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OCTOBER 2015

The New M350

The Updated Single Brings Unparalleled Comfort & Safety

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Making



Since its introduction more than 30 years ago, Piper's PA-46 Malibu has undergone a series of significant performance enhancements, while its cabin, often less noticed, has seen corresponding makeovers of its own. As we lounged in the back of N350CS, a new M350 on the ramp at Columbia Air Service in Groton, Conn. (GON), Gordon Ramsay, Piper program manager at Columbia Air Service, commenting on vintage Malibus, said, "At

the time, they seemed very comfortable; now we realize they were fairly Spartan... this is refined."

Indeed, in this update of the Malibu Mirage introduced this spring, with its interior by Boston's trend-setting Blokk Design, passengers in the all-leather seats can listen to Internet radio, recharge their personal devices at USB ports or make phone calls through the optional Iridium Satellite Transceiver. But it's the signature addition of electronic stability protection

(ESP) to the flight deck of the M350 that has brought the PA-46's evolution full circle, definitively addressing questions about the nexus of aircraft performance and pilot capability that the sleek, pressurized, cabin-class piston single raised soon after its debut.

The Malibu has always had its share of owners who sat in the back, but it was first and foremost a pilot's airplane. As aspirational as it was practical, the Malibu was at the top of the food chain for GA flyers who

Safety

THE UPDATED SINGLE
BRINGS PILOT PROTECTION
AND COMFORT UP TO SPEED

BY JAMES WYNBRANDT

More Than A Mirage



never saw value in the cost or complexity (or accident rates) of a twin, but needed that level of capability. The pressurized fuselage and cabin-class configuration created a new category of single, and the 25,000-foot service ceiling and the efficiency of the 310 hp Continental that first powered the PA-46 afforded pilots more sky than they had ever had in their hands before. But a rash of in-flight breakups and other accidents led to questions about the integrity of the design, the reliability of the engine and the ade-

quacy of its pilots to handle the demands of the flight levels. While seeking answers, the FAA issued an AD removing certification for flight into known weather, and Piper carried out extensive further testing of the design, the results of which ultimately led the FAA to withdraw the AD. The breakups were attributed largely to pilot error. (A faulty encoding altimeter producing uncommanded pitch changes was suggested by one pilot who survived an incident as playing a possible role in some accidents.)

The 350 hp Lycoming TIO-540-AE2A introduced in 1989 added greater redundancy with dual intercoolers, dual alternators and dual vacuum pumps. The standard Garmin G1000 glass panel introduced in 2010 delivered situational awareness and weather data unavailable at any price in the last century. Meanwhile, the rise of high-performance singles from Cirrus, Cessna's Corvalis/TTx and Mooneys (Bonanza pilots seem to migrate to Barons) prepared pilots for the M-class transition.

PILOT REPORT | PIPER PA-46 M350

But things happen fast in this airplane, and despite better equipment and pilots, the consequences of encountering heavier weather than anticipated at altitude or a moment's inattention in the pattern have remained undiminished. Until now.

During our walkaround, little on the airframe distinguished the M350 from the predecessor Mirage, save for two small storage areas—one in the tail, and one in the rear of the radar pod, beneath the right wing, that can house small items—like fuel strainers and pitot covers you don't necessarily want or need inside the aircraft. But enhancements added over the years are plain, including the beefed-up wing, three-bladed prop, LED lights and composite gear doors. Columbia and Ramsay have witnessed most of the evolution. Columbia became a Piper dealer in the mid-1990s, and Ramsay was recruited soon after to join the team. A Hartford native, he had been buying, rebuilding and selling airplanes since he was a teen. We passed his Piper Cub in a Columbia hangar on our way to N350CS.

After our moment in the cabin absorbing the passengers' perspective we pulled in the clamshell doors and headed for the cockpit. (For the record, 350CS has the Premier Elegance interior with Dune leather and matching coordinated carpet and headliner.) The fold-down cabin and copilot's seats introduced in a previous upgrade ease entry, but it's still a tight squeeze. But once seated before the panel, dominated by the two 10-inch primary flight displays (PFDs) and a 12-inch multifunction display

(MFD) in the center, there's plenty of room. An Aspen EFD-1000 standby instrument has replaced electromechanical backup gauges and wet compass.

