

# TIGHAR TRACKS

A Publication of The International Group for Historic Aircraft Recovery  
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July 2003



The Niku Vp expedition is finally underway and by the time you read this the team will have reached Nikumaroro and begun its work. As promised, now that the TIGHAR team is on-site, we have released a full account of what New England Aquarium marine biologist Dr. Greg Stone reported seeing at the island in June of last year (see "Wheel of Fortune" page 5). The results of the on-site investigation (unknown to us when this newsletter was mailed) are reported in the daily Expedition Updates on the TIGHAR website at [www.TIGHAR.org](http://www.TIGHAR.org).

There have been two changes to the expedition team since the latest issue of *TIGHAR Tracks*. Tom Roberts (TIGHAR #1956CE) decided to forego participation in this year's trip and will be on the Niku V team next year. Taking his place on the the Niku Vp team is veteran TIGHAR expedition member John Clauss (TIGHAR #0142CE).

Another new addition to the team was to be Kiribati Wildlife Officer Aobure Teatata. The Republic of Kiribati has a firm policy that any visit to the uninhabited islands of the Phoenix Group must be accompanied by a government representative. We pay for the transportation and expenses of the assigned officer who also performs Customs and Immigration clearances for the expedition. We've always seen their participation as a valuable addition to our expeditions. This time, however, a cascade of difficulties conspired to prevent Mr. Teatata from getting from his home island of Kiritimati to the expedition's port of embarkation in American Samoa and the Ministry of Foreign Affairs in Tarawa

graciously allowed the expedition to proceed without him. The full expedition party is made up of:

- S/V *Mollie* owners/crew, Ken Durey, Louise Fry, and daughter Mollie, age 7
- Expedition leader and diver, Van Hunn (TIGHAR #1459CE)
- Coral reef geologist and diver, Howard Alldred (TIGHAR #2489)
- Niku expedition veteran and diver, Walt Holm (TIGHAR #0980CE)
- Niku expedition veteran, John Clauss (TIGHAR #0142CE)

The plan is to spend seven days at the island, which we anticipate will be Monday, July 28 through Sunday, August 3. The work will include an investigation of the "wheel of fortune," a reconnaissance of the "overwash" area on the western end of the atoll in preparation for next year's search, the detailed measurement of the reef and portions of the *Norwich City* shipwreck debris which will help us further refine tidal data, and continued underwater examination of the reef edge. If time permits, the team will briefly visit the Seven Site at the far end of the island to see how well, or how poorly, our attempts to secure the archaeological site in 2001 have fared. Everyone should be home by Saturday, August 9.

There is an old saying at TIGHAR that "adventure is what happens when things go wrong." Just getting this expedition launched has been quite an adventure. Reproduced below are the first few days of updates from the TIGHAR website. Let's hope the rest of the trip is less fraught with adventure.

# Adventures in the Pacific

Dateline: Monday, July 14, 2003, Wilmington, Delaware.

The departure of the Niku Vp Expedition was delayed due to an interruption in airline service to the South Pacific. The team was originally scheduled to rendezvous with the expedition vessel S/V *Mollie* in Pago Pago, American Samoa on July 3rd but in late June, deteriorated runway conditions at Pago Pago forced a suspension of all overseas service. Some quick repairs were made and it was hoped that service would soon resume but an FAA inspection on July 3rd found that further repairs were needed.

Expectations at that time were that the runway at Pago Pago would be closed until September so we made the decision to shift the expedition's port of embarkation to Apia in neighboring Western Samoa. Over the next week *Mollie* repositioned to Apia and we rebooked the team's airline travel to that destination at a considerable increase in cost. Then to everyone's surprise, the runway at Pago Pago reopened and service resumed on July 12th. Backlogs, delays, and cancellation penalties, however, made it impractical to go back our original plan.

The above summary of the events of the past two weeks is, in all honesty, a gross over-simpli-

fication. To relate the whole story would be as cruel as it would be pointless. All that really matters is that we're now (in theory) set to embark the expedition from Apia on July 17th .

As of Monday July 14:

- Our New Zealander coral reef geologist, Howard Alldred, is with *Mollie* in Apia.
- The Kiribati Wildlife Conservation Officer designated to accompany the expedition as a representative of the Republic of Kiribati, Aobure Teatata, was scheduled to travel on Sunday to Honolulu from his home island of Kiritimati (Christmas Island) and thence on Monday to Pago Pago where he'll have to wait until Wednesday evening to catch a commuter flight to Apia.
- On Tuesday, July 15th, Van Hunn, Walt Holm, and John Clauss will fly from Los Angeles to Auckland, New Zealand and from there to Apia, arriving early on Thursday morning July 17th. Assuming *Mollie* sails on the 17th she should arrive off Nikumaroro sometime late on Sunday July 20th or on Monday the 21st.

## Another Delay

Dateline: Wednesday, July 16 2003, Wilmington, Delaware.

