

# Baseline settings

*The first steps are complete on your airplane's rework*

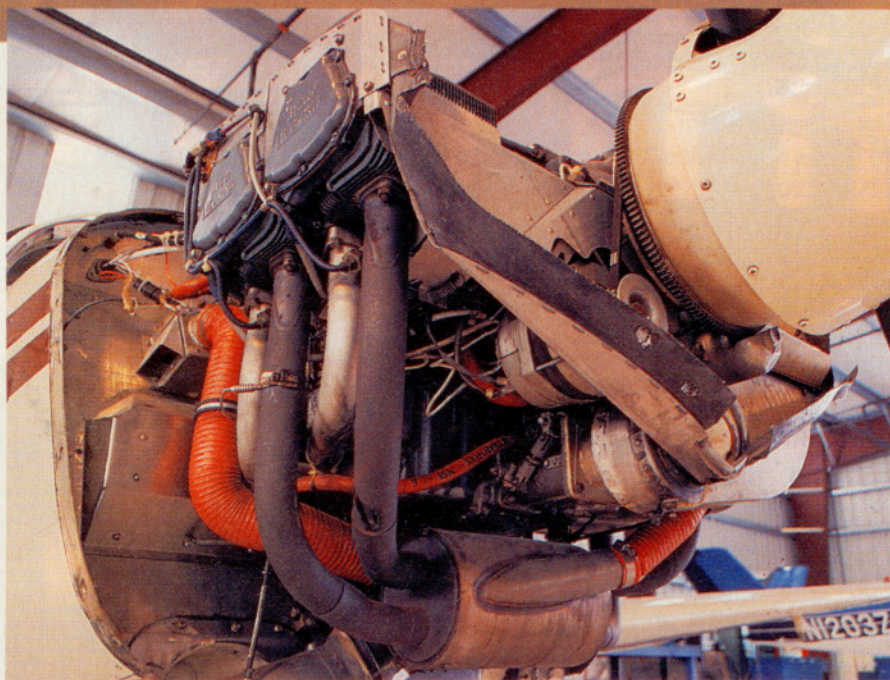
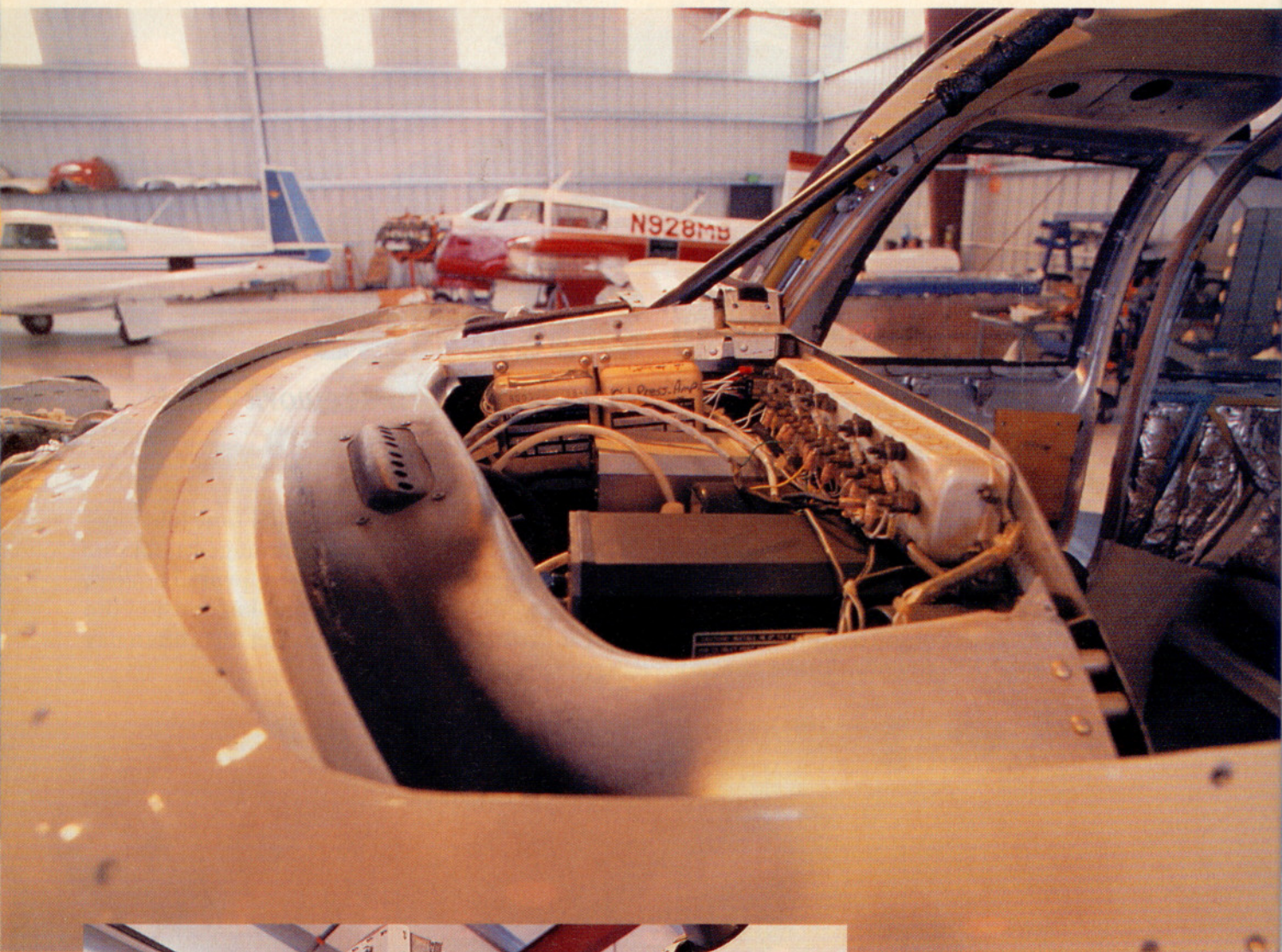
BY MARC E. COOK  
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**Y**ou've got to start somewhere. As we have done for the past few AOPA sweepstakes airplanes, we've begun the journey of refurbishment by focusing on the basic airworthiness of the airframe and making the first of the many modifications to this 1987 Mooney 201. This much we knew: The 201

