



# MULTI-MODDED MOONEY

*A 252's powerplant  
takes the 231 to  
the head of the line.*

BY RICHARD L. COLLINS

**NOT** many new airplanes are being built, it's true, but there is no shortage of modifications or tweaks. One of the latest is the Thunderbird 261 from The Mod Squad, Incorporated, a company that has been upgrading Mooneys for years. The T-Bird is a Mooney 231 into which the Mod Squad fits the engine of a 252, bringing the aircraft near to the latest in engine/airframe technology.

The 252 engine features intercooling (of intake air), an automatic wastegate that maintains manifold pressure until the aircraft is at critical altitude, and other improvements over the 231 engine that are said to increase reliability. The horsepower remains the same.

The modification includes a 252 cowl with electrically operated cowl flaps; all the parts used are from either Mooney or Continental. One thing that is not upgraded is the electrical system. It remains at 14 volts (the 252 is 28) although the Mod Squad is working on a dual alternator system that was not available on the 231.

The modifications are done mainly to airplanes owned by individuals, though the Mod Squad does buy, convert, and sell 231s. They'll do the firewall-forward work on your airplane for \$39,995 (not including propeller overhaul). The basic price for a completed airplane is \$109,000, which includes internal VOR antennas, a one-piece fiberglass belly, rounded (and thicker) windows, and the engine and cowling conversion. The avionics are all inspected; most 231s came from the factory with complete Bendix/King Silver Crown avionics and autopilots. Detail cleanup is done, and options



include a thicker windshield, articulating front seats, dual alternators, and wing landing lights. Speed brakes and auxiliary fuel are also available, as is a TKS (weeping wing) anti-ice system.

One thing buyers should always be curious about is how an aircraft modification is approved. Many hold that the Federal Aviation Administration is far more lenient in granting supplemental type certificates for aircraft mods than it is in granting initial type certificates, and certainly at least some of the STCs that have been granted are highly suspect. In the case of Mod Squad Mooney modifications, no airframe or power change is made that has not been done at the factory. (For example, they will install a retractable step; the parts come from an old Mooney.)

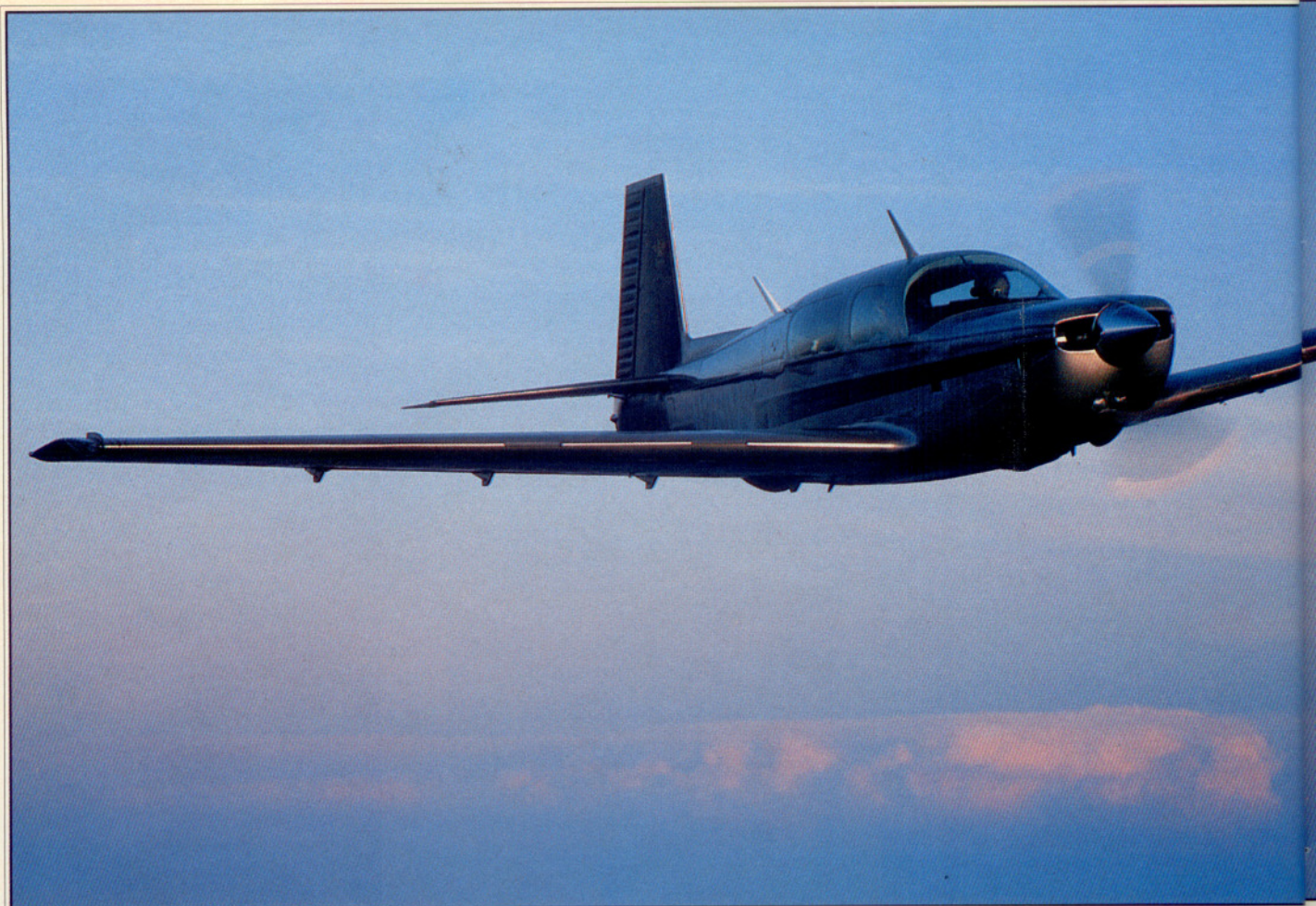
Because the airframes of a 231 and a 252 are virtually identical, not a great deal of testing was required by the FAA for approval of the modifications. According to Coy Jacob of Mod Squad marketing, one day of flying and a lot of paperwork were all that was required for

