Jerry Lawhorn

Oral History Interview
Jerry Lawhorn
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Anchorage, Alaska
Interviewed by Jim King and Bruce Conant

Jim: Here we are in Jerry's house and he is going to tell us about what just happened the other day.

Jerry: Gordy Watson had his birthday party the other day and they had a whole banquet room at the hotel and a lot of folks were there to celebrate his 75th birthday. His kids had brought a bunch of pictures and pasted them all over the walls all the way around the room on a strip of butcher paper. Apparently their family theme is "Moon River" and the verse was posted top and bottom all the way around so you could sing the song. Well, you remember Evelyn Brown? She started everybody singing this thing. Just the day before, I went down to my daughter's house in Soldotna and she dredged this stuff out of the "on line thing" and it is their version of "Moon River." It's a color picture of 14 people in a shallow river, bare, with their butts up in the air. I didn't know at the time that Watson's family theme was that or I would have nailed this right up there along with the rest of the pictures. I must send this version to Gordy. You can find all kinds of things on that Internet!

Jim: How is Gordy doing?

Jerry: He is as skinny as ever or worse. He has a good outlook. He still instructs ski lessons once a week at Mt. Alyeska. He told the story of his latest ski lesson that he gave the other day. A young fellow was riding up the ski lift with him and he asked Gordy how long he had been skiing and Gordy looked at his watch and said, "oh, since about 10:00 this morning." The kid said, "oh, you know what I mean, how long?" Gordy replied, "oh, pretty close to 70 years!"

Jerry: The early Fish and Wildlife Service Aircraft Division did a lot of neat things. We went through the tandem gear era. You know the big tire thing, Gary Stephenson

picked that right up and he is selling big tires and adapters down in Homer. We established the long propeller and Roger Borer picked that up right away. We established a lot of things right there at the hangar that are common place now. Everybody was looking to see what the Government was doing and trying to keep up with all the latest stuff. We were leading industry up here. We were the people they all looked up to and tried to mimic and then when we went under the Office of Aircraft Services, our new boss said, "well, this isn't the way industry does it, this isn't the way the operators do it, get rid of all those funky old airplanes."

The main reason we were there and didn't cause any static among the operators was the fact that we didn't step on anybody's toes. We had special purpose airplanes that weren't available to them. We had all the Beavers, a whole yard full of them. They didn't have any Gooses. A lot of the standard airplanes that we had similar to those that the operators had were either wired for telemetry for finding animals that had neck collars on. They didn't have the right HF radios for our communications. We kind of stayed out of trouble by not being in direct competition with all the folks. But the minute OAS took over, this all went down the tube.

First off, it wasn't a mesh with Fish and Wildlife and the Bureau of Land Management. It was a BLM takeover is what it amounted to. The Director, the Regional Director, and the Superintendent of Maintenance and the Chief Pilot – all BLM folks. Anything and everything that Fish and Wildlife did, BLM would not do. John McCormick, Regional Director for the Office of Aircraft Services was a pretty hardheaded individual.

Jay Fry, I call him the "Cal Worthington of the Edo floats." You could go into any of those seminars in the spring of the year. The FAA requested all pilots partake of this and Jay would go to great lengths to show pictures of what the federal government was doing which he said was highly illegal. Right off, he and I didn't get along too well. He would always bad-mouth Fish and Wildlife.

We installed automotive rear view mirrors on the underside of the Cessna wings, close to the fuselage. When the airplanes were on amphib floats, the factory indicator lights weren't very reliable.

One time one of his engineers came up with him. This engineer would go out there to the Cessna N750 that was tied down, and he would put a rock beside the wheel. He would get up in the wheelhouse and look into the mirrors and try to figure out which wheel he was looking at. We established the mirrors and we wanted them close enough so that you could see the wheel. It was the right hand mirror looking at the inside of the left-hand wheel and the same on the other side. This guy would climb in and out, in and out. He nearly wore the door handles off trying to figure out where he could see the wheel. This engineer finally got it figured out – some engineers aren't too swift.

The floats that came from the factory for the Cessna's, now come with our mirrors with them. The old Goodyear brakes that were on the things. When you would haul out on a sand bar or a gravel bar or out of the water, sometimes the current would stir up the rocks and act between the brake disc and the castings of the wheel and break the castings out. We made these fancy little shields that go down there and keep the rocks out. Sure enough, next year or two, here would be this modification.

You remember the little Plexiglas windows that they had in the front of the floats and you watched this mechanism go back and forth. If you stand on those Plexiglas windows with your muddy boots, you can't tell what the gear is doing so that's why the mirrors got put on. You could always look at the left front nose gear and see if it was up or down.

Jim: I remember that time when I got one set stuck down and one set stuck up out at Bethel. I got hold of you and Smitty on the radio and the first think you asked me was "are you sure you know which side is stuck down?"

Bruce: How about the big tires on the front of the floats, how did that come about?

