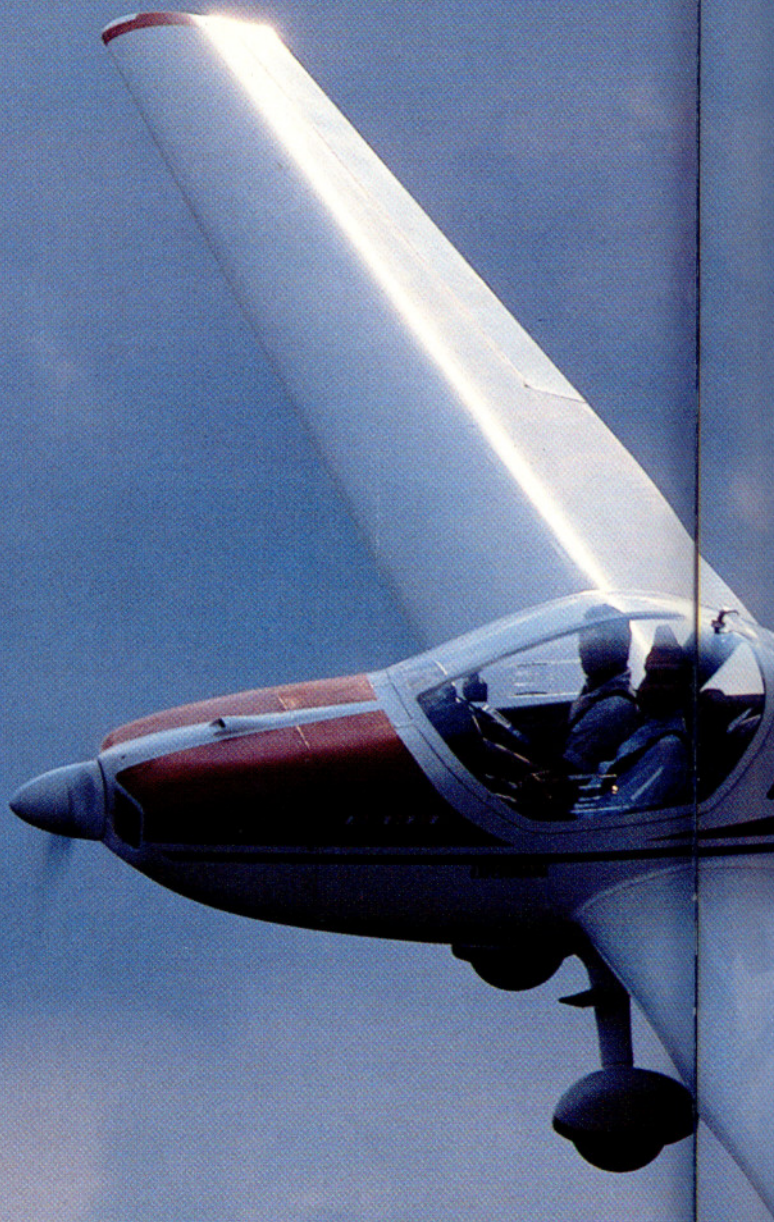
GROB G 109

Having it both ways—in certified plastic

BY THOMAS A. HORNE



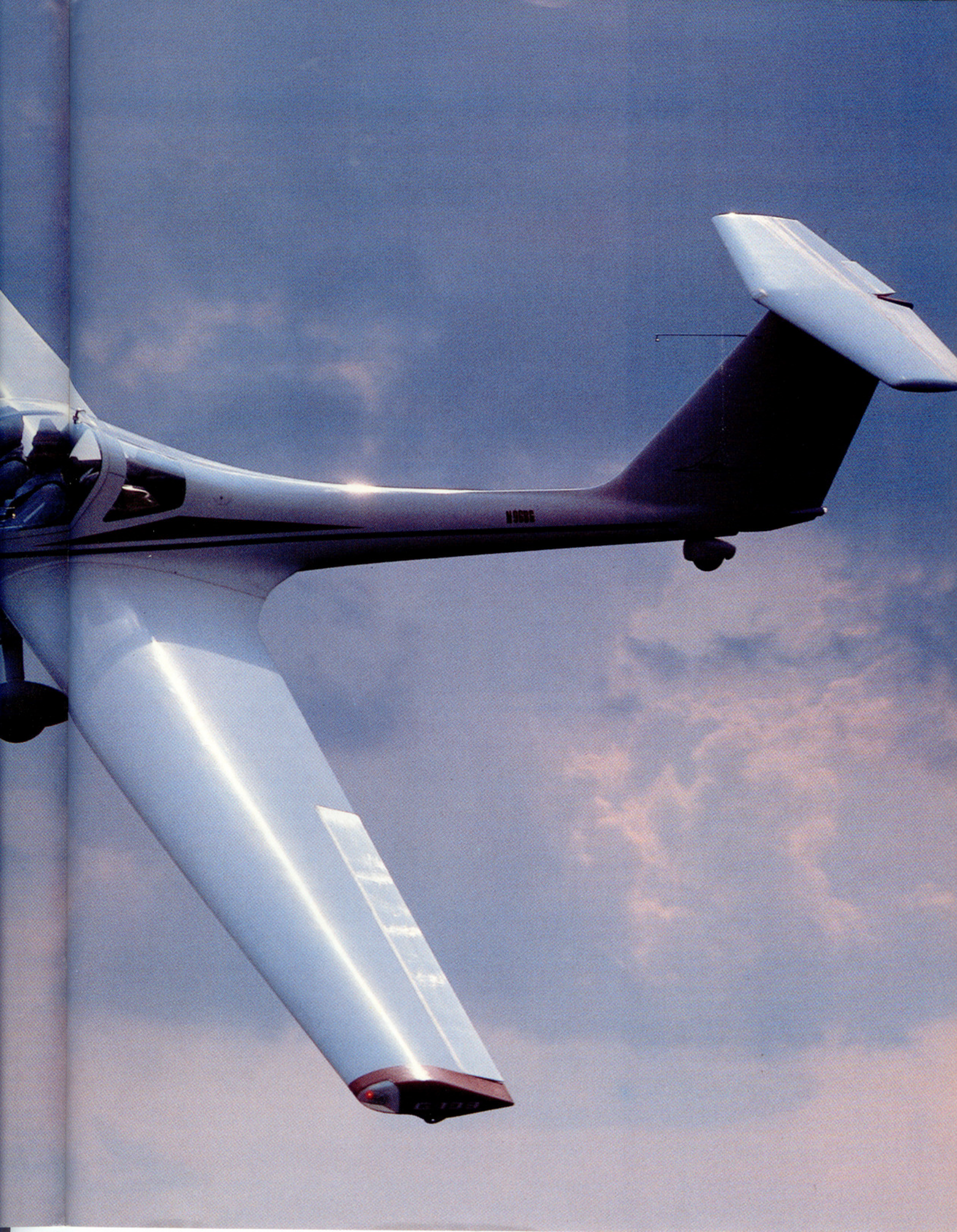
It had to happen. The *Wirtschaft Wunder* that is post-war Germany finally has begun its penetration of the American general aviation market in earnest. The Burkhart Grob Flugzeugbau of Mindelheim, West Germany, known for its Astir and G 102 series sailplanes, has come out with a new design—the G 109 motor glider. This past August, the G 109 received its U.S. type certificate, removing it from the Experimental category and thus setting it apart from the competing European motor gliders—the Valentin Taifun, the Scheibe designs, the Fournier RF-10, the Schempp-Hirth Janus CM, the Siren (Eiriavion) PIK 20-E and the jet-powered Caproni A-21SJ. What this means is that soon G 109s may be rented out like any other airplane in a fixed-base operator's lot.

This relief came none too soon. Numbed by annual successions of bland, uninspiring two-seaters from the major American manufacturers, pilots who want something different in a relatively inexpensive airplane now have an alternative.

In the power mode, you can fly the G 109 cross-country at speeds around 100 knots. Power off and prop feathered, you can perfect your skills as a sailplane pilot, knowing all the time that salvation is at hand. The best of both worlds, the saying goes, packaged in a Bauhaus-clean form that transforms the cockpit view of even the shabbiest countryside into a verdant corner of Baden-Württemberg.

