THE GLASER-DIRKS DG–500M

FREEDOM AND INDEPENDENCE

Part-time power in a high-performance sailplane

BY BUZ MARTEN

This huge, white, supple, slippery thing is an ultimate toy—the plaything of the experienced sailplane pilot for whom money is not an obstacle. Its surface-bound equivalents would either be red, with prancing horse emblems, or white, flying the colors of country and yacht club. ■ Soaring and sailing are easily compared; in fact, the ranks of sailplane pilots are about equally filled with sailors and power pilots (with a lot of crossover to be

PHOTOGRAPHY BY LONNA TUCKER

sure). For the sailor, the challenge is enhanced by adding a third dimension and working in a largely invisible medium. The power pilot is offered the closest thing to eaglehood. But as the sailboat without a breeze lies dead in the water, so does the sailplane without a tow lie helpless upon the ground. Hence, we have seen the evolution of so-called powered gliders.

Most of these are odd-looking craft that are attempts at a dual-purpose machine capable of powered cruising and unpowered soaring. They are known as motorgliders, and the Hoffmann Dimona and Grob G109 are perhaps the most refined examples. They look like small lightplanes—usually two-seaters—with long wings. Most are powered by a Volkswagen engine derivative whose prop can be stopped and/or feathered for soaring.

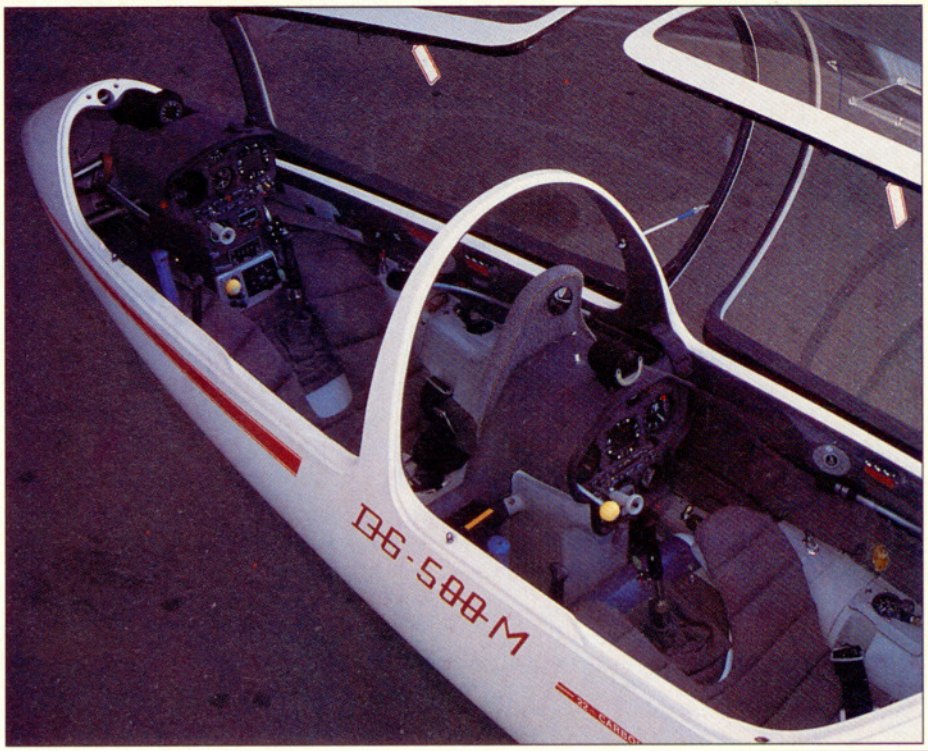
As expected, each capability limits the other, making the motorglider, like the motor sailor, a compromise and a disappointment to those who value high performance.

