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TIGHAR Tracks

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The Race To Find Amelia

And they're off!

The Deep Water Handicap

Never in the 65 years since the Earhart Electra failed to appear over Howland Island has there been more evidence that it did not crash into the sea, and yet, three (count 'em, three) separate multimillion dollar deep sea searches for the airplane are hoping to depart later this spring – all planning to scour the same patch of sea floor and each dreaming of being the first to find aviation history's Holy Grail. All are commercial enterprises in which investors will pay contractors to try to find the airplane. TIGHAR, of course, is not involved in any of these searches, but because they are likely to generate considerable press attention in the coming months, we thought the TIGHAR membership might like to know how such a bizarre race came about and see what the contestants are up against.

The Patron Saint of Crashed & Sank

All of the deep sea searchers want to look in the same place because they're all using the same set of assumptions compiled by retired airline pilot Elgen Long. Elgen is a mild-mannered, sincere gentleman who, in 1961, set an aviation record of his own by flying a twin-engine Piper Navajo around the world pole-to-pole solo. Almost thirty years ago Mr. Long and his wife Marie decided that the then-popular allegations that Amelia Earhart had been captured by the Japanese were not true and that the missing flight had instead run out of fuel and ditched in the ocean moments after the last inflight radio transmission heard by the Coast Guard at 08:43 local time on the morning of July 2, 1937. Of course, there is no evidence that it happened – no distress call, no floating debris – but the Longs just knew that it must have happened. As they say in their 1999 book, "We have known for twenty-five years that the solution of the Earhart mystery lies on the ocean floor under 17,000 feet of water." The Longs were also sure that the aircraft would be relatively undamaged and preserved in the cold, dark, oxygen-starved depths. Over the years, Elgen became the best known and most quoted proponent of the Crashed & Sank Theory.

In 1989, at their own expense, the Longs commissioned a bathymetric mapping of the ocean floor north and west of Howland Island where they were sure the plane went down. The average depth proved to be 17,250 feet and the bottom topography was smooth enough to permit a sonar search. The mapping cost about $35,000, but an actual search would be far, far more than the Longs could afford. Their solution was to seek an investor who would see the business opportunity in finding, recovering, restoring, and exhibiting the world's most famous missing airplane. They found him in venture capitalist Dana Timmer.

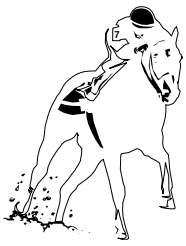
The Search That Didn't Happen

In 1994 Timmer put up the money to hire Williamson and Associates of Seattle, Washington to mount an underwater search for the Electra. The deep ocean technology firm led by founder and CEO Michael Williamson is best known for its

1986 discovery of the treasure ship *The Central America.* For the Electra search, Timmer commissioned Williamson and Associates to define a search area based upon Elgen Long's calculations of where the plane came down. The result was a daunting 2,000 square mile block of ocean to be examined with towed-array side-scan sonar. For a search platform Timmer arranged to charter a Russian vessel and for a while it looked like the Longs were finally going to be able to test their theory, but when the ship showed up in Seattle it was not as advertised and was incapable of supporting the technology Williamson needed to deploy. The whole venture fell apart with much embarrassment, great disappointment, and not a little acrimony. Timmer and Long parted company and Williamson went back to more profitable, if less romantic, pursuits.

In 1998 Elgen Long entered into an association with another deep ocean exploration company – Meridian Sciences of Annapolis, Maryland – with the understanding that the firm would find investors to back a search of his target area. Founded in 1987 by David Jourdan, Meridian Sciences (since renamed Nauticos) is an aggressive newcomer to the intensely competitive world of underwater engineering firms. Nauticos claims among its successes the discovery of the lost Israeli submarine *Dakar* in May 1999. Williamson and Associates also claims to have found the *Dakar* and, in truth, a third company, Phoenix Marine, had a hand in the operation. All three had help from the U.S. Navy. As we said, it's a competitive business.