Hit the battery master on the left overhead panel to get the Garmin going. This is an injected Lycoming, so you'll want to review your hot-start procedures, but on this first flight of the morning, a little priming with the throttle cracked, and a push of the start button overhead got the prop spinning. After engaging the avionics master, we turned on the air-conditioning, especially welcome when OAT is ISA plus 20 degrees F like it was on this day. (Ramsay noted he had never seen a Mirage that didn't have A/C onboard.)

Our destination was Plymouth, Mass. (PYM), via Martha's Vineyard (MVY), a total distance of 96 nm, giving us time to see climb performance and perform maneuvers en route. No need to go to the 25,000-foot service ceiling to check its well-documented top cruise speed (213 KTAS). Ramsay programmed the flight plan. With the two of us and 85 gallons of fuel onboard, we were about 300 pounds shy of the 4,340-pound MTOW. The G1000 runs everything, and in addition to ESP, the M350 adds digital pressurization, a hypoxia recognition system and coupled go-around (for autopilot-flown missed approaches, but helpful on hand-flown departures, as well) to its functions.

At 1,000 rpm, the PA-46 develops enough momentum when taxiing to steer without brakes, using some muscle on the pedals.



For takeoff, flaps are set to 10 degrees, pitch to just aft of neutral, and rudder trim is centered. Engage the go-around button, located in a thumb-sized hollow on the left side of the throttle. Once airborne, this will activate the flight director's command bar in a seven-degree pitch-up attitude, the desired climb angle for either takeoff or going around on a missed approach. Hold the brakes, advance the throttle to 2,000 rpm, and with engine instruments in the green, release the brakes and smoothly advance the throttle. Turbochargers kick in at about 32 inches, and rotation is at 75 to 80 knots.

Pulling back to climb power of 35 inches and 2,500 rpm and following the command bars gave us a 750 to 800 fpm climb at 115 knots, burning between 35 and 36 gph. The fuel pump and landing lights (the former on



An upgraded interior, Garmin glass panel and LED lights are among the refinements that have marked the evolution behind the M350.



Outward appearances have changed little on the M350, the new update to Piper's PA-46 Mirage, but the Electronic Stability Protection (ESP) added to the flight deck provides a greater safety margin, whether the destination is a major airport or a grass strip.

the left overhead with the rest of the electrical system rocker switches, and the latter on the right overhead light control panel) can be turned off at 1,000 feet AGL. By now, most Mirage pilots would likely have the autopilot engaged, but I was enjoying the smooth and stable hand-flying eastbound over Long Island Sound, the scattered cumulus and their attendant bumps to the north stopping at the shoreline. By the time we made our turn to the mainland at MVY, we'd be well over them.

We flight planned for 13,500 feet and engaged the autopilot just before it gave its 200 feet to target altitude alert and observed the uneventful altitude capture. We set cruise power of 30 inches and 2,400 rpm, and leaned to about 21.5 gph. Calling up the handy range ring on the map showed we had enough fuel at

ground speed to make it to Canada's Cape Breton Island, more than 500 nm to the NE.

The pressurization system was working automatically, with the cabin altitude showing about 300 feet—no need to dial in our cruising level. (You do have to input the field elevation of your destination to avoid the possibility of a sudden pressure dump depending upon where you're landing, but Ramsay said destination elevation will likely be picked up automatically from the flight plan in a future upgrade.) At its service ceiling, the cabin's pressure altitude is about 9,500 feet.

Recent high-profile accidents in other aircraft in which hypoxia is thought to have played a role have brought renewed attention to its dangers, and Piper has responded in the M350. First, the panel has a built-in pulse oximeter and CO detector.

It feels odd sticking your finger in a socket in the instrument panel, but anyone who has used a pulse oximeter will be familiar with the firm clamp of the alligator jaws onto the middle finger. Heart rate and blood oxygenation level are displayed on the MFD. More impressively, the M350 also has a Hypoxia Recognition System, active whenever the autopilot is engaged and the cabin altitude climbs above 14,900 feet, as would happen in the event of depressurization. (Cockpit oxygen masks are stowed beneath the copilot's seat.) If no pilot interactions are detected in these conditions, the system engages Automatic Descent Mode, bringing the aircraft to an altitude allowing recovery from hypoxia.

