



Dave Morss

TEST PILOT, ROCKET RACER, FLIGHT INSTRUCTOR, HOMEBUILDER

BY STEVEN W. ELLS

NEED A TYPE RATING for a B-25, F6F, F8F, P-51, P-40, L-29, L-39, T-28, A6M (Zero), Yak-3, -9, or -11, Spitfire, F4U Corsair, AD-1 Skyraider, Focke-Wulf 190, or Bf 109? Dave Morss is your man.

Dave, EAA 133735, is a well-known small-airplane test pilot; he flies air show demonstration and aerobatic routines and is likely to fly four or five different airplanes at the National Championship Air Races in Reno each year. He also does 25 or 30 first flights for kit builders around the country each year and is called on to do first flights after restorations of extremely rare warbirds and antiques. He's also often called to fly prototype airplanes. Dave is one of the few pilots on the planet lucky enough to feel the kick-in-the-butt acceleration generated by the 100-second burn of the rocket engine in a Rocket Racer airplane.

To say the least, Dave is an accomplished pilot. He has an Unlimited air show waiver for 20 to 25 different airplanes—he said he can't remember exactly how many.

He has built or restored nine airplanes; his working airplane is *Martin's Legacy*. When I first spoke with him the week before Christmas, he had just returned from a series of test flights on a Focke-Wulf 190 restoration. Later in the week he was flying a P-51 to gather test data for a new propeller. Dave seems to be involved in everything aeronautic at a deep level, but in spite of all this, he's as approachable as an airplane salesman at EAA AirVenture Oshkosh.

In addition to his long list of aviation firsts, Dave spends a considerable amount of time passing on what's he's learned during his 27,000 hours of flight time.

Dave said he was bitten by the flying bug at the tender age of 8 when he began building and flying glider models. Soon he graduated to radio-controlled airplanes before getting his first wash-and-sweep-for-stick-time airport job at the San Carlos Airport (SQL) in California.

HE was 16 when he earned his glider certificate at the old Fremont glider strip in a Schweizer 233. He earned his private pilot certificate at 17 and a commercial pilot certificate at 18.

“Absolutely, glider pilots make better all-around pilots; this helps me especially in my test pilot and race pilot flights where engine failures can happen,” Dave said.

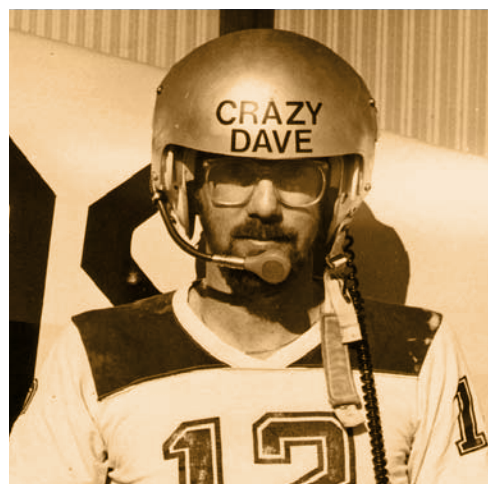
OUT ON HIS OWN

Dave moved to Salt Lake City in a second attempt to comply with his parents’ request that he obtain a college degree, but the school routine held little interest. He quit school, financing his ski bum life by working a variety of aviation jobs including flying cable inspection patrols, pumping gas at an FBO, and towing gliders three days a week. He was impressed someone was paying him to fly.

“When I first started flying, I set my goals on flying a Pitts, a P-51 Mustang, and a Learjet. I later added flying for United Airlines, flying off an aircraft carrier, and doing the first flight of a prototype airplane,” Dave said.

At 56 he has long checked off each one of those goals. He flew as flight engineer on a Boeing 747 for United Airlines, but found that it interfered with his fun flying and quit after a year and a half. He piloted a Grumman Wildcat off the flight deck of the USS Carl Vinson as part of the 50th anniversary of the end of World War II and has flown first flights on more than 40 prototype airplanes to date.

Dave’s early flying misadventures include a back injury when the Progress Aero Discovery he was testing got into a flat spin that he



had to ride to the ground. He’d let himself be convinced that the ballistic parachute the builder installed was sufficient, but it was undersized. He’d been talked out of wearing his own parachute. Never again, he said.

In 1975, when he was 21, he moved into a trailer behind the hangar at the Vacaville Gliderport. “I walked out of the trailer, took 15 steps, and I was at work,” Dave said.

Caption... Tossedipis inctemolor mi, qui to que non re nita vellorempore volores cumenihillum essim vercia cuptam qui.

