## Aircraft Design Super Stallion

# Wild Horse

### A plastic six-seater for the do-it-yourself set

BY MARC E. COOK

PHOTOGRAPHY BY MIKE FIZER

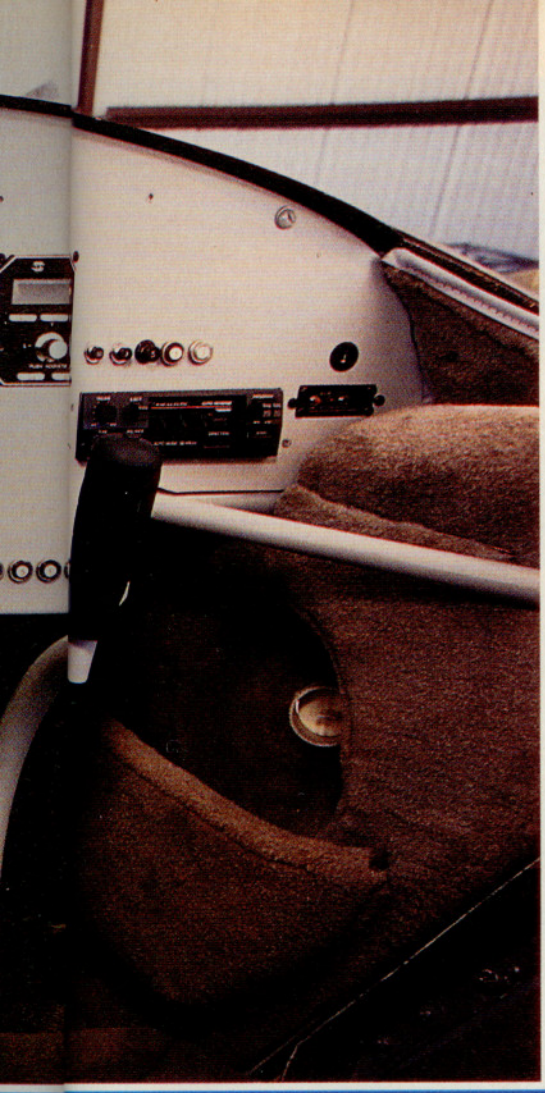
When contemporary aircraft homebuilding began, the field was populated with small, simple gadabouts that were intended as much for the experience of building as for Sunday-afternoon pleasures. And while there still are experimentals to fill this niche, the market has moved inexorably toward ever more sophisticated and capable designs—designs built for traveling and family hauling in the best Spam-can tradition. ■ You needn't look long at designer Martin Hollmann's Stallion to know into which end of the spectrum it fits. By combining the same airfoil as that used in Lancair's kit-built ES—though it's now different from the production Columbia's—with a beefy fuselage, Hollmann has created what can be described only as a new-age Cessna 210 Centurion. A high, cantilevered wing; tubular-steel main gear legs that swing back into the fuselage belly; and six-place cabin

all recall Centurion specifications. But Hollmann, one of the most outspoken and polarizing personalities in the aircraft kitbuilding industry, will dispute that the Stallion has much in common with the Cessna. "With composites, we get a surface finish that lets the airplane far outperform the Cessna."

By using a combination of standard fiberglass with select applications of carbon fiber in high-stress areas, Hollmann has indeed been able to produce an airplane with a smooth skin. But what might be surprising is this: Under the plastic face, there's a steel-tube fuselage shell that runs from the firewall to the bulkhead behind the baggage bay. Such construction allows Hollmann to fit large doors—including a snap-out cargo door on the right that's almost the same height and length as the cabin—without structural complications. In addition, the cage provides the homebuilder with a measure of security. Assuming the factory has welded all the pieces in the right places, a major portion of the airframe should always be the right shape and size.

