USED TURBINE REVIEW

MITSUBISHI MU–2s

High speed for low cost—at a price

BY THOMAS A. HORNE

Rice Rocket. Saki Sucker. Twin Honda. No matter what slang moniker comes to mind, the Mitsubishi MU–2 evokes strong pilot emotion. For those unfamiliar with the breed, the MU–2 is a high-work-load hot rod with a propensity to kill. To the pilots who operate them, MU–2s are wonderfully capable and a dream to fly. Somewhere in between lies the truth. ■ It's easy to agree that MU–2s are hot rods. Depending on the model, maximum cruise speeds run from 280 to 321 KTAS. The airplane's aggressive appearance and screaming, high-pitched 700-plus-shp Garrett TPE-331 engines further reinforce the MU–2's reputation as a fire-breather. ■ An unconventional collection of flight control systems and airframe oddities add to the MU–2's macho-man image. The wing, for example, is tiny for an airplane so massive. At 178 square feet, the MU–2's wing

PHOTOGRAPHY BY MIKE FIZER AND ART DAVIS

area matches that of a light single and looks somehow mismatched on a beefy airframe that can gross out as high as 11,575 pounds.

Spoilerons are used for roll control, since the entire wing's trailing edge is taken up by a huge set of full-span flaps. Roll trim is accomplished with small, electrically actuated tabs set in the flaps. Out at the wing tips are a pair of large fuel tanks, capable of holding 93 gallons each. Top off the tanks, and that's 623 pounds of fuel at each wing tip. It's a whale of a lot of weight far from the CG, one reason why roll trim can be so important.

Come to think of it, trimming in all

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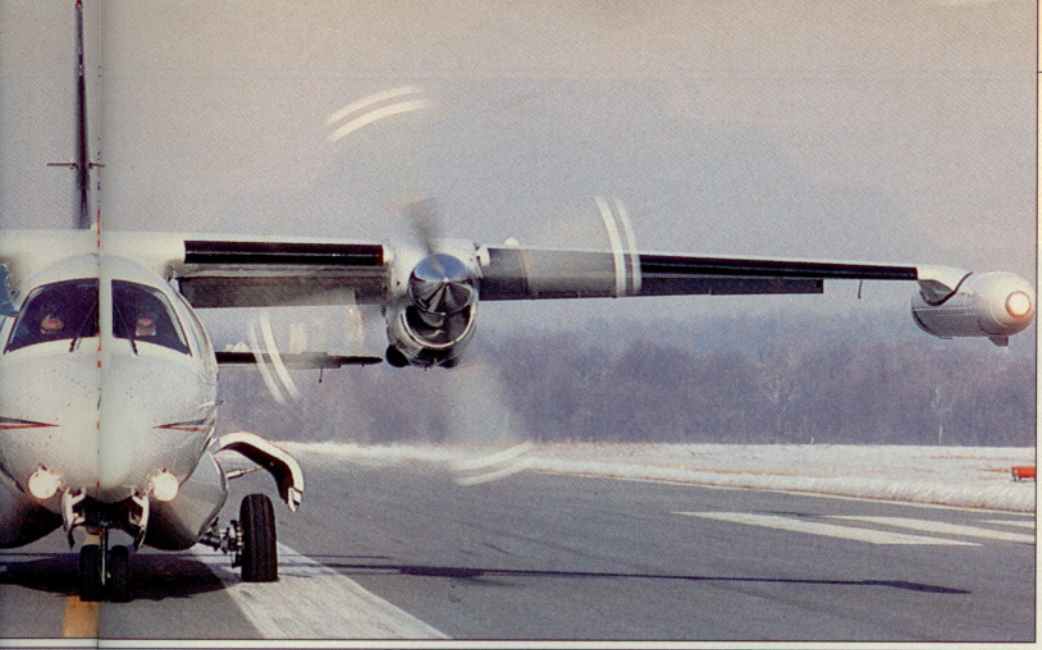
axes is very important to smooth MU–2 flying. One glance at the airplane tells you that it's short-coupled all around, and that goes double for the "short-body" models (more specifically, the MU–2B, -D, -F, -K, -M, and -P models built from 1967 to 1978, plus the 1979 to 1984 MU–2B-40 Solitaires). Any change in power, roll, pitch, or yaw means a new flurry of trimming to keep the ship on an even keel. Until you learn the ropes, you'll find the MU–2 a trim-hungry animal.

