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Aircraft Review

LIBERTY XL2

by Jeff Moody

Several months back, when winter was still throwing curve balls at GA coast to coast, we had scheduled a test flight of the new Liberty XL2, the new FADEC equipped two seat trainer/personal cruiser, that is being manufactured out of Melbourne, Florida. Pete Lehmann, the regional Sales Representative for Liberty, stayed in constant contact with us and tried his best to get the Liberty up to our area for that test flight. Unfortunately, the demo airplane that Pete had possession of at that time was lacking one important ingredient for winter flying, a cabin heater. As Melbourne, Florida is not known for its frigid winter temperatures, the factory had made the decision to get the demo aircraft in the air and in front of buyers as soon as possible and, since most of the sales calls were in the south, a heater is not a necessity when ambient temperatures rarely see the south side of 50° F.

Bringing any airplane up to New England in January, however, takes the cabin heater out of the optional category and firmly places it in the "must have" column. Deciding frost bite at the controls would not be the proper introduction to the new Liberty, we settled for doing an Aircraft Preview of the XL2 at that time, with a firm promise from Pete that as soon as he returned to New England with a heated aircraft we would get first shot at giving it a test flight. True to his word, Pete came through for us this month.

In the Preview, Pete and I spent a great deal of our conversation talking about the Liberty in the context of the potential market that Liberty was addressing, the advent of the FADEC system and its application to the Continental IOF-240B engine that powers the Liberty and the reasons that he felt the Liberty XL2 was going to be a hit in the trainer/personal cruiser market. Not that I intend to review here the contents of the prior article, but I do intend to hit on a few of the highlights to give some context to the current test flight, see how they compare to my experience actually flying the XL2 and give some thoughts as to the market they are shooting for.



Pete Lehmann, Regional Sales Representative for Liberty Aerospace

In the Preview, Pete talked about the underestimation of the two seat aircraft market by the big players such as Cessna and Piper and his conviction, and that of Liberty, that this was the biggest blunder in targeting customer needs that GA had made in years. "The 2-seat market was considered a dead end by the major manufacturers many years ago." Pete continued "There was the thought that if they only offered a 4-place aircraft, FBO's would buy into the idea and flight schools would have no choice but to follow suit. What seemed to be forgotten in that equation was that many flight schools still operated the old trainers like the Cessna 150 and that moving up to 4-seaters was more expensive in the initial purchase, cost more to operate on a per hour basis and their insurance would also be higher. What was the logic of insuring four seats, flying around most of the time with two seats empty, paying for the avfuel that a bigger engine used in flight and having to pass all those higher costs along to students, possibly placing the cost of training beyond their means." Pete concluded.

Taking Pete's logic to the ultimate test, I used the time between the Preview and actual Test Flight to talk to flight schools around the Northeast to get their view of going back to two seat trainers. The results, as expected, were split between those that already had

updated to new four seat trainers and those that had continued to fly their existing fleet of older aircraft. The owners of new four seat trainers, mostly Cessna 172 SP's, did lament about the higher prices of the new aircraft, the added insurance costs and the increased hourly costs, but, to the last, felt that the four seat aircraft offered more versatility to renters, was not all that much more in hourly flying costs, and provided students and CFI's with a larger more comfortable cockpit that increased training efficiency. Overall, not a lot of dissatisfaction in this group.

The other group, which was far larger in numbers, still offered training in old Cessna 150's, Piper Cherokee's and an assortment of other, generally, long in the tooth, training aircraft. This group was the hold outs, so to speak, waiting for a less expensive alternative to a new four seater. When asked about buying a two seat aircraft for training that was less than \$150,000.00 new, with a nice assortment of avionics, used less fuel and cost less to insure, this group embraced the potential offerings. The main reason was not to make training more affordable to their students but was to offer a modern aircraft on the their flight line and, hopefully, pocket the savings in costs. If you can get nearly the same hourly rate for a nice new two seat trainer as you could for a four seat

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unit, why not make your instruction division more profitable?

Overall, the market is there for the two seat aircraft.

The second issue I passed around was the new FADEC system as a major reason to buy a new aircraft for a training aircraft. Surprisingly, the FADEC system received very mixed responses. Most FBO's felt that FADEC was the wave of the future but most were surprised and a bit confused about the need for it in simple four cylinder aircraft. Most of the concerns were along the lines of thought that students may learn to fly in a FADEC aircraft but what kind of experience will they be getting when they move up to an aircraft that requires real engine management knowledge. For students that learn in traditional two or three engine control cockpits moving up to another aircraft is a simple matter of engine management. They felt this would not be the case with FADEC.

