, something we didn't have to do as much with the CH-46.

And the ship's design has to take all of this into account.

Baseline Characteristics of USS America.

BLUF: LHA 6 (USS AMERICA) is basically an aviation-centric modified repeat of LHD 8 (USS MAKIN ISLAND); with no well deck.

Background Information:

- Key differences between LHA 6 and the LHD class ships include an enlarged hangar deck, enhanced aviation maintenance facilities, increased aviation fuel capacity, additional aviation storerooms, electronically reconfigurable C4ISR suite and removal of the well deck.

- Removal of the well deck for landing craft provides for an extended hangar deck with two significantly wider high bay areas, each fitted with an overhead crane for aircraft maintenance. These changes were required in order to operate the F-35B Joint Strike Fighter and MV-22B Osprey which are considerably larger than the aircraft they replace, the AV-8B Harrier & CH-46E.

- LHA 6 will provide a flexible, multi-mission platform with capabilities that cover the entire range of military operations (ROMO) from forward deployed crisis response to forcible entry operations.

- With a displacement of 45,000 tons, LHA 6 is as big as the aircraft carriers of other nations, and can easily fulfill similar missions when configured with 20 x F-35B Joint Strike Fighters.

- LHA 6 will also provide forward presence and power projection as an integral part of joint, interagency and multinational maritime expeditionary forces.

- Scheduled to be delivered to the U.S. Navy in late 2013, LHA 6 will eventually replace the USS PELELIU (LHA 5) which is currently operating with the Third Fleet Commander (C3F) on the West Coast.

- LHA 7, the USS TRIPOLI, is scheduled to be delivered to the U.S. Navy in late 2018.

- LHA 8 is currently being designed to be able to embark two LCACs or one LCU; a smaller well deck than that of the WASP Class LHDs.

General Characteristics of LHA 6 vs LHD 8

LHA 6 (USS AMERICA)	**LHD 8 (USS MAKIN ISLAND)**
Length: 844 feet	**Length: 844 feet**
Beam: 106 feet	**Beam: 106 feet**
Displacement: 45,000 tons full load	**Displacement: 42,000 tons full load**
Speed: 20+ knots	**Speed: 20+ knots**

Crew: 65 officers, 1,059 enlisted	**Crew: 65 officers, 994 enlisted**
Marines: 1,687 troops (184 surge)	**Marines: 1,687 troops (184 surge)**
Aircraft: 12 x MV-22Bs, 6 x AV-8Bs,	**Aircraft: 12 x MV-22Bs, 6 x AV-8Bs,**
4 x CH-53Es, 4 x AH-1s, 3 x UH-1s,	**4 x CH-53Es, 4 x AH-1s, 3 x UH-1s,**
2 x MH-60s	**2 x MH-60s**
Landing Craft: None	**Landing Craft: 3 LCACs or 2 LCUs**

<u>General Arrangement Considerations of LHA 6</u>

- LHA 6 is an aviation-centric modified repeat of LHD 8

- LHA 6 hangar is significantly larger than LHD 1-8

- Aviation shops & storerooms generally larger than LHD 1-8

- LHA 6 cargo capacity greater than LHD 1-8

- LHA 6 JP-5 capacity greater than LHD 1-8

- LHA 6 vehicle capacity less than LHD 1-8

- LHA 6 has no well deck = no LCAC or LCU

<u>Traditional MEU missions that LHA 6 could potentially support include</u>:

- Conventional Operations (Amphibious Assaults, Raids & Demonstrations)

- Tactical Recovery of Aircraft & Personnel (TRAP)

- Humanitarian Assistance/Disaster Relief (HA/DR)

- Non-Combatant Evacuation Operations (NEO) & Embassy Reinforcements

- Aviation Ops from Expeditionary Shore-Based Sites/FOBs

- Theater Security Cooperation (TSC) Events

- Stability/Security Operations & Peace Enforcement

- Maritime Interdiction Operations (MIO)

- Reconnaissance & Surveillance (R&S)

- Airfield & Port Seizures

Summary

LHA 6, enabled with the F-35B JSF and MV-22B Osprey, significantly increases your ability to conduct over-the-horizon (OTH) ship-to-objective maneuver operations.

With the ability to project Marine Air-Ground Task Forces (MAGTFs) directly to critical operational objectives located deep inland while simultaneously dislocating our adversaries both in space and in time, LHA 6 becomes an immediate game changer.

The Coming of the USS America to An Expeditionary Strike Group (ESG)

We first met Col Weisz before and after BOLD ALLIGATOR 2012, an exercise that presages in many ways the role, which the USS AMERICA will play in future Expeditionary Strike Groups.

(For an earlier interview with Weisz on the USS America see the following:

http://www.sldinfo.com/the-coming-of-the-america-class-warship-to-the-usn-usmc-blue-green-team/).

In many ways, the operational characteristics of the USS AMERICA with its new aviation capabilities can lead to a re-naming of the ESG itself.

The point being is that the ship and its associated fleet elements are about presence, and the ability to provide extended forward presence. With MV-22 Ospreys and F-35 Bravos the ship can operate to envelop an adversary and to project force to where the enemy is not; rather than providing simple frontal assault, and pushing landing craft and amphibious assault vehicles ashore.

It is a different approach and a different capability; which has been presaged in BOLD ALLIGATOR 2012.

SLD: How does the AMERICA class LHA affect ESG operations?

Col Weisz: With its improved C5ISR capabilities as well as increased operational and planning spaces, the USS AMERICA can operate very effectively as an ESG Flagship. When the ESG Commander comes aboard the USS AMERICA, he or she will be able to command the Strike Group more effectively than in the past, than can be done with our current large deck amphibs.

Yes, the Command and Control (C2) capabilities will be quite similar to what we currently have aboard our large deck aircraft carriers, from a C5ISR point of view. You will also have access to critical operational and planning spaces that you currently see on both the USS BLUE RIDGE and USS MOUNT WHITNEY; very capable Fleet Command Ships.

SLD: With BOLD ALLIGATOR 2012, we saw a couple of lessons learned which might shape the way ahead for the AMERICA. The first was the launching of 16 Harriers off of the USS KEARSARGE and working with several large decks at the same time, and the challenges to managing command and control.

Col Weisz: For BOLD ALLIGATOR 12, we had 16 AV-8B Harriers operating aboard the USS KEARSARGE. All in all, it worked out fairly well. The Blue-Green Team, the Navy-Marine Corps Team, has done this before; specifically in Operations DESERT SHIELD, DESERT STORM, and more recently IRAQI FREEDOM; so the concept is well proven but will always need some adjustments according to the situation and environment you are operating in.

What we hadn't done in awhile though was put two big deck amphibs, two LHDs, in close proximity of each other, so that caused us to work through some of our aviation command and control procedures and ensure we were always operating safely.

But again, the concept of using the big deck amphib as an AV-8B Harrier Carrier worked out well.

In the very near future, we will be able to do this same mission with 20 plus F-35 Bravos operating off the flight deck; which significantly increases our strike, EW, ISR and C2 capabilities.

Can you imagine what we could have done in support of Operation ODYSSEY DAWN if we had 20 plus F-35Bs on the USS AMERICA operating off the coast of Libya? Yes, one could have easily run the air war, the air campaign, from right there. The USS AMERICA with 20 plus F-35 Bravos aboard gives you a phenomenal strike, EW, ISR and C2 capability. It truly is a mini- aircraft carrier; very capable.

SLD: We have observed that one aspect that bringing a big warship like the USS AMERICA to the fleet is that provides for innovation in the entire strike capabilities of the fleet.

Col Weisz: Yes, currently Rear Admiral Terry Kraft from the Navy Warfare Development Command here in Norfolk, is running the AMERICA class LHA integration initiative. He is a former Carrier Strike Group Commander; in fact, he recently commanded the ENTERPRISE Carrier Strike Group in support of Operations ENDURING FREEDOM and IRAQI FREEDOM.

He is utilizing his extensive experience as a Naval Flight Officer with thousands of flight hours operating from large deck aircraft carriers and applying them to both the AMERICA class LHA and FORD class CVN integration initiatives.

His Chief of Staff is Captain Pete Pagano, former Phibron Four Commodore who led the KEARSARGE ARG strike operations in support of Operation ODYSSEY DAWN in Libya.

SLD: We have observed as well that there is a new role for the "black shoes" in all of this. The surface navy can play an ever-greater role than in the immediate past as the AMERICA enters the fleet. When you have an officer like Captain Hall, prospective commander of the USS AMERICA, who really is very, very knowledgeable about the weapons aboard the Aegis and the systems aboard the Aegis, he can actually start thinking as he gets his 35s airborne about the relationship between this ship and Aegis and the other surface combatants.

There's a real revolution possible here and shaping approaches to get better value out of the capabilities we've already put on the destroyer class.

Col Weisz: Yes, that is a great point. The current commander for Expeditionary Strike Group TWO is Rear Admiral Ann Phillips, a Surface Warfare Officer. She was the first Commanding Officer of the USS MUSTIN (DDG 89), the Commodore of Destroyer Squadron 28 and the recent Director of Surface Warfare (OPNAV N86).

She is a subject matter expert in the surface warfare community and has the right background to understand how the surface combatant fleet like cruisers and destroyers can effectively integrate with the amphibious warfare ships; it is those kind of officers that are able to integrate and network these systems together.

SLD: Another aspect of an AMERICA led task force or ESG is its "chameleon" like quality. It can hold a variety of assets, which can be mixed or matched for the mission. It can be a full up F-35B strike ship with 19-23 planes; or have a majority of Ospreys or more CH-53s aboard to carry equipment ashore.

It is a flexibility that can signal to the enemy presence; but not present a final statement as to capability.

As one combatant commander put it, "When the Marines bring the F-35B to my area of operation, as an air-enabled ground force, they can demonstrated innovation across the combat enterprise that our allies and ground forces can see themselves."

Col Weisz: An AMERICA class ESG can perform a variety of amphibious missions, depending on the capabilities aboard. You can deploy the ESG to lead a humanitarian assistance and disaster relief mission, what we can HA/DR.

You can have the AMERICA class ESG lead a large scale non-combatant evacuation operation, a NEO, where thousands of US, Coalition and Third Country Nationals need help. You can beef up the America class ESG so that it can conduct major combat operations; utilizing its robust strike capabilities.

You can even add Special Operations to the ESG, giving yourself a unique niche capability.

SLD: Let us close on discussing how the new ship and its capabilities might lead to a different approach to integrating a surface and subsurface ship task force. Rather than using the Carrier Battle Group concept as the organizing principle, there now is the possibility of getting very creative in terms of ESG approaches and concepts. What are the possibilities?

Col Weisz: The possibilities are numerous and there is significant potential, great potential, for innovation here. You have to remember that cruisers, destroyers and submarines use to deploy with the ESG. Then we moved away from that concept.

With F-35Bs, MV-22Bs and soon to be CH-53Ks aboard AMERICA class LHAs, I think there could be a return to these deployments, with a significant focus on strike, raid and ISR capabilities.

This is a great time for innovation across the fleet.

The Impact of the USS America on USMC Operations: "A MAGTF ACE on Steroids"

11/21/12 With Major General Walsh, Deputy Commanding General of the USMC Combat Development Command, we focused on how the ship provides an important impulse to the USMC approach to the future.

Walsh attended the christening of the USS America and with his background in Aviation as former background working at both HQs Marine Corps, in Iraq and at 2nd MAW is well qualified to discuss its impact on USMC operations.

But his current position as Deputy Commanding General, Marine Corps Combat Development Command means that he charged with the responsibility of working for the Corps on thinking through the evolution of expeditionary operations in the period ahead.

The USS America is a new type of large deck amphibious ship. As Captain Hall, the CO of the ship has put it:

We are a large deck amphibious ship, just as the Kearsarge. But we are an aviation-centric large deck amphibious ship and we've been designed specifically without a well deck so we can support the next generation of aircraft.

