TIGHAR TRACKS

THE JOURNAL OF THE INTERNATIONAL GROUP FOR HISTORIC AIRCRAFT RECOVERY

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. . . that they might escape the teeth of time and the hands of mistaken zeal.

– John Aubrey
Stonehenge Manuscripts
1660

About TIGHAR

TIGHAR (pronounced "tiger") is the acronym for The International Group for Historic Aircraft Recovery,a non-profit foundation dedicated to promoting responsible aviation archeology and historic preservation. TIGHAR's activities include:

- Compiling and verifying reports of rare and historic aircraft surviving in remote areas.
- Conducting investigations and recovery expeditions in co-operation with museums and collections worldwide.
- Serving as a voice for integrity, responsiblity, and professionalism in the field of aviation historic preservation.

TIGHAR maintains no collection of its own, nor does it engage in the restoration or buying and selling of artifacts.The foundation devotes its resources to the saving of endangered historic aircraft wherever they may be found,and to the education of the international public in the need to preserve the relics of the history of flight.

TIGHAR Tracks is the official publication of The International Group for Historic Aircraft Recovery. A subscription to *TIGHAR Tracks* is included as part of membership in the foundation (minimum donation $55.00 per year).The editors welcome contributions of written material and artwork. Materials should be addressed to: Editors, *TIGHAR Tracks*, 2812 Fawkes Drive, Wilmington, DE 19808 USA; telephone (302) 994-4410, fax (302) 994-7945; email tigharpat@mac.com. Photographs and artwork will be returned on request.

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He was known to his fellow Alaskan bush piilots as "Thrill 'em, spill 'em, but never kill 'em Gillam" until the snowy day in 1943 when his luck ran out. Now the wreck of his Lockheed Electra has yielded important clues in TIGHAR's investigation of the Earhart disappearance. Artwork courtesy University of Alaska. Used by permission. All rights reserved.

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THE YEAR OF THE DADO

In the annals of TIGHAR's Earhart Project the year 2004 will be known as the Year of the Dado. Three expeditions were conducted to test the hypothesis that artifacts recovered on Nikumaroro in 1989 and 2003 were "dados" identical, or at least significantly similar, to those used in the construction of Lockheed Electras. As so often happens, the results of the tests did not support the original hypothesis but, instead, suggested a new and potentially more conclusive possibility.

Before we describe the expeditions and what we learned from them it will be helpful to briefly review what we knew, and what we thought we knew, when we began this year's investigations.

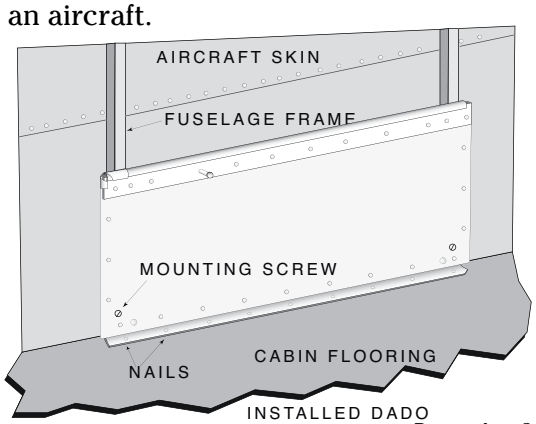
The September 2003 issue of *TIGHAR Tracks* featured an article entitled "Dados Galore" which recounted how the first TIGHAR expedition to Nikumaroro in 1989 had collected a rectangular structure that we at first thought might be the cover of some kind of aluminum box. Materials analysis by the National Transportation Safety Board (NTSB) laboratory confirmed that the object was made with aircraft-grade aluminum and rivets. Then in November of 1991 we showed it to some senior employees in the "completions shop" (the facility that tailors the interior furnishing of new business aircraft to a specific customer) at Atlantic Aviation here in Wilmington, Delaware. They immediately recognized the assembly as a "lower dado panel" – a baseboard-like non-structural component commonly used in a category of relatively small aircraft known as "cabin class twins," two-engined airplanes that typically carry between six and twelve passengers in a cabin that is entered via a door in the side.

A dado (pronounced DAY-doh) serves as a juncture between the floor and the fabric-covered interior wall of the cabin, providing protection to control cables or other components against kicks and bumps. The one we had appeared to have been anchored to the floor by means of a right-angle flange. The holes in the flange are not a standard rivet size and the bottom of the flange exhibits what appear to be pry marks immediately adjacent to the holes, leading us to conclude that his particular dado was probably nailed to a wooden floor. The Lockheed Model 10 had a wooden floor.

Along the top edge of the artifact was an elongated rivet at the base of which was a small surviving fragment of the original insulation and woven fabric that once covered its surface. A short 180° flange along the top edge held the insulation in place and the mottled appearance of the metal surface may have been caused by residue from adhesive used to attach the insulation. The fragment of insulation was 1/4 inch thick. The woven fabric was blue. Unfortunately, the fragment of insulation and fabric were lost by the NTSB lab before we were able to perform tests to conclusively identify the materials. We do know, however, that Lockheed Electras were soundproofed with 1/4 inch "kapok felt" and a material called "Seapak."

Two holes near the bottom edge of the artifact were thought to be "mounting holes" where the object had been fastened to the underlying aircraft structure. The fact that the holes are 15 inches apart was seen as possibly significant because the circumferential bulkheads of the Lockheed Model 10 are nominally 15 inches apart.

This drawing appeared in the September 2003 *TIGHAR Tracks* as an illustration of what we thought the dado would look like when installed in an aircraft.



The whole dado question became more pressing when the 2003 Niku Vp expedition team returned with two more dados that were discovered very close to the spot where the first one had been found in 1989. Rather than a single isolated artifact, we now had three identical objects of various lengths in assorted states of disassembly. It was now apparent that someone who lived on Niku at some time in the past had somehow acquired a number of these objects and had systematically taken them apart and cut them up for some local purpose – most likely fishing lures. With this new understanding we were able to identify another artifact recovered in 1989 as very likely the remnant of a fourth dado.

Artifact 2-7-V-1 was found in 2003. TIGHAR photo by J. Clauss

That there had been a number of these objects recovered and used by the people who lived on the island was an important revelation but the essential questions were whether Lockheed Electras, and specifically Earhart's Electra, had dados and, if so, did they look like our dados? None are visible in photos of the interior of NR16020 but it is entirely possible for a dado to be installed behind the upholstering that covers the inside of the cabin walls and, besides, the only known photos of the Electra's interior were taken before the extensive repairs and refitting that followed the Luke Field crash.

Electras in museums were of little help. If the interior of an aircraft has been refurbished or upgraded at some time in its career, chances are that features like dados have been replaced. Electras in museums have survived long service with many owners and most have had their cabins stripped and refurbished several times. It is also true that museums take a dim view of visitors slitting open the upholstering to see what is behind it.

We hoped that the Lockheed engineering drawings for the Model 10 on file at the Smithsonian's Garber Facility archive would tell us whether dados were used and what they looked like. Days of peering at reel after reel of microfilm revealed some tantalizing hints but no drawings of dados. Close examination of old photos seemed to confirm the presence of dados in Electra cabins but there wasn't enough detail visible to tell if they were made like the ones we found on Niku.

Somehow we had to find a Lockheed Electra with cabin furnishings that were still just the way Lockheed had installed them in the 1930s. We reasoned that our only hope was to find an airplane that had crashed early in its service life and had remained relatively undisturbed ever since. It was a tall order but as we went down the list of known Electra losses there were three that seemed like possibilities.

THE MOUNT RICHMOND WRECK

Union Airways Electra ZK-AFE. Courtesy Electra Flying *by Richard J. Waugh*

On May 7, 1942, a Lockheed 10A operated by Union Airways of New Zealand flew into Mt. Richmond, a 5,770 foot mountain in the northern part of South Island. Registered as ZK-AFE and named "Kereru," the aircraft was built in 1937 and bore constructor's number (c/n) 1103. The pilot, copilot and three passengers who died in the crash were New Zealand's first airline fatalities. The airplane served its entire five-year career with the airline and almost certainly still had its original interior at the time of the crash.

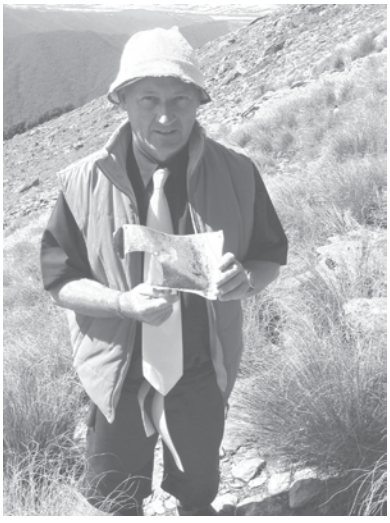
People who had visited the site in the past few years reported that the wreck was still in remarkable condition, and although it had burned on impact, much of the debris was still there "looking like it crashed yesterday." Photos of the wreckage confirmed the excellent condition of the metal so New Zealand TIGHAR member Howard Alldred – a veteran of the 2003 Niku Vp

expedition – volunteered to go to the site and see what might remain of the cabin furnishings. Howard visited the site on February 19, 2004 via chartered helicopter.

The fragmented wreckage of Lockheed 10A ZK-AFE is scattered on the face of Mt. Richmond.

The Hughes 500C on Mt. Richmond. Photos courtesy Howard Alldred.

The plane had impacted the rock face of the mountain "going full chat" (as Howard put it) and the wreckage is a study in what happens when the irresistible force meets the immovable object. Although the many photos Howard took give us valuable information about how an Electra comes apart under those circumstances, no portion of the cabin survived to provide a context for our dado investigations.



Howard Alldred with debris from ZK-AFE.

THE IDAHO WRECK

In the early morning hours of December 18, 1936 Northwest Airlines Lockheed 10A NC14935, carrying mail from Missoula, Montana to Spokane, Washington crashed during a winter storm in heavily wooded mountainous terrain in northern Idaho. There were no passengers. The pilot and copilot were killed on impact. The wreck was located on December 26 and the bodies were recovered along with the seven of the sixteen mailbags that did not burn in the post-crash fire.

The 24th Electra built, c/n 1024 was delivered to Northwest on May 25, 1935. Because it had only one owner and was lost only about a year and half after it entered service it probably still had its original interior furnishings, including dados. Contemporary reports suggest that the post-crash fire was limited and there seemed to be a good chance that portions of the cabin were not burned. As far as we could determine, no one had intentionally visited the wreck since 1936 so we had hopes of a relatively undisturbed wreck.

On July 9, 2004, a team of seven TIGHAR expedition veterans, accompanied by three representatives from the U.S. Forest Service, located the crash site in a creek bed at essentially the exact position described in a 1936 newspaper account. Unfortunately the location was a little too easy to find because it immediately became clear that the wreck had been salvaged for aluminum – possibly during the scrap drives of the 1940s. There was very little aluminum left, while virtually all the ferrous material was still there.

As with the Mt. Richmond wreck, valuable information was gathered from the wreckage that remained but the search for dados was again frustrated.

The Idaho team; l. to r.: Andrew McKenna, Bill Carter, John Clauss, Gary Quigg, Team Leader Walt Holm, Craig Fuller, and Tom King. TIGHAR photo by W. Carter.

THE KETCHIKAN WRECK

NC14915 in service with the Morrison-Knudsen Company in Alaska.

On the evening of January 5, 1943, Lockheed 10B NC14915 owned by the Morrison-Knudsen Company (a construction firm) made a forced landing due to an engine failure in heavily wooded mountainous terrain approximately 30 miles east of Ketchikan, Alaska in what is now the Tongass National Forest. There were five passengers plus the pilot aboard. The descent into trees resulted in extensive damage to the aircraft and serious injuries to three of the passengers. There was no fire. The pilot, a well-known Alaskan bush pilot by the name of Harold Gillam, tried to walk out to get help but died of exposure in the attempt. One of the passengers died of her injuries after two days without medical attention. An extensive land, sea, and air search of the region by civilian and Coast Guard resources gave up after three weeks of hazardous but fruitless operations.

On February 3rd two of the four survivors hailed a Coast Guard patrol boat from the shore and led rescuers to the other two. The four had survived for an incredible 29 days in the Alaskan winter. For the story of the wreck and the rescue see “The Men Did Their Duty,” page 9.

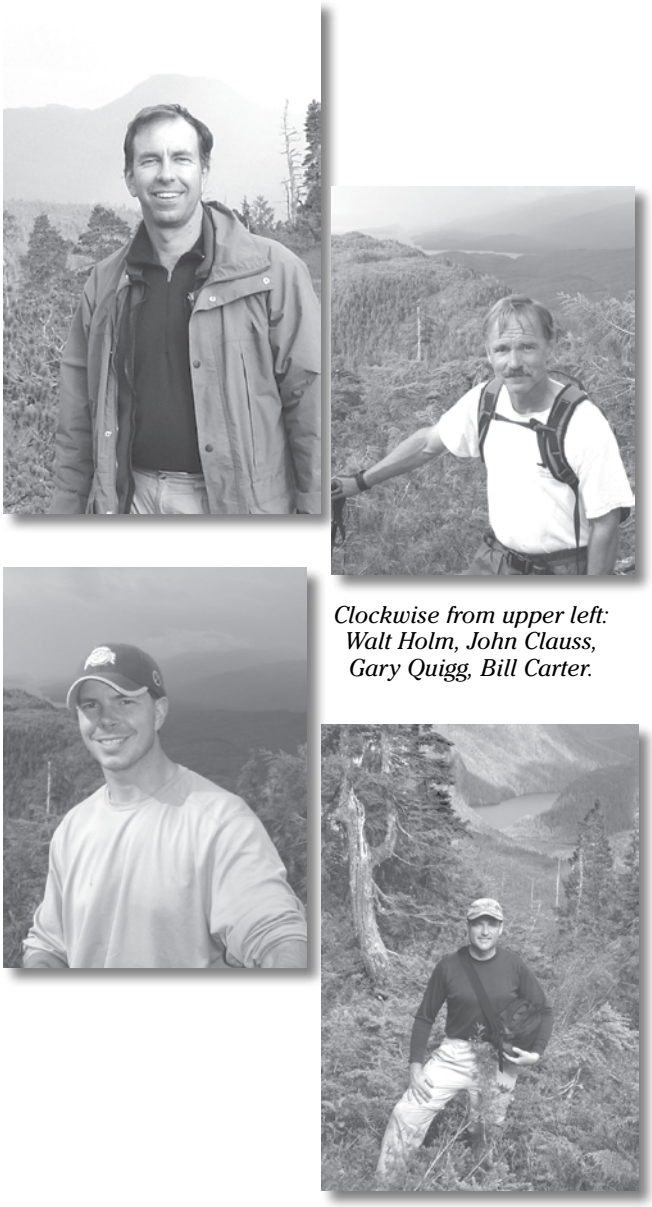
NC14915 was Lockheed c/n 1021, the 21st Electra built. It was delivered to Northwest Airlines as a Model 10A on March 29, 1935 and was, in fact, part of the same batch of Northwest Electras as the wreck in Idaho. Northwest later sold the airplane to Boston & Maine Airlines who, in turn, sold it to National Airlines in Florida. It was subsequently sold to Star Airlines who converted it to 10B configuration (replaced the P&W R985 engines with Wright R975s of the same 450 hp) and finally to Morrison-Knudsen.

