



## **2024 DOCA Conference #2**

**Florida Panhandle Area**

**April 7-10, 2024**

**Pensacola Beach Resort**

**Pensacola, FL**

### **Monday, April 7: Hurlburt Field**

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After a short drive along the Florida Gulf coast, our DOCA contingent arrived at Hurlburt Field, what used to be one of many auxiliary fields of nearby Eglin Air Force Base, which will be our destination on Tuesday. Named for a pre-WWII pilot who crashed nearby, Hurlburt is now the center for Air Force Special Operations Command or AFSOC, the USAF component of US Special Operations Command, which we visited last year in Tampa. Making our first stop at HQ AFSOC, we gathered in the lobby surrounded by plaques representing scores of medal-winning Air Commando heroes, as explained by the AFSOC unit historian, before entering the main conference room for the command briefing hosted by Major General Rebecca Sonkiss, the Deputy Commander, on behalf of her boss Lt. Gen. Tony Bauernfeind, who was TDY during our visit, and his senior enlisted advisor, Command Sergeant Brian Bischoff.

Major service decorations awarded to Air Warriors since 9/11/2001 include

- 17,000+ Air Medals for heroism or meritorious achievement in aerial flight
- 375 Bronze Stars for acts of valor in combat
- 64 Silver Stars for gallantry in action against an enemy
- 121 Distinguished Flying Crosses for heroism/extraordinary achievement in aerial flight
- 12 Air Force Crosses for extraordinary heroism in combat against an armed enemy
- 1 Medal of Honor - Tech. Sgt. John Chapman, Taku Gar, Afghanistan, 3 MAR 2002.

### **AFSOC Command Brief**

Air Force Special Operations Command provides special operations units for global deployment to the regional unified commands. These highly trained and highly capable units conduct missions ranging from the application of massive, yet precision firepower to destroy the enemy's ability to resist, to the infiltration, extraction, resupply, refueling of ground and sea based special operators from the other branches, such as Navy SEALs and Army Green Berets, as well as those of our global allies, as exemplified by their motto of "Any Place, Any Time, Anywhere".

Before we get any deeper, please allow me to clear up some jargon because as DOCA knows the military loves jargon almost as much as they love acronyms. The “special” in special operations refers to a whole panoply of “other than conventional warfare”, historically referring to soldiers (operators) who *specialize* in unconventional warfare missions, such as helping a friendly government fight off an insurgency (or to assist one against an unfriendly government or occupier), to operate in remote areas, behind the lines, or to go undercover in the enemy capital. DOD defines the term as “activities conducted to enable a resistance movement to coerce, disrupt, or overthrow a government or occupying power by operating through or with an underground, auxiliary, and guerrilla force in a denied area”.

Whew, so when you hear “Special” as in Special Forces, Special Operations, Special Operator, Special Operations Forces (SOF), think of these kinds of missions, although the terminology changes between service branches, the Army has Special Forces (Green Berets and Rangers), the Navy calls it Naval Special Warfare (SEAL teams and Special Boat teams), the Marines have Marine Raiders, and the Air Force has Air Commandos, and yes, the Space Force is building a special capacity and has assigned a Colonel as Element Commander to USSOC. While generated by the individual services, these SOF units all fall under the overall command of the joint US Special Operations Command, but are typically operationally chopped to the regional unified combatant commanders (e.g. CENTCOM or INDOPACOM) for actual mission assignments. Course, Marine Recon units go through similar training as Green Berets or SEALs and conduct similar missions, but they aren’t Special Operators because they belong to the USMC, not USSOC. Clear as mud? To make it simple, unless you are talking to an Army soldier wearing a Green Beret (Special Forces), refer to them all as Special Operators (individual) or SOF (units) and you will be in the clear... mostly.

Although born into action during WWII as the Army Air Corps operating in Europe and China-Burma-India, continuing through the Wars in Korea and Vietnam, the modern Air Force Special Operations heritage was truly forged in the failed 1980 operation to rescue the American hostages held in Iran. In this first of its kind joint special operation ordered by President Carter, Army Delta Force soldiers and Rangers would be flown deep into Iran by Air Force C-130s and refueled by Air Force KC-135s enroute to meet up with Navy CH-53 helicopters flown by Marines off a carrier in the gulf who would take these assault forces deeper into Iran where they would meet up with CIA officers already in country, with the plan to infiltrate the Iranian Ministry of Foreign Affairs and the US embassy, rescue the hostages, and then fly them out via Air Force C-141 cargo planes from an old Iranian military airfield seized by the Rangers. All being supported by Navy attack aircraft flown off the carriers. Sounds easy, right? Well, it didn’t work, the required planning exceeded the available training, with the branches not used to working together and the result was a disaster. But this failure and the subsequent investigation exposed two realities. One, the services needed to learn to work together, from bottom to top, and two, special operations required special operators. Congress and the DOD fixed these issues by creating and funding a new, joint, unique Special

Operations Command in 1987, right after reorganizing the entire DOD itself with the 1986 Goldwater-Nichols Act.



Air Force Special Operations Command was stood up formally in May of 1990 as one of the 10 Major Commands of the Air Force, with the mission to train and equip special operations wings of the USAF, Air Force Reserve, and Air National Guard. Essentially, AFSOC generates the deployable units that the “field generals” need to prosecute their missions across the globe. AFSOC builds them and then sends them abroad to do their thing. The primary mission of AFSOC is to first get the other branches special operators to the fight, flying them in with planes and helicopters, think of the Bin Laden raid from a decade ago. Once the fighters are on the ground, doing their thing, AFSOC provides a variety of logistical, intelligence, and even lethal support ranging from reconnaissance platforms to gather information to provide situational awareness, to pararescuemen to provide emergency trauma care and getting wounded folks (military or civilian) out, to combat controllers, who embed directly into SEAL or SF units on the ground to act as pathfinders and coordinate close air support, even landings and takeoffs where there isn’t an airfield. Modern Air Commandos are ready to fight tonight, but these unparalleled capabilities don’t come easy or cheap.

#### Five Truths of Special Operations

1. People are more important than hardware
2. Quality is better than quantity
3. SOF cannot be mass produced
4. Competent SOF cannot be created after emergencies occur
5. Special operations require non-SOF support

#### AFSOC Vision

Air Commandos ... Ready today, Relevant tomorrow, Resilient always.

#### AFSOC Mission

Provide the nation’s specialized airpower, capable across the spectrum of conflict ... Any-place, any-time, anywhere.

#### AFSOC Commander’s Priorities

- Ensure readiness to execute global special operations today.
- Transform the force and fleet to maintain relevance tomorrow.
- Invest in the resiliency of the force, family and relationships.