We can get out there with a much larger hanger bay with two high-hat areas to support maintenance on the much larger MV-22s. The maintenance requirements for the F-35 are met and we have the capability to expand when required for future development. With our added fuel, maintenance, supply, support, we can sustain the aviation capability much greater on station.

SLD: How is the USMC planning to leverage this new capability?

Major General Walsh: The Marines focus operationally on being a scalable and tailorable force. We tend to look at a deck as an opportunity to maximize scalability and tailorability for the mission that will be assigned.

We want to be able to disaggregate our assets, and having this capability truly allows us to do that, but it also allows us to aggregate and come together dependent upon the mission.

We will be able to use the new aviation assets combined with greater operational support to those aircraft to expand the scope and range of our ability to support scalable and tailorable forces.

SLD: When we talked just after you got back from Iraq, it was clear that the newest aircraft in the USMC operational kit – the Osprey – was a game changer. The F-35 will be as well. But it will take some time to figure how to use it and how operations will change as a consequence. Don't you see a direct parallel to marrying the Osprey with the USS America and the future inclusion of the F-35 B onto the America deck?

Major General Walsh: I do. With the CH-46s in Iraq, I had to put out Forward Arming and Refueling Points (FARPs) to support them. This meant sending convoys, equipment, and Marines out to operate and secure the FARPs. This also required protecting the FARPs after they were in place.

With the Osprey, I could simply leap past all of that. The Osprey completely changed how we operated. The demand became to use the Ospreys throughout Iraq because it could go through Iraq in one day easily, and just run around the battle space. It changed completely how we used our heliborne assets.

I expect we will have the same experience with the F-35 B, only more so. When I went from flying F-4s to F-18s that was a shift.

With the F-35 it is a leap of multiple generations of technology all at once.

It's more of exponential curve than we did when we went from third generation to fourth generation aircraft.

It will not only bring in stealth and precision strike but all electronic attack and C5ISR to the USS America as a presence asset. This will be revolutionary.

SLD: The ship will have a significant upgrade in C5ISR over the USS Kearsarge, for example. And as the F-35B brings its C5ISR capability to the ship, the interaction between the ship and the aircraft, will also shape how the ship can be integrated into the surface and subsurface fleet. What is your perspective on this dynamic?

Major General Walsh: One of the things I participate in is what we are calling the air/sea battle area. I am on the senior steering group as the Marine Corps representative.

One focus area is what we are calling network integrated attack. From a USMC perspective, we are working on integrating such an approach into our presence mission.

We look at the USS America from this perspective.

We are looking to integrate the ship, the aviation assets and the fleet into a single scalable and tailorable operational force.

The ship's got to be integrated too. It has tremendous capabilities from a mechanical standpoint, the size of it, the structure, hanger base, cranes, and an ability to be able connect and do the things that we need from a command and control standpoint.

But if it can't connect in this network integrated world, it's not going to be effective.

It's got to be plugging in just as with our other platforms are so we can talk to Aegis Cruisers, it can talk to subs, we can talk to the AWACS and it can be plugged into the carrier's network.

All of this needs to be integrated into one single-joint force.

The Marines focus on going to go where the enemy isn't, and finding the gaps and seams to insert force.

It is not just about precision warfare.

It is about presence, engagement, and pushing information around the battlespace and sustained operations when necessary.

SLD: From your perspective, the integration of C5ISR from the ship to the aircraft to the ground force and to the fleet is really a central piece of the equation?

Major General Walsh: From a USMC operational perspective, it is central.

We are not going to be doing be able to do all the innovative things that we're developing with our platforms, our aircraft and what our Marines are going to do ashore if we can't work an integrated force.

And all the capabilities that we're developing, like G/ATOR and plugging it in with things like the common aviation command and control system (CAC2S) is central to our effort.

We need to put the glue together to tie the Marine air ground taskforce (MAGTF), with our brothers and sisters out at sea to be able to project power from the sea.

SLD: From the USMC perspective, the F-35 B is a Swiss army navy enabling expeditionary operations. How will it interact with the operational approach of the USS America?

Major General Walsh: Everything we try to do is to buy something that's going to fit into the toolbox, and provides capabilities for many uses. With the Harriers they were good for one thing—precision attack. They were attack aircraft to really be Marine's airborne artillery from the sea or move ashore to be that airborne artillery, so we could start getting some more fire support capabilities early in the operation while we phased our artillery ashore.

With the F-35, fire support is just one element. Preparing to insert force and then provide support for that force ashore, the F-35 will provide C5ISR, electronic strike, and guidance to where to maneuver and support the force.

But I'll tell you, the young guys are hungry to get on with this because they understand that they will be able to support in a 360 degree manner the entire MAGTF. They can not do this with Harriers or F-18s, or the support we get from Navy Growlers.

The F-35 will provide the Air Combat Element (ACE) and the MAGTF the complete package.

This will be an entirely new capability with the F-35 as the combat Swiss army knife connected to the capabilities of the USS America and its power projection assets. The term gamechanger tends to be over used but I truly believe the Litening II will be that set of capabilities.

But my operational experience in Iraq demonstrated that the Osprey was just that.

And the package of USS America, with the Osprey, the C-53K, AH-1Z, UH-1Y and the F-35 Bravo on board will be that in spades.

It will be a MAGTF ACE on steroids.

An Update on the F-35 Integrated Training Center at Eglin AFB

9/16/12 By Robbin Laird

During my visit to Eglin AFB on August 24, 2012, I had a chance to continue my ongoing conversation with Deputy Commander of the 33rd Fighter Wing, Col. Tomassetti.

In previous visits, Tomassetti showed me the plan, then the buildings being constructed, the classrooms being formed, the courseware being written and the preparation for pilots, maintainers and planes to show up.

Now they have shown up and it was a real pleasure to see the ITC in operation and to witness the 200th sortie of the F-35 at Eglin.

In January 2010, Tomassetti outlined the approach of the ITC and its strategic advantages:

We're going to have representatives from all three services in the U.S. and whatever partner countries are here at Eglin, and those students, without us doing anything deliberate or specific, are going to be going to the same classrooms, sitting next to each other. They're going to go and they're going to eat breakfast and lunch together in the same dining areas potentially. They're going to go run in the same jogging rails. They're going to go workout in the same fitness facilities.

So without even trying, there's going to be an interchange of cultural ideas and philosophies. There's going to be an interchange of how we do business, how they do business. There's going to be an interchange of all kinds of basic information that those students will just naturally gravitate to as they're exposed to being in close proximity to each other.

So that's without even trying. Now if you say, "Okay, what if we put a little bit of effort and thought into that?" How much more could we get out of that where we deliberately setup training events that will make Navy, Marine, and Air Force pilots go fly training missions together as they get into their advanced studies where multiple airplanes are required and we allow them to share their ideas and their service techniques of doing things and then add in the partner countries that take part in this. The opportunity to learn and increase the knowledge base of everybody who comes through the Eglin campus is tremendous.

During this visit, I bumped into a British Royal Naval maintainer now at Eglin and beginning his training. The promise is starting to be realized.

Question: How many planes are here now?

Tomassetti: We currently have 19 F35s here at Eglin; 10 F35Bs and nine F35As. We started flying the F35As in March, and we started flying the F35Bs at the end of May.

Working on the F-35 just after its return from flight at Eglin AFB. Credit: PAO, 33rd Fighter Wing

Question: What are the initial results of the training effort?

Tomassetti: The initial results are very good. From the pilot perspective, I gauge success on two primary things. One is when a pilot steps out to the airplane for the first time and flies the aircraft. You have to remember that we have no two-seat versions of the F35, so when they go the first time, they're going solo.

When they walk out to the airplane and they're confident, that's one positive indication. That means that we have done enough to make them feel confident in terms of what we've taught them in the classroom, what we've shown them in the simulator.

When they get back from that first flight and say that nothing was surprising, that the airplane pretty much flew like the simulator did, that everything worked as it did in their rehearsal simulator for the first flight, that's my other measure of success.

That means that if we have now confidence in that ground training that it's accurate.

It is very representative of the real aircraft, and that we've done a good job in giving them enough detail, enough breadth of information so they feel comfortable in the airplane, and they are prepared to handle any contingency.

And it means that we have done the right things in the simulator in terms of making it realistic.

And in terms of what we actually expose them to in the simulator so that when they do that first flight, there are no surprises. Again, everything is just like it was in the simulator when they go out and fly the airplane on that actual flight.

In the beginning, we were happy when we could fly about two or three sorties per week on our airplanes. We were very excited towards the month of June when we were able to execute eight sorties in the same week, which was our first milestone event because that was the sortie generation rate we would need to train a group of four pilots in the block 1A syllabus and keep them on schedule.

And just a month and a half, two months down the road now, we're now scheduling eight sorties a day fairly routinely.

We have come a long way in the past few months.

The maintainers are getting smarter about how to handle them. General operating the airplanes here at Eglin is getting to be somewhat routine; so the pilots are getting more comfortable, the installation, air traffic control is getting more comfortable with us operating in the air.

Question: What is next in terms of the training effort?

Tomassetti: We are injecting two UK pilots into the curriculum this Fall and Dutch pilot next year.

And we are shifting curriculums. The current curriculum focuses on the basics of flying the aircraft. The new syllabus goes beyond that to the use of the combat systems aboard the aircraft. We start to incorporate simulated weapons, we start to incorporate the radar and some of the other sensors on the airplane, and teac the pilot not just how to fly the airplane but how to fight with the airplane.

Question: And this shift in curriculum is associated with the upgrade process on the aircraft itself?

Tomassetti: We've started to modify some of those initial block 1A airplanes to the block 1B configuration. This involves both software and hardware changes to the airplane, but what it brings us a capability to continue executing additional flights in the overall F35 syllabus.

The initial block 1A syllabus consisted of six flights, basically, for the pilots. As we get the full capability of block 1B enabled in the airplanes and cleared for use, we will be up to training about 27 flights on the F35B syllabus.

It's a pretty substantial jump in what we can execute of what will be eventually about a 50-flight syllabus in the block 3 configuration.

It is a small step with block 1A, and a bigger step with block 1B. The biggest thing we bring in with block 1B is we start to bring in some of the war fighting capability of the airplanes, some of the sensor capability of the airplane, and so to introduce the pilots to how to use those sensors, how to employ some of that combat capability.

And that's what we're working towards right now is to get those airplanes converted, get our block 1B syllabus, our courseware and our simulator program reviewed and certified that it's good to go. And then hopefully, by the beginning of 2013, we'll have all that process done. And we'll be training pilots in block 1B and block 1A will be in the rearview mirror.

Question: You are going to leave by next summer. What would you like to see by the time you leave?

Tomassetti: I think from a personal perspective, what I'd like to see happening here at Eglin before I leave is that we are basically into sustained training operations, for both pilots and maintainer.

Matter of course may be a little bit too strong a term, but the process becoming very predictable and very regular would be the goal.

We are advertising to our customers, the Marine Corps, the Navy and the Air Force that we can train a certain number of people in a given time frame, a fiscal year typically is what we use.

And they are sending us people on a regular basis, every couple of weeks, and we're starting a new class of some number of pilots and maintainers. They are executing their training, and they are staying within the prescribed amount of time to complete that training.

And we're sending them off to wherever it is they're destined to go.

And at the very end of it, wherever they go, I would like those people coming and telling us that we developed a pretty high quality product.

Keep up the good work. That's where I'd like to see us next summer and to have the initial people out the door, working wherever it is they've been sent to work.

Question: It is clear that the Marine Corps as the initial operator of the aircraft have a special role within the program. What is the relationship between Eglin and the roll out to Yuma and Beaufort?