With eight years in service, four changes of ownership, and one major modification, the chances that the aircraft still had its original interior at the time of loss were poorer than with the Idaho wreck. However, Electra wrecks that were not consumed by post-crash fires are extremely rare and photos taken at the site in 1981 showed that the wreck was still relatively undisturbed at that time. The decision was made to try to send a TIGHAR team to the Ketchikan wreck.

An expedition into the mountains of the southwestern Alaskan wilderness was a rather different proposition than the New Zealand or Idaho investigations. Because the site is in the Misty Fjords Wilderness, motorized vehicles, including helicopters, are prohibited. The team would have to be landed on the shore by boat or floatplane and then proceed on foot. They would have to be prepared to deal with the weather, the terrain, and the bears. As in Idaho, the operation would require the approval and cooperation of the U.S. Forest Service.

Fortunately, USFS archaeologist John Autrey took an interest in the case and put together a team made up of himself, another Forest Service archaeologist by the name of Martin Stanford, and two experienced back-country Forest

Service Rangers, Chris Prew and Jeff Garnette. They were joined by a TIGHAR team led by Walt Holm (TIGHAR #0980CE) which included Bill Carter (TIGHAR #2313CE), Gary Quigg (TIGHAR #1025CE) and John Clauss (TIGHAR #0142CE) – all veterans of numerous TIGHAR expeditions.

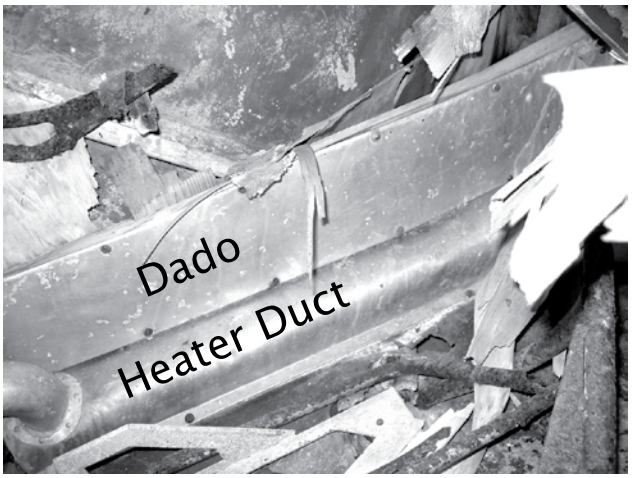


Clockwise from upper left: Walt Holm, John Clauss, Gary Quigg, Bill Carter.

On August 3, 2004 the joint TIGHAR/USFS team was inserted at the head of Badger Bay by two de Havilland Beaver floatplanes and began the five-mile trek to the site. Rain, steep boggy terrain, and thick undergrowth made the going extremely tough but after a nine hour trek the team reached the wreck site and found a time capsule of information.

Thick going. TIGHAR photo by W. Carter.

Although much torn apart in the initial crash, the aircraft had suffered very little from salvage or looting and examples of many of the more fragile components in the cabin including wood flooring, linoleum, insulation, artificial leather, wood veneer – and dados – had survived. The dados were of very simple construction; just pieces of light-weight sheet aluminum fastened to underlying aircraft structure with screws and not at all like the artifacts that have been found on Nikumaroro.



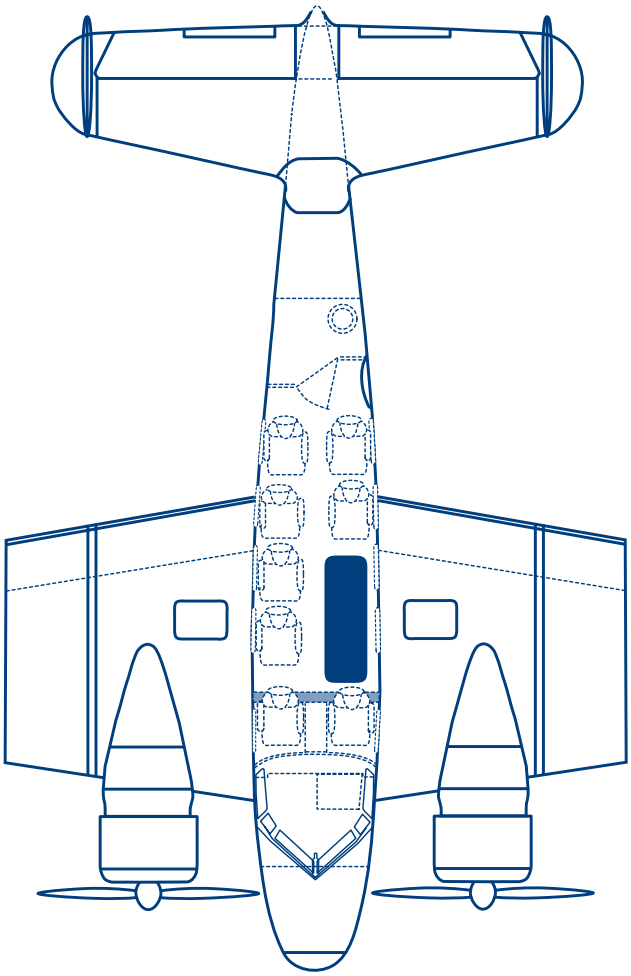
The dados in the NC14915 were installed along the cabin wall just above the heater duct. Also visible in this photo are remnants of the thin wooden mahogany veneer that once covered the cabin wall. TIGHAR photo by J. Clauss.

It was also discovered that NC14915 had been modified by the addition of an auxiliary fuel tank installed in the cabin on the left hand side just aft of the main beam. The addition of this extra fuel reserve was probably prompted by the unusually long distances the aircraft flew in service to Morrison-Knudsen (see graphic next page).

But the most interesting discovery was the presence of heavy asbestos insulation that covered the cabin heater duct where it passed beside the auxiliary fuel tank.

As detailed in The Un-dados (page 34), the now-documented need to provide an insulating barrier between the heater duct and a fuel tank installed in an Electra cabin reinforces a new hypothesis that was already under discussion about the function of the structures found on Nikumaroro that we have been calling "dados."

In this photo the auxiliary fuel tank has been pulled aside to reveal the wooden slats to which it was mounted and the heavy asbestos matting installed over the heater duct and held in place by the dado. TIGHAR photo by J.Clauss



An auxiliary fuel tank was installed in the cabin of NC14915 replacing two passenger seats on the left hand side of the airplane.

A CLASSIC PATTERN

The pattern of this past year's research is classic. Based on the best information available, we formulated a hypothesis that the objects we had found on Nikumaroro were dados from a Lockheed Electra. We tested the hypothesis by seeking out known examples of Lockheed Electra dados. It took three expeditions in various corners of the world but we were ultimately successful in answering the question. The results were negative and do not support the hypothesis. However, in eliminating one hypothesis we stumbled upon clues that support a new possibility which we will, in turn, attempt to test. This two-steps-forward-one-step-back process is how most scientific and historical discoveries are made. It's slow and often frustrating, but it works.

"THE MEN DID THEIR DUTY"

The Story of the Ketchikan Electra Crash

by Arthur Rypinski, TIGHAR #2548

Harold Gillam was worried. The windscreen was obscured by ice and sleet, but, between the cloud and the winter twilight, there was nothing to see anyway. The Electra was icing up, and she handled sluggishly. But that was normal for Alaska in winter. According to the radio compass, he should be right on top of his destination, the Annette Island army airfield. But the chart and the radio beacon weren't adding up. Perhaps they were in a shadow zone? He decided he had better pin down his position with a radio direction finder bearing.

Suddenly, the aircraft yawed sharply to the left. The continuous roar of the two 450 horsepower Wright engines, their props spinning within a few feet of his ears, and deafening after a long flight, became discordant. A glance at the panel showed the oil pressure gauge on the left engine dropping to zero. Gillam reacted: applying right rudder to straighten the aircraft. Because the Electra was not equipped with full-feathering propellors, he set the prop of the dead engine to high pitch to reduce drag, and advanced the throttle on the right engine, advancing its prop to low pitch.

Another glance at the instrument panel showed that the altimeter was unwinding. The ice: with only one engine, the added burden of the invisibly accumulating ice made the aircraft too heavy to maintain altitude. They would be on the ground soon. However, at 7,000 feet, he had some time.

He picked up the microphone and called the Annette Tower, declaring an emergency. At that instant, the aircraft seemed to fall away beneath him. The altimeter began to spin, round and round like Death's own clock. Gillam dropped the microphone and grabbed the yoke with both hands. As quickly as it had begun, it stopped. The aircraft broke out of clouds and into the winter twilight. The altimeter stopped spinning but continued its downward course. The downdraft had left him at only 2,500 feet. Keeping the rate of descent to a minimum was vital, but tricky. There was less time.

It was only then that Gillam became aware of Gebo. Robert Gebo was sitting next to him, in the copilot's seat. He was a senior manager in Gillam's company, the Morrison-Knudsen construction company. He wasn't an aviator, but he was sitting up front and had

been helping out with navigation. Gebo was shouting at him and gesturing wildly at the windscreen. Gillam leaned over and peered out.

Rearing up above them was the forested wall of a mountainside. There was no way over the wall. Gillam pulled the aircraft over into a left bank, as sharply as he dared. There wasn't much airspeed and a stall would be death. As he straightened the aircraft out, he spotted, just in front of him, a clearing on the shoulder of the mountain. It wasn't very big. It wasn't very flat. It wasn't really clear. No one would voluntarily try to land a 10,000 lb. aircraft in that small, rocky space. But there was no more time.

In his last act before surrendering aerodynamics for ballistics, Gillam pulled the Electra's nose up. The Electra momentarily halted its descent and slowed as Gillam traded his last reserve of forward air speed for a pinch of altitude. As the air speed dropped, the Electra stalled.

The nose began to drop; a huge fir tree appeared and rushed towards Gillam. For a moment, it looked like a clean miss, but the tree slammed into the right wing and ripped it from the aircraft. The tree stood as guardian on the edge of a steep, forested, snow-choked ravine. The aircraft spun round from the impact and disappeared into the ravine. An instant later, the fir tree toppled into the ravine. The snow continued to fall.

2.

In the Annette Tower, the Army air controller was worried, too. At about 6:45 pm on 5 January 1943, a Lockheed Electra 10B, with a pilot and five passengers, had declared an emergency due to loss of an engine. As the minutes ticked away, and the Electra failed to either appear or respond to radio calls, tower personnel would have likely checked by radio with alternate airfields to see if Gillam had landed elsewhere. What they would have learned, then or later, was not helpful. Gillam had not landed elsewhere. There had been no radio contact with Gillam from the time he took off from Seattle's Boeing Field (at 1:27 pm) until his distress call, and none since.

Alaska in the winter is not a good place for an aircraft to go missing, and wartime is not a good time.

Six months before, the Japanese had occupied the islands of Attu and Kiska at the Western end of the Aleutians, and six months later, the U.S. forces would launch a campaign to expel them. In the interim, airfields and supply depots were being constructed and stocked to support the coming campaign, with many of the supplies traveling by sea through the Inland Passage. The Annette air field was part of a chain of military airfields linking Seattle with the Aleutians, located in the perpetually rain and fog-drenched Southeast panhandle of Alaska, about 15 miles south of Ketchikan.

Morrison-Knudsen was one of the civil contractors constructing the network of bases. It was difficult and sometimes dangerous work, and Morrison-Knudsen's Alaska operations, like much else in Alaska, had come to depend on aviation. Harold Gillam was Chief Pilot, holding single and multi-engine commercial pilot certificates, with land, seaplane, and instrument ratings. He had 7,415 flying hours, including 750 hours in the Lockheed Electra.

Harold Gillam was a pioneering bush pilot whose experience dated to the dawn of Alaskan aviation with flying experience throughout Alaska and even Siberia. In November 1929, as a novice aviator with only 40 hours of flight time, Gillam flew an open cockpit Stearman into the interior of Alaska searching for missing aviator Ben Eielson. Gillam found the wreckage and brought out the body. In 1931, Gillam started his own air service. He became known to his contemporaries as "Thrill 'em, spill 'em, but never kill 'em Gillam," because of his six accidents in his first six months of service, none fatal. Gillam's fellow pilots also spoke of "Gillam weather," weather so bad that no one but Gillam would fly.

It is likely that the Annette Tower notified Captain Frederick A. Zeusler, District Coast Guard Officer, 13th Naval District, in Ketchikan. Zeusler, in his fifties, was an old Alaska hand, having spent years before the war cruising the Aleutians. In 1938, he had published an enthnographic study of the Inuit communities he visited.

Captain Zeusler would have studied the available information on Gillam's flight plan. Based on flight time, Gillam should have been relatively close to Annette, but there was no way to be sure. Zeusler ordered an air search for the morning.

3

Disaster had overtaken the Electra so quickly that none of the passengers had a chance to even fasten their seat belts. Joseph Tippets, a husky Civil Aeronautics Administration mechanical inspector, found himself sitting in silence in the dark passenger cabin. As a safety inspector, Tippets couldn't miss an unusual feature of the Electra: a big aluminum auxiliary fuel tank that sat at the head of the passenger cabin, presumably filled with high octane gasoline. Now, Tippets became aware of a loud hissing, like 50 angry teakettles boiling over at once. In his mind's eye, Tippets could visualize the flames starting from the engine and spreading, even now, towards the cabin. Looking about him, Tippets saw light streaming through an opening in the top of the fuselage. He leapt to his feet and shoved his way through the gap. The torn metal slashed at his head and shoulders.

He found himself sitting in the snow outside the aircraft. One wing was gone, and the rear fuselage, though upright, was shattered where an immense hemlock tree had fallen on it. The hissing sound was diminishing, and Tippets saw that the hot engines were settling in deep snow, boiling off the snow around them. There was no fire. He began calling the names of his companions, but there was only silence and torn metal. "I am the only one alive," Tippets thought. Suddenly, the Alaskan wilderness seemed infinite.

He spotted the cockpit section, and entered. There he found, to his immense relief, Gillam and Gebo, alive but unconscious. Gillam had a bloody gash on his head. He roused Gillam, and together they climbed out of the aircraft.

Gebo gradually returned to consciousness. He was sitting in the cockpit of the Electra, and Gillam was moving around outside the aircraft. He felt a wound over his eyebrow, and noticed he was covered in sticky blood. He released his seat belt, and tried to stand up, but his left leg collapsed under the weight and he lost consciousness again. When he awoke, he crawled through the cockpit door and into the passenger cabin. The cabin was dark. He heard the voice of passenger Susan Batzer calling for help.