Jerry: Well, like all amphib floats out of an aircraft factory, they are made for man-made ramps and paved runways. You usually have concrete or perforated steel ramp, or some sort of a hard surface. Your thrust line is above the floats and if you have the little nose wheels on there and the beach is a little soft, it is kind of like driving tent pegs in the earth. They just didn't have enough flotation for our work. As usual, we had to modify. We made these stainless steel forks up in front and retained all their mechanisms except for the big tires up there. They worked pretty good except the shimmy damper was extremely sensitive as to how much friction was on it to keep the thing from shimming. The air pressure in the tire was sensitive. Also, when you went to climb up on a beach with these big nose wheels, that 800 x four tire would splatter out and you would have a foot print a foot in diameter. It tended to go ahead and climb up the beach rather than dig in.

I sure was proud of that one time when I landed. I had Howard Sears with me and we were doing surveys. It was at Point Hope. We were about to land there and there was this voice on the radio on FAA frequency 5544. The voice came on and it said, "land beyond the barrels." I landed beyond the barrels. After we landed the airplane, I taxied part way back to the soft stuff and tied it down. The permafrost there had thawed and the larger sized gravel, about golf ball size, was kind of a floating mess with essentially no bottom to it. This was proved later by one of the BLM Argosy's that landed up there and used up all the runway. He left the landing gear in the rear and the airplane is still up there! The next morning, we went to taxi back out and I got in behind these barrels where I shouldn't have been and man was it soupy. I pushed the wheel all the way forward and really got into the power and the rocks were flying. Those wheels were flattened out and it walked right through that stuff. If I had those little tires on then, I would have never made it.

Jim: Chuck Evans was saved when he did a wheels down landing there at Lake Hood. He skated long enough that he didn't go on his back.

Jerry: Yes, and the fact that he was real light too. I didn't see it but I heard that there was a mighty spray. The airplane disappeared into this mammoth spray and when it all settled down, here was this Beaver that bobbed back up to the surface, right side up!

Another thing that I insisted on was the 100-hour inspections. I would only allow one of them to be performed in the field in-between. In other words, you could go out of Anchorage with a fresh 100-hour. You could have one done in the field, if requested, to continue on with projects without interrupting and without having to fly clear back to Anchorage for the next 100-hour. I didn't feel that those folks out in the bushes knew as much about our airplanes as we did and to be safe or safer, I would only allow one to be done in the field.

Way back before I went to work for Alaska Airlines, I worked for United Airmotive for a couple of years on Merrill Field. Fish and Wildlife was contracting a lot of their maintenance out. I remember working on the L1, N704, and the word was then, that the guides would call United Airmotive and ask how long the government airplane was going to be there. Of course, this gave them free reign and United Airmotive wasn't in too big of a hurry because that was guaranteed money so they could take in all this other stuff too and kind of put off the government work until the last thing. That really wasn't the way to go. In case this new regime wanted to contract a lot of work out, they might want to consider this, that we've already invented the damn wheel and it doesn't need to be reinvented again. Every so often you have to reinvent the "wheel" – new bosses.

Another thing that we did was alter or amend the FAA regulations. Nowadays those are considered cast in concrete and that's really not the way it is. We got the regulations changed in two or three spots. They read the same books that we did and they did come up with a pretty good set of regulations. As time goes by and things change, I feel the regulations should change. One of them was about converting a military Beaver to a standard category civilian Beaver. The Canadians say that you should retain this engine fire extinguisher system. I think it was a Halon fire extinguisher. It was only serviced in Toronto, Canada, or one place in Los Angeles. That rubbed me raw right away because

we had a bunch of Beavers that we were trying to get legal. I proposed an epistle that was pretty short and to the point quoting their own regulations about C.A.R. Part 3. This thing that I wrote was direct and narrow minded in one way. I gave it to Smitty to read and he signed the thing and sent it off! This was pretty heavy stuff for Smitty because he generally didn't say "potty" if he had a mouthful.

We changed a bunch of the regulations. It was just one of those things that if you stay status quo then nothing happens. With us being a "can-do" outfit, if there was a way in the world we could do something, we sure gave it a try. Then, if someone came up to me and said, "you can't do something," well, that's the wrong thing to say to me!

Bruce: There was for a while, allowance for 10 percent over gross for Fish and Wildlife operations.

Jerry: Yes, that was due to the cold air up here in the major performance atmosphere. In most cases, the airplanes were structurally designed to be 20-some percent overload anyway. There was a special regulation put out for that. I was out at OAS recently looking for that and somebody had taken it. It was a special sheet unto itself that explained all this stuff that Fish and Wildlife was allowed the 10 percent over gross.

Jim: One of the things I remember was when we all learned to fly, we were taught that the engine might suddenly quit and you had to look for corn fields and be ready. I remember after flying Fish and Wildlife planes for a few years, we didn't even think about engine failures anymore. We just weren't having them. Occasionally, something would cause it to run rough but you knew you needed to get somewhere. This quitting cold like they used to do in the 30's wasn't happening to us unless we ran out of gas or something.

