

The Shakedown Cruise

by Stan Smith



Photo courtesy of Patrick Coyne

CJ1 Owner-Pilot Gains Invaluable Experience and Coaching During Four-Day IOE

As we have discussed in the January issue of *Twin & Turbine*, an Initial Operating Experience (IOE) is a critical element for any pilot to successfully transitioning into a jet aircraft. But how do you efficiently complete the IOE experience?

You want to receive quality “real world” training and you want to accomplish that training in a productive and efficient manner. At Guardian Jet part of the solution is the Shakedown Cruise™.

A typical IOE is accomplished in approximately 50 hours of flight time. An airline pilot will accomplish his/her entire IOE with a

company check airman while flying with passengers on revenue flights. The GA pilot can also complete the majority of their IOE while carrying passengers, but a portion of the IOE should be dedicated flight time one-on-one with your mentor pilot. The Shakedown Cruise provides that dedicated flight time.

Why a Shakedown Cruise versus “normal” flights? There are several good reasons.

First, unlike the airline pilot who is largely isolated from the passengers, you are not. The airline pilot doesn't have to schedule, load, unload, feed, water, answer

questions, and for the most part concern himself with the passengers. Isolated by the cockpit door and with professional representation in the form of trained gate agents and flight attendants, airline pilots are left to safely fly the airplane.

You, however, do not have that luxury. Not only must you interact with the passengers and direct every phase of the process, you know your passengers personally, which means even more interaction especially during flight. Your passengers have direct access to the cockpit at any time and they are effectively “looking over your shoulder” while you fly.

Second, while the point of an IOE is to experience “real-world” flying, a good IOE program should still be syllabus-driven. The syllabus provides a checklist of events that you should be exposed to over the course of the IOE. The Shakedown Cruise allows the mentor pilot the ability to expose you to many more elements of turbine and high altitude flight at the beginning of the IOE. Then during the remainder of the IOE you will be re-visiting those experiences and reinforcing your learning.

Finally, the Shakedown Cruise permits the mentor pilot the flexibility to expose the pilot to many aspects of jet flight that might otherwise take years to experience. It is an opportunity to improve a pilot’s decision-making process by seeing different scenarios and discussing those scenarios with the mentor pilot.

So what is a Shakedown Cruise like? Well let’s go on one.

I recently completed an IOE with a new Cessna Citation CJ1 owner Dr. Richard Scott. Like every owner-pilot, he brought a long list of attributes to the table; very intelligent, analytical, disciplined and dedicated to being a safe and proficient pilot. He also had a fairly unique history in that he had been a trained Flight Surgeon in U.S. Air Force. Thus he was well versed in the real and potential physiological effects of high-altitude flight and of course had experienced “flight” in an altitude chamber.

He even had the opportunity to fly some backseat rides in fighter aircraft. He previously owned an acrobatic airplane so he knows how to keep the blue side up. He brought a lot of attributes to the table. What he didn’t have was any substantial turbine time.

Our Shakedown Cruise began on the east coast in Morristown, N.J., and would take us around the



Photo courtesy of Patrick Coyne

Dr. Richard Scott flying his new Citation CJ1.

United States, lasting four days and 21.4 flight hours. We would visit 13 destinations and cover 5,765 nautical miles.

Day 1

We met at Signature Aviation in Morristown (KMMU), on a cold January morning with temperatures well below freezing and a steady wind from the northwest. Today would be a day to demonstrate techniques and establish good checklist discipline and habit patterns. After careful review of the weather we decided to limit today’s flying to the northeast and return to Morristown for the night.

A day in the Northeast was advantageous for several reasons. It would keep us in an area of good weather; we could fly in airspace and to destinations frequented by the client and it allowed us one less night away from home. We filed our IFR flight plan with ATC,

received a weather brief, reviewed NOTAMS, fuel requirements, and completed our RAP™ (Risk Assessment Program) sheet.

