

Flying the *PiperJet*[®]

A Preliminary Flight Test Report



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In the development and certification of a new, clean sheet aircraft design like the PiperJet, one of the most critical and important phases is “developmental flight testing”. During this phase, the engineering department determines actual in-flight performance and handling qualities of a new airplane. It’s when the airplane demonstrates that it meets or exceeds “drawing board” expectations. Development flight testing is not conducted in a random fashion. Gone are the days of “Let’s go up and see what she’ll do”. Test pilots and flight test engineers conduct developmental flight testing in a very methodical, careful and controlled manner. However, there is still room for test pilots to go beyond the data and evaluate if an airplane “just feels right” or not. The best test pilots are the ones who can conduct a flight and give the engineering designers opinions that go beyond the numbers and data.



Piper has some of the best test pilots in the business. From the developmental flight testing that has been conducted so far, a very compelling and exciting picture is emerging for the PiperJet that goes beyond the brochures and advertising. The purpose of this report is to give you a glimpse into what it’s like sitting in the left front seat of a PiperJet. This report is the result of several interviews with members of Piper’s engineering flight test department. It is also based on a personal evaluation flight made in the airplane. It is written from the perspective of an engineering test pilot and is based on facts – not marketing hype or hope. However, there is a certain amount of excitement and anticipation for this airplane that just cannot be ignored and some of those “just feels right” comments are included.

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The first impression of the PiperJet when approaching it on the ramp is its physical size. This is not a small airplane – it is much larger than imagined. The airplane sets high with the leading edge of the wing almost chest high at the tips. If you’re under six feet tall you can stand underneath the horizontal tail. The tip of the vertical tail is almost 15.8 feet above ground. The impressive and large winglets add to the image of size, strength and strong ramp appeal. It’s as if the PiperJet is creating a new category – the LVLJ (“Large Very Light Jet”). When you think of the PiperJet, think Big.



Entering the cabin through the three foot wide cabin door is easy. So is moving around once inside as a result of the flat cabin floor. All wing spar structure passes underneath the cabin. Access into the front seats is also easy – no wing spar or extended center console to step over and around. It’s great not having wing spar and other structural members protrude into the living space of the pilots and passengers.

Once seated up front, the pilot and copilot will enjoy the unrestricted field of view from wingtip to wingtip. Because the flight crew sits well ahead of the wing leading edge, the view outside from 8 o’clock on the left to 4 o’clock on the right is open and unrestricted. When looking up, down and most importantly level with the horizon, PiperJet pilots have a feeling of flying a much larger, swept wing jet. Even when looking ahead, the pilot sees very little of the nose of the airplane. You’re just not aware of very much airplane structure restricting your view.



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It's during engine start when the pilot and passengers first realize that the "noise maker", the jet engine, is located so far aft. All can certainly hear it, but with the moving parts of the jet engine located well behind the aft pressure bulkhead, starting and operating noises are as far behind everyone as possible. Very little thrust is required to get underway, and ground handling is straightforward with nose wheel steering through a direct linkage system connected to the rudder pedals. Production PiperJets will have a trailing link main landing gear design adding to the smooth ride to and from the end of the runway.



With the Garmin avionics set and flaps at 15 degrees, takeoff is accomplished by moving the power lever forward to the mechanical detent for takeoff. No searching for takeoff power settings in the flight manual or manipulating the power lever to set them is required. The Williams FJ44-3AP engine utilizes a FADEC system to automatically adjust thrust output for airport atmospheric conditions. This is jet flying as it is supposed to be. Acceleration is quite brisk – that's 2490 pounds of thrust pushing forward an aircraft weighing approximately 7,500 pounds. A gentle pull on the side yoke rotates the nose. That rotation consists of a pitch up to 12 degrees and the result is a very smooth and graceful transition off the runway. It appears takeoff distances are averaging between 2,000-2,500 feet here at the Piper factory in Florida with outside air temperatures near 80 degrees F.

Once a positive rate of climb is established, the single-pilot selects gear and flaps up and follows the departure procedure. During enroute climb, the PiperJet first demonstrates it's a new world for those who have been operating turboprop or piston-powered airplanes. Rates of climb average 3,500fpm at 160-180 KIAS through 10,000 feet. The PiperJet has enough thrust to allow cruise climbs at 200 KIAS. Strong mid and high altitude climb rates can also be expected with the flat rating of the Williams FJ44 to the 2490 pound thrust setting. Lots of thrust will be available up high, so the PiperJet can be directed to higher altitudes quickly. Flight level 350 should be obtainable within 20 minutes after takeoff on all but the warmest days aloft.



