

WOLVERINE LEADS THE WAY

Patrick Roegies and Paul van der Linden recently visited CVN-78 USS *Gerald R Ford* off the coast of Greece to witness flight operations prior to the carrier group being deployed in support of Israel

Aircraft carriers occupy a vital position within the United States naval aviation. The support of a technological advanced carrier air wing is essential for the fleet, partly because of the leap in capabilities by possible adversaries in recent decades.

With the developments of new players on the global military stage trying to secure their position as a new world power, the US Navy faces a significant challenge in staying ahead of the game with technological capabilities in the ships in the fleet and the capabilities of their aircraft. With the introduction of fifth-generation fighters such as the

F-35C in the operational squadrons, an important step has been taken to further develop stealth capability, combined with a strong electronic command center-controlled capability to ensure air superiority for the carrier air wing. The implementation of CVN-78 USS *Gerald R Ford*, nicknamed 'Wolverine', the latest technological standard has been integrated in the primary systems of the carrier.

The next generation

Gerald R Ford is the latest carrier of the US Navy (USN). The design is a development of the nuclear Nimitz class

carriers, of which the conventional Kitty Hawk class and Enterprise class were the predecessors. By the turn of the 21st Century, the USN operated ten nuclear powered Nimitz class carriers. Their design, however, dates back to the 1960s.

The first of these, CVN-68 USS *Chester W Nimitz*, was commissioned on May 3, 1975, and an additional nine carriers were delivered to the USN until 2009.

An F/A-18E Super Hornet about to catch one of the two cables on the *Gerald R Ford* flight deck **Jurgen van Toor**



The predecessor of the Nimitz class, CV-67 USS *John F Kennedy*, was the last conventionally powered carrier built for the Navy. She was the only ship of her type and was designed as a variant of the Kitty Hawk class. After a long and distinguished service, *John F Kennedy* was decommissioned on August 1, 2007.

Almost 40 years after the development of the Nimitz class carriers, the USN inaugurated the CVN-21 program, which evolved into the Ford class carrier. The major design changes include a larger flight deck and a new propulsion plant that requires fewer people to operate and maintain, as well as generating more power. Further improvements were implemented in weapons and material handling, and a new, smaller island that has been pushed aft. Technological advances in electromagnetics have led to two new features: an electromagnetic aircraft launch system (EMALS) and an advanced arresting gear (AAG). The Ford class carriers also have a new self-defense system (SSDS) – an integrated warfare

CARRIER AIR WING 8 UNITS

Squadron	Aircraft type	Squadron emblem
Strike Fighter Squadron	F/A-18E Super Hornet	VFA-31 "Tomcatters"
Strike Fighter Squadron	F/A-18E Super Hornet	VFA-37 "Raging Bulls"
Strike Fighter Squadron	F/A-18E Super Hornet	VFA-87 "Golden Warriors"
Strike Fighter Squadron	F/A-18F Super Hornet	VFA-213 "Black Lions"
Electronic Attack Squadron	EA-18G Growler	VAQ-142 "Grey Wolves"
Airborne Command & Control Squadron	E-2D Hawkeye	VAW-124 "Bear Aces"
Helicopter Sea Combat Squadron 9	MH-60S Seahawk	HSC-9 "Tridents"
Helicopter Maritime Strike Squadron	MH-60R Seahawk	HSM-70 "Spartans"
Fleet Logistics Support Squadron	C-2A Greyhound	VRC-40 "Rawhides"

system to allow the ship to more easily take on new missions. The new dual band radar (DBR) combines S-band and X-band.

Other important improvements are the increased hangar bay and flight deck. This allows a higher number of aircraft to be transported and deployed more quickly. It also guarantees efficient maintenance of the F-35C, which requires more hangar space compared to the conventional MH-60R/S Seahawk, F/A-18E /F Super Hornet, EA-18G Growler and E-2D Advanced Hawkeye. It has changed how carriers can operate in a high-end conflict as well as in grey zone situations due to its ability to conduct increased surveillance and electronic warfare operations.

