



# ARTIFACT 2-2-V-1 \*

Found October 18, 1991.

*Submitted to National Transportation Board (NTSB), Washington, D.C. for laboratory examination December 19, 1991.*

The photograph below shows the artifact in situ on Niku's western beach. It is a section of aluminum aircraft skin approximately 25 inches long by 18 inches wide and .032" in thickness. Four parallel rows of rivet holes of one inch pitch (space between individual rivets) evidence 92



TIGHAR Photo by P. Thrasher

rivets with a shaft diameter of  $\frac{3}{32}$ ", one of which is still in place. The skin has failed along a fifth line of 14 rivets of  $1\frac{1}{4}$ " pitch,  $\frac{5}{32}$ " in diameter, except for one section about three inches long where there is an anomaly in the pitch. A detour in the tear at this point (visible in the photo as a "tab" along the top edge) suggests that there was once an external structure which served to reinforce the sheet at this point. Nearby, the letters "AD" are visible; traces of the word ALCLAD in the original manufacturer's labeling.

\* TIGHAR's system of cataloguing artifacts is not as mysterious as it may look. It's just Project code (2, for Earhart Project), Expedition number (2, for second expedition), site identifier (V, for village), and chronological identifier (1, for first artifact found at this site). If the artifact is in several pieces we add a slash number for each piece. The shoe eyelet, for example, is 2-2-G (for grave site)-7/6 (the shoe was the seventh artifact found in the area, of which the eyelet was the sixth fragment found).

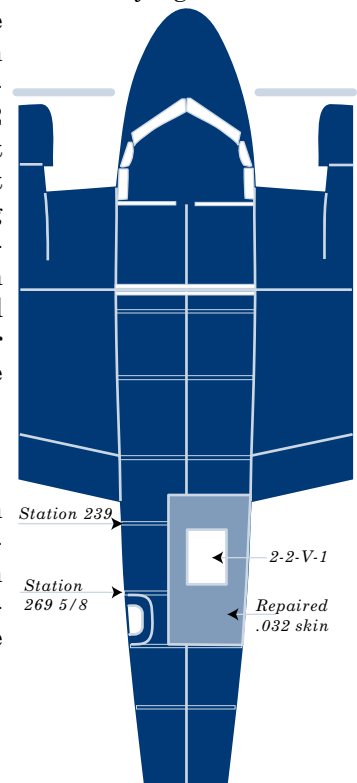
Tangled on one corner of the skin (the upper left in this photo) was a 30 inch length of 22 gauge, single filament copper wire with remnants of rubber insulation surviving in several places (visible only on the original color slide – it's pretty small).

## ALL WASHED UP

The aircraft skin was lying amid the debris of beachfront vegetation torn out and washed up by huge waves which had hit the island's western shoreline sometime between our visit in 1989 and our return two years later. The corrugated metal visible in the upper right of the photo is the collapsed roof of a wooden frame building with "Gardner Co-Op Store 1940" painted over what was once the doorway. In 1989 the building stood intact, surrounded by a jungle of coconut and pandanus trees which extended westward (toward the bottom of the photo) about 50 feet. Beyond, open beach continued another 100 feet to the high tide line. The seaward side wall of the structure was pushed inward by the storm surge and most of the vegetation between the building and the beach was obliterated by the same force. On the first expedition we had thoroughly searched the old store (empty except for a bed frame, some rats, and a very dead cat) as well as the area around it. There was certainly no big chunk of airplane skin lying about at that time. It appears that the extensive beach erosion caused by the storm (apparently the worst in 52 years) churned the artifact up out of the sand and left it where we found it along the high water line. A further search of the beach and areas inland turned up a few more smaller pieces of wreckage which are still under investigation.

## MATCH POINT

This artifact has been matched in every documentable respect to a section on the belly of Earhart's Lockheed 10E between Fuselage





Stations 239 and 269<sup>3</sup>/<sub>8</sub>s (see diagram). With the help of NTSB, Alcoa Aluminum, and the National Air & Space Museum’s Paul E. Garber Facility, TIGHAR has identified, documented and matched 12 separate aspects of the artifact with this specific area on the Earhart aircraft.

- Aluminum alloy: 24ST
- Surface treatment: ALCLAD
- Skin dimensions: Fits within those of Skin #35R on the Electra.
- Skin thickness: Identical to Skin #35R.
- Manufacturer’s labeling: Identical to existing Lockheed 10s and unlike that used during World War II.
- Rivet head: AN455 brazier ( a pre-war style largely superceded during World War II by the AN470 universal)
- Rivet alloy: A17ST (code AD)
- Rivet shaft diameter:  $\frac{3}{32}$ "
- Rivet shaft length:  $\frac{3}{16}$ "
- Rivet pattern: Four parallel lines of AN455 AD 3/3 tapering  $\frac{1}{4}$ " over the length of the sheet.
- Failure pattern: The “tab” on the artifact, which indicates an external reinforcing structure, matches the position of the aft belly antenna mast on the Earhart aircraft.
- Antenna fairlead wire: The wire found on the artifact has been identified as aviation antenna fairlead wire of a type standard in the mid 1930s but obsolete and replaced with multistrand wire by World War Two.

