



# Patrolling the Coastline on Wheels

U.S. Coast Guard Used Motorcycles to Watch Beaches During World War I

By William R. Wells II

American soldiers were now on the battlefields of Europe, and Edward Forbes was patrolling Florida beaches for any signs of the arrival of German soldiers, sailors, or spies on American shores during October 1917.

To help him do his job, the Coast Guard had provided him with a motorcycle—to patrol more areas quickly and to return to his post with news of any sightings as fast as possible.

This day, however, he was caught by the surf and left the motorcycle on the beach after he couldn't get it started before the rise of the tide. The next day, he was able to pull it out and spent the next four days cleaning it up—removing rust from the brightwork and getting the ignition back in working condition. But the clutch was frozen as well, and that took another day to disassemble, clean, and reassemble.

This was not a good beginning for a war patrol, nor would it get any better. In the meantime, those on foot patrol continued their five-mile round trip patrols on the beach.

Forbes's use of the Indian motorcycle, manufactured by the Hendee Manufacturing Company of Springfield,

Massachusetts, was part of an experiment during World War I by the Coast Guard to fulfill one of its missions of guarding the nation's coast.

There had been concern that Germans might try to bring the war to America's shores, and the revelation of the famous Zimmerman telegram—in which the Germans sought to bring Mexico into the war against the United States—had fueled fears of invasion and prompted patrols along the nation's Atlantic and Gulf coasts.

Motorcycles had been requested for patrols on Florida's east coast and the Texas coast along the Gulf of Mexico. They were to be part of America's arsenal in what would be called the World War.

*Above: W. C. Leaird's bicycle shop in Fort Lauderdale, ca. 1916, where repairs were made on some Coast Guard motorcycles. Surfman Wallace King (left) was part owner. The Coast Guard purchased 12 motorcycles for stations along the Florida coast and one for the Point Isabel, Texas, station.*

Putting the nation on a war footing on April 6, 1917, President Woodrow Wilson had moved the Coast Guard under the command of the Department of the Navy.

As part of that move, a squadron of Coast Guard cutters had sailed to Europe on convoy duty, leaving most of the legwork of coastline surveillance responsibility to the professionals at the Life Saving Service (LSS), which had been in existence since 1878 and had been incorporated into the Coast Guard in 1915. The LSS routine of patrolling the beaches on foot remained, which accounted for the large number of stations along the U.S. coastline.

Except for minor administrative reporting hierarchies, the Navy Department left the operations of the civilian-run life-saving stations to their district superintendents with oversight by a commissioned officer in Coast Guard headquarters. But because of its wartime duties assigned by the Navy, the Coast Guard gave the life-saving stations along the coasts the additional duty of looking out for any enemy landings of troops or spies. Stations on the east and Gulf of Mexico coasts had special responsibilities of real and perceived threats from Germany.

The United States was virtually without an intelligence service, and notification of German threats came from British intelligence sources. In February 1917, the British government, after holding the information for a month, alerted the United States of a plan by German Foreign Secretary Arthur Zimmerman to rally Mexican support against the United States. Zimmerman promised the return of former Mexican territories if Germany won the war.

The plot was made believable by Mexican revolutionary Pancho Villa's raids into Texas a year earlier. A month following notification of the Zimmerman plan, an incident unknown to the general American public helped cement the government's perception of the truth of Zimmerman's plan.

The Coast Guard Cutter *Comanche*, under the command of Capt. Henry Ulke, sailed from Galveston, Texas, to investigate a rumor that U.S. citizens "were secretly building submarines for a belligerent power" on Hog Island near Aransas Pass, Texas.

Upon arrival at Hog Island, the cutter's officers found these supposed "fifth columnists" to be a group working for American inventor Lemuel John Husted. The group experimented in the building and testing of "an automatic steering device for torpedoes," but the cylindrical shape of Husted's test models raised local suspicions. The investigating officer, Lt. William P. Wishaar, found only workmen and workshops and reported that no explosives or even the device were on the island.

Although not substantiated in this instance, Wishaar's report appeared to validate the Navy Department's suspicions of at least the possibility that a belligerent power could build submarine bases in or near Mexico.