With our faculties intact, we disengaged the autopilot to try out the ESP. Piper isn't the only company to offer this protection.



PILOT REPORT | PIPER PA-46 M350

The King Air 200 is so equipped, Cirrus introduced the feature in its 2015 model year SR-22s, and it's available for experimentals with G3X glass cockpits. Designed to prevent stall/spins, steep spirals and loss of control, ESP acts to keep the aircraft away from the edges of its envelope. Once bank angle steepens beyond 45 degrees, servos engage and begin applying countering pressure that grows stronger as the bank steepens. Keep trying to override the pressure, and the system will relieve the pilot of command, announcing, "Engaging autopilot," and restoring the aircraft to wings level. The ESP can be disengaged, for training purposes, for example, through a setting on the Garmin's Aux page, but as the unalterable default setting, ESP is active whenever the G1000 boots up. The M350 also has Underspeed Protection (USP) and Automatic Level Mode. Pitch up or pull back the power to the point where airspeed approaches a stall, and the USP automatically lowers the nose to a safe airspeed. Should any loss of control or unsafe situation arise, the Level mode can be engaged by simply pressing the blue button marked "LVL" in the center of the panel, which restores the aircraft to wings level and zero vertical speed.

We were now 27 nm from PYM with 8:57 minutes to lose more than 13,000 feet. We dialed in a descent rate of 165 knots (top gear deployment speed), dropped the gear and popped the now-standard speed brakes, producing a 2,500 fpm descent. With a top speed of 195 KIAS with gear extended, "You could lower the

nose and go down 6,000 fpm without touching the power," Ramsay said.

Of course, with the M350, you don't always have to climb up in the first place, unlike the turbine-powered M500 (formerly the Meridian) and the forthcoming M600, where it almost always makes sense to fly at FL280 or 290 for fuel efficiency, regardless of the winds. With the optional GTS 825 Traffic Advisory System and GTX 33ES digital transponder onboard for ADS-B In and Out, the MFD displayed conflicting traffic, vertical separation and even N-numbers of ADS-B-equipped aircraft, taking a lot of the pucker factor out of flying in congested airspace. The MFD can also display returns from the optional GWX68 radar atop Nexrad imagery, for finding optimum routes through weather at altitude. As Ramsay said, "If you can't get over it, under it or around it in this airplane, you shouldn't be flying."

Plymouth Municipal's ASOS was reporting winds from 310 at 14, peak gusts to 18, but traffic was using Runway 24 rather than Runway 33, providing an opportunity to see the M350's crosswind-handling characteristics. Basic pattern numbers are simple: 110 knots on the downwind, 100 on base and 90 on final, coming over the fence at 85 knots. But with a 12-to-1 glide ratio, it's important to have your speed under control, otherwise, you might have to do a go-around. But no worries: As noted, in the new, safety-enhanced M350, there's an app for that. P&P

SPECIFICATIONS

Standard Equipped List Price: \$1,155,500

Engine: 350-hp turbocharged Lycoming
TIO-540-AE2A

TBO (hrs.): 2000

Propeller: Hartzell 3-blade composite

Wingspan (ft.): 43

Length (ft.): 28.9

Height (ft.): 11.3

Standard equipped weight (lbs): 3050

Standard useful load (lbs.): 1308

Max fuel capacity (gals): 120

PERFORMANCE

Max cruise speed (KTAS): 213

Max takeoff weight (MTO, lbs.): 4340

Max ramp weight: 4358

Service ceiling (ft.): 25,000

Cabin pressurization: Max cabin
differential: 5.6 psid

Range with 45-min. reserve (nm): 1343

Takeoff distance

Ground roll (ft.): 1087

Total over 50-ft. obstacle (ft.): 2090

Landing Distance

Ground roll (ft.): 1020

Total over 50-ft. obstacle: (ft.) 1968

Source: Piper Aircraft