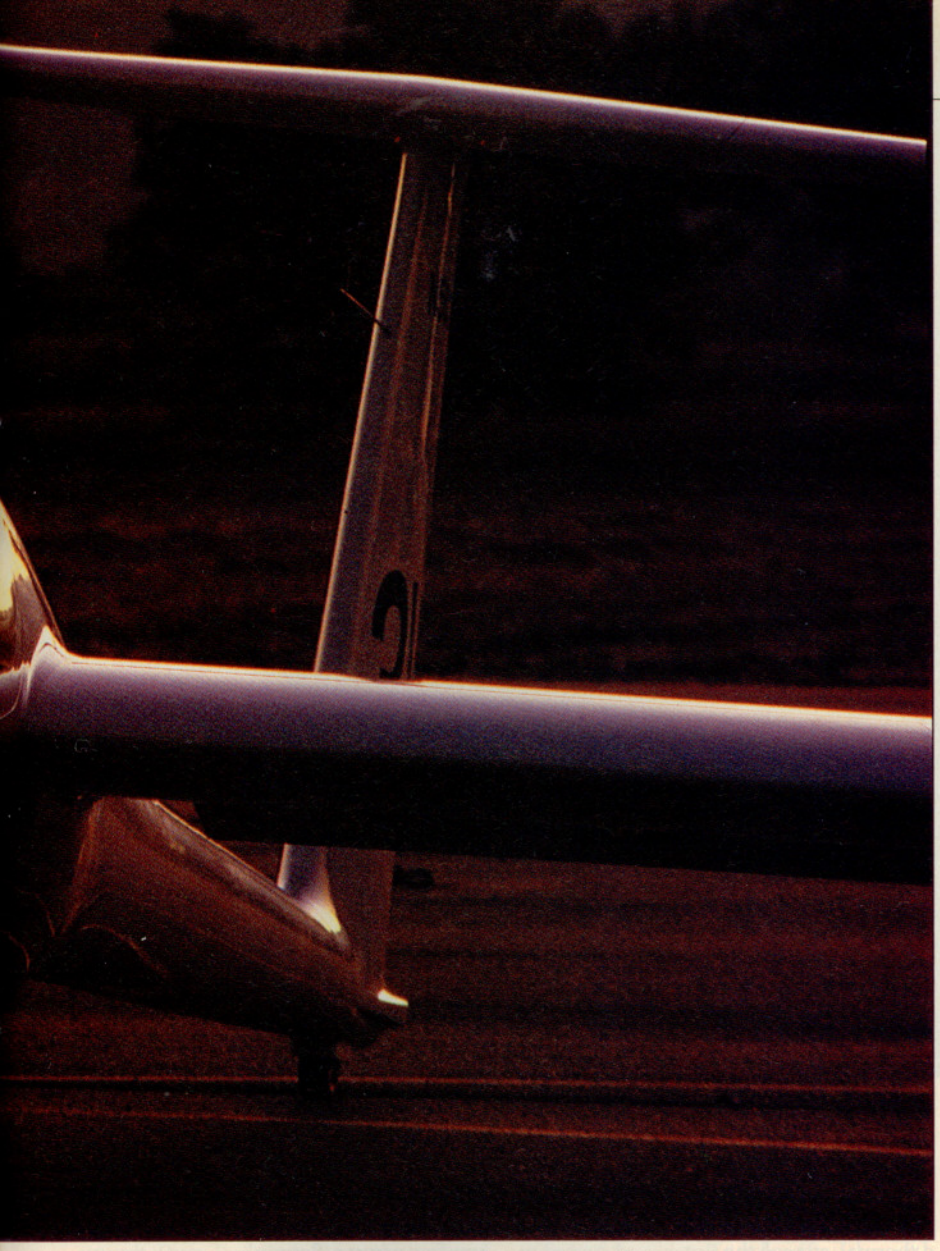
About a decade ago, the first aircraft to demonstrate the self-launching-sailplane concept appeared. These devalue powered cruise somewhat (because the small, retractable engines are, when extended, not streamlined and are set up for takeoff and climb performance) but give up nothing to soaring performance. Germany's Glaser-Dirks was among the first, with its DG–400 single-seat sailplane with a 15-meter (49-foot) carbon-fiber wing, retractable gear, and a Rotax powerplant/propeller unit that disappears into the fuselage just aft of the cockpit. It quickly became and remains the preeminent design in a new category, providing independence—the perfect adjunct to the freedom of soaring.

The DG–500M achieves its ultimate status by allowing the lucky pilot who has achieved this level of expression of flight to take along a friend. The pair can launch on a whim into the nearest rising air current, throw four switches, and quietly join the turkey buzzards.

My first look at the DG–500M came when the only example in the United States landed at my workplace. Unaware of its special status, I was impressed by the 22-meter (72.2-foot) wingspan—fully six times as wide as Calistoga Gliderport's Runway 10 on which it sat, with its upraised wing tip waving a bit in the light breeze.

