

The 737 and the Thrust Reverser or Just one more Day!

By Bob Bogash

Have you ever wondered why some things can't last just one more day? Just one more damned day! OK, here's a couple of examples.

I started to notice while flying my airplane that the engine starts were getting a little "anemic." I checked the battery - it tested good, but I figured it was getting close to giving up the ghost. So I bought a new one. It arrived, and I took it to the hangar one Saturday morning, placing it on the bench. I needed to make a quick flight over to Paine Field to give a tour of our B-52 to a few friends from Texas (Jim Gabriel - the original pilot of that very B-52 in Viet Nam). When I got back, I'd be wisely pre-emptive and change the battery. So I jumped in and hit the starter - and - nothing. The battery was dead. So, I had to change the battery, which took about an hour - before my flight, instead of after. Now why couldn't it have lasted one more flight??? Just one more flight? See what I mean?

Another example - also on my airplane. The RV-12 fleet was having bad problems with the Voltage Regulator - a unit made by Ducati, in Italy. Reading other people's problems, I carefully monitored all my engine parameters on my computer after every flight, and although all was good, decided to beat Fate and install a new one from a different vendor (actually, a John Deere lawn tractor VR - something you can do on an Experimental airplane!) I bought the new JD regulator and ordered wire and connectors from SteinAir in Minnesota. During my Annual Inspection, I installed the new Regulator in a new location - it was a Thursday. My wiring was due on Monday. In the interim, I flew down to Sonoma California to fly my friend Chris's Curtiss P-40. When I got back, on Monday or Tuesday, I was going to hook up the new VR. But wait! On the return flight - Saturday - my Voltage Regulator gave up the ghost around Medford, Oregon. I ducked into Cottage Grove, where fortunately, a good Samaritan named Ron English fabbed a temporary (5 years later - still installed) wire bundle for me to connect to my already installed new VR, to get me home. OK, Sky Gods, all that VR had to do was last one more flight - one stinkin' more flight - and all would be good. But No - they couldn't do it. They always seem to have to prove that THEY are in charge!

So, here's a story about a Boeing 737 where the same Sky Gods decided to play dirty tricks and deny the airplane just One More Day.

Background

When the Boeing 737 was designed, Boeing decided to utilize maximum commonality with the Boeing 727. It had the same body, same cockpit, same engines, same system architecture - A & B hydraulic systems, Standby system, same pressurization system. On and on. One thing it had were the same thrust reversers.

The 727 thrust reversers, IMHO, weren't very good. First, they were pneumatically operated. In my experience, pneumatically operated systems were poor performers and unreliable. The 707 and 747 fan reversers operated that way; so did the 747 leading edge flap drives. Hydraulically driven units were 1000 % better. But then, I don't design 'em. I 'jes fix 'em.

