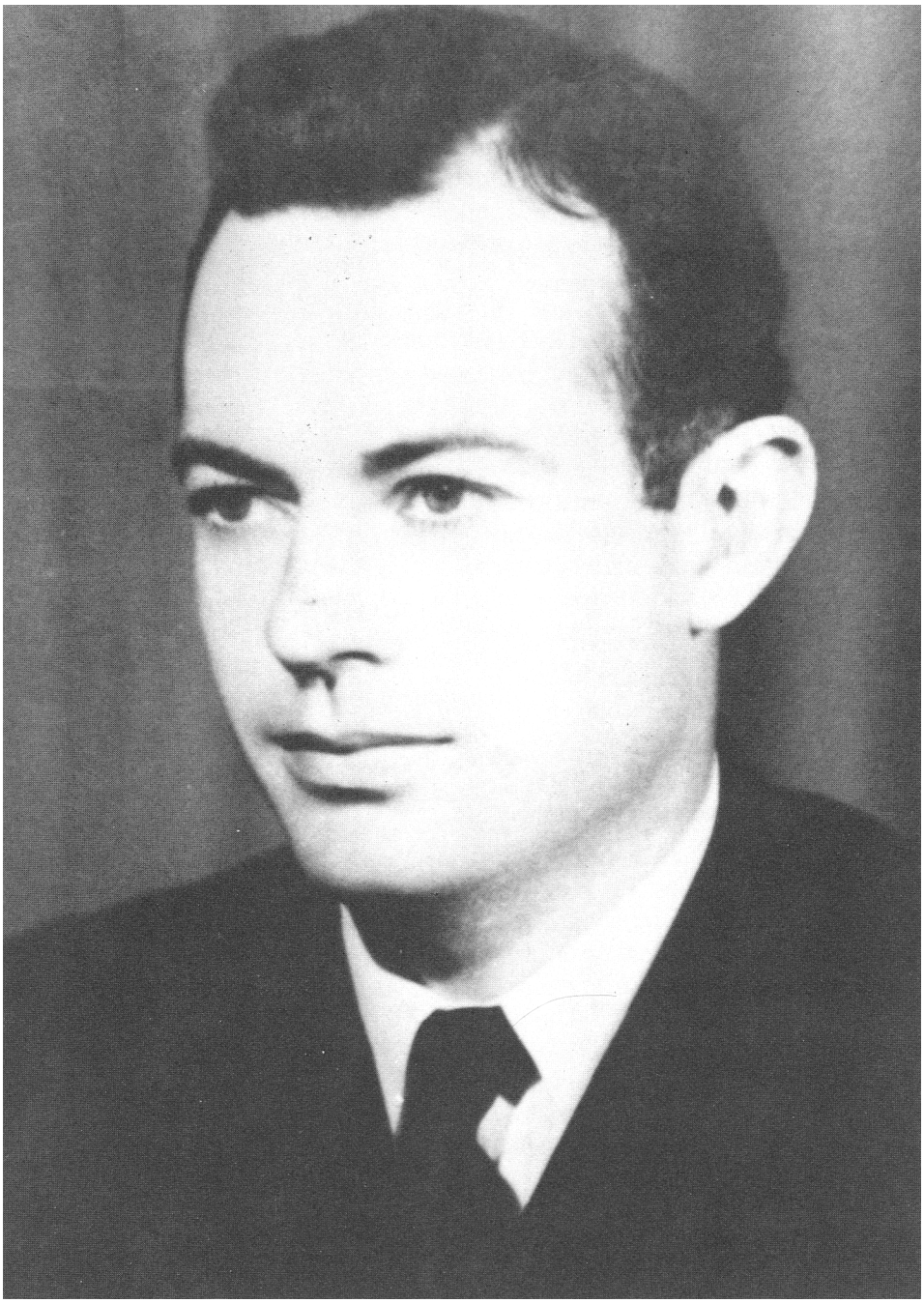
TIGHAR TRACKS

THE JOURNAL OF THE INTERNATIONAL GROUP FOR HISTORIC AIRCRAFT RECOVERY



September 11, 1995

Volume 11, Number 3

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

–John Aubrey
Stonehenge Manuscripts
1660

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.

Contents

COVER:

What PBY pilot Lt. (jg) John Mims saw on Gardner Island in 1945 didn't make sense to him then. Can we make sense of it now?

The publication of *TIGHAR Tracks* is made possible by a generous grant from

Honeywell
Space & Aviation Control
Phoenix, Arizona

Our sincerest thanks.

TIGHAR Tracks, published four times each year, 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 $45.00 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. Photographs and artwork will be returned on request.

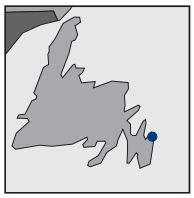
Back And Forth

Dear TIGHAR

Dear Ric,

I received the latest issue of *TIGHAR Tracks* several weeks ago, but it has taken me this long to cool off enough to be able to write you without setting fire to the paper.

I refer of course, to your "Project Director's Field Journal" section of the article on page 11, "An Adventure in Newfoundland."



Imagine my shock and dismay, to see myself and my volunteer efforts on behalf of you and the other TIGHAR members on the expedition to Gull Pond denigrated so cavalierly, and for no apparently good reason. My collection of *TIGHAR Tracks* is admittedly less than complete but in all of the volumes I have read which contain accounts of other expeditions, I cannot recall ever seeing such blatant criticism of a member.

My last contact with you in person when you made your last trip to the province led me to believe that we had formed at least a rudimentary friendship based on a shared interest in things aeronautic. True, I was anxious to gain information that would make compelling reading for the 100,000 people who each day read the newspaper I work for. But I also demonstrated a deep and abiding interest in your work and it was on that basis that I volunteered my services and took out my membership in TIGHAR (at considerable expense I might add, factoring in the exchange between the greenback and the Canadian dollar).

For my troubles readers of *TIGHAR Tracks* are given the impression that the bumbling backwoods Canadian couldn't find the "LZ," as you term it, and that I wandered about the ice like some sort of accident waiting to happen. Finally, your readers are informed that, being the good and all-knowing shepherd, you lowered yourself to overfly me and "wave to Gary" like some benevolent father humouring a not too bright child.

The reality, of course, is somewhat different and, since you have chosen to give this rather colorful and thoughtless interpretation to the events of March 25, 1994, I hope you will allow me space in the next *TIGHAR Tracks* to present my side of the story.

Regarding my late arrival, I plead guilty. Was I dilly-dallying along the way, stopping at every whim to admire the fabulous offerings of benevolent nature? No. I was nursing a heavily loaded car along some of the most frost-heaved and pot-holed pavement you'll ever see. Did I take a wrong turn at one point? Again, guilty as charged. Not all of us are possessed of your sublime sense of direction, not to mention a pilot with electronic navigation gear to guide him.

Second, you would like readers to believe that because I wasn't wearing an immersion suit it was necessary that I be herded about like some innocent lamb, ever fearful I would fall prey to some hideous fate that would spell disaster to the entire expedition. What you fail to mention, and a fact which you knew because we had discussed it in the past, was that I lived for many years in Canada's far north. I've walked more miles over frozen water, both fresh and salt, than you've had hot dinners.

Finally, you might have explained that the reason you overflew me and waved was so I would know that you had safely extracted the other expedition members from what was fast becoming a critical situation. If you had not done so I would have assumed that the quickly deteriorating weather had closed in, trapping you at Gull Pond, and governed myself accordingly.

In the end, I transported some of your most vital equipment for you out of the goodness of my heart and made every effort to be a friend and a committed TIGHAR member. I might also note that in the space of less than a year TIGHAR received extensive publicity from the nearly dozen articles I wrote for my paper. For my efforts, I am depicted in your report as falling somehow short of your lofty ideals.

Will I now turn my back on you and TIGHAR, hugging my anger and disappointment to me and nursing my wounded pride? No. If you should return here some day I'll be glad to see you and offer further help. I'll just be sure to wear some armour plate to ward off the knife blades from my exposed back.

Finally, I invoke your well-known feelings about a certain editor of a certain aviation magazine who is in the habit of editing your letters to him, removing the parts he finds objectionable or too close to the truth before publishing them. Let's see if you can now take as well as you can give.

Sadly but sincerely,
Gary Hebbard
TIGHAR Member #1865
St. John's, Newfoundland

Gillespie Responds:

Gary Hebbard's letter has been reproduced here in its entirety. I'd like to publicly apologize to Gary for the offense he felt at the publication of "An Adventure In Newfoundland" (*TIGHAR Tracks* Vol. 11, No. 1). His clarifications of events on the ice and in the air that day are correct and welcome. My field notes were written as events unfolded and, therefore, reflect the uncertainties of the moment while lacking the tact of hindsight. As a professional writer himself I hope Gary will understand that my purpose in publishing them was, in part, to share with TIGHAR members the atmosphere of self-doubt and anxiety which is an inescapable part of expeditions. I also hoped to make the point that, no matter how thoroughly we prepare, the one constant in field work is that everybody, at one time or another, screws up. Any implication of incompetence, however, was unintentional and is regretted. I value Gary's friendship and appreciate the significant support he has given Project Midnight Ghost. When we return to Newfoundland to continue the search for whatever remains of l'Oiseau Blanc we'll look forward to Gary's continued participation.

