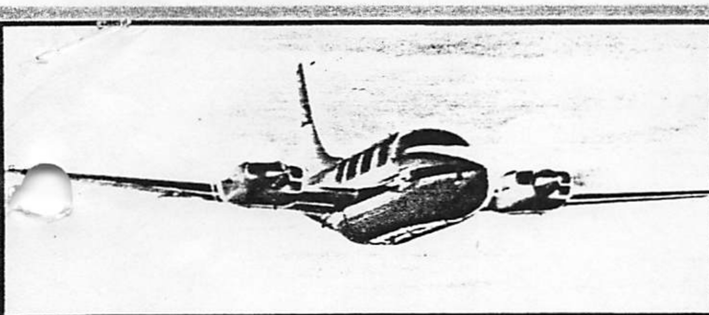
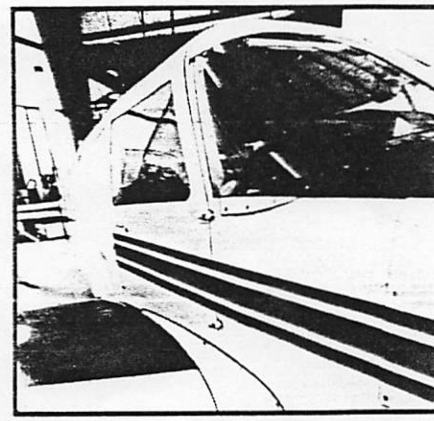
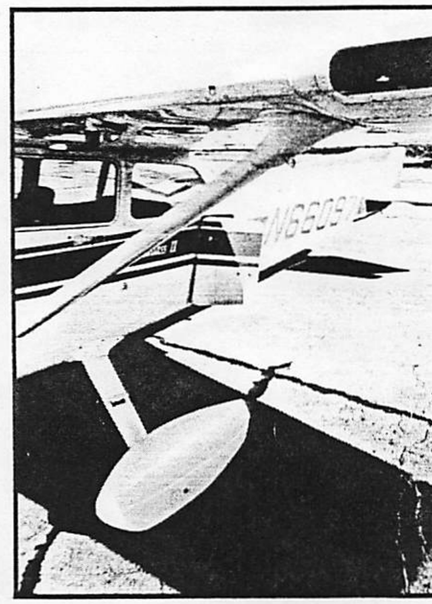


The Aviation Consumer

USED AIRCRAFT GUIDE

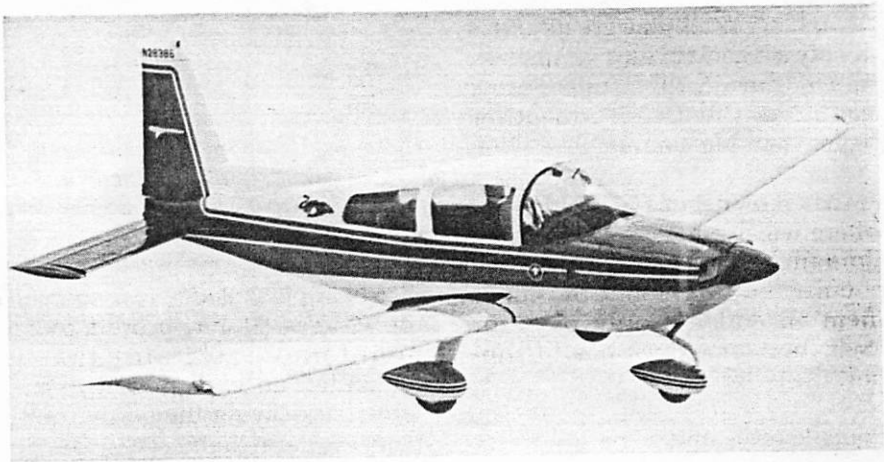




Richard B. Weeghman, Editor

Grumman American Tiger

The Grumman American Tiger has won wide acclaim as a speedy, economical and nice-flying airplane that can deliver more performance per dollar than any fixed-gear airplane. The Tiger has a few off-beat features—a sliding canopy, all-bonded construction and a free-castering nosewheel, for example—that make it seem odd to first-time pilots, but once converted, a Tiger aficionado is usually vociferous in his enthusiasm for the aircraft.



So fast it will out-drag some retractables, the Tiger has delightful handling qualities, but deficient flaps for steep approaches.