You say an engine quit on takeoff? Uh, oh. Now there's no propeller blast over half that mini wing. The same one you're trying to hold up with a ton of yoke pressure and a maximum of "aileron" trim. Meanwhile, all that yoke pressure translates into spoiled lift on the wing with the good engine. Of course, you're also stomping on the rudder to help maintain directional control. This adds up to a lot of drag at a very critical time. It's a good thing that the MU–2 has such tremendous power or climbing away would be impossible. With gear retracted and flaps at the 20-degree takeoff setting, most post–1972 MU–2s have maximum takeoff weight, single-engine climb rates of 400 to 500 fpm. Blueline in this configuration is 138 to



The "long-body" MU–2s (top two aircraft) are the flagships of the fleet. "Short-body" versions, like the 1980 Solitaire shown here, are the real hot rods. They average 15 to 20 knots faster than their stretched counterparts.

152 KIAS, depending on the model.

The MU–2 landing is also the subject of many a hangar yarn. Cut the power too soon, and the arrival is likely to be a very firm one. Even with a nice flare and touchdown, the nosewheel seems to have a habit of falling to the runway with a thump—make that a ka-blam.

Right about now I can hear all the MU–2 pilots shouting their protest. Sure, the MU–2's got complicated systems and has some unique handling traits, they're saying, but so do all high-performance aircraft. A pilot who's well-trained and stays that way—and has a professional attitude—can fly the MU–2 safely, right to the edges of its envelope.

Yes, there are handling challenges with an engine out, they'll say. But what large twin doesn't present a handful on a single engine? Again, training and familiarity will carry the day. Besides, how many other turboprop twins can be counted on to climb at 500 fpm with a dead engine?

Landings? Sure you can blow them. But the MU–2's 40 degrees of flaps let you fly patterns at 100 KIAS, cross the threshold at 90, and touch down at 80. So what if you land hard? The main gear is based on the design used in the F–104 and is as stout as the rest of the airframe. Put the ship in reverse thrust, get on the brakes, and you can stop in 1,900 feet or less—assuming the 50-foot obstacle—or no more than 1,100 feet if the approach is unobstructed.

And while we're on the subject, they'll be sure to add, MU–2s can take off in about the same distance. What other turboprop twin has such good short-field performance?

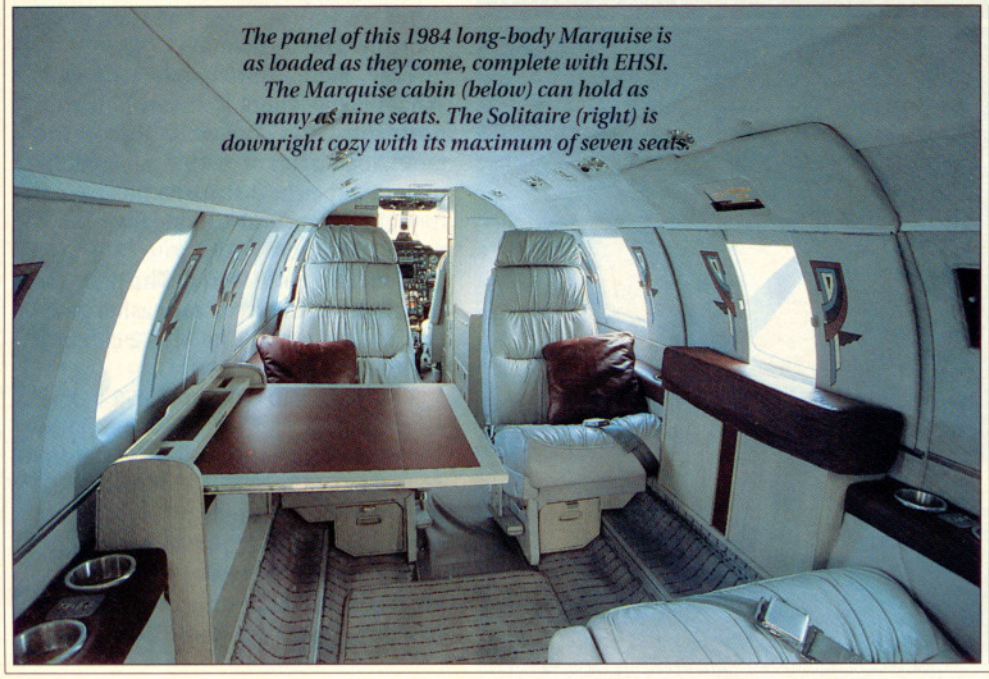
True, there is much to boast about. What we have here is an airplane that performs very, very well. Top off the tanks, load a ton of people or cargo, fly in or out of a short strip, climb at 2,200 fpm or so, then cruise in the high twenties at 280 to 300 KTAS.

Something else is true. The price for all this performance is unceasing practice and vigilance. The MU–2 can bite back, and certainly has.

This brings us to the MU–2's dark side.

According to turbine aircraft accident analyst Robert E. Breiling Associates of Vero Beach, Florida, the record shows that the MU–2's accident rate is atrocious. As Breiling himself says, "Like an early Learjet, if you don't stay ahead of [the MU–2],

The panel of this 1984 long-body Marquise is as loaded as they come, complete with EHSI. The Marquise cabin (below) can hold as many as nine seats. The Solitaire (right) is downright cozy with its maximum of seven seats.



it'll wipe you out."

