

A History of Coast Guard Aviation

The Growth Years

1939-1956

Summary Overview

The Coast Guard was transferred to the Navy Department by executive order 8929 on November 1, 1941. In actuality, certain units of the Coast Guard had been under Navy control for some time. Congress had passed the Neutrality Act on November 4, 1939. This legislation was designed to preserve the neutrality of the United States and made it unlawful for any U.S. vessel to carry material or passengers to any designated belligerent State. Coast Guard aircraft and vessels were used to enforce this act. In April of 1941 an agreement was signed with Denmark for the protection of Greenland. Cutter based aircraft played an important part in this operation.

The Japanese attacked Pearl Harbor on December 7, 1941 and by December 11 a state of war existed with both Japan and Germany. The German U Boats immediately conducted a devastating attack on allied shipping along the Eastern Seaboard and then moved into the Gulf of Mexico in mid 1942. CNO ADM Ernest J. King did not aggressively oppose the German operation. The Coast Guard had a series of coastal air stations ideally suited for anti submarine patrol. They were located at Port Angeles, Washington; San Francisco, California; San Diego, California; Biloxi, Mississippi; St. Petersburg, Florida; Miami, Florida; Elizabeth City, North Carolina; Brooklyn, New York; and Salem, Massachusetts. The problem was lack of aircraft. There were a total of 51 aircraft, none of which were armed. In the spring of 1942 the Coast Guard acquired 53 OS2U-3 Kingfisher aircraft for ASW patrols. It would be 1943 before the Coast Guard acquired aircraft that could be considered combat capable and by this time the German submarine offensive had relocated to the North Atlantic. Never the less, beginning in January of 1942, the existing aircraft were armed to the limit of their capabilities and patrols commenced. Coast Guard aircraft delivered 61 bombing attacks on enemy submarines during World War II.

From the beginning Coast Guard patrol aircraft played an important roll in rescuing survivors from torpedoed vessels. There are numerous stories in which these aircraft were landed in the open sea and picked up survivors of torpedoed ships. Many times they were so overloaded with survivors that they could not take off. In some cases they could taxi to shore but most of the time they would transfer the survivors to small vessels as soon as possible. At other times they would direct surface vessels to the survivor's location. The experience the Coast Guard had acquired over the years served them well in the effective coordination of surface and air assets and the greatly enlarged search and rescue operations that would come.

In 1943 the loss of life associated with the tremendous increase in aircraft training activities and operational missions became a major concern of the Joint Chiefs of Staff of the Army and Navy. Admiral Waesche, Commandant of the Coast Guard, proposed that the Coast Guard be assigned Air Sea Rescue responsibilities to address this situation. The Joint Chiefs determined that the scope of the operation was beyond the capability of the Cost Guard but an Office of Air Sea Rescue, under the Commandant, was established to coordinate and develop Air Sea Rescue equipment and operational procedures. The Army and the Navy would remain responsible for providing their own Air Sea

Rescue. The Navy, in turn, assigned Air Sea Rescue responsibility for all continental Sea Frontiers to the Coast Guard. This more than doubled the size of Coast Guard aviation. The first Navy Air Sea Rescue squadron was formed at San Diego, California under the command of LCDR Chester Bender USCG to provide SAR coverage for extensive West Coast pilot training. It was an all Coast Guard squadron equipped with nine PBY-5A aircraft and AVR rescue boats.

The Coast Guards association with the International Ice Patrol and its experience in Arctic operations lead to a primary role in the Greenland area. On 5, October 1943 Patrol Squadron 6 (VP-6CG) was officially established. This was an all Coast Guard unit. The home base was at Narsarssuak, Greenland, code name Bluie West-One. It had 9 PBY-5A's assigned. Commander Donald B. Mac Diarmid was the first commanding officer. As additional PBY's became available, the units area of operation expanded and detachments were established in Argentina, Newfoundland and Reykjavik, Iceland, furnishing air cover for North Atlantic and Greenland convoys. Hundreds of rescue operations were carried out during the 27 months the squadron was in operation.

During early stages of the war the Coast Guard became a driving force in the development of the helicopter. CDR. William J. Kossler, chief of the Aviation Engineering Division at Coast Guard Headquarters, was the Coast Guard representative on the Inter-Agency Board administering the Dorsey Act which pertained to the development of rotary-wing aircraft. The first official American helicopter demonstration occurred on 20 April 1942. CDR Kossler and CDR Watson A. Burton attended this demonstration. Impressed by the demonstration, both Coast Guardsmen agreed that the helicopter would meet many of the service's requirements. During the summer of 1942 the number of merchant ship sinkings was horrendous. Erickson wrote a letter to Vice Adm. Russell Waesche, Commandant of the Coast Guard, outlining how the helicopter could be used in anti-submarine warfare. This was followed up by Kossler. During this period, the British who had also witnessed the original demonstration put in an order for 200 helicopters. A helicopter demonstration was arranged for Waesche. He was very impressed. He contacted Adm. Ernest J. King, Chief of Naval Operations on the subject. On February 19, 1943 King issued a directive which placed the development of the helicopter with the Coast Guard. There were no objections from the Army.

The first tests got underway in May of 1943 to develop the helicopter as an anti-submarine warfare (ASW) aircraft. The CGAS Brooklyn, NY was officially designated as the helicopter training base. CDR Erickson was the commanding officer. In January of 1944, Coast Guard helicopter pilot LTJG Stewart Graham made the first flight from the deck of a merchant ship in convoy in the North Atlantic. In April of 1944, experiments with dipping sonar commenced. By January 1945 the monthly sinkings of US merchant vessels had declined to 15,745 tons. With the threat of the submarine all but gone, the helicopter program was cut back.

Erickson, however, had simultaneously continued multi-purpose testing of the helicopter and submitted design recommendations to facilitate its use as a rescue vehicle. Perhaps the most significant development during this period was the development of the hydraulic hoist. On 6 February 1945 the training base at Brooklyn was closed and the aircraft stored. The Coast Guard was not interested in further development. It was a setback for Erickson but his work had not gone unnoticed. It was valued by both the Army and the Navy. His dream of a rescue helicopter and lifesaving machine came to pass during the Korean War. The Navy developed a helicopter ASW program using the expertise of Coast Guard. In 1951 the Coast Guard was the recipient of the nations top aviation award. President Truman presented the Collier Trophy presented for the development of the helicopter.

Starting in early 1945, Capt. MacDiarmid, who was now the commanding officer of the Coast Guard Air station San Diego, initiated a multi-year study of open sea landing procedures. Tests showed that

landing and taking off parallel to the swell was the safest course. Further experiments revealed that reversible pitch propellers shortened the landing run and jet assisted takeoffs (JATO) reduced the takeoff run. The results of this research work resulted in an internationally accepted manual on air sea rescue techniques. The Octave Chanute Award for 1950 was presented to Commander Mac Diarmid for his work.

After the war suitable search and rescue aircraft became readily available. The flying boat had always been associated with Coast Guard operations and reached its peak during this period. At one time, midway between 1945 and 1950, the service was operating some 56 PBY-5As plus 23 PBM-5 Mariners. It is fortunate that a surplus of existing Navy aircraft was available. The Coast Guard was downsized significantly and the budget was severely restricted. Additional Air Detachments were established but they were limited in size. The PBYs were phased out and replaced by long range search aircraft such as the PB-1G flying Fortress, the P4Y-2G Privateer, and the R5D Skymasters. It was not until 1951 that the UF-1G Albatross and the HO4S were procured. The PBYs were gone by 1954. The PBMs were reduced in number with the procurement of the UF and were gone with the purchase of seven P5M-1Gs acquired in 1954 and the T-tailed P5M-2G that allowed followed.

North Korean forces crossed the thirty-eighth parallel in June of 1950 resulting in the Korean War. The Coast Guard remained under the Treasury department throughout the conflict. The Navy requested that the Coast Guard assume the responsibility for port security and also requested additional Ocean Stations and search and rescue capability in the Pacific. Search and Rescue Groups with enhanced communication equipment and one or more cutters assigned and were established at Sangley Point in the Philippines and on the islands of Midway, Wake, and Guam. This was necessitated by the dramatic increase in air traffic between the United States and the Orient. The Navy and the Air Force desired more extensive LORAN coverage and Coast Guard aviation soon found itself in an increased role in LORAN station supply efforts. LORAN station supply would continue long after the war ended and the Coast Guard began to set up air stations with logistics as the primary mission..

World War II had a profound affect on many things. This was the case with Coast Guard Aviation. It more than doubled in size; assumed a primary roll in Search and Rescue; and over the next several decades assumed additional missions and expanded horizons.

Search and Rescue

Prior to World War II Coast Guard Aviation operated a total of 51 aircraft from nine air stations along the coastal regions of the United States. Search and rescue was local in scope. During the war Coast Guard aviation was assigned a specific roll in developing the capability and operational evolution of Search and Rescue. Rescue Coordination Centers were established and effective utilization of both aircraft and surface vessels over a wide area was established. The budget was tight but by the mid 1950s there were 127 aircraft assigned to 22 Air Stations and Air Detachments stretching from Sangley Point in the Philippines to San Juan Puerto Rico. The number of survivors rescued and lives saved increased dramatically and would continue to do so.

The rescue aircraft of choice was the seaplane/amphibian. Starting in late 1947 the first of a small number of HO3S helicopters was purchased. By 1951 the number of helicopters had doubled with the procurement of 14 HO4S-1/2's. This was followed by an order for 23 HO4S-3Gs. They had a more powerful engine, carried hydraulic hoists and the Coast Guard designed rescue basket. They also were fully equipped for instrument and night flight operations. With the loss of life and aircraft while attempting open sea landings and a series of stunning helicopter rescues, such as the one at Yuba City, Arizona where two crews alternated flying a HO4S and rescued 138 people, took place, it became

obvious that the helicopter could perform missions that no other aircraft could perform. The helicopter had become, and would remain, vital to Coast Guard rescue operations.

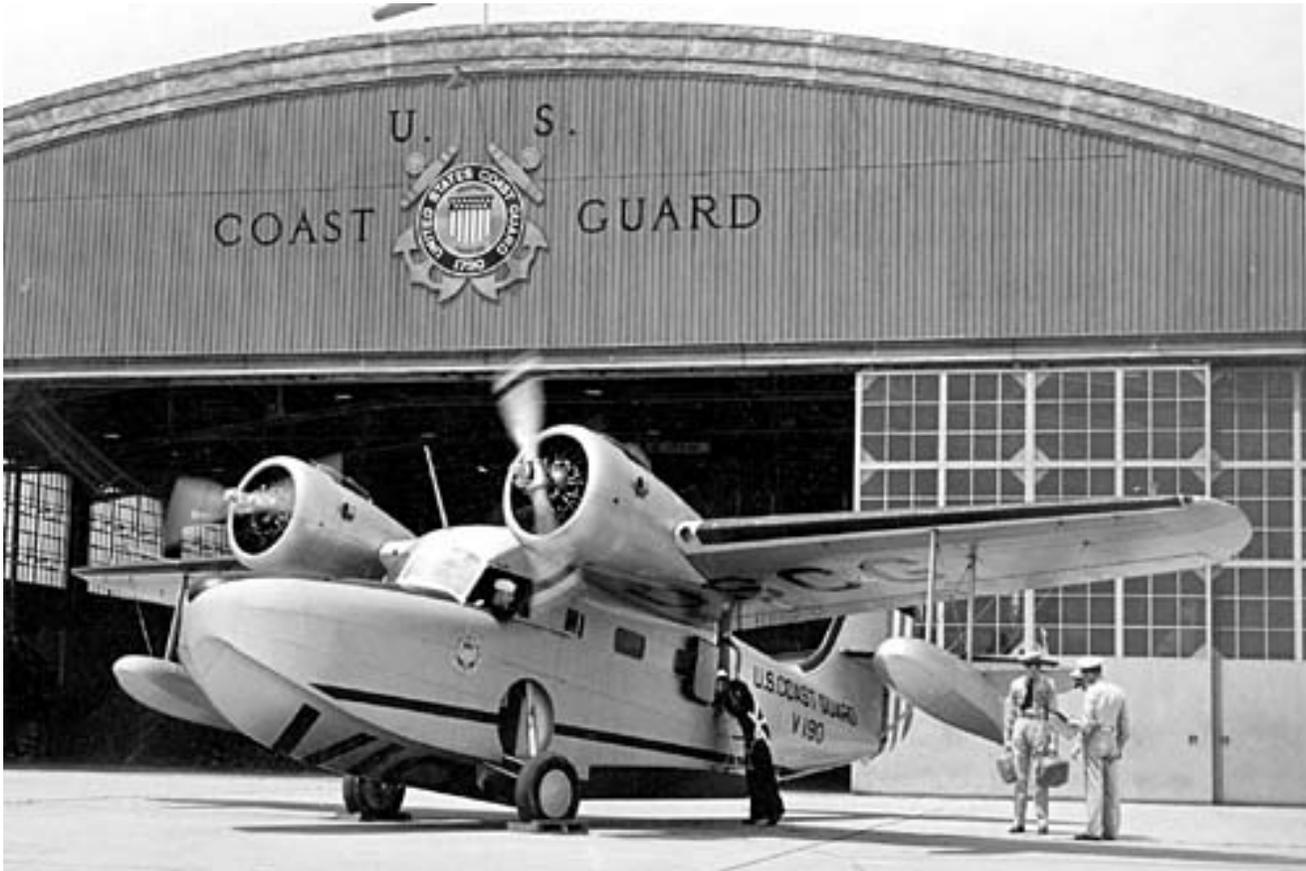
Historical Time Line of Events:

The Growth Years 1939-1956

YEAR	DATE	REMARKS
1939	July	Grumman JRF-2/3 and 5G Purchased:
1939	6 September	Coast Guard Participates In the Neutrality Patrol:
1940		The Coast Guard and The Birth of the Helicopter:
1940	15 August	Coast Guard Air Station Elizabeth City Established:
1940	18 October	Aircraft and Crews Provided for The U.S. Coast & Geodetic Survey:
1941	15 February	Coast Guard Air Station San Francisco Established:
1941	April	The Coast Guard and the Greenland Operations:
1941	7 July	Grumman J4F-1 Purchased:
1941	October	Coast Guard Acquires Consolidated PBY-5A/6A:
1941	11 December	Coast Guard Aviation Anti-Submarine Operations:
1942	March	The Coast Guard Acquires OS2U Kingfisher Aircraft:
1943	13 February	Coast Guard Assigned the Sea-going Development of the Helicopter:
1943	April	Coast Guard Acquires Martin PBM-3/5 Flying Boats:
1943	23 July	The Development of Air-Sea Rescue:
1943	21 August	Coast Guard Patrol Squadron VP-6CG Established:
1944	14 March	Air Detachment Annette Island Alaska Established:
1945	September	Coast Guard Auxiliary Aviation:
1945	December	Coast Guard Acquires P4Y-2G Privateer for Air-Sea Rescue:
1946	1 January	Post World War II Coast Guard Search and Rescue:
1946	1 January	Coast Guard Air Detachment Traverse City Established
1946	January	Coast Guard Air Detachment Argentia Established:
1946	January	Pacific LORAN and Post World War II Aviation Support: CG Air Detachments Sangley Point and Guam Established:
1946	12 March	Post War Helicopter Development:
1946	March	International Ice Patrol – Aerial Surveillance Becomes Primary:
1946	July	Coast Guard Acquires PB-1G Long Range Search and Rescue Aircraft:
1946	2 December	Operation High Jump:
1947	3 January	Coast Guard Aircraft Repair and Supply Base Established:
1947	April	Coast Guard Air Detachment San Juan Puerto Rico Established:
1947	17 April	Coast Guard Air Detachment Kodiak Alaska Established:
1948	September	Coast Guard Provides Aviation Support for The Treasury Department Alcohol Tax Unit:
1949		Coast Guard Air Detachment Barbers Point Established:
1950	25 June	The Korean War and Coast Guard Aviation Participation:

1950	20 November	Coast Guard Air Detachment Corpus Christi, Texas Established:
1951	20 February	The ASW Helicopter Becomes a Reality
1951	May	Coast Guard Acquires the UF-1G/2G Albatross Aircraft:.
1951	November	Coast Guard Acquires the HO4S Helicopter:
1952	20 February	Coast Guard Air Detachment Arlington Established:
1952	31 October	Coast Guard Air Detachment Bermuda Established:
1954	May	Coast Guard Acquires Martin P5M Seaplanes:
1955	July	Coast Guard Air Detachment New Orleans Established:

1939 – Grumman JRF-2/3 and 5G Purchased:



JRF-3G

Grumman developed the G-21 Goose as a civilian transport aircraft designed to meet the needs of wealthy business organizations. It was put on the market in 1937. The Goose was a high wing monoplane amphibian with a two step hull. It was powered by two Pratt & Whitney Wasp Jr. radial engines mounted on the wing leading edge forward of the cabin. The engines were fitted with collector rings exiting above the wings to reduce noise in the cabin. Positions for two pilots were provided in a

cockpit forward of the wings and accommodations for four to six passengers were provided in the cabin below the wing. An entrance door was located on the port side just aft of the cabin. Baggage storage compartments were provided aft of the cabin and in the bow of the aircraft.

The aircraft had hand cranked landing gear. The main gear retracted upward into the side of the fuselage and a steerable tailwheel retracted into the hull behind the second step. The wing floats could be removed, if desired, for land operation and the airplane could be equipped with skis for winter operation.

The Navy began acquiring the G-26 version in 1938 and designated them as JRF, Seven G-39 design aircraft designated JRF-2, built to Coast Guard specifications, were purchased by the Coast Guard in 1939 and 1940. Three additional JRF-3s were purchased in 1940. The JRF-3 had deicing boots on the leading edges of the wings and tail surfaces. In addition to utilizing these aircraft for transports and utility purposes the Coast Guard saw their value as search and rescue aircraft. All were fitted with electric starters and automatic pilots and were capable of carrying a single-lens aerial mapping camera.

Beginning in 1941 Grumman Aircraft Corporation commenced delivery of the G-38 design JRF-5. The Coast Guard purchased 24 of the G-38 model, designated JRF-5G, beginning in 1941. The JRF-5 engines were Pratt & Whitney R-985-AN-6 radials.

Prior to World War II these aircraft carried out search and rescue as well as aerial mapping flights and participated in the Coast Guard's contribution to the enforcement of the Neutrality Patrol. During the war, the JRFs conducted search and rescue operations, transported supplies and personnel and were utilized for ASW operations. Depth Charges or Bombs were carried externally under the wing.

Most of the remaining Coast Guard's JRF-2/3s were disposed of shortly after the end of World War II while many of the JRF-5Gs remained in service with the Coast Guard until 1954.

Manufacturer	Grumman Aircraft Engineering Corporation, Bethpage, Long Island, NY
Designation	JRF-2; JRF-3; JRF-5G
Aircraft Type	Amphibian
Wing Span	49'
Height	16' 2"
Length	38' 6"
Fuel Capacity	220 gallons
Top Speed	201 mph @ 5,000'
Cruising Speed	191 mph @ 5,000'
Stall Speed	65 mph
Initial Climb	1,300 fpm at sea-level
Range	640 statute miles
Empty Weight	5,425 lbs
Gross Weight	8,000 lbs

Crew	2/3
Service Ceiling	21,300'
Engines	2 -- P&W R-985-AN6 Engines Hamilton Standard 2D30-235 Props

1939 – Coast Guard Participates In the Neutrality Patrol:

On 3 September 1939, two days after the German invasion of Poland, France and Great Britain declared war against Germany. The war would expand to all of Europe. European allies, much the same as in World War I, would again look to the United States for munitions and supplies which could reach them only by ship. It was realized that the Germans would make every effort to halt such traffic and the Atlantic Ocean would become a major battleground. The mood in the United States was isolationist and the Neutrality Act of 1935, made further restrictive by amendment in 1937, forbade arms exports, either direct or by trans-shipment, to any belligerent. President Franklin D. Roosevelt issued his first proclamation of neutrality on September 5, 1939 declaring in part that any use of United States territorial waters for hostile operations would be regarded as unfriendly, offensive, and in violation of United States neutrality.

On 6 September, the Chief of Naval Operations directed the establishment of air and ship patrols to observe and report, by classified means, movements of belligerents approaching or leaving the east coast of United States or the eastern boundary of the Caribbean. Ships were to be identified by name, nationality, estimated tonnage, color, markings and were to be photographed. Course and speed was to be estimated and included in the report. By the middle of September, Atlantic coastal waters from Nova Scotia, Canada to the Lesser Antilles, were under daily surveillance by surface and air patrols.

Forces involved were primarily patrol planes from Patrol Squadron VP-51 (12 PBY-1s) which was deployed to San Juan; Patrol Squadron VP-52 (6 P2Y-2s) which deployed to the Coast Guard air station at Charleston, SC; Patrol Squadron VP-53 (12 P2Y-2s) initial based out of Norfolk and in November deployed to Key West; Patrol Squadron VP-54 (12 PBY-2s) based at Norfolk and deployed a detachment to Newport RI; Patrol Squadron VP-33 which deployed to Guantanamo Bay, Cuba. The Navy patrol effort was expanded by Coast Guard coverage of inshore areas by aircraft based out of Miami, Charleston, Brooklyn and Salem (19 aircraft). The Coast Guard aircraft utilized were the Curtiss SOC-4 , Douglas RD4, Fairchild J2K, Grumman JF-2, and the PH-2 Hall Boat.



Grumman JF-2



Hall PH-2



RD-4 Dolphin



Curtiss SOC-4

Surface forces assigned were ships of the Atlantic Squadron, four seaplane tenders and the aircraft carrier USS RANGER with her air group. Coast Guard cutters supplemented the effort and were assigned inshore areas.

The scope of the Neutrality Patrol expanded during 1940. The war in Europe saw the apparently invincible German Forces defeat France and bring Britain to her knees by the success of the U-Boat actions in the Atlantic. The specter of a British defeat and the danger to the United States was obvious. In September of 1940 President Roosevelt announced that, by executive agreement, the United States would exchange 50 World War I destroyers and 10 Coast Guard cutters for 99 year leases on British sea and air bases in the Western Hemisphere. The "Destroyers for Bases Deal" marked the functional death of U.S. neutrality and the beginning of a period of "non-belligerency." Two of the sites, Argentia, Newfoundland and Bermuda became key elements in the Battle of the Atlantic.

Patrol Squadrons VP-55 and VP-56 were commissioned and both equipped with PBM-1s. VP -54 deployed to Bermuda and VP-52, after acquiring PBY aircraft and finding the Coast Guard air station at Charleston no longer large enough to support a PBY operation, deployed to San Juan and then to Argentia, Newfoundland. The Coast Guard acquired Grumman JRF amphibians in 1940 and the Grumman J4F amphibian came on board in 1941. These aircraft replaced the RD4s and the JK-1s. On April 8, 1941 VP-51 moved to NAS New York (Floyd Bennett Field) and together with VP-52 based at Argentia, patrol activity was expanded to include convoy escort and ASW search in the northern offshore shipping lanes.



Grumman JRF



Grumman J4F

As the countdown toward WW II continued during the final months of 1941, the Neutrality Patrol operations moved ever farther from "neutrality" toward active support of the Allies. Convoy escort and

ASW patrol planes began carrying general-purpose and depth bombs during the summer months. Orders for attacks on hostile forces threatening U.S. and non-Axis foreign flag shipping were in force and were amplified and extended by Navy Argentinia Air Detachment Op Orders in September and October. Based on Commander in Chief, Atlantic Fleet (CINCLANTFLT) orders, these directives were explicit regarding the protection of shipping. With the torpedoing of the USS Kearny (DD-432) and the loss of the of the USS Reuben James (DD-245) Congress took action to relax the restrictions of the Neutrality Act by allowing U.S. ships to escort convoys into combat zones and U.S. merchant ships to be armed.

Just five weeks after these final events in the history of the Neutrality Patrol, the attack on Pearl Harbor plunged the United States into WW II.

1940 - The Coast Guard and the Birth of the Helicopter:



German FW-61 Helicopter



Platt-LePage XR-1 Helicopter

Starting in 1909 a series of attempts at vertical flight was conducted. The concept was feasible but the technology had a long way to go before any significant advances could be made. Apart from the lack of a suitable engine, powerful, and light enough to enable a helicopter to lift more than its own weight, the principle problem which all the early pioneers encountered was controlling the helicopter. Vertical flight did not really progress until the arrival of the autogiro. Both the Army and the Navy evaluated the military application of a Pitcairn autogiro in the mid thirties but it did not meet their needs. The Navy dismissed the idea of vertical flight but the Army Air Force continued to show interest. The then LT. H.F. Gregory who became the Army's Rotary Wing Project Officer remained faithful to his belief that rotary-wing aircraft had great potential for military applications.

In 1937, Professor Heinrich Focke and another German named Achgelis joined forces to conduct helicopter research. The result was the production of the FW-61 based on the fuselage of a small biplane trainer with two outriggers supporting the contra-rotating rotors. The cut-down propeller mounted on the front of the radial engine was

used only for cooling. The control was so precise that the machine was demonstrated by Flugkapitan Hanna Reitsch inside the Deutschlandhalle stadium in Berlin.

There were skeptics in the United States but there were also believers. The Platt-LePage Company had already begun designing a similar machine. The Army was interested in the project but there was no money appropriated for development. Representative Frank Dorsey of Pennsylvania introduced a bill

in Congress for funds to develop the autogiro and procure a sufficient number of service tests. The bill passed on June 30, 1938 and was not limited to autogiros. It appropriated \$2,000,000 for rotary wing and other aircraft research. An Inter-agency Board, representing all possible government users of rotary-wing aircraft was created to administer the program. Commander William J. Kossler, a strong advocate of the potential of helicopters, was the aviation engineering officer at Coast Guard Headquarters and served as the Coast Guard representative on the board. In 1940 this board, chaired by the U.S. Army, had secured \$300,000 of the \$2 million appropriated by Congress. It met to consider a proposal by Platt-LePage and Sikorsky who had again become involved in the development of helicopters. Kossler said the Platt-LePage proposal for an experimental helicopter was chosen because it was considered more practical.

Igor Sikorsky did not give up and continued to make impressive progress without government help. By the end of the year the United Aircraft Company (Sikorsky) had sunk \$100,000 into the development of Sikorsky's first experimental helicopter, the VS-300. Unlike most other designers he opted for the Main Rotor plus Tail Rotor configuration. However, Sikorsky was not so much an inventor as a designer who made use of the best of all the currently available designs and melded them together.

The Platt-LePage XR-1 helicopter was experiencing difficulties and did not make its first tethered flight until May 22, 1941. By this time Sikorsky had already tested the VS-300 in tethered flight and established a new International helicopter endurance record. The board, impressed by Sikorsky's accomplishment met on December 17, 1940 and decided that two helicopters of different design were better than one, but only \$50,000 of the appropriations remained unspent. United Aircraft agreed to provide an additional \$50,000. Additional funds came later.



Igor Sikorsky Flying the VS-300

The Sikorsky XR-4 flight test program began on January 14, 1942 when the second Sikorsky helicopter lifted off the ground for the first time in free flight. By April, Gregory, now a Lieutenant Colonel, decided that the XR-4 should be demonstrated before the Board. Not all of the Board was present but CDR Kossler who had invited CDR W.A. Burton, Commanding Officer Coast Guard Air Station Brooklyn, to accompany him, witnessed the demonstration. Also present was Wing Commander Reggie Brie, RAF who had been sent to the United States to investigate the potential of helicopters for anti-submarine duty on board British merchant ships. Brie's support would later be of significant value to Kossler. .

Sikorsky Chief Test Pilot Les Morris performed aircraft maneuvers that if they had not been demonstrated would have been considered fictional. The helicopter lifted off the ground about seven feet and then remained in that position. It then settled gently back to earth at the spot it first lifted off. The aircraft was flown forward, sideways, and backward. Morris then flew a twisting course between rows of trees followed by a vertical climb to 500 feet. The helicopter pitot tube extended out in front of the aircraft. A Sikorsky employee, using a pole, held aloft a ring about 10 inches in diameter and Morris flew the probe into the ring and lifted it off the pole. The helicopter was hovered at 25 feet and

a man climbed up a lowered rope ladder. He pulled the ladder in after him and the helicopter flew away. Morris followed this with an intentional power off approach from a 2000 foot altitude to a perfect landing. (Autorotation).

Since the beginnings of Coast Guard aviation the concept of a “flying life boat” for air rescue work was pursued. The aircraft chosen were lightweight, landing and takeoff speeds were low, and the distances required across the surface of the sea was short. Successful open-sea landings became common – so did crashes. The frequency of these crashes prompted a request by the Commandant that each aviator submit suggestions for developing safe procedures for open-sea rescues by airplane. The danger in these operations became a deep concern for CDR Kossler and a young aviator by the name of Frank Erickson who had worked on developing methods for aerial delivery of survival equipment without the necessity of landing in the open sea. After witnessing the Sikorsky demonstration Kossler had found his answer. He was so impressed that he would dedicate the rest of his life to achieving a Coast Guard aviation organization built around the rescue helicopter.

The demonstration caused great excitement in all that viewed it. Kossler, openly enthusiastic, wrote a report to the Commandant pointing out the many advantages of using the helicopter for rescue work. CDR. P.A. Leamy, Aviation Operations Officer was impressed and advocated the purchase of several helicopters for training and experimental development. Kossler thought that three should be purchased for \$250,000, but neither the Coast Guard’s Engineer-in-Chief, Rear Admiral Harvey Johnson nor the Assistant Commandant, Rear Admiral Lloyd Chalker were in favor of the purchase. Chalker, in 1939, had attended a conference that set performance criteria for rotary-winged aircraft. Due to lack of real data the committee established parameters that mirrored general requirements for fixed wing aircraft of this period. This most probably influenced his reasoning. The reasons cited for disapproval were that the cost of acquisition was too great for the limited performance capabilities of the aircraft and the helicopter was not essential to the war effort. Kossler was told; “Hell, Bill, the Navy isn’t interested in life saving; all they want to do is get on with the business of killing the enemy.” Without the support of these two officers- next in rank to the commandant- the future for Coast Guard helicopters looked bleak. Kossler was upset with the reception his helicopter proposal received but he remained undaunted. Over the next several months he would orchestrate a series of events which would lead to the Coast Guard’s involvement with the helicopter. The emphasis would be placed on a machine that had the capability “to get on with the business of killing the enemy.”



Sikorsky XR-4

The German submarines were extracting extraordinary losses. Surprisingly it was the Army Air Force, that recognized the helicopter might have a potential as an antisubmarine weapon. The Army was already flying antisubmarine patrols using fixed-wing aircraft and Gregory, speculating that the helicopter could be an extension of this mission, began experimental development with the XR-4. Kossler, aware of this, discussed the situation with LCDR Frank Erickson and enlisted him as part of the team. Erickson was the Executive Officer at Coast Guard Air Station Brooklyn. Burton was the Commanding Officer and had been favorably impressed with a helicopter demonstration. CGAS Brooklyn would make be an ideal location to develop and evaluate the helicopter. Several days later LT. Bill Healy, Kossler's assistant, arrived at the air station and during lunch he asked if someone could fly him to Bridgeport for an appointment with Igor Sikorsky. Erickson quickly volunteered. Erickson spent hours with Sikorsky and his Chief Engineer, Michael Gluharoff, discussing possible uses for the helicopter. He witnessed a convincing demonstration of the VS-300 which including repeated landings within an inch or two of a given point. This was an important factor if the aircraft was to be operated from a small platform on board ships in rough water.

Erickson put together a proposal to Headquarters. Fully aware of Kossler's set back in his proposal of the helicopter as a rescue aircraft, he stressed the use of the helicopter as an anti-submarine weapon to operate from vessels in convoys. In the proposal he pointed out specifics. He said that a 30-foot square platform would be needed on ships that would carry helicopters. He further stated that the XR-4 could give greater protection for a convoy than a similar number of blimps or airplanes. With a crew of two and a 325 pound depth charge on board the helicopter could scout for enemy submarines at a speed of 25 to 60 miles per hour for up to four hours per sortie. A top speed of 100 miles per hour could be obtained when desired. Additionally he suggested an arrangement for rescuing survivors of torpedoed ships. He also pointed out that the British were switching from the autogiro to the helicopter for anti-submarine protection. This was based on the recommendation of Wing Commander Brie who had witnessed the XR-4 demonstration. CDR Burton strongly endorsed Erickson's proposal alluding to the fact that the Coast Guard was actively engaged in this type of warfare. CDR Burton's endorsement pointed out:

“The Army has demonstrated its belief in the value of the helicopter by contracting for a number of present models. Unfortunately the Navy has not shown any great enthusiasm for this type aircraft. It is therefore an excellent opportunity for the Coast Guard, with a very modest appropriation, to initiate and proceed with the naval development of the helicopter.”

Erickson's proposal arrived in Headquarters in early July, 1942 immediately after one of the most disastrous months in the anti-submarine war. During June, 55 U.S. Merchant ships comprising a cumulative total of 289,790 tons or more than 4% of the total U.S. Tonnage, had been sunk. Kossler's endorsement advised haste knowing the Army planned on completing a six month test program and return the XR-4s to Sikorsky. This time the helicopter proposal was given serious consideration. Appearing at the bottom of Kossler's endorsement is a handwritten note: “I concur. HFJ.” (Harvey F. Johnson, Engineer-in-Chief USCG). Kossler had his support. Kossler suggested that the British, who were procuring helicopters under lend lease, might turn a few helicopters over to the Coast Guard if requested. On July 24, 1942, the Navy Bureau of Aeronautics ordered four helicopters – one YR-4, similar to the XR-4 (Navy designation HNS) and three XR-6s (a later model that would become the XHOS).

The Commander Coast Guard Forces, Third Naval District, Rear Admiral Stanley V. Parker, a World War I aviator, still very interested in aviation, let it be known that he would like to see the VS-300. He

and Kossler flew to the Vought-Sikorsky plant at Stratford, Connecticut on December 21. Dr. Sikorsky was delighted. It was his first opportunity to show his helicopter to an officer of flag rank. RADM Parker was also a former dirigible pilot. He was forward thinking and had requested his training in LTA aircraft when going through flight training. He also required it of those pilots going through training at the time of the first Coast Guard air station on the premise that it might prove valuable to Coast Guard search and rescue efforts. He was converted to the helicopter that day by a pull-out-all-stops demonstration by both Dr. Sikorsky and Les Morris.

RADM Parker wrote to the commandant:

“Kossler and I saw the Sikorsky helicopter fly at Bridgeport. It was a remarkable thing, capable of flying forward, sideways, and astern. Its control is unbelievable. It landed on a roof of a small building, on top of a pile of aircraft engine cases, on the water, and flew abreast at the same speed as a tug boat. A couple of these with each convoy might give a degree of protection which might be decisive. A new model is being developed. Might not the Coast Guard be given the job of showing its application to convoy protection? Kossler can tell you all about it. Maybe we can get the Coast Guard on the wagon.”

As a result of Parkers comments, ADM Waesche, the Coast Guard Commandant, decided to go to Bridgeport. He and several high ranking officers arrived at Bridgeport on February 13, 1943. They were greeted by Igor Sikorsky and Michael Gluharoff. During the demonstration, Sikorsky flew the VS-300 while Morris flew the XR-4. Two helicopters in precision maneuvers, impressively showed their potential for anti-submarine warfare. ADM Waesche was completely “sold.” He conferred with CNO, ADM King, who then issued a directive placing upon the Coast Guard the responsibility for developing the sea-going helicopter. Kossler had the beginnings of his program, the support of his superior and a direct conduit to the Commandant.

This project and the subsequent development of the helicopter laid the groundwork for the extensive Navy and Marine Corps helicopter programs that followed.

1940 – Coast Guard Air Station Elizabeth City Established:



An Act of Congress approved by President Wilson on August 29, 1916 authorized the Secretary of the Treasury to establish a total of 10 Coast Guard air stations distributed along the coast line of the United States. Unfortunately the Act made no provisions for funding. During the 1934-1939 time period a number of Coast Guard air stations were established utilizing federal public works funding. In 1938 a combination of circumstances took place that would establish a Coast Guard air station at Elizabeth City, North Carolina. Located sixty miles north of Cape Hatteras, north of Albemarle Sound and along the east coast's northern most ice-free river, the old Holowell Plantation near Elizabeth City was selected by the Coast Guard for its potential strategic value as a seaplane base.

The Coast Guard Air Station Elizabeth City was commissioned on August 15, 1940 with four officers, 52 enlisted men and ten aircraft including three Hall PH-2 seaplanes, four Fairchild J2K landplanes, and three Grumman JF-2 amphibians. The assigned mission was two fold; The preservation of life and property at sea and the assumption of Neutrality Patrol duties which had been a responsibility of the Coast Guard air station at Charleston, South Carolina. By Executive Order the United States Coast Guard was transferred from the Treasury Department to the U. S. Navy on 1 November 1941 and on December 8, 1941 the United States became fully involved in World War II.

Spurred by the demand of war, the station was in a rapid state of expansion and served as a training base for both Army and Navy personnel, as well as a base for Coast Guard coastal patrols. Initially there were very few resources available to combat the German submarines. The Coast Guard aircraft, not designed for combat, were equipped with locally fabricated depth charge racks and pressed into service. During the first six months of 1942 resources were strained in a concentrated effort to rescue survivors of torpedoed ships. In March the OS2U Kingfishers arrived. When coastal shipping was organized in convoys after April, 1942, the Elizabeth City Air Station was designated to furnish an escort in its assigned area. This proved to be effective.



PBIG, C-130 and R5D On the ramp Elizabeth City

Navy Fleet Air Wing Five deployed three PBYS to the station in May 1943 to transition Coast Guard aviators to this type aircraft. After the establishment of VP-6 in Greenland initial training for replacement crews was conducted at Elizabeth City. The first adequate aircraft designed for anti-submarine warfare to be assigned to the station were the PBMs, the first of which arrived 5 December 1943. The submarine menace along the East Coast had subsided materially by this time as the German Navy redeployed their submarine assets to the North Atlantic.

Search and rescue became the primary mission in 1944. PBYS and PBMs were the initial aircraft; PBIG long range search aircraft came on board in 1946; the P5Ms in 1954; R5Ds in 1958 followed by the C-130s in 1960. The operational helicopters arrived in 1948 with the assignment of two HRPs. The HO3S followed which were in turn followed by the HO4S; the HH-52; and then the HH-60J. The capabilities of the rescue aircraft increased exponentially.

In April 1946, a repair and supply facility was added to the Air Station. By 1948 it had expanded and became a separate Headquarters Unit. In 1949 training enlisted personnel in some aviation rates become another responsibility. The training facilities were later expanded and consolidated into an independent command. In 1964, the Fifth Coast Guard District established Air Base Elizabeth City and in 1966 The Air Base expanded after absorbing the air stations located in Bermuda and Argentina, Newfoundland. The Atlantic Strike Force was welcomed aboard in 1973.

As of 2006 the complex consists of The Support Center, Air Station, Aircraft Repair and Supply Center, Aviation Technical Training Center, and the National Strike Force Coordination Center.



P5M-2 launching at Air Station Elizabeth City

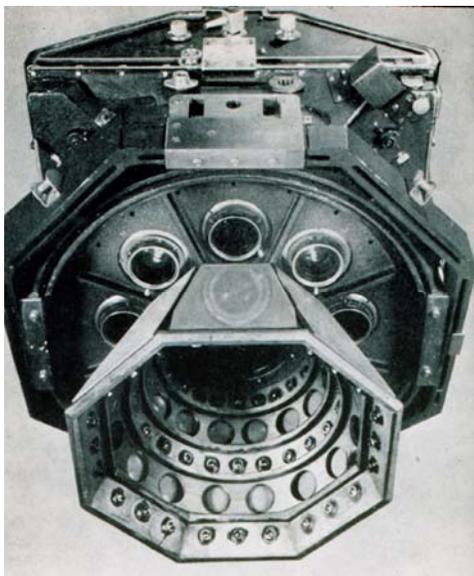
1940 – Coast Guard Provides Aircraft and Crews for the US Coast and Geodetic Survey:

On February 10, 1807 Congress authorized an accurate survey to be taken of the coasts and harbors of the United States. The Survey of the Coast was established to provide this service. The name of this organization evolved into the United States Coast and Geodetic Survey. (C&GS).

Each chart was built from two types of surveys. The first was a hydrographic survey, which mapped the depths of the waters and depicted hazards. The other was a topographic survey which mapped the land, including the shoreline, natural features, and elevations above the sea. The first shoreline map drawn by the Coast Survey covered the shore of Great South Bay on Long Island, New York. The Coast Survey relied on a method called *plane table surveying*. This was the primary method of mapping for the next 80 years.

By the late 1800s photography was recognized as a useful tool in mapping. The C&GS first used a surveying camera with a plane table for mapping the international boundary between Alaska and Canada in 1894. The use of ground photos continued and in the early part of the next century, aerial cameras were developed with multiple lenses, producing a much wider field of view. The rapid development of the aircraft during World War I provided an effective platform by which the cameras

could be used for mapping. The C&GS started work with the US Army Air Service using Air Service aircraft and crews to provide photographs to compile coastal topography. Between 1920 and 1928, a series of aerial surveys were made of the New Jersey coastline, the Florida coastline, and the Mississippi River delta. Topography from aerial photographs not only proved to be more detailed and accurate than the plane table but could be done for about one-third of the cost.



Nine-Lens camera designed by O.S. Reading. It was state-of-the-art for many years

Multiple photos were taken but because of the narrow fields of view it required many photos to cover a moderately sized area. Area could be increased by taking the photos at higher altitudes but detail was lost. A multi-lens, high resolution camera could take several photos looking downward at different angles simultaneously. These could be combined into a single quality composite image that covered a much larger area of ground. In 1935, the C&GS had a precision nine-lens camera built. The camera was large weighing 750 pounds when fully equipped and the roll of film it used was 200 feet long and 23 inches wide.

A satisfactory aircraft was needed as a platform for the camera. The C&GS, except for a short period of time, had been and was under the jurisdiction of the Treasury Department. It was thus logical for the Treasury Department to turn to the Coast Guard to provide the needed aircraft and crew. The Coast Guard purchased PBV, Bureau Number 2290 from the Navy on 18 October, 1940 and renumbered it V-189. The aircraft was purchased for the specific purpose of aerial mapping in conjunction with the C&GS. The aircraft was configured to include a mount to accommodate the nine-lens camera in the “waist gunners” position. The first assigned crew under the command of LCDR George Bowerman included Captain Kay, a C&GS officer. This crew and aircraft conducted the first aerial survey assignment utilizing a Norden Bomb-sight in the aerial mapping process.



Coast Guard PBV-5 V-189. Used for nine-lens camera photography

The marine and aeronautical charts of Alaska were less than satisfactory; especially along the Alaskan Peninsula and the Aleutian Islands. Upgrading the existing charts became the immediate tasks for the summer months of 1941. PBV V-189 operated from both Kodiak Island and Dutch Harbor, Unalaska Island. Poor weather and inadequate facilities, especially at Dutch Harbor, effected both operations and results. In August V-189 returned to its home base at San Francisco and was immediately given a new assignment. This mission included aerial photo-

mapping of the coastal areas of the Gulf of Mexico and the east coast of the United States from the southern tip of Florida to Maine. Shortly after V-189 returned to San Francisco the Japanese attacked Pearl Harbor and the United States was at war. On December 15, 1941, PBY-189 and crew were transferred to Navy Patrol Squadron 44 (VP-44) at Naval Air Station, Alameda California. In May of 1942, V-189 was transferred back to the Coast Guard to carry out vitally needed photo mapping of the Alaska area of operations. The crew and aircraft proceeded to Sitka, Alaska and commenced a mapping of southeast Alaska. From there they proceeded to Kodiak to obtain detailed photos of specific areas and then on to Unga of the Shumagin Islands. Weather was much more favorable than on the first mission and photo mapping pressed westward until encountering Japanese patrols. Some of the operations required flight altitudes as high as 20,000 feet. In September of 1942 V-189 returned to San Francisco. V-189 was then used in the construction of the LORAN chains in Alaska and throughout the Pacific.



L to R - LCDR Fred Merritt USCG; LCDR Art Benton C&GS; J.T. Smith C&GS; T.K. O'Driscoll C&GS: The nine-lens camera is installed in PB-1G 7254

Mapping operations continued and were carried out with a second aircraft obtained by the Coast Guard for this purpose. The camera was transferred to PBY-5A Bureau Number 08055. This was an amphibious aircraft and the availability of landing gear made it more versatile in the extreme environment of Alaska. Unfortunately this aircraft crashed on Mount Moffet, Adak, Alaska, on 18 July 1943. Only two crewmembers survived. The nine lens camera, the only one in existence, was severely damaged. It was recovered and rebuilt and then installed in a specially adapted Coast Guard PB-1G aircraft after World War II.. During the war II a Coast Guard Beech JRB aircraft was specially equipped to assist in C&GS photo-mapping operations.

The PB-1G selected was transferred to the Coast Guard in 1946 and given the CGNR 7254. It had only 52 and ½ hours on the airframe at the time of acceptance making it for all practical purposes a new aircraft. The bomb bays were sealed and oxygen tanks installed. The aircraft construction readily accepted the nine-lens camera under the fuselage. The Norden Bomb-sight was retained. The capability of the aircraft was such that most of the photo-mapping missions were flown between 20,000 and 30,000 feet. At 22,000 feet the camera could photograph 315 square miles of terrain with one click. For twelve years the 7254 flew mapping missions ranging from Alaska to Puerto Rico. During these years the aircraft, home based at the Elizabeth City air station, flew just under 6000 hours covering more than one and a half million miles.

As the years past the nostalgia generated by the aircraft continued to increase. Coast Guard crews stated that in cases when they would transit or base out of an Air Force installation, where the commanding officer had flown B-17s during World War II. the reception was especially warm. The 7254 was the last PB-1G/B-17 operated by the United States military services. The last flight was made on 14 October 1959.



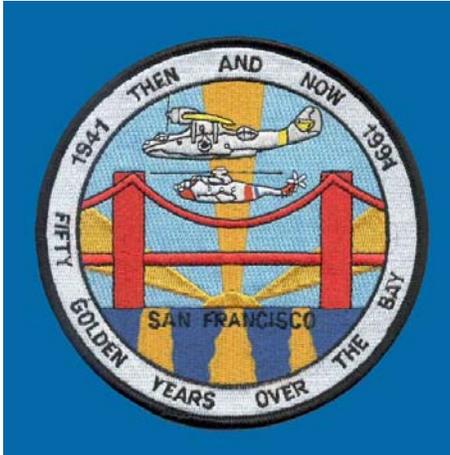
Coast Guard PB-1G 7254 and the ramp Adak, Alaska

The Coast Guard operated 15 R5D-3/4 (C54) aircraft, nine of which had been acquired from the USN and six from the USAF. The first six R5D-3's were acquired from the USN in 1945. The remaining nine were acquired after 1949. In addition to logistical and transport duties, these aircraft were used for search and rescue (SAR), service with the International Ice Patrol. Specific missions such as electronic testing and photographic mapping were assigned to specially equipped aircraft. The R5D CGNR 2486 had been a RC54V aircraft, V denoting photo reconnaissance, and in 1960 the nine-lens C&GD camera was installed. This became the photo-mapping aircraft for the next four years.

In 1964, after 25 years of working together the Coast Guard and the C&GS service ended their arrangement for aircraft services. In 1965, the C&GS was reorganized along with the Weather Service and some other agencies to form the Environmental Sciences Service Administration (ESSA) in the Department of Commerce. Under ESSA the C&GS leased aircraft and in 1969 acquired a surplus deHavilland Buffalo aircraft. Converted to aerial photography, this aircraft served for ten years.

The ESSA was reorganized in 1970 and became the National Oceanic and Atmospheric Administration (NOAA)

1941 – Coast Guard Air Station San Francisco Established:



Coast Guard Aviation expanded significantly during a nine year period which saw the construction of nine aviation patrol stations along the coastlines of the United States. The Construction of the Coast Guard Air Station San Francisco was the last of this group. The station was constructed during 1940 on a 20.5 acre piece of property adjacent to San Francisco Airport, then know as Mills Field. The air station was formally dedicated on February 15, 1941, LT George H. Bowerman commanding. The facility was designed to operate seaplanes and also had access to the runways at Mills Field for landplane operations. The initial aircraft complement was a PBY-5 Catalina and two RD-4 Dolphins. The primary mission was the saving of life and property in the maritime environment.

