

LOOKING BACK AT THE COLD WAR AND P-3C ANTI-SUBMARINE WARFARE (ASW) 40 YEARS AGO

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Streszczenie: Chociaż wiele osób zapomniało już o napiętych czasach zimnej wojny, coraz ważniejsze staje się ponowne przyjrzenie się tym wydarzeniom w celu przedstawienia kontekstu i odniesień, w miarę jak angażujemy się w coraz bardziej napięte stosunki z Rosją i Chinami. W ciągu 44 lat zimnej wojny biliony dolarów zostały wydane, jako że miliony Amerykanów, Alianci oraz nasi Sowieccy odpowiednicy wraz z Układem Warszawskim służyli, będąc gotowi do ataku podczas wart w bazach, w odległych posterunkach, na statkach, okrętach podwodnych, statkach powietrznych i silosach rakietowych, aby utrzymać niełatwą równowagę sił podczas tych niebezpiecznych czasów. Zimna wojna dotknęła kilku pokoleń, setki tysięcy osób zostało zabitych lub rannych, służąc utrzymaniu stabilności i pokoju. Niniejszy artykuł zawiera krótki przegląd makrowydarzeń związanych z zimną wojną, odstraszaniem jądrowym oraz ekspansją Marynarki Wojennej Stanów Zjednoczonych i ZSRR. Zapewnia również mikrosposzczenie na operacje zwalczania okrętów podwodnych (ZOP) Marynarki Wojennej P-3C pod koniec lat 70. XX w. oraz technologie obejmujące wczesne komputery cyfrowe, manipulatory kulkowe, bezwładności, łącza danych, ekrany dotykowe, boje sonarowe oraz wykrywanie anomalii magnetycznych. Przegląd zimnej wojny oraz skupienie się na rozległych i kosztownych operacjach alianckich ZOP może nam przypomnieć o złożoności tych operacji, niebezpieczeństwie czasów, wyciągniętych z nich wnioskach i poświęceniach obu stron, przy jednoczesnym zachowaniu stałej czujności na całym świecie w napiętych czasach.

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Abstract: While many have already forgotten the tense times of the Cold War, it is increasingly important to relook at those events to provide context and references as we engage in increasingly tense relationships with Russia and China. During the 44 years of the Cold War, trillions of dollars were spent as millions of Americans, Allies and our Soviet and Warsaw Pact counterparts - served and stood watches on bases, remote outposts, ships, submarines, aircraft, and missile siloes to maintain an uneasy balance of powers during dangerous times. The Cold War affected several generations and hundreds of thousands were killed or injured while serving to maintain stability and the peace. This paper briefly reviews macro events of the Cold War, nuclear deterrence, and US and Soviet naval expansion. It also provides a micro look at Navy P-3C Anti-Submarine Warfare (ASW) patrol operations in the late 1970s, and technologies including early digital computers, trackballs, inertials, data link, touch screens, sonobuoys, and magnetic anomaly detection. Reviewing the Cold War and a focus on extensive and expensive Allied ASW operations can serve to remind us of the complexity of these operations, the danger of the times, lessons-learned, and the sacrifices by both sides while maintaining constant vigils around the world during tense times.

Słowa kluczowe: zimna wojna, odstraszanie jądrowe, SLBM, ZOP.

Keywords: Cold War, nuclear deterrence, Submarine-Launched Ballistic Missile (SLBM), Anti-Submarine Warfare (ASW).

Introduction

As the years pass, it is sadly evident that many have now forgotten or seem unaware of the critical events during the 44 years of the Cold War and the sacrifices in blood and treasure made by several generations of Americans, NATO, Allies-and by our adversaries. Over the past few years we have re-entered a “renewed version” of a Cold War in which we are facing Russian, Chinese, and North Korean challenges in cyberspace, military, economic, and political arenas. Now, it is especially important to relook at the Cold War to put the current times in perspective and prepare for the future.

After World War II, the Soviet Union brutally took-over Eastern Europe and Communism spread quickly in war-torn Greece, Italy, and France. The long “Cold War” began in 1947 with the Truman Doctrine to contain Communism and the Marshall Plan to rebuild Europe and ended with the disintegration of the Soviet Union in 1991. While this era has faded and the sacrifices of many thousands of service personnel (on both sides) and their families may have been forgotten, we should study the Cold War and its lessons which can help inform us as we have now entered a “renewed version” of Cold War.

The Cold War dominated the world for over four decades. It was an all-out competitive struggle on political, military, scientific, and economic fronts by the US and our allies to contain communist expansion. The Cold War included military and civil defense, massive industrial mobilization, intelligence gathering, espionage, and many deadly confrontations around the world punctuated by deadly conflicts in Korea, Berlin, Cuba. Laos, Vietnam, Angola, Congo, Central America, and elsewhere.

Many trillions of dollars were spent during the Cold War as millions of Americans and Allies --and our Soviet and Warsaw Pact counterparts--served and stood watches on bases, remote outposts, ships, submarines, aircraft, and missile siloes to maintain a constant vigil around the world...and hundreds of thousands were killed or injured. In a 1953 speech, President Eisenhower stated, “This new (Soviet Secretary Khrushchev) leadership confronts a free world aroused, as rarely in its history, by the will to stay free. The free world knows, out of the bitter wisdom of experience, that vigilance and sacrifice are the price of liberty”².

Looking back at the many incidents and crises of the Cold War, it is amazing that both the United States and the Soviet Union managed to stabilize their super-power stand-off and maintain controls to survive many tense events which had the potential to escalate into nuclear war. It is a tribute to the professionals on both sides that a tense peace was maintained over 40 dangerous years.

Every day and night throughout the Cold War, Navy crews were on patrol, tracking and gathering intelligence on Soviet submarines and ships. P-3s were part of vast US and Allied Navies’ ASW (Anti-Submarine Warfare) efforts to locate, track, and potentially destroy Soviet submarines in the event of war. The P-3C was the Navy’s first airborne ASW digital computer platform with an early data link capability, “track ball” (mouse), and other new technologies eventually including touch screens.



Fig. 1. Patrol survivors of 1955 MiG-15 attack

Source: ovpnavy.org/vp9_mishaps

² President Eisenhower, The Chance for Peace Speech to the American Society of Newspaper Editors (1953), Washington DC, p. 3.

There were extensive VP (fixed-wing patrol) losses in “Peacetime” during the Cold War. According to VP International’s Book of Remembrance: “Since 1947, there have been 1149 American casualties” on Navy patrol missions; some patrol crews were shot down by Soviet, Chinese or North Korean fighters³. Crews and marriages were strained by steady deployments throughout the Cold War. During my first tour 1976-79, five P-3s were lost from VP-11, 23, 8, 22 and VP-9 (ditched in North Pacific and most of the crew rescued by a Russian ship – see *The Rescue of Alfa Foxtrot 586* by Andrew C.A. Jampoler)⁴. From 1980-83 another 20 died on two P-3s from VP-50 and VP-1. Over 50 crewmen died or were injured in these very different mishaps.

These were highly-skilled volunteers from all over the United States who stepped-up to serve their country during the Cold War and many still remain lost at sea. We should not forget the unheralded sacrifices and services of those on both sides during the long Cold War.