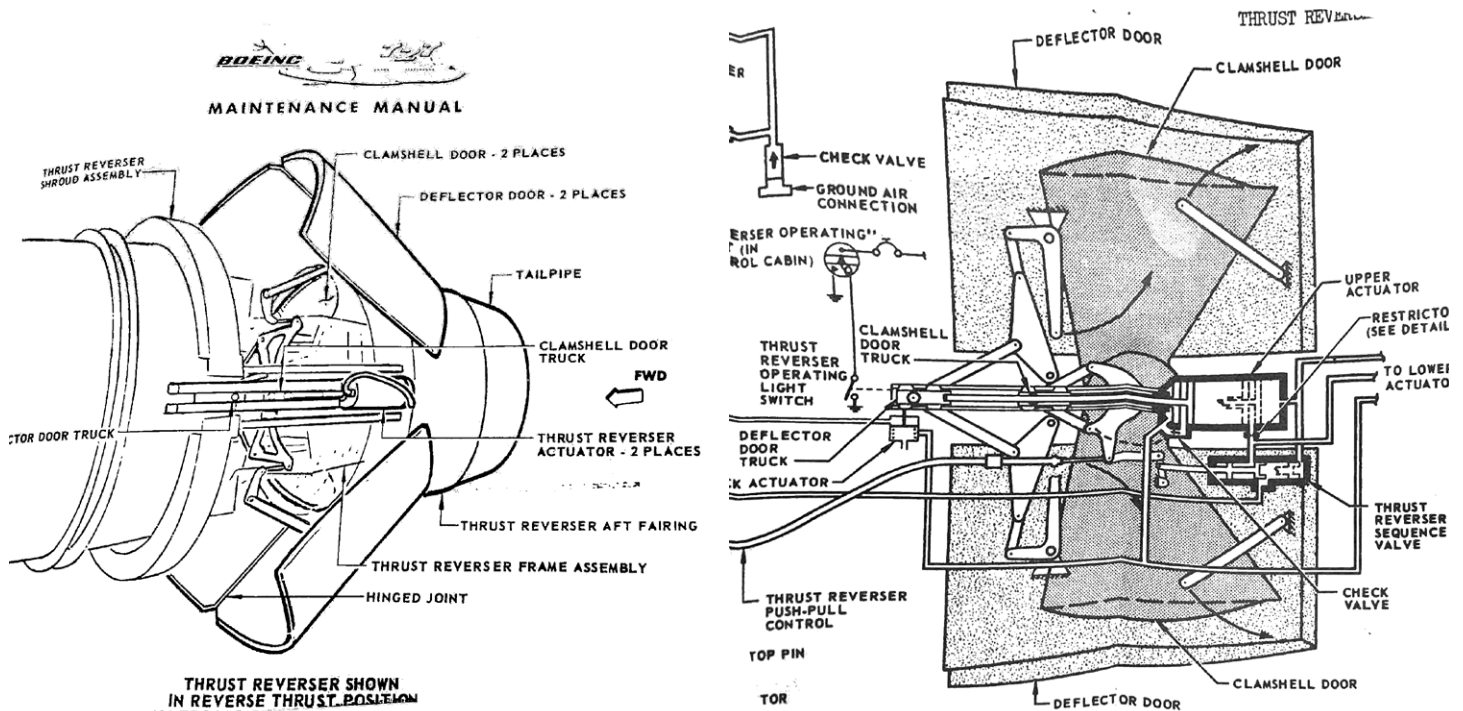
The 727 thrust reversers had six parts: two clamshell doors inside the tailpipe that closed and blocked the exhaust gases; two sets of cascade vanes that redirected the exhaust gas flow; and two sets of deflector doors that aimed the redirected exhaust gases forward. The deflector doors were the problem. They were semi-hemispherical doors that were attached with a four bar linkage.

Those bars would often break, and the door would depart the airplane. LaGuardia Airport police would drive me out to the runway with some frequency to pick up the departed deflector doors. Their reliability was so poor, that airlines began leaving them off altogether. The doors were on the MEL (Minimum Equipment List), meaning the airplane could be flown for limited periods without them, so the airlines petitioned to make that permanent - and approval was granted. In the latter part of the 727s service life, very few airplanes retained the deflector doors.

Now, on the 737, the exact same reverser was fitted to the airplane's engines. The deflector doors opened horizontally, like the center engine on the 727. But the problem on the 737 was that, with the flaps extended to 30 or 40 degrees for landing, the reverse thrust exhaust gases became trapped between the wing, flaps, and ground, and levitated the airplane. The airplane actually rose higher on its landing gear, and by doing so, reduced the effectiveness of the wheel braking significantly. The airplane began acting like a Hovercraft and I believe the landing distances actually increased when using reverse versus using just wheel brakes. Since the 737 was intended for operation into smaller cities and airfields, with shorter runways, that could be a problem!



Boeing 727 thrust reverser. (Photo by Bob Bogash)



Maintenance Manual drawings showing the thrust reverser in the deployed and stowed position. (Boeing via the author)



HPTR Thrust Reverser, aka DC-9 Reverser. (Photos by Bob Bogash)

To rectify that problem, Boeing switched to a new reverser - one that was hydraulically operated, had only two parts, and was relocated aft of the flaps via a five foot tailpipe extension. Actually, it was a DC-9 reverser. It was called the HPTR - for High Performance Thrust Reverser. It was so effective, that the airplane could now land in a shorter distance than originally certified, using reverse thrust only and NO wheel brakes!

My later boss, Dick Taylor, felt strongly that the new reverser needed to be fitted to all airplanes - even retrofitting them to already delivered airplanes - and - at Boeing expense. The cost would be \$20M, not insubstantial - and at a time when Boeing was going through big financial woes over the 737 and 747 programs. Dick went to Boeing President Bill Allen, laid out his case; Brien Wygle backed him up and the deal was done.