History

The AA-5B Tiger was introduced in 1975 as an outgrowth of the AA-5 Traveler. Developed by speed demon Roy Lopresti (formerly with Mooney and the man responsible for the Mooney 201), the Tiger got a 180-hp Lycoming engine to replace the Traveler's 150-hp, a bigger horizontal tail, and cooling drag plus aerodynamic improvements that raised cruise speed to a blistering 139 knots—faster than most 200-hp retractables. The airplane was an immediate hit, and soon became the second best-selling 180-hp airplane, behind the Piper Archer. About 1,300 Tigers were built, and there were no major changes during the airplane's five-year career.

Unfortunately, the Tiger production line shut down in 1979 shortly after Grumman American was purchased by Allen Paulson and renamed Gulfstream American. Paulson apparently felt he could put the factory space to more profitable use building multi-million-dollar Gulfstream bizjets. Several groups have negotiated to take over production of the Tigers (and perhaps the other Grumman lightplanes as well), but so far nothing has come of it.

Used Tiger Market

Surprisingly, the Tiger does not have a particularly high value on the used-plane market—perhaps because of the halt in production. A Tiger holds its value about as well as the Cessna Cardinal and Beech Sundowner, (according to the *Aircraft Price Digest*) and not as well as the Piper Archer. A 1977 Archer, for example, commands $27,000 today, while a 1977 Tiger is worth about $20,500. Both cost roughly the same when new.

Performance

The Tiger's performance is, in a word, stunning. Cruise speed is a sizzling 139 knots. In fact, our editors have flown the Tiger side-by-side with a Piper Arrow and pulled away from it by a knot or two. In a side-by-side test with the 180-hp fixed-gear Piper Archer, the Tiger zoomed by the Archer by a good 15 knots, and was able to keep up with a flat-out Archer while turning a leisurely 59 percent power and burning 20 percent less fuel. Readers report that the 139-knot book figure is easily reached in the real world (and we have gotten as high as 144 knots out of a lightly loaded Tiger). Typical owner reports show: 142 knots on a fuel burn of 9.7 gph; 137 knots at 7.8 gph; 130 knots at 8.2 gph. (Variations are mostly due to altitude.)

Climb rate is also strong; owners report it will deliver about 1,000 fpm at sea level with all but the heaviest loads. Listed gross-weight climb is 850 fpm, superior to any of the 180-hp competition. Climb rate tends to decay quickly at heavy weights under high/hot conditions, however, and the Tiger's service ceiling is only 12,800 feet, quite a bit less than the Archer's and the Cardinal's.

Handling

It's a toss-up whether Tiger owners rave more about speed or handling qualities. Its light controls and responsiveness in the air win praise from pilots, and the Tiger seems to achieve this sprightly handling without the twitchiness, pitch instability and high sink rate that plagues the smaller two-seat AA-1s, which enjoy a similar reputation for "sports car handling." The Tiger's controls are all nicely harmonized; landings are relatively simple, with no sudden drop or excessive sink rate, and owners report the Tiger tracks reasonably well in IFR conditions or in turbulence—though perhaps not in the rock-solid manner of a

Skylane. With no retractable landing gear to worry about, and no flap lever, the pilot has little to do during takeoffs and landings except fly the airplane.

One drawback is the flaps, which don't have much effect. As a result, steep descents aren't possible, and it's easy to overshoot the landing, particularly if approach speed is too fast.

On the ground, the Tiger is unusual. There is no steerable nosewheel; one steers by differential braking while the nosewheel swivels freely. Although ground maneuverability in tight places is superb, crosswinds can make taxiing a real chore—not to mention hastening brake wear from constant pressure to keep the plane from weathercrocking. But such idiosyncrasies are easily adjusted to, and most Tiger pilots come to prefer the free-castoring nosewheel because of the quick, light response and extraordinary agility on the ground.

Loading

The Tiger carries an average load for this class of aircraft. Gross weight is 2,400 pounds, while typical IFR empty weights run a bit over 1,400 pounds, for a useful load of about 950 pounds. That's good for full fuel and four people, but no baggage. The baggage compartment is adequate, but the baggage door is not. (One owner referred to it as a "mail slot.") With four people and 100 pounds of luggage, fuel is limited to perhaps 35 gallons—enough to fly comfortably 435 miles with a small reserve, or 348 miles with IFR reserves. Competitive aircraft like the Archer and Sundowner offer slightly better useful loads, but this advantage is partially offset by the Tiger's extra speed, which allows it to fly the same distance on less fuel—and thus carry a little more payload for the same useful load on the same trip.