The Coast Guard was transferred to the Navy Department by executive order 8929 on November 1, 1941 and Air Station San Francisco was placed under the operational command of the 12th Naval District. In April 1942, the station was assigned to the operational control of the Commander, Western Sea Frontier, U.S. Navy. The Station continued to conduct Search and Rescue operations and commenced Coastal Patrols. Coast Guard and Navy personnel flew joint ASW patrols in OS2-U Kingfisher aircraft. The Coastal Patrols became limited as Japanese submarine activity on the West Coast of the United States was minimal during World War II. The station was also tasked with aiding in the construction of the highly classified and secret Long Range Navigation (LORAN) stations in the North Pacific during 1943. The Navy leased 85 acres at Mills Field and commissioned a Naval Auxiliary Airfield supporting Pan American which was flying under contract to the Navy. The

Commanding Officer of the Coast Guard Air Station was also the Commanding Officer of the Naval Air Facility. In 1944, with the creation of responsibility for Air/Sea Rescue operations, the San Francisco Sector, consisting of Coast Guard aircraft, surface rescue craft, and facilities, was placed under the command of the Commanding Officer, Coast Guard Air Station San Francisco. At the end of the war, the station returned to Coast Guard operational control and continued as a search and rescue unit.



P4Y-2 Long Range Search Aircraft

In addition to PBY-5A Catalinas the PB2Y Coronado flying boat had been flown out of San Francisco in the last years of World War II. In 1945 Boeing PB-1G flying fortresses were assigned and then replaced by P4Y-2G Privateers. In 1947 the first helicopter, a HO3S-1 Dragonfly arrived and was followed by the HO-4S. The HU-16 Albatross, known to many as the “Goat,” arrived in the 1950s and was supplemented by R5Ds until the C130s came on the scene. The HH-52 amphibious helicopter came on board in 1963.

In 1978, due to space limitations and an increase in operational requirements, all fixed-wing aircraft were moved to the newly constructed Coast Guard Air Station Sacramento. San Francisco became a

helicopter only air station. The HH-52As were replaced by HH-3F Pelicans which were in turn replaced by HH-60 J- Hawks. Restructuring in Coast Guard Aviation lead to the replacement of the HH-60s by the HH-65 in June of 1996.

While the airframes evolved, the primary mission of Air Station San Francisco remained unchanged for six decades – maritime search and rescue along 300 miles of coastline from Point Conception to Fort Bragg. In addition to SAR, Air Station San Francisco expanded its missions to include maritime law enforcement, environmental, aids to navigation, and logistics. In 2003, the USCG became part of the Department of Homeland Security, further expanding the Air Station’s role in protecting America’s shores and its citizens.



Coast Guard Air Station San Francisco – Mills field

1941 – The Coast Guard and the Greenland Operations:



During 1940 the United States had been looking to the defense of Alaska, Hawaii, and the Panama Canal. An exchange of Atlantic and Caribbean bases for destroyers was being negotiated with the British. Canada and Britain were consolidating their position in the North Atlantic by stationing troops in Iceland and were contemplating countering reported German activities in Greenland. A charting and aerial survey flight of the west coast of Greenland was completed and several possible sites for airfields were determined but there was no follow up on the part of the War Department. American diplomacy went through a good many convolutions during this period. The official American position, simply stated, rested on nonintervention but as the War in Europe progressed the United States became more and more involved.

On 9 April 1940 Germany invaded Denmark. Totally unprepared for war the Danes capitulated on the same day. This precipitated an immediate response as Denmark exercised sovereignty over Greenland and the U.S. did not want to see a German presence in the western hemisphere. In addition, located at the small village of Ivigtut, Greenland was the only known sizeable deposit of cryolite, a soft translucent mineral that looks like quartz, which

when in a molten state and subjected to an electric charge, was used to extract metallic aluminum from bauxite ore. This was the standard means of producing industrial aluminum and was vital to the American aircraft industry. The State Department adopted the position that the Danish Ambassador, Dr. Henrik de Kauffmann, was still the legitimate representative of his country and agreed to work with the Greenland authorities to protect the cryolite mine.

On May 20, 1940, the USCG Cutter COMANCHE transported James K. Penfield, the first American Consul to Greenland, and a new American consulate was established at Godthaab. Over the next three weeks the Coast Guard Cutters CAMPBELL, DUANE and CAYUGA worked in the Davis Straits and Baffin Bay, taking soundings and making preliminary charts of the coast line. The source of the extant charts of Greenland was located in German occupied Copenhagen. The Duane carried a Grumman SOC-4 seaplane which augmented this operation and additionally identified possible locations for the construction of airfields. Two pilots, Lieutenant Shields USCG, Captain Lacy US Army Air Corps, and Coast Guard Aviation Radioman Merada were the aircraft crew. The cutter NORTHLAND put a 3-inch gun ashore at Ivigtut and the CAMPBELL delivered assorted small arms. Fourteen Coast Guard personnel were recruited from within the Coast Guard, accepted discharges, but retained their ratings, and formed the nucleus of an armed guard at the mine. This became the model used to form the American Volunteer Group, *Flying Tigers*, for operation in China prior to the US entry into WWII.

American bases were under construction in Newfoundland, American troops were present and strategic planning was changing to include the defense of Iceland and Greenland. A joint meeting of the State Department, War Department, and Navy department took place on 6 February 1941. It was agreed that it would be desirable to have the defense of Greenland under U.S. control. The conference further recognized that efforts by the Germans to obtain weather data from Greenland were to be expected. During the late summer of 1940 the British had dismantled several weather stations under German control in northeastern Greenland and intercepted a vessel off the coast of Greenland with fifty

Germans, some of them meteorologists, on board. In March a survey expedition made up of American diplomats, military commanders and a representative of the Royal Canadian Air Force departed Boston on the Coast Guard Cutter CAYUGA to locate sites for airfields, weather stations and other military installations. Narsarsuak was reported to be the most promising. On 9 April 1941 an agreement signed by Secretary of State Hull and Hendrik Kauffmann, the Danish Minister to Washington, established an American protectorate over Greenland for the duration of the war.

As soon as the negotiations with the Danish Minister were sufficiently advanced, President Roosevelt authorized the War Department to go ahead with preparations for building the airfields. During the following months various details were worked out. The Greenland force consisted of the Army transport USS MANARGO, the troopship CHATEAU THIERRY, the 21st Engineers battalion, a composite battery of the 62nd Coast artillery (AA), plus the necessary service troops. Colonel Benjamin Giles, Army Air Corps was in command. The Greenland force proceeded to Narsarsuak and construction on the



Bluie West 1 Narsarsuaq Greenland

major U.S. Army and Navy airbase, *Bluie West I*, began in July 1941. The infrastructure was erected, the grading was completed and the first runway was ready for use in February 1942. This airfield was one of the first to make use of steel matting in runway construction, an important engineering development that contributed greatly to winning the war, especially in the Pacific. Construction began on the airfield at *Bluie West 8* at Sondre Stromfjord in October and this airfield was also ready for use in February 1942.

The Chief of Naval Operations, ADM Harold Stark directed naval operations in the Greenland area be expanded to serve two purposes. The first purpose was to support the Army in establishing Greenland airdrome facilities for use in ferrying aircraft to England. This generated convoy escort responsibilities. The second purpose was to defend Greenland and specifically to prevent German operations in Northeast Greenland. This would be a coordinated multi-tasked operation in a harsh environment and the U.S. Coast Guard with its long experience conducting the Bering Sea Patrol, the International Ice Patrol and experience in Greenland waters was the logical choice to head up the operation. In the early summer of 1941 the American naval forces operating in Greenland waters were officially organized. The patrol consisted of two sections; the Northeast Patrol with CDR Edward “Iceberg” Smith in command consisted of the cutters NORTHLAND, NORTH STAR, and the USS BEAR, that had served many years on the Bering Sea Patrol and now had a modernized superstructure. The South Patrol with LCDR Harold Belcher was composed of the cutters MODOC, COMANCHE, RARITAN, and the Navy auxiliary BOWDIN. In October the two commands were consolidated under CDR Smith as the Greenland Patrol, designated Task Force 24.8, and placed under the jurisdiction of the U.S. Atlantic Fleet.

From Cape Farewell up the east coast of Greenland to the Scoreby Sound area where previous German weather station activity had taken place, was a distance of over 600 miles with only one settlement, the village of Ammassalik, in between. There was no habitation between Scoreby Sound and the northern tip of Greenland 1000 miles away. There were, however numerous fjords and other locations along the entire coast where German weather stations could be set up. The NORTHLAND the NORTH STAR and the BEAR. the nucleus of the initial northeast patrol, each carried a Grumman

J2F-4. amphibian. Although cumbersome to put in and take out of the water they proved to be invaluable. These aircraft were sent on countless long search missions over the fjords and mountains looking for enemy activity. They greatly increased the cutters operating and search capabilities.

When the new cutters such as the STORIS and Wind Class icebreakers arrived they continued to utilize on board aircraft.



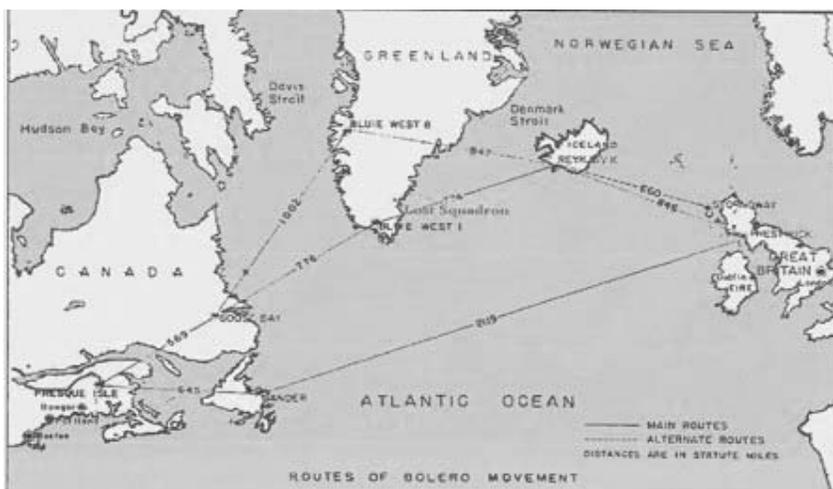
US Coast Guard Cutter Northland with J2F-4 on board

War with Germany was declared December 11, 1941 and Smith, who had been promoted to Captain, found himself extremely short of aircraft and escort vessels to convoy the intensive increase in Greenland shipping and to supply the outposts and the Army weather stations on the Greenland coast. Navy Patrol Squadron 93 was assigned to the Naval Air Station Argentia Newfoundland in May of 1942 to combat the German submarines and provide convoy cover. Six aircraft were based at Argentia and six were based in Greenland; three at Bluie West 1 and three at Bluie West 8. The aircraft based in Greenland were also used by Task Force 24.8 for search, rescue and supply purposes. Smith located ten 120-foot fishing trawlers in Boston, and recognizing their potential for the Greenland operation, requested assistance in obtaining them from the Commandant of the Coast Guard Vice Admiral Russell R. Waesche. They were very capable navigating the narrow fjords, dense fields of icebergs and ice cake, and their maneuverability could not be equaled by larger ships. They served well until a new generation of ships especially designed for the Greenland operation arrived in mid 1943.

Bluie was a code naming system. There was a total of 14 geographical locations that were given these code names. Bluie West 1 (BW-1) to Bluie West 9 (BW-9) on the west side of Greenland; Bluie East 1 (BE-1) to Bluie East 5 (BE-5) on the east side. The east side was in sequence from south to north. The west side was mixed.

Smith was also largely responsible for the creation of the Greenland Sledge Patrol, a contingent of Eskimos, Danish and Norwegian hunters, recruited by the Greenland government, supported by the Coast Guard cutters and supplied by the Army. They patrolled the northeastern coastal regions on dog sleds looking for German weather and radio installations. The NORTHLAND, with two Danish-speaking interpreters on board, became the nerve center for the Sledge Patrol's operations. The patrol had scarcely begun operations when it proved its worth by assisting in the capture of the trawler BUSKOE on 12 September, as that vessel, a small German-controlled Norwegian ship, was attempting to establish a radio and weather station in the Mackenzie Bay area. The patrol continued to be effective in this type of operation throughout the war. Although not one of the primary reasons for establishment, the patrol proved to be valuable for rescue operations as well.

From the beginning all European invasion plans called for the movement of large numbers of U.S. military aircraft to the British Isles. This began in late 1940 when the first Lockheed Hudson was ferried to Ireland through Gander and in March 1941 B-17s and B-24s commenced flying from Gander to Prestwick, Scotland. These aircraft had long cruising ranges and were instrument equipped for flying in bad weather. For fighter aircraft with more restrictive cruising ranges to make it to England, a northern flight route consisting of a series of legs was required. The distance concept between landing fields on the northern route was that a P-38 Lightning, chosen at that time to be the dominant fighter aircraft in Europe, need not fly more than 850 miles to advance to the next base. This left the aircraft with enough fuel to return to the departure base if the destination weather went down. This was part of a Top-Secret operation and was code named Operation Bolero.



In January of 1942 the Air Corps Ferry Command contracted to establish radio range beacons and weather communication facilities along the northern ferry route from the United States to Prestwick, Scotland. Construction began and on June 25, 1942 the first fighter group left Goose Bay, Labrador for Prestwick Scotland completing the trip on 9 July. Because of minimal navigation equipment the P-38s flew in groups of three to five aircraft with a B-17 as a

mother ship to do the navigating, The remaining men and equipment would make the trip aboard C-47 transports or by ship. Weather along the northern route was generally poor and despite prodigious efforts there remained gaps in the communications, navigation, and support facilities and weather reporting was sometime faulty. The weather forecast reliability was improved by stationing Coast Guard cutters along the route of flight that conducted and transmitted weather observations. An auxiliary airfield Bluie East 2 was established on the east coast of Greenland and two additional airfields were constructed in Iceland. The Army expected possible aircraft losses on the northern route to be over 15%. When compared to the losses being inflicted by German U-Boats on North Atlantic convoys at the time this was considered acceptable. Losses did occur but were just under 5%.

On 15 July eight aircraft, six Lockheed P-38s and two B-17s departed Bluie West 8 for Iceland after several days delay. They left with out of date communications codes (codes changed daily) and ran into blizzard conditions. They became lost –were unable to communicate – began icing up and the six P-38s were running out of gas. They reversed course and just barely got back to the east coast of Greenland where all eight crash landed on the icecap. The AAF contacted the Coast Guard and a PBV and crew was made available for a search. The downed aircraft were located near Bluie East 2 East. The Coast Guard cutter NORTHLAND happened to be there. Contact was made and the PBV, piloted by Lt. George Atterberry USN, led a dog sled team to the crash site. All 25 crewmen were rescued and transported to the NORTHLAND, were picked up by the PBV and returned to Bluie West 1.

LT. John Pritchard and ENS. Dick Fuller of the NORTHLAND lead a rescue party that reached the crew of a Royal Canadian Air Force bomber that had been stranded on the ice cap for 13 days and brought them safely back to the ship. Searches and rescues would continue throughout the year. When not needed by the Coast Guard cutters the assigned J2Fs flew out of Bluie West 1 or Bluie West 8. Seaplane ramps were constructed at Bluie West 1 and at Ivigtut.

Although good relations existed between the Coast Guard and Army Air Force personnel at the local level, with Coast Guard liaison officers assigned to the bases, the Army Air Force command was adverse to requesting search and rescue assistance from the Coast Guard unless circumstances forced them to do so. Such was the case in early November 1942. A C53 transport went down somewhere on the east coast of Greenland. It was never found. Several in transit B-17s were sent to look for it. One of the B-17s, PN9E, experienced a white out and flew into the ice cap near Comanche Bay. The ice cap in this area had multiple crevices. The base commander at Bluie West 8 commandeered a TWA C-54 and located the PN9E. Even though the NORTHLAND was in the area the Army decided to do the rescue themselves and set up at Bluie East 2 approximately 80 miles north of the crash site. An attempt was made to equip an Army aircraft with skis but it did not work. The base then sent its two motorized sleds to the downed B-17. One sled was lost in a crevass.



**Lt. John Pritchard and ARM1 Bottoms
First takeoff B-17 PN9E ice cap Rescue**



**Return to ship with two B-17 PN9E
Crewmembers**

On November 28 the Coast Guard entered the operation. The NORTHLAND launched Lt. John Pritchard, with ARM1 Bottoms as crew member, at daybreak and located the downed B-17. He dropped a note asking about landing conditions. The pilot of the downed B-17, 1st Lt. Monteverde

signaled Pritchard not to land because the site was surrounded by crevices. Pritchard found a clear spot about two miles distant and landed in the snow with wheels retracted. Using a broomstick to test the snow, Pritchard and Bottoms made their way on foot to the B-17. They returned to the J2F with three B-17 crewmembers and after pushing it free, departed with two survivors for the NORTHLAND and landed after dark. Early the next morning Pritchard took-off again for another load. After landing the weather deteriorated rapidly and they left with only one B-17 crewmember. A heavy fog engulfed the entire area and Pritchard was unable to locate the NORTHLAND and crashed on the ice cap. The wreckage of the J2F was located by an aircraft four months later but the crew was never found.

LT. Pritchard and ARM1 Bottoms were awarded Distinguished Flying Crosses for their efforts. Lt. Pritchard's citation is below.

**CITATION TO ACCOMPANY THE AWARD OF
THE DISTINGUISHED FLYING CROSS
TO
LIEUTENANT JOHN A PRITCHARD
UNITED STATES COAST GUARD**

For heroism while participating in aerial flights as pilot of a plane which rescued Army fliers stranded on the Greenland Ice Cap November 28-29, 1942. After safely landing on the Ice Cap, he took aboard two of the injured men and, with superb airmanship, successfully took off for his ship, arriving safely. The following day, he again volunteered to resume rescue operations for remaining Army fliers. After getting one more on board, he started for his ship, but failed to arrive.

Winter set in and the crew of the B-17 was sustained by airdrops. Lt. Spencer used the other motorized sled in attempt to get three badly injured men out. The sled broke down on the way back and a base camp was set up about 6 miles from the downed B-17. Lt. Bernard W. Dunlop USN, flying a PBY, made the first of three landings on the icecap on February 5 and got three men out taking them to BE-2. On March 17 he again landed on the ice cap bringing a dogsled party to travel to the B-17 and return to the landing site with survivors. On 5 April he returned to pick up the dog sled party but had engine problems on take off which required repair. The PBY departed with no survivors the next day with reduced power available in one of the two engines. The Dog sled team departed the site for Beach Head Station, Comanche Bay. The dog sled and team was picked up ENS Henderson on April 18 and flown to BE2. On May 8 the Coast Guard party that had been searching for Bottoms and Pritchard were flown out of Comanche Bay for BE-2. Both PBYs returned to BW-1 on May 13.



Lt. B. W. Dunlop USN landed on the ice cap to deliver a dogsled party to travel to B-17 - PNPE and get the remaining three survivors out.

The 230 foot Coast Guard Cutter STORIS, designed to serve as a supply ship for Blueie bases, was commissioned on September 30 1942 . The ship was lightly armed, had sonar, a hull strengthened for ice operations and carried an aircraft. In mid 1943 three of the new 180 foot Buoy tenders arrived. They were single screw and had icebreaker bows. They were used to install and maintain aids to navigation, supply duties and when required; convoy duty. The establishment of the airbases and Army installations in Greenland generated more marine traffic than had ever before been experienced. Prior to the Greenland Patrol the Danes had operated one light station and piles of rocks upon which kerosene lanterns were hung. Late in 1941 the Coast Guard began the implementation of a system of aids that would make the fjords and coastal waters tolerably safe for navigation. In the course of two years, in extremely primitive conditions, they set up range lights, shore lights, shore markers and radio beacons at more than 50 sites. In autumn of 1944 the new ice breakers EASTWIND and SOUTHWIND, specifically designed for arctic operations, arrived. They were armed with four 5-inch guns, twelve 40mm anti-aircraft guns six 20mm anti-aircraft guns, depth charges, hedgehogs, and carried an aircraft on board.

Aircraft ferry operation plans for 1943 called for discontinuing the Bolero flights of fighter aircraft going to Europe. With convoy losses considerably reduced these aircraft and some twin engine bombers would again be transported by ship. During the Bolero operation, June 1942 to January 1943, 185 P-38s, 150 transports and 366 heavy bombers had been delivered to Great Britain over the northern route. Four engine bombers were to fly directly from Gander to Prestwick and two engine aircraft two engine aircraft were scheduled for the northern route via Greenland. However, in practice many four engine aircraft also used the northern route. . Ferried aircraft in 1943 moved over the ferry routes with much greater safety. Experience had been gained; communications had improved; weather reporting and forecasting had improved; and on March 11 the Coast Guard's Greenland LORAN station went on the air. The North Atlantic LORAN chain, the first of many throughout the war, vastly

improved navigation capabilities of both surface and aircraft. The aircraft loss rate for 1943 was 1.14%.



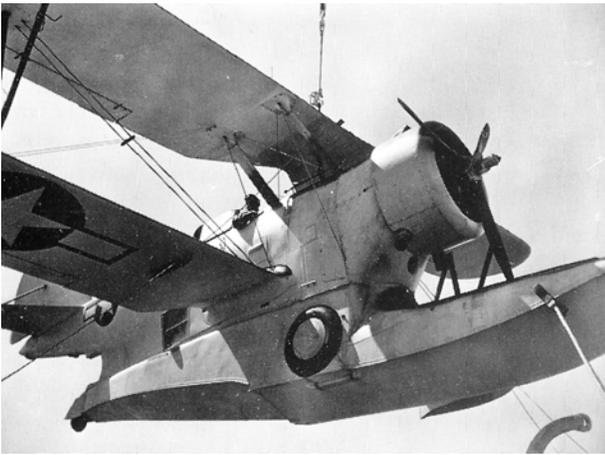
Coast Guard Cutter STORIS with J2F-5 on board

The Greenland Patrol PBYs were organized into an all Coast Guard VP squadron in August of 1943. It is the only Coast Guard VP squadron to have been designated as such and was in reality an evolution. The development of VP 6 is treated as a separate Timeline narrative in order to provide a more complete and detailed history. RADM Smith had been appointed to flag rank in June of 1942 and in November of 1943 was given the command of all of Task Force 24 which included both Iceland and Greenland and surrounding waters. Coast Guard combat operations continued and as late as the end of 1944 units were still engaged in locating and destroying German weather stations and support operations.

The cutter NORTHLAND left dry-dock at the Boston Naval Yard at the end of May 1944, for the trip back north. The ice-blue-and -white camouflage, which proved to be very effective in the Greenland ice pack, had been painted on both the hull and superstructure. LTJG Ken Bilderback, his aviation crew, and a J2F-5 joined the ship in Casco Maine. The initial destination, via Blue West 1, was Reykjavik Iceland where 20 Army Commandos were picked up for northeastern Greenland operations.

Many reconnaissance flights were made along the coast and to plot open leads through the ice. On one flight a German weather station was located near the Shannon Island, about 50 miles north of the Arctic Circle and two miles off the Greenland Coast. The Army commandos checked out the station. The station was destroyed after finding that it had been abandoned earlier in the year. Later a German trawler, of 180 feet in length, was sighted in the ice floes about 20 miles southeast of Shannon Island. It was determined that it had been caught in the ice, burned out, and an attempt had been made to scuttle it. The German crew was not present having apparently been rescued.

Fog set in but after three days at anchor the NORTHLAND resumed patrol. Rounding the southeast point of Shannon Island a vessel, similar to the burned out German trawler, was spotted. The ship



**J2F-5 being hoisted aboard the NORTHLAND ,
Ken Bilderback, pilot and Spike Wojicki radioman**

appeared to be headed for Dove Bay, about 75 miles north of Shannon Island, and the chase was on. The NORTHLAND was a short distance into the icepack when a strong concussion was felt and a geyser of ice and water flew skyward off the port quarter. This was followed by another blast a little farther astern. Two torpedoes had been fired at the NORTHLAND which were initially thought to be mines as a submarine firing torpedoes in an ice pack had not been heard of. This changed the NORTHLAND'S tactics and the ice flows were used as cover as she pursued and gained on the trawler. After five hours the trawler came within maximum range of the forward 3-inch gun. No direct hits had purposely been made as it was desired to capture the ship undamaged. Three hours later, in open water, the

NORTHLAND had caught the trawler and ordered it to surrender. The crew departed the trawler in lifeboats but had planted demolition charges which exploded and sank the ship.

The German crew was taken aboard and as the NORTHLAND turned eastward a conning tower of a submarine was spotted. Several shots were fired at the submarine, with no effect, as it fully submerged. A search began to find an open lead large enough for the J2F to take off in. Finding a minimal area the Duck was launched and searched for a little over an hour and a half without sighting the submarine. The following day another attempt was made and a little over an hour into the search a German submarine was sighted. The J2F circled and commenced an attack from the stern of the submarine. Two bombs were dropped, landing close aboard, but apparently caused little damage to the submerging submarine. It was felt that a shipboard type depth charge, set for 30 feet, would be more effective and a system was jury-rigged to allow the aircraft to carry and manually drop a Mk VI depth charge. Aerial searches, weather permitting, continued through over the next week without success. The cutter EASTWIND made rendezvous a few days later. and the German Prisoners were transferred.



**Ken Bilderback on board CG Cutter
NORTHLAND – Greenland 1944**

LTJG Ken Bilderback received the following citation.

“ LTJG Bilderback contributed materially to the outstanding successful summer operations of the Greenland patrol. Frequently flying as many as three daily missions under extremely hazardous conditions, LTJG Bilderback increased the effective patrol range of his ship through his own observations and through the transfer of vital stores to isolated patrols and outposts. His timely sighting of an armed enemy trawler resulted in its interception by his mother ship, the enemy's subsequent destruction, and the resultant prevention of the enemy weather station. ”

The patrol was continued until the first week of October. By then it was semi-darkness most of the day. High wind sleet, snow, and fog were daily affairs. In mid October the NORTHLAND accompanied by the cutter STORIS arrived at Reykjavík and the J2F was put ashore.

The final campaign against the weather stations marked the end of American actions against the Germans in Greenland.

1941 – Grumman J4F-1 Purchased:



J4F-1 in Pre World War II Livery

The Civil Aviation approved type certificate for the Grumman model G-44 Widgeon was issued on 5 April of 1941. The initial production of 41 aircraft was delivered to civilian customers and the Portuguese Navy. Production then switched filling orders for both the Navy and Coast Guard for a light amphibian utility transport designated as J4F-1. The Coast Guard acquired 25 J4F-1 aircraft purchased in two groups. The initial order consisted of eight aircraft, purchased under contract TCG-33459, with the first aircraft delivered from Grumman on 7 July 1941. These aircraft were given USCG service numbers V197 through V204. The following year the second batch, consisting of 17 aircraft, was acquired under contract TCG-34026. The first J4F from this batch was delivered to the Coast Guard on 25 February 1942 and the final was delivered on 29 June 1942. These aircraft were given the service numbers V205 through V221.

In addition to utilizing the J4F-1 as a utility transport the Coast Guard intended to use them for search and rescue purposes. The Coast Guard J4F-1, basically the civilian G-44 Widgeon differed only in the addition of a hatch on top of the fuselage, just behind the wing, for loading stretchers. With the advent

of World War II these aircraft were assigned to coastal anti-submarine patrols and a wing rack was added to each aircraft beneath the starboard wing. These racks could hold a depth charge, a bomb, a raft, or search and rescue gear. A J4F-1 patrolling out of the Houma, Louisiana, piloted by Chief Aviation Pilot Henry C. White, was credited with sinking the *U-166* on 1 August 1942 in the Gulf of Mexico. In the year 2001 this was determined to be in error when a diving operation located the *U-166* in a position different from the location of White's attack. White's aircraft has been preserved in the Naval Aviation Museum in Pensacola, FL.

Manufacturer	Grumman Aircraft Engineering Corporation
Designation	J4F-1
Aircraft Type	Light amphibian; utility transport
Wing Span	40'
Height	8' 10"
Length	31' 1"
Fuel Capacity	108 gallons
Top Speed	153 mph
Cruising Speed	138 mph
Stall Speed	61 mph
Initial Climb	870 fpm at sea level
Range	780 nautical miles
Empty Weight	3,225 lbs
Gross Weight	4,525 lbs
Crew	2
Service Ceiling	14,600'
Engine(s)	2 x 200 hp Ranger L-440-5; 2 x two-bladed, 6' 10" Sensenich 32-RS-72 propellers

1941 -- Coast Guard Acquires Consolidated PBY-5A/6A Aircraft:



Coast Guard PBY-5A on the ramp San Diego with airborne droppable life boat attached

The Consolidated PBY Catalina was created in response to the U.S. Navy's request to replace the Consolidated P2Y and the Martin P3M. The XP3Y, designed by Isaac Laddon, distinguished itself clearly from its precursors by its monoplane configuration. First flown in 1935, it was an all-metal flying boat with internal wing bracing which greatly reduced drag. The wing tip floats retracted upward into the wing tip adding to the aerodynamics of the wing. Performance was modest but it was a sturdy, reliable aircraft, ideally suited for long patrols over the oceans.

The US Navy had given the prototype the designation P3Y, but then changed it to PBY because of the Catalina's ability to carry four 1000 pound bombs under the wing. PB meant "patrol bomber", and Y was the manufacturer letter assigned to Consolidated. Consolidated received an initial order for 60 PBY-1s, the first production model, in 1935. The first aircraft of this series entered service in 1937. They were followed by 40 PBY-2s, 66 PBY-3s, and 33 PBY-4s; the latter model introduced the large dorsal blisters that became so characteristic for the Catalina. Starting in September of 1940 there were 684 PBY-5s built. A retractable tricycle landing gear was added and the amphibian PBY-5A became operational in October 1941. The name Catalina was given to the aircraft by the British, but later also adopted by the U.S. Navy. It was called a Canso by the RCAF.

Two Pratt & Whitney R-1830 radial engines were installed in the wing leading edge just aft of the cockpit. To keep the propellers away from the water, the wing was put on top of a sturdy pylon, and braced with two struts on each side. The fuselage itself had a two-step flotation bottom, and a rounded upper side. The fuselage was wider than it was high, an unusual feature for a flying boat, and inside there was only one deck. In the nose, there was a position for a gunner / bombardier. Behind him was the cockpit for the two pilots, and immediately aft of the cockpit there was a cabin for the navigator

and the radio operator. Behind them was the flight engineer, whose workplace extended into the wing pylon. Aft of the wing there was a cabin with bunks; finally, there were two waist gun positions covered, in most versions, with large blisters. The PBY was one of the first US aircraft to carry radar. At first this was a metric wave radar with arrays of dipole antennas on the wings, and later a centimetric radar in a fairing on top of the cockpit. A Leigh light was installed under the wing.

The Naval Aircraft Factory built 156 Catalinas. These were designated PBN-1 and named Nomad. They had a new, sturdier wing, larger fuel tanks, a longer hull, and a taller tail surface. These changes were also incorporated in the PBY-6A

The first PBY obtained by the Coast Guard, V189, was purchased from the Navy in the spring of 1941. It was specially outfitted at Air Station San Francisco with a nine-lens-camera for mapping coastal regions around the country. While the arrangement worked well in the lower 48, after two mapping trips to Alaska the camera was transferred to a newer PBY-5A (PBY BuNo 08055), an amphibian, making it more versatile in the extreme environment of Alaska. The detachment operated out of NAS Kodiak.

Because of the Navy's great need for PBY patrol aircraft in the North Atlantic and the Pacific it would be early 1943 before the Coast Guard acquired them in significant numbers.

In 1943 Construction of the Pacific LORAN chains began. Coast Guard PBY aircraft, V189, reported for duty, having been assigned by Headquarters to transport personnel, mail, supplies, and materials, to the various sites to expedite the construction. Flight surveys of the sites for the Loran stations were made. These inspections provided a good grasp of the problems involved in the landing of materials and the construction of the stations. Construction of the Loran chains began in Alaska and the construction of additional chains followed the battles across the Pacific to Japan. V-189 was permanently assigned to this Top Secret project.

On 5 October 1943 an all Coast Guard Patrol Squadron, VP-6 CG, home based at Narsarsuak, Greenland, code name Blue West 1, became operational. Thirty officers and 145 enlisted men were assigned to the squadron. In the hostile environment of the North Atlantic VP-6 provided anti-submarine patrol, air support for convoys, search and rescue, intelligence survey flights, as well as mail and medical supply delivery.

In December of 1943 the Navy established the first Air Sea Rescue Squadron at Air Station San Diego. An all Coast Guard unit, it led to the Coast Guard's heavy involvement in Air-Sea Rescue. Starting in 1944 the Coast Guard had the Search and Rescue responsibility for the Continental Sea Frontiers. By the end of 1944 there were 114 PBY-5A/6As in Coast Guard service.

Consolidated PBY-5A / 6A "Catalina"

Manufacturer	Consolidated Vultee	Designation	PBY; PBY-5A; PBY-6A
Aircraft Type	Patrol flying-boat	Wing Span	104'
Cruise Speed	125 mph	Height	18' 11"
Stall Speed	69 mph	Length	63' 10"
Fuel Capacity	1,750 gallons	Empty Weight	15,384 lbs

Range	4000 miles @ 6000 ft.	Gross Weight	24,332 lbs
Service Ceiling	23,4000 ft.	Engines	Two R-1830 Radial--1200hp
Crew	7	Propeller	Curtiss-controlled pitch
Armament	Two .50 caliber machine guns; up to three 30 caliber machine guns; 4000 pounds of bombs, torpedoes or depth charges.		

1941 - Coast Guard Aviation Anti- Submarine Operations:

The East Coast of the United States



**Grand Admiral Karl
Donitz**

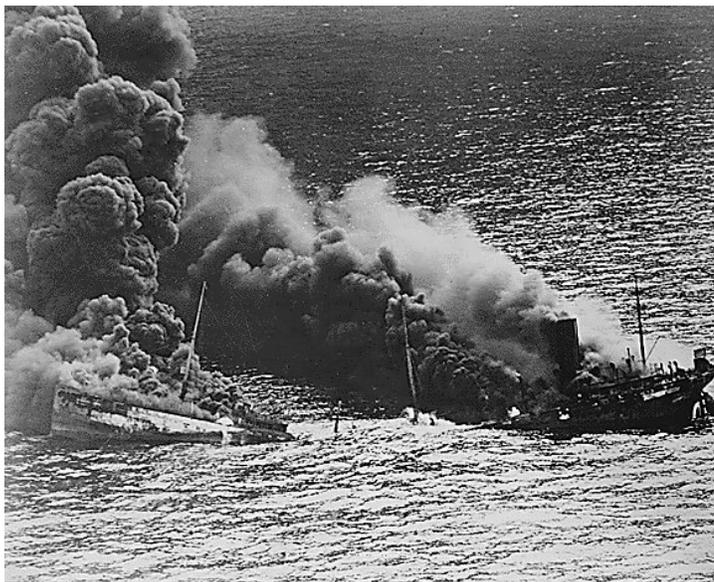
As a result of the Japanese surprise attack on Pearl Harbor Germany was bound by agreement to declare war on the United States. The United States and Germany declared war on each other on December 11, 1941. Unlike most navies operating submarines the primary target of German U-boats was merchant shipping in order to cripple the enemies' ability to wage war. Admiral Karl Donitz, the Commander of German Submarine Forces, immediately drew up plans for operation *Paukensschlag* ("Drumbeat"), a devastating attack on shipping along the North American eastern seaboard, arguably the most congested sealanes in the world, using 12 of the longer range Type IX boats. Donitz believed that the industrial cities of the eastern seaboard were vulnerable to the disruption of these sea lanes. Oil was critical for the American war effort. Most of the oil was provided by ships carrying it from the Netherlands West Indies,, Venezuela, and the Gulf of Mexico ports of Houston and Port Arthur Texas. The Naval Staff in Berlin, however, would release only six U-boats, one of which encountered mechanical difficulties, leaving only five submarines for the opening moves of the campaign.

As the U-boats exited the Bay of Biscay they were picked up and plotted by British intelligence. The progress of the submarines was observed and it was deduced that the target area was the North American eastern seaboard. This information was passed to Admiral Ernest J. King, Chief of Naval Operations, but little or nothing was done about it. There was a shortage of anti-submarine vessels partly because of President Roosevelt's 1941 decision to loan 50 obsolete destroyers and Coast Guard Cutters to Britain in exchange for bases and partly because available escorts were used for North Atlantic convoy duty. ADM King directed a frantic effort to reinforce the Pacific Fleet and compensate for loses. VP-51, VP-71, and VP-72 were ordered to the West Coast and thence to Hawaii. Patrol Wing 8 was transferred to the West Coast. VP-52 and half of VP-81 stationed at Key West were immediately sent to patrol the Pacific approaches to the Panama Canal in case of a Japanese attack. To compound the problem ADM King held the Atlantic Fleet in reserve. For all practical purposes the East Coast of the United States had been stripped of escort vessels and its anti-submarine aviation.

The German offensive began 11 January 1942 when U-123 sank the SS Cyclops south of Nova Scotia. The first wave ended operation on February 6 and headed back to Germany. They sank 25 ships for a total of 156,939 tons. They were replaced by succeeding waves of U-boats without interruption. During the first six months of the U-boat offensive in North American coastal waters 397 ships totaling

over 2 million tons were sunk with the loss of roughly 5000 lives. In the process only 7 U-boats were sunk.

Rear Admiral Adolphus Andrews, Commander of the Third Naval District was given the command of the North Atlantic Coastal Frontier consisting of the First, Third, Fourth and Fifth Naval Districts. This would later expand southward and become the Eastern Sea Frontier. At the beginning of January the surface craft available to him to combat the U-boats were 4 - PY boats, 4 - SC boats, 1 - 165' Coast Guard Cutter, 6 - 125' Coast Guard Cutters, 2 - PG boats, and 3 - Eagle Boats. The review of the aircraft revealed similar conditions. There were 51 - Trainers, 18 - Scouts (OS or OB) 14 - Utility, 7 - Transport, and 6 - Patrol aircraft. Of this number 18 were Coast Guard aircraft; all of them unarmed at this time.



Tanker sunk off the east coast 1942

Once in the hunting grounds, German submarines would rest on the continental shelf from early morning until late afternoon. During the day the U-boat would rise to the surface for air and sunlight, usually during late morning, for a limited time, submerging again if sighting any object. Late in the afternoon they began the night's activity against the shipping lanes. Unbelievably the merchant ships ran with their running lights on and were silhouetted against the fully-lit coastal cities and resort towns. All navigation aids were still lit and the ships followed the established sea lanes. The surfaced submarine would lay in wait for an appropriate target to pass by. Surface attacks were preferred by the U-boat commanders. The Type IX boat had a surface speed of 18 knots. The submerged range was limited to 70 mile at 4 Knots. Periscope depth attacks were made if operations dictated. With the advent of submarine tankers the VII boat also began operating in American waters.

An aerial patrol utilizing available aircraft was initiated. With the limited daylight operations conducted by the submarines and the effectiveness of aircraft limited by a lack of radar and darkness, the odds of locating a submarine were not good. What they did see were oil slicks where the tankers had been sunk, debris, lifeboats with survivors, people clinging to rafts, some in life jackets and dead bodies. This was the result of the previous night's U-boat activity. The aircraft would drop provisions to provide immediate help, find a ship or boat and direct it to the survivors. Many were wounded or badly burned and in great need of medical assistance. Others were beyond the point of endurance and slipped away into the sea. When evaluating the situation the lives of the survivors were balanced against the risks off an offshore landing. Many were made. Coast Guard records showed 95 landings in the sea and over 1000 rescued during the period Jan 1942-June 1943.

Three OS2U Kingfishers on a routine patrol spotted men in the water 30 miles east of Cape Hatteras. Depth charges were dropped in an area where it would not injure the men. All three aircraft landed and picked up all the survivors who rested on the wings until a boat arrived from the Elizabeth City air station to pick them up. A PH-2 Hall boat, while on patrol, spotted a large oil slick 100 miles south of Biloxi, Mississippi. This marked the spot where a German U-boat had torpedoed and sunk a Norwegian oil tanker which had been traveling unescorted. Two badly damaged lifeboats and several survivors were spotted in the rough oil covered sea. With no sign of a U-boat in the area the PH-2 landed and taxied close to the damaged lifeboats. The aircrew removed one sailor with an apparent broken back. Several others suffering from severe burns were taken aboard as the life boat broke apart and sank. The crew taxied the aircraft through the thick oil rescuing a total of twenty-one sailors from the sea. An OS2U Kingfisher on patrol out of Miami received a radio message to search for survivors of the torpedoed tanker GULFSTATE. When locating the remains of the tanker the pilot saw three groups of survivors. Dropping the depth charges in a location distant from those in the water he landed and picked up the three men in the first group. He taxied to the second group and gave them his rubber raft for support and proceeded to the third group, one of which was badly burned, and took them aboard his already overloaded aircraft. He then stood by until additional aircraft arrived to assist.

A favorite hunting ground for German submarines was in the waters off Cape Hatteras, North Carolina. The narrowness of the continental shelf enabled the U-boats to operate in deep water close inshore with great effectiveness. Ordinarily two U-boats were stationed there operating on a carefully prepared schedule. On the 25th of January three J2F-5s were taken from the Atlantic Fleet pool, configured to carry two 325 pound depth charges and stationed at the Coast Guard Air Station Elizabeth City. Elizabeth City was chosen because of its strategic location. Two days later Aviation Pilot Harry Logan made an attack on a submerging submarine straddling it with two 325



J2F-5

pound depth charges. On 28 January RADM Andrews attempted to obtain additional aircraft for the CG air station. He wrote to ADM King "It is understood, there are approximately twenty PBY-5s belonging to the Royal Air Force now at Elizabeth City, N.C. and due to lack of ferry crews they are not in transit. In view of the immediate demand for long range patrol planes – it is suggested that arrangements might possibly be made for temporary assignment for six of the PBYs at Elizabeth City until such time as suitable replacements can be furnished." The request was not approved. However, by means of local arrangement, two PBY-5As were made available for a short duration.

Commander, North Atlantic Naval Coastal Frontier in a memorandum written at the end of the month on conditions in the Fifth Naval District stated "The available forces have been entirely inadequate to handle the situation properly. Constant offshore patrols should be kept off the Capes and the critical Hatteras area. This is impossible with the forces available." It was pointed out that "From the 18th to the 25th, when there were no armed planes at Elizabeth City, six sinkings occurred within a radius of



Arming a PH-3 Hall Boat with aerial depth charges

were being used to train pilots while the contribution of the experienced pilots of the Coast Guard was restricted because of the "unarmed obsolete" planes used.

In February negotiations were begun which promised to alter this situation. On the last day of January, the Commandant of the Coast Guard informed the Bureau of Aeronautics that personnel under his command were not being used to full advantage. It was his recommendation that forty-six additional planes be assigned to bases throughout the country. One week later the Chief of the Bureau of Aeronautics approved this recommendation with the suggestion that forty OS2U-3s be assigned to Coast Guard Stations as soon as possible. On the ninth of the month, the Chief of Naval Operations took further action in the matter by ordering that all of these aircraft be located on the Eastern Coast instead of dispersed throughout the country as originally planned. On the 13th, the planes were assigned to five Coast Guard air stations from Salem, Mass., to St. Petersburg, Florida, but the dates of delivery were estimated as February 27 through March 11. The first OS2U-3 was delivered on The 28th and the rest at the rate of four per day. Additional OS2U-3s were later delivered to the Biloxi and San Francisco air stations. The JRFs and the increasing numbers of J4Fs were fitted with bomb/depth charge racks and in some cases local fabrications provided additional capability to previously unarmed search planes. The Coast Guard air stations finally had armed aircraft.

By the end of 1941 the British Navy had developed convoy protection to the point where Admiral Doenitz elected to deploy assets to the mid-Atlantic. It was suggested to Admiral King that a similar convoy system be set up to combat the German submarine operations along the eastern seaboard of the United States. ADM King rejected the suggestion. In March representatives of the petroleum industry met with the Navy and War departments warning them that if the rate of tanker sinkings was maintained that America would be crippled due to the lack of oil. The situation was so serious that in the same month Winston Churchill wrote President Roosevelt "I am most deeply concerned west of the fortieth meridian and in the Caribbean Sea. The situation is so serious that drastic action of some kind is necessary." President Roosevelt got ADM Kings attention and RADM Andrews was directed to plan and develop a coastal convoy system. RADM Andrews put a temporary convoy system, referred to as the "Bucket Brigade," into operation which moved ships from protected anchorage to protected anchorage by whatever escort vessels were available.



OS2U-3s on the ramp -- Coast Guard Air Station Salem

During January and February the preponderance of sinkings occurred along the coastline between Cape Hatteras, North Carolina to a point south of Cape Cod, Massachusetts and then off shore on the route to Halifax Nova Scotia where Atlantic convoys were formed. By April the majority of all sinkings were occurring in the Cape Hatteras area. Based on this information the Commander Eastern Sea Frontier chose the Cape Hatteras area to evaluate the effectiveness of the convoy system. RADM Andrews's assets were still limited but more were coming available. Ships sailing between the Chesapeake and Cape Lookout spend the night in protected anchorages. In the early morning the merchantmen would form up in four ship columns. RADM Andrews had Two Coast Guard 165 foot cutters, Four Coast Guard 125 footers, eight British trawlers, four PC-110 footers and a pool of 20 Coast Guard 83 footers attached to the Fifth Naval District that were available. Aircover was provided. Coast Guard Air Station Elizabeth City had the patrol responsibility for the Cape Hatteras area.

The activity report of the Eastern Sea Frontier lists an attack on an enemy submarine by a Coast Guard OS2U on 7 April, another on 8 May, and on May 15 an OS2U spotted a U-boat off Cape Hatteras. Twelve men were seen on deck just as the aircraft started the bombing run. The U-boat at the same moment began to dive. Ten of the submariners were able to get down the hatch but two were left on deck. Two depth charges were dropped 150 ahead of the conning tower. The U-boat went under and the two depth charges exploded. The pilot continued to circle and was joined by another aircraft. He could no longer see the men in the water but he did see pieces of wood rising and then an oil slick. The destroyer Ellis came over and dropped more depth charges and more oil came up. They did not sink the U-boat. It was later determined that the Ellis had depth charged a sunken ship and that was

where the oil came from. Still the Coast Guard plane made a nearly successful attack on a U-boat and this was a harbinger of things to come.

With the success of the “Bucket Brigade” a 20% increase in escort vessels and aircraft was made and the first full convoy took place on May 11. On May 10 RADM Andrews sent a dispatch to his command outlining his expectations. Very little had been left to chance including air support. A circle with a radius of 20 miles was patrolled around the ships and searches were to be made along the track of the convoy 25 miles to each side. It was a south bound convoy leaving Hampton roads and on the first day it was covered by planes from Langley Field and CGAS Elizabeth City, On the second day aircraft from Cherry point covered them at daybreak and then the convoy was picked up by aircraft from Wilmington and Charleston. On the third day the planes from Charleston accompanied the convoy all the way to Jacksonville and stayed there. On the fourth day planes from Banana River picked up the convoy and on the fifth day aircraft from the Coast Guard Air Station Miami took over. By the last of May a full convoy system had been established. During June Convoy escort and aircover, some of the aircraft newly equipped with airborne radar, were provided for coastal convoys from Halifax in the north to Key West in the south. ADM Doenitz had recognized in early May that the “American shooting season” as it was called in Germany was over. By use of submarine tankers placed in prearranged location he was able to deploy his submarines into the Florida Straits, the Caribbean and the Gulf of Mexico.

The Gulf of Mexico



German type IX submarine

The success of the “Bucket Brigade” also had an impact on ADM Doenitz. He strongly felt that it did not really matter where the enemy merchant ship was sunk because the shipping network was employed to accomplish a single objective. His strategy, therefore, was that his U-boats should be employed wherever the most merchant tonnage could be sunk with the least cost to his submarine fleet. Thus he began operations off the South Florida Coast and in the Gulf of Mexico. From May through August 1942 the Gulf Sea Frontier, consisting of the Gulf of Mexico, the northwestern Caribbean, most of the Bahamas, and the east coast of Florida from Miami up to

Jacksonville was the deadliest place on earth for shipping. In the Gulf of Mexico alone, during a five month period, 58 ships of approximately 300,000 tons would be sent to the bottom.

The Gulf Sea Frontier was formed to defend the southern coast from Jacksonville to Texas on February 6, 1942. The Seventh and Eighth Naval Districts headquartered in Key West and New Orleans respectively comprised the Gulf Sea Frontier under the Command of Captain Russell Crenshaw. The forces at his disposal were even less than RADM Andrews originally had at his disposal and they were overwhelmed by the events that followed.

The first ship sunk by a U-boat in the Gulf Sea Frontier was an American tanker, PAN MASSACHUSETTS. ADM Doenitz had moved his main point of attack southward to a position off the Florida coast. During the month of April 18 additional ships were sent to the bottom. During May, with the advent of RADM Andrews full convoy system extending down to Miami, the German U-boat emphasis switched to the Gulf of Mexico. The first U-boats U-506 and U-507 entered the Gulf of

Mexico at the beginning of May to take up station southeast of New Orleans. There were six submarines operated in the Gulf during May and seven during June. They sunk 38 ships. The initial surface force to oppose this consisted of two Destroyers, nine Coast Guard Cutters of various sizes, a limited number of small patrol craft and unarmed Coast Guard Auxiliary vessels. Aircraft available consisted of Navy Patrol Squadron VP-81 flying six PBYs and a detachment of three B-18 bombers at Key West, nine Coast Guard OS2Us at St. Petersburg, six CG OS2Us and two armed JRFs, and the first of the armed J4Fs at Biloxi. There were in addition 8 unarmed aircraft.