Responding to the Response

Dear Ric,

All is forgiven! Seriously, though, I had to reply right away to your gracious letter. I could not have been more gratified by your prompt and courteous response. It was truly appreciated and obviously the act of a real gentleman.

With best personal regards and looking forward to working with you again,

Gary

A Answer: An Answer: 5¢ An Nickel

Ric—

Further contributions will be considered provided you don't use "an historical ……" An is used only where the "h" is silent – like the "p" in pswimming!

William Huegel
TIGHAR #1189
Glendale, Wisconsin

Dear Bill–

Thanks for your donation and for your note. As the editor of *TIGHAR Tracks* and almost everything else that leaves this office in printed form, I suppose I must take responsibility for this one.

My authority for using *an* before *historical* and *historic* is as follows:

> Baker, Sheridan. *The Practical Stylist.* New York: Thomas Y. Crowell Company, Inc., 1969. Page 143: **A, an.** Use **a** before h sounded in an accented first syllable: a HOSpital, a HAMburger. Use **an** before a silent or an unaccented h: an honor, an hisTORical event, an halLUcination.

This guide was my Bible through college, and I have continued to refer to it to resolve all such questions. However, I note that Margaret Shertzer, in *The Elements of Grammar*, expects that *historical* will take *a*. (Man with one watch knows what time it is; man with two watches never sure ….) Could we have a regional difference here? I know that in southern Virginia, where I grew up, one always heard *an historic*, pronounced as one word: anistoric.

One is somehow reminded of the gentleman in a monologue by Tom Lehrer. His name was Hen3ry. The 3 was silent.

Thanks for writing.

Best regards,
Patricia R. Thrasher
President

Letters to the editors of TIGHAR Tracks *are always welcome. The editors reserve the right to edit any letter to conform to the limitations of space or subject in any issue. No anonymous, abusive, or personally directed letters will be published (unless they're really funny). The views expressed in this section are those of the letter writers, and have not been changed in any way. Please address letters to:*

TIGHAR Tracks, 2812 Fawkes Drive
Wilmington, DE 19808, USA
Fax (302) 994-7945.

Your Tax Dollar At Work

In April of this year TIGHAR and a number of other historical authorities and organizations were sent a draft copy of National Register Bulletin 25 soon to be published by the U.S. National Park Service. Subtitled "Guidelines for Evaluating and Documenting Historic Aviation Properties," the publication is intended to help owners, as well as recommending and approving authorities, decide whether various types of aviation-related properties are eligible for inclusion in the National Register of Historic Places. No big deal, right? Wrong. Because "objects" such as ships and airplanes are eligible for inclusion in the National Register of Historic Places (go figure), this bulletin represents the first attempt by the U.S. Government to define just what is – and is not – an historic aircraft. Although not technically a body of regulations, the publication will be a guide for owners who have no particular expertise in the field of historic preservation, and for officials who have no particular expertise in aviation. In other words, as far as the National Register is concerned, Bulletin 25 will pretty much govern which airplanes are regarded as genuine historic properties and which are not.

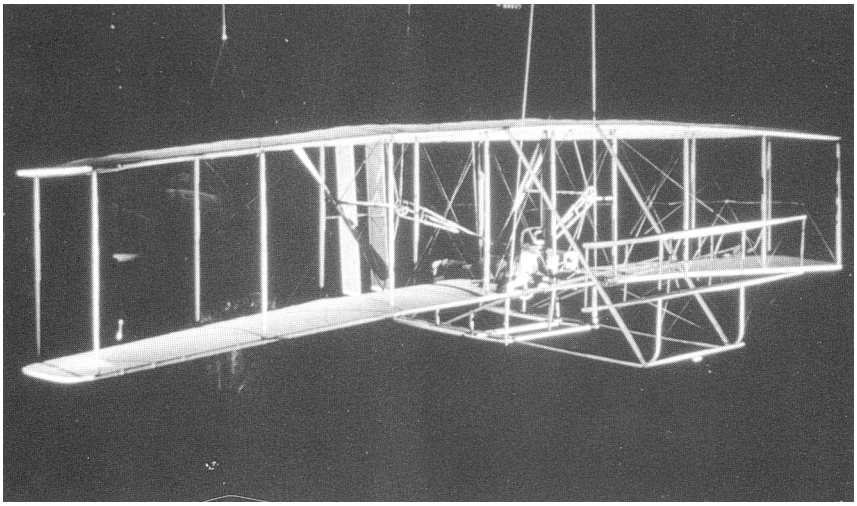
All of this will be a **GOOD THING** so long as the published guidelines are fairly and intelligently written, but a reading of the draft bulletin revealed some serious problems. Then again, that's what a draft is for. TIGHAR's letter pointing out a number of difficulties in the proposed guidelines brought an invitation from the Keeper of the National Register of Historic Places for a meeting to discuss our concerns. We were happy to oblige and a conference in Washington in late June identified two areas of the bulletin which needed significant improvement:

- An introductory section entitled Aviation in American History intended to provide an overview of why aviation-related properties are worthy of preservation.
- A section entitled Evaluating the Integrity of Historic Aviation Properties, specifically the discussions relating to location and setting, and integrity of materials.

TIGHAR offered to rewrite these sections the way we would like to see them, understanding that the Park Service would use as much or as little of our work as they choose, and would compensate us only with a credit in the final publication. It is admittedly difficult to spend unfunded time rewriting, for free, something the government paid someone else several tens of thousands of dollars to produce, with no guarantee that any of it will actually be used. But if TIGHAR is genuinely dedicated to the cause of aviation historic preservation, we have no choice but to do what we can.

Here, then, is our rewrite of Aviation in American History. Whether or not it ever appears, in whole or in part, in National Register Bulletin 25, we wanted you, the members of TIGHAR, to see what your organization proposed. Our rewrite of the Evaluating the Integrity of Historic Aviation Properties section will appear in the next *TIGHAR Tracks.*

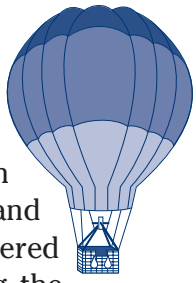
Aviation In American History: A Preservation Perspective



National Air & Space Museum

So entwined is the United States in the development of aerospace technology that any discussion of "Aviation In American History" might just as accurately be titled "America in Aviation History." The flying machine was, after all, an American invention, born at the dawn of the 20th century of classic American entrepreneurial imagination and zeal. Less than a hundred years later, the product of the Wrights' genius has grown to become the nation's single largest industry and, in the international marketplace, the country's defining product. America builds airplanes.

Ironically, our new-found ability to move about in, and ultimately beyond, the Earth's atmosphere has changed American life so rapidly that it has been difficult to remember to preserve the relics of that process. For many years, preservationists struggling to conserve sites, structures and objects hundreds and often thousands of years old had difficulty seeing an urgent need to save airfields, hangars and machines whose historic period may well have been within their own memory. Furthermore, National Register criteria discouraged the inclusion of "moved properties," "reconstructed properties," and "properties which have achieved significance within the past fifty years." Enthusiasts stepped in where professionals feared to tread with the result that, while the renovation and exhibition of old airplanes became a multimillion dollar industry, relatively little aviation historic preservation took place. As the air museum community matures, the principles and practices of artifact conservation are beginning to replace wholesale rebuilding as the accepted standard of collections management. In assessing the historical significance of a particular aviation-related property it is, therefore, essential that we have not only a grasp of where the structure, site or object fits in the nation's story, but also an understanding of how several decades of public enthusiasm for aviation nostalgia may have affected the property's historical integrity.



The earliest aeronautical activities in the United States were the brief ascents of hot air balloons in the late 18th century. The use of hydrogen and helium as lifting gases soon offered meaningful time aloft, and during the Civil War the U.S. Army organized a Balloon Corps whose tethered observers were the first American military airmen. Throughout the 19th century gas-filled free balloons entertained the

public at fairs and political rallies. Although some impressive distance and endurance flights were achieved, these wind-borne adventures served mostly to spur the desire for a more useful method of aeronautical travel.

Artifacts surviving from this period are relatively rare and tend to be limited to the wicker and leather baskets or gondolas which were suspended beneath balloons. The development of safe, economical propane burners and envelopes made of lightweight synthetic fabrics has in recent decades prompted a rebirth of hot air ballooning. Gondola construction, however, remains relatively unchanged from the 1860s.

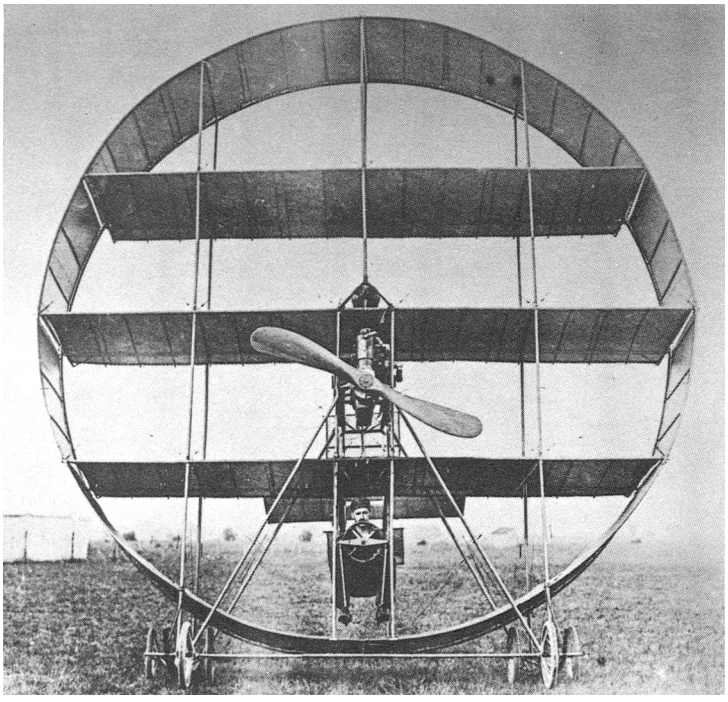
Although the takeoff of the first airplane dates from December 17, 1903, the takeoff of widespread aeronautical development does not.