1. A Renewed Cold War?

In early December 2017 the Australian Air Force monitored Russian TU-95 Bear bomber flights from Indonesia, in 2016 the Russians secretly shipped weapons and advisors to the island nation of Fiji, and in 2014 Russian ships operated near Australia highlighting their expanded presence in the Asia-Pacific region⁵. Russia has rapidly developed new generations of weapons systems, is providing support for North Korea, and is collaborating with China on developing new attack submarines. By 2020, the Chinese Peoples Liberation Army (PLA) Navy will have over 80 submarines compared with the US’ 30 subs in the area.

Over the past several years the Western Allies have become engaged in a type of New Cold War which has required the development and redeployment of military, cyber, intelligence, and surveillance assets at great costs to the nation. Relooking at the experiences of the past and lessons-learned can help us confront the New Cold War which we have experienced in Cyberspace, Ukraine, Syria, Iran, Afghanistan, North Korea, South China Sea, Baltic Sea, Black Sea, the Pacific, and elsewhere.

This “renewed version” of the Cold War has included a troubling spectrum of recent political, military, and economic events including: Russia’s invasion of Crimea and later Eastern Ukraine in 2014, cooperating with Iran and supplying

³ N. Donovan, *VP International Book of Remembrance*, Accident List – United States, <http://www.vpinternational.ca/BOR/US.html>.

⁴ Jampoler, *The Rescue of Alfa Foxtrot 586* (2003), Naval Institute Press, Annapolis <http://www.orneveien.org/adak/contributors/jampoler/>.

⁵ C. Knaus, *Australian Air Force put on alert after Russian long-range bombers heads south*, *The Guardian*, December 30, 2017, pp. 1-2.

arms to the Taliban and Syria⁶, assassination of former Vice Premier Boris Nemtsov within sight of the Kremlin in 2015, and many dangerous incidents involving Soviet aircraft flying dangerously close to Navy and Air Force aircraft in Syria, the Baltic Sea, Black Sea, and the Pacific. Vladimir Putin has aggressively led a resurgent and aggressive Russia. He has rapidly built-up military, cyber, and intelligence capabilities including active measures to interfere in European elections and the US 2016 election and extensive infiltration of social media necessitating increased US and Allied resources and heightened vigilance. American troops have been training with Eastern European, Baltic, and Asian counterparts and are reapplying lessons-learned from the Cold War years⁷.

To meet these rising threats and secure our nation's future in this "Renewed version" of the Cold War, we need to remember lessons from the Cold War such as cherishing our allies, building-up regional and global alliances, upgrading civil defense programs, and not entering into wars without a defined exit strategy (Vietnam). We also need more military and civilian leaders who have experience in, and have experience in complex global issues, including hard languages like Russian, Chinese, Arabic, and Farsi.

1948-49 Key Events: In 1948 Stalin ordered the blockade of all truck, rail, and water supply routes to Berlin to force the Allied Powers out of the city. President Truman reacted quickly and ordered the organization of the massive Allied Berlin Airlift to resupply the city. After a year and 277,500 flights, the Soviets finally backed



Fig. 2. 1948 Unloading during Berlin Airlift

Source: USAF

⁶ C. Gall, *Iran Flexes in Afghanistan As US Presence Wanes*, The New York Times, August 6, 2017, p. 1.

⁷ E. Schmitt, *US Troops Train in Eastern Europe to Echoes of the Cold War*, The New York Times, August 6, 2017, p. 1.

down and President Truman's commitment to supply Berlin became a key turning point in the emerging Cold War. It had "(...) cost the lives of 73 Allied airmen...39 British citizens, RAF regulars and civilians, and 32 Americans were killed during the airlift, along with 9 or more German airlift employees"⁸.



Fig. 3. 1952 NATO stamp Bureau of Engraving & Printing
Source: Design Charles R. Chickering

The North Atlantic Treaty Organization (NATO) was formed in 1949 to provide mutual defense and act as a united bulwark against Communism. NATO initially included the US, Canada, United Kingdom, France, Belgium, Netherlands, Luxembourg, Italy, Portugal, Norway, Denmark, and Iceland. President Truman observed that "The Marshall Plan had brought some relief, but the constant threat of unpredictable Soviet moves resulted in an atmosphere of insecurity and fear among the peoples of Western Europe. Something more needed to be done to counteract the fear of the peoples of Europe that their countries would be overrun by the Soviet Army before effective help could arrive. Only an inclusive security system (NATO) could dispel these fears. We hoped it (the NATO treaty) would serve to prevent World War III"⁹.

Throughout Eastern Europe, tens of thousands of very brave citizens rose up against Soviet domination and were brutally put down:

- 1953 East Germany strike;
- 1956 uprising in Poznan, Poland; put down by 10,000 troops & 360 tanks¹⁰; over 74 protesters killed¹¹;

⁸ Reeves, *Daring Young Men-The Heroism and Triumph of The Berlin Airlift, June 1948-May 1949*, Simon & Schuster, New York 2010tr, pp. xv-xvii, 271.

⁹ H. Truman, *Years of Trial and Hope-Memoirs*, Volume II, Time, Inc. Doubleday & Company, New York 1956, pp. 286, 288.

¹⁰ G. Ekiert, J. Kubik, *Rebellious Civil Society: Popular Protest and Democratic Consolidation in Poland, 1989-1993*, University of Michigan Press 2001, pp. 27-29.

¹¹ M. Szewczyk, *Poznański czerwiec 1956*, Official figures, 2005, Official figures.

- 1956 Hungary (2600 killed, over 300 executed, many thousands imprisoned, tortured; over 200,000 fled the country)¹²;
- 1962 Workers protest against Khrushchev's raising food costs & work quotas in Novocherkaask, Russia; over 110 casualties, many sent to Gulags¹³;
- 1968 Prague; Czech Spring;
- 1981 Poland Solidarity strike; Jaruzelski Martial Law; Lech Walesa and Catholic leaders led opposition;
- 1989 Berlin, Eastern European border walls taken down.

1960-62: Tense Years in the Cold War: In May 1960 the Soviets shot down Captain Gary Power's U-2 as he photographed Russian installations and put him on a show trial with an accompanying propaganda barrage. The Central Intelligence Agency (CIA) trained Cuban exiles for the failed April 1961 Bay of Pigs invasion of Cuba and Fidel Castro increased military, political, and economic relations with the Soviet Union. In May 1961, President Kennedy sent Army Special Forces "A Teams" to Vietnam to train and bolster the South Vietnamese against Viet Cong guerrilla operations. In August 1961, as the East Germans started building the Berlin Wall to close off the eastern part of the city, the US called up 150,000 reservists and both superpowers ratcheted-up their conventional and nuclear confrontation. The Soviets and the Allies rapidly deployed tanks and troops along the new Berlin Wall, increased defense readiness, and reinforced frontiers.



Fig. 4. 1961 US & Soviet tanks Berlin stand-off

Source: US Army MHI

¹² V. Sebestyen, *Twelve Days-(Hungarian) Revolution 1956*, Penguin Press, New York 2007, pp. xxv-xxvi.

¹³ V. Zubok, C. Pleshkov, *Inside the Kremlin's Cold War: from Stalin to Khrushchev*, Harvard University Press, Cambridge 1997, p. 262.

After the Soviets blockaded Berlin, President Kennedy made a speech on television and initiated nation-wide efforts to build fallout shelters since we appeared to be on the brink of nuclear war. He stated “In the event of an attack, the lives of those families which are not hit in a nuclear blast and fire can still be saved if they can be warned to take shelter and if that shelter is available. We owe that kind of insurance to our families and to the country. The time to start is now. In the coming months, I hope to let every citizen know what steps he can take without delay to protect his family in case of attack. I know you would not want to do less”¹⁴.