approval. The pilot's operating handbooks of the 231 and 252 had to be merged, with the 252 book used for performance and the 231 book primarily for the electrical system. Although the modification carries the number 261, implying that it is nine miles per hour faster than a 252, it is unlikely that there is any measurable speed difference, and the performance charts are the same.

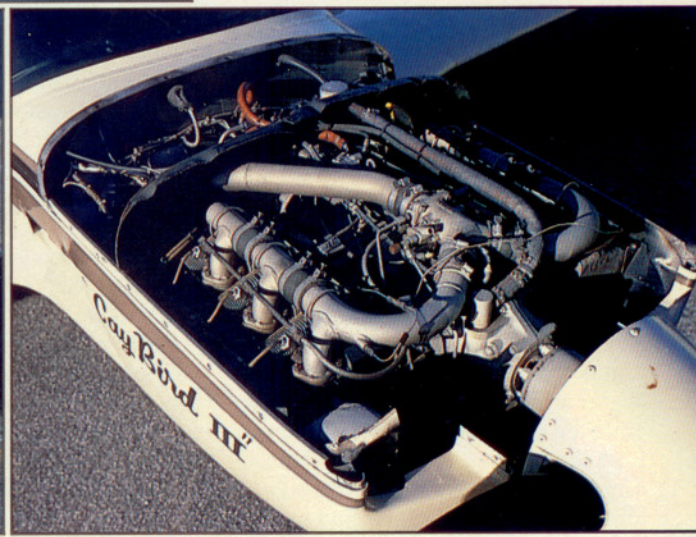
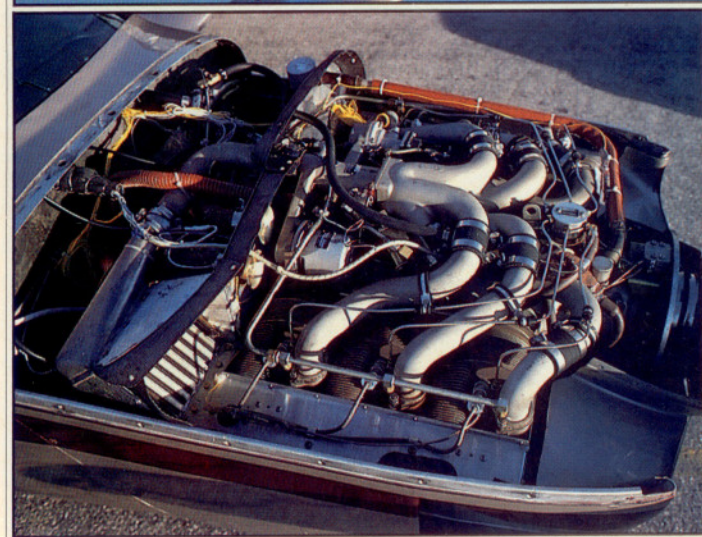
The Mod Squad is working on a plan to increase the horsepower on the airplane to 225 from 210. If the additional horsepower were to be used, this would require much more extensive flight testing.

