BY IAN J. TWOMBLY

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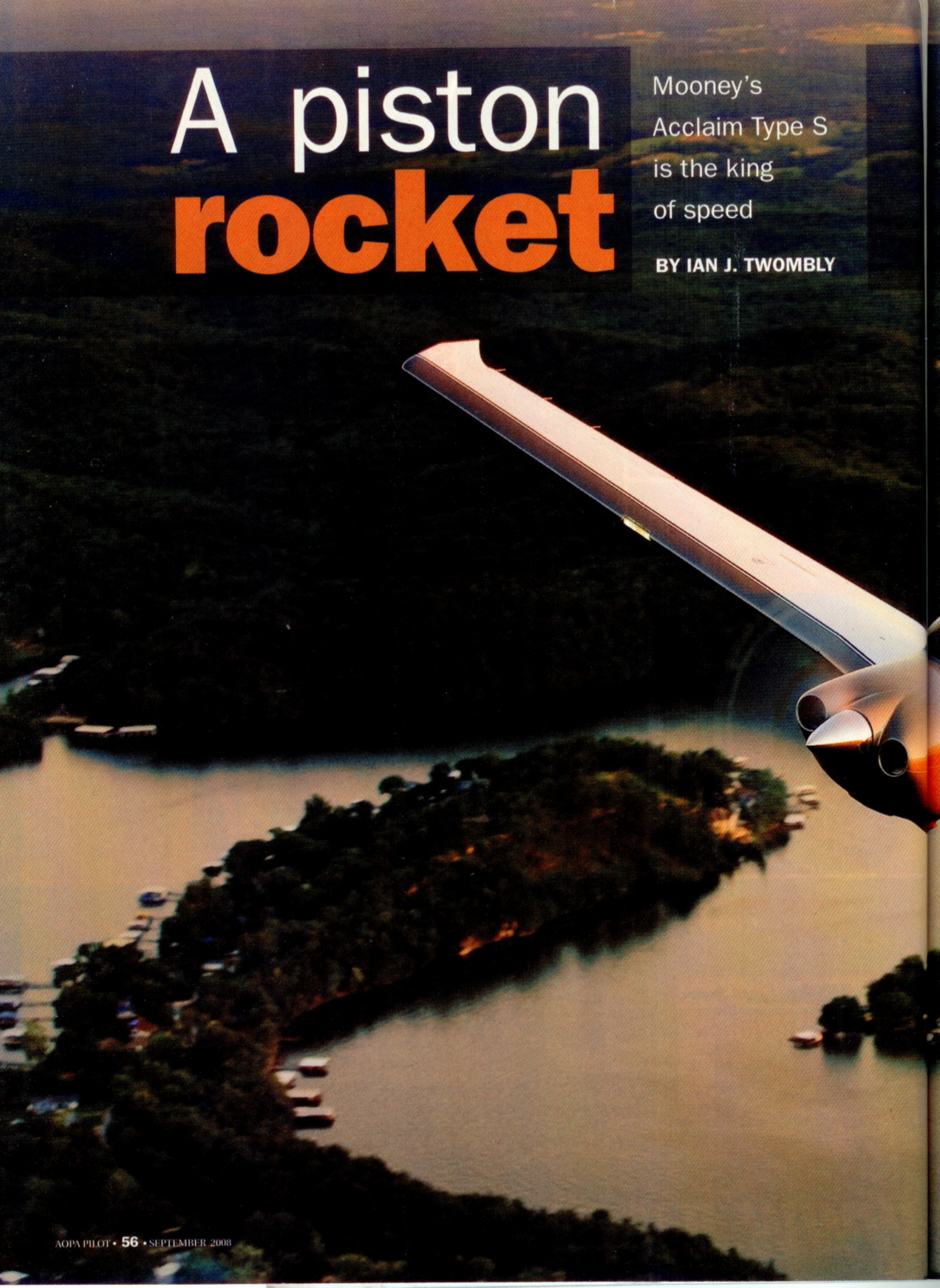
A piston rocket

Mooney's Acclaim Type S is the king of speed

BY IAN J. TWOMBLY



"Mooney Niner-Niner-Four Tango-November, climb and maintain Flight Level Two-Five-Zero." My thought turned back to the conversation Mooney Senior Manager of Flight Operations David McGee and I had about the company's new Acclaim Type S just prior to takeoff. "Will we make it to Two-Five-Zero?" I asked. McGee laughed, and, wearing a sly smile said, "Yeah. We'll make it." Consider we were climbing at 1,000 feet per minute as we entered the flight levels, I was starting to see why he thought it was a funny question.