## **Defense Fund MWR Donations and Lunch**

We took this opportunity with Gen. Sonkiss present to make our first DOCA Defense Fund donation to the Air Commando Foundation, which provides critically needed support and financial assistance directly to Air Commandos and their families, such as benevolent expenses, travel, lodging, medical rehabilitation and other treatments not covered by the USAF. As the ACF is very agile and 100% of donated funds go towards the servicemembers and their dependents, DOCA was proud and honored to be a small part of this amazing effort. Afterwards we quickly made our way out to the flightline to see these remarkable aircrews and their aircraft up close before squeezing in the Air Commando Development Center briefing (below) after which we enjoyed a very nice lunch at the Soundside Club, a waterfront space available to DOD ID card holders and their families, often utilized as a dream wedding venue and where some of us were able to get outside to check out the 2024 Eclipse for a little break.

## **1<sup>st</sup> SOW Mission Aircraft Briefing and Walkaround**



The 1<sup>st</sup> Special Operations Wing is one of five active-duty special operations wings and has multiple squadrons operating and maintaining the AC-130J, MC-130J, the U-28A, MQ-9, and the C-146A, plus a medical group and various staff elements for command and control, public affairs, JAG, finance, and all the little but critical jobs that any human organization requires. 1<sup>st</sup> SOW provides airpower to conduct special operations missions worldwide by rapidly planning and executing core missions like close air support, precision firepower, specialized mobility, intelligence, surveillance and reconnaissance (ISR) operations in support of national priorities.

## AC-130J Ghost rider



The Ghost rider is a highly modified C-130J cargo airframe and is the fifth-generation gunship replacing the aging AC-130 U and W model gunships, the initial operational capability authorized in 2017, with the last airframe delivery scheduled for some time this year for a total fleet of 37 airframes. Known primarily as the latest model of a long lineage of gun armed cargo planes beginning with the original "Puff the Magic Dragon" a WWII era C-47 armed with three .30 caliber mini-machine guns first utilized in Vietnam throughout the 1960s, the gunship system evolved through several aircraft models, weapons, and systems, into perhaps the greatest and most beloved air-to-ground precision weapon systems ever flown. But the AC-130J is so much more than just guns on a plane. It is an entire precision strike package platform, which includes a variety of

optical, infrared, and electronic sensors, a robust communications suite, and a mission management system which fuses the sensors, comms, environment, mission planning, and threat information into a common operating picture provided to the pilots to enable very precise munitions delivery to the target from the onboard weapons, which on the J model, include a 30mm autocannon and a 105mm army howitzer. Yes, this plane has a howitzer, a very, very accurate piece of artillery. It can also delivery standoff precision guided munitions such as GPS guided bombs and missiles. The aircraft is capable of extremely accurate navigation with its dual inertial nav systems, integrated GPS, and even color weather radar. As long as the aircraft can be protected for enemy fighters and SAM, the Ghost rider can and does obliterate enemy formations, bunkers, and equipment all while flying in a NASCAR like left hand circling pattern but is also capable of taking out singular targets, such as a single house in a neighborhood and can read a license plate from 15,000 feet.

## MC-130J Commando II



The Commando II is an entirely different kind of specialized C-130 than the Ghost Rider. Whereas everyone knows when a gunship is on station, the Commando II flies clandestine in low visibility, often at night in politically sensitive or hostile territory where something went terribly wrong if anyone ever realized it was there. First delivered in 2011, the MC-130J model is replacing the old fleet of MC-130E, H, and P models on a one-for-one basis up to a final fleet of 57 with the primary

mission is the infiltration, exfiltration and resupply of special operations forces by airdrop or landing and the aerial refueling of SOF helicopters and tilt-rotors. Where the AC-130 blows things up from the sky, the MC-130 delivers those who blow things up from the ground. While not a stealth platform per-se, the J model has fully integrated digital avionics supporting extremely low level flying at night in all weather conditions, with defensive systems (classified), six bladed composite propellers (quieter), enhanced cargo-handling systems, air refueling pods, an abundance of voice/data communications, and improved environmental and ice-protection gear. The MC-130 flies mostly at night, alone or in multi-ship formations, to avoid detection and is tailor made to get special operators where they need to be, which are typically places the enemy doesn't want them or ever knows they are there until it's too late.

## U-28A Draco



In order to make up time, half our group received a tour of the U-28A, while the other half visited the C-146A Wolfhound, but I will cover both. Highly unusual for the Air Force, the U-28A Draco is actually just a regular civilian general aviation aircraft, bought open source from the international market, then converted

by the government to fill a highly specialized need. In fact, the early models were actually purchased used from doctors, lawyers, and other private owners, rather than going through the laborious and time-consuming Federal acquisition/contracting process. Essentially a PC-12 pressurized turboprop utility plane built by Pilatus of Switzerland, typically serving as a corporate executive transport, regional airliner,

commonly used by NGOs as cargo planes/air ambulances in rugged areas across Africa, Asia, and the Pacific, the PC-12 is a dependable, rugged, efficient platform which met the needs of AFSOC for an intra-theater platform supporting special operations forces via the role of intelligence, surveillance, and reconnaissance in an airframe which isn't inherently identifiable as "military" or even US. Operated by the 1<sup>st</sup> SOW, 319<sup>th</sup> Special Operations Squadron, the U-28A is essentially a manned, fixed-wing tactical ISR platform more capable and higher performance than a drone, with a smaller footprint than a C-130. It can operate anonymously out of commercial airports, short fields, and third world airstrips without waiving the "US Special Forces are here" banner, but is highly capable as an airborne communications hub, surveillance platform, all while living up to its commercial legacy of humanitarian support and search and rescue. Originally a single engine turboprop executive "jet", the U-28A is packed to the brim with electronic sensors, comms gear, and survival equipment, while offering outstanding reliability and performance at a relatively low cost. Other than the classified electronics, parts and maintenance are available commercially around the globe, especially in otherwise remote areas and the profile itself is commonplace enough to not attract attention. All U-28A aircraft, based at Hurlburt or Cannon AFB in New Mexico, are maintained by commercial contract, but flown by USAF crews.