By the turn of the century a number of Americans were actively involved in aeronautical research in the hope of achieving controllable, powered flight in a heavier-than-air craft. Among them were prominent figures such as Chicago engineer Octave Chanute; Secretary of the Smithsonian Institution, Samuel Pierpont Langley; and inventor Alexander Graham Bell. It was, however, the work of two lesser known businessmen and experimenters from Dayton, Ohio that was rewarded with success. But although the takeoff of the first airplane dates from December 17, 1903, the takeoff of widespread aeronautical development does not.

Determined to realize the potential financial rewards of their achievement, Orville and Wilbur Wright spent the two years following their first flight refining their patented invention in self-imposed isolation. In 1905 they stopped flying altogether, dedicating the next three years to the solicitation of licensing agreements in Europe and the negotiation of a contract with the U.S. military. Satisfied that they had the market locked up, the brothers stunned the world of 1909 with breathtaking flying displays in the U.S. and in Europe. Patents or no, the revealed technology inspired a host of imitators on both sides of the Atlantic whom the Wrights, in turn, vigorously sued for infringement. The resulting litigious environment was a major impediment to progress during aviation's early years.

From a preservation perspective, the materials used in the construction of aircraft during this period present significant challenges. Flying machines were built primarily of light weight varnished woods, linen or cotton fabric often (but not always) coated with a sealant, steel fittings and wire, and leather. Engines often included aluminum components. Intact examples of aircraft from this period are rare indeed. The world's first airplane, the 1903 Wright Flyer, was wrecked by the wind minutes after its historic flight. The aircraft which now hangs in the National Air & Space Museum is a 1985 restoration of a 1927 renovation of Orville Wright's 1916 reconstruction from what was salvageable from 1913 flood damage to the 1903 wreckage. Similarly, the 1905 Wright Flyer listed on the National Register and exhibited in Dayton is a reconstruction supervised by Orville Wright shortly before his death in 1948 and was based upon debris retrieved in 1911. The most original examples of aircraft from this period are also the most obscure. Aviation's stormy infancy prompted

from Aviation on Long Island



The Geary Circular Triplane of 1911 infringed upon no known Wright patent. Neither did it fly.

many inventors to try their hand at devising machines which could successfully circumvent the Wright patents. A surprising number of these early birds were ultimately squirreled away in barns and lofts only to be rediscovered many years later. One such example is a 1911 STECO (Stephens Engineering Company) "aerohydroplane" found in 1990, carefully crated and stored in a garage. Virtually complete and undamaged, the unusual machine is now part of the Minnesota Air & Space Museum collection.

With war in 1914 came a reordering of priorities among European designers and manufacturers. Legal concerns gave way to an eager and urgent market for anything that might provide a military advantage. While American aviation stagnated, the sky above the Western Front saw an almost monthly progression of new and better aircraft. When the U.S. entered the war in 1917 it could offer the Allied cause no combat-worthy aircraft. The domestically produced Curtiss JN-4D or "Jenny" performed yeoman service as a primary trainer, but even so the schooling of American pilots was completed in Europe and they went into combat flying French and British types. No American-designed aircraft saw action in World War One, although the American Liberty engine powered the British DeHavilland DH-4, many examples of which were built under contract in the U.S.

Preservation of aircraft from the World War One era is beset with all of the problems inherent in their mostly biodegradable construction, plus the difficulties paradoxically brought about by their very popularity. Although largely myth, the "knights of the air" image of World War One aerial combat made aircraft of that era the subject of public interest from an early date. After the Armistice, a few examples, usually either trophies of war or the mounts of famous pilots, went to museums and today remain the best surviving examples of their type. The wartime airplanes that escaped the scrap yard often entered the private sector as surplus. In the mid-1920s many surviving combat types found new careers in the entertainment industry and became the featured attractions at public events and in films. Other training and civil types of wartime vintage were modified to meet the demand for matinee warriors. Today, surviving World War One-vintage types which include more than a few components of the original aircraft are few. Replicas and reproductions abound both as airworthy performers and museum displays, and span a broad spectrum of accuracy in construction and authenticity of materials.

USAF photo

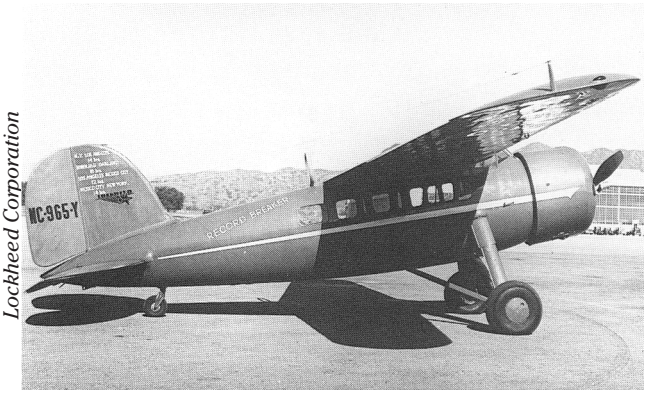
Auto racing star Eddie Rickenbacker became America's highest-scoring WWI ace flying French machines like this Nieuport.

The end of the Great War left America with a reborn fascination with the airplane, a ready supply of trained pilots and mechanics, and a fledgling aviation industry eager to beat swords into profitable ploughshares. At first, a glut of surplus military machines dampened demand for new airplanes and American aviation became typified by the reckless antics of itinerant "barnstormers" who thrilled crowds and sold rides in war-surplus trainers. The Air Mail Act of 1925 and the Air Commerce Act of 1926, however, brought government subsidies and regulation which, in turn, spurred the development of economically viable aircraft and facilities. Charles

Preservation of aircraft from the World War One era is beset with all of the problems inherent in their mostly biodegradable construction, plus the difficulties paradoxically brought about by their very popularity.

Lindbergh's 1927 transatlantic flight became the defining moment in the American public's awakening to the possibilities of air commerce as the man whom reporters in New York had labeled "The Flying Fool" became "The Lone Eagle" upon his arrival in Paris. Soon struggling young companies run by men named Boeing, Douglas, Loughead (pronounced Lockheed), Grumman, Sikorsky, and others began to emerge as major players in a new and growing industry that was changing the way Americans thought about, and dealt with, the world. Accepted notions of time and distance born of 19th century rail and steamship timetables were shattered by the exploits of air racing heroes like Jimmy Doolittle, and long-distance record setters like Wiley Post and Amelia Earhart. During this "Golden Age" all-metal construction gradually replaced the cloth-covered wood or steel skeletons of World War One and the ubiquitous biplane gave way to the sleeker monoplane. Quantum improvements in engine horsepower and reliability combined with more aerodynamic designs to deliver dramatic increases in speed, altitude, and load carrying ability. Commercial air travel entered the 1930s as a drafty and dangerous adventure and left the decade as a reliable and indispensable part of the nation's economy.

Commercial air travel entered the 1930s as a drafty and dangerous adventure and left the decade as a reliable and indispensable part of the nation's economy.

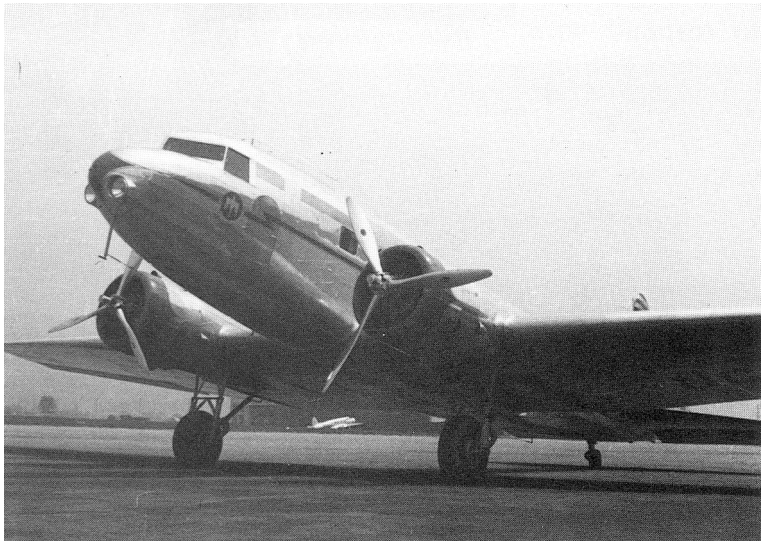


Lockheed Corporation

In the mid '30s, old records were being broken almost weekly by bold pilots and new designs. This Lockheed Vega belonged to Amelia Earhart.

