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### Dangerous Crossings: The First Modern Polar Expedition, 1925<sup>1</sup>

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*The U.S. exploration of the northern most regions of the world in 1925 was mounted by three extraordinary individuals: Donald B. MacMillan, a colleague of Robert Peary's and a renowned polar explorer; Eugene F. McDonald, Jr., the man responsible for Zenith Radio Corporation's prominence in the radio industry and himself an explorer; and, Richard E. Byrd, a young naval aviator set on making a name for himself as an explorer. All three held the rank of Lieutenant Commander. Their combined efforts led to the Navy co-sponsored expedition's success as the first modern expedition to the Arctic: it was the first time that both aviation and shortwave radio were used in systematic exploration. The accomplishments of the expedition, the details of which have been long suppressed due to impact on the Billy Mitchell court martial trial, significantly changed the future of exploration and long-range communication. Considered one of the most heroic non-combat missions in the annals of naval aviation, the expedition included the overflight of some thirty thousand square miles of the High Arctic in open-cockpit near-prototype Loening amphibian biplanes.*

**Radio and Aviation:** Donald B. MacMillan became one of the first explorers to use radio in the Arctic during his 1923-24 Arctic Expedition. Although helpful for receiving, its use was limited for transmission because of the long wavelength frequencies used at the time. By the 1925 expedition, however, *shortwave* radio was being used, allowing communication both night and day over trans-continental distances with shortwave frequencies around 7 MHz or around 14 MHz. The implications of reliable long distance communications, even in daylight, were not lost on either the U.S. Navy or on Arctic explorers.

The first five years after World War I also witnessed rapid developments in aviation. Arctic explorers had long dreamed of using aircraft to explore the vast expanses of both polar regions. The Arctic Ocean, with large areas of wind and tide-driven ice floes, frequently with pressure ridges reaching 30 feet in height, seemed particularly amenable to exploration by air. Balloon flights were attempted as early as 1897 and fixed-wing

aircraft were in use experimentally in Spitzbergen, Northern Canada, and Alaska by the winter of 1924-25. The only questions that remained were which expedition would prove the use of aviation in the High Arctic and whether the craft used would be fixed wing or dirigible. In planning for the 1925 expedition, MacMillan developed four main objectives: 1) Utilize aircraft to prove the usefulness of heavier than air flying machines in Arctic exploration; 2) In conjunction with the Navy, utilize the new Zenith shortwave radios to prove the usefulness of these devices for reliable long distance communication in the Arctic and in ship-to-ship and ship-to-base communications world wide. The usefulness of new battery-powered shortwave "trans-mitters," which well known engineer John Reinartz and Zenith had designed for the aircraft of this expedition, were also to be proved; 3) Extend knowledge of Arctic birds and fish under the guidance of Dr. Walter N. Koelz, the expedition's naturalist; and, 4) Gather further magnetic, tidal and meteorological data necessary for navigation in the Arctic regions.

The over-arching goal of the expedition was, however, the exploration of the last unexplored region of the Northern Hemisphere, the 3 million square mile area lying between the north coast of Alaska and the North Pole. In the 1920s, some scientific evidence and much speculation indicated that this vast unexplored area contained a large land mass. Even in 1925, it was not difficult to visualize how the world strategic balance might have shifted in favor of the discovering nation, had there, in fact, been a "lost polar continent" in that large area of unexplored territory.

**Early Planning:** Our research has clearly documented that the concept for the 1925 expedition originated in discussions between MacMillan and Eugene F. McDonald, Jr. in the Fall of 1924.<sup>2</sup> Several exchanges among Navy Secretary Curtis Wilber, McDonald and MacMillan resulted in the crystallization of the idea by early February. By mid-February, McDonald and MacMillan had changed the concept of the expedition from dirigible based to one using fixed wing aircraft.<sup>3</sup> The prototype Loening amphibian was selected by McDonald and MacMillan and the considerable political clout of McDonald, working through his friend President Calvin Coolidge, resulted in the first three planes produced being taken from the Army and awarded to the Navy for the expedition.<sup>4</sup> The Loenings were the first total amphibious planes developed in the US and featured an unproven inverted Liberty engine, the inversion raising the crankshaft as high above the water as possible. Secretary Wilber had not initially supported taking aircraft North, but soon warmed to the expedition and gave it his full support.

