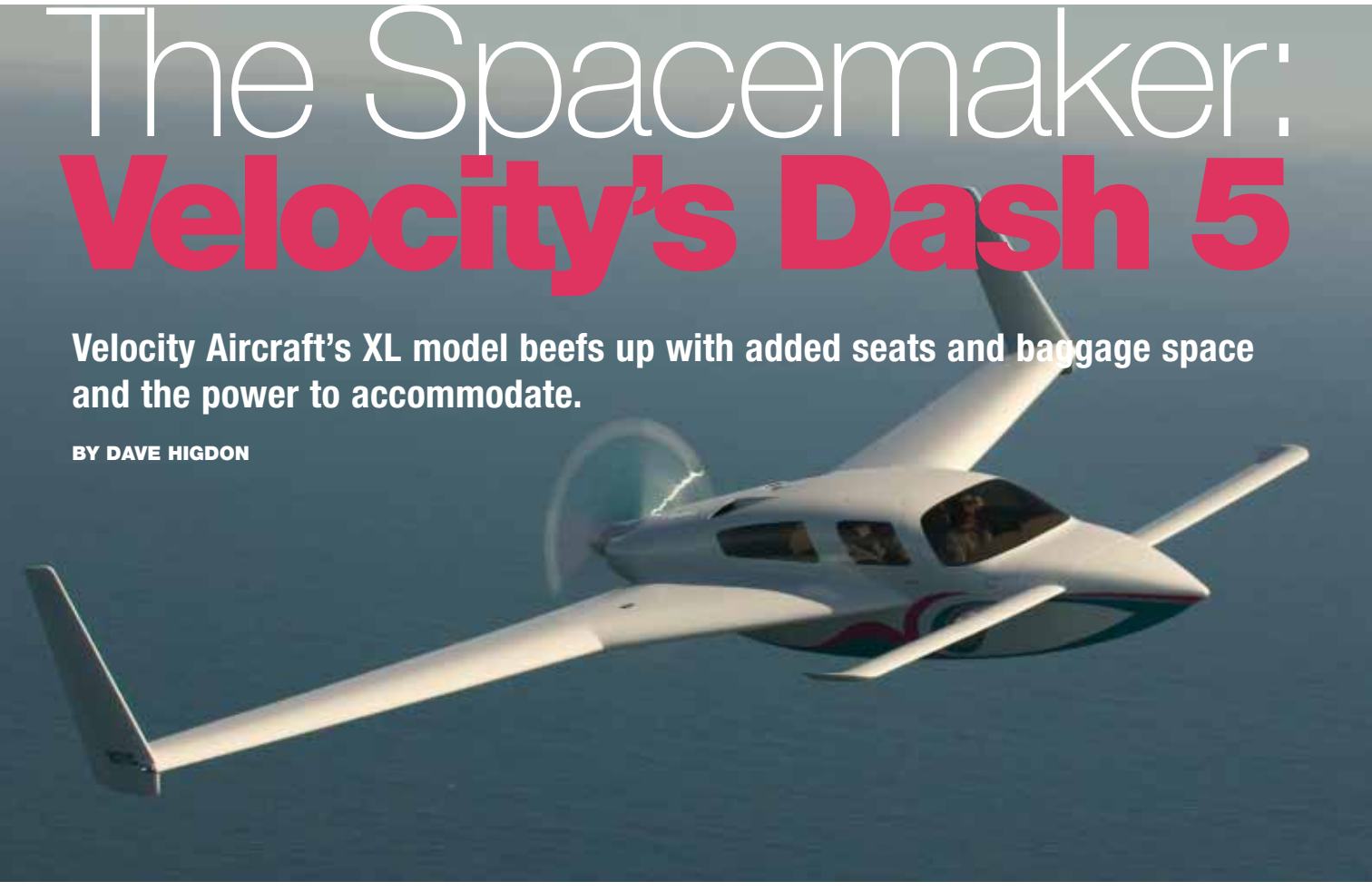
The Spacemaker: Velocity's Dash 5



Velocity Aircraft's XL model beefs up with added seats and baggage space and the power to accommodate.

BY DAVE HIGDON

Ever find yourself in a dream-state movie that stars you as the pilot-in-command of a futuristic aircraft—a sleek, sexy, sophisticated machine with remarkable capabilities but almost intuitive flying response? Or find yourself filling in for a lack of external stimulation with some old-fashioned fantasy flying, zooming around the airspace in a one-of-a-kind speedster that's equally at home at major metropolitan airports and out-of-the-way aerodromes?