Fig. 5. 1962 P-3 flying during Cuban Missile Crisis US Navy
Source: US Army MHI

In October 1962, President Kennedy initiated a successful naval blockade of Cuba to prevent the Soviets from completing installation of nuclear missiles. Navy squadron VP-45 flew many missions during the Cuban Missile Crisis and in 1976, I joined that squadron as we deployed to Iceland to hunt and track Soviet nuclear missile submarines at a time when the USSR was rapidly increasing its nuclear capabilities.

2. Nuclear Deterrence Triad

Initially, the US had a monopoly on nuclear weapons and concentrated on building-up strategic bomber forces until surprised by the Soviet nuclear test in 1949. In the 1950s, both superpowers worked to develop a much more powerful Hydrogen (thermonuclear fusion) bomb. The US tested it in November 1952 followed closely by a successful Soviet test in August 1953. During the 1950s, the US embarked on

¹⁴ Kennedy, July 25th televised speech to the nation (1961).

accelerated nuclear bomb-building programs, eventually constructing about one bomb a day to build up the nuclear arsenal.

During the 44 years of the Cold War, the US, Allies, and the USSR developed deterrence doctrines to keep the other side from using nuclear weapons since both sides knew they could also be destroyed (Mutual Assured Destruction-MAD). The US, Allies, our professional counterparts in the Soviet Union and the Warsaw Pact created vital stability by building organizations of highly-trained professionals and procedures to handle, support, maintain, and defend against nuclear weapons. In addition to manned bombers, in the late 1950s, the US and USSR both developed Intercontinental Ballistic Missiles (ICBMs) hardened in underground siloes to survive attacks.

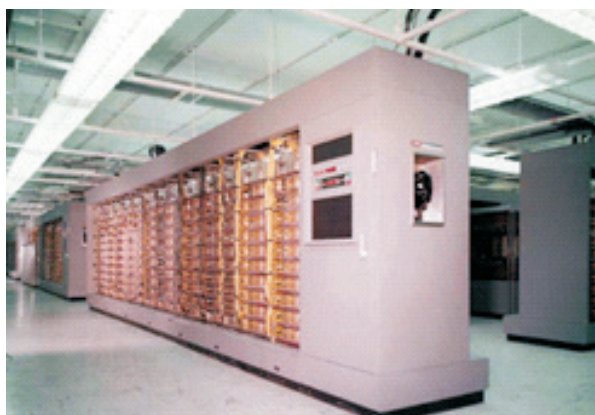


Fig. 6. IBM SAGE air intercept computer

Source: USAF

To protect against Soviet attack, the US and Canada formed the North American Air Defense Command (NORAD) in 1957 as a joint command with headquarters at Peterson AFB Colorado and CFB Winnipeg Manitoba. Initially, the US and Canada both operated the Air Force's new Semi-Automatic Ground Environment (SAGE) air defense system. SAGE utilized the largest computer of its time, the 250-ton Q-7 command and control computer (created by MIT's Lincoln Lab and built by IBM) which had tens of thousands of vacuum tubes and was operated in twin units for back-up reliance¹⁵.

In the early 1960s, both sides began to deploy Submarine-Launched Ballistic Missiles (SLBMs). Since submarines were constantly moving requiring their positions to be updated, early submarine inertial navigation systems (INS) were not as accurate

¹⁵ B. Ulmann, *AN/FSQ-7: the computer that shaped the Cold War*. de Gruyter Oldenbourg 2014., pp.179-181.

as those in fixed silo ICBMs. Navy ASW forces – including VP – complemented submarines whose mobility and stealth became increasingly important to the US strategic nuclear deterrence Triad along with B-52 bombers and ICBMs. Eventually in the late 1970s and 1980s, mobile short and intermediate range nuclear delivery systems became operational and increased the difficulties of detection.



Fig. 7. B-52 bomber

Source: USAF



Fig. 8. 1958 first Atlas ICBM

Source: USAF



Fig. 9. Polaris SLBM

Source: US Navy

3. Nuclear Agreements and Strategy

In 1963, President Kennedy and Premier Khrushchev signed the Partial Nuclear Test Ban Treaty which banned atmospheric, oceanic, and outer space testing. This was the beginning of efforts between the Superpowers to improve communication, coordination, and to develop confidence building in the nuclear age. *Détente* (easing of poor relations) was a series of efforts by the Superpowers between 1969-79 to increase dialogue and ease confrontations and tensions. *Détente* led to agreements including SALT I, the Helsinki Accords, and SALT II. *Détente* was scuttled by the Soviet invasion of Afghanistan in 1979.

The United States' ability to survive a first strike, capability to conduct a second strike, and whether a nuclear war could be "won" were debated vigorously. John Newman observed, "If taken seriously, the first strike threat applied with greater threat to the Soviet Union; roughly 75 percent of its strategic weapons were deployed in vulnerable silos, as distinct from just 25 percent of the American forces – a more balanced mix of ICBMs, SLBMs, and heavy bombers. The side attacked could empty its silos if forewarned or use its surviving weapons to destroy the other. But common sense was no match for the minatory bolt from the blue; it had become the fashionable anxiety. So does the corollary preposition (to powers deploying nuclear arms) that a nuclear war can be won. Even with a large enough second-strike capacity to destroy the Soviet Union many times over, American policy was captive in the 1970s and most of the 1980s – and to a degree still is – to the Pearl Harbor psychology: by fear of a bolt from the blue"¹⁶.

¹⁶ J. Newhouse, *War and Peace in the Nuclear Age*, Alfred A. Knopf, Inc., New York 1988, pp. 298, 426.

In the early 1980s, President Reagan embarked on a large defense build-up, including more aggressive military operations, growth toward a 600 ship Navy, and the massive “Star Wars” missile defense shield technologies program. The Soviets worried that Star Wars (combined with the short and intermediate missiles stationed in Europe) “ would upset the delicate balance of nuclear deterrence that had governed the entire nuclear age. Mutually Assured Destruction had kept crises from slipping into hot war for more than a generation. So long as each superpower retained the ability to annihilate the other, the theory ran, neither would ever dare to attack. Perhaps no longer”¹⁷.

Additionally, new Trident D5 SLBMs provided such increased accuracy combined with stealth and mobility, that the Soviets feared a potential “decapitation strike” by the US which motivated them to create “Systema Perimetr” or the “Dead Hand” nuclear control system to enable a Second Strike-back capability¹⁸.

4. US and Soviet Navy Expansion 1960s-1980s

The first submarine nuclear deterrent patrol was carried out in 1960 by USS George Washington (SSBN-598) with 16 Polaris missiles (2500 NM range) and eventually the Navy operated 41 SLBM submarines; the Soviets deployed SLBMs in 1963. The early SLBMs were not as accurate as ICBMs which remained the US’ primary nuclear strike vehicles.

The Soviet Union was predominantly a land-based power, unlike the US which had an extensive maritime history and naval doctrine to maintain the Sea Lines of Communication (SLOCs) with other continents. The Soviet Army was the premier military force, with the Air Force and Navy providing support for the Army’s defense of the USSR. Soviet missile strategy was originally centered on the land-based Strategic Rocket Forces.

