

VELOCITY VIEWS

Volume 34

Velocity XL-5 Debut of the “Dash 5”



HOW CAN YOU IMPROVE ON THE VELOCITY XL? Fly in the newest Velocity factory-built demo plane and you'll know! The “Dash 5 Edition”, introduced at Sun n Fun, is an exciting new option to the highly successful Velocity XL design. Still x-tra long, x-tra wide, x-tra head room, x-tra large engine, x-tra fuel capacity, x-tra fast, x-tra easy to board, and all the other popular features of the Velocity XL... but with even more “extra's”:

An extra seat
Dash 5's five-seat interior layout features two bucket seats in the front

and a single rear bench seat with enough room for three. The curvature of the fuselage gives the back seat passengers an extra-wide 49” of total hip room, with as much as 50” of shoulder width.

Extra baggage space
Behind the back seat is an extra-large baggage platform, measuring 18” deep by the full width of the fuselage, 48”.

Extra packing versatility
Need to pack your golf bag? The seat back of the rear bench seat is split

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Velocity XL-5 story

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60/40, with each section able to be folded forward, providing versatile loading configurations for large baggage. This aircraft can comfortably carry 3 adults and 3 sets of golf equipment! Or, if just two of you are travelling, both rear seat sections can be folded forward, offering an extra-extra-large area (50" deep x 48" wide) as a baggage platform behind the pilot and copilot seats.

Extra passenger comfort

The rear seat back also features a deluxe armrest that is stowed in the center of the seat back. The armrest can be folded down into position, like in many automobile rear seats, providing a comfortable elbow rest when there are two rear passengers. The center keel of the Dash 5 is cut down to within four inches of the floor, allowing the back seat passengers ease of entry plus lots of leg room. The kit option comes with a reinforced keel cap and a drop-down aileron control mechanism.

Extra load bearing

The main landing gear legs are wrapped with carbon fiber BID reinforcements at the factory, to accommodate the expected heavier loads of the aircraft over the main wheels.

Extra engine power, extra braking power

A 300 hp Lycoming or 310 hp Continental can be selected to power the Dash-V aircraft. The gross weight of the aircraft is increased to 2,900 pounds with either of these engine choices - a 200-pound increase in useful load compared with the Velocity XL with a 260hp engine. Heavy-duty Cleveland brakes are provided with this kit option to accommodate the heavier gross weight of the aircraft.

Extra rudders

New! A dual, interconnected rudder pedal assembly, with toe brakes, comes standard with the Dash 5 option. This allows full rudder deflection during crosswind land-



ings, without worrying that the brakes are engaged.

As an option to the existing Velocity XL, the Dash 5 Edition is available on both the fixed-gear or retract-gear versions. The introductory price of the "Dash 5 Edition" option is \$3,000, and is immediately available for new Velocity XL kit buyers. Velocity will also offer a "Dash 5" retrofit kit for Velocity XL owners in the field, at a cost of \$3,500. Special Dash-V components, such as the Cleveland brakes, toe-brake pedal assembly, and drop down keel, will also be available as individual subassembly options.

The New Demo Velocity

Velocity's new factory-built demo airplane, N271TC, boldly demonstrates the fantastic enhancements of the Dash-V Edition of the Velocity XL. In addition, this plane is packed with the latest state-of-the-art technology now revolutionizing general aviation - making this a truly exciting aircraft!

The new Velocity factory demo plane features all the Dash 5 options, plus:

Continental 310hp engine with PowerLink FADEC (Full Authority Digital Engine Control) Engine

Power Management System:

A multitude of sensors send engine information to three computers, which then analyze and adjust the ignition spark, engine timing, and fuel delivery to each of the six cylinders, maximizing performance. The system allows the pilot to select best power - or best economy. Mixture control is eliminated. The system is electrically operated and does not require the use of magnetos for ignition (there are no magnetos on the engine). PowerLink FADEC promises a 15% improvement in fuel economy and about a 5% increase in power. This is the first Velocity aircraft powered with a FADEC system. Five Velocity customers have already purchased Continental FADEC engines through Velocity's OEM buying program.

Dual Large Screen "Glass Cockpit" EFIS Display Units:

Manufactured by Blue Mountain Avionics, the EFIS/One system provides a full display of flight information including attitude information, heading information, a moving map, air speed, rate of climb, turn coordinator, altimeter, true air speed, trend meters for airspeed and altitude readouts - and a host of information that are too numerous to list in a single page! See their product informa-

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Velocity XL-5 story

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tion at www.bluemountainavionics.com. For the demo aircraft, the factory installed a second display, so guests can experience the same full EFIS sensation that is offered the demo pilot. The EFIS/One comes with an optional autopilot sub-assembly, with climb, descent, and altitude hold capability.

WSI In-Flight Cockpit Weather:

The demo aircraft has a WSI satellite receiver to collect and process a full menu of aviation weather information. For less than \$50/month, pilots have unlimited in-flight access to weather reporting products such as composite radar images, thunderstorm tops, METAR's, TAF's, a color graphic depiction of airports based on their current weather reporting status (IFR or VFR), and more! The WSI system integrates with several display units including the Blue Mountain Avionics EFIS/One and the UPSAT MX-20MFD. All from outer space and updated every 6 seconds!

The UPSAT Unveiling:

Velocity has the distinction of introducing (nationally and for the first time) an exciting new radio product from UPSAT at Sun n Fun in this new demo plane. Sworn to secrecy (legally and in writing) not to reveal the name or any of the details of this product before April 1st, information was not available from the factory at press time, except for the fact that this radio is the "latest and the greatest" from UPSAT, manufacturer of Apollo brand radios.

You can experience the new Velocity XL Dash 5 Edition, in all its splendor, at Velocity headquarters in Sebastian, Florida.

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Colonial Williamsburg

Williamsburg Fun Time Gathering

By Scott Baker

Join Velocity, Inc. at Williamsburg, Virginia during September 18-21 for the Annual Velocity Fly-In and Fun Time Gathering of Velocity Enthusiasts!

Please mark your calendars to join Velocity and fellow Velocity flyers and enthusiasts in historic Williamsburg and Yorktown, Virginia. The dates of the Fly-In are from Thursday, September 18th through Sunday morning, September 21st. Group events will be planned for each day – however you are welcome to pick and chose your schedule to take in some personal sight seeing and activities.

Aircraft home base is Williamsburg International Airport (PHF) – where Velocity, Inc. will be sponsoring a welcome BBQ. Plans are in the works to arrange ground transportation to nearby Yorktown, Virginia, and the Duke of York Motor Inn, where a block of rooms will soon be reserved for the event. Williamsburg International Airport is a complete service airport that supports both VFR and IFR operations. Rental cars are available for those who plan to travel about this beautiful area of the country.

Group events are still in the planning stages, but are sure to include a dinner in an historic colonial inn, a tour of historic Colonial Williamsburg (also home to William and Mary College), side trips to several museums including the Virginia Air and Space Museum, shopping at the pottery and glass factory (save room for extra weight in the aircraft for the trip home!). Williamsburg is also home to Bush Gardens (amusement park and brewery) and to Kingsmill

Golf Resort. Historic Yorktown and Jamestown are nearby as is Virginia Beach (less than 30 minutes away). Home to some great seafood restaurants – we will probably be having a dinner at famous Nick’s Seafood Pavilion.

On Sunday morning Velocity, Inc. will scoot over to nearby Dinwiddie, Virginia to show off new Velocity XL “Dash 5” at the Virginia State EAA Fly-In. The Virginia State EAA Fly-In program is scheduled for Saturday and Sunday, September 20th and 21st. It would be great to have several Velocity aircraft join us for the trip to Dinwiddie!

Be sure to contact Melanie at the Velocity factory to add your name to our Annual Velocity Fly-In mailing list. Do this now so that we can better plan this sure to be fun event!

OSHKOSH 2003

Velocity will be at Oshkosh with a full force of aircraft and people to show off the latest and greatest from Velocity, Inc. “Oshkosh” runs from Tuesday, July 29th through Monday, August 4th.

Something new as far as demo ride procedures - Velocity, Inc. will be offering demo rides the day(s) following Oshkosh, and not during the days of the show. For those who are planning to attend Oshkosh and who want to take a demo ride, please take this into account when making your travel and lodging plans.

