



MITSUBISHI MU-2

turboprop has image problems,
but it gives pilots jet-like performance

OVER THE YEARS, MITSUBISHI'S MU-2 HAS ATTRACTED A GOOD DEAL OF ATTENTION, MUCH OF IT NEGATIVE, AS THE AIRPLANE HAS DEVELOPED—PERHAPS UNFAIRLY—A REPUTATION FOR CRASHING. OFTEN IGNORED IN THESE INSTANCES, HOWEVER, IS THE PILOT: FLYING THE AIRPLANE REQUIRES THE SAME DISCIPLINE AND PROFESSIONALISM AS FLYING A HIGH-PERFORMANCE JET. OWNERS WILLING TO INVEST IN THE PROPER TRAINING FOR THEIR PILOTS CAN BENEFIT FROM THE AIRPLANE'S SULLIED REPUTATION—AND SUBSEQUENT BARGAIN PRICES—AND GET A TURBOPROP WITH NEAR VLJ PERFORMANCE FOR THE PRICE OF A NEW PISTON MODEL. *_by Mark Huber*



THE MITSUBISHI MU-2'S CHIEF DEFECT is that it is terribly misunderstood. Yes, there may be propellers on this airplane, but your pilots and mechanics really need to fly and maintain it with the same discipline, resources and respect they'd give a high-performance jet. For years, Mitsubishi has tried to drive this message home and has even asked the FAA to mandate special pilot training for the aircraft (which will finally take effect this year). Unfortunately, numerous pilots have died trying to fly the airplane without proper experience and training.

Of the 703 MU-2s built between 1966 and 1986 at Mitsubishi's San Angelo, Texas plant, only 400 are still

flying and more than 270 people have died in MU-2 accidents. These naked statistics have caused the airplane's resale value to drown in factless folklore and made it the darling of tort attorneys. The MU-2 presents an easy target for craven politicians and lazy reporters as well. (Over the last five years, the MU-2's accident rate has fallen below those of other popular turboprops, including the Cessna 441 and the Turbo Commanders.)

True, the airplane has scant patience for pilots whose hubris outruns their abilities. The MU-2 demands a pilot's attention and respect, but the rewards it provides are great, including a smooth ride through turbulent air, fast cruise speeds, responsive controls and rugged construction. This is an airplane for pilots' pilots, particularly fighter jocks. Indeed, the tight cockpit is resplendent with a plethora of toggle switches and gauges that harken back to the 1950s' and 1960s' "Century Series" fighters flown by U.S. armed forces.

Former Apollo astronaut Frank Borman has owned three MU-2s. Franklin Graham flies them in support of African relief missions performed by his Samaritan's Purse charities. They are a favorite of retired airline captains. The Navy uses 13 MU-2s to simulate targets for teething F-18 pilots and the Federal Reserve relies on MU-2s to transport checks and currency. Of the 309 MU-2s registered in the U.S., 20 percent are flying some sort of public-sector mission. The Japanese Defense Agency still flies 40 MU-2s for coastal-patrol and search-and-rescue missions. These are hardly duties assigned to a discredited aircraft.

Still, the criticism persists. Rep. Tom Tancredo (R-Colo.), he of presidential aspirations and 1 percent poll numbers, went so far as to call for the dismissal of the heads of the FAA and the National Transportation Safety

economics

HOURLY DIRECT OPERATING COSTS

- Fuel (\$5.59 per gal): \$497.51
- Maintenance labor (at \$81 per hour): \$136.84
- Parts, airframe, engine, avionics: \$132.91
- Inspections, component overhauls, life limited parts: \$58.43
- Engine restoration: \$138.44
- Misc. expenses

Landing and parking fees: \$9.55

Crew expenses: \$30

Supplies and catering: \$24

TOTAL VARIABLE FLIGHT COSTS PER HOUR:

\$1,027.68

Average speed: 266 knots

- Cost per nautical mile: \$3.86

ANNUAL FIXED OPERATING COSTS

- Crew salaries (estimates)

Captain: \$79,300

Copilot: \$41,200

Benefits: \$36,150

- Hangar rental (typical): \$20,400

- Insurance (insured hull value = \$770,000)

Hull (1.02% of value): \$7,854

Admitted liability: \$4,000

Legal liability: \$12,500

- Recurrent crew training: \$16,800

- Aircraft modernization (avg. per year): \$45,000

- Navigational chart service: \$1,961

- Refurbishing: \$9,720

- Computer maintenance program: \$2,400

- Aviation weather service (typical): \$700

TOTAL FIXED COST PER YEAR: \$277,985

ANNUAL BUDGET-BASED ON 45,000 NM

(Utilization: 169 hours)

