Our own Airmail Beacon House – update, part 2

(As published in The Oak Ridger's Historically Speaking column on July 7, 2009)

Last week we brought you up to date on the continuing efforts to document the specific nature of the mission of our Airmail Beacon House. Up to now our focus has been on a visual marker in the form of a small building housing a generator and a large tower with a light on it. There is one other possibility that comes from the research. Might it have been a radio range transmitter?

The Smithsonian representative also tentatively identified our beacon house as potentially being a "radio range beacon" that was part of what was termed the "Knoxville, Tenn., radio range." The low frequency radio range approach to navigation aids came into being as early as 1927 and immediately was recognized as an improvement in navigational safety.

However, the visual light beacons continued in use and even continued expanding into the 1930's. According to the online article *Nocturnal Travels* by John Schamel, by 1933, the Federal Airway System had 18,000 miles of lighted airways containing 1,550 rotating beacons.

These radio range transmitters operating in the late 1920's and 1930's consisted of four way transmitters that sent Morse Code signals for the letter "A," • **–** , and its opposite, the letter "N," **–** •, such that when an airplane was "on beam" a steady drone would be heard, but when the pilot allowed the airplane to drift in off course either the "N" signal or the "A" signal became stronger overriding the steady drone, thus letting the pilot know which direction to turn to correct the airplane's course.

This low frequency radio range transmitters were soon joined by the next technological advance. By 1930, the Very high frequency Omni-directional Radio range (VOR) was an improvement over the low frequency system as weather did not adversely affect the signal. However, VOR was limited to line of sight whereas the low frequency signal would follow the curvature of the earth.

The US Post Office operated the air mail system from 1918 – 1927. By 1927 the air transport system was growing so much that the post office put air mail delivery out to competitive bids. This was the start of significant increases in air transportation.

The Kelly Airmail Act of 1925 had provided private airlines the opportunity to function as mail carriers through involvement in a competitive bidding system. These private carriers, through the airmail revenue, could then expand into carrying other forms of cargo, including passengers.

By 1925 only nine of the 40 pilots originally hired by the US Post Office in 1918 were still alive. This is when the US Post Office first began to bid routes. In two more years, by 1927, all air mail routes were put out to competitive bids and the Post Office got out of the airmail business.

With the high; number of pilot deaths it is easy to see why so much attention was paid to the lighted beacons, various radio frequency signals, multiple direction finder technologies and other safety related technological advances. While air transportation was in its early stages, the industry was pushing for safety improvements and even requesting government regulation of airways.

From the online history of night navigation the following specific details of the airway beacons is found:

> "Beacons were positioned every ten miles along the airway. At the top of a 51-foot steel tower was a 1 million candlepower-rotating beacon. Pilots could see the clear flash of light from a distance of 40 miles. Also at the top of the tower were two color-coded 100,000 candlepower

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> course lights. These pointed up and down the airway. They were colored green, signifying an adjacent airfield, and red, signifying no airfield.
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> "The course lights also flashed a Morse Code letter [W, U, V, H, R, K, D, B, G or M]. The letter corresponded to the number of the beacon within a 100-mile segment of the airway. To determine their position, a pilot simply had to remember this phrase – "When Undertaking Very Hard Routes, Keep Direction By Good Methods" – and know which 100-mile segment they were on.
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> "The beacons were also built to aid daytime navigation. Each tower was built on an arrow shaped concrete slab that was painted yellow. The arrow pointed to the next higher numbered beacon. An equipment/generator shed next to the tower had the beacon number and other information painted on the roof.
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> "An English aviation journalist, visiting the U.S. in 1924, wrote, 'The U.S. Post Office runs what is far and away the most efficiently organized and efficiently managed Civil Aviation undertaking in the World.'

Our Beacon House was a part of the historic world-changing growth in air transportation. It was most likely operated by a local family sometime prior to 1942. It was either a flashing light beacon or a radio range beacon.

If it was a flashing light beacon, it would have been a type "B" as defined by the fact that it was powered by a direct current generated at the site and had no air field immediately nearby. There was type "A" (connected to commercial power), a type "C" (similar to "B" but located at an intermediate air field) and a type "D" (similar to a type "A" but located at an air field).

It was painted white or chrome yellow number 4 with a 2' wide band painted black midway up the exterior walls with the window frames and exterior door painted medium grey. It had the numbers "2," indicating the airway, and "12," indicating the beacon house number, painted black on the roof.

I wonder if it ever had a 54' concrete arrow. This would have admittedly been unusual, but no physical evidence exists to suggest there was ever such a large slab of concrete there. Of course, if it was a radio range beacon, then the concrete arrow might not have been there. The tower, fuel tank and generator shed would have completed the radio range installation.

The beacon house is a most interesting bit of history and is worthy of the efforts being put forth by ORNL to gain recognition by restoring the structure and obtaining National Historic Register status. Additional articles on the ORNL Beacon House will be published when it is restored and that historic status obtained.

I hope you have enjoyed visiting Oak Ridge's unique Airmail Beacon House and now have a better appreciation for the historic structure. At some point in the future, I hope to see this small building restored to its original colors and structural integrity. I also hope to see the historic marker and informational display installed there and the place added to Oak Ridge's historic tours.

Places such as this Airmail Beacon House and Freels' Bend Cabin can contribute to the telling of our history just as the Manhattan Project, Medical Isotopes, Cold War, Birth of a City, International Friendship Bell and other historic sites in our city. Even the deteriorating Guest House/Alexander Inn - if it is ever

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taken off the unfortunate demolition by neglect path it is now on, could still play a key role in telling our history!

Oak Ridge has many unique historical structures and stories. I have been pleased to bring you this update on our own Airmail Beacon House.

Our Beacon House located near the Oak Ridge National Laboratory

The location where the generator would have set on the two concreted foundations.