Risk assessment is an important part of any flight, but especially for the single pilot-owner operator. The Guardian Jet RAP sheet provides an analytical process to

evaluate total risk. By assigning a point value to various elements of

risk the pilot is able to calculate a total value. The higher the total points, the higher the total risk. This is a great tool, permitting the pilot to systematically recognize potential risks and possibly eliminate some elements of risk.

This day we face several factors that increased risk over the norm. To start with, we were training. Second, the pilot in the left seat had less than 100 hours in the airplane and less than 2,500 total flight time. Would these risks stop us from flying? No, but they certainly influenced our decision to mitigate the risk by flying in an area of good VMC weather. This is a safeguard that RAP provides and the flexibility that the shakedown cruise allows.

After a thorough pre-flight (fortunately in the hangar because it was freezing out there) we jumped in the CJ1 and began the flight. Because we were not carrying passengers there was no outside pressure to rush. During any IOE, I emphasize proper checklist usage and pacing, and now was also the time to really learn that FMS.

Our first flight took us from Morristown, to Hanscom Field (KBED), Mass., just outside Boston, VFR for air work west of Manchester, N.H., and on to Pease International Tradeport (KPSM) near Portsmouth, N.H.

Bedford was a good location because it is a frequent stop for Dr. Scott and he is familiar with the airport. However, multiple approaches in a jet are not encouraged due to noise concerns. We flew a VOR Procedure Turn (coupled to the autopilot and FMS) circle to a low approach and then departed west VFR under Boston's Class B airspace.

We contacted Manchester approach and advised them of our intentions to do air work west of Manchester and requested traffic advisories. We practiced steep turns and accomplished a stall series to see how the airplane differs from the simulator. While the simulator provides great training, it is more of a "one-size-fits-all" approach to stalls. We saw how forgiving the straight wing CJ is during approach to stalls and emphasized situational awareness when recovering from the "stick shaker."

We shut down one engine and then accomplished an airstart using the appropriate checklists. Manchester Approach Control was very helpful with traffic advisories and we had an opportunity to see the TCAS I in action.

We then received vectors to Pease for serious transition work. Pease is nice because it is usually uncongested and has a very long and wide runway. We practiced multiple visual patterns and two short field landings. For the second short field landing, we added 15 knots to approach speed to demonstrate the dramatic increase of runway required if you're above Vref or landing with a tailwind.

We accomplished a no-flap approach and landings and a simulated single engine approach to landing. I demonstrated a noise abatement takeoff and then Dr. Scott practiced the same.

The next leg was from Pease to Burlington, Vt. (BTV). We departed with radar vectors on-course to BTV. The field was reporting VMC but we encountered IFR conditions

and light icing en route. This gave us the opportunity to utilize the de-ice systems and pay close attention to the Enhanced Ground Proximity Warning System (EGPWS), which was alerting us to the high terrain east of the field. Once we cleared the Green Mountains the weather cleared and beautiful Lake Champlain opened up before us. We requested a visual, stayed in the overhead pattern practicing balked landings and go-around procedures.

Following a full stop at Burlington we taxied back, copied a new IFR clearance and departed for Morristown. On the return flight we looked at a subtle issue that can easily become a major dilemma if not quickly recognized during single-pilot operations. This CJ1 is equipped with the three-tube Collins Pro-Line EFIS, a Universal FMS and dual Garmin 530s.

The autopilot defaults to the pilot's (left) side at power up, but can be selected to follow the copilot's flight director. Whether selected inadvertently or intentionally (and forgotten) this condition can be confusing and difficult to recognize. The indication of which side the autopilot follows is a small green arrow displayed at the top of each primary flight display, which points in the direction of the flight director with control. It's not hard to imagine the confusion when the airplane starts flying in an unintentional direction because it is not following the intended flight director. The day ended with an ILS at Morristown with gusting crosswinds.

Day 2

Day two begins our journey west with our goal being to see the Pacific. After reviewing the Jet Stream winds on the 200MB chart and surface temperatures (the whole country seemed to be an ice box) we decided to arc south. The first stop would be Birmingham, Ala. (KBHM). This leg would be 731 nm with a duration of 1.9 hours.