Tomassetti: One of the Marine pilots who is here was selected to be the commanding officer of 121 out in Yuma. So we're already starting to see the Marine Corps reach into the Eglin training pool.

We'll mix in some experienced people from Eglin and they'll bring in some new folks as well with some fresh ideas to shape the new USMC squadrons.

We are not only taking some of the folks from here and getting them ready to populate those places with their expertise, but we're doing a lot of work now trying to bring in as many people as we can from Yuma. We let them spend a couple of days here, learning what a day in the life at Eglin is like, or a day in the life of F35 operations is like. This way, they can see things and take that back to Yuma and inform the folks there.

And there is cross-fertilization across the test and training sites; between here, Pax River and Edwards.

Typical USMC "two-ship" flight formation for the F-35B. This particular flight encompassed sortie 199 and 200. Credit: SLD

Question: Could you talk about the software on the plane and explain the importance of software stability for a fly by wire airplane?

Tomassetti: It's very easy when you talk about airplanes, especially, in the 21st century to talk about things like weapons capability, speed, turning capability, maneuverability, and low observability.

But what you don't hear many people talk about is it an easy airplane to fly?

Pilots make that comment oh, this is an easy airplane to fly and that's sometimes taken for granted, and the understanding of what it takes to make an airplane that's easy to fly.

This is especially the case when we talk about F35, an airplane that has to fly as a conventional airplane, that has to fly as a STOVL airplane, it has to be able to perform carrier approaches and carrier landings.

Trying to make all of those different types of flying that the F35 has to do, fall into that category of easy to fly is no small achievement.

With the F35B, right now, we have seen pilots with no Harrier background, with no Harrier experience, with no STOVL experience, get in the airplane after their first time and say that was pretty easy to fly in the STOVL mode.

We have lots of visitors here at Eglin and we get a chance to put many of them in the simulators. And one of the things that we do with everybody is we let them do a vertical takeoff, fly around and come back and do a vertical landing, either at the fuel or at the ship.

And the comments from everybody from heads of state, chiefs of staff, or foreign folks, folks with lots of flying experience to folks with next to no flying experience and they come back from the simulator and say well, that was pretty easy to do.

That was what the engineers were hoping would happen, and that's what a lot of years and a lot of testing and analysis and research was put in place to allow to happen. And I think we've actually achieved it.

I think we finally built the STOVL aircraft that we've been trying to build for about six decades.

We have an airplane that is comparable to its conventional counterpart that has all of the capabilities that its conventional counterpart has. It doesn't really sacrifice much in the way of significant capabilities in order to retain its STOVL capability.

And for that STOVL capability, we have an airplane that's easy to fly, which means we won't spend a lot of time having to teach people how to fly STOVL. And we won't spend a lot of time practicing STOVL when we're out there.

We will spend the majority of our time with this airplane focusing on tactics and missions.

I can tell you from a training perspective, if I'm spending more time teaching someone how to fight with the airplane, then on how to fly the airplane, I'm giving the fleet a much better pilot, a much better combat ready pilot at the end of the day.

I think that's worth however many lines of code it takes, and however many hours in the laboratory it took to get there, it was worth every minute of it, and worth every line of code that we got to enable that to happen.

Living the Transition: Shaping the F-35 Maintenance Approach at Eglin

09/25/2011 – In early August 2011, *Second Line of Defense* sat down with Col. Sampsel and Secretary Wynne to discuss the transition in maintenance culture and its challenges for the F-35. Col. Sampsel is living through the transition and Secretary Wynne was one of the architects of the F-35 and its maintenance approach. It was unusual to have an architect and a key implementer in a dialogue about transitional dynamics. This article summarizes some of those interactions and ways to understand the transitional dynamics and challenges.

Col. Laura Sampsel, 33rd Maintenance Group commander, is responsible for the bed-down and operational readiness of the three variants of the Joint Strike Fighter F-35 aircraft. The primary mission is to enable the production of pilots and maintainers for future training and combat units. (Credit: USAF)

Second Line of Defense sat down with Col. Laura Sampsel shortly after her departure from Eglin and retirement from the USMC. During her time at Eglin, Col. Laura Sampsel, 33rd Maintenance Group commander, was responsible for the bed-down and operational readiness of the three variants of the Joint Strike Fighter F-35 aircraft. The primary mission is to enable the production of pilots and maintainers for future training and combat units.

Secretary Wynne with his years of industrial, and acquisition experience was the dialogue partner with Sampsel during this interview and provides an interesting look inside the transition ahead for maintenance practices for the three services moving ahead with the new airplane.

The F-35 is the first combat aircraft designed with maintainability as part of the con-ops of the airplane. Increased ability to share maintenance practices across the services and the partners, as well as common parts provisions, are at the heart of allowing the aircraft to operate globally more efficiently and effectively. In light of the financial stringencies facing the allies and the services, if such a plane and approach were not available, air power capabilities would be reduced even more.

If one took the report which projected more than a trillion dollars to support the F-35 over its lifetime in 2065 dollars, and if one used those same 2065 dollars the figure for support would be north of 4 trillion dollars. We are not fans of using hypothetical 2065 dollars to do any analysis, but using the terms of the projected 1T in support, the maintenance revolution if fully realized can save more than 3 trillion dollars in hypothetical 2065 dollars.

At the heart of the maintenance approach is the digital capability built into the aircraft. As we argued earlier:

Digital systems allow many changes to occur throughout the military. We have already seen these changes in the commercial sector, and it is difficult to believe that the military cannot mimic such changes.

First, there is a significant reduction in the touch labor required to maintain modern vehicles or planes. The computer chips provide sensors and information, which allows a significant migration of knowledge to the machine, rather than relying upon armies of maintainers.

Second, the machines can tell when maintenance needs to be done. Rather than having a manpower intense scheduled maintenance regime, the platform tells you when it needs to be maintained.

Third, firms like Fed Ex manage fleets. They buy with a fleet in mind and with as much commonality as possible. This allows them to drive down cost by supporting more assets with common maintenance procedures and operations.

Fourth, commercial aerospace firms build their products with maintainability as a key driver. And they can use incentivized-based systems such as fly by hour to gain savings, which they can then invest in evolving the systems, which they build to optimize operational savings.

Fifth, the commercial standard is clearly to manage a supply chain to build and sustain a fleet. The global supply chain to produce modern products is assembled by manufacturers to deliver a viable and cost effective product. The same supply chain is used to deliver support. Having a core firm to manage both is a cost driver both for support as well as gaining information about planned product improvements.

SLD is a group populated by realists. The ability to realize the advantages rooted in the new aircraft will not happen overnight or without significant cultural shifts. In an interview with Master Gunnery Sergeant McKay, shortly before his retirement, the challenge was highlighted:

When I first got into the program a couple of years ago, the Nirvana was a USMC jet can land in an Air Force-Navy Base that has F-35s and be repaired, and fly home. The reality is that nobody else wants to play in that world; the Air Force and the Navy have no desire to play the game that way. Even the Marines at some point along the way have a real problem with somebody else fixing their toys and calling it good.

There is no standardization of maintenance practices among the services, let alone internationally. You're talking an entirely different nightmare of, "I'm over-flying some other country, you need to land for whatever emergency, and need to get fixed." Traditionally, you send a maintenance crew from very far away to fix that one aircraft, takes days, and then you fly home. Where if it was already resident on the base, why couldn't you fix it right there with what you've got?

And the interview went on to discuss the challenge of transition:

SLD: But clearly the technology can drive change. The problem with maintaining the maintenance stovepipes, as they exist now, is that the technology and the plane doesn't require them. It is as if Southwest Airlines with a common fleet of 737s would have three different maintenance cultures. This makes no sense. Deployment differences among the services are real and adjustments

to the culture needs to be made to provide for such differences but simply to ignore commonality is costly, ineffective and reduces core combat capability significantly going forward.

MGySgt McKay: Absolutely. If we can have the services drive towards even common terminology, this would be good. For example, the USAF and the USMC do not have a common understanding of what being expeditionary means, and the maintenance challenges associated with expeditionary are different for the two services.

If we could get the services to agree on common terms and explanations of exactly what those mean. Differences in services, absolutely, there should be were appropriate but working through expeditionary logistics is a good place to start, at least, so we're talking on the same sheet of music.

SLD: Why not use the common maintenance training facility at the JSF training compound at Eglin? One could build a cadre of cross-service folks who could shape that dictionary or build that language because you're trying to do the cross-service training, cross-service maintenance.

Maybe one should be thinking about adding a core-competence to that schoolhouse of an elite corps of instructors who are actually bargaining through some of the language. And of course, you have the advantage of having the maintainers from the different nations there and the different pilots, which are actually informed by some cultural reality as opposed to just making it up. Does that make sense?

MGySgt McKay: It absolutely does. And I believe the pilot portion is much more integrated than the maintainer side. Because the core structure is broken out into modules, you can insert modules as you see fit for you service.

They can rebuild or they can build that courseware to fit a service need. The pilots like combat integration. USMC pilots like the fact that they fly with the Navy and will fly with the Air Force; maintainers, not so much. You haven't broken that paradigm at all. And breaking that paradigm will be crucial to taking advantage of what the F-35 program offers.

Breaking Glass	Shaping the Cultural Revolution with Regard to People, Processes and Training
Shape and Leverage the Joint Experience	Shape and Leverage the Joint Experience
Re-Alignment of Maintainers and Maintenance Process with the Airplane	Re-Shape Grades and Skill Sets of Maintainers and Shape Appropriate Transition Metrics
Shape a Service-Contractor Relationship or PBL For Effective Sustainment	Focus on Mission Effectiveness and Proper Roles for Government and the Contractors in Maintenance and Supply Chain Management
Management of the ALIS Upgrade Process	ALIS will Evolve Through Block Upgrades; Manage the Process and Expectations with Realistic Block Upgrades in Overall Maintenance Practice
Alignment of F-35 ALIS Information Systems With Other Maintenance Information Systems	Build Migration Strategy and Tactical Realignment to Get Most Effective Outcomes for Mission Effectiveness

The dialogue between Sampsel and Wynne focused on the core challenges of transition. Sampsel has shaped and lived through the beginnings of the revolution; Wynne was one of the architects in setting the revolution afoot.

It was a complex and varied discussion. In this article we will breakdown the conversation into several key elements around which the transition is evolving. The accom-

panying chart summarizes some of those key themes and each will be discussed separately.

Sampsel started the conversation by underscoring the core strategic opportunity offered by shaping a new maintenance approach.

Col. Sampsel: If we can align processes and policies within the services, I have full confidence that in the future decades, there will be two significant positive outcomes.

One, deploying fewer airman, marines, or sailors into harm's way, quite honestly, which would be a key objective, especially for me. I've got a marine lieutenant who's going out there. So the fewer that need to be deployed the better.

Second, you can shift your operational paradigm. It would give you untold flexibility when you're doing your operational planning. You are no longer bounded by any of the basing or sustainment things that can, today, limit your capability. You can potentially launch, recover or divert anywhere, anywhere where there are F-35 deployments. The entire battle space grows exponentially.

And for me, I want Eglin to be the proof of principle for integration and jointness because this is what the F-35 program really is all about.

Breaking glass is how Sampsel described the paradigm shift. She argued that a cultural revolution in the maintenance and supply culture would be affected as one changed the approach of personnel, the processes to govern maintenance and logistics, and the training necessary to do joint and coalition maintenance and logistics.

Sampsel indicated that at Eglin they had put together a process among the services to both reflect and generate change.

Col. Sampsel: A key driver in getting the cultural shift was shaping and then leveraging the joint experience.

I had to figure out a way to force the Air Force and the Marine Core to stop talking past each other. My Deputy, now the Commander, was Col Mark Fluker. He and I started by realigning people and structure. The F-35 and the Eglin opportunity were new and unique. Neither a USMC nor USAF cookie cutter was going to work. We looked at what was best from each of our services and then decided to build an organization within the Maintenance Operations Squadron called the Joint Integration Division. It is "affectionately" referred to as the "JID" at the 33 MXG. It is actually quite simple.