- Variable cost: \$173,678

- Fixed cost: \$277,985

TOTAL COST (WITHOUT DEPRECIATION): 451,663

- Per hour: \$2,673

- Per nautical mile: \$10.04

- Per seat nautical mile: \$3.35

TOTAL COST (WITHOUT DEPRECIATION): \$451,663

- Book depreciation (10% per year): \$77,000

Total cost (with book depreciation): \$528,663

- Per hour: \$3,128

- Per nautical mile: \$11.75

- Per seat nautical mile: \$3.92

TOTAL COST (WITHOUT DEPRECIATION): \$451,663

- Market depreciation: \$38,500

TOTAL COST (WITH MARKET DEPRECIATION): \$490,163

- Per hour: \$2,900

- Per nautical mile: \$10.89

- Per nautical seat mile: \$3.63

MU-2 COMPARED WITH OTHER TURBOPROPS

Model	First year built	Variable cost/hour	Seats exec./max	Range (nm)	Maximum cruise (kt)	Max takeoff weight (lb)
MITSUBISHI MU-2 MARQUISE	1979	\$1,028	6/9	1,012	300	11,575
PIPER CHEYENNE IIIA	1984	\$1,456	6/9	1,240	305	11,200
BEECH/RAYTHEON KING AIR 90	1979	\$1,254	6/9	1,040	265	10,950
ROCKWELL TWIN COMMANDER 690A	1973	\$1,232	6/7	942	285	10,250
CESSNA 441 CONQUEST II	1978	\$1,077	6/9	1,494	311	9,850

Assumptions: Marquise, Conquest and King Air are 1981 models; Commander is a 1976 and Cheyenne is a 1984. Jet fuel \$5.59/gal; variable cost: fuel plus maintenance reserves; two passengers; VFR reserve fuel; passenger weight 200 lb includes baggage; one pilot.

Cost source: Conklin & de Decker Life Cycle Cost
Performance source: Conklin & de Decker Aircraft Performance Comparator, Orleans, Mass.

Board because they had not grounded the airplane after one crashed in his district. (The NTSB's report shows that the fatally injured pilot clearly botched the instrument approach.) When that didn't work, Tancredo introduced legislation to ground the airplane. (The bill died in the House aviation subcommittee.)

Despite an extensive public relations campaign by Mitsubishi and two thorough FAA studies that exonerated the aircraft's design, a cloud still hangs over the MU-2. But that tarnished reputation makes it *the* best bargain among all turbine-powered business aircraft—jet or turboprop. Depending on the model, MU-2s hold six to nine passengers; they also cruise at 315 knots, land on very short and rough fields and have a range of 1,100 nautical miles. Prices vary from \$160,000 to \$800,000, depending on model and condition. For the cost of a new four-seat, single-engine piston airplane, you can get

a turboprop that performs almost as well as a very light jet and has a larger cabin.

Used MU-2s also cost less than half as much as comparable used turboprops (see chart on page 46), are built like a tank and enjoy the best product support of any used business aircraft. In many ways, they recall the Lockheed C-130, the rugged, go-anywhere cargo airplane that has been the backbone of the Military Airlift Command for 50 years.

The MU-2 was in a state of constant evolution over its 20-year production run, but it basically comes in two flavors: short-body, which seats six or seven; and long-body, which seats seven to nine. The long-body models have a six-foot-longer fuselage and give up 10 knots of airspeed (down to 305 from 315). The most recent versions of the short and long bodies are referred to as the Solitaire and Marquise, respectively,



specifications

CABIN DIMENSIONS

- Height: 4.3 ft
- Width: 4.8 ft
- Length: 16.1 ft
- Volume: 265 cu ft
- Door height: 3.8 ft
- Door width: 2.3 ft

BAGGAGE

- Internal: 44 cu ft

TYPICAL SEATS CREW/PASSENGERS: 2/6

MAXIMUM WEIGHTS

- Takeoff: 11,575 lb
- Landing: 11,025 lb
- Basic operating: 8,100 lb
- Usable fuel: 2,700 lb
- Maximum payload: 1,850 lb
- Payload with full fuel: 825 lb

performance

RANGE (IFR NBAA 200-nm reserve)

- Seats full: 784 nm
- Ferry range: 1,113 nm

RATE OF CLIMB

- Both engines: 1,900 fpm
- One engine not operating: 425 fpm

CRUISE SPEED

- Max: 300 kt
- Long range: 480 kt

SERVICE CEILING

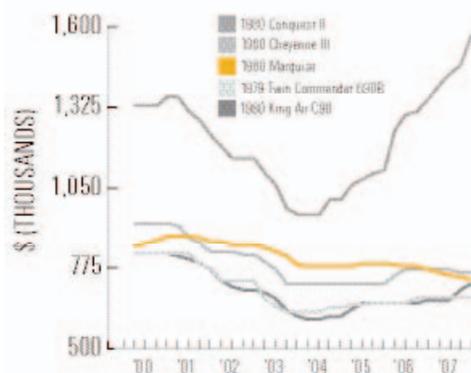
- Both engines: 30,000 ft
- One engine not operating: 14,800 ft

Source: Conklin & de Decker, Orleans, Mass.