No matter how you look at it, the new Mooney Acclaim Type S is a rocket. This is the fastest piston airplane Mooney has ever built, which is saying something when you consider Mooney is a company with a reputation of producing fast airplanes. The Type S (for *speed*, of course) is a minor development over the original Acclaim certified in October 2006. The Acclaim had a certified top speed

PHOTOGRAPHY BY MIKE FIZER

of 237 knots true at FL250. That put it in close competition for speed champ among production piston singles with the then Columbia 400, which is a fixed-gear composite airplane. After much public back and forth, Mooney dropped the gauntlet and introduced the Type S less than a year later in September 2007. With a certified top speed of 242 knots true at flight level 250, new 400-type certificate holder Cessna has been forced to accept second place on the speed board.

Certified as the Mooney M20TN, the Type S is the latest of the so-called long-body Mooneys that began in 1988 with the Porsche-engine M20L PFM. The five crucial knots come from a variety of minor aerodynamic improvements. Exactly what those are is not public, according to Mooney Chief Executive Officer Dennis Ferguson. "The aerodynamic engineer and I are concerned about owners of previous aircraft making the changes [without certification]," he said. But Ferguson did confirm the five general changes, which include a new Hartzell propeller, a redesigned nose gear door, the addition of flap gap seals, removal of control surface hinge covers, and adjustment of the cowling cooling fins. To make the improvements, the company reached out to Curt LoPresti, owner of LoPresti Aviation, and the son of former Mooney chief Roy LoPresti. LoPresti studied the Acclaim and suggested changes. Then Mooney's aerodynamicist engineered and implemented them, according to Ferguson.

The powerplant

The result of Mooney's improvements is the fastest piston single in production today. Like the Acclaim before, the Type S is powered by a Teledyne Continental Motors six-cylinder TSIO-550-G. Mooney's says the engine is "turbo-supercharged twin turbo with dual intercoolers," and the pilot's operating handbook says the engine is turbocharged thanks to a pair of Kelly Aerospace Model TA36s. However, the TN on the type certificate stands for *turbonormalized*. The difference between turbocharged, or supercharged for that matter, and turbonormalized is not a minor one.

Let's forget about supercharging at the beginning. The TSIO-550-G isn't supercharged. Turbocharging means an engine can be boosted above standard sea-level pressure, while turbonormalizing limits the power output to sea-level pressure. Turbonormalizing an engine reduces the harshness of turbocharging, and hopefully extends its useful life. So is the Type S turbocharged or turbonormalized? According to Ferguson, the TSIO-550-G is certified as a turbocharged engine, but Mooney wanted to convey the idea that it ran at temperatures more closely aligned with a turbonormalized engine. That's borne out in the maximum continuous manifold pressure setting of 30.4 inches, which is only slightly higher than sea level. Calling the engine turbonormalized was also a way to distinguish the Acclaim from the Bravo, which is clearly turbocharged, Ferguson said.

The Type S makes 242 knots on an engine that's rated at 280 horsepower. The Cessna 400 sports an earlier version of TCM's TSIO-550 rated at 310 horsepower. Also, Cirrus' competing SR22-GTS

The Type S has five basic aerodynamic improvements over the original Acclaim to give it that little speed boost. They include a redesigned gear door and cooling vents (far left), removal of hinge covers and the addition of gap seals (left), and a new Hartzell prop.

G3 makes a relatively slow 219 knots true with a TCM IO-550 and aftermarket twin turbos rated at 310 horsepower. (Of course, Cirrus also sold more than two-and–a-half times as many SR22s as Cessna 400s and Mooney Acclaims combined in the first quarter of this year.) But the point is that the Type S is not only fast, it's also efficient. Mooney owners will tell you that is a key benefit of the airplane. And Ferguson said that although speed is fun to talk about, efficiency is a benefit of that speed. With today's high fuel prices, it makes one wonder why Mooney's marketing efforts have focused almost exclusively on speed, while neglecting the efficiency.

The Type S has other new upgrades as well. It comes with an option for a BMW Designworks paint and interior. The paint scheme is certainly distinctive, while the interior adds a few nice touches, such as the Mooney logo in the headrests and a pin stripe down the side of each seat. It's a $2,900 option that adds weight, and thus reduces top speed by about two knots, according to McGee. Aside from those downsides, owners are almost unamiously selecting the BMW Designworks option.