Jerry: We had a good record. We had wonderful engines. There was an incident once where Wally Smith, (Tremblay's assistant) lost a cylinder in Ruby. Theron and I went over there and changed the cylinder. There were a lot of trivial things. Every once in

awhile, somebody would call in and say "hey, the fuel pressure is doing this or that or whatever" and I would lead them through fixing their own airplane. Some of the guys were like Chuck Evans who hardly knew which end of the screwdriver you were supposed to use. I led Chuck through adjusting his fuel pressure on a Beaver. It saved him days and days on his project. It also saved someone going out to adjust the fuel pressure. The pressure was just very slowly coming down. It was slowing wearing out. I told him which side of the cowling to get in and what he would see. I told him to follow the line, the flexible hose from the carburetor up to the first "thing" – it has a round end on it and it has a hose in it and the hose pulls out, etc. I told him how to go about it, just step by step. He would get so far then he would call on the radio again. We finally worked through the process then he put it all back together, he fired the engine up and his fuel pressure was up and he was happy as a clam.

It saved everybody time and money. With OAS, you can't do that. If you are pilot, you are a pilot. If you are a mechanic, you are a mechanic, and never shall the twain meet. In Fish and Wildlife, a lot of the pilots were mechanics too. You then got both sides of the picture then. You got to be a better mechanic because you were a pilot and a better pilot because you were a mechanic. You have a better feel for the whole show. If there was a plane down somewhere, one of us would go out and fix the thing and fly it back to wherever it needed to be. That was generally my job.

Jim: That was a wonderful service that just completely disappeared with OAS, and that was to be able to call in and get advice on things to do with the airplane.

Jerry: The HF communication went away and if you were down in the bushes somewhere between the mountains, then your VHF was just dead weight. Without maintaining that, we used to have to call every 45 minutes to an hour when we were out to make sure that someone was keeping track. If the sunspots were bad (every 11 years we would have a sunspot cycle) the skip on the HF was really bad. Sometimes you had to talk to someone way far away and they would relay. Some frequencies would go

bananas and you would have to call up from the FAA or BLM or Geological Survey to get your message across.

Jim: Sometimes we would get boats at sea.

--end of Side A, Tape 1—

--start of Side B, Tape 1—

Jim: The radio was a wonderful system.

Jerry: When I was flying my home built airplane to the international fly at Rockford, I was trying to get hold of Burwash Landing on 5544. My maps were not very up-to-date. Honolulu answered! The guy proceeded to tell me they had decommissioned the HF out of Burwash Landing. That was one of those things, if you were down or going to be somewhere that was unscheduled, you needed to let someone know. Eventually the word would get back to whoever was responsible for your well being.

Jim: I hung on to the HF as long as I could but there weren't many places that you could call at the end.

Jerry: The FAA Flight Service Stations got tired of listening to the static and hash on the HF receivers. Every time the lightening would strike, there would be a blast of static. They would keep turning the volume down to where they wouldn't have to listen to the hash and pretty soon, it became useless. A lot of the secretaries in our outfit were that way at the base stations in Anchorage, Fairbanks, and Juneau.

We had one secretary that was always on the phone and the receiver speaker was right there at the end of her desk and every time she would get on the phone, she would turn the speaker down. One day our radio man, Loren DeChant, went in there after he had turned the volume up three or four times and he said, "look, you are dealing with people's

lives right now, regardless of what happens over the telephone. You've got to listen on the radio." He reset the volume then took the knob so she couldn't mess with it anymore! He said, "these folks that are flying are dependent upon somebody listening on the radio!"

Jim: That time we taxied into Burner's Bay in the fog when Bruce's wife was in the hospital about to have their first daughter, I was able to call Yakutat and have them call my wife from Yakutat to send a car out for us. Now, I think you couldn't do that. You would just be stuck.

Bruce: We wanted to talk with you about N754. It seemed like N754, in some respects, was more of an afterthought.

Jerry: The turbine engine was so reliable that we figured that if we had a bunch of these engines we could outfit all the fleet with the same engines, Nacelle's, propellers, accessories, and everything. The only difference the Goose and the Beaver would be which panel you put the exhaust pipe out of. That injected a lot of common sense because the taxpayers didn't have to put out lots of dollars for different engines. We would only have to buy one spare engine and it could be shipped wherever it was needed, throughout the United States or up here in Alaska. That would have saved my tax dollars, just a little. It really would simplify the maintenance operation.

Garrett Engines had in their mind, the Albatross. The military wanted to get rid of the Albatross and being a Grumman product, they wanted to get their engines on a Grumman product. This would be a good test bed for them so that they could put four-800 hp turbine engines on an Albatross and use all four to get up and going. You could then shut two of them off for your cruising. It made a little sense. Air Research said Garrett had never had an engine put on a Grumman product.

Before we started this conversion on the Goose, Theron and I went to Toronto, or wherever they made the PT-6. We argued with those folks about the airplane that we

were building and we told them we wanted the air scoop up on top. They rather bluntly told us that, "no, the scoop is going to stay down there, and that we were not going to put any other engine on our Grumman product. Grumman's have always had Pratt and Whitney engines and that's it!"

We had a brochure at one time from Volpar, the turbo liner – where they converted the Twin Beach to two Garretts. I took a long look at that and I carefully cut the engine and the Nacelle out of this brochure and found a picture of a Goose that was headed in about the same direction and about the same size. I had to reduce it a little on the Xerox machine but I stuck that on there and I said, "Theron, have a look at this!" We got a brother-in-law price from Garrett, the head of sales. For $47,000 each, we got three engines and if this all turned out correctly, we would want a bunch more.