Above: The "type N.E. Indian motor cycle, 1917, Powerplus Twin Cylinder, cradle spring frame, three speed type with complete electrical equipment, including ammeter" used by the Coast Guard in Florida during World War I. The Coast Guard hoped this new technology would enable surfmen to patrol more areas quickly and to return to their posts with news of any sightings as fast as possible.

Below: Coast Guard Captain-Commandant Ellsworth P. Bertholf agreed to requests for motorcycles from the Eighth District at Jacksonville, Florida. His June 19, 1917, letter specifies the model and the quantity for each station.



These stories of war and suspicions of spies, saboteurs, assassins, and international intrigue caused the Coast Guard and Lighthouse Service to discharge all unnaturalized German citizens in its ranks; including several members of the cutter *Comanche's* crew.

Rumor and fear were enough, and spy fever gripped the nation.



In March 1917, John W. Richardson, the superintendent of the Coast Guard Eighth District at Jacksonville, Florida, and J. W. Quinan, the customs inspector at Key West, reported “strange doings and night signaling . . . at various points on the east coast [of Florida].” No one, however, confirmed or investigated the reports. The lack of investigation was due largely to the time required to get to the sighting location by foot. The foot patrols carried flares, but these were intended to signal the station lookout of trouble. The signals were useless for military reports. Something faster was needed.

Introducing any new technology to the life-saving stations was a difficult task because of their reliance on traditional methods, but it was made doubly problematic by the well-known frugality of the Treasury Department. The war, however, would change station life and technology.

To speed reporting, Richardson and Quinan made a pitch to Coast Guard headquarters in Washington, D.C., for at least one motorcycle to each of the stations on the east coast of Florida and the Texas coast (from Brazos to Corpus Christi).

Coast Guard Captain-Commandant Ellsworth P. Bertholf agreed and on June 19, 1917, specifically asked the Navy Department to provide 13 “type N.E. Indian motor cycle, 1917, Powerplus Twin Cylinder, cradle spring frame, three speed type with complete electrical equipment, including ammeter.” As an afterthought, remembering their wartime mission, he added “all machines to be finished in olive drab color.”

In one small order, the Coast Guard took a large step in technology. Commandant Bertholf issued shipping locations for the 13 motorcycles, 12 in Florida and one in Texas.

The war brought increased budgetary sup-

port and gave the Coast Guard an opportunity to improve its equipment and operability. Bertholf had already used the war to replace many of the cutter’s obsolete weapons systems and scheduled more for replacement.

Ordering the equipment marked the first and least expensive step. The motorcycles would need not only operators but men with enough mechanical ability to keep them running. On May 19, Bertholf sent a telegram to Superintendent Richardson asking him if he knew how many men at the various stations had any knowledge of motorcycles or any mechanical ability at all. Richardson, in turn, asked the keepers of the affected stations.

On May 19, Keeper Charles Skogsberg (Fort Lauderdale) logged in his scrupulously kept daily station journals, “telegram received [*sic*] from Superintendent at 6:00 P.M. naming men of crew familiar with operating motorcycles . . . answered at once naming the men familiar.” Skogsberg reported Wallace King, Alonzo L. High, and John L. Simmons. The seven other stations queried reported 16 more men. The information sent to Coast Guard headquarters was encouraging; however, the plan also called for stationing a motorcycle at unmanned locations such as the lighthouse at Jupiter Inlet. There, Keeper Skogsberg hired Edward Forbes as the motorcycle patrol operator and mechanic.

With orders placed and men hired, Inspector Quinan waited but grew anxious at the delay in the motorcycles’ arrival. On August 20, he finally wrote to Senior Captain Daniel P. Foley asking about the progress of the order and the patrol. Foley responded three days later that the Navy Yard at Washington, D.C., had accepted the bid proposals a day or two earlier and the patrols should begin as soon as the equipment arrived.

Foley had some doubts about the urgency of Quinan’s initial claims. Foley advised that the patrols could wait because the first sightings of “strange doings” may have been ships practicing at sea.