CF-NAB on the ramp at Fort Chimo on a happier day. Note the old 727 thrust reversers. (Photo by Bob Bogash)

The new reversers would go on new production airplanes, and the first 135 airplanes would be retrofitted at no cost to the airlines. To accomplish the mods, Boeing contracted with United Air Lines who set up a Mod Line at their Overhaul Base in San Francisco. All the airplanes were modified there (except for DLH - Lufthansa - who elected to do them in-house) and the airlines arranged to get slots in the Mod Line.

Nordair 737

That brings us to my customer, Nordair in Montreal, and my subject - Just One More Day!

At the time, Nordair had just a few 737s, but only their first airplane, CF-NAB, had the old reversers and was affected by the retrofit. Despite operating off snowy and icy runways, Nordair was less impacted than might be surmised. For one thing, their main base in Montreal had very long runways, as did their southern destinations, and required use of reversers was modest at best. But, more importantly, their Arctic airfields were almost all gravel runways. At that time, use of reverse thrust was prohibited on gravel runways (that later changed.)

Nordair negotiated a slot in the UAL Mod Line. It was for Dec 1, 1969. Airplane CF-NAB was to make its last revenue flight on November 28, 1969. The airplane flew from Montreal to Frobisher Bay (CYFB), (now called Iqaluit) and then returned to Montreal with a stop at Fort Chimo (CYVP.) Fort Chimo (now called Kuujjuaq) is in northern Quebec about 900 miles north of Montreal - at 58N at the SW corner of Ungava Bay.

It had two gravel runways, but one had just been paved. After return to Montreal (CYUL), the airplane would be taken out of service and prepared for its flight to UAL at SFO. For its last revenue flight prior to the reverser mod, the airplane was in a 3 pallet/57 passengers combi configuration with 45 passengers on board. Art Hale was the Captain and Bob Jones was F/O. Both were good friends.

During the takeoff (very unusual - only occurrence to my knowledge) the Number 1 engine thrust reverser deflector doors (both sides) failed with four broken links. The pilot aborted the takeoff; it was a high speed RTO (Refused Take Off) from 120 kts. Never been sure how he knew the doors

had failed. To be honest, I've always suspected they failed on landing and were found on walk-around. If true, this would have been an interesting twist. How so? Well, the runway had just been paved - allowing use of reverse. Up until then, being gravel, no reverse would have been allowed. No reverse - no



Nordair 737's, CF-NAB, route was to have been Montreal to Frobisher Bay (Iqaluit) and back to Montreal with a stop at Fort Chimo (Kuujjuaq). Things didn't go quite as planned. (Base map from the Canadian government)

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The main terminal building at Fort Chimo at the time. (Photo by Bob Bogash)

failed deflector doors. In other words, paving the damn runway allowed this whole story to transpire!

The airplane was taxied back to the small terminal. Here, the logistics and infrastructure in "The North" - something we dealt with every day - came into play. For one thing, the "terminal" was actually a very small building with a counter, an office, and a so-called "waiting room" smaller than my living room. It was actually luxurious compared to many, or even most, Arctic locations, which had almost nothing. It had been built by the U.S. Army Air Forces during WWII and was virtually unchanged. It had a small bunking area in the back (where I spent many a night), with GI cots complete with olive drab woolen army blankets from the War. Jimmy Grist was the Station Manager.

The lack of facilities made it impossible to remove the 45 passengers to the terminal since there was no place for them to sit. So, it was decided to leave them on the airplane, with heat and light provided by the APU (Auxiliary Power Unit - a small gas turbine engine in the tail.) Of course, there was no food service, and also no lavatory or potable water servicing, but they could go into the building for that.