The first thing you notice about the Grob is the sleekness of its lines, made possible by molded fiberglass construction. The second thing is its immense, 54-foot 6-inch wingspan. One also notices the attention to detail. All airframe gaps are sealed with tape to re-

PHOTOGRAPHY BY ART DAVIS



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duce drag. Inspection ports are provided for a look-see at the wing, tail and control-rod attach points. (The company claims that the wings can be detached, permitting easier storage, in less than 15 minutes.) The wing tips have built-in protective skids to help guard against ground-loop damage. The wing spars are fiberglass, the tail's structural members are a carbon fiber composite.

Though the airplane's slenderness suggests frailty, the Grob is stressed to withstand 6.5 positive Gs and 2.3 negative Gs. Aerobatics, however, are *verboten*—by the certificate, anyway.

Up front, you will find a Limbach L 2000 engine with dual carburetors. This is essentially a bored-out Volkswagen engine and a very popular choice among manufacturers of Experimental aircraft. Capable of obtaining a mighty 80 hp at 3,400 rpm, the power output of the Limbach/VW suits the Grob's mission well, and it is not as noisy as some of the other VW-aircraft-engine installations.

At gross weight on a hot August day when two of us on the staff flew the Grob, we saw 500-fpm climbs—not breathtaking, but comparable with a Cessna 152's performance. At cruise, the book says you can fly at 103 knots burning 4.2 gallons per hour, at 5,000 feet with a power setting of 3,000 rpm. To achieve the same performance from a 110-hp 152, you would have to use nearly all the available horsepower and burn a hair more than six gallons per hour. And the Grob has a gross weight of 1,820 pounds, compared to the 152's 1,670. Their useful loads are comparable: about 540 pounds, not counting any optional equipment.

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A four-point safety harness is standard equipment.

The reason the Grob can do on less than 80 hp what takes full throttle in a 152 is its aerodynamics. There is very little form and interference drag. The laminar-flow wings, which use the Eppler 572 profile, have slightly drooped trailing edges, a common feature in sailplane airfoils. The larger wing area provides less induced drag and more lift. More lift with less drag means more speed for less power. Or, as the art-school types might say, form follows function.

The ungraceful things about the Grob, though, are the contortions you must perform to enter and exit the cockpit. Once inside, you are reminded of a sailplane cockpit. You sit in a semireclined position, have a control stick and spoiler controls, and the visibility is excellent. Dual controls are standard on the Grob.

Another important item is pilot weight. A placard reminds the pilot that, if he weighs less than 155 pounds, ballast must be added. Grob can supply lead "trim cushions" to correct a too-light load. The cushions are attached to the lap belts of the unoccupied seats.

The Grob is a taildragger, but a tame one. Rudder inputs are adequate for turning—the Grob has a locking tailwheel—and the ship is not as squirrely as other, shorter-coupled taildraggers. But, just in case, you have three ways to stop. The wheel brakes can be actuated—singly or together—by pushing on the rudder bars to their last inch or so of travel. An automobile-style parking brake, located in the center console, actuates both brakes simultaneously, and the spoiler control, when pulled fully aft, also will engage the main wheels' disk brakes.

Engine and propeller operation is a bit out of the ordinary. You first notice this when running through the start procedures. What the manual—a poorly organized, confusing mess of insufficient information—calls a prop control knob is really a rope pull, as on a lawn mower. Before starting, you pull on the rope until it extends from the center panel "10 cm (four inches)." This helps ensure that the propeller is in the Start position, meaning at a low pitch, climb angle of attack. The variable prop's other positions are Cruise and Feather.

Push in the main and generator circuit breakers, flip on the ignition, give it some choke (it's a VW, remember), then hit the starter button. Funny, there is no mixture control, and the company offered no explanation as to why.

Since the Limbach has a single-ignition system, there are no magnetos to

check during the runup. Apart from the carburetor heat check, the only runup procedure is to firewall the throttle and observe the engine's oil temperature and pressure. You should see about 2,700 rpm on the tachometer. If it is lower—at 2,200, say—the prop is in the Cruise position, and the pitch must be changed back to Start. To do this, you back off to below 1,300 rpm and pull the rope.

On the takeoff roll, the tail seems to rise automatically at about 20 knots, regardless of stick position. Even at low airspeeds, only the slightest control pressures are needed to make crosswind or other corrections during the transition to flight.

