

OCEAN WEATHER SHIPS

1940-1980

Capt. R.P.Dinsmore, USCG (Ret.)

The idea of ocean weather stations goes back to the early days of radio communications and trans-oceanic aviation air service. It was customary to set up temporary stations for special purposes such as the U.S. Navy NC-4 trans-Atlantic flight in 1919 and the ill-fated Amelia Earhart Pacific flight in 1937. As early as 1921, the Director of the Meteorological Service of France proposed establishing a ship stationed continuously in the North Atlantic for purposes of weather observations to benefit merchant shipping and the anticipated inauguration of trans-Atlantic air service.

The loss of a Pan-American aircraft in 1938 due to weather while on a trans-Pacific flight prompted the Coast Guard and Weather Bureau in 1939 to begin tests of upper air observations using instrumented balloons from Coast Guard cutters of the International Ice Patrol. The success of these tests resulted in a recommendation by Commander E. H. Smith of the International Ice Patrol to establish a network of ships in the Atlantic Ocean.

The advent of World War II brought about a dramatic increase in trans-Atlantic air navigation. Wartime radio blackouts ended what little weather information was available from ships at sea. The transoceanic airlines, chiefly Pan American, supported by the Weather Bureau strongly advocated weather reporting ships. In January of 1940 President Roosevelt directed the establishment of the "Atlantic Weather Observation Service" using Coast Guard cutters of the 327-ft "Secretary" class and U.S. Weather Bureau observers. Announcement of this service and descriptions of the ships were given to the belligerent nations. Most flights at this time were using southern routes and the stations selected were on the tracks from the U.S. to the Azores.

On February 10th 1940, the cutters *Duane* and *Bibb* occupied Ocean Stations 1 and 2 - the forerunners of Stations E and D (see chartlet). Additional Coast Guard cutters which rotated on 21-day patrols steaming within a 100 mile radius of the assigned station included the 327's *Hamilton* and *Spencer*. The ships were under the operational control of the First Coast Guard District but orders actually came from Washington. In mid-1940 a third station was established northeast of Newfoundland (near later Station C) in order to support military aircraft flying to England. Cutters of the 250-ft *Champlain* class and 240's *Mojave* and *Modoc* were added for this duty.

The Coast Guard was placed under the Navy on November 1st 1941 and the weather ships became part of the Atlantic Fleet but operational control remained with the Boston Coast Guard (it was then termed "District Coast Guard Officer, First Naval District").

In 1942 Lend Lease supplies to Britain resulted in short range aircraft flying the northern route over Greenland and Iceland to the U.K. In support of these routes, the program was expanded to include northern stations shown as A and B on the chartlet. The *Champlain* class (10 ships as part of the “destroyers for bases” trade) had been transferred to the U.K. and ships to occupy the stations were drawn from the wartime Greenland Patrol under Commander Task Force 24 (now Rear Admiral Smith), and included the 165-ft cutters *Comanche*, *Mohawk*, *Algonquin*, and *Tahoma*, and the old icebreaker *Northland*.

With the U.S. entering the war, in 1942 the 327-ft Coast Guard cutters were withdrawn from weather patrol and diverted to anti-submarine duties. Replacements were five old World War I cargo ships, 247-ft, obsolete and scarcely able to make 9-10 knots speed. These ships lasted barely a year, and one, the *Muskeget*, was torpedoed while on Station I, about 400 miles south of the Grand Banks. Their replacements were an assortment of available vessels: buoy tenders (*Evergreen*, *Conifer*, and *Sorrel*), converted luxury yachts including the *Sea Cloud* and *Nourmahal*, and two ex-Navy “Q-boats”: an old tanker, the USS *Big Horn* and an ancient freighter, the USS *Asterion*. Q-Boats were heavily armed vessels disguised as merchant ships to lure enemy submarines into combat. Reports by crew members of the *Big Horn* assert that the ship continued as a Q-boat even as a Coast Guard-manned weather ship. No information is available for the *Asterion* except that the heavy armament did remain on the vessel during the relatively short weather ship operation.

During 1943 and early 1944 North Atlantic stations were moved around to fit air routes in use. Some reached as high as 640 N.; first as “plane guard”, then weather stations when trained weather observers were available. On April 1st 1944, the North Atlantic stations were reorganized into a coherent network of eight stations numbered 1-8 and under the control of Commander, Task Force 24 at U.S. Naval Station, Argentia, Newfoundland. British ships would man two additional stations in the Eastern Atlantic. Weather observers which up to now were Weather Bureau civilians were taken into the Coast Guard as Temporary Reserves mostly with Chief Aerographers Mate ratings. There were about 55 of these meteorologists; four had gone down with the *Muskeget* along with 117 Coast Guardsmen and a Public Health Service doctor. Stations now were designated as a square ten miles on a side. Assigned to man them was a new class, frigates.