The Velocity dinner is on Friday, August 1st – and will again be hosted on the Kitty Hawk Deck of the Oshkosh Hilton Garden Inn (located at Oshkosh Airport). This is a won-

derful location for a gathering! If the sky conditions and temperature cooperate, we can enjoy the time together and judge the landings as aircraft come into Runway 09.

Social hour begins at 6PM – Dinner follows. Be sure to let us know if you plan to attend!

Be sure to monitor our website for details on all our events!

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Velocity Workshop

Velocity will be conducting a composite workshop Friday **May 30th** through Sunday June 1st. We will cover all the basic skills needed in order to complete a Velocity. The first night will be used to get acquainted with one another. We will also go over the basic tools needed to build a Velocity, FAR's and general F.A.A. paperwork needed to register an Experimental aircraft. On Saturday we will start off with basic fiberglass lay-ups that will be used throughout the building of your Velocity. On Sunday we will continue with the fiberglass lessons building on some of the pieces constructed from our Saturday session.

Basic program schedule:

Friday 5:00 p.m. - 8:00 p.m.
Saturday 8:00 a.m. - 12:00p.m.
Lunch 1:30p.m.- 5:00p.m.
Sunday 8:00 a.m. - 12:00p.m.
Lunch 1:00p.m.- 3:00p.m.

Dinner Friday night, lunch Saturday and Sunday will be provided by Velocity Inc. Coffee and donuts will be provided each morning and refreshments will be available throughout the day.

Fee- \$325 per person

If we do not get a minimum of 6 people we will not conduct the class. Maximum is 20 people.

Calendar of Events

April 27 - Patrick AFB Air Show,
Patrick AFB, Florida

May 3, 2003 - Factory Open House and Workshop

Factory's semi-annual open house in Sebastian, Florida (X26). * 9:00
Welcome! Please register and take in the surroundings. Enjoy some coffee and breakfast snacks. The Velocity Staff welcomes you to the Velocity Service Center. Please introduce yourself and mingle amongst the several Velocity building projects. Nathan Rigaud will be conducting Demonstration flights throughout the day in the Velocity XL-RG model. The price of the ride has been reduced to \$100 for today's event. Be sure to sign up at the registration table.

* 9:45 Factory Tour by Scott Baker
Enjoy a walking tour of the Velocity factory. See how we go about making the many quality parts that go into your Velocity aircraft kit.

* 10:30 Workshop TBA by Scott Swing

* 12:00 Lunch – Courtesy of Velocity, Inc. Enjoy!

* 12:45 More Workshops TBA

* 3:00 Program Ends

Please be sure to call the factory and RSVP! Friday arrivals can book a room at the Key West Inn at Captain Hiram's here in Sebastian. Call 800-833-0555 and mention Velocity to get a corporate rate. When you call the factory to RSVP, let us know when you plan on arriving so we can make arrangements for transportation, etc.

May 30, 31 and June 1 - Velocity Basic Composite Workshop, Sebastian, Florida

Velocity will be conducting a composite workshop Friday May 30th through Sunday June 1st. We will cover all the basic skills needed in order to complete a Velocity. See the article "Velocity Workshop" to the left for details.

June 20-22 - Golden West EAA, Marysville, California

July 9-13 - Northwest EAA,
Arlington, Washington

July 29-Aug 4 - EAA AirVenture
2003, **Oshkosh,** Wisconsin

August 1, 2003 - Velocity Oshkosh dinner will be hosted on the Kitty Hawk Deck of the Oshkosh Hilton Garden Inn on August 1st from 6:00PM to 9:00PM. Dinner tickets will be on sale from now until the event. The dinner price is \$23 per person. A no-host, cash bar will be set up at the dinner. Call the factory to sign up.

Sept. 18-21 - Williamsburg Virginia Velocity Fun Time Gathering and Fly-In (see Scott Baker's article on previous page)

Sept. 21- Virginia EAA Fly-In (Sunday only) Dinwiddie, Virginia
Sept 26-28, 2003 - CSA Rough River Fly-in, Kentucky

Oct. 9-12 Copperstate EAA Phoenix, Arizona

Oct. 30-Nov 1 AOPA
Philadelphia, PA

Nov. 8 Factory Open House and Workshop Factory's semi-annual open house in Sebastian, Florida (X26).

* 9:00am Welcome!

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Dec 5-7 2003 - Velocity Advanced Workshop, Sebastian, Florida

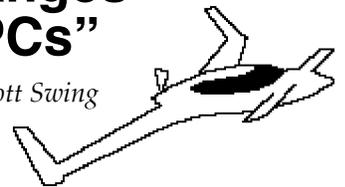
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Reminder

All parts orders placed after 12:00pm EST will not be shipped any way other than UPS ground. If you need an item shipped overnight, the order has to be placed by 12:00pm EST

Kit Plans Changes "KPCs"

by Scott Swing



The reason we haven't had any KPC's for the last three newsletters is not because we couldn't find something to put in, it is because we are

just about done with the new version of the plans and we can then start over. The new version is re-organized, updated, and on line and we should be able to a better job at keeping it that way in the future. We appreciate all of your patience through this process. At least Brendan does since his eyes are bothering him these days from all of the screen watching.

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Builder Hints & Information

by Scott Swing

AIRCRAFT LEVELING AND RIGGING

I am sure that I have talked about this subject before but because of its importance and because it still seems to be an issue, I will discuss it again. The subject is rigging or the relationship between the wings, strakes, canard, and fuselage. Lets first talk about the fuselage. The fuselage is a lifting surface and because of that, it affects the overall flight characteristics of the plane. A little higher angle of attack will help the plane achieve a slightly lower landing speed but will also increase drag and make the airplane slower at the top end. The differences though are so small that other things about the aircrafts construction can offset them. Since we understand that the fuselage angle of attack is not that important to the flight qualities of the aircraft, we will concentrate on what does affect it. The first thing you put into the fuselage that has something to do with flight will be your canard or your main spar. If you put your canard in first, you would then use it as your leveling device and not the firewall or main spar. If your main spar is put in first then it should be closely matched to your firewall. Even after your spar is glued in, you still have some latitude as to how much the nose of the plane can move to its permanent location. Once the main spar is in you will be working with the wings. So, with the aircraft level (firewall, spar) you install the wings. To keep things from moving around, you need to support the main spar. You then would use your wing jig to align your incidence angle. This may require a little twisting of the main spar but shouldn't take a lot. At this point, the plane is still level (firewall

and spar or canard if you started with that first) and the wings are now level according to the wing jig. Remember that the wings are actually at almost +1 degree but you do not need to know this. The next important thing to consider is the wing strake incidence. The relationship between the wing and strake is one of the most important parts of the mix. When marking the future leading edge position of the strakes, you have to make sure that the wing is leveled with the jig then marking a spot or range on the side of the fuselage that is 2 or 3 inches (depending on SE vs. XL) above a level plane coming off the bottom of the main spar at the side of the fuselage. This position gives the strake a slightly negative angle of attack as compared to the main wing's position. Even after you have glued the strake bottom onto the spar and onto the side of the fuselage, the wing can still be moved slightly since the box of the main spar and strake is not complete. For argument sake, lets say that someone needed your supports and changed the airplanes position while you where working on the bulkheads and baffles of the tank and when you reinstalled the wings and were getting ready to close the strakes, things have moved. What do you do? What do I level now? Well, if you had put some kind of level in the plane while you where doing the work before, it would be easy but if you didn't, it can be difficult since the firewall is not completely flat and levels can be deceiving, and electronic levels need to be calibrated all the time so what do you do? To be sure, you can check your bottom strake. Check the leading edge of your strake as compared to the position it is supposed to be in. You can do this after your wing has been bolted on but as I mentioned, the wing can still be moved a little so just getting the wing level is not good enough. Once you have checked your wing with the jig and you are sure that the leading edge of the strake is in the proper position based on its relationship to the bottom of the spar, you can proceed with the closure. This just makes sure that the relationship of the wing

and the strake is correct. What else makes a difference? The canard is left which will complete the picture. Since your strakes are closed, you just need to use your wing jig to level the plane in order to rig your canard in the proper position. The canard will most likely give you some differences along the surface. What I like to do is to find the average of the two extremes and mark the canard at that point. You should use that position to rig the canard. I tend to cheat on the high side when installing the canard. By that I mean that I like the bubble in the level to be more toward the forward line almost up to it. The reason for this is that from experience I have found that a little too much incidence on the canard is better that not enough. If you already had your canard in position, I would level it like I said then level your wing with the jig, then mark you strake position. Any way you go, you want the wings, the strakes, and the canard to be in proper relationship to each other. The fuselage could be 2 inches high or 2 inches low and it won't make enough of a difference to think about. If you have a fast build fuselage and you are trying to level your fuselage, we usually use the firewall as the judge on fore and aft level of the fuselage. Since the firewall is not completely flat and you know where the spar will be up against it, concentrate on that area to level it. Again, it is not important that it be exact.