The communications and travel difficulties that still plague remote Pacific island nations have forced us to postpone departure of the Niku Vp expedition until July 24. Because the representative of the Republic of Kiribati who must accompany the expedition did not get the word about the schedule change, he did not make the once-a-week flight from Kiritimati (Christmas Island) to Honolulu on Sunday. We now have no choice but to move all of the travel ahead one week and deal with the cost

and scheduling problems such a shift always entails.

Putting these expeditions together is always a challenge, but this trip has had to overcome more than its share of obstacles. In November 2002 we arranged to piggy-back the expedition on a commercial tourist dive trip to the Phoenix Islands organized by *Nai'a* Cruises in Fiji. *Nai'a* scheduled the expedition for departure in June 2003, but by mid-January thought they'd have to cancel the trip because not enough customers

were signing up. We mobilized the TIGHAR membership and by early March we were able to add four TIGHAR's to the passenger list – enough to make the trip a paying proposition for *Nai'a*. The trip was on, but it was also becoming increasingly obvious that the United States was about to start a war. The non-TIGHAR members of the *Nai'a* expedition to the Phoenix Islands began to discover that they had schedule conflicts or personal obligations that prevented them from participating. On March 19th *Nai'a* cancelled the expedition. That same day President Bush announced that military operations against Iraq had begun.

Fortunately, we had a Plan B ready to go. The New Zealand-based sailing vessel *S/V Mollie* would meet our four-person team in Pago Pago, American Samoa and support a one week stay at Nikumaroro. The schedule would slip to early July and the team would change somewhat, but the TIGHAR expedition would go forward.

*Mollie* sailed from Auckland in late April and started making her way north toward Samoa.

May was spent planning the work to be done on the island, assembling gear, and handling the thousand logistical details that are the heart of all field work. In early June a fifth participant was added to the expedition when the government of the Republic of Kiribati specified that a Wildlife Conservation Officer from Kiritimati would

accompany the TIGHAR team (a Kiribati representative has always gone with us to Nikumaroro).

By late June all was in readiness when events beyond our control once again intervened to thwart us. After two weeks of uncertainty and hassle we were able to put the expedition back on track only to have the communications/ travel glitch described above force us to, once again, reshuffle the deck.

The new plan calls for *Mollie* to sail on Thursday, July 24 which should put the team at Nikumaroro on or about the 28th. If a giant asteroid crashes into the middle of the Pacific in the next week or so we

may have to amend that schedule.



Van



John



Walt



Howard

## Two Steps Back, One Forward

Dateline: Thursday, July 17 2003, Wilmington, Delaware.

Space has opened up on flights that were previously full so that we're now able to get the expedition team to Pago Pago, American Samoa on Monday July 21 rather than have to wait until Thursday July 24. *Mollie* will need to re-relocate from Apia, Western Samoa back to Pago Pago but the expedition should now be able to begin the voyage to Nikumaroro late on Monday or early Tuesday. The new ETA for Niku, asteroids notwithstanding, is on or about Friday, July 25.

# The Game's Afoot!

Dateline: Monday, July 21, 2003; afternoon, EDT

In theory, Kiribati Wildlife Officer Aobure Teatata traveled from Kiritimati (Christmas Island) to Honolulu yesterday and will, later today, meet up with TIGHAR team leader Van Hunn and expedition members Walt Holm and John Clauss who are – in theory – now enroute from California to Hawaii. Tonight they'll all fly from Honolulu to Pago Pago, American Samoa where – in theory – they'll join expedition member Howard Alldred who is already aboard *Mollie* which is – in fact – standing by in Pago Pago and ready to depart for Nikumaroro.

At this point, no news is good news. As Sherlock Holmes used to say, "The game's afoot." And, if all goes well, the next hard news we expect to have will be via a satellite phone call from Van aboard *Mollie* sometime around midday Tuesday (EDT).

## Left Behind

Dateline: Tuesday, July 22 2003; morning, EDT.

Van, Walt and John have arrived in Pago Pago, American Samoa and are now with Howard aboard *Mollie*. However, at the last moment Aobure Teatata, the representative of the government of Kiribati who must accompany the expedition, was denied boarding on the flight from Honolulu to Pago Pago because he did not have the documents necessary to enter American Samoa. At his point we're not yet sure how or why this problem came about but we're hoping that we can get it straightened out quickly and get him to Samoa in the next few days so that the delay doesn't cut into the seven days the team needs on Nikumaroro to accomplish the various aspects of their mission.

Needless to say, this is a very frustrating development. As soon as we can get Mr. Teatata to Samoa the expedition will depart for Nikumaroro.

## Underway At Last

Dateline: Wednesday, July 23 2003; 0700, EDT.