Lt. Commander Richard Evelyn Byrd, USN (Ret) had been attempting to develop an Arctic expedition of his own in the late winter of 1924. His expedition, based on a TC-type dirigible airship, was floundering because of inability to raise funds.<sup>5</sup> Evidence indicates that Byrd was telling half-truths and outright lies in his attempts to obtain supplies and funding.<sup>6</sup> Byrd attended a briefing with McDonald and MacMillan, his first, in Wilber's office on 28 March and by the end of the same day, had submitted to Wilber a new "Byrd Expedition" plan based on fixed wing aircraft. From this point on, Byrd claimed that the expedition had been "stolen from him by McDonald and MacMillan;"<sup>7</sup> irrefutable evidence documents that the expedition was conceived and planned months earlier by the two Macs. Byrd's specious claims have been accepted, however, and today

most Arctic history texts (as well as the National Geographic website) credit Byrd with planning the 1925 expedition.

**Race to the Pole:** There were three different expeditions planned for the spring and summer of 1925. These activities were a constant source of news copy and sensational headline journalism. Some journals characterized the events as "the most picturesque sporting event in the history of mankind with the possible exception of the aerial race around the world in 1924."<sup>8</sup> A slightly less sensational headline led the front page of Section Nine of the Sunday New York Times of April 26, 1925:

Three Nations In Air Race For Polar Land. Uncharted Continent to Be Sought This Summer by America, Norway and Britain - MacMillan Has Support of U.S. Navy--Amundsen to Fly From Spitzbergen, Algrarsson to Use Blimp.

of the they Three rival groups are speeding preparations to reach the North Pole by way air, to solve the secrets of The Top of The World and to bring back first, if succeed in getting back, the solution of the Arctic mysteries that have always baffled science.

The first is the MacMillan-United States Navy Expedition. The second, headed by Roald Amundsen, using airplanes and starting in May, will carry the flag of Norway. Another, led by Grettir Algrarsson of Liverpool, using a blimp, starting in mid-June, will bear the British flag.

Thus, with the American expedition starting in June, an international air race is in prospect. Aside from being the outstanding aeronautical event of the year, the competition promises to be the most thrilling -- more spirited even than the round-the-world flight that the Americans won.

The article further detailed the plans of each of the three expeditions. A major goal of each expedition was the location of a possible "lost continent" lying between Alaska and the Pole. Prophetically, the *Times* article noted that many aeronautical experts considered Amundsen's plans, using two giant Dornier "Val" (Whale) monoplane seaplanes, extremely risky and suggested that the much more thoroughly planned MacMillan Expedition, leaving a month later, might even have to become a rescue mission for the intrepid Amundsen (which it almost did.)

**The Navy Arctic Unit:** McDonald was made second-in-command of the expedition and placed in command of the *Peary*, a steam-powered yacht purchased by McDonald and modified to carry the three Loenings. MacMillan's Arctic schooner, the *Bowdoin*, was the second ship in the expedition. Secretary Wilbur created a new temporary unit, the Navy Arctic Unit, and placed Lt. Commander Byrd in command. In April, Admiral W. A. Moffett, Chief of the Bureau of Aeronautics, determined that the personnel to serve under Lt. Cmdr. Byrd in the Arctic Unit should be selected from volunteers, due to the potentially hazardous nature of flight in the Far North. A request for volunteers was

issued to all Navy air stations and squadrons. Within days there were over sixty volunteer officers and men to fill the seven remaining slots. After some deliberation, Moffett selected: Lt. M.A. Schur, a highly respected flyer and Navy racing pilot, Chief Boatswain Earle E. Reber, also a well respected Navy racing pilot, and five other non-commissioned naval personnel.<sup>9</sup> The group was headquartered at the Naval Aircraft Factory, then a part of the Philadelphia Navy Yard.

In mid-May, pilots Schur and Reber were authorized to proceed to the Loening factory in New York City to accept the first two production Loening amphibians, numbered NA-1 and NA-2, and to fly them to the Naval Aircraft Factory. The next four weeks were a blur of plane modification. Reber paused long enough to return to New York to accept the third Loening, NA-3, and fly her back to Philadelphia. After the Loenings had been modified, the Unit then flew all three Loenings to the Charles River and Boston Navy Yard where, in a final frantic 36 hours, they were disassembled and loaded on the afterdeck of the *Peary* for the voyage North.