For the American military, the inter-war years began with a dispute over whether airplanes could sink battleships and ended with the desperate recognition that the fate of the world hung, quite literally, upon America's ability to build enough airplanes.

Because aviation changed so much and so rapidly during the years between the wars, the surviving properties of that period are important candidates for historic preservation. America's first major airports were built during this time and not a few original terminals and hangars still stand. Their architecture struggles to convey the solid respectability of rail travel while simultaneously expressing the excitement of flight. Other relics which dot the American landscape—lighted beacons that once marked aerial highways for night flying, or a town's name painted on a barn roof—still speak to yesterday's skies. Many of the era's record setting aircraft have survived in more or less original condition and hold places of honor in museums. A few aircraft of the period have remained in relatively constant service since their manufacture. A pre-war Douglas DC-3 with more than 100,000 flight hours – more than any other aircraft – was still working for a living in the 1990s. A 1931 Pilgrim 100B currently listed in the National Register hauled freight in Alaska well into the 1980s before being retired to a museum. Hun-



TIGHAR Carter-Johnson Collection

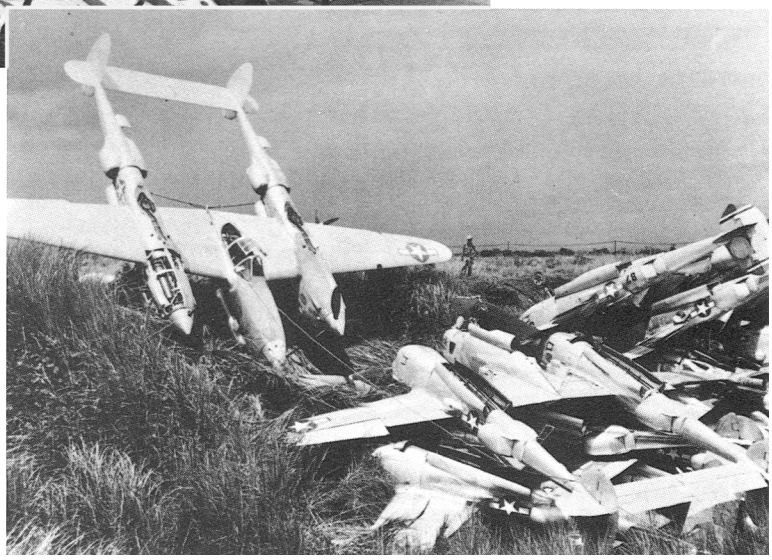
Commercial air travel came of age with fast, reliable, all-metal airliners like this Douglas DC-2.

dreds of Golden Age machines have been returned to flying condition and compete for honors at "fly-ins" held by enthusiast organizations such as the Antique Airplane Association and the Antiques & Classics Division of the Experimental Aircraft Association. As with the antique automobile community, emphasis is placed upon the return of the machine to like-new (or better) condition using materials and techniques identical to, or resembling as closely as possible, those replaced. Often the only original material remaining in a "restored" fabric-covered aircraft is the steel-tube frame and whatever engine components were not replaced during its rebuild. The products of these efforts are most accurately termed "rehabilitations" and best serve the interest of historic recreation rather than preservation.

As Europe went to war once more in 1939, American aircraft designers and manufacturers found a new and urgent market in British, French and Dutch demands for combat aircraft. Unlike the conflict of a generation earlier, U.S. firms were in a position to respond with talent and ability nurtured during the preceding decades. Mindful of the worsening world scene, the U.S. War Department had throughout the '30s increasingly encouraged the development of military aircraft with the result that virtually every American warplane used during the Second World War was already either flying or on the drawing board before December 1941. As America moved from neutrality to overt support of the beleaguered Allies, a crash program of new construction and tooling created the infrastructure which would enable the U.S. to become the "Arsenal of Democracy" in fact as well as name. America's production of fewer than 6,000 airplanes in 1939 doubled in 1940, doubled again in 1941 and yet again in 1942. With the country's entry into the war came a world-wide deployment of U.S. Army, Navy, Marine and Coast Guard air forces which played crucial, and often deciding, roles in every major engagement. By war's end Americans had built a staggering total of 300,718 military aircraft and had seen their nation's airpower projected around the globe.

The public's interest in World War Two aircraft as historic objects followed the pattern established after the preceding war, but on a grander scale. Massive post-war scrapping operations destroyed the majority of the aerial armada whose very success had rendered it unnecessary. The 1950s saw a few surplus bombers employed in corporate travel, fire fighting, and agricultural work, while many of the surviving fighter aircraft found second careers in the air forces of developing nations. A few well-heeled veterans were able to acquire, refurbish, and fly examples of high-performance wartime types as sport aircraft. In the 1960s, social turmoil fostered in many

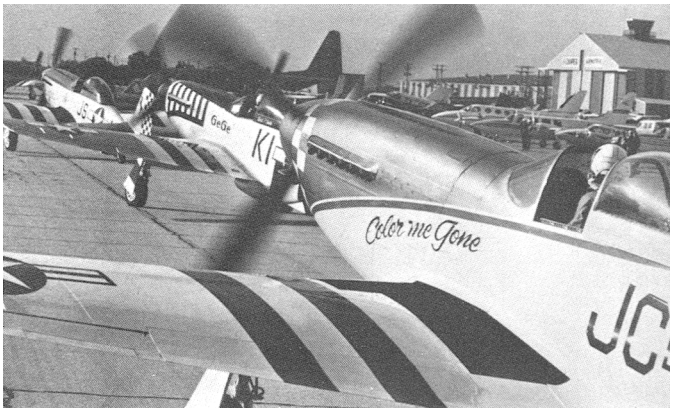
The Boeing Company



In April 1944, production of B-17 Flying Fortresses (above) reached an incredible sixteen per day. Two years later, scenes like the disposal of these P-38 Lightnings were commonplace.

AAHS Journal

Americans a nostalgia for a simpler, prouder time. The public flocked to airshows featuring World War Two airplanes and by the close of the decade big-budget Hollywood epics like *Battle Of Britain* and *Tora, Tora, Tora* were starring squadrons of genuine and quasi-genuine warplanes. A very real and very pricey market developed for what came to be known as "warbirds." By the 1980s, a flyable North American P-51 Mustang could easily command a price of $500,000 and an airworthy Lockheed P-38 Lightning was sold in the early 90s for over a million dollars. As with aircraft of the Golden Age, the desired standard is like-



Bud Davisson photo

new, factory-fresh condition. Because most of the materials and construction techniques used to build, repair and maintain these machines are still commonly available, achieving that standard is primarily a function of time and money. During this same period, public enthusiasm for World War Two aviation also sparked an explosion in museum construction. Prior to 1960 the world's free-standing air museums could be counted on the fingers of one hand. In less than thirty years they numbered in the hundreds.

The growth of a multimillion dollar industry around World War Two aviation presents advantages and problems for the preservationist. Intense public interest constantly brings new opportunities to light (in 1992 a rare P-38 fighter emerged virtually intact from the Greenland ice cap where it had landed in 1942) but market forces often operate against preservation (the airplane was subsequently rebuilt to airworthy condition). Demand for flyable airplanes of vintage design has prompted the construction of replicas of surprising complexity and sophistication. With no example of the world's first operational jet fighter (the German Messerschmitt 262) available for rebuild to flying condition, a Texas company borrowed a preserved example, disassembled it for patterns, and began construction of five new Me 262s with modern, reliable engines to be sold for over a million dollars a copy.

The jet engine, invented in the late 1930s and developed during World War Two, transformed post-war aviation. The Korean conflict saw the first jet-to-jet duels, and later the B-52 became a symbol of Cold War vigilance. In 1952 the British were the first to put a jet airliner in service but a series of accidents forced its withdrawal. The Boeing 707 first flew in 1954 and soon established the Seattle-based company's domination of the world airline market. Meanwhile, the rocket motor, pioneered by America's Robert Goddard in the 1920s, powered both the instruments of "Mutually Assured Destruction" and the vehicles of space exploration. In the second half of the 20th century aerospace images became synonymous with America: from the Berlin Airlift to the U-2 Incident; from Air Force One to Apollo 11; from the ultimate business tool, the corporate jet, to the ultimate "big stick," the nuclear-powered aircraft carrier. For the aviation preservationist, the challenge will always be to save for future generations the touchstones of a journey that has carried America into the air and across the cosmos.

The Boeing Company

Project Reports

CATCH OF

It didn't take a fisherman to admire the catch. PBY pilot Lt. (jg) John Mims USN and his navigator Lt. (jg) Eyvind Wahlgren USN stood on the beach at Gardner Island that morning in 1945 and marveled at the huge fish that lay before them on the sand. The beaming Gilbertese islanders who had fought the 1,000 pound giant all night long delighted in displaying their trophy to the two Americans, but what fascinated Mims and Wahlgren more than the prodigious size of the fish was the tackle used to catch it. The hook still set in the gaping mouth had been fashioned from aircraft aluminum while the leader was, to the two aviators, obviously an aircraft control cable. Most puzzling was the cable's size. They were well aware that their PBY-5, now riding at anchor in the atoll's lagoon, represented the only type of airplane capable of landing at Gardner Island, and yet the cable before them was far too small to be from a Catalina. They speculated, in fact, that it seemed about right for an SNB, the twin-engined Beechcraft they had flown in training – but that made no sense at all.