Sergei Khrushchev (a missile engineer and son of the Soviet leader) commented that in 1962. “It may surprise some readers that our submarine fleet, equipped with ballistic missiles, was not given as important a role at that time as US doctrine gave US Polaris-armed submarines. In those years we had no missiles comparable to Polaris. The range of our missiles was not half that of Polaris. Our submarines carried only two or three missiles, whereas US boats carried sixteen”¹⁹.

¹⁷ J. Engel, *When the World Seemed New*; George H.W. Bush and the End of the Cold War, Houghton Mifflin Harcourt Publishing Co., New York 2017, pp. 15-16.

¹⁸ Dead Hand-System Perimeter, [https://en.wikipedia.org/wiki/Dead_Hand_\(nuclear_war\)](https://en.wikipedia.org/wiki/Dead_Hand_(nuclear_war)).

¹⁹ S. Khrushchev, *Nikita Khrushchev*, The Pennsylvania State University Press, University Park, Pennsylvania 2000, p. 470.



Fig. 10.1960 First SSBN

Source: USS George Washington US Naval Historical Center



Fig. 11. 1963 First Soviet SSBN Hotel

Source: *Dept of Defense*

In the 1960s the Soviets built-up their naval capabilities to counter US aircraft carrier battle groups and Polaris submarine forces. They concentrated on putting guided missiles aboard cruisers, submarines, and even patrol boats to threaten Navy battle groups. Sergei Khrushchev noted, “During the previous few years submarines had become the navy’s main strike force. They were grouped along both coasts of the United States. Their mission was to launch ballistic missiles against enemy cities. Submarines armed with cruise missiles lay in wait for US aircraft carriers at the outlets of harbors. They lurked not only near the coastline, but in the open ocean as well, and were capable of striking an enemy from a distance of hundreds of kilometers. The Navy’s principal mission was to keep the Americans away from our shores”²⁰.

²⁰ Ibidem, p. 468.



Fig. 12. Echo II launches anti-aircraft carrier cruise missile
Source: CIA



Fig. 13. Helicopter carrier Moskva
Source: US Navy

In 1956, General Secretary Khrushchev appointed Admiral Gorshkov Commander of the Soviet Navy and he was instrumental in modernizing forces and expanding presence into the Mediterranean around 1968. The Soviets commissioned the ASW command ship Moskva helicopter carrier in 1967 and developed new naval platforms and technologies. To cover and defend access to the Black Sea, the Soviet Navy deployed to the Eastern Mediterranean with a key base at Tartus Syria and at several sheltered anchorages off Egypt, Libya, and Tunisia to support ships and submarines.

The USSR continued to increase its military budgets, built up its SLBM capabilities, and demonstrated their global naval reach in 1970 with over 200 ships and aviation units in the Okean 70 exercise. In 1975, the Soviets commissioned the Kirov aircraft carrier, and again demonstrated their worldwide naval capabilities in the Okean 75 exercise involving over 200 ships, submarines, and aviation units.

5. U.S. Patrol Aircraft Evolution and Technologies

Navy VP squadrons' mission is long-range patrol support for the Fleet at sea by providing anti-submarine, surveillance, and intelligence capabilities. During the 1950s and 1960s the US Navy transitioned its long-range patrol mission from flying boats, airships, and Lockheed P-2V Neptunes to the P-3A Orion which was a modified commercial Lockheed Electra L-188. In 1959 the Navy contracted with Lockheed to develop the P-3A based on the Electra and the P-3A became operational in 1962. The last P-3 was produced in 1990 and has now been replaced by the Boeing P-8 Poseidon.

In 1959-60, several fatal airline Electra crashes had given it a reputation as a deadly airplane since some wings had failed due to weak engine mounts and harmonic metal fatigue. The Navy heavily modified the Electra by taking 7 feet out of the fuselage, strengthening and stiffening the wing, strengthening engine mounts, adding weapons hardpoints, a "synchrophaser" for the propellers, a bomb bay, and all the ASW equipment/antennas including a MAD (Magnetic Anomaly Detector) boom on the tail. The result was the powerful P-3A (and later the -B, -C, and Updates II, II.5, and III) which was a reliable fuel-efficient performer at low altitudes and could loiter on 2 or 3 powerful engines to fly 8 to 11 hour missions.

The P-3C was the Navy's first computerized patrol aircraft; in the 1970s it cost about \$37M and was one of the most expensive aircraft in the Navy inventory. It had taken a decade of dedicated work by leading engineers in the Navy and industry to develop it into an effective long-range patrol platform to support the Fleet in taking on the growing Soviet submarine threat.

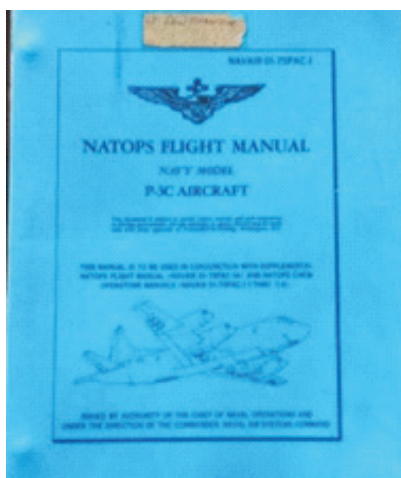


Fig. 14. NATOPS Flight Manual

Source: Personal Photo

The P-3C had a max gross weight of 139,760 pounds and was powered by four Allison T-56-14As each capable of developing 4600 shaft horse power. The P-3Cs fuel flow was about 4500 lbs. per hour, with cruise at 330 knots True Air Speed, and a range of about 2400 nautical miles. The first time I pushed the power levers forward and called “Takeoff Horsepower” to the Flight Engineer, I was impressed by how quickly the turboprops came up and pushed you back in the seat you knew that this plane had plenty of extra power and would be a rugged and dependable workhorse... and it had the very latest computer technology!

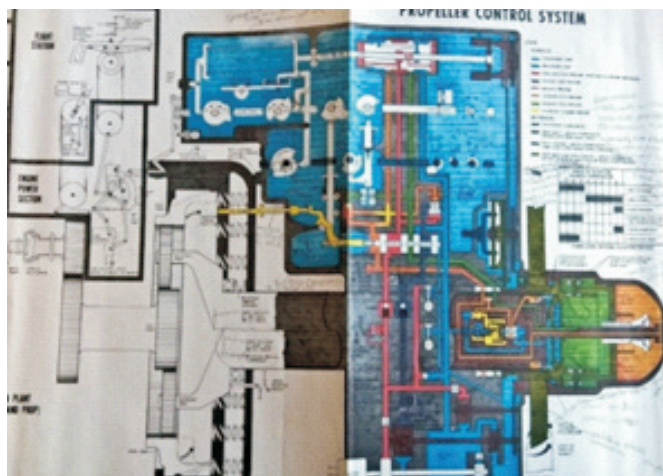


Fig. 15. Prop Diagram “What does that Reverse Back-up Valve do? Explain the flow of prop fluid from the reservoir and how the prop works...”

Source: Personal Photo

The “Tube” (fuselage) was dominated by about 20 feet of the Univac CP-901 digital computer with blinking lights mounted in bays along the port side. The TACCO (Naval Flight Officer-NFO Tactical Coordinator) managed the tactical picture via the new computer system and had a large 15” round display, a keyboard, a track ball roughly the size of an orange (which was an early mouse), and a lot of push-buttons; we had a smaller tactical display in the cockpit. NAVCOMs (NFO Navigator Communicators) carefully monitored and updated the inertial navigation system (INS) to maintain aircraft position and sonobuoy plot stabilization. The NAVCOMs also spent a lot of effort trying to perfect new data link communications systems.