LATERAL FUSELAGE LEVELING

The right to left level of the fuselage is important and you must consider three things when leveling it. These things are the gear boxes that the spar will sit on, the gear pivot locations (RG only), and the canard bulkhead. On the fixed gear, you have some latitude since you can move axles if you need to but you need to know the axle to axle position or how level the fuselage will sit on the level floor, the gear boxes, and the canard bulkhead. Some of this also

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Builder Hints & Info

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has to do with how it looks from the front or rear of the aircraft. Lets go back to the RG. You must be careful not to concentrate only on the canard bulkhead since you will be bedding the canard in place and a gap on either side will be eliminated. What you can't do, is mess with the pivot holes in the fuselage. If you level the aircraft with these two holes way out of level, you will have to teeter the gear more to level it before you install the sockets and you will end up with a big difference in camber angles on the gear. There is nothing wrong with the pivots being a little out of level but you don't want it out much. What I am saying here is that a little compromise helps here and you shouldn't need to put a lot of shims under the spar on one side to get it to level up. I would say if you need more than two or three tongue depressors under or behind anything, something else is wrong and you need to give us a call. On the fixed gear you just need to remember that your main spar should be level to a level floor since the tires are already in place. In order to remove the differences that can occur with tires at difference camber angles, you should use the centers of the axle locations for your reference. You can also set your cambers first, then make sure your floor is level and the tires are at the same air pressures and use that as your starting point.

Next time, we will talk about how good is good enough when building an aircraft. I will go over things such as neatness, tolerances, lay-ups, what can be fixed and what can't, common questions that builders have about these things and more. It should be interesting.

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**Visit
the Factory's
Official Web Site:
velocityaircraft.com**



by Duane Swing

Insurance issues

How many times have I addressed this subject and how much time have I devoted to finding solutions to the many problems regarding this subject? Most recently I received a call from one of our flying Velocity owners who has insurance with Falcon. He told me that Falcon requires him to return to the Velocity Service Center every year for factory re-currency training. After talking to Falcon and being assured that all the underwriters were now requiring this training, I spent considerable time organizing a curriculum that could be sent to our Velocity owners so they could work with their local CFI's and get the necessary annual training. I first ran this past Falcon as an alternate to factory training to save the expense of the owner having to travel to Sebastian. Falcon agreed to work with the underwriters and get their OK before we proceeded further. It has taken 5 weeks for the underwriters to agree and this policy was then put into effect ----- with certain conditions. If the instructor has 1500 hours total logged time and 250 hours of RG time (if applicable) with 50 hours of Velocity flying time, Velocity can approve this instructor. If he does not meet the minimums, then his qualifications must be sent to Falcon for approval. I guess this is better than a stick in the eye.

Sometime later I got a call from a potential Velocity builder who called Falcon at my request to find out the cost and availability of insurance for the Velocity he was planning on building. He was told by Falcon that he would need a minimum of a private license, 500 hours of pilot in command time, 100 hours of retractable time and an instrument rating. This was for a standard RG

airplane. I immediately called Falcon and was told the same story. I ask the Falcon representative if all the underwriters were requiring the same thing and I was assured that they were. I later received another call from someone wanting to purchase an already flying Velocity and he confirmed that Falcon wanted all the above. He ask Falcon if he could purchase just liability and no hull coverage and was told that Falcon would no longer insure the Velocity or any other high performance homebuilt for liability only. He would have to meet the requirements plus insure the hull for fair market value.

By now, I was getting quite upset and tried on several occasions to call the president of Falcon who I had worked with in setting up the reasonable conditions for insurance over a years ago. I was not able to get through to him and decided to try talking to the underwriters direct. My first call was to Aerospace Insurance Managers, Inc. who I know was one of the underwriters Falcon uses. After four attempts I spoke to the vice president and what he told me was totally different than the information I was getting from Falcon. What I found out was that Falcon was not even checking with Aerospace Insurance Managers and was, instead, using a company called Global and AIG. In any case, I was told that the conditions that applied a year ago still apply today. What follows is what we determined to be acceptable to both parties. Please remember, however, that Aerospace Insurance Managers are not licensed to do business in all states. Your state might be one of those where the following does not apply. If Falcon uses other underwriters, the conditions will be quite different

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Factory News

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than what is specified below.

PILOT QUALIFICATIONS FOR INSURANCE

Standard Elite Fixed Gear 200 HP or less (this includes the Franklin)

1. Private license minimum
2. 150 hours total logged time minimum
3. Factory check-out
4. No home brewed auto engines or turbines
5. No instrument rating needed
6. No annual re-currency training needed

Standard Elite Retractable Gear 200 HP or less (this includes the Franklin)

1. Private license minimum
2. 200 hours total logged time minimum
3. Complex or high performance endorsement in log book
4. Factory check-out
5. No home brewed auto engines or turbines
6. No instrument rating needed
7. No annual re-currency training needed

XL Fixed Gear 250 HP or over

1. Private license minimum
2. 200 hours total logged time minimum
3. Complex or high performance endorsement in log book
4. Factory check-out
5. No home brewed auto engines or turbines
6. No instrument rating needed
7. No annual re-currency training needed

XL Retractable Gear 250 HP or over

1. Private license minimum
2. 250 hours total logged time minimum
3. Complex or high performance endorsement in log book
4. Factory check-out
5. No home brewed auto engines or turbines
6. No instrument rating needed
7. No annual re-currency training needed

Note:

1. Deductible amounts and premiums rates will vary based on pilot experience, total time, ratings, retract hours, time in type and other variables.
2. All aircraft will require a one-time inspection by an authorized factory inspector prior to any hull insurance coverage.
3. Liability insurance only is available if desired.
4. Please note that the insurance underwriters may elect to change any of the above at any time without consultation with Velocity.
5. Also keep in mind that the premiums and deductibles have a constant upward spiral.

Electrical Problems

Wayne Lanza has been receiving numerous calls from some of you about your electrical glitches in radios, navigation equipment, wire sizes, circuit breaker sizes, his advice on what to buy, how best to do the wiring in the Velocity, which radios are best for your airplane etc. We all appreciate his knowledge in these matters but it is important for all of you to know that Wayne is not on the Velocity payroll. Many of the things he does for you, he charges us by the hour as a private contractor. Your call to him about why your #2 com radio has a scratchy sound is billed to Velocity by the hour. Wayne does his best to sort out what should be a Velocity bill and what is not. It is your responsibility to sort out the same. I know of one instance (there are many more) where Wayne spend many hours over several days working with one of our customers helping him design his panel and organize the items he would need to make it complete only to find out later that the customer purchased everything from sources other than Velocity. This is wrong. Wayne is here to help us help you. I just ask that you use some common sense in your approach to what you want him to do.

Kit Aircraft Sales

I received a call the other day from a potential new Velocity owner and he wanted to know if Velocity was going to continue building kit aircraft. The reason for his question was a result of someone who had told him that we have so many sales to countries and individuals who want completed airplanes that we were no longer building kits. This is, of course, just not true. The kit business is our bread and butter. All the other stuff is just extra. If we were to actually sell and build all the aircraft that we are presently working with customers on, the total would be over 65 aircraft. Some of these are US government projects and some are foreign customers, none of which do we have any deposits on. Therefore, if you are concerned about us being around, don't worry, we will be here.