The only Gilbertese who spoke English was the island's young radio operator who, when queried, explained that the metal had come from the wreck of an airplane – a plane much smaller than the Americans' flying boat – which had been on the island when his people first arrived a few years earlier.

As part of the crew of the only search and rescue aircraft in that part of the Pacific, Mims and Wahlgren were aware of no missing plane that could possibly account for what they had just seen. Upon returning to their base at Canton Island, 200 miles to the northeast, they made a point of asking the local British colonial administrator if he knew of any earlier unaccounted for flights. He didn't. The only possibility anyone could think of was Amelia Earhart back in 1937, but they dismissed the idea because she had been headed for Howland Island far to the north. On later visits to Gardner, Mims noticed the Gilbertese using crude knives made of aluminum. When his tour of duty ended he brought home, as souvenirs of Gardner Island, finely crafted wooden boxes and canoe models in which were inlaid, as decoration, small pieces of polished aluminum.

After the war John Mims finished medical school and enjoyed a long and rewarding career as a physician in his small Alabama town. He eventually lost track of his friend Wahlgren and his mementos from the Pacific became playthings for his children who knew them as "the boxes with the metal from the crashed plane." Then, this year, Dr. Mims happened to see a television documentary about TIGHAR's investigation of the Earhart disappearance and his puzzling experience of half a century ago suddenly took on a new significance. His daughter contacted officials at the Smithsonian who, in turn, put her in touch with TIGHAR.

When, in early April, we received a letter relating Dr. Mims' story we were fascinated and, as always, skeptical. First we checked our copies of the original logs and flight plans for U.S. Navy and Coast Guard flights to Gardner Island during World War Two. Sure enough, Lts. Mims and Wahlgren made numerous trips to the island in late 1944/early 1945 flying PBY-5 Bu. No. 08456. They brought perishable supplies and mail from the large U.S. Navy base at Canton Island to the 25 Coasties who manned the Loran radio station at Gardner's southeastern tip. (Typical was the load for January 17, 1945: 40 lbs of personal gear, 140 lbs of mail, 30 lbs of cheese, 50 lbs of apples, 50 lbs of ham, 120 lbs of butter, 90 lbs of eggs, 20 lbs of franks, and 30 lbs of mayonnaise.) We next checked with Dr. Mims'

F THE DAY

daughter, Rosemary Fisk. Did this story first come up after her father had seen the TV show? No—the tale of the mysterious airplane wreckage on Gardner Island had been a family staple for as long as she could remember. We then wrote to Dr. Mims asking him to answer some specific questions for us in writing before we interviewed him by telephone. He was happy to oblige. By the time we actually spoke with him we were satisfied that we were getting the best recollections he had with minimum chance of outside influence.

Back in 1988 when the Earhart Project was launched we made the decision that anecdotes – that is, recollections related or written down years after the event – would not be regarded as evidence whether or not they appeared to support our own hypothesis. That, of course, does not mean that all oral history is false. Quite the contrary. The problem is that, in the absence of corroborating sources (contemporaneous written accounts, dated photographs, or conclusively identified artifacts) accurate memories are impossible to distinguish from those which have been flawed or distorted over time. In short, with the best of intentions, we all often remember things wrong.

So how do we assess a story like Dr. Mims'? First of all, we accept that it is not, in itself, evidence. Second, we ask if there is real evidence which may help us make a judgement about its possible accuracy or inaccuracy. In this case, there certainly is. We know for a fact that the Gilbertese settlers on the island used aircraft debris for local purposes; we've recovered several such objects. U.S. Navy records agree with Dr. Mims' memory that, at the time of the incident he relates, there is no readily explainable source which would make airplane wreckage of any description available to the Gilbertese on Gardner Island. Some of the airplane debris TIGHAR has found on the island appears to be from an airplane considerably smaller than the types that frequented the area during World War Two. In other words, our own experience is remarkably similar to that of Dr. Mims.

What, then, of the explanation that there was an airplane wreck on the island (not just wreckage washed up on the beach) when the first Gilbertese settlers arrived? Is it conceivable that an airplane could exist on that island for all these years, unknown and undiscovered by anyone except the settlers, despite numerous official surveys, government inspections, and wartime activity (not to mention two TIGHAR expeditions)? Technically speaking, it is impossible to prove a negative hypothesis (i.e. that such an airplane does not exist on the island), so, in a strictly logical sense, its existence is possible, although highly unlikely. Still, TIGHAR's original hypothesis that the aircraft debris found on shore was washed up after the airplane was destroyed on the reef-flat, is based primarily upon the assumption that there is not, and never was, an airplane in the bushes. What if that assumption is wrong?

If nothing else, Dr. Mims' story has given us an opportunity to review the hard evidence from a slightly different perspective and make sure that we plan our upcoming operations on Nikumaroro so as to explore every possibility for further discoveries.

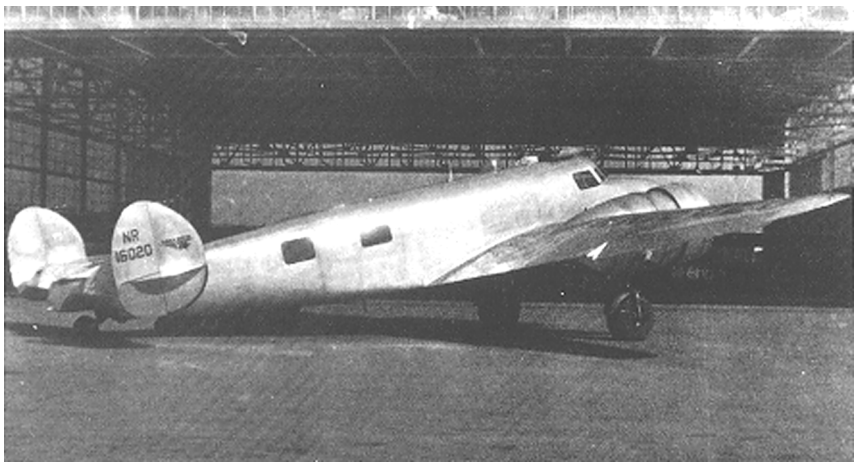
TIGHAR™
THE EARHART PROJECT

The Way It Was

The Earhart Electra Part Two:

Around the World

Part One of TIGHAR's documentation of the evolution of the Earhart Electra ("A Star is Born," TIGHAR Tracks *Vol. 11 No. 2) traced the airplane's development from its construction in the spring of 1936 through a Bureau of Air Commerce inspection performed in November of that year. This second installment chronicles the modifications made in preparation for the first world flight attempt which ended with an accident in Hawaii on March 20, 1937. Part Two also details the changes made during and after the extensive repairs which preceded Earhart's second attempt to circle the globe, and describes the newly confirmed unintended alteration to the Lockheed's configuration in New Guinea which precipitated its loss. Like Part One, Part Two deals only with the aircraft's external features. Part Three, to appear in* TIGHAR Tracks *Vol. 11 No. 4, will address the more difficult question of the cockpit and cabin layout as well as the radio equipment at the time of the airplane's disappearance.*



Courtesy Wm. F. Harney

JUST WHEN WORK WAS BEGUN TO MODIFY THE Electra specifically for the world flight is not clear, but by the time the photo above was taken at Burbank in February, 1937, a larger-than-standard window had been installed in the starboard side of the fuselage just aft of Station 293 and the aircraft's registration number had been amended to reflect the international NR designation (approved the previous September). Other photos from this time show that the cabin door had also acquired a window. The airplane still carried the original trailing wire antenna installation (visible as a white protrusion from the tip of the empennage) and the faired housing of the Hooven/Bendix radio compass loop antenna (evident just forward of the dorsal antenna mast). At this time only one of the two belly antennas previously on the airplane is in evidence.

