FAA's Unsung Heroes: Maintenance Techs Celebrate 100 Years of Service

By: Terry Kraus, FAA Historian

A FAAer wrote in an in-house magazine in 1985, "Unlike the highly visible air traffic controllers, safety inspectors and other specialists who interact with the public on a continuing basis, the technicians do their best work in back rooms and basements and lonely mountaintops. And, unfortunately, out-of-sight frequently means out-of-mind." How true! This year, 2022, marks the 100th anniversary of FAA's hard-working aviation technicians. If an innocent inquiry by a FAA maintenance technician about why I had not yet written anything on the Tech Ops workforce, we would have all missed this major milestone.

HERE'S A CHANCE FOR AN UNUSUAL GOVERNMENT JOB

Jobs as airway mechanicians, paying a salary of $2,100 a year to start and with the duty of being responsible for 200 miles of airway and the visiting of beasons and emergency fields, the hiring and instructing of caretakers, and the making of minor repairs on field apparatus, are now open with the government.

To qualify one must have had three years' experience in automobile manufacturing or repairing, but six months in an automotive school or a year as a machinist or machinist's helper will be accepted as the equivalent of one such year.

All applications must be filed before Dec. 15. An appointment will be made for a territory in Iowa and Illinois. For further details see Leo J. Norpel, secretary of civil service, at the local post office.

In 1921, the U.S. Army deployed rotating beacons in a line between Columbus and Dayton, Ohio, a distance of about 80 miles. The beacons, visible to pilots at 10-second intervals, made it possible to fly the route safely at night. The U.S. Post Office took over the operation of the guidance system the following year, and hired the first federal civilian maintenance technicians to operate and maintain the beacons. From that first short experimental route, the Post Office worked to establish and light additional airways and, as a result, began employing larger and larger numbers of airway mechanics, then called mechanicians, and caretakers.

On May 20, 1926, President Calvin Coolidge signed the Air Commerce Act of 1926 into law. The act instructed the Secretary of Commerce to foster air commerce; designate and establish airways; establish, operate, and maintain aids to air navigation (but not airports); arrange for research and development to improve such aids; license pilots; issue airworthiness certificates for aircraft and major aircraft components; and investigate accidents. With the passage of the legislation, those lighted airways became part of the new Aeronautics Branch's (FAA's first predecessor agency), oversight responsibilities.

The act did not create a new bureau within the Department of Commerce to perform airway maintenance functions. The Department assigned many of the aviation safety functions to the missions of its existing bureaus. For example, the task of establishing, maintaining, and operating aids to navigation along air routes went to the Lighthouse Service. The service's maintenance section, now responsible for the maintenance and operation of navigation facilities of all types along the air routes, carried out its work through the regular district organizations of the Lighthouse Service, augmented by the necessary special personnel. Those districts included:

- Third lighthouse district headquartered at Staten Island, NY, maintained the airways from Boston to New York and from New York to Bellefonte

- Tenth lighthouse district headquartered at Buffalo, NY, maintained the airways from Bellefonte to Bryan
- Twelfth lighthouse district headquartered at Milwaukee, WI, maintained the airways from Bryan to Omaha, from St. Louis to Chicago, and from Dallas to Chicago
- Eighteenth lighthouse district headquartered at San Francisco, CA, maintained the airways from San Francisco to Reno, Los Angeles to Salt Lake City, and Los Angeles to San Francisco and Redding
- An additional office headquartered at Salt Lake City, UT, maintained the airways from Omaha to Reno, Salt Lake City to Pasco, and Pueblo to Cheyenne[1]

Each lighted airway was divided into sections. An airway mechanician was responsible for the maintenance and operation of one 175-mile section of the airway. The mechanicians used a 114 ton panel truck equipped with all necessary spare parts and tools to take care of practically any emergency repair job. Within each section, full- and part-time caretakers tended the lights and the emergency landing fields. Landing field caretakers assisted air travelers who made emergency landings on fields in their charge. Beacon caretakers ensured the lighting equipment function properly and reported to the airways mechanician or the district superintendent of lighthouses any failures which could not be remedied by simple measures, such as changing lamp bulbs or fuse plugs.[2]