Susan Batzer was 26 years old, and had just been hired by the Civil Aeronautics Administration as a stenographer. She had four sisters and her parents in Idaho Falls, and was traveling to her new job. Robert Gebo was unable to help. He climbed onto the auxiliary fuel tank, and shouted to Gillam that he had broken his leg.

When he next awoke, he was sitting on a log outside the aircraft, with no recollection of how he had gotten out.

Dewey Metzdorf was lying beside Gebo, covered in coats. He had been pinned in his seat by the auxiliary gas tank, and suffered a broken collar bone and several broken ribs. Metzdorf ran the Anchorage Hotel, and was returning from a business trip. Since Metzdorf weighed 220 lbs, extracting him from the wreckage must not have been easy.

Percy Cutting initially seemed the least injured of the passengers, though, along with Metzdorf, he had been pinned in his seat by the fuel tank. Cutting, a mechanic, was also employed by Morrison-Knudsen.

Gillam, Cutting, and Tippets returned to the cabin to see to Susan Batzer. She was conscious and alert, but her hand was pinned between the ruins of the cabin door and the cabin wall. Tippets noticed with horror that her hand had been nearly severed from her arm, and was bleeding badly.

For two hours, the injured men struggled to free her from the wreckage. Susan remained calm and conscious, sometimes offering a suggestion. But it gradually became apparent that if they couldn't get her arm free, they couldn't stop the bleeding. If they couldn't stop the bleeding, Susan would die. So, one of the men gently explained to Susan what they would have to do, and sawed through the remaining flesh and tendons, amputating her hand. They swiftly put a tourniquet on the severed limb.

The men collected seat cushions and placed them on the floor of the aircraft for Susan to lie on. They spread a wing cover over the broken fuselage to keep out the rain and sleet. They covered her with her coat to keep her warm. The tourniquet helped, but the bleeding didn't stop.

After Susan had been made as comfortable as possible, Gillam spread tarpaulins under the tail of the aircraft, and built a fire. Gebo and Metzdorf huddled around the flames, trying to keep warm. Cutting collapsed inside the aircraft, paralyzed. He couldn't move his legs, perhaps due to a back injury, perhaps from shock. Gillam rose frequently during the night, to tend the fire and to try to make Susan more comfortable.

4.

At daybreak, Navy Lts. Fred Tuxworth and Marshall "Swampy" Creel taxied their OS2U Kingfisher float planes from the dock at Ketchikan and into the Tongass Narrows, and took off "to see what we could find," as Tuxworth wrote later. The weather was dirty, with a ceiling of only 200 feet. Gillam should have been approaching from the South, across the Dixon Entrance, and the only place suitable for an emergency landing was a wide beach on the north end of Queen Charlotte Island. If Gillam ditched in the sea or crashed in the mountains he was probably dead, and they couldn't see anything above 200 feet anyway. So Tuxworth headed south over the ocean to Queen Charlotte, back-tracking over Gillam's probable route to Annette, and overflew the beach. He saw nothing of interest. On the return trip, it began to snow, and Tuxworth had to descend to 25 feet to maintain visual contact with the water. The windscreen was almost completely obscured by pelting snow and crusting ice. By some quirk, there was a tiny triangle of viewable space beneath the gunsight, so Tuxworth flew squinched down in his seat, peering out at the waves rushing by. Many years later, he wrote, "I experienced pretty intense anti-aircraft fire later on occasions in the Pacific, but I don't think I was ever as scared. Anti-aircraft fire usually is over in a short time, this flight was for over an hour. Even today I "pucker up" when I think about it."

The continuation of the air search would have to depend on the weather. The weather worsened.

Lt. Marshall "Swampy" Creel, USN, in the cockpit of an OS2U, 1943. Photo by Ens. J.J. Casby; courtesy of Alan Casby.

5.

At the crash site, it rained steadily for three days, melting the deep snow around them, while the survivors took stock of their supplies and attempted to improve the quality of their shelter. The Electra was well stocked with emergency provisions. They had an axe, a hunting knife, two sleeping bags, magnesium signal flares, a .22 rifle with 300 rounds of ammunition, a plumber's blow torch, some high octane gasoline siphoned from the fuel tanks, five pounds of beans, four cans of corned beef, four or five cans of sardines, 10 bars of Nestles chocolate, a package of hardtack, three or four boxes of bouillon cubes, and a pound each of coffee and tea.

Susan Batzer died during the night of the second day, uncomplaining to the end. As the snow melted, the survivors carved out a shelter from the snow beneath the shattered fuselage, and spread seat cushions within the shelter.

On the fifth day, the weather cleared, though it turned much colder. Cutting recovered from his paralysis and was able to emerge from the cabin. He built a signal fire in the morning. Later in the day, Gebo saw an aircraft flying through the valley below the wreck, and later another aircraft circling a nearby mountaintop, presumably searching for them.

On the sixth day, the weather remained cold, and the snow had frozen hard. Gillam and Cutting climbed up to a ridge above the wreck site to try to ascertain their location. In the distance, they could see water. Gillam believed that since they had been right over Annette air field just before the accident, that they were mostly likely in the mountains at the north end of Annette Island, between Annette and Ketchikan.

When they returned from the trek to the ridge, Gillam gathered up some supplies, (a box of raisins, a can of sardines, a few bouillon cubes, matches, a parachute, and some magnesium flares) and told the other survivors that would build a signal fire on the ridge. If he saw any encouraging indications, he would try to hike out. Gillam did not return.

On the seventh day, the remaining survivors decided that the food might have to last as long as two more weeks. The pooled the food, and everyone went on reduced rations. The survivors spotted a float plane that flew down the valley below the crash sight. It rained or snowed most of the next week, but the weather cleared on the twelfth day. Cutting climbed to the top of hill, and saw two boats in the body of water to the North.

The next day, Cutting took a sleeping bag, the rifle, and a little food and set off for the bay with the boats. Gebo and Metzdorf were still immobilized by their injuries. Tippets remained at the wreck site to care for them.

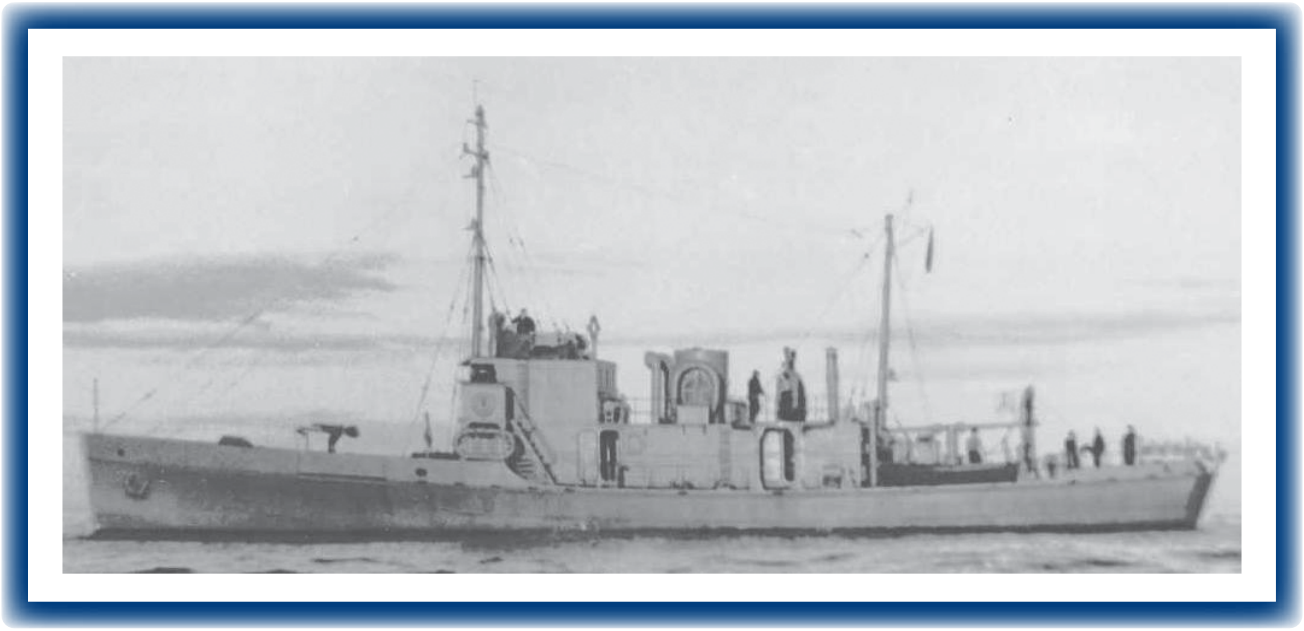
6.

Harold Gillam's disappearance made news. The total population of Alaska in 1940 was only 75,000, and aviation formed the link between the many small communities. Morrison-Knudsen was an important local employer. The Alaskan civil aviation community turned out to search for one of their own. Morrison-Knudsen assigned its two other aircraft to the search, led by Gillam's colleague, Don Brady. The Alaska Game Commission contributed a single engine float plane at Ketchikan, flown by Ray Renshaw. Ellis Airways also provided a float plane.

The military also provided help: several Army Air Force aircraft were assigned to the search. The Navy had spotted OS2U Kingfisher float planes from Scouting Squadron 70 (VS-70) at various points along the Inland Passage. The two Kingfishers flown by Lts. Tuxworth and Creel came from the Ketchikan detachment.

The Coast Guard cutter *McLane*, based at Ketchikan, was assigned to guard the Dixon Entrance to the Inland Passage. The Coast Guard and Navy had nationalized a large number of small craft, fitted them with makeshift armament, and assigned them to coastal patrol and harbor defense. The Coast Guard organized the marine search in conjunction with routine patrol duties, assigning boats to methodically search along the innumerable bays, islands, and inlets of the Inland Passage.

There were also resources on land. Major Marvin "Muktuk" Marston was organizing Inuit and native Americans across the Territory into the Alaska Territorial Guard, charged with maintaining surveillance over Alaska's vast expanses. In southeastern Alaska, the Territorial Guard was composed largely of Haida and Tlingit Indians. They would report on any unusual air activity, and detect any downed aircraft in their vicinity.



USCGC McLane*, 1942. Photo by Ens. J.J. Casby, courtesy of Alan Casby*

Whenever the weather broke, the air search was concentrated in a 100 mile radius around Annette, initially focusing along the radio range bearings from Annette. The Canadian authorities also searched the Queen Charlotte archipelago on their side of the border.

There were the usual false reports. An observer at Salvus reportedly spotted an aircraft, and there was a report of an aircraft hitting Mt. Alverson. Both reports were proved negative.

It was by no means unusual for aircraft to disappear in Alaska at the time. Just two weeks before, on 20 December, a Canadian Pacific Airways Lockheed L14 "Super Electra" disappeared out of Vancouver and remained missing for many weeks. So, searchers were actually looking for two missing Electras in January 1943. After three weeks, with no trace being found of either aircraft, the search was called off.

7.

On the nineteenth day, Cutting returned. He had been down to the waterline, floundering through heavy snow and icy streams, but seen nothing: no boats, no signs of human habitation, just endless wilderness. He kept a signal fire burning for two days, to no avail. On the return trip, he was able to shoot four grouse, which the survivors ate.

With their food almost gone, the survivors were running out of choices. Noting that most of the aircraft they had seen had been flying below their altitude, they decided that they had a better chance of being found if they could light their signal fires down in the valley beneath the wreck site. By this time, Robert Gebo's leg had knitted together to the extent that he could hobble along. On the twenty-second day, Gebo, Metzdorf, Cutting and Tippets left the wreck site. The body of Susan Batzer slept on in the fuselage where she had died.

The trip to the valley floor was four miles and 2,400 vertical feet, but it took them two days of hobbling along and floundering through deep snow. At lower elevations, they were impeded by brush and fallen logs. On the twenty-fourth day, they set up camp in a clearing on the floor of a long North-South valley, hemmed by mountains on either side. With the axe, the survivors chopped wood for a fire, and built a makeshift leanto out of branches, with a canvas wing-cover from the wreck as a roof.

Gebo had boarded the Electra wearing ordinary oxford shoes, and they proved inadequate for his winter trek. He lost feeling in his toes, and his feet turned first white, and then black. The other survivors must have known that Robert Gebo would never be able to walk out of the clearing.

The twenty-fifth day was cold and snowy. Remaining food supplies were a pinch of tea and bouillon cube. At some point, the survivors had become aware

that there was a second body of water to the south of them, and Cutting and Tippets decided to set off and try their luck on this southerly body of water. They left the tea and bouillon, and set off with no provisions at all.

Gebo and Metzdorf had become very weak. The effects of their injuries were multiplied by exposure and starvation. Over the next few days, they drank the tea and the bouillon, and burned the last remaining cut wood for warmth. The weather turned warm and rainy, melting the snow.

Both men pinned identification papers to their hats, for easier identification of their bodies, and wrote letters to their spouses.

A stream of ice water flowed flowed through their leanto, but Gebo and Metzdorf were too weak to do more than lie in their soaking bedding, waiting to die.

8.

One of the many small craft nationalized by the Coast Guard was a 46-foot fishing boat named *Tuscan*. In the Coast Guard, the *Tuscan* became CGR-232 and was assigned to patrol duty. Captain Zeusler had arranged for CGR-232 to be fitted with a single .30 caliber Lewis gun and five depth charges. We don't know anything about the crew of the CGR-232, except the name of her skipper: A. W. Angelison.

What we do know is that on the morning of February 3, 1943, the CGR-232 was patrolling the Boca de Quadra, a long narrow East-West finger of water, framed by steep forested slopes, with a kinked knuckle in the middle, pointing from the Behm Canal towards the Canadian border. A Norwegian would call it a "fjord," perhaps left by a retreating glacier. Boca de Quadra was named for Juan Francisco Bodega Quadra, the Spanish navigator who, in 1775, was the first European to sail the Inland Passage. The Boca de Quadra is about 35 miles east-southeast of Ketchikan, and 30 miles east of Annette.

The lean-to. Photo courtesy Alan Casby.

During the night, someone had seen a bright light on the north shore of the Boca de Quadra, at a place called Weasel Bay. The CGR-232 had been sent to investigate. As the CGR-232 cruised along the shoreline, the crew spotted two men shouting and waving.