The second fear of FADEC was who would service the units. While every FBO is competent with servicing existing magneto equipped aircraft and most can tackle carburetors or fuel injection systems, FADEC set them back. The comments ranged from, "Even if I send a mechanic to school for it, they will not see enough of them to be good at servicing them." to "I don't want the first generation of anything on my flight line."

Is that FBO's being overly tied to the past or are there real concerns out there? Only time will tell.

The third area of question that I passed around for comment was the perception that with an aging pilot base (the average pilot is now 47 years old according to the FAA data base) would they be at the time in life that trading down to a two seat aircraft for personal use be a real alternative?

For this answer, I not only spoke to FBO's but also cornered aircraft owners that currently owned a four seat or larger aircraft.

These answers were also split, as you would expect. The realists that I spoke with welcomed the thought of trading down to a fairly fast two seat aircraft that cost less to operate. "Fairly fast" is, of course, subjective, but for comparison purposes most used the cruise

speed of a Cessna 172 as the benchmark.

"When I bought my airplane, my kids were at home, we took vacations in it, traveled to relatives homes and used it like a SUV. Now that the kids are gone, we fly around with empty seats most of the time and really don't need this big of an airplane." Was one comment that summed up those of many others.

The other side of the coin was the group of pilots that had spent their lives moving up to new and bigger aircraft and were not about to "go backwards", as one pilot put it.

"I like the room I have in my airplane, the speed is far in excess of anything that is offered in the two seat market and I just like having a heavier airplane in IFR conditions." was another response.

Is there a market for aging boomers to move into this category aircraft? Depends who you talk to, how big their last fuel bill was and whether their spouse is aware that there are cheaper ways of plying the airways. Overall, I came away with the impression that there was a market, though not as big as the training sector.

With all that said, let's take a look at the Liberty XL2 in the environment of a flight test.

The day that Pete and I set for our outing coincided with his return to his former home in the Northampton area of Western Mass to visit his parents. Originally set for meeting at Pittsfield Airport, early phone conversations had us changing plans to instead meet in Keene, New Hampshire, where the ceilings were more accommodating for a test flight. Arriving at Keene, slightly behind Pete, I had my first opportunity of looking at an entire Liberty XL2. I say "entire" as when I attended the AOPA convention in Tampa last fall, Liberty had an XL2 on display, but that was limited to the cockpit section only.

Parking next to Pete and the Liberty at Keens, the first thing that struck me was the copious amount of glass and excellent visibility that the XL2 offered. With one if the gull wing doors open and the other shut, the XL2 looked roomy, sleek and thoroughly modern on the flight line.

Exchanging greetings, Pete and I set right

to the business of the day and began a close up inspection his steed.

"The Liberty is a blend of composite and traditional construction techniques." Pete began, "The fuselage is covered with carbon fiber and allows us to make a very sleek and light weight body. Underneath the carbon fiber skin the construction is 4130 steel cage that forms the structure. All the flying surfaces are of traditional aluminum design with flush rivets on the wings to cut down on drag.

"Under the carbon fiber cowling, is the heart of the XL2, the FADEC equipped Continental IOF-240B engine that puts out 125 horsepower and burns only 5.5 gallons per hour in cruise." Pete continued, "We are certified to the new Part 23 standards and, if you look at the entire airplane as a package, you'd see that we combined the best of cutting edge technology with the best of traditional construction techniques."

Walking around the Liberty, the workmanship is first class and the amount of parasitic drag associated with the airframe appears to have been considered at every flowing curve. After looking closer at the airframe and stepping back to take in the "big picture" the Liberty appears to be a rather "chunky" airplane, for lack of a better word. While quite small in overall dimensions, with a 28 foot wingspan and an overall length of 20' 6" the cockpit of the Liberty is very large for an airplane that size. Not to the point of looking out of place, but far larger than one would expect in so diminutive an aircraft.

Opening up the engine cowling, my first order of business was the inspection of the much heralded FADEC system. Mounted on the left rear of the engine, in a side by side format, the two FADEC control units take the place of the traditional mags, fuel mixture controls and engine management. The system itself is does not appear to be complex, as evidenced by the limited number of wire leads coming form the units; but, as with anything computerized, the true complexity lies in the many chips and circuits that are the heart of the inner system. I somewhat equate my looking at the FADEC system with the first time I looked at a PC. "Looks simple enough!" belied the underlying complexity.