Now, the next problem reared its ugly head. Communications. You see, at that time, there were no landline communications available to most of the Arctic. The only

communication was via HF (High Frequency) radio. There was a radio station in the terminal and the airplane also had HF. So, Jimmy Grist tried to raise Nordair Dispatch in Montreal on one of several frequencies used by ND in the North. It was at this point that I became involved. The Dispatchers came down to my office and requested I come to Dispatch immediately as NAB had some sort of problem in Chimo. I've been a life-long ham radio operator, operate on HF virtually every day, and can say that comms are very dependent on time-of-day, season, and solar activity. Sometimes copy is good (armchair copy, it's called) just like your local AM/FM radio station, and sometimes it's completely unusable, with everything in-between. On this day, reception was "poor." So we all huddled over the radio trying to understand what was happening, what was wrong with the airplane, through the interference and static crashes. Eventually, we came to understand there was something wrong with the Number 1 reverser and the deflector doors. So we began planning for a rescue mission. All of this despite having a very incomplete understanding of the condition of the airplane - we were depending on the pilot's description, and he knew little about the technicals. Should we fix it and return to service? Or, fix it for a ferry flight? Not really knowing what was needed to fix the airplane, and knowing that replacing the reverser itself would be near impossible in the Arctic (weather



Another view of the ramp at Fort Chimo at the time. (Photo by Bob Bogash)

was about -20 degrees F, high winds and snow), the plan was to use the second 737 airplane - NAH - to go up and fix NAB, at least good enough for a ferry flight home. That would mean the second airplane would have to carry the repair crew north and pick up the passengers for their return flight down south.

Meanwhile, I coordinated with Boeing Seattle and received approval to ferry the airplane with the thrust reverser deflector doors removed. We had a 280 kt/ M 0.70 speed restriction.

Bob Wright was the Director of Maintenance at Nordair. It was decided that he and I would go up to fix the airplane for the ferry flight. I've thought of this endlessly in the years since – but why would we go? Except to watch, advise, or direct the mechanics. Why weren't we even bringing several mechanics? They certainly had quite a few. And, in case you didn't know, Boeing Reps were strictly prohibited from "working on airplanes." I had been reminded of this fact repeatedly by my boss Andy Jones, who continually got reports about me working on the airplanes. It's a wonder I never got fired over this, I had certainly been threatened! But when you're in the field, following the No Work edict (and a bunch of other "thou shall not's") is a lot easier said than done. Plus, I was a very hands-on guy.

Over-laying all this mess were a number of other factors. One was the fact that the airplane had a load of passengers headed - not just to Montreal – but to the 1969 Grey Cup Game. The Grey Cup is Canada's Superbowl, and the battle was between Ottawa and Saskatchewan and was being played in Montreal on November 30 – for the first time in 31 years. Air tickets to and from the North were very pricey and these fans were definitely at risk of missing the big game.

The next problem – and a much bigger one from the airline's perspective – was that the airplane was expected to be on-dock at UAL in SFO on December 1. There was virtually no cushion and no reprieve. Scheduling all the 135 airplanes (less DLH) through the mod line was something that required a great deal of precision. It was not like showing up late to the dentist.

So, we began gathering tools and equipment and waiting for NAH to arrive off its sked flights to depart for Chimo.

And then, . . . and then, . . . the APU quit. NAB's APU, that is. We got a static-crashed HF message from Chimo saying NAB's APU had quit. The passengers had all been evacuated into the tiny terminal where they were jammed in cheek to jowl all over the floor; but at least they were out of the brutal snow, cold, and wind. Well, they were residents of the Arctic and knew what the weather was like.

The APU was one of the most unreliable pieces of equipment on the 737 – and one of the most vital. Nordair's Chairman, Jim Tooley, said it stood for "All Phucked Up," spelled with a "Ph" instead of an "F". I have many gruesome stories and many rescue missions in my APU file. In fact, this was my second APU rescue mission in two weeks! Nordair used the unreliability to squeeze a sizable dollar concession out of Boeing during subsequent airplane purchases. The APU was designed to make the airplane self-sufficient, but this wasn't Yakima, Wash., or Roanoke, Virginia. In remote areas, the APU was more than a convenience, it was critical – absolutely critical. And it was totally unreliable.

I've thought of these events frequently over the years – especially when reading about irate passengers and lawsuits and congress passing laws about events that kept airplanes sitting on the tarmac at various airports for a few hours, due to weather or mechanical delays. Here we had a substantial number of passengers – stranded in the dark, cold Arctic, crammed into a tiny shack with no food, having spent a lot of money to attend a big football game, and nary a peep. People in the North understood – the airplane was broke. They could see that with their own eyes. They knew what the weather conditions were and the primitive facilities that were available. And they accepted it. They were not "soft." No tweets and no text messages. No calls to the media or their lawyers.