We finally got the serial numbers, 97001 and 97002 on the Goose and 97003 on the Beaver. They are special made in that 331-2UA, the dash two engine, which means that it is 715 shaft horsepower. The U stands for in let up and the A is for the aluminum gear case. There is only one segment of that engine that is magnesium and that is that little thin diaphragm that separates the nose case from the rest of the power section. The magnesium goes away pretty quick with a little salt water on it. We wanted aluminum in the worst way because you could get salt water on it and not have it go away.

I think that would be the only drawback on the old OV-10 engines unless they made their gear cases out of aluminum too. The old OV-10 became a Garrett operated powered thing. The airplane was so maneuverable. The military pilots would rack them around real quick and the P factor of the propeller would break the gear cases on the PT-6. On the Garrett, they couldn't break it and you can't beat that with a stick!

Another thing that the Garrett did, that we really liked was the instant power response. When you run in the open ocean in a swell system you land kind of on the uphill side of a swell. You want to follow the swell and hopefully fall off the step before you come down the other side of the swell. If you bobbled this, with the PT-6, you would have

from 2 to 5 seconds power lag. That would just kill you right there! You can't survive a power lag of 5 seconds. You would go right in to the next wave and everything just blows up and there you are. That was another big plus. It was easier on gasoline too. It had all the pluses that we needed.

We wanted the inlet up so it wouldn't suck up everything like a vacuum cleaner and it wouldn't get green water in it. It spits out the ice. The first stage compressor is running 43,000 rpm, and it is like a steel disk. You can throw things at it and it will spit them back out. The blades are so close together and going so fast that things can't penetrate, other than sand. With the inlet being up, it made the viewing better also; the observation part, and that's what we built the thing for, so you could see out of it.

Jim: You can't see out of the back windows in the Pratt and Whitney engined Beaver. It's all heat shimmers. The exhaust system is located wrong.

Jerry: Yes, it's just exactly in the wrong place on both sides. The reason we didn't have a right and left was because of the propeller. The Hamilton standard propeller on the old OV-10 was a considerably amount heavier than the Hartzell prop. It is a lot more complicated. Rather than send all our troops to Connecticut or wherever and go through the school to learn a little something about the propeller and not carry this extra weight around, we needed to hopefully, with this caldron configuration of two engines pretty close together, canted, supposedly that makes it where it doesn't care which engine drops dead. In theory that may work but in actuality, it doesn't.

Alveraz Caldron, that was part of his thing, a patent. McKinnon's first Goose had that with the PT-6's and the flaps were hinged at the trailing edge. They opened from the front edge of the flap, down and went back through to trail. That makes the airplane do a "floop-tee-doo" – unannounced "di-do" until the flaps get back into trail. You can then start putting them down again to whatever you want. That, in essence, made a fall flap out of it. They would be real susceptible to water.

Bruce: The N780 has the regular standard flaps.

Jerry: We tried to maintain all the basic controls of a standard Goose so we wouldn't have to have specially modified flaps or rudders or elevators or stabilizers or any of that stuff. We had a bunch of that "stuff" and that part of the wheel had already been "invented" and it was working good so we decided not to reinvent that. My third home-built was a twin-engine amphibian. All its controls were in a dorsal fin. That's where N780's are.

Bruce: There is a story about wandering, especially on the single engine when you discovered the fence idea up front?

Jerry: That's directional stability. We added 40 inches to the front of the plane and that's de-stabilizing because that's a head of the center lift. You are supposed to add some more back in the back to counteract this. You could drive it along just fat, dumb, and happy and it would go pretty straight but it is a fairly unstable airplane in that you just couldn't just let go of the thing. After you got it trimmed out it would just go forever.

The more unstable that you make an airplane, the more efficient it is. If it is extremely stable, then the FAA really likes that because the pilot doesn't enter in to the picture. He just kind of points it and lets it go. It used to be if a pilot gets in trouble, just let go of the controls because the airplane will straighten itself out in the Goose. You could go along at cruise speed and the nose would drift off center just a little bit one way or the other, then it would really grab and go. The pilot would then have to get serious on the rudder and bring it back straight.

We were going down through Yakutak on to Seattle and we picked up a load of rough ice and the thing settled down. Well, that stuck in my head. We were fighting this stability problem to get it certified down at Van Nuys. The FAA engineers were there. We struggled with that for quite a while and all of a sudden – this thing I remembered – I

went out there with some duct tape and a couple short pieces of T-angle and taped them on up on the bow. The Goose is a very slab-sided thing. If you look at it from the top down, it is a double cambered airfoil. If you get the airfoil pointed left or right, it would tend to lift in that direction. That was our problem. I taped those "T" angles on and it settled right down. They have been on there ever since! I think they have replaced the tape! That explains how the thing was de-stabilized directionally, because it was lifting latterly. The "T" angles kill the lift, then it settles down.

Jim: That's a good story.

Bruce: With N754, you didn't have to do any of that fine-tuning like with the Goose, did you?

Jerry: It flew good except that it was nose heavy and every body said, "well, you take off the 900 pound anchor up front and you put on this 300 pound anchor, how come it is nose heavy?" Well, if you put this 300-pounder out on this long stick, that makes a different. The empty weight is less because there isn't as much total weight but it is where the weight is in relation to the center lift. That's why the flying wing works so well.