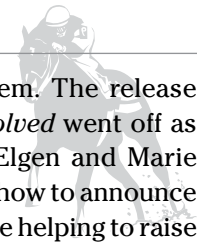
The Search That No One Noticed



By late 1999 no investors had stepped forward to fund the Electra search. Nauticos hoped that the publicity surrounding the Long's soon to be released Simon and Schuster book *Amelia Earhart – The Mystery Solved* would make the money hunt easier. On November 4, 1999 the local Annapolis, Maryland press carried the first public mention of Nauticos' intention to go looking for the Earhart plane. Ten days later, Nauticos and the Longs were thunderstruck by the news that a sonar search of "their" target area was already underway. Dana Timmer, as it turns out, had quietly maintained his relationship with Williamson and Associates and, with the help of Sacremento businessman Guy Zajonc, had secretly put together a reported $1.2 million for another search effort, this time using a 200 foot ocean-going tug named the *June T*. The new partnership, incorporated as Howland Landing, only revealed itself as its expedition sailed from Majuro in the Marshall Islands on November 14, 1999, provisioned for a 45 day voyage. To make matters worse, Timmer had reportedly gone so far as to negotiate the purchase of the Electra, wherever it may be, from Earhart's heirs. Although the legitimacy of such a transaction might be questionable, the seriousness of the searchers was not. For the first time, Elgen Long's theory was about to be tested while Elgen and Nauticos stood jumping up and down on the dock.

There was talk of a lawsuit, until somebody remembered that it was Timmer who had paid Williamson to delineate Long's search area back in 1994. The search was underway and all Nauticos could do was pretend it wasn't happening, and that's what they did. Fortunately for them, whether by accident or intent, the Howland Landing expedition received almost no media coverage. There was no film crew or media representative aboard, nor was the search equipped with any way to photograph and identify whatever targets the side-scan sonar might find. After six weeks at sea, during which an undisclosed portion of the 2,000 square mile area northwest of Howland Island was searched, the expedition returned to announce that "a couple" of interesting targets had been found. They hoped to return in the spring of 2000 to photograph the targets using a Remote Operated Vehicle (ROV) and, if neither proved to be the Electra, to search the remainder of the area. The media did not pick up the story and very few people were aware that the search even happened.

More Expeditions That Didn't Happen



Elgen Long wasn't about to tell them. The release of *Amelia Earhart – The Mystery Solved* went off as scheduled and, in Jaunary 2000, Elgen and Marie used an appearance on the NBC TODAY Show to announce that the PBS science series NOVA would be helping to raise the money to pay Nauticos to search for the Electra. An expedition was planned for later that spring, but although spring materialized, neither the second Howland Landing expedition nor the Nauticos search did. The economy was soaring but so was the cost of looking for airplanes on the bottom of the ocean. Two million, three million, five million – estimated budgets seemed to change weekly and apparently even dot-com start-ups looked like better investments than searches for a lost Lockheed.

For the next year or so, the prospect of further deep-sea searching for the Electra seemed to be dead in the water. Media attention focused on TIGHAR's planned Niku IIII expedition and over-blown (despite our best cautionary efforts) expectations that the anomaly in the satellite photo of Nikumaroro would prove to be the wreckage of the airplane. Nauticos maintained that they were planning a search for "late in the year" but nothing happened, nor was there further word from Timmer and company.

And ARGUS Makes Three

TIGHAR's Niku IIII expedition went off without a hitch and returned in late September 2001 with an abundance of new artifacts and information (see Progress Report in this issue of *TIGHAR Tracks*) but no "smoking gun." For TIGHAR members who understand that scientifically sound historical investigation is an exercise in delayed gratification, the expedition was another important and very successful step in what has become an epic quest to uncover the secrets of Nikumaroro and prove the project's hypothesis.