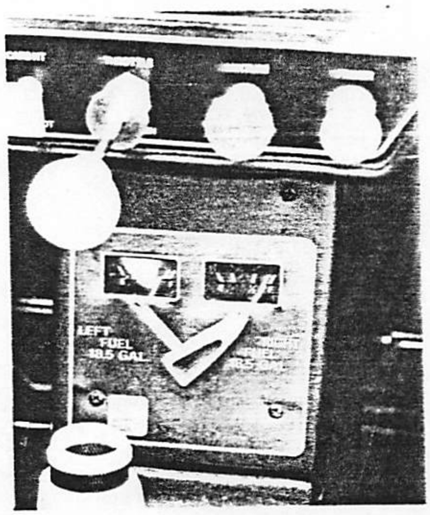
Creature Comforts

Here is where the Tiger departs from the norm. The first thing a Tiger passenger notices is that he or she must slide back the canopy and step down and in, rather than enter by the usual open-the-door method. This is generally no problem, but if you are fat and/or wearing a dress, it may be a bit awkward. Rain also makes entrance a bit messy, since sliding open the canopy drenches the entire cabin. Take an umbrella.

Once you're inside, the Tiger is comfortable, if not sumptuous. Room is adequate front and rear, but the seats seem a bit chintzy, and have neither height nor recline adjustments. One feature of the Tiger is unique: the rear seats fold down into a six-foot cargo area that will hold skis, a couple of ten-speed bikes or whatever. A pair of short people can even sleep back there.

One caveat for boarding passengers: If you've got two heavy people to go in the back, board one of them after a front-seater is already in the plane. With two big people in back and nobody in front, the Tiger will tip back on its tail, a gyration that may disturb a first-time passenger.

The Tiger is noted for its superb visibility, which makes both pilots and passengers happy. For pilots, it's easy to watch for other aircraft and see the runway on landing; for passengers, the rather tight seat room is less noticeable because of the airy, open feeling provided by the canopy and broad side windows.



The next best thing to having both fuel tanks feed together automatically is to have the fuel tank selector point to it respective gauge, right below the throttle quadrant.

Safety

The one black mark against the Tiger is its accident record. According to NTSB accident statistics for the period 1972-76, the AA-5 series (which includes the 150-hp Traveler as well as the Tiger) had the worst fatal accident rate of any popular fixed-gear four- or six-place airplane, with 3.9 fatal accidents per 100,000 flight hours. By comparison, the Cessna 172 had a fatal accident rate of 1.5. In overall accidents, the AA-5 series also ranked poorly, trailing all the comparable four/six-placers except the taildragger Cessna 170 and 180 and the Piper Tri-Pacer.

A major cause of AA-5 accidents seems to be landing overshoots. In fact, the AA-5 led all 33 aircraft studied by the NTSB in landing overshoot accidents. The Tiger's flaps are not very effective, and the plane tends to float if speed is too high. Another trend in AA-5 accidents is the overload takeoff on high/hot conditions. (Most of these crashes presumably occurred in the 150-hp Traveler, which performs poorly under those conditions, and not so often in the more robust Tiger.)

NTSB figures show no other obvious pattern in AA-5 accidents, and frankly we are mystified by the high accident rate. Wing loading is a bit higher than for competitive Cessnas and Pipers, but approach speeds are a reasonable 65-70 knots under most conditions, and sink rate is not excessive.

Operating, Maintenance Costs

For a 140-knot airplane, Tiger operating and maintenance costs are extraordinarily low; for a 180-hp fixed-gear airplane, they're average or a little better. Fuel costs generally run around $20 per hour, and owners report the typical annual costs around $300-$500. The Tiger has no standout maintenance problems that we're aware of.

The Lycoming O-360-A4K engine generally has an 2,000-hour TBO, and the O-360 series in general has a superb reputation for reliability. But for some reason—perhaps a tendency to run hot—the Tiger seems to suffer more engine problems than other 180-Lycoming-powered aircraft. Top overhauls and/or cylinder and valve problems are not unusual at the 1,000-hour mark, and we have no reports of the Methuselah-like 3,000-hour engine lifetimes reported for the small Lycomings in other aircraft.