Due to the P-3C seating arrangement, crews had to learn to communicate briefly and effectively via the Intercom; some TACCOs used long lead cords to be able to walk back to see sensor displays and talk with the operators. Eventually our Sensor Operators were trained in something very new plasma touch screens to help them process acoustic data quicker.



Fig. 16. TACCO & Track Ball (early mouse)

Source: US Navy

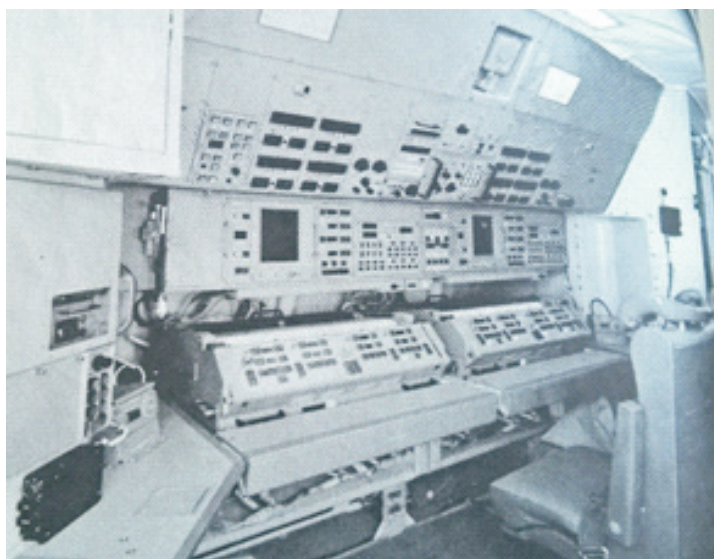


Fig. 17. Acoustic Sensor Station (SS1) and SS2 positions

Source: US Navy

CP-901 (Univac 1830A) Computer

In 1962 Naval Air Development Center (NADC) created a concept for a new digital airborne computer (called ANEW) to upgrade patrol capabilities. Sperry-Rand's Univac Defense Systems Division worked on developing a prototype and initially looked at integrated circuits used for the USAF Titan II inertial guidance system, but decided to build a new computer which was compatible with NTDS; in 1963 they provided the CP-823U prototype to NADC. In 1966 the Navy contracted with Univac to work with NADC on a Navy contract to coordinate airborne patrol sensors (acoustic and non-acoustic: radar, MAD, infrared, etc.) and utilize the new Naval Tactical Data System (NTDS). In 1968 this effort evolved into the first airborne digital ASW computer CP-901 /ASQ-114 computer using 30 bit Instruction Set Architecture²¹ which formed the avionics backbone of the top-of-the line P-3Cs flown by NAS Jacksonville squadrons which I flew as I joined VP-45 in 1976.

The IFT (Inflight Technician) was a new and vital position on P-3C crews to keep the moody CP-901 computer and avionics going. The CP-901 was notorious for dying just at the wrong time, like during the run-in for an attack and mad trapping to maintain contact. It took a good crew to quickly transition to manual tracking when the CP-901 died. Another overall problem at JAX was that the priority for avionics parts went to deployed squadrons and sometimes key parts for the avionics suite were unavailable to keep all the aircraft up to ASW readiness.

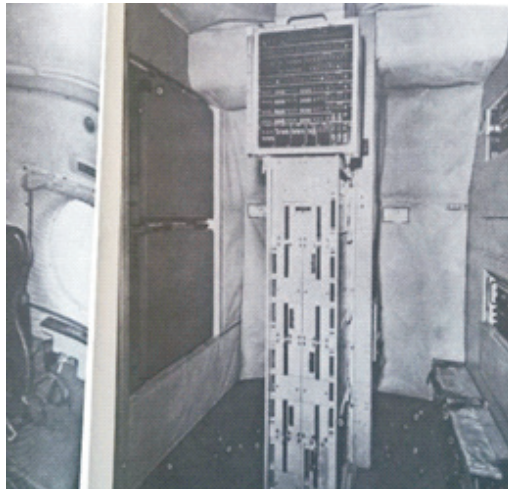


Fig. 18. CP-901 IFT station (note bench seats in equipment bay)

Source: vpnavy.com

²¹ Rapinac, Blixt, A History of the Relationship between Sperry Univac Defense Systems Division and Lockheed California Aircraft Company; P-3C Early Computer Development at Univac; 30-Bit Computers Chapter (2006), Information technology Pioneers, <http://vipclubmn.org/CP30bit.html>.

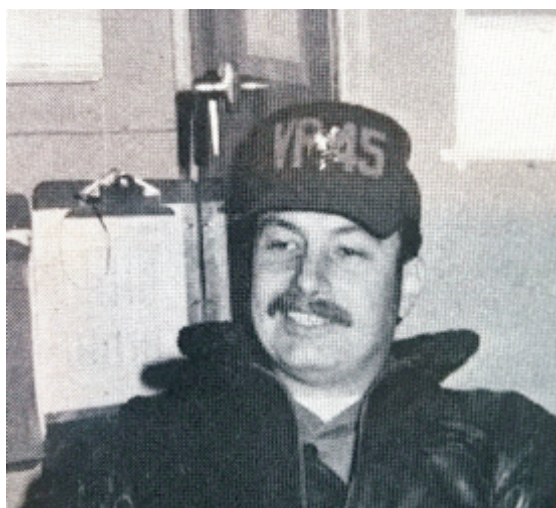


Fig. 19. IFT Jim Cole VP-45

Source: 1977 Cruisebook

AVCM (Ret.) Jim Cole, our Combat Air Crew (CAC) 2 IFT says: “I have 5-10 times the computing power in my iPhone 6, than was in the man-sized, CP-901. After getting a hot contact in ASW, it was very rare for a crew of a P-2 or a P-3A/B to still have contact when going OFSTA (Off Station). The opposite was true of the P-3C. When it got a sniff, with a competent crew, it hung on. I remember a Fleet exercise we participated in VP-56, where our services were declined, so we were kept high and out of the way of the fleet’s S-2s and helos. With our sensors, we were able to watch the enemy sub (one of our own actually), sneak in through the escorts, and sink (stimulated) the task force’s carrier, while the players on the surface hadn’t a clue. The (P-3) “Charlie”, was such a quantum leap in ASW – I don’t think we’ll ever see another leap like that in weapon systems again. I, like Admiral Tobin, feel really good about the sub-hunting we did, especially in the late Seventies, early Eighties.

We carried 84 sonobuoys: 36 internals and 48 externally mounted in the belly; the buoys could be set for 1, 3, or 8 hours life. Each TACCO had different buoy deployment tendencies; for example, when LT Stump started to lose contact, he would let loose what he called a “rain of steel” (many buoys) to try to regain contact. I think buoys were about \$100 each for the common LOFAR and about \$500 for a DIFAR. Ordnancemen called the aircraft belly sonobuoy tube area Sherwood Forest because when you looked up, the many tubes resembled trees.

Hazards on Patrol Since we usually operated in EMCON (Emissions Control--all transmitters and other active emitters turned off) on 8 to 10 hour-long missions often 2-3 hours from base, if something happened, you were on your own. Monitoring activities might not know that you were missing until you failed to return at the end of an on-station period which might delay Search And Rescue (SAR) efforts

for several hours. We operated with forecast barometric altimeter settings which could be somewhat inaccurate and this could be a big problem – especially at night when you were descending IFR (on instruments) below 1000 ft.