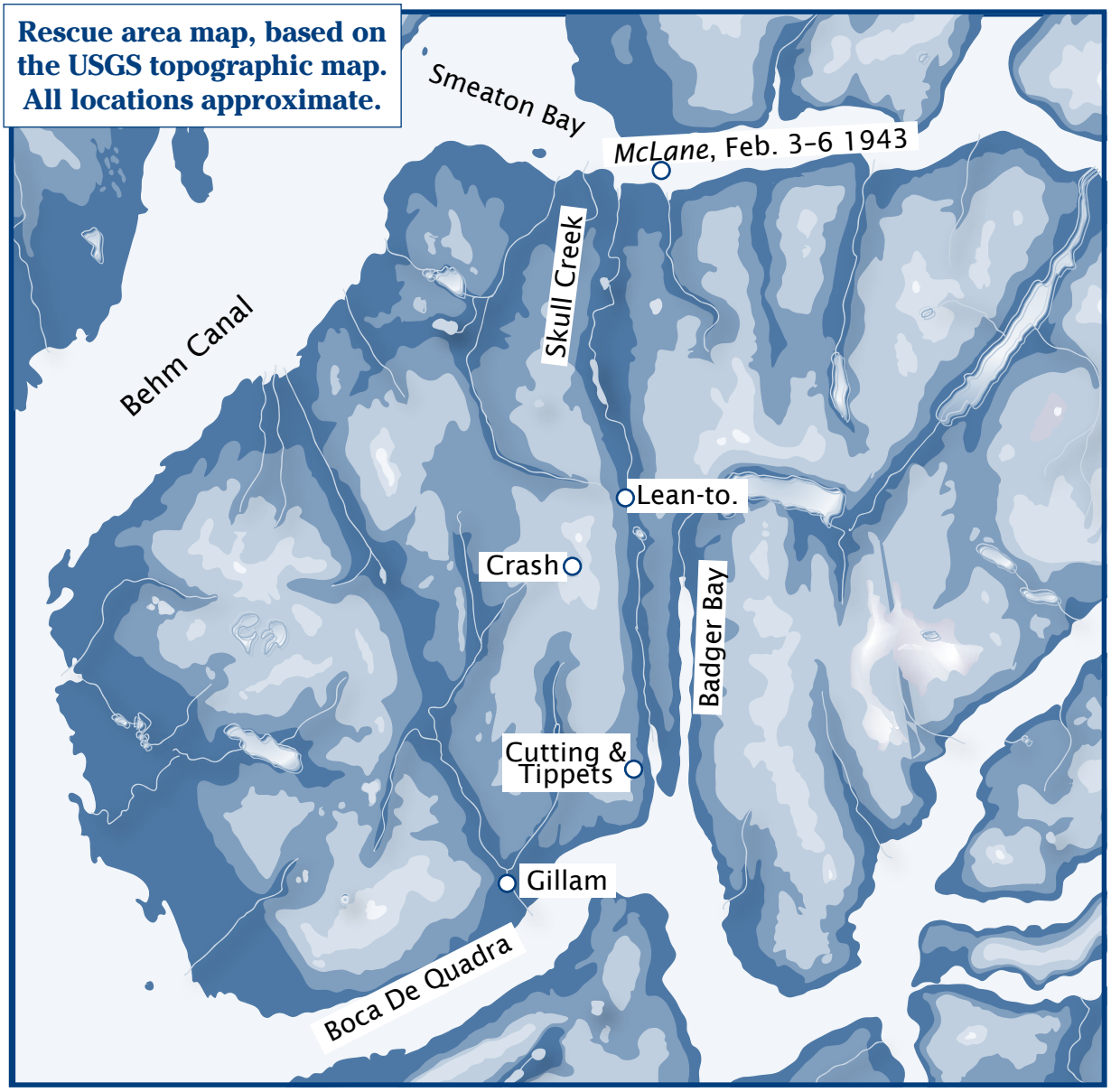
Back in Ketchikan, the USCGC *McLane* was tied up at the city "float," preparing to depart for a yet another routine patrol of the Dixon Entrance, the *McLane's* normal station. QM3 Jim Gill was standing watch on the bridge when he received a call on the land line: "Prepare to get underway. Stand by for immediate orders."

The *McLane* was built in 1927 to chase rum runners. She was (and is) small for an ocean-going cutter: 123 feet long, and displacing 232 tons, about half the length and a tenth the displacement of a destroyer. She had a crew of 3 officers and 17 enlisted men, and her skipper was Lt. (j.g.) Ralph Burns. Lt. Burns was already a lucky man: on June 4 1942, the *McLane* depth charged and sank the Japanese submarine RO-32 in the Dixon Entrance.

While the CGR-232 returned to Ketchikan with the two survivors, Captain Zeusler set about organizing a rescue. The man chosen to lead the shore party was Chief Boatswain Art Hook. Chief Hook seems to have been an important figure in Alaska. He was described as a pioneer Alaska diver, and was apparently responsible for provisioning the lighthouses on the Inland Passage, a duty which required him to travel extensively throughout southeast Alaska.

Cutting and Tippets followed the valley southward until they encountered a bay, blazing a trail as they went. On the shores of this bay, they found an abandoned cannery. They killed some crows and ate them. They pried timbers from the cannery and built a makeshift raft, which they used to sail across the channel in order to investigate a cabin on the other side. The cabin was empty, except for some weevily rice, which the promptly ate, along with as many mussels and clams as they could scrape from the rocks. They also found a one-man skiff and some tar. They recaulked the skiff with a notion of sailing to safety, but the skiff sank on its maiden voyage, and Cutting and Tippets had to swim for their lives through the icy waters.

At night they lighted fires on the beach. On the night of the twenty-eighth day, they tossed a magnesium flare into the fire for extra visibility. On the morning of the twenty-ninth day, they were taken aboard the CGR-232 and sailed for Ketchikan. It was Wednesday, February 3, 1943.



Rescue area map, based on the USGS topographic map. All locations approximate.

10.

The interrogation of Cutting and Tippets began almost as soon as they were on board the CGR-232, but was not entirely satisfactory, because, of course, neither man knew where he had been. As reconstructed by their rescuers, the aircraft must have crashed into one of the mountains that flanked the north-south rift valley that contained Skull Creek and Badger Bay, in what is now the Misty Fjords National Monument. The crash site was 33 miles east of Ketchikan, and nearly 40 miles from Annette air field. The body of water to the north was Smeaton Bay, the body of water to the south was Badger Bay off of the Boca de Quadra. The rift valley connected these two bays, and Gebo and Metzdorf were somewhere in the valley. Based on this discussion, the rescuers decided to land the rescue party at Smeaton Bay (see map previous page).

Cutting and Tippets, despite their fatigue and extreme emaciation (Tippets had lost 50 pounds) insisted on going along to guide the rescuers.

The landing party was large: 20 men, all from the Coast Guard shore establishment at Ketchikan. The party included two pharmacist's mates, a photographer, and an assortment of coxswains, boatswains, and seamen. They came aboard at 0450 on Thursday, February 4, accompanied by Joseph Tippets. It is possible that one or more civilian guides accompanied the party. The *McLane* was underway at 0500. At 0930, the *McLane* anchored off Short Point, Smeaton Bay.

At 0955, Ray Renshaw, of the Alaska Game Commission, landed his float plane alongside the *McLane* and reported that he had spotted one survivor in a shelter about five miles to the South, and had dropped supplies. When he spotted the aircraft, the survivor ran in circles and waved his cane. Percy Cutting had flown from Ketchikan with Renshaw, and boarded the McLane to join the shore party, which begin landing at 10 o'clock.

A steady stream of floatplanes landed alongside the *McLane* to report on progress. However, by afternoon, air operations had to cease because of intensifying snow. The float planes returned to Ketchikan.

Shore party prepares for departure. Photo by Ens. J. J. Casby, courtesy of Alan Casby.

11.

At daybreak on the thirtieth day, Gebo and Metzdorf were awakened by the roar of a low flying aircraft – Renshaw's float plane. Gebo was too weak to move, even for an aircraft, but Metzdorf somehow staggered to his feet, ran out into the clearing, and waved his arms. The aircraft made a second low pass. The cockpit door opened, and a box tumbled from the aircraft. In repeated passes, the aircraft dropped three boxes of rations and two bundles of Navy blankets – four blankets to a bundle, surrounding two cans of fruit juice.

One of the bundles missed the clearing and landed in the woods. Metzdorf and Gebo were too weak to recover the second bundle. For Robert Gebo, the fact of their being found was far more important than the food and blankets. He allowed himself to think of his wife and three children, whom he now knew he would see again.

During the morning, at least two more aircraft overflew the camp. As the day wore on, it began to snow, and no further aircraft appeared.

12.

On the afternoon of the 4th, Lt. Burns, the skipper of the *McLane*, was a worried man. As the senior officer on the scene, Captain Zeusler had placed him in command of the rescue effort, and right now, things were not going well. The landing party had been ashore since 10 a.m., but was making almost no progress. The flat terrain was wet, boggy, and choked with brush and rocks. The uplands were forested and filled with deep, soft, snow. The Coasties had neither proper shoes nor proper winter equipment. It was now snowing hard, and visibility was nil. The shore party was groping through the underbrush, and it would soon be dark. With all the aircraft grounded, there was nothing that Burns could do to help his men on the ground. It was beginning to look like Lt. Burns might need a rescue party to rescue the rescue party.

Lt. Burns contacted Captain Zeusler, in Ketchikan. Lt. Burns told Captain Zeusler that he needed a second shore party, composed of experienced woodsmen with proper winter equipment, if he was to extract the survivors alive. Captain Zeusler, meanwhile, had his own problems. The discovery of survivors was headline news in the Alaskan press, and the reporters were jumping on any scrap of news they could extract from Coast Guardsmen or the civilian float plane pilots returning to Ketchikan.

Unaware of the excitement they were causing, the shore party struggled on in darkness.

Lt Creel's OS2U approaches the McLane. *Photo by J.J. Casby, courtesy Alan Casby.*

13.

After dark, Gebo and Metzdorf heard the sound of gunshots, and knew that rescuers were near. Around midnight, having taken 14 hours to cover five miles, the shore party found the leanto. Gebo, Metzdorf, Cutting, and Tippets met again, wept, and embraced.

Art Hook later said that all the parts of their bedding that were not wet were frozen. The shore party built a fire and prepared hot broth. When handed the broth, Gebo said: "You never know what a fire means and what heat means until you've been through something like this – and I hope you never do." Gebo choked on the first sip and began to weep.

Having found their friends, Percy Cutting and Joseph Tippets had reached the outer limits of their strength. They would have to be evacuated.

Dewey Metzdorf is treated by Coast Guard Corpsman. Photo by USCG. National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska).

14.

On Friday morning (the 5th), the weather improved. It stopped snowing, and the ceiling rose enough to permit flying. Additional personnel, including some Territorial Guardsmen, arrived from Ketchikan. Still anchored in Smeaton Bay, Lt. Burns continued to dispatch boats, aircraft, and small landing parties to search the shoreline of Boca de Quadra and Smeaton Bay for Harold Gillam, who was still missing.

Ray Renshaw overflew the camp and dropped more supplies. At about 6 pm, Cutting and Tippets appeared on the beach, escorted by two Coast Guardsmen. All were taken aboard the *McLane*. Lt. Burns wrote in the *McLane's* war diary: "Cutting and Tippets were in a state of complete exhaustion, both physically and mentally." Cutting and Tippets were transferred to a small boat to be sent to Ketchikan.

The Alaskan winter, however, was not quite finished torturing Cutting and Tippets. The The boat had no sooner left than a savage snow squall struck. The skipper of the boat was unwilling to risk the trip to Ketchikan, and returned alongside the *McLane*. Cutting and Tippets were transferred to a larger vessel, the *Sebanus*, and returned to Ketchikan where they were immediately hospitalized.

Float plane overflies the camp. Photo by USCG (probably M.J. Bailey, Ph. 3/C). National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska)

15.

The shore party turned to constructing better shelter for themselves and the two remaining survivors. It was clear that Gebo and Metzdorf were not going to be able to walk out of the wilderness on their own. Gebo's feet, in particular, were badly frostbitten. So they turned to constructing improvised sledges, with the aim of dragging out the survivors. Photographs also show a substantial roofed structure, made from cut branches and logs, lashed together with rope.

Since they couldn't communicate with directly with the aircraft, they took to stamping out messages in the snow, which the pilots could then read. "Send blimp," read one. "Blankets" read another.

The rescuers suffered as they worked. They lacked proper shoes, sleeping bags, or warm clothes in conditions where the weather alternated between raining, snowing, and freezing cold. It was impossible to keep their feet dry in conditions where wet feet risked frostbite and immobility risked death. Art Hook remembered that some members of his party slept standing up, fearing that if they lay down in the snow they would never get up.

Messages in the snow. Photo by USCG. National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska).

16.

When Cutting and Tippets returned to the *McLane*, they brought with them some crucial information. The route from the camp to Smeaton Bay was flat and relatively easy going, but only if temperatures were below freezing and the muskeg was frozen hard. With a mild thaw, the Smeaton Bay route became a barely penetrable swamp. Even worse, some of the Coast Guard rescuers had frostbitten feet, and might have to be carried out as well.

On Saturday morning (the 6th), Lt. Burns dispatched Lt. Creel's Kingfisher to Badger Bay. Riding in the observer's seat was Bruce Johnstone, an experienced local hunter and Territorial Guardsman. Lt. Creel landed at Badger Bay, and in short order Johnstone was able to climb up to the camp and to confirm that there was a relatively short route from the camp to Badger Bay.

Lt. Burns decided to try to bring the survivors and the shore party out to the South.

The *McLane* weighed anchor and set course for the Boca de Quadra, in company with the FWS1901. The second shore party, which Lt. Burns had requested the two nights before, had just arrived from Ketchikan on board the *Prince of Wales*. By 2 o'clock, the *McLane* was entering Badger Bay, in the Boca De Quadra. Badger Bay is a long skinny spike of water extending northward from the knuckle of the Boca de Quadra, into the Skull Creek Valley. On arrival, Lt. Burns saw that the new plan had a problem. On the chart, the *McLane* could steam straight up Badger Bay, deep into the rift valley, and take off the survivors more than a mile inland from the Boca de Quadra. However, on arrival, Badger Bay was frozen over. The highway into the interior was blocked.

Lt. Burns had only about half an hour to consider the problem of ice on Badger Bay, before he had to confront a more immediate problem. Harold Gillam had been found.

The rescuers built improvised sledges. Photo by USCG (probably M.J. Bailey, Ph. 3/C). National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska).

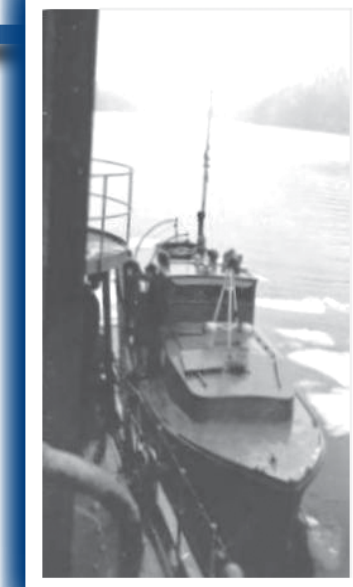
17.