Here are the numbers: MU–2s have the worst accident rate (6.62 per 100,000 flight hours) of any turboprop twin. Its fatal accident rate (2.91 per 100,000 hours) is also the worst. That's almost three times as many fatal accidents as experienced by the Beech King Air fleet. In fairness, let's note that all Twin Commanders have a 2.24-per-100,000-hour fatal rate, and Cessna Conquest Is have a 2.02-per-100,000-hour fatal rate.

Here's another way to look at it: 21.1 percent of all 730 MU–2s ever built have been in a crash. The fleet average of turboprop twins involved in accidents is 8.4 percent of total deliveries.

The first MU–2s were delivered in 1967. By 1981, the National Transportation Safety Board began to notice the MU–2's relatively high number of fatal accidents. Most were caused by pilot error, but a series of four uncontrolled descents from altitude prompted investigations. One delved into the possibility that toxic engine fumes were leaking into the pressurization system. This theory was discounted. Another explored the MU–2's Bendix M-4 autopilot for potentially fatal defects. This also led nowhere. In 1983, still suspicious, the NTSB recommended that the FAA conduct a special certification review of the MU–2. The FAA agreed, and a complete study ensued: engines, fuel system, autopilot, flight control systems, behavior during flight in icing conditions, engine-out handling, and characteristics on IFR approaches.

Ultimately, the MU–2 was given a clean bill of health. But the reputation damage was done.

Actually, the certification review came as a wake-up call. FlightSafety International (FSI) and Mitsubishi came up with a series of traveling, two-day safety seminars geared to the MU–2 pilot. Called the PROP (Pilot's Review of Proficiency) program, the seminars are ground schools covering the ins and outs of MU–2 maintenance and flying. And they're free.

This year, four PROP seminars have been held around the nation, with an average of 80 attendees at each session. FSI's Houston Learning Center, which has been offering intensive, simulator-based pilot initial and recurrent training in the MU–2 since 1975, gives a 10-percent discount to PROP graduates. FSI charges $7,800 for its week-long pilot initial course and $4,400 for recurrent training. Higher tuition fees let pilots return for brush-up training as many times as they want.

Now that the MU–2 fleet has put on some age—and for many, its reputation remains tarnished—you can pick one up for about the same price as most new or used piston singles. In the twin-engine market, turboprop or recip, they are extremely competitive in price. The *Aircraft Bluebook–Price Digest* says that 1967 and 1968 MU–2Bs and -Ds, the ones with the 605-eshp engines (equivalent shaft horsepower, a term that takes into account the engine's rated power and adds the jet thrust produced by the Garretts' exhaust), can sell for as little as $87,000.

You can't walk away from it for a month or two. This is an airplane you have to fly every week.

With the 1968 to 1970 -F models, horsepower was upped to 705-eshp per side, range was increased, and the TPE-331's TBO was raised to 5,400 hours. MU–2Fs now sell for an average of $150,000 to $210,000, depending on condition.

The -G model came out in 1970 and 1971, and it was the first "long body," a stretched version with fuselage pods for the main gear, a bigger cabin, and a toi-

let. New, they were a half-million dollars; now they go for less than half that.

The next big change came in the 1972 to 1974 model years, with the long-body -J and the short-body -K. Horsepower went up again, this time to 724 eshp. These models now are listed as selling for between $265,000 and $370,000, with the long bodies fetching more than the short.

By the time the product line ended in 1984, horsepower crept up to 778 eshp for the long bodies (called Marquises from 1979 on) and 727 eshp for the short bodies (called Solitaires). TBOs for both these engines crept downward to 3,600 hours, way down from 5,400 hours.

The Solitaire photographed for this article is a 1980 model and carries an asking price of $550,000. A 1984 Marquise we also sampled has a price tag of $975,000. This Marquise, however, has EFIS, is one of the last four built, and has just 1,300 total hours.

While used MU–2s offer a lot of bang for the buck, the purchase price is just one aspect of ownership. If you're a single-engine recip pilot and you're thinking about an MU–2, get your mind right. Figuratively speaking, you'll be moving from a go-cart to a Lamborghini. If you think you can make the move after an around-the-patch check-out, forget it. That kind of thinking was behind a lot of the Mitsubishi's early accidents. You won't get off cheap, either.

Anyone who thinks they'll save money by buying a used MU–2 over a Piper Malibu or a Beech Baron is in for a big shock. We've seen variable operating costs (fuel, reserves, and maintenance) of $96,000 per year for a 1980 Marquise, and that's based on 360 hours of flying. Fixed costs (hangar, insurance, and crew training) were ballparked at $24,000.

