PILOT FLIGHT CHECK

Bellanca Aries T-250

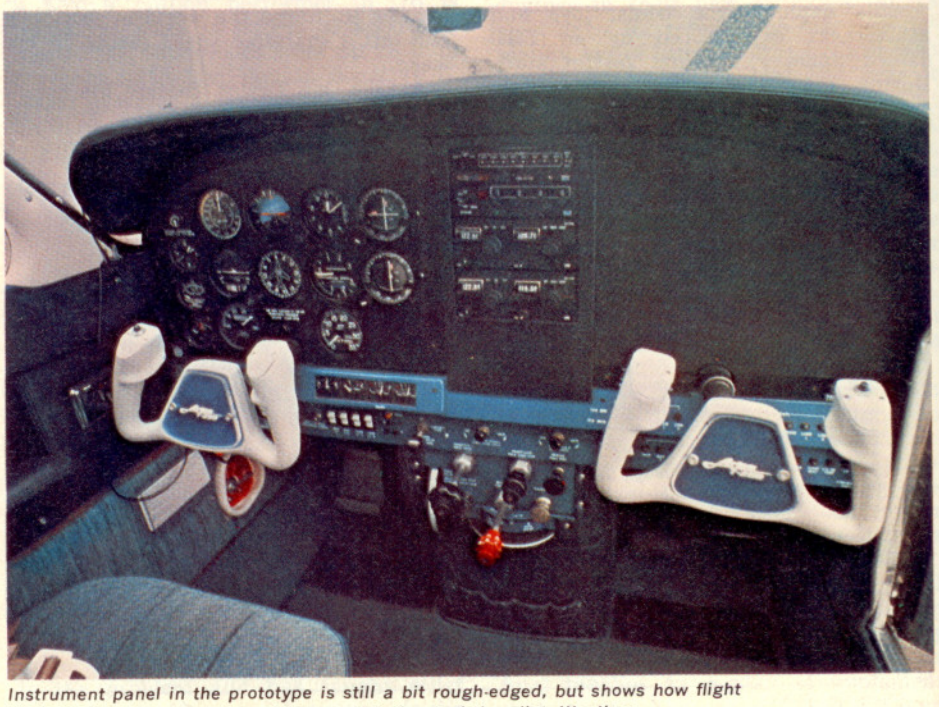
It's only a prototype now, but a plane created by a Houston valve-builder might mean the end of the blues in Alexandria, Minnesota

by BERL BRECHNER / AOPA 466558

■■ If things go as planned, Bellanca Aircraft Corp. will soon be selling its first all-metal airplane—a four-place aluminum bird that will offer speed and flying economy that will, for many, outweigh the wood-winged Viking's long-touted luxury and ruggedness.

The new airplane is called the Aries T-250, and is an all-new airplane developed by a company that has touched only the fringes of aviation for the past 20 years. Notable, then, is that this is the first new airplane in almost a decade, emanating outside the established airplane companies, that has a good chance of getting into production. The last craft with similar upbringing was Jim Bede's '60s homebuilt that evolved into today's Grumman American line.

This newest project comes from Anderson-Greenwood & Co., a Houston firm that has been primarily a producer of industrial valves. But the two men for whom the company is



Instrument panel in the prototype is still a bit rough-edged, but shows how flight and engine instruments are all grouped in front of the pilot. Weather radar is being considered for right side.

T-tail stabilator and angular shape characterize the new 217-mph, all-aluminum Bellanca. Flying is test pilot Jack Burden and designer Marvin Greenwood (right seat).

named, Ben Anderson and Marvin Greenwood (AOPA 53852), are long-time lovers of airplanes, in addition to being talented designers and engineers. Their company created one other airplane in its history, the AG-14, a two-place, mid-wing pusher with a 90-hp engine. Four of those were built around 1950 before shortages of materials and lucrative contracts along other lines brought on a beginning of a long hiatus in the company's airplane involvement.