Through the courtesy and cooperation of the Ministry of Foreign Affairs of the Republic of Kiribati, TIGHAR's Niku Vp expedition has been cleared to depart Pago Pago for the Phoenix Islands without being accompanied by a government representative. This special exception to official policy was extended to TIGHAR rather than further delay the expedition's departure. *Mollie* will now proceed directly to Kanton Island where the expedition party will clear Kiribati Customs and Immigration formalities before continuing on to Nikumaroro.

All of these diplomatic negotiations were handled in a rather intense few hours yesterday afternoon (early morning in Hawaii, Samoa, and Tarawa). As soon as I had the clearance from Foreign Affairs I phoned Van aboard *Mollie* and released the expedition for departure. They were going to put to sea as soon as they cleared U.S. Customs and Port Security. Van will check in by satphone later today with a progress report.

The detour via Kanton will add an estimated day and a half to the sailing time from Pago Pago. We now expect *Mollie* to arrive off Nikumaroro on or about Monday, July 28.

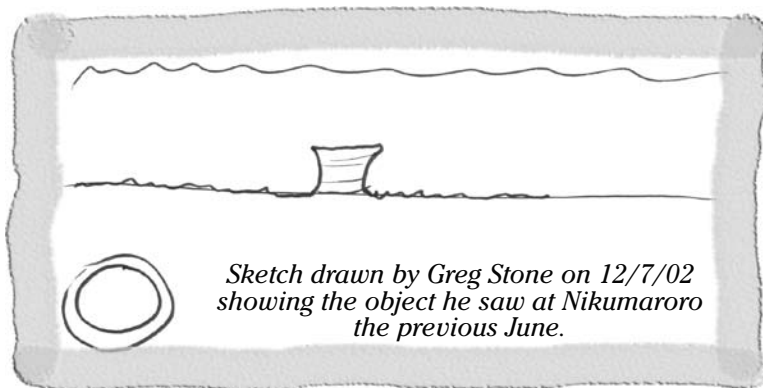
Check for daily updates on the expedition at <http://www.tighar.org/Projects/Earhart/NikuV/dailies.html>. There is also a link to the daily reports on the home page.

# Wheel of Fortune

In June of 2002, Nai'a, the Fiji-based ship that TIGHAR has used on our last three expeditions to Nikumaroro, was supporting a survey of the Phoenix Group by marine biologists of the New England Aquarium. On June 10 or 11, the leader of the expedition, Dr. Gregory Stone, Vice President for Global Marine Programs at the New England Aquarium, was walking alone along the beach at Nikumaroro on the south side of the seaward entrance of the main lagoon passage when he noticed an unusual object in knee-deep water about 15 or 20 feet from shore. He waded out to investigate and found the object to be a "wheel rim" – the metal part of a wheel that supports a rubber tire. There was no tire present nor was there any other man-made object in the water nearby. The wheel was standing on end and was roughly 12 inches across the rim and perhaps 15 inches tall. Sand covered the lower part of the wheel. No part of the wheel was projecting above the surface of the water. Greg reached down into the water and tried to pick up the wheel but found that it was anchored firmly to the reef surface and he couldn't budge it. The metal was not rusty but "looked old" and was covered with a smooth coating of marine vegetation, possibly coralline algae, but not coral per se or barnacles. The top surface of the wheel featured a lip surrounding an indentation in the middle but there were no spoke-like structures apparent.



*Dr. Gregory Stone, V. P. for Global Marine Programs at the New England Aquarium. TIGHAR photo by R. Gillespie.*



*Sketch drawn by Greg Stone on 12/7/02 showing the object he saw at Nikumaroro the previous June.*

Greg considered the wheel to be no more than a curiosity. He was familiar with TIGHAR's work in a general sense and knew that we had made numerous searches on Nikumaroro. Because the wheel had been so easy to see from shore, he assumed that we had seen it many times. He remembers thinking, "Boy, I'll bet that has gotten some people excited." He had a camera with him but did not photograph the object. He vaguely assumed that it must be an automobile wheel.

Nikumaroro was the first island of the Phoenix Group visited by the expedition. After three days at Niku, during which the scientists discovered a new species of Damsel Fish on the atoll's reef, they continued on to visit Orona (Hull Island), Phoenix Island, Kanton island, Enderbury Island, Manra (Sydney Island), and then returned to Nikumaroro for two more days before beginning the one thousand mile journey back to Fiji. The incident described above happened during the initial visit to the island. Sometime during the return trip to Fiji, in a conversation with Rob Barrell, co-owner of Nai'a, Dr. Stone casually mentioned having seen the wheel at Niku. Rob, who had accompanied TIGHAR's 1997 expedition to the island, was quite surprised and doubted that

we were aware of the artifact. He suggested that Dr. Stone get in touch with TIGHAR when he got home.