As the *McLane* cruised up the Boca de Quadra, the FWS1901 traveled in company, but much closer to the shoreline, searching the coast for signs of life. At 2 pm, a lookout spotted a patch of bright red on the beach, and the FWS1901 put about to investigate.

The patch of red proved to be a pair of red long underwear, carefully hung on a pole. Harold Gillam's frozen body was found about 150 feet above the tideline. He had wrapped himself in a parachute, and he was fully clothed, except for his shoes, which were stuck bottom up on two poles at the shoreline. He had a set of dry matches in his pocket.

Joe Lynch, the skipper of the FWS1901, reported that there were no marks on Gillam's body, and that his beard was not very heavy, indicating that Gillam died not very long after leaving the camp. Gillam was found perhaps three miles from the wreck site.

By 3 o'clock, Gillam's body was loaded aboard the FWS1901, and brought to the *McLane*, lying to at Badger Bay. An Ellis Airways float plane landed, and flew the body back to Ketchikan.



FWS1901 approaches the McLane*, bearing Harold Gillam's Body. Photo by J. J. Casby, courtesy of Alan Casby.*

Meanwhile, Lt. Burns had been consulting with Lt. Creel, who had arrived from Ketchikan with his Kingfisher. Perhaps they could blast the ice. So, Lt. Creel obligingly climbed back into his aircraft, and dive bombed the ice with two 50 lb. depth bombs. There were very satisfying explosions, and big pillars of water, but the resulting fracture zone in the ice was small. *McLane* wouldn't be able to bomb her way up Badger Bay through the sustained application of air power.

Lts. Burns and Creel consult, second shore party waits to land. Photo by USCG, National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska).

Lt. Burns now faced another command dilemma. Dragging the survivors on sledges the extra two miles to the mouth of Badger Bay posed a significant risk: if they went overland, the terrain was awful, and would add a minimum of four hours to the trip. Traveling over the possibly thin ice of Badger Bay posed the risk of a serious disaster. Turning around and going back to Smeaton Bay would leave the survivors and the shore party in the wilderness for at least another day. Right now, the weather was passable. Who knew what tomorrow would bring?

So, Lt. Burns decided to try his hand at ice breaking, a task for which the *McLane* was certainly never designed. How strong was the *McLane's* bow, really? Would the shock of collision unseat some piece of engine room machinery? Lt. Burns decided to find out. He pointed the *McLane's* bow towards the ice, called for full power, rammed the ice pack, backed off, and inspected. The *McLane* held together, and Lt. Burns battered his way up the Bay.

By dawn the next day (Sunday, February 7th), the *McLane*, unscathed, was at the head of Badger Bay, with a trail of broken ice as much as 14 inches thick behind her, leading back to the Boca de Quadra. The second shore party had the "experienced woodsmen" that Lt. Burns had requested, consisting of four Alaska Territorial Guards and three Coast Guardsmen. Their mission was to link up with the original rescue party. There is a photograph in the Coast Guard archives showing several tough-looking men holding pistols, including one man with his dark hair in braids. The caption identifies them as Coast Guardsmen, but they are probably the Territorial Guards.

According to Gebo, the combined rescue parties set out at 11:30 am, carrying him on an improvised sled (a wire stretcher mounted on a cedar log), followed shortly thereafter by Metzdorf, strapped to a toboggan.

The descent was terrible. On the level parts, the snow was waist deep, and those without snowshoes sank at every step. The hills were worse. Gebo and Metzdorf, tied in their heavy conveyances, had to be lowered over cliffs, hand carried down a waterfall, and lifted over slush-jammed streams. At times, said Art Hook, the rescuers had to form a human chain to ease the two men down steep slopes.

At noon, Ray Renshaw found some open water to land his float plane, and reported that the rescue party was nearing Badger Bay. The *McLane* weighed anchor, and began cutting a channel through the ice to the point on the shore where the rescue party was expected.

During the afternoon, the VIPs began to arrive, flying out by float plane from Ketchikan. Captain Zeusler arrived, along with E.S. "Gene" Gull, a Civil Aeronautics Administration Inspector, and Dan Ralston, of the Alaska Game Commission. Gull and Ralston planned to form a ten-person shore party, aimed at recovering Susan Batzer's body and inspecting the wreckage. After a turn ashore, this third group abandoned the idea of trying to reach the accident site.

The rescue party arrived on the shoreline, and by 4 o'clock, rescuers and survivors were all aboard. The *McLane* weighed anchor once again, and by 9 pm, Gebo and Metzdorf were admitted to the Coast Guard Hospital in Ketchikan. More than a dozen members of the Coast Guard rescue party were also hospitalized, mostly for frostbite, though there were many other minor injuries.

Shore party members. Note roofed structure constructed by shore party in the background. Photo: USCG, National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska).

19.

We don't know much about the later activities of either the survivors or the rescuers. Robert Gebo remained in the hospital for several months, and lost most of his toes to frostbite. He penned a dramatic "as told to" story for *Alaska Sportsman* magazine, published in the summer of 1943, in which he wrote that he expected to be able to save his feet and to walk again. Dewey Metzdorf, who lost 50 lbs, showed reporters how he could wrap his trousers half-again around his shrunken body.

Joseph Tippets apparently recovered quickly from his ordeal, though Percy Cutting stayed for some time in hospital with what the physician called "a shock lapse."

Susan Batzer remained in the fuselage of the Electra for more than a month. Her body was finally recovered by the Coast Guard in early March, and shipped to her home town for burial. Remembering her, Joseph Tippets told one of his Coast Guard rescuers, "She didn't say a word during the operation. She was the bravest person I've ever seen."

Later on in 1943, a local aviator returned to the wreck, and salvaged a number of cockpit instruments and engine parts from Gillam's aircraft. In the 1990s, long-time bush pilot Ken Eichner salvaged an engine and propellor and part of the tail structure from the aircraft and brought them back to Ketchikan with a view to constructed a memorial to Harold Gillam.

The USCGC *McLane*, after a distinguished career, is now a museum ship in Manitowoc, Wisconsin, and is open to the public.

Captain Frederick Zeusler was promoted to Real Admiral at the end of the war. He died in 1981. Lt. Ralph Burns was eventually awarded the Legion of Honor for his Japanese submarine kill, but, so far as I am aware, no medals were awarded to any Coastie for the Gillam rescue. Captain Zeusler, when asked by a reporter about the performance of his men, replied, tersely, "The men did their duty."

Art Hook's later career in the Coast Guard was eventful. He participated in other rescues. In 1944, now promoted to Lieutenant, formed the first and only Coast Guard pararescue unit, based in Ketchikan. The records contain some of Captain Zeusler's correspondence with Coast Guard Headquarters, trying to get jump pay for Lt. Hook and his men. Headquarters can't seem to understand why Coasties should jump out of airplanes, and if they do, why they should get extra pay. Coast Guard Public Affairs archives contain a photo essay showing the activities of the pararescue unit. No names are attached to the photos, but there are several photographs that include a young man with a rakish grin and an Errol Flynn mustache. Perhaps this was Art Hook.

Lt. Marshal "Swampy" Creel, the ice bomber, was reported to have died in 1945. The place of death was listed as "Japan."

In death, Howard Gillam has become one of the icons of Alaskan aviation. There is a "Mount Gillam" in Alaska. His son and namesake, Howard Gillam, Jr. became mayor of Anchorage. Howard Gillam, Jr. died in 1999.

20.

When spring came, Gene Gull, the Civil Aeronautics Administration Senior Inspector, was able to examine the wreck site, and his testimony shaped the findings of the Civil Aeronautics Board, which issued a report in August 1943. Gull was able to find Harold Gillam's chart in the wreckage, with his planned course plotted in pencil. Gull discovered that Gillam's chart was several months out-of-date, and the radials for the Annette radio range had been changed since the older chart was issued. Further, in plotting the radials, Gillam drew them using true north, which meant that he would have to do mental conversions to magnetic north when studying his compass.

Gillam had been able to navigate visually as far as Alert Bay, at the north end of Vancouver Island, which he reached at 4:30 pm. He than struck out over water, flying a course (300° magnetic) direct for Annette. The aircraft flew into overcast, and Gillam went on instruments about 5 pm. He eventually crossed, as he thought, the Annette "southeast" radial (actually bearing 172° magnetic from Annette), homed on it, and entered (as he thought) the cone of silence, meaning he was directly over the airfield. There was however, some confusion in the cockpit, the nature of which neither the accident report nor Gebo's account elucidates. It seems likely that their course while "on the beam" homing on the radial was different from the

course indicated on the chart, which Gillam would have found ominous. He was maneuvering to get a better indication, and had just decided, says the accident report, to get a radio direction finder bearing when the engine quit.

Gull decided the Harold Gillam was actually homing on the Ketchikan beacon, believing he was homing on Annette. Either he never picked up the Annette beacon at all, or at some point traded Annette for Ketchikan without being aware of it. Somehow, Gillam flew right past Annette air field, well to the East, and was more than thirty miles east of Annette and getting further away at the time of the mishap.

The CAB report mentions (without further comment) that forecast winds aloft were 30-40 knots above 6,000 feet, at 270° (i.e. blowing from the west). If the forecast winds prevailed, athe Electra would tend to drift east, like a swimmer in a strong current. This may have put him East of his intended track, and perhaps in a position where the Annette beacon was obstructed by intervening mountains.

The CAB report was scathing. It was Gillam's responsibility to ensure that his charts were up-to-date. If Gillam had periodically fixed his position by radio direction finding, he would have recognized his navigational mistake. If Gillam had radioed position reports, the search-and-rescue effort would have been far more effective. The Board concluded:

"While the stoppage of the left engine from an undetermined cause in extremely rough weather and over hazardous terrain undoubtedly was the primary cause of the accident, it is apparent that strong contributing factors were the pilot's failure (1) to equip himself with an up-to-date aeronautical chart and (2) to utilize the radio aids available to him to accurately establish the position of his flight while on instruments."

In his book, *Broken Wings*, Alaskan aviator G.P. Liefer writes:

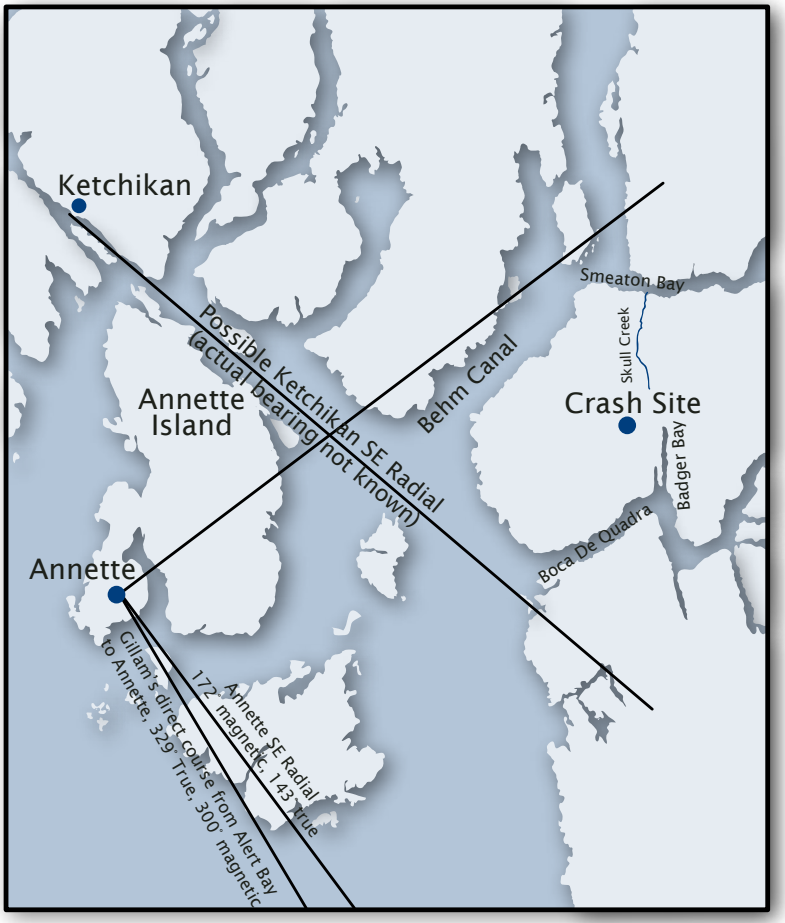
"Gillam did not become a certified instrument pilot until 1942… Even after receiving his instrument certification, his tendency to do things his own way continued getting him in trouble with the agency in charge of civil aviation. On more than one occasion in the months preceding the accident, he had charges filed against him for violating prescribed flight procedures on airways and during instrument approaches."

The custom of Alaska bush pilots before there were navigational aids was to "get below the weather" and navigate point-to-point. With the arrival of radio navigation and the CAA, this style of flying became both obsolete and contrary to regulations. On this particular trip, Gillam was flying with his boss in the co-pilot's seat and two CAA employees as passengers. The situation compelled Gillam to use radio navigation.

Robert Gebo told the CAA that he had been doing much of the radio navigation for Gillam. The CAB report does not stress this point, focusing on Gillam's absolute responsibility as pilot-in-command. As Gebo was neither aviator nor navigator, his navigation skills must be regarded as unproven at best, which raises the possibility that Gebo may have made any number of elementary errors.

As in most aircraft accidents, it was not a single event, but a chain of individually unlikely mishaps and normally recoverable lapses that deposited Harold Gillam and his passengers in a remote corner of the Alaskan wilderness.

All human enterprise is periodically confounded by bad luck, error, ignorance, and the unexpected. Human knowledge is always incomplete, and human beings are distinctly imperfect. Often, however, disaster can be redeemed because people rise to the occasion. Faced with catastrophe, Harold Gillam couldn't save all his passengers. But he could, and did, die trying. His passengers couldn't save themselves, but they never stopped trying to live. Once rescued, Cutting and Tippets could have stayed in their hospital beds. Instead, they insisted on returning to the frozen landscape from which they had just been plucked so they could help



Radio ranges for the Ketchikan area, January 1943. CAB Accident Report, USGS topo map.

save their friends. The rescuers were ill-prepared for the conditions they faced, they underestimated the task that confronted them, and their plan proved faulty. Yet they endured, and they tried one thing after another until everyone was brought to safety.

The Gillam accident and rescue are well documented from multiple sources. This account is largely drawn from contemporaneous primary sources. These sources are in general agreement on the broad outlines of what happened, but are routinely contradictory in matters of detail.

SOURCES

In writing this account, my objective has been to tell a coherent and entertaining story that is as accurate as possible. Therefore, rather than highlighting discrepancies in the text, I have usually attempted to resolve them in favor of the most likely (in my opinion) course of events.

This section is divided into two parts: the first part lists and discusses the sources. The second part forms a set of notes to the text, highlighting discrepancies, and documenting my choices in constructing this narrative.

Allen, June, "Harold Gillam: A Tragic Final Flight," Sitnews, August 14, 2004. See: http://www.sitnews.us./JuneAllen/HaroldGillam/081704_final_flight.html.

