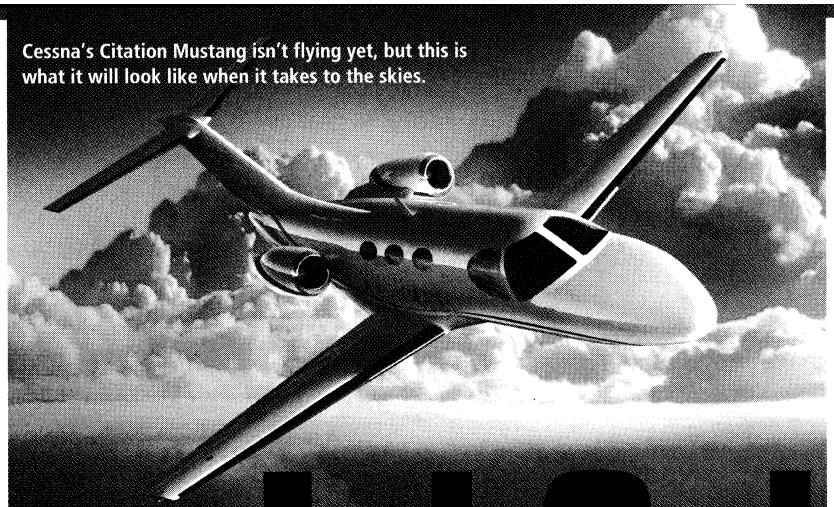


Cessna's Citation Mustang isn't flying yet, but this is what it will look like when it takes to the skies.

Joining the Jet Set

Seen here during flight testing, at $1.175 million, the Eclipse 500 is a revolution in price for the jet industry.

Aviation's Newest Acronym: VLJ

BY ED STEPHENS, JR.

LAS VEGAS IS a city of brash—but calculated—audacity, and there's no better way to describe aviation's nascent Very Light Jet (VLJ) industry. The VLJ revolution, and it is a revolution, was visible at the National Business Aircraft Association's (NBAA) annual convention, which saw about 30,000 industry pros per day bellying up to over 1,000 exhibits in the Las Vegas Convention Center from October 12 through October 14, 2004.

Oh, what a score for the little guys: Amid all the weighty iron, the ponderous corporate monoliths and the usual heavy hitters, the terms "private pilot" and "owner/pilot" were buzzing from one end of the center to the other. Yes, little jets are big news, which means that owner/pilots aren't just crumbs under the table in the business jet industry, but are now front and center as a main course.

The old boast that private flying is a way around the airline cattle cars is, finally, going to meet most of its promise. The near future is shaping up—and up, and up—into the jet routes, airspeeds measured in percentage of Mach (yeah, buddy!), digitized avionics that would put many airliners to shame, auto pilots, even auto throttles and serious IFR capability for serious point-to-point transportation.

The term VLJ is a new one, enjoying the industry's favor over "microjets" and "personal jets," so it looks like we've got another clunky abbreviation added to our lexicon. There is no definitive definition of VLJ, but think small: six seats, single-pilot capable and about 8,000 pounds as a rough upper limit, though that weight might balloon a bit.

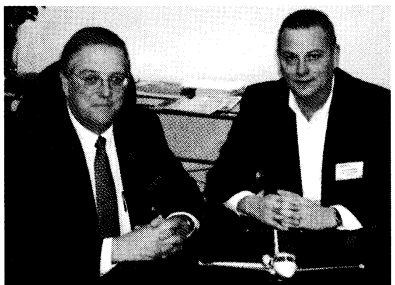
Two of the three top VLJ contenders are bold, entrepreneurial start-ups: Eclipse Aviation, of Albuquerque, New Mexico, and Adam Aircraft, of Englewood, Colorado. Both were founded by computer software magnates, so aviation is enjoying an echo from the computer technology boom.

Meanwhile, industry Goliath Cessna is in the VLJ business as well; that's an easy move for Cessna since it's already the largest player in the business jet industry.

The Eclipse 500

When history writes about the VLJ revolution, it will be the little Eclipse 500 that is cited as the shot heard round the world.

The Eclipse is the brainchild of founder and CEO Vern Raburn, who is an experienced pilot and part of the early Microsoft cadre. Eclipse has rolled with the punches and survived



Eclipse CEO Vern Raburn (left) gives *PRIVATE PILOT*'s Ed Stephens, Jr. (right) the latest scoop on their progress.

an abrupt change of course in the engine realm from Williams International to Pratt & Whitney Canada. Some things in aviation haven't changed since the days of the Wright Brothers, and pioneering aircraft are just funny looking anchors until they find pioneering engines to drag them out of the mud. That's evolution, baby.