In mid May RADM James L. Kaufman took command and began taking action. He felt the Keys were too remote and moved the Frontier offices to Miami which provided better communications with air and surface forces. He instituted a coastal dimout and patrolled for compliance. A hunter killer group concept was launched and additional forces were obtained. On June 13, after being pursued through the Bahaman Channel by a Key West Killer group consisting of two destroyers, the Coast Guard Cutter THETIS and Army B-18s the U157 was sunk by the THETIS. The B-18s were equipped with early air to surface radar, not as effective as the later microwave radar, but never the less a welcome addition.

During 1942 and 1943 the Coast Guard air station at St. Petersburg flew patrols over Tampa Bay and its approaches both south and north. The air station had nine OS2U aircraft assigned capable of carrying a 325 pound depth charge under each wing. A two plane detachment of OS2Us known as the 'Port St. Joe Detail' flew patrols in the northeastern Gulf of Mexico in the area of Cape San Blas. The tanker JOSEPH Mc CUDABY was sunk southwest of Tampa on May 4th and another ship off Cape San Blas on June 29th. Surprisingly this was the sum total off the west coast of Florida.



OS2U-3 with aerial depth charges attached

There were 10 U-boats that operated in the Gulf during July and 7 in August, usually for two week periods, resulting in 27 merchant vessels sunk. Most of the sinkings were concentrated in an area south of the Mississippi River delta. This was the mid point of the patrol area assigned to the Coast Guard air station at Biloxi. The Biloxi patrol area extended from a position east of Mobile Bay to the Galveston area.



J4F-1 Operating from a grass strip – Pre-war markings

submarine patrols each day. The aircraft carried a single 325 aerial depth charge under the wing. There was no storage for depth charges at Houma, so once they were attached to the aircraft they remained there until used or removed for major maintenance. Light maintenance was performed by the flight crews but when major maintenance the aircraft were flown to Biloxi for the work and then returned to Houma. Another detachment, using six OS2U-3s was established at Barataria Bay which is just west of the Mississippi River Delta south of New Orleans. They also flew five four hour anti-submarine patrols a day. Operations were from the water and the USS CHRISTIANA, YAG-32, a converted auxiliary vessel serving as a seaplane tender, supported the aircraft. The planes were moored to buoys between missions. Personnel lived on board the CHRISTIANA. Again the aircraft were flown to Biloxi for major maintenance.

On 1 August 1942 Chief Aviation Pilot Henry C. White with RM1 George H. Boggs as his sole crewmember was flying the afternoon patrol. They were at 1500 feet at the base of a broken cloud deck 100 miles south of the Houma base. Through the open windows of their twin-engine Grumman J4F-1 Widgeon amphibian they could see about 10 miles across the hazy gulf sea. White had just turned to the northeast to set up a ladder search for the assigned area and moments later they saw a surfaced German submarine. White started to maneuver the Widgeon behind the sub for a stern attack but it immediately became obvious that as soon as White and Boggs had seen the sub, the sub had seen them, and the U-boat began to slide underwater in a crash dive. White banked sharply to starboard and from a half mile away began his dive towards the sub fully aware that he had only a sole depth charge under his wing and that he would have but one try. At an altitude of 250 feet the single depth charge was released. Boggs stuck his head out of the window and watched the depth charge fall into the Gulf waters, its fuse set to explode 25 feet below the surface. He estimated it entered the water 20 feet from the submarine on the starboard side. Boggs saw a large geyser of water rise from the explosion. White later wrote that the submarine was visible during the entire approach being just under the water but still clearly visible when the depth charge was released. When they circled back around they saw only a medium oil slick. German records obtained after the war verified that the U-166 had been sunk in that area during at the beginning of August. White and Boggs were given credit for the sinking .

Note: In 2001, the U-166 was discovered near the wreck of the SS ROBERT E. LEE a vessel attacked and sunk by the U-166 on 30 July 1942 about 45 miles south of the Mississippi River Delta and well away from White's reported position when he attacked a U-boat. The LEE's escort, USS PC-566, reported attacking a U-boat after the patrol craft's crew sighted a periscope minutes after the

Lee was torpedoed. After dropping depth charges near where the crew had seen the periscope, they reported spotting an oil slick. The commanding officer of the PC-566 claimed that they had damaged the attacking U-boat in his report of the action.

Bottom searches of the area of the reported attack by the USCG J4F Widgeon have been made by civilian divers and no wreckage of any kind has been found. Interestingly, another U-boat, the U-171, reported coming under attack by an Allied aircraft on 1 August 1942 in the general area of that White reported attacking a U-boat. The U-171 was sunk prior to the end of the war and the ships log is not available for verification

Additional assets became available and by the end of July a full convoy system was in place. In addition the Army Air Force Anti Submarine Command had supplied additional aircraft for patrol and convoy escort. The convoys proved effective and the number of sinkings decreased. There were 7 sinkings in August and 1 in September. Donitz redeployed assets to the North Atlantic and to the trade routes coming along the African Atlantic coast.

The submarine battle of the Atlantic and Gulf Coasts was essentially over. The Last German submarine left the Cape Hatteras area on 19 July and the last of the U-Boats left Gulf of Mexico during the first part of September 1942. From February through December of 1943 there were one or at times two U-Boats that reappeared, however, during this 11 month period only four vessels were sunk. Singular U-Boats also returned during 1943 and mined the approaches to the East Coast and Gulf Coast ports. Sporadic sinkings did occur but they were far fewer in number.

The West Coast of the United States:

The Japanese had the most diverse submarine fleet of any nation in World War II. The fleet included midget submarines, medium-range submarines, long-range fleet submarines with ranges exceeding 20,000 miles, and submarines that could carry and launch aircraft. They built 110 submarines capable of submerged speed 16 knots and a surface speed of 23 plus knots. In addition they employed the Type 95 torpedo which gave them three times the range of the Allies.



**Japanese Type B-1 Submarine capable of launching a
Yokosuka E14Y1 "Glenn" seaplane**

Considering the advantage in range, speed, and torpedo capability, Japanese submarines achieved surprisingly little. This, in large part was due to Japanese naval doctrine which employed the submarines against enemy warships and also the use of them as screening forces ahead of fleet movements. This approach brought success in 1942 when they sank two carriers, one cruiser, and several destroyers plus inflicting damage on two battleships, one carrier on two different occasions, and a cruiser. However, as the Allied anti-submarine technologies, methods, and numbers improved the submarines were never again able to achieve this level of success.

Japanese activity on the West Coast during the months immediately following the attack on Pearl Harbor was limited to submarine operations. In a pre-war operations order dated 5 November 1941 the

Japanese Navy had directed its Sixth Fleet to conduct submarine reconnaissance of the American Fleet along the West Coast of the United States and conduct surprise attacks on American shipping. A detachment of nine modern submarines, seven equipped to carry small patrol planes, arrived off the coast and dispersed to nine stations from Cape Flattery in the North to San Diego in the south. They stayed on station for a two week period. During this time two tankers were sunk off the California coast and another was shelled. A fourth tanker was shelled off the mouth of the Columbia River. The detachment withdrew and there was no further activity off the coast until February 1942.

Navy Patrol Wing Eight had the responsibility for training and ASW warfare on the West Coast. The aircraft available were initially limited as the majority of VP squadrons were being deployed to the Pacific. Squadrons operated OS2Us, PBYS and PV Hudson Bombers based primarily out of San Diego and Moffet Field. The Army Air Corp provided two heavy bombardment squadrons and three light bombardment squadron for ASW purposes. The Coast Guard had three Air stations on the West Coast. San Diego, San Francisco, and Port Angeles.

Coast Guard Air Station San Diego experienced little expansion and little change in function during the period leading up to the fall of 1943. The station had two unarmed Hall Boats, a PH-2 and a PH-3, and three JF-2s, capable of carrying 325 pound aerial depth charges, assigned. They provided search and rescue services and, other than occasional convoy escort assignments, performed utility and administrative missions for the Navy. The Navy VP squadron at North Island was assigned the ASW duties for the area. Search and rescue missions remained primary and this experience made Coast Guard Air Station San Diego the ideal choice for the Navy's first Search and Rescue Squadron in the fall of 1943. By January 1945 the number of aircraft assigned totaled 16 PBYS.

Coast Guard Air Station San Francisco was formally dedicated on February 15, 1941. In the years immediately prior to World War II the volume of marine and air commerce increased dramatically in the San Francisco area. There were two Coast Guard air stations on the west coast at the time; San Diego, 440 statute air miles to the south and Port Angeles 750 statute air miles to the north. Immediately after Pearl Harbor anti-submarine patrols began with the unarmed aircraft assigned to the station. In April of 1942, the station came under the command of the Western Sea Frontier. A squadron of Navy OS2U-3 aircraft was attached to the base and six additional Coast Guard OS2U-3s were provided for the air station operations. It was in practice a joint operation and on a number of occasions missions were flown with mixed crews. The area of responsibility was the Bay and approaches to San Francisco as well as inshore patrols both north and south of the Bay.

Coast Guard Air station Port Angeles saw rapid growth during World War II. The Navy established a Section Base, an aircraft gunnery range was established, anti submarine patrols commenced, and a short runway was constructed to train Navy pilots to land on aircraft carriers. Initial anti-submarine patrols were flown with unarmed aircraft. The J2F-1s were equipped to carry aerial depth charges and J4F-1s and JRFs were assigned and also equipped to carry aerial depth charges. The air station patrolled the Strait of Juan de Fuca and the inshore area off the coast.



**Curtiss SO3C-2 -- Shown in landplane configuration
The aircraft was also operated as a seaplane**

Coastal detachments were set up at Neah Bay and Quiayute Washington. In 1943 the station was equipped with the land-plane version of the SO3C-3. The performance was less than satisfactory and all were retired from service by March 1944.

Two Japanese submarines arrived off the west coast during February 1942. The first, the I-8 patrolled northward from off San Francisco to the Washington coast without taking action against any shipping and then returned to Japan. The second arrived off San Diego on the 19th of February and on the 23rd it surfaced off the California coast near Santa Barbara and fired thirteen rounds of 5 ½ inch shells at oil installations. The damage was negligible. After this attack the I-17 proceeded north to a point off Cape Mendocino in northern California and then returned to Japan. On June 7 the SS COAST TRACKER was sunk by I-26 south of the Strait Of Juan de Fuca. A Port Angeles J4F spotted the survivors and directed a Canadian Corvette to the rescue site. The I-26 shelled the radio station at Estevan Point, Vancouver Island on June 26 and the I-25 shelled Fort Stevens, Oregon on June 21.

On September 9, 1942 the Japanese submarine I-25 surfaced near the Cape Blanco Light House, close to Port Oxford, about 60 miles from the California-Oregon border. The intent was to cause panic along the Pacific Coast. On the fore deck of the submarine was a hangar containing a disassembled single engine Yokosuka E14Y1 "Glen" seaplane. The aircraft was assembled, armed with two 170 pound phosphorus fire bombs, and launched. Its mission was to drop the incendiaries among the giant forest of the Northwest triggering a vast firestorm. The aircraft flew inland over the Siskiyou National Forest. Everything was concealed by a dense fog so it was not possible to see the point of impact when the bombs were released. It had been foggy and rainy for a period of time and the forest area was very wet. Possibly this is the reason that the forest did not ignite. The aircraft returned to the I-25 and just as the crew had finished putting the aircraft back in the hangar the submarine was attacked by an army anti-submarine patrol aircraft. The I-25 crash dived for safety sustaining only minor damage. Daringly the submarine sought refuge in the Port Oxford harbor and remained motionless on the bottom. Two days later the I-25 slipped out to sea. The I-25 mounted a second attempt on September 29. Japanese Navy records indicated that the pilot observed flames on the ground after this attack. The bomb did start a small fire which was quickly extinguished.

On October 4 the freighter SS CAMDEN was sunk off Coos Bay Oregon and on October 6 the tanker SS LARRY DOHENY was sunk off Cape Sebastian. These attacks marked the end to direct enemy activity off the west coast of the continental United States.

Many have argued that the Japanese submarine forces would have been better used patrolling allied shipping lanes. It would seem reasonable that an all out blitz of the American west coast during the period that this country was desperately building up its Pacific forces would have had caused great difficulty. Losing a significant number of merchant ships in addition to those sunk by the Germans would have required the spreading of the meager defenses even more thinly and would have had substantial consequences for the United States.

1942 – The Coast Guard Acquires OS2U Kingfisher Aircraft:



Vought OS2U-3 Kingfisher

In 1937 The U.S. Navy issued specifications for a two seat Observation Scout floatplane with non-folding wings and the capability for a quick conversion to a land plane. Vought proposed the XOS2U-1 all metal monoplane as opposed to the biplanes currently in use. Spot welding construction was used providing a smooth, non-buckling fuselage skin. Weight was saved by covering the wings with fabric aft of the main spar. The aircraft featured full span flaps that hung from the trailing edge of the wing. Spoilers were also incorporated to supplement aileron control at low speeds. The aircraft was equipped with a Pratt & Whitney R-985-48 engine producing 450 HP. The small engine was selected in order to remain within weight requirements imposed by shipboard handling. The OS2U, however, could carry a respectable load. For antisubmarine work the aircraft carried two 325 pound depth charges, Two 100 pound bombs could be substituted if desired. A fixed .30 caliber machine gun was mounted in front of the pilot to fire forward and flexible .30 caliber mount was installed aft for the crewmember. The OS2U, named Kingfisher, was the U.S. Navy's primary ship-based scout and observation airplane during World War II.

Vought delivered 54 OS2U-1s by November 1940. The OS2U-2 model was equipped with leak-proof fuel tanks, armor protection and a more powerful R-985-50 engine. The OS2U-3 was similar to the OS2U-2 but had increased fuel capacity. In September of 1942 production passed to the Naval aircraft Factory, with no basic changes, the aircraft designation became OS2N-1.

The Kingfisher could and did perform a variety of tasks. Beginning in March 1942 the Coast Guard received the first of 53 Kingfishers. Some were OS2U-3s and others OS2N-1s. Their primary purpose was to provide the Coast Guard's early anti-submarine efforts along the coastlines of the United States. Area patrols were flown and air cover for merchant convoys was provided. They carried two 325 aerial depth charges and could fly patrols of up to six hours. None of the OS2Us were credited with sinking a submarine but they did make a number of attacks on submarines along the seaboard. There were 61 recorded attacks on enemy submarines made by Coast Guard aircraft. The preponderance of these was made in 1942 when there was a heavy concentration of German submarines off the Atlantic and Gulf coasts. They also made and coordinated many rescues of survivors from torpedoed ships.

The Kingfishers were discontinued from Coast Guard service by October, 1944

Designation	OS2U-3 and OS2N-1
Manufacturer	The OS2U-3 was manufactured by Vought –Sikorsky Division, United Aircraft The OSN-1 was manufactured by the Naval Aircraft Factory,
Aircraft Type	Observation Scout – Seaplane -- Used by the Coast Guard for ASW and rescue of personnel
Wing Span	35' 10"
Height	15' 1"
Length	33' 10"
Fuel Capacity	144 gallons
Max Speed	164 mph at 5,500 feet
Cruise Speed	119 mph at 5,000 feet
Stall Speed	50 mph
Initial Climb	890 fpm
Range	805 statute miles
Empty Weight	4,123 lbs
Gross Weight	6,000 lbs
Service Ceiling	13,000 feet
Crew	2
Armament	The Coast Guard flew them with two 325 pound aerial depth charges attached
Power Plant	A 450 HP Pratt & Whitney R-985-AN-2/8 engine with a Hamilton Standard constant speed propeller

1943 – Coast Guard Assigned the Sea-going Development of the Helicopter:

CDR William J. Kossler USCG, a member of the Inter Agency Board, established to research and develop rotary-wing aviation, was convinced that the helicopter was the rescue vehicle of the future and would fulfill the future needs of the Coast Guard. As a member of this board he attended a very impressive flight test demonstration conducted by Sikorsky Aircraft Corporation on April 20, 1942. The demonstration caused great excitement at Coast Guard Headquarters resulting in a recommendation by CDR. Frank A. Leamy, the Aviation Operations Officer, that several Sikorsky VS helicopters be purchased for training and experimental development. CDR Kossler advocated the purchase of three but neither the Engineer-in-Chief nor the Assistant Commandant was convinced. They stated that the acquisition of helicopters was not essential to the war effort and without the support of these two officers, next in rank to the Commandant, the future looked bleak for Coast Guard involvement with the helicopter.



Captain William J. Kossler USCG

The helicopter as an anti-submarine weapon:

Kossler, although disappointed, was not about to give up. This was the period of an intensive and effective German submarine campaign off the east coast of the United States. He reasoned that the helicopters vertical take-off capability would enable it to operate from a merchant ship underway and provide protection from submarines. A series of events – some manipulated and others serendipitous – took place that would result in the development of the helicopter by the U.S. Coast Guard.

The Coast Guard air station at Brooklyn, New York was across the sound from Bridgeport, Connecticut which was the location of Sikorsky Aircraft. The Commanding Officer of the Brooklyn air station was CDR W.A. Burton who had accompanied Kossler on the first helicopter flight test demonstration. His Executive Officer was LCDR. Frank Erickson. Kossler had spent time with Erickson during a trip to Hawaii. The two men discussed search and rescue techniques and after Kossler's return to Washington, as the chief of the Aviation Engineering Division, the two men continued to exchange ideas. In the middle of June Kossler stopped by the air station and discussed the helicopter situation with Erickson. A few days after the visit, Kossler's assistant, Lt. Bill Haley arrived at the air station. During lunch he casually mentioned that he had an appointment with Mr. Igor Sikorsky and wondered if anyone would care to fly him to Bridgeport. Erickson volunteered. Erickson met Igor Sikorsky and Michael Gluhareff, his Chief Engineer, and spent hours discussing the possibilities of the helicopter. Sikorsky put on a very convincing flight demonstration during which he repeatedly landed the helicopter within inches of a given spot. Erickson later stated that he did not realize that this whole sequence of events had been arranged ahead of time for his benefit.



CDR Frank Erickson USCG

Erickson immediately started drafting a report for headquarters. The rescue capabilities of the helicopter were obvious but being aware of Kossler's set back he submitted a proposal for the use of the helicopter as an anti-submarine weapon. In the proposal he laid out specifics as to armament, aircraft capabilities, and utilization. He further stated that Coast Guard aircraft were presently flying anti-submarine patrols and it would be a natural for the Coast Guard to develop the anti-submarine capabilities of the helicopter. Burton strongly endorsed Erickson's proposal. Burton's endorsement pointed out that the Army had demonstrated its belief in the value of the helicopter by contracting for a number of the present models. His endorsement continued "Unfortunately the Navy has not shown any great enthusiasm for this type of aircraft. It is

therefore, an excellent opportunity for the Coast Guard, with a very modest appropriation, to initiate and proceed with the naval development of the helicopter." Rear Admiral Stanley V. Parker, Commander Coast Guard Forces Third District also favorably endorsed it. Kossler noted that there was good reason for believing the Army would turn over a few of their machines for evaluation. This proposal for helicopter acquisition was approved by the Commandant in June 1942 -- a month during which 55 merchant ships totaling 289,790 tons were sunk. A request was made for one YR-4 trainer and three XR-6 helicopters. The Navy designation for the YR -4 was HNS-1, the XR-6 was designated XHOS.

RADM Parker, who held Coast Guard Aviator Designation Number 7, was interested in seeing the helicopter. Erickson called Sikorsky and advised them of the request. They were delighted. Up until this time the highest ranking naval officer to see the Sikorsky helicopter was the inspector of naval aircraft at the Vought-Sikorsky plant and his primary interest was fighter aircraft production. Joined by Kossler, Erickson and Parker visited Sikorsky on the 21st of December, 1942. Igor Sikorsky and Michael Gluhareff gave the Admiral the “Red Carpet” treatment and put on an impressive demonstration of the capabilities of the helicopter. How effective is indicated by the following letter Parker sent to Admiral Waesche dated 24 December:

“Dear Admiral Waesche,

Although Admiral Land believes that we are already overcoming the German submarine campaign, it is still a serious menace which gives many of the responsible people in this war much concern.

Kossler and I saw the Sikorsky helicopter fly at Bridgeport. It is a remarkable thing, capable of taking the air and flying forward, sideways, and astern. Its control is almost unbelievable and it landed, for our edification, on the roof of a small building, on top of a pile of aircraft engine cases, on water, and flew along breast and at the same pace as a tugboat.

A couple of these with each convoy carried on the sterns of any convenient ships would give a degree of protection to a convoy in dangerous waters, which might be decisive.

A new model is being developed. Might not the Coast Guard be given the job of showing its application to convoy work? The newly projected machine will carry a bomb. It is of interest to note that the Navy Department official most closely in contact with the problem has given it very little encouragement. I think he is missing a bet. The Army is in the picture.

Kossler can tell you all about it. Maybe we can get on the bandwagon.

With best regards and wishes for the New Year,

Sincerely

(s) Parker”

Admiral Waesche decided to come to Bridgeport to see the helicopter for himself. On February 13 a flight demonstration using both the XR-4 and the VS-300 was conducted. Admiral Waesche was completely sold. On his return to Washington he addressed the issue of helicopter development with Admiral Ernest J. King, Chief of Naval Operations. As a result of this conference Admiral King issued a directive to the Chief of the Bureau of Aeronautics which ordered that testing and evaluation of helicopters be initiated and expedited to determine their practical value for operating from merchant ships in ocean convoys. The Bureau of Aeronautics was to carry out the tests with the Maritime Commission providing a typical merchant ship with suitable platform and equipment, and with the Army Air Force providing three of its YR-4A helicopters. The last paragraph was of the most significance to the Coast Guard so it is quoted in full.

“ The sea-going development of helicopters and their operation in convoys will be a function of the Coast Guard. To this end Naval Aviators of the Coast Guard will be employed as practical in the early testing and evaluation of helicopters.”

The next day Admiral Waesche sent the Engineer-in-chief a letter which quoted the above directive and stated:

“ Captain W.J. Kossler, under your direction, shall be responsible for the development of the Coast Guard’s part in this program. The project shall include the training of personnel and establishment and control of training stations until the project has been carried through the development stage and the training program has been placed on a routine basis.”

Kossler lost no time with his new authority. That very day a confidential directive went out to the chief personnel officer soliciting volunteers to apply for training as pilots and mechanics in the new helicopter program even though a training program was not yet in existence. Two days earlier, Kossler had contacted Commander Labort of the War Shipping Administration urging a higher priority be given to a speedier delivery of the first of the YR-4As. The original date had been the latter part of April. On the 19th he was at Sikorsky’s plant discussing training and technical matters. Test pilot Charles Morris was drafting a training syllabus. He and Colonel Frank Gregory USAAF, who was involved with the Army’s helicopter test program at Wright Field, were the only two pilots qualified to teach helicopter flight. That left Morris limiting the initial number of qualified pilots. Kossler made arrangements with the Army Air Force and the Navy’s BuAer for pilot and maintenance training. Erickson was selected to be the first Coast Guard Aviator to qualify as a helicopter pilot. Kossler’s target date for the commencement of training was April. CMM Oliver Berry and Aviation MM1 James Boone accompanied Erickson and completed the mechanics course.

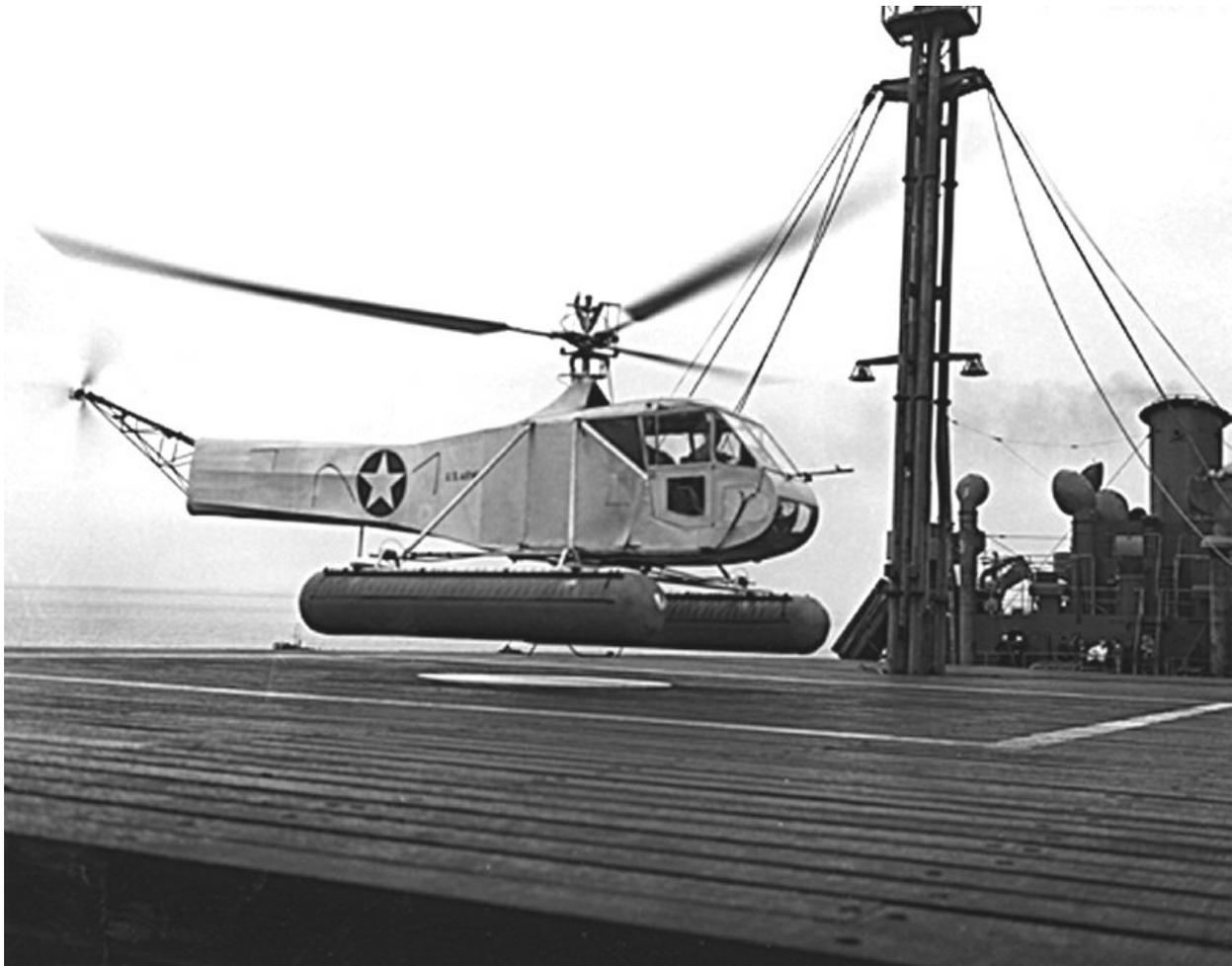
The Army chaired the Dorsey Commission and thus was involved in the development of the helicopter. Previously the Navy had not been interested and had not interfered. However, with the Coast Guard moving aggressively and assuming the role of developing the helicopter for the anti-submarine mission BuAer suddenly saw this development as their responsibility. Kossler was quietly informed that BuAer’s interpretation of Kings directive was that the Coast Guard’s role was subject to bureau’s needs. The Commandant immediately sent a letter – authored by Kossler – to the chief of the Bureau of Aeronautics RADM John S. McCain asserting the Coast Guards primary role in the development of the helicopter. A test of wills took place. It is not clear if Admiral King became involved but the climate at BuAer suddenly changed. On March 12 Kossler received a telephone call from CDR. McCoffrey USN, newly assigned at BuAer, informing him that a letter was being sent to ADM Percy Noble, head of the British admiralty delegation creating a joint committee to evaluate the helicopter. Members of the committee would be the British, the Coast Guard, and BuAer. The machines to be used were to come from the present Army procurement program now assigned to the British. Kossler was pleased with this for the British were also very interested in the development of the Helicopter and would be an asset.

In April Erickson showed Sikorsky and Morris a photo of a tanker broke in half after being torpedoed. The point of interest was a platform built on the deck amidships. Morris had already landed a helicopter on a platform at the Army’s Wright Field. He and Sikorsky agreed a XR-4 could operate from a platform like the one depicted despite the obstruction s of rigging and superstructure. Erickson passed this information to Kossler who immediately contacted R.W. Seabury, President of the War Cargoes Incorporated, who was extremely interested in protecting his merchant vessels. An

arrangement was made for a meeting at the Sikorsky plant. After a thorough discussion and briefing on the potential of the helicopter Sikorsky asked Mr. Seabury if it would be possible to use one of his ships with a platform of the type under discussion. He said yes and immediately started making arrangements. Seabury then conferred with Admiral Davison of the Bureau of Aeronautics. He then called Kossler and told him that everything was ready and trials would be held the first week of May.

The tanker BUNKER HILL was made available for the tests and a deck 78 feet long, with obstructions at both ends, was put in place. An eight foot bulls-eye in the center of a square was painted in the middle of the platform. Colonel Frank Gregory arrived on 6 May to fly the Army XR-4 provided for the tests. The entire helicopter project rested on the XR-4s ability to land on a ship. Gregory was concerned at first. His "shipboard" experience was limited to a stationary 20 foot platform at Wright Field. He immediately set about getting "additional experience." Gregory noted with reference to his first attempt:

"The space on the deck looked even smaller --- It didn't look like the helicopter would fit. The cabin superstructure towered up like a two story building, and the people on it had that "*it can't be done*" look on their faces --- yet the big white bulls-eye stuck out like a target -- The XR-4 came true to the white marker as though being pulled by a powerful magnet, and a minute later the floats touched the deck."



XR-4 Hitting the spot on the BUNKER HILL

He continued to practice landings and takeoffs that afternoon with the ship at anchor, then underway at five, seven and one-half, ten and fifteen knots. As the speed increased the landings became more difficult because of increased turbulence over the superstructure but the helicopter proved to be completely controllable.

The next morning guests were ferried out to the BUNKER HILL. They included Representatives from the War Production Board, National Research Council, Representatives from the Office of Secretary of War, Army Transportation Corps, The delegation from Great Britain, Bureau of Aeronautics, Mr. Seabury of War Cargoes, , RADM Parker USCG, Kossler, Erickson and almost all of the top officials from United Aircraft- Sikorsky. A total of 97 names appeared on the guest list. Gregory put on an impressive and flawless performance as the ship cruised at various speeds up to 15 knots and on various headings with relation to the wind which was blowing at 12 knots. Everyone was very favorably influenced. Capt. Walter Diehl of the Bureau of Aeronautics, in a shift in attitude toward the helicopter, confided to Erickson that if he had seen a film of what just took place he would have been sure that it was faked. There would continue to be periodic assertions of authority on the part of the Bureau of Aeronautics but Kossler, with well placed support, was winning his battle.

The first meeting of the joint US-British Board for Evaluation of Helicopters for Anti-submarine Warfare was held on 18 May, 1943. The board decided the test would be conducted in three phases. Phase 1 would be carried out in calm water such as Long Island Sound; Phase 2 would be carried out in the open seas; and Phase 3 would involve operation from a convoy on an Atlantic crossing. Two vessels were to be fitted with helicopter landing decks. The War Shipping Board turned the GOVERNOR COBB over to the Coast Guard and the other was the SS DAGESTAN, a cargo vessel taken over by the British under a Lend-Lease agreement.

The second YR-4 scheduled to be delivered to the British and the third to be delivered to the Navy were due in early July. The Army had taken delivery on the first helicopter in May. This generated an immediate need to start a flight training program. One naval officer, two army officers and Erickson were in the first class. Les Morris, the Sikorsky Chief Test pilot was the instructor. Morris continued to give instruction to the British pilots involved in the program. The Army had stated that they did not see the development of the helicopter for ASW purposes their primary responsibility but were exceptionally supportive of the Coast Guard. A second helicopter demonstration was conducted by the Army on board the Army Transport JAMES PARKER on the sixth and seventh of July. The official observers included many of those who had been on the BUNKER HILL, however, this was the first helicopter demonstration that CDR. James Russell of the Bureau of Aeronautics had seen. On the ninth of July, Russell turned in a very favorable report on the helicopter. Shortly thereafter the Bureau of aeronautics placed an order for 173 helicopters consisting of 23 HNS (R-4) trainers, 100 HOS-1s (R-6) with 225 HP engines and 50 HO2S (R-5) with the 450 HP engine.

CDR Charles Booth, the naval aviator in the initial class, was involved in moving the Navy's flight test facility from NAS Anacostia to the Naval Test Center at Patuxent River Maryland and as a result had not followed through on his qualification. Erickson thus remained the only naval aviator qualified in the helicopter. In the summer of 1943 Erickson took charge of the Navy's helicopter development program. On 3 September the Chief of the Bureau of Aeronautics requested that Erickson prepare a weekly report for the Bureau outlining the progress made on various model helicopters, estimates of completion, trial and delivery dates; and in addition, such other technical information determined from time to time which had or may have a bearing on present or future operations of this type aircraft. Erickson submitted his first report on 18 September. It noted that the YR-4s for the joint evaluation program were on schedule. The two British helicopters had been completed but had not yet been delivered because of rotor problems. He further stated the problems were being addressed. On 25

September a YR-4A was released to the British and the first Navy helicopter was accepted for delivery on 16 October. CDR Booth returned to complete his course at Sikorsky – It would be his responsibility to conduct aerodynamic, stability and performance tests on the new helicopters at Patuxent River as soon as one could be assigned. With the acceptance of two additional helicopters at the end of October the Sikorsky facilities became very crowded. Erickson sought to transfer all operation to Floyd Bennett Field. The Chief of Naval Operations approved and designated the Coast Guard Air Station Brooklyn as the Helicopter Training and Development Base. On 20 November LCDR John Miller USN and LTJG Stewart Graham USCG completed flight training. Graham received Coast Guard Helicopter Pilot Designation Number Two.



LT Stewart Graham departing the SS DAGHESTON in convoy during Atlantic crossing 16 January 1944

On November 23 a helicopter detail proceeded to Bridgeport to take part in the joint US-British ASW Evaluation Trials. The British SS DAGHESTAN arrived the same day. Two helicopters were used - one British and one American. Weather was bad but improved by the 25th allowing for training flights in preparation for Phase 1. Among those observing was GEN Frank E. Lowe, Military Executive of the Special Committee Investigating the National Defense Program. He became an interested ally of Erickson. Phase one was essentially a repeat of the tests on the BUNKER HILL. Phase two was conducted off Block Island. The most difficult condition under which

operations were conducted were a wind of 42 knots over the deck, roll of four degrees, and a vertical deck movement of five feet. There were 328 landings made during this operation. The only major difficulty encountered was starting and stopping the rotor in high winds. Phase three consisted of operations from a vessel in convoy on the Atlantic crossing. The SS DAGHESTON sailed in convoy in January. Wind and sea conditions prevented any attempt at flight operations except for three days during the 16 day voyage. The ship's roll was never less than 10 degrees and during the worst conditions the roll increased as high as 45 degrees. Wind gusts were as high as 80 knots. A 30 minute flight was conducted on 16 January by LT Stewart Graham USCG and a 30 minute flight was conducted by F/L Jack Cable RAF. Both pilots, and later the Board, concluded that helicopters could operate from ships at sea but the performance of the helicopters presently available was too marginal to be operated satisfactorily off merchants ships in convoy.

There still existed, however, a possible defensive ASW role. In March of 1943 LCDR George Synon USCG, working as a researcher, advised Kossler of a sound device created by DR. Harvey Hayes. The device was to be suspended from a cable and lowered into the water to search for submarines. The letter stated that this could possibly be operated from a helicopter. It was not followed up on at the time because there were only two helicopters in operation, both with limited capabilities. Evaluations were made using Lighter-Than-Air craft. This did not prove to be satisfactory and development stopped. In December of 1944 under the direction of LT. Roy Rather USN the earlier efforts of Dr. Hayes were reopened. Dr. J.J. Coop, who had earlier been involved, assisted. On 12 January the Vice Chief of Naval operations was directed to make available the Hayes equipment to the Anti-Submarine Development Detachment. Technical assistance was to be provided by the Bureau of Ships and the

Naval Research Laboratory. The Coast Guard was directed to provide the helicopter and crew. This would later prove to be the thread that kept the development of the helicopter going and is covered in a later narrative in this Time Line.

The helicopter as a rescue vehicle

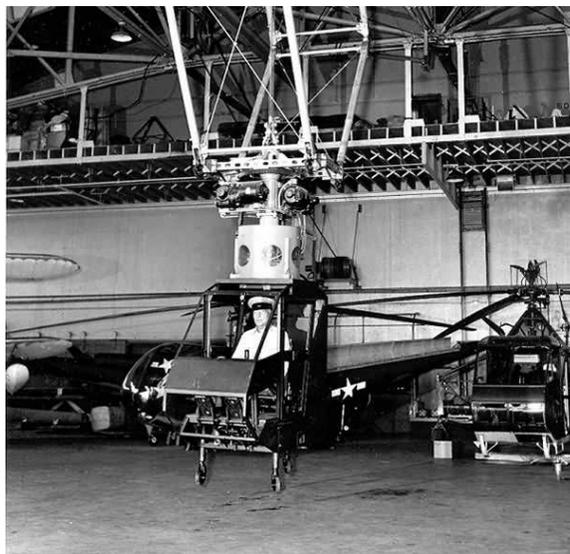
New and more powerful helicopters being developed would have been able to operate off the merchant ships but the submarine threat had decreased substantially and it was obvious the helicopters would not be ready to play an important ASW role during World War II. During the testing and evaluation program modifications had been made and the ability of the helicopter to take off and land vertically had been successfully demonstrated. Nothing, however, had been done to take advantage of the helicopters ability to hang motionless over a specific spot.

Preparations for the convening of a formal school to train pilots and maintenance personnel had continued through winter of 1943 and into the spring of 1944. LCDR O.R. Smeder USCG, in charge of ground school wrote most of the training manuals. Four additional Flight instructors had been trained and the first of 12 British Officers arrived 15 January. In May the Royal Navy flying School was set up at Brooklyn and would remain until 7 March 1945 when it transferred to the United Kingdom. A 40 by 60 foot landing platform that simulated landing conditions aboard ship by rolling five to ten degrees with a period of ten seconds became operational on 1 April. It was christened USS *Mal de Mer*. Soon actual landings were being made on the COBB which had been specially equipped with a deck designed for this purpose. In addition a synthetic trainer, a flyable cockpit simulator, an effective training device ahead of its time, was designed and fabricated. Erickson formalized the flight curriculum and the first six week course began on 4 June. Kossler attended the first class and completed the course on 1 July.



Above: USS *Mal de Mer* simulated shipboard landing platform.

Right: Synthetic cockpit simulator trainer



On 3 January, 1944 an event occurred that would provide the first test of a helicopter in an emergency situation. The USS TURNER, anchored off of Sandy Hook, New Jersey had an enormous explosion which was followed by a second 47 minutes later sinking the ship. The survivors were brought to the hospital at Sandy Hook. The weather was snow squalls and sleet, winds of 20 -25 knots and extremely

reduced visibility, All airfields in the area were closed and blood plasma was needed. Admiral Parker called Erickson and asked if it was possible to pick up plasma at the Battery in New York and get it to Sandy Hook. Erickson answered "Yes." and within minutes he, with Walter Bolton as co-pilot, was on his way. The visibility was so low that considerable care was exercised passing around the ships anchored in Gravesend Bay. Wind was blowing off the buildings at the pick up area creating a considerable amount of turbulence. Weight restriction was a problem and in order to facilitate the delivery of the plasma, Bolton reluctantly stayed behind. Erickson had to back the helicopter out on departure. It was evident that the weather conditions were such that no other type aircraft could have completed the mission. It was so noted in a New York Times editorial dated 6 January.

In April, when Admiral Waesche testified before the House Appropriations Committee in support of the Coast Guard's procurement of helicopters he stated to the committee "The Coast Guard has been assigned the duty of carrying on extensive experimentation in connection with the use of helicopters, both aboard ship and at coastal stations in connection with both anti-submarine warfare and air-sea rescue operations." This may have been a stretch at the time but it indicated that the Commandant was aware of the rescue capability evaluations that Kossler and Erickson were engaged in. This was the first official recognition of the search and rescue potential of the Helicopter.

To fully utilize the capabilities of a helicopter a method of lifting a person from peril while the helicopter was in a hover had to be developed. The first attempt was to devise a net suspended from the helicopter that would scoop a person out of the water. Tests showed that without a means to get the rescued person inside the helicopter the person scooped would be in the rotor wash and suffer the effects of hypothermia. Erickson proposed a modification to HO2S (R-5) helicopter in which the cabin would be widened to carry a stretcher case, doors that swung outward and up into the open position, and a motor driven hoisting unit. The problem with the plan was that he did not have an HO2S on hand. The only practical way to prove the hoist concept was to devise something simple that could be demonstrated on the HNS. A hoist boom and drum were connected to the rotary actuator and driven by a 12 volt motor with a high gear ratio. The cable had a pick up hook and harness. It worked well except the magnetic brake was apt to slip with a weight of over 200 pounds. The motor was changed to a Vickers hydraulic pump system permitting the hoisting of 400 pounds at a rate of two and one-half feet per second. The redesigned system worked perfectly.



Igor Sikorsky – being hoisted to the helicopter

The upgraded hoist system was installed at an opportune time. Captain Robert Dixon USN, the Director of Military Requirements, called Erickson inquiring about the hoist and asked if it could be

demonstrated in a Navy Air Sea Rescue Exhibit Test Demonstration at the Naval Air station, Lakehurst on October 2, 1944. Erickson answered yes. This provided a weeks time to practice picking up people from rubber rafts. Arrangements were made for the use of the USCGC COBB , which was equipped with a helicopter landing deck, as a base to carry out the tests. The COBB anchored at Manasquan Inlet on the first and Erickson and Graham flew down to Lakehurst on the morning of the second. Not long after arrival RADM DeWitt C. Ramsey, Chief of the Bureau of Aeronautics, dropped by and looked over the rig. Just after 1300 Erickson and graham flew out to the COBB and spent the next several hours watching Navy rescue units demonstrate parachute drops, survival gear, and methods of egress from parachutes and aircraft after entering the water.

When it became time for the helicopter demonstration to start, four men wearing life jackets equipped with pick-up harnesses were put over the side in two rubber life rafts. Graham started the engine and when it had warmed up he took off and hovered 15 feet above the deck. He then hoisted a man up to the helicopter and lowered him to the deck testing the hoist and hovering performance of the helicopter. Seeing this, the observer boats all headed for the COBB. Exactly on schedule at 1700 Graham flew off the ship and made a circle to approach the first raft from downwind. He hoisted a man up to the helicopter and returned to hover over the ship and lower the man to the deck. He repeated the routine for the other three men except for the last pick up during which he flew backwards from the ship to the life raft. All four pick-ups were completed in less than the ten minutes allowed. A rescue demonstration by a blimp followed the helicopter demonstration. They ran into troubles and required 45 minutes to lift one man from the water. The contrast between the helicopter and blimp was obvious. One man that was very much impressed was RADM Ramsey USN. From that day on the helicopter program had his unqualified support.



Sikorsky HOS-1 (R6) Helicopter

The Army Air Force was also impressed with the performance of the hoist and ordered twelve rescue hoists and visited the Coast Guard helicopter unit to copy details of the installation. The hoisting equipment was installed on the XHOS (R-6) and worked just as well. Sikorsky was impressed and submitted a proposal to the Army Air Force recommending this modification be made on all Army Air Force R-6s. The Army agreed. On 15 December RADM Ramsey conferred with Erickson to discuss the Navy helicopter program. He told Erickson he wanted all Navy helicopters equipped with hoists for

rescue work. Erickson was directed to coordinate this with the Naval Aircraft Modification Unit at Johnsville Pennsylvania.

Actual rescues continued and a number of different opportunities presented themselves to demonstrate the versatility and capabilities of the helicopter. The Brooklyn Navy Yard asked for the service of a helicopter one day a week for use in calibrating fire control radars on ships. It worked so well that the practice became common at other shipyards and would continue for several years. In October of 1944 an evaluation of the utilization of helicopters for spraying mosquitoes to control malaria was conducted.

The Coast Guard Helicopter Development Program terminated:

Events took place that led to the termination of the Coast Guard helicopter development and training program which had been established at Coast Guard Air Station Brooklyn.

In March of 1944 the Air Sea Rescue Agency was established when the Joint Chiefs of Staff requested the secretary of the Navy to establish an agency in the Coast Guard to conduct joint studies and assemble information on technical data, design of air sea rescue equipment, methods and techniques, and procedures including adequate facilities for air-sea rescue. The agency was to disseminate this information to appropriate agencies and maintain liaison with agencies of other nations. The Navy and the Army Air Force were to continue to provide search and rescue for their own operations.. The Coast Guard was still part of the Navy at the time and was directed by the Navy to provide the men and material for search and rescue operations in the Continental Sea Frontiers. This function was carried out by the Coast Guard Office of Search and Rescue – not to be confused with the Air-Sea Rescue Agency. The number of authorized aviators was increased and fixed wing amphibians and seaplanes were provided. This was beneficial for the Coast Guard and solidified its claim to prominence in search and rescue operations. Many people involved in the search and rescue operation saw little or no benefit in the helicopter and some thought it to be detrimental.

Kossler and Erickson felt that just the opposite was the case. They strongly believed that the future of Coast Guard rescue operations involved having helicopters placed at small stations up and down the coasts, supported by air stations, and working in conjunction with Coast Guard cutters and lifeboats. Both men were visionaries that possessed the capabilities to turn a vision into reality and they did it well. Erickson was willing to assume authority, was direct and totally dedicated to the development of the helicopter. He was able to convince many of the value of the helicopter. These same traits would come to alienate those within the Coast Guard aviation establishment that he was not able to convince.

Senator Meade and two members of the Helicopter Subcommittee, senators Harley Kilgore and Homer Ferguson inspected the facilities on 17 February. They reported that they were pleased with the progress being made with the helicopter but time was running out for the helicopter program. With the end of the war in site the large orders for helicopters were cancelled. Kossler was again in poor health and requested the Commandant transfer the helicopter program into regular channels. Headquarters aviation staff saw no use for the helicopter in the Coast Guard ASR operations and steps were taken to discontinue operations. Training classes at the school were canceled except for Navy personnel that would commission and operate the first Navy helicopter squadron. The majority of the helicopters were put in storage. The landing platform and training simulator were scrapped. Only enough helicopters were kept in service for the limited amount of training; the radar calibration flights that had been set up with the Navy for the ship yards at Boston, New York and Philadelphia: and the XHOS-1 which was scheduled for the testing of the Hayes sonar equipment as per direction of the Vice Chief of Naval Operations.

CDR Arthur J. Hesford USCG relieved Erickson as Commanding Officer of Coast Guard Air Station Brooklyn in March. Erickson was not transferred as is customary with relieved commanding officers nor was he reverted to executive officer or any other position in the chain of command. Erickson located in a small office and continued with the sonar project assigned by the Navy with little interference. It was not the best of circumstances for either Hesford or Erickson. Hesford was considerate and it was reciprocated. However, the relationship between Erickson and the headquarters staff is best described as acrimonious.

Erickson Continues:

Erickson had been relieved; he had no command; but he still had the CNO's letter of 15 February 1943 ordering the development of the ASW helicopter. In January of 1945 Lt Roy Rather USN and project engineer DR J.J. Coop reopened the earlier effort in developing underwater sound detection equipment. Within two months they believed they had the earlier problems solved and had a unit ready to install on a helicopter. During this period Erickson accepted a new XHOS-1. Rather and Coop arrived at Floyd Bennett Field early in March, ready to begin the tests.

Dr. Coop had been successful in eliminating the very high static noise of previous tests and the mechanical defects in the attachment of the Sonar head. The sound equipment was installed in the XHOS after modification of its small cabin to accommodate all components. Erickson suggested the helicopter sonar test be conducted from the Coast Guard Cutter COBB. In mid April Erickson, Lt. Stew Graham, and others boarded the COBB for the test area off Block Island, Long Island Sound. Erickson and Graham took turns piloting the helicopter with Coop and Rather alternating as sonar operators. To obtain Sonar readings the helicopter had to hover over one spot and keep the suspended sonar cable vertical while dipping the transducer below the water surface. In order to do this a reference on the water was required. Float lights and dye markers were tried but the helicopter downwash swept both away. Surprisingly a sheet of the Sunday newspaper colored comics was found to soak up enough water and not blow away and could easily be seen from an altitude of 25 feet. While okay for these early tests an instrument was developed to tell the pilot when the cable was vertical.



XHOS with Sonar transducer under water

The results of the tests proved that the Sonar equipment was sufficiently effective in locating and tracking the target submarine to warrant further development. Dr. Coop and his assistant redesigned the Sonar's electrical components and in January of 1946 the testing continued in Jamaica Bay and then at Key West Florida.

