



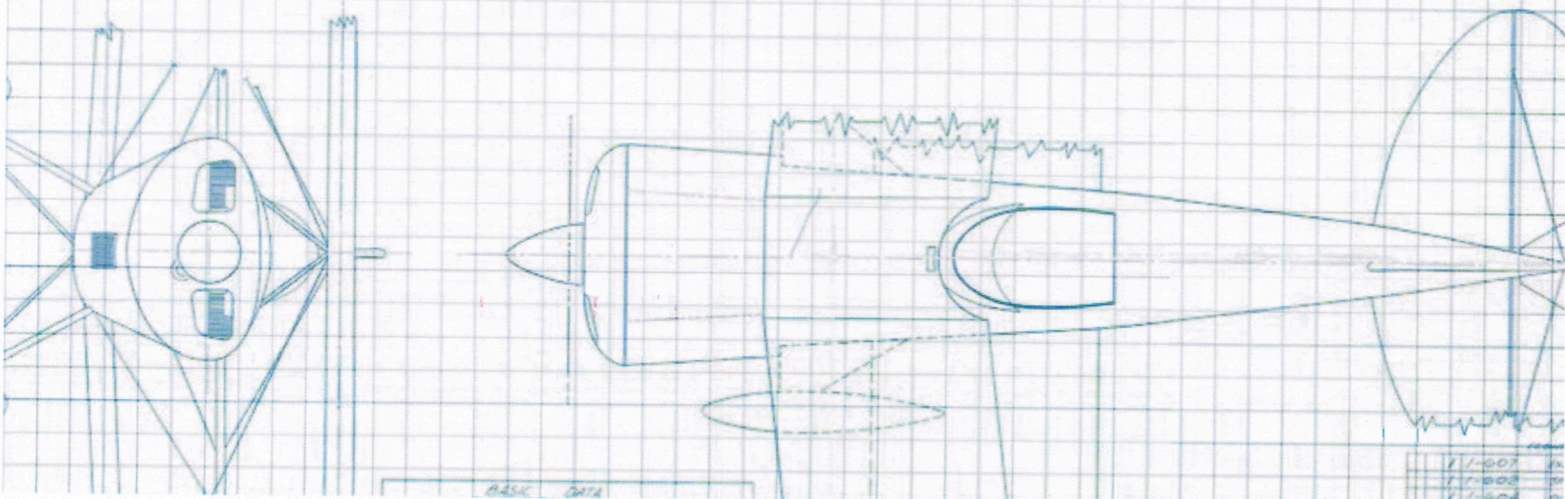
BY STEVE SCHAPIRO

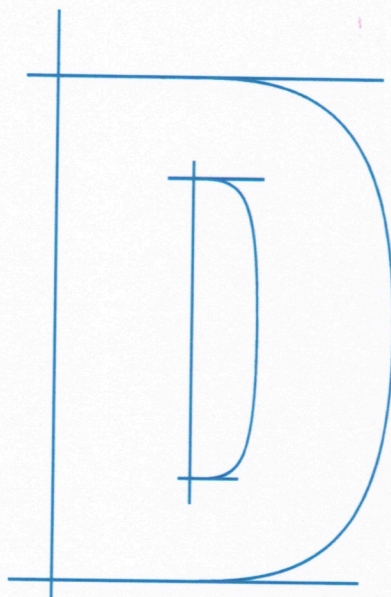
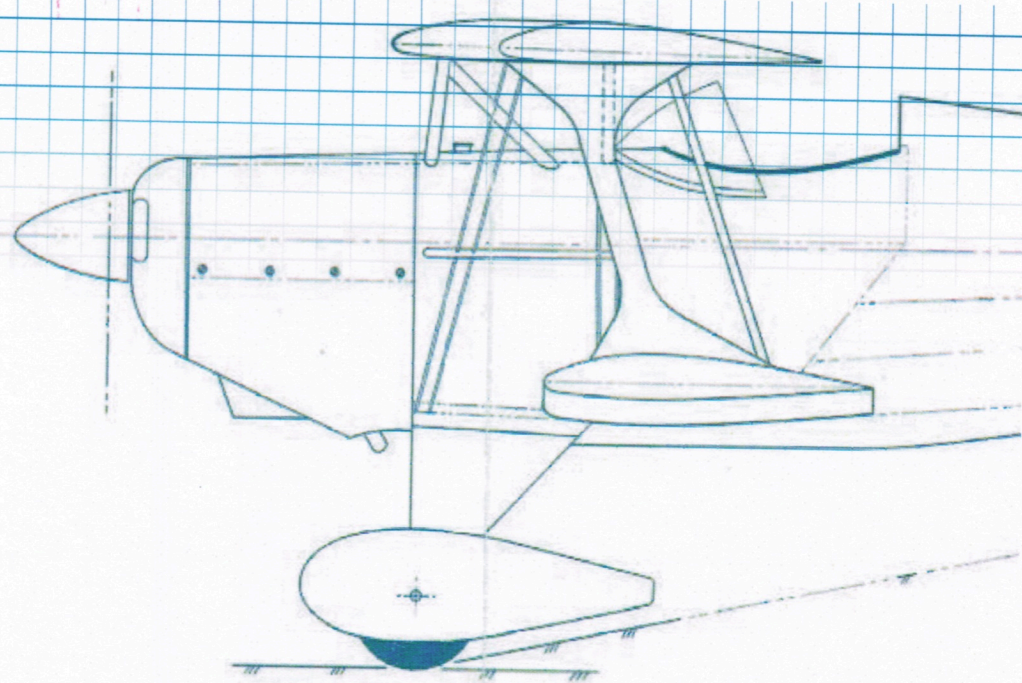
Model for SUCCESS

— RC school makes full-scale dreams come true

INFORMATION			
NAME	DIMENSION	TOLERANCE	
	10"	±.1"	
	12"	±.1"	
	10"	±.1"	
SURFACE TRAVELS			
DOWN	UP	LEFT	TOLERANCE
2.3"			±.1"
	30"	30"	±.1"
2.5"			±.1"
4.2"			±.1"
CABLE TENSIONS			
	MIN. LB.	MAX. LB.	REMARKS
1	300	350	
2	400	450	
3	250	300	
4	150	200	(swing loaded)
ALIGNMENT			
RIGHT 20"			POSITION ± 1/2"

As a kid growing up in Oshkosh, Wisconsin, Dave Scott would ride his bike over the railroad tracks and sit on the fence at the end of Runway 27, where planes would fly over his head on final approach. In the summer he would volunteer at the EAA fly-in convention—it wasn't called AirVenture back then—mowing grass and pounding signs into the ground that read "Paul says don't litter" to earn a free flightline pass.





DAVE REMEMBERS getting the perfect spot to watch the Red Devils tumble through the sky. He was so close he could see Charlie Hillard, Tom Poberezny, and Gene Soucy's faces in their cockpits. "I dreamed of flying aerobatic competitions with a plane that I built and returning to Oshkosh to fly in the show," Dave said.

Thirty-five years later, his dream is becoming reality. In September, Dave, EAA 540157 and IAC 24053, completed the first flight of a Pitts S-1S that he built and will compete in this summer. What's remarkable is that it was all made possible by making a career out of teaching people how to fly radio-controlled (RC) models at the only full-time RC flight school in the United States.

LOOKING SKYWARD

Aviation is a Scott family affair. "My father had it in his blood and started it in me," Dave said. Even though he wasn't a pilot, his dad inherited a love of aviation from Dave's grandfather, who was a flight instructor during World War II and had Stearmans and PT-19s that he flew from his grass strip in his backyard.

Dave never flew with his grandfather, as he died when Dave was about five. That's about the same time Dave started building cardboard control-line models, before trying his hand at the rubber-band powered balsa wood models—the kind with the tissue paper covering that you can never get to stick quite right.

One summer afternoon while swimming with friends at the county pool, he heard the buzzing of RC planes. He called his dad and asked if he would pick him up at the field where the models were flying. By the time the afternoon was over, his dad had ordered a Cox .049 powered Cessna 210. Little did the nine-year-old boy know, that afternoon would lead to the foundation of his career, and provide the path for his dreams to take flight.