On departure things happened fast. Our CJ1 wanted to blast through 200 knots as we leveled at 2,000 feet. As we learned, the key is to be prepared for the speed, know the departure and learn the proper pace of events. You can get behind the airplane very quickly flying even an Instrument Departure Procedure (DP).

Time at altitude is an opportunity to talk and learn. We looked at different functions of the Universal and Garmin 530. The weather at BHM was good and we were cleared a visual approach to follow a Boeing 737. This prompted a later conversation about traffic pattern spacing and wake turbulence avoidance.

Leg 2 was off to Amarillo, Texas (KAMA), another destination with a big runway and lots of airspace. We accomplished a noise abatement departure out of BHM and discussed using the weather radar while at cruise. I requested an en route descent to a holding fix south of Amarillo. During the descent we set up the FMS for holding followed by a GPS approach that included an arc and circle-to-the-landing runway.

Strong winds are not uncommon at Amarillo and this day was no exception resulting in a significant overshoot on the turn to final. Live and learn.

Leg 3 was Amarillo to Santa Fe, N.M. (KSAF). Because of the short duration of this leg (one hour) we had to consider maximum landing weight when computing our weight and balance. Amarillo provided our first opportunity to depart with a significant crosswind. Into Santa Fe we flew a vanilla ILS to a full stop.

The decision to fly the next leg was actually a bit impulsive. Once on the ground at SAF we decided to take a quick hop up to Taos, N.M. (SKX). Why Taos? Neither one of us had ever been to Taos and we wanted to see the place.

The weather was good so we decided to go. This was a very short flight (18 minutes) and I flew the leg from the left seat. This gave the pilot an opportunity to manipulate the switches from the right seat and observe another pilot going through the paces. We flew the GPS approach to a visual final. With a field elevation of 5,798 feet and a 75-foot wide runway, we experienced two phenomena during landing. The first was a 9.8 knot increase in our ground speed on final due to our higher true airspeed at 5,800 feet pressure altitude. The second was the illusion of being higher in the flare due to landing on a (relatively speaking) narrow runway.

At Taos we fueled the airplane and flight-planned to Lindbergh Field (KSAN) in San Diego, Calif. During engine start we witnessed a significant increase in ITT (engine temp) during the start. This is to be expected when starting at high pressure altitudes and especially when starting with the ship's battery. Fairly uncommon in the jet world, we departed VFR and picked up our IFR clearance from Albuquerque Center at 16,500 before climbing into the flight levels. During the initial climb out while VFR, I briefed Dr. Scott and then pulled the right engine to idle. It is fairly dramatic to see first hand the loss of climb performance in a twin jet at heavy gross weight and high pressure altitude.

I picked San Diego as our final destination of the day for several reasons. First, it is a busy airport in Class B airspace. But, unlike most Class B airports where you are almost guaranteed vectors to an ILS final, San Diego presents some distinct challenges and provides an opportunity to learn some lessons.

You are always cleared to fly a long Standard Terminal Arrival (STAR) at KSAN which transitions to a localizer final rather than vectors to final. The STAR clearance



Photo courtesy of Patrick Coyne

usually includes mandatory step-down altitudes and airspeed restrictions.

You need to be very aware of the high terrain you overfly during the letdown and carefully monitor the controller's altitude instructions. The final approach portion is a localizer with several step-down altitudes and ATC inevitably asked you to maintain 170 knots until the final approach fix (FAF).

Additionally, the airport and runway are often very difficult to acquire visually due to haze, fog or smog. Finally, any pilot who has landed at Lindbergh (prevailing winds usually dictate landing to the west) will remember the parking garage that seems to stick right up into your flight path a quarter mile from touchdown (thus the reason for no ILS glidepath and a displaced threshold). All these factors can lead to "getting behind the airplane" at San Diego.