**The U.S. Navy and Shortwave:** The needs of fleet communications and emergent naval aviation mandated close attention by the Navy to developments in radio communication. In fact, ships of the U.S. fleet had carried very bulky longwave equipment since just before America's entry into World War I. As radio science developed, amateur operators were relegated to a part of the spectrum outside the longwave band which was generally considered useless for long distance communications. This part of the spectrum was called variously: "below 200 meters," "the higher frequencies," or "shortwave" (all three terms refer to the same portion of the radio spectrum). It was commonly believed that shortwaves were only good for line of sight communication and were worth little, either militarily or commercially. The head of the Naval Radio Laboratory noted in later years that the bridging of the Atlantic by American and French amateurs operating on 100 meters (January 1923) was the beginning of naval interest in these shorter wavelengths.<sup>10</sup> As trans-Atlantic communication by amateurs became more routine in 1923-24, and as the phenomenon of shortwave signals "skipping" off the underside of the ionosphere was recognized, research at the Naval Radio Laboratory struggled to keep pace with the amateur community. As of the spring of 1925 however, the U.S. Fleet continued to depend on the now traditional, bulky spark-gap transmitters which operated in the longwave (low frequency) spectrum.

There are indications in the Zenith archives that Commander McDonald played an important role in the adoption of shortwave communication at the fleet level. Indeed, the founders of Zenith--McDonald, R. H. G. Mathews and Karl Hassel--were all Navy men, and both McDonald and Mathews were very active in the USNR. A 26 March 1925 personal two-page memo from Staff Headquarters, Ninth Naval District, to McDonald, discusses the desire of the Chief of Naval Operations to enroll "several thousand of these amateurs as radio operators in Class 6 of the Naval Reserve Force," and went on to detail use of the 76 meter (shortwave) transmitter at Great Lakes Naval Training Station for the purposes of training operators in the Ninth District in proper naval communications procedures.

The Zenith files for 1925 do not contain the bulk of correspondence between McDonald and the Navy. Conjectural evidence published in *QST* magazine in 1925, and the Zenith

corporate history published the 1950s, however, describe McDonald's personal role in convincing Navy brass to undertake fleet communications experiments in the summer of 1925. Both sources indicate that McDonald was personally responsible for ARRL Traffic Manager Fred Schnell being commissioned a naval Lieutenant and placed aboard the *USS Seattle* for the Pacific cruise of 1925. The *Seattle* was the flagship of Admiral R.E. Coontz, Commander-in-Chief of the U.S. Fleet. That spring and summer the Pacific Fleet had another amateur, Ed Willis, 6TS, aboard the *USS Relief*, operating as Navy station NEPQ. The fleet sailed from San Francisco on 14 April 1925.

**Radio Equipment for the Expedition:** With shortwave equipment and techniques in their infancy, and with shortwave avionics being virtually unknown in 1925, Zenith engineers were challenged to develop the expedition radio equipment in less than two months. To assist the effort, McDonald hired John L. Reinartz, recognized as a brilliant young circuit designer and radio propagation theoretician, to assist both Zenith and the amateur community as they explored these new "short" waves. A Zenith press release that spring reports his salary as \$1000 per month, "the highest salary ever paid to a radio operator."

One of Reinartz' main responsibilities was to encourage his fellow amateurs to migrate from their former area of operations, now shared with AM broadcasters, to the new shortwave bands. The initial expedition-related Zenith press release of Spring 1925 noted that "during the last MacMillan Expedition ('23-'24) there were 17,000 American amateurs who could receive and transmit on 180 meters (medium wave) then, now (Spring 1925) there were only 20 American amateurs who could do so on shortwave."

A short time later, Zenith published another release which described in complete detail how to construct a "Reinartz-Zenith Shortwave Receiver" and a similarly named transmitter. Assistance to the amateur community continued after the return of the expedition, when Zenith published a second set of plans for constructing a more advanced shortwave receiver and transmitter. The November 1925 cover letter which accompanied these latter plans was signed by Karl Hassel, and spoke of Zenith's desire to share this knowledge with the amateur community and the lack of commercial interests in shortwave by Zenith. This letter also records the successful two-way communication between the High Arctic and points in southern Australia and New Zealand.

March, April and May of 1925 were a frantic time for the Zenith engineers responsible for the expedition equipment. Karl Hassel led the design team, with H.C. Forbes and John Reinartz also making major contributions. The shortwave transmitters were 250 watt and 2 kilowatt units (aboard the *Bowdoin* and *Peary* respectively) capable of transmitting on 20, 40, 80 and 275 meters. It is important to note that the transmitting equipment aboard the *Bowdoin* was assembled and tested in Chicago before it was sent to Wiscasset, Maine for installation. The size and configuration of the radio room aboard the *Peary* was not known until rather late in the spring, due to the time it took to find and purchase the second ship. Reinartz constructed the *Peary's* transmitter aboard her as the refitting took place. Among the receivers taken along was a Super VII Zenith broadcast receiver, a longwave receiver for press messages and time signals, and two portable loop broadcast receivers for use by exploring parties or a plane in distress.

