



RANGER VERSUS TIGER:

The Gear-Down Showdown

In this corner, the Ranger—fast and famous for economy. And the challenging Tiger—new and claiming retractable-style performance. Is a new efficiency champ about to be crowned?

by Richard L. Collins

GRUMMAN AMERICAN'S Tiger is almost a new concept in airplanes. It is compact on the outside but offers generous room for four on the inside. It's a bit like the new "on-purpose" small cars from abroad: They maximize passenger space and performance while minimizing outside dimensions and fuel consumption. Performance is good, too; the Tiger moves along at 139 knots top cruise, and that is something new for a 180-hp airplane with a fixed landing gear and fixed-pitch propeller. The Tiger numbers light a different fire in the prospect: The plane comes on like a high-performance airplane in the retractable class (because of its cruise speed), rather than as a medium-performance, basic four-place airplane. Then nagging questions arise, and eyebrows arch. Will it really go that fast? How might its mission profiles work out in relation to those of the only 180-hp retractable, the tried and true Mooney Ranger? We decided to try them both and see.

The Grumman American machines are all compact, spirited and brightly painted. To walk in their midst is to want to strap one on and go fly. A red-and-white Tiger was ready for me on the Cleveland ramp, eager to accommodate that desire and to prove its claims. First, though, some initial salesmanship from the Grumman Americans. I had mentioned hearing complaints about the backseat room being sparse, and so I was asked to be seated in the rear while someone sat in front and adjusted the pilot's seat to the flying position. The room is generous, though if you rest your foot on the spar before the front seat occupant slides his seat forward, your shoeshine will disappear forever as the seat is moved. A minor item, but forewarned is forearmed.

The mission was from Cleveland to Asheville, North Carolina—379 nautical miles

along the flight planned route. The weather map showed a low center roaming the area, with rain and snow, but at Cleveland, tops were reported at 5,000 feet and uniform. The weather to the south also sounded flyable, so an IFR flight plan was filed. In the process of launching, I took the advisable step of pausing to find everything and arrange things for IFR operation.

The Jeppesen books found a good place to rest. They stand neatly on the floor in front of the seat. When solo, line them up in front of the right seat. If someone is seated there, the books are almost equally handy in front of the left seat below the pilot's legs. The panel arrangement was not ideal for IFR, with the nav indicators one set of instrument holes away from the flight instruments, thus stretching the scan. (A Narco DGO-10 horizontal situation indicator is on the option list and would solve this problem for the serious IFR pilot.) The test Tiger had Narco Spectrum, in quantity adequate for basic IFR.

The Tiger comes with one size of fuel tanks—no options—and the book indicates that the 51 gallons usable will last four and a half hours at 75-percent power. For this mission, it came out even: Asheville would take three hours and 20 minutes with the forecast wind. A return to Tri-City, the alternate, would take 25 minutes, so the required 45 minutes would be left for the law. With full fuel, and as equipped, this Tiger would fly with 684 pounds in the cabin. That's quite good—four 170 pounders and one Jepp book.

The Tiger's spry rate of climb was appreciated as I left Cleveland. There was a little ice in the clouds, and the sooner the Tiger got on top, the less ice it would accumulate. The trace of ice quickly melted in the warm air overrunning the colder air below. When we were level at 8,000 feet, the Tiger's indicated

airspeed settled on 124 knots. That converted to 138 knots true, which was right on the money. I had the engine turning 2,650, which is slightly under 75-percent power. The cabin sound level was quite acceptable, and vibration was average. The airplane does have a bit of low-frequency shudder at higher power settings—if they could get that out, it would be quite smooth.

After leveling at cruise on a trip, I always make kneepad notes on my first impressions of any new airplane. The things that stood out on the Tiger were recorded as follows: "The visibility is superb. You sit atop a Tiger, not down in it. The cabin is tight, with no cold drafts. Interior quality is quite good. The seats sit high off the floor and are comfortable, even though none reclines. The engine started with a thump. (Maybe some engine-mount work to smooth the shudder would handle that, too.) Ventilation is good. There's plenty of heat, and the defroster works well. The trim is in a good spot on the center console. The backseat folds down like in a hatchback car, which would be very convenient for two and baggage or for cargo flights. The Tiger has a big and roomy feeling because it bows out at the shoulders. The side windows are both high and low, too. Shoulder harnesses are fitted for occupant protection, but nothing is done to save your legs from the sharp panel bottom or the carburetor-heat knob. The baggage door looks small, but a big suitcase went through it." The last of the initial notes was about the autopilot, which handled the airplane well in the tracking mode.