Takeoffs in most airplanes have the pilot tilted back a few degrees, the nose pointed skyward, clawing at the air. In the G 109, you sit level. To maintain the recommended climb speed of 51 knots, you even have to exert forward stick pressure. The impression is rather like ascending in some kind of elaborate elevator.

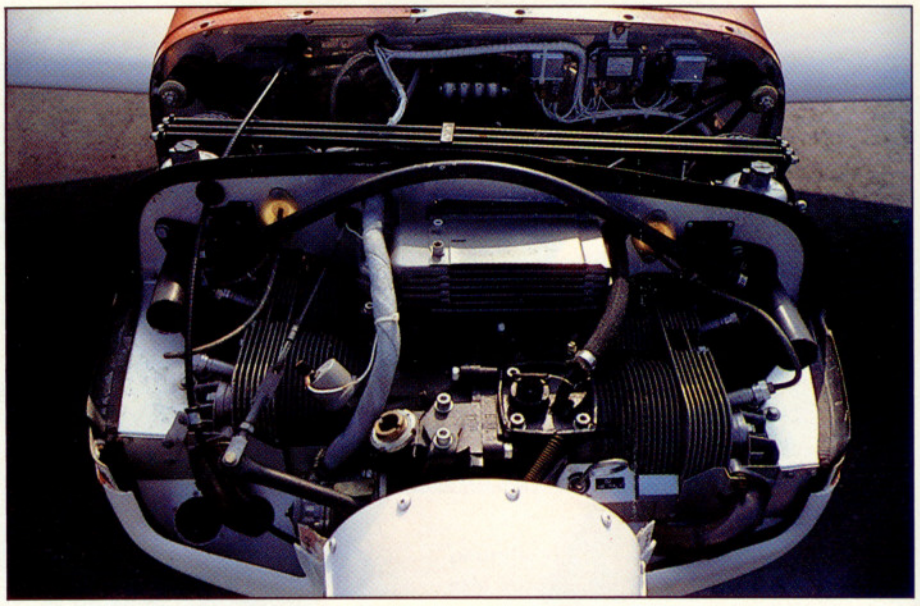
Another unusual sensation is the need for *left* rudder in a climb. The reason is that the Limbach turns counterclockwise.

Stalls are very docile, the buffeting barely discernible. The straight-ahead stalls I performed produced no pitch changes. The only way to confirm that a stall had taken place was to check the vertical speed indicator.

Establishing the Grob in a cruise configuration takes no small amount of tweaking. First, there is the matter of setting the propeller. With the power set somewhere above 1,800 rpm, pull on the rope again and the prop will go to Cruise pitch. Then you begin trimming, a procedure that can last awhile. The elevator is very sensitive, and finding the right trim setting can be tedious until you become accustomed to the airplane.

Once at a comfortable altitude, it is time to turn the Grob into a sailplane. To prevent shock cooling, idle the engine for two minutes. Then slow the airplane to 55 knots, switch off the ignition and feather the propeller by pulling back the feather handle and rotating it 90 degrees clockwise. Within two revolutions, the prop swings to a halt.

Best L/D speed (lift over drag or maximum distance glide speed) is 62 knots, marked on the airspeed indicator. Without the benefit of lift, the



The Limbach L 2000 engine is really a bored-out, dual-carburetor version of a Volkswagen Beetle powerplant. The feathering control is connected to the arm extending from the right rear of the propeller hub. Machined rods and levers (between engine and firewall), not cables, are used to actuate the throttle, carburetor heat and choke controls. No mixture control is provided.