However, for Mike Kammerer, the eccentric New Mexico millionaire who funded about half of the cost of the expedition with his $300,000 purchase of the commercial exploitation rights (see *TIGHAR Tracks* October 2000), the lack of a smoking gun meant no story to commercially exploit. The way Kammerer saw it, TIGHAR was obviously wrong and Elgen Long was obviously right. Mike decided to launch his own deep ocean search of those fabled 2,000 square miles. On November 13, 2001 his company, In Search of Amelia LLC, announced that:

> The multi-million-dollar scientific expedition will search the seafloor under 17,000 feet of water off Howland Island with the autonomous underwater vehicle ARGUS (named after the all-seeing god of Greek mythology). The only underwater system in the world capable of conducting both sonar surveys and immediate photographic identification at these depths, ARGUS is the product of over two decades of underwater robotics research.

Well, sort of. ARGUS, in fact, is a new name for the Advanced Unmanned Search System (AUSS) developed and tested ten years ago by the U.S. Navy's Space and Naval Warfare Systems Center in San Diego, California. The device is essentially a remote-control 17 foot unmanned miniature submarine equipped with side scan sonar for finding things and lights and cameras for photographing whatever the sonar finds. Designed to operate at depths as great as 20,000 feet, AUSS performed well in 1992 U.S. Navy sea trials conducted at 12,000 feet and proved capable of searching almost one square mile of sea floor per hour. The battery was good for ten hours and it was estimated that the vehicle could be operated indefinitely with 3.5 hours between maximum depth dives. In theory, therefore, the sub could search about 20 square miles per day and cover 2,000 square miles in a little over three months of continuous operations. Set aside by the Navy for several years, the vehicle was later loaned to a relatively new company called Ocean Workers whose owner, Kenneth Collins, was yet another apostle of Elgen Long's assumptions. Ocean Workers refurbished and updated the Navy submersible in hopes of finding a commercial client who would fund a search for the Electra.

Because Mr. Kammerer has the financial resources to pay for his own treasure hunt, the principal obstacle to his planned search would seem to be whether ARGUS will pass sea trials at depths a mile deeper than it has ever been tested. At this writing (early February 2002), those trials have not yet been conducted and no firm expedition date has been set. Nauticos is talking about a thirty-day expedition later this spring but they are still looking for investors and have no ship chartered nor has a departure date been set. Likewise, Williamson and Associates are ready to continue their search if the Howland Landing group can come up with the money, but they too are looking for additional investors – no ship, no date. So, the Deep Water Handicap doesn't look like much of a horse race. Of the three declared entrants, two are still trying to come up with the entry fee and the one who is at the track isn't sure his horse will go the distance.

More information and updates, when available, may be found on the following websites:

Nauticos: http://www.nauticos.com

Williamson & Associates: http://www.wassoc.com

In Search Of Amelia LLC: http://www.insearchofamelia.com/index.html

For a description of the AUSS vehicle (aka ARGUS): http://www.spawar.navy.mil/robots/undersea/auss/auss.html.

RMS Titanic versus NR16020

Assuming one or more of the deep ocean searches actually puts to sea, what are the chances that Amelia's Electra will be found? As a means of getting some perspective on the probabilities, we thought it would be interesting to run some comparisons between the deep ocean search for the lost Lockheed and history's most famous successful undersea quest – the 1986 discovery of RMS *Titanic*. It's apples and oranges to be sure. The technology has improved and the sea floor in the Central Pacific is not as rugged as the bottom of the North Atlantic, but the biggest difference, of course, is that there was never any doubt that the *Titanic* was down there somewhere within a reasonably definable area, whereas the Earhart Electra is truly lost. Maybe it's on the bottom of the Pacific and maybe it's not. All that can be said with any degree of certainty is that it came down somewhere within an expanse of ocean and islands that represents the airplane's maximum estimated range from its last estimated general position. The area portrayed here is based upon the assumptions shown and represents just over 636,000 square miles. It is a conservative estimate.