Note: The further tests and ASW operations of helicopters is presented in this section under the heading; **1946 - Post War Helicopter Development.**

The rescue capability of the helicopter was again displayed at the end of April. On 19 April a Canadian PBV-5A had been forced down 180 miles south of Goose Bay Labrador. Two men were badly burned when the PBV caught fire after crashing in the wilderness. Several days passed before a USAAF C-47 spotted their distress signal. Two RCAF Norseman ski-equipped planes dispatched to the scene landed safely. One crashed on take off after taking aboard survivors. No injuries resulted. One managed to take off with the two burned survivors. A blizzard prevented any further attempts during the next two days. When the weather cleared, the Norseman returned and landed, but when the takeoff was attempted the skis became bogged down in the mushy snow and they could not take off with any survivors aboard. Both were stripped to reduce weight and later flown out without survivors. Rescuers anticipated the nine men left behind would be stranded for weeks until the lakes thawed sufficiently for float planes to land.

The answer was the helicopter. The XHOS was loaded with sonar equipment and involved in the sonar testing. However, Erickson still had an operable HNS. Though lacking in range, and capable of carrying only one passenger it was disassembled, loaded on an Army Air Force C-54 and flown to Goose Bay, arriving on the twenty-ninth. Working continuously the crew had it reassembled by the morning of the thirtieth. That morning Lt. August Kleisch, USCG, departed in the float equipped helicopter, burdened with seven five-gallon cans of gasoline lashed to the floats, for the 184-mile trip to Lake Mecatina via the survivor's camp. Kleisch, escorted by a Canadian PBV, landed about midway on the flight, refueled the helicopter from the gas cans and departed for the survivor's camp. The plan was to fly the survivors to the Mecatina radio range station located on an island in the middle of Mecatina Lake. This was 32 miles distant from the crash site and served as a base camp. Gasoline was available there. With a helicopter that flew the trip at 50 miles per hour only one man was evacuated on the first day. Kleisch continued the next day. The last survivor came out three days and nine round trips later on the afternoon of 2 May. The survivors were flown from the base camp to Goose Bay.



HNS-1 being loading aboard Army Air Transport Command C-54



LT. August Kliesch in helicopter - Canadian PBV crew -- only one could come out at a time

News of this remarkable feat spread and even with a war on it captured the public's interest. Gen Lowe dropped by to see Erickson within days of the rescue bringing with him General Jacob L. Devers, US Army for a helicopter demonstration. Devers had just returned from Europe to take command of the Army Field Forces. Erickson tailored his demonstration to his audience. The Army, moving ahead, assigned R4s to Liberty ships with landing platforms designated as Aircraft Repair Units in the Pacific. On 1 May Lt. Carter Harmon USA in an R-4 (HNS-1) made the first Combat SAR helicopter pickup behind Japanese lines in Burma.

Erickson continued to promote the helicopter to all that would listen. In 1946 Erickson and a small dedicated group moved to a location on the Elizabeth City air station to continue development work.

1943 – Coast Guard Acquires Martin PBM-3/5 Flying Boat:



Coast Guard PBM with Air-Sea Rescue markings

The Glenn L Martin Company began work on an improved military flying boat in 1937. Martin developed the "Model 162". On 30 June 1937, the Navy awarded Martin a contract to build a prototype with the naval designation of "Experimental Patrol Bomber Martin 1 (XPBM-1)". The Model 162 featured a deep hull and shoulder-mounted gull wings, with a flat twin-fin tail assembly, and wing floats that retracted inward. The gull wing kept the engines out of the ocean spray without use of a drag inducing parasol wing mount. The aircraft was to be powered by twin 1,600 HP Wright R-2600-6 Cyclone engines. The XPBM-1 prototype first flew on 18 February 1939 and deliveries of 21 PBM-1s began in October 1940. The type was given the name "Mariner", in keeping with Martin's custom of giving their aircraft names starting with "M". A single PBM-1 was converted as a prototype of a long-range variant of the Mariner, designated the "XPBM-2" and used for development purposes.

The Navy's experience with the PBM-1 was satisfactory enough to order 379 improved model designated PBM-3s in the fall of 1940, with the ultimate quantity being about twice that number. The initial PBM-3 was similar to the PBM-1 in most respects, differing mainly in the addition of upgraded Wright R-2600-12 Cyclones rated at 1700 hp each; a four bladed propeller; larger and fixed wing floats; and revised engine nacelles that featured much bigger bombbays. A number of variants PBM-3 C/D/R/and S were produced. The variants primarily addressed differences in armaments and improvements in engine power.

Inadequate engine power remained a problem and a PBM-4 series that was to be powered by Wright R-3350-8 Cyclones rated at 2700HP each was considered. Orders were placed but the availability of the R-3350 engine became an issue and the PBM-4 orders were canceled. When the more powerful P&W R-2800-34 Twin Wasps, 2,100 HP engines became sufficiently available the Navy went to the PBM-5. The engines were fitted in revised and lengthened cowlings and drove four-bladed Curtiss props. The PBM-5 was fitted out for "jet (rocket) assisted take-off" (JATO). The configuration of the PBM-5 was otherwise similar to that of the PBM-3D, with the same defensive armament, armor, self-sealing fuel tanks, and AN/APS-15 radar. Deliveries began in August 1944, with 589 delivered before the end of the war and the abrupt termination of production. The very last Mariner model to be produced was the PBM-5A, which was a PBM-5 fitted with tricycle landing gear for amphibious operation. The nose gear had twin wheels and retracted backward, while the main gear had single wheels and rotated up into the sides of the fuselage.



Salem PBM-5 making Jet Assisted Take-off

The Coast Guard acquired 27 Martin PBM-3 during the first half of 1943. In late 1944, the service acquired the first group of 41 PBM-5 models and the additional PBM-5s were delivered in the last half of 1945. The last of the PBM-3s were retired from service July 1, 1946. By May of 1947 there were only 24 PBM-5s still in service. The last ten were still in service in 1955 although all were gone from the inventory by 1956. These flying boats became the backbone of the long-range aerial search and rescue efforts of the Coast Guard in the early post-war years.

Manufacturer	Glenn L. Martin	Cruise Speed	170 mph
Designation	PBM-5	Initial Climb	410 fpm
Type	Flying-boat	Fuel Capacity	3,488 gal
Wing Span	118 ft	Range	3,400 statute miles
Length	80 ft	Service Ceiling	17,000
Height	27 ft 6 in	Engines	P&W R2800-34 Radial
Empty Weight	32,378 lb		2100 HP
Gross Weight	58,000 ;b	Propellers	Curtiss

1943 – The Development of Air-Sea Rescue:



Before World War II there was little need for the Military to establish an extensive Air-Sea Rescue organization. Pan American World Airways had started trans-ocean flights with large flying boats but long over-water flights were limited. Traffic which was not coastal depended upon international shipping services for assistance. This was considered to be adequate.

With advent of World War II this picture changed rapidly. During May and June 1940, the RAF, by official British accounts, lost 959 aircraft, including 477 fighters. The Royal Air Force fought the German Luftwaffe over Britain between the 10th July and 31st October in what came to be called the Battle of Britain. Fighter Command's inventory totaled only

331 Supermarine Spitfires and Hawker Hurricanes. The British aircraft industry provided replacements for the aircraft losses but as combat attrition continued the absence of an effective rescue capability became critical since the downing of aircraft in the Channel or North Sea usually meant the loss of combat experienced aircrews.

Rapid progress in rescue capability was made and by September 1941 a Deputy Directorate of Air-Sea Rescue was established supporting Fighter, Coastal, and Naval Commands. Numerous aircraft and surface rescue boats were provided for full time rescue duty; a communication network was established to handle distress calls; survival equipment was placed aboard aircraft; operating procedures were established; and a specialized rescue training school was established at Blackpool.

In 1941 the Army Air Force (AAF) was not prepared nor equipped for rescue operations at sea. Help came from the U.S. Navy and the British. The Navy readily provided assistance, however, Navy policy was that rescue efforts were not to interfere with operations. By formal agreement with the Royal Air Force it was stipulated that the AAF would not duplicate Britain's well-organized and experienced air-sea rescue service. American crews were protected by the existing British service over the English Channel, the North Sea, North Africa and the waters off India and Burma. The U.S. Coast Guard had developed some of the aspects of the British system prior to the war but facilities were local and the practice of diverting commercial surface craft in cases of forced landings at sea had experienced parallel growth with prewar aviation advancement.

As of the spring of 1943 the scale of the AAF combat operations was no longer limited enough to allow the continued dependence upon the assistance of others for air-sea rescue. The Navy was experiencing a growing requirement with the expansion of the war in the vast area of the Pacific Ocean. Added to the normal hazards of war was a pilot training program that had grown exponentially. As a result forced landings and ditchings increased substantially. The problem of achieving better coordination of effort between the Navy and the Army Air Force, and a closer liaison with interested Allied services was addressed by the Joint Chiefs of Staff. An integration of existing services promised savings in equipment and personnel and additionally would establish common rescue procedures among the Armed Services. There was agreement on the need for improvement but disagreement on how to achieve it.

The Navy argued that the rescue function should be turned over to the Coast Guard as a logical step based upon that services' traditional mission. It was pointed out that the Coast Guard could supply a trained cadre of pilots and crews versed in over-water operation; personnel trained in small boat operations; and with existing and newly established shore stations; could effectively emulate the highly successful British model. It was further argued that, with the diminished submarine threat off the coasts of the United States, the Coast Guard could transition to an effective air-sea rescue force quickly. This proposal was fully supported by the Commandant of the Coast Guard, Admiral Russell R. Waesche, in a letter of 23 July 1943. The Army's preference was to retain its own rescue forces with the establishment of a liaison committee providing coordination of efforts, procedures, and equipment.

The Air-Sea Rescue Agency

AAF arguments prevailed in the deliberations of the Joint Chiefs of Staff which concluded that the Coast Guard, despite its well earned tradition as a search and rescue organization, would face insurmountable obstacles should it have to expand its responsibilities to provide Air-Sea Rescue for both the Army and the Navy. It was recommended that the Army and the Navy continue the development of separate rescue services but that a new agency be established for their coordination. On February 15, 1944 the Joint Chiefs issued a memorandum which resulted in the Air-Sea Rescue Agency. It is quoted as follows:

“The Joint Chiefs of Staff request the Secretary of the Navy to establish an agency in the Coast Guard to:

- (a) Conduct joint studies and assemble information on
 - (1) technical data concerning research, development, and design of air-sea rescue equipment.
 - (2) methods, techniques, and procedures, including the adequacy of facilities for air-sea rescue.
- (b) Disseminate the forgoing information to the appropriate agencies of the War and Navy department and to other interested departments, recommending appropriate action in connection therewith.
- (c) Maintain liaison with agencies of other United Nations (such as the British Deputy Directorate of Air-Sea Rescue) concerned with these matters.

It is recommended that this agency be headed by the Commandant of the Coast Guard and assisted by a board consisting of:

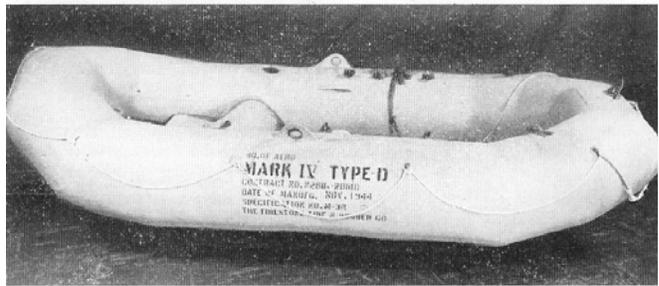
- (a) Two representatives from the Army Air Force
- (b) One representative from the Army Service Forces
- (c) Two representatives from the Navy.”

The Agency was established as recommended. Agency committees reported directly to the board on the following subjects: (1) Emergency and survival Publications; (2) Adequacy of Air- Sea Rescue Facilities; (3) Communication Facilities and Requirements for Air-Sea Rescue. (4) Special Aircraft Equipment for Rescue and Survival; (5) Life-saving on Transports; (6) Medical and Physiological Aspects of Air-Sea Rescue; (7) Ditching Procedures. Liaison with the air-sea rescue agencies of Allied nations was carried out through working contacts with their missions in the United States. Liaison with the services of the United States was maintained through liaison officers from the Agency attached to combat theater and frontier commands. The attached liaison officers were Coast Guard. AAF leaders, still fearing that the Navy wished to turn full Air-Sea Rescue responsibility to the Coast Guard, objected in that this could result in executive functions given to a body that had been designated as advisory. The Navy continued the practice as beneficial to those involved.

The Air-Sea Rescue Agency projects were both practical and functional. The Committee to Study Special Equipment for Rescue and Survival was especially effective. The research and development activities of the Army, and Navy together with other agencies established by Presidential Directives were coordinated and numerous new equipment items were developed.

A quick donning exposure suit was developed for crews in multi-engine aircraft operating in the colder regions of the world. Sea Marker dye, which would spread in sea water forming a large splotch of bright color which improved greatly the probability of locating a survivor, was developed and each Mae West life preserver had a packet of it attached. Shark repellent packets were developed and also attached to the Mae West. An assortment of pneumatic rafts, tailored for specific needs and usage, were developed. These rafts contained emergency food rations, hand held mirrors that could be aimed, hand held orange smoke signals, hand held pyrotechnic signal pistols, radar target screen, a solar still capable of making 750cc of drinking water from the sea in an eight hour period, a chemical conversion kit capable of making five pints of water from sea water.

Several aerial delivery kits were developed by the AAF which could be dropped to survivors in all areas of the world providing a method of providing continuous equipment, food, water and medical supplies to sustain survivors until they were rescued. The Navy developed a shipwreck kit, rations kit, and signaling kit for the same purpose. A radio transmitter, called the “Gibson Girl” that automatically operated alternately on the distress frequencies of 500 kilocycles and 8280 kilocycles

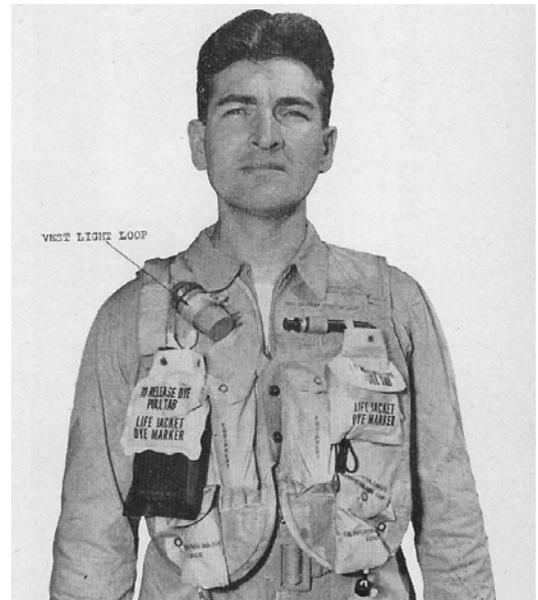


USN PNEUMATIC DROPPABLE RAFT MARK 4



was developed to provide a means for searching aircraft and surface vessels to home in on the position of a survivor. This was carried on board multi-engine aircraft and was also packaged in a waterproof buoyant case that could be dropped by parachute to a survivor. The Coast Guard developed a delivery system that was shaped like a bomb. A long line was attached and strung out during delivery to facilitate retrieval.

Training in the use of the new equipment was also necessary. Operational Training Centers set up schools approximating as nearly as possible, tropics, arctic or open water conditions. Courses were designed to teach crewmembers the basic principles of living off the land and sea. Emphasis was placed upon individual survival. The fundamentals taught included; travel in all types of terrain; orientation; situation management; collection and the identification of plant and animal food; construction of shelters; preparation of food including fire making and cooking; and knowledge of the biological and physical hazards of the area in which the training was given. To these fundamentals were added the operation of emergency rescue equipment, procedures for ditching aircraft, bailout techniques, water survival, medical procedures, methods of communicating with rescue units, and hand-to-hand combat.



One program of the Air Sea Rescue Agency was to develop a distinctive, highly visible color scheme for ASR aircraft. The color scheme was overall aluminum with yellow wing tips, floats, the top of the wing between engines, patches beneath the pilots' compartment, and a band around the aft fuselage. All the yellow markings were bordered with black, and the word RESCUE in black letters, was painted in the yellow area between the engines. Eventually, all Coast Guard aircraft utilized these colors, as did the Air Rescue Service of the U.S. Air Force, until the 1960s, at which time both services adopted different paint schemes.

The Air-Sea Rescue Agency was renamed the Search and Rescue Agency in 1946. It continued to be headed by the Coast Guard until its disestablishment in 1949 when events superseded it. The Coast Guard proved to be an excellent choice to head up this agency. Because of the uniqueness of the Service it was able to promote coordination and cooperation among the various military and civilian organizations thus making the Air-Sea Rescue Agency both effective and worthwhile.

ADM Russell R. Waesche, Commandant of the Coast Guard and head of the Air-Sea Rescue Agency, very clearly outline the importance the Agency played during World War II when he said; “ Our aviators and seamen, with confidence that they will fly and sail again, dare to face greater odds in the war today. Vision of the Services, and ingenuity of industry have provided survival and rescue equipment, which has lessened the hazards, improved the safety, and given our men greater courage. May we never be content with the present equipment, but constantly improve it with experience, continued study, and cooperative effort.”



Coast Guard PBY-5A - Air-Sea Rescue markings

Air-Sea Rescue Operations

In the fall of 1943 the AAF drafted plans to organize seven Emergency Rescue Squadrons (ERS). Each squadron was to be equipped with PBY-5As for rescue operations, Stinson L5s for liaison and Beechcraft AT-7s for utility purposes. The schedule called for the squadrons to be operational by the spring of 1944. Most of these units were scheduled to support the Pacific Air Forces and rescue support for the Air Transport Command. Initial PBY training was provided by the Navy at NAS Pensacola. This formed the nucleus for the establishment and training of the 1st ERS at Boca Raton, Florida and The 2nd ERS initially at Hamilton AAF California and then Keesler AAF, Biloxi, Mississippi. Delays were incurred during training and squadron implementation. The AAF had procured Canso PBYs (OA10) manufactured by Canadian Vickers. Hull reinforcement was required to prevent damage during water landings resulting in shortage of aircraft. There were very few personnel experienced in small boat handling and training had to be conducted. As a result there were only two ERS squadrons in operation by the summer of 1944. Another became operational in the Southwest Pacific by the end of the year but the others did not achieve that status until mid 1945.

During 1943 the Navy added rescue duties to the missions of the patrol squadrons in the Pacific. The Navy, because of its expanded training programs, was also experiencing a high number of aviators being forced down on numerous over-water flights. RADM David Bagley, Commander Western Sea Frontier and 11th Naval District was well aware of the situation when he was approached by Commanders Max Black, USN and Watson Burton USCG with a plan to organize the Coast Guard San Diego air station as an air-sea rescue unit similar to the British model. The San Diego air station, except for occasional convoy escort duty, had been used primarily for utility and search and rescue duties. The plan was approved by RADM Bagley and operations began in December with nine PBY-

5As and high speed Air-Sea Rescue boats. The main base of operations was San Diego with detachments placed at Santa Barbara and El Toro. This, an all Coast Guard unit, was the first Navy air rescue squadron commissioned and it proved to be very successful. The Navy followed with three VH rescue squadrons that deployed to the Pacific. Between Jan 1, 1944 and December 1, 1945 124 aircraft went down in the San Diego area. Of the 201 pilots and crews involved, 137 were saved, 59 were killed by collision or impact with the water and five were lost because of lack of or improper use of equipment.



Rescue 1 - aircraft number 2485 – The first aircraft assigned to the Air-Sea Rescue squadron at CG Air Station San Diego

Courtesy of the San Diego Aerospace Museum

The Coast Guard had been given ASW duties within the Sea Frontiers beginning in early 1942. By mid 1943 the submarine offensive off the coasts of the United States had diminished significantly and the Coast Guard air stations experienced a gradual shift in emphasis back to a rescue mission operation. As air traffic and merchant marine operations increased in scope the number of planes and vessels requiring assistance increased accordingly. By the end of 1943 the Coast Guard air stations were operating primarily as rescue units.

In August 1944 the Commander in Chief of the United States Navy directed Naval Sea Frontier Commanders to establish centralized control for Air-Sea rescue operations. In the same month, Army authorities established Emergency Rescue organizations (ERS) at strategic points , particularly in Alaska and along Air Transport Command routes. The AAF additionally completed organization of its

air-land rescue system with emphasis on the western mountain regions of the United States under the control of the Second and Fourth Air Forces.



Coast Guard PBM with Air-Sea Rescue markings

The Chief of Naval operations further directed that, for the duration of the war, control of Air-Sea Rescue was to be effected through and as an integral part of the existing sea frontier facilities. Required operational units were to be supplied primarily by the Coast Guard. Rescue task units were established consisting of specially equipped and manned air and surface rescue craft under the operational control of the Commanders of the various naval districts within the Sea Frontiers. Coast Guard officers were assigned to the Sea Frontier staffs. Operational procedures and communication doctrine were established. The Commanding Officers of the nine major Coast Guard air stations were assigned as primary task unit commanders.

The air stations operated as control centers. Aircraft and crash boats were located at the parent air station and at assigned detachments strategically located throughout the Sea Frontiers. Within the Eastern Sea Frontier, for example; in addition to the three parent air stations there were 33 aircraft located at 16 different aviation facilities throughout the Sea-Frontier. As soon as a distress was reported immediate action was initiated. A determination of available assets was made. If a search was required to locate survivors then the last know position was obtained and using the know characteristics of the object searched for and the sea currents and present weather conditions, a most probable area of location was determined and rescue craft were launched. The air stations were part of the effective communication network. Specific search patterns and procedures were utilized. Coast Guard assets were primary but if assets of other services were closer or better able to perform the mission, a request was made directly to that organization. This at times could be awkward as the air station Commanding Officer was apt to be junior in rank to those that assistance was requested from. It was handled well.

In August of 1944 the Coast Guard had 16 Grumman JRFs, 21 Grumman J4Fs, 18 Martin PBM-3s, and 20 PB5Y-5A aircraft available for Air-Sea Rescue duties. The Navy supplemented this by transferring 90 PB5Y-5As and 23 PBM-5s to the Coast Guard. In addition five PB4Y-1 Liberators and five PB2Y flying boats were supplied. Two of the PB4Y-1s were assigned to VP-6 and one replaced V-189 as the Loran survey aircraft. It is not known where the other two were assigned. The PB2Y Coronados were based out of San Francisco. Seventeen PB-1s (B-17s) were set aside for the Coast Guard but they did not arrive until 1946. There were 334 Aviators and Aviation Pilots on board at the end of August 1944, Over the next several months, in addition to current Coast Guard personnel assigned to flight training, the Navy commissioned 175 graduating Naval Aviation Cadets in the Coast Guard. By the end of December 1945, a little over a year later, the number of aviators and aviation pilots on board was 570. An extensive training program was organized and carried out.. Close coordination with the Air-Sea Rescue Agency ensured that the latest equipment and procedures were utilized.

PB4Y-1



The PB4Y-1 was a Navy variant of the Army Air Force B-24D. It was initially developed to provide a long range land based patrol and ASW aircraft. Powered by four Pratt & Whitney R1830-65 engines it had a range of 2960 statute miles with a cruise speed of 215 mph. These aircraft were obtained in late 1944 and the last was retired from service by 1951.

PB2Y



The Consolidated PB2Y Coronado, except for retractable floats, was a totally different design than the PB5Y. It was a huge long range flying boat powered by four Pratt & Whitney R1830-88 engines. A production contract was placed in 1940 but production was limited because of emphasis placed on PB5Y construction during WWII. Five were acquired by the Coast Guard in 1944 and were retired from service in 1946.

On the first of December 1944 the Commandant of the Coast Guard established the Coast Guard Office of Air-Sea Rescue. This office was a component part of Coast Guard Headquarters established to deal with aspects of air-sea rescue operations of Coast Guard vessels, aircraft and shore stations. It should not be confused with the Air-Sea Rescue Agency which was a joint advisory and development committee under the direction of the Commandant of the Coast Guard.

During the 1942 period the Eastern Sea Frontier had been assigned the secondary function of providing rescue, assistance and salvage to vessels up to 500 miles off shore. In August of 1944 when the Commander Eastern Sea Frontier was directed to develop suitable methods and procedures to implement the Air-Sea Rescue program he elected to integrate existing sea frontier facilities into the procedures. Close and rapid coordination and dissemination of information as to the location and occurrence of distress was provided for. Shore based radar and high frequency direction finding equipment was utilized. A continuous Air-Sea Rescue Operations watch was established at a control center and manned by qualified Coast Guard watch standers. Air Sea Rescue Task Units were established at the Coast Guard Air Stations. Group operation plans were developed and communication channels were established. Assets included aircraft, 65 foot and 104 foot rescue boats, Coast Guard Cutters, and lifeboat stations. The operations center also maintained a continuous plot of all Merchant and Naval vessels within the frontier area. The coordination of Coast Guard, Navy AAF and civilian assets through a centralized operational control provided a very effective search and rescue operation and was the basis of future Coast Guard search and rescue organization.

The objective of the ASR organization was to first find the wrecked vessel or plane; to provide the survivors a means to remain on the surface of the water until help arrived; to provide food and water, and when required medical supplies, to keep survivors alive; and finally to transport them safely ashore. Properly equipped planes and rescue boats and vessels, manned by well trained crews worked together as an effective team. All rescue agencies operated as a basic unit once on scene. Normally the unit aircraft assumed command of all units. The aircraft on scene, unless the situation dictated that a landing be attempted, acted as a communication platform and directed surface vessels to the survivors. An excellent Coast Guard communications system contributed to the efficient and effective interaction of surface vessels, air stations, coordination centers, task unit commanders and on scene ASR units. The Coast Guard performed ASR well.

Although the Prime responsibility for ASR in Alaska was the responsibility of the AAF, the Coast Guard established an air detachment at Ketchikan on Annette Island and a parachute rescue unit trained by the U.S. Forrest Service was based at Ketchikan. The helicopter was used very effectively on several occasions but was not assigned as part of the Air-Sea Rescue operations.

1943 – Coast Guard Patrol Squadron VP-6CG Established:



Since the beginning of the War in Europe the United States had been engaged in supporting Great Britain while technically remaining neutral. Cryolite, a substance used to extract metallic aluminum from bauxite ore, was obtained in quantity from a mine at Ivigtut Greenland and was essential for aircraft production. When the British and Canadian governments expressed concern over the defense of Greenland, the United States, citing the Monroe Doctrine, undertook the task. In March of 1941 the Lend Lease Act was approved giving President Roosevelt almost unlimited freedom in directing military supplies to Europe without sacrificing U.S. neutrality. Construction on two air bases in Greenland to facilitate the ferrying of aircraft to the British was commenced at the same time. The Defense of Greenland was assigned to the Coast Guard due to its unique status

outside of the War and Navy Departments and its experience in arctic operations.

In June and July of 1941, the American forces congregating around Greenland were organized into the Greenland Patrol. The purpose of the Greenland Patrol as outlined by ADM Stark, the Chief of Naval Operations, was to:

1. Support the Army in establishing airdrome facilities in Greenland for use in ferrying aircraft to the British Isles.
2. Defend Greenland and specifically to prevent German weather observation operations in Northeast Greenland.

Greenland remained a Coast Guard operation throughout World War II. CDR Edward "Iceberg" Smith USCG was designated Commander Greenland Patrol which became task force 24.8. He would remain so during Greenland operations and was promoted in accordance with the increase in responsibility. In June of 1943 he was promoted to the rank of RADM and in November of that year he was given command of all of taskforce 24 which encompassed operations in both Greenland and Iceland.

Because of extremely limited Coast Guard aviation assets initial aerial support by Coast Guard aircraft was limited to J2F amphibians carried aboard those cutters equipped to handle them. Anti-submarine Patrols and search and rescue activities were carried out by Navy aircraft assigned to Commander task force 24.8. The initial Navy aircraft (PBY-5As) assigned to Smith's operation, in the spring of 1942, were provided by VP-93 based out of NAS Argentia, Newfoundland. Six aircraft were retained at Argentia; three were deployed to Bluie West 1 (Narsarsuak) and three to Bluie West 8 (Sonde Stromfjord) on the west coast of Greenland. They were under operational and administrative control of Fleet Air Wing 7 (FAW-7). The mission was aerial coverage for convoys between Newfoundland and Greenland and the Greenland section of the North Atlantic convoy route to the British Isles. They also provided search and rescue support.

As Navy patrol squadrons transitioned to long range land based operations PBY-5As, which Smith considered essential for Greenland operations, were obtained from various sources. This evolved into a Greenland Air Group supported by VB-126 and Headquarter Detachments (HEDRON) under control of FAW_7. The area of responsibility encompassed Greenland, Labrador and the Canadian Arctic.

In early 1943 plans were in place for the transfer of FAW-7 to the European Theater of Operations. Air support in Iceland would become the responsibility of the British but the Commander US Atlantic Fleet wanted the Greenland area of responsibility to remain a Coast Guard function. It was planned to establish an all Coast Guard patrol squadron for Greenland operations. In June of 1943 the Commander of FAW-7, Captain William H. Hamilton, met with CAPT C.C. Von Paulson USCG who was SOPA at the time in the absence of RADM Smith. They discussed the coming Coast Guard aviation operation. Von Paulsen advised that the Coast Guard had the crews but not the desired PBY-5As.

On July 16 1943 orders were issued by C in C U.S. Fleet for the Coast Guard to organize a patrol squadron to operate PBY-5A aircraft. It was designated VP-6 (CG) and attached to FAW-7 for duty in Greenland, Labrador, and the Canadian Arctic. The first of the VP-6 (CG) personnel arrived at Argentia on 23 July and a training and indoctrination program was immediately initiated for pilots and crews using four PBY-5As transferred from HEDRON 7. Training consisted of qualification in aircraft type and a thorough familiarization with arctic flight operations. The Training program remained in continuous operation until 1 October. On 21 August 1943 VP-6 (CG) was established at Argentia Newfoundland, under FAW 7, CDR Donald B. MacDiarmid USCG, commanding. The squadron's main mission was anti-submarine patrol and convoy coverage. On 13 October three PBY-

5As assigned to the Bluie West One (BW-1) HEDRON detachment were relieved by VP-6 (CG) aircraft and air support became an all Coast Guard operation. Administrative control was transferred to FAW 9. All personnel matters however remained the responsibility of Coast Guard Headquarters.

Note:

An entry in the VP-6 (CG) War Diary dated August 1943 states that a Coast Guard PBV-5A #7243 was attached with personnel, with the reservation that the operational control of this aircraft remain always under Commander Greenland Patrol for duties as required. This was construed to mean that VP-6 (CG) would have an additional aircraft to authorized strength while operating under Commander Greenland Patrol, but if the squadron would be transferred to other duty by orders of FAW under which it operated this aircraft would remain with Commander Greenland Patrol. There was no further amplification except that this aircraft was apparently attached to Commander Greenland Patrol prior to the establishment of VP-6(CG) and was presumably located in Greenland at the time.



Coast Guard PBV-5A aircraft on the ramp at Bluie West 1

The squadron's home base was BW-1. Initially there were six aircraft assigned plus CG PBV-5A #7243. The compliment was composed of 30 officers and 145 enlisted men; 22 of the officers were aviators and eight of the enlisted personnel were aviation pilots. The squadron mission was anti-submarine patrol; air support for convoys; search and rescue; surveying and reporting ice conditions; and delivering mail and supplies to military bases and villages. All of these missions were conducted in a hostile environment. The PBV-5A was well fitted for the duties assigned. It could carry 4000 pound bombs, two torpedoes, or four 325 pound depth charges. The cruise speed of 105 knots and range of 2000 miles made it an excellent search vehicle. The amphibious capability was a definite asset. The drawback was that the aircraft were not heated and even with heavy winter clothing, cold and frostbite were problems.

Flying over thousands of miles of ice and open sea with few navigational aids was the norm. Strong winds over the ice cap of 120 knots were a constant threat. At BW-1, surface winds were rarely less than 25knots and the single runway had a considerable slope towards Narssarssuak Fjord. Landings were made uphill and takeoffs down hill. Under inclement weather conditions it was necessary to fly up or down the fjord at low altitudes to get in or out. There were 4000 foot mountains on each side and the pilots said it was like flying in a tunnel. John Redfield, one of the squadron pilots, said. "Most of

the time, our return to BW-1 during bad weather conditions was an exercise in nail-chewing. We had very few instrument landing aids. Sometimes when we were inbound with one-quarter to one-half mile visibility we would receive a report that another plane had just departed BW-1 on a priority mission! After radar was installed in the PBYS navigation up and down the fjord became easier and safer. At the last turn to the west, if we could not see BW-1, less than a mile away, we would pull up and climb out.”



Ramp at Blue West 1 – note steel matting on the ramp and Quonsets in the background



Maintenance was done outside – If a hangar was needed the aircraft was flown to Argentina

At BW-1 the squadron aircraft sat outside and all maintenance, refueling and arming took place in the open regardless of weather conditions. Moving the aircraft in and then out of a heated hangar caused condensation resulting in subsequent freezing in fuel pumps, controls, and instruments. Herman Nelson F-1 portable heaters were used to warm the engines and aircraft interiors prior to starting.

In December of 1944 six aircraft were replaced by new PBY-5As direct from Consolidated's San Diego plant. Three additional aircraft arrived by the end of March. Five aircraft operated under operational control of Commander Greenland Patrol. Two planes were assigned to ice observation and two were in Argentia for operations and maintenance. All squadron aircraft rotated through Argentia for maintenance. With the coming of summer operations were expanded.

On 15 May CDR William I. Swanston, USCG relieved CDR D.B. MacDiarmid as Commanding Officer of VP-6 (CG). The authorized strength had been raised to twelve aircraft but three of these were retained at Air Station Elizabeth City for training of replacement crews. The rapid expansion of Coast Guard aviation produced a shortage of experienced pilots. A pre-training syllabus was set up at Elizabeth City to provide initial training newly assigned for VP-6 (CG) crews. Relief of personnel was staggered over a four month period to permit absorption and orientation training for replacements without disrupting operations. In July of 1944 two aircraft were deployed to the Canadian Arctic, Crystal-1 and Crystal-2, to provide ice reconnaissance and provide air cover for vessels operating in the Hudson Bay, Hudson Strait, Frobisher Bay and off the Coast of Labrador. The detachment returned at the close of the navigational season having flown over 400 hours on this assignment. Convoy support and ice observation also showed a marked increase during the summer months. As an example; LT. Carl H. Allen's record shows he flew more than 100 hours a month during this period.

The detachment at Argentia was increased to three aircraft and VP6 (CG) was redesignated as VPB-6 (CG) in October. During the period from mid September to 16 November 1944, two PBY-5As and their crews, under the command of LCDR. G.R. Evans, were sent to RAFB Reykjavik Iceland to provide ASW sweeps, ice reconnaissance and support of four Coast Guard cutters engaged in thwarting German efforts to establish weather stations in northeast Greenland.

During February of 1945 the installation of AN/APS-3 radar in squadron aircraft began. Germany surrendered in May and U-Boat activity ceased. However VP-6 activity in search and rescue operations, ice reconnaissance, logistic support and LORAN station supply continued unabated and the squadron remained very active. Enroute aircraft traffic across the Atlantic picked up considerably.



PBY-5A aircraft Bluie West 1

Squadron entries for May 22, 1945, reflect operations for this period: PBY-5A #46575 departed BW-1 in the early morning to survey ice conditions along the west coast of Greenland. Enroute passengers were landed at Ivigtut. PBY-5A #46458 returned to BW-1 with passengers and mail from BW-8. At 0800 the Army advised VPB-6 (CG) that a B-24 headed for Iceland from Goose Bay Labrador was in distress with two engines out. PBY-5A #46372 responded immediately and within an hour the B-24 was contacted and escorted safely to BW-1. PBY-5A # 46372 was refueled and departed again on ice surveillance. A chart depicting the information was dropped at Ivigtut to assist a

convoy scheduled down the Davis Strait. On return to BW-1 information was received that an Army B-17E enroute to Goose Bay from Iceland was in distress with two engines out and the third running rough. Intercept was made and the B-17 was escorted up the fjord to BW-1. The third engine quit while landing. Lt. Allen in PBY-5A #46410, departed with passengers enroute Stephenville, Newfoundland. On his return flight he was directed to search for another Army B-24 reported down near Port-au-Choix. Allen located the downed aircraft on the beach, He then landed the PBY-5A in the water nearby, picked up the downed crew and flew them safely to Stephenville.

On May 30 1945 CDR Loren H. Seeger, USCG relieved CDR Swanston as commanding officer. In a letter dated 30 May 1945 it was suggested that the squadron be redesignated as a non-combat operating squadron in order that combat equipment could be removed from the aircraft and replaced with more suitable rescue equipment. In June the authorized complement was reduced to six aircraft and one operational spare. The reduction was accomplished by transferring the PBY-5A aircraft to Coast Guard air stations in the United States. On 12 July, administrative control of VPB-6 (CG) was transferred from Commander FAW-9 to the Commandant U.S. Coast Guard and it was



Blue West One, 1945, Crew not identified

redesignated a non-combat squadron. Operational control remained with Commander Task Force 24.0. Two PB4Y-1 aircraft were assigned for ice reconnaissance test work with AN/APS-15A radar. In August VPB-6 (CG) was directed to transfer its headquarters from BW-1 to the Naval Facility at Argentina. The Coast Guard was returned to the Treasury department on 1 January 1946. VPB-6(CG) was disestablished as a Navy Squadron at that time. Elements of the squadron would continue as an air detachment which operated as part of the North Atlantic Ocean Patrol (NORLANTPAC).



There is no official letter of approval from CNO on file for the squadron's only known insignia, but it is believed that the insignia was an authorized design. It was first in use when the squadron was designated VP-6, and a white camouflage paint scheme was used for Greenland operations. The insignia featured a startled-looking cat, a creature favored among the Catalina squadrons, sitting on top of a depth charge coated in ice. The cat, white in color is superimposed on a large number 6, with VP to port, and CG to starboard. Not as well known as the Navy's *Black Cats of Green Island*, the squadron name, the *White Cats of Greenland* is thought to have been a play on words

1944 – Air Detachment Annette Island Alaska Established:



In the years leading up to World War II the thought was that any major operations by an enemy in the Alaska-Aleutian area was highly improbable. By April of 1940 the anxiety level had increased and it was concluded that there was a need for development of permanent installations at Kodiak, Sitka, Unalaska, Anchorage, and Fairbanks. Traffic through ports on the Pacific coast became extremely heavy. At Seattle in particular, facilities were stretched to their limits, and the American forces began discussions with Canada for using Canadian ports for shipment of troops and materials to Alaska. The build-up also required improved air service between the States and Alaska. In order to provide for larger and faster aircraft an airport with runways was needed as a refueling station between Seattle and Anchorage. Annette Island, a flat boggy island of about ten square miles, located twenty-five miles south of Ketchikan, was chosen as the site for a ten-thousand-foot runway. Construction started in the fall

of 1940 and the first aircraft landed on the not-quite- complete runway in September of 1941. An important American sub-embarkation port and ammunition dump was opened at the port of Prince Rupert, Canada in April 1942 but Canada's ability to defend it against attack was very limited. The air base at Annette provided a location for defensive air support. Canada offered to supply a squadron of fighters to Annette, and by May 5, 1942, No. 115 (Fighter) Squadron was in place, becoming the first Canadian force ever based in U.S. territory to directly assist in American defense.

Annette Island became a transit base for aircraft being relocated throughout Alaska. On June 3, 1942, a large carrier-based Japanese force attacked Dutch Harbor, and resulted in a huge increase in activity. Air traffic at the Annette base became quite heavy at times, with C-47 transports, Canadian PBV-5 Cansos, Bristol Bolingbroke bombers, Norsemen utility aircraft, and P-40 fighters.

A U.S. Coast Guard Aviation Detachment was established at Annette Island on 14 March 1944. It consisted of two pilots, five enlisted crew members, and one Grumman JRF amphibian. Personnel were billeted in the Civil Aeronautics Administration (CAA) Quonsets. The CAA provided hangar and office space. At the end of the war the several commercial airlines including Pan American resumed expanded operations.



Grumman JRF Amphibian

In June 1946 a second JRF, pilot and crewmen arrived. In November of 1947 a PBV-5A was assigned, however PBV operations were discontinued in March of 1948. In the fall of 1952 UF-1G Albatross aircraft replaced the JRFs and the number of assigned personnel assigned to the Air Detachment increased.. Ownership of the hangar was transferred to the Coast Guard in 1956. A BOQ/BEQ building was added in 1961 and families began moving into the newly constructed Roland

Village Housing site at Tamgrass Harbor in 1965. The Air Station had grown to 83 enlisted personnel, 18 pilots operating three Grumman Albatrosses and two Sikorsky HH-52A amphibious helicopters. Replacement of both the HU16E and HH52A type aircraft with the HH3F helicopters commenced in 1972. In 1977 the Coast Guard Air Station was relocated from Annette Island to Sitka, Alaska which was more centrally located in the Southeastern Alaska operating area.



Coast Guard Air Station Annette - 1957

1945 – Coast Guard Auxiliary Aviation:



Mr. Malcom Stuart Boylan planted the seed that eventually grew into the Coast Guard Auxiliary. As a result of discussions with the officers of the USCGC HERMES, Boylan sent a letter dated August 23, 1934, outlining a basic concept for a Coast Guard Reserve composed of flotillas of small craft to be placed at the disposal of the Coast Guard for utilization during emergencies incident to its duties and responsibilities. The letter made its way to the desk of CDR Russell Waesche, an aide to the Commandant, who saw the merit in the idea. When Waesche became Commandant of the Coast Guard in 1936 the creation of a reserve became one of his projects. With the backing of the Secretary of the Treasury, the Secretary of the Navy and several influential Congressmen, Waesche was able to gain Congressional approval.

The Coast Guard Reserve Act of 1939 passed on June 23 of that year, created an organization that was unique in the federal government. The new Reserve was composed of citizens of the United States and its Territories and Possessions who were owners, sole or in part, of motorboats or yachts. The

Reserve had four broadly defined interest: (a) The safety of life at sea and upon the navigable waters; (b) The promotion of efficiency in the operation of motorboats and yachts; (c) A wider knowledge of and better compliance with, the laws, rules, and regulations governing the operation and navigation of motorboats and yachts; and (d) facilitating certain operations of the Coast Guard.

The Coast Guard Reserve was a civilian volunteer organization and the members were not considered to be government employees. Members did not to hold ranks, wear uniforms, or receive military training. Reservists were invited to place their boats at the disposal of the Coast Guard with the understanding that each such boat would be commanded by a regular Coast Guard officer or petty officer. The Coast Guard reimbursed the owners for operating cost incurred during an assigned mission.

The basic unit of the Reserve was a flotilla, consisting of 10 or more boats and presided over by an elected civilian with the title of Flotilla Commander, Five or more Flotilla composed a Division with an elected Division Captain. The Reserve Divisions within each Coast Guard District were administered by civilian officials called the District Commodores. The Coast Guard administered the Reserve through a regular officer with the title Chief Director of the Reserve. He was located at Headquarters and was assisted by a Director in each Coast Guard District.

In this original form the Coast Guard Reserve lasted less than two years. In early 1941 the Coast Guard was preparing for war. On February 19 Congress passed a law restructuring the Coast Guard Reserve to function as a military source of wartime manpower like the reserves of the other armed services. Two Reserve categories were created. "Regular Reservists" met full military requirements, were paid for their service, and when assigned active duty, were assigned anywhere the Coast Guard deemed appropriate. Men who for any reason could not meet these requirements were invited to become "Temporary Reserve" (TR) members. A Coast Guard TR was a less than full time volunteer who served only in some designated geographic area, usually near his home. Age limits for "TRs" were 17 to 64 and physical requirements were not stringent. Members of the initial organization were invited to enroll in the reserves as "TRs." These reservists, along with newly enrolled civilians, performed coastal defense and search and rescue duties. They engaged in anti-submarine patrols and port security. As the ranks grew, thousands of Coast Guard personnel were freed up for service overseas.

The war changed the character of the initial Reserve. It was conceived as a boaters organization but during the war the Coast Guard had used it as a means to recruit and man the Temporary Reserve. Many of these "TRs" did not own boats and filled billets not directly related to boating. When the Coast Guard obtained funding after the war for a small military Reserve the need for a civilian peacetime auxiliary was affirmed. This organization became the Coast Guard Auxiliary. The functions of the Auxiliary were identified as: (a) To provide orderly and efficient means for bringing to the attention of the Coast Guard, recommendations for improvement in matters of maritime safety for which the Coast Guard is responsible. (b) To provide continuous liaison between the Coast Guard and small craft interests. (C) To provide means for the prompt and efficient mobilization of volunteer resources in case of local casualties. (d) To provide nucleus for assistance in mobilization of personnel and small craft resources in case of National Emergency. (e) To encourage universal safe and courteous operation of vessels by precept and example of members of the Auxiliary and to assist in dissemination of safe marine practices.

Aircraft had joined the Auxiliary informally during World War II. Public Law 451, passed by congress in September 1945, added owners of aircraft and radio stations to those eligible for membership in the Auxiliary. Public education, vessel examinations and search and rescue became the basic missions. The postwar period brought cutbacks in funding and reductions in the number of personnel, aircraft

and vessels available for search and rescue while at the same time the need was increasing. The Auxiliary supplemented active duty forces and proved to be a welcome addition. The Coast Guard, over the years to come, would rely on the Auxiliary to fill the gaps. Aircraft utilization increased and as a result there were several Auxiliary Districts that had aviation flotillas. Pilots from the 11th district operated out of Vail Field in Los Angeles and the 14th District formed two air divisions in Hawaii where the Coast Guard total aviation assets were very limited.



AUXOP

In 1952 the Commandant of the Coast Guard, ADM Merlin O’Neill, authorized the creation of Auxiliary Operational Units (AUXOPS). Specially trained groups consisting of five boats, two aircraft, two radio stations, and 50 Auxiliarists were organized to assist the Coast Guard in emergencies. This evolved into a specialized, rigorous training program for individual Auxiliarists. A member who passed seven courses, Administration, Communications, Patrols, Piloting, Seamanship, Weather, and Search and Rescue, were eligible for the AUXOP status, symbolized by an insignia incorporating a wreath of excellence.

An eight-lesson course in “Outboard Safety” was offered in the early fifties. This was added to and expanded and by the mid 1950s more than thirty thousand men and women had participated in the Auxiliary education program. In 1958 the Auxiliary helped implement provisions of the Federal Boating Act. By the early 1960s the number of registered yachts and motorboats had surpassed five million. The Auxiliary offers free vessel safety checks. These safety checks are the best way of learning about problems that might put you in violation of state or federal laws, or worse, create danger for you or your passengers on the water. In 1962 the Coast Guard and the Auxiliary initiated a program with the National Oceanic Service in which copies of its charts were provided to members of the Auxiliary for the purpose of identifying and reporting discrepancies. The sheer number of Auxiliarists became a significant asset to the Oceanic Service.

During the Vietnam Conflict 82 foot patrol boats were transferred from their normal patrol stations to Southeast Asia. Auxiliarist put their boats to work as replacements. As a result of the 1971 Federal Boating Act, Flotillas were established on state and inland waters. Search and rescue cases increased dramatically. During the spring of 1980 a mass exodus from Cuba occurred. For a period of three weeks Auxiliarists manned radios, performed SAR along the Florida coast, and stood watch at Coast Guard stations from which personnel had been deployed to the Florida area.

Auxiliary aviation assets did not expand nearly as much as surface assets during this period. To a large degree this was a result of emphasis. Utilization tended to be location and mission specific. The aircraft were effective in search missions as they could cover more area in less time. They also were effectively used in checking and verifying the operation and location of various aids to navigation. In a number of Coast Guard Districts they were used to provide rapid transportation to and from Coast Guard stations not served by commercial air transport. On the Great Lakes they were used for ice patrol. During the period the Coast Guard was



One of 15 General Aviation aircraft operated from six airports between San Francisco and Sacramento by AUXAIR Squadron 11N.

engaged in air interdiction of drug smugglers they served as target aircraft effectively duplicating the flight characteristics of drug running aircraft. Beginning in 1991 auxiliaries began flying as observers on Coast Guard HC-130 aircraft.

The 1996 Coast Guard Auxiliary Act greatly expanded the missions of the Auxiliary. Auxiliary Aviation began to expand rapidly and was tasked to assist the Coast guard in any mission or operation authorized by law and authorized by the Commandant. In January of 1997, Coast Guard Auxiliary Aviation (AUXAIR) was upgraded and a standard command and control network was established. Coast Guard responsibilities had increased both in number and magnitude and as a result the Team Coast Guard concept, consisting of the Active Duty Forces, the Coast Guard Reserve, and the Coast Guard Auxiliary, came into being. Coast Guard Auxiliary aviation became a force multiplier. It became essential to implement a finely tuned agenda to maximize mission effectiveness, improve internal as well as external communications, and, with the advent of more complex operations, develop an upgraded qualification and flight safety program. Auxiliary Aviation (AUXAIR) has its own structure, separate from surface operations, and is distinctive in that it is organized on a District basis without a parallel structure at the Division or Flotilla level.

