

# For Want of a Nail . . .



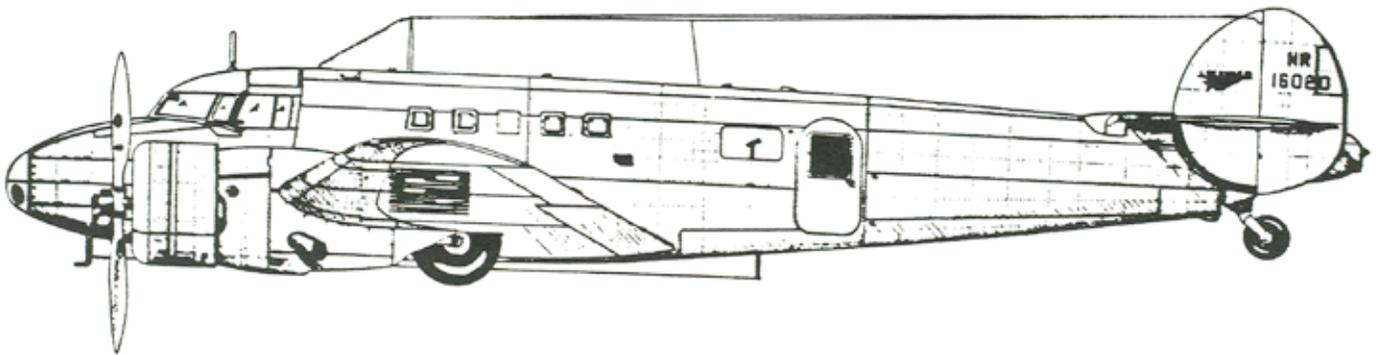
Finding the Earhart aircraft involves, in part, acquiring a thorough understanding of the events which led to its disappearance. In assembling and examining the documented historical record of the Electra's final flight we are repeatedly struck by how much "new" information is readily accessible to the dedicated researcher and by the extent to which previous speculation about the flight's fate has been based upon erroneous assumption and just plain bad information.

A classic example is the problem of why Earhart failed to establish two-way voice communication with the Coast Guard cutter *Itasca*. Had she been able to get useful information from the *Itasca* she almost certainly would have reached Howland Island or, at the very least, been quickly rescued. But, although *Itasca* could hear her voice loud and clear, she couldn't hear their replies. Attempts to explain why have ranged from allegations that the whole incident was an elaborately staged hoax to speculation that Amelia simply wasn't wearing her earphones at the right times. More often, it is simply written off as an inscrutable mystery the answer to which, like Amelia herself, is forever lost. Nonsense! The Earhart disappearance is an extraordinarily

well-documented sequence of events, and an examination of the historical record suggests a logical explanation of what went wrong. It is also a solution to the mystery that may be absolutely provable from existing photographic evidence. Here's what we think happened and why.

***Earhart couldn't hear the Itasca's voice transmissions because her receiving antenna was inoperative. Mounted on the belly of the Electra, the antenna was broken off when it struck the ground while she was taxiing for takeoff in Lae, New Guinea. Unfelt by Earhart or Noonan in the heavily overloaded aircraft, and unseen by those watching her departure, the bump that broke the antenna began the sequence of events that ended in aviation's most famous disappearance.***

We began to suspect the antenna when an examination of the *Itasca's* radio logs made it clear that Earhart's problem was clearly not the radio



For the second world flight attempt NR16020 had three radio antennas:

- For transmitting, a vee-type wire antenna stretched from a mast atop the forward fuselage to the tip of each vertical fin. A length of fairlead wire attached to the starboard arm of the vee entered the cabin on the starboard side and connected the antenna to the Western Electric Type 13C transmitter mounted on the floor just forward of the cabin windows.
- For radio direction finding, a manually rotatable Bendix loop antenna was mounted over the cockpit and connected to the Western Electric Type 20B receiver installed under the copilot's seat. There has been much confusion and controversy over whether a separate RDF receiver was aboard the aircraft at this time. The historical record, however, clearly indicates that there was not.
- For receiving communications, the receiver under the copilot's seat was connected by fairlead to a straight wire antenna which ran from the starboard pitot mast under the aircraft's nose to a mast approximately amidships (hidden in this illustration by the retracted wheel) and terminated at a mast on the belly directly under the cabin windows. This aftmost mast is the one that appears to have been broken off while taxiing for takeoff at Lae on July 2nd.