Sitnews appears to be a Ketchikan-based on-line news service, though it may perhaps be the online version of a newspaper. Ms. Allen has written a journalistic account of Harold Gillam's final flight and the rescue, including a very interesting short biography and description of Harold Gillam. She doesn't list sources, but it would appear that she is using the clipping file from a contemporary Ketchikan newspaper. Her account generally follows the accounts appearing in the Anchorage Daily Times, except that what were paraphrases in the Anchorage paper have often become quotes in her accounts. She quotes from a more extensive interview with Percy Cutting than I have been able to find, with some additional details. She also obtained two splendid photographs (not included in this article) from the Ketchikan Historical Society: a photo of the Morrison-Knudsen Electra 10B before the accident, and a recent photo of the wreckage.

Burns, Lt. (j.g.) Ralph, "Memorandum from Commanding Officer, *McLane*, to Commandant, 13th Naval District: War Diary, Submission of," (9 February 1943) National Archives, Washington, DC.

Functionally, the *McLane's* war diary serves as a sort of a "weekly report," describing where the *McLane* went and what happened. This report was found in the in the National Archives. War diaries for January 1943 (covering the search) were missing. Lt. Burns submitted the report to Captain Zeusler, (District Coast Guard Officer Ketchikan), who endorsed it and forwarded it headquarters, 13th Naval District. Lt. Burns wrote up his report no later than the evening of the *McLane's* return from Badger Bay bearing the survivors, clearly with the deck log in front of him to refresh his recollection of times and dates.

Casby, J. J., Photo Scrapbook. Available at: http://www.uscg.mil/hq/g%2Dcp/history/webcutters/mclane1927.html.

Ensign (later Lieutenant) J. J. Casby, USCGR, was one of the officers on the McLane. Ensign Casby kept a photo scrapbook of his tour on the *McLane*, which included many photos of the rescue. Alan Casby, J. J. Casby's son, donated scans of the rescue to the Coast Guard, and they are now posted on the web site of the Historian of the Coast Guard. The photographs appearing in this article are used by permission of Alan Casby.

One of the numerous minor mysteries associated with the rescue is the origin of several of the Casby photographs. Like Jim Gill, Ensign Casby was not listed as a member of either of the two rescue parties, yet he was in possession of a slew of snapshots taken ashore, along with a pair of several photographs, showing the rescue party leaving the ship, and then returning. Presumably Ensign Casby took the photographs of the rescue party arriving and leaving, and obtained the other photographs from one of the participants in the rescue.

Civil Aeronautics Board, "Report of the Civil Aeronautics Board on an Accident Involving Aircraft in a Cross Country Commercial Flight," (File Number 1299-43), adopted 25 August 1943.

This is the official accident report on the Gillam flight. There was no air safety investigator in Alaska, so this report was based on an investigation by E. S. "Gene" Gull, CAA Inspector, and the testimony of passenger Robert Gebo, with additional information provided by CAA employee and passenger Percy Cutting. Gull was able to visit the crash site and inspect the wreckage. Gull was not, however, able to recover and inspect the failed left engine, so the report contains no information on why the engine quit.

Eichner, Kenneth, *Nine Lives of an Alaskan Bush Pilot,* (Bellingham, WA: The Taylor Press, 2002).

Ken Eichner founded Temsco Helicopters, a major Alaskan aviation firm. In 2002, he wrote an engaging memoir of his half-a-century of bush piloting in Southeast Alaska, including innumerable rescues. In 1943, Mr. Eichner was a 22 year-old cab driver and a sergeant in the Alaska Territorial Guard. He participated in the Gillam rescue, and described the event from the point-of-view of the Territorial Guard.

In common with other accounts based on fifty year-old memories, Mr. Eichner's account is unreliable on details: the

cutter *McLane* becomes the buoy tender *Cedar*, Lt. Creel becomes "Gill Joint."

However, only Mr. Eichner's account elucidates one of the minor mysteries of the Gillam rescue: why the rescue effort was shifted from Smeaton Bay to Badger Bay.

Gebo, Robert (as Told to Ethel Dassow), "The Gillam Plane Was Missing," Alaska Sportsman, Volume 9, #7 (July 1943), p. 17. Buelah Marrs Parisi Papers, Univerity of Alaska-Anchorage Library.

This article was found in a scrapbook collected by Morrison-Knudsen employee Beulah Marrs Parisi, and later donated to the University of Alaska at Anchorage, where it can be found in the Beulah Marrs Parisi manuscript collection. Gebo's account, written less than six months after the accident, covers the flight up the accident and the ordeal of the survivors. Gebo also gives accounts of the activities of survivors Tippets and Cuttings. Gebo's account of the accident in this article is very close to the account in the CAB report. His account of his own activities seems pretty reliable, his account of Cutting and Tippets somewhat less so.

Gill, Jim, "The Gillam Plane Crash." Available at www.jacksjoint.com/gilliam.htm.

Mr. Gill was a Quartermaster's mate aboard the *McLane*. At some point in the 1990s, he wrote a memoir about the Gillam rescue and submitted to a Coast Guard veteran's web site. It is a great yarn, and makes gripping reading. Mr. Gill's recall of detail about events of 40 years ago is imperfect, and it would appear that his imagination supplied many of the missing details. The result probably gives an accurate overall impression of overall events, but there are numerous factual errors in his account.

Hoffman, Fergus, reports to Anchorage Daily Times via radio, 3 February 1943 – 9 February 1943. Beulah Marrs Parisi Collection, University of Alaska-Anchorage Library.

The University of Alaska Manuscript Collection contains two instances of an untitled document, comprising a series of reports filed by a newspaper reporter in Ketchikan for the use of his editor in Anchorage, each report identified by a date and time. The document is pasted into Beulah Marrs Parisi's scrapbook. A second copy is in the Dorothy and Grenold Collins Collection, identified as "Harold Gillam Rescue Logs, 3 February – 9 February 1943." In fact, this item is a series of reports filed by a newspaper reporter in Ketchikan to his editor in Anchorage. Many of the words in these reports later turned up in a page 1 article in the Anchorage Daily Times, February 8, 1943, "Four Survivors Safe," with the byline, "Fergus Hoffman, Special Radio to the Times." From the internal evidence of the document, Mr. Hoffman stayed close to the radio room at Coast Guard Station in Ketchikan, and also interviewed float plane pilots and passengers when they returned to Ketchikan. Mr. Hoffman also interviewed Joseph Tippets. Civilian pilots were identified by name. Due to wartime security considerations, most military personnel were not identified, though Captain Zeusler did provide a quote for the record.

In the early hours of the rescue, Hoffman talked to various Coasties who told him what they had heard that Cutting and Tippets had told their rescuers. Hoffman frequently sent corrections to his earlier reports, and apologizing and complaining to the editor about the contradictory information he was receiving. Hoffman doesn't always specify his sources, but I presume that when he provides direct quotes he spoke directly with the quoted individual.

Hoffman's material is a good source for "what people were saying" in Ketchikan, but is less reliable as a source for events at Smeaton Bay and Boca de Quadra. The most useful elements were information gleaned from Ray Renshaw and Joseph Tippets.

Hoffman, Fergus (?), Anchorage Daily Times: "Mystery Shrouds Fate of Plane and Passengers," (Jan 22, 1943, p. 1). "Four Survivors Safe" (February 9,1943, p. 1). "Tippets Pays High Tribute to Companions." (date unknown – circa February 9). "Gillam's Final Flight and Dramatic Rescue Finally Told" (date unknown-circa February 10). "Tragic Death Closes Thrilling Career of Gillam, Noted Air Ace (February 12, 1943). Beulah Marrs Parisi Collection, University of Alaska-Anchorage Library.

The articles listed above were found in Beulah Marrs Parisi's scrap book. In some cases, the back end of the article was not reproduced. Much of this material was, of course, based on Fergus Hoffman's radio reports, probably reshaped by a rewrite man in Anchorage, which provides yet another opportunity for error to creep in. The most useful material was the interview with Tippets. The first article (Mystery Shrouds…) was helpful in describing the search.

Liefer, G. P., *Broken Wings: Tragedy and Disaster in Alaska Civil Aviation*, (Blaine, WA: Hancock House, 2003).

Mr. Liefer's book is an a series of accounts of notable civil aircraft accidents in Alaska from the 1930s through 1970s. He includes a chapter on the Gillam accident, apparently drawn from the Civil Aeronautics Board accident report and Robert Gebo's account in *Alaska Sportsman*. His account of the accident is fairly detailed, his account of the rescue cursory. Mr. Liefer also reports some interesting facts about Harold Gillam's flying record, probably drawn from CAB reports.

Tuxworth, Fred, "Nine Months With Captain Bob," Available at www.kadiak.org, official website of the Kodiak Military Museum. See: http://209.165.152.119/vs/tuxworth.html

Lt. Tuxworth was based at Ketchikan with a detachment from Navy Scouting Squadron 70 (VS-70), flying OS2U Kingfishers during World War II. At some point in the 1990s, he wrote a memoir of his wartime service, and provided it to the web site of the Kodiak Military Museum. His memoir is another great yarn, and well worth reading. I elected to include a description of one of his flights searching for Harold Gillam, both because it's a good story and because the story illustrated perfectly some of the difficulties the searchers faced. However, this is another instance of decades-later

recollections that should be treated with caution.

U.S. Coast Guard, Deck Log, USCGC *McLane*. 3 February 1943 – 9 February 1943. National Archives, (Washington, DC).

The *McLane's* deck log can be found in the National Archives, Washington, DC. Physically, the deck logs of the McLane are a large bound book with ruled paper, approximately 11″ x 17″. The log was kept in pencil or ink by the officer of the deck, who recorded the ship's position a couple of times a day, the number of hours steamed, the name of every person entering or leaving the ship, ships or aircraft spotted or coming along side, as well as various personnel notes (minor punishments, for instance). Unfortunately, my 8.5″ x 11″ portable scanner wasn't adequate to capture the log pages in their entirety: I was able to scan each morning's records, and some of the afternoon.

As a contemporaneous written record, the log is an excellent source. However, the OOD records what happened, but not why. The OOD normally records only information directly pertinent to the ship, and doesn't record anything that might be going on elsewhere. Radio communications, orders, and signals are not entered in the deck log, either. The deck log proved useful in establishing a chronology, and identifying the membership of shore parties.

U.S. Coast Guard Photo Archives, (Box 97, Alaska Rescue Operations), National Archives (Suitland, MD.)

At some point after World War II, the photographic archives of the Coast Guard Public Affairs Office were turned over to the National Archives. These photos, with captions, include several photographs taken during the rescue that were released to the press and published in the Alaska newspapers. The first rescue party included photographer 3rd Class, M. J. Bailey, who probably took the photographs.

U.S. Coast Guard, Historical Section, Public Information Division, "The U.S. Coast Guard at War: Transports and Escorts." (May 1949). Available at: http://www.ibiblio.org/hyperwar/USN/ships/tande/WSC/wsc146.html

This document, posted on the internet, is part of the text of Coast Guard's official history of its activities during World War II. The cited section covers the wartime activities of the USCGC *McLane*. It is a secondary source that is primarily based on the *McLane's* war diary. However, as the *McLane's* war diary for January 1943 was missing from the National Archives, this summary provides some useful detail about the maritime search for Gillam.

U.S. Navy, 13th Naval District, War Diary, National Archives (Washington, DC)

The Ketchikan District was an element of the 13th Naval District, which encompassed Alaska and much of the Pacific Coast. The War Diary was a sort of weekly report. The weekly reports for the weeks of January 3-9 and January 10-16 briefly describe the Navy and Coast Guard search for Gillam. The level of effort as described in the War Diary is lower than the level of effort described in the newspaper articles at the time.

U. S. Navy, Records of Ketchikan Section, 13th Naval District (601 File), National Archives (Washington, DC)

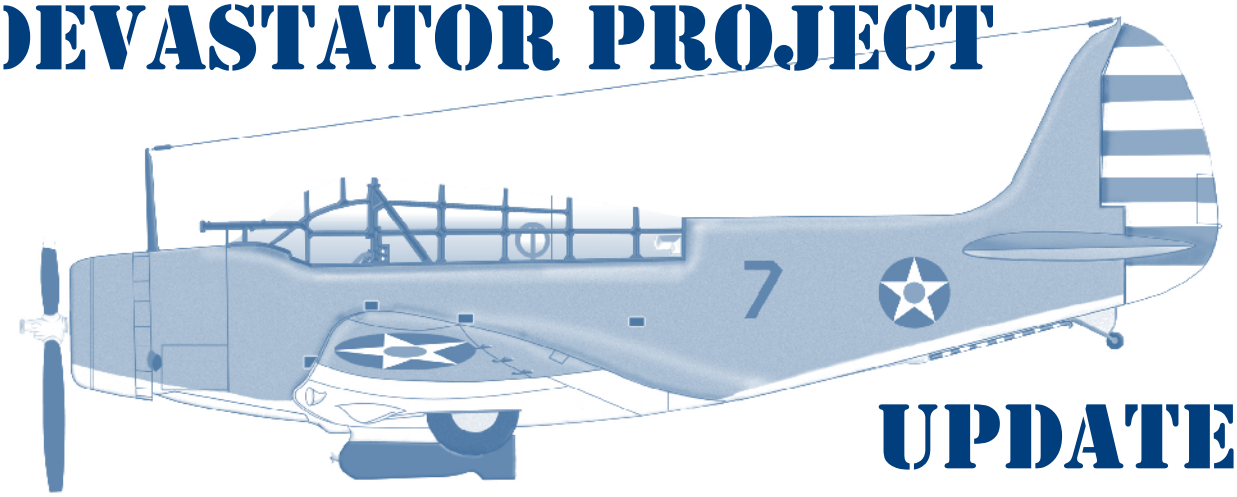
The principal Ketchikan records that are preserved in the National Archives are primarily unclassified administrative records. They take the form of great folders of correspondence, roughly organized chronologically, and dealing almost entirely with administrative matters, including routine reporting of supply, budget, construction. Operational matters, such as orders to or reporting by ships or aircraft, were not included. Hence, the records were of little use for this investigation, though they provided some insight into the character and habits of Captain Zeusler, who, from his administrative correspondence, seemed like a diligent and capable manager.

The evacuation begins. (Robert Gebo is on the sled, Art Hook is wearing the hat). Photo: USCG – National Archives, Suitland, MD (USCG Box 97: Rescue Operations, Alaska).

Shore party and survivors return to the McLane*. Badger Peak in the background. Photo by J. J. Casby, courtesy of Alan Casby.*

Alaska Game Commission and Ellis Airways float planes off the bow of the McLane*, probably in the Boca de Quadra. Photo by J. J. Casby, courtesy of Alan Casby.*

DEVASTATOR PROJECT UPDATE



In December 2004, TIGHAR's "Minister of Foreign Affairs" Col. Van Hunn, USAF (ret) was once again in the Marshall Islands helping to lay the groundwork for the eventual recovery and preservation of one of the TBD-1 Douglas Devastator torpedo bombers in Jaluit lagoon surveyed by TIGHAR in May 2004 (see *TIGHAR Tracks* Vol. 20, No. 2).