FROM STUDENT TO TEACHER

"No less than five guys offered to teach me how to fly [my model]," Dave said. While his first instructor, Darwin, was teaching Dave, the other four guys were telling Darwin he was doing it all wrong. "I crashed," Dave said. "They let me do that, claiming it was my initiation into the theory that crashing is how you learn."

Darwin thought the key to flying well was learning how to recover and employed the "three-mistakes-high" method of flight instruction. "In theory, you could make a mistake, make another mistake trying to recover, and make even another mistake



Before every flight, Dave Scott conducts a detailed briefing on which control inputs to use in flight.

before the instructor would have to recover the airplane," Dave said. That meant flying the airplane at an altitude of 400 or 500 feet, which made it hard to see what he was doing, Dave noted.

"My father knew better," Dave said. "We would learn faster on our own." So Dave and his dad would go to the field when no one was there. They bought half a dozen planes and taught themselves how to fly.

The next summer while attending the EAA Fly-in, Dave saw the Byron Originals RC Demo Team. Byron helped start the giant scale movement in RC modeling with modified chain saw engines in the 1970s. "At EAA it hit me like a ton of bricks—we can fly [RC models] like real airplanes," Dave said. His hero was Bob Herendeen,

who flew a Pitts Special. So Dave built himself a biplane model and began thinking about the criteria of the maneuvers. "I was trying to fly perfect 10s." He learned quickly, and soon became a club instructor—at the age of 10.

1ST U.S. R/C FLIGHT SCHOOL

After school, Dave moved to Colorado to pursue skiing and a career as a draftsman. While he was flying with the RC club there, other pilots noticed his skills and offered to hire him to be their instructor. "A funny thing happens when people pay," Dave said. "I felt compelled to put together a lesson plan."

When Dave told his father about the training methods he was developing, he suggested Dave instruct full time. His dad

signed up a few dozen students and acquired a field to use for the school, and in 1987 Dave moved back to Wisconsin to launch the 1st U.S. R/C Flight School. The first class with six students and four airplanes got off to a difficult start. "Within three days all four planes were destroyed," Dave said. "The saving grace was I started the business in my early 20s, so while I made a ton of mistakes, I had plenty of time to recover from them."

The breakthrough came when Dave asked himself, "Who are the people who learn the fastest?" The answer, he discovered, was children. "Kids think like Nike—Just Do It!—if something doesn't work, forget about it," Dave said. "Kids are not overly concerned with 'what ifs,' just the things they do that produce favorable results, and they forget everything that was unfavorable. Grown-ups always say, 'Yeah, but...'"

Around the same time, he developed the "crawl-walk-run" methodology, which he credits with his success. "You learn your A-B-Cs, then you learn how to spell words, then you learn how to put words into sentences," Dave said. "The next thing you know you're writing the great American novel." The same theory is true for flying.

Recognizing that most teaching focuses on what you are doing wrong and making corrections, Dave decided to take the approach he saw kids using—focus on the

LEFT: Twelve-year-old Dave shows off one of his early models.

MIDDLE: Dave presents the fleet of the 1st R/C Flight School's training aircraft

RIGHT: Dave with two of his homebuilts – a Pitts S-1S and a radio-controlled Extra 260



The squared wing tips and larger ailerons provide a faster roll-rate and more stability at slower speeds.



Dave credits winning his first aerobatic competition to his years as an RC instructor



good results, repeat them, and they'll become habits, and many times bypass the need for corrections. "I developed a system of training that is based on controlling the plane as opposed to reacting to it," he said. "The key to accelerated training is pre-flight planning: Have an idea what it is you're going to do before you take off, and control what happens in the air by paying attention to your control inputs. That is completely opposite what everyone else is doing."

Most people new to the sport learn from RC pilots they meet at the local flying club, "who basically say 'I've been flying for 20 years, let me show you how I do a landing.' They're talking and describing everything, and it's going right over your head because there are so many new things to consider," Dave said. "And then they say, 'Okay, now you try it.' Needless to say, the results are less than favorable."

Dave has a private flying field for his school in Shawano, Wisconsin, about 30 miles northwest of Green Bay. Before every flight he holds ground school for about 30 minutes, and then students fly for an hour. Students will then debrief with Dave and

discuss what they are going to build on for the next flight.