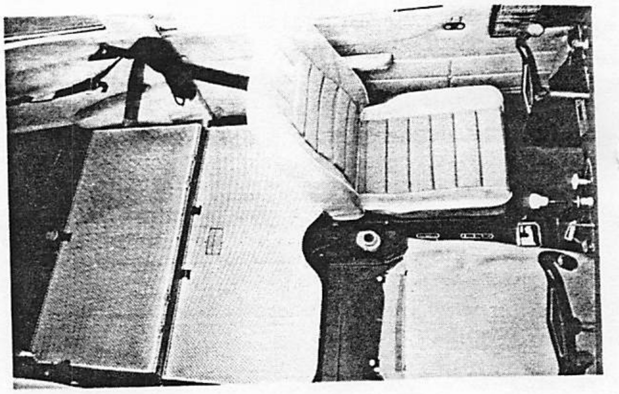
One maintenance kicker on the Tiger: in case of an accident, few mechanics will have any experience fixing the bonded wing and tail surfaces or the honeycomb fuselage skins. Instead of getting a quick-fix repair job, an owner may find it necessary to order a whole new component.

Airworthiness Directives

The Tiger has had its share of ADs, but none have been crippling. In addition to the ELT, vacuum pump and oil pump ADs that it shares with many aircraft, the Tiger has had ADs on the rudder control bar, cowl hinge, carb mixture control, bonded skin joints, oil cooler, alternate static source, and seat belts. A ludicrous AD (apparently triggered by a slight roll oscillation in a few airplanes) would have required a complete rework of the aileron system, but this was amended after a storm of protest; now only an inspection is required. All of these directives should have long since been complied with, of course. Two ADs deserve close checking though: a repetitive 100-hour inspection of the propeller hub once it reaches the 800-hour mark, and an inspection/replacement of the Slick magneto impulse coupling.

Maintenance Checkpoints

The Tiger, with its fixed gear, fixed prop and simple design philosophy, has been a fairly trouble-free aircraft. ("The most trouble-free machine of any kind I've ever owned," reports one owner.) But the Tiger does have its problems, of



If the "mail-slot" baggage compartment door leaves a lot to be desired, the fold-down rear seat baggage bay makes up for it.

course. In addition to the previously mentioned ADs, which should be complied with on any airplane considered for purchase, check the following maintenance points:

• Cracking prop spinner. Pre-1979 Tigers (serial numbers before 1048) had a poorly designed spinner. Check to see that any Tiger you're looking at to buy has the improved spinner used on the later models. According to Gulfstream, virtually all of the Tigers in the field have the new spinner.

• Nosewheel shimmy. The Tiger's nosewheel not only looks like a supermarket shopping cart wheel; it sometimes acts like one. Properly rigged and maintained, it should not shimmy, but adjustment and maintenance are critical. A competent Tiger mechanic should be able to eliminate any shimmy; if not, check whether the nosewheel strut may be slightly bent.

• Air induction box problems. Although this is not an AD item, it should be. Tigers built before about mid-1977 (serial numbers 1-550) had the "banjo-style" air box, which tended to crack and come loose. We have received several reports of gaskets and air filter material breaking loose and blocking the carburetor, causing power interruption. Some Tigers have been updated with the later-style air box; check this carefully. The 1978 and later Tigers (serial numbers 551 and up) had the improved air box to begin with.

• Magneto replacement. According to reader reports, the Slick magneto may not last the engine TBO. Many seem to malfunction after 600-700 hours, and one reader reports the left (impulse) mag is more trouble-prone.

• High brake wear. Because of the Tiger's steer-by-brakes setup and the need to ride one brake at the start of a crosswind takeoff, brake wear can be higher than on comparable aircraft. Although pads are cheap, the brakes should be inspected regularly, for brake failure leaves a Tiger owner helpless to steer or maneuver on the ground.

• Sticking canopy. Canopy rails need to be kept lubricated, with either graphite or Teflon lubricant.

Grumman American had won praise from Tiger owners for its product support. The company has often paid for defects that showed up after the warranty period (a bad batch of interior fabric that faded severely, for example). The company also came through with flying colors in fixing bond-line separations in many 1975-76 Tigers. In a couple of cases of severe delamination, customers had their airplanes virtually rebuilt at no charge.

Help & Support

Tiger owners can get information and support from The American Yankee Assn, P.O. Box 3052, Everett, Wash. 98203. They publish a newsletter six times a year. Ken G. Blackman is the editor.

Cylinder Problems

The most expensive maintenance surprise a Tiger owner is likely to discover is a bad cylinder or valve well before overhaul. We have received several reports of cylinder and valve problems at the 800-1,000-hour mark, and Tiger mechanics say that such problems are quite common. "The cylinder barrels run very hot," one mechanic told us, "and the walls get glazed and they really start to pump oil." As a result, plug fouling is common in Tigers.