(Similar claims surfaced in Florida following the 1962 Cuban missile crisis. The calls for protection from then “subversive activity” were frequent. In 1963, the Coast Guard



Surfman Wallace King suffered the first mishap with the new motorcycles at the Fort Lauderdale, Florida, Coast Guard Station in February 1918 when he ran over a log covered with seaweed.

responded and established an infantry-styled Coastal Forces within the U.S. Coast Guard Reserve. The Coast Guard resurrected this idea in the 21st century in a response to international and domestic terrorism.)

The relationship between motorcycle patrol ideal and reality became muddled as the first motorcycle arrived at Fort Lauderdale. However, it was not until September 24, 1917, that the Coast Guard established its first “Special Motorcycle Patrol” at Jupiter Inlet Light House. The Fort Lauderdale station journal explains that the boundaries of this patrol between “Lucie Inlet to the north and Lake Worth to the south, about 25 miles total.” Quartered at the Jupiter Inlet Light House, Surfman Forbes finally received his motorcycle from Jacksonville on September 26 and began assembling it.

Reminiscent to anyone who has attempted assembly of children’s toys, Forbes found some minor parts missing and assembly not as easy as first thought.

The gas tank leaked, and he charged the battery at the Jupiter Inlet Wireless Station. Forbes then made the 40-mile ride to West Palm Beach for parts and further repairs at W. W. Hill’s Motorcycle Shop. The next day



Senior Captain Daniel P. Foley in Washington doubted the urgent need for coastal motorcycle patrols in Florida advising that the first sightings of “strange doings” may have been ships practicing at sea.

he took the motorcycle on a 200-mile test ride. The motorcycle appeared to give “satisfaction” even though he reported the weather to be very stormy. This was nearly the last time the motorcycle functioned consistently, but it was a great ride.

Road use for the motorcycle appeared to be satisfactory, but actual use on the beaches was another matter. It is not known if Richardson or Quinan directed anyone to make surveys of the prospective patrol areas to support the need for motorcycles, and despite their supervisory status, neither appeared to know the terrain of their district very well. Three days after receipt, assembly, and test rides, Forbes found that he could only patrol about one and one half to two miles on the north leg of his patrol area, where “any further progress was impractical on account of High Surf, washing up on the Beach, on to a Rockledge [*sic*].”

Forbes then turned south and found his way blocked by the surf and another rock ledge. He tried his patrol again on October 2, but this time the surf caught him, and he left the motorcycle on the “Beach 2 miles South of [Lake Worth] Inlet, from breakers wetting it and stopping [*sic*] it and unable to get it started before the rise of the tide.” He managed

to pull it out the next day and spent several days getting it back in shape.

High water and surf were only two of the motorcycle’s natural enemies. Forbes spent part of his time walking “on the trail at Spouting Rocks,” removing “cactus plants, etc” that endangered the tires. Mechanical problems continued as the weather worsened. Typical Florida fall rains shorted out the magneto and caused the closure of the Hobe Sound Bridge for repairs. Then the storage battery died, and the engine ran out of lubricating oil. All factors seemed to conspire to hamper or prevent patrols, resulting in the loss of the motorcycle for 17 days during October 1917. The next month did not start with any greater promise.

On October 11, 1917, the Fort Lauderdale station received its motorcycle. John Simmons was the first operator, and he too immediately ran into mechanical problems and difficulties with Keeper Skogsberg. Simmons had to explain to Skogsberg why he decided not to take his time clock on patrol, telling the keeper that he thought it “probably in the way” while operating the machine. Then, as now, the time clock was the bane of the watchman. Four days later, his motorcycle overheated, causing valve leakage that required a complete overhaul of the motor. Within a week of the repairs he, like Forbes, was forced to leave the motorcycle on the beach. Unlike Forbes, he was able to get it above the high-tide line, but evidently not far enough because the electrical system short-circuited from the salt water.

It is unclear, but the mechanical problems of these supposedly new motorcycles seemed indicative of used machines. Although the motorcycles were packed in crates upon arrival, no one ever said these were new machines. In previous years, Marine Corps units in Haiti used the same style of motorcycle. It would be logical to issue reserviced machines to the Coast Guard beach patrols and save the newly manufactured ones for more military uses. The continued mechanical problems seem to bear out this possibility.