Frigates, 303-ft ships designated PF by the Navy and built by the Maritime Commission to merchant ship specifications and design based on the British “River” class, were intended to be cheaply and quickly built escort vessels. However, they had temperamental reciprocating steam engines, and were slower and less maneuverable than their Destroyer Escort (DE) cousins. Seventy five of the 96 built in 1943-44 were manned by the Coast Guard, the remainder going to the Royal Navy. Although inferior to DE’s as convoy escorts, they were among the most seakindly and comfortable ships in this size range, and the decision to assign them to weather patrol was a correct one. Nineteen frigates were assigned to the Atlantic weather patrol, and the first of these took up station in November 1944.

Early in 1945 the demand for more stations grew as they demonstrated their usefulness to the burgeoning trans-Atlantic air traffic. By May there were a total of 16 stations in the North Atlantic, 11 of which manned by USCG frigates, and nine in the tropical and South Atlantic manned by British and Brazilian ships (although one later defaulted to U.S. operation). A total of 26 frigates were now assigned. This was the peak number of stations and ships either before or since.

In the Pacific Ocean the role of weather during the Battle of Coral Sea and the increasing volume of trans-Pacific flights resulted in stations being set up in that ocean also. However, it was not until 1943 that the Navy established two stations, one north of Hawaii and another in the Gulf of Alaska (near Station P on the chartlet). The latter was manned by the 240-ft. Coast Guard Cutter *Haida* which continued to rotate on this station during the remainder of the war. This was followed shortly afterward by three plane guard stations on a line between Hawaii and San Francisco. As the Pacific war moved westward additional stations were set up under air routes and in areas of special meteorological interest. Throughout the war, stations were established and directed by Navy commands. Initially these were occupied by Navy patrol vessels and auxiliary craft but as Coast Guard manned frigates arrived in 1944 most were assigned to weather station duty. One, in the Gulf of Alaska, was manned by Canadian frigates. By the end of 1945 there were a total of 24 weather and plane guard stations in the Pacific stretching as far as Leyte where the CG frigate USS *El Paso* (PF-41) took station. Altogether, a total of 22 CG manned frigates were assigned to Pacific weather patrols.

At war's end weather ship operations were maintained to support the huge demobilization program, but weather ships themselves were subject to the same reduction pressures, and cutbacks were effected throughout 1946. In March of that year the Atlantic stations had been reduced to 8 US and one British. By the year's end all frigates were taken out of service, the number of U.S. stations occupied varied from one to four depending on the availability of older cutters. The British withdrew totally. In the Pacific by February 1946 the number of stations had been reduced to 16. In July the Canadian station was terminated and two stations remained east of Hawaii where operational control now was assigned to the Coast Guard. Six stations west of Hawaii remained under Navy control but were occupied sporadically and terminated by year end.

The peacetime continuation of weather stations included a plan for the Coast Guard to operate a total of nine stations in both oceans using surplus Navy ships to replace the frigates. However, the subject was in doubt and became a matter of funding. Under pressure by the transoceanic airline industry and the Weather Bureau, the Coast Guard for 1947 agreed to maintain four stations in the Atlantic and two in the Pacific. Interest, however, was being focused on a conference in Montreal by the new United Nations International Civil Aviation Organization (ICAO) which was examining the establishment of an international ocean station network in the North Atlantic. This conference concluded in 1947 with a recommendation that 13 stations be established in the North Atlantic operated by the U.S., Canada, and six European nations. Acceptance was slow in coming and may not have occurred at all were it not for the spectacular rescue

by the CGC *Bibb* of all 69 passengers and crew of the transatlantic aircraft Bermuda Sky Queen forced down on station C in October 1947. This event spurred ratification of the treaty, and assured ocean weather stations a place in history. A second conference in 1949 reduced the number of Atlantic stations to ten but provided for three Pacific stations. These are the stations along with the operating nations shown on the attached chartlet. It shows the U.S. to operate five and a third stations in the Atlantic and two in the Pacific. Costs of the stations were to be prorated amongst the twelve signatory nations based on numbers of transoceanic flights and contributory station operations.

Peacetime patrols included the six remaining 327-ft cutters (CGC *Hamilton* was lost in the war) and thirteen new 255-ft cutters built in 1945-46 to replace the ten 250-ft cutters transferred to the U.K. in 1941. (Of the latter, six were returned and two placed in service for a short time.) The new 255's were poorly regarded by the crews which sailed them, especially during early years. They were considered to be very uncomfortable sea boats with unreliable machinery. Modifications made over the years made them more tolerable. To replace the frigates which had been returned to the Navy in 1946, eighteen 311-ft. ex-seaplane tenders (AVP) were transferred from the Navy to the Coast Guard. These ships were spacious, comfortable and favorably regarded. They entered service from 1946-49. The U.K., France, Canada and Netherlands continued the use of frigates. In fact, the French and Dutch ships were ex-USCG frigates. Headquarters of the U.S. patrols were New York and San Francisco respectively; and in 1947 the system settled into peacetime routine. By 1948 all U.S. stations were manned continuously except Station H. That station was operated only from 1952-54 and again from 1971-76.