A-G grossed $21.7 million in sales of industrial valves last year—safety relief valves, hand valves, and instrument valves primarily used by producers and suppliers of energy: gas, oil and nuclear. Aviation is a relatively small part of A-G's present posture: nine employees are assigned to the aircraft project (of a total of about 500 at the company) and about $1.2 million was spent on its development and certification in 1975 and 1976 fiscal years.

But Anderson-Greenwood is now managing, and soon will be majority owner of, Bellanca Aircraft Corp., so its involvement in aviation will likely see significant growth.

Like any completely new airplane, the T-250 with its T-tail stabilator and almost boxy profile looks strange. But after viewing it for awhile your eye becomes more accustomed to its different appearance, and soon it begins to look sleek, and even pretty.

But Greenwood, chairman of the board and the primary designer of this craft, never tried to make it pretty. He sought speed, ease of operation, and utility from his plane. He wanted a flying machine in which you could comfortably fill all the seats with grown-ups, top off the gas, throw in some baggage and go.

He got what he wanted.

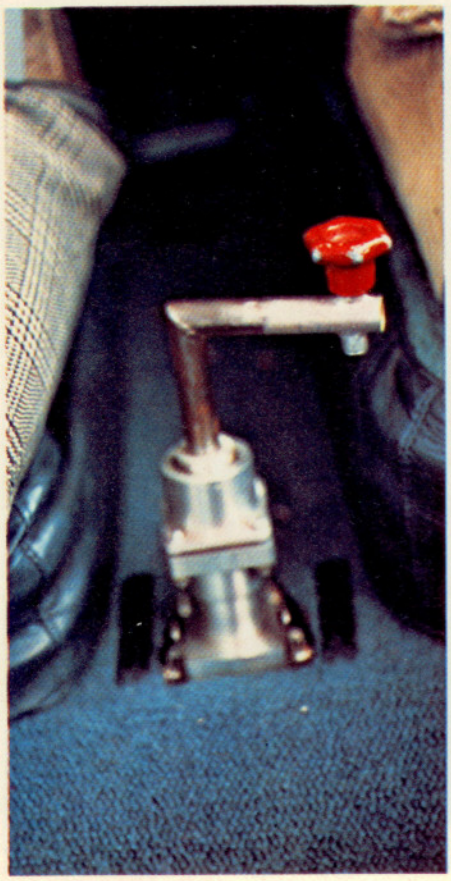
Now time will determine whether the plane-buying public gets a chance to vote on the Aries T-250. For, so far, only one of these airplanes is flying. Anderson-Greenwood, keeping Bellanca financially alive in recent months, has yet more capital to raise before production of the T-250 will get underway. But expectations are high at both companies, and their officials look for completion of 12 to 14 of the new metal airplanes a year, once production gets rolling later this year or in early '78.

The PILOT pressed for a chance to fly the prototype Aries T-250, and was invited down to Houston by the manufacturer. Their plant is an unlikely looking place for airplane-building, for it's found in the city's southwest suburbs, miles away from the nearest airport. The prototype T-250 was fully assembled and then trucked, during a pre-dawn police-escorted motorcade, to an airfield.

Another prototype airframe was kept at Anderson-Greenwood, and still stands in the corner of one building where it underwent static stress testing. Stress and flight testing were completed by mid-year. Closing out nine years of development of the Aries, the FAA issued a type certificate on the airplane last July 28.

It looks as if all that development time might just be recompensed, for the result is a 250-hp airplane with high top speed, decent low-speed handling, acceptable range, and good carrying capability—without a great deal of system complexity.

In a check flight of N51AG, the prototype T-250, I found its speed ranged from 217 mph true down to 63 for stall. It



Long side windows and space between the seats give roomy feeling inside the Aries T-250. Emergency landing gear crank (left) is normally stowed between the two rear seats.

could be loaded with four men, full fuel and some baggage and still be within its maximum allowable gross weight. It carries 76 usable gallons of fuel, offering a range, with 45-minute reserve, of almost 1,000 miles at 75% power.