TIGHAR first became aware of the wheel when Ric Gillespie contacted Greg Stone in September 2002 to compare notes about the island and discuss the possibility of a joint expedition some time in the future. During the conversation Greg said, "Oh yes. There's something I'm supposed to tell you about." Ric and Greg later met at the New England Air Museum in Windsor Locks, Connecticut, where a videotaped interview was done of Greg's recollections. Ric and Greg then toured the museum looking at various wheels on airplanes, including the museum's Lockheed 10.

## What Could It Be?

Greg's impression was that the object he saw was a wheel; his sketch looks like a wheel; and his description certainly sounds like a wheel – but it is quite possible that it was not a wheel. It could be the drum of a small winch or some other object that looks similar to a wheel. There are similarly shaped larger objects among the S.S. *Norwich City* shipwreck debris on the reef roughly half a mile north of where Greg saw the "wheel." However, all of the ship wreckage, except for a few brass and bronze items, is heavily rusted iron and steel. The object near the shore was not rusty and Greg, who is very famil-



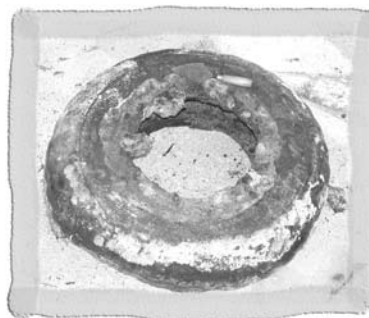
Some of the *Norwich City* debris resembles Greg Stone's sketch in general shape but is much larger and rust covered. TIGHAR photo by R. Gillespie.

Large open-spoked wheel of cart near shore of main lagoon passage. TIGHAR photo by P. Thrasher.



iar with the shipwreck, feels strongly that the "wheel" is not *Norwich City* debris.

The object could also be associated with the village that once stood near the shore on that part of the island, but the only wheeled vehicles known to have been used in the village are bicycles and a cart thought to have been used for launching a surfboat (a whale boat type of launch used for ferrying people and goods between vessels and the shore). Neither type of wheel is at all like the object reported by Greg Stone. It seems likely that there were other carts, wheelbarrows, etc. used in the village but it is difficult to imagine a wheel that would not rust.



During the *Niku III* expedition in 2001 we found a Goodyear U.S. military rubber tire in the lagoon near the village which appears to be consistent with the tires used on Weapons Carriers. The metal wheels for these vehicles were steel and of much larger dimensions than the object reported by Greg Stone. TIGHAR photo by R. Gillespie.



The U.S. Coast Guard Loran station that was located at the southeast end of the island from 1944 to 1946 had a four-wheel drive pick-up truck type of vehicle known as a Dodge WC51 Weapons Carrier. Photo courtesy RobertsArmory.com

**In summary, none of the known wheels or wheel-like objects on Nikumaroro fit the description and sketch of the object reported by Greg Stone.**



# Could It Be An Airplane Wheel?

The lack of rust and the relatively small size of the putative wheel suggest that it may be from an airplane. We know that airplane parts were brought to Nikumaroro during or after World War Two; however, most of the airplane types that served in the region had wheels that feature very different proportions from the object seen at Nikumaroro in that the diameter of the rim is less than the depth of the wheel. The “wheel” described by Dr. Stone is deeper than the rim is wide. That is a characteristic of airplane wheels such as the Goodyear “Airwheel” design that was popular during the 1930s. These wheels carried wide, relatively low-pressure tires with deep sidewalls that provided a high degree of shock absorption for rough-field operations. The wheels were made of aluminum or aluminum/magnesium alloy and the heavy duty tires were reinforced with “piano wire.”

If the object seen at Nikumaroro is a Goodyear Airwheel it seems to match the dimensions of Goodyear Wheel Assembly Code #395-612. (*Goodyear Catalog courtesy of Chesapeake Airways, Inc.*)

Goodyear Airwheels and heavy duty tires were standard equipment on all Lockheed Model



*The wheels on most of the World War Two aircraft that were based on Canton Island were far too large to be what Greg saw, but even the wheels of smaller aircraft, such as those on this Curtiss P-40 were relatively “thin” because they were designed to retract flat into the wing. USAF photo.*



*Earhart's 10E Special NR16020 featured Goodyear Airwheels. TIGHAR collection courtesy W. Larkins.*

10 Electras. The size was 35x15-6. The 35 refers to the uncompressed height of the tire, the 15 refers to the width across the face of the tire, and the 6 is the diameter of the opening in the middle of the tire, all in inches. (*Lockheed publication EE1135 revised 5/1/36.*)

*This 1937 Beech 18a features “fat” Goodyear Airwheels which retract rearward into the engine nacelles. U.S. Civil Aircraft, Vol. 7*