I introduced myself to the pilot. Oliver Dyer-Bennet, AOPA 561965, Glaser-Dirks' sole U.S. distributor, said he was flight-testing the newly assembled aircraft. He grinned as he pushed a switch to pop out the hidden powerplant and prop and then offered a demonstration flight to occur when his test series was complete. At that time, the German-certified DG–500M was still operated





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in the Experimental category in the United States. Now the German/U.S. reciprocal paper swap is complete, and it is an FAA-certified, Standard-category machine with limited aerobatic approval.

A week later, Dyer-Bennet and I started the walkaround. (Of course, a full preflight of a sailplane starts at the trailer hitch, but we'll leave the assembly procedure to be found in the owner's manual.) One checks the fluids, ballast (if any), operation and condition of the engine, and its retraction system. Then, it's a good idea with any newly erected sailplane to do a positive control check, with one person moving the surface and another the stick or rudder pedals, to make sure that pressure can be applied both ways.

With preflight complete, we strapped on slim-pack parachutes. Parachutes are required for contest flying, and they double as padding for the fiberglass seat pan.

No one enters a sailplane gracefully. I settled into the rear-most of the two near-identical cockpits by first standing on the seat, then with hands braced on canopy jambs, lowering myself to near-horizontal and hooking my toes into pedal straps (which are needed to keep shoes separate from canopy at negative G). Fastening the four-point harness, I had a momentary, creepy flashback of being strapped to a stretcher, a feeling rapidly replaced by the impression of settling into a twenty-first-century interceptor.

This particular DG–500M belongs to engineer/sportsman Tupper Robinson, AOPA 611426, of Monte Sereno, California. Robinson, a certificated flight instructor who also owns and flies a Bonanza, will operate the aircraft in his Hyper-Soar Company, offering rides, check-outs, and "customized soaring adventure trips." It is loaded with options, including a steerable nosewheel (a must for unassisted launching), wing tanks for extra fuel and water ballast, an automatic engine extension/retraction system, and dual instrument panels. Instruments include small, 58-millimeter airspeed indicator and altimeter, leaving room for the Hamilton vertical-card compass; the large, compensated mechanical variometer (a sophisticated vertical-speed gauge that factors out pitch change); and a rectangular liquid-crystal display that depicts the functions of the Cambridge S-NAV navigation computer, which has—get this—a remote keypad, so you don't have to stretch to call up 100 or more displays and functions.

Briefing for takeoff, it hit me that this is a complex aircraft, which—even with its automatic functions—requires attention to details that constitute a work load comparable to a heavy single or light twin. While the prop is fixed, it's brakeable and retractable.

The main gear retracts, and the pilot must modulate the effective camber of the Wortmann-designed natural-laminar-flow wing by moving the flaps in 5-degree increments from plus 10 to minus 10 degrees as the aircraft passes through its speed range. This includes the takeoff roll where -5° is set initially to get maximum aileron effectiveness at low speed. (With the lever arm of the long wing, catching a tip wheel on a grass tuft could produce a ground loop.) At about 20 knots, the flaps are moved to the +10° takeoff position. On landing, the procedure is reversed, going from the +15° (landing only) position to -5° on the rollout. Furthermore, most flap changes require a dos-à-dos of the flap lever around the spoiler handle, a distracting process at first.

After a conventional runup of the 60-hp Rotax 535, including a check of the dual electronic ignition, Dyer-Bennet demonstrated the first takeoff, which consumed about 1,500 feet of bumpy asphalt on this calm-wind, 100° Fahrenheit day. With full 20.6 gallons of fuel and 360 pounds of Marten/Dyer-Bennet aboard, we were very near the maximum gross weight of 1,819 pounds, and acceleration was very sluggish. Once airborne, though, we climbed out at a respectable angle and 500 feet per minute at the 49-knot best-climb speed, which is marked on the airspeed indicator with a blue line. That's a performance equal to a loaded Cessna 150 that weighs less and has two-thirds more power. After a 7.5-minute climb to 3,500 feet, we found a thermal, stowed the Rotax, and started to soar. It was very quiet.