Fig. 20. Ordnanceman loading buoys
Source: US Navy



Fig. 21. P-3 MAD boom
Source: wikipedia/commons

P-3 Magnetic Anomaly Detection (MAD)

For practice attacks using MAD, you might descend in the middle of the night with poor visibility to 300 feet using a several hours-old forecast barometric altimeter setting, so you needed to transition carefully trying to maintain some sort of visual horizon – and if you were IFR, it could be a tense time. Flying a clover leaf MAD pattern required thinking ahead and a smooth set of hands. You pulled slight G as the bank angle increased and kept an eye on the horizon and MAD-trapped at 200

feet in the day and 300 feet at night; The goal was to get quickly back around on top of a submarine to enable the Sensor 3 Non-acoustic operator to get a MAD needle swing to pinpoint the target and enable the TACCO to attack.

Late 1970s Background

During 1976-79, our squadron VP-45 deployed to Keflavik (KEF) Iceland and twice to Sigonella Sicily for 6 month deployments against Soviet Navy submarines. During the 1976-79 timeframe, Soviet Mig-25 fighter interceptor pilot Victor Belenko defected to Japan, the Arabs embargoed oil to the US, and NATO agreed to install over 500 short and medium-range nuclear missiles in Western Europe. President Carter negotiated the Camp David Accords, the Panama Canal Treaty, normalized relations with Red China, and in 1979 faced the Iran Hostage Crisis and the Soviet invasion of Afghanistan which ended Détente.

The Soviets had rapidly built-up their nuclear delivery systems including submarines – and exceeded the US in nuclear “throw weight” capabilities. The New York Times reported in late 1977 that the Soviets had built a massive new missile submarine named Typhoon to rival our upcoming Trident boats. The Typhoon was massive (563 feet long with 20 ballistic missiles) and by 1980 the Soviet Navy had 94 cruise and ballistic missile boats and 71 attack boats²².



Fig. 22. Soviet submariners

²² National Museum of American History, <http://americanhistory.si.edu/subs/const/anatomy/sovietsubs/index.html>.



Fig. 23. "Northern Fleet 25 years" Submariners pin

6. P-3C ASW Ops in Keflavik (KEF) Iceland

We lugged our gear into Hangar 1000 of Naval Air Station (NAS) JAX (sonville) around Christmas 1976 for VP-45s five to six month deployment to Keflavik, Iceland. 23 of us boarded a P-3C and I squeezed into my assigned spot which was a fold-down seat sandwiched between two computer equipment bays. It had taken me an intense 18 months at flight school and VP-30 RAG (Replacement Air Group) learning the P-3 and ASW tactics to get into this seat and I was very glad – and apprehensive – about finally joining a deploying operational patrol squadron to fly the new P-3C. Today, I am still amazed by how the squadron could expeditiously pack-up all its gear into collapsible metal footlockers, load aboard 3 Air Force C-141s, fly 9 P-3Cs, and deploy far away to start immediate ASW operations.

We had left the live oaks, humidity, and morning paper mill smell of JAX for cold and windy Keflavik on the Arctic Circle, where in late December there were only 4-5 hours of sun hanging low on the horizon. We landed at KEF in blustery darkness, were towed into the old WWII hangar, and the main cabin door opened and in came the cold air, Icelandic Customs officers, and our squadron mates.

Our sister squadron VP-49 was in the process of turning over to VP-45 and our arriving crews immediately were put on rest and went on the schedule for operational patrols ASAP. As an incoming 45 crew went out on an 8-hour patrol relieving a 49 crew and silently (we were always in EMCON – Emissions Control) picking up submarine contact, a 49 crew was released to return to JAX.

The KEF routine was brief-fly 8-hour mission, debrief, go to the Brass Nut, sleep (sometimes optional), try to do ground job at hangar and repeat. While the

Brass Nut was just a BOQ room converted to a bar run by the Ready 2 crew who stocked it and kept it in a constant state of readiness for visitors, the 'Nut provided a very important international hub for camaraderie among ASW crews and visitors. If you got there after hours, the crew would tend its own bar; we always stopped by the 'Nut to "debrief" after every mission. We hosted Canadian, British, Dutch, and any other crews who might be coming through KEF.

ASW was a coordinated Allied effort and many countries contributed significant forces to the continuous Cold War efforts to hunt and track Soviet submarines, especially when they became capable of delivering nuclear warheads in the early 1960s. Norwegian, Dutch, British, and Canadian crews were highly integrated into operations including deployments to Iceland, Azores, and Sicily. French and German crews were also involved in coastal ASW operations.



Fig. 24. KEF Op(erations) areas

Source: US Navy



Fig. 25. Soviet Yankee II missile boat

Source: US Navy



Fig. 26. Dutch P-3C at KEF
Source: US Navy



Fig. 27. RAF Nimrod based on the Comet airliner
Source: RAF

Norm Donovan entered the Royal Canadian Air Force (RCAF) in 1953 and served on exchange duty with American VP forces hunting Soviet submarines in the late 1960s. “I joined VP-24 in Nov 1967 qualified as a P-3A/B TACCO. A very significant evolution occurred in 1969 when a Yankee SLBM was tracked from his home port to his patrol station in the southern North Atlantic. VP-24, deployed at KEF and Lajes, was assigned this task. I flew 15 sorties during this tracking evolution, of which 11 were conducted in a 20-day period. Minimum crew rest resulted in very hard and exhausting flying.” (Note: Flying eleven 8-10 hour patrols in 20 days is an absolutely amazing record and a tribute to these crews).

Admiral James Stavridis, former NATO senior commander and a Surface Warfare Officer, observed “What was cold war like in the Atlantic? First and foremost, it was a battle for control—really complete surveillance and the positioning of strategic and

tactical assets—in the Greenland-Iceland-United Kingdom (GIUK) gap. This zone of thousands of miles of empty ocean became critical strategically. Thus in the cold war, there was a constant maneuver between the Soviet Union (and its Warsaw Pact allies) and the NATO forces led by the United States for the control of the (GIUK) gap. This required significant deployments of US combat power to Iceland, Canada, Denmark, and of course the United Kingdom itself. Combat power was also stationed at base in the Northeast. The operative maritime forces were long-range P-3 Orion anti-submarine warfare aircraft, formidable hunter-killer machines used to find Soviet submarines; nuclear attack submarines of the United States and our allies; satellite coverage of the deep ocean; and occasional deployments of destroyers and cruisers (like mine) with significant sonar, torpedo, and other sensors suitable to pursue submarines. The Soviets deployed their ballistic missile submarines (equipped with long-range missiles tipped with nuclear weapons) as well of flotillas of submarines and surface ships. While not exactly crowded up there, it was a “target rich zone” for antisubmarine forces”²³.

Cold War sub-hunting was very complex and expensive, requiring extensive coordination between Submarine, Surface, and Air and our Allies’ ASW platforms which all contributed to round-the-clock tracking of submarines. VP provided unique long-range and rapid reaction capabilities to support the Navy Fleet ASW and intelligence gathering. During the Cold War, the East Coast Navy deployed VP squadrons continuously to Keflavik, Bermuda, Lajes Azores, Rota Spain, and Sigonella Sicily.