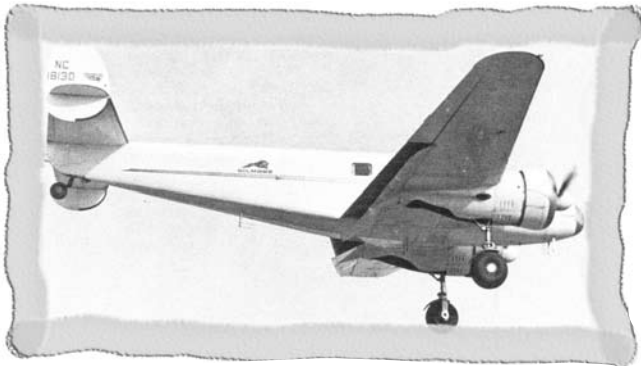
## STANDARD EQUIPMENT ON LOCKHEED "ELECTRA" MODEL 10E

### GENERAL EQUIPMENT

- 1 Fuselage, complete with windshield, windows (with curtains) and door.
- 1 Wing, complete with ailerons and engine nacelles.
- 1 Wing Flap System (air brakes), with complete electrical operating mechanism.
- 2 Fins, non-adjustable, and 2 rudders with controllable tab.
- 1 Stabilizer, non-adjustable, and 2 elevators with controllable tabs.
- 1 Surface Control System, complete with lock (dual wheel type).
- 1 Parking Brake System, complete.
- 1 Landing Gear, retractable, with complete high speed electrical operating mechanism auxiliary hand mechanism, Goodyear 35x15-6 Airwheels with 35x15-6 Heavy Duty Tires, hydraulic brakes, fenders and Aerol struts.
- 1 Tail Wheel, with Goodyear 16x7-3 Airwheel and Aerol strut.
- 1 Pilot Seat, with adjustable, vertically, with safety belts.

Goodyear 35x15-6 Airwheels with 35x15-6 Heavy Duty Tires.

In addition to the Lockheed 10, this size Airwheel was used on the following aircraft types:



*Lockheed Model 12 "Electra Junior." U.S. Civil Aircraft, Vol. 7.*

*Barkley-Grow T8P. U.S. Civil Aircraft, Vol. 7.*



*Stinson A, T & U (the aircraft pictured is an "A"). U.S. Civil Aircraft, Vol. 6.*



*Fairchild A-942-A amphibian. U.S. Civil Aircraft, Vol. 6.*



*Bellanca 66-70 "Aircruiser". U.S. Civil Aircraft, Vol. 6.*

**As far as we know, the only example of any of these of these types to operate in the Central Pacific region was Earhart's Electra.**



# Location, Location, Location

Greg Stone has a clear recollection of where he was when he saw the object. He had come ashore at the blasted channel with a photographer from *National Geographic* and a Fijian member of the *Nai'a* crew who were going to try to get some photos of coconut crabs. While the others went crab hunting inland, Greg walked northward along the shore intending to follow the coastline around to the lagoon. He was particularly interested in the lagoon's function as a nursery for Black Tip sharks. As he remembers it, he had just rounded the corner of the passage and could begin to see into the lagoon when he spotted the object 15 or 20 feet from shore. In considering the possibility that the object might be wreckage from the Earhart plane, the location described by Dr. Stone is especially interesting.

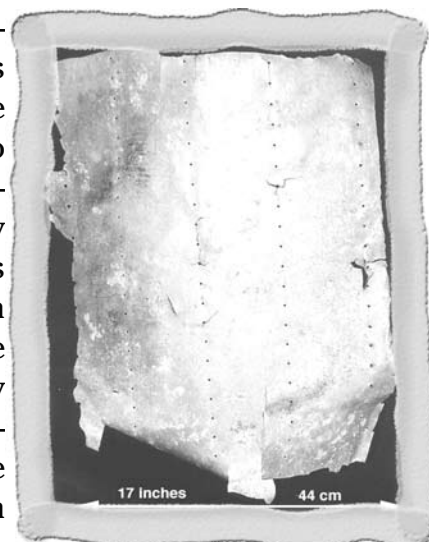
In 1997 Jeff Glickman of Photek did a forensic imaging analysis of two photos from a series

of aerial mapping photographs taken in 1953. He was seeking to corroborate anecdotal accounts by former residents of the island which described airplane wreckage allegedly seen on the reef-flat and shoreline near the main lagoon passage. Jeff's examination