John Reinartz was primarily responsible for the design of the innovative shortwave transceiver which the Loening amphibians would use. In mid-May, a prototype of the transceiver was placed aboard a Navy float plane and tested extensively during flights over, and landings on, Lake Michigan. A Zenith press release during those tests relates that this "Reinartz-Zenith" set was the first aircraft set able to operate whether or not the plane was flying. Previous aircraft sets had been powered by wind-driven generators, usually mounted on the wing. The Reinartz design operated exclusively on batteries. This was extremely important, since generators driven by the aircraft's slipstream would have been useless to power emergency communication had these new type aircraft been forced down in the Arctic.

By early June, a Zenith team led by Reinartz had installed the radio equipment aboard the *Peary* at Boston Navy Yard, and aboard the *Bowdoin* at her berth in Maine, just in time for the projected mid-June departure of the expedition. As with the 1923-24 expedition, many manufacturers contributed parts and supplies to this effort.

**On The Way North:** After a tumultuous send off from Boston on 17 June 1925 and another from MacMillan's home port of Wiscasset, Maine, on 20 June, the *Peary* and the *Bowdoin* made their way east and north in fair-to-poor weather, pausing several days in North Sydney, Nova Scotia, for provisions, and to weld steel plates over the forecastle portholes of the *Peary* as further protection from the ice fields. On the second day out of Wiscasset, Byrd was nearly electrocuted by a radio transmission cable,<sup>11</sup> and later, a shipboard fire was discovered and nearly not extinguished in time. The expedition then passed west of Newfoundland, crossed to the Labrador coast and paused for several days each in Battle Harbor, Hopedale, and finally, Jack Lane's Bay. The *Peary* ran hard aground near Hopedale and after determining there had been no damage, McDonald did not report the incident to Navy officials for fear they would halt the expedition.<sup>12</sup>

On July 9-10, the expedition journeyed north to Windy Tickle at the mouth of Jack Lane's Bay, soon to be their departure point for the hazardous crossing of Davis Strait to Greenland. While at Windy Tickle, they made the first of a number of "broadcasts to the world" over the powerful transmitter aboard the *Peary*.

**Godhavn, Coal and Bureaucracy:** The *Peary* arrived in Englishmen's Bay at Godhavn, Greenland on July 16, 1925, seven days ahead of the *Bowdoin*, which had fallen behind to careen and replace a damaged propeller. Upon *Peary's* arrival, the Governor of North Greenland and the local doctor came aboard, and although they spoke little English, McDonald was able to make clear that the *Peary* was part of the MacMillan Expedition. An extended discussion revealed that there was a quarantine on the village due to whooping cough (no one could go ashore), and the *Peary* would not be able to obtain its much needed supply of coal. The governor explained that a ship had called recently, taken aboard most of the coal available, and that there was not enough coal in Godhavn for the coming winter.

Lt. Commander McDonald began at once to solve the problem by making maximum use of both diplomacy and shortwave radio. At some point on the seventh day stuck in Godhavn harbor, it became clear to McDonald that Governor Rosendahl could supply coal, or at least permission to mine it at nearby Umanak, if only the Danish government gave its permission---and that could be gotten via their Embassy in Washington. It was not possible, of course, to contact the Embassy with the local longwave transmitter until nightfall, and nightfall was several months hence. McDonald contacted the Danish Embassy in Washington using the shortwave equipment of the *Peary*. The message was received by a young ham in Washington who relayed it to the Embassy and permission was received within hours.<sup>13</sup> This incident, by itself, demonstrated the vast superiority of shipboard communications *using the shortwave spectrum* over both the long and medium wave spectrums then in standard use.

**On To Etah:** As soon as the coal was loaded, the *Peary* put on steam to catch up with the *Bowdoin*, already well up the coast, heading for the village of South Upernivik. MacMillan had taken the *Bowdoin* north soon after the *Peary* left Godhavn, knowing that the more powerful engines of the *Peary* would enable her to catch up. MacMillan, McDonald and Byrd were very anxious to reach Etah by 1 August. MacMillan knew that the three-week-long "summer season" at Etah and nearby Smith Sound almost always began on 1 August; they needed every minute of those three weeks if the goals of the expedition were to be achieved before the ice closed back in for the year.