Raburn expects FAA certification of the Eclipse 500 in the first quarter 2006, and they've already pre-sold their production clear into the first

part of 2008, claiming an eye-popping 2,126 orders so far. You can order one over the Internet (naturally) by downloading a form and sending it in with a deposit, and Eclipse reports that a number of pilots have done this without so much as talking to a salesman. The $1.175-million price tag is downright cheap in jet terms, and is, in fact, less than half the cost of many turboprops. It also makes the Eclipse about $1 million cheaper than its nearest viable VLJ competitor.

"In inflation adjusted dollars," said Raburn, "the Eclipse costs less than the Cessna 414 did when it was new." Now that's food for thought. In fact, the Eclipse is priced less than today's fully equipped Beech Baron.

With a pilot and three passengers, Eclipse projects an NBAA IFR range of 1,280 nautical miles. (NBAA sets very specific and stringent requirements for calculating IFR range). Eclipse lists a 375-knot maximum cruise speed and a Maximum Mach Number (Mmo) of .64 Mach, and the stall speed is listed at just 67 knots. Talk about a wide envelope.

More numbers: The Eclipse will top out at 41,000 feet, has a max takeoff weight of 5,640 pounds and a useful load of 2,250 pounds. It offers up to six seats, though five will probably be more typical, and lists takeoff and landing distances of under 2,200 feet in standard conditions. Huh, just 2,200 feet? Neat...but required runway distances have a lot of technical nuance in the jet world, and there is more to these numbers than meets the casual eye.

The petite PW610F turbofan engines push out 900 pounds of thrust each, and will be massaged by high-tech auto-throttles.

The Adams A700

As for Adam Aircraft, they've taken an interesting approach to matters with composite offerings. Their pressurized A500 piston twin is a push-me pull-you arrangement that looks like a slicked-up Skymaster on steroids. By removing the recips and hanging two Williams FJ-33 turbofans on the back, presto-chango, they've got the A700 jet with 1,200 pounds of thrust per engine, hefting about 7,600 pounds of max takeoff weight, though this weight hasn't yet been officially finalized.

Company founder and CEO Rick Adam is also an experienced pilot, and, incidentally, a West Point graduate. He's expecting the FAA to certify the A700 in mid-to-late 2005. The A700 will set you back $2.1 million, and gives you six seats (plus an aft potty). With that twin-boom style tail, this is one aircraft that won't be mistaken for anything else on the ramp.

In May 2004, Adam announced a $150-million order for its jets from a new charter company, called POGO, formed by two well-known aviation names, Donald Burr, founder of the legendary People Express discount carrier, and Robert Crandall, former CEO of American Airlines. That's quite a vote of confidence in the A700.

Cessna Citation Mustang

Meanwhile, Cessna's Jessica Myers (Manager, Media Relations), reports that they've muscled in over 230 firm orders for their VLJ, the $2.395-million Citation Mustang. Citations comprise the largest share of the business jet market, so they need no introduction to readers...or to customers, which means that the Mustang's success is already assured, or at least as assured as anything can be in aviation.

Of those currently owning positions in Mustang deliveries, "The large majority of the buyers are owner/pilots," said Myers.

Myers expects FAA certification in mid-2006 and the first delivery to customers by the end of 2006. The Mustang is a six-seater, and is Pratt-powered by PW615 turbofans that crank out about 1,350 pounds of thrust, though the final rated number may be a bit different. Cessna doesn't yet disclose a max takeoff weight, saying only that it will be "less than the CJ1's" of 10,700 pounds. Whatever it is, it will probably wind up defining the upper weight limit of VLJs in the common parlance.

Training

In order to serve as pilot in command of a jet-powered airplane, the FAA requires that a pilot is type rated in it (FAR 61.31(a)(2)). For

Here's a peek inside a mock-up cabin of an Eclipse 500.

NBAA conference attendees check out the Eclipse 500.

Adam Aviation's A700 is a composite Very Light Jet (VLJ).

The Adams Aircraft A700 is the jet derivative of the piston-powered A500.

VLJs, then, we'll be seeing private pilots, who are multi-engine and instrument rated, stepping into type training for the specific type of VLJ that suits their fancy.

Cessna's Citations are already an established part of the curriculum at simulator schools like FlightSafety and SimuFlite, so it's reasonable to assume that the Mustang will simply join these training rosters. In these schools a typical small-jet type rating takes two weeks and runs about $15,000. The first such week is typically just bookwork, no hands-on flying.

Eclipse is establishing a one-week, in-house training and type-rating course, and this will be more than enough time for a proficient pilot who hits the books beforehand to get competent in the jet. "At a minimum, we will require pilots to have a private pilot license with instrument and multi-engine ratings prior to entering the Eclipse factory school," says Eclipse.

