

## THE MOD

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The urge to improve or modify the existing machine must be as old as mankind and is especially rampant among pilots who tend to be at the cutting edge of adventure and technology in our society. Indeed, the wonderful people with whom you associate is a major reason to be a pilot, and I have not been disappointed in that regard. Early attempts to make my Father's 1958 Thunderbird more potent for drag racing included the addition of a Mallory dual point distributor, but it didn't make much difference despite many speed trials trying to prove otherwise. My first airplane, an elderly Comanche 180, was soon upgraded with MetCoAire wingtips and I could talk myself into believing that the landings were smoother although cruise was still too slow. I considered gap seals and a new cowling for my subsequent Saratoga SP, but it was only when I purchased my Cheyenne that the seeds were planted which would one day yield the subject of this missive.

I acquired my 1980 Cheyenne I in 1992 without my ever having been in a Cheyenne, but the numbers looked great and it was sexy. I had considered Navajos, Mitsubishis, Mojaves, Aerostars, Golden Eagles, Conquests, and even the engine troubled P-Navajo with the criterion being speed, pressurization, reliability, and single engine performance. I settled on the Cheyenne I as having no maintenance prone SAS and most Cheyenne I's were fitted with King Silver Crown avionics which I had in my Saratoga and UPS had confirmed as ultimately reliable by outfitting their Caravans with this package. In addition someone referred to the Cheyenne as the Corvette of turboprops and that settled the issue in my mind. Hurriedly I took eight hours in an Aztec for a multiengine rating and finally found my airplane with damage history – a gear up landing by a salesman in 1986 and a hydraulic line rupture collapsing the left gear immediately prior to the reduced price sale. As all had been repaired, the props overhauled, and the engines gone over by Pratt and Whitney, I had no problem with this wart and time has proven my original thinking correct. My wonderful instructor and subsequent lifelong friend started with the basics and I never flew without an instructor for the first six months, finally becoming fledged with a safety pilot initially and then alone. At first I flew it like the Saratoga to be safe, but now it fits like a glove, honed by yearly trips to Flight Safety and an every six month lesson just to be safe.

I had figured my engines would be good for ten years of use prior to the dreaded expensive turbine overhaul, and I got it just about right. An annuity purchased for that occasion turned into an exercise in futility thanks to the current stock market, but that is a lesson for another time. As N49AC approached the engine TBO, I began to examine the alternatives which included the MORE program, engines overhauled, a different airplane, or the tantalizing new upgrade to a "Super or Legacy Cheyenne" just being mentioned in the magazines. My review of the current data showed that the Cheyenne remained one of the best buys on the market, especially when compared to the price of the new single engine turbines, and we just blow them away with performance, twin engines, reliability, and payload. The MORE program is an expensive hassle which seems to make an engine which will be unsalable to many and too expensive to overhaul, and seems to have fallen by the wayside. To overhaul my existing engines would mean a lot of money passing out the door to get only what I had now, so I was looking elsewhere. The upgrades both use the PT6A-135a engine which improves on the PT6A-135 engine (both are rated at 750 shp) found on the seldom seen Cheyenne II XL, but with a better compressor, better efficiency, and better high altitude performance. I note that the Cheyenne II XL with its PT6A-135 engines has the same wing and nacelles as the Cheyenne I and Cheyenne II, but flat rating the PT6A-135a improved engine (derated to the 500 shp or 620 shp depending on the Cheyenne model) allows it to produce full rating up to 22,000 feet (my -11s peaked at 13,000 feet) while still remaining at heart a good old bulletproof PT6A. It seemed like this was the way to go.

There were two outfits doing the modifications when I investigated, T-G Aviation in Canada and the Aircraft Restoration Company (ARC) in Provo, Utah, differing in the conversion props with T-G using a three blade prop and ARC using a newly designed Hartzell four blade prop which has a TBO of 4000 hours or 72 months. I received literature from both groups and decided to go with the group at ARC, but I was hesitant to commit in such a crummy stock market.

For six months I tormented the gentlemen in Provo with questions about experience, performance, reliability, how long it would take, and things of that ilk. The cork was bobbing but I had not taken the bait, still circling and trying to make up my mind. I talked with a wonderful gentleman in Nebraska who had modified his Cheyenne I using T-G and he was ecstatic about the performance and new found high altitude capability. I talked with an engineer at Hartzell who discussed the four blade prop with me and the fact it is used on certain King Airs- he emphasized its reliability, efficiency, and safety. Emails came and went and each week as it seemed I always came up with a new series of questions, patiently answered by my long distance friends in Utah. Finally ARC did a wonderful thing – they set a deadline of two weeks on the price which was precipitated by Pratt and Whitney announcing a significant price increase on the new engines. The cork went under as I took the bait and ran, not looking back, and the difficult decision was made in the middle of August and sealed with a check.