#### C-146A Wolfhound



Akin to the U-28A, the C-146A Wolfhound is a civilian airliner converted to military use by AFSOC, although the 20 C-146A were acquired directly by USSOCOM and modified by Sierra Nevada Corporation (same as the U-28A), the aircraft were first deployed by USAFRICOM in 2011, but have since operated just about everywhere in

support of 4 different regional commands. The Wolfhounds primary mission is to provide USSOCOM flexible and responsive operational movement of small teams and cargo in support of Theater SOC commands. Effectively a military version of the commercial Dornier 328 turboprop commuter airline (which I've flown on before), the Wolfhound provides an intra-theater capability to move people and equipment around without relying on military airlift and in an unobtrusive manner, again not advertising the presence of special operators. Capable of carrying a maximum of 27 passengers, 3 tons of cargo, or up to 4 patients on litters, this convertible twin engine airframe provides just the right amount of capacity for special operations forces at an affordable acquisition, training, operating, and maintenance expense. AFSOC has landed these aircraft on a rural road in Michigan in a 2022 training exercise, operated them from a highway in Latvia, and were highly utilized in both Iraq and Afghanistan. Like the U-28A, parts and service are available across the globe and the airframe isn't uniquely identifiable as US military, making it an ideal acquisition for AFSOC.

## **Air Commando Development Center Mission Briefing**

“We’re reframing our thinking on the way we organize, train and equip Air Commandos to meet our future challenges. We must continually develop our teams by ensuring our Air Commandos have the right training and experiences they need to fight tonight...and standing up the ACDC will meet that intent.”

--- Lt Gen Tony Bauernfeind, AFSOC commander.

Hosted by the dual-hatted 492<sup>nd</sup> Special Operations Training Group and ACDC Commander Colonel Robert Johnston, we learned that, just about a year ago, AFSOC stood up the Air Commando Development Center to lead the way in which the Air Force trains Air Commandos and forges them into capable, deployable units to prepare, prevent, and prevail against our nation’s adversaries. The Center provides policy, oversight, and guidance to support AFSOCs collective training to fulfill the mission of “any place, any time, any where”. This new directorate integrates AFSOC leadership in collaboration with Headquarters Air Force, USSOCOM as well as Air Force Education Training Command, and our foreign SOF partners to maximize knowledge sharing, leverage best practices, and integrate lessons learned. In a nutshell, this new Center will be responsible for the professional development of all personnel assigned to AFSOC, direct specialized combat training in the down-cycle, as units prepare to deploy and oversee all certifications, verifications, and validations for complete mission-ready units as they then are spun out into combat deployments.

As the first of its kind Center of Excellence in the AF, the ACDC creates training based on a holistic SOF mindset with real world problem sets, not traditional red vs blue with nominal enemies like “Elbonia”, but focused on our realistic peer competitors. Training modules are designed from the outset to be able to “insert” into traditional existing joint exercises as a SOF module. But besides operational capability, the ACDC is also working on issues related to the stability and predictability of deployments. There is always a need for more SOF and there is never enough to go around, but having a more predictable cycle of training after deployment before spinning up to deploy again, so that the families can know what to expect in terms of a normal family life is a key driver of retention. As the saying goes, if you just keep throwing resources at a problem, you never learn to moderate the risk or appreciate the cost.

### **1<sup>st</sup> SOW Mission Sustainment Team**

Finally, we bussed over to the other side of the base for our final tour of the day. AFSOC Mission Sustainment Teams establish forward operating bases by providing initial site security, receiving cargo and personnel and setting up shelters to allow SOF units to operate in otherwise inhospitable and austere locations. Designed around a mission rather than a function, think of them as a small unit of multi-capable folks able to create a mini-base out of a bunch of boxes and equipment making up a couple C-130 loads. Essentially, they are able to create what amounts to a flexible, but capable operating base out of nothing. A typical MST will be a squadron sized unit, led by a



Captain, in our case, Captain Fagan, of 100 or fewer airmen of a bewildering array of specialties (as many as 22 different job codes), most of whom are crossed trained. There are vehicle mechanics, security specialists, ready to engage and defeat the enemy, engineers of every type from mechanical to civil to electrical, capable of setting up a small town of air-conditioned tents complete with fresh water showers, sinks, galleys to prepare food, bunks to sleep in, and offices with networked computers to provide secure communications globally. They are capable of creating an airstrip out of nothing, ready to land aircraft to bring in heavy equipment while also building field hospitals, in short, everything a special operator could need to sustain operations anywhere, anytime, anyplace.

Relatively new to AFSOC, the MST idea existed only as a proof of concept as recently as 2022, but are now a critical fully integrated component of SOF operations, eventually, AFSOC intends to build 6 such MSTs by adding teams at Cannon AFB, RAF Mildenhall in the UK, and at Kadena Air Base in Japan. 1<sup>st</sup> SOW MST recently demonstrated this full capability as part of Air Combat Commands Agile Flag exercise in a simulated rural CONUS deployment, but also excelled at INDOPACOM Rim of the Pacific (RIMPAC) exercise in a drastically different theater of operation which also included maritime assets. In fact, this concept is being looked at by the SOF components of the other services to provide more options for the joint SOF force and coalition commanders on how to generate and employ airpower in support of SOF.



## **Tuesday, April 8: Eglin Air Force Base**

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As mentioned earlier, Eglin AFB is a quite large (largest in the USAF) and sprawling complex hosting not only the Air Force, but a wildering variety of 40 tenant units including those from the Army and Navy, Marines, even a small Space Force squadron related to near-earth and deep-space space object tracking, basing nearly 20,000 uniformed personnel and providing services for over 70,000 folks including civilians, contractors, and families. Taken together, Eglin hosts 5 Wings, 4 Wing Equivalents, supporting 5 Major Commands (MAJCOMS); Air Combat Command, Air Education Training Command, Air Force Material Command, Air Force Reserve Command, and our hosts from Hurlburt, AFSOC (yes, Hurlburt Field is technically an outlying field of Eglin AFB technically called Eglin Field No. 9). In addition, Eglin is home to an Army Ranger Camp, Army 7<sup>th</sup> Special Forces Group (Green Berets), and the US Navy Explosive Ordnance Disposal School, where Marines also teach and attend. Eglin Field No. 10 is also used by Naval Aviator trainees from nearby Pensacola Naval Air Station (where we visit tomorrow).