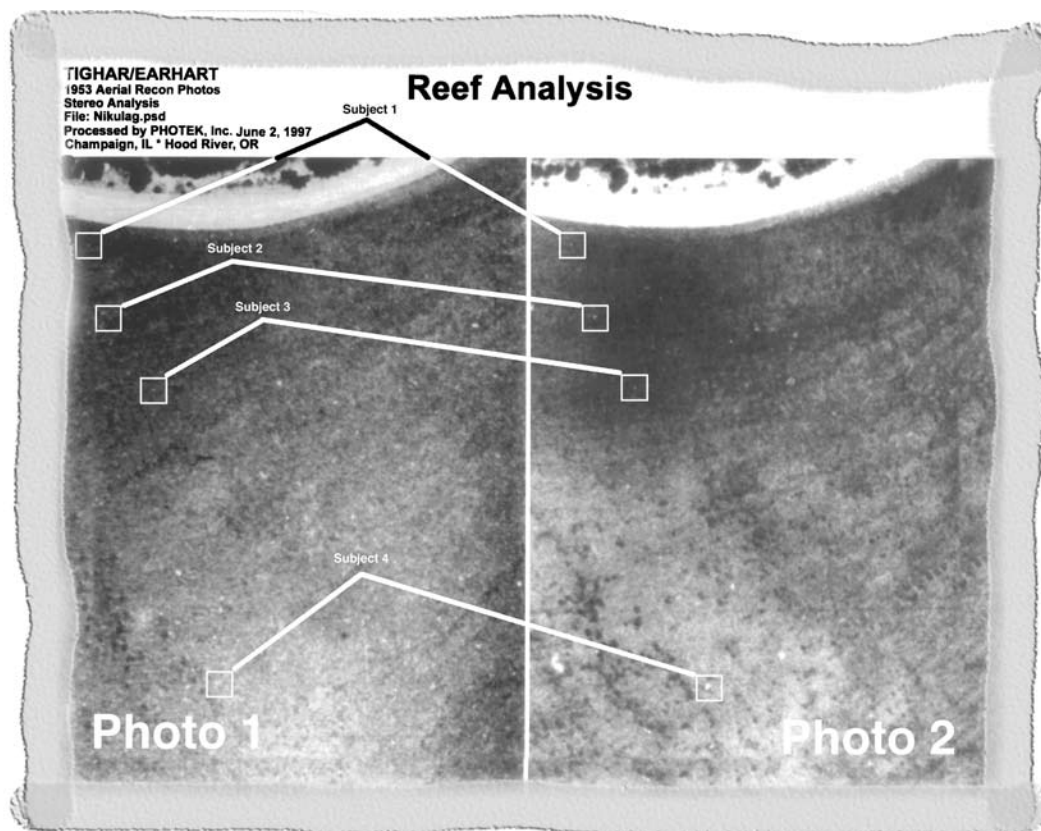
identified four light-colored objects, visible in both photos, lying on the reef-flat in perhaps three feet of water. In one photo the southern-most object is exhibiting a specular reflection typical of sunlight reflecting off metal. Although

there is no way to know what the objects were, their appearance in the photos is consistent with a debris field of sections of aluminum sheet nominally three to four feet square – somewhat larger, but not unlike, the section of aluminum aircraft skin found by TIGHAR (Artifact 2-2-V-1) just inland from the blasted channel.

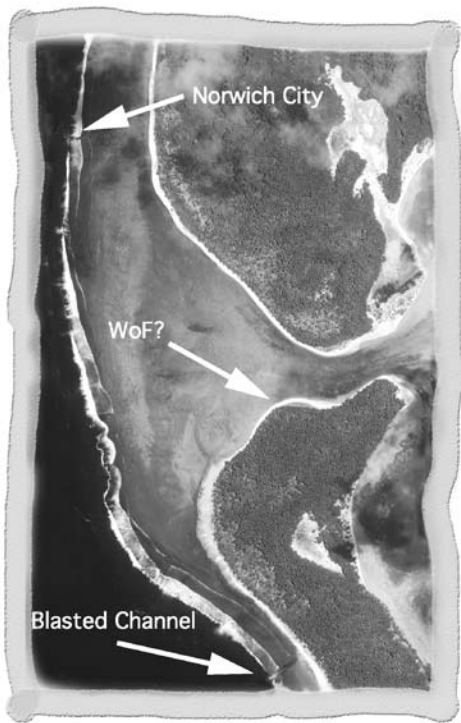
Whatever the identity of the objects seen in the 1953 photos, an inspection of the passage bottom by TIGHAR divers in 1999 suggests that they are no longer



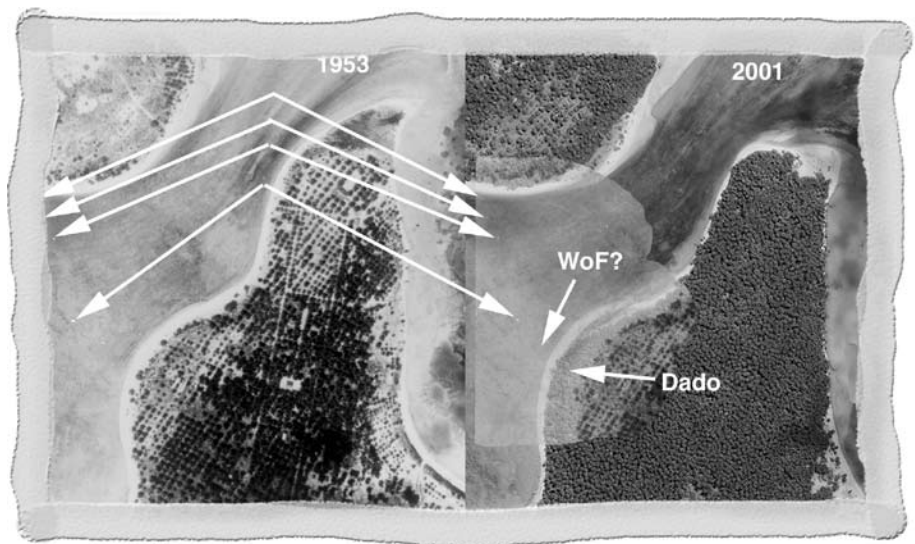
Artifact 2-2-V-1. TIGHAR photo by F. Lombardo.