My Retirement

Several months ago I told you about my desire to slow down and smell the roses. Sometimes things don't work as planned and the sale of the business was moved back to April or May of this year. As I told you before, Scott Swing and all the other key people here will remain in control and set policy, R & D and continue working to make our airplane better. The new owner will be working hard at establishing a European manufacturing facility to better handle customers in that part of the world and working with the Chinese on a certified version of the Velocity. I will have a working relationship with Velocity for at least a year after the sale is complete and will stay in touch with what is going on and make a contribution whenever and wherever necessary. That includes the new Dash 5 and the pending twin project which is on the back burner awaiting proper engines.

Engine Things

We are often encouraged to jump in bed with a new engine manufacturer

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Factory News

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so you, our customers, will be able to take advantage of the newest technology available out there.

Sometimes these changes must pass the test of time before we can get involved. I actually had a customer hang up on me because I would not support his desire to put an 800 horsepower Pratt and Whitney prop jet engine in a pressurized Velocity. We had some customers that just could not understand why we would not build an engine installation kit for the French diesel engine. This engine is now certified but to purchase one you would have to shell out over \$65,000. Something we felt our people will just not do. We have also spent considerable time trying to convince the Velocity builders not to buy the Affordable Turbine Power (ATP) engine until they could prove their claims of same fuel burn per horsepower as a piston engine with acceptable reliability. More than one of our customers have given ATP a deposit on an engine and now the company is on the verge of bankruptcy with little chance of getting any money back. Their claims of 300 horsepower on a 150 lb. engine burning 20 gallons of JP4 per hour was just not going to happen. We have seen many auto engine conversion that look good on paper and many, in fact, are not that much different from the certified aircraft engines. The Subaru four and six cylinder engines are horizontally opposed water cooled engines and look very much like an aircraft engine. They are not, however, designed to run almost all the time either wide open or at 75% of the rated power. Can you imagine how long your auto would run if all your accelerations were pedal to the metal and a cruise of over 100 miles per hour when not accelerating? As an example, my 240 horsepower Honda would be using 180 horsepower at 75% power and would result in a fuel burn of over 10 gallons per hour or a maximum endurance of less than two hours or about 225 miles. I can drive this car all day at 65 miles per hour and con-

sume only about 2.25 gallons per hour. (about 13% power) I am not suggesting that an auto conversion is not possible; it is just that Velocity is not able to support an engine installation kit for every conversion package out there. Many of you ask us about the Delta Hawk diesel engine and many of you purchased your kit years ago with the intention of installing one of these engines. Our comments back then was to put in a Lycoming and fly the airplane until the Delta Hawk is on the market. The Lycoming will hold value very well until the Delta Hawk is ready. I talked to Doug Doers of Delta Hawk a couple days ago and he said they will be flying the diesel powered Velocity at Oshkosh this year. We hope to support Doug by giving him space at our booth to show to all the world that he has done what Lycoming, Continental and others have not been able to do. We wish Doug and his team well in this pursuit.

I suppose it is only natural for many of us homebuilders to look long and hard at those alternate engines and dream of flying on a fuel that the by-product is water and oxygen. You could then quench your thirst with the water while breathing in the newly produced oxygen at a cruising altitude of 18,000 feet doing 240 miles per hour on a dollars worth of hydrogen.

Velocity Views Renewals

Many of you have received a letter from me requesting that you renew your subscription to the Velocity Views. I got a call from one of you suggesting that the Views is no longer necessary as he is getting the KPC from our web site. Please be advised that not everything regarding the safe operation of your airplane is part of KPC's. I ask you to read the Safety Corner articles as an example. These will not be reprinted on the web site and if you are not a subscriber, you will not get this information. One of my problems is that those who have left their subscription lapse are not reading what I

am now saying. Perhaps this is a reminder for the future. I can't imagine anyone building or flying a Velocity that would feel the fee for this is too much even though I have heard of many who have not renewed just for this reason. It is interesting to note that the people here at Velocity spend well over 50 hours an issue researching information and offering it to you in the written form. We give of this time freely so you might be better informed. Velocity receives no kickbacks from Lavoie Graphics and pays Lavoie Graphics the going rate for the first year subscriptions for new Velocity buyers. Believe me when I tell you that Rick Lavoie is not getting rich on publishing the Views and it takes a certain number of mailings to just break even. Over 200 people failed to renew this year. If Rick gives this up, we will probably not be able to find anyone else willing to take the time to do it at even twice the price.

Stolen Aircraft

Many of you have called asking about our demo aircraft that was stolen in early December. We have not found the aircraft, but the authorities are almost certain who it was that put together the theft. A word of warning should be issued here. If your trying to sell your Velocity, don't allow anyone to talk you into letting them fly the airplane away from your home field unless you are in the airplane. The story goes like this; "I will give you a deposit on the airplane if you will allow me to fly it to Tampa for my investors to look at and to do a pre-buy inspection." You will probably never see your airplane again. I can't mention names but if a potential buyer from the Tampa area contacts you, give us a call and we will notify the FBI who is handling this case. They, in turn will be in touch with you with instructions as to what to do.

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**Visit
velocityaircraft.com**

Annual Velocity Fly-in "The Williamsburg Gathering"

- September 18-21, 2003
- Historic Colonial Williamsburg
- See Scott Baker's article page 4
- Get latest details on:
velocityaircraft.com

Mt-Propeller Service Notice

This note affects Velocity aircraft powered by Lycoming 4-cylinder engines without a counterweighted crankshaft, including the popular IO-360C1C (200hp) and IO-320-B1A (160hp) model engines. Be sure to check with your engine shop or Lycoming to learn if your model engine features a counterweighted crank - or not. Again, this note is only applicable to non-counterweighted Lycoming engines. Counterweighted engines, such as the IO-360C1E6, do not have a restricted rpm range.

Mt-Propeller has announced the following rpm restrictions for all MTV-12-B (hydraulic) and MTV-18-B (electric) propellers that are mounted to non-counterweighted Lycoming engines:

Avoid Continuous Operation between 2250-2550; and above 2,650 rpm

Be sure to placard the aircraft and reference the Aircraft Limitations section of the Operator's Handbook to highlight this restriction.

Operators of MTV-12 or MTV-18 propellers on non-counterweighted Lycoming engines should check the leading edge of the propeller blades for possible signs of fatigue cracks that run perpendicular to the blade. Please consult with Mt-Propeller or Velocity, Inc. if you suspect possible damage to your propeller.

Mt-Propeller is performing additional analysis to determine if a propeller dampener might mitigate the affects of the stresses imposed by non-counterweighted Lycoming engines on Mt- propellers.

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Safety Corner

Accident & Incident Reports,
Maintenance & Service Difficulties

I have a good friend in Ohio who is a car dealer. Several years ago he and his brother decided to add a motorcycle dealership to their businesses. One of his long time friends decided to purchase a motorcycle for his son as a birthday present. Two weeks later, he had to go to the funeral of this young man who crashed the cycle and was killed. This event had such a profound effect on him that he sold the motorcycle business and vowed never to again place himself in such a guilt complex situation.

I tell you this because of the effect losing one of our builder / pilots has on me. A couple months ago we had a pilot killed in his Velocity near our facility here in Florida. He was a good man who I am sure loved his family and they loved him. How does one cope with these kinds of tragedy without losing total interest in ever selling another airplane? Believe me it is not easy. I guess a firm belief in God and the knowledge that He is always in control helps, but is not always enough. Sometimes the circumstances help sooth the pain, as I will try to explain in this case.

The airplane was partially built by the owner and then turned over to others to complete. Wiring, engine installation, panel work and the like were handled by others. The airplane had been flown about 10 hours when the owner showed up on a Saturday morning. His intentions were to fly the airplane back home, a trip of about three hours. The person who had flown off the first 10 hours of the restrictions strongly recommended he wait until Monday and get some dual with our instructor and then spend several hours flying locally getting used to the airplane and making sure all was ready for

his intended trip north. We understand the owner had not flown anything for about three years and had limited Velocity time prior to that. He said he had to get back home for some meeting scheduled for Monday and that a Saturday departure was imperative. At about noon on this Saturday he came into our shop and ask if I could find the problem with his Horizontal Situation Indicator, as he could not rotate the CDI function. He also said his GPS was inoperative and wanted to know if I could figure out why it didn't work. I suggested he not take any chances and wait until the radio shop opened on Monday and have everything checked out and while he's waiting, pick up some dual with Nathan. He told me no, he had to get back home for a meeting and wanted to know if he could borrow a hand held GPS as he was concerned about flying through the Florida airspace with all the restricted areas and no VOR or GPS.