Van delivered another shipment of educational supplies to Jaluit and collected information we'll need to put together further shipments of school and medical assistance in 2005. TIGHAR's support of the Jaluit community is made possible through funding provided by the Phoebe W. Haas Charitable Trust and by the members of TIGHAR, with shipment from the U.S. to Majuro donated by FedEx and from Majuro to Jaluit by Air Marshall Islands.

Van also worked with the authorities on Jaluit toward the completion of a local project directly related to the TBDs in the lagoon. The raid of February 1, 1942 during which the Devastators were lost was also the first time the war had come to Jaluit. The Japanese administration had brought families from the atoll's many islands to Jaluit's main town of Jabor to work on the construction new wartime facilities there. When planes were heard overhead on a rainy morning neither the Japanese nor the Marshallese workers had any idea that they were hostile and no one took shelter. In the bombing attack that followed an American pilot apparently mistook the residential labor camp for a military installation and nearly a hundred Marshallese men, women and children were killed. The devastation was so complete that few of the dead could be identified. The survivors buried what they could find in a mass grave at the southern end of the atoll. Every year since then the people of Jaluit have gathered on September 3rd "Liberation Day," the day the Japanese garrison on Jaluit surrendered, at the place they call Koban Maron which means "all of us united together" – because people of all the different islands of the atoll

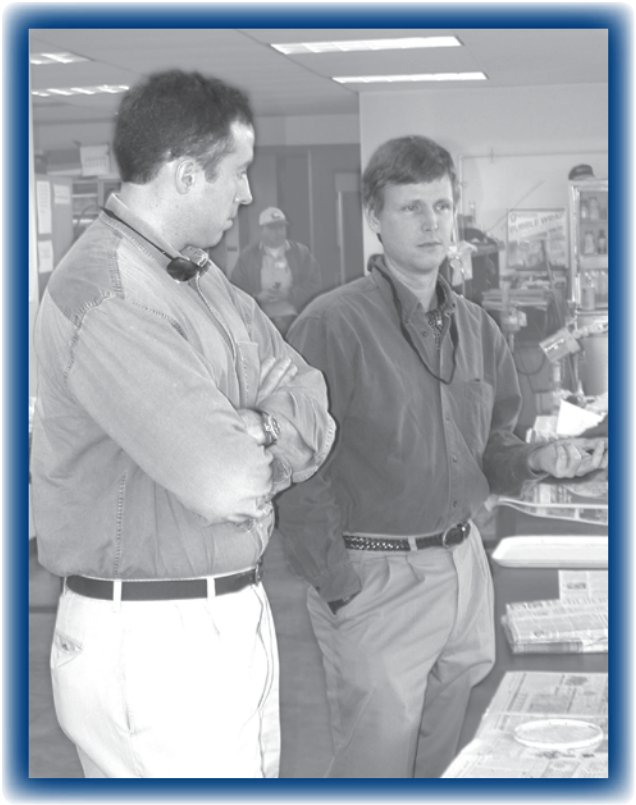
Van Hunn, far right, with some of the students and their supplies. TIGHAR photo by V. Hunn.

were united in death. The mass grave at Koban Maron is surrounded by a simple fence made of coconut logs because the community has never been able to afford a proper memorial.

This year, with funding pledged by the Phoebe W. Haas Charitable Trust and donations from the members of TIGHAR, materials will be purchased and a monument will be constructed at Koban Maron. A design has been approved by the local Monument Committee and the monument and low wall surrounding the site will be built by local volunteers under the direction of Odar Lani who was a witness to the 1942 tragedy. Dedication of the new monument is scheduled for September 3, 2005 and will be attended by the President of the Republic of the Marshall Islands, the American Ambassador, and other dignitaries.

TIGHAR's Van Hunn (L) at Koban Moran with Monument Construction Supervisor Odar Lani. TIGHAR photo by V. Hunn.

On a different but equally important front, continued support from the Edward E. and Marie L. Matthews Foundation has made it possible for TIGHAR to partner with the Conservation Research Laboratory of the Texas A&M University Nautical Archaeology Program for the creation of a comprehensive conservation plan for the TBD.The importance of this research cannot be overstated. What we're talking about is the first-ever recovery and conservation of an historic aircraft from a saltwater environment according to accepted archeological and historic preservation standards. What we're talking about is raising the bar for the entire historic aviation community. What we're talking about is pioneering a new era in aviation historic preservation. It's no small task and you'll be hearing much more about it.



TIGHAR's Russ Matthews confers with Texas A&M conservator Peter Fix at the university's Conservation Research Laboratory. TIGHAR photo by R. Gillespie.

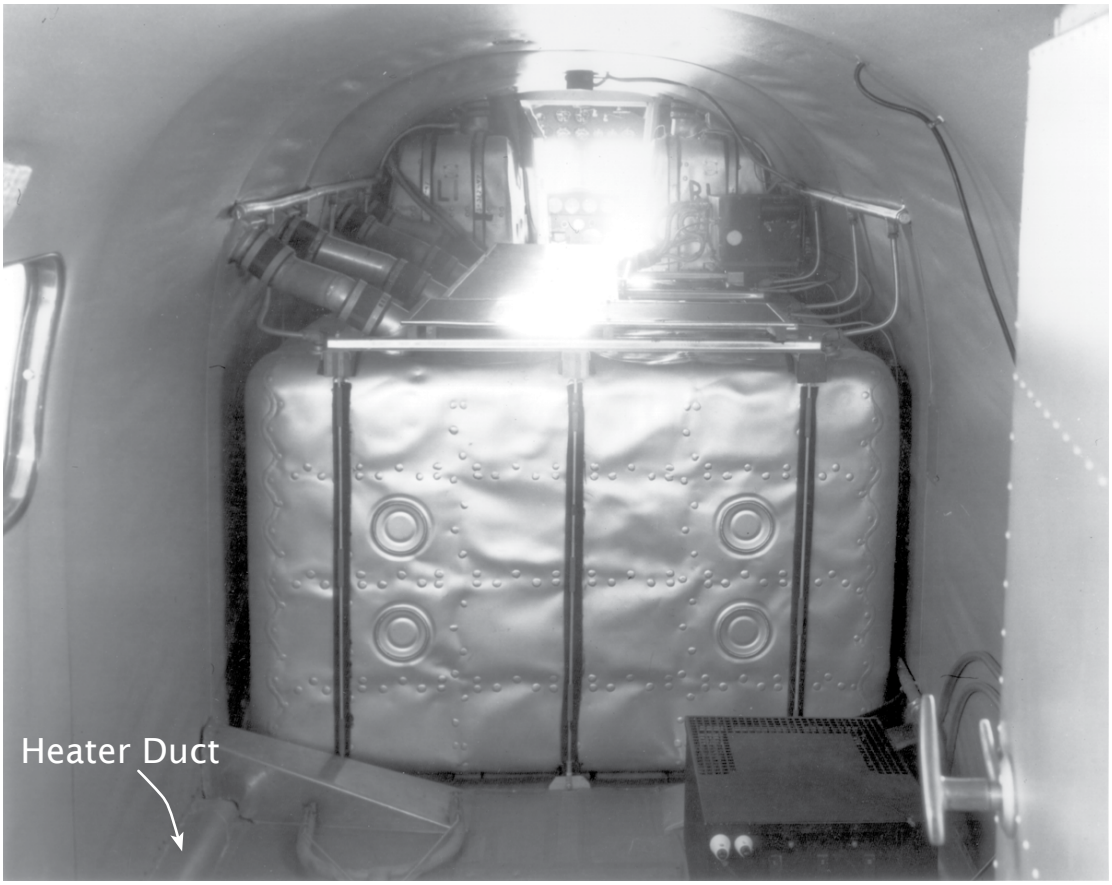
Photos by J. Hoover. Used by permission.

THE UN-DADOS

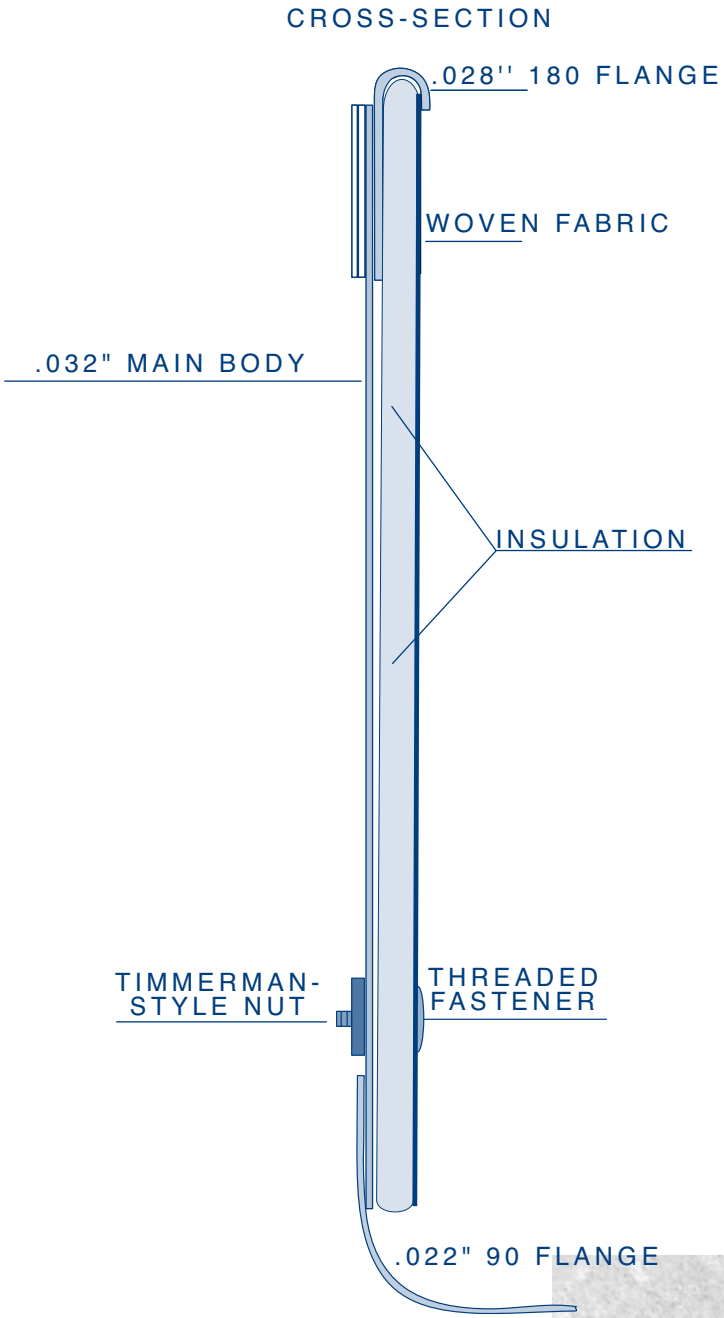
Even before the Ketchikan wreck provided details of how Lockheed Electra cabins were outfitted we knew that there were two problems with our original "dado" hypothesis.

We had originally theorized that our dados were installed along the juncture of the cabin wall and floor (as shown in the illustration on page 3), but the passenger cabin of a Lockheed 10 was heated with hot air that was fed into aluminum ducting which ran along the juncture between the cabin wall and the floor. If installed against the wall, our dados would have to be mounted behind the heater duct. Although the cabin of Earhart's 10E Special was not set up to accommodate passengers, photos show that the standard heating ducts were installed.

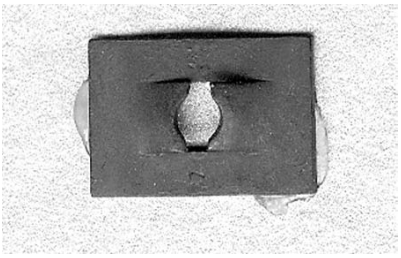
There are rust marks on the face of our most intact dado on the side opposite the insulation holes which clearly indicate the former presence of a fixture similar to a "Timmerman nut." We had originally identified these holes as "mounting holes" where a screw had attached the dado to some part of the aircraft structure, but that is not possible if there was a nut of some kind abutted directly to the face where we see the stain. It appears that what we had been calling "mounting holes" are, in fact, merely an accommodation for fasteners that helped secure the insulation to face of the dado.



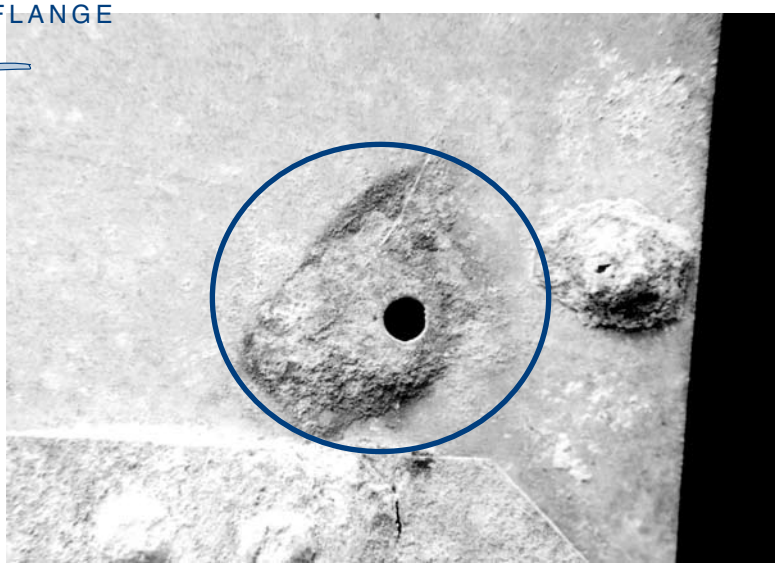
This photo clearly shows the heater ducts installed in the cabin of NR16020. Although it can't be seen whether they also extend forward beside the fuel tanks, hot air entered the system well forward of this point. If the ductwork that is visible had any function there must have been ductwork forward.



Timmerman nut. TIGHAR photo by F. Lombardo.