If he wasn’t flight instructing he was towing gliders, teaching soaring, or giving scenic and aerobatic rides. On his days off, he learned to sky dive and then taught sky diving. He has made more than 300 jumps.

In 1980, Dave regrouped for a few months after he realized he was exhausted from his fly-anything-anytime routine. After a few months of flight instructing at San Carlos, he continued to fill in his pilot log-book by flying everything from a DC-7 fire bomber, to a C-46 Commando, to a Hansa Jet at locations up and down the West Coast and Alaska. During this period he tried the flight engineer seat on trans-Pacific flights in a United 747. His heroes had always been United pilots, and they told him to try it, even though none of them thought he would last. They were right.

MYRIAD AVIATION

By 1984, Dave saw changes taking place in the homebuilt airplane world.

“1984 was an interesting time,” Dave said. “Rutan had come out with plans that were a little bit easier to build.” Dave thought that this presented an opportunity as the industry began to ramp up. “I wanted to do the first flights in the new airplanes,” Dave said, so he started Myriad Aviation.

In the beginning Dave gained a lot of press doing these prototype flights, but upon reflection he said his real bread and butter has always been first flights of airplanes built by amateur builders.

FIRST FLIGHTS

Dave said that it’s not unusual for a kit builder to contact him months before the owner’s airplane is ready for the first flight. His answer is always, “Call me two weeks before you think you’re going to be ready,” because years of experience has proven that not one builder in 100 will be ready for a first flight on the date he or she is shooting for.

“I also tell them that they need to have the hard copy of the airplane registration in their hand before they call me,” Dave said. When owners call him for a first flight, he tells them to plan on two half days so he can



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inspect the first day and the owner can fix squawks before the flight on the morning of the second day.

“During my inspection I typically find half a day to two weeks of work that needs to be completed before the first flight,” Dave said. After the owner/builder has corrected the discrepancies he begins his first flight tests.

Dave has only flown three test flights on the first day he sees the airplane. One owner called Dave to fly his Glasair IIS. At the owner’s insistence that his airplane was perfect Dave agreed to bring along his helmet and parachute. He told the owner he’d fly it if it was perfect, and it was.

“After about three hours of inspecting I realized I hadn’t found one discrepancy,” Dave said. “I’ve flown hundreds of these, and

only one was perfect. That’s so out of the norm that I still remember it.”

First flights for common kit-built airplanes usually take about 30 minutes. “My biggest concern will be cooling. If the engine stays cool, that means I can climb, and I’ll climb up to five to six thousand feet,” said Dave. “When I come back from that half-hour flight, what I’m really doing is telling the owners that their airplane is going to handle like a normal one of that model airplane.”

DAVE’S DON’T DO LIST

“I can’t tell you how many times I go to do a first flight and there’s family and friends and helpers, 40 or 50 people, and they’re standing on the edge of the runway and they’re saying, ‘Hey, if it doesn’t overheat,

can you give us a low pass?” Dave said. He always says no. His answer is always the same, “Fifteen or 20 hours from now give them an air show.”

Because unforeseen delays are the norm prior to almost every first flight, Dave doesn’t want anyone there except the owner. He wants more than an hour of fuel aboard, but he does not want the tanks full. There has to be enough fuel aboard to eliminate the risk of unporting a fuel pickup during uncoordinated flight.

First flights and prototype test flights are scheduled for the crack of dawn in still air if at all possible. Dave will do a stall or two on kit-built airplane first flights if the airplane is in rig; if the airplane doesn’t fly straight and level, he doesn’t do stalls.

THE FIRST FLIGHT ROUTINE

His business unfolds one of three ways. Very few owners—Dave remembered only one during the last four-year period—have no interest in the EAA Flight Advisor program. They want the airplane inspected and signed off as airworthy. Dave holds an FAA-issued designated airworthiness representative rating and is qualified to issue airworthiness certificates. These owners plan to do their own first flights.

The second scenario is an owner who wants the personalized guidance that’s the core of the EAA’s Flight Advisor program. Dave looks the airplane over, makes suggestions, issues the airworthiness certificate, and helps the owner develop the flight-test program and find a competent test pilot.

The last and most common scenario is when a builder wants Dave to inspect and certificate the airplane as airworthy and do the first flight. “When I do the first flight I want the airplane to be

Caption... *Tiossedipis inc-temolor mi, qui to que non re nita vellorempore volores cumenihillum essim vercia cuptam qui.*



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opened up when I get there,” Dave said. Experience has taught him to touch every cotter pin installation and every safety wire wrap before a first flight.