The wind forecast called for a cross-head wind at 36 knots for the entire route, but my groundspeed calculations showed that, typically, the forecast was inaccurate. For the level-flight legs, the groundspeed calculated at 114, 124, 133, 123 and 106 knots. I didn't

calculate the speed on the last leg, a rather short one from Tri-City into Asheville, because it was quite turbulent and I had the airplane slowed down.

The ride I got in the rainy turbulence indicated to me that the Tiger does well in a squall. It has a nice solid feel, with very little yaw response to turbulence. Roll control is effective, and you can fly with your fingertips regardless of the level of turbulence. There were some cabin water leaks during the heavy rain, and I later noticed that some paint was gone from the fiberglass extremities.

Landing at Asheville came three hours and 30 minutes after leaving Cleveland, or 10 minutes over flight plan. The time should have run less, because the wind components were lower than anticipated, and it took me a moment to figure out why it didn't. The last leg, the uncomputed one, during which I slowed down because of turbulence, was actually at an average groundspeed of 76 knots. It took 49 minutes to fly the 63 nm from Holston Mountain Vortac to the Ashe-

ville airport. The combination of slowing down and a rapidly increasing southwesterly flow in the area had really played hob with the time. It didn't seem to take that long, but when you have other things to think about, like turbulence, heavy rain and mountains, the time must pass faster.

The fuel came out better than expected. I had anticipated something over 10 gph (the book shows almost 11 for 75-percent power) but averaged 9.4 for the 379-nm leg. I had almost two hours' fuel remaining at Asheville, far more than the bare legal minimum I had expected.

The plan was to fly back to Cleveland over the same route, but that bumpy mess over the high mountains was forecast to become thunderstorm activity by midafternoon, so a detour to the east was chosen as the best bet. This would extend the distance to 427 nm, but it looked worthwhile.

Loading to leave Asheville with a passenger, I came face to face with what I consider the only disadvantage of the sliding canopy

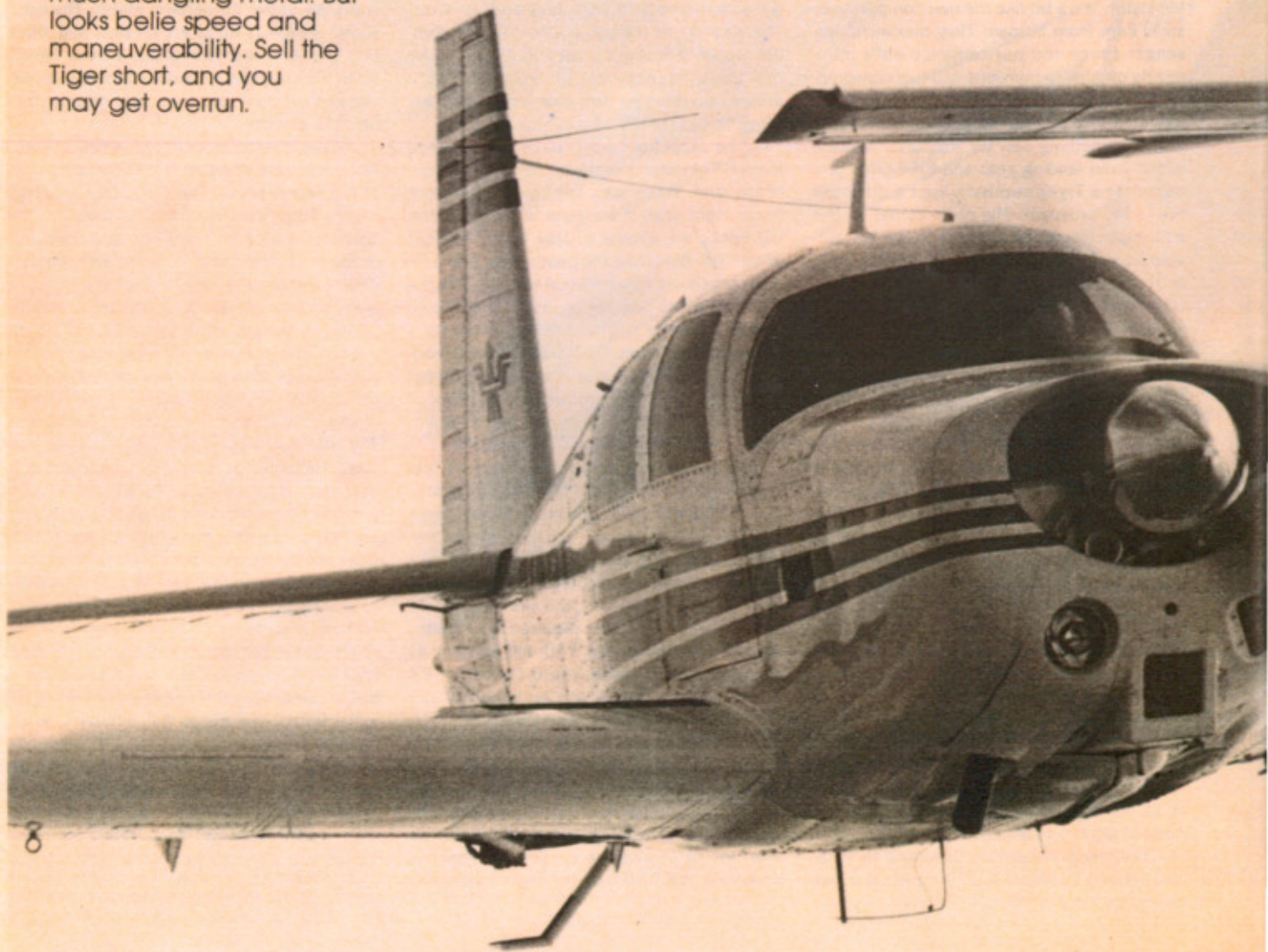
used on the Tiger (and other Grumman American singles). The rain was enthusiastic, and even though we had an umbrella, boarding was a soaking experience. All the Jepp charts got wet, as did the clipboard full of notes. I still like the canopy, and if I owned a Grumman American, I'd hope to learn how to minimize the effect of rain on boarding.