Don't even think about trying to get insurance without first going to FSI. Premiums vary according to the individual and the coverage he selects, but someone with 1,000 total hours, 500 multi-engine, and FSI training ought to be able to buy $200,000 worth of hull coverage and $1 million in liability for about $5,000 a year. Pilots with less multi time can face premiums double that.

Maintenance-wise, MU–2s have few airframe-related problems. Let's face it, the thing's built like a tank. Robert Kidd, president of Intercontinental Jet in Tulsa and chief of perhaps the biggest MU–2 shop in the world (dial 800/FIX-MU2S), says that "infrequent use by part-time pilots is the hardest on an MU–2." Kidd says that the best thing a pilot can do for an MU–2 is to clean it regularly. "The airframe's all mechanical, so you have to keep those worm gears, jackscrews, flaps, and flight controls clean." He says to spray the wheel wells, landing gear, and flap wells with solvent and a spray gun every 50 hours if flying in dirty air.

Oh, and Kidd says the nose gear (ka-blam!) trunnion is under an airworthiness directive to check for cracks. Install a new, stronger trunnion, however, and you comply with the AD.

The TPE-331's third stage turbine wheel and stator has been another long-term source of trouble for MU–2s and other Garrett-powered turboprops. Since 1974, there have been a dozen ADs relating to this area of the engine, most of them prompted by cracking and uncontained failures of turbine blades. The turbine wheels have to be inspected at every hot section inspection (1,800-hour intervals): A new wheel costs $12,000; a new stator, $10,000. AlliedSignal Engines recently offered a newly designed wheel and stator that it claims fixes the problem.

There's also been a propeller blade separation problem in the four-blade Mitsubishis built from 1978 on. So far, four accidents, two of them fatal, have been caused by cracked propeller hubs. The flawed hubs allowed propeller blades to separate in flight. The most recent involved an April 1993 flight carrying South Dakota Governor George Mickelson. In both fatal accidents,

Astute MU–2 watchers know that a short-body's landing gear retracts into the fuselage. Long-bodies use external pods to store the main gear.

blades penetrated the hull. In the Mickelson accident, the pilot had to cope with an engine that had broken its mounts and a depressurized cabin. He was forced to descend and attempted to find an airport but struck a silo and crashed near Zwingle, Iowa. Similar conditions surrounded the crash of a French-registered MU–2 that killed three in May 1991 near Troyes, France.

Following an AD, Hartzell offered new hubs and propeller blades. The cost for both sets of new propellers and hubs is approximately $16,000.

The Mickelson crash revived dormant fears about the MU–2's safety, but only momentarily. Thanks to those low, low prices and high, high speeds, MU–2s continue to move on the market. Pilots continue to move into MU–2s from piston singles, but they're more conscientious than ever about training and proficiency.

Dick Allan, an MU–2 broker (800/FLY-MU2S), gives about 15 hours of dual to owners who buy their MU–2s from him. "By then, they're pretty familiar with the airplane and know how it ought to behave under normal situations," he says. "But then it's off to FlightSafety." For Allan, who sells a half-dozen or so MU–2s a year, a safe MU–2 pilot is one with "at least 1,000 total hours, 500 multi, FlightSafety training, and 50 hours in MU–2s."

After a special certification review, the NTSB gave the MU–2 a clean bill of health.

Once in the saddle, Allan emphasizes that you can't relax. "This is an airplane you have to fly every week. You don't just walk away from it for a month or two, then expect to come back and be as sharp as you should be."

Dean Ryder, a banker from Carmel, New York, would agree. He stepped up from a Cessna T210 into an MU–2J three years ago and now owns a 1982 Marquise. He took the FSI training, flew with Allan to get his feet wet, and attends PROP meetings regularly. "But even after that I didn't feel completely comfortable with the airplane until I had maybe 30 hours in it," he said.

"This may sound funny, but I bought the MU–2 for its safety record," Ryder adds. "I looked at the accident statistics very closely and found that very few accidents were caused by component failures. That leaves the pilot responsible for most problems. So I do everything I can to minimize risk.

"The more I fly it, the more I like it. It's just such a fantastic machine that I can't stop raving about it. It's got speed, range, load-carrying ability, I can land it on my own strip, and I can get from New York to Palm Beach in three and a half hours, guaranteed."

Then a note of humility enters the bombast. "But sometimes, up in the Northeast corridor when it's IFR and busy and they're vectoring you all over the place, I gotta slow down and sort things out," Ryder says in a confessional tone. "That's when I cut the power back and fly around at 155 knots—just like when I flew my 210."

It's not what you'd expect to hear from the archetypical MU–2 driver. (Real MU–2 men live at redline!) But let's hope it's indicative of a renewed respect for the aging "Mits" and the payoff for 20 years' worth of safety programs. □