What you do during these flights doesn't really matter—saving the world, meting out justice, uncovering an unknown wilderness or just drilling holes in the sky. What matters is that you indulge yourself in some aviating daydreaming. If that description fits you, then you might find some time to fantasize about flying Velocity Aircraft's Dash 5.

Sleek, sexy and speedy, even the *Dash 5* nickname imparts a secret-agent tone to the plane. That Dash 5 indication notes the latest Velocity model's seating capacity, but far more went into making the XL into the Dash 5 than a simple seating change. In addition to adding the ability to seat a fifth in back, Velocity made the Dash 5 a more flexible flyer with in increase in gross weight, extra baggage space, more packing versatility and additional passenger comfort.

To support all this new capability, Velocity also gave the model more engine and braking power. And, the company managed all these changes in an aircraft that gives up nothing to its competition or its hangar mate, the original XL. This Velocity retains the futuristic good looks and responsive handling that makes a fan of pilots looking for both hot performance and practical utility in a high-value package.

The Dash 5 XL: What's in a Name?

Velocity gave meaning to its names by labeling its larger-cabin model the XL in 1997. Designating an eXtra Large Velocity, the XL meant an additional 5.5 inches in width, 10 inches in length, 1 inch in height for the front seat and 2 inches more height for the back seats. The XL also accommodated big-bore six-cylinder engines and either the standard 70 or optional 93 gallons of fuel, flew faster and carried more than anything in the company's line.

With the 2003 introduction of the Dash 5, Velocity also gave the world a link between the name and its signature departure from the XL—the three-person rear bench seat. Velocity notes that it intends the bench seat for three children, not three adults. But the focus on the seating capacity alone ignores other advantages of the Dash 5.

For example, the broad rear seat—it's 49 inches wide at the hip, 50 inches at the shoulders—employs a 60/40 split useable in a variety of configurations. First, with the back seat full up, the luggage platform measures 48 inch-

es wide and 18 inches deep; the bench seat also sports a center armrest. Second, you can fold down the narrow portion for luggage, leaving the wide portion for two children or an adult—and still use the armrest.

The wide part of the seat may be folded down, leaving the narrow side useable by a child or small adult. Or you can fold down the entire back seat for luggage—and a lot of luggage at that, with a space 50 inches deep and 48 inches wide. The Dash 5 also employs a much-shorter keel tunnel, opening up the floor for six legs.

Velocity accomplished these improvements with no external changes. The Dash 5 retains the same 20-foot length, 31-foot wingspan and 15-foot, 8-inch canard span as the standard XL. But the higher gross weight improves the Dash 5's ability to handle a wider range of payload/fuel combinations and more seating/luggage variations.

Best of all, the Dash 5 accomplishes these gains with minimal change in performance or handling—two areas in which both XL versions excel.

Total-Tech Demonstrator

The Dash 5 demonstrator employs some seriously high-technology gear that enhances its fantasy-flyer credentials. Starting in back is a three-blade MT composite prop, a constant-speed unit optimized for its role of driving the airplane forward instead of dragging it. The MT translates the engine's power into vibration-free, fuel-efficient thrust at a sound level lower than what I expected.

Bolted in ahead of the MT sits Teledyne Continental Motors' (TCM) proven IO-550, a naturally aspirated six cylinder that produces 310 hp. But if TCM's own tests hold true on this mill, the engine could be making as much as 15 additional hp thanks to the installed Aerosance PowerLink FADEC system.

A fully digital engine management system, PowerLink unifies and automatically adjusts spark timing and fuel flow. A series of multiple sensors on each cylinder track exhaust gas temperature, cylinder head temperature, manifold pressure, ambient and atmospheric temperature and engine speed. All the data goes simultaneously to three redundant processors, which in turn adjust the ignition pulse, spark timing and fuel pumped precisely from individual electronic injectors.

No mechanical magnetos, no constant-flow injectors—and no red mixture knob. The net result, according to Aerosance and TCM: up to 15% better fuel efficiency and up to 5% more power. And power is controlled through a single lever, much like a turbine engine. The 15% improvement in fuel burn translates into an extra 150 n.m. on the 1000 n.m. available from the standard 70 gallons of fuel.

In the panel, Velocity opted for a dual-screen installation of Blue Mountain Avionics' EFIS/One system. Sporting two 10.4-inch screens mounted portrait style, this EFIS/One installation offers all the advantages of the full-featured BMA package. Those tools include all the attitude and air-data information of a primary flight display package, the navigation options of a multi-function display and horizontal situation indicator and the engine-management tools of an engine information control and alert system.