The two of us tried to keep him on the ground but to no avail. Saturday afternoon he departed a near-by airport, retracted the gear and headed northwest. A few minutes later he made a left turn and reduced the power. It was thought he was returning to the airport to land for some unknown reason. No radio contact had been made. About 1/4 mile from the end of the runway, the airplane was observed rolling inverted and diving into the ground. Post accident investigation revealed no apparent control surface malfunctions and no obvious reason for this accident. The individual who had flown the airplane the first 10 hours reported no control problems during this phase of flying. He did, however, offer a feasible answer as to why the air-

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Safety Corner

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plane would have rolled inverted. He said he observed the pilot set the portable GPS on the glare shield and it was his theory that it probably slid off and under the pilot or co-pilot seat during the take-off. His attempt to find it could have resulted in a twisting body turn that would apply rudder pressure and thus the roll to the inverted. This is exactly what is concluded caused John Denver to crash his Long Ez into the water. Rudder application at low speed is about the only way we can get the Velocity to roll as was described by an eyewitness.

Regardless of what caused his crash, he is no longer with us and I feel emotional pain at his loss. I know many will say he should have been more careful and listened to advise and that his actions should not force a guilt trip on anyone associated with his loss. This is a whole lot easier for you to say than for me to accept.

What I am trying to say to you is this; I cannot totally divorce myself from what happens regardless of the reasons. It is up to all of you out there to do your absolute best in being prepared for every flight you take. Make sure the airplane is ready. Have you done an adequate pre-flight? Make sure you are ready. Are you taking risks regarding your health? Are you flight current? Are you pushing your limits regarding weather? Is the "get home at any cost" going to get you in trouble? If you can minimize the risks, you will have a much better chance of reaching your destination safely. I'll sleep better knowing you did.

Service Caution Water Ingestion

We have had two reports of water injection caused by water accumulation on the lower lip of the early XL's. On the early XL's, we supplied a surface

NACA duct that was installed on the lower cowl and supplied air to the engine mounted oil cooler and to the fuel servo. This duct has a lip on the lower edge that will hold water after a wash job or after a rain. On the take-off roll, the water is forced

directly into the fuel servo causing engine misfiring. It is important that water drain holes be drilled on this lip. Failure to do so could cause the engine to sputter or quit entirely.

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Flight Check! Be Safe!

Velocity Service Center Inc. offers flight training for builders/pilots to safely learn how to transition into flying a Velocity. Get a **Flight Check Out** prior to your first flight!

Flight training is available from:

- Nathan Rigaud, CFII
- Brendan O'Riordan, CFII
- Scott Baker, CFII

The following Flight Instructors have also been approved by Avemco Insurance:

- Sam DaSilva - Seminole FL 727-595-6384
- Mike Gunvordahl - Burke SD 605-775-2952
- Mack Murphree - Dayton NV 775-246-9364
- Manny Lewis - Scotia NY 518-399-8614

Don't take a chance, get checked out prior to your first flight. Please note that you should be current in some other type of aircraft prior to your Velocity check out. The purpose of the "flight check" program is to transition you from flying other aircraft types (like a Cessna) to a canard pusher (Velocity).

Factory Authorized Insurance Inspectors

Please make note of these individuals:

Name - Location Home Phone / Work Phone

Brian Gallagher - Murrieta CA 909-461-9990 / 909-696-0160

Barry Gibbons - Palmdale CA 661-273-7398

Don Pearsall - Owasso OK 918-272-5551 / 918-474-2610

Mike Pollock - Sachse TX 972-530-8400 / 972-728-2725

Glenn Babcock - Tampa FL 813-677-2543 / 813-604-2637

Wes Rose - Grand Rapids MI 616-772-7235 / 616-530-0255

Jean Prudhomme - Boca Raton FL 954-559-4988

Mack Murphree - Dayton NV 775-246-9364

Gary Stull - Tampa FL 813-949-1297

(Gary is an airline employee and can travel inexpensively)

Mike Watson - Mt. Vernon NY, 914-699-3915 / 201-476-8231

Installing StormScope and StrikeFinder antennas in Velocity aircraft

by Scott Baker

Those who fly composite aircraft should have a healthy respect for thunderstorms and the prospects of “bad things happening” in the event of a lightning strike. The Velocity aircraft design – as is the case with all composite kit aircraft manufacturers – offers no safeguards against possible damage from a lightning strike. For Velocity pilots, the best protection is to avoid flying in or near thunderstorms – and the best way to do this (besides refusing to fly in bad weather) is to have an in-cockpit display of where lightning strikes are occurring relative to your direction of flight.

B.F. Goodrich and Insight are two companies that offer lightning detection devices and displays for the general aviation market. These systems start in price from \$4,300 for the Insight Ultra Bright LED Strike Finder Display unit – to \$5,950 for the remote mounted Goodrich WX-500 StormScope (more on this later) – and higher for more sophisticated systems such as the Goodrich WX-1000 Series with its own display that is capable of showing traffic threats on the same CRT display. Velocity, Inc. is a dealer for both StormScope and Strike Finder products. Both the StormScope and Strike Finder units use a “hockey puck” shaped receiver antenna that must be mounted against a ground plane. To work properly, the antenna must be mounted in an area of the aircraft that is free of electronic interference. To many installers, finding a “quiet” location for the antenna is the supreme challenge. Avionics shops will tell you that every aircraft is different. An antenna location that works for one, may not work for the other (even amongst aircraft of the same make and model). This is why most shops perform an operation call “skin mapping” to locate the best antenna location. Skin mapping

involves the waving of a portable sensing device over the aircraft wing and fuselage surfaces to determine the presence and severity of electronic noise. Technicians confess that there is a certain “Black Magic” element to all of this – in that there sometimes is no scientific reason why one spot of an aircraft would turn up “suitable” for the antenna; and others, not.

The dilemma facing Velocity builders is this: should you guess the best antenna location and install the antenna ground plane, mount, and route the antenna cable during construction – or wait to determine the antenna location through the use of skin mapping after the aircraft is built, making the job of installing the ground plane and routing the antenna cable much more difficult?

The good news is that we have installed several StormScope and Strike Finder antenna installations in both Velocity SE and Velocity XL models – and have found a set location on the left main wing that (for every installation so far) has been working well. The antenna is mounted on the underside of the left main wing, just forward of the main spar and over the pre-formed channel in the foam (see diagram). It is important that the antenna be oriented as per the manufacturers instructions (parallel to the line of flight).

The ground plane is made of perforated wire mesh (available through Velocity, Inc.) and measures 10 square feet in area. The antenna does not need to be centered on the ground plane in order to work effectively. The diagram shows what we have done ref: the positioning of the ground plane.

The installation procedure goes like this:

Locate the center mounting position of the antenna (make sure it is centered over the pre-formed channel in



the foam).

Remove wing foam as needed to embed the base of the antenna mount. Position the base of the antenna mount so that it is flush with the surface of the foam, and aligned with the direction of flight.

Position 4-each pieces of masking tape – approximately 3/8” diameter (round in shape) – over the base plate. These will later serve as cutout guides to achieve a grounding bond between the wire mesh and the antenna base plate.

Prepare the foam to receive Triax according to the Velocity Construction Manual. Perform skin lay-up as instructed and let cure.

Notice that depression in the wing surface at the wing spar caps. Fill-in this depression with micro so that the wing surface forms a consistent plane. Let the micro cure.

Using a razor or Exacto-knife, cut and remove the Triax that overlaps the masking tape that was previously positioned over the antenna base plate. Remove the masking tape and sand away epoxy residue that might be present on the exposed areas of the base plate.

Trial fit the layout of the wire mesh (see sketch)

Rough scratch the surface area of the Triax that will be under the wire mesh, plus about a 4” border.

Remove dust and wipe the surface clean before proceeding to the next step.

Apply a thin layer of Cabosil mix to help adhere the mesh to the wing surface. Be careful not to apply Cabo or epoxy over the 4 spots on the antenna base plate.

The wire mesh must be bonded to the

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Antennas

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antenna base plate to complete the ground plane. Addressing the 4 spots over the antenna base plate, drill a 1/8th inch hole through the wire mesh and then through base plate. Install 4 pop rivets (1/8th inch diameter) to fasten the wire mesh to the antenna base plate.