Every documentable aspect and feature of Artifact 2-2-V-1 matches the Earhart aircraft.

**But might it also match some other aircraft?**

The manufacturer’s labeling, the rivet, and the wire all confirm that this was a pre-war aircraft. Prior to World War Two, only three airplanes ever came anywhere near Nikumaroro: the 1934 transpacific flight of Sir Charles Kingsford Smith, whose Fokker trimotor “Southern Cross” is now in an Australian museum; a 1939 photo-mapping flight by the U.S. Navy, which was completed without incident; and the 1937 disappearance of Amelia Earhart.

**But what if an aircraft built before the war had been lost in this region during the war?**

Since the island’s first settlement in December 1938, no aircraft has ever been reported wrecked or even dam-

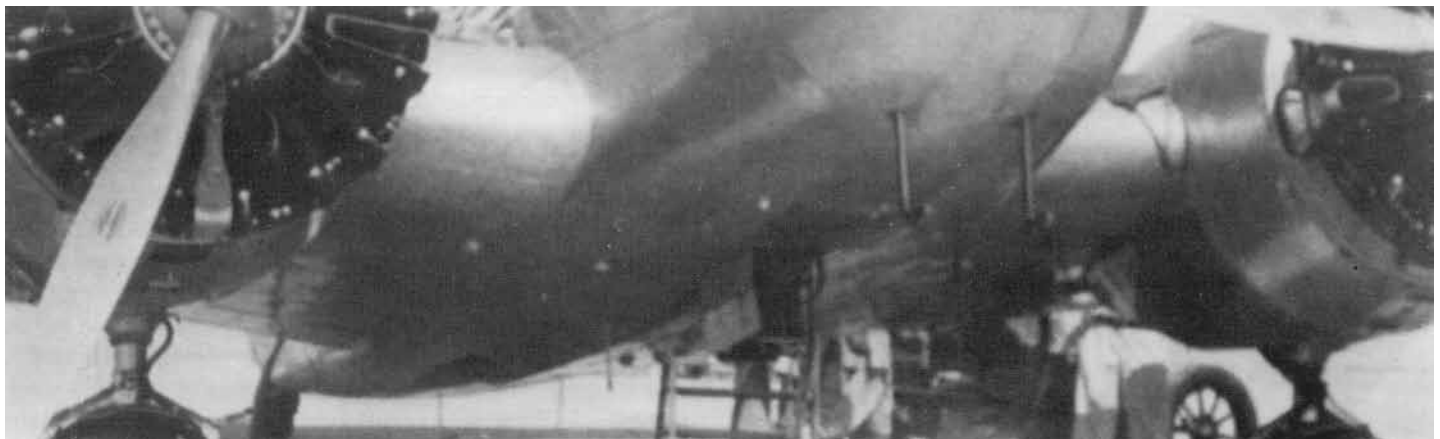
aged at Nikumaroro. The Gilbertese colonists did, however, use shards of aircraft aluminum to make decorative hair combs (like one we found). Although 2-2-V-1 shows no sign of anyone ever trying to turn it into attractive headwear, we need to consider the possibility that it was brought to the island from elsewhere. Total wartime losses within 500 miles of Nikumaroro were:

- March 1943 – A PB5A destroyed on the ground at Canton Island (200 miles northeast of Niku) in a Japanese bombing raid.
- October 18, 1942 – Consolidated PB4Y-1 Bureau Number 32102 lost at sea.
- September 5, 1944 – Martin PBM-3D Bureau Number 45236 lost at sea.
- “[L]ate in the war”, according to a still-unconfirmed report, “a large four-engined aircraft” crashed 200 miles east of Niku on Sydney Island. (See *TIGHAR Tracks*, Vol. 7, No. 5, “The Crash At Sydney Island.”) Extensive research has so far only confirmed that the Sydney Island crash was not a U.S. Navy accident, nor was it a Consairway or United Airlines (carriers under government contract) loss.

None of the first three aircraft was built early enough to contain aluminum labeled with the lettering style we see on 2-2-V-1; no prewar “large four-engined” type ever operated in the region. According to Alcoa, stocks of aluminum sheeting were low when aircraft production began to burgeon in the years immediately preceding the war and the chances of a piece of “old” aluminum ending up in a wartime aircraft are virtually nil.

**THE BOTTOM LINE**

Through laboratory analysis of its physical features, and archival documentation of their significance, Artifact 2-2-V-1 has been shown to be identical, in every knowable aspect, to a particular and unique section of NR16020. At the same time, it has been shown to be unlike any part of any other aircraft known, or even rumored, to have been lost in the region. The conclusion is inescapable. This is a piece of Amelia Earhart’s aircraft.



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