

# Transatlantic Crossing: ON THE TRAIL OF THE MIDNIGHT SUN

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■ Who hasn't had a great desire to make a really long trip in his own aircraft?

Just such an opportunity arose for me last year. My family and I were moving to England and, after discussing the prospect, my 14-year-old son and I decided it would be a great adventure to fly our M-35 Bonanza across the Atlantic.

I'd had 32 years in the flying game—most of that time spent flying over water—and I knew that good equipment and planning would be musts. Perhaps what I tell you about our preparations may help you prepare for such a flight.

I had had my 1960 M-35 Bonanza for about a year, and it was just beginning to feel like mine after a top overhaul, an annual check, and about 150 hours of flying. I began to plan for the big trip about the time of the annual, and I installed some extra equipment then to save some labor money. These installations were a remote indicating compass (the cheap, \$75 rebuilt kind, but still very serviceable) and a KR-85 digital tuning ADF with beat frequency oscillation (BFO) capability for overseas low-frequency stations.

I already had an IFR suite, with one Narco MK XII with omni/ILS and an older MK X with omni, pitot heat, and a good panel grouping. I had pulled out my old Lear ADF but had saved the components. The vacuum directional gyro must have been in the airplane for 12 years. This was replaced with a rebuilt one—a wise investment.

The first problem was one of design. My Bonanza had 67.5 gallons of usable fuel (I determined this by judiciously running each tank dry), and I wanted 120 gallons in order to have 8 to 9 hours of fuel for what I figured would be an 1,100-mile range plus an hour's reserve. Oil consumption is very important, and mine was then 1 quart every



"It was easy to see why the Norse chieftain Eric the Red chose this sheltered spot from which to launch his forays." Photos by the author.

5 to 6 hours, so endurance was not a function of oil supply.

I designed an auxiliary fuel tank myself, choosing a low, rectangular shape to place on the rear-seat support. The design had the FAA-required vent overboard, feed lines and sealed cap with fuel-spillage container, and room for the needed extra radio equipment on top.

Thinking the major hurdle was accomplished, I began to inquire into regulations that would govern the flight. AOPA's Flight Department has a very fine booklet entitled "Transatlantic and Europe," which I obtained. After reading this, I began to wonder if I could afford what was required, but I decided that if others could do it so could I.

I found that there were minimum equipment requirements levied by the Ministry of Transport (MOT) of Canada. Survival equipment, radio equip-

ment and fuel system must be approved.

I sat down and wrote on 3×5 cards everything I needed to do or install in the airplane to make the trip, and then annotated these cards with dates that would allow us to meet our desired departure schedule. This became our "critical path," in the parlance of the program planners.

Since regulations were the items least known to me, I tackled them right away. The FCC must make an addendum to your radio license for HF frequencies you will use. The FAA must approve the design of your auxiliary fuel tank and its installation, which must be done by a certificated mechanic. The Canadian MOT performs the final inspection in Moncton, New Brunswick, and grants the authorization for a transatlantic flight originating from Canada.

I began lining up my equipment: an



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MIDNIGHT SUN *continued*

HF radio for the long-range communications, a second ADF as backup (required by MOT), and survival gear for a June crossing. We found two quick-donning immersion suits, Mae Wests, and liferafts.

I talked to my favorite mechanic and began to hoard some of the most commonly needed items—extra spark plugs, an extra-long spark-plug lead, safety wire, cotter keys, etc.

Our doctor recommended a small packet of medicines that we might need en route at remote places—things such as aspirin, diarrhea tablets, Chapstick, etc.

I found someone who donated an up-to-date Bonanza maintenance manual, and I picked up a few more good tools to fill out a lightweight tool box.

The auxiliary fuel tank was built of 3/16-inch aluminum. In retrospect, it was far too heavy; when completed it weighed 90 pounds. However, it certainly met all the specifications, and I am convinced that it would outlast the airframe.