The villain is heat. The Tiger's designers, in an attempt to achieve maximum speed by reducing cooling drag to the bare minimum, may have cut the cooling margin too thin. Tiger owners tell us they've seen cylinder head temperatures as high as 450 in normal cruise conditions. Cooling suffers particularly when the engine baffling is not perfectly aligned and sealed. Because of thinner-than-usual baffles and what we'd characterize as chintzy sealing and fitting, many Tigers run hotter than they are supposed to. The almost inevitable result is premature cylinder problems.

Any used-Tiger shopper should carefully check cylinder compression and the condition of the cooling baffles. A borescope inspection of the cylinder walls would also be a good idea. Check cylinder head temperature during flight. (One reader reports that using probe-type CHT pickups instead of the standard sparkplug style type caused his CHT readings to shoot up. So it's possible that standard Tiger CHT gauges are too optimistic.)

One way to lessen the heat buildup and decrease the possibility of cylinder problems is to avoid full-power climbs at low airspeeds. (Climb rate at 95 knots is only slightly less than at the Tiger's best rate-of-climb speed, which ranges from 78 to 90 knots, depending on altitude.) Also, use restraint in leaning on hot days.

A better solution is offered by Gunnell Aviation at Santa Monica Airport in Calif., 213-391-6355. Gunnell's Bill Heard has developed a cooling outlet modification which, combined with baffle improvements, has dropped CHTs by 50 to 75 degrees on first eight Tigers modified. The mod is basically an enlarged cooling air outlet with a small fixed flap. According to Heard, there is no noticeable performance loss. We'd recommend the mod for any Tiger. We'd also suggest that Tiger owners purchase a four-probe CHT gauge to more carefully monitor engine temperatures. At the very least, keep the baffles and seals in tip-top shape.

Bond Separations in 1975 Models

The Tiger's innovative bonded construction technique backfired in the mid-70s when a spate of bond-line separations started showing up, often on the trailing edges of control surfaces. Aircraft in hot, humid, salt-air environments seemed to have the worst problems. Some minor separations had occurred in all the Grumman American airplanes for several years, but the problem grew to near epidemic proportions in 1976 and 1977, the result of an improper bonding sealant, American Cyanimide FM-123, known as "purple passion" among production employees. The FM-123 adhesive was used in all Grumman American aircraft built from April 1974 until December 1975—some 760 airplanes. All 1975 Tigers and perhaps a few early 1976 models, up through serial number 125 or so, were glued together with the purple stuff.

At least one severe delamination occurred in flight on a 1975 Tiger, but no crashes resulted. Two Tigers, serial numbers 15 and 19, were virtually rebuilt from scratch because of severe delaminations in major structures. A former Grumman American employee told us that some 30 or 40 honeycomb fuselage test panels bonded with FM-123 mistakenly found their way into production aircraft during late 1974, possibly affecting Tigers with serial numbers below about 30.

In any case, have an experienced Tiger mechanic closely inspect any 1975 Tiger considered for purchase, with special emphasis on the fuselage panels of the first couple of dozen aircraft built. Also find out if the aircraft was based in a tropical, salt-air environment. Tigers built in 1976 and 1977 should also be scrutinized for bonding delamination, since a few problems were reported in those models, too. The 1978 and later models had a completely new primer/sealant system that has apparently solved the problem completely.

Mods 'n' Ends

The only STC on the Tiger we're aware of is held by Ameromod Corp. in Everett, Wash., 206-353-3559. Ameromod's Manard Crosby

Cost/Performance/Specifications

Model	Year Built	Number Built	Average Retail Price	Cruise Speed (kts)	Rate of Climb (fpm)	Useful Load (lbs)	Fuel Std/Opt (gals)	Engine	TBO (hrs)	Overhaul Cost
AA-5B Tiger	1975	111	$17,750	139	850	950	51	180-hp Lyc. O-360-A4K	2,000	$6,750
AA-5B Tiger	1976	288	$19,000	139	850	950	51	180-hp Lyc. O-360-A4K	2,000	$6,750
AA-5B Tiger	1977	292	$20,500	139	850	950	51	180-hp Lyc. O-360-A4K	2,000	$6,750
AA-5B Tiger	1978	212	$22,000	139	850	950	51	180-hp Lyc. O-360-A4K	2,000	$6,750
AA-5B Tiger	1979	417	$25,000	139	850	950	51	180-hp Lyc. O-360-A4K	2,000	$6,750

in fact, is something of a Grumman American guru, and offers several modifiations for the two-place AA-1 series as well as the AA-5. The only current Tiger STC is a very useful one: a Sensenich propeller in place of the standard McCauley. Not only does the Sensenich prop increase speed by several knots and climb rate by about 100 fpm, according to Crosby, but it also removes the "yellow arc" rpm restriction that applies to all Tigers. This rpm restriction, which prohibits engine operation between 1850 and 2250 rpm in descending flight because of vibration of the engine/prop combination, is extremely annoying during the landing approach, particularly ILS approaches. According to Crosby, ILS approaches must be made either below 100 knots or above 140 knots to avoid the critical rpm band.