The eastbound clearance gave us a downwind run in the area of strong wind, but as we got a bit farther east, the flow seemed to abate; the average for the first leg was only 160 knots. That was not bad, though, because we did run slow (105 knots indicated) for a bit until we were out of the turbulence.

The trip back was at 7,000 feet, with the calculated groundspeeds running 132, 150, 157 and 155 knots following the one 160-knot leg. After the eastbound leg to get away from the worst part of the weather, the tailwind component might not have been quite as good as the head-wind component had been bad on the trip to Asheville. The Tiger goes as fast as they say.

Showdown

All fly-legged and draggy-looking, the Tiger would seem to suffer from too much dangling metal. But looks belie speed and maneuverability. Sell the Tiger short, and you may get overrun.



Back in the Cleveland area, there was some vectoring for an ILS approach to Cuyahoga County Airport, Grumman American's home base, and this added a few miles to the 427 nm on our flight plan. With a little added for the vectors, this meant a groundspeed of 148 knots. Shutdown was two hours and 58 minutes after takeoff at Asheville. They pumped 27.7 gallons of fuel from the truck into the Tiger's tanks. That is 9.3 gallons per hour—again less than the book shows. (The trip back was flown at 2,650 rpm, very nearly 75-percent power, according to their figures, and with a true airspeed of 136 knots.) I had leaned enthusiastically, easing out the mixture until the rpm dropped and the engine ran rough and then enriching only enough to take the roughness out. Grumman American's figures are probably based on best power mixture, and I was running it leaner than that, which explains the low fuel flow. Regardless of the cause, it is always pleasant to use less fuel than anticipated. The Tiger averaged 128 knots for the day (108 one

way and 148 the other), based on timing from takeoff to the parking ramp, and averaged 9.35 gph.