On December 7, 1926, the first airway light beacon erected by the new Aeronautics Branch began operation. Airway mechanician A. J. Baldwin became responsible "to travel at intervals over the route to attend" to the lights. The beacon was located 15 miles northeast of Moline, Illinois, on the Chicago-Dallas air mail route. By June 30, 1927, there were 4,121 miles of lighted airways, including 2,041 miles on the transcontinental airway that had been previously lighted by the Post Office Department.[3]

The Post Office Department transferred the transcontinental airway to the Department of Commerce on July 1, 1927, the beginning of fiscal year 1928. At that time the airway extended from New York to San Francisco; was 2,612 miles long, with 2,041 miles lighted. Its facilities included 92 intermediate landing fields, 101 electric beacons, and 417 acetylene beacons. Personnel involved in the transfer included 45 radio operators, 14 maintenance mechanics, and 84 caretakers. At the close of fiscal year 1927, the Lighthouse Service employed 31 airway mechanicians and 161 caretakers in charge of 4,121 miles of lighted airways, with 590 automatic acetylene and electric aids.[4] Those numbers increased to 40 mechanicians and 408 caretakers by the end of fiscal year 1928,[5] and to 44 mechanicians and 498 caretakers by the end of fiscal year

1992.[6] Mechanicians earned approximately $2,100 per year, plus "subsistence at $3 a day when traveling."[7]

Enclosed beacon tower at Fort Crook, NE
Source: National Air & Space Museum

The job of the mechanician was not easy. As C.P. Maddox, who worked on a section of the Reno-Oakland airway, explained: "Passengers flying the airway at night see a guiding beacon flash every 6 minutes on the western transcontinental, never realizing that on the ground it takes sometime two days to make the 10-mile trip between some of the lights because of the topography."[8] The mechanicians often reached the more remote beacons on foot, by boat, horse cart, and skis depending on the weather and location of the beacon tower. And, sometimes they had to actually tunnel through the snow to get into the shed to fix the beacons.[9] One reporter described the mechanicians as "woodsmen, electricians, mechanics and hardy pioneers."[10] In reality, they were the backbone of the entire transcontinental air route.

In 1932, the Department of Commerce promoted the Aeronautics Branch to a full-fledged bureau – the Air Commerce Bureau. The new organization became responsible for all aviation activities. As part of the reorganization, the maintenance workforce moved into the Airways Maintenance and Operation branch, reporting to the Air Navigation division. Four years later, the Air Commerce Act of 1938 established the Civil Aeronautics Authority (later the Civil Aeronautics Administration). The new agency established an Airways Engineering division, with the Maintenance branch as one of its subunits. With the creation of the Federal Aviation Agency in 1958, maintenance of air navigation facilities and related equipment fell under the new Facilities Bureau.[11]

"Dusty" Rhodes, Bureau of Air Commerce
Source: FAA

For some technicians, especially those working in remote areas, the job presented some challenges. For example, in 1977, a FAA field maintenance party had a unique encounter with a bear they named Beauregard. The crew set out to check a non-directional beacon near the Chandalar River in the remote Brooks Range of Alaska. Trekking on foot, they stumbled across a bear on top of a fifty gallon fuel storage bladder. The bear was using the bladder, made out of a strong rubber, as a trampoline. According to FAAer Dennis La Chance, a witness to the event, the bear "looked like a four legged kid, having one heck of a good time," bouncing up and down on the fuel bladder. Hoping to scare the bear, who blocked their way to the beacon, the field party screamed at the bear. "Beauregard stopped in mid-bounce, took a look at the three men and apparently decided those two-legged critters were kind of noisy, but otherwise of little significance." The bear "resumed its fun." The FAAers returned to their base and contacted Alaska Department of Fish and Game personnel for help, who moved a tranquilized Beauregard and released him forty miles up the river. About a week later, the same field party once again

found Beauregard bouncing on his trampoline. This time, the Fish and Game wardens moved the bear 400 miles up river near Kotzebue, and the field party once again returned to work.[12]