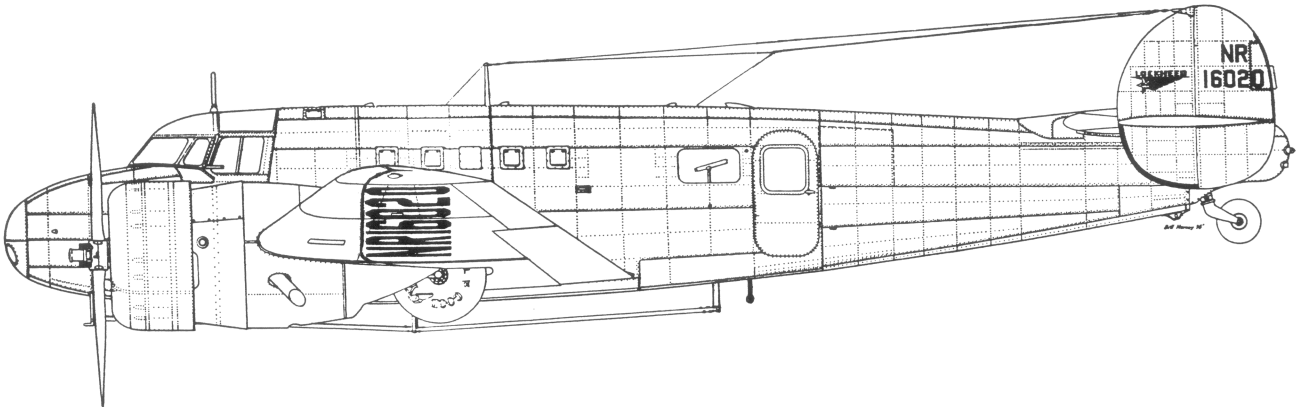
Courtesy Wm. F. Harney

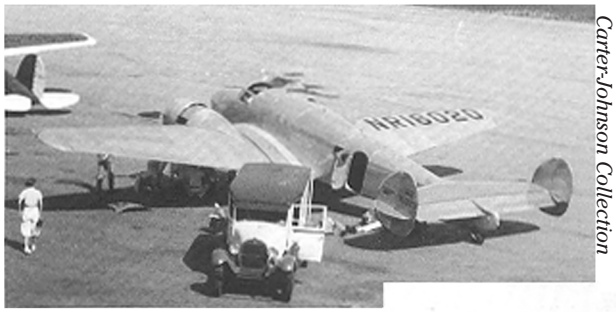
By early March, the second belly antenna had returned and the trailing wire had been removed from the tail and relocated. The new installation deployed the wire through a mast extending from the belly at a point just forward of the cabin door. The ball-shaped object at the end of the mast is the weight at the end of the wire. More apparent was the replacement of the Hooven/Bendix radio compass antenna with a more conventional open loop mounted over the cockpit. This also appears to be a Bendix product, possibly a Type MN-5, which was manually rotated and considerably lighter in weight (although higher in drag) than the more advanced automated unit it replaced. A further modification to the fuel system has caused a fifth filler port to be added to the side of the fuselage forward of the other four, and the third (and now middle) filler port has been sealed off. It is at about this time that orange paint with a black border is added to the leading edge of the wings and on the top of the horizontal stabilizer.

After a successful initial leg from Oakland to Honolulu on March 17, Earhart's first attempt to fly around the world came to an abrupt end when she lost control of the aircraft on takeoff from the U.S. Army's Luke Field on Ford Island at Pearl Harbor, March 20, 1937. Although no one was hurt, damage to the Electra was severe and the airplane was shipped back to Lockheed at Burbank for extensive repairs.

Purdue University Library Special Collections, W. Lafayette, Indiana.

World Flight Electra - First Attempt - March 17, 1937





Carter-Johnson Collection

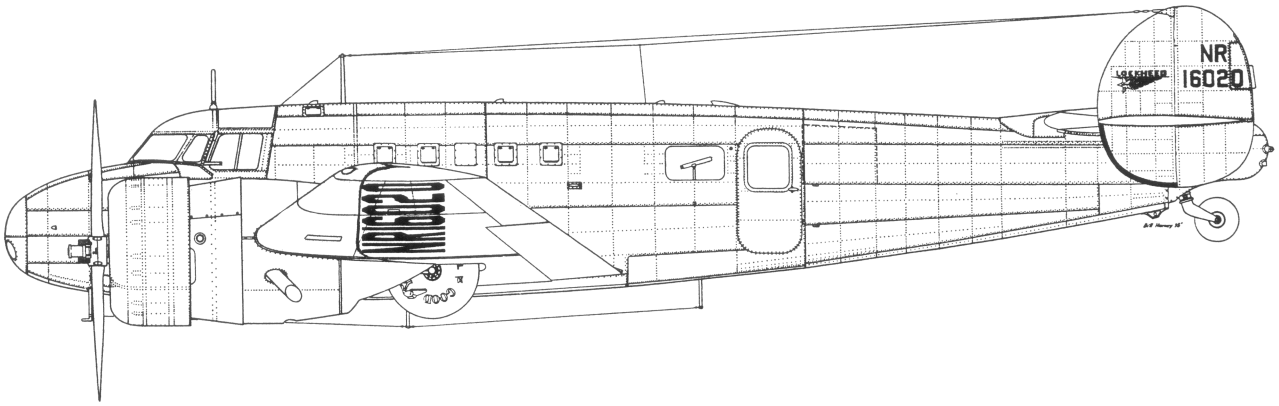
The repairs were signed off on May 19 and the very next day, with no fanfare, Earhart began her second world flight attempt under the pretext of a cross-country test flight. A young photographer named Dustin Carter happened to be at Burbank that morning and took the only known pictures of the preparations for departure. (A grant from John T. Johnson, TIGHAR #0939C, made it possible for TIGHAR to acquire the original negatives from Carter's widow in 1991.) Bureau of Air Commerce records confirm that the airplane at this time had a new right wing, a mostly new belly, and incorporated a number of specially approved internal structural modifications designed to strengthen the airframe. The Carter photos show that new-style single wingtip lights replace the Electra's original top and bottom nav lights. More significantly, several changes have been made to the airplane's antenna system. The dorsal mast supporting the forward terminus of the vee antenna has been moved forward approximately 48 inches to Station 129, thereby providing for a considerably greater length of wire. On the belly, only the starboard antenna is present. The masts and wire of the port side unit are gone, as is the entire trailing wire assembly. Folklore has long held that the trailing wire antenna was removed several days later in Miami but Carter's photos confirm that the device was not present on May 20 and, most probably, had simply not been reinstalled after its unceremonious removal by the runway at Luke Field.

Carter-Johnson Collection

Carter-Johnson Collection.

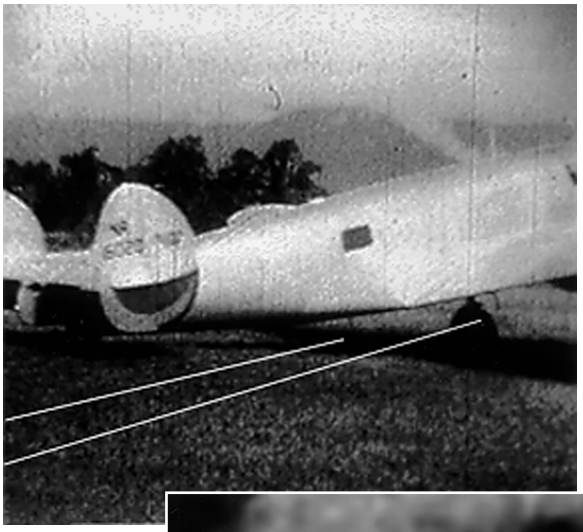
The public commencement of Earhart's second world flight attempt was made from Miami on June 1, 1937. As can be seen in the photo at the bottom of the page, taken as the airplane taxiied for takeoff, the most apparent change made to NR16020 during its eight day stay in Florida was the replacement of the starboard rear window with a patch of new aluminum skin. Again, legend has often described this feature as a removable hatch but the photographic record indicates otherwise. The opening first appears in early 1937 and is present as a window in every known shot of the airplane's starboard side until Miami, when it becomes shiny metal which grows gradually duller in photos taken at progressive stops in the world flight.

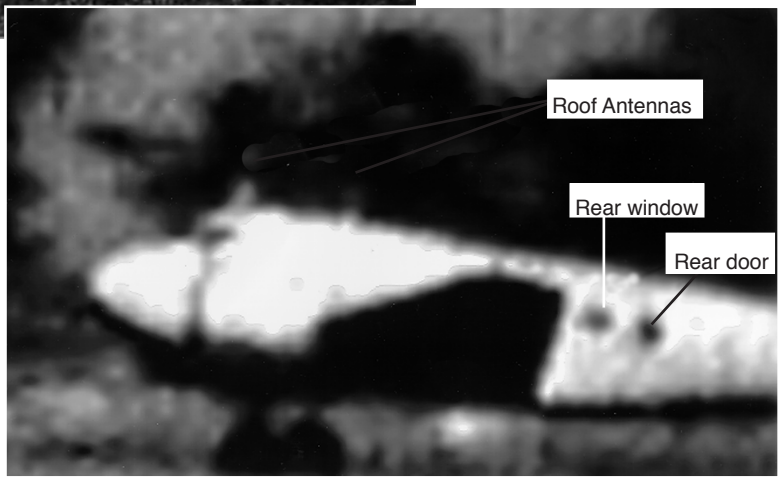
TIGHAR Collection



World Flight Electra - Second Attempt - June 1, 1937

INDEPENDENT ANALYSIS OF MOTION PICTURE FILM showing Earhart's July 2, 1937 takeoff from Lae, New Guinea has recently confirmed that there was one last and accidental modification to NR16020 before it began its final flight. According to Photek, a highly regarded forensic image processing laboratory headquartered in Champaign, Illinois, state-of-the-art digital examination of the film bears out TIGHAR's earlier suspicion (see *TIGHAR Tracks* Vol. 9, No. 4, "For Want of a Nail…") that the airplane suffered damage to its belly antenna while still on the ground at Lae. Frame by frame examination revealed both belly masts to be present as the aircraft taxiied past the camera, but as it came back by on the actual takeoff, neither mast could be seen although both "roof antennas" (the dorsal mast and the loop) were clearly visible. Because the exact internal radio configuration of NR16020 at the time of its final takeoff is still being researched (and may never be resolved), we cannot say with certainty what the ramifications of this accident might have been. That what happened on the ground at Lae had a direct bearing on the communications difficulties experienced later in the flight seems highly probable. That it was the root cause of the flight's failure is certainly possible. That, piece by piece, the Earhart puzzle is coming together, is beyond question.





Research In Progress

What's A Dado Anyway?