Performance figures for this aircraft call for a 75% power cruise speed of 208 mph. At 6,500 feet, partially loaded, the aircraft showed an indicated speed of 185. A conversion for the 50-degree temperature outside turned up 208 true for what calculated out to a 73% power setting (22.5 inches of manifold pressure (full throttle) and 2,300 rpm).

Though you'd never fly it this way, prop and throttle full forward, the airspeed needle registered 215 mph at 1,000 feet in choppy air, or 217 true.

Speed is gleaned through use of a laminar-flow wing, lots of flush riveting, elimination of most external protrusions on the airframe, and an almost flat-bellied fuselage once the wheels are sucked up.

Pulling the craft is a Lycoming O-540 similar to that found on the out-of-production Piper Comanche 250. A derated version of the same engine is installed in the Cherokee 235 Pathfinder. It carries a 2,000-hour TBO, plus the traditional carburetor. On this airplane, it is neither fuel-injected nor turbocharged.

Simplicity of design is carried through in other aspects of the Aries project:

- It doesn't have, and doesn't need, cowl flaps.
- Fuel is contained in two wing tanks, and the selector has three positions; left, both, right. The fuel shutoff valve is in another place in the cockpit to eliminate one possibility for fuel starvation mishaps.
- The one cabin door closes in car-like fashion: slam it shut. It doesn't need any second latchings from the inside once it's closed.
- There is only one fuel drain on the aircraft, opened by pulling a knob next to the oil filler neck inside an opening in the upper cowling.
- Electric flaps are controlled by a switch with three positions: up, half and full down. Thus, the switch is the indicator and flap settings can be made by feel.
- All three of the engine controls—throttle, prop, and mixture—are of the vernier variety for ease of minor adjustments.

Flying the T-250 is not a particularly complex matter, either. The three flight controls are fairly evenly balanced, and though the craft will roll quickly with application of aileron, the control yoke does not have an unusually sensitive feel.

Notable is the fact that the lowering of flaps and gear has a negligible effect on aircraft pitch. Not until the flaps extend through the last half of their travel does the nose begin to inch downward. Gear extension, which creates the biggest slowdown from cruise speed, affects pitch not one bit. Gear down speed is 168 mph, same as for half flaps. Though the aircraft gains its quickness through minimized drag, it can also be slowed relatively quickly. Gear and half flaps come

down at 168, and the rest of the flaps go down at 128. My check showed a slowdown in level flight from 185 mph to 100 could be attained in under a minute.

Unusual for a light aircraft, the T-250 sports a T-tail arrangement topped by a stabilator, rather than the stabilizer-elevator arrangement found on other light T-tails.

Characteristics cited along with the T-tail include "greater longitudinal stability" and "more positive control." During takeoff and landing, what this translates into is a stabilator that will keep flying at a speed well under that at which the rest of the plane is willing to fly. On takeoff the craft can be rotated off the runway in ground effect, but will settle back down for a little more speed before the real takeoff comes about.

On landing you can make a full-stall touchdown, but you'll find on rollout at a relatively slow speed that a jerked pull-back on the yoke will put the nose sharply back up in the air.

Both of these situations are easily overcome by smooth application of pitch change—a slow pull on the yoke will get you airborne at about 65 or 70 mph with no strain and no loss of climb once airborne.

A short-field takeoff, as about 12 knots of wind blew slightly from the left of Houston Hooks Memorial Runway 35L (elevation 150 ft msl, air temperature 42° F), used about 700 feet of runway. The aircraft was about 350 pounds under its allowable gross weight. Rotation speed was 60 and initial climb registered 1,300 fpm, at roughly 70 mph. Crossing the far end of the 5,300-foot runway, the altimeter showed the craft to be almost 900 feet above the field.

A landing to a full stop was executed in the same distance without excessive braking. Approach speed of 80 mph, full flaps, and no power was recommended by aviation consultant and Aries test pilot Jack Burden for the short landing. Any excess speed or carrying power on a landing will almost surely result in excessive floating of this slick aircraft during its flare.