FAA publications often shared stories of the harried maintenance workforce overcoming any and all obstacles to get the job done. Such dedication was evident with the restoration of navigation aid in Florida after Hurricane Andrew in 1992. The category 5 hurricane demolished some FAA facilities and equipment in south Florida. While helping its own employees harmed by Andrew, the agency moved swiftly to minimize the storm's effect on airspace users. For example, technicians raced to replace the roof, and remove, dry out, and then reinstall one of the Miami VORs. The technicians completed the job, which normally would take three months, in less than one month.[13]

For some technicians, the job is really harder than most of us can imagine. As one FAA publication reported: "The technicians' jobs in keeping the National Airspace System operating takes them from frigid mountain aeries to burning deserts and lonely islands. You come to recognize that they are made of sterner stuff." The article continued: "The getting to the site is often the lion's share of the technicians' time, and it's by whatever means possible, including car, all-terrain vehicle or four-wheel drive, sand buggy, helicopter, air taxi, seaplane, boat, snowmobile, snowplow, snowcat, skis, ski lift, snowshoes, cable car, and when all else fails, hiking."[14]

Today, the job of ensuring operation of the FAA's equipment and systems resides with the Technical Operations office within the Air Traffic Organization. As the agency evolved, so too has the work of the agency's technical staff. With the advent of new technologies, navigation aids, and computerization, maintenance personnel skills increased and job requirement certainly require more than the three years-experience as an automotive mechanic required in 1926.

Technicians come from a wide variety of backgrounds and disciplines, but remain just as dedicated as in the past to keeping the national airspace system infrastructure maintained and upgraded to ensure safe operations for all users. Technical Operations now has more than 9,500 employees in the technical workforce, including technicians, engineers, and specialists for computers, logistics, environmental and energy, and occupational safety and health. This workforce maintains almost 74,000 systems and facilities. The work and the skills to do that work has evolved quite significantly over time and it will continue to as the NAS shifts into its next generation.

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[1] United States. Department of Commerce. Aeronautics Branch. *Annual Report of the Director of Aeronautics to the Secretary of Commerce for the Fiscal Year Ended June 30, 1927* (Washington, DC: U.S.G.P.O., 1927): 4.

[2] United States. Department of Commerce. Aeronautics Branch. *Annual Report of the Director of Aeronautics to the Secretary of Commerce for the Fiscal Year Ended June 30, 1928* (Washington, D.C.: U.S.G.P.O., 1928): 19.
[3] "Representative of Department of Commerce Stops in Moline," *Daily Times* (Davenport, Iowa), December 18, 1926.
[4] United States. Department of Commerce. Aeronautics Branch. *Annual Report of the Director of Aeronautics to the Secretary of Commerce for the Fiscal Year Ended June 30, 1927* (Washington, DC: U.S.G.P.O., 1927): 7.
[5] "He's 'Landlubber Lighthouse Tender,'" *The Woodville Republican* (September 29, 1928): 2.
[6] *Annual Report of the Director of Aeronautics to the Secretary of Commerce for the Fiscal Year Ended June 30, 1928*, 19.
[7] "Airway Mechanicians Wanted," *Morning Register* (April 21, 1928): 7.
[8] "Fliers Look to Lone Footman," *Oakland Tribune* (January 18, 1930): 6.
[9] "Employees on Northern Transcontinental Airway Battle Snow 20 to 30 Feet Deep," *Air Commerce Bulletin*, vol.6, no. 8 (February 15, 1935): 192-193.
[10] "20 Airways Beacons Light B-A Air Route," *Fitchburg Sentinel* (July 8, 1948): 13.
[11] FAA Historical Chronology, 1926-1996, Appendix I, accessed online at https://www.faa.gov/about/history/chronolog_history.
[12]Warren Runnerstrom, "The Case of the Bouncing Bruin," *FAA World* (August 1977): 5.
[13] Edmund Preston and Theresa L. Kraus, "In Andrew's Path: a historical report on FAA's response to and recovery from Hurricane Andrew" (Washington, DC: U.S. Dept. of Transportation, Federal Aviation Administration, History Staff, Office of Public Affairs, 1993): 21.
[14] "Nothing Stays the Technician," *FAA World* (August 1977): 3-7, 12.