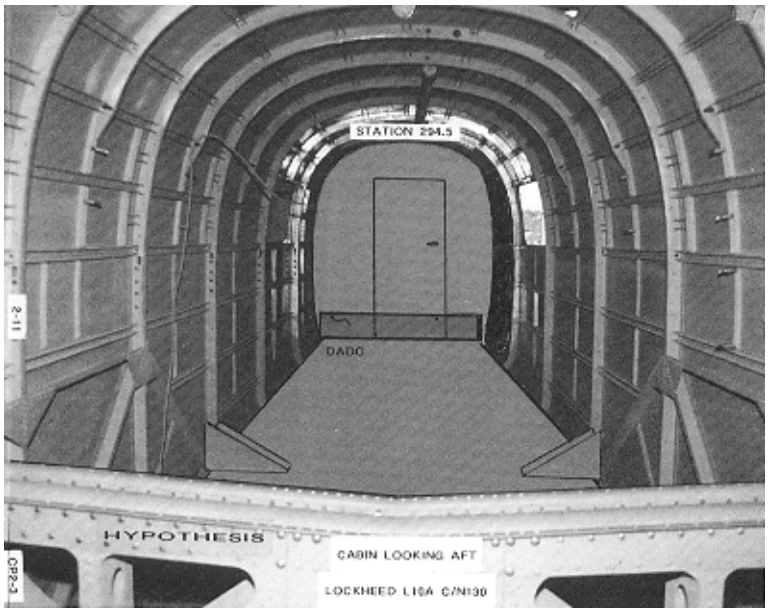
When we first found the thing back in 1989 we took it to be the cover of some kind of box. Although it didn't look much like an airplane part it was, at least, made of aluminum and, at the end of a grueling expedition which had found little else, that was good enough. In the catalogue of artifacts from NIKU I, accession number 2-18 is described as "aluminum plate with riveted bands on edges; part of box?" found at "Karaka village, Ritiati, structure 17 (carpenter's shop?)." After six years of research we're now able to provide a somewhat better description.

TIGHAR Artifact 2-18 is a structure known in aviation parlance as a "dado." An internal fixture rather than part of the airframe, a dado is a panel (often insulated) which covers and protects the juncture of the aircraft's cabin flooring and the fabric-covered interior wall. Most commonly found in "cabin-class" twin-engined airplanes, they are typically a feature of civilian rather than military aircraft.

The dado found on Nikumaroro has a number of features which make it particularly interesting:

1. Although evidently used in what appeared to be the village's carpentry shop as a surface to hammer upon, it was never cut apart, broken or even seriously bent. Alone among the various pieces of aircraft debris found on the island to date, 2-18 is a complete structure, and yet nowhere does it carry a part number.
2. Identical pry marks at each of the holes in the right angle bend suggest that it was originally attached with nails to wooden flooring.
3. Several modifications made to the structure suggest that it was installed in a different location and served a slightly different purpose than originally intended. Rather than being one of a string of dados along a cabin wall, 2-18 appears to have been a stand-alone item.
4. When the dado was found, a unique elongated rivet still had remnants of insulation attached which appeared to be comprised of 1/4 inch kapok covered with a blue woven fabric. Unfortunately, this material was lost during the NTSB's examination, but excellent photos were taken by TIGHAR and provide a reference for the material.

Was there such a fixture aboard NR16020? We don't know. Is it reasonable to postulate that 2-18 is part of the Earhart Electra? Here is how the above-listed features correspond to what is known about that aircraft.



Graphic and primary research by Frank C. Lombardo, TIGHAR #1806.

1. The lack of a part number is consistent with what we see in existing Lockheed 10s. Electras generally have part numbers only on major castings (i.e. landing gear legs). Part numbers on other components, when they appear at all, are hand written in marker. Military aircraft, on the other hand, consistently feature stamped-in part numbers on each component.
2. The flooring in Earhart's aircraft, like that in all Model 10s and Model 12s, was 5-ply wood with a balsa core. We have a wooden access panel from the floor of a Model 12. The metal strips around its edge are attached with nails which also fit the holes in the right angle bend of 2-18.
3. Although it was not uncommon for dados to be used along the cabin wall in Lockheed 10s, the few existing photos of the interior of NR16020 show no such feature. However, we know that NR16020 had a bulkhead installed at Fuselage Station 294.5 where, in the airline version of the Electra, the main cabin was separated from the lavatory. If, perchance, this bulkhead did include a dado (anybody got a photo?) then 2-18 would fit very nicely between the wall and the door as a stand-alone item.
4. Pursuing this hypothesis, Lockheed specifications call for the "partition enclosing the lavatory compartment" to be insulated with a material known as "seapak" (1/4 inch kapok covered with woven fabric, often blue in color). The unusual elongated rivet would fall in the correct position to anchor a rod or bungee for holding the lavatory door open.

In summary, Artifact 2-18, the dado, is an aircraft component which was used for local purposes by the villagers on Nikumaroro. At this time we have no way of knowing for certain where it came from except to say that it does not appear to be from a military aircraft; that it is consistent with features found on aircraft of the size and type of Earhart's Electra; and that it is possible to construct a reasonable hypothesis which places the object aboard the aircraft.

The Any-Idiot Artifact

What does it take to end the mystery of Amelia Earhart's disappearance? That, of course, depends upon who you're trying to convince. The complex body of independent, yet mutually supportive, archival and physical evidence TIGHAR has already assembled has proven sufficient to persuade almost anyone who takes the time and trouble to become familiar with our work. If our only goal was to satisfy our own curiosity, or to convince the academic community, we could stop now. Artifacts such as the dado clearly meet the "preponderance of the evidence" standard set for cases in civil law, and even the "beyond reasonable doubt" standard of criminal law. So why go back?

We've always acknowledged that, in a strictly historical sense, it really doesn't much matter what happened to Amelia Earhart. Had she completed her flight the world today would not be noticeably different. But if Earhart's disappearance seems to have meant little to history, it's also clear that her loss meant, and still means, a great deal to a great many people. It is the public, not the scholars, who ask what really happened to Amelia Earhart. Any meaningful answer must, therefore, satisfy a general public which has little interest and less time for academic solutions to anything. If we are really going to alter sixty years of public perception about what happened to Amelia Earhart we'll have to come up with something that is instantly and intuitively conclusive. Whether it is a pair of Pratt & Whitney R1340 S3H1 Wasps (serial numbers 6149 and 6150), or Pioneer Bubble Octant serial number 12-36, or any of the unique features of NR16020 which can be directly matched to historical photographs, the physical object will have to qualify as what we have come to call the Any-Idiot Artifact.

Is there reason to think that such an object still exists on Nikumaroro after nearly sixty years? Yes. If we discover and recover it, will **everyone** accept it as proof? Probably not. But if most reasonable people are satisfied that TIGHAR has solved the mystery, that should be enough.

The Gilligan Hypothesis

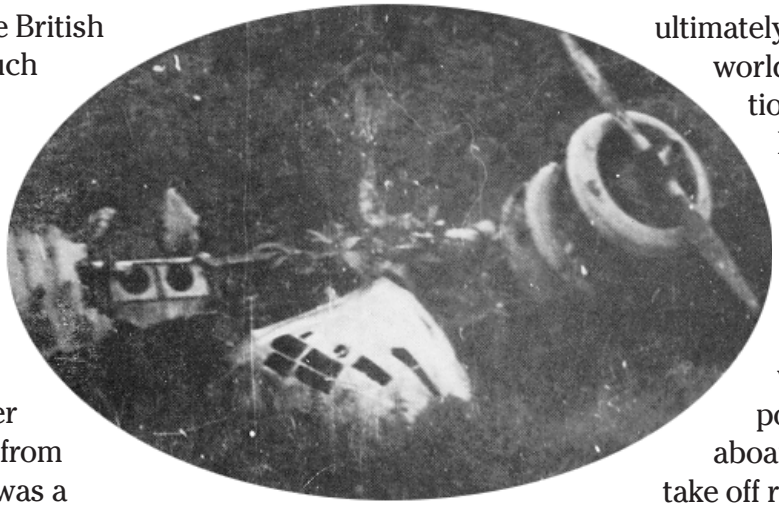
The ship's aground on the shore of this uncharted desert isle ...

There is an episode of *Gilligan's Island* in which the *Minnow's* resolute mate stumbles across an abandoned airplane (a twin Beech) hidden deep in the island's underbrush. Although we try to keep similarities between the Earhart Project and that regrettably immortal sitcom to a minimum, new information has forced us to acknowledge the possibility that next year's NIKU III expedition could encounter a truly bizarre case of life imitating art (if you want to call it that). For years now, we have resigned ourselves to the notion that the Earhart Electra in all probability no longer exists as an aircraft, but rather as a scattering of debris. Our fondest hope has been that our return to the island will uncover something—anything— that qualifies as the Any-Idiot Artifact (see previous page). Then along comes Photek, the forensic image processing company which confirmed the loss of the belly antenna at Lae (see page 17), with a cautious suggestion that we might want to take a closer look at an unusual feature which appears in some early aerial photography of Nikumaroro.

