

A high-wing airplane, likely a Luscombe, is shown in flight against a backdrop of a mountain range at dusk. The sky is a mix of orange and blue, and the mountains are silhouetted against the light. The airplane is white with a red nose and a red stripe along the wing.

# A *Fine* ROMANCE

*A 42-year love affair  
with a Luscombe*

BY RALPH SEELEY

**S**uppose someone told you that Jack Norris had discovered an amazing way to beat the high cost of flying, that he had figured out a way to own an efficient, “real” airplane—not an ultralight, but a machine for serious traveling—for a capital cost of less than \$30 per year. ■ If you knew anything about Norris’ background, you’d wonder what the engineering breakthrough might be. For nearly 40 years, he has been designing, manufacturing, and selling things, and some remarkable projects they have been, both in aerospace and other industries. For example, after shaking hands with Walt Disney personally to close the deal, he “gave life” to the Abe Lincoln figure and the Pirates of the Caribbean at Disneyland; his electrohydraulic controls paved the way for hundreds of “audioanimatronic” figures in Disney World, Epcot Center, and their counter-

PHOTOGRAPHY BY LONNA TUCKER

parts in Europe and Japan. More than 100 items his company designed and manufactured now are in the Great Hall of the National Air and Space Museum, in the Mercury, Gemini, and Apollo capsules. And thousands of airliners are flying with Norris-designed items in the landing gear and flight control systems.

Jack Norris became a familiar name to those interested in matters aeronautical during the *Voyager* world flight, for which he served as technical director and color commentator for ABC television. But his own products in the Smithsonian are his real pride.

It turns out that Norris did discover a method to fly for a capital cost of less than \$30 per year. But he didn't do it with an ingenious design breakthrough. He did it by spending \$1,225 for a Luscombe 8E when he was a college senior in 1950. Forty-two years and 300,000 miles later, he's still flying it, and it's been everywhere.

"When I first saw it, it was the exhibition model at the Cleveland Sportsman Show in March of 1947. I thought it looked sharp but walked by it without really looking close."

That was the year he learned to fly,

■  
*"I've landed in wild crosswinds," he says, "and you always have controllability."*

by winning a national model-airplane competition where the prize was flight lessons. Winning those sorts of contests was nothing new to him by then; he'd attended his first at age 11 in 1938 and held 160 trophies, two national championships, and two world records by the time he learned to fly.

Three years later, he was looking for a Cessna but found the Luscombe instead. "All the Cessnas I found had fabric wings," he says. "The Luscombe was not only all-metal, it was the deluxe version—wheelpants, electric starter and lights, nylon fuel cells." The airplane had 290 hours; he had 86 hours in his pilot logbook. "I never dreamed I'd own it for a lifetime," he says.

And what of the Luscombe's reputation as a hard-to-control ground-looper? He didn't believe it then, and





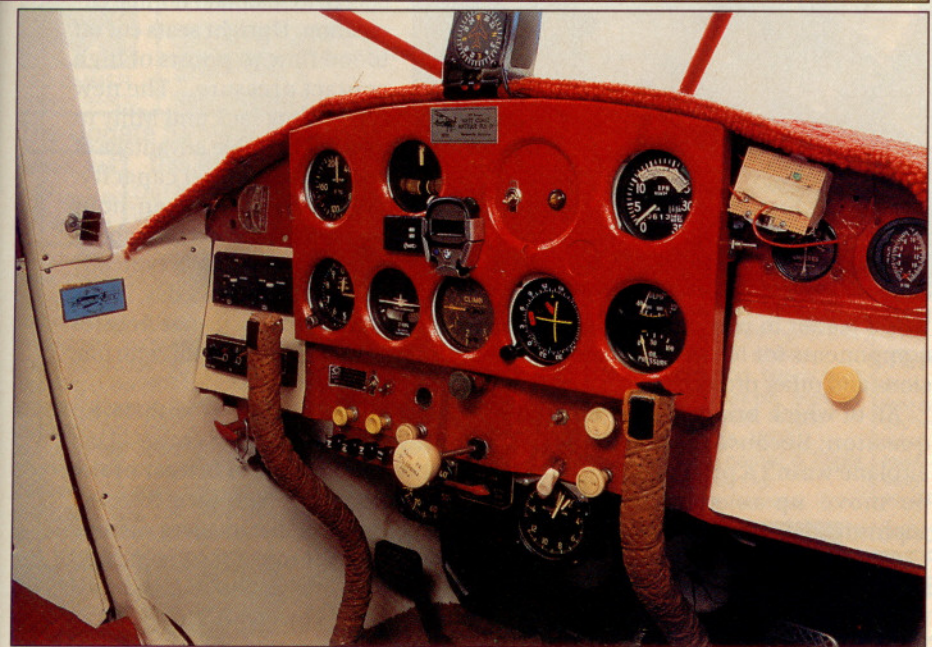
42 years of experience have borne out his skepticism. "I've landed in wild crosswinds," he says, "and you always have controllability." What is true, when you compare Luscombes to similar vintage taildraggers, is that the landing gear is supported by tension straps, which collapse under compression. So while a Luscombe may be no more likely to ground loop than any of its counterparts, other designs may be more forgiving and let you come away from a ground loop with only a red face. Get most Luscombes sideways, and the "upstream" landing gear can fold up. Thus are reputations for vicious handling qualities and macho pilots born.