PROTOTYPE TESTING—SLOWLY GETTING TO KNOW THE AIRPLANE

When it comes to flying a prototype for the first time, Dave said, “First of all I have to determine that it will fly. I’ve seen some that won’t.”

“I start out taxiing, then I go a little faster, then I get it light on the gear, then lift off an inch and set it back on the runway. It’s a very slow process, and I just sneak up on it.”

“It doesn’t matter if it’s a Wright Flyer or a twin jet, I follow the same pattern of introducing slight changes, then a little more speed,” he said.

Dave has flown prototype first flights on about 40 aircraft. “There’s only about five of them that anyone has ever heard of,” he said. One example of this is the Star Kraft, an



eight-place, pressurized, twin-engine, centerline thrust, composite structure airplane. In late 1995, Dave set two speed records in the Star Kraft including a 59-minute, 30-second flight from Phoenix to El Paso at 346 mph. The airplane never moved into production and sits in a hangar in Fort Scott, Kansas.

PYLON RACING SEMINAR

Dave has flown in 216 air races over his 30 years attending Reno. Times have changed since his first race in 1980. Back then, “They figured if you could find Reno and your airplane made it there in one piece, you could race,” Dave said. Newcomers were given a briefing and were on unofficial probation for the first couple of races. “If you didn’t piss anybody off, they gave you a race license,” he said.

Things eased along like that until 1998 when the Sport Class was established. The first races featured 16 amateur-built airplanes—two heats of eight airplanes. Dave said veteran racers felt okay when one rookie was racing in an eight-airplane heat; then someone realized that there were going to be seven rookies—and one veteran—in the eight-airplane heat.

The class asked Dave, who was already involved in training Formula One racers, if he would set up seminars to certify the racers in the new class. “We got to introduce them to how to race,” Dave said. There weren’t any issues with the new Sport Class racers, and eventually the seminars were expanded to include all racers in all classes. Today the FAA requires that every new pilot have a pylon racing certificate that is issued by the Pylon Racing Seminar.

In spite of training, Dave said, there are some pilots who “revert to a more primitive state” when racing. He tells of the difficulty of sitting down someone who was a very good pilot until the race flag dropped.

GOING ELECTRIC

At EAA AirVenture 2009 Dave demonstrated the Yuneec e430—a very light composite airplane powered by an electric motor. He was impressed.

“If I still owned a flight school, I’d be very excited about electric airplanes,” Dave said. He explained that 99 percent of all instructional flights were less than an hour, and even with today’s battery technology the direct cost of an hour’s worth of electrical power is between \$3 and \$5. Add in very

smooth propulsion and the elimination of exhaust noise and electric flight starts to make sense.

Dave said he can see the day within three to five years when part of every student’s pre- and post-flight chores would include carrying a freshly charged battery out to the airplane and returning a depleted battery to a charger at the end of the flight.

A SECOND SET OF EYES

Dave was ready to test fly the ninth airplane he had built or restored, the Lancair Legacy that he had built between flying jobs. Unbeknownst to Dave, his father, Martin, who disliked flying of any kind, was secretly financing some of the parts acquisitions. Even though Dave was worried about the costs, Karen, Dave’s wife, was in on Martin’s secret plan and kept urging Dave to set aside his money worries. After Martin passed away Dave discovered the plot and named his airplane *Martin’s Legacy* in honor of his father.

As Dave prepared for the first flight, Karen asked, “Who is going to inspect it for you?” After asserting that he had just spent a solid year in intimate contact with every square inch of the airplane, Karen reminded Dave that he was always preaching that anyone who didn’t get a second set of eyes to inspect his or her work is an idiot. Then she asked, “Are you going to get a second set of eyes or are you an idiot?”

Dave asked Richard “Butch” Pfeifer, one of his United Airlines heroes and a very experienced builder, to look at his work. In spite of his long list of aviation accomplishments and years of inspecting airplanes before first flights, Dave had, like more than one builder, gotten too excited about the first flight of his new airplane. He was also humble enough to see his error and get back on track. “In about an hour he found five things,” Dave said. After working off the squawks the first flight of *Martin’s Legacy* was flawless. **EAA**

Steven Ells, EAA 883967, is an A&P-IA with a commercial pilot certificate and instrument and multiengine ratings. He owns a Piper Comanche and lives in California with his wife, Audrey. You can visit him online at www.EllsAviation.com. For links to more information, on Dave Morss visit www.SportAviation.org.