I know, I live in the past - but I prefer it to the present.

The Dunlop

So, now all the plans were wrecked. We had an engine thrust reverser to repair, and now we also had an APU that was Inoperative. Meaning - there was no way to start the engines! Nordair had expended quite a bit of money to plan for this situation. They had purchased a "Dunlop." The Dunlop was a ground starting rig made in the UK for jet airplanes that used a low pressure (40 psi) pneumatic starting system – like the 737. The Dunlop consisted of two substantial units, each on a sizable trailer. One unit consisted of racks of high pressure (3000 psi) cylinders - about 12 -15, in about 3 racks. They were manifolded together, and passed through one or more regulators that dropped the pressure to 40 psi, that were then connected to about a 4 inch low pressure hose that could be connected to the airplane's low pressure external air port. They were a lot smaller, lighter, and more portable than a big gas turbine air start cart, and way less expensive!

The second trailer consisted of an air compressor that was used to recharge the cylinders on the first trailer. The recharging was a slow process and took 24-36 hours.

Now the Plan was changed again. The 737 NAH would ferry to Fort Chino to pick up the stranded passengers, and return to Montreal. DC-4 CF-IQM would follow with Bob Wright, me, tools and equipment to fix the thrust reverser, and the Dunlop air cylinder cart to start NAB's engines. DC-4 IQM (still in service with Buffalo Airways), would dump me and Bob Wright and the equipment in Chimo and would stand by to support the operation. Me and Bob Wright would fix NAB and then return to Montreal with the DC-4 while NAB was ferried back with just the flight crew – Art Hale and Bob Jones. This was Plan "B".

As we started putting that Plan into motion, Nordair decided using the DC-4 would delay the operation even further – I love that DC-4, but it's not very fast! – and they were bumping up against the arrival in San Francisco deadline. So when NAH arrived off sked, she was converted into a 3 pallet/57 passengers combi configuration. We were on Plan "C" already, and we hadn't even left yet. They loaded the Dunlop and gear on 737 NAH and we departed for Chimo.

When we arrived the weather was very poor – cold, wind, snow - and dark (of course.) The passengers were glad to see NAH arrive. We unloaded the Dunlop and gear, loaded the

passengers, and NAH departed back for Montreal with a much happier group. We were not so happy. As we watched it depart, we realized we were just the two of us alone, no DC-4, on the cold, wind-swept, snowy ramp with no backup, a badly busted airplane, and a deadline to be in San Francisco not many hours away. Jesus!

ALONE

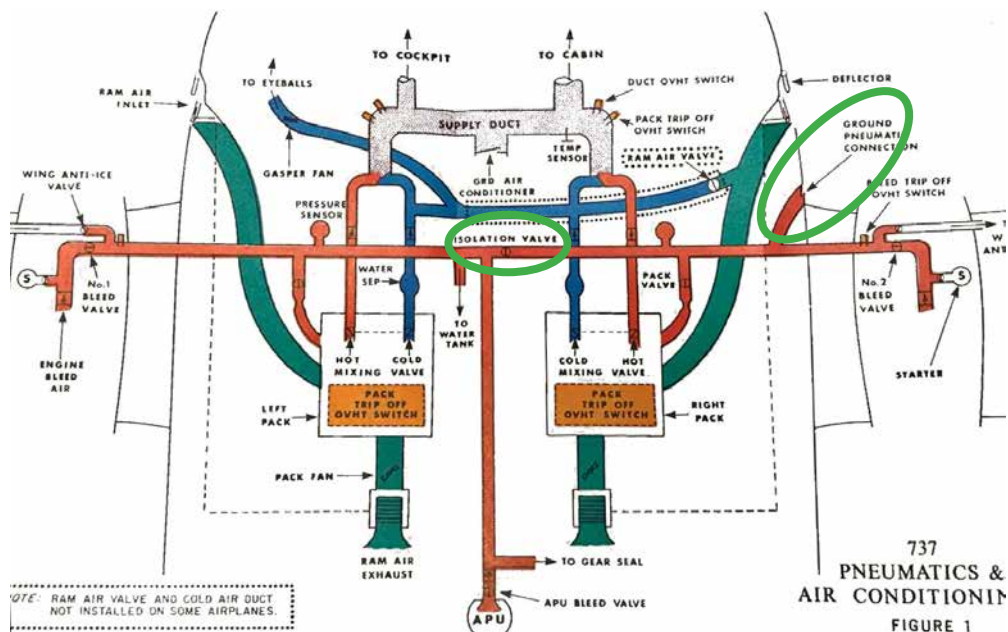
Using just flashlights, we examined the broken, now thoroughly cold-soaked, airplane. It was snowing heavily and the wind was blowing the snow sideways. There were no engine inlet covers installed, and there was snow accumulated in the engine inlets. A lot of variables to worry about. We found four of the deflector door links broken, and removed them. That could have been the end, but I worried a great deal about the clam shell doors inside the tailpipe. I worried about their integrity and position. Specifically, I was worried about the possibility of their moving rearward out of the forward thrust position. If that should happen on take-off, or in flight, we would lose the airplane.