About this time I became very much aware that weight was going to be a major factor in our crossing, and we weighed everything we were planning to take. After analyzing the weight of the tank installation and its fuel, we did some double takes on our equipment and pared our list of items down. We had been too optimistic in thinking that we would have little weight restriction.

In organizing the required charts, I decided to make strips from sectionals to cut down on the bulk. We used our desired flight path, with 75 miles on either side. The most important charts were the instrument-route charts. We used the U.S. government's low-altitude series for the eastern United States, Canada, and Europe, which covered nicely everything we wanted. Low-altitude approach books were also obtained as well as U.S. and European flight information manuals.

Last but not least, I made sure that my medical and airman's certificates were up to date.

With regard to insurance—U.S. insurance companies will give you coverage for the crossing, but not for flying in Europe. The cost of insurance in Europe is three times higher than we pay in the U.S. There is no reason for this other than that closer, more frequent borders evidently compound the liability problems. In any case, the fact remains that insurance costs more in Europe, and U.S. companies will not insure you except through an overseas broker.

We had now completed our planning. It was time to "cut metal" and get on with it to meet our departure deadline.

Choosing a single-engine transatlantic route is not hard. You have to pass through Moncton, as mentioned earlier, and the rest is determined by the amount of fuel you carry.

After looking at the range available with our 120 gallons of fuel, we decided to make the overwater flight in three

relatively easy legs. We would leave from Goose Bay, Labrador, fly 760 nm to Narssarsuaq, Greenland, then 740 nm to Keflavik, Iceland, and finally 900 nm to Prestwick, Scotland.

My wife had informed me that "no way" was she going to fly with us, so we removed the back seat of the Bonanza and shipped it with our household goods. My local mechanic, who is a whiz at innovation, installed our auxiliary fuel tank in the rear wing spar area of the cabin. When the FAA became overly legalistic about CG travel—perhaps rightly so—some adjustments forward were required. The tank feed system was boosted by an electric pump, filtered, and given a shutoff valve before being "T'd" into the fuel-feed line for the right main tank. This would allow us to use the right main for one hour and then switch to the left main while the right main was being filled again. A temporary red line was placed on the right main gauge to indicate maximum in-flight transfer and help prevent overboard discharge of fuel. FAA approval of the total installation was contingent on our not exceeding the Bonanza's published gross weight limit of 2,950 pounds plus 10%.

The old Lear ADF was installed on top of the tank. The loop antenna had been left in the tail just for this installation.

The FAA inspector went over the installation with a fine-toothed comb and, after some close CG figuring, granted the vital Form 337 that authorized the overweight long-range ferry



flight. My young son was allowed to go as "crew."

One of the prime items for overwater navigation is an HF radio. I had made arrangements to rent one for the flight, but five days before our scheduled departure, our source failed to produce, and we were seemingly "high and dry."

After I had made frantic phone calls around the country, Floair, in Wichita, Kan., came to my rescue with an HF radio for sale; however, we had to go there to get it. With our cockpit tank installed, our survival gear on board, and a last-minute compass swing for our wet and remote indicating compasses, we took off from Norfolk, Va., one Sunday and headed for Wichita.

We spent Monday at Floair while the HF radio was "built up," and the installation was completed by noon on Tuesday.

All worked well, and we left Wichita and Floair with a great feeling of accomplishment. Four months of planning had finally gotten us to the point where we were actually on our way.

We had decided to enjoy ourselves and take moderate legs each day, so our first day of flying was planned to Niagara Falls, with one enroute stop for fuel at Terre Haute, Ind. This was an easy 700 miles on the chart, but our beautiful blue sky had turned into an unstable air mass, and giant thunderstorms became real obstacles as we battled turbulence and heavy rain. My 14-year-old son is an excellent instrument pilot, so while I made position reports and did the navigation, he flew

on. Our arrival in Niagara Falls was at 2100, and we were both tired after fighting the weather for 7½ hours.