Fig. 28. An American SSN: “No Slack in Fast Attack”

Source: US Navy

²³ J. Stavridis, *Sea Power*, Penguin Press, New York 2017, pp. 82-83.



Fig. 29. Soviet Victor II Attack boat
Source: US Navy

Norwegian P-3s initially tracked Russian subs as they transited around the Kola Peninsula and turned them over to the US. Our mission was to locate and/or track the subs (missile or attack) as they proceeded south to determine whether they were heading toward the G-I gap (Greenland-Iceland) which meant they were headed deep into the Atlantic or via the I-UK gap (Iceland-United Kingdom) to head down towards the eastern Atlantic or possibly by Gibraltar into the Mediterranean.

VP squadrons were focused on tracking Russian missile boats which were a key strategic threat to the US. In 1977, the Soviets had about 33 Yankee missile boats (1300 mile missile range) and 21 newer Delta boats (their 4200 mile range which meant they didn't even have to go to sea to reach US targets.) The Yankees had to operate relatively close in patrol areas east of Bermuda and in the Eastern Pacific to target US cities and defense establishments with nuclear ballistic missiles.

While American submarines were the premier anti-submarine force; VP's job was to locate and track submarines and be ready in the event of a nuclear war, to assist in attacking Soviet "boomers" before they launched their ICBMs or to torpedo Soviet attack boats threatening our submarines. During our KEF deployment, the Soviet Northern Fleet--comprised of about 125 submarines conducted its annual month-long exercise which NATO named SpringEx 77.

TACCO Warren Tisdale remembers checking into the VP-45 in Winter 1977 at Keflavik Iceland: "Steve F. picked me up in the duty truck when I got off the Air Force C-141 transport at Keflavik; he said the squadron was in a FLAP. I may have missed the term while training in VP-30, so Frick explained it stood for 'F...ing Launch All Planes.' It was not unusual to be in contact with a Soviet submarine on the flights out of Keflavik; the water seemed to be good for propagating sound. On my first mission, we happened to see a Soviet Bear (TU-95 bomber) transiting south, and

we tracked a submarine. My Plane Commander made a big deal out of my getting two Soviet contacts on my first flight. One nice thing about KEF was the relatively long transit (compared to SIG) back to base – plenty of time for paperwork”.



Fig. 30. TU-142(ASW variant) & VP-45 P-3

Source: US Navy

Crew Concept

The squadron had 12 Combat Air Crews (CACs). Each crew contained 12 men (5 officers and 7 enlisted): 2 NFOs--TACCO and a NAVCOM, 3 pilots (Patrol Plane Commander-PPC, Second Pilot-2P, and 3P), a Flight Engineer and a Second Mech(anic), 2 Acoustic and 1 Non-acoustic sensor operators, an Ordnanceman, and an IFT (In Flight Technician).

What really counted was your ability to work smoothly within a team and contribute to the crew's success. For pilots, it was very important to gain the trust of the crew and not scare them by taking risks or throwing the plane around – and hard landings did not help. I immediately liked the VP crew concept because everyone was recognized primarily by their professional abilities and we worked to weld ourselves into a close team. New NFOs and pilots were integrated into crews, continuously trained, and watched closely to prepare them for increased responsibility. Both Naval Flight Officers (NFOs) and pilots could become Mission Commanders and attain squadron command. The average squadron tour was 3 years, so every year between deployments, 1/3 of crewmembers and squadron personnel were replaced, which meant that we were constantly studying and training to upgrade quickly to rebuild crew qualifications in preparation for the next deployment.

The crew I was assigned to over 3 years was a constantly changing composite of varying backgrounds as new members rotated in: we were a cross-section from

many backgrounds; most of us were from small inland towns looking for adventure and to fly to serve our country.

Crews were briefed 3 hours ahead of takeoff time and then were dropped off to preflight the aircraft. During preflight, if any of the critical ASW avionics or mechanical systems went hard down, everyone had to pack-up their gear and move quickly over to another aircraft and work to make-up lost time in order make the assigned takeoff time. Everything was built around getting on station exactly on time to relieve an on-station crew passively and conduct a smooth turnover on a hopefully hot contact. It took about 2 hours to get out on station with 4 hours on station, and then 2 hours back home. I was extremely impressed by entire squadron's determination and total focus on its mission of prosecuting Soviet submarines aggressively and maintaining passive sonobuoy contact.

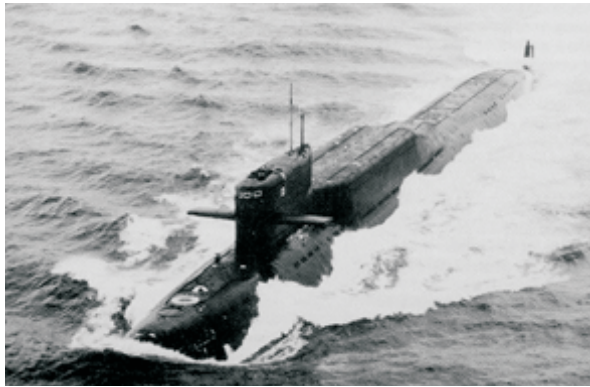


Fig. 31. Soviet Delta II missile boat

Source: US Navy



Fig. 32. "On Top" Soviet sub diving (periscope, EW mast)

Source: US Navy

Squadrons

Each squadron developed a different personality and reputation depending on a combination of its leadership, personnel, and history. A squadron had over 350-400 personnel including crews and hundreds of very skilled sailors in trades ranging from mechanics and avionics technicians to operational and tactical support for our 9 ASW aircraft. There were 24 active duty and 8 reserve VP squadrons covering deployments across the world. A squadron was designed to be support itself for long periods and be able to shift ASW operations to distant bases within a matter of hours.

Sonobuoys and Plot at KEF we flew a “high mission” and dropped sonobuoys (1, 3, or 8-hour settings) from somewhere around 14,000 to 16,000 feet. When the sonobuoys hit the water, a string with a hydrophone deployed to pre-set depths. The buoys could be set for 1, 3 or 8 hours life (and then sank) and our sonar operators listened and recorded potential submarine signatures passively, so the sub didn’t know we were onto them. It took quite a while for the buoys to drop and we often had problems with them freezing up on the way down, so it could be a crap shoot if they would come up and by then valuable minutes had been lost. We were constantly marking on top of a buoy to maintain plot stabilization so that we knew where the buoy pattern was in order to track a Soviet sub accurately.



Fig. 33. P-3C taxiing at Keflavik

Source: US Navy

Weather

Big storms, winds, and changing weather routinely hit Iceland, so taxiing and taking off could be challenging in high gusting winds and icy concrete. KEF was notorious for quickly changing weather and heavy wind so our linesmen often tied themselves to the “Buddha” (big push-back tractor) to keep them from being blown into the propellers. One night, one of our planes ground-looped (was turned around into the wind) while taxiing out in high gusting winds on an icy taxiway. Sven, KEF’s “Snow King” led a crew who used big brushes and plows to keep the runway constantly open in the teeth of winter. White-outs were a threat, especially in the dark of winter, so we had to be careful not to get disoriented and lost in blowing snow.

“Magic Power Levers”

Keflavik was reporting deteriorating weather with winds gusting more than 30 knots at over 30 degrees off the runway, light turbulence, and blowing snow as the PPC (Patrol Plane Commander) and I were briefing his night approach after our 8-hour patrol when he said “You take it”. As the GCA (Ground Controlled Approach) controller talked us onto glide path; I kept telling myself “Concentrate, stay on the gauges, smooth power changes, don’t peek outside, keep scan going” and made tiny corrections with the rudder pedals according to the commands of the controller, who set us up crabbing into the wind down the bumpy approach.