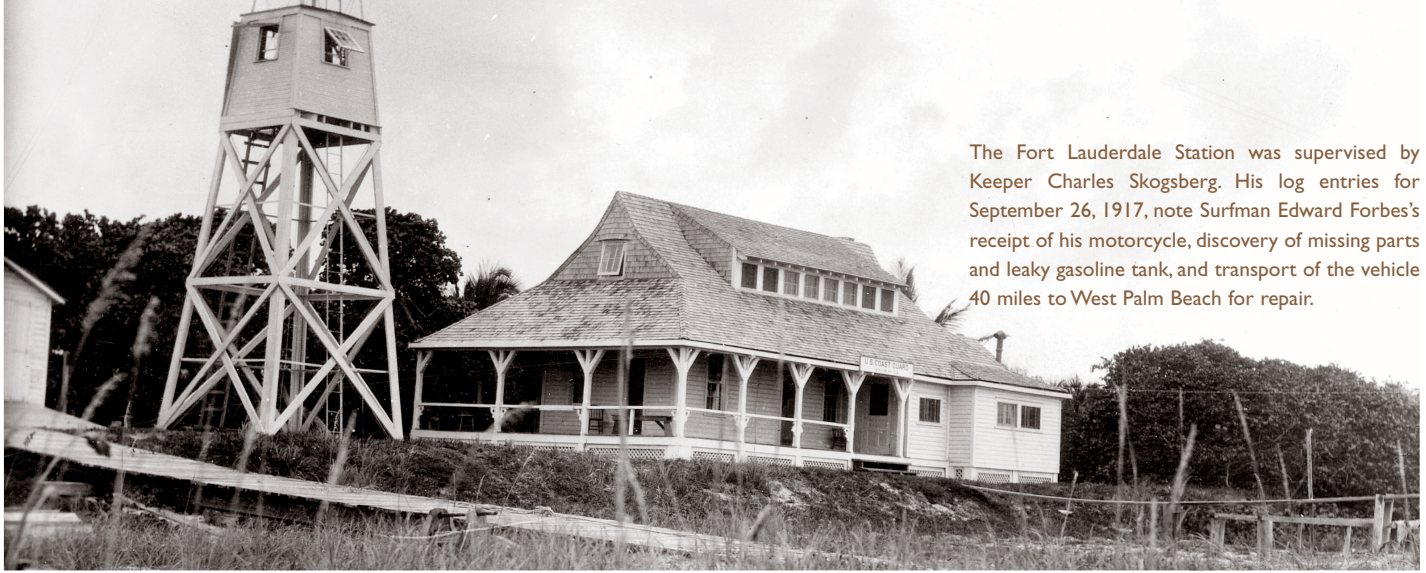
Simmons continued to report problems. He could not complete his November 20 patrol because of carburetor trouble in which the “butterfly valve [was] so badly worn [it is] impossible to get [a] satisfactory slow speed adjustment.”

Forbes’s mechanical problems continued, too. In a potentially dangerous operation the following January, he disassembled the battery and “found plates badly warped and so badly eaten as to be beyond repair.” Despite the mechanical and natural problems, the motorcycle operators persevered, which testifies to their willingness to try to make a new technology work. Then again, this was their sole job. If the motorcycles failed, then they would have to find employment elsewhere.

At Coast Guard headquarters, the question of motorcycle spare parts had become a matter of concern. Commandant Bertholf wrote the Navy asking for enough spare parts to keep the machines operating. The Navy balked at supplying the parts, but Bertholf reminded the Navy Department that the Coast Guard had no congressional appropriation for passenger-carrying vehicles and that the upkeep of the motorcycles was the Navy’s responsibility. Bertholf also asked for gasoline. His point was that because the motorcycles were doing Navy work and the Coast Guard was under the Navy operational orders for the duration of the war, the Navy had to allocate funds to meet those operational requirements.