Usually, multiple construction materials—steel tube and composite skins, in this case—don't lend themselves to low empty weights. According to Hollmann, the Stallion weighs about 2,200 pounds empty; compare this to a nonturbo Cessna 210 at about 2,300 pounds. (A smaller wing than the 210's is part of the weight savings, as is the hydraulic gear system with simple doors that do not require their own hydraulic cylinders and hardware.) Because there are no other Stallions yet flying, it's difficult to tell if the prototype's empty weight will be typical. Normally, such is not the case; nor are composites guaranteed to be lighter than metal. At least the Stallion leaves plenty of room in the envelope for load-hauling. Maximum takeoff weight is 4,100 pounds (landing weight is 3,800 pounds), which leaves about 1,900 pounds of useful load. The Stallion can be configured to carry as much as 180 gallons of fuel—that's 1,080 pounds in

The Stallion's metal instrument panel is accommodating (above). Gear and flap controls are in the lower center console.



gas alone—but you'll still be able to put 820 pounds in the cabin.

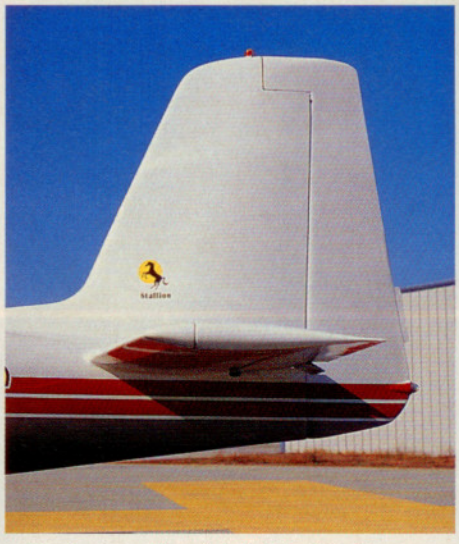
Stallion builders can afford to have the take-it-all mentality because the airplane has the cabin volume to handle it. As is true of Cessna 210s, the Stallion is either a slightly cramped six-seater (with comparatively little baggage room left over) or a marvelously roomy four-placer. In fact, the cabin volume is quite close to a late-model 210's, although the cockpit is slightly wider near the front, and with a bit more headroom forward of the wing carry-through structure.

**Designer Martin Hollman emphasizes, with good reason, the Stallion's speed and lifting ability.**

Performance is the Stallion's calling card, according to Hollmann, and his specifications paint it as a real fire-breather. Using a 280-horsepower Continental IO-550, the Stallion is said to be capable of 195 knots true at 8,000 feet on 75-percent power. Claimed climb rate is better than 1,600 feet per minute from sea level. In our flight tests, the airplane managed 1,000 to 1,200 fpm at a climb speed of 120 knots, performance about what you'd expect from an airplane of this heft and power. A brief speed check at 5,000 feet revealed a two-way GPS run averaging 180 knots at approximately 70-percent power. The IO-550-G, also used in the Mooney Ovation, is one of Continental's more efficient engines, with a cruise fuel consumption of about 0.40 pounds per hour per horsepower at 25 degrees lean of peak exhaust-gas temperature. Extrapolating from that, you can figure on high-cruise consumption of about 14 gph.

By these measures, the Stallion fairly whips the Centurion; but the airplanes


Those sleek, cantilevered wings can be crammed with as much as 180 gallons of fuel.



The horizontally split left-side cabin door is supplemented with a large, snap-out section on the right, providing access to cargo or the comfortable back seat. The production vertical tail will be larger than the prototype's.

are more alike in handling qualities. Although the Stallion uses sticks instead of yokes, any pilot with 210 time will feel at home. Roll and pitch forces are moderately high, and the airplane has an admirable rise in pitch forces with G loading. It also returns to trimmed airspeed without histrionics. (In the prototype at near the forward cg limit, there's insufficient nose-up trim authority at approach speeds, meaning that you must exert a 10-pound pull for the flare.) Generally, the Stallion acts like the 4,000-pound airplane that it is, with a firmness of control and a commendably taut and comfortable ride in turbulence. Little pitch change accompanies deployment of the gear and the first three-quarters' flaps. The last increment of flap travel pitches the nose up, though not as dramatically as on most high-wing Cessnas.

So far, the Stallion has the makings of the ideal traveling companion. Unfortunately, the prototype exhibits poor yaw stability—worse than even the most maligned certified aircraft. When upset by turbulence or intentionally kicked out of coordinated flight, the Stallion is slow to return the nose to straight-ahead and requires frequent input from the pilot to keep the ball in the center. It's worse with the gear down because


Sticks are unusual in this class of airplane, but the control pressures needed to move them are in line with the Stallion's size.

the main-gear doors add to the instability, making approaches in the Stallion more work than they should be. Hollmann admits to miscalculating the volume of the vertical tail and has made it larger in production kits. Because we have only the prototype to judge, we'll have to hope his modifications provide the fix.