Old Jack Northrop had this all thought out, if you get your center of gravity. Up to where the center lift is on the wing, all the controls were light and fluffy and would do just what you wanted it to do. The minute that you dropped the center of gravity down, you now have this pendulum affect. That is where the rudder comes in because the center of gravity is down below the center lift. You are trying to get this weight to go around the corner and the lower you put the weight in the floats, it doesn't want to turn very good. It also doesn't want to go up hill very good or very good down hill. It would go straight, but there again, the weight is down and you are trying to go up hill. It is trying to lift this weight. It is a simple thing but unless somebody explains it to you –

Jim: Is that part of the trouble with N750 on the amphib floats? It cruised beautifully but it didn't want to climb.

Jerry: Yes.

Bruce: That is something they never explained when doing weight and balance. There was always fore and aft.

Jerry: Well, common sense doesn't enter into the picture at a lot of these schools. Once you see it explained to you, in common language, then it is easier to understand.

Bruce: So putting all that weight and fuel in the wing in N754 makes it a lot nicer flying because of that.

Jerry: On a standard PT-6 powered Beaver, they added another fuel tank in the belly. There you go again, destabilizing it! I learned a lot of stuff the hard way but after you build a couple or three airplanes of your own, you kind of get a feel for how this whole thing plays. I never could get too much technical stuff out of a book. If I was really interested in that particular aspect, then I could get it. Otherwise, that part of my brain never did develop very well.

Jim: I flew that amphib-180 quite awhile. I liked it because no one else wanted it so if I wasn't using it, I could park it for a few months. No body would bother it.

Jerry: It wasn't a very good floatplane and it wasn't a very good land plane. The minute you have a combination there, there is going to very likely be a compromise on both ends.

Bruce: Well, certainly N754 and N780 are success stories.

--end of Side B, Tape 1—

--start of Side A, Tape 2—

Jerry: The Office of Aircraft Services overhauled the N780 before they sold it, which is typical government. I think they got $600,000 out of it. The outfit that bought it wanted to use it in Wisconsin to take charters up to their fishing lodge in Canada and then in the wintertime, they would take it down to Chili. They had another fishing lodge in Argentina. I think they had problems with the seats. They weren't certified or the papers didn't come with the airplane, or something as such.

They sold the plane to a guy that bought it for a fairly decent price, all right, but about three months before Terry (Smith) checked him out, they decided that with the short propellers and the engines on a hot day and high altitude, it could stand some more power. He thought he would just go ahead and send the thing back up here and leave it up here along with his Bell Jet Ranger that he has here and when he passes through, he would just go fishing. A couple of months before he brought it up, he had an offer for $1.5 million for it. At this point he had already made about three-quarters of a million there! Then, just before he left, he was offered $1.7 million. You see how the government works! They are chartering a Twin Otter to do the same work or trying to do the same work. There is only one observer up in front, no gas range, and you can't land that Otter more than once in the water!

Terry is sort of running the show now. He has 40% and he can do with it as he wants. If he bends it, he fixes it.

Bruce: Bob Zarkovich said they went through the plane completely before they sold it and it was in the best shape that it had been in, in a long time. So the props are cut off the same as N754 and N780?

Jerry: Yes. If they put those 1,000 hp on the N780, I hope they put the long props back on. That's a whole different program; just like the Beaver was. Did you ever ride in that when it had the long props?

Bruce: We are thinking about going back to the long props.

Jerry: It's just like you dumped another 1,000 hp in it. I mean it is serious!

Jim: That engine can swing it, however long it is.

Jerry: The engine was made for 102-inch propeller. It needs that much to absorb the power. The minute you chop the propeller off – well you say, the difference between 102 inches and 96 inches is only 6 inches. You take that 3-4 inches and you run it around that whole circle, that's a lot of square feet that's not working anymore, that you don't have available.

Bruce: Do you think it would cruise a little more efficiently?

Jerry: Yes, it would be more efficient because a long propeller is more efficient at slow speed. The higher the speed of the airplane, the shorter the propeller can be.

Jim: Why did you cut it down?

Jerry: Well, Herman took it out one day. There was a big south wind blowing on Lake Hood and instead of taking off at the airport, he taxied off the ramp with the little floats and then when he went to turn around at the other end of Lake Hood, down wind side, he kind of dipped the propeller in the creek. There was a lot of splashing, etc. He scared himself so bad that he told any and every body that would listen, that the airplane was going to kill somebody, so Smith cut the propeller off to 96 inches. It buzzes nice but it doesn't set you back in the seat and keep you back there like it used to. You could definitely tell when you were flying with the longer propeller. It definitely implanted you in the seat and kept you there.

You start with LH switch and as soon as its function is complete, you go to the next switch in line. When you get to the RH end of the row of switches, everything is on and running and in the right sequence.

The slope in the fuel control is fairly steep in the N780 whereas in the Beaver, if it's right, it would have a real shallow decline, near the flight idle position of the power lever.

Bruce: So if we went back to the longer propeller –

Jerry: It would be nice – if you could get it done. I don't know if you can get it done through Air Research or not. There would be $25,000 worth of paperwork! If you can change the ratio of the power lever back in that critical range so when you move the power lever, it is not so sensitive. You may have to change some stuff. You would have to think the whole thing through and get the levers to where it doesn't move the fuel control in that area at all. Then you wouldn't have to change the slope on the fuel control.