### **JPRIMES**

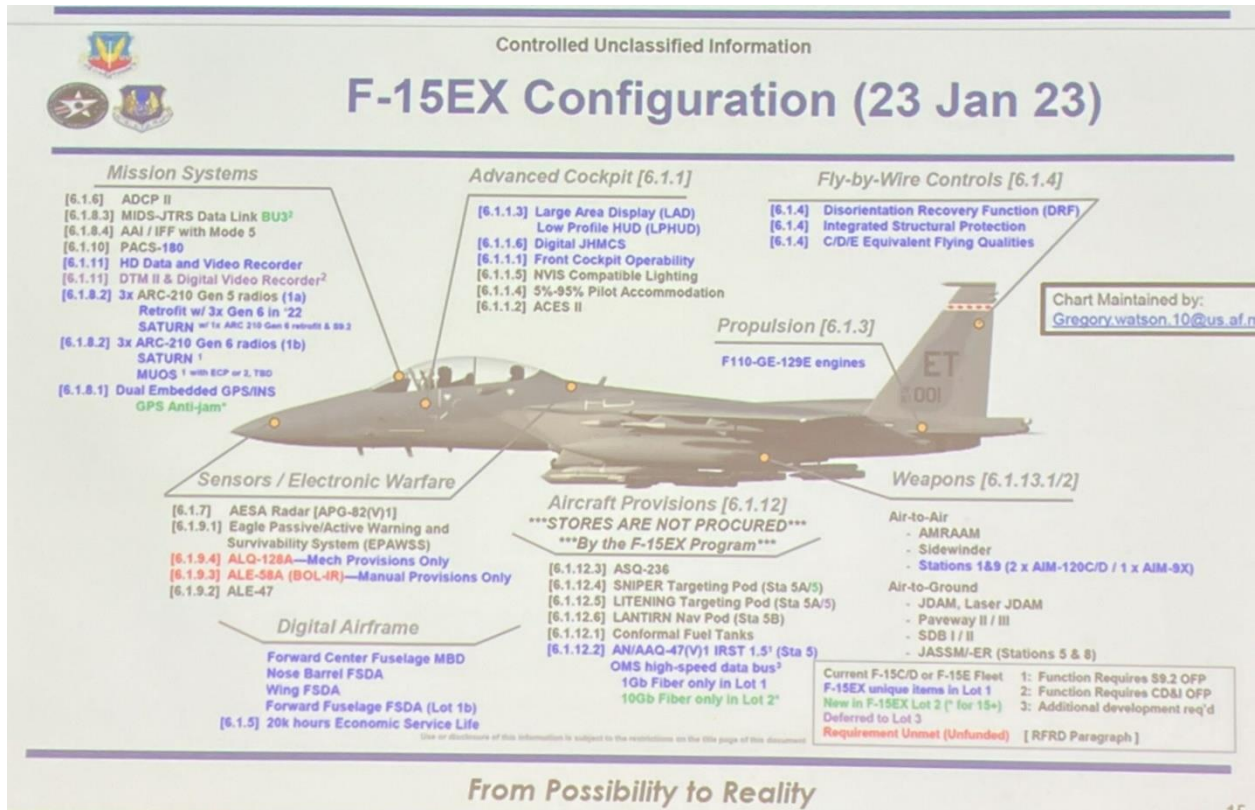
Our first stop of the day is to visit the Joint Preflight Integration of Munitions and Electronic Systems or JPRIMES, operated by the 46<sup>th</sup> Test Wing, part of the Air Force Test Center, which falls under Air Force Material Command. JPRIMES provides a technical evaluation environment to facilitate testing of air launched munitions and electronic systems mounted on aircraft (and other vehicles) from all services prior to open world testing. The core facility (one of two in the USG, DOCA visited the other in Edwards AFB a decade ago) is built around a massive anechoic chamber into which the airframes or vehicles are suspended in the air by a 40-ton hoist and isolated from outside electromagnetic signals or noise. Both chambers serve to test and integrate avionics systems in a secure and repeatable, electromagnetically controlled environment, using state-of-the-art simulation and stimulation technology that closely duplicates operationally representative environments. This allows technicians to evaluate the interaction between the systems and the aircraft to cost-effectively identify, isolate, and correct potential issues, long before flight testing. Inside this chamber, full power EM signals either onboard or external can be utilized without blowing out, frying, or jamming local electronics, radio/TV signals, or even personal devices like computers, phones, cars, basically anything more advanced than a light switch. Funding is primarily through user charges paid by the entity requesting the testing, which could be by any of the services, non-military USG users, Allied partners, even commercial businesses, charges can run up to \$10-15K per day, depending on the level of effort requirements and setup. The signals detected are captured by a wildering array of EM, IR, optical, and auditory sensors and the results are processed by a bank of computers in the next room. The setup and analysis of the tests typically require far more time than the actual testing, but the demand is immense, often booked out years in advance and there are always those ready to step in if space becomes available.



### **F-15EX Program Brief**

We next briefed on the F-15EX program by one of the senior test pilots, Major Abby. In 2018, DOD analysts determined a gap in the capability of the USAF fighter fleet due to retirements of the older technology and used up 1980s era F-15C/D models, inadequate numbers of F-22s built, and the delays in the F-35 program. Therefore, it was decided to order new F-15s from Boeing to bridge the gap before substantial numbers of F-35s became available. Taking advantage of this opportunity, rather than build new, but dated F-15C/D models, the USAF ordered a newer, more advanced version of the F-15 which Boeing was currently building for allies such as Saudi Arabia, and delivery of the first 6 of these Advanced Eagle F-15EX airframes began in 2021. While not survivable against true 5<sup>th</sup> Gen fighters like the F-22 and F-35, the F-15EX is still an extremely capable air superiority fighter better than anything anyone else has while also excelling at interdiction strike missions, having a rear seat weapons systems operator allowing the pilot to focus on flying the plane and worrying about air or ground threats. The basic airframe remains very similar to the original F-15A first adopted in 1972, although fresh from the factory in St Louis (the first 3 were diverted from a Qatari order) and jam packed with a new active electronically scanned array radar, cutting edge targeting sensor pods, active and passive electronic warfare/countermeasure systems, a larger fuel capacity, and, of course, the best weapon in the skies, US pilots. While relatively low numbers will be produced, on the order of 100 or so, Boeing has orders or is in the sales process with multiple US Allies, from Saudi Arabia to Israel to Thailand and has pitched the A/C to Poland and Egypt and the fact that Boeing already had active production lines setup, this reduced the cost to the US taxpayers. As more F-35 become available to the Active AF, the F-15EX fleet will be transitioned to Air National Guard units in California, Louisiana, and Oregon. With only 6 aircraft, the F-15EX program at Eglin is focused on test and evaluation, working with Boeing and other vendors to perfect and integrate the new systems into the aircraft up to USAF

standards, including the adoption of an infrared search and track pod to provide a new capability not found on any other US fighter.