Auxiliaries involved in Auxiliary Aviation take aviation training and complete a syllabus required for their level of qualification. Upon certification by an Auxiliary Flight Examiner they may be certified by the District Director of Auxiliary as Pilots, Observers, or Air Crew in the AUXAIR program. There are three qualification levels for pilots: Aircraft Commander, First Pilot and Co-pilot. Minimum requirements for the different levels are measured by Pilot in Command time and are 200 hours for Co-pilots, 500 hours for First Pilots, and 1000 hours with an Instrument Flight Rules rating for Aircraft Commanders. These qualifications are also linked to the type of mission flown. All pilots must pass recurrent flight checks and undergo annual safety training. AUXAIR does not offer flight training for pilots. Rather, it builds on what certificated pilots already have learned. Non-pilot crew positions must pass air operations training and egress/water survival training.



The alignment of Auxiliary aviation assets in a District with a Coast Guard Air Station is known as the Squadron Concept. Based upon the needs of the Air Station and the crew and facility availability operating orders are issued. Coast Guard Air Stations are the Order Issuing Authority for AUXAIR and provide oversight of the program. While assigned by a Coast Guard unit commander to duty under orders, qualified and current Auxiliary pilots are considered Coast Guard pilots and approved aircraft are considered Coast Guard aircraft.

Since 9/11 and the assignment to the Department of Homeland Security the Coast Guard has become engaged in an overarching transformation in which means to protect the homeland and mitigate risk of terrorist attacks have been implemented. The primary components of the strategy include awareness of threats and vulnerabilities, prevention and protection against these threats, and response to potential attacks. The

Auxiliary, a key component of Coast Guard forces, is involved in this transformation and is fully aligned with the active duty forces. Awareness is a key component.

When missions involve the movement of an Auxiliary aircraft they are termed patrols. Most patrols are multi-mission in concept. Aircraft may be tasked with several simultaneous or sequential missions. Some types of missions carried out in AUXAIR's multi-mission environment are as follows:

- Maritime Domain Awareness and Marine Safety Patrols: Maritime Domain Awareness (MDA) is a concept that underscores many of the missions of AUXAIR. MDA is not a mission of its own, but is an inherent part of virtually every activity in which operations are involved.

- Search and Rescue: For the Auxiliary aircraft, SAR response often takes the form of searching for a person or vessel on the waterways. The Auxiliary aircraft, in this scenario, functions as a search and communications platform, following certain criteria.
- Ports Waterways and Coastal Security: Auxiliary aircraft may be tasked with overflights of critical infrastructure areas to record and report information. The objective of these missions is to search for and report boaters in distress, obstructions to navigation, fires, or other disasters; and may include specific tasking to search for or identify vessels near bridges, in shipping lanes, in the approaches to harbors, or sensitive locations and/or to photograph such events and vessels.
- Marine Environmental Protection: Auxiliary aircraft may be assigned missions to fly over channels or harbors to report pollution or oil or fuel spills. Auxiliary aircraft can assist Sectors in this mission by patrolling/observing harbors or other areas for unreported spills, and reporting their observations back to the applicable Sector.
- Aids to Navigation: Coast Guard AUXAIR provides assistance to the Coast Guard and other concerned federal agencies in checking and verifying aids to navigation (ATON) and charting details, including reporting discrepant aids to navigation, verifying private aids, and submitting chart corrections/updates.
- Ice Reconnaissance: Auxiliary aircraft may be assigned missions to fly over channels or harbors to report ice conditions.
- Area Familiarization: Auxiliary aircraft provide excellent resources for familiarization of a Coast Guard unit's area of responsibility (AOR). Commanding officers (COs) may request that personnel at Coast Guard Groups, Sectors, other units, or cutters, travel as passengers or crew aboard Auxiliary aircraft for area familiarization purposes.
- Photographic Missions: Auxiliaries are encouraged to carry digital cameras on patrols, since photographs of areas of interest are of great assistance in Homeland Security of harbors, pollution spills, vessel traffic, public relations events, and environmental concerns.
- Logistic Flights: The Auxiliary Aviation Program is often tasked with transport of personnel or equipment both within a District and across its boundaries. In times of local disaster or emergencies (flood, storms, earthquake, etc.), the use of Auxiliary aircraft may be requested by outside agencies. Only the District commands and/or Coast Guard air station may approve such use.
- Exercise Support: Auxiliary aircraft may be deployed on actual or practice Coast Guard or defense and non-defense exercises. In some cases Auxiliary aircraft serve as "targets" for detection and intercept, in others the AUXAIR asset will provide support for the exercise through observation or transport.

The success of AUXAIR has been due in large part to coordination and liaison with Coast Guard air stations. Maintaining this relationship and joint training is essential for maximum effectiveness of AUXAIR.



1945 - Coast Guard Acquires P4Y-2G Privateer For Air Sea Rescue: Duties:



P4Y-2G

Marsten Matting, a series of portable prefabricated interlocking pierced steel planks, had been developed, enabling rapid construction of runways in forward combat areas capable of supporting heavy gross weight aircraft operations. In order to take advantage of this capability the US Navy wanted a force of land based B-24 Liberators to fly long range overwater maritime patrol missions against enemy shipping and submarines. A share of the B-24 production, slightly modified, and designated PB4Y-1 was agreed to in July 1942. Five of these aircraft were eventually used by the US Coast Guard.

The development of a B-24 variant, more suitable for Navy operations began in May 1943. Wind tunnel testing by Consolidated Aircraft Corporation had demonstrated that the B-24 would be more stable if the twin fins and rudders were replaced by a single large tail fin and rudder. Since most Navy missions were flown at low altitudes the engines were changed to non-supercharged R-1830 -94 engines. The oil cooler scoops were repositioned above and below the nacelle and a single tall vertical tail was installed. In addition the fuselage was extended to accommodate a flight engineers station. Defensive armament was also increased. This variant was given the name of Privateer and designated PB4Y-2.

The first Privateers were delivered in October of 1945. The Privateers were built by Convair-San Diego. The PB4Y-2 was used exclusively in the Pacific theatre in World War II where it was used primarily for patrol missions in support of amphibious operations. After the war numerous PB4Y-2s

were converted for various other missions. The Privateers were again used in the Korean War with the last one leaving Fleet service in mid-1954.

During 1945, with the expansion of Air Sea Rescue responsibilities, the Coast Guard took delivery of the first of nine Privateers which were designated P4Y-2Gs. Their long range capability and reliability made them well suited for maritime search and rescue missions. Armament was removed and turrets were replaced by large observation blisters and glazing. The aircraft operated out of Coast Guard air stations at Barbers Point, Hawaii and San Francisco, California. They were also used by the Coast Guard air rescue detachments at Guam, Wake and Midway Islands during the Korean War

By 1958 only four remained in service and in 1960 they were returned to the US Navy for disposal. A number of the Coast Guard P4Y-2Gs were later utilized by private corporations as aerial fire bombers.

Manufacturer	Convair	Max Speed	237 mph
Designation	P4Y-2G	Cruise Speed	140 mph
Other	Privateer	Stall Speed	95 mph
Aircraft Type	Patrol – Search and Rescue	Range	2800 st. miles
Wing Span	110'	Empty Weight	37,485
Height	30' 1"	Gross Weight	65,000
Length	74' 7"	Service Ceiling	20,700 ft
Crew	11	Engines	Four P&W 1830-94S

1946 – Coast Guard Air Station Traverse City Established:



In 1938, an Coast Guard aircraft was assigned as an Air Patrol Detachment at Traverse City, Michigan to operate on a seasonal basis and determine the feasibility of constructing an air station. During 1941 a Grumman JRF-3 Grumman Goose twin engine amphibian number V-192 was assigned and by the end of the year a Grumman J4F-1 Widgeon twin engine amphibian number V204 had been added.

The first confirmed use of the present air station site was by the United States Navy which established an air facility for research and development of pilotless aircraft. The Coast Guard began basing aircraft at the facility in 1944. At the end of World War II the Naval Air Facility Traverse City was made available to the Coast Guard and in January 1946 the USCG Air Station Traverse City came into being. The site also became the location

of a commercial airport. In 1949 the Coast Guard deeded 20 acres to the city and when the new 10-28 instrument runway was constructed additional land was provided by the Coast Guard. The original Navy structures were utilized until 1980 when a new maintenance and administrative buildings were completed. The new hangar provided over 50,000 square feet of work space; including the hangar deck, work shops, and offices.

The primary search and rescue aircraft during the late 1940's were PBY-5As and in the early 1950s were replaced by UF-1Gs. These were in turn replaced with the upgraded UF-2G. During the late 1950s two Sikorsky HO4S-3G helicopters were assigned to the air station. A Bell HTL had previously been assigned for support of the icebreaker USCGC MAKINAW. Helicopter capability was upgraded with the assignment of the HH-52A amphibious helicopter in the early 1960s. In September 1978 the HU-16 (UF-2G) aircraft had reached the end of their service life and were replaced by three C-131 search aircraft. IN June of 1983 two HU-25A fan jets were assigned two support the air station missions. In 1986 three HH-3F amphibious helicopters replaced the HU-25A fan jets and the HH-52A helicopters. The Sikorsky HH60-J helicopter came aboard in the early 1991. The compliment of aircraft in 2006 consists of five HH-65-B Dolphin Helicopters.

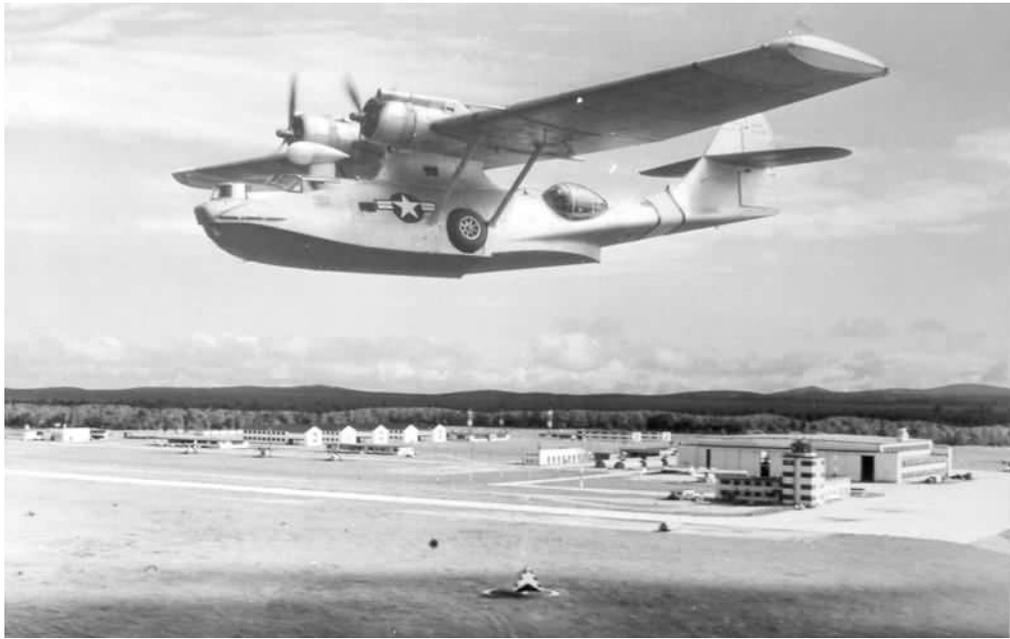


Traditionally search and rescue is at the top of an air station priority list. The Traverse City air station was charged with this responsibility in the Great Lakes region. To give some idea of the search and rescue area the Great Lakes have a surface area of about 95,000 square miles and a shore line of more than 9600 miles. The center of Lake Superior is 185 miles from Traverse City, 150 miles to the center of Lake Huron, 250 miles to central Lake Erie and 450 miles to reach eastern Lake Ontario. At 150 knots in a HU-16 or 90 knots in a HH-52, these distances translate into considerable flight time. In

order to enhance the effectiveness of the HH-52, helicopter air stations were established at Detroit Michigan and Chicago Illinois. Chicago was later closed as an air station and is now operated as an air facility by the Traverse City air station during the spring and summer.

The types of missions assigned to the air station have increased over the years. On the environmental front the role in oil spill prevention has increased as has fisheries law enforcement. Law enforcement support for Federal, State and local agencies has increased. Winter and spring ice patrols have been expanded. Assisting the Coast Guard icebreakers and the iron ore and cement carry vessels in safe navigation in an extended season becomes at times a daily task. An increased role for aircraft in Aids to Navigation operations has also been implemented. As an example; within the northern hundred mile semi-circle centered on Traverse City are nearly 150 aids to navigation. In many instances it is much more economical to supply manned aids to navigation and service others by air than it is to use surface vessels.

Until the assumption of these additional responsibilities and increased pressure to extend the Great Lakes navigation season there was serious question, in view of escalating costs, as to whether, operational justification in fact existed to maintain the aviation unit at Traverse City. Strong justification now exists.



1946 – Post World War II Coast Guard Search and Rescue:



During the war air-sea rescue had been primarily a military operation. The coordination of efforts had been a topic of the Joint Chiefs of Staff since 1942 and under discussion was whether a separate agency should be created for rescue operations or whether one of the existing services should be charged with primary responsibility. In July of 1943 VADM Waesche, Coast Guard Commandant, presented to the Joint Chiefs, factors qualifying the Coast Guard for this responsibility. He concluded his presentation by saying that air-sea rescue was a most proper and normal function of the Coast Guard. This proposal was strongly endorsed by the Navy and just as strongly opposed by the Army Air Force. A sub-committee, set up to evaluate the proposal, concluded that the Coast Guard would face insurmountable obstacles if it were to attempt to expand

into all types of rescue activity for all military forces. It did, however, recommend a joint service Air-Sea Rescue Agency, headed by the Commandant of the Coast Guard, be established to analyze technical data, develop and design air-sea rescue equipment and procedures and to disseminate information to all parties engaged in search and rescue activities. It further stated that each service should retain responsibility for its own aircrews.

The Navy chose to utilize Coast Guard assets and expertise. Plans were developed whereby the Navy would provide air-sea rescue units for the Pacific operations and the Coast Guard would assume all rescue activities within the Continental Sea Frontiers and on all overseas airways. It also suggested that the Coast Guard, based on its communication system and past experience, handle all radio direction finding and the navigational aids along the airways now serviced by the Army Airways Communications System (AACS). No official reaction was forthcoming from the Army Air Force with the exception that on the principle routes of the Army Air Force, AACS would continue to handle all communications and navigational aids as a matter of primary interest. During the summer of 1944 Major General Laurence S. Kruter proposed that ASR become an integral part of the Army Air Force Organization and to become part of the Air Transport Command.

The Navy pressed ahead and assigned ASR responsibility to the Sea Frontiers and designated the Coast Guard to man and operate ASR facilities for the Sea Frontiers. The combination of aircraft, ships, shore stations and communication facilities were developed into a highly efficient operation. The Navy position was enhanced when in March 1945 General George, ATC commander, officially expressed concerns over the assignment of responsibility to ATC for rescue coverage on transportation routes. As part of his conclusion, disagreed with by many within the Army Air Force, he wrote that when the magnitude of the operation for emergency rescues at sea is



Coast Guard PBY-5A aircraft in Air-Sea Rescue livery

realized, that a conclusion is reached that the only way to provide the maximum rescue capability is by turning this responsibility over to the Navy.

The CNO in a letter outlining policy, serial number 3744 (25 April 1945), stated that the responsibility for Air-Sea Rescue as assigned to Frontier commanders would terminate at the end of the war and that post war ASR would be a function of the Coast Guard. It directed that a detailed study of facilities and equipment be made for the purpose of turning over to the Coast Guard that which would be required. LT. Gen Hoyt Vandenberg, USAAF, recognizing that the coverage of the transport routes by the AAF had been neither efficient nor economical, proposed that the AAF provide global coverage with rescue squadrons assigned to the various Air Forces throughout the world to adequately provide for potential combat needs. In recognition of the merit in the Navy's proposal, the Coast Guard would be responsible for a comprehensive sea rescue program for transoceanic air routes and the maritime regions of the United States and its possession. In addition an AAF land-air search and rescue organization would be established for the interior areas of the United States and liaison would be maintained with the Coast Guard. In the late fall of 1945, the Navy began to deactivate its own rescue units and pressed for the Coast Guard to take over responsibility for ASR. On 4 December the Commandant of the Coast Guard informed the Navy that the Coast Guard accepted in principle the responsibility for Air Sea Rescue.

There were those within the Coast Guard that had serious reservations. During 1944 a comprehensive description of the functions the Coast Guard expected to perform in peacetime had been drawn up. The result would be an expansion of pre-war activities but a dramatic reduction in the size of the Coast Guard from the wartime level. It was felt by some that an Air-Sea Rescue responsibility of the size envisioned would expand one branch of the Service to the detriment of the others. It was further feared by some that the full implementation might result in a degree of Navy jurisdiction in Coast Guard operations. ADM Wasche, who was ill, retired effective 1 January 1946, the date the Coast Guard was returned to the Treasury Department. As a result the Coast Guard lost its most effective advocate for the expansion of Coast Guard rescue duties. A series of events took place, however, that established a logical transition into a much greater role in search and rescue operations on the part of the Coast Guard.

Fifty-two allied and neutral states met in November of 1944 and an interim agreement was reached for a Provisional International Civil Aviation Organization (PICAO), with headquarters in Canada, to become effective 6 June, 1945. Regional meetings were held dealing with the various technical subjects of concern to civil aviation such as Aerodromes, Air Routes and Ground Aids; Air Traffic Control; Communications; Air Navigation Aids; Meteorology; and Search and Rescue. Although it was not readily apparent in the early stages of the PICAO that the Coast Guard would become involved to any great extent, it was noted that at least two and possibly three of the technical subjects under discussion involved items in which the Coast Guard had an interest. The Montreal divisional meeting in the fall of 1945 was concerned with the development of a search and rescue program. LT. John M. Waters attended as the Coast Guard aviation representative. The meeting developed certain search and rescue terminology, the conditions under which search and rescue action was taken; and outlined requirements for the establishment of Rescue Coordination Centers and specially equipped rescue units. The work which the representatives performed in this meeting was important as it established a firm foundation upon which the future organization of international search and rescue would be built.

The Coast Guard had developed and was operating the LORAN navigation system. This too would effect future operations. This system was in use by both aviation and marine transportation. PICAO policy was that the LORAN, along with certain other aids, should remain in operation until a final

determination of a standardized long range air navigation system evolved. Upon final determination, LORAN became the standard navigational system and remained a Coast Guard operation.

As a result of these duties and previous experience the Coast Guard was designated as the coordinating agency for Search and Rescue operation and the agency with primary responsibility for providing Search and Rescue facilities and services to meet United States obligations to PICAQ. This was in addition to Coast Guard responsibility for search and rescue operations upon and above the maritime waters and adjacent areas of the United States and its Territories. On 3 September The Air-Sea Rescue Agency, in recognition of expanded responsibilities, was renamed the Search and Rescue Agency and Search and Rescue (SAR) became the descriptive name of choice.

When the Coast Guard transferred back to the jurisdiction of the Treasury Department nine Coast Guard air stations plus the detachments at Annette Island Alaska and the detachment at Kaneohe Bay were returned to Coast Guard operational control. Additional air detachments were established at Traverse City Michigan and Sangley Point in the Philippine Islands during 1946. A detachment was also established as part of the joint North Atlantic Ocean Patrol (NORLANTPAT) at the Naval Air Station Argentia, Newfoundland. The function of the patrol was to maintain up to 11 Ocean Station Vessels, the North Atlantic Loran chain, and provide rescue services for the area. In 1947 air detachments were established at Kodiak, Alaska; Guam and San Juan, Puerto Rico. NORLANTPAC was discontinued and the air detachment at Argentia remained as a Coast Guard air detachment The PB-1G went operational in 1946 and P4Y-2 long range search aircraft were on board replacing a number of the PBYS. PBM-5s were also obtained and replaced the PBM-3s and some of the PBYS. The Coast Guard, in 1947, was operating four ocean stations in the Atlantic and two in the Pacific. A realignment of LORAN was taking place to better serve the needs of the present military and civilian requirements.



USCG Cutter BIBB

Ocean station vessels played an important part, In addition to weather information the provided positive locations of aircraft transiting the oceans. An inbound aircraft would be picked up on the ships radar and tracked for a period as it passed over and beyond the ship. This provided excellent track and speed information for the aircraft. The vessels also were available to assist if ditching became a necessity. No ditching is safe but they are a lot safer if the aircraft can ditch alongside a vessel with rescue capabilities.

In 1947 a ratification of a treaty of ICAO members for the establishment of ocean stations to be prorated among the member nations. The United States agreed to accept responsibility for seven stations. Full establishment of all stations was expedited by an event on the night of 13-14 October of that year. One of the Boeing 314 clippers, a flying boat named Bermuda Sky Queen, enroute from England to the United States, encountered 100 mile-an-hour headwinds after

passing the point of no return. Unable to make the North American coast and unable to get back to Europe, the pilot elected to fly back to and make a controlled ditching alongside the Coast Guard cutter BIBB at Ocean Station Charlie. The landing would not be routine. A moderate gale had been blowing and a confused sea was running. The pilot put the plane down with 62 passengers and seven crewmembers sustaining very little damage. Getting the passengers transferred to small boats and then to the Bibb was challenging but accomplished. All passengers and crew were rescued without loss. The story became headline news and solidified the establishment of the ocean stations. There were a number of additional controlled ditchings carried out; all were successful.

A reduction of personnel and obtaining sufficient funding were serious problems faced by the Coast Guard as a whole after the war. ADM Joseph Farley had become commandant of the Coast Guard and the task confronting him was gargantuan. He oversaw the Coast Guard's demobilization and supervised the renewal of traditional peacetime activities without neglecting the duties that had accrued to the service during the war. By mid 1947 the Coast Guard reached a nadir of 2,195 officers, 532 warrant officers, and 15,730 enlisted men, little more than half the number thought necessary to carry out the post war program drawn up by ADM Waesche's planners. Several senior officers later asserted that the Coast Guard would have fared better during the immediate postwar years had it remained under the Navy Department for a longer period of time, principally because neither the Treasury department nor congressional committees responsible for Coast Guard support after the war had any recent knowledge of the Coast Guards expanded role and attendant requirements. By early 1948 the number of operational aircraft had been reduced from 195 to 71. Never the less, the Coast Guard continued to perform the search and rescue mission very well.

Extensive evaluation of methods, procedures and techniques used to land seaplanes in rough water were conducted by the Coast Guard under the direction of the then CDR. C.B. MacDiarimid beginning in 1945. Largely as a result of this work, seaplane rough water landings in the open sea became safer – not safe – but safer. The results were also used successfully in training aircrews, both military and civil, for ditching at sea. The Coast Guard initiated and carried out a program to indoctrinate commercial and military flight crews in correct emergency procedures. An understanding of swell and wave action by a pilot ditching is essential. Following closely in importance to the pilot placing the aircraft on the water properly, correct evacuation procedures are crucial. Crew members must be able to get life rafts and associated equipment into the water promptly. To safely evacuate persons on board, fast and effective action is necessary. Training was conducted at principal Coast Guard air stations. Mock-ups were employed with good success. At San Francisco where the crews of many airlines flying the Pacific, both US and foreign, received training, the fuselage of a four engine plane was moored half submerged in San Francisco Bay. After preliminary training crews were placed aboard the mock-ups and exercised in abandoning the mock-up and getting survival equipment into the water. Most trainees were afforded the opportunity to participate in an exercise with a large cutter. They would depart a smaller vessel rigged with a mock-up hatch and wing section and upon signal the trainees would abandon the mock-up in liferafts which they themselves inflated. In a heaving sea this was an illuminating experience.

The initial concept of air-sea rescue was geared to the survival and rescue of the crews of aircraft who, for whatever reason, were in peril due to the loss of their aircraft. Two approaches were advanced. The Army Air Force (AAF) approach was to analyze the frequency and concentration of aircraft traversing a given area. This was known as route coverage. Facilities were the responsibility of the command and were placed to reach a given location in the shortest period of time. The approach used by the Navy was area coverage in which facilities were placed so as to provide a blanketing effect on the entire region. The potential drawback here is that the number of facilities is determined by equipment availability. When the Coast Guard was charged with air-sea rescue responsibilities for the Sea

Frontiers they integrated both approaches into a very effective network. Vessels such as 110 foot PCs, 125ft and 165ft cutters were factored into the equation. In addition to the AVR boats at the air stations they drew upon a series life boat stations, all equipped with small boats, up and down the coasts. Further, they fully utilized an excellent land-line and radio communication system.

Coordination was a key part of the equation. It was recognized that it would be impossible, from an economical standpoint, to establish adequate facilities for the exclusive use of search and rescue. However, other assets already in existence for other purposes can frequently be utilized to great advantage. Arrangements were made to monitor merchant vessel position reports and liaison was maintained with various HF/DF radio facilities. Additional liaison was maintained with Federal, State, and Municipal agencies capable of rendering assistance. The matter of establishing a working plan and providing for the supervision of available facilities best describes what is meant by coordination. Rescue Coordination Centers were established for this purpose. Commandant Coast Guard Circular 13-44 dated 1 April, 1946 established four Coast Guard Area Commands, to act as Task Force Organizations under the Commandant. The Task Forces functions, analogous to the naval Sea Frontiers, maintained joint operation control centers. The Task Forces were composed of the Coast Guard Districts within their respective areas. The Eastern Area command had the added responsibility of the North Atlantic Ocean Patrol. The number of Task Forces was later consolidated into Eastern Area and a Western Area commands.

This concept is illustrated by an incident involving a twin engine Navy patrol bomber that departed from an overseas base for Norfolk. Disaster does not always arrive all at once. It may start as a minor difficulty that is soon compounded by others. Shortly after takeoff, the LORAN, an electronic device for determining the position of the aircraft, was found to be inoperative. The flight entered clouds prohibiting taking a sun line by sextant or obtaining a drift reading from the sea below. But with only several hours remaining before reaching Norfolk the flight continued and the navigator computed his assumed position from course and speed flown. The aircraft was on autopilot and a steady course of 295 degrees was flown. Late in the afternoon the aircraft broke out of the clouds and the pilots realized that the sun was not setting in the position it should have been. Disengaging the auto pilot the aircraft was turned toward the sun. The compass card did not move. The compass was stuck and it was not known how long it had been in that condition. They did not know where they were!



Coast Guard PBM-5 in Search and Rescue livery

They promptly reported the circumstances to New York Overseas Radio who in turn reported it directly to the Coast Guard's New York Rescue Coordination Center, known by voice call as "Atlantic Rescue." Atlantic Rescue assumed control and an alert went out by high speed teletype to the various rescue commands along the Atlantic coast. This included the Net Control Station of the Federal Communications Commission (FCC) in Washington. The FCC had high frequency direction finding stations (HF/DF) and the first priority was to locate the lost aircraft. Bearings from several HF/DF stations were obtained from the patrol bomber and plotted on a chart establishing the position of the lost aircraft. Instead of being 550 miles to the west of Bermuda the aircraft position was 420

miles northeast of Bermuda. Bermuda was the closest landing point and it was suggested that the aircraft take steers for Bermuda. Bermuda DF gave a steer of 205 degrees magnetic. Bad weather was not a novelty to Bermuda but fog was a rarity. A thick fog was settling in with low ceilings and less than a quarter of a mile visibility. The island had no precision instrument approach and due to the hills in the area the minimum ceiling allowed for aircraft instrument approaches was 700 feet. Bermuda was below minimums but it was the only place that could be reached with the fuel remaining. When the lost aircraft reported that it was marginal as to whether there would be enough fuel to reach the island a PBM-5 was scrambled from the Bermuda Coast Guard Air Detachment for intercept and escort of the inbound aircraft. Fog was thick and radar was used to reach the sealane for takeoff. In addition, the Coast Guard cutter COOK INLET, the standby rescue vessel at Bermuda, was ordered to proceed to assist.

The PBM-5 homed in on the inbound distress aircraft using VHF/DF and commenced escort. Fuel was re-evaluated and it was thought to be enough to reach Bermuda. The COOK INLET proceeded to a point five miles off the end of the runway, turned on her radio beacon and was ready to provide radar service and talk the navy pilot down. The weather was reported as 200 ft and visibility one-half mile. It was not an approved approach but there was little choice. If the approach failed then a night ditching - an extreme measure - would have to be made. The pilot of the Navy plane was thoroughly briefed on the procedure to be used. It was explained that on final approach COOK INLET would call out the distance to the island every one-half mile. If the runway was not sighted at one mile an immediate pull up to the left would be executed and preparations for a ditching would be initiated.



Coast Guard Cutter COOK INLET

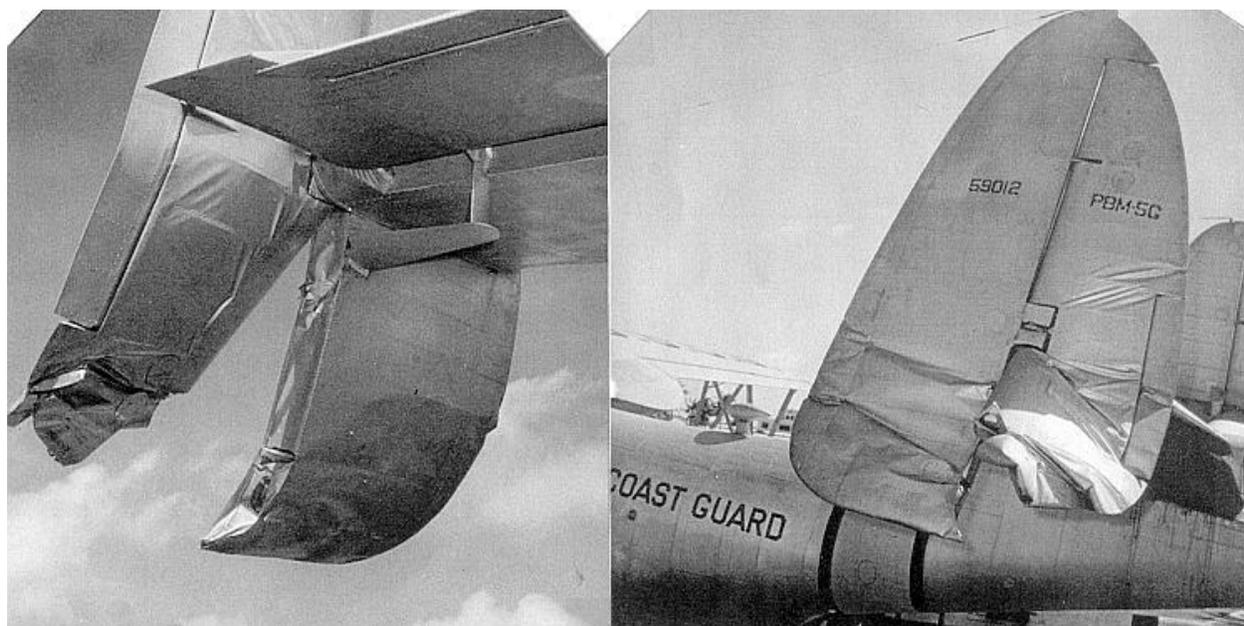
Communications were established between the Navy aircraft and the COOK INLET and as he arrived over the ship he let down to 1000 feet and executed a procedure turn ten miles out and proceeded inbound for final approach. As he passed over the ship and homed in on the Kindley AFB radio beacon, COOK INLET was transmitting a steady flow of information. He was on course and distance was provided. He established a rate of decent to arrive over the end of the runway at 200 feet. As he neared the runway COOK INLET transmitted standby to mark one mile. At Mark one mile— “Pull up” - was transmitted. The response from the pilot was – “Runway in sight” and the aircraft landed safely. The PBM made an approach to the Naval Station seadrome on its own radar and the COOK INLET returned to its moorings at St. George.

Intercept and escort of lost aircraft as well as those experiencing a loss of an engine became a regular part of search and rescue (SAR) activities. Accuracy in aerial navigation was a relative thing. Over the United States and Canada, with the vast electronic navigation system, a professional pilot on an instrument flight plan called his fixes down to the minute. But over many vast stretches of ocean, navigation aids were few and the aircraft could be 50 miles in error in its position without seriously affecting the flight. As it approached its destination and picked up shore based aids the position became increasingly accurate. It is difficult to locate survivors in the water. The greater the

uncertainty of the location of survivors the greater the possibility they will not be located. The loss of an engine affected the range and endurance of an aircraft. Even four engine aircraft were affected by the loss of an engine. The loss of two became a very serious matter. The intercept and escort of an aircraft provided a positive fix in case of a ditching. In some cases, if the escort was a seaplane and a landing could be made it was, but in all cases additional life rafts and survival equipment could be provided and surface vessels could be directed to the location of the survivors. In the years to come, aircrew training, the ocean station program and aircraft escort were phased out as the jet aircraft came on the scene. The jet was faster, more dependable, had greater range and navigation aids improved dramatically. The services provided the early trans-ocean operation were no longer needed.

Many an hour was spent searching for overdue recreational boats and/or commercial fishing vessels. Many ships and vessels were saved by cutters arriving with additional pumps. Soon after World War II some unrecognized Coast Guard genius came up with the idea of a small portable pump which could be delivered rapidly by air and parachuted to a sinking vessel. A pump, capable of pumping over 60 gallons of water a minute, was packed in a water tight container complete with suction and discharge hoses and a can of fuel. They proved to be immediately successful. A retrieving line and parachute were attached to the container. The retrieving line was strung out and the pump was dropped from a low but sufficient altitude in such a manner that a portion of the retrieving line came to rest upon the vessel.

The decade beginning in 1945 was the age of the seaplane in Coast Guard aviation. In addition to landings in the open sea to pick up survivors, medical evacuations became a regular occurrence. Large seaplanes from San Diego would fly down the Baja to remove injured seamen from charters and tuna boats. San Francisco was kept busy. East Coast and Gulf aircraft would fly far out to sea to make emergency pickups. It was a dangerous undertaking and accidents did occur and aircraft were lost. IRA McMullan landed 800 miles off San Francisco, had his elevator torn off and the fuselage broke in two. Harry Solberg landed off Bermuda and the bow gave way. He escaped underwater after the crew had evacuated. Andy Couples landed to pick up a sick sailor from a submarine and both engines tore loose from their mounts. John Vuckic landed in 12 foot seas close to the Red China Coast to rescue the crew of a P2V that had been shot down by Communist anti-aircraft fire. On take off, after the JATO had been fired, one engine failed and they crashed. Four Navy and Five Coast Guardsmen were lost.





The above three pictures show damage incurred by a PBM-5 during an off-shore landing

The continued loss of seaplanes triggered a reaction from Headquarters. It was directed that before landing in the open sea the pilot would have to obtain permission from the District Commander. This was to allow his staff to make a current check on the necessity for a landing and the availability of other means, such as surface vessels, to perform the SAR operation more safely. In theory it was a good step but in practice there were shortcomings. Primary was that the authority of the on scene commander had been usurped – in some cases by those with limited knowledge of aircraft capabilities – which is very poor SAR practice. The aviators chaffed under the restrictions and let their feeling be known but change did not result. The situation was brought to a head when a Navy P2V ditched in the Atlantic. The survivors were promptly located and the pilot, reporting favorable sea conditions, requested permission to land and pick them up. In the RCC, the plot showed a cutter 40 miles away. The survivors were in a raft and the duty officer decided the ship would make the pick up and refused to grant permission to the pilot to land. The Navy people ashore were monitoring the situation and became very upset with the decision. They called the Air Force and asked them to make

the pick up. An Air Force SA-16 soon arrived, landed and picked up the P2V crew and returned them to the Navy base. Word of the “forbidden landing” quickly spread and loud protests arose from within the aviation establishment.

The Commandant modified the directive to give pilots the right to land without permission when, in their opinion, it was necessary to save life. But it was understood the decision put the burden on the pilot. If the aircraft was damaged, the pilot had best be sure the landing could be shown to be really necessary. But there was more to it. Compensation and liability were not commensurate. For a number of years medals or awards were refused for even the most difficult jobs. Theories as to why were advanced but no official explanation was ever given. The fact was, however, that the policy was deliberate, arbitrary, and ill-considered. The pilots fully understood the danger in landing in the open sea but never the less many risked their lives and reputations to save others during those years and never received so much as an official thank you message. Fortunately this situation has been corrected.

By 1951 the performance of the helicopter had been greatly improved and it was becoming an integral part of the SAR picture. The HO4S could pick up multiple people close in to shore that in former years would have required a seaplane’s help. As the range of the helicopter increased, seaplane landings became even less frequent. Moreover the helicopter could hoist people from vessels at sea or from the water in sea conditions that the seaplane could not operate in. The helicopter also proved to be an ideal vehicle for flood and hurricane relief. The P5M Mariner aircraft, designed for rough water operation were obtained in the mid fifties but proved very costly to operate. They were retired from service a short while later leaving only the amphibious HU-16. The helicopter soon became predominate.



1946 – Coast Guard Air Detachment Argentia Established:



On 12 July 1945, administrative control of VPB-6 (CG) was transferred from Commander FAW-9 to the Commandant U.S. Coast Guard. Operational control remained with Commander Task Force 24.0. It was reduced to six PB4Y-1 aircraft and redesignated a search and rescue squadron. Two PB4Y-1 aircraft were assigned for ice reconnaissance test work with AN/APS-15A radar. In August VPB-6 (CG) was directed to transfer its headquarters from BW-1 to the Naval Facility at Argentia, Newfoundland. The Coast Guard was returned to the Treasury department on 1 January 1946 and VPB-6(CG) was disestablished as a Navy Squadron at that time. Elements of the squadron continued as an air detachment which operated as part of the North Atlantic Ocean Patrol (NORLANTPAC).

NORLANTPAC provided weather information, navigational facilities and search and rescue services for the marked increase in traffic, predominately military, between Europe and the North American continent. Components were the North Atlantic Weather Patrol vessels, LORAN stations in Greenland and along the Atlantic Seaboard of the United States and Canada, and the air detachment at the Naval Air Facility at Argentia Newfoundland. During the spring of 1946 the International Ice Patrol was resumed. In addition to the assigned Coast Guard cutter, the two PB4Y-1 aircraft were used for ice reconnaissance. Ice Patrol became an aircraft only operation.

NORLANTPAC ceased being a separate operation under the Area Command but the duties of the air detachment continued. The PB4Y-1s were replaced by PB-1Gs which were used for searches and for the International Ice Patrol. In addition there were two PB4Y-5As assigned which were used for search and rescue (SAR) and the supply of LORAN stations. The stations were, for the most part, in rather isolated locations. Heavy supplies, equipment and fuel were supplied by land transportation to the Newfoundland LORAN stations and during the summer months a Coast Guard supply vessel serviced the Labrador station. Aerial supply took place approximately every two weeks. During the winter months when water landings were restricted because of ice, the supply part of the mission was conducted by flying over the station and dropping supplies by parachute. The pickup of outgoing mail, repairable items, and used parachutes was accomplished by hooking a line strung between two poles.



Search and rescue missions varied. In September 1946 a Sabena Airliner crashed and Argentia provided search and medical evacuation for survivors. Because of the location of the crash, Coast Guard helicopters, which were in their early development state, were disassembled, flown in and then reassembled in order to transport the survivors to a lake where the Argentia PB4Ys could evacuate them to medical facilities. Additional examples of SAR activities

include a 1200 mile medical evacuation of a seaman with a ruptured appendix. This medical evacuation of the seaman required a hazardous open sea landing and take-off. A pilot in a small float-plane doing survey work crashed 100 miles south of Goose Bay, Labrador was located and rescued. In May 1947, in response to a request, Argentia PBYs flew about one ton of emergency food supplies to the 150 residents of a lumber camp in Three Rapids, Labrador. The camp had been devastated by fire. Four men injured during the fire were evacuated. These types of rescues were gradually phased out as land based aircraft replaced the amphibians at Argentia.

When the PBYs were phased out the primary mission became the international Ice Patrol and a limited search and rescue function was maintained. The PB-1Gs were replaced by R5Ds in 1958 and they in turn were replaced by HC-130 aircraft in 1963. The Argentia air detachment was disestablished in 1966. HC-130 aircraft continued to be deployed to NAS Argentia for the International Ice Patrol until its closure in 1971 at which time the Ice Patrol continued to operate out of several Canadian facilities. 1983 saw the introduction of the APS-135 Side Looking Airborne Radar (SLAR). The use of SLAR altered the Ice Patrol aircraft deployment schedule. A HC-130 was no longer deployed to Canada on a continuous basis during the ice season. A SLAR equipped aircraft was deployed for a one week period every other week.

Aerial Resupply – The Old Way

BY

LtCol Ted A. Morris, USAF (ret)

Note: This is an authorized abridged reproduction of an article written by LtCol Morris as it appeared in the 1991 summer addition of Coast Guard Flight Lines. It is presented as a first person depiction of Coast Guard air operations in a by-gone era. Photos were provided. During the period of this article, 1946-1948, Ted served as a Coast Guard Aviation Machinistmate, flying PBY-5A aircraft from the Coast Guard air detachment at Argentia Newfoundland.

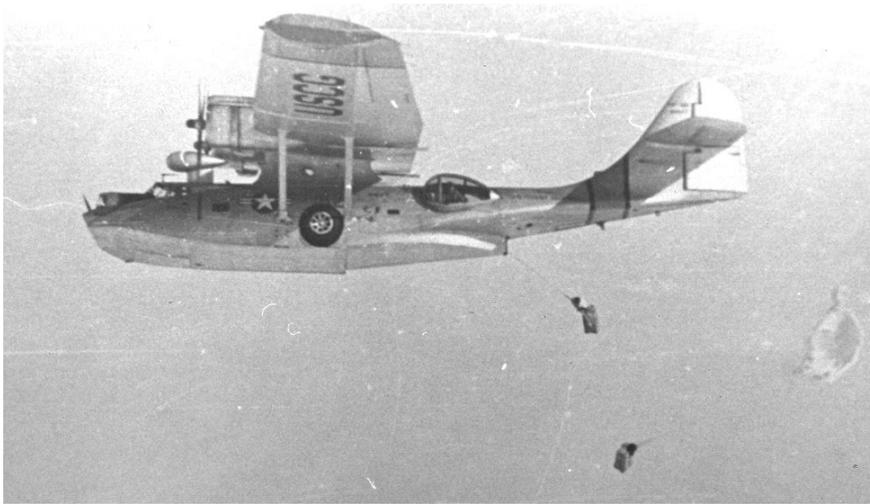
Several LORAN stations providing coverage for the North Atlantic ocean were located in Newfoundland, at Port aux Basque, Bonavista, Twillingate and one very remote site was located at Battle Harbour, Labrador. The three LORAN stations in Newfoundland were supplied for the most part by land transport. About once a month, however, it was necessary to use airdrop resupply. The Battle Harbor station was supplied with mail, food, personnel and maintenance parts all year by PBY-5A missions. Water landing operations were restricted during the winter months because of ice. During this time, the supply portion of the mission was basically to fly over the station's drop zone and dropping supplies by parachute. The pickup of outgoing mail, repairable maintenance items and used parachutes was a bit more challenging.

A Battle Harbour mission was approximately eight flying hours for two pilots and four crewmen: usually an aviation radioman (ARM), two aviation machinist mates (AMM) and an aviation ordnanceman (AOM). Prior to take off, the retrieving equipment was checked over and the cargo was loaded and distributed throughout the aircraft compartments.

The PBY-5As were "winterized", which meant that heat exchangers were installed on the outboard exhaust of each R-1830-92 Pratt & Whitney engine. This supplied a hot wing anti-ice system for the wing, provided that the engine was operating. An inoperative engine meant no anti-icing capability on that side of the wing making

it difficult to fly on one engine in icing conditions.

The heating system for the crew consisted of three Stewart Warner heaters located in (1) the tunnel compartment aft of the blisters, (2) the bunk compartment forward of the blisters where SAR equipment was stored, and (3) the navigator compartment immediately behind the pilots. These heaters used aviation gasoline for fuel, a glow plug for ignition and a minimum of 80 knots airspeed for air supply, which hopefully would mix with the fuel and be ignited by the glow plug. As the PBV did most everything in the neighborhood of 100 knots, the heaters should have worked. Most flights required at least one in-flight heater overhaul to keep at least two of the heaters in operation. The PBV had plenty of openings around hatches and windows to provide ample air flow of outside temperatures throughout the aircraft. It is safe to say that the crew members had to ensure that they were dressed warmly and to plan on generating their own body heat. During air drops and retrieving operations, heaters were turned off and the blisters and tunnel hatch were opened, making the PBV a very cold aircraft.



During the air drops, the pilots flew the aircraft manually just above stall speed for several hours. The crewmembers manhandled the cargo to the blister compartment, secured the parachute static line to the gun mount and heaved the bundles out of the blisters as the aircraft flew over the men on the ground. Eight or ten passes at heights of about 100 feet were required to drop all mail and cargo.

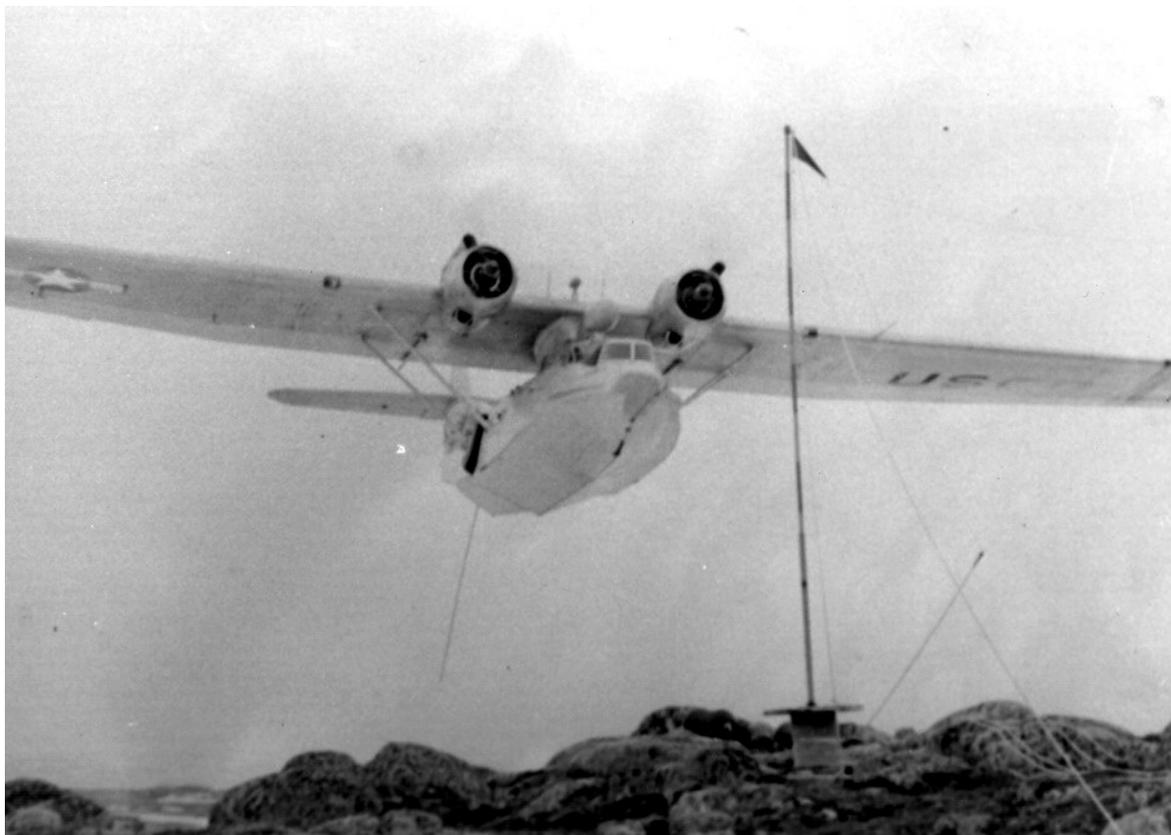
To make pick-up retrievals, the tunnel hatch, located at the bottom of the yellow SAR band around the aft fuselage, was opened and latched. The hatch, originally intended for a .30 caliber machine gun, was about 30 inches long and 21 inches wide. A special rig was installed on the gun mount, through which a two section wood catcher pole (3 inches in diameter and 20 feet in length) was inserted. At the lower end of the pole was a spring-loaded catch, into which a hook was attached. Spliced to this hook was a 30 foot length of one-half inch diameter nylon line. The pole and attached line trailed below and somewhat behind the tunnel hatch. It was, of course, very necessary to secure the other end of the nylon line to a specially mounted stanchion.

