The following can be found at: http://www.starfire.douglas.ma.us/jetwing/testreport.html

Test Pilot's Report Jet Wing Trike

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(Note that training methods have changed since this was published and that it is ABSOLUTELY esential that you get proper instuction by a BFI in a 2 place training trike! This article is presented for information only and is NOT the proper way to learn to fly!)

Transitioning from hang gliders to the Flight Designs ATV Jetwing Trike is an experience of mixed emotions. Excitement is present on either side of the fence. A new world is awaiting that first flight. Even true with pilots with other ultralight airtime, you can expect the trike concept to be quite different. If you are a proponent of weightshift, you will love triking. If achieving soaring flight (on a motorized system) is important to you, the trike idea holds excellent promise. Frankly though, do not concern yourself with soaring on the first flight. Not, mind you, that it cannot be accomplished; you simply ought to get the fundamentals down first. It will not even consume a whole day. On the darker side of the fence is fear. One of the earlier transitioning flyers observed a deeply experienced ultralight pilot. An airman whose credentials can make for endless war stories, came in visibly shaken from his first encounter. He was also smiling so widely that it seemed his face would crack in the cold morning air. The mixed bag of emotions is extremely positive, overall; the mention of the fear is only to suggest that, indeed this is a very different species of flying animal. In the case of the Jetwing ATV (all terrain vehicle), the animal is a tiger, and on lift-off, you feel as though you have an especially fleet cat by the proverbial tail. But this is getting out of sequence---let us start nearer the beginning and follow a sample transition through the steps. Since witnessing ten such transition experiences first hand, a pattern for success has been discovered. After extensive conversation on exactly how to proceed and after getting nods of agreement on each step, the wise sequence of which seemed undeniable, two early transitions (let us call them Dave and Scotty) blasted off the runway in a crescendo of decibels, two cycle smoke, fear and apprehension, seeking the safety of being airborne. In both cases, perfect flights were achieved and apologies were offered for so badly violating the careful steps each had planned and agreed to follow. Funny thing. The most important consideration, however , brought them back safely as both were accomplished pilots who stayed with the flight till its satisfactory conclusion back on the

tarmac. A novice would have been in big trouble. But a novice might have followed directions. Etch this into your mind before your initial trike experience arrives. Locate a good strip, the kind usually sought for ultralight training. Hard surface assures smoothness, but a smooth grass strip will do just fine. A thousand feet or more is highly advised, with no significant obstacles or hazards in a surrounding perimeter of another thousand feet. Use calm winds only...zero is absolutely best. Get used to the overall system by ground handling. Force yourself (or your friend) to spend at least 20 minutes doing nothing but taxing and feeling out the throttle, specifically, articulation of the throttle and the acceleration produced by various settings. (as yet the Flight Design throttle does not hold its position so your hand must stay on it.) In no event should the nosewheel lift off the ground during this part of preparation. Be careful. Use an airspeed indicator and keep the speed below 25mph. Next, go to high speed taxing. It is possible, though tricky, to raise just the nosewheel. As the Jetwing is balanced lightly over the nosewheel, and as acceleration is fast, the nose comes up very subtly, and in the aforementioned cases of Dave and Scotty, once the nosewheel was raised, the rest followed very rapidly. So advising another 20 minute session of high speed taxi has a specific point. The idea is to slowly, smoothly increase the speed to nearly 30 mph. (rotation or lift-off speed), then back off the throttle to about one-third to one-half. Not all the way. At this time, while good forward motion is present, push the bar forward several times, pausing, relaxing, then pushing out again, each time a little farther. During acceleration, hold the bar at trim which is approximately above the knees. When the energy dies down, slowing you to say, 15mph, start the cycle again, by accelerating back to nearly, but not quite, 30mph. In the initial push outs, you may raise the nosewheel. This is why you reduce the throttle first, so as not to get airborne...not yet. But it will impart some extremely valuable information on pitch control, authority, and the sensation of how the trike carriage wants to swing underneath you. The importance of this must be stressed. When you feel you have gotten it down, do it a couple of more times. You will be glad you did. Crow hopping is a customary technique for training in ultralights. A new student should not get too high until more knowledge is gained. Crow hopping in the Jetwing is darn near impossible. Maybe it is not even advisable. Recall here, though, that this transition training method is not for beginners. Hang III, intermediate skills are strongly recommended first. All this is to explain why the high speed taxi session is very important and should not be cut short. The next step will put you in the air and climbing at 700fpm. Blast off may sound overly dramatic, but judge its accuracy after you have experienced it. Basically, once you are 100 feet in the air climbing fast, you can relax. Until then, alert is the key word. It and lateral control. You tow pilots may comprehend this phrase very well, as the same instructions apply to a pop start launch. Do not worry about a stall. At full power, you cannot stall the Jetwing. And since forward speed is good (30mph), lateral response will be good too. Use it! Stay all over the bar until you have stabilized in straight ahead climbing flight. But again, this is out of sequence. Let us go back to the start of the runway, approach end, it is called. Clear the traffic area first. The last thing you need is a distraction like a twin engine Baron zooming just overhead because you began your takeoff run just as he was on final. It is also darn important, not to say dangerous. Then smoothly add power to 3/4 or more. That amount is not terribly critical. Move the bar forward to approximately full arm extension, and hold it there. The roll off is surprisingly long. Remember a wing like the Demon needs some airspeed to begin lifting, especially with the 115 pound Jetwing package attached. Plan on 100 to 200 feet. A small 36" propeller and prop airflow blockage are probably other factors, as is the need of the Kawasaki to wind up before max thrust is obtained. So now you are rolling down the runway, accelerating. As 30mph is approached, the nose will lift, distinctly but smoothly, and when it does, the trike carriage will begin to move directly under the center of gravity. Now the nosewheel will be straight in front of you, the angle of attack very high, like towing almost. When the carriage moves forward, you should relax your pushout, returning the bar to trim above your knees, where trim remains regardless of power settings. If you have not already done so, add the rest of the throttle for sustained climb to 100 feet, and maintain lateral control precisely, correcting all course deviations as quickly as they can be recognized. Do not release the throttle! This cannot be overemphasized. Think about this all the while you are leading up to actual liftoff. The most common error of new ultralight students is releasing the throttle exactly at lift off. They are surprised by the rapid rotation and initial climb attitude. If this occurs without pull in (body forward) a nose-in becomes very likely. This will do you and the Jetwing no good at all. Here is an ironclad rule to commit to memory regarding powered craft, the throttle controls the altitude, and the control bar (or stick) movement controls the speed. Once at 100 feet or so retard the throttle somewhat to help prolong the engine life and aid cooling, and continue your climb. Keep a sharp eye for any other traffic. Maintain even power using your