The longer lead time item was the Hartzell props and they were ordered forthwith with delivery in about six weeks, so it seemed that the best time for the aircraft to go out was late September. I arranged with them to accomplish my Events while changing the engines just to make everything work together, and that proved to be a reasonable decision. I wheedled a few days off from work and ordered my tickets on Delta for the round trip, achieving a reasonable price of \$900 from Panama City round trip. The day of departure loomed cloudy and overcast thanks to Hurricane Isidore coming up from the Gulf, but after taxiing out at 7:30 AM I climbed to FL200 with some bumpiness in IMC until the Mississippi River when I burst into the clear. All the big boys up high were complaining about the turbulence, so I had selected an ideal compromise, achieving a TAS of 240 knots with the Ram Air Intakes and Speed Stacks by American Aviation. The green soon faded to the browns of the Texas panhandle and Amarillo appeared after four flying hours as a verdant patch where a LearJet was doing touch and goes at the airport. The only FBO was excellent with fast turnaround while a breakfast at the adjacent restaurant lived up to its recommendation by my friend there the week before. Departure saw N49AC vectored over an MOA by struggling up to FL260 where I could just barely go 200 knots, but then I returned to FL220 for the rest of the trip over the tortured terrain of the continental divide and the Rockies.

Provo is in a beautiful valley of the Wasatch Mountains on the side of Lake Utah, a freshwater lake just south of the Great Salt Lake, with the uncontrolled Provo airport on the Lake.

As I landed at 1:30 PM I noted the plethora of Katanas indicating an active training program and indeed Provo is the home of Brigham Young University. I taxied up and down the flight line looking for ARC to no avail, and finally stopped at the main FBO where I felt a chill when the linesman said he had never heard of them. Inside, however, the conference room was reserved for us and the wonderful Tom Sutton soon arrived unaware of the curse that always makes me early for appointments. Tom was retired Air Force (C-130s) who pulled a couple of Corporations out of the ditch, but then retired to Provo to be with his family of eight sons and two daughters and to return to aviation- and what else is there in life? We went over to the ARC hangar where their modified Cheyenne II was located along with the P-51 replica building by Jan Fronk with a Chevrolet 502 engine and about two more years of work was needed. The hangar also sported a lot of equipment, a StarDuster, and was immaculate, confirming that I was in good hands. The other honcho of ARC was Dave Fronk who is a LearJet guru who was out of town on a repair mission, but his real love is for the Cheyenne and it shows. I was shown the hangar next door with the red modified real Mustang P-51 which had just won the Reno Air Races along with a couple of extra

immaculate real Mustang P-51s in back for backup, all lovingly attended by mechanics with white gloves in a class operation reflecting many Drachmas. I was impressed to be among giants.

We did the paperwork (I wrote the check) and that completed the important part of the day. We did some perfunctory taxi work in N49AC, but that was it and I left my aircraft with the new found friends. Tom took me through town and the University, and then we went the fifty miles north to Salt Lake City where I spent the night at a Holiday Inn, toured the city in a wretched rental car, and had a steak at Diamond Lil's.

The trip home started at 7:00 AM on Delta with me randomly selected for the extensive security check in front of everybody, and then we were herded onto the plane to Las Vegas where I had got the front seat (no tray). The layover in Vegas was blessedly short and then I got the back seat (no recline) on the wrong side of the plane (sun glare) for the trip to Atlanta, but then the fun began. We had five consecutive thirty minutes mechanical delays on ASA (we could see no one was working on our ATR-72) to Panama City while others continued to come in from Fort Walton before finally they said "bad weather due to Isidore" and the flight was canceled- if they had told us that when I arrived we could have driven almost all the way to Panama City by the time of the last announcement. The hastily gathered consortium of four of us rented the last car at Alamo (no pun intended) and we pulled into Panama City at 2:00 AM with a bad taste in our mouths about commercial flying and reinforcing why I was into General Aviation originally- I noted reasonable IFR weather the entire way.

Tom Sutton was wonderful about keeping me posted by Email and there was nothing for me to do but work, and I threw myself into that with determination as my hangar was empty. The aircraft was moved to Wasatch Aero Services at Heber City for the Events where they discovered that some of my maintenance had been less than optimal including a nosegear hydraulic leak due to a seal installed backwards; starter-generators far past their TBO; the heater (and I have a wonderful heater!) needed overhaul; previous workers had left tools and debris in dark corners; the radar cable was pinched; the Speed Stacks were mounted wrong; and paperwork was not in order. Each item was addressed in turn with overhaul of the start-generators accomplished with new splines as recommended by Pratt, but then replacement of the splines needed again when the new -135a engines arrived with different splines. The engines and props were installed as they arrived, but the rate limiting step turned out to be the silk screening of the instruments for the new settings. These took the longest time, but the finishing date was set and I had scheduled my pickup date coordinating with my office and the precious little time off available for early November. At the last minute, however, the torquemeter test machine at the instrument shop exploded and with it my hopes of going back to Utah- Tom called me on Saturday to cancel the Monday trip. The instrument shop then frantically sent the torquemeters on to Atlanta for overhaul where they delayed a day, fixed the gauges, and then shipped them into oblivion, with Airborne Express acknowledging they had no idea where they had gone.