N271TC, the demo plane, also employs the datalink receiver needed to download and display satellite-delivered subscription weather information from WSI. By providing composite radar images, graphical and text METAR and TAF reports, and even cloud-top reports, the WSI product provides pilots with in-flight tools that beat the verbal descriptions of the best Flight Service briefer you'll ever hear on Flight Watch.

For baseline navigation and communication, N271TC sports the cutting-edge Apollo CNX80 all-in-one IFR GPS/VHF navcom. Capable of displaying datalink inputs for both weather and traffic, the CNX80 is also equipped with a WAAS receiver capable of providing GPS-guided instrument approaches nearly equal to the gold-standard ILS—but at airports without ground-based equipment. That is, as the FAA writes and implements such WAAS approaches, a process currently proceeding slowly.

There's nothing old-tech in this factory demonstrator, and it shows in the ease of managing it in-flight.

On the Ground

It's not always science fiction to claim great strength in seemingly conflicting traits. The blend of sporty response and inherent stability the Dash 5 exhibits stands as evidence of this truth where handling is concerned.

Likewise, the Dash 5's high-speed capability comes without degrading the Velocity's low-speed performance or enviable runway needs—about 1400 feet for a gross-weight takeoff and about

The Dash 5's three-blade MT composite prop is a constant-speed unit optimized for driving the airplane forward instead of dragging it.

Velocity Dash 5

CONTINUED

1600 feet for landing. With the assistance of Nathan Rigaud, the company's factory demo pilot, I started my demo mission with the requisite preflight walk-around.

As preflight inspections go, the Dash 5 makes the tour quick and easy. With the tall gull-wing doors open, you can generally see the center-mounted stick from anywhere you can make it waggle including the canard's elevator surface and the ailerons. A rudder check on a conventional tractor-configured aircraft amounts to little more than pulling inboard on the tip rudders and assuring that a return spring brings them back to the stowed position.

Rigaud supervised me during my check of the fuel tanks, the canard attachments and the landing gear.

After strapping into the left seat, the great view of the wing, the canard and their control surfaces made easy work of confirming the linkage between

rudder pedals and tip sails and between the rudder pedals and the tip rudders.

Pre-departure cockpit checks include a backup power system for the FADEC system and a standby battery, as well as some self-test functions of the FADEC system itself. From there, it's time for engine start. As with my previous experience with the PowerLink system, the big Continental started effortlessly and more like a modern car than the typical aircraft engine, regardless of brand, model or fuel-supply system—carbureted or injected.

We needed virtually no warm-up time because N271TC had flown for my cameras earlier in the day, so with Rigaud coaching me on steering, we headed for the main runway. The coaching helped because the Velocity requires a learned combination of power, speed and differential braking—no nosewheel steering, as with several of today's tricycle-gear factory and kit aircraft designs. As Rigaud suggested, the best steering comes with a few mph of speed and a bit more than normal taxi power to counter the deceleration that occurs with any brake application. And turning to a stop works best by ending the taxi with braking to straighten the nosewheel. As many a pilot knows, doing it is easier than describing it—and Rigaud didn't flinch once during my taxi to the run-up pad.

Final run-up checks include a final check of the FADEC's backup power and its redundant processors, cycling the prop and checking the EFIS/One display for the configuration desired. For me, that meant having the engine parameters sub-screen showing over the lower portion of my display.

Inflight Impressions

Doors latched, lights on, transponder on Mode C. A little nudge on the throttle knob started the Velocity rolling again, and with a minimum of coaxing it lined up with the runway centerline. Power at redline, and the Dash 5 surged ahead—of course, wanting to dart toward the left side, it required a bit of right brake to counter...but only once.

The tip sails became active quickly (at about 25 to 30, it seemed), and quicker than I expected, the Dash 5 accelerated through 70 knots. A couple of fingers worth of back pressure on the center stick brought the nose up, and the big Continental pushed us skyward at about 1000 fpm—at about 120 knots, no less.

Slowing to 90 sent the VSI needle swinging toward 1500 fpm, yet the view over the short, sloping nose remained pretty good. Mind you, for my usual flying habits, 120 and 1000 fpm makes me more comfortable—it gets me away from the airport area much faster, gets me to altitude fast enough to bring smiles to the faces of terminal controllers and gives me a much better view of the sky ahead.