A typical weather patrol was 21 days on-station plus enroute time and about 10-days in port. Four or five U.S. Weather Bureau observers joined the Coast Guard crews during each voyage. A "station" was a 210-mile grid of 10-mile squares each with alphabet designations. The center square, which the ship usually occupied, was "OS" (for "on-station"). A radio beacon transmitted the call sign of the station and the square in which the ship was located. Overflying aircraft would check in with the ship and receive its position, course and speed by radar tracking, and weather data. Surface weather observations were made and transmitted every three hours; and upper winds every six hours by radar tracked balloons with a known ascension rate. Using radiosonde transmitters and radar tracking, air temperature, humidity, pressure, wind direction and speed were obtained every twelve hours to elevations up to 50,000 ft.

In 1950, the wartime phonetic alphabet: Able, Baker, Charlie, Dog, etc by which many of the stations were designated (numbers also had been used) was changed to the new international phonetic code, and the stations became known as Alfa, Bravo, Coca, Delta, etc. (the word "Coca" proved unpopular and was reverted back to "Charlie" in 1955.)

Oceanographic observations were recommended as an important role for weather ships almost from the start. As fixed stations, they provide a valuable source of time-sensitive

data. Many of the locations were in areas of oceanographic interest such as air-sea interaction, biological productivity and formation of bottom water. Beginning in 1945 and continuing to the end, U.S. ships made bathythermograph observations, which today still constitutes the largest B/T archive in existence. Many specific, short-term programs were carried out with oceanographers frequently riding the ships. Canadian station P (known as PAPA) was among the first to conduct routine hydrographic and biological observations. This station has the longest record of oceanographic data. Atlantic ships, both European and U.S. frequently towed plankton nets for marine biology laboratories.

Regular oceanographic observations from weather ships came under the cognizance of the International Council for the Exploration of the Sea (ICES) and by 1965 most weather ships were equipped for and made routine deep-sea observations. U.S. ships carried trained observers from 1965-1975 and made daily temperature and water samplings to 1,500 meters depth on-station and occupied standard sections enroute. Data were processed by the Coast Guard Oceanographic Unit and deposited with the National Oceanographic data Center (NODC). The Coast Guard also published reports in its CG-373 series.

During the Korean war four additional stations were set up in the Pacific from 1950-54 to support the high volume of trans-Pacific military traffic during that period. Two were northeast of Hawaii and two were in the western Pacific. To meet this requirement twelve destroyer escorts (DE) were taken out of reserve fleets in 1951 and assigned to the Coast Guard. (Most had been Coast Guard manned during the war.) Although excellent wartime escorts, they were rough riding and not generally favored as ocean station vessels. Converted with balloon inflation shelters and weather offices, eleven were assigned to the Pacific duty. All were returned to the Navy in 1954.

In the 1960's, the Coast Guard replaced its 255-ft. cutters by twelve new 378-ft. ships. These cutters were spacious and comfortable both in sea keeping and accommodations. Canada, Britain, France, Norway, and Netherlands also built new ships to replace their old wartime ships, mostly frigates. In addition to weather reporting and navigation aids, ocean station occasionally made rescues of downed aircraft and foundering ships. Pan-American 943 (Station N) in 1956; and SS *Ambassador* (Station E) in 1964 are examples. All were dramatic rescues by the weather stations indicated. However, by 1970 new jet aircraft were coming to rely less on fixed ocean stations; and satellites were providing weather data. The need for ocean stations was being questioned.

By 1974 the U.S. operation was reduced to three Atlantic and one Pacific station, and that year the Coast Guard announced the termination of the U.S. stations. At the end of 1975 only Station H remained and the last ship on that station (the venerable 327-ft. cutter *Taney*) was replaced by a newly developed buoy in 1976. European stations and the Canadian Station P continued for a short time after, but by the end of the decade, they too were discontinued. The international program ended when the Dutch ship

Cumulus departed Station M in 1981. Norway continued to operate Station M unilaterally and on a part time basis until 1999 when that station was finally terminated.

Weather ships remain in the form of research ships equipped for special meteorological projects. Russia has, or had, ten “weather ships” for special projects in marine meteorological research, and the new U.S. NOAA ship, *Ronald Brown*, is specially outfitted with modern meteorological observation equipment.

In their half century of ocean station operations, weather ships are an epoch of maritime history. They filled well a niche in meteorology, oceanography, national defense, and safety at sea. The ships now are mostly gone, and the pilots who flew over them and the crews who sailed on them are fewer, but their role in the lore of the sea will remain.

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Note: The author of this document, Captain Robertson Dinsmore, USCG (Ret), served on the following weather ships: USS *Muskegon* (PF-24), CGC *Sebago* (WPG-42), CGC *Duane* (WPG-33), and CGC *Cook Inlet* (WA VP-384) during which he sailed on seventeen Atlantic Weather Patrols.