Reef analysis photos courtesy PhotekImaging.com.



The "Wheel of Fortune" (WoF) was reportedly seen near the south shore of the main lagoon passage. Satellite photo by Spacemaging.com.



there. However, a comparison of the putative 1953 debris field with the location of the "wheel" indicated by Greg Stone and the place onshore where TIGHAR found another suspected Electra component – Artifact 2-1-V-8, the dado – in 1989 raises the possibility that all might be part of the same debris field.

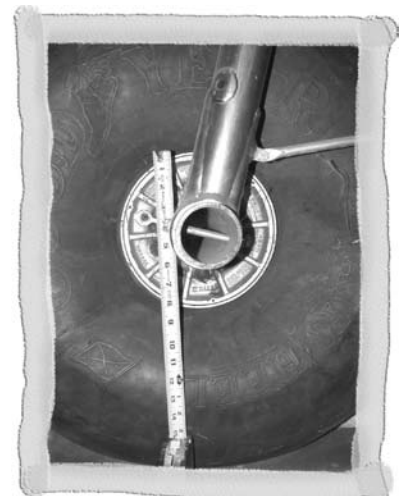
The WWII tire found in the lagoon suggests that rubber survives well in the Niku environment but no rubber was present on or near the "wheel" that Greg saw. The heavy duty Goodyear Airwheel tires were extremely durable and are not likely to have come off the wheel during the breakup of the aircraft nor could they have been cut off the rims without great difficulty. The wheel almost had to have been intentionally disassembled. It would therefore seem most likely that if the object Greg saw is from the Electra it is not simply a piece of debris that washed up but is, rather, a discarded component from a wheel and tire that washed ashore and was taken apart, possibly so that the rubber tire could be used for some local purpose.

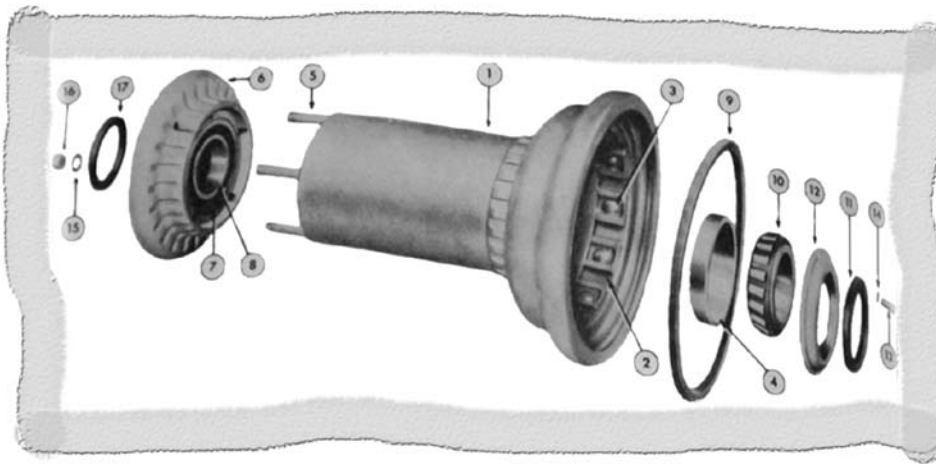
## Practical Considerations

Greg's recollection is that the diameter of the rim was approximately 12 inches. As shown in this photo of the Goodyear Airwheel on Lockheed 10A c/n 1052 at the New England Air Museum, the diameter of the "outboard" side of the Electra wheel is 8 inches in diameter and is, in Greg's opinion, a bit too small.

If the wheel was disassembled, the rim that Greg saw would have to be the "inboard" side that carried the brake assembly. The diameter of that rim is greater and more in line with what Greg remembers. The outboard rim of the Airwheel features identifying numbers and letters cast into the metal. The inboard side, unfortunately, may not.

However the object got to where Greg saw it, the fact that it was cemented into the reef surface so firmly that he was unable to pull it loose indicates that it had been in that spot for a matter of decades.