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Target cruise performance is expected to be near 360 KTAS for high speed cruise and approximately 320 KTAS for long range cruise. High speed cruise fuel flows are expected to be in the 77 GPH range decreasing to 64 GPH at long range cruise. Maximum operating altitude and longest range will be obtained at 35,000 feet. However, the determination of airplane drag characteristics and high altitude operations are next on the list of activities for Piper’s engineering test team. That means all cruise performance projections are subject to change. But early indications are very promising for meeting the above listed projections. The PiperJet will be a no excuses, high speed cruise airplane. Jets need to fly high and fast, not only to justify themselves but to be able to fit in with other jet traffic in the flight levels. The PiperJet should fit well into the traffic flows in the jet routes. One thing is for certain – it is a quiet airplane in level cruise. With all the noise exiting the tailpipe as far back as possible, pilot and passengers enjoy the quietest locations in the airplane, far forward of the “noise maker”.

One flight characteristic to date that has proven to be a pleasant surprise is the minor amount of pitch change with thrust or power changes. With the engine mounted high in the vertical tail, preliminary wind tunnel testing conducted prior to first flight indicated the possibility of the nose pitching up or down with the application or reduction of thrust.



Specifically, wind tunnel data suggested adding thrust could cause the nose to pitch down. Reducing thrust might cause the nose to pitch up. Flight testing has confirmed that the wind tunnel predictions were conservative. It appears that pitch trim changes as the result of power changes can be controlled by the pilot through the aircraft’s normal electric pitch trim system. Further testing is required. But at this time there appears to be a less than anticipated need for any type of automatic pitch trim system to handle large changes in thrust– great news for keeping the airplane simple and easy to operate.

Descending from altitude, the PiperJet pilot enjoys a high Mmo/Vmo speed profile for mixing with other serious high speed jet traffic. Descents can be made at .65 Mach until reaching 250 KIAS. These speeds allow for descents to lower altitudes without restrictions sometimes seen when flying jets with less performance. There is nothing more embarrassing for a personal jet pilot than being vectored off course to make way for overtaking, higher speed jet traffic. With the higher Mmo/Vmo descent speeds available, the PiperJet pilot will be able to comply when the controller says “keep the speed up”. Speed brakes will allow the PiperJet pilot to modulate descent rates with the higher descent speeds.



Into the airport environment, flap speeds are appropriately high enough for slowing and transitioning into the approach and landing phase. The landing gear can be extended at 200 KIAS, followed by flaps 15 degrees at 200 KIAS. Closer to the airport, the pilot can select full flaps (36 degrees) at 145 KIAS. Once on the final approach segment with no overtaking traffic, the PiperJet can be slowed as desired between 120 KIAS to 100 KIAS for a stabilized approach. A good target Vref at 50 feet over the threshold will be in the neighborhood of 85 KIAS. These very manageable approach and landing speeds will allow the single-pilot the time to keep thinking ahead of the airplane. Plus, the lower speeds will keep landing distances in the 3,000 foot or less range.

Near the airport is where another feature of the PiperJet will make itself known, but this time to those outside the airplane. With its single engine configuration, the PiperJet will have one-half the noise source of similarly sized jets with two engines. As important an issue as flyover noise is today, it will be doubly important in an even “greener” future. One engine equals one-half the fuel burn, one-half the carbon footprint and one-half the flyover noise of a comparable twin-engine jet. The PiperJet will be among the very best airport neighbors flying.

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So that's an updated look at the PiperJet from accounts and actual experience in the cockpit of the first test airplane. Preliminary flight test results suggest a large, quiet, comfortable, flat-floored cabin for passengers and a cockpit with excellent outside visibility and roominess available from the installation of side yoke instead of control wheels. Combine that cabin and cockpit environment with single engine efficiencies, 360 KTAS cruise speeds, under 77 GPH cruise fuel flows and an environmentally friendly noise and carbon footprint and you have the ingredients of a winner.

What is not described in the test data is just how you feel when sitting in the left front seat. The PiperJet gives the pilot a "serious jet" experience.

You feel you are flying a real jet, with the performance and systems capabilities to fit into the air traffic environment with other high-speed jets. Piper's test pilots use the non-engineering term "this is a good one" when returning from every test flight. Worth the wait? Our test pilots think so, and they are some of the most critical pilots you will ever find.

Thank you for already being or considering becoming a future PiperJet owner. Contact your Piper dealer for more details on how to place an order or look further at this website to learn more about the PiperJet. And don't forget the other excellent models we build and deliver today. Piper offers you a plan to move in and up, eventually resulting in you owning and operating a personal business jet. We offer significant incentives for purchasing a new Piper today while waiting on your PiperJet for tomorrow. And we invite you to come see the PiperJet at the Piper factory in Vero Beach or see it at one of the major trade shows this year.

As the flight test hours continue to grow, our test pilots are very complimentary and excited about the PiperJet's emerging personality. "It's a fuel and fly test airplane. No surprises. We've got some work to do, but we think we have a solid test airplane that can be molded into a market changer. Combining single-engine efficiencies with a large cabin and the performance of a twin-engine jet will change the way pilots think about owning and flying their own jet." It's comments like these from our flight test department that is beginning to prove that the PiperJet will be worth the wait.