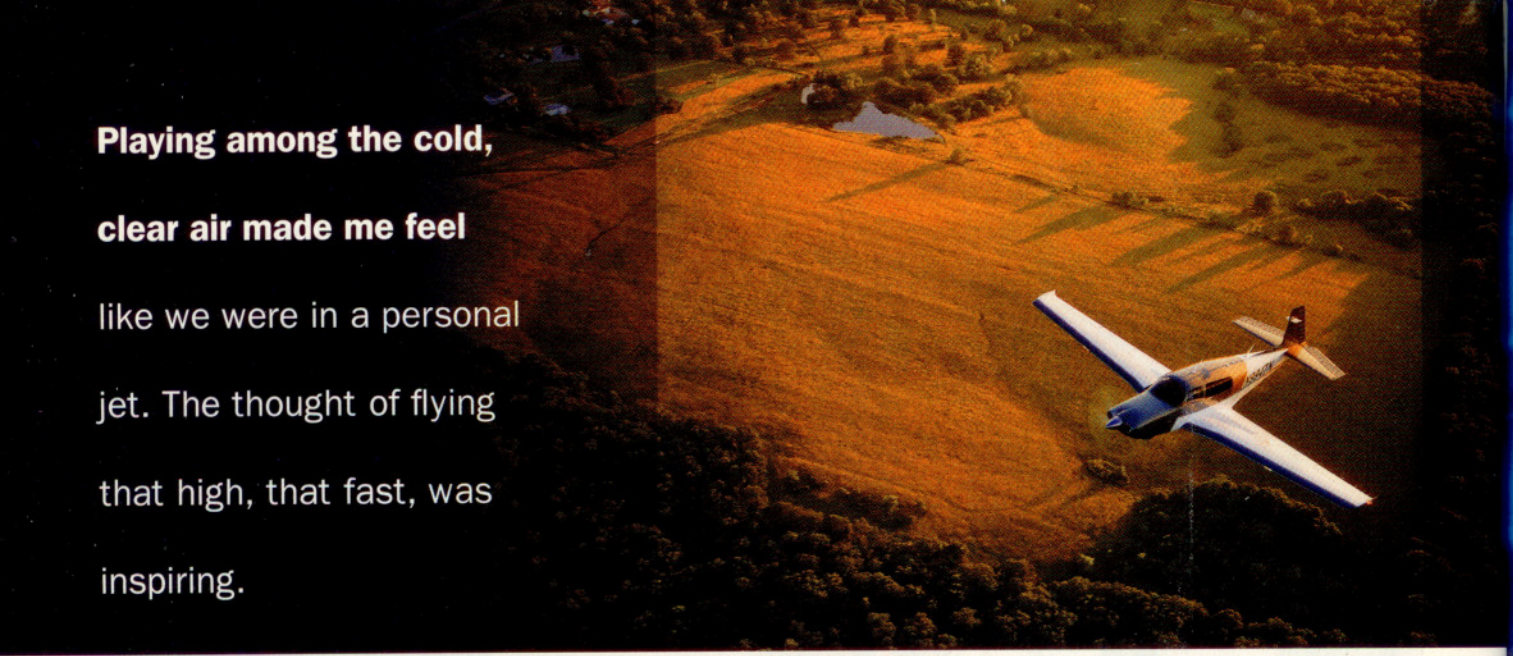
The instrument panel comes standard with a Garmin G1000 integrated cockpit suite and GFC700 autopilot. Garmin's new synthetic vision will be available as an option soon, if not by the time you read this, according to Ferguson. WAAS is also available.

Other options include a TKS anti-ice system that approves the Type S for flight into known icing. The entire system weighs 37 pounds dry and 96 pounds with the full 6.3 gallons of fluid. Owners can also opt for air conditioning and Monroy long-range tanks for an extra 30 gallons. With the long-range tanks, Mooney says the airplane will fly an astounding 1,852 nautical miles.

Test flight

We test flew serial number 94 (hence 994TN) over the Lake of the Ozarks in central Missouri. McGee said the company is registering the aircraft by serial number because owners are all requesting personalized N numbers. The Type S gives a great first impression. It sits low to the ground with the nose high. That, combined with its forward-swept vertical stabilizer, gives the impression of a fast airplane. This aircraft featured the BMW Designworks paint and interior, which has its fans. Personally, I think Mooney should have saved the design fee and stuck with the factory paint scheme. The BMW option somewhat detracts from the fast lines of the airframe.