The next day, Wednesday, we left Niagara Falls for our nonstop flight to Moncton via Rochester and Cambridge, N.Y., and Kennebunk and Bangor, Me. The trip was again plagued by IFR weather and a little ice as we topped out over the stratus at 11,000 feet.

Five hours after leaving Niagara Falls, we landed at Moncton and quickly cleared Customs. After a short wait, a Canadian MOT official arrived to clear us for the transatlantic flight. He checked off the items we were required to have—one of which is an ELT that will float. We had purchased a Sharc model with this capability in Wichita, and luckily so, since this particular item was checked closely.

After a short oral quiz on radio communications procedures and flight altitudes for the trip, we were certified as okay and given a clearance slip to hand to the last Canadian authority. The MOT official was most helpful and readily supplied the answers to one or two questions that we were hazy on. He was really trying to see how much we knew, rather than to quiz us academically.

After refueling and checking the weather, we took off for Sept Iles, Quebec, our stop for the night. We landed there at 2000 local time, with plenty of light left, and fueled and cleaned up the airplane for the next leg of our trip the following day. We had come 2,400 miles from our original starting point at Norfolk, and N4EL was performing beautifully, with nothing more required than fuel and a very little bit of oil.

We secured the airplane and headed for town, where we found one of the last rooms in the whole area in a small hotel. Our room was over a bar where they obviously were having a good party, but we quickly fell asleep and did not hear a thing.

We were up early Thursday morning for our longest flying day. We were going to fly to Goose Bay and then on to Narssarsuaq. Weather at Sept Iles was 300 feet overcast with 20 miles' visibility underneath, not an uncommon occurrence in northern latitudes. But Goose Bay was more disappointing, with 100 feet and ¼ mile in fog and rain. Conditions were forecast to improve, though, and we settled down to that old aviation game of waiting and watching the weather sequences.

By 0930 Goose Bay had 300 feet and ½ mile and was forecast to go to 500 and 1 mile, so we took off. As we climbed through 300 feet, we had our last look at the ground until we were on final at Goose.

The Canadian skies had turned hostile, with steady rain and light icing at our cruise altitude of 9,000 feet. We had the skies all to ourselves, though, and the trip was uneventful. Goose Approach picked us up well to the west of the field and gave us an old-fashioned GCA into the airport.

The day was slipping away. It was now 1400, and we checked the weather for our next landing point, Narssarsuaq. It was VFR—a prerequisite to any approach there—but we were coming up on the "advertised" end of their day, which according to the publications was 1700Z. But we felt we had better use the current good weather there to best advantage, since the next day looked bad for a departure, so we filed, handed in our Moncton transatlantic flight clearance paper, and took off on our first overwater leg. The weather at Goose had improved until it was now 3,000 overcast and 15 miles. The temperature was in the high 60s and the wind was easterly at 15 knots.

As we took off in midafternoon there was no sun, and the overcast seemed to stretch forever. Visibility was good and we climbed through the overcast on our easterly heading for Cartwright, Newfoundland, our last landfall in Canada. We broke out on top at 7,000 feet, our assigned eastbound altitude. (The floor of the oceanic control zone is 5,500 feet, and 7,000 feet was the lowest eastbound altitude we could have.)