I found a supply of beefy heavy gage lockwire, and located a place on the clamshell doors or their linkages, where I could tie in. My primitive plan was to tie the clamshell doors in the forward thrust position, as securely as possible, tying them to the cascade vanes using multiple wraps of lockwire. Totally buckshee, I knew, but whatever worked..... that is, IF it worked. Somehow, I did that, working with feeble flashlights, lying on my back, in my Arctic work parka and boots, from below the nacelle, using my bare hands to manipulate the lockwire, in the brutal snow, cold, wind and darkness. The wind chill was probably -40 or -50 F. The feel of steel lockwire on your bare hands at 40 below is something I will never forget. I was 25 and you can do a lot of things when you are young. I wondered occasionally what my boss Andy Jones would think, but figured Nordair would hire me if I got fired. "Honest, Andy, I'm not working...." Or maybe I'd get killed if this Rube Goldberg lockwire job failed and the plane crashed. I was single then and death didn't mean anything.

Eventually, I figured I was done. It had taken many, many brutal hours. Bob Wright, who was a mechanic in his younger days, mostly watched and held the weak flashlights. I was the Boeing Rep, and he thought I knew what I was doing.... Now, for the next part of the adventure. The Fun part.

Engine Start

We man-handled the Dunlop air bottle cart into position on the gravel and snow covered ramp. It was heavy and the ramp was very rough, and slippery. The Station Manager Jimmy Grist, had long disappeared. And the pilots were sacked out in the back rooms – on those U.S. Army cots with the olive drab



Schematic of the 737 pneumatics and air conditioning system from the 737 Flight Training Manual. Green ellipses highlight the isolation valve and connection for the ground pneumatic connection. (Via the author)

blankets. Just the two of us were working the airplane. How come we didn't have any mechs? That question has irked me for 50 years. There was an aerostand up to the left rear door that the passengers had used; we moved it to the L1 front entrance door. The Dunlop was on the left side with the hose hooked up to the airplane (under the bottom right, near the centerline). Hooking it up was difficult – the fittings were frozen, of course.

I went on board the airplane, closed all the doors except for L1. The airplane was totally cold soaked and pitch black inside. We had no intercom, so we would communicate by yelling above the wind and use hand signals through the pilots sliding window. Once the engine started, communication would become near impossible.

If you haven't any experience working in the extreme cold, I can tell you that it is no fun – both on a human scale, and on a mechanical scale. Nothing wants to work. Even the simplest of things. The Dunlop's flexible air start hose was not flexible, it was like a frozen accordion board. I was especially worried about all those air pressure regulators that dropped the pressure from 3,000 down to 40 psi. Air pressure regulators are among the most vulnerable pieces of equipment in the cold. Even in Montreal, we had continual problems servicing the landing gear struts. The whole Dunlop might not work. It was possible. More than possible. And, even if it did work, but we couldn't start an engine, we did not have the second cart – the compressor cart. We left that behind in Montreal 900 miles away. And it required a day or two to recharge the bottles in cart #1 anyway. We'd be there for days. I hated that APU and I hated AiResearch (the manufacturer.) Their APU was a piece of garbage. All of it.

Next problem was the engines, no covers and snow blowing through them for about a day or more. I cleared the snow from the inlets and turned the fan by hand. That told me N1 was free and clear. But I worried that the snow had migrated back into

the N2 section of the engine while still warm and had melted, then drained to the bottom of the compressor case and froze, locking the N2 compressor. We had no heaters, and if locked, it was game over. I also worried if the ship's battery had enough umph left due to the bitter cold. Would the cross-feed, isolation, and start valves open and close. There were a million things that could go wrong.