Three years ago, an article in *TIGHAR Tracks* (see Vol. 8 No. 4 "A Whole New Beach Party") described the discovery of a 1941 U.S. Navy aerial photo which, we suspected, shows the abandoned campsite along Nikumaroro's shoreline which had previously been described to us by two Coast Guard veterans. All we had at that time were suspicions. Now we have more suspicions. Jeff Glickman of Photek has done some preliminary work on the photo and concurs with our original opinion that there may be man-made objects on the beach, but the photo is too fuzzy to be sure. More importantly, he echoes our feeling that the long (estimated 600 feet) cleared strip in the beachfront vegetation is not a natural feature. Later photos show that it had grown back in by 1975. He also notes that the same cleared area is visible in a 1939 U.S. Navy overhead photo of the island. That observation prompted us to reexamine a 1938 aerial photo taken for a New Zealand survey and the July 9, 1937 shot of the island taken from one of the USS *Colorado's* search planes. Guess what. The cleared strip is there.

The implications are mind boggling. If there was, indeed, a man-made clearing in Niku's beachfront vegetation one week after Earhart disappeared, how did it get

there? Is this what Navy search pilot Lt. John Lambrecht meant when he wrote in his official report, "Here, signs of recent habitation were clearly visible…"? The island had been uninhabited since 1892. Certainly, ocean-roaming Micronesians could have visited there despite British strictures against such travels. But why would they hack out a 600 foot-long strip of bush—a miserable job (as any TIGHAR team member can attest). Is it possible that back under the trees, sheltered from the equatorial sun, was a Lockheed 10? Might it still be there just waiting to be discovered by Gilligan? One thing is certain. If that clearing is man-made it was done by somebody who was highly motivated—like somebody who could only save her heavily-mortgaged airplane and her career by calling for help and getting the Coast Guard to bring fuel. With 200 gallons she could ferry the aircraft to Howland Island and, ultimately, complete her world flight. Calculations based upon Lockheed specs indicate that taking off into Niku's prevailing 15 knot wind, a Lockheed 10E with only 1,200 pounds of fuel aboard would need a take off run of, say, 600 feet. Rank speculation? Of course. Worth getting excited about? Not yet. Worth further research? Absolutely.



Fund Raising Update

Now working toward our second quarterly goal of $78,759.90, fund raising for the Earhart Project continues on track thanks to the dedicated support of hundreds of TIGHAR members. Our first quarter (May through July) success enabled us to produce high quality promotional literature which is now in hand and ready to be put to work to solicit major sponsorship from individuals and corporations. An Earhart Project video is currently in production thanks to a grant from Joe Hudson (TIGHAR #1689CE). When completed, the video will present an exciting and informative overview of the project and is sure to provide an additional boost to the funding campaign.

To raise the full $1,034,000 needed to see the project through the 1996 expedition and the 1997 sixtieth anniversary of the Earhart disappearance we'll need all the help we can get. Members who have contacts with potential major contributors or commercial sponsors are encouraged to call Project Director Ric Gillespie to discuss an appropriate approach. Please remember—eager as we are to complete the funding for this important work, TIGHAR accepts no contributions or sponsorship from companies with connections to the tobacco, alcohol or gambling industries.

In Memoriam
G. Robert Bessett
1934—1995

by Kristin Tague, TIGHAR #0905CE

This year TIGHAR has lost an active member and good friend in Bob Bessett (#1397, of Alameda, California). When the Niku II expedition returned in the autumn of 1991, Bob became intrigued by our results and contacted TIGHAR for more information. He soon joined, and from then on he offered to TIGHAR a variety of opportunities and venues to present its case on Earhart. He arranged for two presentations at the prestigious Commonwealth Club of San Francisco. There were many others as well: the Northern California Aviation Historical Society, the Western Aerospace Museum in Oakland and Civil Air Patrol Educational Seminars among them.

He would have arranged these talks even if he had not been a TIGHAR member; it was what he did. He was program chair not only for the Commonwealth Club but for NCAHS as well as the Association of Former Intelligence Officers. In all his work he exhibited an unflinchingly open mind and a consistent desire to have the facts aired in a public forum. He didn't much care for hearsay, always going to the source, and more often than not arranging a fascinating talk for us all in the process.

One of Bob's best qualities was the kindness and generosity he displayed to others. He always tried to bring those with similar interests together, to share in the companionship of history told in individual stories. Through him I had the pleasure of first hand accounts from a WWII WASP, a Dutch resistance fighter, a glider pilot in the Normandy Invasion, and Vietnam era intelligence agency pilots with hair-raising flying stories to tell. The scope of his interests and enthusiasm in making this aviation history available to us all was amazing.

Aside from his public work, he always had research projects of his own going. Two that were particularly dear to his heart were his search for the fate of the Doolittle Raider that landed in Russia, and his efforts to make a definitive identification of the pilot of the last helicopter off the roof of the U.S. Embassy during the fall of Saigon. The first project brought him an invitation to attend the Raiders' reunion last year and many new Russian friends. The second exemplified the kind of person he was: fiercely loyal to those with whom he had served, abiding care for the correctness of history.

Bob is survived by his partner of many years, Dolly Garcia, six children, and a host of friends with similar interests who will miss greatly his intellect, warmth and friendship.

Kris Tague (TIGHAR #0905CE, of San Mateo, California) has been a TIGHAR member since 1990 and has participated in numerous expeditions and activities, including the Niku II trip in 1991. She works for The Research Libraries Group, Inc., a non-profit support association for archives and libraries.

Photo courtesy Dolly Garcia.

Once More, With Feeling

There is apparently something about great voyages, whether nautical or aeronautical, successful or unsuccessful, which makes people want to recreate them on some anniversary of the original achievement. In 1957 a replica of the Mayflower sailed from Plymouth, England to Plymouth, Massachusetts. In 1992 a new Santa Maria discovered America again. In 1967 Ann Pelegrino flew a Lockheed 10A around the world, roughly duplicating Amelia Earhart's route (but not her fate) of thirty years before. Last year a reincarnated Vickers Vimy commemorated the 75th anniversary of the first England to Australia Air Race with a lumbering 42 day reenactment of the 11,000 mile journey completed by Ross and Keith Smith on December 10, 1919 in 27 days, 20 hours and 20 minutes.

Musée de l'Air

More is in store. Nineteen ninety-seven will mark the sixtieth anniversary of the Earhart disappearance. Another Amelia wannabe, Linda Finch of San Antonio, Texas, has purchased Lockheed 10A c/n 1015 and is hoping to rebuild the airplane as a replica of NR16020 and (what else?) fly it around the world in 1997. If she does, she may find herself competing for media attention with yet another commemorative flight. A French television production company is planning to build two (count 'em, two!) flying replicas of our old friend l'Oiseau Blanc. One airplane will be the star of a made-for-TV movie to be filmed in France, and the other one will (you guessed it) fly the Atlantic from Paris to New York on the 70th anniversary of the failed Nungesser/Coli attempt. Just what all this is supposed to prove is not clear, but if it actually comes off it should be a lot of fun to watch.

BULLETIN BOARD FOR USE OF MEMBERS ONLY

Wanted to Buy

Bob Dabrowski, TIGHAR # 1341, of Marlborough, New Hampshire, needs two heads and one set of pistons for an Allison V-12 -1710. He's willing to buy or trade, but the parts must be airworthy. Bob can reached at 603/876-4046.

TIGHAR needs a CD-ROM drive, Macintosh-compatible. We also need a much bigger hard drive for the TIGHAR On-line computer, which is a PC (it now has a 40 MB drive; 500 would be more like it!). If you have either of these items and you would like to donate them to TIGHAR, please get in touch. A tax deduction for the fair market value of the hardware can be taken for donations of this type. Ask for Pat when you call the TIGHAR office, 302/994-4410.

Honeywell helps the TIGHAR keep on tracking

For several years, Honeywell has provided funding for TIGHAR's important historic aircraft recovery work. We are now taking a role as a dedicated sponsor for this worthwhile publication.

This is especially appropriate, we believe, for a company like ours. Honeywell itself has been in the aviation electronics business since World War II. But with our acquisition of Sperry eight years ago, we trace our heritage to the very beginning of powered flight.

Today, Honeywell's Space and Aviation Control business spans five divisions, with manufacturing, engineering and support facilities around the world, serving the commercial, military and space markets.

Our products and services encompass everything from sophisticated guidance and navigation systems to the most advanced display technologies.

We're proud that we're able to make this unique contribution to "The Year of the TIGHAR."

Honeywell

Helping You Control Your World

MEMBERSHIP FORM

I would like to join TIGHAR. Enclosed is my donation of

☐ $45 for a one year membership
$30 for full-time students

☐ $80 for a two year membership

☐ $195 for a five year membership

☐ $1,000 for a corporate membership

Please send me —

***TIGHAR Tracks** four times a year*
Invitations to participate in expeditions, courses, seminars
Opportunities to subscribe to special internal TIGHAR project publications
Opportunities to do research, interviews, and reports for aviation historical projects

Name _____

Address _____

_____

Telephone _____

Please return this form with your membership donation to TIGHAR, 2812 Fawkes Drive, Wilmington, DE 19808 USA; Telephone (302) 994-4410, 9 a.m. to 5 p.m., M-F; Fax (302) 994-7945. All donations tax-deductible within the limits of the law. Personal checks may be drawn in U.S. or Canadian funds. VISA and MasterCard accepted for all donations.

The International Group for™ TIGHAR Historic Aircraft Recovery