A Garmin G1000 integrated flight display system comes standard (top). The G1000 makes a clean, professional-looking panel. Vernier-type engine controls make for precise inputs (above). Of course, no new airplane would be complete without cup holders.



Playing among the cold, clear air made me feel like we were in a personal jet. The thought of flying that high, that fast, was inspiring.

SPECSHEET

Mooney Acclaim Type S

Base price: $599,500
Price as tested: $602,400

Specifications

Powerplant	TCM TSIO-550-G
Recommended TBO	2,000 hr
Propellers	3-blade Hartzell
Length	26 ft 8 in
Height	8 ft 6 in
Wingspan	36 ft 6 in
Wing loading	19.26 lb/sq ft
Power loading	12.03 lb/hp
Seats	4
Cabin length	125 in
Cabin width	43.5 in
Cabin height	43 in
Empty weight	2,319 lb
Empty weight, as tested	2,330 lb
Max gross weight	3,368 lb
Max landing weight	3,200 lb
Useful load	1,049 lb
Useful load, as tested	1,038 lb
Payload w/full fuel	479 lb
Payload w/full fuel, as tested	468 lb
Fuel capacity, std	95 gal (89 gal usable) 570 lb (534 lb usable)
Fuel capacity, w/opt tanks	130 gal (128 gal usable) 780 lb (768 lb usable)
Oil capacity	8 qt
Baggage capacity	120 lb, 22.6 cu ft

Performance

Takeoff distance, ground roll	1,400 ft
Takeoff distance over 50-ft obstacle	2,125 ft
Max demonstrated crosswind component	18 kt
Rate of climb	1,350 fpm
Max level speed, sea level	186 kt
Max level speed, 25,000 ft	242 kt
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption) @ 75% power, best economy, 25,000 ft	236 kt/3.72 hr (18.3 gph)
Max operating altitude	25,000 ft
Service ceiling	25,000 ft
Landing distance over 50-ft obstacle	2,600 ft
Landing distance, ground roll	1,920 ft

Limiting and Recommended Airspeeds

V_X (best angle of climb)	85 KIAS
V_Y (best rate of climb)	104 KIAS
V_A (design maneuvering, max gross)	127 KIAS
V_{FE} (max flap extended)	110 KIAS
V_{LE} (max gear extended)	164 KIAS
V_{LO} (max gear operating)	
Extend	140 KIAS
Retract	106 KIAS
V_{NO} (max structural cruising)	173 KIAS
V_{NE} (never exceed)	194 KIAS
V_R (rotation)	77 KIAS
V_{S1} (stall, clean)	67 KIAS
V_{SO} (stall, in landing configuration)	61 KIAS

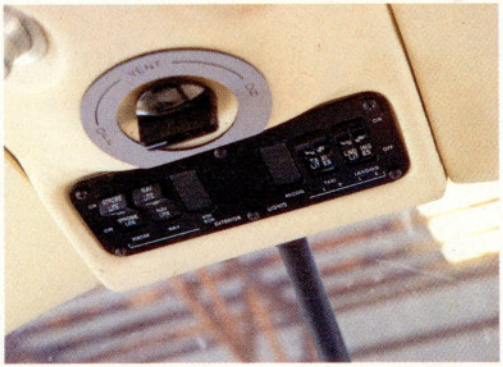
For more information, contact Mooney Airplane Company, 165 Al Mooney Road North, Kerrville, Texas 78028; 830-896-6000; www.mooney.com.

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.

Stepping into the cockpit, one can't help but consider the popular notion that Mooneys are small and cramped inside. Here's a newsflash: this one isn't. The cabin is 43.5 inches wide, an inch-and-a-half wider than the Beechcraft Bonanza G36. Although it is five-and-a-half inches narrower than the Cirrus SR22-GTS G3 and six-and-a-half inches narrower than the Cessna 400. Regardless, the cabin feels plenty wide enough for the average pilot. Head and legroom are also ample. Sitting in the Type S feels like sitting in a Corvette or other sports car. The seating position is reclined with your legs well out in front. It's no wonder that Porsche found Mooney to be the right choice to enter the aircraft market. There's a nice-looking center pedestal that goes to the floor and finishes with two well-positioned cup holders.