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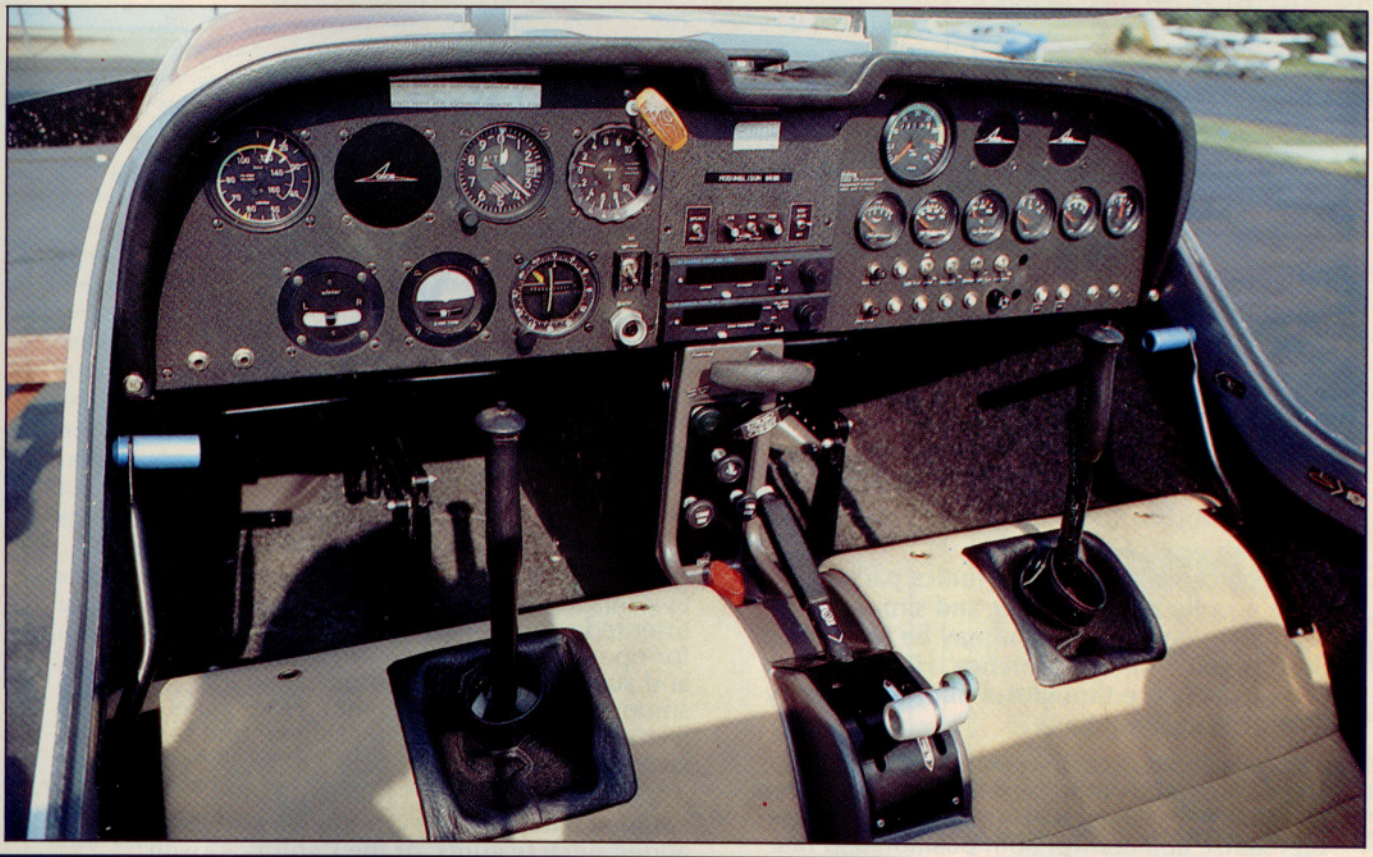

Though not certificated for instrument flight, the Grob's panel has room for expansion. The yellow handle is the emergency canopy jettison lever.

G 109 will sink at a rate of 30:1 (for every foot of altitude lost, the airplane travels 30 feet horizontally), which translates into roughly a 200-fpm descent.

None of us on the staff is an experienced sailplane pilot; but on a day we were told was "less than average" by our check pilot, we saw 800-fpm climbs in thermals west of Frederick, Maryland. Having made it close to cloudbase (4,200 feet) two times—and running out of lift—we knew it was time to land. Four miles out from the airport at 2,500 feet, we began to wonder, "Will we have to resort to starting the engine?"

We made it. On the downwind leg, the spoilers were cracked open. With the airspeed held at 65 knots, we went to half spoilers after turning final. The spoilers on the Grob are so effective that you have to be careful not to go to full spoilers too soon. The G 109 has no flaps.