The windshield wipers going high speed made a thumping urgent sound and close to approach minimums we broke out of the clag and I transitioned outside to dazzling driving snow shooting past in the landing lights and saw the approach and runway lights shining up in the night. I fought to stay aligned on centerline compensating with crosswind corrections with wing-down and top rudder and flared to land smoothly—which was a very big mistake because the runway was slick and suddenly we were sliding sideways off centerline, but quickly, the 4 power levers started moving magically in my right hand as the PPC applied asymmetric thrust to correct to centerline and compensate for my mistakes. I had maybe 350 flight hours total, my knees were shaking, but the lessons from this experience remained imprinted on me. Months later, returning from our final mission on the deployment, I landed firmly in driving rain and gusting crosswinds and was able to maintain control as we started to hydroplane on the standing water.

When finally qualified, your Patrol Plane Commander papers said you were qualified “to take the P-3C and crew anywhere in the world in any weather” which was quite a commission and responsibility. Our Royal Air Force exchange Squadron Leader pilot said “I was initially shocked to see that you had Lieutenants Junior Grades (about 25 years old) as crew-holding PPCs, but later I saw that they performed very well”.

7. Sigonella (SIG) Sicily

Sigonella was located south of Mt. Etna and west of Catania and been a WWII base and in the late 1970s you could still see the “lollipops” of tarmac (with concrete poured around them later) where Italian and German fighters had been positioned. At SIG Naval Air Facility (NAF)II we got to see their F-104 fighters and Breguet Atlantic twin engine patrol planes training and operating; we heard that the Italian Navy practiced real single engine landings with an engine actually shut down (we only pulled the engine back to idle). SIG was a low altitude mission and we flew around the Med usually at 1500 or 2500 feet on the hunt for mostly diesel submarines and almost every mission had a “Ham (mamet Bay off Tunisia) Check” to photo the Soviet wagon wheel of ships and subs. A typical SIG mission involved shutting down 1 engine at Top of Climb, transiting to on-station, shutting down 4 and loitering on patrol search; if descending below 2500 feet you had to relight off 4 and if you went below 1,000 feet you lit off 1 engine. Sonar ranges were very short due to the shallowness of the Med, mud bottom in places, etc.

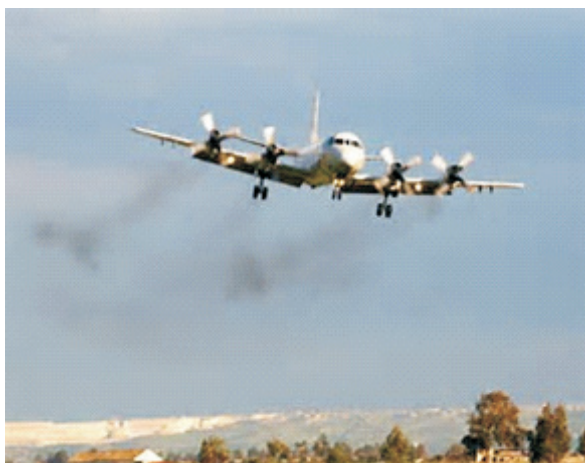


Fig. 34. P-3 Inbound to SIG

Source: wikipedia/commons

TACCO Warren Tisdale remembers “Sigonella operations were a lot different from those in Keflavik. There was considerably less long-term tracking of submarines with hot turnovers to relieving aircraft. Mostly short contact and a lot of surface search/reconnaissance. The missions were more helter-skelter, with an anchorage check either going out or coming in, or both. Rigging ships at Hammamet (Tunisia) and Kythira (Greece) anchorages, with the occasional puckering flight near Sollum (Egypt). Short detachments to Souda Bay, Crete. Low level and bumpy flights with

a lot of surface traffic. One night we jumped a sub that was submerging right as we roared into Hammamet. We rained down buoys – but were not able to track it because we couldn't identify the sub's acoustic signature amongst all the noise”.



Fig. 35. Gulf of Hammamet & Sicily
Source: wikimedia.org

Night-hunting the Juliett

We flew at lower altitudes to enable use of all sensors: radar, sonar, FLIR, and our observers' eyes. Our Ops Officer worked out a set of innovative tactics for crews to hunt the Juliett on many nights. The Juliett was a big conventional diesel boat with 4 nuclear-capable cruise missiles with a range of 300 miles which threatened our



Fig. 36. Juliett diesel submarines carried anti-aircraft carrier cruise missiles
Source: US Navy

Carrier Battle Groups in the Med. Since they had to snorkel or surface at night to keep their batteries charged up, Dave set up a nightly plan to hunt the Juliet using over the shoulder radar and coordinating observers to scan up-moon. On an 8-9 hours patrol, the TACCO set up a watch schedule to rotate aft observers frequently because their Recognition Differential (ability to alertly scan the ocean) declined rapidly after 15 or 20 minutes, especially in the middle of the night.

Conclusions

Over the 44 years of the Cold War, the US/Allies, and the USSR/ Warsaw Pact maintained balance and stability at great costs by building organizations of highly-trained professionals and the procedures to handle, support, maintain, and defend against nuclear weapons. While memories of the Cold War and those who served during it have faded, it is important that we relook at these critical times, study the crises, incidents, and lessons-learned and use them to form a baseline of knowledge as we look ahead into a renewed version of the Cold War.

From 1947-1991, the Cold War dominated several generations as millions of American, NATO, Allied personnel and our professional counterparts in the Soviet Union and the Warsaw Pact (and their families) served to maintain a constant vigil. Looking back at the many incidents and crises of the Cold War, it is amazing that both the United States and the Soviet Union managed to stabilize their superpower stand-off and maintain controls to survive many tense events which had the potential to escalate into nuclear war. It is a tribute to the professionals on both sides that a tense peace was maintained over forty dangerous years.

It is important to review events of the Cold War because we can use lessons-learned from past experiences to assist in planning for future contingencies:

- cherish Allies; build interoperability and capabilities to deploy quickly anywhere;
- create long-term regional and global alliances;
- plan an exit strategy before foreign intervention;
- learn more about adversaries, languages, and culture;
- build resilient Civil Defense programs;
- protect technologies and cyber activities.

Many countries committed their blood and treasure to maintain peace and a balance of power during these turbulent and dangerous times; we need to continue to remember their sacrifices, especially those still missing or lost at sea.

“Eternal Father, strong to save,
 Whose arm hath bound the restless wave,
 Who bid'st the mighty ocean deep.
 Its own appointed limits keep;
 Oh, hear us when we cry to Thee,
 For those in peril on the sea!”²⁴

*My thanks to former VP-45 TACCO Warren Tisdale for his thoughtful review of this effort.



Don Stanton was commissioned through Cornell University Navy ROTC, served off Vietnam aboard ships, and flew as a P-3C anti-submarine Patrol Plane/Mission Commander/Instructor Pilot deployed to the Atlantic & Mediterranean. He later flew aircraft including the B-747, 757 & 767, served as Aviation Advisor to the Secretary of Transportation, and as Deputy Assistant Secretary of Defense for Transportation. He holds an MA in National Security Studies from Georgetown University and teaches Political Science for the University of Colorado-Denver.

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