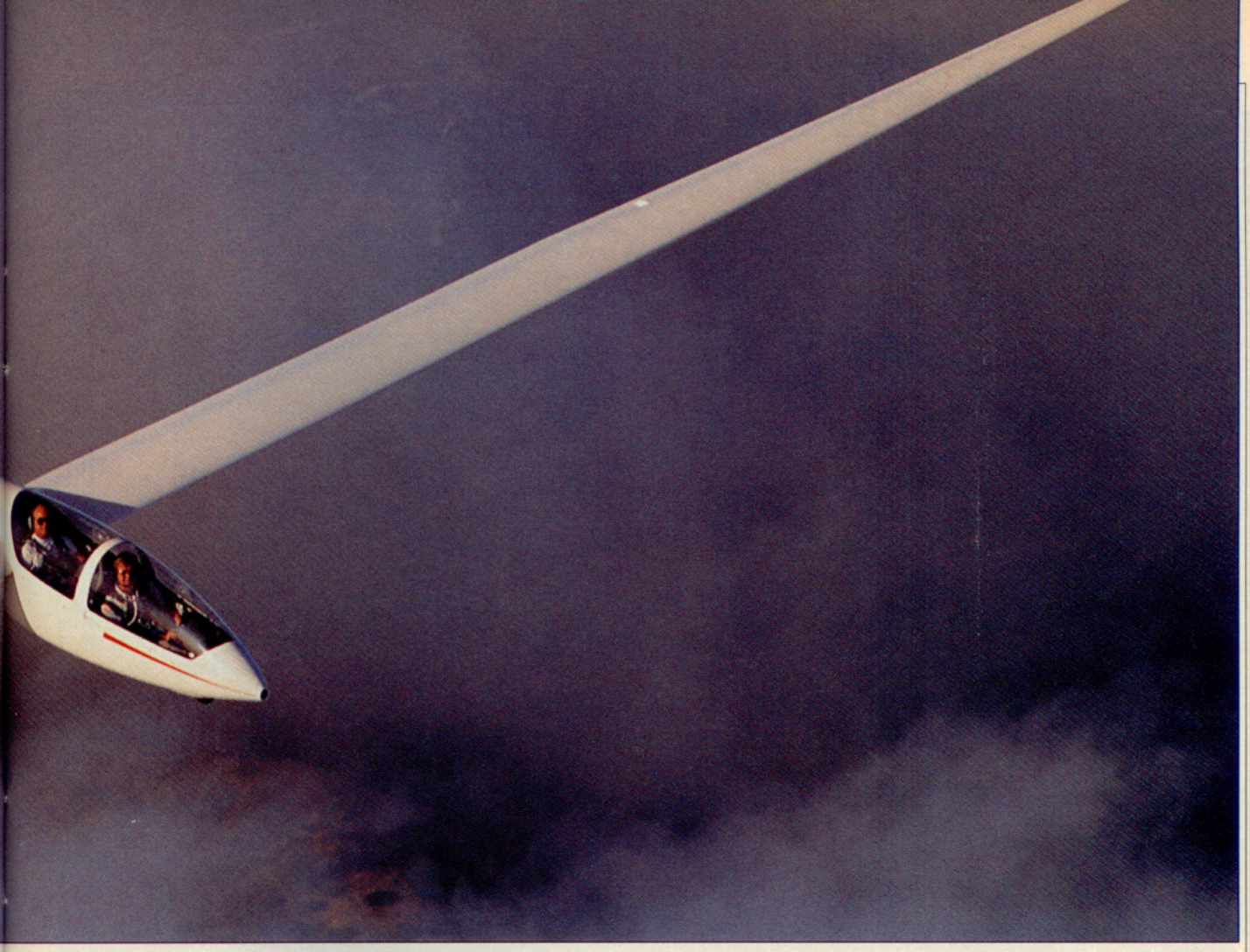
As Dyer-Bennet passed the con to me, I found very light stick forces, a good roll rate (for a sailplane), effective rudder, and very sensitive pitch. The latter—along with a limited view of the horizon from the rear pit—caused me to bobble some before pinning down the airspeed. A distracted novice pilot could tear past the 146-knot redline in an eye blink because the ship is so slippery and generates so little wind noise. One must develop a helicopter-like touch in pitch and match that to the larger excursions needed for roll. I found bracing my hand against my leg to be helpful, and Dyer-Bennet recommends a steadier two-hand grip for high-speed work. That aside, taking its performance into consideration, the DG–500M is stable and forgiving.

And what a delight—it wafts up like a fleck of down off a hot duck, with a climb-rate margin of 100 to 200 fpm over the sailplanes I'm used to, an unbeatable advantage in a contest. In what seemed to be just a few turns, we'd corkscrewed ourselves up to 7,000 feet, and I had to head back to work. A 130-knot TAS glide took us 10 miles back to Calistoga fast, and we spoilered in to land, playing the flap game as we bobbed along the rough, patchy runway, wings a-flappin'.