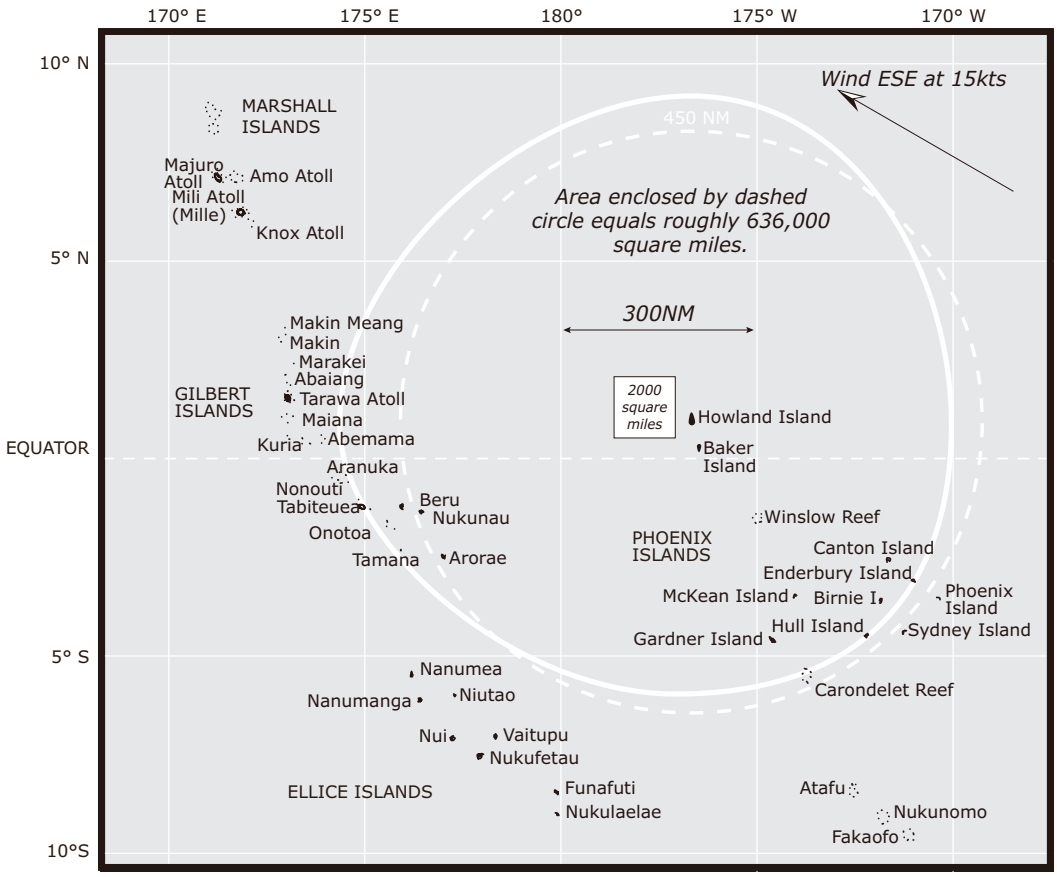
Constraining the search area to practical limits requires that guesses be made about what actually happened. We at TIGHAR, for example, launched our investigation in 1988 based upon the guess (or "hypothesis" if you prefer more syllables) that the flight had flown down the navigational line Earhart had said they were following and had landed at Gardner Island (now Nikumaroro). Searches of that location have uncovered compelling, but not yet conclusive, evidence that our guess is correct. All of the proposed deep water searches are based upon Elgen Long's guess that the airplane ran out of gas very shortly after 08:43 that morning and that it is possible to reconstruct, within searchable limits, where the airplane was when that happened – hence, the 2,000 square mile search area.