The Luscombe started as an all-Ohio airplane. Norris lived in Cleveland and was finishing school in Columbus, 110 miles away. After graduation, he was scheduled for a hitch in the U.S. Air Force at what was then called Wright Field (now Wright-Patterson Air Force Base), about 150 miles from home. It didn't take long for the airplane to find non-Ohio skies, however. For spring break in March 1951, he flew to Fort Lauderdale, Florida.

From 1951 to 1953, he was spokesman and group leader for (take a deep breath) the Aircraft Laboratory on Mock Up and Engineering First Article Inspections. In other words, he was one of the first Air Force officers to get his hands on the first models of the latest hot airplanes, including the F-100, F-102, F-104, B-66, and dozens more. He would inspect for small design items that the Air Force had discovered would lead to big problems. "For example, if they left the drain holes out, in the real world that means water gets in. If an aileron freezes and then flutters, that's a serious problem.

"The designers used to hate to see us coming," he continues. "I'd spend a week with them, and the first three days I'd spend just convincing them that I wasn't there to booby-trap them."

Norris usually flew his Luscombe to the inspections, which led to taking his share of ribbing over the years. That's no surprise when you hear the names of some of his colleagues: Chuck Yeager would be preparing for the flight tests, and Gabby Gabresky would evaluate the fighting capabilities. "They'd fly in the latest Air Force



jets, and I'd arrive in the Luscombe," Norris says. "Then we'd kid about Mach numbers and fuel burn."

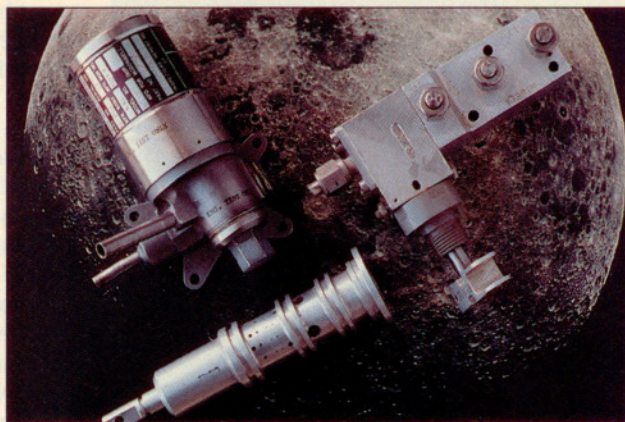
But, he adds, he often beat them. They would waste time on airline connections, or they'd be grounded by mechanical problems or weather in combination with Air Force rules, and he would be putting along, ready to turn around if visibility dropped. "It's amazing how seldom I couldn't get through," he says.

In 1953, Norris married Milly Mello, also from Cleveland, and for a honeymoon, they flew—in the Luscombe, of course—to Banff National Park in Canada. The 4,000-mile trip included a stayover at the then-infamous "uphill" Banff airport—regardless of the wind, you always landed uphill and took off downhill. Jack and Milly have since spent nearly 3,000 hours in the airplane together, from Key West to Puget Sound, from Cape Cod to Baja California. But ask either of them to name the best time in all those years—even when they can't hear each other's answer—and they both mention the honeymoon. "It was the first time I'd done more than just a day trip in the Luscombe," Milly says. Jack adds, "It was the first time either of us had flown out West in the mountains. We were just kids. It was beautiful—a great adventure."