Many soaring purists contend that self-launching sailplanes (and motorgliders) are tainted by their powerplants and don't achieve the essence of pure soaring flight. But if one considers that gliders, from the earliest designs, have sought to emulate the great soaring birds, then the DG–500M comes perhaps closer to, say, an albatross than does a straight sailplane.

The gooney bird makes a long takeoff run to struggle into the air with limited power, using precious energy to reach soaring conditions, where it relaxes and spends most of its time. Without lift, it makes long glides, then climbs and glides again.

The DG–500M is cruised from A to B in the "saw-tooth" mode. While it's capable of droning along for extended periods at about 80 KIAS with its climb-optimized powerplant screeching at 6,500 rpm, it's far more efficient to climb to, say, 10,000 feet, then glide—engine stowed—for about an hour at 90 KTAS, with the process repeated as needed. Thus the name saw-tooth. This mostly quiet mode



doubles the range possible with powered cruise, at little sacrifice in speed.

My next day off from work found me back in the front seat of the DG–500M for a full check-out. The view from here was superb. Dyer-Bennet had me take off and fly to nearby Lampson Field to do touch and goes on a wider runway.

Arriving with good lift, I landed it first as a sailplane. The technique called for placing the single main gear on the downwind (in this case, the right) side of the 50-foot-wide, paved strip, slowing, letting the left tip wheel drop to the pavement, leaving the right wing raised to clear the runway lights. Next, I took off and—with Dyer-Bennet's coaching—made landings with engine out and running, out and off, and finally again as a sailplane, then as we rolled out, extending the engine, starting it, and making a touch and go. By this time, we had drawn a small crowd, who stood applauding the bird.

Climbing back to 3,000 feet, we put the noisy part to bed for good, and I thermaled up under a cumulus as Dyer-Bennet played with the computer. With the main screen displayed, it showed our altitude, average climb rate over the last 20 seconds, and commanded either a pull or push on the stick to optimize speed. It also produced audible "climb tones" that rose—in frequency and pitch—with the climb rate, and different-sounding "cruise tones" that rose with the sink rate.

Next, I took my longest glider trip ever. Using just airspeed, altimeter, and the tones (very useful for thermaling with eyes outside), I went about 75 miles north, then east around Clear Lake, out to the Sacramento Valley, and back to Calistoga, pausing perhaps a dozen times to circle up to 10,000 feet or so, then gliding at about 100 KTAS to the next lift. It took 3.5 hours and covered maybe 220 nautical miles, all of it pure fun.

Perhaps soaring is so pleasurable because it realizes our dream-time flights. If you'd like to learn more about the sport, talk to the Soaring Society of America, Box E, Hobbs, New Mexico 88241; telephone 503/392-1177. □

Glaser-Dirks DG–500M

Base price: $122,946

Price, as tested: $164,551

Specifications

Powerplant	Two-cylinder, liquid-cooled Rotax 535, 60 hp @ 7,000 rpm (2,333 prop rpm)
Propeller	MT epoxy-clad-wood, two-blade, fixed-pitch
Length	28.4 ft
Height	6 ft
Wingspan	72.2 ft
Wing area	197 sq ft
Wing loading	9.24 lb/sq ft
Power loading	30.31 lb/hp
Aspect ratio	26.5
Seats	2
Empty weight	1,210 lb
Max takeoff/landing weight	1,819 lb
Useful load	609 lb
Fuel capacity, std	10 gal (60 lb)
Fuel capacity with opt wing tanks	20.6 gal (123.6 lb)
Water ballast (max)	220 lb

Performance

Takeoff distance, ground roll	950 ft
Takeoff distance over 50-ft obstacle	1,475 ft
Max crosswind component	8 kt
Rate of climb, sea level	510 fpm
Min sink rate, engine retracted	90 fpm
Min sink rate, engine extended, off	300 fpm
Best glide ratio/speed	47:1/60 kt

Limiting and Recommended Airspeeds

V_A (design maneuvering)	106 kt
V_{S1} (stall, clean)	40.5 kt
V_{S2} (stall, airbrakes extended, landing flaps)	43.2 kt
V_{S3} (stall, airbrakes retracted, landing flaps)	38.9 kt

For more information, contact Glaser-Dirks USA, 5847 Sharp Road, Calistoga, California 94515; telephone 707/942-5727, fax 707/942-0885.

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.