That said, the ability to fly the Velocity at full power and as slowly as 65 knots adds tremendous flexibility for blending with other traffic, depart-

ing airports in constrained areas, and for the plain-old *Gee-whiz!* factor that comes from feeling like you're climbing in a Mercury capsule or *SpaceShipOne*.

Whether flying at the cruise-climb setting at max-climb attitude or leveled out for high-speed cruise, the Dash 5 answers control inputs immediately and with full tactile feedback. It took only a couple of roll-in/roll-out/roll-in maneuvers for me to realize that the Dash 5 responded to the slight muscle pressures that came with thinking about turning—much like a well-rounded motorcycle reacts to its rider's smallest body inputs. A slight bit of rudder at the start of a turn helped with roll/yaw coupling, and after a few tries I could keep the little black ball centered throughout a turn, from start to finish with no altitude change.

Even pulling back into what passes as a stall gave me a feeling of complete control. Pitch pressures increased as air-

Velocity equipped the Dash 5's panel with a dual-screen installation of Blue Mountain Avionics' EFIS/One system.

speed decreased, just as they should in a well designed aircraft. The nose seemed to stop flying at about 65 and drop a few degrees and then start flying again before hitting 70. The main wing never seemed to get mushy, and aileron control remained strong enough to control roll throughout the exercise. Aileron pressures grew with the degree of roll input applied, and the feedback made easy work of stabilizing a bank or fighting off wing drop at the Dash 5's slowest.

Even the rudder pressures felt balanced and proportional, whether controlling a crab or correcting from a skid or slip. And because the nosegear doesn't respond to rudder inputs, crabbing to a touchdown doesn't bring the threat of the nosewheel touching down at an

The Dash 5's broad rear seat employs a 60/40 split useable in a variety of configurations for added seating and luggage space.

Not traveling light? Simply fold down the narrow portion of the Dash 5's rear seat, and you'll have added luggage space and seating for two children or one adult.

Fold down the wide part of the rear seat for even more luggage space, and you'll still have seating for a child or small adult.

angle, a great crosswind benefit.

The Dash 5's gear-extension speed helped me slow the big Velocity in the pattern, with 90 knots entering downwind and slowing to 75 as we crossed the threshold. Landing well challenged me more than any other aspect of flying the Dash 5, likely attributable to my lack of recent experience in a canard-configured aircraft. But the heavy-duty fiberglass maingear forgave my initial clumsiness. And with Rigaud's tutelage, my Dash 5 approaches improved.

As is often the case with high-performance airframes, the key to smooth, short touchdowns amounts to nothing more than speed management on final. Arriving with too little speed creates problems equal to but different than arriving with too much. Shoot for 90 downwind, slowing to 80 through the base and easing back to 75 on final—then hold that attitude and manage the rest of the descent with power changes.

Slowing to a flare is not part of the

The tall gull-wing doors can be opened during preflight inspection so the pilot can easily see the center-mounted stick from anywhere he or she can make it waggle.

smooth-landing formula. Stalling the canard can bring down the steel-strut nosegear assembly at the wrong time and into runway contact before the mains touch. Here, attitude is everything. Best to hit the speed mark and hold that pose.

But it's the time between the climb and the descent that the Velocity XL-5 shines brightest. Speeding along at cruise brings the true-life fantasy of controlling a winged sports sedan at race-track speeds—187 knots true is no fantasy up here. For the statute-mile minded, that's about 215 mph.

For upwards of 1000 miles—or about 1150 with the FADEC-controlled engine.

And on 70 gallons, with reserves.

Comfortably and quietly.

The combination of pusher powerplant and the heavy-duty airframe made the Dash 5 much quieter than many composite factory airplanes in my logbook. Add to this the space, comfort and economy, and you have the fulfillment of many flights of fantasy.

The Price of Performance

Got access to a one-car garage, some normal hand tools and about $130,000? With a little time, patience and persistence, a similarly equipped Velocity XL-5 will call your hangar home.

With more time and patience you can do it for less; go without a slick EFIS panel and you can get there for less. Live with a standard-configuration engine, and the entry price drops further.

But with the quickbuild options available—for wings, canard, fuselage and the $3000 Dash 5 option, $130,000 isn't out of line for a version identical to N271TC.

Or you can take your Dash 5 in fixed-gear form at a savings of more than $6000, complexity and build time—for a loss of only 10 to 12 knots.

And for those who already own—or are currently building—the Velocity XL, the company offers a field retrofit kit and the option to install the bigger brakes and drop-down keel of the Dash 5.

FOR MORE INFORMATION, contact Velocity Aircraft at 772/589-1860 or visit www.velocityaircraft.com.