Jack has had a tremendously successful career as a businessman and designer. His already excellent reputation was bolstered when he got involved with the controls for the Mercury spacecraft. The original Mercury astronauts demanded manual controls in case the automatic controls failed. (Remember the "We're pilots, not monkeys" sentiment in *The Right Stuff*?) NASA officials decided to add the manual system, and Jack found out about it. "I was the Johnny-on-the-spot with what they needed," he says. It didn't hurt that John Glenn used his system to save the flight when the automatic system failed. Jack founded a company that became the



Norris in 1946 won a trophy in international model airplane free-flight competition, then went on to manufacture flight control components for space capsules (below).



world leader in maneuvering control components for NASA's manned missions and other projects.

All of which brings up the obvious question: Because money for a new airplane wasn't a problem, why didn't he move up to something more sophisticated?

"Basically, I was so involved with business, there was just no time to consider or look for another airplane," he

says. More sophistication means more things to go wrong. "The Luscombe never needed fixing, it's always ready, the perfect low-dem and R&R escape vehicle."

Remarkably so. In 42 years, most of the maintenance has involved parts that you know will wear out—batteries, brakes, and voltage regulators. He's had the airplane apart twice for inspections but found little wrong. The 85-horsepower Continental has been apart three times, with as much as 23 years between teardowns. Spark plugs last about 17 years. With more than 3,000 hours, it leaks not a drop of oil. It's been repainted twice and is on its fourth windshield; it wasn't hanged until 1985.

Eight years ago, Jack put his design abilities to work to solve a problem that vexes all pilots of vintage airplanes—the poorly designed seats result in the airplane's range being limited more by "butt-itis" than by fuel capacity. He developed and STC'd the "No Numb Buns Seat," which reclines the body and spreads body weight. In engineering terms, he explains, "You have to spread the weight over a large enough area that it lowers contact pressure to less than one-and-a-half to two-and-a-quarter psi, which allows blood pressure of 80/120 to maintain normal circulation. Upright seats cut off blood flow to points of high contact pressure." The new seats allow Jack and Milly to take comfortable advantage of the 30-gallon fuel capacity. They plan up to seven-hour legs, which still leaves an hour of reserve fuel. "We typically plan 1,200 miles a day," Jack says, "which means we fly Los Angeles to Oshkosh in a day and a half, with one overnight and two fuel stops."

Most Luscombe pilots with 85-hp engines plan on 110-mph cruise—Luscombes are easily the fastest of the post-World War II, high-wing two-seat taildraggers—but that involves running the engine at the top of the green band and uses 5 gallons per hour. Jack, as his engineering/Voyager planner back-

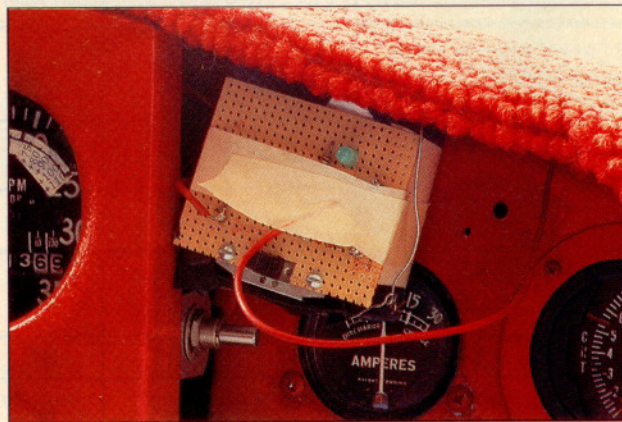
ground would dictate, has developed an optimum cruise procedure: 85 (mph) IAS, 100 TAS at 8,500 feet pressure altitude, 10,500 feet density altitude, 2,280 rpm swinging a 71-51 propeller. Result: a fuel burn of only 3.75 gph for an 800-statute-mile range. "A lot of times, I'll beat guys with faster planes," he says, "because they're on the ground, with sore butts, buying fuel, in the heat, while I'm comfortable and 'air conditioned' at altitude enjoying the scenery."