Despite the motorcycle problems, other improvements came to the life-saving stations. The war pushed the Coast Guard to upgrade and include the stations in the organization as military members. This included issuing the beach patrols small arms for the first time in the history of the life-saving stations. During August 1917, the stations received three Springfield 1903 .30 caliber rifles and three .38 caliber Colt revolvers. The following January the station received an additional Colt revolver for the motorcycle patrol. Improved surfboats were also transferred from New Jersey to Florida.

The Coast Guard added a telegrapher’s key and wire to the list of carried equipment that already included a revolver and the time clock. The key and wire allowed the motorcycle patrol to tie into the telegraph lines on the patrol route and report immediately instead of making a time-consuming return trip to the station—an important feature considering the growing failure rate of the motorcycles.



The Fort Lauderdale Station was supervised by Keeper Charles Skogsberg. His log entries for September 26, 1917, note Surfman Edward Forbes's receipt of his motorcycle, discovery of missing parts and leaky gasoline tank, and transport of the vehicle 40 miles to West Palm Beach for repair.

The addition of a telegrapher's key to the World War I patrols became the communication model used by the Coast Guard beach patrols during World War II. During 1918, the stations received telephones to enhance communications, but these telephones were to be used only for emergency work. In addition, each surfman received, on average, increased pay to about 14 dollars a month.

Mechanical failures, bad weather, and at least two accidents plagued the motorcycle patrols. The first accident occurred in February 1918, when Surfman Wallace King, operating from Fort Lauderdale, wrecked when he ran over a log covered with seaweed. Forbes's accident was potentially more serious. As if in a silent film slapstick scene, Forbes reported that the footboard "flopped to [an] upright position, lacking [a] brake pedal, causing him to lose control of machine and ran into railing [of Hobe Bridge], breaking headlight, footstep starter and Mag[neto] control."

By November 1918, the enthusiasm exhibited earlier for the motorcycles waned as they became more nuisance than assistance.

The general disappointment showed as Richardson wrote now Commodore-Commandant Bertholf on November 13, 1918: "Owing to the great expense in keeping up motorcycles and unfavorable results . . . it is recommended the motor cycle patrol at Florida East Coast Stations . . . be discontinued." Richardson's use of "unfavorable results" was an admission the motorcycles had not been as reliable or useful as hoped. The hopeful 1916 reviews of motorcycle use by the U.S. Marine Corps and the Spanish Army dimmed.

Richardson added an exception for Lemon City (Station No. 209), which had a seven-mile stone road, as well as the special patrol at Boynton, Florida, which also used a stone road for about 35 miles. In previous months, the stations themselves sent complaints that the motorcycles were useless on some mudflats and sand dunes. The Coast Guard station at Port Isabel, Texas, retained its motorcycle.

Richardson listed the lack of repair parts as a leading cause for infrequent use of the motorcycles. He complained that repair parts were not available locally, and those ordered from the manufacturer took from 4 to 12 weeks to receive. He was frustrated that when the parts did arrive, "some small item such as an additional screw or other similar part is needed and consequently [the] machine is again placed out of commission for another month or two."

The motorcycles at stations Nos. 202, 204, 205, 206, and 208 were out of commission for months at a time. It appeared to Richardson (as a whole nation would ultimately learn about automotives) that the older the machines became, the more repairs they needed.

Richardson estimated that 75 percent of the motorcycle fleet was out of commission at any one time. The cost was too high. When Fort Pierce (Station No. 206) received a second motorcycle, its repair costs rose to more than \$125 for both its machines from June to November 1918. The motorcycle used by Forbes at Hobe Sound "is beyond repair owing to the length of time this machine being used and the mean character of the beach." Considering the motorcycles

cost about \$152 each, the patrols could not be justified much longer. Except for the motorcycles that Richardson wanted saved for stone road use, he recommended the remainder be disposed of "to the best advantage of [the] Coast Guard."