sense of sound, it is quite accurate. Relax. At least try. At a thousand feet or so, you should quit gazing around and prepare to practice some maneuvers. Do some basic turns, right and left, at about 1/3 to 1/2 throttle. Then again, with steeper turns. After that try a series of reversals, linked 180's or 360's. Do these shallow first, then steeper. If you have plenty of altitude, reduce the throttle to what is called idle thrust and repeat all of the above. This will cut your altitude, so climb back up. Clear both sides, plus front and rear of other traffic, then begin stall practice. Start at 1/2 throttle. Expecting only a mellow noseover, stall and recover twice, then clear the area again. Always use whatever bar movement seems necessary to maintain lateral control throughout the stall. Do an accelerated stall (stall from 45 degree bank) experiencing stall at a much higher airspeed. Now, repeat the above under full power. Expect a mush only, but extreme angle of attack. This will elevate you so that you can now do a third full repeat, but at idle thrust. Here you can expect a breaking noseover. Clear the engine periodically by reving it to assure the power will come on when you want it. 2 cycle engines load up at idle speed. Your last maneuver in this check out flight should be a simulated landing. Imagine a runway at a thousand feet. An altimeter is handy for this, but references to a ridge if available will work. Pretend you are doing the real thing. One comforting thought about now is that the landing is one of the easiest maneuvers to do. Line up with your imaginary runway once again maintaining precise lateral control. Control your approach altitude with the power till the imaginary field is positively made. Make all throttle movements as smooth as possible. When you are sure that steep glide will get you to the field, slowly release the throttle to idle thrust. Start this while high. The sink rate as the propeller idles is 400fpm or so, and about 300 fpm engine off. The glide will vary with atmospheric conditions but will not drop below 5:1, and can stay at 8:1. Adjust to these rate factors in your power off descent . Keep a good airspeed, even as the ground rises up to you at a rapid closure rate, flare to touchdown. The touchdown will be much slower than the takeoff roll, but still rapid. A 25mph approach speed is recommended. Also, it may be useful to pump the bar once the ground is close. This transmits a feel for pitch authority and slows your forward speed incrementally, which in turn will continue your descent. Plan to finally use full arm extension in the flare out. Do not add power except to execute a go around, and even a little power to smooth things out will more likely confuse the effort than aid it. Try it both ways later on and decide for yourself. Power has been preferred by all transition-ees to date. Since this was a simulated landing, you should repeat the maneuver at least once before actualizing a real landing. Once on the runway again, you can finally relax, for real, then discuss your relative success with a knowledgeable friend or your instructor. Finally repeat the takeoff and landing phase till you are quite comfortable. 25 such repetitions are not unreasonable before you operate out of small fields or land out on a cross country flight.

After my first experience with the Jetwing I had one word to sum up the feeling...smooth. The Jetwing operates powerfully yet more gracefully than any other ultralight I have flown. Of course I am partial to modern hand gliders, enjoy the simplicity of weightshift, and prefer neutral stability (hence quick banking and light pitch pressure). It took some time before I would fly ten feet off the ground with confidence--a maneuver I enjoy in the Quicksilver. But thermaling the Jetwing was vastly more pleasurable. I can do the 360's inside a Quicksilver turning at a normal rate; can climb with the best of them; cruising with the faster craft; and can land easier than most other ultralights. Still this is no beginner ship. Training a novice can be done but should be approached with extreme trepidation. But I can go soaring with just the wing, even including triking to the soaring site, disconnecting the carriage, and powering back home when the thermals die away. I can car top the entire rig with ease in my little Datsun pickup. I can set it up by myself in 15 to 20 minutes (though not the first time). And cross country in the Jetwing takes on a whole new significance...

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