Much of the Mod Squad's business is in adding various upgrades to Mooneys, but selecting options has to be done with care because of weight. Despite the fact that Jacob said his beautiful demonstrator, N261MS, would fly with full (including auxiliary) fuel and two people, the payload with full fuel was found to be 203 pounds. Full is a lot (108.5) of gallons, good for about eight and a half hours of flying, so you'd probably want privacy on a maximum endurance flight anyway—just don't carry a lot of bags.

The handling qualities of the modified airplane are identical to a 252's, with the same caveats. There is a strong nose-down pitching moment with flap extension (vice versa with retraction) and you have to be quick with the manual or electric trim unless you want to exert considerable force on the wheel. The other item is a characteristic related to a quotation in the Mod Squad's sales letter: "Generally speaking, some 231s have suffered minor 'prop ground strikes,' which we normally do not con-



*There are big differences under the cowl of a Thunderbird 261, below left, when it is compared with a 231, below. The intake system is highly tweaked, and an intercooler, aft, helps ensure cooler engine operation.*





sider to be damage history." If a Mooney is flown too fast on an approach and a landing is attempted before the airplane is slowed, it, like many airplanes, can be coaxed into a porpoise. The prop on a 231 or 252 is farther ahead of the nosewheel than on other Mooneys, thus it is more vulnerable to a strike during any porpoising action. Why fly too fast? When it's windy and bumpy, it is tempting to pile speed onto that recommended for an approach. Mooney pilots soon learn that if an approach is going to be flown faster than normal (75 knots), best do it without flaps. The porpoising tendency is less strong and landing can be at a higher speed with better control. There has been a school of thought that all landings should be with full flaps, but subscribers to this theory haven't matched wits with a Mooney (and a lot of other airplanes) in a crosswind.

Jacob's demonstrator has speed brakes, which are very effective and should almost be required on a Mooney. They give so much more flexibility and completely remove the temptation to pull the throttle back too much too quickly when the need arises to descend rapidly. This contributes greatly to engine longevity because turbocharged engines suffer greatly when cooled too rapidly. The speed brakes do cause a rumble, and some wing skin flexing can be seen in the vicinity of the speed brakes, but the system has been installed on a lot of airplanes and appears not to cause any problems.

The 252 and the modification are approved for flight to 28,000 feet. The Mod Squad offers a large Kevlar oxygen bottle and recommends that owners keep and modify the old oxygen bottle as an emergency system. Still, 28,000 is a lot of feet, and one trip through the altitude chamber will convince you that any failure of an oxygen system at 28,000 feet would likely result in an unconscious pilot before the airplane could be flown to a breathable altitude. How we evolved into a system that allows flight at such altitudes without the proper training is a reflection on the FAA's ability to understand how we use airplanes. Pilots should certainly take the extra step on their own; contact your local FAA flight standards district office for details on altitude chamber availability.

The 252 does fly at the very top of the single-engine performance spectrum when flown at altitude. Down low, the airplane isn't particularly fast—none of the turbos are—but at the compromise

altitudes (from which you could safely descend if an oxygen failure were caught immediately) in the high teens and low twenties, the airplane will literally streak across the country with the tailwinds that are often available there. With true airspeed close to 200 knots, adding 70 or 80 makes for fancy performance—as witness the speed records that have been set by the airplanes.

The 231 and 252 add another element to this. They are highly personal airplanes that can be tailored to individual missions. The long range freaks among us can have that 108.5 gallons of fuel. Snowbirds can get deice. Weather radar and a Stormscope can be fitted. Dual electrics and vacuum are available. The airplanes have answers to virtually all of the questions, save one: weight. But then most of us fly alone or with one other person. In that case the airplanes

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offer a beautiful balance of capabilities from which to choose.

Almost all the Mod Squad installations of 252 engines have gone into the airplanes of owners who also choose from the long list of available options. Some keep the old engines and just buy the options, the most popular being the larger oxygen system, fiberglass belly, speed brakes, and thicker windows. The Mod Squad also does interiors, and if you go the whole nine yards you can have your registration number or whatever embroidered in the side panels.

The company currently does the work in St. Louis but is in the process of negotiating for a site on the Venice, Florida, airport. Eight of the engine conversions have been completed, and currently the Mod Squad can do one or two a month.

The 252 engine installation was a big improvement over the 231, though pilots who operated the latter properly got good reliability out of the airplane.

So now there is a clear choice: You can go to the Mooney factory at Kerrville and get a brand spanking new 252, or you can take a four- or five-year-old 231 and make it like a new one in the engine department. □