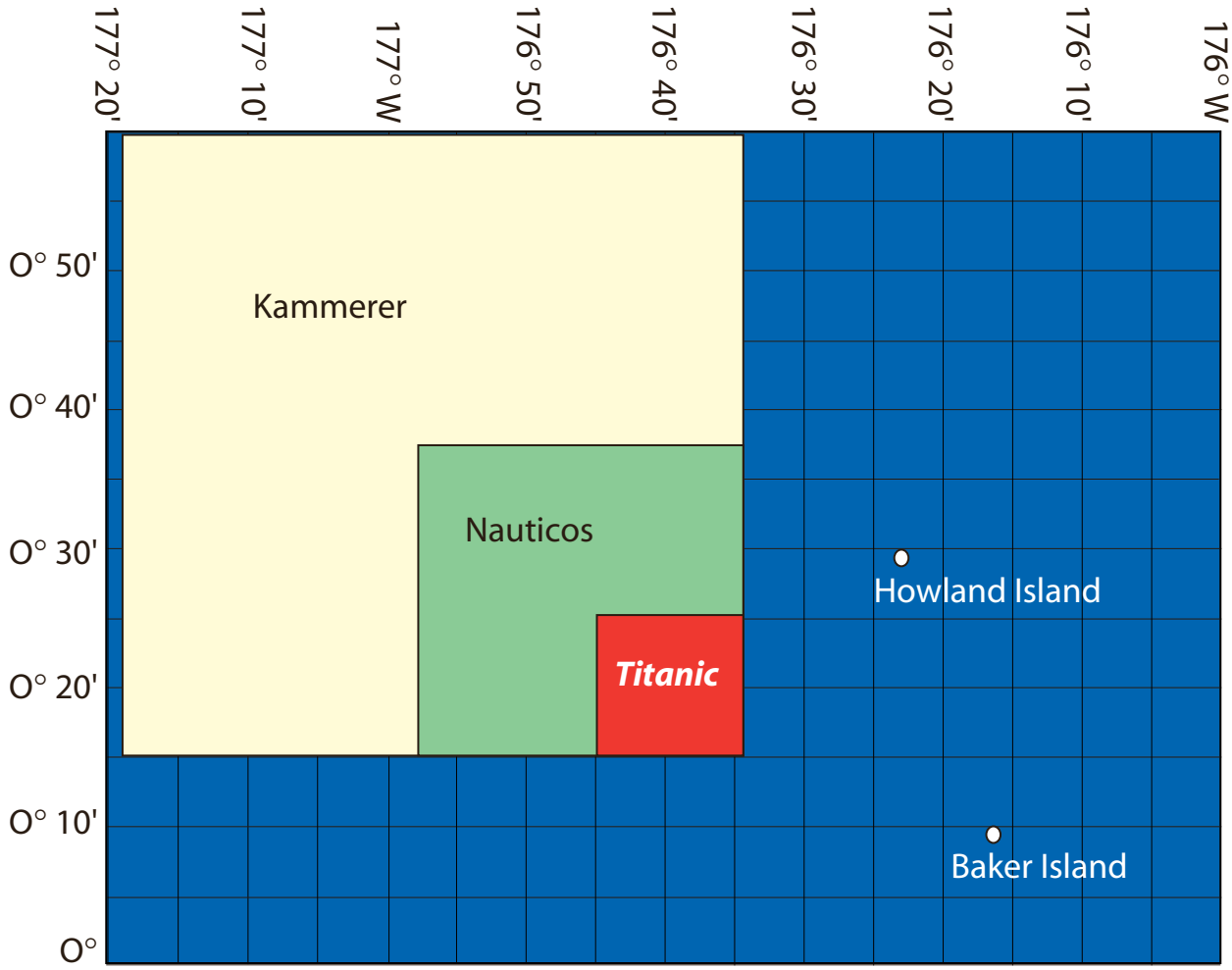
Nauticos, in fact, is willing to pile the guesses higher and feels that the search area can be narrowed to a mere 500 square miles. In the 1986 *Titanic* search, the primary area covered by the French research vessel *Le Suroit* and the American ship *Knorr*, was 100 square miles, and the ship was only found after the French sonar search had failed and Dr. Ballard's team aboard the *Knorr* decided to cover one last corner with a visual search using the Remote Operated Vehicle (ROV) "Alvin."

Area Enclosed by Solid White Line Represents Estimated Maximum Possible Range of Earhart Electra.