had just more than 1,600 hours total time (airframe and engine); had no recorded damage history or evidence of unrecorded troubles; appeared to be in generally well-kept condition; and had most of the major updates that owners of earlier 201s often pay to have retrofitted.







*This 1,800-hour Lycoming IO-360 (above) will be overhauled by Mattituck and outfitted late in the project with Continental's FADEC system. With the windshield out (top), it's a perfect opportunity to take care of behind-panel housecleaning.*

Of course, finding the right shop to do the work is nearly as important as snatching up the right airplane in the first place. Early in the planning stages we considered modifying an M20F (the last of the pre-201, 200-horsepower Mooneys) into the carbon copy of a 201. Because we wanted to be able to use modifications from all the major players—Lake Aero, Mod Works, Mooney Mart, and Southwest Texas Aviation—it seemed important to find a shop to do the work that would be deemed neutral, like a Switzerland with an airframe and powerplant ticket.

Top Gun Aviation, in Stockton, California, seemed the right choice. The facility has an excellent reputation and has installed just about every Mooney modification made with generally good success. Company principals (and father-and-son team) Tom and Mark Rouch are hands-on types, extremely knowledgeable about Mooneys and forthright in their opinions. When their shop was finished with the Millennium



Mooney, you could see artifacts of the Rouchs' years in the business—small touches like the careful routing of engine-compartment pieces and the way the interior was fitted back together without tearing it up. All airplane types are different, but Mooneys are more different than most. It should be considered an imperative that Mooney owners take their charges to a knowledgeable shop at least semiregularly.