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As Pete and I had exhausted the exterior inspection, we decided there was no time like the present to get into the Liberty, check out the cockpit and fire up the engine for some real flight maneuvers.

Getting into the Liberty XL2 cockpit, at his point in its production, is not a thing of grace. The suggested method from Pete was to stand in front of the leading edge of the wing, near the fuselage, and lift yourself up on the wings, hind end first. Once there, use the two cheek sneak method of getting further back on the wing and then lift both feet into the cockpit. From there, a slight lift and swing of my upper torso was required to settle into the seat. Pete commented, "Liberty is looking at installing a step for easier access." That, as Martha Stewart is fond of saying, "Is a good thing."

Once in the cockpit, the roominess of the aircraft is exposed. With a full 48" width, the Liberty is truly a roomy and comfortable office for flight operations. The rudder pedals, which are adjustable fore and aft, make situating a pilot of any size easy, combine with the leather bucket seats to provide a comfortable and open flying position.

The panel of the Liberty, which is quite low to take advantage of the expansive glass and not restrict an visibility, is nicely formatted and will be make any pilot feel at home. There is nothing in the layout that would have anyone searching for a control, tuner or other cockpit item.

The only difference will be the addition of the two FADEC control switches located on the left of the panel and to the right of the key ignition switch. The FADEC system is redundant, similar to mags, in that each will drive the engine independently, and separate switches are provided for testing and operation.

Getting ready to start the Liberty is a simple as aviation offers. Flip on the master, flip the two FADEC switches out and up, move the throttle ahead, or not, as you may prefer, and turn the key to the start position. Once the engine catches, release the key and watch the prop rotate. There is no concern about mixture controls, throttle positions, cold or hot start sequences, or any of the other pilot learned black magic usually associated with

starting an engine in aviation. After start up, check your gauges, in this case on the VM-1000 unit, and prepare to taxi.

The Liberty XL2, unlike most aircraft, has the throttle control, the trim and the brakes, located on the console between the two front seats. If you are rereading that last sentence, to check about my statement about the brakes being located there as well, that is not a misprint.

To the right and slightly behind the throttle, is a pair of short levers, contoured to accommodate finger control, that provides differential braking to control your ground direction and steer the free castering nose wheel. In front of the two brake levers is a parking brake lock that, to set the brakes, is lifted up and backwards while you apply rearward finger pressure to the levers. Unique? Yes indeed.

Applying a bit of throttle to give the Liberty some thrust, I placed my right hand on the two brake levers and began my taxi to the active. To my surprise, the finger action of the levers was fairly intuitive and the Liberty was easy to control. My years of feathering toe brakes, though, had me constantly applying that technique as well, to no avail.

Arriving at the run up area just short of runway 2 at Keene, Pete took me through the engine run up procedures. "Pick an engine rpm, 1,500, 1600, 1700, whatever you like. Once there, flip off one FADEC control, look for the annunciator light to come on, listen for the annunciator roughness and then repeat the same process with the other FADEC control. If the engine runs rough during this stage, abort the flight and get things checked out." Pete advised.

The key ignition start still has a traditional 5 position switch like most single engine aircraft. Off, right, left, both and start are still represented and I switched the key position to left/both- right/both as part of my run up. I was never told if that did anything other than make me feel better and assume that Mr FADEC found the whole process amusing.

Lining up with the centerline, it was time to apply the 125 horses and take the Liberty into the air." Be careful not to over rotate the stick when you get up to speed." Pete advised,

"Most people pull back too much, just a slight amount of back pressure will get you flying."

As I applied the power, I realized that I was one arm short of being able to take the Liberty off if I was to use my traditional techniques. I am accustomed to keeping my right hand on the throttle, my left on the controls, my feet on the rudders and, if needed, my toes on the brakes, for directional control until the rudder becomes effective. In the Liberty, your right hand moves the throttle full forward, and then goes to the finger brake position, guiding the Liberty with small inputs until the rudder becomes effective. The jury is still out on this whole matter of finger brakes, but my first impression is that it may be a bit much for a low time student pilot to comprehend. On the other hand, maybe I have just embraced geezerhood too thoroughly to be open to such new "improvements". That one issue will be up to the individual pilots preferences.