On the ground, the men from the LORAN station set up the ground portion of the retrieval gear. Two poles, 18 feet high, striped red and white, each topped with a small flag, were erected about 20 feet apart. Between these poles a 25 foot loop of one-half inch nylon line was stretched and attached. A cylindrical container, 20 inches in diameter by 30 inches in length and made of hard rubber, was shackled to the main nylon loop with a 10 foot nylon leader.

During retrieval operations the pilots flew the aircraft manually, literally "buzzing" at the height of about 20 feet. Flying the aircraft at wave-top level made it easier to see the upright poles and make a run at them. As the aircraft neared the poles, the pilot eased up so the keel just cleared the line between the poles, dragging the catcher pole and its line across the loop line. As the loop was snagged, the hook pulled from the spring catch on the pole. The 30 foot of catcher line, 25 feet of ground loop and 10 feet of leder line, dragged the container into the air.

The pilot then gained altitude to prevent the container, which was strung out behind the tunnel hatch for approximately 50 feet, from dragging across the ground and into the water. A crewmember hauled in the catcher pole, while two others, crouching in the tunnel compartment, hauled in the swinging cargo container hand over hand. As the heavy container bounced along at the end of the stretching nylon line, fingers arms and legs were easily mashed. The limited space in which to maneuver made it necessary to keep everything

clear of the catcher line in the event someone slipped or the container struck the ground. After the contents were removed from the retrieved container, it was dropped back to the ground crew for another round of use. Each pickup necessitated re-rigging both the aircraft catcher and ground retrieval gear. About ten passes were required to complete the pickups



On more than one occasion the nose of the aircraft was stuck through the ground loop. The container was snatched into the air, but there was no method with which to get the container into the aircraft. In this situation, it was necessary for a crewmember to open the bow turret top hatch, which then greatly contributed to the cooling inside the aircraft. As the aircraft flew over the ground party in the drop zone, a crewmember stood up in the wind and cut the loop line, hoping that the container would fall where the ground personnel could retrieve it.

During the summer months the ice melted, permitting water operations. Mail, cargo and replacement LORAN personnel were flown in. Water landings and takeoffs replaced the airdrops and pickups. The landings and takeoffs were not usually made in sheltered water. They could be hazardous operations and an experience in themselves. Below the flight mechanic's station, located in the pylon attaching the wing to the hull, was an auxiliary power unit (APU) with a built in bilge pump. This APU was manually started with a pull rope and a good standing position was necessary, or the result could easily be a nasty fall into the bilges. In preparing for the landing the APU was started and the bilge pump suction laid out for immediate use. The APU ran continuously while on the water, providing electrical power for radio and restarting the engines, as well as operating the bilge pump. Prior to landing, all hatches, nose gear doors and locking pins were checked in place. Normal landing technique was to stall the aircraft unto the water.



The aircraft was taxied using engine throttles, rudder, sea anchors deployed from the blisters, and lowered landing gear to aid in steering the aircraft on the water. The small bay at Battle Harbor had an anchored mooring buoy, to which the aircraft could be moored. Depending on water and wind conditions, mooring was a wet job for the crewman in the bow. A catwalk, four inches wide four feet long, was built in, just above the water level on each side of the bow turret. An anchor and mooring post compartment was located on the port side of the bow. The crewman crawled out the bow turret top hatch and, crouching on the port catwalk, rigged the mooring gear. As the aircraft passed the mooring buoy, he would catch the eye splice.

To reach the aircraft, the men from the LORAN station used a small wooden power boat, which they inevitably tried to crush against the hull of the aircraft. Often it was necessary to use one of the aircraft's inflatable life rafts to ferry mail, cargo and personnel to and from shore. This frequently turned into considerable work, such as the time we hauled fifty sacks of cement.

Water takeoffs were usually aided by Jet Assisted Take- Off (JATO) bottles. On the aircraft were mounts for two bottles forward and two bottles aft of the wing struts, on each side of the hull. Normally, two or four bottles mounted on the aft mounts were used. Heavy and difficult to install from a boat or liferaft, JATO bottles were normally mounted onto the aircraft prior to departure from the home station. A crewman crawled out onto the hull, and leaning over the side, installed and connected the black powder JATO igniters. The mooring was cast off and the stations secured. The aircraft was then taxied to the takeoff area, engine power was applied, and takeoff run begun. The JATO was fired by the pilot as near to lift-off as possible to add extra thrust (1000 pounds per bottle) to assist in becoming airborne. It was then time to get as many heaters going as possible and head for home.

1946 – Pacific LORAN and Post War Aviation Support; CG Air Detachments Sangley Point and Guam Established:

LORAN (**LO**ng **RA**nge Navigation) is a terrestrial navigation system using ground-based transmitters. Hyperbolic LORAN lines of position (LOP) are formed by measuring the difference in reception times of synchronized signals. A LORAN net, or chain, requires a master station, initiating the pulse, and a series of slave stations. In very simplified terms, the master transmits and the slave responds. Charted values of this time delay measurement were placed upon a navigational chart. The measurement

observed placed one somewhere along a LOP. That information is of little value without a LOP from a second pair. The point of intersection of the two LOPs is the location of the ship or aircraft receiving the signals. The station configurations thus must provide a geometry that allows such intersection.

This initial LORAN system is known as LORAN A. This "Top Secret" project was developed during World War II in response to needs of military ships and aircraft for a precise navigational system. Scientists at the Massachusetts Institute of Technology and the Bell Laboratories, with the support of the War and Navy Departments made theory a reliable reality. The Coast Guards involvement began in 1942 when Vice Admiral Waesche, Commandant of the Coast Guard, was asked to recommend an officer to direct the program. Lieutenant Commander Lawrence M. Harding was given the task and brought rapid progress to the project. In mid 1943 the North Atlantic chain became operational. The success in the North Atlantic led to rapid expansion elsewhere.



LORSTA Ulithi Atoll

type of support throughout the construction of the Pacific chains. When the command unit moved to Guam an additional PBY-5A was obtained as was a PB4Y-2. Construction of the Western Aleutian and Hawaii chains were next. From that point on the other five chains came into being. The Pacific military campaign was the determining factor and construction overlapped. Three construction detachments were utilized.

The importance of LORAN to the war effort can not be overstated. The extent of problems overcome in establishing the individual stations was exceeded only by the magnitude of the task in general. The stations which were erected provided LORAN service for practically the entire Pacific area in which combat operations were performed.

In the post war period LORAN became the primary electronic navigation system for both ships and aircraft. The Coast Guard was given the responsibility of maintaining and operating the vast majority of all LORAN stations. The LORAN chains in the Pacific were realigned and modified to support post war military and commercial requirements. Whenever and wherever support could be obtained from local sources and/or other military installations it was utilized. A number of the stations, however, were constructed on isolated islands or other remote locations.

A large vessel to supply equipment and personnel was needed for construction and logistical support of the Pacific LORAN chain. The USS COLQUIT (AK-174) was obtained and converted to Coast Guard requirements. The name was changed to USCGC KUKUI (WAK-186). The KUKUI carried two

LCMs on her decks to ferry men and equipment to shore and also had three bulldozers, several trucks and a few jeeps stashed in her holds. Seven months a year she was underway providing necessary logistic support to members of the Coast Guard LORAN chain throughout the western Pacific. During this time she delivered "everything from toothpicks to antenna poles; from a can of pepper to a "Quonset Hut." She also carried the complex electronic equipment necessary to set up the LORAN system. The Officers and men not only sailed the ship but they operated bulldozers, landing craft, trucks and jeeps."



Coast Guard Cutter KUKUI

The USCGC NETTLE (WAK-169), a former Army FS, was also obtained for LORAN support.

She spent the first six years at Kwajalein atoll followed by a year at Guam and then was based out of Sangley Point to support the Philippines Section. At intervals during the years a 180 foot buoy tender was stationed at Guam. At other times, support for the Pacific island stations was provided quarterly by 180 foot buoy tenders based at Hawaii.

Completing the picture was regular aviation support. The isolated stations in Alaska were serviced out of Air Station Kodiak and French Frigate Shoals was supplied initially by the Air Detachment at Kaneohe, Hawaii and continued when the air detachment moved to Barbers Point. In addition to French Frigate shoals the detachment flew an extended logistic flight throughout the Pacific, The logistic flights were WESTPACs and those that flew these flights referred to themselves as "Cosmic Overseas Airways." In addition there were air detachments established at Sangley Point in the Philippines and at Guam to provide logistic support to isolated LORAN stations.

Coast Guard Air Detachment Sangley Point

In April of 1945 an advance base maintenance organization and construction of a runway was begun to support the continuing war effort. The Naval Air Base Sangley Point was not large, encompassing an area of only 341 acres. Half of which was occupied by its most valuable asset: the 7000 foot runway and its associated air-operations facilities. A small Coast Guard air detachment was established at Sangley Point and over time it increased in size and responsibilities and the Commanding Officer of the Air Detachment would serve a dual function as Commander Philippine Section, responsible for all Coast Guard Forces in the Philippines

LORAN stations were constructed at Naulo Point on the west coast of Luzon, Talampulan in the west central Philippines between the large islands of Mindaro and Palawan, and Tarumpitao on the island of Palawan facing the South China Sea. The stations went operational on 19 July 1945. The Coast Guard was constructing and operating the LORAN stations as part of the Navy and upon transfer back to the Treasury Department on 1 January 1946 retained this responsibility. A one PBY air detachment, under the command of LT Walter Curwen, was established in 1946 for the purpose of aerial support for the LORAN Stations.



Coast Guard UF on the buoy at Talampulan

can be found under the narrative “1952 – Coast Guard and the Korean War”). Another took place 14 July 1960: - Following the loss of a propeller, which resulted in fuselage damage and an engine fire, a Northwest Airlines CD-7C airliner carrying 58 persons ditched in Philippine waters. During the Coast Guard-coordinated air search, a Coast Guard UF amphibian aircraft sighted four life rafts in the vicinity of the Polillo Islands, landed, and rescued 23 survivors. A U.S. Navy P5M seaplane, meanwhile, rescued 34 others and also recovered from the body of the only fatality.

SAR coordination and responsibility rested with the Joint Search and Rescue at Clark AFB. The Air Force had a rescue squadron at Clark but for reasons not completely clear, rarely responded to requests for help from the civilian sector. The Navy limited SAR activities to its own and the Philippine Air Force operated SA-16s but were not overly involved. Though the primary mission of the Coast Guard air detachment was logistics, it always responded. Medivacs from LORSTA, ill and injured Filipinos from remote provinces, searched for overdue boats and aircraft, assisted in relief to disaster areas and helped the Navy search for missing aircraft. SAR decreased in the mid to late 60s.

In 1953 two additional LORAN stations became operational and the air detachment was then supporting five LORAN stations. Conditions and resources were primitive by today’s standards. The Coast Guard facilities consisted of a cluster of Quonset huts between the main entrance road and the runway. One Quonset housed the Commanding Officer, XO, the administrative staff, Operations and wardroom. Two smaller Quonsets housed the Avionics Shop and Supply Office. Next came the Spare Parts, Hydraulic, and Aircraft Maintenance



. UF-2G 7234 in the maintenance nose dock

With the advent of the Korean War the SAR responsibilities of the Coast Guard were expanded and the Sangley Point operation was augmented with the addition of PBM aircraft. Logistics remained a primary mission and SAR responsibilities increased substantially. One mission of note was the attempted rescue of a P2V crew, on a covert mission, that had been shot down by the Communist Chinese. (Note: A detailed narrative of this attempted rescue

Office. Two UF-2G aircraft were maintained in an open nose dock with a corrugated steel roof

It was a different time and a different environment. The District Headquarters was over 4000 miles away. There was no direct communications with the air detachment. The pilot in most cases was his own everything. Once away from the Manila area, navigation was the LORAN that was being serviced and a low-powered radio beacon at the LORAN station. Visual flight operations were dominate. IMC could be flown but approaches to the destinations had to be fabricated. The destination facilities were marginal. A description of the air operations at the five LORAN stations (LORSTA) is of interest.

LORSTA Batan: The Batane Islands lie 375 miles north of Sangley Point midway between Luzon and Taiwan. The normal morning flight path was north over central Luzon and the return flight normally diverted over the west coast to circumvent the afternoon cumulonimbus build ups. The LORSTA was located on the east side of the main island and the airstrip was on the west side at the capital city of Basco. Basco International Airport, as it was referred to by the Coast Guard aviators who flew in there, was 3000 feet long, unpaved and situated on the side of a mountain running from the sea upslope with approximately a 5 degree grade, Landings were made uphill. Takeoffs were made down hill and normally with a tail wind. JATO was armed and ready in case it was needed for the take off. The trip to the LORSTA was an adventure. Supplies were transported by station vehicle over a narrow twisting one lane road carved out of the side of the mountain.

LORSTA Catanduanes: The island of Catanduanes lies 230 miles east-southeast of Sangley Point. The hilly terrain was unsuitable for an aircraft runway. The LORSTA, known simply as Cat, was situated at the north end of the island with a bay immediately to the west that was adequate for UF/HU-16 water operations as long as the wind and sea conditions were favorable. The aircraft tied up at a buoy and supplies were unloaded by small boat and transported to the boat dock. The bay was semi-exposed to the sea and when the incoming swells made the bay dangerous, landings were made at the south end of the bay. This was separated from the main bay by an island and coral reefs. The aircraft, when using the south bay had to be unloaded at anchor and supplies transported to the LORSTA.

LORSTA Naulo Point: Naulo Point LORSTA was in the midst of a coconut plantation on the west Coast of Luzon five miles south of Santa Cruz. Naulo had a grass and dirt 3000 foot airstrip with tall palm trees at each end that the native land owners refused to have cut down. When wet the runway limits were defined on each side by heavy mud and an errant taxi turn would result in the aircraft being bogged down requiring a combination of truck and caribou power to regain the runway. Carabou (water buffalo), the beast of burden in the Philippines, grazed on the runway and had to be herded off prior to landing. Usually this was accomplished by the combined effort of station personnel and the distinct loud propeller noise generated by a UF making a low pass. The impact of a main gear coming in contact with a freshly deposited pile of Carabou dung produced the expected results.

LORSTA Talampulan: Talampulan was one of the islands forming the Calamian group which lie 200 miles southwest of Sangley Point between the large islands of Mindaro and Palawan. The island was a long and narrow jungle covered hill without a landing strip. Landings were made adjacent to the island and heavy ocean swells frequently made it a hazardous operation. It is ironic that regulations required permission of the District Commander, 4000 miles away, for an open-sea landing involving a rescue but that once a week a landing was routinely made in the open sea to deliver supplies to a LORSTA. A slot between two islands to the east offered a more protected landing but required a long wet taxi through the swells to the mooring buoy. With windows and hatches secured for water tightness, this prolonged taxi in the tropics was far from popular. A truly beautiful island, Talampulan was a source

of giant clamshells that were sought after by the military personnel throughout the Pacific. Many a clam shell was hauled out.

LORSTA Tarumpitao: Tarumpitao was located on the western shore of Palawan Island, 375 miles southwest of Sangley Point. The station was a collection of Quonset huts and a 3000 foot grass runway set in a clearing in the middle of a dense jungle. The strip had been built by Coast Guard civil engineers and there was little doubt in crewmembers minds that the person who designed it hated aviators. The runway ran into the jungle perpendicular to the shoreline. A tall hill was at the other end. Of further concern was the narrow clearance between the runway and the trees and the prevailing wind was across the runway at a ninety degree angle. During the rainy season the runway was covered with standing water. Braking action was nil and reverse thrust was used to stop the airplane. The native population, unlike at the other LORSTAs, were Morros and were Muslim. There was friction between the Morros and Christians but for some reason that did not apply to the Coast Guardsmen. A discarded Quonset had been donated by station personnel for use as a school house. There was a standing invitation to the locals to come on board the station and watch the movies. The invitation was eagerly accepted.

The entire Coast Guard Philippine Section operation was turned over to the Philippine Government in 1971 and the Coast Guard air station was closed.

Coast Guard Air Detachment Guam



PBY-6A

In 1946, after World War II, all coast Guard activities in the western Pacific area were consolidated under a command called the Western Pacific Section. In 1947 a Coast Guard air detachment consisting of one PBY-6A and crew was established at the Naval Air Station, Agana, Guam to provide aerial logistics support for LORAN stations in the southern Marianas and Western Caroline Islands. In 1953 the Western Pacific Section became the Marianas Section located at Cabras Island, Guam. The LORAN stations supported by the Marianas Section were Saipan, Cocos Island, Ulithi, and Anguar in the Palauan Islands. The Morotai chain had been discontinued at the end of World War II and the Palau LORAN station was moved from Peliliu to the previous monitor station at Anguar. Anguar was then

paired with Ulithi. The LORAN stations at Saipan, Ulithi and Anguar were serviced by the air detachment. Cocos Island at the southern end of Guam was serviced directly by the Marianas Section.

By the mid 50's the PBY had been replaced by a UF (Grumman Albatross amphibian). The air detachment consisted of several Quonset huts adjacent to the runway used for administration and maintenance support. A section of a large Quonset, open at both ends, was used as a nose hangar for maintenance. It was wide enough for the wings to be under roof but the tail protruded into the open. Spare parts, if not in stock, were not readily available. It was a long way to the supply base in Elizabeth City. In some cases parts could be obtained from the Coast Guard Air Detachment at Barbers Point and some could be borrowed from naval sources at Guam, but quite often parts were rebuilt or repaired by the stations maintenance personnel. The units maintenance personnel were, or soon became, quite talented.

The primary mission of the air detachment was aerial supply of the Marianas section LORAN stations. The LORAN station at Saipan received support via facilities on the Island and the aerial supply by detachment aircraft was Coast Guard specific in nature. This was transportation of Section personnel, transfers of personnel in and out, and light maintenance equipment and operational repair parts. The sequence of flight would depend upon need. The LORAN stations at Ulithi and Anguar were scheduled weekly. These stations were located in the region known as Micronesia encompassing an area of 3,000,000 square miles of the tropical Western Pacific Ocean. Most of the islands were quite small, the total land area being only 700 square miles.

The Ulithi atoll, location of LORSTA Ulithi, is between Guam in the Marianas and the Western Carolines 350 miles southwest of Guam with nothing but ocean in between. The atoll is composed of small islets that have a total land area of 1.75 square miles. The huge 209 square mile lagoon is the worlds fourth largest. The Island was isolated and the population was indigenous with their own culture but after World War II a Trust Territory was established providing intensive education and much of the original culture has been eroded over the years. The original LORAN



Runway Falalop Island

station was built on Pontangeras Island. A 3300 foot paved landing strip had been built on Falalop Island during World War II. The runway extended from ocean edge to ocean edge. The aircraft would arrive from Guam and the LORAN station outboard skiff would make the 12 mile runs across the lagoon and pick up the supplies. The skiff was soon replaced by a DUCK amphibious vehicle which was in turn replaced by a LCM. The LORAN station was moved to Falalop Island in 1953 at a location easily accessible to the air strip.

The Coast Guard personnel got along very well with the Ulithians and twice a year, Christmas and the Fourth of July, people from all the inhabited islands were invited to the Loran station on Falalop to celebrate. Activities were athletic games, native dancing and a feast. Movies were always open and well attended by the people of Falalop. Inhabitants of the other islands would periodically come over for that purpose also. When the Yap LORAN C station went on the air in 1964 the Ulithi Loran A station was decommissioned and the LORAN A function was moved to Yap Island.

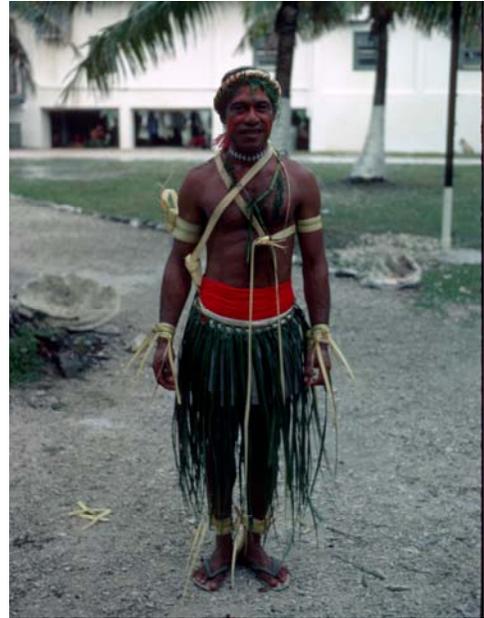


Photo top left is a photo of female dancers during one of the celebrations.

Photo above right is a Ulithi male in dancing dress.



Photo left is two Ulithians making a sailing canoe. When finished it will have an outrigger and will be used to travel between the islands.

Anguar is an island in the Palauan Chain (Western Carolines) with an area of three square miles and a population that varied around 200. It lies 4000 miles west/southwest of the Coast Guard District Headquarters in Hawaii, 826 miles southwest of Guam and 620 miles east of the Philippine Islands. The population of Palau, primarily Melanesian, had experienced outside influence by both Japanese and German administrations which introduced coconut planting and phosphate mining to the islands. Anguar as well as the adjacent island of Peliliu saw extensive military battles during World War II. When the islands were taken from the Japanese a 7000 foot runway was built on Anguar to accommodate B-24 bombers in the campaign against the Philippine island. This runway was maintained and used to supply the LORAN station located a short distance away.

The trip to Anguar usually included an over-night (RON) stay either at the station or at Koror 46 miles to the north. Koror was a water operation and had a seaplane ramp which was used to park the aircraft. Trust Territory and Coast Guard personnel were flown in and out as requested. The distance from Guam, size of the cargo loads, and the fact that the route of flight passed through the Inter-tropical

Convergence Zone could at times make the round trip “fuel critical.” As a result aviation fuel, in 55 gallon drums, was transported to Anguar quarterly. Fuel would be put into the float tanks and transferred to the mains. Fuel in 55 gallon drums was also stored at the Ulithi station in case it was needed.

The establishment of the United Nations Trust Territory of the Pacific Islands (TTPI) in 1947 affected the Guam operation. The United States was named as the administering authority. The area stretched from the Marshall Islands in the east to the Carolines in the west and included the Marianas (excluding Guam). The headquarters of the Trust Territory was located in Saipan. In the early years transportation was limited and requests for assistance were frequently made of the Coast Guard. A number of islands within the Trust Territory had runways built during WWII but a number did not. The Coast Guard had an amphibian that could utilize the runways and was capable of water operations where runways did not exist. As a result the air detachment would make flights to Majuro, Ponape, Truck, Yap, Koror, and other destinations when requested. The Trust Territory established its own air transportation service and by 1960 had three SA-16 (UF) aircraft that were flown on contract by Pan American World Airways. The Coast Guard continued to supplement the operation but normally in emergent situations. As development continued airport facilities were constructed where needed and jet service was initiated.

The initial priority within the Trust Territory was education followed by economic development. Initial schooling was provided by missionaries and this was followed by the establishment of elementary schools. If a young person wished to go to High School or Junior College they had to go to Guam. In order to facilitate this, personnel on Guam were asked to “sponsor” these young people which meant to take them into ones home not as a servant but rather as part of the family. A number of the people attached to the air detachment sponsored these young people during this period. It is of note that Kuniwo Nakamura, sponsored by Merrill and Mona Woods, air detachment, 1962-1964, went on to the junior college at Guam and from there to the University of Hawaii. Kuniwo became the third President of the Republic of Palau in 1993 and served two four year terms. In 1965 the movement toward autonomy began. In 1975 the Northern Marianas voted to become a commonwealth of the United states. By 1986 all remaining island groups were either Federations or Republics and the Trust Territory agreements were no longer in effect.



The photo on the left is a picture of a traditional house on Yap, similar to those located on other islands in the region. Leaning against the wall is a stone disc which is Yapanese stone money. The stone money of Yap, though not legal tender in the international currency market, is still used as legal tender on the island. Yap is sedimentary in origin and rock on the island is shale. Palau, 250 miles to the southwest is predominately volcanically uplifted lime stone. Voyaging to Palau by canoe, Yapanese quarried this stone, risking their lives to get home with the quarried “Coin.” These large circular stones, carved symmetrically and holed in the center for transportation can be quite large in size. The size and the difficulty of the voyage determined the value of the coin. Most of the stone money is stored in a canal known as money bank, though some still rest outside a family home to denote wealth and status.

SAR activities were limited. They consisted primarily of medical evacuations both Coast Guard and Trust Territory. The loss of aircraft or ships at sea was infrequent. When they did occur, the Coast Guard was called upon to assist. The on-scene search time of the UF was of definite value to the search operation.

In 1962 a Typhoon devastated the Island destroying the facilities and for a two year period operations were conducted out of temporary structures until the new hangar and Marianas Section building was completed at Agana. In 1964 a Loran C station was constructed on Yap Island which is an Island about 106 miles almost due west of Ulithi. An airport was built at the same time. A LORAN A station was co-established, replacing Ulithi, and continued to operate until the LORAN A chain was disestablished in 1978. The UF aircraft was replaced by two C-123 aircraft capable of hauling larger and more bulky loads. In 1966 one of the Guam C-123s, with crew, was deployed to assist in the construction of LORAN stations in Thailand and Vietnam. This was a Top-Secret project requested by the US Air Force. It is detailed in a narrative in the 1957-1975 section of the History Timeline.

The Coast Guard air detachment, by then called an air station, was disestablished in 1972.

1946 – Post War Helicopter Development:

In January of 1946 work on the new sonar, designated XCF, moved ahead. Dr. Coop and assistants redesigned certain components and improved the electrical components. The Coast Guard took delivery of a new 450-horsepower HO2S and by March 12 the sonar had been installed and tested. Graham and his crewman, Martin Westerburg, flew the helicopter to Key West and reported to Commander Anti-Submarine Development Detachment VX-1 for temporary duty. They were joined a month later by ENS William Coffee, USCG as a second pilot.

A LST fitted with a platform served as a helicopter carrier, a destroyer served as the control station, two smaller vessels took underwater sound measurements and several submarines – including a captured German U-boat – served as targets. Actual testing began on 22 March using a U.S. Submarine between Key West and Cuba. Success was immediate. The final test was conducted using the German U-boat, the newer type, capable of a sustained 15 knots underwater. The sonar worked very well. Graham later wrote “that once the helicopter sonar tests were analyzed even the most skeptical decision-makers were convinced that the helicopter mounted sonar was the answer for the anti-submarine warfare program.”



HO2S with sonar head lowered into the water

At the beginning of May CDR. Charles Houston USN and Major Armand DeLalio, USMC arrived at Air Station Brooklyn with a contingent of officers and enlisted men to establish the Navy's first helicopter squadron. The new Navy squadron, VX-3, acquired 14 helicopters from Coast Guard storage. VX-3 took over the responsibility for training all Navy helicopter personnel. They also

assumed the responsibility for the radar calibration flights that Erickson had continued doing. VX3 moved to NAS Lakehurst, New Jersey on 10 September and continued training helicopter pilots.

On 18 June 1946 Erickson was moved to the Coast Guard Elizabeth City air station. His downsized Helicopter Test and Development Unit consisted of a small group of dedicated personnel, one hangar, one HNS and two HOS helicopters. The hangar had been used for livestock and required considerable effort to make it suitable. The first project the unit undertook after arriving at Elizabeth City was the development of floatation gear that was concealed in “pants” on the landing gear, with the wheels extending through for normal ground operations. In case a forced landing on water, the donut shaped floats inflated keeping the fuselage out of the water.

Erickson had been and continued to promote the helicopter. In July of 1946, the Coast Guard icebreaker NORTHWIND with a HNS helicopter aboard participated in Operation NANOOK. The purpose of this mission was to assist in the establishment of advanced weather stations in the Arctic regions and to aid in the planning and execution of more extensive naval operations in polar and sub-polar regions. The HNS, on floats performed very well. This would lead to the Coast Guard icebreaker NORTHWIND having a helicopter aboard for Operation High Jump at the end of the year.



HNS-1 landing on a wood platform at the rescue site

On 20 September, 1946 a Belgian airliner operated by Sabena Airlines crashed about thirty miles from Gander, Newfoundland in country that was inaccessible for any type of surface vehicle. The rescue party requested helicopters as the only practical means of bringing the survivors out. CAPT Richard Burke USCG, the Eastern Area Rescue Coordinator, immediately contacted the Army Air Force and requested the assignment of two C-54 transports to fly Coast Guard helicopters

to Gander. There were two helicopters at Brooklyn. The HOS-1 had been modified and was chosen. A HNS at the Development Unit at Elizabeth City was chosen as the second aircraft. Both Helicopters were partially disassembled for transportation and arrived in Gander the next day. The area next to the crash site was vast marsh covered with muskeg. Lumber was dropped from a Coast Guard PBY and a platform to support the weight of the landing helicopters was built. The survivors were flown from the platform to a small lake seven miles distant. From there they were transported by PBY. All survivors were flown out plus a 14 member Army rescue crew. It was a remarkable operation and the story was picked up by the national news media generating favorable attention for the helicopter.

In December 1946 Operation HIGH JUMP began. This was an exploratory expedition to Antarctica. The Navy had purchased four new Sikorsky S-51s in November which they designated HO3S. One was placed on the Seaplane Tender CURRITUCK, another on the PINE ISLAND. A third was placed on the carrier PHILIPPINE SEA and the fourth on the icebreaker BURTON ISLAND. The BURTON ISLAND was not commissioned until January 1947 and joined the expedition later. The Coast Guard ice breaker NORTHWIND had a Grumman J2F-6 Duck aboard and, at the insistence of the commanding officer, a Coast Guard HNS-1. The NORTHWIND lead the center group through the ice pack to the Bay of Whales. It was this group that established Little America. CAPT Charles W. Thomas, commanding officer of the NORTHWIND, was euphoric in his praise of the helicopter. He sent the following message to the Commandant U.S. Coast Guard: “HELICOPTER BEST PIECE OF

EQUIPMENT EVER CARRIED IN ICE VESSELS.” He deliberately capitalized all letters for effect. The Navy lost two of the HO3Ss.

In January 1947, four Sikorsky S-51 helicopters, which had been sold to small commercial operators, were returned to Sikorsky. Sikorsky had originally designed the S-51 with rescue utilization in mind. They were offered to the Coast Guard. CAPT Richard Burke, who had been responsible for sending the helicopters up to Newfoundland for the Sabena rescue, had been assigned as the Chief of the Coast Guard Aviation Division at Headquarters. He managed to find the money for the purchase and the Coast Guard acquired four S-51 helicopters which were designated as HO3S-1G. The HO3S saved thousands of lives over the next several years.

Emergency flotation gear was developed for the HO3S as was an external stretcher that was equipped with a blister to protect a survivor during a medical evacuation. This concept was used by the U.S. ARMY during the Korean War to transport wounded directly from the front lines to Mobile Army Surgical Hospitals (MASH) in Bell HTL helicopters. The saving of countless lives was the direct result. Many other lives were saved were when survivors were hoisted from the sea by HO3Ss operating as “plane guards.” The hoist operation had been improved upon but the development of a rescue basket was essential, especially for Coast Guard operations, because in addition to men it was called upon to rescue women and children who did not fit into the type of sling that had come into use. Records showed a significant number of cases where people could not get into the sling or they put it on backwards or fell from the sling while being hoisted. Gus Grissom, for instance, got into the sling backwards on his first sub-orbital flight which lead NASA to use a basket device for further water recoveries.



LT Stew Graham at the hatch of a HO3S with a rescue basket attached to the hoist. With the advent of the HO4S the basket could be brought inside the cabin. Note the flotation devices on

The Coast Guard rescue basket was designed with a spreader and floats which, when deployed, submerged the basket about 20 inches under the surface of the water in a level position. When a pull on the spreader bar was initiated and the basket heeled over approximately 45 degrees. The helicopter was maneuvered to bring the basket to the person in the water. If the person in the water was unconscious or disabled he/she could be “scooped” into the basket and hauled up. The HO3S did not have sufficient room in the cabin to accommodate a rescue basket so it was not until the Coast Guard got the HRP-1 and the HO4S helicopters that full use of the basket was realized.

During World War II, while the Coast Guard was serving as part of the Navy, there had been some helicopters ordered specifically for Coast Guard use. The aircraft did not come off the production line until after the war and in June of 1947 Erickson’s program received a shot in the arm with the delivery of two Bell HTL helicopters. Erickson used them to replace worn out helicopters in his training program. A year later, three Navy HRP-1 tandem helicopters were also turned over to the Coast Guard. One was assigned to the Rotary Wing Development Unit. The other two went to the Elizabeth City Air Station.



Coast Guard Piasecki HRP-1

The Coast Guard had been involved with the design of the HRP-1. The Navy Bureau of Aeronautics had asked the Coast Guard in 1943 for its requirements for a rescue helicopter. CAPT William Kossler drew up specifications for an amphibious helicopter with overlapping rotors at each end of the aircraft. He further recommended that it be powered by two 450 horsepower engines. Erickson spent time with Frank Piasecki who developed and submitted the design accepted by the Bureau. The HRP was the first helicopter with sufficient room in the aircraft to accommodate either the rescue basket or a stretcher. The door had to be redesigned as a sliding door and the hoist was redesigned to swing in and out like a boat davit. Donut floats were designed for it. It was a good rescue helicopter except for one unsatisfactory feature. The main door was located so far behind the pilot he could not see the hoisting operation. These modifications and drawbacks were corrected by Piasecki resulting in the H-21 which became a standard Air Force rescue helicopter.

In early 1948 CDR Erickson was ordered to proceed to Buffalo New York in one of the HO3S-1G helicopters and report on board the Coast Guard icebreaker MACKINAW, which was about to start the icebreaking season. With the demand for steel the greatest since World War II it was essential that the Great Lakes be opened as early as possible to transport iron ore from the Mesabe range in eastern

Minnesota to the steel producing centers. CDR. Edwin J. Roland was assigned as Commander of a task force which consisted of the MACKINAW and several buoy tenders with icebreaking capability. CDR Harold J. Doebler was in command of the MACKINAW. An ice survey and photographic flight of Lake Erie was conducted on 16 March and on 18 March the MACKINAW led a convoy of ore carriers out of the harbor and headed for Cleveland. It was the earliest opening of Buffalo Harbor in recorded history. CDR. Roland flew every day keeping a constant check on the ice conditions. A change of direction or force of the wind could cause windrows of ice to form or blow an ice field ashore with ships trapped in it. Advantage was taken of open leads in the ice that could only be spotted from the air. This speeded up the operation considerably and as a result the Great Lakes were opened to navigation two months earlier than in the past.

The helicopter was praised in the press for its part. One aviation periodical carried the following account:

“ Use of helicopters operating with Coast Guard icebreakers in the Great Lakes last winter freed icebound shipping at Buffalo 67 days ahead of schedule and increased the effectiveness of ice breaking operations by 50%. The helicopter scouted as much as 100 miles ahead of the icebreaker and determined the route of the thinnest ice ahead. It also permitted the icebreaker skipper to perform frequent inspections of icebound groups of ships to determine the most effective route for freeing them.”

The Navy was expanding its helicopter operations. In April of 1948 VX-3 was deactivated to form two helicopter utility squadrons. HU-2 took over the training activities and the responsibility for providing the helicopters and personnel for plane guard and utility duties on board vessels of the Atlantic Fleet. HU-2 records indicate that the demand for helicopters was so great that out of 25 HO3S helicopters on hand during 1948, 23 were constantly deployed. Catapults were removed from cruisers leaving sufficient room for helicopter operations. HU-1 was assigned to the Naval Auxiliary Air Station Miramar and supported the Pacific Fleet. The Marines were also making progress in their assault concept and the Army, now separate from the Air Force, was expanding helicopter operations.



HO3S-1G

Unfortunately the Coast Guard program continued to fall behind. The HNS and HOS helicopters were obsolete and wearing out. The only helicopters acquired since World War II were four used HO3S-1s

and two new Bell HTLs previously mentioned. Three HRPs had come on board at the end of the year. This was the extent of the Coast Guard helicopter program, most of which took place at the Rotary Wing Development Unit. There was no helicopter available for the NORTHWIND on Bering Sea patrol that year and the commanding officer, stated in his report, that the lack of a helicopter reduced the effectiveness of the patrol. In general, the higher Coast Guard administrative officers supported the helicopter program as did all of the commanding officers of the icebreakers. Commandant Farley wrote an article published in *American Helicopter* supporting the development of the helicopter for Coast Guard use. This position was backed by the EBASCO Group, a firm of efficiency experts, hired by the Coast Guard in 1948 to conduct a study of the Coast Guard and make recommendations to improve its operations. On the subject of aircraft the following was concluded.

“With the exception of helicopters, which should be replaced as soon as possible by an increased number of more recently developed and highly versatile rotary wing aircraft, there appears to be no alarming shortage of operational aircraft as a whole.”

The report further recommended:

“Research and development in application of helicopters to Coast Guard rescue work should be materially increased. Additional helicopters of modern type and increased capacity should be authorized and obtained. All Coast Guard air stations should be provided with helicopters, and be authorized trained complements of personnel to operate and maintain this additional equipment.”

As a result of this report the Rotary Wing Development Unit was established as a separate Headquarters unit under the direction of the Engineer in Chief. In addition an order was placed for five new HO3S helicopters.

The Coast Guard helicopter program continued to have difficulties because of opposition from some senior aviators in key positions and most of the recommendations submitted by EBASCO were simply ignored. The seaplane advocates did everything in their power to make the seaplane look good while strongly pointing out the shortcomings of the helicopter. There is no doubt they believed themselves to be right and the helicopter, at this stage, did have significant shortcomings but also entering into the equation is a resistance to change and the old idea of a seaplane “flying lifeboat” died hard. As is the case in many instances the immediate dominates and vision suffers.

The Coast Guard rotary wing advocates were just as determined to prove that the helicopter was the future in Coast Guard rescue operations. Over the next several years Erickson and his group took every opportunity to showcase the helicopter and demonstrate that it could do things that the seaplane could not. In the process they stretched the existing aircraft to the limits and in some cases beyond. HO3Ss made medical evacuations at night using the phosphorescence of the surf as a visual clue. Rescues were made in swamps as well as the open sea. The hoist was used effectively and at times the helicopter actually touched down on the ship in distress to affect the rescue. Range was stretched to the limit and many times skill and experience compensated for the machines lack of power. Erickson wrote prolifically for various publications and would talk to any group that would listen.

In early 1949 the Marine Division of the Canadian Department of Transport became interested in using helicopters. A Mr. Jack Charleson, who had received helicopter pilot training provided by the U.S. Air Force, spent a period of a week on the MACKINAW which carried a Bell HTL-1 on floats. Thus he had the opportunity to fly ice recon flights and become familiar with icebreaking work. On Charleson's return to Ottawa he submitted a request through the U.S. Embassy to U.S. Coast Guard Headquarters

that CDR. Erickson be assigned temporary duty with the Canadian Department of Transport in connection with drawing up plans for a flight deck and hangar facilities for the icebreaker D'IBERVILLE. The request was granted and the Canadians became the first to design an icebreaker from the keel up with all of the facilities needed for helicopter operations. A later modification provided a telescoping hangar to accommodate larger helicopters. This led to hangars being placed on Coast Guard icebreakers and the high endurance cutters when built.

During 1949 the Air Force loaned the Navy a new Sikorsky H-19 for tests at the Naval Test Center. The aircraft had been designed to carry ten passengers. The cabin was directly under the main rotor which eliminated potential center of gravity problems. The aircraft had a hydraulic flight servo control system that relieved the pilot of the heavy control forces encountered in earlier helicopters. It was equipped with a rescue hoist on a boom just forward of the sliding cabin door and could be cranked out to clear the side of the helicopter. The hoist had 110 feet of cable and a lifting capacity of 400 pounds. The Navy placed an order for a HO4S-1, which was equivalent to the Air Force H-19A, on 28 April, 1950. On 25 June the Republic of Korea was invaded by North Korean Forces and helicopter production increased significantly.

In early 1950 the Coast Guard Rotary Wing Development Unit had completed the development projects it had been authorized and as a result the unit was decommissioned on 31 March, 1950.

The December 22nd issue of Colliers Magazine in 1951 announced that:

"The nation's top aviation award goes this year to the industry, the Coast Guard and the Military Services for developing and using the craft (sic helicopter) in air rescue work. In Korea alone, over 10,000 UN wounded have been evacuated with whirly birds."

Colliers explained the Coast Guard's contribution in the following statement:

"Deservedly sharing honors with the helicopter industry and the military services is the United States Coast Guard. It has pioneered in peace-time rescue work. During the eight years it has been using helicopters; it has saved many hundreds of lives in offshore rescues, in floods, fires and other disasters on land."



HO4S-3G making hoist with rescue basket

During November 1951 the first of seven HO4S-1Gs was obtained followed by an additional seven HO4S-2Gs. In January of 1952 the first of 23 HO4S-3Gs were purchased. The 3G was powered by a Wright R-1300-3 700 horsepower engine. It was instrumented and had all weather capabilities. It had a cruise speed of 80 knots and a range of almost 400 miles. It would be operated inshore and far out at sea. The cabin could easily accommodate the rescue basket. An additional eight HRS-3 were obtained and configured for Coast Guard operations. The HO4S-3Gs were placed at all major air stations. An additional eight HO5S-1Gs were purchased in 1952 but proved too small and short ranged to be effective.

With the purchase of the HO4S-3G the helicopter became an integral part of the Coast Guard search and rescue operations. In the years to come the helicopter became predominate. During the 1960s, Frank Erickson's dream of having helicopter life-saving stations along the coasts had become a reality.

Brief Description of Helicopters of the period

HO3S-1G



The first HO3S was delivered to the Coast Guard in August of 1946. Built by Sikorsky Aircraft Corporation, these helicopters had a three-blade articulated rotor and the blades could be folded back so that the helicopter could be transported by a cargo aircraft virtually anywhere. Each of the HO3S-1G was fitted with a rescue hoist and emergency flotation bags that were fitted around the landing gear. A "Wobble Plate Stabilizer" which consisted of a small wing mounted on and behind the non-rotating portion of the wobble plate and served primarily as a means of trimming the inherent control forces and damping any displacements occurring during flight was

developed and attached. The helicopter was 57' 8" long, 13' high with a rotor diameter of 49'. The fuel capacity was 100 gallons providing a maximum range of 275 miles. It flew at 85 mph and with full fuel had a payload of 700 pounds. The Pratt & Whitney R-985-An-5 was rated at 450 hp. It carried three people including the pilot.

HRP-1G



The Coast Guard acquired three Piasecki HRP-1 twin-rotor helicopters beginning in November 1948. The unique "Flying Banana," as it was known, had a fabric covered fuselage. It was powered by a single 600 hp Pratt & Whitney R-1840-AN-1 engine that drove both rotors. It was 83' 4" long, 14' 11" high and the rotors were 41' in diameter. All three helicopters were stationed at Coast Guard Air Station Elizabeth City along the North Carolina coast. One was assigned to the Rotary Wing Development Unit based out of

Elizabeth City. Here they participated in numerous experiments, including on-the-water landings with newly invented flotation gear and the testing of various types of hoists, rescue baskets, and rescue harnesses. The fuel capacity was 100 gallons which provided a range of 140 miles at 74 mph. It had a payload of 1040 pounds and could carry 10 people including the pilot.

HO5S-1G



The Sikorsky Aircraft S-52, the first helicopter to have all metal blades, was designed for military observation. The Marine Corp purchased a modified version of the S-52 to replace its OY fixed wing observation aircraft. The S52-2 designated as a HO5s was a four place, three bladed machine with a quadricycle landing gear. Small in size it was 29 feet long, 8' 8' high with a rotor diameter of 33'. Powered by a 245 hp Franklin O-425-1 engine it cruised at 90 mph with a range of 190 miles. The Coast Guard acquired their HO5S-1Gs in September 1952. The co-pilots seat could be removed and two litter patients carried.

The problem with the helicopter was that with a maximum take-off weight of 2,769 pounds, a pilot, crewmember and 220 pounds of fuel, the 245 hp engine would allow only a 160 pound payload. The HO5S was retired from Coast Guard service in 1954.

HO4S-3G

A description and narrative of the HO4S-3G is included in this section as a separate and expanded narrative.

1946 – International Ice Patrol -Aerial Surveillance Becomes Primary:



On April 15, 1912, four days after departing Southampton, England, the *RMS Titanic* collided with an iceberg 400 miles south of Newfoundland, with the loss of over 1500 people. This disaster was the impetus for the establishment of the International Ice Patrol. Media coverage created an awareness of an icebergs potential for tragedy and created sufficient public reaction in Europe and the United States to prod reluctant governments into action. The result was the first Safety of Life at Sea (SOLAS) convention in 1914. The convention, representative of the world's various maritime powers, provided for an international derelict-destruction, ice observation, and ice patrol service, consisting of vessels which would patrol the ice regions during the period of danger from icebergs and attempt to keep the trans-Atlantic lanes clear of derelicts during the remainder of the year. The United States Government was invited to undertake the management of the service with the expense defrayed by

thirteen nations interested in trans-Atlantic navigation. On February 7, 1914, the President of the United States directed the (then) Revenue Cutter Service to begin the International Ice Patrol as early as possible. Congress enacted legislation in June of 1936 formally requiring the Commandant of the Coast Guard to administer the International Ice Patrol and described in general fashion the manner in which the Patrol was to be performed. With only minor modifications, this remains today as the basic Coast Guard authority to operate the International Ice patrol.

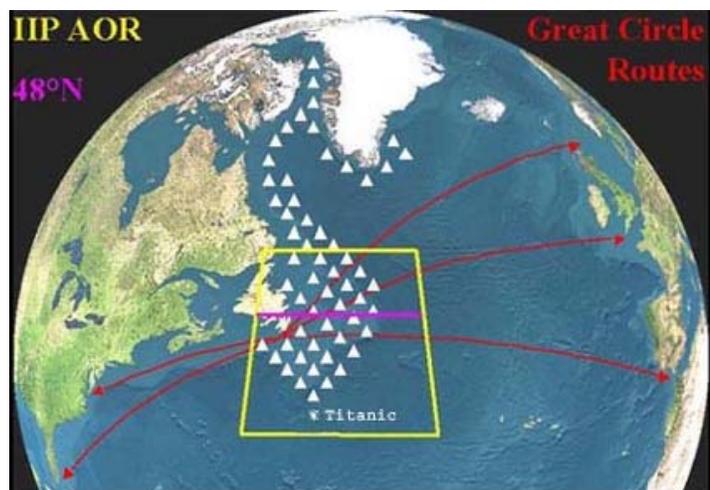
To accomplish the mission search areas are determined by available ice information over the Grand Banks, prevailing weather conditions and the activity of the Labrador Current. The primary objective of the patrol is to ascertain and disseminate information concerning the southern limits of the iceberg threat. A secondary objective is to fix the location of as many icebergs as is consistent with the accomplishment of the primary objective.

The principal origins of icebergs that reach the North Atlantic Ocean are the 100 or so major tidewater glaciers of West Greenland. Between 10,000 and 15,000 icebergs are calved each year. Glaciers are formed by thousands of years of snowfall accumulation which eventually is compressed into ice. Being fresh water they will float and be carried by ocean currents. It is estimated that these glaciers account for 85% of the icebergs which reach the Grand Banks of Newfoundland. Other sources of icebergs are the East Greenland glaciers, which produce about half the amount of icebergs as the West Greenland glaciers, but account for only 10% of the icebergs reaching the Grand Banks. The remaining 5% are thought to come from glaciers and ice shelves of northern Ellesmere Island.

The cold Labrador Current carries some of the icebergs south to the vicinity of the Grand Banks and into the great circle shipping lanes between Europe and the major ports of the United States and Canada. Vessels transiting this area try to make their voyage as short and as economical as possible. Therefore, ships in the vicinity of the "limit of all known ice" normally will pass just to the south of this boundary. Vessels passing through Ice Patrol's published ice limit, run the risk of a collision with an iceberg and insurance concerns. In this area the Labrador Current meets the warm Gulf Stream and the temperature

differences between the two water masses, of up to 20 degrees Celsius, produces dense fog. The combination of icebergs, fog, severe storms, fishing vessels and busy trans-Atlantic shipping lanes makes this area one of the most dangerous. Iceberg information is made continuously available to interested parties.

The present Ice Patrol operations area is bounded by the area 40 to 52 North and 57 to 39 West. It is within this area that the dangerous area is defined each iceberg season. The severity of an iceberg season is determined by an estimate of the number of icebergs drifting south of latitude 48 North. The reason for selecting latitude 48 North is tied into the great circle routes between Europe and the United States. Up until 1988 the estimate of the number of icebergs was derived from hand counting and model inputs. Starting in 1989, computerized techniques were developed using iceberg drift and deterioration models and sighting data.



From its inception until the beginning of World War II, the Ice patrol was conducted by two Coast Guard Cutters alternating surveillance patrols of the southern ice limits. In 1931 and thereafter a third cutter was assigned to perform oceanographic observations in the vicinity of the Grand Banks. With the resumption of the Patrol after World War II aerial surveillance became the primary ice reconnaissance method with surface patrols phased out except during unusually heavy ice years or extended periods of reduced visibility. Use of the oceanographic vessel continued until 1982, when the Coast Guard's remaining oceanographic vessel was converted to other uses. The aircraft has distinct advantages for ice reconnaissance providing much greater coverage in a relatively short period of time.