The war's end was likely as great a factor in Richardson's decision as the deficiencies in the motorcycles. Once the war ended, so did the Navy's funding. In January 1919, W. B. Furcher, commandant of the Seventh Naval District, Key West, wrote Richardson asking him whether or not they should retain any or all of the motorcycles. Giving Richardson a hint to the answer he wanted, Furcher added, "now that hostilities have ceased and they are no longer needed for military purposes."

Bertholf wrote Richardson in early February 1919, and officially ended the wartime motorcycle patrol on February 7, 1919, except for those asked for by Richardson. As directed, Richardson selected the best five motorcycles, retained all the spare parts, and shipped the remaining motorcycles to the Navy at Key West. Now without the bothersome motorcycles, the stations resumed the prewar foot patrols of about two and a half miles on either side of the stations.

Bertholf also informed Commandant Furcher where the motorcycles were going to be stationed and that the "double patrols" (around-the-clock) would cease and each station would reduce its complement to nine men. The ending of the war and motorcycle use forewarned the ending of another era. By November 1919 the Coast Guard reduced East Florida stations Nos. 202, 203, 204,

205, 206, 207, 208, and 209 to two surfmen each and changed their designations from life-saving stations to “Houses of Refuge.”

The reduction, although part of a postwar austerity plan, was in part perpetrated by wartime improvements in technology, particularly in communications and motorboats, which made a number of stations obsolete. Similarly, in the mid-1990s the Coast Guard attempted to close 22 search-and-rescue (life-saving) stations on the same rationale of increased technology, specifically aircraft and satellite communications and navigation.

The romance of the lone surfman on beach patrol returned to east Florida without the twin-cylinder Indian noise. Unfortunately,

there were few lessons recorded. The Coast Guard published no official history of its activities during the war and left whatever experiences in the memories of its officer corps. Nevertheless, some in the Coast Guard may have remembered and the exclusive use of motorcycles for beach patrol was not repeated.

During World War II, the Coast Guard relied primarily on foot and horse patrols to defeat the “mean character” of the beaches and keep a security vigil. A group of German saboteurs was captured on Long Island during the war because of a lone Coast Guardsman on foot patrol.

The Coast Guard discovered that the introduction of technological advances did not

automatically increase reliability or enhance its mission. However, the Coast Guard learned to accept and apply technology where it would work and throw it off where it did not.

This pragmatic outlook helped keep spending in check while adhering to its motto—*Semper Paratus* (“Always Ready”). **P**

© 2009 by William R. Wells II



#### Author

**William R. Wells II** is an author and historian of the U.S. Coast Guard and the U.S. Revenue Cutter Service and is an adjunct instructor of history at Augusta State University.

#### NOTE ON SOURCES

Archival sources used in this article are mainly drawn from the Records of the U.S. Coast Guard, Record Group (RG) 26, at the National Archives in Washington, D.C., and in Atlanta, Georgia.

The National Archives in Atlanta has Logs of Lifesaving Stations, Entry 245. The only journals available for this period were those for the Fort Lauderdale station: Fort Lauderdale, Florida, Station Journal, May 19, 1917, to January 30, 1918. Also in Atlanta is Customs Inspector Quinan’s report on “strange doings and night signalings”: confidential letter titled “Motorcycle Patrol,” sent by J. W. Quinan (U.S. Navy Aid for Information, Key West), August 20, 1917, to Inspector (Capt. D. P. Foley, USCG), Letters Sent by the Fifth, Sixth, Seventh, Eighth, and Thirteenth Districts, Eighth District, RG 26, NAB. The May 15, 1917, letter referenced by Quinan was not located.

Correspondence at the headquarters level is at the National Archives Building (NAB) in Washington, D.C. The investigation of rumors of submarines being built on Hog Island is recorded in a report by 2nd Lt. William P. Wishaar, USCG: “Investigation of Alleged Neutrality Violation,” March 9, 1917, to his commanding officer, Capt. Henry Ulke, General Correspondence, 1910–1935, File Classification 64, Cooperation with Other Departments, State Neutrality, Comanche, Entry 82A, RG 26, NAB. This report was classified “confidential” by the secretary of the Navy on March 15, 1917, and declassified by NARA (NND867200) on February 1, 1993.