## PROJECT NOTES

receiver itself. On one occasion, and one occasion only, Earhart heard signals sent by the *Itasca*. At 19:28 GCT, when the strength of her radio transmissions indicated that she was close to Howland Island, she asked the *Itasca* to send signals upon which she would try to take a bearing with her own Radio Direction Finder (RDF). To do that she had to switch from the regular receiving antenna, a long mast-supported wire that ran along the belly of the airplane, to the rotatable loop antenna mounted over the cockpit. For the first and only time she heard something: a series of A's (dit dah, dit dah, dit dah), but because she had asked that the signals be sent on a frequency far higher than her RDF could home in on she was unable to "get a minimum" (obtain a direction to the station). She then switched back to the belly antenna and never heard anything more. Clearly, the receiver is working and the loop is working. The culprit must be the belly antenna.

We then asked, "When is the last time that we know the belly antenna was working?" Although it has been widely stated that Lae radio operator Harry Balfour was in two-way radio communication with Earhart for the first seven hours of the flight, a close examination of the historical record shows



In this photo of AE (taken in Natal, Brazil on June 6, 1937) clearance between the aft belly antenna and the ground appears to be about 16 inches. (Purdue University Collection.)

that Balfour's recollections are not accurate. There is, in fact, no evidence that Earhart heard anything over the belly antenna at any time during the flight. The last documented instance of voice communication with the *Electra* is during an early morning test flight at Lae on July 1st, the day before the takeoff for Howland. Photographs of the aircraft being prepared for departure on July 2nd clearly show the antenna intact but also reveal that clearance between the aft antenna mast and the turf surface at Lae has been reduced by the heaviest load NR16020 has ever been asked to carry.

A careful look at home movie film of the takeoff, included in NBC News Production's "Untold Stories – The Search For Amelia Earhart," showed that both the loop and the transmitter antenna mast on the top of the fuselage were visible but no trace of the belly antenna could be seen. Still, the film is of poor quality and the airplane is too far away to call the scene conclusive evidence that the belly antenna had somehow disappeared between engine start and take off. However, we recently realized that additional footage from the same home movie sequence was used in the EAA's production of Buddy Brennan's conspiracy story *Witness to the Execution*. In a close up shot of the *Electra* taxiing past the camera, the belly antenna mast amidships can clearly be seen but the aft antenna mast – the one most at risk to ground strikes – is just as clearly missing. An interesting sidelight to this hypothesis is an anecdote told by R.E. Fullenwider (TIGHAR #0126) who, as he puts it, "spent some time in Lae during World War Two courtesy of Uncle Sam." As he remembers it, the old-timers there often said they hadn't been surprised when Earhart was lost because "she left part of her trailing wire antenna laying on the runway." Of course, the *Electra*'s trailing wire antenna had been removed long before. If antenna wire was found on the runway at Lae after her departure we have a pretty good hunch where it came from.

We're presently trying to assemble the best prints available of any photographs or film taken on the morning of the Lae takeoff. We'll then have them evaluated by the best photogrammetrists we can find in the hope that independent expert analysis will confirm our suspicions. Establishing beyond reasonable doubt the cause of Earhart's failure to reach Howland Island will not, of course, help us find the rest of her airplane. It will, however, be an important contribution to the historical understanding of the Earhart disappearance and illustrate to those who have difficulty accepting TIGHAR's methodology that, yes, the truth can be discovered by anyone with the discipline and determination to seek it out.