Day 3

Day 3 would take us from San Diego to Jackson Hole to Provo to Wichita. Departing San Diego can be as unique as arriving. The FBO ramp at Lindbergh is mere feet from the runway hold line, noise (turbines at idle) is a big issue, aircraft are sequenced for departure from both sides of the runway, there is a complicated SID to set up and review, and the tower (along with the four or more airliners in sequence) expects you to be ready when you're called to line up

and hold. All this adds up to planning ahead. It can be very tempting to deviate from the checklist or skip items completely. You must think through the events ahead of time and plan accordingly.

Another challenge this morning was to plan ahead to our next destination, Jackson Hole, Wyo. (KJAC), and also the departure out of KJAC. Due to the mountainous terrain and climb requirements we needed to ensure we could leave KJAC before we even arrived.

Jackson Hole took a little over two hours en route and we received vectors to an ILS final. We paid close attention to the EGPWS and minimum sector altitudes as we were IMC until 3,000 feet MSL. We uploaded a minimal amount of fuel to increase our single-engine climb gradient as determined by the AFM. For any pilot who has never been to destinations like Jackson Hole, Aspen, Eagle, and Telluride, after their first visit they will realize the importance of flying to these airports during good weather and daylight.

Next stop was Provo, Utah (KPVU) for fuel. We departed Provo and received a TCAS traffic advisory in the climb out, followed by a vector heading from ATC, again demonstrating the value of TCAS. We climbed to FL410 in order to overfly an area of forecast moderate/severe turbulence in central Colorado. The purpose of landing at Wichita (KICT) was to

visit the Cessna Service Center. I usually try to stop at least one Service Center during the Shakedown Cruise to introduce the owner to service center personnel and get a feel of the facilities and process.

Since we had plenty of fuel inbound to KICT we decided to drop into Hutchison, Kan., (KHUT) first. We used the FMS again to enter holding and then arced to a localizer final. While we were turning to final, tower reported heavy bird activity between the field and us. We elected to abandon the approach and depart the area. That turned out to be a good decision as we climbed above thousands of birds on what would have been a two-mile final.

We cancelled IFR, requested traffic advisories, and headed for KICT. En route to KICT we took advantage of the airspace to practice several go-arounds, re-enforcing the proper procedures. We landed at ICT around dusk, visited the Cessna Service Center and stayed in Wichita for the night. Tomorrow would be the final day of the Shakedown Cruise and we were going to end on a high and memorable note.

Day 4

We departed Wichita on our longest leg so far, 1,154 miles to land at Tweed-New Haven Airport, Conn. (KHAVN). This would be an opportunity to talk weather radar and fuel. I do a lot of talking about

fuel consumption and planning during an IOE.

Jets like fuel. Or, maybe I should say they don't like fuel because they tend to get rid of it rather quickly, especially at lower altitudes. Again, planning and staying ahead of your fuel situation is the key to success. You also need to plan for contingencies as you fly. Plan for the unplanned, expect the unexpected.

As planned, we were descended by ATC prior to optimum (from a fuel standpoint) and cleared for the STAR into New Haven. Dr. Scott flew a flawless visual approach and we taxied to Guardian Jet's offices on the east parking ramp to brief our final leg and formation flight!

Our final flight back to Morristown would include 20 minutes of formation flying and air-to-air photography. At New Haven we briefed the flight with the camera ship pilot and air-to-air photographer. (I should be clear that formation flight is not a part of Guardian Jet's transition syllabus. Formation flight requires special skills and proper planning.)

It was a perfect day over Long Island Sound and the photographer got some great pictures of the owner-pilot and airplane in-flight. We soon broke formation and picked up our IFR clearance back to Morristown ending with an ILS to full stop.

Conclusion

It was a great four days and we accomplished an incredible amount of training. Dr. Scott was exposed to many aspects of operating a jet aircraft with an emphasis on the areas in which he had little or no prior experience.

If you are moving up to the turbine world, I hope you will recognize the benefits and "just plain good sense" it makes to complete your own initial operating experience



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