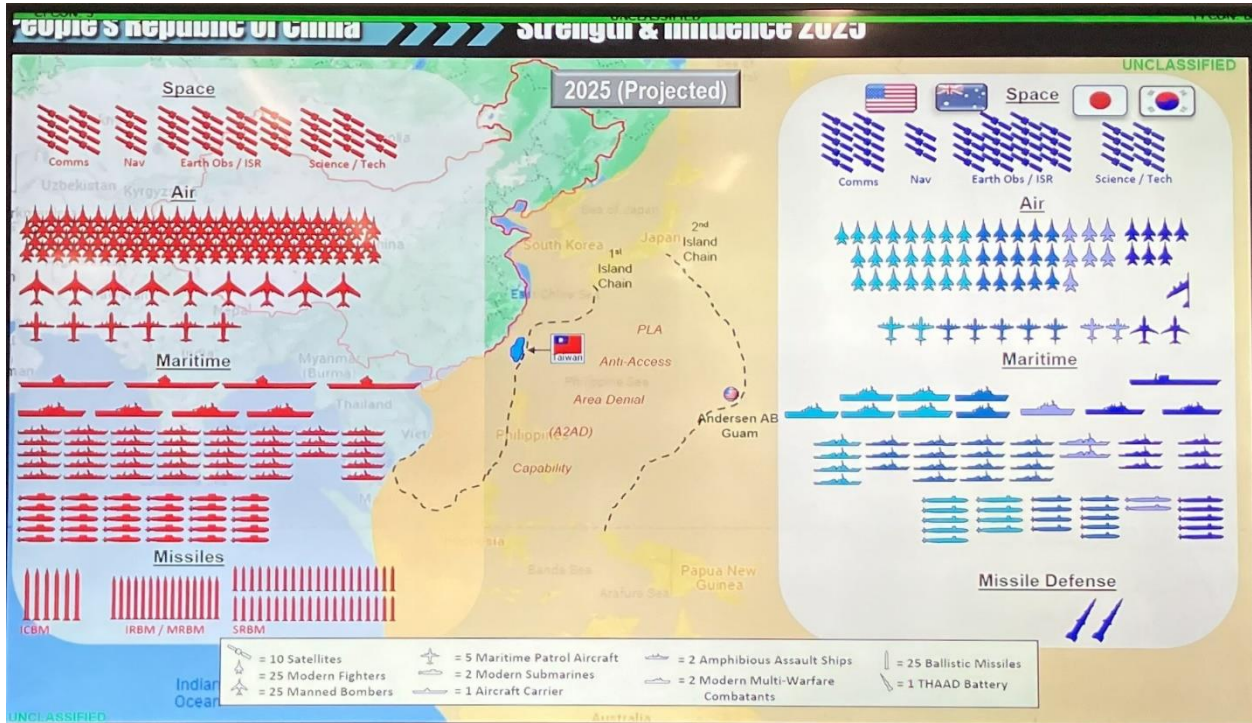
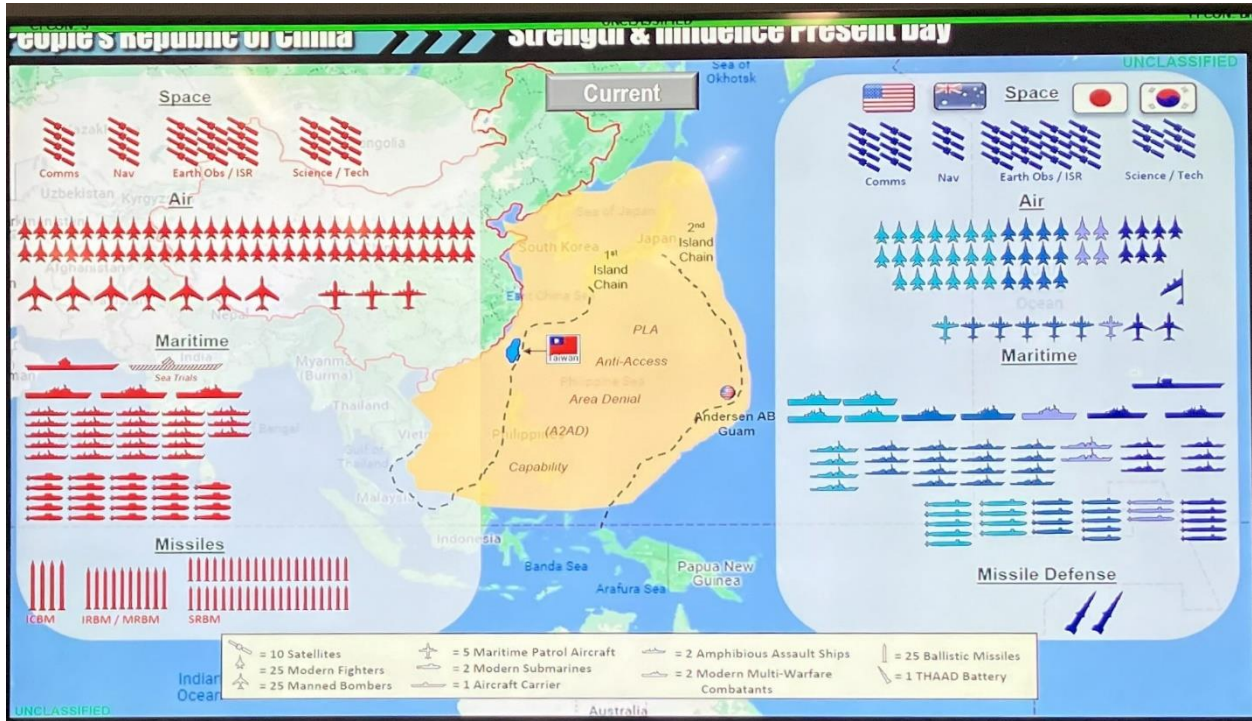


### 96<sup>th</sup> Test Wing Mission Brief

Our last session before lunch had us transition to the HQ Building for the command brief of the 96<sup>th</sup> Test Wing, which tests and evaluates state of the art weapons systems, navigation and guidance systems and cyber capabilities, provides quality installation and mission support, and serves as the host unit for Eglin as the 96<sup>th</sup> Wing Commander is dual-hatted as the installation commander responsible for all of the traditional services provided to a small city, including engineering, logistics, personnel, comms, medical, computer services, security, and just about anything else tens of thousands of people need to live and work on base.

The Wing command chief, Chief Master Sgt. Jaime Auger (26 years of service) opened the briefing by describing the threat we face, namely that while our military was focused on asymmetrical warfare in the Middle East, China was watching, learning, and building a capacity against us and this requires that we entirely refocus, top to bottom, on a potential struggle against a peer or near peer industrial opponent, as we had during the Cold War. In the words of the Secretary of the Air Force “My Priorities from Day One were China, China, and China”. China has embarked on a massive defense spending project to develop capabilities directed at opposing our own capabilities against them. Interactions with China have become more aggressive and at times

unsafe, with reckless maneuvers in the air and at sea. More than 180 such incidents have occurred in just the past two years, all designed to push us further away to coerce a change in our lawful operational monitoring activities. Likewise, Russia has also expanded their investments destabilizing the global security situation from Ukraine, to Syria, to Cyber and Space and North Korea and Iran are still active disruptors.