For every Air Force Maintenance Specialty that was built you had to have a buddy from another service. That's your buddy. You, Mr. Air Force, are going to come in and tell me everything I never wanted to know about the NAMP (Naval Aviation Maintenance Program). How does an Air Force maintainer do it? You Mr. Marine are going to tell me everything you loathingly never wanted to know about the Air Force approach. I'm talking about in terms of their competency. Then they each had to come back in. All briefed me independently. Then they had to come back together, and put a piece of paper together to tell me that where were the significant differences between what they did.

Almost across the board, they together decided that really, there weren't that many differences. Not only did this structure change and process build an increased technical competence; yet, equally important, it brought about, and continues to drive, a significant amount of respect and trust among the service members. That was the only way we were ever able to get a set of common maintenance operating instructions within the 33rd Maintenance Crew.

The shaping of a joint experience of providing what Sampsel referred to as commonalities appropriate to the task is central to the transition. And Sampsel indicted that the services have already swapped personnel to help with cross testing.

Col. Sampsel: One way you do it is you do exactly like what we did, which is you send Airmen to Pax, and you send Marines to Edwards! That's one way to do it. Pax River needed qualified individuals to support some activity. The reality is the Air Force, in my opinion as a Commander, had the singular most hands on time with the aircraft. So after collaborating with my Air Force Deputy, Col Mark Fluker, we said, "Send the Air Force." I didn't care what color their uniform was because they didn't have to deal with uniform paradigm, they had to deal with a plane.

Secretary Wynne added that as this gains strength the application of commonality where appropriate can shape an allied approach as well.

Secretary Wynne: The approach she is discussing can be extended into the international arena as an operating baseline. And as you shape in effect a maintenance Top Gun, why can't you invite the partners WHO ARE ALREADY training there. This can be extended to an international Top Gun for maintenance, because the maintenance activities are across the board the same.

The third way to understand the transition is shaping the maintenance structure with the capabilities of the aircraft. You will need different skill sets for the F-35 than for legacy aircraft; and you will need to shape the grade structure differently.

Col. Sampsel: We need to figure out what are the core competencies required to actually fix the aircraft, and align our personnel to those core competencies versus persistently taking round holes and trying to shove them into square pegs.

If you do that, everything, a huge amount of the current inefficiencies start falling apart because now I can have Air Men, Marines, and Sailors in the same classroom learning the same core competencies.

Right now we have three separate service training tracks, we have different training curriculums and that's driven by the fact that we're all just different enough to warrant having to do that.

You're really only different at the very micro levels based upon your operating paradigm. But technically you have significant commonalities.

With shaping common training, a lot of the inefficiencies start falling apart if you can get as far ahead of the game in terms of the man-power management, and really necking down to what are the core competencies required to correct the aircraft, to fix the jet.

And you need to focus on those core competencies.

Sampsel and her colleagues have made significant progress in shaping a correlation of the different service approaches and the ability to bring about core commonalities. It is important to respect service differences, but the commonality inherent in the plane drives significant change.

As Secretary Wynne put it: "Operational tempos and rhythms will shape differences. But those differences should not be used to block the commonality inherent in the aircraft or the weapon systems."

The fourth key element to understand transition revolves upon re-shaping the contractor-services relationship in evolving the maintenance approach. The current structure is for contract services, but the goal is to evolve into a Performance Based Logistics Program.

Secretary Wynne argued that the key challenge is to focus on mission effectiveness and aircraft availability, rather than the government simply spending its time on oversight of contractors, or the contractors seeking to use government metrics to shape profit structures. The point of a common supply chain and support structure is to enhance significantly mission effectiveness and to seek optimization of the working relationship between the services and the contractors.

The fifth key element is managing the transition through the various block upgrades of the core software for the digital management systems for the aircraft. The Autonomic Logistics Information System or ALIS is at the heart of the revolution.

http://www.sldinfo.com/crafting-the-f-35-sustainment-approach-a-central-element-of-the-con-ops-of-the-new-aircraft-system/

Col. Sampsel: ALIS is a true paradigm shift. It is not just an enhancement of current technology. But, and this is key, its full capabilities will not show up Day 1. We are in the very early blocks of ALIS's software, and we are doing things with this software we have NEVER done before with an aircraft. We will transition through many blocks of the software as capability is rolled out. This part of the transition is without doubt, in my opinion, the most difficult to execute and manage.

We need as we do the rollout to have effective and realistic transition plans for each phase. We should have realistic expectations of what we can achieve at each phase. We have not done enough in this area.

Secretary Wynne underscored that a key challenge was gaining confidence in the reliability of the data as one moved forward with the new maintenance regime.

Col. Sampsel: I agree. . You have to mitigate it by getting service and industry experts aligned and putting them in the "right" place. Cut out all the middle men between the tactical unit and ground truth. Get people the information they need quickly. That ensures that you build that level of confidence. I remember when ATM's first started. I remember my mother saved every single little piece of paper printed by the ATM, and checked her bank statement. Tell me how many Americans do that today? If you start demonstrating capability, you can gain people's confidence.

Secretary Wynne: Except for one thing, and that is that safety is paramount. And I think you need to say that. And safety drives you to strong configuration control. Especially when it comes to expected maintenance activities. And until you get, frankly, reliability of presentation, you can't get to reliability of expectations In other words, if you're told you're going to be presented with your bank statement then and there, and you don't, there is a confidence problem.

A final element of the transition, which was discussed, is making sure that ALIS does not end up being a stove-piped information system. Sampsel emphasized that the USN and USMC have worked hard and long to shape an IT system for maintenance in which they had confidence to determine aircraft reliability and availability. That system required massive amounts of manpower to generate the data up to the Navy Aviation Enterprise, but is was considered reliable. How will this system be modified to work with ALIS and how would ALIS evolve to play a similar function?

Col. Sampsel: The Naval Aviation Enterprise has for the last 20 years, 15 years, evolved to one of the most significant and effective forums for Navy and Marine Corps deliberate logistic decision making. . Once something makes it to the top of the NAE, the F18's are doing great, but this commodity is under performing, decisions are mad to reallocate focus or resources. . Decisions that you never ever have seen happen in the past are now capable of happening because the NAE is very powerful.

Within an NAE you have an IT system, which has been put together to report to the NAE. And the IT system is called Marine Commanders' Current Readiness Assessment Tool (MACCRAT.). The cockpit charts, if you've ever seen them, they're genius. Once you learn how to read it, unfortunately they're not intuitive, but once you learn how to read it, it is one stop shopping at the General Officer level to truly be able to make permanent decisions. The key to that is they have absolutely confidence that the data they're looking at is accurate and there is integrity from the sources.

There are very significant manpower costs to generate the verification of data. How much benefit do you get out of those and how much man-power are you willing to spend to keep it?

Final conclusions were provided by both participants about the challenges facing the transition process.

Secretary Wynne: We have effectively subscribed to and paid for a culture shift in capabilities that we now need to take advantage.

And your frustration is two-fold.

Number one, you see the cultural transformation that can happen. And you're faced with a system that at West Point we call it 200 years of tradition unhampered by progress. So we, what you see, a system that doesn't want to move forward.

Second, the things that you see that can really lead to breakthroughs are having berthing problems. So you are afraid to, frankly, risk your credibility by asking people to change this cultural phenomenon and bring those two systems together because the system might not work fully as expected, and indeed won't.

Col. Sampsel: I agree. A key challenge is to figure out what are the core competencies required actually to fix the aircraft, and align our personnel to those core competencies. I.

If you do that a huge amount of the current inefficiencies start falling apart and you can shape the Cultural Revolution. Quite honestly, Eglin is the place to do it!

Strategic Dynamics from the Combat Learning Dynamic Launched At Yuma

The developments at Yuma are the "tip of the spear" driving combat innovation. As the USAF adds its F-35s to Hill AFB and works on con-ops innovations at Nellis at the Fighter Weaspons School, and as Coalition partners work with the US services at these various facilities but centered at Eglin AFB, significant change could be unleashed. And with it the kind of con-ops innovation crucial to 21st century operations and execution of strategy.

In this section, we look at four illustrations of thinking along these lines. The first comes from the current 7th USAF Commander. The second comes from the Commander of MarForPac. The third looks at the innovations in combat learning facilitated by the F035 and the fourth at the evolution of Pacific strategy which a fleet of F-35s could enable. From this point of view, the F-35 squadron(s) at Yuma are the acorn for the oak.

Meeting the Korean Defense Challenge: The View from the 7th Air Force

8/3/12 In an interview this month with Lt. General Jan-Marc Jouas, *Second Line of Defense* had a chance to discuss the challenges of defense in the Korean Peninsula. This area remains a key driver for U.S. forces in the Pacific, and any consideration of how to strengthen alliances in the Pacific must start with South Korea. This is especially important given the coming transfer of command within South Korea which will elevate the South Korean role.

Lt. Gen. Jan-Marc Jouas is the Deputy Commander, United Nations Command Korea; Deputy Commander, U.S. Forces Korea; Commander, Air Component Command, Republic of Korea/U.S. Combined Forces Command; and Commander, 7th Air Force, Pacific Air Forces, Osan Air Base, South Korea. He is also the U.S. representative to the joint committee for the Status of Forces agreement between the two countries.

General Jouas was commissioned in 1979 as a graduate of the U.S. Air Force Academy. He is a command pilot with extensive operational experience in F-4, F-15 and F-16 aircraft, including more than 80 combat missions. He has commanded at the squadron, group and wing levels, and served as a Joint Staff division chief and special assistant to the Chairman of the Joint Chiefs of Staff. Prior to his current assignment, he was the Pacific Air Forces Director of Operations, Plans, Requirements, and Programs.

SLD: What about S Korean AF Modernization and its importance?

LT. GENERAL JOUAS: Whatever aircraft South Korea purchases has to be capable not just today, but five years, ten years, 15, 20 years from now. And you have to get the best aircraft that you can afford for your war fighters. When you get down to it, they need an aircraft that meets those citeria.

SLD: Let's talk generally about the world of air power in Korea and beyond. What does air power bring to the party in the defense of Korea, and our ability to be flexible and reinforce, and all that kind of stuff. What makes sense to talk about in that demeanor?

LT. GENERAL JOUAS: Air power, not unlike in 1950, will initially stem the flow of aggression against the ROK. Historically, the reason we were able to establish a defensive perimeter in 1950 was because air power was able to slow the advance of the North Korean Army as it moved south.

Air power is always able to attack in depth; we're able to operate at the strategic level, the operational level, and the tactical level. An air campaign on the Korean peninsula would follow that blueprint, establishing air superiority and creating effects across the spectrum of a joint battle space. In doing so we would provide ground and naval forces the freedom to maneuver and engage, so that we jointly defeat the adversary.

SLD: So to summarize this, whatever the realities perceived elsewhere, you are the point of the spear in a traditional air force sense, and that you really need to be able to conduct simultaneous operations. You need to be able to manage effects on the battlefield, so you need a real capacity to be multi-mission, and have a lot of similitude and reach, any decent reach. So those are the functions that you need to execute. Does that make sense?

LT. GENERAL JOUAS: Absolutely. We need to be able to attack in depth. We also need to be able to attack at the forward edge of the battle space.

We need to be operating against targets that will create not just tactical effects, but operational and strategic.

We need to be operating cross domain, and by that I mean kinetic and non-kinetic effects, one reinforcing the other.

One of our greatest advantages is our air operation center that will oversee the entire air campaign, and where I will be situated as the air component commander.

SLD: How will the coming of F-35s to South Korea affect the template?

LT. GENERAL JOUAS: U.S. overseas basing decisions are not yet determined; however, any deployment of F-35s to the Korean peninsula will clearly modify the template, including the Marine Corps F-35B.