Stalls showed moderate buffeting, a clean break, and easy recovery with addition of power. If held in a deep stall, however, the Aries will break sharply downward and to the right. It stalled clean at 69 mph, and with gear and flaps down at 63. The stall horn sounded about 6 or 7 mph above those speeds. In 45-degree banked, accelerated stalls, the craft almost rights itself. When the stall arrives, the wings bank back toward level. All the pilot needs to do is stabilize the airplane.

If you're looking for flaws in this craft, you'll find them in two areas. The landing gear is designed to retract inward under the rear seat. There it can be fully covered by gear doors that are flush with the bottom of the airframe, which allows use of a thinner wing. But it also means that the wheel track is narrow—about that of a full-size car. Ground steering feels a bit sluggish, and more attention on the part of the pilot is required during crosswind takeoff and landing rolls.

The other problem might be found in the craft's yaw characteristics. A shove of rudder in smooth air resulted in considerable back and forth rebounding of the tail before the yaw dampened out. This characteristic, though, was not particularly noticeable at high cruise speeds in choppy air. In fact, it seemed less intense than in some other airplanes that are short on yaw stability.

A couple other gripes: there are no sun visors installed on the airplane, and none planned; and its compass and temperature gauge, grouped together in the middle of the windshield, create an unnecessarily large vision obstruction.

On the other hand, some good features are worth mentioning, too. Seats come with vertical adjustment capability; front seat inertia-reel shoulder harnesses will be standard; overall visibility is excellent, including visibility toward the rear through long side windows; high never-exceed speed (244 mph) leaves lots of latitude for descent from cruise without fear of exceeding the redline; baggage capacity is 250 pounds, and the airplane's builders say it is virtually impossible to load this craft outside the allowable center-of-gravity range.

Also, all engine and flight instruments are found on the left side of the panel. A full set of IFR radios, including transponder and ADF, will stack in the center of the panel, leaving the whole right side of the panel empty. Weather radar is being considered to fill that hole, said pilot Burden.

Company officials both at Anderson-Greenwood and at Bellanca are still tight-lipped about final marketing plans. It's apparent, though, that this airplane will be sold in the traditional manner—basic price, plus option packages, plus avionics. A basic IFR-equipped airplane will probably cost in the $60,000 to $70,000 range, equivalent to current prices for Bellanca nonturbocharged Vikings.

A Bellanca spokesman at the Alexandria, Minn. factory admitted that the new airplane presents "price and performance competition to the Vikings . . . but there will always be a handful of—what do you want to call them—Viking nuts, who will want that airplane." This winter, the Viking plant was virtually shut down, awaiting a further influx of money and a rehiring of people to do the assembly work.

By next year, according to representatives of the two companies, Bellanca will be building the Viking, their Citabrias, and Anderson-Greenwood's new Aries T-250—looking for the end of the financial doldrums that have beset the Minnesota planemaker for over two years. □

BELLANCA ARIES T-250

Specifications

Engine	Lycoming O-540-A4D5, 250 hp @ 2,575 rpm
Propeller	Hartzell constant-speed, 2 blade, 77 in diameter
Wing span	31 ft 4 in
Length	26 ft 2 in
Height	8 ft 7 in
Wing area	170 sq ft
Wing loading	18.5 lb/sq ft
Passengers and crew	4
Cabin length	115 in
Cabin width	45 in
Cabin height	48.5 in
Empty weight (dry)	1,850 lb
Useful load	1,300 lb
Gross weight	3,150 lb
Power loading	12.6 lb/hp
Fuel capacity (standard)	80 gal (76 usable)
Oil capacity	12 qt
Baggage capacity	250 lb (27 cu ft)

Performance

Takeoff distance	not available
Rate of climb	1,240 fpm
Maximum level speed	215 mph
Normal cruise speed (75% power)	208 mph
Economy cruise speed (65% power)	200 mph
Range at normal cruise (with 45-min reserve)	990 sm
Range at economy cruise (55% power with 45-min reserve)	1,170 sm
Service ceiling	18,100 ft
Stall speed (clean)	72 mph
Stall speed (gear and flaps down)	64 mph
Landing distance	not available