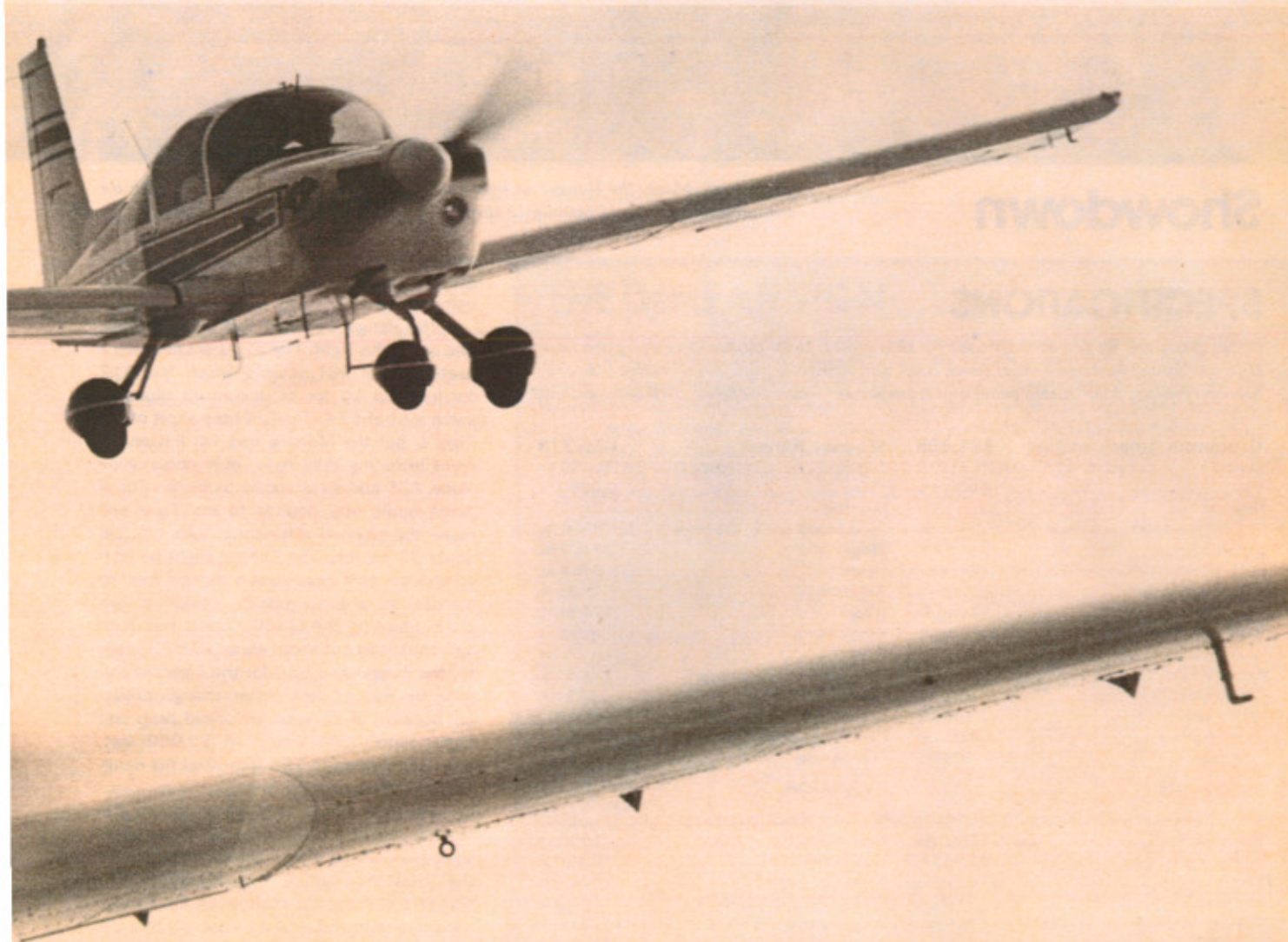
The Tiger's capability was well framed by the trip. I knew its numbers would compete with those of any other four-cylinder singles and with a lot of the sixes—retractable and otherwise. The advertised top cruise is there; shave it just a few knots and the airplane will run on substantially less fuel than the manual indicates. A business appointment 400 nm away is an easy one-day accomplishment in the airplane, and three associates could go along. The weight of larger than average people or baggage would have to be subtracted from the fuel. In all, it's a pretty happy balance of capability.

Moving from Grumman American country to Kerrville, Texas, Mooney's home, we found the economy champ of long standing, the 180-hp Ranger. The Ranger's official designation is the M20C, and from an aerodynamic and power standpoint, it has remained virtually unchanged since 1962.

Detail has had a lot of attention in the Ranger, and the most noteworthy new item is the instrument panel. Mooney went, in one swoop, from one of the most unfortunate instrument panels in the business to one of the very best. The airplane is compact, but the new panel is not. There's room for everything a pilot can afford, and everything is convenient. An annunciator panel across the top of the new glare shield tells if a system goes astray, and a new pistol-grip throttle, with the landing-light switch on the top, adds a perfect touch.

Mooney interiors are a touch stark on the sidewalls—early Texas plastic mostly—but carpeting on the walls of the baggage area and bright new upholstery fabrics liven things up. The exterior colors are brighter, too; the red-white-and-blue Ranger I flew was especially attractive. Anyone who doesn't like airplanes in this color scheme would be against apple pie and the flag.