My plan was to isolate the right side pneumatically; the ground connection was on the right side and by closing the isolation valve, I could avoid using up precious air from the Dunlop pressurizing the ducting to the left engine and APU. Then I would do a battery start of Number 2 engine; if she started, I'd open the main cargo door and load the Dunlop and gear on the main deck and tie them down. Then close the main cargo door, get the pilots and perform a cross-bleed start of Number 1. Then leave. Once we started Number 2, I knew the noise would be deafening and ground movement dangerous and communication difficult.

I climbed into the pilot seat, and went over my planned sequence for a battery start. I needed to have it all straight in my head. Once I started, there would be zero time for thinking. I wanted to drain the battery as little as possible. Opening the sliding window, a blast of frigid air and snow blasted into the icy, black cockpit. It was surreal. I yelled at Bob to get ready and to open the Dunlop valve on my command. I sat back, looked up at the overhead panel with my flashlight, and flipped the battery switch to ON. The battery and standby buses came alive. I checked the battery voltage, which looked good. AC Power through the standby power inverter looked good – good voltage and frequency. I closed the pneumatic crossover valve, and isolated the APU so as to just send air to Number 2 engine. Double checked that the A/C packs were OFF.

It was Show Time.

I motioned for Bob to open the Dunlop air valve. I watched the air pressure gage and it came up to 40 psi - we were in business. Now for the litmus test – we'd soon find out if the start valve would operate and if the N2 rotor was locked. I raised the guard and moved Number 2's start switch to START. I could hear the rush of air, the pressure dropped and I knew the start valve had opened. Next, I moved my attention to the N2. The little needle kicked over and the big needle started moving. N2 was not locked and was starting to crank up.

In a normal start, after signs of N1 rotation, you advance the start lever at 15 -20% N2. Although 15% is the minimum, I prefer going to at least 17% or even 20% if I have a lot of air, to ensure a cool start. But those JT8Ds are built like tanks, and we're gonna test just how tough they are. Advancing the start lever supplies fuel and ignition; the engine lights off and accelerates, and the starter kicks out at around 37% N2. You watch for fuel flow, and then ignition is indicated by a rising EGT. As the start progresses, you watch to ensure you're not getting a "hot start" by carefully watching EGT, and watching N2 to ensure the starter kicks out on time. You also note the low oil pressure light goes out and the oil pressure gage shows good oil pressure. After the engine starts satisfactorily and stabilizes, you can advance the start lever from start to idle (later airplanes only had a two position start lever.)

Two Additional Examples - "Just One More Flight!"

On May 9, 1970, Nordair was returning a United 737 lease airplane, CF-NAI, to San Francisco. The airplane made a refueling stop in Salt Lake City, where the APU failed on arrival. Its failure necessitated a refueling with one engine running. If it had not failed, the airplane would have successfully, and uneventfully, made its last flight from SLC to SFO. All that was needed was for One More Start.

I spent six years maintaining NASA 515, the 737 Prototype, in Moses Lake, Washington. On Sept 21, 2003, it made its last flight from Moses Lake to Boeing Field in Seattle to be placed on exhibit at the Museum of Flight. The APU, which had operated satisfactorily for six years while the airplane was being maintained in Moses Lake, quit shortly before engine start for departure. All that was necessary was for it to operate for just another 20-30 minutes and its service life would have been over. Unlike Fort Chimo, we had ground support equipment that allowed engine start so we could make the flight. Visit that airplane at the Museum of Flight in Seattle today, look up, and know that the APU is INOP. It's in its normal, preferred state – crapped out. That was 34 years after the APU failure in Chimo. Some things never change.

I was aboard for both of those flights. Each only needed One More Start. But such was not to be.