**People's Republic of China** // **Spending**

**China: Military Expenditures (Billions USD)**

Year	Expenditure (Billions USD)
2001	25
2002	30
2003	35
2004	40
2005	45
2006	55
2007	75
2008	85
2009	95
2010	100
2011	105
2012	110
2013	115
2014	125
2015	135
2016	145
2017	155
2018	170
2019	180
2020	185
2021	200
2022	210
2023	230

**Robust Space Program**

**Next Gen Fighters**

*"The initial decades of the 21<sup>st</sup> century are a period of strategic opportunity in the international environment that would allow China to focus on building comprehensive national power and secure our status as a great power."*  
*- Chinese Communist Party*

**Artificial Intelligence**

**Hypersonic Tech**

**Defense spending up 1,000% since 2001; cyber warfare reduces Research & Development cost/timelines**

**Russia** // **Defense Spending**

**Russia: Military Expenditures (Billions USD)**

Year	Expenditure (Billions USD)
2001	15
2003	20
2005	25
2007	30
2009	35
2011	40
2013	45
2015	50
2017	55
2019	60
2021	65

**Significant Global Efforts in the past 10 years**

- Seizing of Crimea Peninsula & Donbass
- Intervention in Syrian Civil War
- Destabilize Eastern Ukraine / Invasion of Ukraine
- Shaping Information Environment (IW / Cyber)

**Missiles/Nukes**

**Hypersonics**

**While Russia is continuing to play a role on the global stage, they haven't prioritized human and test investments to make their weapons programs fully successful. Their soldiers don't have personal care items, MREs are expired by nearly a decade and firearms don't work.**

**Lunch at Legends Grille with airmen and Team Eglin First Sergeants.**

We enjoyed a nice lunch at Legends Grille with Airmen from across the various units at Eglin including a donation to the Eglin First Sergeants Council, which provides rapid, red-tape free financial assistance to over 400 families, covering issues such as community food security, providing toys for children of deployed servicemembers, gas

cards for emergency travel, and a whole host of unmet requirements affecting the human needs of the Eglin community.

### **Air Force Research Laboratory**

The Air Force Research Laboratory (AFRL) is the primary scientific research and development center for the entire USAF and plays an integral role in leading the discovery, development, and integration of technologies for our warfighters in air, space, and cyber. Headquartered in Dayton, Ohio at Wright-Patterson AFB, but with locations in 9 other states, plus the UK, Japan, and Chile, AFRL operates multiple technology directorates across the country, even overseas, with the Munitions Directorate based here at Eglin. Focused on delivering war-winning effects with hyper-precision and speed against ground, sea, or air targets in all weather conditions, day or night, including both the ordnance and guidance technologies, the AFRL has the goal of keeping the fight as unfair as possible. Our briefing gave the long history of AFRL before diving into the work of what was formed in 1951 as the Air Armament Center, renamed the Munitions Systems Division in the '80s, before finally being merged into the 96<sup>th</sup> Test Wing in 2012.

Now part of the largest test wing in the USAF with a portfolio covering cutting-edge munitions such as the Advance Medium-Range Air to Air missile, Joint Air-to-Surface Standoff Missile, the workhorse of Iraq and Afghanistan Joint Direct Attack Munition, but also legacy weapons, training systems, threat emitters, and aerial targets such as the GF-16 and the BGQ-167A drones, the roughly 1,000 uniformed, civilian, and contracting folks cover the entire spectrum of science and technology research from pure science like bomb casing metallurgy, to applied research such as carbon nanotube materials manufacturing, to advanced technology development like hypersonic missiles, and experimental/operational development in areas like hypersonic missiles and networked swarming AI drones. Especially cool is the NIRF, or Nature Inspired Research Facility, where researchers look to the natural world to reverse engineer how nature has evolved unique flight capabilities such as bumblebees, hummingbirds or dragonflies, or how the mantis shrimp's compound eyes "see" light spectrums invisible to us would make for a very interesting capability for a future pilot in a threat environment like Ukraine. Less futuristic, but no less impressive is the MOAB, the famous mother of all bombs, the deep earth penetrator used in Afghanistan to destroy an ISIS tunnel complex in 2017, but designed, built, and tested here at Eglin (we saw an early test model almost the size of our bus parked outside)




CUI
AFRL

## Nature Inspired Research Facility

Mission: Research, develop, and transition nature inspired Guidance, Navigation, and Control (GNC) technologies to enable improved seeker designs for agile, robust, autonomy-capable small precision guided munitions

- Our Nature-Inspired Program investigates sensors and information processing for advanced autonomous guidance, navigation, and control capabilities. This is done by studying and exploiting natural systems, usually insects, in our *Nature-Inspired Research Facility* at Eglin site C-86.
- Create and operate world-unique instrumentation to characterize insect vision and behavior
- Flying insects are an existence proof of low size, weight, and power (SWaP) goal-oriented autonomous agents and their goals are very similar to the kinds of missions that we need our Air Force systems to perform










AIR FORCE RESEARCH LABORATORY
CUI

### 96<sup>th</sup> Operations Group

At the 96<sup>th</sup> Wing Operations Group, we split into two groups to rotate through a technology brief by the 40<sup>th</sup> Flight Test Squadron and a visit to the Joint Test and Training Operations Control Center (JTTOCC).