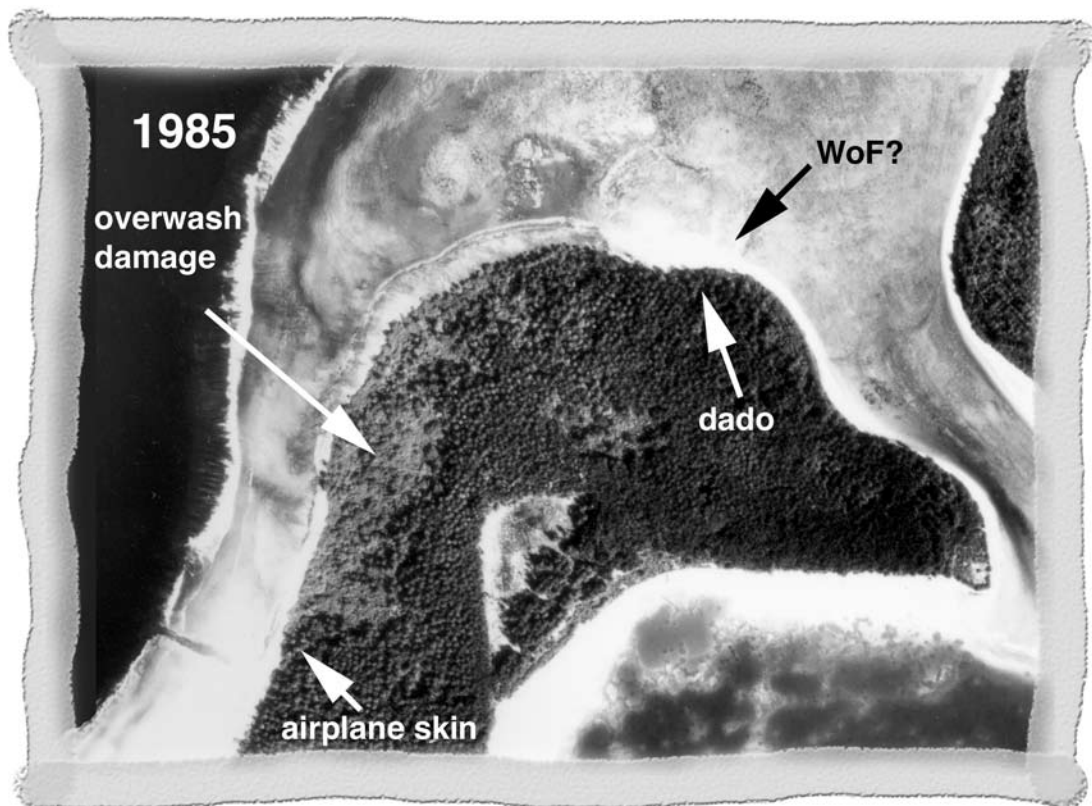




coconut jungle further inland and, for that reason, TIGHAR has previously spent little time in the overwashed area. We now, however, note that two of our most interesting artifacts were found on the borders of the overwash and we suspect that a detailed search of that area may turn up more aircraft wreckage that was driven ashore and buried in the sand.

TIGHAR's failure to notice it on previous trips is probably due to the fact that the sand depth on that part of the reef-flat varies greatly from year to year and even month to month. During periods of calm weather, the sand level near shore and on the beach tends to build up. Storms strip the sand from the bottom and from the beach and deposit it inland. The WoF was probably buried at the times when we walked past that spot. The incursion of sand and seawater also kills the beachfront vegetation causing the effect seen in this 1985 aerial photo. The vegetation grows back to dense underbrush rather than the open

Among the tasks of the Niku Vp Expedition will be an attempt to find, examine, and – if warranted – recover the object seen by Greg Stone in June 2002. Over the years we have investigated many leads. Some have rewarded us with important new information, but most have not. It's always easy to take incomplete information about an artifact and fill in the blanks with all the reasons why it could, or even should, be what you want it to be. This article is just such an exercise. All we can say at this point is that there appears to be more than enough reason to find out what the thing is.



*Photo courtesy Kiribati National Archive, Tarawa.*

# Realistic Expectations

Does the “WoF” have the potential to be the long-sought “smoking gun?” Probably not. Even if the object turns out to be part of a Goodyear Airwheel of the type used on NR16020 there will be no way to be sure that it is from that particular airplane (there is no known record of the serial numbers of the wheels on Earhart’s Electra, if they had serial numbers). The fact that there seems to be no other way for such a wheel to get there would make the circumstantial case for Nikumaroro even stronger than it already is – but that’s not a smoking gun.

The Niku Vp team will also conduct a reconnaissance in the overwash to assess how difficult it will be for the 2004 Niku V Expedition to run a detailed visual and metal detector examination of that area. In carrying out the recon they might come upon significant artifacts, but they probably won’t. It’s a large area.

The WoF and the overwash are pieces that seem to be part the puzzle we have already partially assembled. Only time will tell if they really fit and help fill in the picture further.