<u>Assumptions:</u>

1. Aircraft is 100 nm from Howland at 20:13 GCT (based on strength of last message received by *Itasca*).
2. Four hours fuel remaining at 20:13 GCT (based on known fuel load at takeoff, Lockheed fuel consumption tables, and known time en route).
3. Altitude 1,000 ft as reported to *Itasca*.
4. Airspeed 110 kts. Fuel consumption 38 GPH. (Twenty knots have been subtracted from the the flight-planned cruising speed of 130 kts which assumed an altitude of 10,000 ft.)
5. Weather, scattered cumulus at 2650 feet. Wind ESE at 15 (actual weather observation at Howland Island).

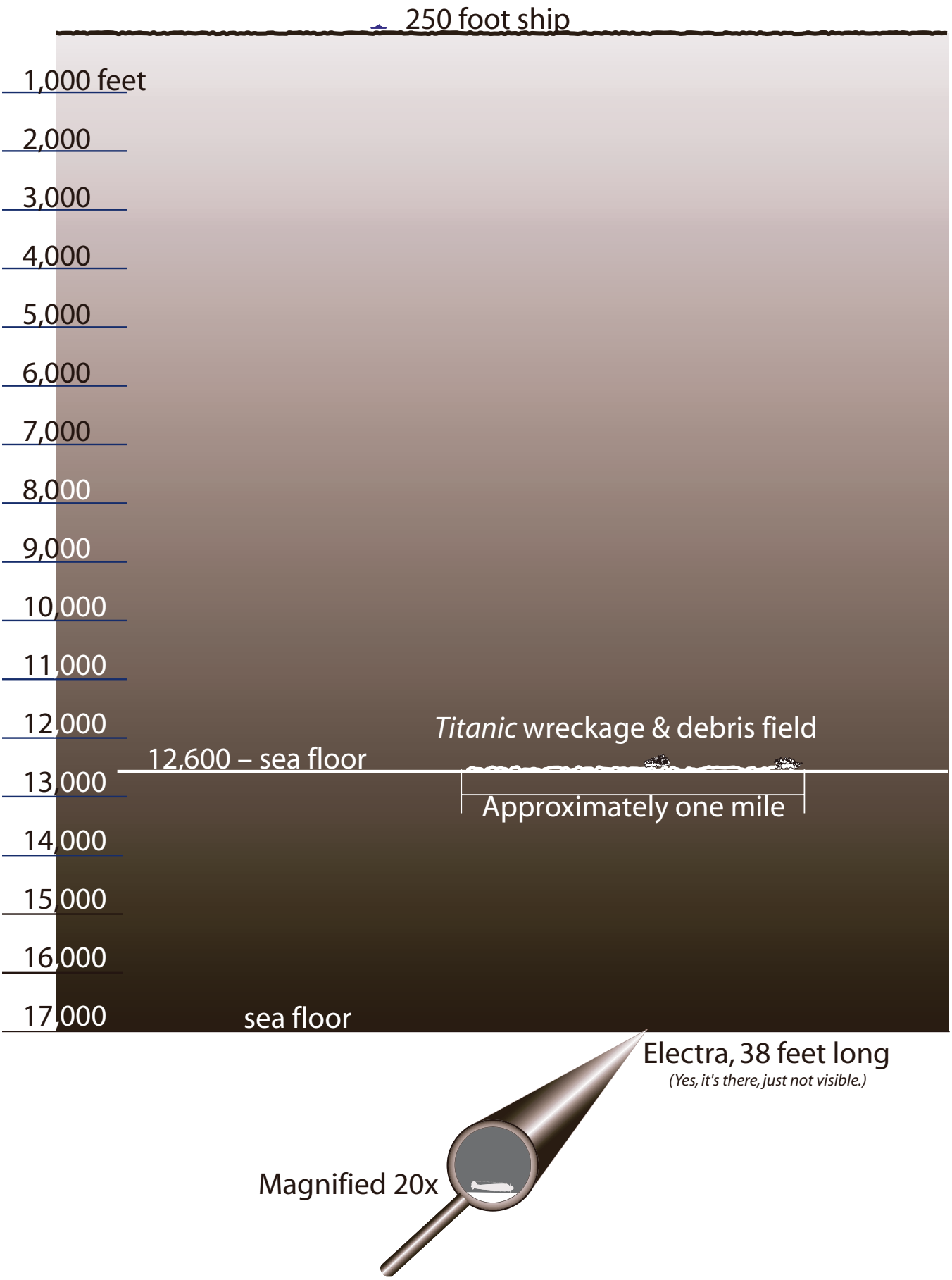




Note: Squares shown are for size comparison only. Exact delineation of the search areas planned is not known to TIGHAR.