The Mooney trip was planned to cover 371 nm. It was a seven-leg flight, originating





Showdown

Set in basic black, the Ranger cockpit has a solid, professional look to it, with an annunciator panel and pistol-grip throttle (including landing-light button) . . .

SPECIFICATIONS

Prices given are for the aircraft used for this report. Both planes were equipped with Narco avionics packages—dual coms, dual nav receivers, glide slope receiver, marker beacon receiver, ADF, audio panel and transponder—plus the usual airframe options.

Grumman American Tiger \$31,805

Engine	Lycoming O-360-A4K, 180 hp
TBO	2,000 hrs.
Propeller	fixed-pitch, two-blade, 75-inch diameter
Length	22 ft.
Height	7 ft. 8 in.
Wingspan	31 ft. 6 in.
Wing area	140 sq. ft.
Wing loading	17.1 lbs./sq. ft.
Seats	4
Empty weight, IFR equipped	1,408 lbs.
Useful load, IFR equipped	992 lbs.
Gross weight	2,400 lbs.
Power loading	13.3 lbs./hp
Fuel capacity	51 gals./306 lbs.

Performance

Minimum runway requirement	1,550 ft.
Rate of climb	850 fpm
Service ceiling	13,800 ft.
Maximum speed	147 knots
Cruise (75% @ 8,500 ft.)	139 knots
Economy cruise (52% @ 10,500 ft.)	115 knots
Average trip speed, as tested (from takeoff to parking ramp)	128 knots
Average fuel flow, as tested	9.35 gph
Endurance, as tested	5.45 hrs.
Miles per gallon, as tested	13.7 nm
Stall speed, clean	55 knots
Stall speed, landing configuration	51 knots

Mooney Ranger \$36,373

Engine	Lycoming O-360-A1D, 180 hp
TBO	2,000 hrs.
Propeller	constant-speed, two-blade, 74-inch diameter
Length	23 ft. 2 in.
Height	8 ft. 4 in.
Wingspan	35 ft.
Wing area	174 sq. ft.
Wing loading	15.1 lbs./sq. ft.
Seats	4
Empty weight, IFR equipped	1,606 lbs.
Useful load, IFR equipped	969 lbs.
Gross weight	2,575 lbs.
Power loading	14.2 lbs./hp
Fuel capacity	52 gals./312 lbs.