The Seventh Air Force relationship with the Marine Corps is the best I've ever seen. Their aircraft will be dedicated to the Marine Air Ground Task Force (MAGTF) at some point, but before then, they will be used as part of our air campaign to the greatest effect that we can deliver.

The F-35A, B, and C will give us greater flexibility, and greater options in terms of where and how we can operate.

We will integrate the F-35 with F-16s, F-15Ks, F-15Es, F-22s, and other airplanes in a way that will enhance and increase everybody's capability, much in the same way that we currently see the F-22 and the F-15 integrating and increasing their capabilities. Our targeting, and the effects that we will seek, will be adjusted by the fact that we have F-35s.

SLD: Lt General Deptula often makes the point that the F-22 and the F-35 is not really an F but is an ISR platform in a new way. How do you look at these developments?

LT. GENERAL JOUAS: I'll just say it has an inherent ISR capability that we can exploit. And as our sensors join together to form a common picture, hopefully that would integrate with the ground and naval components' capabilities, so that we can rapidly target the developing threats before they are in position to employ.

And that's just one example. When the F-22 and F-35 will be over flying any terrain, and relay what it sees and what it senses, and have that distributed to other weapon systems, we will have a significant growth in capability.

SLD: What will be the impact of the transition in 2015 to South Korean military command?

LT. GENERAL JOUAS: In December 2015 operational control will transition to the Republic of Korea. Now we have a U.S. General heading Combined Forces Command and US Forces Korea.

US Forces Korea will be deactivated, and in its place we will stand up a U.S. Unified Command called Korea Command, KORCOM.

South Korea will have command and responsibility for its defense, and we will provide supporting forces.

South Korea understands the need to develop its own capabilities in key areas. We are in very earnest discussions with them about the supporting and enduring capabilities that we will provide.

SLD: Basically this F-35s entering into this particular period of political history, political military transition right?

LT. GENERAL JOUAS: Absolutely. And air power is an essential element in Korea. **This is a "come as you are" fight over here.** No one is going to let us reinforce for six months; when people take on the United States, they know they don't want to give us the time to build up our forces.

SLD: Looking to the future, as the F-35 becomes a reality in the Pacific, he point is that by having common aircraft, Australia, and Japan or anyone who chooses to get into the program, buy and plus it up, that commonality gives them a low-hanging fruit to try to shape their own interoperability. Is that fair to put it that way?

LT. GENERAL JOUAS: You're exactly right. You have a commonality and interoperability, and when it comes to either exercises or contingencies, you'll find that it'll be a great advantage. And it's not just that we fly the same airplane, or we employ the same ordnance, but it's that **we'll be linked into the same common operational picture**, have the same situational awareness, and become interdependent.

The Challenge of Persistent Presence in the Pacific: An Interview with Lt. General "Guts" Robling

9/29/12 In an interview with *Second Line of Defense*, the highest ranking Marine in the Pacific discussed the challenges facing the United States as it reset policies in the Pacific.

In the interview,Lt. General Terry "Guts" Robling, Commander, USMC Forces Pacific, focused on the key contribution of the USN-USMC team in the Pacific to what he called, *persistent presence*.

Lt. General Robling with the South Korean Marine Corps Commander, Lt. General Lee.

The "tyranny of distance" in the Pacific makes crafting persistent presence a major challenge.

But the demand side of working with partners and allies in the littorals required the ability to do so.

Crafting capabilities for persistent presence in spite of the geographic and deployment challenges is a key element in shaping a 21st century Pacific strategy.

Lt. General Robling underscored the importance of persistent presence.

The United States has been a significant presence in the region throughout the post-war period. And that presence has been significant glue in the region facilitating both security and economic growth. Our allies and partners certainly recognize this and are a looking at new ways to work with us to get that persistent presence.

A key driver of demand is from partner nations, as well as the more obvious allies. South Korea, Japan, Australia and Thailand are certainly core allies, but we have growing demand from and opportunities with Cambodia, Vietnam, India, Malaysia and Indonesia for expanded working relationships.

The US faces a tyranny of distance in dealing with the Pacific. And needs to operate in a strategic triangle from Hawaii, to Guam and to Japan. And in a strategic quadrangle which reaches from Japan to South Korea, to Singapore and to Australia. Credit: Graphic Second Line of Defense

SLD: What is the challenge of shaping persistent presence?

Lt. General Robling: Distance and Demand. Distance means that I need to have assets forward deployed and operational.

This means for the USMC, an ability to train with partners and allies in what you have called the strategic quadrangle.

This means an ability to have enough capable amphibious ships forward deployed to operate with those partners and allies.

Sebasing is a key element of providing persistent presence.

And amphibious ships are real part of a whole sea-basing capability and engagement capability. The amphibious requirement in the Pacific goes well beyond our support to South Korea. It is a key element in building partnership capacity and overcoming presence gaps and needs. This is why we need more platforms and more capable platforms of the sort we are building now.

Many of our partners in the region do not want us to be the Uncle that visited and never returned home. They want us engaged and present but not permanently based in their countries. This means that seabasing and its augmentation is a fundamental requirement. When we add strategic lift aircraft, high-speed vessels or super ferries to the ARG-MEU lift equation we extend our strategic reach and significantly enhance our ability to enhance partnership capacity.

SLD: Could you talk to the challenge of distance to providing for presence?

Lt. General Robling: To get from Hawaii into the strategic triangle or quadrangle takes significant time. Between Hawaii and Okinawa is about 5 steaming days. It is longer to get to Australia and Guam and then back up to Okinawa and Tokyo within the Quadrangle.

Strategic aircraft lift – C-17s – cuts that time down significantly…hours vice days. However, they are expensive to use, take several sorties to move the same amount of equipment you could move on shipping and are not always available.

Our strategic partners and allies are spread out over a significant geographical area. They want to train with us , but not always bilaterally, they sometimes want us to work with them and some or several of their partner countries. That means we must take the training to them. This adds further challenges to the persistence equation and in turn, makes available amphibious lift even more important.

SLD: Obviously basing is a challenge as well. Could you talk about the roles of the new working relationship with Australia as well as Guam in facilitating presence?

Australian army officers watch an AV-8B Harrier jet aircraft assigned to Marine Attack Squadron (VMA) 542 take off from the flight deck of the amphibious assault ship USS Bonhomme Richard (LHD 6). Members of the Australian army were onboard

Bonhomme Richard to observe the amphibious capabilities of the Bonhomme Richard Amphibious Ready Group (ARG) and the 31st Marine Expeditionary Unit (31st MEU). The Bonhomme Richard ARG and 31st MEU are participating in a certification exercise. (U.S. Navy photo, September 14, 2012

Lt. General Robling: You need places to train the MAGTF within the Pacific. This means ranges large enough to train all of the elements of the MAGTF in a combined setting across the full range of military options. These are hard to find. Australia affords us with ranges where we can do that type of training. While training in Australia, we are looking at using rotating units in and out periodically. We will rotate them in during the dry season when the terrain is viable for mobility, and we will rotate them out during the wet season to other areas in the Pacific when it is impossible to train or move due to terrain saturation or flooding.

Guam ranges will not be quite as large or well defined. We will have to find some unique ways to get after all the unit training METLs in and around Guam and the outer islands while linking in combined fires and effects where we can. I am confident we will find ways to get the training done we are required to do and due to its location, Guam becomes an important basing option for a balanced MAGTF.

Amphibious ships will be a key element to the Australian working environment.

Due to Australian agricultural, quarantine and inspection requirements, it will be more cost effective in both time and money to preposition some equipment ashore, but have equipment on the amphibious ships we can use to train in other areas of the Pacific, and avoid the necessary restrictions.

SLD: The USN-USMC team is to receive an additional ARG-MEU sometime in the next decade. There has been some talk about putting this ARG-MEU in San Diego and giving this a 90 deployment window. Isn't this a bit challenging from a tyranny of geography point of view?

Lt. General Robling: It is. If we put it in Hawaii or Guam, it is much closer to the countries we will work and interact with. Having amphibious ships forward deployed means less response time in a crisis and more visibility, interaction and partnering opportunities when crisis are not present.

SLD: You have worked on Marine Corps aviation all of your life, and have been intimately involved with the F-35. Indeed, the first F-35 squadron to be based in Yuma will come to the Pacific as early as 2014.

How can the allied F-35s work with yours to shape a new Pacific capability?

Lt. General Robling: In two ways.

First, we would have common or like support structures. This will increase are forward readiness posture by being able to fix and maintain aircraft that are deployed vice send them back to the states for repair or reach back to the US for parts. The more allies who buy the aircraft the more spread out that support structure would be.

Second, the capability of the aircraft as a C5ISR platform will allow significant sharing information sharing and fusion to more of our partners who are able to receive and use the information. This increases our persistent presence capability. The aircraft will help fill in capability gaps or seams between us and our partnering countries and in the end, help build or increase their own capacity.

Shaping a New Approach to Combat Learning: The Role of the F-35

11/30/12 by Robbin Laird

Ed Timperlake has pioneered work on how to understand the entire approach to re-thinking what the new generation of combat air is really all about. To capture the difference between his generation of aircraft and the F-35, Timperlake has focused on what he calls the Z-axis and the fusion engine.

The design characteristics blended together prior to F-35 have been constantly improving range, payload (improved by system/and weapons carried), maneuverability (measured by P Sub s), useful speed, and range (modified by VSTOL–a plus factor).

The F-35 is also designed with inherent survivability factors; first, redundancy and hardening and then stealth. Stealth is usually seen as the 5th Gen improvement. But reducing the F-35 to a linear x-y axis improvement or to stealth simply misses the point. The F-35 is now going to take technology into a revolutionary three-dimensional situational awareness capability.

This capability establishes a new vector for TacAir aircraft design.

This can be measured on a "Z" axis.

Traditionally, the two dimensional depiction is that the x-axis is time and the y-axis is performance and captures individual airplanes that tend to cluster in generation improvement. Each aircraft clustered in a "generation" is a combination of improvements. Essentially, the aeronautical design "art" of blending together ever improving and evolving technology eventually creates improvements in a linear fashion.

The F-35 is not a linear performance enhancement over legacy or fourth generation fighter aircraft. When one considers information and the speed at which it can be collected, fused, presented and acted upon in the combat environment, those who possess this advanced decision capability will be clearly advantaged.

While this is not a new concept having been originally conceived in the famous Boyd "OODA" loop, the information dimension of combat aircraft design now is so important that it forces us to gauge the value of such a weapon system along a third dimension, the "Z" axis.

The Z axis is the pilot's cockpit "OODA" loop axis or his ability to observe, orient, decide and act. This ability is measured as the combined capability the pilot gains from integrated command, control, communications, computers, intelligence, surveillance, reconnaissance and his resultant decision-making and employment or action.

From Boyd's theory, we know that victory in the air or for that matter anywhere in combat is dependent on the speed and accuracy of the combatant to make a decision. The better supported the pilot in a combat aircraft is by his information systems, the better the combat engagement outcome. The advantage goes to the better information enabled. Pilots have always known this was true but the revolutionary advancement 5th Generation, designed in C4ISR-D requires a similar advancement in how pilots approach their work.

In addition, today's industrial learning curve to improve sensors, system capability and weapons carried is likely flatter than that required to build another airframe and may be a new American way of industrial surging. The American arsenal of democracy may be shifting from an industrial production line to a clean room and a computer lab as key shapers of competitive advantage. This progress can be best seen in movement out the Z-axis.

http://www.ndu.edu/press/the-f-35.html

Shaping a New Approach to Combat Learning

Ed Timperlake has been expanding his research to shape an understanding of how the new pilot culture might emerge with a fleet of Z axis airplanes interacting with themselves and shaping a whole new approach to combat learning.

