

Successful line of powerful yellow 'work horses' got its start when Texan became dissatisfied with agricultural aircraft he flew and built one of his own—and Olney, Tex., got a new industry

Mr. Snow And His AG PLANES

by DON DOWNIE • AOPA 188441



Leland Snow, designer and builder of the Snow Commander agricultural airplane. The company he formed to produce the aircraft at Olney, Tex., was purchased by Aero Commander Divisions of Rockwell-Standard Corporation last year. Snow is now vice president and general manager of Aero Commander's Olney Division

Olney, Texas. There's really not too much snow in the flatlands of Texas, south of Wichita Falls. That is, until you land on the broad airport at Olney, population 4,000. Then there's Snow all over the place. Bright yellow S-2D Snow agricultural aircraft are parked along the side of the 24,000-square-foot factory building in various stages of flight test or fly-away configuration.

Sixty-five of these big three-ton agricultural aircraft were completed last year, and the production estimate for 1966 is 80 units. The S-2D is now called the *Snow Commander*, because the Aero Commander Divisions of

the Rockwell-Standard Corporation of Pittsburgh, Pa., purchased the growing company in 1965. However, designer-builder-test pilot-salesman Leland Snow is very much in evidence in Olney as vice president and general manager of Aero Commander's Olney Division.

At first impression, you'd expect Leland Snow, now 36, to be teaching math and physics to high school seniors. He's quiet and unassuming. He wears a white shirt and tie, usually complete with coat. When you talk with him at Mrs. Wright's boarding house at lunch, he's usually called Leland. However, first impressions can be deceptive.

There's no Caterpillar Club pin in his lapel, though he has every right to wear one. His skydiving experience—12 jumps in 1947-48—really paid off in 1957 when he was flight testing the S-2 prototype in Harlingen, Tex.

"The least expensive way to get FAA certification on the prototype was by flight test analysis rather than building a second model for static test," explained Snow, "since the static test ruins your airplane. We were required to fly at limit loads plus 15%. That meant a 5-G pullout at 170 m.p.h. with a very rapid pullback on the stick to build up the loads. A misplaced decimal point in some stress calculations resulted in the wing snapping off at the root at 4,500 feet, and the ship naturally went into a very violent spin. I was able to get out of the cockpit in about five turns."

Talk with Leland Snow about how he worked his way into the ag plane business and you find out more things that make his unassuming manner a surprise. He attended Texas A & M University and received his degree in aeronautical engineering. During the summers he flew dusters and sprayers to help pay his college expenses. Snow, who started flying at 15—he was a line boy and washed airplanes—soloed on his sixteenth birthday.

He started his spraying career in *J-3 Cubs* with big engines and the load behind the pilot. Then he went to 450 h.p. Stearmans that were uncomfortable and "blind." "Neither was an efficient ag airplane," he commented.

Ask him about unusual experiences and he'll reply quietly, "Everyone in the business in those days had his share of close ones."

He flew ag airplanes for seven years, including three winters in Nicaragua dusting cotton. Snow mentioned that ag flying in Central America was not as safe as in the United States because of the primitive flight strips, maintenance problems and the humid, soggy tropical air that cut into aircraft performance.

With this background in a front-row seat of agricultural flying, he soon decided that he could design and build a much better airplane than the con-

verted models he was flying. All the profits from his flying went into the project that started in his garage in Harlingen, Tex.

The configuration of the original S-1 was basically the same as the present Snow production model, with a low wing and conventional gear. However, with the introduction of extremely toxic chemicals, Snow put the pilot in front of the load for protection from the spray materials. The powerplant was a 190 h.p. Lycoming, and Snow took 2½ years to complete the prototype in 1953. At the same time he was working on his Master's degree in aeronautical engineering at Texas University.

After his original agricultural airplane shed its wing, Snow soon found

load. Later came the S-2C in 1961 with a redesigned fuselage. The 600 h.p. S-2C first flew early in 1961, as customer preference seemed to indicate a larger plane and more horsepower. The present D model has over eight years of field testing behind it.

Forward of the firewall in the *Snow Commander* is a standard Pratt & Whitney 600 h.p. R-1340. Over 34,000 of these reliable powerplants were built during World War II and coupled to the dependable Hamilton-Standard controllable propeller. Snow purchases these engine and prop units overhauled to top standards for less than \$4,000 from Southwest Airmotive Company in Dallas.

"Where else can you buy 600 proven horsepower with fresh, chromed cylin-

plane and pilot came to a stop upside-down in a ravine. Workers pulled the ship out of the dry wash, installed a new prop, and both plane and pilot were back at work that afternoon.

The *Snow Commander* will stall at 57 m.p.h. with its hopper empty. At full gross, it stalls at 70. Top speed with spray booms installed is 140 m.p.h., and it will do 167 m.p.h. without the external drag of booms and wind-driven pump.