Bruce: Do you know anything about the reasoning or the thought process of why OAS happened?

Jerry: Yeah! (tape turned off at this point – a "Nixon time-out")

Jim: I remember you talking about the fuel system in N754. You used to tell people that you had "biologist-proofed" the airplane but you didn't tell us that.

Jerry: Well, you never knew who was going to fly it. Bob Richey flew it, Don Ross flew it, Herman Ruess flew it, Biff Reed from USGS, flew it quite a lot.

Jim: Actually, that is exactly what we wanted, a plane that we could fly that would be incidental to what our main theme was.

Jerry: You can't be tending the airplane all the time and looking out the window counting ducks or whatever.

Jim: That was a good description. I thought we would have to wonder if you started saying you had made the airplane foolproof.

Jerry: I recognized that you are pilots incidental to your job and if I could make your job easier and safer, then why not.

Jim: That little warning light on the fuel pressure that you put in for me on the Beaver, that was great. It took care of a little thing that could have caused a serious situation.

Jerry: Yes, you could have run aground there if you switched to the wrong tank. It gets your attention when the noise quits up in front!

Jim: You couldn't just switch, you had to get on the wobble pump.

Jerry: Yes, and on the standard Beaver, the fuel selector in the middle position isn't the middle tank. It must have been some French influence in the design of the Beaver.

Jim: That kind of thing is really important. I never did fall off the wing but I like the handles you put on for me.

Jerry: Yes, except they knocked five miles an hour off your cruise. I still have those things! It is amazing, talking about airflow over the center of the airplane, different airplanes are quite critical. Avionic folks are especially bad about putting antennae up there.

Jim: A wire can make quite a difference.

Jerry: Yes. To go a little farther with that, along with your episode of those two little round knobs at ¾ inch in diameter and about 2-1/2 to 3 inches long, it will knock about 5 miles an hour off the cruise speed, which is already slow. The Beaver has an overhead window and we tried to get that certified and I got it certified and then Engineering decided that was not too good. I got it certified through Engineering up here. Somewhere along the line, back East, the military experienced one of those going away because it was rather thin Plexiglas and it popped out. We had to put metal in place of the Plexiglas.

Getting back to that spoiled center on the fuselage. You remember Fred Frakes way back when. He was a 7-Day Adventist out of Dillingham. He decided to give up the Jesus part of this thing and get at the airplane part of it. He decided he would put a pair of PT-6's on a Mallard. He kept the same propeller plane as in the standard Mallard, short little PC-6 Nacelle's right up there. He thought he had this thing all whipped and he was going to make a pile, because there were quite a few Mallards still in existence at that time. He was going to convert all these Mallards to PT-6's. The vertical stability wouldn't pass. They (FAA) wrestled with that for months and months. Finally, somebody got up there with a paint stripper and stripped all the grip tread off this big wide sloth that was up there across the wing that went from engine to engine so the pilots wouldn't fall on their butts. Well, that is built in frost! They took the grip tread off and it passed all the flight tests. That center is pretty critical on a lot of airplanes. It is something that no one stresses. Avionics people don't know that. They want a nice flat place up there where it is convenient for their wires. They always put it in the wrong spot and they mess up the airflow. It is a critical part of the stability of the wing.

Bruce: How about the overhead windows in N754. Are they customed?

Jerry: Yes, it is just one piece. In that case, that is a whole quarter inch or 3/8-inch thing that is blown into a single piece and it is strapped in. If it ever breaks, you have other problems.

Another one of my projects was the windshield on N780. I knew that we needed a windshield that was 36 inches from top to bottom. It also had to have the right curvature and hopefully the curvature would be such that it would be ambidextrous, left or right. I spent a week and a half just looking at windshields on trucks and busses and stuff. One day there was this tour bus and it immediately got my attention. I had a rough pattern of what I wanted and this tour bus pulled up there at Airport Machinery, which is across the street there from Merrill Field. It parked back there in the back. Before the bus driver even got the door open, here was this guy out there with a piece of cardboard over his windshield. I found out that the bus was made in Belgium, the Golden Eagle, special made. I asked him all about the windshield. He said, "yes, we have to replace them every so often because of rocks hitting them. They are available in Seattle." There was a phone number right on the bottom of the windshield. My problems were solved right there except I couldn't make the windshield ambidextrous. .I found some guy in town that could cut that safety glass.

Bruce: You were saying the auto fill valve in N754 that was fairly old technology.

Jerry: Yes, it is. It solved a couple of problems that I had. If we could ever get the thing certified, then we wouldn't have to test that front fuel tank. The auto fill valve served two purposes. The primary one was so that it wouldn't over pressure that front tank and have it split on a rough landing, especially if you are not within paddling distance from land because that is where all the engine fuel comes from.

Bruce: That is not designed for that extra pressure from the wings above.