Our recent trip to MAWTS to discuss the USMC approach to leveraging the F-35 in re-shaping the combat approach of the MAGTF was an important input to Timberlake's work on combat learning associated with the new plane.

And our discussions with MAWTS focused in part on shifting away from C5ISR as the definer of change in the cockpit to C2 and Information Warfare as the means to describe the approach to the pilot and their culture to working with the MAGTF.

As "Boo Boo" Weber, the head of Tac Air at MAWTS put it:

There's no doubt that initially when we start talking about the syllabus of the communities that are primarily going to feed into the JSF that you will see change.

You have the fighter attack syllabus and the attack syllabus for the F-18 community and then in the AV8 community. And you need that because you definitely need the pointy-nose guy out there. You're going to have a high-end platform, fifth generation aircraft that's going to have some capabilities that are unmatched.

And there's really only one type of individual that can take advantage of that. That's somebody from the fighter and/or the attack community.

But there's some other considerations as well when discussing the F-35.

It is a C2 and Information Warfare aircraft. Our best operators in this world are from the Prowler community, and they are key to shaping the F-35 culture.

For the Marines, such integration is crucial.

We are naval officers, we are Marine Corps officers, but above all we are MAGTF officers.

Which means that once you become a bit more mature, you have to start thinking about not just airspace or battlefields but battlespace. In other words, it's important that the individual that's building the syllabus for the F-35 thinks about command-and-control.

Whether you call it cyberspace or information warfare or pushing the right pieces of information to the right places, the F-35 is a centerpiece for Marine Corps thinking about the future.

In other words, you don't want to put people in charge of training, creating training syllabi, or essentially, creating tactics that are thinking simply at the air operations level. You have to think about this holistically from the MAGTF perspective and not just operationally from the air or from the air for the air.

We have to think operationally from the air for all the other elements of the MAGTF.

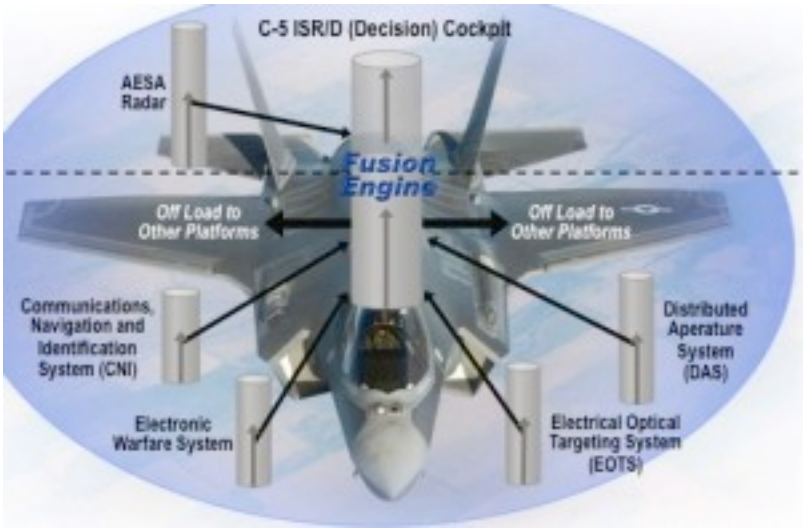
http://www.sldinfo.com/mawts-and-the-yuma-f-35-squadron-evolving-capability-into-operational-reality/

Rethinking the OODA Loop

Based on this an other discussions we had at MAWTS, Ed Timperlake has re-set his thinking about how to best proceed in understanding the combat learning revolution associated with the F-35.

In May of 1981, Ed Timperlake published "A Methodology for Estimating Comparative Aircrew Proficiency" for The Theater Forces Division, Office of Strategic Research CIA.

Col John Boyd USAF (ret) was very helpful and instrumental in providing insights into how to evaluate both aircraft technology, and a nations tactics, training and combat proficiency. Measuring the ever-evolving aircraft maneuvering energy capability Boyd's emphasis on P sub S energy maneuverability performance curves were seminal.



Adding his OODA loop formula to technology was a brilliant insight in merging technology, training and tactics. This period of TacAir development was in a never ending quest to quest to always achieve "SA"–Situational Awareness.

Because of the technology limitations of then Command and Control battle management the focus was focus was appropriately on building a better "Observe Orient" half of his "formula" (AWACS is an example).

With the F-35 Cockpit Z-axis the key words are actually now embedded in the second half of his OODA –the words "decide, act."

The quest for US way of war to always fight and win is to now embrace the entire spectrum of Boyd's OODA by not questing for Situational Awareness, because that is only half way but rather everything should be now focused on developing technology, training tactics and C&C at all levels to empower "Situational Decisions."

This is the true revolutionary step beyond just SA that the "z-axis" F-35 Fusion engine brings to the fight as a catalyst for a 21st Century refocused way of support equipping and training all Service joint con-ops.

The research continues with the above insight into rethinking the OODA loop.

Timperlake adds:

I have been trying to formulate a way to expresses the human/machine evolving action/reaction cycle understanding that everything is always relative. "Beef" (an Air Command and Control Officer) gave me the insight I needed to complete a year's worth of research on ways to look at this dynamic.

Based on our discussions with Dean Ebert, (NGCO employee and former USMC EA-6 driver) I have been focused on the combat learning cycle associated with the new cockpit, the sensors in the aircraft and fusion prospects.

I seized on an MIT concept of the "engagement process of content" to understood how learning evolves. Similar to some of the thinking of Piaget, that one's ability to learn evolves over time with age and learning, we now need to understand that learning in the cockpit powered by the fusion engine is not simply a linear repetitive experience. It is a learning experience and is done so within the fleet, both flying, just returned and about to engage.

In our very robust discussion with "Beef," he added "in context" to the statement and clarified the approach. We are now not talking about Situational Awareness as the key dynamic but Situational Decisions.

A foundation for "fifth generation" operations realize is built around the notion of learning rapidly in a combat situation and acting on that knowledge.

The engagement process of content in context empowers dynamic situational decisions at all levels and gives the fighting force the best chance of prevailing.

The "engagement process of content in battle context" which empowers dynamic situational decision making at all levels has the best chance of prevailing. It is the foundation of war winning in the 21st century.

And the discussion with "Beef" highlighted an important clarification in another sense. Instead of confusing folks with C5ISR and with situational awareness, we should focus on C2 plus information war. Pilots in the F-35 are Information Warriors. A fleet of F-35s puts in the air with a 360 degree swath a decision and information warfare grid. This grid is leveraged throughout the battlespace for ground and surface operations throughout the engagement.

Adding "Beef" to MAWTS a 7202 –and going back to using the term "Information War" (I used that term in Red Dragon Rising published in 1999) actually brings more clarity than just "cyber" which is a critical subset. Additionally going back to C&C is equally important -C5ISD just does not add much–getting to too cute.

Skaff and Timperlake Discuss Future Evolution of Combat Learning

When Ed and I visited the Fort Worth plant of the F-35 program, we had a chance to continue the discussion with Mike Skaff, one of the legendary designers of pilot interfaces for cockpits. His work was seminal for the F-16 and foundational for the F-35. The dialogue between Skaff and Timperlake – between a former F-16 and F-4 pilot – provided context to understanding the transition in pilot culture.

Question: When we visited MAWTS, they underscored that the experience of Prowler pilots was crucial to shaping the new IW and C2 pilot culture for the F-35. They are positioning themselves to live the new Z axis culture and to shape future requirements for the evolution of the plane as a combat system.

Skaff: The Z axis and the fusion engine graphic captures the essence of the change, or the foundation from which change will occur.

It points out the advent of the information age.

We're old enough, and we can remember when there weren't cell phones. There was a time when there wasn't an Internet. We can remember that distinctly.

When these tools show up in the early '90s, there's a paradigm shift that we call 'the information age', and now it arrives in the airplane. With the F-35 we enter into the information age in a new way and we can connect these airplanes just like nodes of the Internet. I'm not saying we're connected to the Internet, but it is like that. I like to think of this as information dominance. When a 5th generation fighter arrives in battle space the pilot has information dominance. The F-35 was specifically designed to provide the pilot with information dominance through multi-spectral, multi-sensor, distributed processing and advanced fusion – this is the distinction and the difference from the 4th generation. This is the paradigm shift.

Because this is software-defined plane built around evolution over time, we know the future is going to be different. The threats will evolve and everything else.

But initially, these initial airplanes have all of the hardware in place to last for a couple of software upgrades. And so, we can redefine the airplane in its missions and how the sensors work and what they detect. Hypersonic cruise missiles, seeing that the horizon maybe with DAS, who knows what is the next evolution, but we know it is coming. And the plane is built to anticipate change.

Recently a Marine Corps general underscored that we are not making this airplane for Harrier pilots.

In fact, most F-35 pilots haven't been born yet.

You're making it for the next generation. And they're going to jump into the cockpit and they're going to see a Nintendo or a PlayStation or whatever is the deal at that time.

But they're not like us old guys that are looking for air speed, altitude, conventional electro-mechanical gauges. They literally see a video console in front of them, and we've got to make the airplane for them. They can deal with information and they can process it differently than you and I can.

Question: Currently we try to achieve such dominance with a fleet of specialized air and related assets. What will be the impact of doing so with a core fleet of interactive Z axis airplanes?

Skaff: It is about survivability in an information dominance environment. By reducing the gaggle of aircraft to an interactive air system with other combat assets, we can pursue air dominance against a reactive enemy. It will be a different paradigm leveraging the Z axis to pursue information dominance.

Question: And the fact that the US will be flying a plane similar to its allies and able to share information across the battlespace will be important as well. How do you look at information sharing across a coalition fleet of Z-axis airplanes?

Skaff: Now we can get airborne in a coalition and we have all of the synergy of deployed combat fleet. We can't go wars all by ourselves anymore, we want our allies to be there with us and share the burden and share the costs, share the risks, and now we can do that extremely well with the global F-35 fleet.

Timperlake: Mike, we came up through the generation of always trying to achieve SA, situational awareness. That was the nature of my fighter squadron and your your squadron, too.

I think now with the F-35 cockpit, you've moved to a different level, a paradigm shift of situational decision making with information available across the fleet even to the youngest aviator.

They have situational awareness, but it takes it to a different dimension, it takes it to situational decision making in the context of the particular environment they're in.

And that, I think, is a revolution, which makes it an action item as just opposed to an awareness item. You can use information as a weapon. You can use kinetics, and the machine/man interface will allow an evolving battle management fleet to address current and near-term threats.

Are we entering a new era of deterrents and airborne situational decision making?

Skaff: Yes, and I think we can relate it to our experiences.

As a young blue 4 wingman, I had no clue what was going on. For 300 hours, they drug me up and down the East Coast. I could fly formation, but I couldn't do much else. In fact, I wasn't sure I'd ever figure this out; it was so complicated in an F-16. And now, because what you've been talking about, blue 4 has the same knowledge as 1 does.

If one gets shot down or has to return to base for some reason, two has the knowledge one has and can just take over.

This is the value of distributed information.

Timperlake: So, we have a constant sorting of consistent information.

Skaff: That is right.

Timperlake: This is why the real testers are the pilots. The actual testing of this Z access F-35 cockpit fusion engine revolution rests with the pilot and the operators and not the test community.

Skaff: That makes sense.

Timperlake: Let me be clear. The test community does great work in ringing out the airframe and making sure the weapons release and the airplane will be solid and safe.

But the evolution of the Z access and the cockpit revolution can not be tested by someone from a desk running test protocols.

It's the dynamic learning of a young, middle and senior aviator feeding it back to the engineers and learning the capability of the brand new step generation or paradigm shift of this cockpit.

Is that a fair statement on putting the test community in perspective?

Skaff: I think so.

