



JEFF SKILES

COMMENTARY / CONTRAILS



The Lighted Airway System

Aviation's first navigation system

BY JEFF SKILES

THERE WAS A TIME when it was difficult to envision a commercial purpose for the airplane, believe it or not. Certainly airplanes could provide an escape for the very brave by offering thrill rides at fairs or simply at the field by the edge of town. These aerial excursions would be delivered by dashing barnstormers doing the only thing they could think of to eke a living out of aviation. The concept of using an airplane in a commercial transportation system was so far removed from mainstream thinking as to seem preposterous.

POST OFFICE PROMOTES AIR COMMERCE

One of the first organizations to see a purpose in aviation was the Post Office Department. It had conducted a few pioneering flights whereby mail would be carried between two closely spaced destinations with limited success. In a few cases at public events, letters had been carried aloft only to be brought right back to where they started again. These letters would be dutifully canceled across their face with the stamp of "AIR MAIL" to the satisfaction of collectors. None of this, however, was really a system to transport the mail, rather it was a mere carnival sideshow much like the traveling aerial circuses of the day.

To develop a real air mail system required more than just an airplane headed in the proper direction; it required a means of navigation for the airplane that hadn't been envisioned yet. A reliable transportation system required day and night flying in all weather, and at the time, there was simply no means of air

navigation at all. Even maps of the period were of the most rudimentary quality, and none showed topography effectively, certainly the most critical information for a pilot.

RACING THE TRAINS

To be commercially effective, air mail had to be delivered from coast to coast, and in a manner that would be significantly faster than the 90-some hours that it took the mail to traverse the continent by train. A system of airfields, both commercial and emergency, would have to be developed and a means to navigate between them. The effective radio navigation that we enjoy today was simply nonexistent in the early 1920s, leaving a visual system as the only option—a course of visual markings clearly identifiable day and night that would guide a pilot along his intended route. This idea was the birth of the nationwide lighted airway system.

In 1923 Congress funded a lighted airway for the 2,665-mile transcontinental air mail route from New York to San Francisco. Only

one year later the first night air mail flight took place, and the entire route was complete by 1925. Further feeder routes were added, and by the early 1930s that first route from New York to San Francisco had become the transcontinental airway system and was said to encompass more than 1,500 beacon lights stretching more than 18,000 miles.

A HIGHWAY OF LIGHT

The inaugural segment was from Chicago to Cheyenne under the assumption that a mail plane, or more accurately a series of planes, taking off from either coast could achieve one of those cities by nightfall. The lighted beacons and their surrounding identification markings were a study in ingenuity that would allow mail planes to continue their journey through the inevitable darkness.

Construction of each beacon began by erecting a tall beacon tower. Various heights were used given the prevailing terrain, but the standard tower was 51 feet tall. Atop the tower was a rotating glass airway beacon either 24 or 36 inches in diameter. Every 10 seconds this beacon would flash a 5 million candlepower white light said to be visible for up to 40 miles in good weather.

Smaller 18-inch course lights mounted to the beacon platform pointed horizontally marking the route direction. These course lights were either red or green with the color dependent on whether there was a nearby landing field, and they would flash with a specific Morse code letter identifier. Unlike the two-, three-, and four-letter aural identifiers of today, each station would be represented by only one letter, "K" for instance. There would be 10 uniquely identified beacons in a line, each with distinct letter identifiers, before the whole sequence would repeat itself. Pilots could determine their place along this line of beacons by reading their course lights flashing with this Morse code identifier. The sequence of letter identifiers along the airway was WUVHRKDBGM. This led to the memory jogger pilots of the day used to remember this sequence: "When Undertaking Very Hard Routes Keep Directions By Good Methods."

By day the beacons were equally visible with garishly painted red and white striped towers. Beacons without a ready power source would have a small shed at their base housing a generator with nearby fuel tanks. These sheds would be striped as well with specific identifying markings on the metal roof, such as SF-SL 31 meaning that this was the 31st beacon along the San Francisco to Salt Lake City leg of the transcontinental airway. The beacon, tower, and shed would all sit on a concrete slab foundation, and many beacons had large concrete arrows painted in yellow pointing in the direction to the next beacon.