The new prop also eliminates a recent AD on the McCauley calling for dye-penetrant inspection of the prop spacer every 100 hours, at a labor cost of $50-$100. Price of the new prop and STC paperwork is $1,680 if the aircraft is already equipped with an updated spinner; $1,413 if a new spinner is necessary. By eliminating the AD, the new prop would pay for itself eventually.

Ameromod is also working on an STC to increase the Tiger's fuel capacity to either 60 or 70 gallons, but that approval isn't expected until the end of the year.

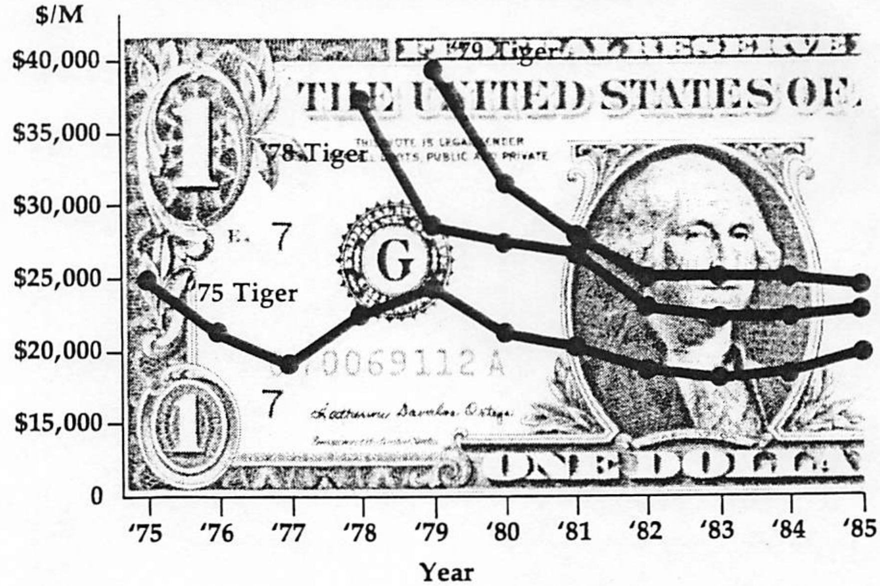
Contact Maynard Crosby at Ameromod Corp. in Everett (206) 353-3559 for parts, service and a series of upcoming engine mods including a 180-hp turbo and a 250-hp installation that is expected to push the aircraft to 165 knots.

Owner Comments

The following comments come from Ken Blackman, an expert on Grumman American airplanes and their maintenance.

Many accidents chalked up to the Tiger are a result of overshooting.

Aircraft Resale Value Chart



This is because the Tiger has one of the best glide ratios in the industry, especially for fixed-gear airplanes, and a too-fast approach speed can cause a long float. The two-place version is the opposite and gives birth to the falsehood that all Grummans will drop like a rock if you are slow. The sad result is that many pilots go through life trying to land a Tiger at 80 knots and will porpoise if they try to force it onto the runway. When the Tiger sets up a porpoise, chances are good it will get the prop, or nosegear, or worse. The proper approach speed is 65 to 70 knots over the fence for a normal landing. However, short-field approaches may safely be made at the ragged edge of stall, yet still leave a margin for safety.

The Tiger has many other safety attributes, such as the ability to recover from a stall, yoke full back, flaps full down. The super strength of the airplane gives it the ability to "take a licking and keep on ticking" in hard landings. Another unique feature is its ability to float, almost indefinitely, if ditched in water. If the Tiger remains upright, *it will float*, simple as that. Several cases are on record of the planes being towed to shore, dried out, and returned to service with only minor repairs required. If you compare the Tiger with a Cessna or Piper, you measure the time afloat in hours rather than minutes, or even seconds. A very important feature for those who spend a lot of time over water.