Although not "brisk" the Liberty does accelerate smoothly and is easy to control directionally once the rudder becomes effective, about the same time the airspeed indicator comes alive.

As Pete suggested, a slight amount of backward pressure on the stick was all that was needed to get the XL2's nose climbing skyward.

Climbing out of Keene, Pete and I calculated that we were within 20 lbs of the Liberty's gross weight of 1653 pounds (588 useful load) as we had nearly full fuel and two well fed pilots onboard. Liberty does have to be lauded for the room they have engineered into the XL2. Pete and I are both well over 6' tall, in the 225 lb range and still had room to spare. The nicely appointed cargo area behind the seats and map pockets and storage molded into the headrests spoke of engineering planning for a lighter pilot and passenger to have sufficient room to carry a weekends worth of gear along with them.

As mentioned earlier, the Liberty is a veritable flying greenhouse with all the glass that surrounds the cockpit. Anywhere you look, the Liberty offers unobstructed views.

Making a few clearing turns to get prepared for some steeper maneuvers, the XL2 is

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responsive and tracks well. The rudder is very effective and I found myself, at first, applying too much rudder in the turns. That is easily overcome with only a few minutes at the controls. Steep turns proved to be as docile as the shallow turns with no tendency to go nose low or high.

Getting back to level flight, I then flew the Liberty at 75% power to get an idea of real life cruise speeds. While the "book" called for a maximum cruise speed of 132 kts and an economy cruise figure of 120 kts, this Liberty settled in at 124 kts at 4500 feet, msl.

Next, as with most flight tests, I ran the Liberty through an approach stall scenario. Pulling back the power and lifting the nose to drain off excess speed the Liberty stalled, flaps down, in the 48 kt range. The buffet was a good warning and the ailerons were effective through the stall. On test flights, I like to aggravate the stall and hold the stick all the way back through a series of stalls and see if the airplane has any hidden vices. The Liberty, with the ball centered, bobbed a couple of times and the third time broke hard left with the right wing coming over the top. As the day was gusty and far from an ideal day to be playing test pilot, I assume a gust of wind contributed to the Liberty's reaction. If this is a trait that is inherent to the Liberty XL2, be aware that it will go over and probably spin as well in the right conditions.

Heading back to the pattern, the Liberty once again showed its docile handling in level flight and was easy to slow down and get set up for landing. The flaps, dropped in

two increments, gave little pitch change and, with the electric trim handy by the throttle, the Liberty was easy to relieve control pressures.

Turning onto final, a bit high intentionally, I slipped the XL2 to reduce altitude and found the Liberty very easy to handle in the crosswind that was blowing that day. The runout from landing was uneventful and the "finger brakes" directed us towards the tie down area without issue. Heading into the parking spot, Pete demonstrated the advantage of the free castering nose wheel and, applying full left brake, had the Liberty swing into position within its own wingspan.

Summation

The Liberty XL2 is a value driven airplane that offer the first FADEC system on the market and does so at a base price of only \$139,900.00 for the VFR model.

While I did have some issues with the access to the cockpit with the climbing on the front of the wing the standard method and the "finger brakes" that I just found unusual, and no real improvement over the traditional toe brakes, the Liberty is a viable aircraft for the two seat training market and the pilot owner market.

The strong points are the very nice construction, the roomy and well appointed cockpit, and the wide open views the abundant glass has to offer. The price is also extremely inviting.

My view of the FADEC system on this

aircraft is it either will be a selling point for those that purchase the "latest and greatest" technologies or a stumbling block for those that don't want to spend their hard earned dollars on a system that is really overkill for such a simple engine.

I think we will see Liberty address the access problem to the cockpit, making that issue a non starter. The FADEC preferences will fall to those that embrace it or don't.

One thing that can't be argued is that the Liberty does provide exceptional low operating cost, a real world cruise speed and ample room for most any two seat mission. I wish them well.

Performance Specifications

Vne: 162 kts
Max Cruise: 132 kts
Economy Cruise: 120 kts
Rate of climb: 682 ft/min
Fuel burn: 5.5 gph
Stall speed w/flaps: 43 kts
Stall speed clean: 50 kts
Wing span: 28' 9"
Length: 20' 4"
Height: 7' 5"
Cabin Width: 48"
Empty Weight (VFR): 1065 lbs
Max take off weight: 1653 lbs
Useful load: 588 lbs

Base Price: \$139,900.00



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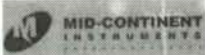
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