The expedition arrived at Etah on 1 August and began the long and arduous process of unloading the aircraft and re-assembling them on the rocky shale of the only sliver of beach in Etah fiord. The fuselages were floated ashore one at a time and the wing sets were then assembled and attached. The back-breaking difficulties of this work in 30 degree sea water is not even remarked upon in the private papers of these men, although Lt. Schur lost two toes from each foot and others must have suffered similarly.

Late on 3 August, Lt. Schur took NA-2, the first Loening assembled, up for a 30 minute test flight. He was accompanied by Rocheville as mechanic and Lt. Cmdr. MacMillan as observer. They flew out across Smith Sound and then returned to the Greenland coast to venture over the great ice cap for a brief time. Thus, Lt. M.A. Schur, USN, became the first American pilot to fly in the Far North and the first person in the world to overfly the ice cap of Greenland.<sup>14</sup>

The following day other exploration flights confirmed MacMillan's and the flyers' worst fears: the coldest winter and spring on record meant that there was much less open water in the area for amphibious landing than expected. Further, everyone had underestimated the extent of pressure ridges in the ice fields. The specially fabricated aluminum skis for the Loenings would be useless when faced with these often thirty-foot high ridges.

It was very clear to the aviators that, on flights away from the open water of Smith Sound, severe engine trouble with the newly inverted Liberty engines or any other major problems with the new Loenings would mean certain death for the flyers involved. There were no safe landing areas. In fact, the conditions were so much more hazardous than

expected that Lt. Comdr. Byrd called a meeting of the aircrew and told them that, though he would continue with air operations, all others were excused and would only fly as absolute volunteers. It is a great credit to all concerned that air operations were continued by all hands and, though not all goals were accomplished, significant research and exploration was carried out. The weather continued to be very uncooperative. Byrd later reported to Secretary Wilbur that of the next 15 days, only 3 3/4 offered even marginal flying conditions.

**Radio Activity At The Top Of The World:** The first of a series of general broadcasts was arranged when WAP (the *Peary*) notified Zenith, the press, and the amateur community on 30 July that the first broadcast from the Far North would take place on Saturday night, 1 August. The notice was sent out on Thursday, July 30, from WAP. An August 15 article in *The Talking Machine World*, detailed the first two of these broadcasts as follows:

The press of the country and the higher powered broadcasting stations notified the public of the amazing event and at the appointed time both amateurs and the Zenith experimental station 9XN with its two operators stood by and waited. WAP sent out their CQ call, signalling their going on the air, and faintly came the voices of McDonald and MacMillan, gradually increasing in volume, until, within one-half hour, the Arctic voices were as clear and distinguishable as continental stations. Music and songs were reproduced with such faithfulness as to make even the hardened operators stand aghast. Radio had penetrated the Auroral bands, a feat heretofore never accomplished during the six months of Arctic daylight.

On Sunday, McDonald radioed the Zenith offices that they had received reception reports not only from various parts of the U.S., but that they had been heard in London, as well. McDonald was so excited that his predictions about shortwave in the Arctic had borne fruit that he announced that he and MacMillan would submit to a "real time" press conference via radio on the following evening, August 3rd, at 11:30 PM. That evening, various Zenith officials, guests, representatives of Chicago newspapers, and the Associated Press, gathered at the little transmitter shack of 9XN, in Arlington Heights, some forty miles from the Loop. S.I. Marks, then General Manager of Zenith and McDonald's normal business contact at headquarters during this trip, briefed the guests on the procedure for the press conference. Each reporter was asked to draft a single question. These were then sent to McDonald and MacMillan, apparently via Morse code rather than voice. In all, five questions were sent to WAP during the press conference, with the answers coming back very rapidly. The press conference was so successful that other messages were exchanged that evening which resulted in McDonald's promise to broadcast a program of Eskimo music from WAP to 9XN. The program was then to be relayed to the country on medium wave by WJAZ. The broadcast was to occur "within the next thirty days."