For its part, Adam has participated in the FAA Industry Training Standard (FITS) program, and has developed a curriculum in line with this standard.

Let's demystify this training stuff: Jets are high-altitude multi-engine IFR platforms...nothing more, nothing less. Any pilot who can handle a piston twin on instruments will find that jets are, in most (though not all) ways, easier to fly than pistons. There's no mixture to mess with, no propellers to primp, no carburetor heat to harangue, no mags to monkey with, no turbos to tend and no feathering to fret.

In the realm of emergency procedures, engine failures are a ho-hum snooze; tail-mounted engines are so close together that there's little asymmetrical thrust, and since there are no props to feather, there's nothing a pilot need do in a hurry. And if you need to do a single-engine go-around in a jet, you've usually got plenty of thrust available for the chore.

Private pilots are only part of the training story, and VLJs are going to see serious service with professional drivers in corporate and air taxi roles. As such, we can expect all VLJ pilots to benefit from the formal, structured curricula that the pros use. Haphazard, shade-tree training sessions won't see any favor in the VLJ industry, at least while it's getting established, so don't look for "Bubba's Flying Skool" to be offering VLJ training any time soon...and even if Bubba does offer it, don't expect your friendly insurance agent to accept it.

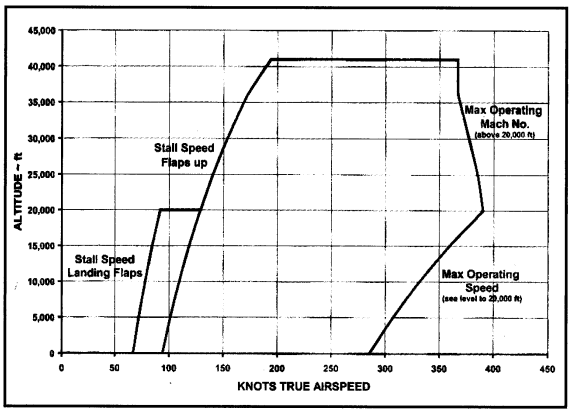
Insurance

Did somebody say "insurance"?

Some insurance experts covered their ears and almost ran away when asked about insuring private pilots in VLJs. But at least two companies are whispering enthusiastic things about the VLJ realm, though with two important caveats: (1) they prefer two-pilot operations in some cases, and (2) they are big on training, training, training.

Newbie jet pilots can probably expect to have a mentor or instructor riding shotgun until they amass a bit of flight time.

For its part, Eclipse has issued this statement: "Global Aerospace (formerly AAU), one of the largest aviation insurance providers, has announced that it will provide hull and liability insurance for Eclipse 500 customers. While it is too early to set premiums, Global has said it expects insurance premiums for the Eclipse 500 will be similar to those for existing aircraft, as



This aircraft flies fast and stalls slow; the Eclipse envelope shows remarkable aerodynamics. This is preliminary data.

long as customers successfully complete Eclipse's training programs."

Jets are fundamentally safer than anything else in the air, so the prognosis for insurance is excellent, but you have to play the game the way your insurance company wants it played. They will select which schools are approved for training, and they will demand recurrent training at approved schools as well. That's the way it works today, so it's really no change.

Money, Money, Money

Most pilots can't afford to buy a million-dollar jet, but that doesn't mean that most pilots can't afford to fly them. This is the age of fractional ownership, shared ownership and all manner of leasing schemes, rental arrangements, clubs and partnerships that spread the cost of an aircraft over the broadest possible number of users.

Meanwhile, in terms of new IFR iron, a million bucks isn't much these days. An equipped Beech Baron weighs in at about $1.15 million. A King Air 90 runs about $3 million.

Revolution? Yes.

Of course, the word "revolution" has always been used promiscuously in aviation, and for decades we've been told that every suburban driveway would have a helicopter in it, or that swarms of "personal aircraft" were going to alleviate the congestion on Interstates. Humbug.

But the VLJ is a genuine revolution. As Donald Burr, of POGO, said, "VLJ is a home run...I can't see why this isn't visible to people."

Well, it is not visible to some people because they either have some legitimate doubts about the technology, or because they're curmudgeons who will always insist that anything invented after 1972, or that costs more than a Ford Pinto, is just no darned good. But for the optimists among us, the time seems ripe for the miniaturization of computers to be followed by the miniaturization of jets. A million-dollar jet is the equivalent of a $500 desktop computer, and the "trickle down" theory will push prices down even further in the used aircraft market.

So, bottom line: Revolution, yes. Freebie, no. This is, after all, aviation.