The weeklong classes have no more than four students and run from May through September. In 2011, there will be eight primary training courses and 12 aerobatic courses. Dave can accommodate students at different skill levels at the same time and finds it helpful. "The advanced guys are always being reminded of the fundamentals while I'm addressing them with someone of a lower skill level," Dave said. "In the meantime the lower skill level guy can see the logical progression on what they are doing now and how it will lead to the next thing."

Students in the five-day primary course use aircraft and equipment provided by the school and follow Dave's One Week to Solo syllabus. Dave designed the training plane, which has an 8-foot wingspan and the strength to withstand flight training. Flying larger planes makes it easier for the students to see the effect of control inputs, and they are more stable in windy conditions, giving students maximum flying time.

The aerobatic courses are four days in length, and students may use school models or their own. Each maneuver is broken down into step-by-step sequences that students practice. Once each step becomes second nature, additional refinements are added and new maneuvers are introduced. While Dave's personal flying goals have always centered on full-scale, two of his students have gone on to be International Miniature Aerobatic Club (IMAC) National Champions.

With a niche in the market, Dave created the One Week To Solo training manual and four more manuals covering sport, precision, and advanced aerobatics, as well as park and 3D freestyle flying. He also writes monthly how-to columns for *Model Airplane News* and *Model Aviation*.

FLYING FULL-SCALE

Dave believes RC flight instruction should be given with the same level of professionalism as full-scale flight instruction, and that flying model or full-scale aircraft should be held in the same esteem.

While Dave was busy teaching and writing about RC flight instruction, he never lost sight of his goal—to fly full-scale aircraft in aerobatic competition.

In 2002 he earned his private pilot certificate and immediately started aerobatic training in a Decathlon. After 15 years of teaching RC aerobatics, the maneuvers came naturally to Dave. "The real key to my rapid transition into full-scale [aerobatics] was my school," Dave said. "I had been teaching stick position and timing for years." That allowed his coach, Woodie Woods, who used to work closely with legendary air show performer Duane Cole, to focus on refining Dave's maneuvers rather than teaching them from scratch.

Dave would plan his practices, think about where he would place the stick at certain points in the maneuver, and then take to the air. When Woodie would point out where his mistakes were, Dave was able to make corrections quickly. "Because I knew where the stick was at that point in the maneuver, I knew just by changing my stick position I could effect a better result."

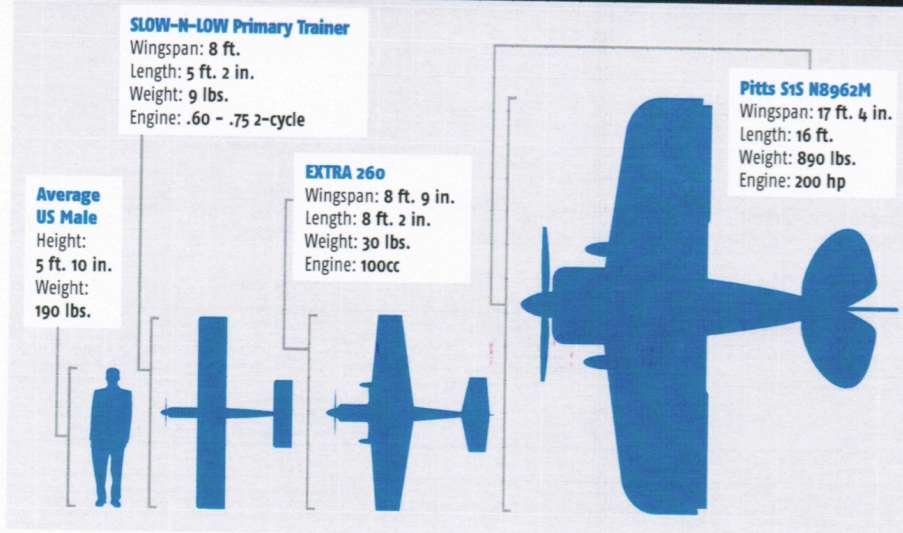
Dave explained, "Whether flying a model or full-scale, you don't want to be a variable. Consistency is the key, even if you make a mistake. As long as you're consistent, it can be fixed in just minutes. But the greatest coach in the world won't be much help if the pilot performs the maneuver differently each time."