The carrier performed its three-month maiden cruise in 2022.

Increased efficiency

Cdr Mike Simpson, the Air Officer or AirBoss on *Gerald R Ford*, explained that the EMALS and AAG systems affect the directing of the aircraft on the carrier deck as faster cycles lead to more efficient deck logistic handling: "Flight deck personnel are trained to launch and recover aircraft every 60-70 seconds. The cycle length depends on how long the personnel are continuously working on the flight deck and how much time there is to refuel and rearm the aircraft. Cycles vary in length from 45 minutes to two hours."

With the additional elevators integrated in the new design, the cycle times to rearm the aircraft can be performed much more efficiently. Cdr Simpson noted. "While *Ford's* enhanced technology greatly improves our ability

The new tower of *Gerald R Ford* is sleeker compared to its Nimitz class predecessors Paul van der Linden





“FLIGHT DECK PERSONNEL ARE TRAINED TO LAUNCH AND RECOVER AIRCRAFT EVERY 60-70 SECONDS”

to launch, recover, refuel and rearm aircraft, the professionalism of the sailors and hard work made all these first-in-class upgrades come to life.”

Given all the technological developments and computers integrated in the *Gerald R Ford*, the daily work of the AirBoss is similar to previous carriers: “The daily schedule of the Air Boss hasn’t changed significantly from Nimitz class carriers. As the Air Boss, I still help manage the flight deck, the airspace above the ship, the tempo of evolutions, and I oversee the care and development of over 600 air department sailors. The main changes are seen with AAG, EMALS and fuel operations. The manpower required to operate each of our critical systems has decreased, allowing for more personnel flexibility. *Ford’s* upgraded flight deck delivers greater lethality, survivability and joint interoperability while reducing operating and maintenance costs.”

Cdr Simpson also commented on the learning curve of the crew during the last two operational cruises: “The personnel on this ship have and continue to prove the Ford class is the most technologically advanced and capable aircraft carrier in the world. Every day, the crew identifies procedures that make us more capable, efficient and sustainable. We continue



to provide critical operational data to enhance our state-of-the-art equipment, making it more reliable and sophisticated. It has been a real pleasure to host our allied nations and share this historic deployment with them. There is no doubt this deployment is the beginning of a new era and the dawn of the next generation of sea power.”

Carrier air wing ops

Carrier Air Wing 8 (CVW-8) is the first air wing to operate from *Gerald R Ford*. Coincidentally, CVW-8 was also the first to operate from *Chester W Nimitz* when the carrier performed its maiden cruise in 1975. This is the second operational cruise that has CVW-8 embarked on board *Gerald R Ford*.



F18 403 RTB
Two F/A-18Es from
VFA-87 'Golden
Warriors' and a
single F/A-18E of
VFA-31 'Tomcatters'
returning to *Gerald
R Ford* following a
sortie **Jurgen van
Toor**

The mission of CVW-8 is to conduct offensive air operations against both land and sea targets, provide Carrier Strike Group TWELVE (CSG-12) defense and conduct sustained air operations in support of allied forces as directed by the National Command Authority.

CVW-8 currently has no F-35C squadron integrated. Cdr Simpson explained: "Although CVW-8 has not been allocated a fifth-generation F-35C Lightning II squadron at this time, the carrier is capable of operations with F-35Cs. Both AAG and EMALS support the F-35C operations. The Ford class will eventually have F-35Cs as they supplement the F/A-18E/F platform, which is a combat-proven platform capable of executing a wide range of missions, including traditional air superiority, fighter escort, reconnaissance, aerial refueling, close air support and more."