THE POSITION OF THE PROPELLERS ON THE MU-2 MEANS THAT PASSENGERS WILL NOTICE SOME NOISE IN THE CABIN. THE HONEYWELL/GARRETT ENGINES CAN OPERATE 5,400 HOURS BETWEEN RECOMMENDED OVERHAULS.

FAIR MARKET VALUE

comparison of competitive aircraft



Source: Vref Aircraft Value Reference (www.vrefpub.com)



SUPPORT & SERVICE

mitsubishi mu-2 & competitors

	2007	2006
Beech/Raytheon King Air 90	7.07	6.64
Rockwell Twin Commander 690A	6.40	6.27
Mitsubishi MU-2 Marquise	N.R.*	7.87
Cessna 441 Conquest II	5.88	5.52
Piper Cheyenne IIIA	5.78	5.29

Overall average for newer business jets, i.e. those less than 10 years old. Rating scale: 1 to 9: 1-inadequate; 3-poor; 5-average; 7-good; 9-excellent. N.R.-Not rated due to insufficient data

Source: Aviation International News, 2007 Product Support Survey

and these are the most desirable MU-2s on the market. Power comes from a pair of Honeywell/Garrett engines that are compact and incredibly durable, with long intervals (5,400 hours) between recommended overhauls, which cost about \$175,000 per engine. Most used MU-2s have accumulated 5,000 to 10,000 hours.

The MU-2's massive main cabin door is aft of the wing and propellers. An optional toilet can be located back there and there is also a cargo net for baggage that can be accessed in flight. While far from a stand-up cabin, the MU-2's passenger area boasts a flat floor that makes transiting between seats easier than in trenched-aisle aircraft. Foldout sidewall tables can be deployed between the facing "club four" seats and also from the front-cabin bulkhead in the long-body models. Taking into account the engine's distinct high-pitch and the proximity of the propellers to the fuselage, interior cabin noise, while certainly noticeable, is less than you might expect.

There is room for a small coat closet, beverage drawers and built-in CD/DVD players.

Most of these airplanes will need a refreshed interior and the average price runs around \$60,000. Add top-notch exterior paint and an MU-2 can be cosmetically made over for around \$100,000.

Because of the MU-2's underrated market appeal, you won't find the avionics upgrades that are available on comparable turboprops. For instance, an RVSM altimeter isn't available for the MU-2, effectively limiting its service ceiling to 27,000 feet.

But you can buy other upgrades. Tulsa-based Intercontinental Jet Service, a Mitsubishi subsidiary, is offering remanufactured MU-2s for between \$1.1 and \$1.2 million. The MU-2 LTD package includes pilot training; warranted and updated engines; overhauled propellers; new paint and interior; and new cockpit avionics, including new radios and glass-panel displays. Even at that price, the MU-2 is an unequaled bargain. ■

THE COCKPIT OF THE MU-2—WITH ITS ANALOG GAUGES AND TOGGLE SWITCHES—MIGHT SEEM A LITTLE OLD-FASHIONED. LIMITED DEMAND FOR THE AIRPLANE MEANS THERE ARE FEWER AVIONICS UPGRADES AVAILABLE THAN FOR COMPARABLE TURBOPROPS.

WHAT ABOUT SAFETY?

Model	ACCIDENTS PER 100,000 HOURS			
	2002-2006		1998-2002	
	All	Fatal	All	Fatal
PIPER CHEYENNE IIIA	1.07	0.47	0.98	0.26
BEECH/RAYTHEON KING AIR 90	1.09	0.29	1.25	0.46
MITSUBISHI MU-2 MARQUISE	1.86	1.05	2.22	1.11
ROCKWELL TWIN COMMANDER 690A	1.99	0.93	1.51	0.20
CESSNA 441 CONQUEST II	2.03	1.16	0.91	0.45

In the last several years, the safety record of the MU-2 has improved considerably. It is now better than that of some other turboprops.

Source: Robert E. Breiling Associates