More daunting, perhaps, than the immensity of the proposed search area is the tininess of the target. What Ballard's team initially found was not the sunken ship but part of the mile-long trail of debris deposited when the ship broke up as it sank. Not only is the lost Lockheed infinitely smaller than the aptly-named *Titanic*, but there will be no traceable debris field to stumble across even if the plane did not remain intact as Elgen Long supposes it did – and remember, the sea floor in the proposed search area is more than a mile deeper than where the *Titanic* was found.

Think of it this way: Climb aboard a blimp and take it up to 17,000 feet (remember to put on your oxygen mask). Look down and see if you can pick out that Lockheed Electra parked on the airport three miles below (did you bring your binoculars?). Now look out toward the horizon and imagine a square of countryside that's about 45 miles on each side. Your job is to find a crashed Electra somewhere out there and the fastest you can go is 5 knots. Oh, and by the way, you have to do it in the dark. And there's an excellent chance that's it's not there at all.


250 foot ship
1,000 feet
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
14,000
15,000
16,000
17,000
Titanic wreckage & debris field
12,600 – sea floor
Approximately one mile
sea floor
Electra, 38 feet long
(Yes, it's there, just not visible.)
Magnified 20x

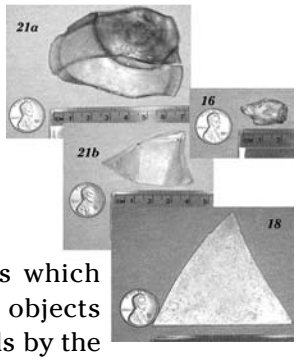
Niku IIII

Post-Expedition Analysis Progress Report

Artifact Identification

For more photos and full descriptions of artifacts see TIGHAR Tracks *November 2001, "Mysteries of the Seven Site" or Earhart Project Bulletin November 20, 2001 on the TIGHAR website at http://www.tighar.org/Projects/Earhart/Bulletins/11_20_01%20Bulletin/mysteriesbull.html.*

Glass Objects

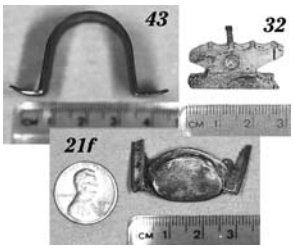


2-6-S-21a
2-6-S-21b
2-6-S-16
2-6-S-18

These are the glass fragments which we suspect are beachcombed objects which were used as cutting tools by the castaway. They are currently in the custody of Dr. Rob Jackson, an archaeologist in California with extensive experience in the evaluation of prehistoric tools. Here's an excerpt from his preliminary report:

> I have had an opportunity to take only a quick look at each of the glass artifacts so far. None appear to have secondary flaking (retouch) or obvious micro-flaking that may reflect heavy use. …
>
> Microflaking would not be expected for an unmodified flake tool that was used to cut soft material – even butchering. Anyone who knows how to butcher properly would avoid cutting into bone and damaging the tool edge. In other words, there is no obvious evidence of modification of the glass for use as tools. I looked at the newsletter sent with the glass artifacts and noted that some of the descriptions stated that the glass artifacts can be held "comfortably" or "safely" in the hand. I would caution against the "ease of prehension" argument, which I sometimes see in reports. Five million years of evolution have resulted in hands that accommodate all sorts of shapes.
>
> I will examine each artifact and describe the fracture patterns as well as both macro and micro wear, including striations that may reflect use."