While embarked, a typical day for CVW-8 varies depending on the mission set at that given time. During the deployment of the carrier, the air wing flies day and night in support of maritime security on behalf of NATO Allies and partners. CVW-8 consists of eight operational squadrons including a detachment of the Carrier Onboard Delivery (COD) squadron. As CVW-8 is not equipped with the F-35C Lightning II yet, the COD aircraft in use operated by Fleet Logistics Support Squadron 40 (VRC-40) is still the 40-year-old C-2A Greyhound. However, the cargo hold of the C-2A is insufficient to carry a spare F-35C engine and it will eventually be replaced by the CMV-22B Osprey.

Assistant public affairs officer Ens Paula Niederland said that the deployment of *Gerald R Ford* is a prudent measure that

Left: An F/A-18E of VFA-31 'Tomcatters', the second-oldest US Navy fighter attack squadron, catches the #2 wire **Ben Gorski**

Below: F-18 catapult A Green Jacket guides a Super Hornet of VFA-87 'War Party' into position for its launch **Jurgen van Toor**



INCREASED EFFICIENCY

During the maiden cruise of the *Gerald R Ford*, the Carrier Air Wing passed the point where they were not trying to figure out if the Ford-class could do the same thing as the Nimitz-class. Instead, the focus rapidly changed to take what the Nimitz-class could do and raise it to the next level.

Capt Paul Lanzilotta, commanding officer on CVN-78 USS *Gerald R Ford*, explained the increased efficiency offered by the carrier: "We have developed an improved, flatter information flow, taking advantage of the capabilities of the dual-band radar. The top priority of the Carrier Air Wing is gaining and maintaining air superiority around the carrier. Although the carrier does not deploy a fifth-generation F-35C Lightning II squadron, the Carrier Air Wing has been able to prove not only that they can do it on the Ford-class but that they can do it better than on a Nimitz-class ship."

"One of the things the Carrier Air Wing has been able to do through independent steaming events is not only to validate that the air wing can operate in the same manner that we used to on a Nimitz-class, but also expand and develop how we can refine our tactics, techniques and procedures based on the additional capabilities integrated in the *Gerald R Ford*."

Specifically, the Electromagnetic Aircraft Launch System (EMALS) and AAG (Advanced Arresting Gear) enables the Carrier Air Wing to launch and recover a greater number of aircraft in a more efficient manner. With the in-deck flight refueling station and the advanced weapons elevators, the flight deck crew is learning how to spot the aircraft, enabling them to rearm, re-crew and eventually relaunch the aircraft. This is not just executing cyclic operations, but also going to more of a flex deck mindset or an open deck mindset.

Anthony Della Jacono, the aircraft launch and recovery equipment (ALRE) boatswain, explained the advantages of the EMALS and AAG systems: "The weight of the jets launched from the conventional steam catapult was important to apply the correct force. For steam catapults, the weight of aircraft and wind over the flight deck determine how much steam is used to launch the aircraft off the deck. The same concept applies for EMALS when using power. The deck crew presents a board on which the aircraft weight is presented to

the pilot. The pilot can correct this number by using his thumb: up for an increase of weight and down for a decrease of weight. Both EMALS and steam catapults are relatively quick in regaining steam and power, but as long as EMALS is healthy, it is always ready for the next launch."

On a Nimitz-class carrier the tension of the wires for the recovery of the aircraft are adjusted to suit the aircraft type. This is still an important factor with AAG, as it uses the same method when recovering aircraft. The type of aircraft selected into AAG allows the engine to pay out just enough cable, while engaging a mechanical brake to fully stop the aircraft landing. AAG has three wires, just like most of the Nimitz-class aircraft carriers. If a wire goes down for cable damage, the other two wires will stay online. The affected wire will have to be replaced to not affect flight operations.

A simple improvement in the layout of *Gerald R Ford* is a different situated place for the watchstanders than on a Nimitz-class carrier, so they have better access to each other to talk face-to-face and discuss what they are seeing, as well as using systems that can pass data between the weapons systems. The sea combat commander suite is approximately three times bigger on *Gerald R Ford* compared to the Nimitz-class. The Tactical Flag Command Center and the Combat Information Center have also increased in size and feature reconfigurable workstations so that any watchstander can work from any location if required. This also means that numbered fleet staff or NATO personnel could embark on the carrier and have access to the right command and control information for the mission.