On July 12 1945 the administrative control of VP-6CG was transferred from FAW9 to the Commandant of the Coast Guard. A month later the squadron was transferred to facilities at NAS Argentia Newfoundland. The aircraft complement was six PB4Y-5As and two PB4Y-1 equipped with AN/ASP-15A radar used for ice reconnaissance. In January of 1946 the Coast Guard again became part of the Department of the Treasury and aircraft of the decommissioned VP-6 became an air detachment, based at NAS Argentia, assigned to the North Atlantic Patrol. (NORLANTPAC) NORLANTPAC responsibilities included ships and crews manning almost a dozen Ocean Weather Stations in the Atlantic Ocean; operating the electronic LORAN navigation system from isolated land based stations in Newfoundland, Labrador and Greenland; and the operation of the International Ice Patrol using both ships and aircraft. The air detachment was further charged with providing search and rescue services for both civilian and military entities. During the ice season of 1946 the International Ice Patrol was resumed and the Coast Guard air detachment assumed primary ice surveillance responsibility using the two PB4Y-1s. The aircraft were assisted by the Coast Guard Cutter MOJAVE.

In 1947 the NORLANTPAC Air Detachment was formally commissioned as Coast Guard Air Detachment Argentia. The unit had two PB4Y-5As attached and the PB4Y-1s had been replaced by two PB-1G aircraft. PB-1G aircraft conducted Ice Patrol surveillance during the period 1947 through 1958 at which time they were replaced by R-5D aircraft which were in turn were replaced by HC-130 aircraft in 1963. HU-25 aircraft were used in 1989 but proved to be range limited.



Coast Guard PB4Y-1 on the ramp Argentia – They retained the Navy markings and armament



Coast Guard PB-1G aircraft used for SAR and International Ice Patrol



Coast Guard R5D with early 1960 livery markings



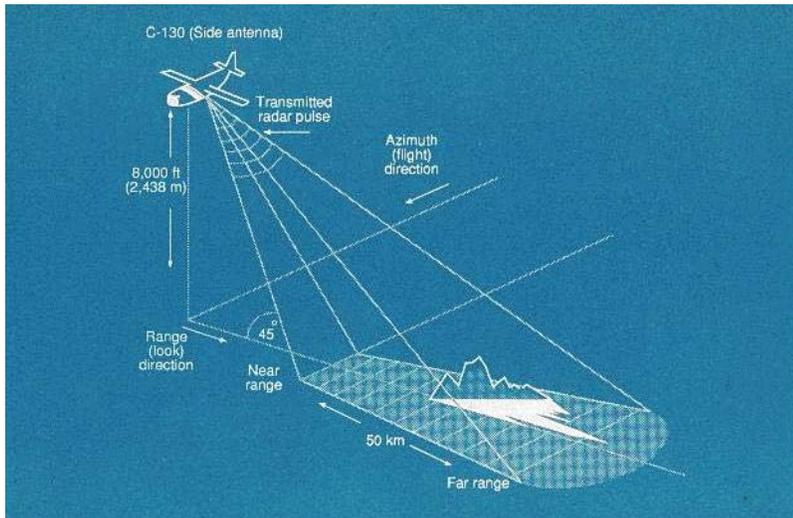
Coast Guard HC130 with modern markings

During the period 1947-1982 visual aerial reconnaissance was conducted. Compared to today's standards the procedures used were rudimentary and unsophisticated. Until 1964, when Doppler navigation equipment was installed on the aircraft, the primary navigation available was LORAN-A. The radar in use could not distinguish between a ship and an iceberg so during periods of reduced visibility, when a radar contact was made, the aircraft would approach the target at an altitude of 300 feet, determined by a radio altimeter, for visual identification. The flight path flown resulted in the target passing close in on the starboard side of the aircraft. When an iceberg was identified its position was noted and logged into the flight report which was turned in upon return to base. The Ice Patrol maintained a hand plot of iceberg positions and predicted motion. The PB-1G search track was 1000 miles and the normal mission was 12 hours. The R5-D operation extended the search track to 1200 miles. This was extended to 1500 miles with the HC-130B and again extended to 1800 miles with the HC-130H. A standard parallel track search pattern was used. During heavy seasons, or when operations dictated, two aircraft based out of Argentina were used.

The Coast Guard has conducted experiments to determine means for accelerating the disintegration of icebergs. It was determined that approximately one- hundred 1000 pound charges of conventional explosives would be needed for the destruction of an average berg. Furthermore, to melt a medium-size berg of 100,000 tons would require the complete theoretical heat of combustion of over a quarter of a million gallons of gasoline. Such methods are, of course, economically, as well as practically unsound.

From 1947 until 1970 Ice Patrol reconnaissance aircraft were based out of Argentia Newfoundland. The Coast Guard Air Detachment Argentia was decommissioned in 1966 but a C-130 deployed out of the Elizabeth City Air Station to Argentia for the next four years. With the closing of NAS Argentia in 1970 the deployed aircraft operated out of the Canadian Forces Base at Summerdale, Prince Edward Island. This resulted in increase transit time and decreased search time and as a result the operation was moved to St. Johns, Newfoundland.

In 1973 inertial navigation systems were installed on the aircraft followed by GPS in the early 1990s. 1983 saw the introduction of the APS-135 Side Looking Airborne Radar (SLAR). The use of SLAR altered the Ice Patrol aircraft deployment schedule. A C-130 was no longer deployed to Canada on a continuous basis during the ice season. A SLAR equipped aircraft was deployed for a one week period every other week.



The SLAR provided a near all weather target detection capability. Patrols were conducted at 6000 – 8000 feet with a 25 mile track spacing providing an overlapping coverage of the search track increasing the probability of detection considerably. Cloud cover and fog is no longer the problem it once was. An experienced operator, by matching movement or lack of movement on different legs of the search pattern could determine whether the target was an iceberg or a vessel. In 1993 the AN/APS -137 Forward Looking Airborne Radar

(FLAR) was added as an additional sensor. The FLAR automatically tracks target course and speed. The two systems, although not fully integrated provide all weather detection of icebergs. The combination of the two systems has allowed the International Ice Patrol to increase flight track spacing to 30 nautical miles and still maintain 200 percent coverage of an expanded area with less flight time per ice reconnaissance flight.

1946 – Coast Guard acquires PB-1G Long Range Search and Rescue Aircraft:

In 1944 specifications were drawn up by the US Army Air Force for a 27 foot boat, with two engines, providing a speed of 8 knots, designed to be carried by an aircraft and dropped by parachute. The Higgins Company built the boat and it was in full production by January of 1945. The initial boats were configured to be carried by stripped down B-17 aircraft. The boat was faired into the belly of the aircraft and as a result produced little additional drag resulting in the loss of but 6 mph airspeed. The boat was usually released at a speed of 120 mph from an altitude of 1,500 feet. The boat proved satisfactory in operation.

During the last year of World War II and shortly thereafter, the US Navy acquired 48 former USAAF B-17s for ASW patrol work. Initially these aircraft operated under their original USAAF designations

but at the end of July they were given a Navy designation of PB-1W. The B stood for Boeing and the W stood for anti-submarine warfare. This was actually a misnomer as the B-17s in question were built either by Douglas or Lockheed but Boeing had been the primary designer.



Coast Guard PB-1G with droppable lifeboat carried under the fuselage

In July of 1945, 18 B-17Gs were set aside by the USAAF for transfer via the US Navy to the Coast Guard to be used as search and rescue aircraft. Rework began to convert the aircraft in question for search and rescue duties and provide for the carrying of droppable lifeboats. On 1 January 1946, the Coast Guard was returned to the Treasury Department, but nevertheless, the Navy continued to rework the B-17s and transferred the first of 15 to the Coast Guard in July of 1946. These aircraft were Lockheed-Vega and carried Navy serial numbers. An additional PB-1G was obtained directly from the USAAF in 1947 and it served with a truncated AAF serial number.

The PB-1Gs were stationed throughout the hemisphere and were used primarily for search and rescue purposes. They were also used for Ice Patrol and photo mapping. The photo aircraft carried a nine-lens, 1.5 million dollar, aerial camera for mapping purposes. Interestingly, the Norden bombsight, used by the B-17s in the bombing campaign against Nazi Germany was retained and was used to pinpoint targets for the camera.

The PB-1Gs were painted in yellow and black air-rescue markings and those utilized for search and rescue initially carried the droppable life boat. The PB-1G carried no armament and the B-17 chin turret was replaced by a search radar. The USAAF had made several successful lifeboat drops during the war but no record of an actual Coast Guard drop could be located. The Coast Guard PB-1Gs served well over a period of years - the last was not withdrawn from service until October 14 1959.

Manufacturer	Boeing: Built under License by Douglas and Lockheed-Vega
Designation	PB-1; PB-1G; SB-17G
Other Designations	“Flying Fortress”

Aircraft Type	Long Range Patrol; Search and Rescue
Wing Span	103' 9"
Height	19' 1"
Length	74' 4"
Fuel Capacity	2,520 gallons; with auxiliary tanks up to 3,612 gallons
Max Speed	310 mph
Cruising Speed	200 mph
Range	2,500 miles
Empty Weight	36,135 pounds
Gross Weight	55,400 pounds
Crew	6
Service Ceiling	35,000 feet
Engines	Four 1,200 hp Wright R-1820-97 Turbo-charged
Propellers	Hamilton Standard 23E50

1946 – Operation High Jump:

The American political environment, territorial claims of several governments, and deteriorating Soviet-American relations created the opportunity for the United States Navy to heavily expand polar operations. The purpose was both strategic and exploratory. It was deemed to be in America's best interest to expose and prepare men, ships and equipment to the harshness of polar regions as rapidly and efficiently as possible.



HNS-1 on the water off the Greenland Coast

During the fall and winter of 1945-1946 an operation to determine the feasibility of a large naval force in polar conditions was conducted. This was followed in the summer of 1946 by Operation Nanook, under the command of Captain Richard Cruzen. The second phase of the plan called for the establishment of weather observation and reporting stations in the Canadian Arctic and Greenland. But there was more to the operation. The task force was made up of two Navy AK transports modified for sub-zero operations, fully equipped to construct the stations. In addition the Seaplane tender USS NORTON SOUND, with two PBM seaplanes, was part of the Task force as was the submarine ATULE which conducted tests and carried out operations under the ice in Baffin Bay and to the north. In addition the wooden hulled net tender WHITEWOOD was used as a survey ship. The Coast Guard ice breaker NORTHWIND joined the group

north of the arctic circle providing escort and navigation through the ice fields. The NORTHWIND had on board an HNS helicopter piloted by Coast Guard Aviation Pilot 1/c John Olsen. This was a precursor of things to come in polar operations.

Admiral Richard E Byrd USN (Ret) was a Naval Aviator and in addition to flying over the North Pole he had conducted three expeditions to Antarctica between 1928 and 1941. During World War II, Byrd, a close personal friend of President Roosevelt, had been appointed a special assistant to Admiral Ernest J. King, Chief of Naval Operations. With the war over, it was Admiral Byrd who persuaded Secretary of the Navy James Forrestal and the Chief of Naval Operations, Chester Nimitz, into launching a huge naval expedition to the Antarctic. Congress approved and provided funds. It was emphasized that the expedition would be a Navy operation with naval interests predominating over scientific studies.

During the summer of 1946 orders addressed to commanders in chief of the Atlantic and Pacific Fleets established the Antarctic Developments Project. It was code named Operation High Jump. High Jump was carried out during the 1946-1947 Antarctic summer. Instructions were for twelve ships and several thousand men to make their way to the Antarctic rim to:

- (1) Train personnel and test material in the frigid zones;
- (2) Consolidate and extend American sovereignty over the largest practical area of the Antarctic continent;
- (3) Determine the feasibility of establishing and maintaining bases in the Antarctic and to investigate possible base sites;
- (4) Develop techniques for establishing and maintaining air bases on the ice, with particular attention to the later applicability of such techniques to operations in interior Greenland, where, it was claimed, physical and climatic conditions resembled those in Antarctica;
- (5) Amplify existing knowledge of hydrographic, geographic, meteorological, geological, and electromagnetic conditions in the area.

It was planned to construct an American base on the Ross Ice Shelf near Little America III, home to Richard Byrd's 1939-41 expedition. When the base, known as Little America IV, was established, a systematic outward radial expansion of air exploration would be conducted by ship-based planes operating along the Antarctic coastline and by land-based airplanes departing from the base camp.. Although not specifically stated in the August 26, 1946 orders, a central objective of the project was the aerial mapping of as much of Antarctica as possible, particularly the coastline

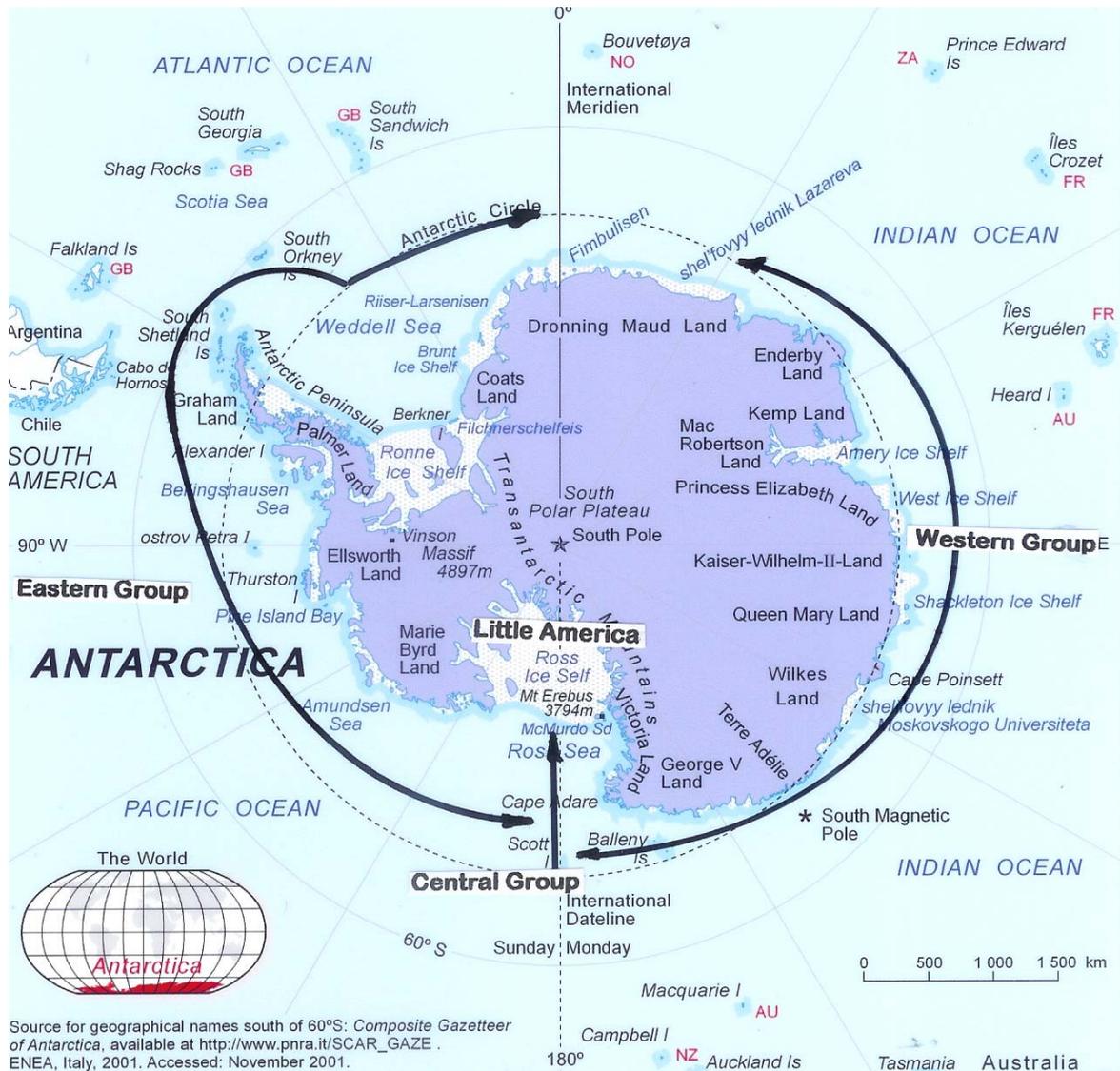
RADM R.H. Cruzen was the Task Force Commander and RADM Richard Byrd, who based his operations at Little America IV, headed up the scientific and technical work of the expedition. In order to expose as many men as possible to polar conditions, none of the ships used in Operation Nanook, with the exception of the NORTHWIND, were sent south. Instead the commanders of the Pacific and Atlantic Fleets each designated six ships for the expedition. A conference was held in early autumn to prepare charts and navigational aids. Cruzen, Byrd and others gave serious thought to the goals and priorities of the expedition and agreed that the primary objective should be the complete mapping of the Antarctic coastline and as much of the interior as possible.

The expedition was divided into three groups with the central group, led by the USCGC NORTHWIND thrusting into the ice pack of the Ross Sea. Following close behind were the cargo ships USS YANCEY and USS MERRICK, the submarine USS SENNET, and the flagship USS MOUNT OLYMPUS. The Navy's newly launched icebreaker USS BURTON ISLAND was undergoing sea trials and did not arrive until late in the final stages of the operation. On either side of the center group was the Eastern and Western Groups. The Eastern Group, built around the seaplane tender USS PINE ISLAND, rendezvoused at Peter Island and moved towards zero degrees longitude. With the PINE ISLAND was the oiler USS CANISTO and the destroyer USS BROWNSON. The Western Group was built around the seaplane tender USS CURRITUCK. With the CURRITUCK was the oiler USS CACAPON and the Destroyer USS HENDERSON. The Rendezvous point was the Balleny Islands. Each of the seaplane tenders carried three PBM flying boats. The aircraft carrier USS PHILIPPINE SEA was used to deliver six specially equipped R4D aircraft for operation out of Little America IV. The Navy purchased three additional HO3S helicopters for the expedition. One was assigned to the USS Philippine Sea and one to each of the seaplane tenders. A fourth HO3S was carried by the USS BURTON ISLAND when she joined the Task Group. Two of the HO3Ss were lost. The USCGC NORTHWIND had a J2F-6 amphibian and a HNS-1 helicopter aboard. The helicopter was aboard at the insistence of the commanding officer, Captain Charles W. Thomas. A HNS-1 had been used during Operation Nanook, in Arctic waters during the past Summer and proved to be of significant value to the operation.

The NORTHWIND departed Norfolk Virginia on December 2, 1946 bound for the Antarctic via the Panama Canal. The J2F made reconnaissance, liaison and supply flights and acted as a standby rescue and medical evacuation aircraft. The helicopter served admirably in finding leads in the ice for the NORTHWIND.

The Central Group rendezvoused at Scott Island on December 30, 1946 to follow the NORTHWIND through the pack ice into the open waters of the Ross Sea. RADM Cruzen shifted his flag to the NORTHWIND and the convoy, strung out at 100 yard intervals, headed south along the 180 degree meridian. The HNS-1 operated from a specially built platform and was put into immediate use. The Helicopter flew at 600 feet and surveyed the packed ice that barred entry into the Ross Sea. The three pilots aboard the NORTHWIND were Lt. Jim Cornish, Lt. Dave Gershowitz and aviation pilot Jack Olsen. Lt. Gershowitz stated that both Captain Thomas and Admiral Cruzen, who had changed his flag to the NORTHWIND for the trip through the ice pack, went up on every suitable occasion. Gershowitz wrote that due to the low temperatures the air was very dense and greatly increasing helicopter performance. Aircraft corrosion was not a problem but on one occasion the airspeed indicator froze up. Only 60 minutes of preparation for the purpose of pre-heating the engine and removing ice from the rotor blades was necessary

The sun shone 24 hours a day, a condition that made possible the maximum utilization of the helicopter. As the NORTHWIND began to buck the ice pack the helicopter would fly slowly in front of the caravan scouting the vast area ahead looking for ice leads; – the cracks in the pack which made penetration by the convoy possible. When it became apparent that the ice presented a serious danger to the USS SENNET, the NORTHWIND towed and escorted the submarine back to Scott Island and then rejoined her convoy. It took 18 days to wedge through 600 miles of ice and reach the Ross Sea and proceed to the Bay of Whales. The Central Group reached the Bay of Whales on 15 January, with the NORTHWIND breaking out a harbor for them. RADM Cruzen shifted his flag back to the USS



MOUNT OLYMPUS. Vital time had been gained because the NORTHWIND did not have to slow up when the helicopter was searching for leads. Three operational flights were made by the J2F enroute but open water was needed for takeoff and landings and valuable time was lost in getting it over the side. The Duck had a greater range but the slow moving ships created a situation where range was not too important.

Upon arrival construction began immediately. An assortment of vehicles including tractors, jeeps, weasels, bulldozers and other tracked equipment were used in the undertaking. By the beginning of February Little America IV consisted of many tents, one Quonset hut, three compacted snow runways and a short airstrip made of steel matting. Once at Little America the mission broadened for both NORTHWIND aircraft to include photo flights and the transfer of personnel. Special floats were made for support in the snow. Jim Cornish was the first aviator to fly a helicopter in and out of Little America. A total of 128 flights were made in the helicopter during Operation High Jump. Gershowitz wrote that the Emperor penguins stared at them in ill-concealed astonishment whenever they took off and landed. They named the HNS-1 the "Flying Penguin."

On 25 January The aircraft carrier USS PHILIPPINE SEA rendezvoused with the NORTHWIND, the oiler USS CACAPON, the destroyer USS BROWNSON and the submarine USS SENNET near Scott

Island. The PHILIPPINE SEA had six R4D which were placed on the flight deck and 57 tons of construction material that was transferred to the NORTHWIND by high wire for delivery to Little America. After transfer the NORTHWIND proceeded to point midway between the PHILIPPINE SEA and Little America and acted as a rescue and weather station for the R4D Flights through the 30th. Two aircraft departed for the flight to Little America on 29 January and the remaining

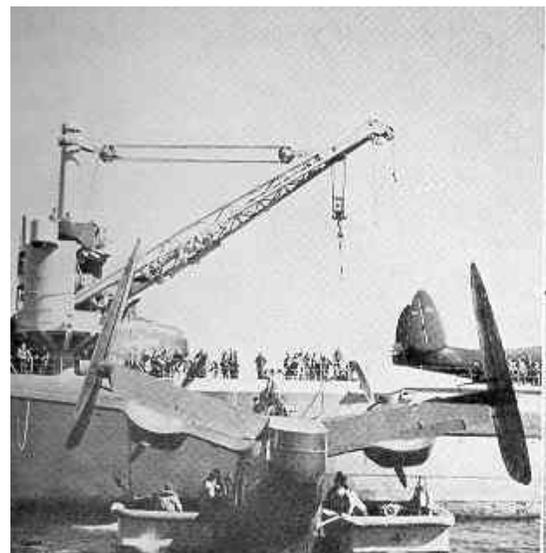


R4D on skis at Little America IV

four departed the following day. JATO assisted takeoffs were required. Upon arrival of the R-4Ds in Little America NORTHWIND proceeded to the Bay of Whales and off-loaded cargo. The carriers objective being completed she departed for her home port. The USS SENNET had served as weather and radio relay station after being escorted out of the ice pack and after acting as stand-by rescue vessel for the R4D flights from the PHILIPPINE SEA to Little America proceeded to Wellington New Zealand completing her involvement in Operation High Jump.

The Western Group reached the edge of the ice pack northeast of the Balleny Islands on 24 December. The USS HENDERSON and the USS CACAPON fanned out to act as weather stations and flight operations from the USS CURRITUCK began. A few flights were attempted but fog plagued them until 1 January. The fog lifted and the first mapping flight of about seven hours was flown along the Oates Coast and was completely successful. Weather held and utilizing ice bays in the ice pack for wind protection, flights were made on the 2nd, 4th, 5th, and 6th over the continent and their staging area. Operations were eminently successful and with the first assignment completed the CURRITUCK proceeded past the Adelie Coast on to Wilkes Land along the Sabrina, Knox, and Queen Mary Coasts. No flights were possible until January 22 due to a huge northerly swell. Over the next week, long and successful photomapping missions progressed to the west.

On February 1 a PBM piloted by LCDR David Bungler USN lifted off and headed south for the continent. Reaching the Coast Line, Bungler flew west and began photomapping. Suddenly in the barren white below there appeared blue and green lake among brown barren hills. The PBM landed but was without technical tools to examine the water but did collect a sample of water in a bottle. It turned out to be brackish indicating that the “lake” was actually an open arm of the sea. Weather turned typically Antarctic limiting flights to only three days for the rest of February. On March 1 the final flights were made in the vicinity of the Ingrid Christensen Coast. On March 3 the USS CACAPON, the USS HENDERSON, and the USS CURRITUCK sailed for Sydney Australia.



PBM being placed in the water



USS PINE ISLAND PBM-5

Operations of the Eastern Group commenced in the vicinity of Peter Island north of the Bellingshausen Sea on 23 December. Fog, Blizzards, heavy swells and frequent snow squalls plagued the USS PINE ISLAND operations. Weather suddenly cleared in the afternoon of 29 December and a PBM was lifted over the side and fueled without difficulty and departed. When weather proved to be satisfactory over the continent a second PBM was launched followed later by the third. The first aircraft, after three hours of flight at 400 feet above the ice climbed to 1000 ft. It began picking up ice in fine driving snow. The plane suddenly entered an "ice blink"; -in which streams of sunshine trapped beneath the clouds and bounced off the snow in a million directions. To make matters worse the fine snow had obscured the ground below. The aircraft was gently banked to reverse course and leave the area

when a crunching shock reverberated along the hull. The plane had obviously grazed something. Full power was applied and an immediate climb was initiated. The aircraft began to rise and then blew up. Inclement weather precluded search flights until 11 January. The survivors were located and supplies were dropped. It was ascertained that they could travel to open water ten miles to the north. A second PBM landed on the open water and transported a sled and supplies to shore and proceeded towards the survivors. They were located and the entire party returned to the aircraft and flew to back to the PINE ISLAND and from there back to the United States. Three crewmembers died in the crash, six survived but one of the survivors, LeBlanc, legs had to be amputated.

Further photomapping flights from the USS PINE ISLAND were conducted covering the Getz Ice Shelf to the vicinity of Thurston Island. In early February the ship moved to the northeast of Charcot Island and flights were made to Charcot and Alexandria Islands and Marguerite Bay. By March 4, the Eastern Group had departed Antarctic waters.

Arguably the greatest achievement of Operation High Jump was the acquisition of approximately 70,000 aerial photographs of the Antarctic Coast and selected inland areas. The Navy had proved its capability of operating in the harsh polar climates. From the operational stand point the use of and need for helicopters in polar operations was firmly established. The following account of operations was written by Captain Charles W. Thomas, Commanding Officer of the USCGC NORTHWIND.

“ Facing the worst pack in Antarctic history, the central Group began its penetration of the ice at approximately the intersection of the Arctic Circle and the 180th meridian on a generally southerly course. Since the Northwind was in the van, Rear Admiral R.H. Crusen, the Task Force Commander, shifted his flag to the icebreaker.

In a well organized ice convoy, the commander needs to know what his ships will encounter within the next day. The skipper of the icebreaker is interested in the picture within the next hour or two and the officer of the deck, within the range of his own range of visibility. Of these, the intermediate situation is the most important, because

conditions may change with amazing rapidity. Moreover in Operation High Jump, the Admiral had no means of making a long range reconnaissance. Hence helicopter reconnaissance within a radius of twenty five miles was essential.

The Central Group began working its way through the pack on 31 December 1946. It reached its destination – the Bay of Whales – on 17 January, 1947. Battering a track through 650 miles of ice in eighteen days would not have been possible without helicopter reconnaissance. I have no doubt that the Central Group would have reached its destination. After all, late February is optimal as far as sea ice is concerned. But for shore based operations, the weather has begun to deteriorate before this time.

Had the Task Group penetrated the pack without “eyes” it would have arrived too late in the season to establish a base; then conduct an aerophotographic exploration of a hidden continent. In other words, the Central Group would have been obliged to turn about and get out of the pack before being able to erect Little America No. 4.

A word about the Sennet. About mid-way trough the pack, it became obvious to everyone she would never make it. She had to be towed out of the pack- and by the Northwind. Here again the icebreaker’s helicopter proved it indispensability. The submarine had to be towed to safety in the shortest possible time. Otherwise, the other ships of the group were in immediate danger of being crushed. Indeed, the two cargo ships, helpless in absence of the Northwind, were badly holed and would likely have been sunk, but for the timely return of the icebreaker.

This proven success of our helicopter impelled me to send the following message to the Commandant, U.S. Coast Guard: HELICOPTER BEST PIECE OF EQUIPMENT EVER CARRIED IN ICE VESSELS. I might add parenthetically that one of the motivating factors was Headquarters resistance to my efforts to obtain one for the Eastwind more than a year earlier.”



HNS-1 landing on NORTHWIND

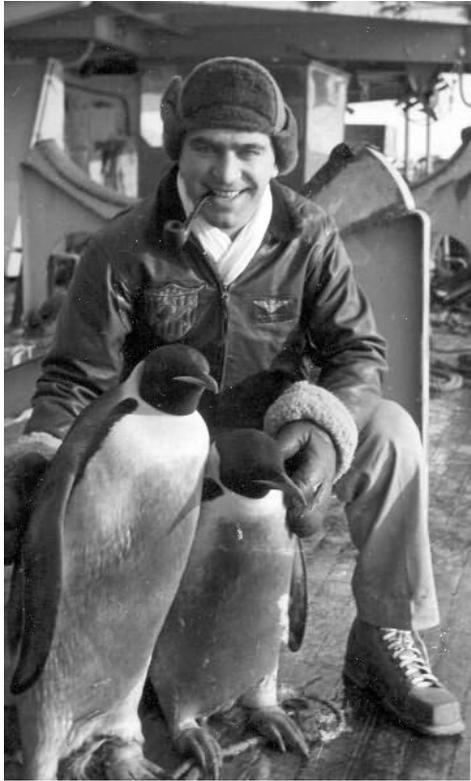
Coast Guard Headquarters did not respond to this recommendation largely due to budget considerations and the ambivalent attitude toward the helicopter. The following year Captain Thomas took the NORTHWIND on the re-established Bering Sea Patrol. He requested a helicopter but it was not provided. In 1948 a HO3S-1G was assigned to the Mackinaw during ice breaking operations. By the early 1950s Bell HTL helicopters operated from the Coast Guard Cutter Storis and other cutters equipped to carry helicopters when serving in Alaskan waters. The Navy, recognizing the potential, placed helicopters and crews aboard icebreakers engaged in subsequent polar operations including those Coast Guard icebreakers assigned to the operation. It was not until 1966 when the Coast Guard began operating both Coast Guard and former Navy icebreakers that Coast Guard helicopters and Coast Guard aircrews were placed on board.



USCG Cutter NORTHWIND during Operation Nanook with HNS-1 helicopter on board



J2F-6 after being placed in water off Little America IV



Dave Gershowitz and friends --



HNS-1 launch from NORTHWIND

1947 – Coast Guard Aircraft Repair and Supply Base Established:



Between 1935 and 1941 aeronautical supply support was achieved by the individual air stations requisitioning from the US Navy and purchasing directly from the manufacturers for those aircraft not provided for in the naval supply system. The Report of the Secretary of the Treasury for 1941 showed that as of June 30 there were 10 air stations in commission and 50 aircraft in the inventory. It also stated that two overhaul bases for aircraft were established; one at San Diego air station and one at Elizabeth City air station. This was done to effect more expeditious repairs and improve upon the timely availability of certain aircraft parts.

With America's direct involvement in World War II approaching, the U.S. Coast Guard was transferred to U.S. Navy control on 1 November 1941. The attack on Pearl Harbor took place a little more than a month later and by April of 1942 Coast Guard aviation units, in order to effectively perform their assigned

missions, were receiving Navy aircraft in increasing quantities. Except for the small number of aircraft purchased directly from the manufacture prior to 1940 the overhaul and parts support was obtained from the Navy's support system. The supply portion of the pre-war supply concept was maintained and a limited number Douglas R4D (C-47) and Curtiss R5C twin engine aircraft were obtained in late 1943 for logistic support. Additional R4D -5s were obtained during the SAR buildup of 1944-1945.

R4D-5



The R4D-5 was an all-weather transport powered by two Pratt & Whitney R-1830-92 engines. It was unpressurized and cruised at a speed of 160 mph. It had a range of 1975 statute miles. The R4D-5 had a large two panel cargo door on the port side of the fuselage aft

of the wing and a reinforced metal cargo floor with tie down fittings. Records are not complete but they show a total of eight on the Coast Guard inventory. However naval records indicate an additional two were transferred to the Coast Guard in 1946. After the war, several of these aircraft were used to supply LORAN and other remote Coast Guard stations. Some were used as search and rescue aircraft and at least one was equipped with an observation blister fitted to the aft windows as shown in the adjacent picture. All but four were removed from service by 1956 and only one, BuNO 12446 remained in service until 1961.

R5C-1



The R5C -1 was a large all weather twin engine transport powered by two Pratt & Whitney R-2800-51 engines. It had a streamlined circular two segment fuselage meeting at the cabin floor. It was a low winged pressurized monoplane with fully retractable landing gear. The R5C cruised at

180mph with a range of 2000 statute miles. They could carry up to 15,000 pounds of cargo and had a large two segment door on the port side aft of the wing. They were based at the Elizabeth City, North Carolina air station and were used for logistic support carrying personnel and cargo to air stations and other Coast Guard units. It could be

fitted with special long-range fuselage fuel tanks giving a range of 3100 statute miles for overseas supply missions. The last R5C was retired from Coast Guard service in 1950.

Although the need for a central supply and overhaul facility became evident during World War II it was not until the end of the war that locations became available for consideration. A large facility used by the Consolidated Vultee Corporation had been constructed by the Navy at the Coast Guard air station located at Elizabeth City, North Carolina. It was a modification center for Lend-Lease aircraft being delivered to Canada and Great Britain and at the end of the war the facility was closed. The Elizabeth City infrastructure had been expanded to accommodate multiple military units and had become a center Coast Guard aeronautical activity during the war. The former Consolidated plant was the logical selection.

In April of 1946 a small compliment of officers and men were assigned to the Elizabeth City air station for the purpose of establishing an aircraft repair and supply base for Coast Guard aircraft. Nine months later, as a result of focused effort, the Coast Guard Aircraft Repair and Supply Base was ready to go into operation. On 3 January 1947 it was placed in commission as a Headquarters Unit with a complement of 10 officers and 63 men. The supply support function began immediately while the aircraft overhaul program was being set up and developed. The first aircraft to complete overhaul was a Grumman J4F which was returned to operational service in October of 1948. It was at this point that the first civilian employees were brought on board.

From 1948 through 1963 the types of aircraft overhauled included the J4F, JRF, PBY , PBM , OY , UF/HU-16, JRB, R4D, PBIG, RM-1Z, C-123 and HO3S, HTL, and HO4S helicopters. Beginning in 1958 the program consisted almost entirely of HU-16 and helicopter overhauls. The HU-16 was phased out in 1979. In 1964 the first HH-52A was inducted and a transition from the HO4S to the HH-52A overhaul was made. In 1972 the HH-3F was inducted. With the phase out of the HH-52 and HH-3F, emphasis was on the HU-25 and the HH-65. Structural modifications such as that done on the C-123 and C-131 and EC-130 were made. In addition a number of electronic installations and modifications were manufactured and/or installed. During 2006-2007 a retrofitting of all 95 of the Coast Guard's HH-65 helicopter engines was accomplished. Aircraft components are also overhauled. Parts are occasionally manufactured when this is more economical than buying outside or the part in question becomes difficult to obtain.

In 1946 the Aircraft Repair and Supply Base was renamed the Aircraft Repair and Supply center. (ARSC) Today (2007) the ARSC is the location for all Coast Guard aviation logistic support. ARSC is responsible for overhauling/repairing aircraft; providing aircraft parts and equipment to the fleet; re-engineering and manufacturing aircraft parts, performing complex , multi-million dollar contracting actions; providing technical engineering support; and providing teams of personnel who perform on-site field assistance to Coast Guard air stations and deployed aircraft. Major support functions are contained within four streamlined product lines. The focus is on HH_60, HH-65, HC-130 and HU-25 aircraft.

ARSC occupies 14 buildings on 55 acres of the 822 acre support complex. ARSC employs 149 military, 495 civilians and 278 contractors. It has the largest unit operating budget in the Coast Guard and possesses an inventory valued at \$743 million.



PB-1G Line



UF-2G/HU-16



H-52



Wright R1820 engines



HU-25 Falcon



HH-60



Coast Guard Aircraft & Supply Center

1947 – Coast Guard Air detachment San Juan Puerto Rico Established:



Puerto Rico and adjacent Caribbean Islands were in the Tenth Naval District and part of the Caribbean Sea Frontier and for short time after World War II there was a Tenth Coast Guard District. An air detachment consisting of Chief Aviation Pilot Fred Guild, a radioman, a mechanic and one JRF Goose was established to provide transportation and services for the District Commander, Commodore Barton. The post war duties and responsibilities of the Coast Guard were being determined. The area from of the Haiti Dominican Republic border eastward including the islands within the area of maritime responsibility became the Antilles Section, with Headquarters in Puerto Rico, and became part of the Seventh Coast Guard District.

In April of 1950 a Coast Guard Search and Rescue air detachment, CDR Ray Blouin commanding, was established at the Naval Air Station on Isla Grande at San Juan. The detachment had nine pilots assigned and

two PBY-5As replaced the JRF. In July of 1952 two UF-1Gs replaced the PBYs. October of 1952 a JRF was again added and a second JRF was received in February of 1953. SAR was provided within the maritime region and a rescue control center was established at the U.S. Coast Guard Base, San Juan which was adjacent to the Naval air Station.

The Coast Guard located the air detachment in Puerto Rico to best cover the area where American activity was the greatest. However, the Coast Guard gives succor to all regardless of nationality or location and aircraft were dispatched on rescue missions, when needed, to any place in the Caribbean. SAR cases ranged from the normal medical evacuations and disaster relief to the unusual and unexpected. The unexpected happened on April 11, 1952. Pan American flight 526-A, a DC-4 with 64 passengers, lifted off from the Isla Grande airport bound for New York. Shortly after take-off two of the four engines failed and the Captain informed the control tower that he could not maintain altitude and that he was ditching at a point approximately seven miles north northwest of Isla Grande. The tower notified the rescue center and a PBY was launched and a surface vessels got underway. The situation being critical, the second PBY was removed from maintenance status and was also launched. The sea was rough but when the orange signal smoke was sighted one of the PBYs flown by LCDR Ken Bilderback made a landing. Only 17 of the passengers and crew were found and rescued. One of which was a small boy not in a raft that Copilot Jack Natwig went out the hatch of the PBY to rescue. Seas were worsening and upon the arrival of the Coast Guard buoy tender BRAMBLE, which had medical personnel aboard, all survivors except two teen age boys were transferred. The PBY was now taking on water and LCDR Bilderback realizing that he would not be able to make a successful take-off taxied in the sea back to the San Juan Harbor.

By 1956 UF-2G aircraft were aboard and the Coast Guard Air Detachment was also serving as the aviation facility for the Navy Base at Isla Grande. In the early 1960s a C-123 was added for LORAN logistics. The C-123 made bi-weekly flights to Supply the LORAN stations at South Caicos and San Salvador. In addition flights were made to Grand Turk to obtain fuel for the generators at South

Caicos. The fuel trailers were easily on-loaded and off-loaded from the C- 123. The supply run was reversed in 1967 and the C-123 was based out of Miami.



UF-1G flying over the north shore of Puerto Rico

With three HU-16s and the desire to provide helicopter coverage for the Puerto-Rico area, Isla Grande had become too small. The Air detachment, now an air station, moved to Borinquen, the site of the former Ramey Air Force Base in the fall of 1971. The aircraft complement was three HU-16Es and two HH-52A helicopters.

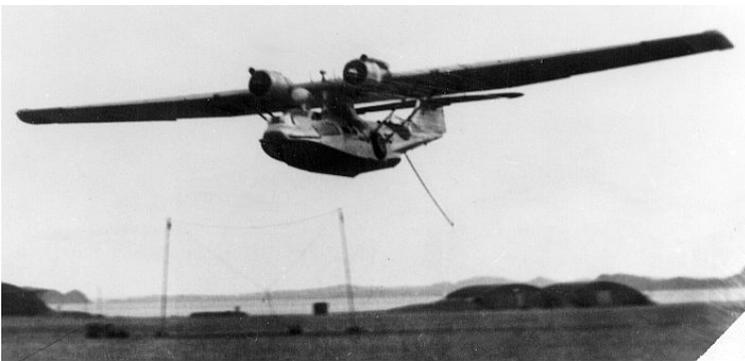
1947 – Coast Guard Air Detachment Kodiak Alaska Established:



The USCGC SPENSER, a newly commissioned 327 foot Treasury Class cutter, was enroute to Cordova, Alaska where it would be based. The 327 foot cutters were capable of carrying an aircraft. Captain Lloyd Chalker, the Chief of Coast Guard Aviation, directed Lt. C.F Edge to put a JF-2 amphibian aboard the SPENCER and assigned him as the pilot. His mission was to reconnoiter Alaska for a suitable site for a Coast Guard air base. During 1937 Edge examined seven locations along the Alaska Coast from Ketchikan to the Aleutians. He recommended Kodiak. He stated none of the locations was ideal but Kodiak was acceptable and centrally located to Coast Guard operations. The Navy concurred with Edge's opinion except they chose Woody Island as the location for a seaplane base. Edge felt that Woman's Bay was

a better location. Chalker arranged a meeting with the Navy and after Edge's briefing they agreed that Woman's Bay should be the location. The Navy began surveys and construction in 1938 and on June 15, 1941 NAS Kodiak was established.

During World War II a Coast Guard PBY and a PBY-5A operated out of Kodiak performing aerial mapping and support for the LORAN A chains being established in Alaska. A permanent Air Detachment, consisting of a PBY-5A, seven pilots and 30 crewmen, was commissioned on April 17, 1947. Several weeks later a second PBY-5 arrived. Initial duties were Search and Rescue and air support for outlying units. In the early days, logistic support required aerial delivery of cargo by parachute and pick ups were made with a pick-up hook protruding from the tail hatch. The package to be picked up was hung on a line stretched between to poles. Cape Sarichef LORAN station was supported by operating out of the Old Sennat Point landing strip. The runway was smoothed out lava rock with series of oil drums marking the edges of the landing strip. Summer of 1952 saw the addition of a third PBY-5A and search and rescue continued to be the primary activity as medical evacuations from remote areas continued to increase. During the summer of 1953 one PBY-5A and crew were deployed to Point Barrow for the purpose of ice observation during the DEWLINE support operation. By the end of the year the first UF-1G Grumman Albatross had arrived. Icing was a problem and in 1957 the UF-1Gs were replaced by the extended wing UF-2Gs which gave much better performance.



PBY-5A making a pickup

In May of 1957 the Commanding Officer of the Coast Guard Air Detachment accepted the duties of Kodiak SAR Coordinator from the Commanding Officer of US Naval Station Kodiak. This meant an increased roll for the air detachment as the operational control of all USCG Cutters deployed within the area and several US Navy aircraft and surface vessels to carry out the SAR mission became their responsibility. In 1960 with the construction of LORAN C

stations a C-123 transport was assigned to the station. Two Bell HUL-1G helicopters were assigned, primarily for use on icebreakers during the Bering Sea Patrols but they were additionally used for SAR. The helicopters could be carried in the C-123 greatly increasing their utilization potential. Law enforcement patrols increased in 1963 and the aircraft compliment was increased to four UF-2Gs.

On 1 July 1964 the unit was designated an air station. It had grown from one PBY-5A, seven officers and 30 crewmembers to 26 officers and 100 enlisted personnel. January of 1966 saw the arrival of the HH-52 helicopter. The first HC-130 was assigned in 1968 and in 1972 the first HH-3F helicopter arrived. The Navy's roll in Kodiak also terminated in 1972 and the entire complex was transferred to the Coast Guard. By 2002 the air station had a diverse inventory of five HH-65 helicopters, four HH-60J helicopters and five HC-130H tactical fixed wing aircraft. The HH-65 operates as a short range SAR and Law Enforcement asset regularly deployed on Alaska Patrol cutters. The HH60J is a long range SAR asset and the SAR workhorse of the unit. HC-130s provide long range SAR and helicopter escort and a most capable law enforcement platform patrolling the vast area of responsibility. SAR detachments are maintained at Cordova from May through September and St. Paul Island during the crab seasons. The Air Station is the major tenant of Integrated Support Command (ISC) Kodiak, and the largest command in D17 and the entire Pacific Area (PACAREA).



The mission of the Coast Guard Air Station Kodiak is to provide aircraft and crews in support of the Coast Guards core missions which include Search and Rescue Operations, covering 4 million square miles including the Gulf of Alaska, Bristol Bay, Bering Sea and the Pacific Ocean above latitude 40N. Enforcement of Laws and Treaties primarily focused on the nations most active fisheries; logistical support of isolated Coast Guard units; Marine environment protection; aids to navigation; Military defense; and assistance to numerous local, state and federal agencies.

1948 – Coast Guard Provides Aviation Support For The Treasury Departments Alcohol Tax Unit:



The history of the United States Coast Guard extends back to the founding of the Republic. One of the acts of the first Congress was to establish protective tariffs to generate revenues for the new Nation. To enforce these tariffs Congress authorized the formation of a Revenue Cutter Service. Congress authorized the merger of the Revenue Cutter Service with the Lifesaving Service on January 28, 1915, and the Coast Guard was officially formed two days later. The mission responsibilities of the Coast Guard have increased dramatically but law enforcement has remained one of the primary functions throughout the years. Some law-enforcement operations are direct and others are in support of other bureaus within the Treasury Department as well as other government agencies. The Coast Guard remained under the Treasury Department until 1967, when it became part of the newly formed Department of Transportation. It transferred to the Homeland Security Department in 2002. Law enforcement duties have been and remain a primary function of the Coast Guard.

In 1948 the Coast Guard was called upon to provide aviation support for agents of the Treasury’s Alcohol Tax Unit. The Alcohol Tax Unit (ATU) was established within the Internal Revenue Service (IRS) in 1934. The unit administered internal revenue laws that governed the alcohol industry after the end of Prohibition. In 1951, the IRS transferred tobacco tax functions to ATU and renamed the unit Alcohol and Tobacco Tax Division. On 1 July 1972, these tax and regulatory functions were separated from the IRS when the Treasury Department created the ATF.

In order to avoid detection, the manufacture of illicit whiskey, commonly referred to as ‘Moonshine,’ typically took place in hard to reach remote areas. Most common locations were the deep woods or a swamp. One method used by law enforcement to address this was aerial surveillance. From the air, the difference between growing bushes and those cut and put over a still could be seen. The still, whether in the deep woods or a swamp, had to be reached and if specific routes to a still were used these quite often could be detected from the air.

The type of aircraft needed for this function was small, lightweight, slow-flying, and capable of making tight turns. One of the many World War II light aircraft meeting these requirements was the US Marine Corps OY-1 Sentinel. It had a 34 foot wingspan and was powered by a Lycoming 185hp engine and was very maneuverable at slow speeds. They were used by the military for liaison, observation and a few for medical evacuations. The aircraft served in both World War II and the Korean conflict. The OY-2 differed in that it had a 24 volt electrical system.



Coast Guard OY-1

The Coast Guard obtained seven OY-1 aircraft in 1948. Four were operational and three were used as spares. The aircraft were based out of the Coast Guard Air Station Elizabeth City and deployed to targeted areas for specific missions. The aircraft were flown by Coast Guard aviators and carried an ATU agent. During May 1949 three of the four OY-1s were retired and in 1952 an OY-2 was added to the inventory.

Unfortunately, the OY-2 crashed while searching for illicit stills in Texas on 11 February 1958, killing the pilot. The Treasury agent survived. The aircraft was working with two radio-equipped cars and while searching a heavily wooded area it struck some tree tops and then plunged to the ground. The cause of the accident could not be determined. After the accident the single OY remaining was surveyed. All future support efforts for the ATU/ATF were performed by helicopter. The helicopter had developed to the point where it was better suited for the mission than a fixed wing aircraft. Future support was specific in nature and when requested, was provided by an air station in the area being worked by the ATF agents.