Apply a layer of 3 oz fine bid over the top of the mesh – overlap the edges by about 3" – wet the layout with epoxy – and cover with peel-ply.

Cover the wetted area with a thin layer of Lexan or Plexiglas and position weights as needed to hold down the mesh. Let cure.

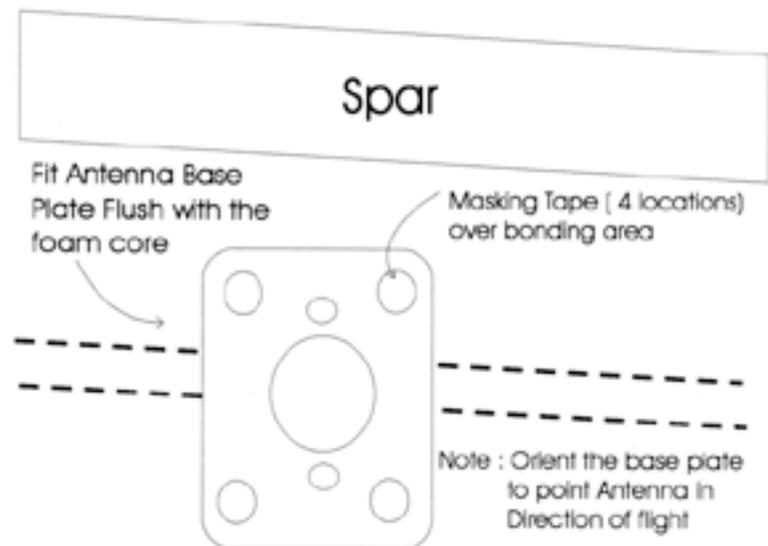
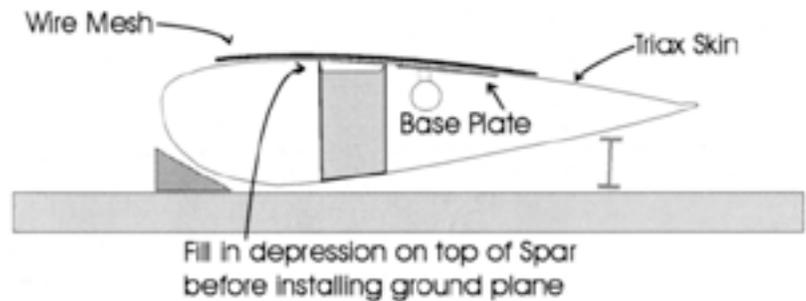
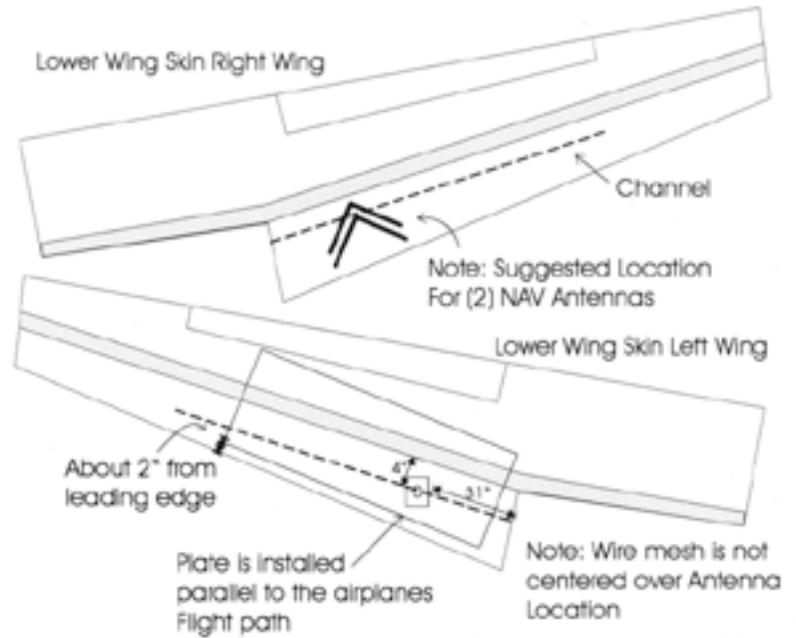
Using an awl, puncture holes through the skin and mesh to locate the antenna mounting screw holes and the center hole for the antenna cable.

When filling and sanding the wings, it might be easier to locate a toothpick in the holes during the "schmoosie" process – than it is to cover everything up and try to find the holes later.

Once the wings are filled, sanded, and primed – clean out the holes for the antenna mounting screws and enlarge the center hole for the antenna.

Fish the antenna cable from the antenna location through the channel and into the wing strake area. Both B.F. Goodrich and Insight recommend against splicing the antenna wires. Since the antenna lead is hard-wired into the StormScope receiver, and the lead to the Strike Finder reaches all the way to the instrument panel – there is no easy way to remove the cable once it is installed. Therefore, if you want removable wings, there is no other option but to have a quick disconnect fitting wired into the antenna cable.

Spicing and installing a quick-disconnect coupler is not a simple task. This operation needs to be done by a professional avionics shop. The same holds true for the wiring of the StormScope or Strike Finder system.



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Antennas

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You have the option of sending the antenna wire to Velocity for the installation of a quick-disconnect fitting. To do so, loop the antenna wire through the bottom bolt access hole to allow a 12-inch service loop. Cut the wire into two pieces. Send both pieces to Velocity, Inc. in Sebastian, FL. The current cost for the disconnect hardware and labor is \$300. (Please don't ruin the performance of a \$5,000 system by trying to splice this wire on your own).

The installation of a metal ground plane necessitates moving the NAV antenna that would normally be positioned in this area of the wing. We suggest relocating the NAV antenna to the other wing, positioning the two NAV antennas in the locations shown in the sketch.

Customers can order this custom service option when ordering Fastbuild Wings from the factory. The cost runs \$600 and includes the wire mesh, the installation of the antenna base plate and ground plane (as described above) and the quick disconnect feature to the antenna cable. The price does not include the actual cost of the StormScope or Strike Finder, antenna, antenna base plate, or the antenna cable.

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We need your input for this newsletter to be a success!

- Builder Forum Input
- First Flight Photos
- First Flight Stories
- Velocity Flying Adventures
- Velocity Fly-in Suggestions

PLEASE!

Send your photos / stories to Rick Lavoie for the next newsletter!

Electric Buzz...

by Wayne Lanza



In this issue of the 'Views, I'd like to mention a couple of tid bits regarding wiring and new electrical stuff. I get a lot of inquiries regarding wiring as you'd expect but there are a lot of questions that I can not and should not be answering. OK now don't get mad at me yet, let me finish... I am a contractor at Velocity and have one of the best jobs in the world! As this contractor deal goes I will honestly charge Velocity for my time supporting certain products sold by Velocity, many are designed and build by my company (Composite Design, Inc). BUT when questions come up like "How do I wire the B&C alternator and regulator?" or "How do I wire my intercom?" and the all time favorite "If I buy the harness, how many feet of wire will I need to finish?" The answer is the same, I don't know... Hate to sound like a jerk but I really can't help with these types of questions. Off the soap box now, back to useful information... As you may recall from some of my earlier articles, I am adamant when it comes to using proper tools for wiring your aircraft. Crimping and wire stripping tools need to be adequate to ensure a reliable electrical system. So after much thought and reflection and finding my Techni-Tool catalog, I'd like to recommend the following tools. I am recommending tools

made by IDEAL, they are a great company and I have used their tools for many years. You can contact Techni-Tool at 800-832-4866, 8AM-5PM EST.

For a wire stripper order (Techni-Tool) catalog number 462ST034, cost about \$30. This has the most used blades - strips 16-26 gauge wire. The crimping tool is catalog number is 462ST500, this includes the crimping frame and dies for crimping red, blue & yellow terminals (22-10 gauge wire), about \$60. The nice part about this tool is that the dies can be changed for different operations. So if you will be doing your own coax prep order die# 462PA581, about \$24. A useful tool for stripping coax is catalog# 618TE255, ~\$16.

As with the stripper, crimper and coax stripper the tools are all designed for the wires and terminals to go in one way. For example, the crimping tool die does a double crimp operation on insulated ring terminals. On the die you will see three dots - red, blue and yellow. The dots tell you the color of terminal for that die and that is the side where the wire goes into the terminal. Do not put the terminals in backwards!