Because of the layout of the ship, the air wing and the destroyer squadron team have come up with a new method for the Carrier Strike Group to oversee opposed strait transits that streamlines the command and control and the information flow.

On air defense, between the control and command and the new dual-band radar, the strike group has worked out a way to make the air and missile defense commander liaise more closely with the rest of the Carrier Strike Group and create a 'flattened' control and command process. This enables a more agile and efficient employment of the available assets.

underpins NATO's collective deterrence and the US commitment to protect its allies and partners: "It is an opportunity to operate with many of our allies across multiple domains, enhancing interoperability and interchangeability. The deployment also provides Carrier Strike Group 12 (CSG-12) with the opportunity to conduct training and operations in a variety of environments,

ranging from the high north to the Mediterranean.

"The lessons learned from the maiden cruise have been secured into standard operating procedures and training programs. Throughout deployment we are continuing to collect data that will be passed to program offices for consideration in future Ford-class carriers. *Gerald R Ford* is the flagship of

“THE PERSONNEL ON THIS SHIP CONTINUE TO PROVE THAT THE FORD-CLASS IS THE MOST TECHNOLOGICALLY ADVANCED AND CAPABLE AIRCRAFT CARRIER IN THE WORLD”



VFA-87 F/A-18E AJ-400 has just been catapulted of the deck of *Gerald R Ford*
Jurgen van Toor

AHEAD OF THE LEARNING CURVE

By the time CVN-78 *Gerald R Ford* completed its maiden cruise it had proved its capability at sea over the preceding 18 months of post-delivery tests and trials. The crew shifted gears and prepared for full-ship shock trials, focusing on material planning, inspections of the ship, setting up sensors and instrumentation, removing non-warfare-related items and training

for potential casualties during a series of blasts detonated in the water near the aircraft carrier.

The main focus during the current cruise is advanced training on repairing small and medium and potentially large leaks in different piping systems and investigating and improve structural issues the crew have experienced.

The sailors on board *Gerald R Ford* have understood that it is an entirely different class of aircraft carrier, and that while there will be similarities to Nimitz-class vessels, there will be aspects that are completely different. One of the key differences is that there is a blank slate for how they want to fight, employ and train on the ship.

In the deck crew, the yellow jackets are the aircraft handling officers, catapult and arresting gear officer and aircraft director, while the green jackets are maintenance personnel and mechanics. Fuel personnel wear purple and aviation ordnance personnel wear red
Ben Gorski



the Carrier Strike Group. As the first-in-class ship for the next generation of aircraft carriers, it has introduced 23 technological developments to deliver greater lethality, survivability and

joint interoperability while reducing operating and maintenance costs. EMALS improves take-off speed while reducing wear on the aircraft, cost for maintenance and support, and personnel

required to operate by one-third. It also allows for quieter and cooler work and living spaces for the sailors. The Ford-class also comprises 11 advanced weapons elevators (AWE) which move more ordnance faster and require less maintenance and personnel to operate, enhancing the ability of the ship to move 24,000lbs per load at speeds greater than Nimitz-class carriers."

"The aircraft carriers are the centerpiece of America's naval forces – the most adaptable and survivable airfields in the world. On any given day, Sailors aboard an aircraft carrier come to the fight trained and equipped across a full range of missions. The new features on Ford-class carriers increase an air wing's efficiency by improving its ability to launch, recover, refuel and rearm aircraft. The lessons learned are shared with the other operational air wings, as some of the improvements can also be implemented on the Nimitz class." CAJ

The C-2A Greyhound primary carrier delivery aircraft will be withdrawn from service soon Patrick Roegies



VAW-124 E-2D AJ-602 has just left its parking position at the rear of the flight deck and is slowly taxiing to the forward catapult Jurgen van Toor