He also used the Luscombe as a scientific test vehicle in developing a method to close a knowledge gap that has existed since the Wright brothers flew. Called "zero thrust glide testing," the method allows a test pilot to accurately throttle the engine so it produces neither thrust nor drag, which in turn permits glide tests to accurately analyze the drag characteristics of the airframe without any propeller bias. That in turn allows more accurate calculation of propulsive efficiency, which Jack characterizes as "widely misunderstood." Generally, he says, "Drag is far lower, and propulsive efficiency is far lower, than is generally recognized." He's not giving out all the details yet, because his paper has passed peer review in preparation for publication by the prestigious *Journal of Aircraft*. But he will tell you that his breakthrough "zero thrust detector" is one of those inventions that is so simple that it's hard to believe nobody else thought of it first.

It amounts to a stiff, high-natural-frequency wire electrical contact (invulnerable to engine vibration), a flashlight battery, and a light bulb. The propeller flange of the engine moves forward a few thousandths of an inch when the engine develops thrust and moves back when it is not. By having an electrical contact made or broken with that movement, which operates a light in the cockpit, you can easily detect and calibrate zero thrust. Jack is working with the CAFE 400 people to use the method to develop complete aerodynamic and performance data on all private aircraft.



An RV-6 (above) will join—not replace—the Luscombe, which doubles as a testbed for Norris-designed gizmos like a zero thrust detector (below).



Unlike "office-bound" engineers, Jack is as likely to regale you with the beauty and poetry of his Luscombe experiences as he is to discuss numbers. There were times, for example, when he would ride the Sierra wave up to 18,000 feet on ski trips to Mammoth Mountain during the "spring westerlies." "It's so smooth," he says, "it's like sitting on your living-room sofa, but you're going up at 3,000 fpm with the engine at idle. The view of the Sierras is just spectacular." He adds that he routinely operated out of the airport at Mammoth, which is 7,200 feet msl, with two adults and full ski equipment. The airplane had no problem carrying the weight in winter, though he admits that a Luscombe cabin gets a bit crowded with that load.

Or he'll tell you about a particularly beautiful return from Oshkosh in 1985. They flew past Mt. Rushmore, then west to Rock Springs, Wyoming, where they turned left and traveled south over the Green River. That route takes you over some of the most spectacular

scenery on the planet—Flaming Gorge, Desolation Canyon, then the Green joins the Colorado River in Cataract Canyon. After that, you can fly over Monument Valley, Rainbow Bridge, Lake Powell, Glenn Canyon, and the Grand Canyon. "We camped at Bullfrog Basin in Utah," he says. "There were more stars than a city boy would think possible." He talks of the "magnificent, empty beauty" of the Arizona desert leading to Death Valley and home.

Jack turned 65 this year and is taking semiretirement from his numerous business ventures. He's still accepting some consulting jobs, both in engineering and business management, but he's finally taking the time to move into (not "move up to") a faster airplane—by building an RV-6. He contends that he will keep the Luscombe; "With only \$30 a year invested in it, why sell it? It's part of the family."

He admits that Richard VanGrunsven's RV-6 will make the Luscombe virtually redundant. The RV-6 will cruise at 180 to 200 mph, depending on the engine/prop selection. But the slow-end performance is so impressive, it will also operate out of any field the Luscombe will fit into. After all, VanGrunsven designed his airplanes to fly out of the strip on his father's farm, which is only 680 feet long.

So Jack might sell the Luscombe once the RV-6 is up and running, but only because the airplane ought to be flying, not turning into a hangar queen. He quickly adds that he won't sell it unless he finds someone who will respect the airplane and care for it well. Which is as close as you're likely to come to finding an accomplished engineer—those most practical of people—saying that it might be a machine, but after 42 years together, it's hard to believe that it doesn't have a soul. □

*Ralph Seeley, AOPA 714862, former managing editor of General Aviation News & Flyer, recently graduated from law school and is studying for the bar exam. He holds a commercial pilot certificate and has owned five airplanes, including two homebuilts and two Luscombes.*