Building an airplane as large and complex as the Stallion will not be for the faint of heart. Experienced airplane builders figure that the Stallion's build time should be around 3,000 to 3,500 hours—more if you lavish the latest avionics on your creation and set show-quality standards for its finish. The composite parts of the airplane should be well constructed, coming as they do from Rich Trickel's Tri-R Technologies group. (Trickel, in addition to building parts for his own KIS and KIS Cruiser, produces composite pieces for many in the kitbuilt community.) The Stallion kit includes all the major fiberglass components, steel-tube fuselage shell, and engine. Three Continentals, purchased separately, are recommended: the IO-550-G at 280 hp, the IO-550-N at 310 hp, and the TSIO-550-E at 350 hp. To the basic kit cost of $59,050, add about $31,000 for the nonturbo engines

The original Stallion uses a 280-hp Continental IO-550-G turning a Hartzell three-blade prop.

($52,000 for the turbo), and another $10,000 for prop and governor. Then budget for avionics, paint, interior, and ancillaries. Hollmann estimates that you can have the airplane completed for about $120,000, which is reasonable if you don't go wild at the avionics shop.

For your investment of time and money, you will have in the Stallion a fast, roomy cruiser. It handily beats a similarly sized 210's performance—in nonturbo form, the Cessna tops out at 170 knots—and can be equipped to haul an almost outrageous wealth of fuel. It's not an airplane kit for beginners, and it's certainly not your basic Sunday knockabout. In that sense, kitbuilts have come a very long way. □

*Links to all Web sites referenced in this issue can be found on AOPA Online (www.aopa.org/pilot/links.shtml). E-mail the author at marc.cook@aopa.org*

**Aircraft Designs Super Stallion**
Basic kit price: $59,050
Manufacturer's estimated completion price: $120,000

**Specifications**

| | |
|---|---|
| Powerplant | Continental IO-550-G, 280 hp at 2,500 rpm |
| Recommended TBO | 2,000 hr |
| Propeller | Hartzell, three-blade, constant-speed, 78-in diameter |
| Length | 25 ft 9 in |
| Height | 9 ft 6 in |
| Wingspan | 35 ft |
| Wing area | 140 sq ft |
| Wing loading | 27.1 lb/sq ft |
| Power loading | 12.3 lb/hp |
| Seats | 6 |
| Empty weight, estimated | 2,200 lb |
| Maximum takeoff weight | 4,100 lb |
| Maximum landing weight | 3,800 lb |
| Zero fuel weight | 3,300 lb |
| Useful load | 1,900 lb |
| Payload w/full fuel | 820 lb |
| Fuel capacity, std | 180 gal |
| | 1,080 lb |

**Performance**

| | |
|---|---|
| Takeoff distance, ground roll | 1,200 ft |
| Takeoff distance over 50-ft obstacle | 2,000 ft |
| Rate of climb, sea level | 1,600 fpm |
| Max level speed, sea level | 212 kt |
| Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption) | |
| @ 75% power, best economy | 195 kt/10.3 hr |
| 8,000 ft | (87 pph/14.5 gph) |
| Landing distance over 50-ft obstacle | 1,400 ft |
| Landing distance, ground roll | 700 ft |

**Limiting and Recommended Airspeeds**

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|---|---|
| $V_A$ (design maneuvering) | 174 KIAS |
| $V_{FE}$ (max flap extended) | 139 KIAS |
| $V_{LE}$ (max gear extended) | 139 KIAS |
| $V_{NO}$ (max structural cruising) | 260 KIAS |
| $V_{NE}$ (never exceed) | 278 KIAS |
| $V_{S1}$ (stall, clean) | 74 KIAS |
| $V_{SO}$ (stall, in landing configuration) | 62 KIAS |

*For more information, contact Aircraft Designs, Inc., 5 Harris Court, Building S, Monterey, California 93940; telephone 408/649-6212, fax 408/649-5738.*

*All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.*