## 40<sup>th</sup> Flight Test Squadron Technology Brief

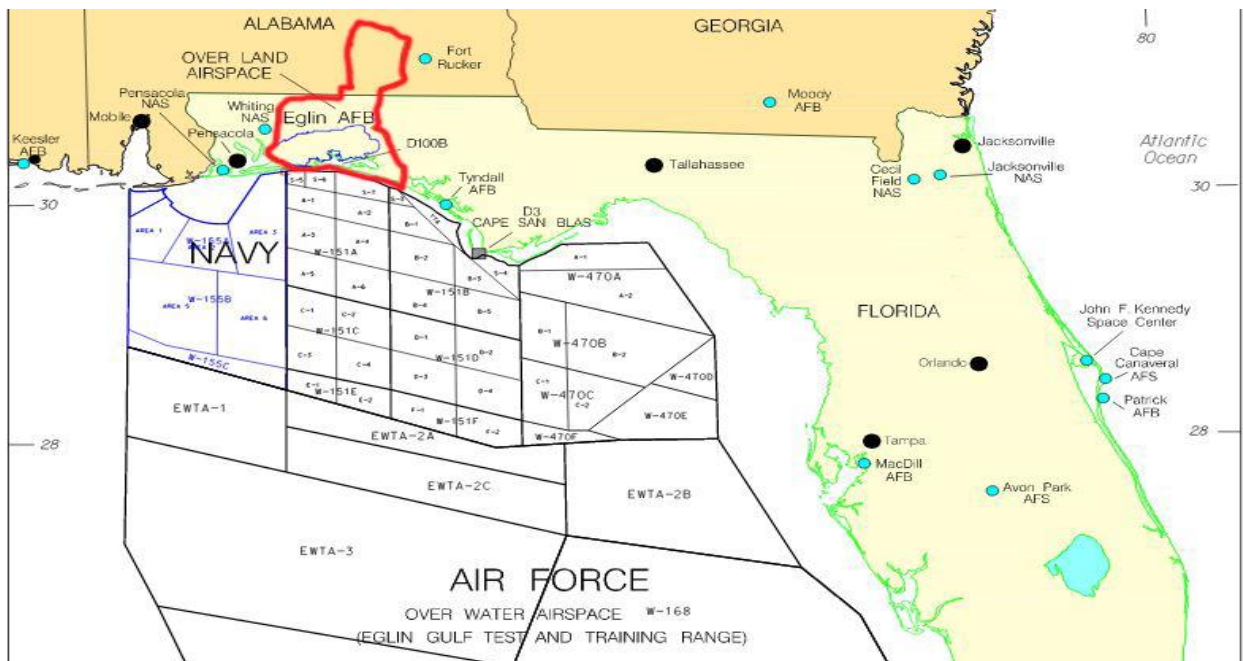


The 40<sup>th</sup> Flight Test Squadron briefing was given by Ms. Vicki Wissel, a senior researcher in the Advanced Capabilities Division. As part of AFTC, the squadron executes fighter aircraft development testing for the F-15, F-16, and A-10 aircraft by bridging the gap between the requirements of the warfighters and the engineers who actually design and build the systems. Ms. Wissel's specific talk to us today focused on testing of the Autonomy Capabilities

being implemented at Eglin in collaboration with DARPA. Fundamentally, autonomy is the ability of a system, such as an aircraft, to operate independently, artificial intelligence (AI), is a subset of autonomy and is described as the ability of a system to emulate human intelligence, through a process called machine learning. In legacy computing, we humans tell, through coding, the computer what to do, but with machine learning, we tell the computer how to learn what to do and it does it itself. She showed us a video of a test flight in which a real autonomously flown XQ-58A drone engaged and defeated a simulated by human piloted aircraft in an albeit scripted live engagement. Still pretty amazing.

## Joint Test and Training Operations Control Center

The JTTOCC operates the massive air, land, and sea test and training missions centered around Eglin, covering an immense area of 724 square miles of land, 134,000 square miles of airspace, 153 miles of shoreline, and 123,000 square miles of water.



Calling it a multi-airport ground, sea, and air control tower is both somewhat accurate and yet severely understated. JTTOCC conducts real-time monitoring and control of range activity to ensure both maximum safety as well as maximum utility and efficiency in the use of range assets, in particular air space (both over water and over land). The Common Operating Picture (COP) network system provides range controllers with essential visibility and situational awareness of all on-going as well as future range activities by integrating air traffic data derived from four regional radars, together with current and future airspace schedule information, into a real-time display overlaid on a 3-dimensional geographic display. JTTOCC range controllers also interact with the COP to review as well as update multiple items of information associated with mission tracks and scheduled airspace, all while monitoring civilian recreational and commercial boating and airline operations to deconflict potential safety issues. If an aircraft goes down for maintenance or a test is scrubbed, the JTTOCC is notified to either release the airspace or to schedule a different mission, if a boater creeps into a range area being used for operations, the JTTOCC notifies the Coast Guard. A few years ago, when an Air Force CV-22 Osprey ditched in the Gulf, it was the JTTOCC which initiated and controlled the rescue response.

### 96<sup>th</sup> Logistics Readiness Squadron



In support all of these incredible operations, LRS Commander Lt. Colonel LaMagna delivered the briefing on how his team is the BEAST for Eglin, meaning to **B**e ready, **E**xceed expectations, **A**ccelerate change, **S**ustain global operations, and **T**ransform the battlespace. The LRS has five flights, each responsible for a different aspect of Eglin logistics, from distribution (getting stuff loaded), materials (storing stuff), vehicles management, fuels storage and delivery (for A/C, trucks, generators), and compliance. The 96<sup>th</sup> LRS maintains the 7<sup>th</sup> largest fleet of vehicles (1.7k) in the AF (& the most fire trucks), stores 55K supply line items worth \$1.2B in 4 warehouses, and flows \$90M worth of fuels and lubricants in 27 fuel trucks, 9 huge jet fuel tanks, 3 smaller ground fuel tanks, and multiple storage units for both liquid oxygen and nitrogen.

For our final stop of this amazing first day, we walked through the 60,000<sup>sqft</sup> warehouse of the future. The million plus dollar upgrades to this warehouse took almost 18 months to complete and included cutting-edge freight elevators, automated vehicle tire carousels as well as new easy access storage racks and bins for mission-essential part. What really makes this place known as the “warehouse of the future” is all the embedded technology allowing fewer airmen to find and pull more parts faster, leading to lower overall logistics costs and reduced customer wait times for the base users, as

they say, the Air Force can't fly without supply. Designed after consultation with industry partners like Amazon, the AF uses RFID tags and scanners to create a real-time inventory management system allowing for tens of thousands of parts to be scanned, counted, and stored for easy retrieval and smoothing ordering replacements, lowering carrying costs and Airman time, not to mention preventing missing/stolen items and alerting when items out on loan are due to be returned. Before this upgrade, logistics personnel were required to manually check parts numbers or serial numbers on weapons issued to units, a complete inventory count would take weeks. Now the entire supply can be inventoried in a day. Another time saving investment is a robotic floor cleaner, which is programmed to clean the entire warehouse by itself, using programmed floorplans and sensors to avoid people and structures, which used to take an Airman hours daily to perform the same task, who is now freed to perform other more fitting work. Also included are a series of automated warehouse equipment such as perfect parts counters, automated cardboard balers, and smart lockers for parts pickup. The retrofits have already exceeded expectations that other logistics squadrons across the Air Force have visited to learn for themselves and the 96<sup>th</sup> is supporting these efforts via the Test Wings Innovation Office and successfully pitched at the AFWERX Spark Refinery last year. The intent is to implement this concept across the Air Force in the future.