For a taildragger, the landing attitude is not very nose-high. The tendency is to flare too much, in an effort to duplicate the visual cues sought in more conventional tailwheel airplanes. The correct tech-

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nique is to set the attitude and fly onto the runway.

The Grob we flew for this story is operated by Janelle Aviation at Godfrey Field in Leesburg, Virginia. When Janelle took delivery from Burkhart Grob USA (located in Bluffton, Ohio), the G 109 had yet to receive its type certificate.

Under a special exemption from the Federal Aviation Regulations arranged by the Soaring Society of America, N96BG was allowed to be used as a trainer for students working on their private pilot-glider certificates. Now that the type certificate has gone through, anyone can be checked out.

The unique glider training program at Leesburg cuts costs and makes better use of instructional time. Conventional glider training gives a student one, maybe two, landings every half hour. By dead-sticking the Grob then firing up the engine for another try, six landings are possible in the same amount of time. Out landings—the soaring term for a forced landing—also can be practiced safely, something that previously was impossible.

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Will the G 109 flourish in America? The Burkhart Grob Manufacturing Company, which began life as a maker of tooling for Volkswagen, Volvo, BMW and Porsche-Audi, originally thought the American demand for the G 109 would lie in its utility as a trainer. But the market is proving them wrong. Of the 16 sold since September 1981, virtually all have gone to VFR-only private pilots (the Grob is not certificated for IFR) who are simply looking for something different in their recreational flying.

At the current exchange rate, the base price of the G 109 is $35,235. Add $3,000 more for shipping costs plus whatever options you purchase, and you come up with an airplane that will cost you at least $39,000. More expensive than any of America's two-seaters, Grobs are left in the position of having to be sold as European exotica in a faltering economy.

The justification for this paradox must rest with the whims of the new-airplane buyers of America. The economy may be sick, but well-machined Teutonic automotive hardware enjoys an unprecedented popularity.

The Grob should secure its niche with pleasure pilots very easily, however, the real U.S. test for Burkhart Grob's design and manufacturing philosophies will come with the Lycoming-powered, two-place Grob G 110. Stay tuned. □

Grob G 109

Base price $38,235

AOPA Pilot Operations/Equipment Category: Sport/Special-purpose*

Specifications

Powerplant	Limbach L 2000 EB 1.A 80 hp @ 3,400 rpm
Recommended TBO	450 hr
Propeller	Hoffmann HO-V62 R/L 160T, variable pitch
Recommended TBO	450 hr
Wingspan	54 ft 6 in
Length	25 ft 8.7 in
Height	5 ft 6 in
Wing area	219.6 sq ft
Wing loading	8.28 lb/sq ft
Power loading	22.75 lb/hp
Seats	2
Cabin width	3 ft 7.3 in
Cabin height	3 ft 8 in
Empty weight	1,280 lb
Useful load	540 lb
Payload w/full fuel	413 lb
Gross weight	1,820 lb
Fuel capacity	126.6 lb (123.6 lb usable) 21.1 gal (20.6 gal usable)
Oil capacity	4 qt
Baggage capacity	44 lb, 5.4 cu ft

Performance

Takeoff distance, ground roll	732 ft
Takeoff distance over 50-ft obst	1,410 ft
Max demonstrated crosswind component	11 kt
Rate of climb, sea level	530 fpm
Cruise speed, max continuous power setting (3,000 rpm) 5,000 ft	103 kt
Fuel consumption	25.2 pph/4.2 gph
Range @ 3,000 rpm w/20-min res, 5,000 ft	485 nm
Glide ratio, propeller feathered	30:1
Service ceiling	14,500 ft
Landing distance over 50-ft obst	1,280 ft
Landing distance, ground roll	673 ft

Limiting and Recommended Airspeeds

Vx (Best angle of climb)	53 KIAS
Vy (Best rate of climb)	57 KIAS
Va (Design maneuvering)	80 KIAS
Vno (Max structural cruising)	100 KIAS
Vne (Never exceed)	140 KIAS
Min sink glide speed	51 KIAS
Max distance glide speed (Best L/D speed)	62 KIAS
V_{S1} (Stall clean)	47 KIAS
Vso (Stall in landing configuration)	50 KIAS

*All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted. *Operations/Equipment Category reflects this aircraft's maximum potential. See June 1982 Pilot, p. 93.*