Also, it would turn out, the Top Gun staff knew of *our* Mooney, N5817L. It has spent its entire life in California, and Top Gun had performed some routine maintenance on it several years ago. When asked about the airplane prior to its purchase, Tom responded, "Yeah, I think I remember that airplane. Let me look it up." A moment after consulting his computer he said, "Right. We worked on it. I recall it was really clean and tidy."

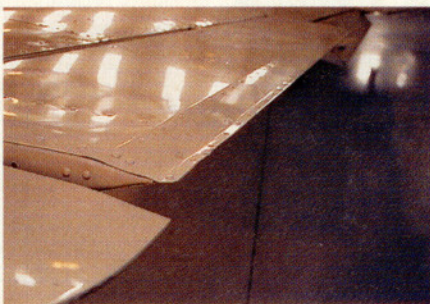
He was right. The more we poked and prodded this 1987 Lean Machine, the more impressed we were with its upkeep, and we were grateful to have found a reasonably priced, late-model machine. It will make someone—you, perchance?—a fine recreational vehicle.

Because we found a later 201, many of the mods we had planned had already been done for us by the factory.

For example, the '87 has the one-piece belly pan—that's an expensive upgrade to earlier airplanes that replaces the myriad access panels with one smooth piece. For many owners, the high cost—on the order of \$5,000 installed—is on the borderline of what they'll spend for convenience. (There are no structural or measurable speed benefits of the one-piece belly.)

We took the opportunity of the Mooney's visit to Top Gun to replace all the windows. In truth, only the windshield on this airplane needed attention, and even at that not right away. But now that we've done a few of these projects,

*Mooney 201 buyers should check for compliance with the aileron link replacement AD. Standard-thickness windows will be used in the Millennium Mooney because of the difficulty in retrofitting thicker acrylics.*



we knew that by the end of the program any flaws in the glass would be painfully apparent. Better to make the swap now, while the airplane is partially apart and before the new paint is applied.

A call to LP Aero plastics had a set of standard-thickness Mooney panels on the way. In previous makeovers, we've opted for thicker-than-standard windows, but two main considerations kept us with stock sizes. For one, retrofitting thick windows in an M20J is a big job, particularly on the windshield. (Mod Works, in Punta Gorda, Florida, has supplemental type certificate approval to use thicker LP Aero glass in the M20s.) And while a thicker set of panes certainly will reduce interior noise levels, the improvement isn't as dramatic as it is on, say, a Beech Bonanza or a Cessna 206, both of which have a lot of glass area. The Mooney's smaller windows are inherently stiffer for any given thickness. Even with the standard thicknesses, Top Gun took 38 hours to remove and replace all the glass. It's a tedious job that requires tremendous care, particularly the final sealing; done incorrectly, the windows will leak, as you'd expect, but such leakage can expose the tubular fuselage members to moisture and set the stage for future





corrosion. All told, complete window replacement will cost around \$3,500 with materials and labor.

Lo Presti Speed Merchants, in addition to being in the process of certifying a replacement cowling for the 201, has received STC approval for a high-intensity-discharge xenon landing light, called the Boom Beam. It replaces the standard nose-bowl-mounted light on the 201. With a claimed 600,000 candlepower, the Boom Beam is between 4.5 and 6 times brighter than a standard landing light and is warranted for five

years. Lo Presti can be so generous with the warranty because there's no filament in the HID light to break. (Filament breakage is by far the most common reason for light failure, and is brought on by vibration long before the filament breaks from use.)

Installation is claimed to take two hours—Top Gun did it in about 3.5—and involves mounting a small power supply on the firewall and replacing the standard light with the Boom Beam. Better yet, the Boom Beam consumes just 3 amps, so you can leave it on all

the time and not worry about excessive charging-system loads. At first blush, the Boom Beam looks impressive, but we'll have to wait until we've flown the Mooney at night to give you a full report. Suggested retail price is \$699 (plus \$135 for the installation kit).

Also on the lighting front, we had Top Gun install wingtip recognition lights on the Millennium Mooney. Using a \$550 Mooney kit (p/n 940054-501),

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these lights fit into the standard late-model (upswept) wing tips with comparatively minor modifications. The small halogen lights may be left on in flight as long as you want, but because they're housed under the wingtip plexiglass, you're warned to not use them on the ground where a lack of cooling air can lead to short bulb and lens life.