"Hi-tech" Objects



2-6-S-43
2-6-S-21f
2-6-S-32

These artifacts appear to be internal components of one or more radio vacuum tubes. Although the exact tube or tubes they come from have not yet been pinned down, there is little doubt that we now know, in a general sense, where these things came from. The tubes were far too large to be associated with any of the radios aboard Earhart's Electra and it seems most likely that they were burned out or otherwise unserviceable components from the wartime Coast Guard Loran station which were brought to the Seven Site and used for informal target practice. We know, both from anecdotal accounts and from M-1 carbine shell casings and pieces of shattered dinner plates – one with the Coast Guard logo – that such activity took place at the site on at least one occasion. At this time at least, it does not look like the "Hi-tech" artifacts are part of the castaway puzzle.

The Knob

2-6-S-45

This object is certainly not part of a radio tube. The most intriguing thing about it is the fact that it appears

to have a patent number in raised letters on its exterior surface. The figures are very worn and are illegible even under conventional magnification. However, our Senior Archaeologist, Dr. Tom King, has been able to arrange for the analytical laboratory of the United States Naval Academy in Annapolis, Maryland to attempt to decipher the numbers. So far, with the help of ultrasound and a 1200X optical microscope, the lab has been able to see PATENT - N(?) - OL or UL and then indistinguishable numbers. The next step is to try a scanning electron microscope. If we can get the patent information we should be able to find out what and perhaps where the knob came from.

The Little Clips

2-6-S-03a
2-6-S-03b

These continue to utterly confound attempts to identify them. The closest we have been able to come is to note their apparent resemblance to fasteners seen in a low-resolution internet photo of a sextant box in a Portuguese collection (see http://www.antique-scientific-instruments.de/sextant.html). If that is what they are it could be an important link to the castaway, but the jury is still very much out on this question. As always, more research is needed.

Faunal Material

In addition to the various artifacts, a considerable amount of faunal material – fish bones and scales, clam shells, turtle bones, and bird bones – was recovered from the Seven Site. These were found in what appear to be meal sites and often show evidence of association with fire. Dr. King has distributed the faunal material to various experts for analysis so that we might learn what we can about just how many and what sort of critters were being eaten and how they were prepared. With that knowledge we should be able to make an informed judgement about whether we are looking at lunch leftovers from a Gibertese work party or the last meals of the castaway. So far, we're seeing evidence of activity that is much more consistent with what might be expected of an inexpert person from a European/American culture than that of Pacific islanders.

Two deposits of clam (*Tridacna*) shells, representing exactly 15 clams in each, were found at the site and, as described in the November *TIGHAR Tracks*, some of the shells were broken rather than pried open. We have since learned that island people rarely harvest the whole clam and carry it home. The clams are hard to pry off the bottom but the bigger ones can't fully close their shell so the islanders just remove the meat and leave the shell in the water.

Equally interesting are the results of expert analysis of the turtle remains we found at the site. It looks like we have a single animal, which would match Gerald Gallagher's description of the castaway campsite: "Body had obviously been lying under a 'ren' tree and remains of fire, turtle and dead birds appear to indicate life." It was probably a Green Sea Turtle (but DNA testing will tell us for sure) in the neighborhood of maybe 200 pounds but the odd thing is that the head and limbs are missing. This suggests that the turtle was butchered where it was found and killed – probably out on the beach while laying eggs – and only the meat and shell brought to the site. Island peoples, in contrast to their clam practices, usually carry the whole turtle, still alive, back home and keep it on its back until they're ready to cook it and eat it.

A sample of charcoal from the site is in New Zealand for radiocarbon dating. This certainly won't pin down whether the fire dates from 1937 or 1940, but will tell us if we're looking at a prehistoric site and assuming that it's much more recent.

Archaeology is a painstaking and often frustrating process, and as we've often said, the real discoveries usually happen in laboratories and archives, not in the field. Bit by bit, the picture of what happened at the Seven Site is starting to come together. So far, the best candidate for the star of this pilot episode of *Survivor* is still Amelia Earhart, but much work remains to be done.

Your continued support makes it possible. Thank you.