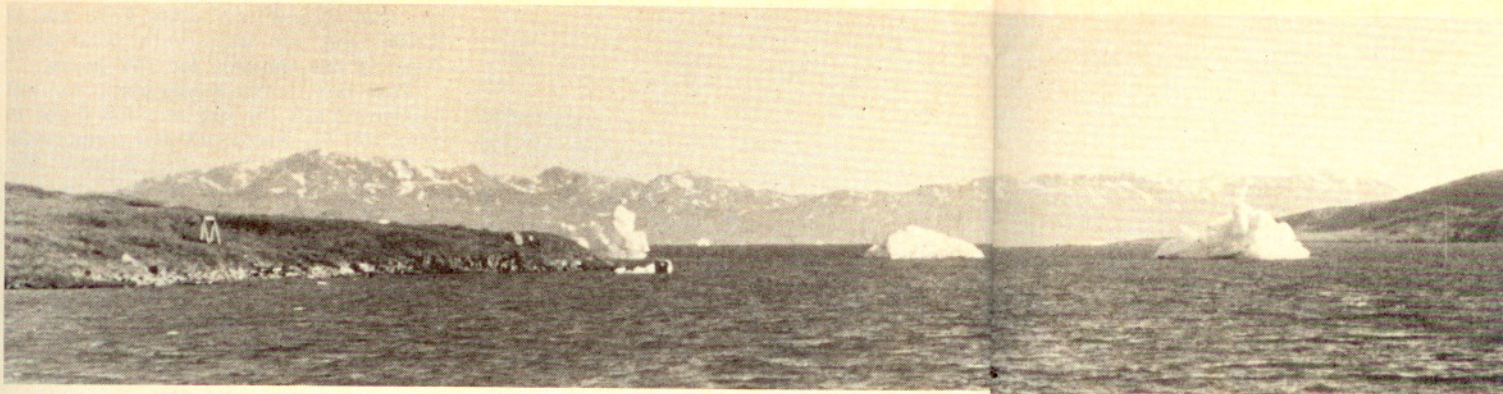
The requirement for HF voice reports is once each hour or every 5 degrees of longitude. Since our Bonanza was cruising at 155 knots TAS, we reported hourly. We reeled out our antenna on the Pantronics 10XDR to the proper length for the first of our channelized frequencies. We were in luck—Gander, Newfoundland, answered right away, and our HF voice reporting for the trip commenced.

We never saw the water on this leg, but we were in the clear. We used the Cartwright ADF halfway, then tuned in Simiutak and were pleasantly reassured as our King KR-85 smartly homed in on that station.

The approach to Greenland was interesting: we knew it had to be VFR if we were to get into Narssarsuaq, and we had only enough fuel to go that far. From a distance, I was surprised to see so many white houses along the coast. Then we came closer, and the houses became large icebergs dotting the coastal waters.

There is no published approach for Narssarsuaq. The people at Floair had been kind enough to give me a hand-drawn copy of the fjord approach. This was the best information available, and was worth its weight in gold because the 42-mile trip up the fjord to Narssarsuaq is replete with box canyons. As we followed directions and flew on the left-hand side of the fjord, it was easy to see why the Norse chieftain Eric the Red chose this particular sheltered spot from which to launch his forays.

Our instructions were to favor the south (right) side of the fjord after passing Mount "Baldy," and to watch for a sunken ship. Even though the hand-drawn chart was 12 years old, the instructions were easy to follow, and the ship was easily visible. By this time the canyon walls were rising vertically on each side of us, and the majestic



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MIDNIGHT SUN continued

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We did not have contact with the Narssarsuaq tower until we were almost upon the field. The time was 2200 local, and the sun was still high in the sky. As we rounded the last bend of the fjord, the end of the runway showed up and we gained welcome VHF contact. We were cleared to land on Runway 08—downwind but uphill. We had arrived at old Blue West One, of World War II fame.

The Danish company, Greenlandair, Inc., runs the field, and the old Navy BOQs are now the Arctic Hotel. The room are clean and well decorated, and the showers are good. A restaurant serves delicious Danish food during the summer months. I was surprised to see so many visitors, but a group of glaciologists were there studying the icecap of Greenland, which terminates 6 miles up the valley in which the airfield is located.

The atmosphere was so friendly, the sky so blue, and the quiet so nice that when we found next day that Keflavik had a 100-foot ceiling and ¼-mile visibility, it was no disappointment to stay an extra 24 hours. We walked up the glacier and picnicked in cool, clear, beautiful weather.