For Zenith and most radio fans, the most memorable radio events of the 1925 Expedition were the next two radio broadcasts made from the *Peary* during that three weeks at anchor in Etah fiord. The first of these broadcasts occurred on the evening of August 12 and was

noted in MacMillan's diary as "our Broadcast to America." MacMillan listed the program as: "1) Accordion played by Bromfield and Gayer, 2) Music of the Eskimo by Myself (MacMillan), 3) General introduction and remarks by McDonald, 4) Singing by Eskimos and beating of Kilante via Eskimo drum"

The second broadcast, which took place sometime between August 16 and August 21, was heard aboard the *USS Seattle*, then at anchor in the harbor at Wellington, New Zealand. This broadcast was described in MacMillan's biography by Allen and referred to several times in reports to National Geographic. It was also mentioned on many occasions in personal letters between MacMillan and McDonald, and in later years was discussed in detail by Admiral MacMillan in a nation-wide "Omnibus" television program in 1955. This broadcast was described in the most detail in the internal news magazine *Zenith Radio Log* of June 1943:

On an August day in 1925 six Eskimos from the world's most northerly settlement gathered before a microphone on the S.S. Peary as she lay at anchor near Etah, Greenland, less than 700 miles from the North Pole. They sang some of their song for Admiral Coontz of the United States Fleet, which was cruising off the shores of Tasmania [*sic*], south of Australia, half the world away.

"That's not singing," exclaimed the Admiral. "It sounds like college yell to me." "Perfect!" exulted Commander McDonald, president of Zenith. "That's what Eskimo songs sound like. It proves that our transmission is getting through to you okay."

In fact, there was quite a volume of communications between the *Peary* (station WAP) at Etah and Down Under during the three week stay at Etah. Lieutenant Schnell, operating on the *USS Seattle* as station NRRL, reported that the signal from the *Peary's* transmitter was almost always a significantly stronger signal in Wellington than that of 9XN in Chicago. McDonald summarized most aspects of their Etah radio activities in similar messages to National Geographic and to *The Talking Machine World*:

We consistently maintained communication not only with the United States, but with England, Scotland, France, Holland, Italy, Hawaii, New Zealand and Australia, the greatest distance having been a two-way communication with Box Hill, Victoria, Australia, nearly halfway around the earth on 37.5 meters. We transmitted the voices of the Eskimo singing his primitive songs within 11.5 degrees of the North Pole, and these songs were heard in Australia and New Zealand, and we received an official radiogram of congratulations both from the Governor-General of New Zealand and the Governor General of Australia. Lieutenant Fred Schnell, with his short-wave apparatus on the U.S.S. Seattle, desiring to send a radiogram extending his compliments to the Convention of the American Radio Relay League [being] held in Chicago, on August 16, being unable to reach Chicago direct, was forced to send it from his ship laying off Wellington, New Zealand, to the MacMillan Arctic S.S. *Peary*, within 11.5

degrees of the North Pole, and we in turn relayed back to Chicago, consuming less than five minutes.<sup>15</sup>

Along with their duties related to the air operations and to the broadcasts, radio operators Reinartz aboard *Bowdoin*, and McGee and Gray aboard *Peary*, were also quite active in communicating with many radio amateurs from a number of countries. The communication that took place between the *Seattle*, the *Bowdoin* and the *Peary* proved to be the convincing evidence needed by the Navy to begin conversion from longwave to shortwave communication equipment.

**Air Operations:** After a number of short flights for radio and navigation checks, actual exploration began on 8 August with flights to Cape Sabine and Cape Isabella. In addition to the lack of landing places, mist and low cloud decks masked much of the rugged topography. The planes were grounded 12-13 August because of gales and flew again 14-16 August in an attempt to establish a forward base. Although the forward base was eventually established, it was established on the ice; upon return of the aircraft, all of the supplies had disappeared. The aircraft were grounded again 17-20 August by gales.

On 20 August, MacMillan, noting that Etah fiord itself was beginning to freeze over at night, decided to terminate the air operations entirely and return south, while that was still possible. The flyers protested and were eventually allowed two more days of air operations while the remainder of the expedition packed equipment. On the 21st, while the other planes were being disassembled and loaded aboard the *Peary*, Byrd, Bennett and Francis flew Loening NA-1 about 50 miles down the coast and established a camp on a beach near the Smith Sound community of Igloodahounay. The next day, they flew far into the interior of Greenland and confirmed that, away from the coast, the ice cap was smooth and featureless and appeared to crest at about 11,000 feet elevation in the center of the island. In recording that flight in his official report<sup>16</sup>, for the first time Byrd mentioned the extreme discomfort of flying at altitude in the High Arctic in an open cockpit. That flight and one short hop the next day closed the air operations of the Navy Arctic Unit.

**The Trip South:** The expedition left Etah on 22 August, just ahead of the freezing of Etah fiord. The *Peary* arrived at Godthaab Harbor on 6 August and anchored for ten days of rest, relaxation and re provisioning. On 14 September, the *Bowdoin* arrived in Godthaab, having been delayed both by the hospitality and by a storm in the town of Sukkertoppen, further up the coast.