Short-field capability is another grossly misconceived area that has never been publicized. The Tiger is a great short-field performer, if flown properly. The manual recommends using zero degrees of flaps, which is okay, but one-third to one-half flaps will make all the difference in the world.

The grass takeoff procedure is as follows:

1. one-half flaps down
2. hold brakes
3. full power
4. right rudder as required
5. yoke back two-thirds
6. nose will lift at about 20 knots and the airplane will lift off at about 45 knots (in ground effect) then settle slightly before making like an elevator at about 55 knots. Note: *Do not* lower the nose until the airplane is positively climbing or it will settle back onto the ground.

During this procedure, the stall warning horn will be on steady until about 65 knots, so for all practical purposes, ignore it.

The same procedure should be followed for short hard-surface takeoffs, except leave the nose flat and flaps up until 45 knots IAS, then pull back and hit one-third flaps at the same time.

Takeoff roll, standard day, gross weight will be between 500 and 600 feet, and 50 feet AGL will come in less than 1,000 feet using the above technique.

There were no major changes in the Tiger during its five-year career. The only way to tell them apart is by the paint job. This is a 1977 model, worth about $20,000 on the used-plane market.

As far as maintenance, there are several unique things to look for with the Tiger. The infamous "Purple Passion" or "Blue Glue" was limited to some 1975 and 1976 models. Just because an airplane was built with this bonding agent doesn't mean it will have separation problems, as I have seen many cases of trouble-free specimens. However, the buyer should be beware of the fact that problems are prone to happen. Most cases will be evident by logbook entries of bond line repair history or replacement of parts, such as wing panels or controls surfaces, not associated with damage. Such an airplane should be avoided, unless inspected by an experienced G.A. mechanic or shop.

The best way to identify these airplanes is to pull a wing tip and look. If there is a blue or purple line around all the bonded seams at the spar-to-rib, rib-to-wing-skin area, it has it. This can also be seen by removing the ELT cover and looking inside the tail cone.

Gulfstream American will, in most cases, still furnish replacement parts and some labor credit for repairing delaminated airplanes, so don't pass up a good deal on a Tiger because of this potential alone.

The next most common maintenance item is nosewheel shimmy. This can be caused by a variety of things: improper tension or worn spring washers, too-loose adjustment of the axle nuts, out-of-balance or out-of-round nose tire, or a loose strut in the torque tube. Only the latter is costly, unless it can be shimmed. Many shops don't follow the checklist, on annuals, allowing the nosegear to go without proper treatment. The strut should be removed from the torque tube, all rust and corrosion cleaned, coated with zinc chromate and lubricant and reinstalled. The 1977 and later models with the shocks on the nosegear are very difficult to remove, especially after a couple of years of neglect. This can take several hours and requires the knowledge of how to do it without damaging the strut or fork.

The fork has a stack of spring washers which may be shot. The tension required is 18 to 22 pounds of side pull, at the axle point, to cause the fork to turn left or right. Most shops think the book means "torque," thus causing a too-loose adjustment.

The axle should be tightened to allow the nosewheel to spin only a couple of turns after lift off.

Another nosegear item is the torque tube. It has bonded "shear joints" at each end which can be broken loose on hard landings. If you hear a metallic "clicking" when the nose is bobbed up and down, check these points inside the cabin. If the joint is working, the torque tube assembly *must* be replaced at a cost of around $1,000 parts and labor. Also check the attaching points for honeycomb damage and worn bolts.

I own a 1978 Tiger with 980 hours. I would choose a Tiger over *any* other single-engine aircraft costing $75,000 or less.

Ground handling—superb. The Tiger can turn virtually in its own circle. I've even seen a Tiger taxiied into a hangar, shut down, then turned around in the hangar and ready to taxi out. The castering nosewheel and differential braking are just excellent for ground handling, in almost all situations. Three minor disadvantages: (a) you have to start moving at least a little bit to start a turn; (b) the plane tends to weathercock in a good stiff crosswind, but continuing to move at least five mph and use of brake covers this problem; (c) backing the plane (especially without a towbar) is a real terror because that nosewheel wants to turn sideways.

Takeoff—Very good to excellent. Again, there is a tendency to weathercock on strong crosswind, but I've never even come close to losing control or ground-looping. It's much better than high-wings, and as good (and generally better) than other aircraft.

It has a rather long takeoff roll, partially because of its high-speed (as opposed to high-lift) wing, and partially because of that fixed-pitch propeller. At 55 knots, I lift the nose two or three inches off the runway, and it flies itself off about 70-75 knots.