Now for some really cool high tech engine development news, I'd like to extend a copy of my report on the Continental 550 / Aerosance FADEC project.

The FADEC concept from Aerosance has been well thought out but we had several problems with the cabling and interface hardware that had to be resolved. I have an extensive electronic background and feel that without this experience we would still be trying to get things right. The president of Aerosance worked with me for several days and we got most of the details cleaned up, he was very knowledgeable and a pleasant fellow to work with. Engine start was uneventful with all systems nominal... The next task was to get the information to

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Electric Buzz

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the Blue Mountain system. Greg Richter made the scene and did a great job of getting the software to work but in the process we found a couple of more minor problems with the Aerosance hardware interface. I was able to remedy these issues and when Greg left we were about 100%.

Bottom Line: Aerosance has done a good job of design but has some details to address for an experimental installation. This is not a negative towards Aerosance, there were a lot of variables unknown to them regarding this installation. Now we know & are in the process of implementing a redesign of problem issues. * Instrumentation is something that needs consideration. The Blue Mountain works but if you are not using their system your options start getting limited. Standard off the shelf engine instruments cannot be used with this system! Most of the probes are part of the FADEC package, they are pre installed and go directly to the ECU modules. Engine data is only available via a serial data source.

Plans:

Composite Design is involved with Aerosance in an effort to redesign the cabling and interface hardware for FADEC installation kits that will be used in experimental aircraft. My objectives are to basically get things to a true plug and play format. This will reduce installation time, confusion, and possibility of error, while allowing the cabling and sub systems to be tested and documented by Aerosance. It will also make trouble shooting a lot easier as more of the system is standardized. To get this stuff to work properly from one type of A/C to another is at times a challenge. * I am the U.S. rep for Digifly, and old Italian company that manufactures electronic flight information systems. Their new fms100 EFIS system is a really nice solution that when coupled with their AHRS and engine module can replace everything in the panel, except radios.

We are in the process of modifying an fms100 display to operate as an engine data display that will directly interface with the FADEC. This could go as an OEM product through Aerosance if all goes as planned...

Comments:

If you feel that the FADEC will benefit your flying needs then I'd recommend the Aerosance systems without reservation.

I'm not too keen on using the Vision Micro System / FADEC for engine data. I have "picked up some bad vibes" regarding this solution.

♦♦♦♦

CFI Notams

by Nathan Rigaud, CFI



Too Cocky for his own good

We had a Velocity owner and his CFI, lets call him Dick, come to Velocity last week for a visit. Dick, his CFI, was going to fly the Velocity back home for the owner. They both came into the Service Center and talked to me about getting some flight training for Dick before he flew the airplane home. The only problem was the Velocity trainer was down for maintenance for a short period of time and not able to be flown. Also, there was no phone call to schedule flight training for Dick so we had nothing planned. They asked me about flight training in his airplane, but I do not do that for a number of reasons.

We talked a few more minutes and then the owner and Dick left. A couple of days later, Dick shows up and starts talking with some of the other builders in the service center asking

general questions about Velocities and about the airport procedures. Well, Dick decides to start the airplane up, and proceeded to taxi to get some gas. After filling up with gas and checking out the local airport, he decides to taxi out to the runway and do some high-speed taxis to get the "feel" of the Velocity. After a short run down the runway, the Velocity became airborne and went about seven feet into the air. Dick now realizes that he is flying and decides to cut the power and land back on the runway before going any further into this flight. Dick cuts the power, and what happens, you guessed it, the nose comes up and the canard stalls and Dick comes down like a ton of bricks. As Dick hit the runway, the left main and the nose wheel broke off and came to a stop in the grass at the end of the runway. Dick probably now realizes that he should have waited and received some of that flight training that we talked about a few days before. After getting the airplane on a trailer and back at the shop, more damage was found. The prop had both blade tips missing, the left winglet and rudder were damaged, and the belly had some damage.

Even though Dick has his CFI and has flown other types of airplanes, this airplane handles a little different and requires some flight instruction.

If you are planning to do only a runway taxi test, then be ready to fly. Anytime you put an airplane on a runway, you should be ready to fly that airplane. Be prepared that when the plane becomes airborne, you have everything ready to fly it safely and able to get the airplane on the ground in one piece. Something as small as putting your seatbelt on, or making sure you have enough gas, or the biggest question, do I have the ability to fly this airplane?

Don't be a Dick; get proper instruction before flying any airplane. Thanks Dick for teaching us another lesson on what not to do.

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Builders Forum

Builders Forum is full of tips, information and letters ("material") supplied to *Velocity Views* Newsletter from individuals that are Velocity builders (or want to be builders). It is provided as "USE AT YOUR OWN RISK" material. Neither Velocity Inc. (The Velocity Factory) nor *Velocity Views* Newsletter (Lavoie Graphics & Rick Lavoie) have endorsed this material, and disclaim any liability for the use of this material. Individuals who use this material for the operation, maintenance, or construction of their homebuilt aircraft do so at their own discretion and at their own risk. Any variance from the builders manual is high risk.

New prop, new airplane

by Gilles Gratton of Embrun Ontario

Once upon a time when I took my first flying lessons back in 1978, I looked upon airplanes as complicated machines made up of intricate parts and pieces put together by geniuses and mechanical wizards in big factories probably in a foreign country. As I became more and more familiar with the Aeroncas, Cessnas and Pipers at the local airport, I soon realized that yes they were intricate and complicated but nevertheless they were the products of human ingenuity and they were necessarily assembled by ordinary human beings. In any case, I would leave the building of airplanes to the factory people. When a friend of mine told me that he was building his own plane, I thought that he must surely be out of his mind; why would he trust something not built in a factory by qualified persons.

Then in 1988 I acquired an Aeronca Chief that needed a new fabric job. I embarked upon this project with the help of a friend who had previous experience with fabric covering. This really convinced me that airplanes were not such a mysterious piece of equipment and that any reasonable person with reasonable skills could work on them as long as one is patient, precise and particular. This rebuilding project turned into a masterpiece, the envy of fellow pilots at local fly-ins and even at Oshkosh in 1994. This success would lead me to more interesting projects.

My friend Nigel Field, flying his own Vari-Eze, challenged my skills again by suggesting that I should build my own airplane. I had previous experience working with fiber-



glass, building veterinary mobile units and contracting fiberglass parts and molds for Clarkson University's Solar Car Team which my son was leading while doing his masters degree. I had been dreaming of owning a Velocity, my wife agreed with the project, my son and daughter-in-law (both mechanical engineers) volunteered to help. So the project got under way and two and one half year later, I conducted my first flight on the Velocity LWFG, C-GDOU.

Meanwhile during the Velocity construction, I was looking for the ideal prop that would propel my airship which was to be powered by a Franklin engine. My friend Nigel surfaced again telling me that if I could build an airplane, I could build a propeller. (He had already built three different ones for his Vari-Eze). He promised to coach me in the process. The challenge was on. My son Mathieu, the engineer, took care



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of the designing. After two months of wood carving, blade aligning, fibreglassing and sanding, I came up with a usable prop. We used Don Bates' optimizing program for designing and Nigel's own construction technique. It's basically a three blade prop, 67 in. diameter and a true pitch of 73. The blades are carved out of laminated pine and are held together on a carbon fiber hub using E glass spars inserted in grooves under the fiberglass skin. A carbon fiber tip allows to obtain a thin airfoil at the tip while at the same time being very strong. Glassing consists basically of intersecting layers of uni glass on the blades covered by multiple intersecting layers of bid glass on the hub. Balancing and tracking of each blade is especially important throughout the construction process. Final balancing is done on a ball bearing spindle during the finishing and painting process.

This prop turned out to be very good on the Velocity. Performances were acceptable and the price was right (total cost of material was around one hundred dollars (100\$). But after flying it for about 100 hrs I now realized that this prop was not quite what I needed to get the Velocity out of the 2500 feet grass strip that I was using as home base. Even after removing the cuffs on my elevators, take-offs on grass were sluggish, not to mention darn dangerous on a short strip with obstacles at both ends. I was not getting maximum power out of the Franklin engine since the most I could get on take-off was 2475 rpm. (Nigel had warned me that the first one would not be right for my plane even if I had purchased an expensive fixed pitch prop from conventional sources).