**Across To Labrador And Home:** Crossing Davis Strait to Labrador at this season in any year is dangerous. In 1925 it was downright perilous. By mid-September, what was to be an active hurricane season was well underway and the remnants of several were to plague the expedition as it fought its way west and south toward home. One major storm caught the badly overloaded *Peary* crossing Davis Strait and she "heeled over like a schooner in a blow," thanks primarily to the Loenings secured high on the aft deck. Due to the curtailed flight schedule in the North, she was also still carrying a large deck load of Navy aviation gasoline. After finally reaching Battle Harbor, Labrador, Commander.

McDonald reluctantly off-loaded the aviation gas, with full documentation for Navy Secretary Wilbur. MacMillan and the *Bowdoin* party had an even more perilous crossing of Davis Strait into the teeth of a dying hurricane. Further, for reasons he never explained, Radio Operator Reinartz ceased keeping the thrice a day radio schedule between the *Bowdoin* and the *Peary* for over 48 hours during the crossing. McDonald and the *Peary* radio operators were not unduly worried when Reinartz missed the first scheduled contact, thinking that the *Bowdoin's* wire radio antenna may have parted in the storm, as had the *Peary's* twice during their crossing. But after missing three scheduled contacts in a row, the *Peary* had to assume that the *Bowdoin* was lost. A day later, with still no response to the *Peary's* now hourly calling, the ship was preparing to sail out into the storm to search for the *Bowdoin* when Reinartz casually radioed that *Bowdoin* was across and safe, far to the north above Jack Lane's Bay. Reinartz was later relieved of duty for this and other problems.<sup>17</sup>

Late on the afternoon of October 9 the *Bowdoin* and *Peary* arrived at Monhegan Island, a few miles off shore from South Booth Bay Harbor, Maine.

**Conclusions: Radio:** The science and technology of radio had matured significantly in the years between the 1923 and 1925 MacMillan expeditions. The ability of powerful *shortwave* equipment like that aboard the two MacMillan ships to communicate almost at will over planetary distances, day or night, was a real breakthrough in the history of both exploration and communications. Even had the expedition turned back after the coaling incident at Godhavn, Greenland, the fact that McDonald and Byrd could easily communicate with MacMillan, almost 1000 miles away in Hopedale, Labrador, and with the Navy and The National Geographic Society 2300 miles to the south in Washington, DC, would have revolutionized polar exploration. The fact that both ships, while on the north coast of Greenland in broad daylight, communicated with the U.S. Fleet, then in New Zealand, and with radio amateurs in southern Australia, played a significant role in the Navy's decision to adopt shortwave radio for fleet communications. **Aviation:** The Naval Arctic Unit, operating under extremely hazardous conditions, without adequate support and with aircraft that proved to be inherently unsuited to the task, managed to build a solid foundation of aeronautical experience in the Far North. Using three planes of a totally new type, these conspicuously brave aviators flew more than six thousand miles, five thousand of which were flights from Etah on work central to the mission. From the air, they viewed more than thirty thousand square miles of terrain, a large part of which was inaccessible to foot travel and, thus, never before seen by humans. The inverted position of the Liberty engines on the Loenings obviously caused oiling problems and the information gained on this expedition was used to improve future models. The foundations laid by the Naval Arctic Unit aviators continued to pay large dividends in World War II and in Operation Deep Freeze on the Greenland Ice Cap some thirty years later. **Byrd:** Byrd, soon to be world renowned as a polar explorer, applied the lessons of the MacMillan expedition almost immediately. Within a year, he adopted funding and the radio public relations strategies pioneered by McDonald and used both as the foundation for his unquestionably major contributions to polar exploration. It is also interesting to note that Byrd never again flew in polar regions in either open-cockpit or single engine aircraft. **Court Martial of Col. Billy Mitchell:** The Court Martial of Col.