So, here we were – pucker time – N2 was advancing, N1 began turning, and I was waiting for at least 15% N2. Below that, and I risked cooking the engine in a hot start. The wind was blowing hard, with snow, and right down the engine too, and it was cold, which was all on my side. Still.... the Sky Gods play hardball. The engine speed advanced to 10% then 11% N2, and then instead of accelerating to my target 15%, it stalled at 11%, then sagged to 10%. The Dunlop had shot its wad and was running out of air. If I didn't start this engine right here and now, the dominos would fall for days – all the way to San Francisco. N2 sagged to 9%. Command Decision Time! I advanced the start lever to start. I noted the start of fuel flow and then ignition. The EGT began to climb. I watched it like a hawk. The engine had started, but would it hot start? N2 began advancing smartly, and at 37% the starter kicked out. The engine started normally and the EGT never came close to the hot start range. Chalk one up for Pratt – a nice cool start with fuel on at only 9% N2. Probably a record.

Whew! I had one turning and burning. I closed the captain's sliding window and turned on the Number 2 generator switch and the cockpit came alive as the normal electrics came on

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Art Hale and his wife came to visit us after we moved to Hawaii. The frozen ramp at Fort Chimo seemed long ago and far away. (From the author)

board. I opened the air crossover valve and turned on the Right A/C pack, turning up the heat control to Max. Maybe I turned on both packs. I don't remember. I wanted hot air! The air conditioning began to warm up the airplane. Well, if we could cross-bleed start Number 1, we'd be in business.

I left the cockpit and opened the main cargo door. Bob Wright removed and stowed the air start hose and Jimmy Grist brought around a forklift so we could load the Dunlop on to the main deck cargo floor. Bob and Jimmy started tying down the equipment; I closed the main cargo door, and went into the terminal to get the pilots.

Soon Art and Bob were seated in the cockpit, and I went through a quick refresher on performing a cross-bleed start. Bob Wright started to climb into the second observer seat behind the pilot while I went to close the L1 door, when Art said,

"Good job, boys. See you in Montreal!"

What! What did he say? Whoa!

"Hey Art, we're all going home together."

"Sorry, Lads, this is a ferry flight - essential air crew only."

Is he kidding me? After all we've just done. We'd be stuck there in Chimo - with those 25 year old rickety cots and those scratchy olive drab army blankets - for days and days for sure, maybe for a week or more, till the next plane came through. Plus I was going with the airplane to California and planned to visit my family for a week while the plane went through the thrust reverser mod line. I reached over and placed my fingers around the Number 2 Start Lever knob, ready to drop it to Cutoff.

"Art, we all go, or we all stay!"

Art looked at me - first in shock - then trying to make up his mind.

"OK, OK", he finally said.

I closed the L1 door, engaged the slide girt bar in the slide floor hooks, and dropped the center observer seat back down, taking my seat in the cockpit. We performed a satisfactory cross-bleed start of Number 1 and taxied out. I remember the takeoff vividly. It was snowing and blowing hard, but the wind was right down Runway 26 - 6,000 ft at the time. I crossed my fingers (and toes) and hoped my lockwire would hold the Number 1 clamshell doors in the forward thrust position. The landing lights were all on and the snow screaming at the nose of the airplane was almost psychedelic. We rotated and lifted off. He left the landing lights on for a full minute or two and I enjoyed the streaming flakes rocketing by the nose. It's quite the sight. Then he flipped them off and we continued our climb into the pitch black night.

The next day, Nordair changed the Number 1 reverser. The one with my clamshell door lockwire. It survived the flight intact. People asked what the heck that was, but I just shrugged. The new reverser was about to become the "old" reverser, since it would only make two flights. The next day, I sat in my familiar fold down observer jump seat as we flew to SFO, with a stop in Omaha. Good bye, 727 reverser. And don't come back! Not ever!

So - maybe you remember at the beginning of this story, and maybe you don't, but I was talking about the Sky Gods, and how they liked to intervene and have a little fun at our expense, when all we wanted was just "one more flight." So, like my airplane battery and voltage regulator, all NAB needed was another flight or two, and everything would be fine. But, such was not to be. ➔

About the Author

Bob Bogash has been a life-long aviation fan, avid historian, writer and photographer; 31 year Boeing veteran, 60 year licensed pilot, and builder and owner of a Vans homebuilt airplane. He worked in all areas of Boeing, starting as an engineer and ending as Director of Quality Assurance for Commercial Airplanes. He spent more than a decade as Boeing Field Rep worldwide, which facilitated his taking tens of thousands of pictures and providing innumerable stories, like this one. He has an extensive and popular website (www.rbogash.com).