Superintendent J. W. Richardson (Jacksonville, Florida) sent a May 26, 1917, telegram (General Correspondence, 1935–1941, File Classification 602: Station and Watch Bills, Seventh District, Entry 82B, RG 26) in response to a May 19, 1917, letter from Captain-Commandant E. P. Bertholf (General Correspondence, 1910–1935, File

Classification 701: Complements, File 1910–1922, Entry 82A, RG 26) and provided the names of the men familiar with operation of motorcycles. The men were Brice F. George, Station No. 202; Gray D. Love, Walter W. Osteen, Commodore G. Huskey, Colon Hutchinson, and Guss Tyson, Station No. 203; Earl E. Kyzer, Station No. 204; H. Spencer Fromberger, Ralph C. Bragg, George W. Duncan, and Buren W. Parsley, Station No. 205; Francis Richards and Lawrence N. Borland, Station No. 206; none at Station No. 207; Wallace King, Alonzo Lee High, John Luther Simmons, Station No. 208; and Henry C. Matthans, Jerry Roberts, and Rudolph Roberts, Station No. 209. Wallace King appeared a good choice. He was a partner in W. C. Leaird’s bicycle shop in Fort Lauderdale.

Bertholf apportioned the stations and numbers of motorcycles in a letter to the U.S. Navy Bureau of Yards and Docks on June 19, 1917 (General Correspondence, 1935–1941, File Classification 602, Station and Watch Bills, Seventh District, Entry 82B, RG 26):

No. 202, Ormond, Fla. (2)

No. 203 Oakhill, Fla. (2)

No. 204 Titusville, Fla. (1)

No. 205 Vero[Beach], Fla. (2)

8th District Superintendent, Jacksonville (2)

No. 206 Fort Pierce, Fla. (1)

No. 208, Fort Lauderdale, Fla. (1)

No. 209, Lemon City, Fla. (1)

No. 222, Point Isabel, Texas (1)

Printed sources: “Saboteurs, Subversives Thwarted,” *The Coast Guard Reservist* 10 (July 1963): 1, 3.

Evans, S. H. and A. A. Lawrence, “The History and Organization of the United States Coast Guard.” (U.S. Coast Guard Academy, 1938). This is the source of the 1938 Jacksonville District chart. This history is unpublished, but some of it was used later by Capt. Stephen H. Evans, USCG, in his

1949 U. S. Naval Institute publication, *The United States Coast Guard 1790–1915*.

“American Motorcycles for European Fighting Men,” *Scientific American* (February 5, 1916): 154.

“Germans Discharged from Coast Guard,” *New York Times*, February 8, 1917, p. 2. Only naturalized Germans were allowed to remain in the U.S. Coast Guard, U.S. Lighthouse Service, and the U.S. Transport Service. All others were discharged.

Felix J. Koch, “Keeping a City’s Police Motorcycles in Repair,” *The American City* (September 1917): 250. This article describes the usefulness and problems of motorcycle patrols in Cincinnati, Ohio. The primary use was to check speeders exceeding eight miles an hour, but the motorcycles were under constant repair because of patrol work and rough roads.

“Coastal Telephone Service,” *Proceeding of the U. S. Naval Institute* 43 (March 1917): 584. On February 13, 1917, Navy Secretary Josephus Daniels asked for a \$250,000 congressional appropriation to enhance the Coast Guard “telephone signal service.” Daniels admitted the Coast Guards telephone system was better than that of the War Department, Navy Department, and the Lighthouse Service. He used the Coast Guard’s communication model for his department. However, there were no Coast Guard–connected telephone systems south of Beaufort, N.C., and none on the Gulf Coast. However, the Coast Guard shrewdly allowed the Navy Department to take full control of its communication system with the full knowledge the system would return to the Coast Guard in an updated condition.

Digital sources: *Google Patents* ([www.google.com/patents](http://www.google.com/patents), accessed February 10, 2009) for L. J. Husted’s patent No. 1,222,630 of April 17, 1917, “Ariel Torpedo Steering Mechanism.” A prolific inventor, elements of Husted’s 1917 torpedo patent was used in torpedo design into the 1970s.