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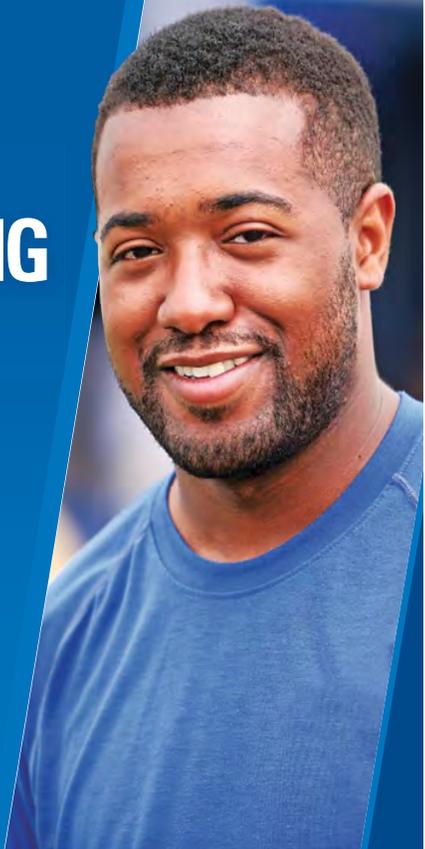
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The light beacon system was originally built by the Post Office and the Department of Commerce, but by 1926 the beacons were, not surprisingly, transferred over to be managed by the Bureau of Lighthouses. Each beacon cost more than \$100 per month to maintain, a significant sum in the 1920s.

THE SYSTEM IS COMPLETE

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When the entire route was complete it was said that a letter could traverse the country in as little as 33 hours. But, time marched quickly in the area of airborne navigation, and just a few years after its introduction, the lighted airway system was obsolete. By 1929 the low-frequency radio range began to supplant airway beacons, and the need for their welcoming flashes of light ceased to exist.

SURVIVORS

Nevertheless, the FAA maintained portions of the nationwide lighted airway system as late as the mid-1960s. And, a few airway beacons still survive today. The state of Montana maintains 17 of those original airway beacons on two routes through the northern Rocky Mountains, from Bozeman west to the Mullan Pass and from Great Falls south to the Monida Pass. These beacons are still shown on sectional charts with the same five pointed star that would otherwise be attached to an airport symbol but with two arrows protruding from it indicating course direction. Next to the star is a number and a Morse code identifier. The number represents the designation of that particular beacon along the route, and the Morse code identifier is for the letter of the beacon in the sequence WUVHRKDBGM. A repairman visits each beacon three times a year to conduct any needed maintenance. Today, however, they

are lit by modern bulbs available at any big box store.

There are other survivors, of course. A restored airway beacon in the EAA museum rotates to signal the impending departure of the tram for the hangars on the north side of Pioneer Airport. Also, EAA Chapter 431 at Brodhead, my home airport, recently restored and erected an old beacon tower that had been lying in a heap of twisted metal beside a hangar on the field. The power shed built at its base houses a small museum with the original airway beacon inside. Many other beacons have been preserved as well.

IMPACT ON WORLD

I cut my teeth in aviation flying the mail 35 years ago. My route carried me along a segment of that original transcontinental air mail route from Omaha to North Platte, Nebraska. By that time the lighted airway system was long shut down, yet the air mail route it supported still thrived as young pilots like myself transported letters and packages to destinations disdained by the fast and sleek airliners of the modern era.

While their reign as a primary navigation method was brief, the string of winking white airway beacons brought aviation into a new realm. For the first time aviation displayed a commercial purpose beyond that of joyrides and stunts. From the lighted airway system's pioneer beginnings sprang a system of aerial commerce that has girdled the globe and brought the peoples of the earth much closer together. **EAA**

Jeff Skiles, EAA Lifetime 336120, is an ATP and CFII-ME who has been an airline and light airplane pilot for almost 40 years. He owned a Cessna 140 and a Waco YOC and currently flies a Cessna 185. Jeff can be reached at JeffreyBSkiles@gmail.com.