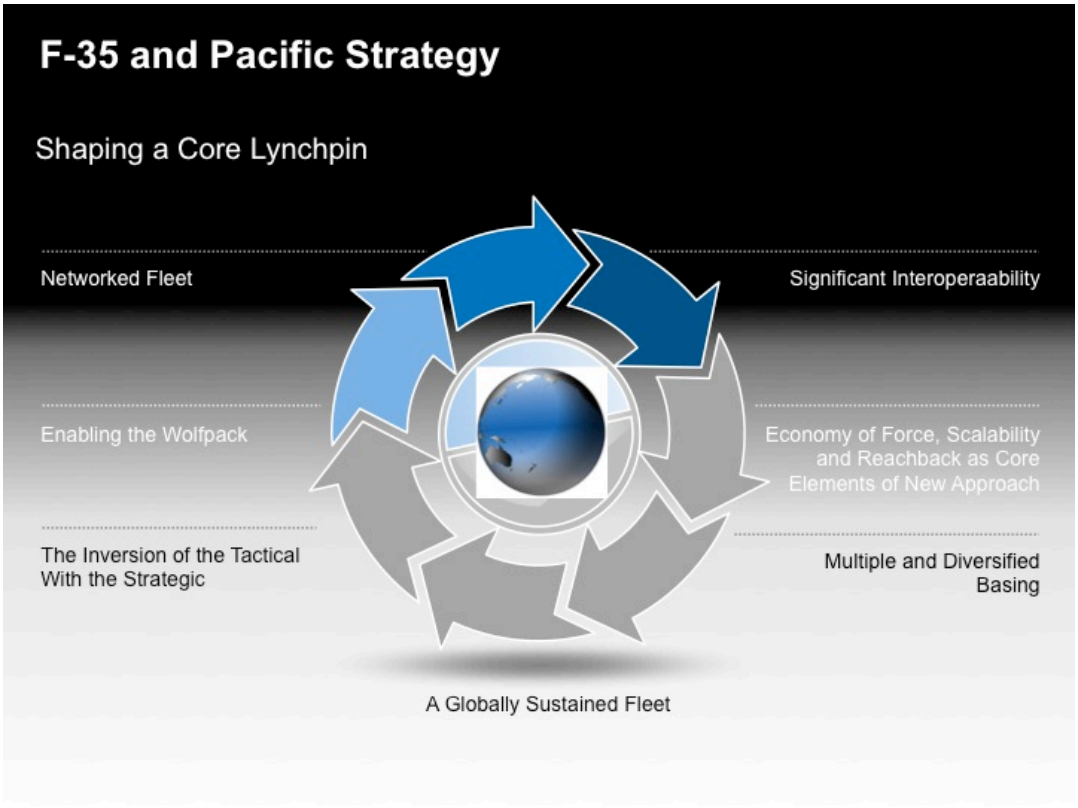
MAWTS, NSWC, and the Air Force Fighter Weapons School are able to explore that Z access and find out just what that does they are the real testers.

The F-35 and Pacific Strategy: Shaping a Core Lynchpin

8/11/12 By Robbin Laird

Many analysts and politicians have discussed the F-35 as if it was a simple replacement aircraft. And in such conversations, the notion of stealth is seen as a high-end capability needed only sparingly and in specialized circumstances.

If this were true, the Marines would not be prioritizing the F-35Bs as a core asset.



For they are not configured to fight for only a few specialized days. Their F-35s are not conceived of in any way as if they were high end F-117s designed for air defense suppression and little else.

The F-35B for the Marines is seen as a C5ISR aircraft which can able the MAGTF, the joint force and coalition forces. It is seen as a key enabler for the sea base, for the amphibious insertion force and for land operations.

It is seen as the replacement for multiple aircraft, and giving the Corps for the first time organic Tron warfare capabilities.

It is viewed as a game changer for how the USMC-USN team will operate and is viewed as the joint force commanders as crucial glue for re-shaping operations.

In an interview with the 7th USAF commander, the key role, which the Bs will play upon entry into South Korean defense, was clearly identified.

Question: How will the coming of F-35s to South Korea affect the template?

LT. GENERAL JOUAS: U.S. overseas basing decisions are not yet determined; however, any deployment of F-35s to the Korean peninsula will clearly modify the template, including the Marine Corps F-35B.

The Seventh Air Force relationship with the Marine Corps is the best I've ever seen. Their aircraft will be dedicated to the Marine Air Ground Task Force (MAGTF) at some point, but before then, they will be used as part of our air campaign to the greatest effect that we can deliver.

The F-35A, B, and C will give us greater flexibility, and greater options in terms of where and how we can operate.

We will integrate the F-35 with F-16s, F-15Ks, F-15Es, F-22s, and other airplanes in a way that will enhance and increase everybody's capability, much in the same way that we currently see the F-22 and the F-15 integrating and increasing their capabilities. Our targeting, and the effects that we will seek, will be adjusted by the fact that we have F-35s.

Even the discussion of the shift from 4th to 5th generation has often missed the point of what the impact of deploying a significant number of F-35s within a region as central as the Pacific could have on the U.S. and its allies.

And the F-35 can play the role of a linchpin in a 21st century Pacific strategy which is allied-centered and enabled. Indeed, the F-35 as a linchpin to interactive allied and American capabilities intersect nicely with the overall strategy whereby the United States is the key lynchpin power in the allied coalitions of the Pacific.

The concepts of operations underlying a new approach to providing for lynchpin capabilities are built around the F-35.

As I argued earlier in my piece on "Shaping an Attack and Defense Enterprise for the Pacific:"

If the projection of power is seen to be about PUSHING platforms and capabilities out from CONUS, Alaska and Hawaii, the challenges are significant to deal with the growth of Chinese power and the needs for interoperability and support, empowering both the allies and the United States operating in the region.

But if a different approach is shaped, one, which rests increasingly on a PLUG-IN strategy, the challenge is manageable. U.S. allies are shaping new defense and security capabilities for the 21st century, and certainly putting resources into the re-crafting of their capabilities going forward. How can these efforts be combined more effectively going forward so that both the allies and the U.S. end up collectively with significantly expanded but cost effective capabilities?

The evolution of 21st century weapon systems and capabilities is breaking down the barriers between offensive and defensive systems. Is missile defense about defense or is it about providing capabilities for global reach, for offense or defense? And the new 5th generation aircraft have been largely not understood because they are inherently multi-mission systems, which can be used for forward defense or forward offensive operations.

Indeed, an inherent characteristic of many new systems is that they are really about presence and putting a grid over an operational area, and can be used to support strike or defense within an integrated approach. In the 20th Century, surge was built upon the notion of signaling. One would put in a particular combat capability, Carrier Battle Group, Amphibious Ready Group, Air Expeditionary Wing, to put down your marker and to warn a potential adversary that you were there and ready to be taken seriously. If one needed to, additional forces would be sent in to escalate, and build up force.

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 can not be certain that you are simply putting down a marker that has its means fundamentally based on your ability to bring in dominant forces.

This is what Secretary Wynne calls the attack and defense enterprise.

The strategic thrust of integrating modern systems is to create a grid that can operate in an area with into a seamless whole able to strike or defend simultaneously.

Although built around presence, scalable forces with significant reach back enable the lynchpin role.

The allies are always forward deployed and when joined with an enduring presence mission for the US projection forces, a powerful foundation for scalability is provided. And with the United States providing strategic depth reachback to an integrated and networked force is inherently possible.

Presence, scalability and reach back are solid foundations for the kind of deterrence necessary in the evolving strategic environment in the Pacific.

The F-35 as an Allied and American fleet brings several key and core capabilities to shaping a new attack defense enterprise which allows the U.S. to play a key lynchpin role and at the same time puts allies in the lead to defend themselves and their interests.

http://www.ndu.edu/press/the-f-35.html

http://www.sldinfo.com/the-f-35-the-impact-of-a-global-fleet/

Networked Fleet

The first thing the F-35 brings to the Pacific is a **networked fleet of C5ISRD aircraft**. A deployed fleet of allied and US aircraft will intersect to create what the USN called in World War II the big blue blanket of ships and aircraft, but now will be delivered by a networked fleet of F-35s.

These aircraft will operate with significant reach via their communications systems, which are built around MADL and their extended 360-degree situational awareness.

In effect this fleet will create a set of strike and defense aircraft able to see hundreds of miles ahead of themselves and able to build a Pacific network for operations.

This capability is inherent in the aircraft with its revolutionary cockpit and what Ed Timperlake has called the Z-axis growth and development capability built into the software systems enabling the aircraft.

Significant Interoperability

The second thing the F-35 brings to the Pacific is **significant interoperability among the US and allied fleets**. This is built out from the common cockpit to embrace shared approaches to sharing data and sharing concepts of operations.

A country like Singapore, which is a pioneer in building an integrated and networked force, will undoubtedly find various innovative ways to leverage the F-35 in this role. And their innovations can be shared among the global partners of the F-35 program.

F-35 Fleet

As Ed Timperlake, a former USMC Marine Corps aviator and squadron leader, has underscored:

A good Libyan War lesson learned is simple—current modern war, especially war in the air requires considerable planning, and high level coordination, and extensive high end airborne assets for command and control to be effective.

Now imagine all combat pilots, from all allied countries having the same intelligence and situational awareness about the Battle Space in their individual cockpit. It gets even better — all pilots will have uniformly understood symbols and cockpit display icons that are not language specific. Much like the emerging universal road and other signage that are understood regardless of language.

The F-35 (T/M/S) "Z-Axis" putting "C4ISR-D" (D is for Decision) in the individual cockpit has the potential to revolutionize the ability of an alliance fighting force. All Fighter Pilots flying the F-35 across US services and allied Air Forces will concurrently operate from the same base line of evolving battle intelligence. The possibilities for new combat tactics for a decentralized yet unified air campaign are only limited by the operator's imagination.

Multiple and Diversified Basing

The fleet of F-35s can be based across a wide range of operational venues. F-35As bought by allies and the US alike will be deployed across a wide range of Pacific Air Force bases. F-35Cs will operate off of large deck carriers.

And the most innovative of the F-35s, from a basing standpoint, the F-35B, will provide significant deployment flexibility. And this flexibility could well provide an inherent deterrent capability because of the significant uncertainty it provides for an adversary seeking to destroy fixed airfields or strike a significant base like Guam.

As Ed Timperlake has underscored:

The sortie rate of the aircraft is more than just rearm and "gas and go": it is continuity of operations with each aircraft linking in and out as they turn and burn—without losing situational awareness. This can all be done in locations that can come as a complete tactical surprise –the F-35B sortie rate action reaction cycle has an add dimension of unique and unexpected basing thus getting inside an opponent's OODA (Observe, Orient, Decide and Act) loop.

The sortie rate of the aircraft is more than just rearm and "gas and go": it is continuity of operations with each aircraft linking in and out as they turn and burn—without losing situational awareness.

Enemy air is predictable by needing a runway and consequently all the problems of precision weapons crating their runways come into play for their battle plan—the F-35B does not have that vulnerability.

Put another way, seabasing now becomes a core element of the overall strategy of diversified and distributed force. The seabase can at once provide for presence as well as lilly pads within an overall distributed force able to be scaled and become dominant interacting with allied capabilities.

As I wrote earlier about drawing upon the lessons of Bold Alligator 2012 and applying them to the new Middle East:

The "new" Middle East is rapidly creating the need for such a capability, and such a transformation of US and allied forces. And remember the core role, which allies played in BA-2012.