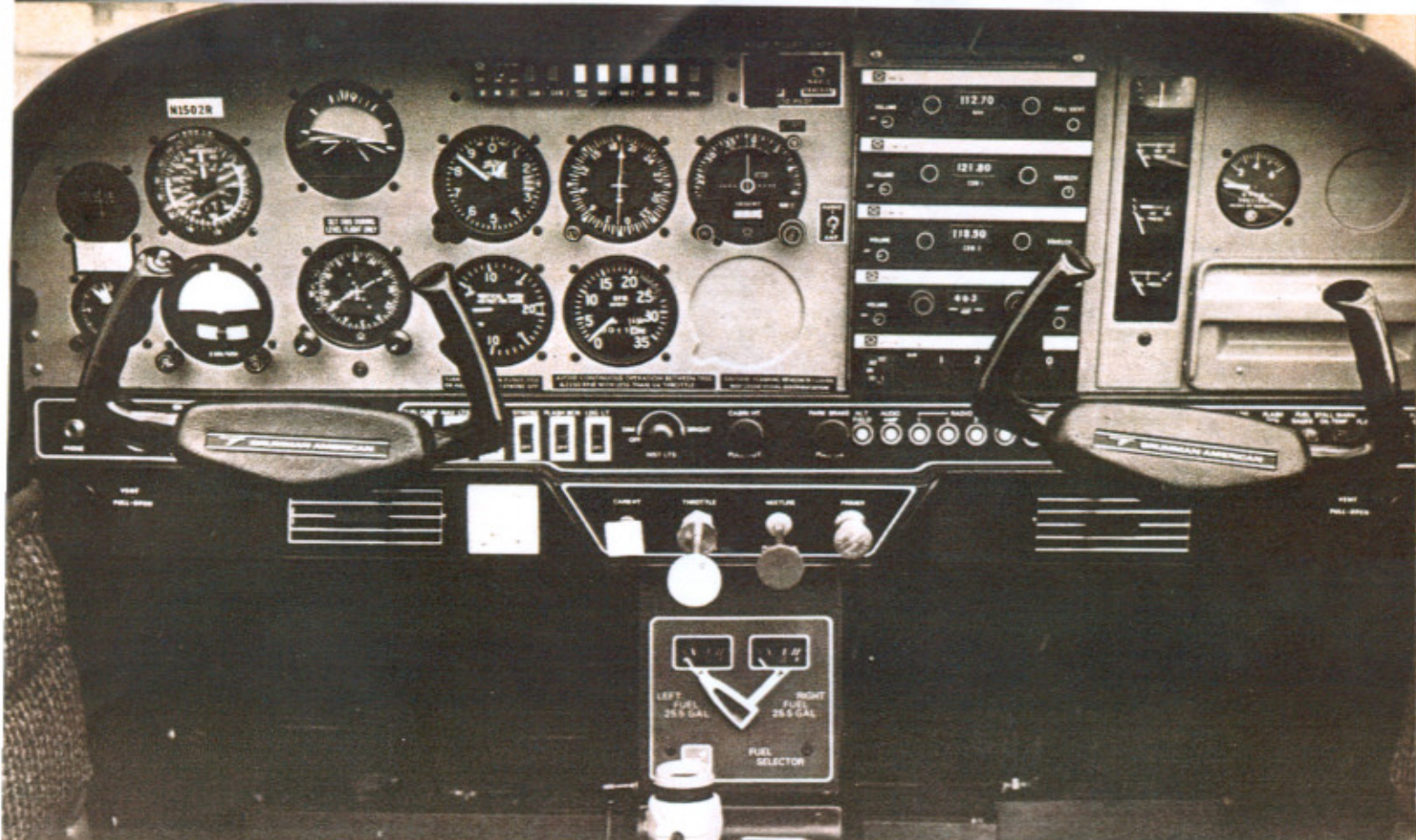
Performance

Minimum runway requirement	1,550 ft.
Rate of climb	800 fpm
Service ceiling	16,300 ft.
Maximum speed	147 knots
Cruise (75% @ 10,000 ft.)	143 knots
Economy cruise (57% @ 10,000 ft.)	123 knots
Average trip speed, as tested (from takeoff to parking ramp)	128 knots
Average fuel flow, as tested	8.9 gph
Endurance, as tested	5.8 hrs.
Miles per gallon, as tested	14.4 nm
Stall speed, clean	58 knots
Stall speed, landing configuration	49 knots

and terminating at Kerrville, and would give groundspeed checks at several points of the compass.

The Ranger's usable fuel is 52 gallons, one up on the Tiger. The airplane I flew had a useful load of 961 pounds, which, less 312 for fuel and 15 for oil, meant an allowable cabin load of 634. That's a little short of the Tiger's, but the Mooney had full IFR equipment including dual navs, dual coms, glide slope, ADF and an encoding altimeter. Those items would add pounds to the Tiger and make the payload differential with full fuel about 30 pounds. The Ranger might be faster, though, or it might use a bit less fuel, so payload on a given mission could be very close. Planning the climb, I noted that both airplanes start out about equal, with 800 fpm for the Ranger and 850 for the Tiger. At altitude, the Ranger does better, though, probably because of its constant-speed prop and higher aspect-ratio wing. At 12,000 feet, the Tiger is down to 195 fpm while the Ranger is still climbing 285 fpm.

The new instrument panel makes the Mooney feel larger inside because the rather large glare shield makes the panel seem farther away than before. I usually do not like big glare shields, but the one on the Ranger was quite desirable. At first, I thought it might interfere with my forward vision, but if I had had a cushion to sit on, there still would have been adequate headroom, and the forward visibility would have been unencumbered by the shield. The feeling is one of sitting down in a Ranger, but the view forward and out the sides is good.



... helping to set the tone. The Tiger also has strong suits, among them a fuel selector that demands no contorting between the knees and gas gauges that are located conveniently nearby.

The Mooney runs smoothly down the runway. If you remember that the nosewheel steering is a touch sensitive, that a bit of a tug is needed to lift off and that the tug should then be relaxed, the departure is graceful. The landing gear comes up in just a few seconds; then the flaps are retracted from the takeoff to the full-up position, and the power is reduced to cruise climb.

The climb from Kerrville's 1,616-foot elevation to 7,500 feet took 11 minutes, and the first leg, 53 nm, averaged 114 knots. Not bad for a climbing leg with a touch of a headwind component forecast.

There was some climbing on the next leg, too. Turbulence suggested that 9,500 might be a better bet, so I tried that. The leg averaged 128 knots. True airspeed at 7,500 had been 138 knots while using about 70-percent power; at 9,500, it was 141 knots on 66-percent power, so the climb paid dividends.