Billy Mitchell convened soon after the expedition returned from the Far North. The MacMillan expedition was a major area of contention in the trial and the Navy suppressed most of its details. With considerable maneuvering, the Navy limited testimony to that of Lt. Commander Byrd and Gilbert Loening. The trial transcript reveals that Byrd committed perjury, not about the details of the expedition, but about his own (non) role in planning the 1925 MacMillan Arctic Expedition.<sup>18</sup>

## ENDNOTES:

1. As authors Harold Cones and John Bryant completed a book on a Zenith Radio Corporation product in 1993/1993, they became further interested in the early years of the corporation. Amazed at the general lack of available information, they discovered that the Zenith “archives,” like those of many near-century old companies, were pitifully incomplete, most of the corporate history having been lost or discarded over the years. In August 1993, however, the authors stumbled into a time capsule of immense value: in an old, soon to be closed television assembly plant, up under the rafters, covered in pigeon droppings, were the personal files of Zenith’s Founder, Commander Eugene F. McDonald, Jr., that had been wax sealed immediately after his death in 1958. The 138 file drawers not only revealed a great deal of information about Zenith Radio Corporation and McDonald’s adventures, inventions, and relationships with historic figures, but also provided an intimate view of American society and culture between 1922 and 1958. The files were transferred to 238 archival storage boxes, stored in a climate controlled area and are currently being prepared by the authors for eventual donation to a scholarly institution so that they will be available for all researchers.

Among the files were three file drawers of original correspondence dealing with the 1925 MacMillan Arctic Expedition that shed light on a unique expedition that was the first to use aircraft in the Arctic, the first to use shortwave radio in the Arctic and that was Richard E. Byrd’s first involvement in polar exploration. This material was of immense importance since all official documentation concerning the expedition had been suppressed because it involved the Court Martial of Col. Billy Mitchell. In addition, the files contained hundreds of never before published photographs and two hours of 16mm film of the expedition.

This material formed the basis of a book on the expedition and considerable documentation of the entire 1925 expedition is found in the text and endnotes of that book: Bryant, John and Harold Cones, *Dangerous Crossings, The First Modern Expedition, 1925* (Annapolis: Naval Institute Press, 2000).

2. Series of letters between MacMillan and McDonald in the private files of Eugene F. McDonald, Jr. Zenith Radio Corporation Archives.

- 3..MacMillan to Moffett, series of letters beginning 5 October, 1924, found in RG 72, Records of the Bureau of Aeronautics, Records of Division and Offices within the Bureau of Aeronautics, Office Services Division, Administrative Services, General Correspondence, A-11 (1) Vol.1, Box 788-89, Entry 62. U.S. National Archives. These records contain much of the planning official correspondence for the expedition. The letter containing plans for fixed wing aircraft was written on McDonald's personal stationary.
4. McDonald Files, Zenith Radio Corporation Archives.
5. Byrd to R.A. Bartlett, c/o Explorers Club, New York, 24 February 1925, found in R.A. Bartlett papers, Hawthorne-Longfellow Library, Bowdoin College.
6. Correspondence between Byrd and R.B. Fosdick, among others, claiming support that did not exist. Byrd Archives, Ohio State University Libraries.
7. Byrd to Bartlett, 30 March, 1925. Byrd Archives, Ohio State University Libraries. The archives contain letters to others with the same claim.
8. Repeated from newspaper accounts without attribution in: Fraser, Chelsea. *Heroes of the Air*. New York: Thomas Y. Crowell Company, 1926.
9. Cones, Harold and John Bryant, Zenith Radio, *The Early Years: 1919-1935* (Atglen. PA: Schiffer Publishing, Ltd, 1997), 70.
10. Taylor, Lt. Commander A. H. "Radio Communication of Shortwaves." *Radio Age— "The Magazine of the Hour"* (June 1926): 19-20.
11. Personal log of Richard E. Byrd. Byrd Archives, Ohio State University Libraries.
12. McDonald Files, Zenith Radio Corporation Archives.
13. Radiogram copies, McDonald Files, Zenith Radio Corporation Archives.
14. Personal log of (then) Lt. (j.g.) M. A. Schur. Schur family, also National Geographic Society Archives, National Geographic Society, Washington, D.C.
15. Commander E. F. McDonald, Jr., Tells The Importance of Radio in Northern Wastes." *The Talking Machine World* (November 15, 1925): 148.
16. Byrd, Lt. Cmdr. R.E. *Report of Activities of Naval Aviation Unit Assigned to MacMillan Arctic Expedition*. Copies located in the U.S. Archives, the Byrd Archives and the Peary-MacMillan Arctic Museum Library.
17. Memo exchanges between McDonald and MacMillan. McDonald Files, Zenith Radio Corporation Archives, McDonald and MacMillan decided to never make their reasons public.

18. Byrd's testimony is found on pages 2103-81 of the official transcript. Special Collection of the Libraries at the U.S. Air Force Academy, Colorado Springs, CO; also the National Museum of Naval Aviation, Pensacola, FL.



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