Manufacturer	Stinson	Maximum Speed	129 mph
Designation	OY-1 / OY-2	Cruise Speed	115 mph
Other	L-5	Stall Speed	57mph Flaps up

Aircraft type	Observation	Fuel Capacity	36 gallons
Wing Span	34'	Range	420 statute miles
Height	8' 11"	Empty Weight	1,550 lbs
Length	24' 1"	Gross weight	2185 lbs
Crew	I Pilot -- 1 Observer	Engine	180 hp Lycoming O-435-A



1949 – Coast Guard Air Detachment Barbers Point Established:



The first permanent Coast Guard aviation unit in the Hawaiian archipelago became reality in 1945 when LT. Ben Dameron was assigned command of eighteen enlisted personnel and five officers located at the Naval Air Station Kaneohe. NAS Kaneohe Bay, located on the windward side of Oahu, was a major advanced training base for Pacific operations during World War II. The Coast Guard Air detachment, consisting of a PBY-5A and one JRF, was established to provide air-sea rescue services. The JRF was retained but the PBY was replaced by two P4Y-2s Privateers. The P4Y-2s were also used for Pacific supply runs. The runs went from Kaneohe to the MATS terminal at Hickam Field, then Johnson Island, Majuro, Kawjelen, Guam, Sangley Point to Japan and then back through Wake, and Midway. The

trip took between 20 and 28 days and the route varied. The detachment transported everything that ATC or MATS would not carry and went to places they did not go.

In 1949 the Navy decommissioned the Kaneohe air station and the Coast Guard air detachment moved to NAS Barbers Point on the west coast of Oahu and was established as a Coast Guard Air Facility. During 1949 the Air Facility received two PB-1Gs and in 1950 two R5Ds replaced the P4Y-2Gs. The Coast Guard had been charged with the continued operation of LORAN after World War II. The stations were consolidated and modified to support post war requirements. The Loran stations west of Hawaii were supported by surface vessel and aircraft based at Guam, Sangley Point P.I. and Barbers Point. The R5Ds in addition to service as search and rescue aircraft were much better suited for the support of these stations as well as other Coast Guard units. The mission support of Coast Guard facilities throughout the Pacific over the next decade plus, was known as “Cosmic Overseas Airways.” The support mission became WestPac and was continued utilizing C-130 aircraft.

During the Korean War Barbers Point became the major air search and rescue unit in the central Pacific with four PB4Y-2Gs, two R5Ds, one PBY and one JRF. The detachment deployed aircraft and crews on a continuing basis to operate as subordinate rescue units at Wake and Midway Islands during the conflict.

By 1961 the PB4Y-2Gs and the PBYs had been replaced resulting in a mix of three C-130s, two UF amphibians and one C-123. The C-123 was later replaced by another UF. The unit received its present designation as an Air Station in 1965. In 1969 the three UFs were replaced by two HH-52A helicopters. In August of 1987 the HH-52As were replaced by four HH-65s.



Coast Guard Air station Barbers Point, Hawaii

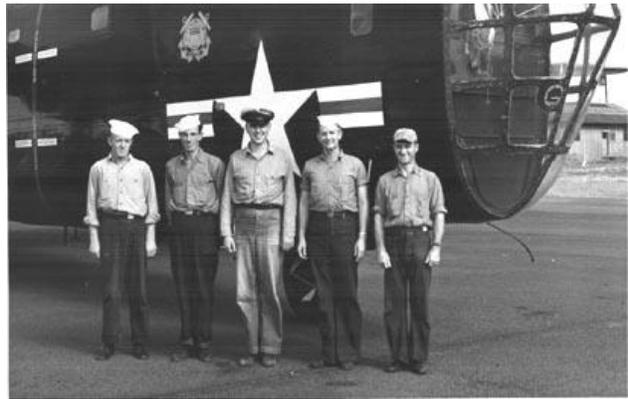
Air Station modernization and upgrading began in 1968 with the construction of the circular bachelor enlisted quarters, an experimental design for noise reduction. The hangar and administration building was dedicated in 1970. This building comprises two hangar bays, fifteen shops, plus 63 rooms and offices. Other construction included facilities for ground support equipment, and a solar hot water for washing aircraft. Social and recreational facilities were also constructed. In 1993 NAS Barbers Point was closed as per the Base Closure and Realignment Commissions recommendation to Congress. The

Coast Guard Air Station remains at Barbers Point, which now serves general aviation and hosts units of the Hawaii National Guard.

The Primary mission of Coast Guard Air Station Barbers Point is search and Rescue within the Pacific Maritime Region. In addition to law enforcement patrols, assistance to Federal, State and local authorities and marine environment protection, the Air Station provides logistical support to Coast Guard units and other agencies within the vast Fourteenth Coast Guard District. From the beginning of the post-war LORAN A chains through the LORAN C chains until their closure in 1993, millions of tons of equipment was provided and thousands of personnel were transported to LORAN stations throughout the Pacific.



P4Y-2 on the ramp Kaneohe - note the turret in the nose



**P4Y-2 with locally fabricated nose blister
L - R: Bishop ARM1, Apple AMM1 ADAMS
AOC, xxx x, Yeager AMM1**

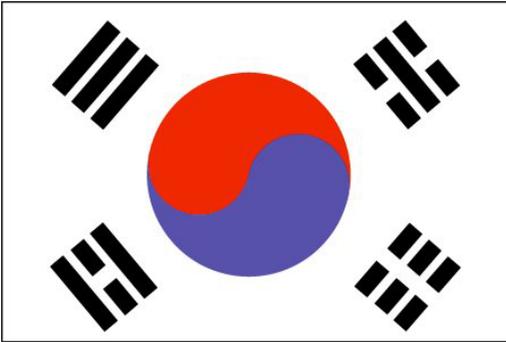


R5D with UF-1G in background



C-130s at Barbers Point

1950 – The Korean War and Coast Guard Aviation Participation:



On 25 June 1950 six North Korean Infantry divisions, supported by large armor and artillery forces, crossed the 38th parallel and invaded South Korea. Much of the world was caught off guard. The Coast Guards involvement would be gradual and the duties assigned would be extensions of peacetime functions.

By direction of the Commandant a comprehensive description of the functions the Coast Guard expected to perform after World War II had been developed by a planning committee headed by RADM James Pine. The mission statement outlined the proposed peacetime duties which included maintaining a military readiness to function as a specialized service with the Navy in time of war. In 1947 the Chief of Naval Operations, in recognition of the mission statement, suggested that the war time functions and duties assigned should be those which are an extension of normal peacetime tasks. Coast Guard units would be utilized as organized Coast Guard units rather than indiscriminately integrating them into the naval establishment. The Coast Guard was not transferred to the Navy during the Korean Conflict.

A Coast Guard contingent, for the purpose of establishing a Korean “coast guard” was set up in 1946. In 1948, when the Koreans decided this was to be a Navy in lieu of a “coast guard,” the active duty personnel were replaced by retired officers to continue with the training of the nascent naval force. The training liaison was in progress at the time of the invasion.



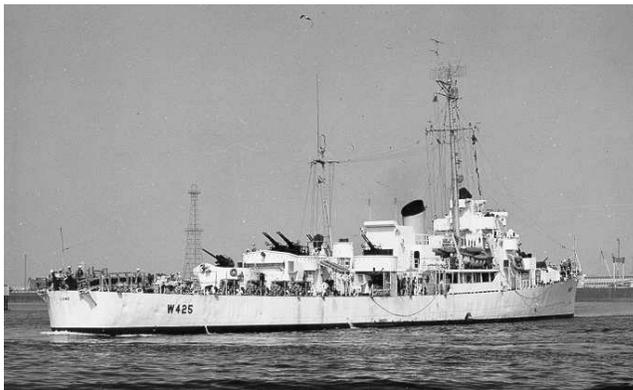
Bell HTL-1

On 9 August 1950 President Truman signed an executive order implementing the Magnuson Act which charged the Coast Guard with ensuring the security of the United States ports and harbors. This reinstated a duty carried out by the Coast Guard during both World Wars. The most immediate problem in implementing these duties was the lack of personnel. The World War II reserve program had been emasculated at the end of the war and, for practical purposes; a functioning Coast Guard reserve did not exist. A supplemental appropriation provided the immediate increase in financing necessary to implement an organized reserve. The budget for the following years permitted the Coast Guard to adequately address the new and expanded demands. In July of 1951 a Coast Guard port security helicopter

detachment was established for the New York City port area. The “police action” was in Korea but the “Cold War” with the Soviet Union was on and the Soviets supported North Korea. The threat of possible sabotage was a prudent concern. The detachment, under the command of LCDR Dave Oliver, had three Bell HTL helicopters and was supported out of the Brooklyn Air Station. More hours were flown than had ever been flown by helicopters before. The daily patrols could spot quickly any thing

that was not normal and radioed the information directly to the police department, the fire department, or other concerned agencies. The effectiveness of the patrol led both the New York City police department and fire department to obtain helicopters for their own use.

Coast Guard cutters manned two Ocean Stations in the Pacific prior to the outbreak of the Korean conflict. At the request of the Navy three additional stations were added in the North Pacific. These stations provided complete weather data and greater search and rescue coverage for the growing trans-pacific merchant and military traffic generated by the war. Most all of the war material bound for Korea went by ship but nearly half of the personnel went by air. In mid 1951 the first of



Coast Guard Cutter LOWE WDE 425

twelve former Navy destroyer escorts were made available to supplement the existing cutter fleet. In order to keep the ocean stations operational and perform search and rescue duties it required 22 coast Guard Cutters in constant rotation. A typical tour was composed of arriving at Midway Island for three weeks SAR standby, three weeks on Ocean Station Victor midway between Japan and the Aleutian Islands, three weeks on SAR standby at Guam, two week "R and "R (Rest and Recreation) in Japan, three weeks on Ocean Station Sugar, three weeks on SAR standby Adak, Alaska, and then back to home port.

The Coast Guard also supported the war effort by manning and operating nine LORAN stations throughout the Pacific. LORAN was the primary navigation system for ships and aircraft. One of the nine was the newly constructed and located on the Korean peninsula itself.

In 1952 the Navy also requested that the Coast Guard provide aircraft search and rescue capability. Two air rescue detachments were established; One at the newly reopened Naval Air Station at Midway Island; one at Wake Island.. The Midway air detachment had a P4Y-2G and a PBY. Aircraft and aviation personnel were permanently assigned as part of the SAR Group. Ocean Station Vessels would rotate through Midway for consecutive three week periods. The aircraft and cutters worked together as a unit. Wake's Group Commander had an 83 footer permanently assigned. P4Y-2G aircraft and crews were supplied on a monthly basis from Barbers Point. Several Ocean Station vessel records show three week standby duty at Adak. A Coast Guard SAR air detachment at Adak, Alaska has been mentioned in several papers but no particulars have been located to date to substantiate this. The air detachment aircraft were primarily engaged in the intercept and escort of military and commercial aircraft that had experienced engine failures. The reason for intercept was that if conditions deteriorated the position of aircraft in distress would be known and the escorting aircraft could drop additional rafts and survival equipment to those in the water. In addition to SAR training exercises, searches for missing or down aircraft were conducted jointly with the Coast Guard cutters when assigned to SAR support duties.

In addition search and Rescue capabilities were upgraded at the existing Coast Guard air detachments at Barbers Point, Hawaii; Guam; and Sangley Point in the Philippine Islands. Guam acquired an additional P4Y-2G and worked with the Ocean Station SAR Standby cutters. Two PBM-5Gs and a JRF were assigned to augment the PBY-5A at Sangley Point. The Coast Guard Cutter Vance, WDE 487, was assigned to the Commander Philippine Section.



P4Y-2G

The most dangerous of the search and rescue missions undertaken by the Coast Guard took place off the coast of mainland China in early 1953. Communist Chinese forces shot down a Navy P2V in the Formosa Strait while on a covert patrol of the China coast. The Coast Guard air detachment at Sangley Point responded to the call for assistance scrambling a PBM-5G Mariner seaplane. In command was Lt. John Vukic, one of the most experienced seaplane pilots in the Coast Guard. The initial PBM-5G was followed by a second PBM-5G piloted by Lt. Mitch Perry as back-up. Upon arriving on scene the P2V crew was located floating in rafts close to shore. The seas were observed to be between 12 and 15 feet making an attempted landing extremely hazardous but with nightfall closing in and almost certain danger of hypothermia the decision was made to attempt the landing. A successful landing was made and 11 survivors in the first raft were brought aboard and the jet-assisted take off bottles (JATO) were attached for use during take-off. Two survivors in a second raft had been swept ashore and captured by the communist forces. With a wind at 25 knots and the seas rising the take-off was attempted. The take-off progressed well and the JATO bottles were fired. It was at that critical moment that the left engine failed. The plane slammed into the sea and broke up. The second PBM-5G on scene circled and dropped a series of flares. The surviving crewmembers were picked up later that night by the Navy destroyer USS Halsey Powell. Four Navy and five Coast Guard personnel perished in the crash



PBM-5G at the ready SAR position Sangley Point



Coast Guard Cutter VANCE WDE 487 working with a Sangley Point PBM-5G

With the signing of the cease-fire on 26 July 1953 the Coast Guard began demobilization. The Destroyer Escorts were returned to the Navy and the air detachments at Wake Island, and Midway Island were closed. The air detachments at Barbers point, Sangley Point and Guam were returned to peace time complements.

The Coast Guard almost doubled in size from its 1947 low of just over 18,000 men and women until June 1952 when 35,082 officers and enlisted personnel served on active duty. The service

demobilized but would never again return to 1947 levels. The role the Coast Guard played in the Korean War was vital but rather obscure. Future Commandants would address this issue. Some ten years later, Commandant E.J. Roland stated that he felt it was absolutely imperative that the Coast Guard become actively involved in a combat role in the Vietnam Conflict, otherwise it risked its status as a Military Service.

1950 – Coast Guard air Detachment Corpus Christi, Texas Established:



The Coast Guard Air Detachment Corpus Christi was established on 20 November 1950 as a tenant organization of the US Naval Air Station (NAS). NAS Corpus Christi is located in the Flour Bluff area, ten miles southeast of the city of Corpus Christi, Texas. The detachment, with just one PBY-5A, four pilots and 11 crewmembers, provided search and rescue support in the western Gulf of Mexico, as well as the 350 miles of coastline and inland waterways in the Texas Coastal Bend area. By the mid 1950s the PBY had been replaced by the UF-1G and two additional aircraft were added. The detachment was formally designated an Air Station in the mid 1960s.

The primary mission remains search and rescue but, much like other aviation units in the Coast Guard, mission responsibilities diversified and increased throughout the years. Typical rescue missions include: searches for overdue boats, assisting disabled or sinking vessels; rescuing survivors; and medical or other evacuations from offshore oil rigs or vessels. Initially aids to navigation surveillance responsibilities were added and during the early stages of the maritime drug interdiction program Air Station Corpus Christi was very much involved in joint operations. They continue to remain so. In addition to local drug interdiction patrols, aircraft and crews are frequently deployed outside the South

Texas waters. Federal fisheries law is enforced and marine environmental patrols are flown. The presently assigned HU-25B aircraft are equipped with a unique AIREYE surveillance system and are deployed nationally to track oil spills and plot winter ice flows.

In order to accomplish the expanded and newly assigned missions the UF-1G Albatross amphibians were upgraded to UF-2Gs, later designated HU-16E, and HH-52 helicopters arrived in the late 1960s. This greatly increased the search and rescue capabilities of the air station. The aging HU-16s were temporarily replaced by HC-131 aircraft in 1977 and these were in turn replaced by the HU-25B in 1982. In the spring of 1986 the HH-52s were replaced by the HH-65A twin engine “Dolphin” helicopters.

To better address the operational responsibilities a Group concept was established and on 15 October 1980 the air station became one of thirteen group units between Port O’Conner, Texas and the Mexican border comprising Coast Guard Group Corpus Christi. The Air Station and the Group Office were located in hangar 41 at the Naval Air station. The Commander of Coast Guard Group Corpus Christi also served as the commanding officer of Coast Guard Air Station Corpus Christi. To better manage the sweeping changes that took place in the Coast Guard, Sector Corpus Christi was established in May of 2005 by joining all units within the area of Port Lavaca / Brownsville under one unified command.



Coast Group and Air station Corpus Christi, Texas

During 2006, Sector Corpus Christi conducted over 450 search and rescue cases, assisted 591 people in distress, saved 83 lives, saved \$3 million in property, seized over 5500 pounds of drugs and interdicted over 130 illegal immigrants.

1951 – The ASW Helicopter Becomes a Reality:



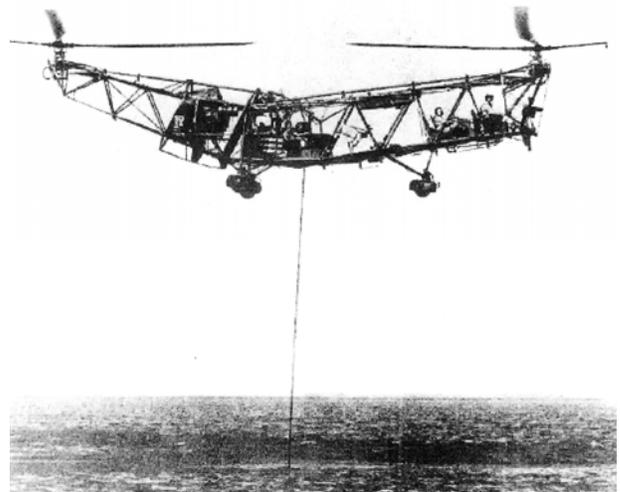
Stewart Ross Graham USCG

The effectiveness of using helicopters for submarine detection had been demonstrated during 1946. During the next four years the sonar underwent major modifications. Reliability and maintainability were improved. To make it more compact the Navy contracted for the development and manufacture of a lightweight dipping- sonar especially designed for helicopters. The result, the AN/AQS-4 was installed in a HRP-1 by the Naval Aviation Test Center at Patuxent River and was ready for operational testing in February 1951.

An ASW personnel-training program began at the VX-1 Detachment in Key West, Florida on February 20, 1951. Pilots and crews from the Navy, Coast Guard, Marine Corps, and Great Britain were in attendance. LT. Stewart Graham USCG, who had previously been directly involved with the development of helicopter sonar ASW operations as the project manager, was requested and assigned to the VX-1 training and evaluation program.

The HRP, in the Key West environment, proved to be heavy and the engines overheated during prolonged hovers in the high heat and humidity. In order to reduce weight the fabric was stripped from the helicopters tubular structure. This weight reduction enabled the HRP-1 to provide satisfactory performance, even under adverse conditions, but gave rise to the problem of corrosion and breaking down of electrical equipment and wiring. As a result the Navy continued the tests using HO4S-1 helicopters that were being evaluated at the time. It did not take long before the HO4S-1s, equipped with the 550 hp R-1340 engines, also ran into troubles due to prolonged hovering under no-wind conditions in the high heat and humidity environment. VX-1 came to the conclusion that the stripped down HRPs performed better than any other helicopter then available and arrangements were made for the return of the HRP to the evaluation program.

The program grew to 10 HRPs. Surface vessels consisted of the aircraft carrier USS SIBONEY and an LST for helicopters based at sea. Destroyers and submarines were also engaged. Each Day all mechanical and electronic components used in the dipping sonar tests of simulated wartime operations were evaluated. One phase of the program tested a search and attack helicopter. It carried the dipping sonar to locate the submarine and a torpedo to attack a submerged submarine. The number of sonar dips needed to detect and locate a submerged submarine for the purpose of closing the range to launch a satisfactory torpedo attack was evaluated. This was later developed into the hunter-killer helicopter ASW concept wherein one helicopter detected and located



the submarine and a second made the attack in a coordinated maneuver. Another phase was to determine the capabilities of a radar equipped surface vessel to tactically control a number of ASW helicopters to cover a given area. From this was developed data referred to as “probability of detection vs range.”

The helicopter ASW program expanded beyond US waters in 1952, when the Cuban Naval Air Station at Puerto Mariel hosted units of the US Naval Operations Development force. The force included the Submarine USS AMBERJACK, Escort Patrol Craft 1431, LST 209 and five HRP. On February 18, 1952, the Key West Detachment was transferred to Cuba and exercises were conducted daily for purpose of deep water echo-ranging. This continued until mid march when a Cuban military uprising forced the detachment to leave Cuba. Evaluations resumed from Key West and by the end of August 1952, the Navy accepted the AN/AQS-4 helicopter sonar package and the first and second Navy ASW helicopter squadrons, HS-1 and HS-2, were formed

In September 1952 LCDR Graham was transferred to the U. S. Naval Air Test Center in Patuxent River, Maryland, as head of the Rotary Wing section of the Tactical Test Division.

Since the stripped down HRP had been the most successful of the project aircraft the Navy favored the tandem rotor configuration. The helicopter of choice was the Bell XHSL-1. This was an interconnected, two blade, tandem rotor design. To address previous power plant limitations the XHSL-1 was equipped with a 2400hp R-1820-50 engine. It had a 425 gallon fuel capacity which provided a flight endurance of four hours. It also had a Bell developed autopilot designed to permit hovering for long periods. The HSL experienced development problems, however, and the Piasecki HUP-2 was used as a less than satisfactory substitute. The main problem with the HUP was the 525 hp Continental Engine. The Sikorsky HSS-1 (H-34) was later developed and became the ASW helicopter of the fleet.

During September of 1953 LCDR Graham was returned for assignment to Coast Guard operational duties.



Bell HSL-1



Piasecki HUP-1

1951 – Coast Guard Acquires the UF-1G/2G Albatross Aircraft:



UF-1G

The Grumman Model G-64, the largest of a series of amphibians designed and manufactured by the Grumman Aircraft Corporation, was the only one originally developed for the military. Design work to meet the U.S. Navy requirement for an all-weather general purpose amphibious transport began in 1944. The Model G64 was a continuation of the Model 21, JRF Goose design philosophy. It had a conventional two-step hull into which the main landing gear retracted; had a high wing; a single tail unit; and fixed stabilizing floats attached to the wings. The Model 64 structure, however, was refined to reduce drag; it had a cantilever tailplane; and tricycle landing gear. The Model 64 was larger and more powerful than the JRF; longer ranged and much more versatile. It was powered by two Wright 1820-76 engines rated at 1425 horsepower. The prototype, designated XJRF-1, flew on 24 October 1947.

Designated JR2F-1, the Navy had decided during development, that the initial order would be for an Anti-Submarine Warfare aircraft configuration to be designated PF-1s. Meanwhile the aircraft had caught the attention of the newly created US Air Force (USAF). They were interested in using the aircraft as a search and rescue aircraft to replace the converted B-17s and B-29s presently in use. The initial Air Force procurement order was for 52 of these aircraft, designated as SA-16As, the first of which was delivered in July of 1949. Grumman delivered a total of 297 SA16As to the USAF. Ironically the Air Force was the first service to



XJR2F-1

receive a production aircraft, because the Navy had dropped its procurement of the aircraft as an ASW aircraft and instead ordered UF-1 Albatrosses to be used for utility aircraft.

Due in large part to correspondence initiated by Congressman Herbert Bonner, addressed to Secretary of the Treasury John W. Snyder, as to the state of Coast Guard aviation, funds became available for the purchase of the Grumman Albatross as a replacement for obsolescent Coast Guard SAR aircraft. Designated UF-1G, four were delivered in 1951; nine in 1952; nine in 1953; and an additional 14 in 1954. In addition, due to a change in Air Force rescue requirements, 15 Air Force SA-16As ordered from Grumman during 1952 were delivered to the Coast Guard as UF-1Gs with serial numbers 2121 to 2135. Beginning in December of 1953, 51 more SA-16s that had previously served in the Air Force were acquired. Coast Guard aircraft numbers were derived by assigning the last four digits of the Air Force serial number.

The Albatross proved to be ideal for the Coast Guard. It could operate from both land and water. For take-offs in open sea or short field operations it could be fitted with JATO affixed to each side of the aft fuselage. The external store racks fitted to each wing were used to carry 295 gallon drop tanks. When combined with the fuel capacity of the main tanks and fuel carried in the wing floats a range of over 2100 nautical miles and 14 plus hours in the air, with sufficient fuel reserve, was obtained, making it an excellent search vehicle. AN/APS-31A search radar was fitted in the nose. HF SSB receivers, interrogators, and MF/VHF/UHF direction finding equipment was standard. Sheltered water take-offs and landings at weights up to 32,000 pounds were possible without the use of JATO. Open sea operations were possible under favorable conditions with JATO. With lives at stake, however, there were numerous times when “possible” was substantially re-defined. There has been at least one recorded take-off without JATO in seven foot seas.

The aircraft were very mission adaptable and were located at air stations throughout the Continental United States as well as Alaska, Bermuda, Puerto Rico, Hawaii, Guam, and the Philippines. In addition to search and rescue the UF/HU-16 flew fishery patrols, pollution surveillance patrols, aids to navigation missions, logistic supply missions, law enforcement duties. A main cabin designed to carry ten passengers was equipped with a series of cargo tie down points which enabled the UF to be used to supply isolated duty stations throughout the Coast Guard. Up to 5000 pounds of cargo could be carried. Servicing at these locations was limited and the aircraft fuel system was such that gasoline could be put into the float tanks from 55 gallon drums and then transferred to the main tanks.



UF-2G/HU-16Es on the ramp Coast Guard Air Station Brooklyn

The one drawback of the UF-1G/SA-16A was unsatisfactory performance on one engine. Grumman engineers corrected the problem by adding a 70 inch wing section outboard of each engine and a 39 inch wing tip extension coupled with leading edge wing camber to replace the leading edge slots. Because of the increased wing area, the ailerons, fin, and stabilizers were increased in size. This modification resulted in a vast improvement in performance. Single engine operation at altitude was made possible. The modification also resulted in an increase in gross weight of 5000 pounds, an increase in cruise speed of 15 knots with no increase in fuel consumption and the stall speed was lowered to 64 knots. The Coast Guard UF-1G aircraft were converted to the UF-2G configuration. When the standardization of military air craft identification went into effect in 1962; the UF-2G became the HU-16E.

World Class Amphibian Records

The Grumman Albatross is the holder of nine world class amphibian records certified by the Federation Aeronautique Internationale, the world's governing body for aviation records. The records were established as a result of a tri-service venture by the US Coast Guard, US Navy and US Air Force. The records were established using by Coast Guard HU-16E 7255 as follows:

- Speed over a 1000km closed course with a 1000kg and a 2000kg load. -- 201.5 knots
- Speed over a 5000km closed course with a 1000kg load. – 131.5 knots
- Altitude with a 1000kg load – 29,475ft
- Altitude with a 2000kg load – 27,405ft
- Distance non-stop – 3104 nautical miles

Unless interest in amphibian aircraft development is renewed these records may never be exceeded.

Note: A complete narrative of this accomplishment may be found in the 1957-1976 section of the Coast Guard Aviation History Timeline.

All of the UF-1G/SA-16A aircraft that were converted to UF-2G/SA-16B configuration had a series of holes drilled in the wing spar as part of the wing lengthening program. A test at the Navy research center at Patuxent River revealed that catastrophic failure along the holes might result. During 1966 the Coast Guard elected to participate in a full scale wing fatigue test. The object of the test was to determine whether major wing repair or replacement of the wing should be required. Tests resulted in a failure of the starboard wing. The Coast Guard chose not to replace the wing on the HU-16E and subsequent engineering calculations resulted in the establishment of an aircraft service life of 11,000 flight hours.

During the 32 years of service with the Coast Guard the Albatross came to be known by those that flew them as the "Goat." It is not clear how the name originated but it was used as a term of affection. By the mid 1970s the active fleet of HU-16s had dwindled to 20, located at five air stations. These aircraft were retired as they approached the 11,000 flight hour limit. During October of 1977 HU-16E 7236

departed the Traverse City, Michigan air station on its last flight, to the U.S. Naval Air Museum at Pensacola Florida where it resides today. On 10 March 1983 the last operational HU-16E, Coast Guard number 7250, made its final flight. In the intervening years these aircraft flew well over 500,000 hours and a countless number of people own their lives to them and the crews that flew them.

Manufacturer	Grumman Aircraft Corporation	Top Speed	210 kts
Designation	UF-2G	Cruise Speed	140 kts
Other Designation	HU-16E – SA16B	Range	2300 nautical miles
Aircraft Type	Amphibian	Empty Weight	22,880 lbs
Wing Span	96' 8"	Gross Weight	35,700 lbs
Height	25' 10"	Service ceiling	23,500 ft
Length	62' 10"	Engines	2 Wright R-1820-76B
Fuel Capacity	1666 gal – with full aux tanks	Propeller	HS Hydromatic 600 1A-7



1951 – Coast Guard Acquires the HO4S Helicopter:

Sikorsky Model S-51 (HO3S) had enjoyed both military and commercial acceptance which led Sikorsky to initiate a follow-on design capable of carrying 10 passengers or equivalent cargo. The Sikorsky Model S-55 was built, without government funds, to compete against large tandem-rotor helicopters such as Piasecki's PD-22 (H21) that did not require fore and aft balancing as did a one rotor helicopter.



The S-55 design placed the engine forward of the center section and relocating the cockpit above it. Not only did this provide direct access to the engine, through outward opening clamshell doors, for maintenance purposes but it eliminated the critical center of gravity problem of the helicopter by placing the cabin compartment directly below the rotor hub. A drive shaft transmitted engine power to the three-bladed main rotor through the center rear section of the cockpit. The fuel tanks were placed under the cabin. The principle drawbacks of a single-rotor design had been overcome.



Clam shell doors open for engine access



HO4S-3G instrument panel

The subsequent impact of the S-55 was unforeseen at the time of its initial introduction. The Korean conflict was on the horizon and this war demonstrated the abilities of the helicopter and brought it into prominence. The Sikorsky S-55, designated H-19 by the Air Force, HO4S by the Navy and HRS by the Marine Corps, was reliable, versatile, and adaptable to diverse requirements. It was used for troop transport; air rescue; cargo transport both internally and by external sling loading; and for the first time casualties could be carried and attended to under cover within the helicopter.

In November of 1951, the Coast Guard acquired the first of seven HO4S-1s modified for search and rescue purposes. The Modification was designated HO4S-2G. These helicopters were powered by a 550 horsepower Pratt & Whitney R-1340 engines. In January of 1952 the first of 23 HO4S-3G helicopters, powered by the 700hp Wright R-1300 engine, was delivered to the Coast Guard. All were fitted with a rescue hoist and in 1954 the Coast Guard designed rescue basket became standard equipment. An additional eight HRS-3s were obtained from the Navy and modified for Coast Guard use. The HO4S-3G was the first helicopter to be equipped for night operations and instrument flight.

The HO4S helicopters extended the Coast Guard’s rescue capabilities far beyond what was imagined 20 years prior. Although underpowered by today’s standards it was the first operational helicopter capable of carrying multiple survivors in a cabin and carry heavy loads, It had a rescue hoist capable of lifting 400 pounds, and could fly at a normal forward speed of 80 knots with a range of 350 nautical miles. It proved, beyond all doubt, the capabilities and value of the helicopter for Coast Guard operations. They performed numerous rescues during the next decade, some best described as miraculous, within parameters never before achieved. The helicopter became the primary asset for the saving of life.

Manufacturer	Sikorsky Aircraft	Top Speed	98 kts
Designation	HO4S-3G	Cruising Speed	80 kts
Aircraft Type	Rescue Helicopter	Fuel Capacity	190 gallons
Rotor Diameter	53’	Range	350 nm
Height	13’ 4”	Crew	2 or 3
Length	42’ 2”	Hover Ceiling	7900 feet
Empty Weight	5250	Service Ceiling	16,000 feet
Gross Weight	7500	Engine	700 hp Wright R-1300

Operation “Tug-Bird”

During August 1957 Headquarters authorized the Coast Guard Air station St. Petersburg to conduct “Operation Tug-Bird” with a HO4S helicopter to determine the practicability of Towing disabled vessels. The project helicopter successfully towed various craft ranging in size from the Air Stations 18 footer to the 794 ton buoy tender JUNIPER. At no times did the tows require more than 3000 pounds line pull under test conditions. Tow speeds averaged 12 knots. Headquarters directed that each air station should have at least one HO4S helicopter permanently equipped for towing. This HO4S had a reinforced tail plate with a stainless steel line attached on the rear of the helicopter by U-bolt equipped with an explosive device. The helicopter could tow a disabled vessel away from the

rocks to deep water and lay the tow line over the bow of a Coast Guard cutter or patrol boat. When the vessels crew had the line, the explosive bolt was fired and the line dropped on the forecastle.

The following is a narrative of a towing mission of San Francisco HO4S CGNR 1309: A towline was put aboard the 36 foot fishing vessel PIRATE II that had lost an engine and was going on the rocks. The helicopter commenced towing in a position less than 50 yards from Seal Rocks. At first it appeared that little progress was being made. The wind at this time was 22 -28 knots and the tow was directly into seas of 10 to 15 feet. With towing tension surging as high as 3100 pounds the helicopter gradually succeeded in towing the PIRATE II out of danger to a point one half mile off shore where the tow was turned over to a Coast Guard patrol boat CG-82328. The mission was a complete success.

Complete records as to how many times this procedure was utilized are not available but with the arrival of the HH-52 the procedures and skill level required had deteriorated and the practice was discontinued. The Navy, however, uses the procedures developed by the Coast Guard for towing paravanes to remove mines.

1952 – Coast Guard Air Detachment Arlington Established:

On February 20, 1952 the United States Coast Guard commissioned, for the first time, an aviation unit for the sole purpose of providing air transportation for personnel as may be directed by Coast Guard Headquarters. It was a tenant unit at Washington National Airport and as is the practice, named for its geographic location. Washington National Airport is located in Arlington, Virginia thus the unit became Coast Guard Air Detachment Arlington. It had been the practice since 1932 to provide air transportation for the use of the Secretary of the Treasury and the Commandant of the Coast Guard but the aircraft were supported by existing air stations not located in the Washington D.C. area.



passengers at a normal speed of 105 mph and had a range of 770 statute miles.

Douglas RD-2 Dolphin: A total of 59 Dolphins, Models RD- through RD-4 were built. Only one RD-2, a custom built aircraft, was produced. It was acquired by the Coast Guard during 1932 and was used as an administrative aircraft for the Secretary of the Treasury. Named for a star, like the other Dolphin aircraft, the RD-2 was the “Adhara.” The aircraft purchase price was \$43,250. It could carry six



The Northrop RT-1 Delta: An executive transport, it was purchased in February of 1935. After use by the Secretary of the Treasury it was operated as a staff transport. The purchase price was \$45,000. It could carry eight passengers at a normal speed of 200 mph and had a range of 1650 statute miles. The aircraft was decommissioned in 1940.



Lockheed XR30-1 Electra: The Coast Guard acquired a single Model 10-B Electra passenger aircraft during March of 1936 and it served as the Coast Guard Commandant's flagship. The purchase price was \$65,000. It could carry 12 passengers at a normal speed of 195 mph and had a range of 850 statute miles. It was replaced by a Lockheed R-50 Lodestar.



Lockheed R50-4: Several different models of the Lockheed Model 18 Lodestar served with the naval services beginning in 1940. The first purchased by the Coast Guard was a R50-2 command transport in 1940. During 1942 four R50-4 executive transports with VIP configurations were delivered to the Coast Guard and the R50-2 sold. An additional three R50-5s, a standard

14 passenger transport were acquired. The purchase price of the VIP transport was \$185,000. The normal speed of the -4 VIP transport was 230 mph and the range was 2000 statute miles. These aircraft were based at the Brooklyn and Elizabeth City air stations and later Washington National Airport. They were used by the Commandant and others as was directed. The Lockheed transports were phased out between 1946 and 1953, and turned over to other government agencies.

The newly commissioned air detachment, a Headquarters Unit, was located at the north end of the airport. The first commanding officer was Lt. L.V. Perry. There were four aviators assigned. Rather than acquire the upgraded and modernized R4D-8 "super DC3" the Coast Guard made arrangement with the Martin Aircraft Company for the purchase of two Martin 404s. A total of one hundred and one of these 40 passenger aircraft had been built for the airlines. The production line was extended by two in order to accommodate the Coast Guard purchase. The two Coast Guard Martin aircraft, originally designated RM-1Gs were delivered at the end of 1952 as replacements for the Lockheed R50-4s in use. The RMs were given serial numbers 1282 and 1283 and at the completion of the installation of VIP packages they were redesignated RM-1Z. The aircraft was pressurized, flew at a normal speed of 190 knots, and a range of 1500 nautical miles. The initial unit cost was \$647,140. After the VIP conversion they could accommodate 20 passengers. With tri-service re-designation directive of 1962 they became VC-3As. After giving excellent service both aircraft were retired from the Coast Guard

Manufacturer	Glen L. Martin	Top Speed	270 kts
Designation	RM-1Z VC-3A	Cruise Speed	190 kts
Aircraft Type	Pressurized Executive Transport	Range	1500 nm
Wing Span	93'	Empty Weight	27,800 pounds
Height	28' 6"	Gross Weight	43,650
Length	74' 7"	Engines	P&W R2800 water injection
Fuel Capacity	1350 gallons	Propellers	3 Blade Hamilton Standard



VC-3A

During this time period, active aviators were required to obtain a minimum of four hours of flight time per month to remain proficient and receive flight pay. An aircraft was provided by Air Detachment Arlington to provide flight time for those active aviators assigned to Coast Guard headquarters. This continued until the proficiency flight time requirement was terminated in 1972. The initial aircraft in use for this purpose was an R4D transport which was replaced by a UF amphibian.

In 1963 a Grumman G-159 executive turbo prop aircraft was obtained for the use of the Commandant, the Secretary of the Treasury, and then the Secretary of Transportation after the Coast Guard was transferred to that department. The designation for the new aircraft was VC-4A. Simultaneous with the increase in requirements and utilization during this period, selected aviator personnel assigned to duty at headquarters were used as supplementary pilots. The VC-3As were retained until 1969 when a VC-11A Gulfstream II executive jet was purchased. The VC-4A was transferred to Coast Guard Air Station Elizabeth City in 1983 for use as a utility aircraft.

In 1974 the unit moved to share a facility with the Federal Aviation Administration in Hangar 6 and the air station became Coast Guard Air Station Washington. In 1985 a VC-20B Gulfstream IV was purchased and in turn it was replaced by a VC-37A Gulfstream V in 2002. Pictures of the VC-11A, VC-20B and VC37A follow. Complete information on these aircraft are available at their chronological sequence in the timeline.



VC-4A Gulfstream I



VC-11A Gulfstream II



VC-37A Gulfstream V

1952 – Coast Guard air Detachment Bermuda Established:



The assets of the former Naval Air station at Bermuda, established during World War II, had been turned over to the control of Naval Station Bermuda after the war. Patrol squadrons returned again when, as a result of the Korean War, it was deemed necessary to have advanced ASW patrols to counter the increased Soviet submarine activity. VP 49, flying PBM Mariners, was the first to return and make the Naval Station its base of operations. VP-45 followed in 1956. In the summer of 1952 the Navy requested that the Coast Guard establish a SAR unit at Bermuda in support of naval operations.

Arrangements for the establishment of both a Group and Air Detachment were made by the USCG Office of Aviation. LCDR Jim Iverson was detailed as the commanding officer of the precommissioning detail. His first assignment was to

proceed, with maintenance personnel, to Navy Norfolk to select three PBM-5As from storage, make them flyable and position them at the Elizabeth City Air Station for deployment with crews to establish the Bermuda Air Detachment. Iverson proceeded to Bermuda in September to make initial arrangements. Administrative, sustenance and maintenance provisions as well as tie down and ramp space for a ready SAR aircraft were obtained. The Air Detachment was commissioned on October 31, 1952, CDR. Jim Cornish commanding.

Ocean Station Hotel was re-established and Ocean Station Echo patrols were continued. The cutters assigned to Ocean Station Echo were also assigned to SAR standby at Bermuda for three week periods. Joint aircraft/cutter SAR exercises were conducted. An Air Detachment aviator would brief the ships officers on what the joint exercise would entail. Usually on the following day the exercise, a response to a simulated SAR case, was carried out with the ship as on-scene commander. This practice greatly increased the effectiveness of the units on actual SAR cases.

Intercepts of aircraft with one or more engines out were frequently made. The main purpose of the intercept was to establish the position of the aircraft being assisted, and if the problem encountered became more severe and a ditching became necessary, the intercept aircraft would be available to drop additional survival equipment to survivors and direct surface vessels to assist. In the case of the Bermuda PBMs; if the sea conditions permitted, the PBM could land and rescue the survivors when the situation dictated.

At the end of the Korean War Ocean Station Hotel was discontinued but unlike the air detachments established in the Pacific, Bermuda was not decommissioned. In addition to providing SAR services for the Navy, the Bermuda air detachment was established to provide SAR coverage for the National Maritime Search and Rescue Region responsibilities of the Fifth Coast Guard District within the ICAO international agreement framework. A Coast Guard RCC center had been established with SAR responsibility for the Bermuda sector. The center controlled all rescue activities both military and civilian. The 55th Air Rescue Squadron at Kindley AFB was mission specific. Aircraft traffic had increased significantly during the first two years and continued to increase after 1954. Military Air

Transport Service and contract carriers passed through Bermuda from Lages in the Azores and commercial carriers began flying the southern route to Europe.

There were some unusual missions such as participation in the Mercury project during which a Coast Guard aircraft would orbit a given location until such time as the Mercury capsule had passed overhead. During the Cuban Missile crisis, in October of 1963, Bermuda aircraft flew searches for Russian Submarines down what was know as the India Route to the Bahamas. But for the most part Bermuda was strictly SAR.



Bermuda PBM-5 launched with two remaining on the ramp

The PBMs were replaced by P5Ms which were in turn replaced by UF-2G/HU-16Es in 1961. In 1964 Navy Patrol Squadron activities transitioned to P-3 aircraft and patrol plane activities moved to Kindley AFB. The Coast Guard followed. A joint RCC was established with the 55th ARRS. The SAR operation continued until the advent of the jet aircraft and the development of INS navigation systems. The Bermuda air detachment was closed in 1966.

1954 – Coast Guard Acquires Martin P5M Seaplanes:



P5M-2G Marlin

The prototype P5M Marlin was based on the PBM-5 Mariner. The P5M had the same wing but an extensively modified fuselage with a hull that extended the full length of the aircraft. It featured a tall single vertical stabilizer instead of the twin tail fins of the PBM-5 and the horizontal stabilizer featured a strong dihedral. The aircraft featured “hydroflaps” operated by the pilot’s rudder pedals, which could be used as water brakes. The P5M was a pure seaplane. The Navy ordered the P5M into production with changes to the prototype. The hull design was revised; the nose turret was replaced with a radome for an AN/APS -80 search radar; the cockpit was raised; the wing floats were mounted on single wide struts; and the dorsal turret was removed. The tail turret was retained but in actual operation the armament was removed.

The P5M was powered by two Wright R-3350-WA Turbo compound engines fitted into long nacelles. Four JATO bottles could be attached to aid takeoffs. As with the PBM-5, the nacelles had weapons bays that could accommodate two torpedoes or two 2000 pound bombs. Up to 1000 pounds of armament could be carried on underwing pylons. Initial service deliveries of the P5M-1 began in December 1951.

Most P5M-1s were given a comprehensive update in the late 1950s to optimize them for anti-submarine warfare (ASW) with equipment such as an active-passive sonar system; an AN/SQ-8 magnetic anomaly detection (MAD) system; an AN/APA-68 radio direction finding system; a tail-warning radar; and a searchlight mounted under the starboard wingtip.

Martin began a major redesign of the P5M-1 in 1951, producing the P5M-2. The P5M-2 had a distinctive tee tail, with a MAD boom fitted at the junctions of the tailplanes; uprated engines; much greater fuel capacity; the bow chime was lowered to reduce spray and the crew accommodations were improved. This came on line in the fall of 1953.

The Coast Guard acquired seven newly built P5Ms directly from Martin Aircraft in 1954. They were designated P5M-1G. These aircraft were used for search and rescue purposes and did not have ASW gear and defensive/offensive armament. In 1956 four P5M-2Gs, equipped for SAR missions, were purchased by the Coast Guard. Both the P5M-1Gs and P5M2Gs were transferred to the Navy in 1961 due to high maintenance and operating costs. The navy used the former Coast Guard P5Ms as training aircraft.

The following data is for the P5M-2G model:

Manufacturer	Glen L. Martin	Max Speed	218 kts
Designation	P5M-2G	Cruise Speed	130 kts
Aircraft Type	Seaplane - SAR	Empty Weight	50,485
Wing Span	118' 2"	Gross Weight	85,000
Height	32' 9"	Crew	3 pilots; seven crewmen
Length	100' 7"	Service Ceiling	24,000'
Fuel Capacity	3,950 gallons	Engines	3,450 hp R-3350-32 WA
Range	1790 nm	Propellers	15' 2" Hamilton Standard



P5M-1G Marlin

1955 – Coast Guard Air Detachment New Orleans Established:



In July of 1955 a two aircraft Coast Guard air detachment was permanently established at the Naval Air Station New Orleans, Louisiana. The detachment consisted of four pilots and seven enlisted personnel flying two Sikorsky HO3S-1G helicopters. The air station was located on the northern edge of the city on the shores of Lake Ponchartrain. Originally commissioned in 1941 as a Naval Reserve Air Base the base was redesignated a Naval Air station in 1942 and assumed the role of a primary training base for student aviators. In 1946 the training of selected Naval Air reservists became its task.

The air detachment was busy from the start and HO3Ss were soon replaced by Sikorsky HO4S-3G helicopters which greatly upgraded search and rescue capabilities of the unit. Specially built for the Coast Guard, the HO4S-

3Gs were the last of the HO4S/H19s built and were the first helicopters equipped for instrument and night operations.



HO3S-1G



HO4S-3G

The New Orleans air detachment mission was search and rescue. Located on the lower Mississippi River, New Orleans is the world's busiest commercial port; fishing and scrimping takes place in lakes, bayous and off-shore along the coasts of Alabama, Mississippi, and Louisiana; The oil industry operates in the off-shore waters; the pleasure boat traffic grew exponentially and New Orleans is in an area subject to summer hurricanes. Typical assistance cases were medico evacuations, assistance to sinking vessels, rescue of those in peril, locating the lost and overdue, and hurricane rescue assistance. The area of responsibility stretches from the pan handle of Florida to the Texas border in the west.



Ramp area Coast Guard Air station New Orleans

Initial construction of a joint air reserve training center located 15 miles south of New Orleans began in 1954 and it was commissioned in December of 1957 as NAS New Orleans, Alvin Callender Field. Units of the Navy and Marine Corps Reserve moved from the lakefront location. An Air Force Reserve Unit from Ellington Field and a Louisiana Air National Guard squadron moved in. The Coast Air Detachment also moved to the new Naval Air Station. The detachment later became Coast Guard Air Station New Orleans. New hangar facilities designed and built by the Coast Guard were opened and dedicated in September of 1968. The buildings provide maintenance facilities, administrative offices and supply areas. Quarters for the ready flight crews and an operations center were also located in the hangar. In 1986 a separate building to house administration, medical, and operations department was constructed. In later years additional missions such as maritime law enforcement, survey flights in support of pollution control and co-operative efforts with local and Federal agencies were added to the air station responsibilities.

The progress in the development of the helicopter is illustrated well in the history of aircraft assigned to the New Orleans air station. The HO4S was replaced by the HUS-1, the last of the piston engined helicopters. These were in turn replaced by the HH-52, an amphibious jet-engined helicopter, and the most prolific life saver of any helicopter built to date. In 1969 New Orleans was the first air station to operate the twin-engine HH-3F amphibian helicopter. In June 1980 the HH-52 again returned to the air station inventory. During 1985 New Orleans became the first air station to operate the new HH-65.



HH-65A

communication center, obtained DF bearings on the merchant vessels radio transmissions and provided assistance in case the helicopter went down. These flights were made both day and night and in both

The HH-65 has an advanced electronics package and a computerized navigation system integrated with the autopilot and a nose mounted forward looking infra-red radar to aid rescue missions by night, in bad weather and in high sea states This is in stark contrast to 1956 when a HO4S would depart the air station for an off-shore medical evacuation from a ship in the Gulf of Mexico. On the way out a stop would be made at Pilottown, Louisiana, 65 air miles south of New Orleans and just north of the mouth of the Mississippi River. The helicopter topped off with fuel from 55 gallon drums and then departed for the medco. Upon leaving Pilottown the HO4S picked up its UF-1G. Albatross escort which navigated for the helicopter, served as a

visual and instrument flight conditions. At night or in IFR conditions the helicopter pilots full attention was required just to fly the helicopter. Today's Automatic Stabilization Systems were not yet available. Depending on winds and fuel state, the return flight either went directly to the hospital helicopter pad in New Orleans or if required, it again stopped at Pilottown to obtain sufficient fuel to reach New Orleans.

The year 2005 was the fiftieth year of operation for Air Station New Orleans. The average number of cases per year had risen to over 500. It was also the year of Hurricane Katrina which was the costliest and one of the deadliest hurricanes in the history of the United States. The Coast Guard and the New Orleans air station did a magnificent job. Air Station crews from Mobile, Houston, and new Orleans, supplemented by personnel from other units, saved 3,689 lives. In the spring of 2006, Captain Bruce Jones, commanding officer of Air Station New Orleans and Captain Frank Paskewich, commander of Coast Guard Sector New Orleans, preside at a ceremony where more than 115 personnel received medals and awards for heroism.