With the G1000, the panel is clean and well laid out. There are two large screens—a primary flight display and a multifunction display—circuit breakers, three backup instruments, the boost pump, the master switch, rudder trim, and a few other switches. Leather-wrapped yokes further refine the look. Anyone familiar with the G1000 will have no problem with the Type S panel. There are engine parameters, weather, and map views on the MFD, and full revisionary capability.

Start-up is a simple prime and fire. The big Connie comes on smoothly and with an authoritative deep throaty signature. Vernier controls allow for precise movements. There's nothing unusual about taxiing the Type S, except for the anticipation of all that power. The wonderful part is that the airplane is smooth. The throttle response is in-



Overhead switches give the feel of a larger airplane (right). The BMW Designworks interior includes the Mooney symbol stitched into the headrests (above). Amsafe seatbelt airbags are standard in the front. Oxygen controls nestle on the front of the pilot's armrest.

stantaneous and without protest. This airplane is not going to belch or lug around the ramp.

Once lined up on the runway and ready to go, it's time to get serious. Power is applied smoothly up to the point when the twin turbos kick in. Then it's a slight hesitation before pushing to the stop. By this time if you're not holding the brakes you are off like a rock from a slingshot.

On this flight we decided to get a clearance and climb up high to stretch the airplane's legs first, followed by some airwork and landings. We leveled out briefly at 15,000 feet to wait for a clearance and found 213 knots true while burning 21.6 gallons per hour at 70-percent power. That was two knots better than the book said we should have done. Passing FL200, we were still climbing at 900 feet per minute, which we held until leveling off at FL250. This was astounding, given that it was in a piston aircraft at gross weight on a day that was anywhere from 12 to 8 degrees Celsius above standard.

While McGee leaned the engine, I took some time to look around. It was beautiful. The weather was well below us. Playing in the cold, clear air made me feel as though we were in a personal jet.

The thought of flying that high, that fast, was inspiring. My attention turned back inside as we got close to best power. This was the moment of truth. Would it do the advertised 242 knots? Not today. The book said we should have gotten 240 factoring in the weight and temperature, but we managed an impressive 239. That was on 21.7 gallons per hour. Going lean of peak is where the range really starts to jump. At 16.5 gallons per hour we were still cruising along at 232 knots. That's a bladder-busting 1,100 miles when you factor in climb fuel. To put the speed and range in perspective, a twin-engine turboprop Beechcraft King Air C90GTi is certified to a maximum cruising speed of 270 knots true, and a maximum range of 1,321 nautical miles. It's no wonder McGee said he's passed King Airs before in the Type S.

For the descent, we deployed the speed brakes and came down at 2,000 feet per minute while staying comfortably at the top of the green arc on the airspeed indicator. While speed brakes may be a luxury on other Mooneys, they are a necessity on the Type S. At 11,500 feet we flew some steep turns (nice response, easy to manage), and slow flight, probably the most surprising part of the entire flight. For such a high-performance airplane, you may expect it to be unstable as the speed drops. But the Type S is like a rock in slow flight. Instead of being mushy, the airplane flies crisply and confidently.

After airwork it was time to debunk another Mooney myth—that they are difficult to land. Sure, the Type S is not as easy to land as a Cessna 172. But it also has almost double the horsepower and can cruise twice as fast. Speed on final is around 85 knots indicated. The thing to remember is that you have to hit the 85, lest you float the entire way down the runway. With its short, rubber puck gear, the airplane also doesn't like to be forced to the ground. McGee cautioned on the speed before we got in the pattern, and said that so long as I held the airplane off until a time of its choosing, we would be fine. But, he said, "The first porpoise is trouble, the second go around, and the third will be a prop strike." His advice was to apply up trim almost continuously in the roundout and flare until it almost reached the stop, hopefully at touchdown.

It worked like a charm and we landed gently on the mains. Two more passes and I felt completely comfortable with the airplane's landing behavior. With speedbrakes, it's possible to have the Type S down and stopped in 2,000 feet, although that's not for beginners. While it's not as forgiving as say, a Bonanza, the airplane lands well when you have the mechanics down correctly.

Mooney's new Acclaim Type S is a joy to fly. It's comfortable, efficient, responsive, stable, and of course, fast. Mooney may have not done itself any favors by focusing on speed. In doing so, it has ignored other, very favorable aspects of a highly capable airplane. So while Type S may be for speed, it's also for stable, smooth, serene, and sexy. AOPA

E-mail the author ian.twombly@aopa.org.

INTERACTIVE ▶

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Fly along with Ian Twombly as he takes the Acclaim Type S through its paces on *AOPA Pilot* Online.
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