With the Arab Spring, the security and defense framework, which the West has underwritten over the past thirty years, is shattered. The Arab Spring states are in upheaval, the Iranians are preparing to enter the stage as a nuclear power, the

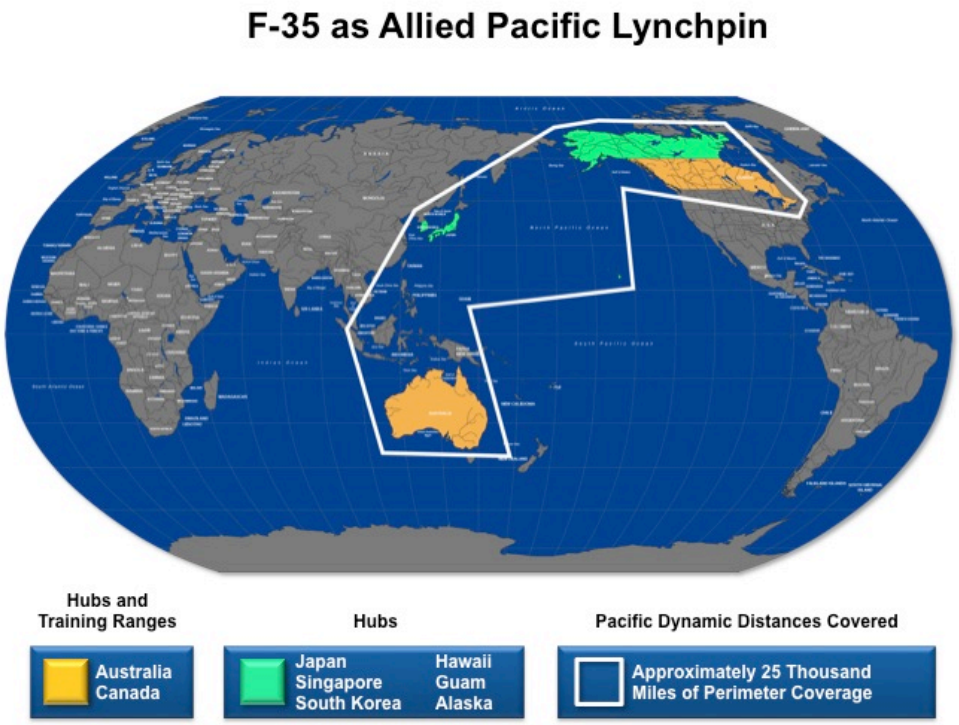
Conservative Arab states have to prepare to defend themselves against Iran, and the interaction between Arab Spring forces and the stability of the key conservative Arab states is significant. Who will the West be aiding and abetting if the Arab Spring continues to pull the rug out from under the de facto Conservative Arab, Israeli and Western alliance?

Will Western states be able and willing to deploy land based forces, whether ground or air, on Arab soil? And given uncertainties even in key Arab allied states, how might the West best defend its interests, and to ensure energy security in the region?

There are several elements presaged in BA-12, which are relevant to the reshaping of Western capabilities to protect Western interests.

First, sea-basing and engagement forces associated with sea basing are clearly well placed to provide for security of choke points and transit in the Mediterranean and the Gulf.

Second, in the exercise, Harriers based on the USS Kersarge worked closely with land-based air to provide for a significant air combat capability to shape the battlespace. This model can be followed with Arab Air Forces, the Israeli Air Force or Western Air Forces deployed temporarily on Arab soil. The point is that the organizer of the spear is on the sea-base, and this capability can be conjoined with the various air combat centers extant or being developed in the region.



Third, the F-35B is a game changer. The combat systems aboard the BACH1-11 during the exercise demonstrated the potential impact of being able to have a wide-angle lens on the battlespace transitioning into dynamic battle management using tactical aircraft.

In other words, the F-35 is part of shaping a scalable force, which can participate in executing an economy of force strategy. Basing becomes transformed as allied and U.S. capabilities become blended into a scalable presence and engagement capability. Presence is rooted in basing; scalability is inherently doable because of C4ISR enablement, deployed decision-making and deployment and operational robustness.

The reach from Japan to South Korea to Singapore to Australia is about how allies are re-shaping their forces and working towards greater reach and capabilities.

A Globally Sustained Fleet

The entire approach of the F-35 enables the sustainment of the fleet in radically different ways from the past. And it is coming at a time when economic pressures create such a need; but if new approaches are not taken money will be invested in maintaining less effective forces.

The F-35 global sustainment approach allows for a more effective and dynamic force at less cost than operating a legacy fleet.

At the heart of the new approach is an inherent capability to leverage logistics hubs throughout the Pacific to create a seamless ability to sustain both allied and American planes.

Presence from this perspective has a whole different meaning. Hub sustainment means that the US can surge aircraft to the region and be supported during surge operations without having to carry its sustainment capability forward with the surged aircraft, which is the requirement currently.

The opportunity and ability to build hubs and training ranges in the Pacific with hubs and ranges in Canada and Australia and hubs in Japan, South Korea, Singapore, Alaska, Hawaii and Guam provides an opportunity to re-shape how sustainment can be done in around the world.

This will bring with it a significant boost to sortie rates and hence operational capabilities.

As Lou Kratz, former Assistant Deputy Under Secretary of Defense, has argued:

The F-35 enables all the Services to dramatically reduce the equipment that is necessary to maintain the aircraft, thereby freeing up both air and sea lift capability to bring in combat elements which then allows you to close the theater faster and enable more rapid responses to emerging threats.

Additionally, because our allies are all over the world, not only do they have the support structure, they have the aircraft.

Our allies become a key part of that coalition force which is already in theatre. So you reduce both the time, and the cost associated with the total force capability buildup.

The Inversion of the Tactical with the Strategic

The public discussion of the F-35 is built on the assumption that it is a tactical aircraft. This, in turn, is built upon focusing on the individual characteristics of a single aircraft and thinking in traditional terms.

This totally ignores the impact of a fleet of networked aircraft operating as a honeycombing and blanketing the Pacific. The fleet working together can shape a number of strategic capabilities that will simply be missing if the fleet did not exist.

An example will be the impact of the deployed fleet on C5ISR which provides for redundant space capabilities.

As Ed Timperlake and I argued in a recent *Space News* op ed:

The key linchpin to do this (i.e to provide for presence, economy of force and scalability) is the C5ISR enterprise in the Pacific. With robust and redundant ISR, the enterprise enables a distributed force presence to be honeycombed.

That is, the network is not about hierarchy and the ability of an adversary to whack the head of the hierarchy; it is about a honeycomb of deployed and distributed capability that no adversary can cripple with a single or easy blow.

A key element for shaping a robust and redundant ISR system in the Pacific is the F-35, a tactical aircraft with strategic impact. The new aircraft is a flying combat system that has C5ISR built into the cockpit.

As a fleet, the F-35s provide a critical layer in shaping a robust and redundant ISR system, which is both synergistic with space systems and complementary to those systems.

A deployed fleet of F-35s — allied and U.S. — provides a powerful deterrent to any Chinese thought of a first strike on U.S. military space systems. It makes such a strike significantly less effective and useful to Chinese military planners.

From the outset, the deployed fleet and space systems forge a powerful deterrent capability.

And the capabilities of the F-35B to operate in a variety of operational areas also have its strategic impact. It is likely that the USMC-USN team is not going to be the only operator of the F-35B in the Pacific and the interaction among the allies and Americans operating this aircraft will shape innovations as well in operations and shape the thinking of adversaries in the region.

As Ed Timperlake has highlighted about the F-35B:

The strategic deterrence, with tactical flexibility, of the F-35B is in the recovery part of an air campaign when they return from a combat mission, especially if the enemy successfully attacks airfields.

Or is successful in hitting the carrier deck-they do not have to sink the Carrier to remove it from the fight just disable the deck. War is always a confused messy action reaction cycle, but the side with more options and the ability to remain combat enabled and dynamically flexible will have a significant advantage.

With ordinance expended, or not, the F-35B does not need a long runway to recover and this makes it a much more survivable platform — especially at sea where their might be no other place to go.

A call by the air battle commander-all runways are destroyed so find a long straight road and "good luck!" is a radio call no one should ever have to make.

But something revolutionary now exists.

In landing in the vertical mode the Marine test pilot in an F-35B, coming aboard the USS Wasp during sea trials put the nose gear in a one square box. So the unique vertical landing/recovery feature of landing anywhere will save the aircraft to fight another day.

It is much easier to get a fuel truck to an F-35B than build another A or C model, or land one of the numerous "decks" on other ships, even a T-AKE ship then ditch an F-35C at sea.

This unique capability can be a war winning issue for countries like Israel, Taiwan and the U.S. Navy at sea.

Enabling the Wolfpack

This generation's Billy Mitchell, Secretary Mike Wynne, has focused attention on the empowerment by 5th generation aircraft of a new wolfpack concept. In the wolfpack, the 5th generation aircraft are the key enablers as forward deployed sensors for a wide-ranging sensor and shooter enterprise.

The 5th generation aircraft can use their weapons sparingly, as they inform and enable, weapons operating off of other platforms to be deployed and targeted more effectively against critical targets.

As Wynne has argued:

The fifth generation platforms; as scouts would be admonished to not shoot lest they give away their position; but rather to expend all the weaponry from the fourth generation platforms; or from any available shooter that could reasonably engage the designated target. If they are required to engage owing to the fact they have been detected; then shoot and scoot is the motto. This concept would seek to preserve the quantity of fifth generation assets well into the second and third day of warfare.

Realizing that you go to war with the weaponry you have, not the weaponry you want, our Air Forces, whether Naval Aviators or Marine Aviators or Air Force Aviators need to think about force multiplication and affordability.

Apparently, our leaders are relating in as loudly as they can that our Nation will no longer 'darken the skies' with the quantity of Air Assets made available to our forces.

As a nation we are reaching out to coalition partners and other friendly nations to adapt our capabilities so there is a symbolic and real reserve force worldwide to thwart any determined competitor. The United States capability must be interoperable with these forces and within our own forces to leverage what we can using situation awareness, the ability to share this situation awareness; and overwhelm competitors needs training and early employment.

Concepts for exploiting the best of fourth generation assets and available fifth generation assets; in combination with what we have learned in the first decade of Remotely Piloted Vehicles will be crucial to deterrence in the face of increasing attention to economics.

The 'Wolfpack' can be more than casual thought; properly employed by well trained pilots, it can change the outcome in surprising ways.

Crafting the 'Wolfpack' can provide a strategic advantage and a best value-leveraging proposition.

The Wolfpack will be a key element of an effective Pacific strategy which leverages the entire gamut of allied and American resources below and on the sea, deployed at air bases or operating off of the various venues provided by F-35B performance.

Conclusion

The F-35 as it is rolled out as a global fleet can enable a new Pacific strategy.

This strategy would be built upon shaping a whole new approach to working with allies, whereby the US would not be surging force to help the damsel in distress, but would be plugging in to leverage robust capabilities of core allies.

These allies would have independent capabilities but with inherent capacity to work with American forces to shape a scalable and powerful reach back force.

I often argued that the F-35 is less about a plane than crucial capabilities for power projection and coalition interoperability. No greater demonstration of this can be seen in the Pacific whereby the capacity to conjoin capabilities across the vast expanse of the Pacific is crucial to the entire set of players in the Pacific.

A scalable structure allows for an economy of force. Presence and engagement in various local cells of the honeycomb may well be able to deal with whatever the problem in that vector might be.

And remembering that in the era of Black Swans, one is not certain where the next "crisis" or "engagement" might be. But by being part of a honeycomb, the deployed force to whatever cell of the honeycomb, the force can be part of a greater whole, whether allied or U.S.

This means simply put, that the goal is NOT to deploy more than one needs to appropriate to the task. Vulnerability is reduced, risk management is enhanced and the logistics and sustainment cost of an operation significantly reduced.

One does not have to deploy a CBG or multiple air wings, when an ARG is enough.

By leveraging the new platforms which are C5ISR enabled and linked by the F-35 across the USN, USMC, USAF and allied FLEETS are new Pacific strategy can be built.

And this strategy meets the needs of this century, and the centrality of allied capabilities, not the last decade where the U.S. dealt largely with "asymmetric" adversaries with limited power projection tools.