The normal range at 50% power is 470 miles on 109 gallons of fuel. However, the hopper makes an ideal fuel tank for ferry flights. Add another 300 gallons of fuel and the ferry range is 20 hours at 95 to 100 m.p.h. Back in 1964, Snow ferried a Model C to Jamaica. It was nine hours over water



it advisable to move to greener pastures to obtain factory space and some financial backing to continue work on a new plane. He discovered Olney, Tex., a progressive little city of 4,000 people who were willing to provide a new factory and a line of credit to get production going.

This proved to be the best investment that Olney has made to date. Now more than 10% of the town's male working force works at the Snow factory, and an expansion of 20,000 additional square feet of building area is planned. All employees are trained right on the job.

Work progressed at Olney, and the first S-2B was produced in 1958. This unit had a 450 h.p. Pratt & Whitney engine with the pilot flying behind the

ders and a completely reconditioned propeller for so little investment?" Snow asked. "The radial engine has the best possible advantages for cooling. It's the biggest bargain in the industry."

"Agricultural flying is a comparatively safe business now that there are planes designed for the job," said the engineer. "The former dangers have been wildly exaggerated, and the new generation of agricultural airplanes has made the accident rate extremely low. In fact, operators using our equipment have the lowest hull insurance rates in the industry, some 20% to 25% below that charged for other ag aircraft."

Recently a *Snow Commander* over-shot a very short strip in Equador. The

Water salvo from the Snow Commander S-2D agricultural airplane at Olney, Tex., location of Aero Commander's Olney Division, manufacturer of the three-ton aircraft. The salvo consisted of 300 gallons of water

Color photo by Don Downie

from Miami with no radio, no blind-flight instruments and not even a needle-and-ball. His only navigational aid was a compass. This is routine for ferry pilots and demonstrates the high reliability of the *Snow Commander*.

With proper loading equipment, the hopper of the *Snow Commander* can be filled with 2,400 pounds of dry material in one minute. Three hundred gallons of liquid insecticide can be pumped aboard through a central filling connection located at the wing trailing edge in just

Snow Commander S-2D ag planes ready for delivery are lined up on the apron at Aero Commander's Olney, Tex., plant. In the background is the factory where the S-2D's are made

45 seconds.

For mosquito control, a fogging nozzle is hooked to the exhaust stack of the 600 h.p. engine. The big engine develops enough heat to do an efficient job of fogging, and the hopper holds enough "mix" for two-and-a-half to three hours of fogging.

The entire fuselage "skin" is assembled with Camloc fasteners and can be removed by one man in five minutes for cleaning.

Until Aero Commander came into the act, Snow did little or no advertising, and his "big yellow workhorses" were sold largely by word of mouth. The *Snow Commander* does at least 40% more work than a 450 h.p. Stearman and twice as much as lighter ag planes.

Designer Snow states that the downwash of a heavier aircraft with a long 44-foot, 7.2-inch span will operate more efficiently and with a wider downwash than smaller aircraft. "The bigger the machine, the more work per hour," he explained. "The economics are quite similar to those of the jets on the airlines today with larger loads and higher speeds. The fixed costs are the same on the S-2D as they would be for a smaller aircraft and we can bring down the cost per acre by larger equipment. We have never had a customer who purchased one of our planes go back to smaller equipment."

Snow sees his product as an ideal firefighting aircraft. While it doesn't carry the loads of the TBM's and B-17's, it can operate from roads and improvised airstrips within a mile or two of a major fire, and has proven particularly efficient in South Carolina fires.

As we had dinner in Olney with Jim Murray, president of the Aero Commander Divisions of Rockwell-Standard Corporation, and Leland Snow, a number of interesting developments were discussed. The ag airplane is, of course, ideal for mosquito control, planting rice and the regular applicator jobs. However, it has a great potential in areas of conflict like Viet Nam, where present defoliation techniques could be of distinct military advantage.

"The present production S-2D is like a junior-sized AD propeller attack bomber," Snow explained. "It's strong as hell, carries more load than a Northrop F-5 and can remain over a target area for more than four hours.

The S-2D's tremendous power is provided by a standard 600 h.p. Pratt & Whitney R-1340 engine coupled to a Hamilton-Standard controllable propeller. Snow, who is shown inspecting the *Snow Commander* powerplant, says that the R-1340 "is the biggest bargain in the industry"

Equipped with an APU (auxiliary power unit) and carbon-arc lights, it would be most effective at night against 'soft' targets."

"With its short-field landing ability, it would be possible to deliver over a ton of supplies per trip—rice, gasoline, hospital equipment or ammunition—to forward areas and unload in seconds by modifying the hopper. We're building a hopper with a larger mouth right now for use in New Zealand for rangeland fertilizing," explained Snow.

Looking ahead, Snow sees a continual upgrading of both aircraft and application techniques. Specialized aircraft with good pilot protection should bring new talent into the industry. The designer sees the potential for turboprop aircraft only when the aircraft size offsets the powerplant cost.