So back to the drawing board. After getting an update from Don Bates' program, Mathieu configured another prop with better take off performance. Figures spewed out by the program indicated that I could get 2800 rpm out of a 67 in. prop with a true pitch of 68. We opted for scimitar blades, hoping to

achieve a self-induced variable pitch effect on take off. (If nothing else, it certainly would look different than anything else on the market today.) Isn't that one of the objective of experimental building? Scimitar blades are not part of Don Bates' options but were Mathieu's own contribution to the design. So another few months of carving, glassing and finishing and the Velocity became airborne in less than 1000 feet on the grass strip. Whow! now that's a different airplane. Now turning at 2775 rpm on take off, the Franklin is now very well matched to this new accessory. And I really like the feeling of being pushed back into my seat as the Velocity accelerates. And those grain bins at the end of the runway look a lot better from 900 feet up. OK, I did sacrifice 10 knots in cruise, but I still get there ahead of everyone in the local flying club. If you think your Velocity makes heads turn on a ramp, wait till' you run it with a scimitar prop that is one of a kind.

Oh, I forgot to mention that this second prop set me back for another 100\$. Maybe if I save enough, someday I will be able to afford a variable pitch prop to recover those bygone knots in cruise

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N713MR FIRST FLIGHT

by Ronnie Brown of CORNELIUS NC

March 4th was a perfect weather day, high clouds and very little wind, my Velocity 173 Elite RG made its maiden flight lasting 40 minutes.

It was a chilly 40 degrees when I got to the airport at 9:00 am, but the excitement was building and somehow it didn't feel that cold at Lincoln County, NC. We followed the first flight plans developed by Dale Ensing, our EAA Chapter 309's (Charlotte, NC) flight advisor and myself. Dale had just completed the EAA/SportAir FA class at Lakeland. We had a ground crew recording data via the flight test frequency 123.45, three folks in a pick up truck and large fire extinguisher, and an

RV6A chase plane with pilot and observer. And a bunch of folks taking pictures and videos. I had kept my planning for the first flight pretty quiet, only inviting the flight advisor, his assistant, and two folks in the chase plane. Somehow the word had gotten out and the audience had grown to over a dozen people. But, no problem, I had rehearsed, I was focused, and tried to keep my mind on the task at hand.

When I got to the airport at Dale Ensing had just arrived. We went to the plane and took the cover off. I briefed him on how to open the nose hatch to disconnect the battery, how to unlock and open the pilot's door using the key, where the master switch and emergency fuel shutoff valves were. I also had chosen runway 23 since there were better emergency fields to the south and west. Then the Andy and John arrived in the RV6A, Howard and Don Sink in his 172, John Schroeder and Ron Szot in a 172, Jim Schnicker in his recently finished Wittman Tailwind, then my wife, Mott and son-in-law Jerry drove up. Then my dad's deaf friend who loves flying and had been tracking my construction project for the last two years and taking great digital photos, arrived to take pictures. Then there was Ron Archer, who had just completed a RV6, offered his helmet, parachute, fireproof jump suit, fire extinguisher, - wow! I took him up on the helmet and fire extinguisher. I already had cotton clothes on and a heavy leather jacket. But Kent Ashton and his newly finished Cozy IV hadn't shown up. We decided to go ahead without Kent. (Later he called to say he couldn't get his engine cranked 'n his primer lines had plugged up).

Dale conducted a preflight briefing, assignments were made, emergency crash fields were discussed, and the ground crew were shown the airplane's emergency features. I decided that since it was a bit chilly, I would make one high speed taxi test before the first flight. Andy and John took off in the RV6A after I took the

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runway, ran the power up to full throttle, held for about 30 seconds and then released the brakes for a trial run up to 60 knots and lifting the nose a bit. Engine is running smooth and strong, although only getting 2200 rpm due to the highly pitched Catto prop (66" dia x 72" pitch). I let it coast to the other end of Lincoln's 5500' runway, then taxied back for the take off. By now, Andy was up at 2000' on a right downwind.

I then took the runway, nervously adding full power. A touch of right brake and here we go! The Velocity with its new VGs but in rough primer, rotated well before my 1500' take off abort limit. (The factory trainer that I flew in December with Nathan was a 173 with VG's and it flew GREAT so I had to do mine the same way.) Dale asked what my rotation speed had been, I uttered 'Uh, I don't know, I didn't have time to notice'. But she rotated easily, wings level and gained speed to 100 knots and I began a slow left turn to crosswind at 500'. Wow, it flies!!!! Andy flew across the airport and caught me on downwind and announced that everything looked great - no smoke, no fluids and no parts falling off. I continued the climb up to 3000' (2100' AGL) reduced power to about 2200 rpm (the most I saw was 2310), to reduce the speed to 130 knots as I leveled off - not bad for the gear hanging out. The head temperatures had gotten up to 344 degrees on the climb but the oil never got over 200. These dropped to 320 and 190 after I leveled off. I decided to get it trimmed and see if I had a heavy wing. Sure enough, it started a slow turn to the right. Ah, ok, not too bad, maybe one shim. But wait, let's try the aileron trim. Tap left, once, twice, three short ones. All right, it is flying straight now!!!! I asked Andy to close up and check my ailerons. Andy reports they are straight. Wow. After three years of building strakes, checking incidences, leveling fuselage, leveling



Ronnie Brown and wife Mott, just after shutting the engine down after the first flight.

wings, and checking incidences, it flies straight! I never was so lucky on any of my RC models. Invariably, all my wooden wings seemed to take on a bit of twist after all the construction was done and the wings were covered.

I flew a race track pattern over the airport at 3000 feet MSL for 20 minutes checking temperatures, flows, pressures, and air speeds. Making gentle turns left and right, checking rudders (pretty stiff at 130 knots). Everything was in the green and working great. I was even getting comfortable, then it came to an end. Its time to start working on the number one objective, getting this hunk of fiberglass back on the ground safely with wings, wheels and me intact! I slowed to 110 knots, called out data to the ground crew, then to 90, 80, and 70. Still no pitch buck but the nose sure is getting high. With my helmet limiting how high I can look over the glare shield, I start getting even more nervous but I pressed on, pulling back and trimming, finally feeling a bit of buck at 65 knots. Ok, power back up, and climb back to 3000'.

After a lap or two trying to decide which runway to land on, we chose 23 - winds were still light and variable. I got to midfield, and started the 1000' above the airport practice

approach and did my GUMP check. Then powered back to 1200 rpm, started a 500 feet per minute descent, turned base and final slowing to 70 knots 1000' above the runway. Feels pretty good, add power and turn back to the downwind still at 1000 AGL. Checked GUMP again, slowed to 100 knots, turned base, but my final was wide, high and I'm still at 100 knots. I decided early on final that this wasn't going to be a good one, announced my intentions that I would do a go around after getting down to 100-200 feet. Add power and back up to the downwind.

This time, I announced that I would make the down wind wider since what wind there was, was pushing me to the left. After I turned base, Andy and John were above me saying I looked awfully low, doing a worm burner approach. I checked the VASI lights and announce that I have two white lights and therefore I was above the glide slope. Hmm, 90 knots and a bit high, I pull the power down to about 1000 rpm, and here comes the red light, right on the glide slope. Now I'm down to 80 knots and I announce this one is looking good, I'm going to put it down this time. Down to the numbers, pull the nose up and just above the asphalt, letting it slow down and kerplunk, and

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whiff of tire smoke, and no bounces, a GREAT landing (probably the best I'll ever make!). After coasting to the other end, I released my death grip on the control stick. WOW. What a great flying airplane!!!

I taxi back, thumbs up everywhere and I popped the door open. Mott comes up and gives me a big hug and kiss after I got the helmet off ñ just like a NASCAR driver. Then I climbed out, lots of big grins, and hand shakes and atta-boys. What a fantastic first flight in an unbelievably great flying machine, everything worked just like it was supposed to. Plan the flight, fly the plan, just like in the Flight Advisor's work book!

And THANKS to the folks at Velocity, Inc.; ALL of you on the Reflector; and my great friend Jim White who pushed me over the edge! Oh, and Steve Korney who has been a great long distance friend after meeting him at Oshkosh in 1998. And you too Rob!

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