Dave entered his first competition with about 10 hours of aerobatic training under his belt and won the Sportsman category, as

Larry Sperberg, helps put the Pitts' fuselage through the front window of Dave's house, where he spent a couple of months covering the plane.



SCALING UP Size comparison of the the aircraft Dave flies



well as the award for the highest percentage of points possible at the contest with an average score of 89 percent.

BUILDING AND MODIFYING HIS PITTS

When it came time to choose an airplane to build, Dave went with the same plane his hero, Bob Herendeen, flew—a Pitts Special. “I bought a Pitts because it’s the biggest bang for the buck. The beauty of a biplane is that flying

on EAA technical counselors. He was fortunate to connect with a highly experienced Pitts engineer who allowed Dave to use his workshop and stay in his guest room. Dave spent the winter of 2008 working 90 hours a week. Come spring, he trailered the plane back to Shawano. After spending the summer performing the final mock-up, he removed the large front windows of his house and put the plane in to cover.

“How you trim the covering, what you do on a corner, what you do on a round wingtip is exactly like modeling.”

wires and struts make for a very strong structure without using expensive carbon fiber,” Dave said. “It’s strong, yet lightweight.”

Having experience building models “helped a ton,” he said. Dave was comfortable with the woodworking, but the steel and aluminum work was new to him. Just like flying, Dave found the key to building an airplane is taking your time and planning what you’re going to do. Like many builders, he used the “measure three times, cut once” methodology.

Dave sought help from friends in the International Aerobatic Club (IAC) and relied

you trim the covering, what you do on a corner, what you do on a round wingtip is exactly like modeling,” Dave said.

“Another benefit of building models is we’re used to working with much smaller tolerances than you typically see in full-scale aircraft,” Dave said. When he came to AirVenture during the two years he was building the plane, he took hundreds of photos to compare his work and see how other people “attached an aileron or bolted on a tail.” Where he thought his parts’ fit wasn’t very good, he found gaps on most

planes were 10 times larger than what he had. “It’s just my model mentality that drove me to fit everything perfectly,” Dave said. “I’m discovering that we have more leeway with full-scale.”

Aerobatic maneuvers are more intricate today than they were when the Pitts was first designed in the 1940s, so Dave made some modifications to his Pitts. The most significant change was making larger symmetrical ailerons with squared wing tips. This increases the aileron area by about 30 percent and, with an enlarged tail, provides more control at slower speeds. The larger ailerons also increase the plane’s roll rate from about 180 degrees per second on a stock Pitts to what Dave estimates is about 250 degrees per second. The ailerons also incorporate 30-percent hinge-points to reduce the loads on the control stick.

Instead of a traditional 180-hp engine, Dave chose a Lycoming AEIO-360-A1E 200-hp angle-valve engine, which turns a custom built three-blade Catto propeller. After 3,400 hours building the Pitts, Dave said, “My airplane came out pretty nice thanks in great part to my modeling experience.”

Before the test flight, Dave was checked out in a Pitts, flying with friends Craig Henry and Pete Tallerita. Pete had a step-by-step Pitts landing procedure he would follow, something Dave can relate to, and when it came time to take his blue and white Pitts up on its first flight, Dave was prepared. Despite an issue with aileron trim and his tachometer, the flight went as planned. Dave has completed the initial 40 hours of flight testing and is spending this winter making dozens of minor adjustments to the plane in preparation for competition this summer.

He plans to fly in several regional competitions in the Intermediate category before heading to the IAC Nationals in Denison, Texas, in September. His goal is to hone his skills in competition for a couple of years and then start flying air shows. Fortunately, his RC flight school classes will finish each day around 3 p.m., which will give him plenty of time to practice.

Perhaps the kid from Oshkosh will perform at a future AirVenture, and when he does, it will be a dream come true. **EAA**

Steve Schapiro, EAA 1018168, is senior editor of EAA Publications. He owns and flies a Piper Cherokee Arrow that has been part of his family since his father picked it up at the factory in Vero Beach in 1968.