I had to cancel my pickup and had my old instructor (to his delight) go to Utah after his last United Airlines gig the following week to pick up N49AC, now sporting the gauges from Fronks own aircraft pending arrival of mine from wherever they went. He coordinated the test ride, transfer of funds, and his flight to Panama City which was uneventful with the only remark when I called him from my seemingly omnipresent habitat in the Emergency Room was "It's a rockets ship!"

So what did I get in performance with all the money and time invested? The time to climb to FL290 is about 18 minutes which is much faster and higher than I could go before, but this was achievable only after further repairs were done in Atlanta to find my five pressurization leaks. Cruise speed is realistically 270 to 280 knots at altitude which is 40 knots faster than the Cheyenne I prior to modification, but it has much more alacrity at all altitudes and it just jumps off the runway. Climb on a single engine is 1000 fpm, another safety advantage and of course a strong suit of the Cheyenne. Fuel burn at the same torque

as book in the middle altitudes gives 15 knots faster cruise speed due to the more efficient -135a's and the more efficient props, and this translates into an additional 5% range at high altitudes in the mid to upper 20s. You have to get used to cruising right at the red line (just like a LearJet) anywhere above 21,000, and at 29,000 my airplane will cruise 280 knots with fuel flow of 470 pph. At 22,000 the numbers are 275 knots TAS (right at red line) with 545 pph, and of course you can throttle back and still beat the book numbers of the -11s in speed and fuel flow, but I just don't have the strength of character to do that. The rescreened instruments are also striking in their appearance and helped my panel, this being one of the most cost effective improvements that one can do. But most dramatic and unexpected is the lowering of the noise in the cockpit by 10 decibels, remembering that this a logarithmic scale, and I have been told this is due to the tips of the props not being supersonic. You can actually have a conversation between pilots in a quiet voice and the reduction in fatigue on long trips is wonderful, not to mention the accolades from the reluctant flying wife who has patiently stood beside me throughout this process writing checks and making dark noises about no more Christmas or birthday presents until 2010.

The airplane arrived with fresh detailing and it looked like it just had been painted, only adding to its ambience and my delight with ARC. The only squawk was an inoperative electroluminescent panels, but ARC promised to repair these when they came to Panama City to exchange the engine instruments and check out any squawks. With the new fat propellers which incidentally are only three inches less in diameter than my old props, the single windmilling four bladed prop creates more drag when feathered which has raised my Vmc to 100 knots, but ARC is working with the FAA to certify vortex generators which will lower the Vmc back to 85 knots, more power on for the approach and the airplane has to be "flown" into the runway to some extent, but that is minor and easily worked with. The prop RPM range is now 1700 to 1900 and frankly no matter which setting you choose it works just a well with no discernable difference in climb or cruise. There is also an incredible reserve available should you lose an engine at Eagle Pass on takeoff at gross weight, and that is just a safety feature for emergency use only.

Three months after completion Dave Fronk arrived in Panama City, but not for the Spring Break ritual which was ongoing at the time. Rather he came for the final adjustments to throttle linkages, installation of the remarked errant torquemeters, revisions to the beta pitch stop, and inspection of the engine installations for leaks or chafing. Dave was incredibly focused as he worked quickly and meticulously in my hangar, demonstrating why this is the man you want to work on your airplane. The installation of the vortex generators still awaits the blessing of the FAA. Dave and I had a great checkride and an even better grilled Scamp dinner at Captain Anderson's Restaurant, demonstrating once again why they rate the Golden Spoon award. I even got a refund from Pratt for hours remaining on the engines and the proceeds of selling my old props.

In summary, my saga has taken much longer than planned, but some glitches just could not be anticipated and mine was the first Cheyenne I that ARC had modified. They have certainly lived up to their end of the bargain and they are a delight to work with in a project like this, but then we all had approached this as gentlemen and I was rewarded with a fabulous aircraft which is uniquely capable and just wonderful to fly. If I win the Lotto tomorrow I would not change a thing and I highly recommend the modification of your Cheyenne. I also note that with the subsequent stock market performance my money was much better spent in Utah than down the abyss of Wall Street.

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