I made some notes about the Ranger environment after things settled down in smooth air: "The climb from 7,500 to 9,500 feet was spirited. There's a tolerable space between the seats for Jeppesen books, and the control-wheel lap clearance is adequate to clear a clipboard. (If I had found a pillow to sit upon, that might not have been true.) The Positive Control (single-axis autopilot) flies the airplane nicely. The Narco IFR package played well, with the nav needles especially well damped. The ride in turbulence was good, the fuel selector is difficult to reach and see (it is on the floor), and the cabin

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THE DOLLAR SIGN

Prices for aircraft and equipment are not always easy to compare directly because of various special packages offered by manufacturers. In order to compare prices of competitive aircraft, we have selected components that are essential to efficient, safe flying and then equipped the aircraft alike insofar as practical. Avionics prices are based on the list price for economical, popular models. Total prices shown do not

include installation costs and taxes; they also may not reflect dealer prices. In all cases, the figures shown are the most recent published list prices furnished by the manufacturers. However, almost all manufacturers and distributors provide that prices are subject to change without notice. Prices may also vary depending upon regional differences and individual manufacturers' policies.

	Mooney Ranger Lyc O-360-A1D	Grumman American Tiger Lyc O-360-A4K
standard equipped price	180 hp \$28,720	180 hp \$24,137
instruments		
full blind panel	included	included
EGT gauge	\$120	\$120
avionics		
2 360-channel navcoms	\$2,990	\$2,990
2 omni indicators, 1 with ILS	\$1,190	\$1,190
glide slope receiver	\$575	\$575
marker beacon receiver	\$195	\$195
ADF	\$995	\$995
transponder	\$550	\$550
audio panel	\$225	\$225
simple autopilot	\$1,195	\$1,195
emergency locator transmitter	\$159	\$159
utility extras		
wing tip strobes	included	\$240
heated pitot tube	included	\$100
dual controls	included	included
alternate static source	included	\$70
IFR equipped price	\$36,914	\$32,741

sound level allows normal conversation—especially with the overhead fresh air vents closed." More good thoughts about the new panel, and finally, leaning was difficult because of the lack of an exhaust-gas-temperature gauge.

I'd sure want an EGT in an airplane with a constant-speed prop. Where in the fixed-pitch-prop Tiger, I could lean to a slight drop in rpm, which indicated the best economy instead of the best power mixture, I had to lean by ear in the Mooney because the prop governor monitored the rpm.

The next leg, the longest of the seven, reflected a tail wind, at 157 knots. As the nose of the airplane was pointed more windward, the legs averaged 137, 135 and then 114 as the nose was pointed even more into the wind. The final leg, including the letdown and the time required to taxi in after landing, was at 113 knots. All the legs averaged just over 128 knots; the 371 nm took two hours

and 54 minutes, and the average for the trip came out about the same as the average of the legs—128 knots. That's from takeoff to the parking ramp, with the climb and taxi time accounting for the difference between true airspeed and groundspeed, as in the Tiger. I was anticipating good news at the gas pump and got it. It took 26.2 gallons to top the tanks, for a flow of 8.9 gph. That is the fuel flow shown for 70 percent in the Ranger manual and confirmed that I had the mixture in pretty good shape.

The two airplanes came out remarkably close on speed, as they do in their respective owner's manuals. The Ranger used five percent less fuel, which can perhaps be attributed to the greater efficiency of the constant-speed prop at altitude and the retractable landing gear.

In either case, both airplanes offer top value, with the Tiger able to challenge the retractable Ranger in speed and efficiency be-

cause of the good drag-reduction effort Grumman American has made for its 1975 models. Mooney is just starting its drag-reduction programs (their vice president in charge of engineering came to them from Grumman American, so he knows how to do it), and I'll bet they'll eventually find 10 more knots in the Ranger.

This is all very important to the user. Fuel is going to be conserved by one means or another, and the healthy competition that will develop to give better efficiency will be very much to our benefit. For now, this experience with the Tiger and the Ranger clearly shows that both planes deliver a lot of swift miles for not much fuel. They are comfortable and have good load carrying ability. By any of the parameters that might be used to judge efficiency—pounds of useful load per horsepower, cruise speed versus horsepower, or simple miles per gallon—both airplanes set a demanding pace. †

TIGER, RANGER—SUMMARY

Flight Characteristics:

Tiger: a fingertip airplane. The controls are light and responsive, the stall characteristics are good, and it zips right through a balked landing. The ride in turbulence is quite good. The Tiger's flaps are not very effective, and this couples with aerodynamic cleanliness to make the airplane glide and glide and glide. If proper attention is given to approach planning and speed management, though, the approach falls into place. Ground handling is okay with nonsteerable nosewheel and the brakes. It'll turn very sharply.