## Wednesday, April 9: Pensacola Naval Air Station

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### Naval Air Technical Training Center

For our third and final day, we arrived at historic Naval Air Station Pensacola, the birthplace of Naval Aviation with an exciting day planned, as long as the weather holds. Dropped off at what they describe as one of the largest buildings in Florida (behind the VAB at Cape Canaveral and I think an Amazon distribution center) simply referred to as the Naval Air Technical Training Center. The NATTC is essentially a giant schoolhouse where sailors fresh out of basic training come to learn their military specialties and gain their ratings. Aligned under the Center for Naval Aviation Technical Training (also located here), Naval Training and Education Command, the NATTC develops and implements the curriculum for aviation ratings, aviation maintenance officer training, and training for all Marine Corps aviation (military occupational specialty (MOS) needs. Notice in the photo that the hand rails are tailhooks.



To explain this a little further, traditionally in the Army and Air Force and somewhat the Marines, new recruits are all sent together to basic military training (boot camp) and upon graduation are then assigned individually to “advanced” schools where they each learn their own specific military occupation. I’ll use the example of “citizen Joe”, who just graduated high school and joined the Army, graduates from 10 weeks of boot camp at Fort Jackson, and is ready for additional training in his assigned MOS, which I’ll say is MOS code 35 (Intelligence). Now Private Joe arrives at Ft Huachuca to

learn basic Intelligence skills in his Advanced Individual Training, while his bunkmate, Private Steve, a MOS 31, is sent to Ft Leonard Wood to become a Military Police trainee. Private Joe, through his advanced training may become a 35F (Intel Analyst), or a 35G (Geospatial Imagery Analyst), or even a 35L (Counterintel Agent), while his buddy Private Joe and most of his MP class will initially graduate as a 31B MP. Although conceptually very similar, the Air and Space Forces utilize Air Force Specialty Codes, while the Navy calls them Naval Enlisted Classifications, in the end, they all are used to describe a servicemembers specific skills training.

As usual, the Navy does things a little differently by also having “job” classifications, called ratings, which are not the same thing as ranks, but may in some cases be more important, especially early in a Navy career. Using similar groupings as the other services do with MOS codes, the Navy divides the skills and abilities required in groups based on the type of work done, such as Electronics Technician, Fire Controlman, or Machinists Mate. After finishing basic training, new sailors are detailed to individual training based on the following factors; the needs of the Navy, the career needs of the sailor, and finally, the desires of the sailor, in that order. If everything aligns right, the sailor gets the assignment he or she wants. The Navy refers to its Advanced Individual Training centers as “A schools” with 12 A schools across the country educating thousands of sailors in hundreds of ratings and sub-specialties. The NATTC houses essentially all of the A schools for the aviation related ratings. While technically, some Marines attend MOS schools, the Marines destined for shipboard careers attend Navy A schools, such, as the NATTC, indeed our first interaction at the NATTC was to walk through several cadres of young Marines led by a Marine officer, but under instruction from Navy trainers.

At Aviation Ordnanceman (AO) school, the sailors are taught the basics of the guns, bombs, missiles, and rockets loaded onto Navy (and Marine) aircraft, how to stow, issue, and load/unload these munitions safely at sea. Next, we observed a classroom full of workstations which would be the envy of any metalworking trade-school, where future Aviation Structural Mechanics (AM) learn how to work the metals out of which the wings, fuselage, tails, control surfaces, landing gear, and hydraulic systems of aircraft are made. They learn how to repair and protect these metals from corrosion. Finally, we observed where Aviation Machinist Mates (AD) learn basic maintenance for the wide variety of jet engines used in naval aviation. The AD techs don’t learn detailed jet engine maintenance here, but do get hands on experience in the basics of engine operation, engine accessories, and how to take them apart, and installing them back into the aircraft, jets, turboprops, or helicopters.



If you noticed the word basic used often, it's for a reason. The Navy considers their Advanced Training A schools to be merely introductions to these career fields, with the real expertise and mastery gained through experience in the field. After leaving A school, these partially trained, but rated sailors will join their units and begin their careers with on-the-job training until they have grown enough in experience and rank where most will be assigned a billet at "C" school where they master a job enough to be assigned an NEC. In this way, a civilian becomes an unrated sailor through boot camp, then earns a rating as say an Aviation Electricians Mate, then performs as a junior worker in a unit as an AEM until such time as he's mature enough in experience and rank to attend C school where he finishes as a specialist, say, in repairing the AN/APG-65 radar from an F-18 fighter jet. Only that relatively short middle part is conducted here at NATTC.

### **Daniel Rex Biddle Training Center for Aviation Rescue Swimmer School**

Exiting NATTC, we boarded the bus to transition over to a special treat, a tour of the elite Navy Aviation Rescue Swimmer School. When I say elite, I mean it. The physical and emotional stress required to complete this A school are immense. The high washout rate is significant enough that the Navy started a 2-week introductory "prep" class in order to maximize the chances of success. This course focuses on water safety, gear familiarization, swimming proficiency, nutrition, and above all, physical fitness, preparing the candidates for the far more rigorous and challenging rescue swimming course. Drawing from a more diverse population than ever, the Navy realized that young sailors fresh from bootcamp are often not in good enough physical and mental shape to make it through the 8-14 weeks of training a rescue diver, but if they graduate (35-55% attrition rate, far tougher than making it through Navy flight school) they will continue further in the two year process it takes to finally earn the right to be those heroes responsible for saving downed aircrew in rough seas, at night, in burning water, possibly in hostile waters. After a short history lesson from the Chief Petty Officer who runs the course, we got to peek inside the shark tank to watch live training involving making rescues from a helicopter door by current recruits.



### **Navy Flight Demonstration Flight Squadron Blue Angels Practice National Navy Aviation Museum and Pensacola Base Tour**

After a terrific start to the day, we moved over near the airfield to watch the Blue Angels morning practice session to be followed by a reserved meet and greet only to have dense fog move in. With the flying session cancelled, we made do by spending a couple hours at the museum of naval aviation, which is accessible to the public and highly recommended if you are in the area in the future. Still, we enjoyed educating ourselves on the wonderful displays before heading to the Oaks club next to the golf course (of course there's golf, this is the Navy) for a nice lunch, watching the last couple finish their back nine before the coming storm hit. Knowing our visit would be cut short, mostly because our tour host was the base commanders head of public affairs, we enjoyed an abbreviated tour of the extensive history of the base by bus, complete with mosquito walls (built taller than it was thought mosquitos could fly), internal control points (not all areas of the are accessible to the public), deep water ports currently used by the Coast Guard, historic (ancient really) hangers, and a visit to the USO lounge where we made our MWR donation before beating the mob now leaving the base and heading back across the bay to our hotel just before the storm hit.