Jerry: It is hard to explain to a lot of people. If you had a garden hose full of water stuck up in the air as tall as the Grand Coulee Dam or any of those dams, it has exactly the same amount of pressure down at the bottom as it would in front of that dam at the same height; it doesn't give a rip about all that water behind it. It's the pressure at the bottom that counts. Of course, we're adding 52 inches of fuel over and above the static of what is in standard Beaver belly tanks. The tanks weren't designed for that. If you

could use Prist in the fuel tank, it should keep that float arrangement from collecting moisture, then I think that the auto fill valve would do it. It would probably work just the way it was designed. I imagine if you got fuel out of Phoenix you probably wouldn't get Prist in it unless you asked for it. The fuel that they get there, chances are they don't have very much entrained water in it. This Prist is just alcohol, an additive that burns clean and keeps the fungus from forming. It is amazing that fungus will form in turbine fuel.

Bruce: Was it your intent to certify N754?

Jerry: Oh, yes. That is why a lot of the things are the way they are so it would be easy to certify. That is why we used the turbine Beaver tail, rudder and fin because that had already been tested. We did retest it again and found out the Canadians were pretty borderline. We had to modify that. It was just simply the relocation of the static balance weight. We took half the weight out of the upper counterbalance and put it on those two lower horns; one on each side of the rudder at the lower end. That cured the vibration problem the standard turbine Beaver had. It could get critical.

Bruce: I noticed a couple of standard Beavers out there around Lake Hood have a steeper approach to the vertical fin on the top. At first, I thought it was just snow but it is a definite fin.

Jerry: They may have run some tests and found out they could get rid of the stabilizer fins. There again, those floats are de-stabilizing.

--end of Side A, Tape 2—
--start of Side B, Tape 2—

If you operate the PT-6 in salt water, every night you would have to run the garden hose through the thing and wash it all off. It is all magnesium and every thing gets all plugged up after a little bit of that salt water. It gets caked on things and pretty soon, the air

doesn't go where it is supposed to go. Your power is then down to pretty nil. There are kits available that enable you to plug the hose right in with spray rings inside in various places.

Jim: We always tried to avoid salt-water landings but still there are times when you need to. I don't think there has ever been a corrosion problem on that engine.

Jerry: That is part of the specifications that we had.

Bruce: It is a nice feature that it is out in front of the floats so even if you have some spray coming up, it is from the float that is going to be aft of the intake. As long as you don't honk it into reverse and blow a bunch of salt water up front, you are not going to be taking on any.

Jim: For the waterfowl project, the planes have really been neat. It is a little different flying but I gather that when the plane goes in for maintenance, that engine comes out in very good shape.

Jerry: Yes, you are not drawing maximum power out of it all the time like you would on a commuter.

Bruce: It's sad in a way that there is only one.

Jerry: Yes, I had a fellow back East, a FWS flyway pilot, who apparently had received information on N-754 and he wanted to write up a justification of having another one. I had quite a session with him and I told him that before he spent a lot of time writing up justifications, etc., that he might want to call Volpar and find out if they still have the footlocker full of prints and the jig and all the data for building another one. They had all the drawings and prints and all the testing data that they did. I never heard from him again.

Bruce: Jim and I were coming back from Mexico and we landed at Troutdale, Oregon. We put it in their hangar there and the next morning when we came out to pick up the airplane, there was guy standing behind it and he said, "you know, I know about this airplane." It turned out he worked for Volpar and he helped hang the engine. He had a picture of it back in his shop. So you went down there to pick it up when it first flew in April of 1972?

Jerry: Yes, I did all the initial flight testing on it. I flew it over to Phoenix and had all the vibration removed there at Air Research. I flew the first 170+ hours of its life trying to get all the bugs out of it. I still didn't have them all out by the time you guys started flying it. At least I could identify the bugs that were left. As time permitted we finished the fuel, the instruments, switches, etc.

Jim: That starting system that you put in is so neat.

Jerry: Yes, you don't have to read a book. If you know your left hand from your right hand, you have it made. You can have an instantaneous visual check. On N780, all the switches that are on the sides, up is on, down is off. All the switches overhead are forward is go, and back is whoa. It is a simple thing but you don't realize it when you get in an airplane and play it for awhile, then you don't even think about the switches. We actually gave these things a lot of thought. All the switches and knobs overhead are recessed. You can't accidentally turn one off or on that shouldn't be off or on. All the knobs up over head are champagne bottle corks. I tried to make the airplane and its systems "biologist-proof."

Bruce: That's how Jack Hodges sort of writes computer programs. He biologist-proofs his computer programs with the same concept. You have a guy like me who doesn't know much about computers but I know what I want done. When were starting out doing this, he would write a program and I would take it home and see if I could screw it up and sure enough, I could screw it up. He would then have to figure out how to write it so I couldn't screw it up. Pretty soon, we had one that even I couldn't screw up.

Jerry: That's how things get done in the correct manner. It's a good method. It's just human nature that you are going to screw up somehow, sometime. Old Murphy's Law seems to always kick in.

Jim: There is a mechanic for ARCO who works up at Kaparuk. I think his name is Jensen. He was saying last summer, "you know what those propellers are for on this airplane?" He said, "that's to keep the pilot cool, because if it stops, just watch him sweat!"

The other nice thing about N754 that I know you probably put months of thought into is having everything right there by your right hand. In the standard Beaver you are up on the ceiling and down on the floor, doing aerobic exercises with your arms.

Jerry: Yes, it took a lot of thought.