By Saturday morning Keflavik weather had lifted to 400 feet and 1 mile, and because of a deepening low between Greenland and Iceland that promised to move east, we decided we had better "go for it." We had serviced the airplane the day before. To ensure that we would have a sufficient quantity of oil of the proper weight, we carried our own extra oil with us. This helped, because frequently only a local oil was available.

We taxied out, took off downhill toward the beautiful bay with all its icebergs, and said goodbye to one of the six airfields in Greenland. The minimum enroute altitude over the icecap is 11,000 feet, so we climbed out over

the fjord and cut across the southern tip of Greenland for Prince Frederick, flying at 9,000 feet. The starkness of the land was made even more dramatic by the vertical walls of the fjords and the many fingers of the majestic glacier, giving way to the deep blue of the sea.

Prince Frederick radio came in loud and clear on VHF. As we departed the land mass out over the pack-ice fields that dominate the east coast, we again reeled out our HF antenna and got ready for the reports enroute.

The flight to Keflavik was at 9,000 feet. As we approached the low weather system, the stratus built up and we climbed to 13,000 feet to stay in the clear. Near the center of the low we could not "top out," and we began to pick up light, clear ice. But the ice never accumulated more than ⅜ inch, the stratus fell away, and we were again in the clear. We stayed in radio contact with Prince Frederick.

Our flight path was to Ocean Station Bravo and then to Keflavik. Bravo (a British ship) came up on VHF when we called, but could not see us on radar. We finally found each other about the time we were losing radio contact, but it was comforting to be in touch. Icelandic Control came up when we called, and we again had good communications.

Icelandic Control had us on radar 60 miles at sea and handed us off to Reykjavik Control for vectors to a GCA for Runway 12 at Keflavik. Our favorite low was influencing the weather, and Keflavik had 300 feet and ¾ mile. We landed at 2052, after a 4½-hour flight, and taxied in to refuel and greet friends who were on hand to meet us. (We had advised them earlier, through Icelandic Control, that we were inbound.)

We chose to stay with friends at Keflavik, but Reykjavik Airfield and the town are nearby, and there are ample accommodations ranging from the finest to the most economical.

The next day we investigated a part of the island that could well have been on the moon. The Icelandic landscape is strongly volcanic and glacier influenced. The town of Reykjavik obtains its heat from natural steam and hot

water coming up from the ground.

When we awoke the following day, our good weather had turned to drizzle and fog, but the weather in Scotland was forecast to be 1,000 feet and 3 miles. We filed our flight plan with Icelandic Air Operations via airways to the Westman Islands, then direct to Stornoway Radio, and Scottish Airways to Prestwick.

We took off at 0845 local. The departure was IFR in rain, and our hoped-for view of the active volcano on the Westman Islands dissolved in clouds. Reykjavik Control came in loud and clear on HF as we lost them on VHF.

Our enroute weather was solid clouds at our assigned altitude of 9,000 feet. Moderate turbulence and light icing characterized the flight to Stornoway, but as we picked up Shanwick Oceanic Control on HF radio we broke out between layers. When we reached Stornoway, it became apparent that we had picked up a 45-knot headwind as a result of a frontal system lying generally north-south along our track to Prestwick.

Scottish Airways gave us good service but poor control, since they did not have an IFF readout on their radar. By this time our flight path along the airway was down a valley of towering cumulus, and we were experiencing heavy turbulence. We could not obtain vectors around the heavy cells because we could not be identified on radar.

Finally, just 40 miles from Prestwick, we were picked up by radar and given a descent around the heavier cells of a very active frontal system. Our approach and landing were uneventful, and we taxied up to the line for customs clearance with a feeling of great satisfaction.

The flight had been a tremendous success for my 14-year-old son and me. We had been able to do something together that was challenging, fun, and highly educational. We had been able to see a part of the world we had never seen before. We had our airplane in the United Kingdom, and we could tour Europe at our leisure.

It was worth all the effort, cost, and time—and who knows, we might just return to the United States the long way around the world. □