That's the total of our first-round modifications. For the rest of its stay at Top Gun, the Millennium Mooney had its maintenance needs tended to. For example, it appeared that the rubber shock discs were original; depending on usage, how the airplane is stored, and other variables, they're considered good for eight to 12 years. A Mooney-savvy shop like Top Gun can do the job quickly—in our case, in just three hours. That, plus the cost of the discs (there are eight, at about \$48 each), means you can have your Mooney sitting at the right attitude for just \$600. Other gear matters included a slightly loose nose-gear trunion, which was reshimmed. One main-gear rod end had excessive play, so the bolt was replaced.

The controversial aileron link replacement (per an airworthiness directive) had already been done on 17L, so Top Gun merely double-checked that it had been installed correctly and that the paperwork was properly filed. (All fine here.) While playing around with the control system, Top Gun's guys found the yoke mounts loose (which were merely tightened) and that the right aileron's pushrod end was worn (to be replaced with a new \$170 tube assembly). The Mooney's rigging was

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checked and minor adjustments were made, although we'll reserve final flight checks until the bulk of the work is finished. (There's just too much ahead of this airplane to expect the adjustment to hold.)

Ahead of the firewall, Top Gun's technicians noted a chafed cowl flap and a broken cowl-flap hinge; the hinge was replaced and the flap patched. These are common problems in the 201 because the four-cylinder engine isn't exactly the smoothest one on the planet. Also, many of the components attached to it (or surrounding it on the airframe) are built with low weight as a high priority. Tom Rouch does note that later 201s like our '87 are definitely better and more robustly built than the earliest models, another reason to buy as late a model as you can afford.

For its part, the Lycoming, now 200 hours from TBO, continues to run just fine, thank you. When we bought it, the engine's dual Bendix magneto suffered from improper internal timing, causing a rough runup and loss of power. A few hours of bench time had the mag sparking on time. It must survive a couple of cross-country trips before the whole thing is replaced with a new electronic ignition, so the mag's total time was unimportant to us.

In addition, the Lycoming is showing a few small oil leaks—one around a cylinder's base gasket—that are expected to be minor annoyances to be endured before the summertime engine

overhaul. The Top Gun techs also found that the Bendix fuel injection was set up too rich at idle—turn the adjuster three clicks and there you go—and they discovered a few worn SCAT hoses, which were replaced. Curiously, when the Horizon electronic tach was installed in 17L, the standard tach cable had not been removed; Rouch and crew plucked the now-useless cable and installed the block-off plug on the engine. Otherwise, the engine, based on compression scores and a visual inspection, seems good to go through the summer.

The Millennium Mooney's next stop is Pacific Coast Avionics, where the instrument panel will be stripped bare and a host of advanced components, new pieces of sheet metal, and a whole new layer of fine craftsmanship will further transform this perky speedster. We can't wait, either. □

**i** Updates on the refurbishment of the Millennium Mooney may be found on AOPA Online ([www.aopa.org/pilot/mooney/](http://www.aopa.org/pilot/mooney/)). E-mail the author at [marc.cook@aopa.org](mailto:marc.cook@aopa.org)

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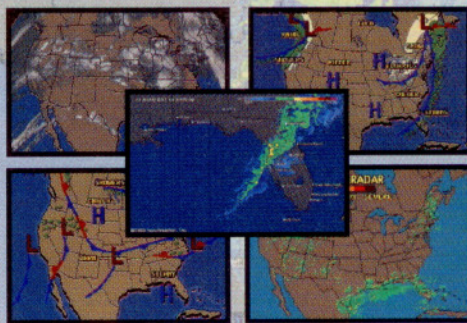
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AOPA would like to thank the following companies that donated or discounted their products and services to refurbish the Millennium Mooney or otherwise assisted in the project.

### Airframe improvements

Top Gun Aviation  
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209/983-8082  
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### Landing light (Boom Beam)

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