Goals of the ag designer, according to Snow are: (1) reliability; (2) ruggedness and the capability to withstand abuse. (The ships should be able to operate for a 100-day season, flying up to 800 hours, without maintenance except cleaning and an occasional oil change.) (3) The product must be forgiving and completely crashworthy. Fuel tanks for the *Snow* are in the wings, several feet away from the powerplant.

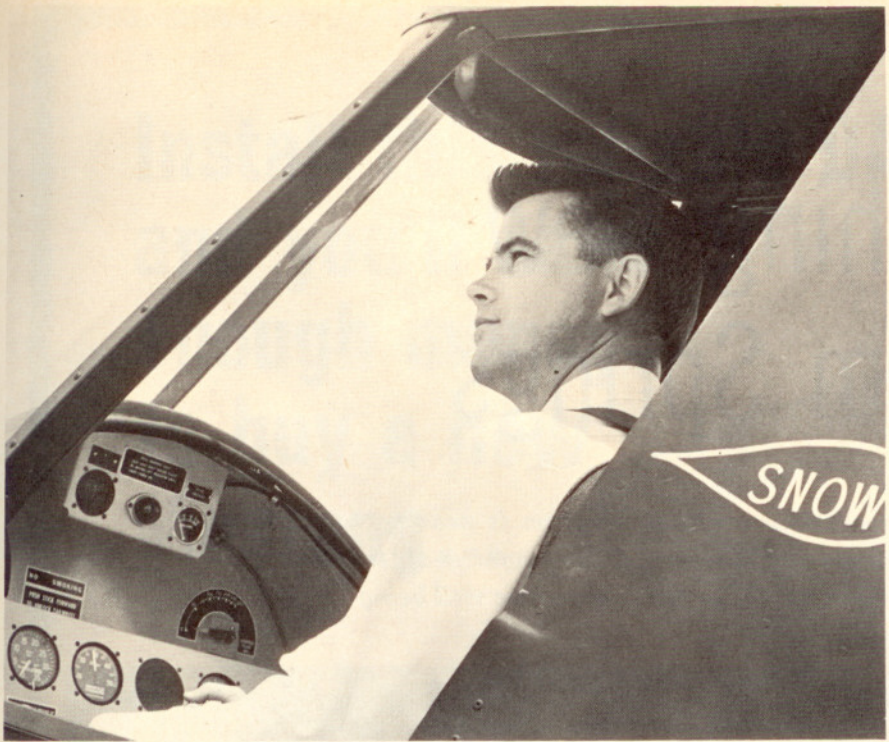
There's a sparkle that appears in Leland Snow's eyes when he talks about agricultural flying. "It's the last frontier in aviation. You do your own flying—don't have to answer to anyone except a farmer if you goof on a job. It's the closest thing to the old barnstorming days that we have left. An ag pilot has more freedom than anyone else in the air."

"However, the real future of the ag airplane, as I see it, is in improving the world's supply of food. The State Department's Agency For International Development is working on the short-range plan of supplying food now, but they also have longer-range plans under which the United States can stimulate interested governments to create the ability to grow more food for themselves. In the near future, foreign aid will include ag planes, loading equipment and fertilizer plants." And, as a point of explanation to non-farm types like this reporter, he said, "By spreading one ton of fertilizer over usable land, you can increase crop growth enough to more than justify the cost of the fertilizer, and provide more food for our expanding world population.

"This is the kind of humanitarian activity where an aircraft can do more for mankind than any other form of flying."

Flying, in all its aspects, is serious business to Leland Snow but it is a hobby, too. While he does not own a personal plane at the moment, he is thinking about buying one some day if he can find the aircraft he wants. It would be a high-performance job, of course. He thinks that one of the rarer British or German fighters of World War II vintage would be about right.

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Snow is no stranger to the planes he builds. Frequently he is to be found in the cockpit of an S-2D at the Olney Airport

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Soaring and sky diving are other interests. He also is an ex-motorecyclist, having given up cycles about three years ago after a 20-year relationship. "I learned better at the age of 33," he said.

There is another side of the busy young Texas executive, which might come as a surprise to some—he is an accomplished pianist and a student of classical literature. He attends night

classes in literature at Midwestern University, Wichita Falls, Tex. He and his wife of two years, Nancy, have their home at Wichita Falls, 40 miles from Olney. Snow commutes to work by automobile.

Snow has one unfinished project, and the odds are pretty good that he will complete that one, too. He wants Mrs. Snow to learn to fly. "She taxied a plane at the Olney Airport the other day, so there is hope," he said. ●

Economic well-being of Olney, Tex.—with a population of 4,000—receives a substantial contribution from the Aero Commander factory located there. This is a view from the air of the town's business district. About 10% of the small city's work force is employed in producing the Snow Commander S-2D ag plane

Photo by Lasater Studio



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