Ranger: The controls are very effective but a touch on the heavy side. Perhaps this is accentuated because they get a lot of action with a minimum of wheel movement and the Ranger has a massive new control wheel that suggests a requirement for muscle. A bit of technique is required for the most graceful lift-off—practice a few and you are an ace. Stall characteristics are good, and it takes the bumps without too much fuss. The Ranger glides beautifully, and if the approach is with too much speed, it will float. Seventy knots might seem slow for final in a retractable, but that's the Ranger's number with gear and flaps down. Ground handling is quite good.

Pilot Utility:

Tiger: You can see it all out of a Tiger. Even looking back, past the new wide-span horizontal stabilizer, you only have to skid slightly to spot six o'clock traffic. Shoulder harnesses are installed, but there's little else in the way of occupant protection. Manuals and charts are convenient if placed on the floor. The panel is almost standard and not arranged as well as it could be for IFR. Presumably, it could be rearranged. Panel lighting is from under the glare shield and was not tested. Controls are convenient. The owner's manual is standard—it covers the high spots.

Ranger: Visibility from the Ranger is good enough, and a small cushion (for a pilot under six feet tall) would make it better. There were no

shoulder harnesses in the airplane I flew—an unfortunate omission—though they are available. Very little attention has been given to occupant protection in other areas. A Jeppesen book or two will fit between the seats, but face it, the Ranger is a compact, so the pilot would want paper work and charts arranged to maximize the available space. The instrument panel is magnificent, with the only slight glitch in some of the controls being hard to find. (The carburetor heat was elusive.) Panel lighting is from under the big glare shield and was not tested. The owner's manual, a nice loose-leaf book, is tolerably thorough, but with quite unstandard cruise tables. It gives "cruise" numbers at settings up to 99.5-percent power, and the space could be better devoted to a wider variety of more likely cruise conditions.

Systems and Engine Operations:

Tiger: a simple airplane with few systems. Fuel management is required, but the arrangement of the gauges and tank selector is quite logical. They are on the console; the selector points to the gauge of the tank selected. The engine starts readily, though with a bit of a wrenching thump at times.

Ranger: The engine is primed with the electric pump and the throttle. Run the pump and pump the throttle, with the mixture control in the rich position, and starting is prompt. The Mooney has a thumpy start, too. The fuel system has two tanks, and the fuel selector is in a rather awkward position on the floor. The other systems are normal, and there's an annunciator panel on the glare shield to warn of malfunctions. Fuel pressure, high and low vacuum, and high and low voltage are the essential items covered.

Cabin Comfort:

Tiger: nicely sized for four, and entry and exit are easy enough through the sliding canopy. Boarding in the rain is a touch damp, and the airplane leaks when flown in heavy rain, as do most. The front seats are high off the floor.

Noise level is about standard at 75-percent power, and there was a bit of a shudder-type vibration in the Tiger flown. Heating and ventilation are good. The baggage compartment and its doors look small but accommodate about what you'd want to put there. The rear seat folds down to make a super-size cargo/baggage area when just two are aboard.

Ranger: relatively quiet as long as the overhead fresh-air-vent system is closed. When the system is opened, things become louder. The cabin is compact, but four fit nicely, with legroom for the rear-seat folks visually sparse but maximized by the fact that the rear seat is high off the floor, so you don't need to poke your legs far forward to be comfortable. All seats recline. The baggage area is large and easily accessible in flight. It's quite a heave from the ground up and over the sill of the baggage opening.

Quality:

Tiger: The metal is bonded (instead of riveted) and its paint is beautiful. The result is an extra slick appearance. Inside, the seats are very attractive, and the interior details, such as the console between the seats, have a nice touch. There's no plastic false front on the instrument panel, thus no cheap gingerbread appearance there. The total impression is of a very well-made machine.

Ranger: The panel is built like something in the finest jet. It's black, the proper color for a panel, and there's no ornamentation—all business. The power console has that super-quality touch, too. The rest of the interior is of fair quality and rather utilitarian. Mooney has brightened and improved the quality of the fabrics since last year, and carpeting the walls of the baggage area has added a dash of color there. Outside, the metalwork is quite nice. Brighter paint colors help the exterior, too, and if you haven't flown a red-white-and-blue Ranger, do so at the first opportunity. The color adds a new spirit to the airplane.