Jim: That really made a difference. You don't think about it when you are doing it but it always took a little time to glance up, glance down, distracting your attention from which way the selectors were and which way to turn the knobs. This way, you are able to trim it with your thumb while you are letting the gear down and putting the flaps down. Everything is right there under your right hand. All those little things really did improve the quality of bird counts. The windows were important.

Jack Hodges wrote about all the records of the bird surveys going back to the 1950's. Suddenly, there was an increase that he couldn't otherwise account for except that was the year we added the turbine Beaver.

Bruce: I remember when he showed me those graphs of different kinds of ducks and birds. On every one of the surveys, when you got to 1977, he wondered what happened in 1977? I told him, "that's when we started flying the Beaver and we could see things!"

Jim: We talked about the turbine Beaver never having got certified. I know you worked on that.

Jerry: Yes, all the tests were done down at Volpar where the thing was actually made under our direction. The FAA engineering tests on the new tubular front on it and the Nacelle were all conducted down there to make sure that structurally the airplane was strong. They put it on the shaker as they do all airplanes to find the critical harmonics that run up and down the fuselage. If you have never seen that before, you would be totally amazed. You can watch the frequencies whey they are induced and you can watch the vibrations go up and down lengthwise. Segments of it just get blurred. That's how they tell the critical vibrations. The engine manufactures have a vibration test on each component of the engine. As you put these airplanes on the shaker, you can induce each one of the little components into the shaker frequency to make sure that some accessory on the back of the engine won't cause a problem with the airplane. They are pretty technical about this.

We went through the Hartzell propeller factory in Ohio and the chief engineer there showed me how they checked all their propellers to know what frequency range is critical. He explained it very clearly. He had a propeller blade in the shaker and he induced various vibrations and it was very impressive! There would be a little segment of the propeller that would just go blurry. He could run it clear out to the tip and back to the hub. He then knew what frequency that he had to deal with on other airplanes, etc. He said he could the turn volume up and you would be able to see the tip clear and the rest of the blade clear, but "this little fuzzy chunk here would jump right out of there." I experienced that with the float wares on a standard Goose. If you don't have them lined up exactly correct, you can tell it by listening to the airplane fly over. It will sing; the same with the floatplane. If you hear it "sing" then you need to line the float wires up correctly. Everytime that Goose came back with the float wire broken, you would have both ends, but there would be a chunk about 2-1/2 inches that just went away!

The engineer showed me a blade that had been put through the test to make sure they knew what they were talking about. They could vibrate it until it broke. They could run the vibration out and the amplitude of it, however vigorous they wanted to make it.

The plane sat out in the woods for awhile. The Department of the Interior (OAS) was not going to fly anymore experimental airplanes. They had to be certified. It is hard to say that an airplane isn't safe just because it doesn't have one piece of paper in it. They put N754 out in the bushes for quite awhile. They were going to take the engine off and sell the rest of it as it was a "non-conforming piece of junk." They would use the engine for N780 when it ever got blessed.

We kept getting pressure from Washington to certify N-780. McCormick and crew out at OAS, just as soon I went away because I was sort of a pain in their butt. Somehow the decommissioning of N-754 didn't take place. It was an airplane that a lot of the guys from the shop had worked on before it was put in the bushes. They realized what a neat airplane it was. There were six of us in that shop that volunteered our time in the evenings, Saturdays and Sundays to put that airplane back into commission with no charge to the government.

Jim: One of the stories that we heard was that you had called Hank Hansen about how they were destroying this airplane and he looked up the paperwork and determined that it had never been turned over to OAS, that it still belonged to Fish and Wildlife. He then talked to Schommer and told him to make the thing flyable or we would send it Outside and use it for what it was designed for. I guess they (OAS) felt this might reflect poorly on the Alaska operations if this happened so that's when it apparently was brought back out of the bushes.

Jerry: Yes, we had offered to do this work for free before all this but they wouldn't accept that. We then got word from Washington and it kind of got pulled out from underneath OAS. I was never really sure how all this occurred. I figured it had to be from somebody back on the Hill.

Jim: So you got it fixed up and I got to use it for bird surveys pretty quick. That is really what the plane was designed for.

Jerry: It was meant to be a "flyway airplane." After 25 years, that experimental airplane is still playing, and still seems to be the best tool for the job!

Jim: It has been used all the way from Mexico to the middle of Arctic Russia.

Bruce: If we are going to build some more, we had better take a long hard look at what worked and what didn't.

Jerry: If this happens and you need someone to "point and talk," I'm available. Between my pipe and the airplane fumes that I inhaled over the years has affected my breathing. I could go through the whole thing and explain it all as to why certain things worked and what has been done to it as far as certification and things they shouldn't have to be duplicated. If the data is lost because of Volpar dissolving, then it is going to be tough to bring that data back. Somebody bought them out and they changed their name to American Jet. Volpar moved across the runway to the west side, then when they were bought out, they were overhauling old Boeing 707's and redoing the interior and selling them to the Arabians.

Jim: It might be worth checking into to see if the new owners are keeping the records on that. Maybe the next time we go through there we could stop and ask if they have the paperwork on this airplane that we have been flying for 20+ years!
--end of Side B, Tape 2—

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