Rust marks on the face of Artifact 2-1-V-8, the dado found in 1989, indicate the former presence of a rectangular securing nut. TIGHAR photo by F. Lombardo,



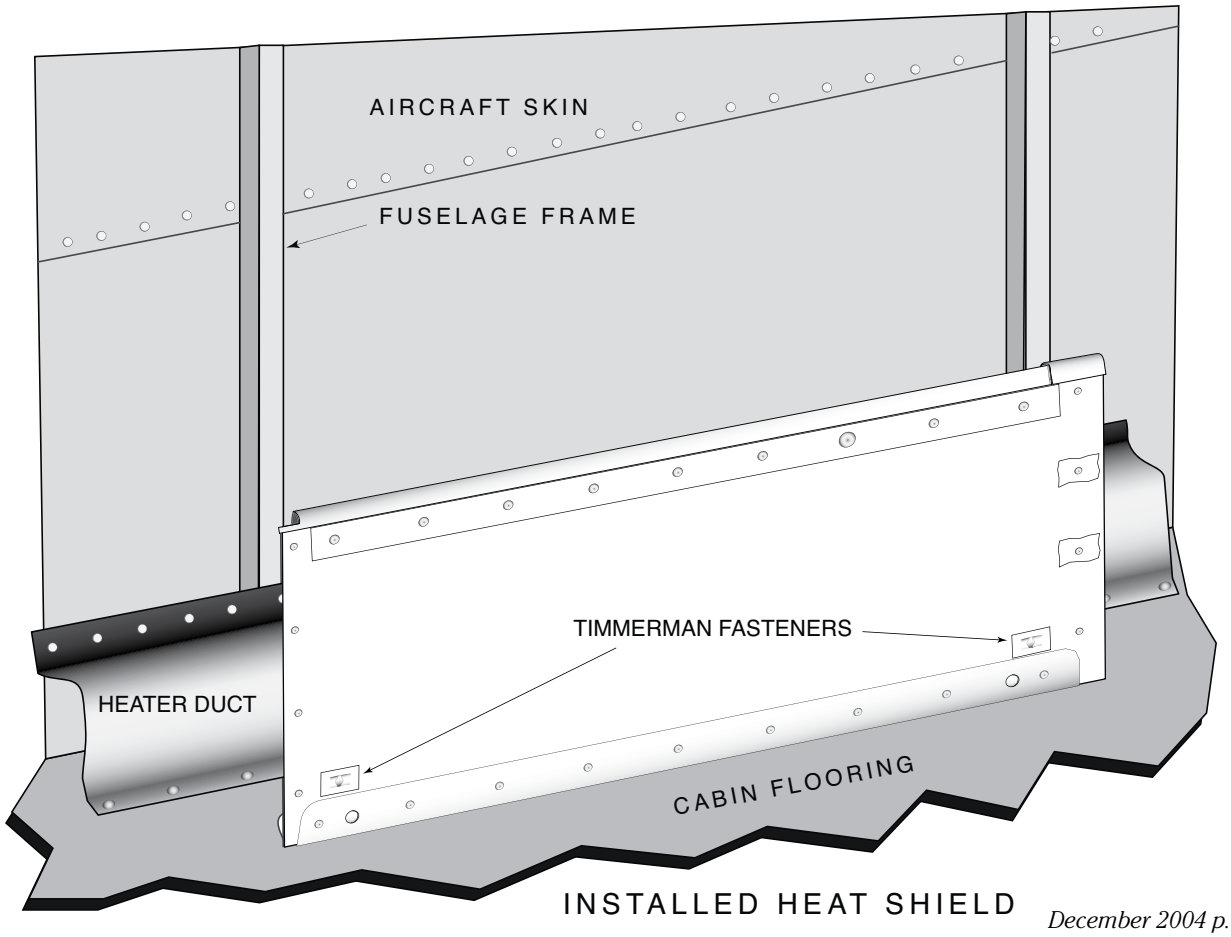
A NEW HYPOTHESIS

The absence of mounting holes means that the dados – or rather, the components we have been calling dados – were attached to the aircraft solely by means of the screws or nails in the 90° flange along the bottom. The presence of what appear to be pry marks on the bottom of the flange suggests that nails were used. Nails may seem like unusual fasteners to find in airplane but the floor of a Lockheed 10 was comprised of plywood panels covered with linoleum that was nailed in place.

These observations suggested to us that the components we found on Nikumaroro are not dados at all. Instead, they appear to have been free-standing cantilevered structures that were nailed to the floor and stood, end to end, like a 6.5 inch-tall fence. But why? What purpose might such a barrier serve? The presence of quarter-inch insulation firmly affixed to one face of the structure strongly suggests that the purpose of the "fence" was to act as an insulating barrier. But insulating what from what? The most obvious possibility is that it was used to insulate something that shouldn't get hot from something that was a source of heat. The only source of heat in an Electra cabin is the hot air duct that runs along the base of the wall on both sides of the cabin, but the whole point of the heater duct is to heat the cabin. What might there be in the cabin that shouldn't get hot? How about tanks full of gasoline, or more to the point, empty tanks full of gasoline fumes? A six and a half inch heat shield would seem about right for mitigating the effect of a two and a half-inch tall heater duct.

All very fine in theory – but was there really a need to insulate a gas tank installed in an Electra cabin from the heater duct? That's the question the Alaska wreck unexpectedly answered for us. When we decided to try to find and visit the site of the Gillam crash we were looking for examples Electra dados. We had no idea, until the team

Below: Our new hypothesis as to how the heat shields (formerly known as dados) may have been installed in the Earhart aircraft shows them attached to the cabin floor in the narrow space between the heater duct and the fuel tank with the insulation side facing the duct.



INSTALLED HEAT SHIELD

reached the site, that the plane had been modified to carry a fuel tank in the cabin. The method used to protect the tank was fairly crude – just a double layer of heavy asbestos matting covering the heater duct. Did the Lockheed factory shop in Burbank have a more elegant (and much lighter) way of approaching the same problem on the 10E Special several years earlier?

That question puts us back, for the moment, in the realm of very fine theory. There are no known photos of the cabin of Earhart's airplane just before the fuel tanks were installed, and after they're in place there is no way to see if anything is in the narrow space between them and the wall.

Maybe asbestos matting was used on NR16020 just as it was on Gillam's ship, but the material is quite heavy and, used in the quantity that would be required in the Earhart Electra, would carry a substantial weight penalty. The (putative) heat shields found on Nikumaroro are, by comparison, very light. It is also encouraging to find that the very function which the structures-formerly-known-as-dados seem to most logically perform is one that we now have good reason to believe was needed aboard the Earhart Electra.

Testing the new hypothesis will be difficult but, perhaps, not impossible. Previously unknown photos of NR16020 taken during the installation of the cabin fuel tanks could come to light – but that possibility seems remote. A more promising area of research might be to search for photos of the other Lockheed 10E Special, NR16059. Virtually identical to Earhart's, the airplane was known as the "Daily Express" and in May 1937 made the first commercial round-trip flight across the Atlantic carrying photos of the Hindenburg disaster nonstop from New York to England and returning nonstop a few days later with photos of the coronation of King George VI. The flights were an epic achievement that convincingly demonstrated the long range capabilities of the 10E Special but, ironically, precisely because they were successful they have been largely forgotten. How were the cabin fuel tanks of the Daily Express shielded from the heater ducts? Are there photos somewhere? For that matter, where is the Daily Express? Later that year it was sold to the Soviet Union and participated in the search for the lost trans-polar aviatior Sigismund Levanevsky. The search was eventually abandoned and the Lockheed presumably went to a new home in Stalin's Russia. Its fate is unknown.

SMOKING GUNS?

The Year of the Dado answered many questions and raised new ones. The objects found on Nikumaroro in 1989 and 2003, although somewhat similar to dados, do not appear to be dados at all but are probably free-standing heat shields. The objects are made of aircraft-grade aluminum with aircraft rivets and aviation industry precision. They almost certainly came from an aircraft. They are not stamped with part numbers and, therefore, do not appear to be military in origin. The objects appear to have once been attached to a wooden surface. Lockheed Electras had wooden floors.

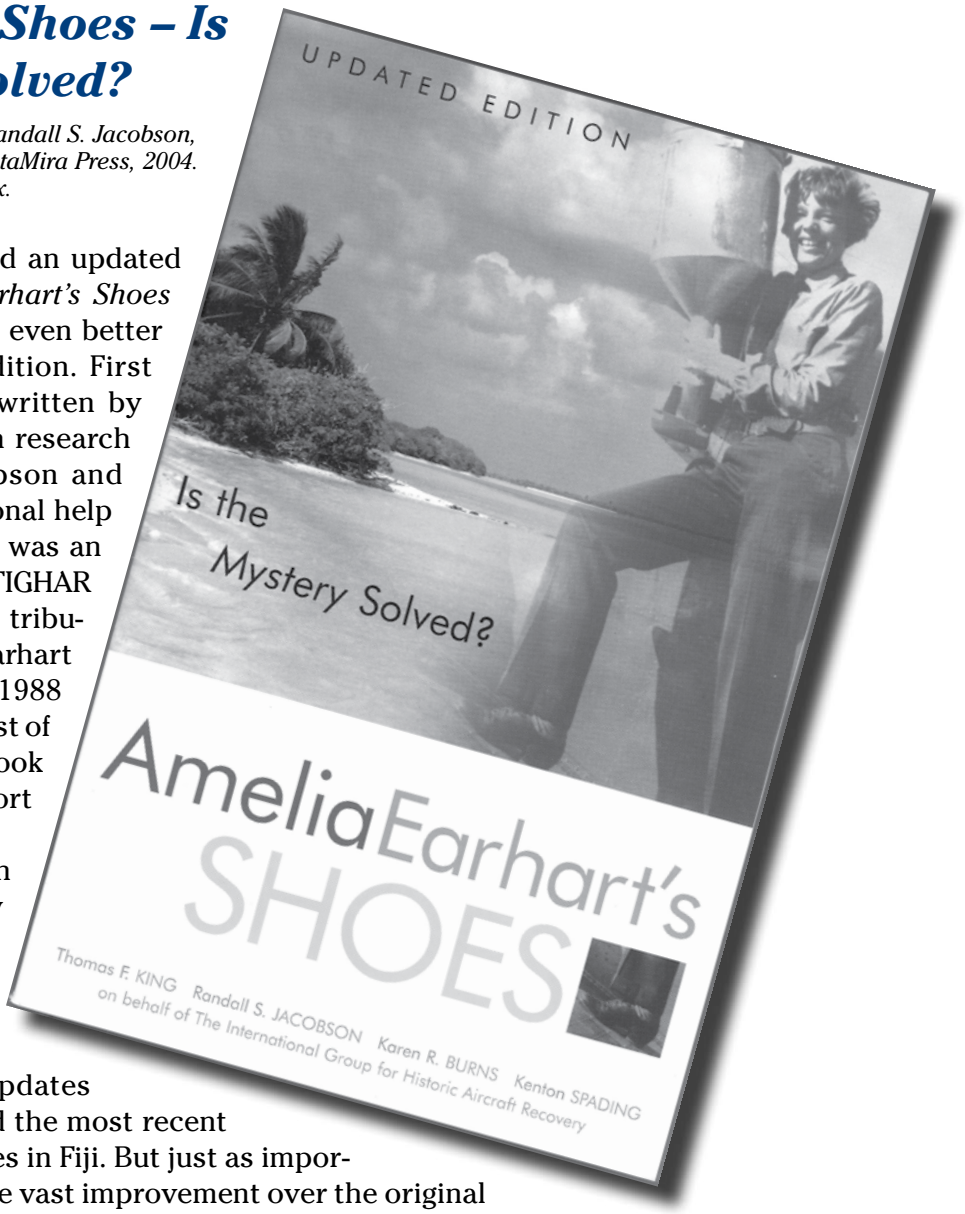
One example of a Lockheed Electra with a fuel tank installed in the cabin has been found and documented. The tank was shielded from the heater duct. If it turns out that Lockheed shielded the tanks in the cabins of 10E Specials with unique structures like the ones we found on Nikumaroro, that makes the four TIGHAR artifacts the proverbial "smoking gun" evidence we've been looking for. The research continues.

Book Review

EVERYBODY NEEDS NEW SHOES

Amelia Earhart's Shoes – Is the Mystery Solved?

Updated Edition, by Thomas F. King, Randall S. Jacobson, Karen R. Burns, and Kenton Spading. AltaMira Press, 2004. 415pp, footnotes, index.



AltaMira Press has published an updated softcover edition of *Amelia Earhart's Shoes – Is the Mystery Solved?* and it is even better than the original hardcover edition. First published in 2001, *Shoes* was written by archaeologist Dr. Tom King with research assistance by Dr. Randy Jacobson and Dr. Karen Burns, and organizational help from Kenton Spading. The book was an independent project by the four TIGHAR members to describe the trials, tribulations, and successes of the Earhart Project from its inception in 1988 through the 1999 expedition. Most of the royalties from sales of the book are donated to TIGHAR for support of the project.

The new paperback edition has been officially endorsed by TIGHAR and brings the project up to date as of 2004 with accounts of the 2001 and 2003 expedition and an analysis of their results. There are also updates on the post-loss radio study and the most recent attempts to track down the bones in Fiji. But just as important as the new information is the vast improvement over the original edition in the quality of the photos and illustrations. Tom's style, as always, is both erudite and reader-friendly. He relates the progress of the investigation as the riveting real life detective story that it is and his warts-and-all portrayal of its personalities makes the characters human and accessible.

Whether you already own the original hardcover edition or have yet to treat yourself to Tom King's talents as scholar and storyteller we heartily recommend the new updated edition of *Amelia Earhart's Shoes*.

Order directly from the publisher, Altamira Press: 1-800-462-6420; www.altamirapress.com.

TIGHAR Membership News

The Earhart Project Forum is a moderated subscription email list dedicated to advancing the search for Amelia Earhart. It's been around for about seven years, and now it's changing. While the change will not affect TIGHAR members we thought you should know about it. Beginning February 1, 2005, the Forum will no longer be free to non-members.

Anyone may subscribe to The Earhart Forum FREE for 30 days. At the end of a non-member's 30 day FREE period, s/he has three options:

1. Decide s/he doesn't want to bother, and sign off or allow the subscription to expire.
2. Join TIGHAR (subscription to the Forum is a benefit of TIGHAR membership).
3. Provide TIGHAR with a form of payment (credit card, check in advance, etc.) in the amount of $5 per month. Note: joining TIGHAR is slightly cheaper, as TIGHAR's Associate Membership is only $55 per year.

TIGHAR members may sign on as a benefit of membership (no extra charge) at http://www.tighar.org/forum/AESForum.html.

Associate membership in TIGHAR is staying at the $55 level for 2005. Here are the assorted categories:

Student/Senior/Museum/Library	$45
Associate	$55
Sponsor	$100
Donor	$500
Patron	$1000

Renewal notices are sent out beginning in the month before your membership is due to expire. You can renew by check, money order, cash (although we don't recommend it), VISA or MasterCard by mail or on line, or by calling us up on the phone, or by sending us a fax, or even a carrier pigeon I suppose. Numbers and information are on your renewal notice and below.

In another change for 2005, we are discontinuing the Earhart Project Book Eighth Edition as a sales item, and will be making all of the information freely available on TIGHAR's website. Additions and updates to the Project Book will be added to the website, but printed copies will no longer be available. We thank those who have supported the Earhart Project by purchasing the book in the past.

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