Climb—excellent under the circumstances (fixed gear, fixed prop, no turbo). Best rate at our field elevation (5,000 feet) is about 85 knots, with very good visibility. Best angle is about 65-67 knots, but poor visibility, and in the summer, it might overheat an engine (I have not had it happen, but with no cowl flaps or CHT/EGT, and small cowl opening near the prop, *I would not recommend frequent maximum angle climbs, especially in heat of summer).* I find that climb performance degrades very little at 90-95 knots (about 100 feet per minute), and even 100-110 knots is good, to say nothing of improved cooling and visibility.

Cruise—fantastic. This is the Tiger's major element, where the fixed-pitch prop is most effective. I consistently obtained 139 knots true (I've measured it), at 7,500-8,500 feet. Now that gas prices are way up, I pull back on the throttle and get 130 knots, and about 9.0-9.5 gph. With the engine at 980 hours, my top cruise speeds at 7,500-8,500 (full throttle) is about 137 knots, and 2650 rpm—both down somewhat from the speeds when new. I haven't seen a Tiger yet in its first 500 hours that can't at least meet the "book" claims on speed.

At cruise, handling is sheer delight, with even faster response—of course—than the very good response at slow speeds.

With 51.5 gallons usable fuel, you have an easy 550-nm range, especially if you lean properly. However, I consistently get much better than the book by pulling back to 2500 or even 2400 rpm (depending on altitude), leaning until the engine just begins to run rough, pushing mixture in until the engine runs smoothly, and pushing in one more "notch." With that technique, I've made a nonstop flight of 677 nm (with 10 gallons left).

Landings—I think, are superb—if you keep the airspeed in hand. A Tiger is "clean," especially without flaps. If you keep it at 65 knots, or about 70 in crosswinds, you'll be fine. But above 70 knots (especially below gross weight), you'll have a long "float," and a temptation to "force" the plane to land. If you try that above 75 knots, you'll get a nosewheel landing and a possible porpoise that tends to aggravate itself.

Crosswind landings—the equal or best of any other single-engine I've flown, and much better than any high-wing (Cessna), especially better than tail-draggers.

Comfort—good, but not superb. The seats are not orthopedic (but are decently comfortable), and do not recline or adjust the backs. On a five-hour flight, I am not as comfortable as in seats in a Bonanza, or good cars. Seats aren't bad, but definitely are not the highlight of a flight.

Baggage area is fair—120 pounds maximum behind the rear seat. The baggage door is small ... a little too small ... and you have to press on it quite hard to lock it (or unlock it).

With back seat down, baggage capacity is great. I've carried bicycles back there. It's like a station wagon, and takes only a few seconds to unlatch the seat backs and lay them down.

Maintenance—I've found it very low—lower than any other good-performing or high-speed airplane. The fixed gear and fixed-pitch prop are great for minimal maintenance. The landing gear is incredibly strong, and has no oleo struts or seals or places to leak (except brake lines, and I haven't had a leak there yet). The nosewheel can shimmy (mine has been free of this, but I've had other Grummans that are rather fierce on shimmy), requiring sensitive adjustment. The rubber at the nosewheel fairing where the nose downtube enters routinely deteriorates and needs replacement each year.

The nose spinner commonly cracks and requires replacement with a new-model spinner that eliminates that problem.

Annual inspections have cost me $350-$500, and I'm about to have another one. Sparkplugs tend to foul at times, especially if you run rich or use a lot of carb heat without leaning mixture.

Disadvantages—the problems in the Tiger are so few that to list them is a real compliment. Here are all I can think of:

1. The yellow arc on the tachometer (1800-2250 rpms)—cured with a Sensenich propeller.

2. Wind noise/rain leak in the forward seal of the canopy, and ungluing of the canopy seal. (Easily cured with the several strips/seals available.)

3. Castering nosewheel cocks when pushing the plane back, unless you use the towbar, or are really careful.

4. "Float" on landings if airspeed is too high. Of course, this is true for most planes, but float is longer on the Tiger than others.

5. Weather-cocking tendency in crosswinds—a little more than other planes, but easily controlled with a little extra taxi speed and use of the good brakes.

6. Cracking spinner. On the other hand, the new spinner—furnished on 1979 planes and easily available on others from parts suppliers and the factory—has no problems and fits right on. Indeed, it fits on a Sensenich prop (which avoids the yellow arc).

7. Small baggage door. (Fortunately, items can be loaded through passenger compartment, especially if rear seat is temporarily or permanently folded forward for the trip.)

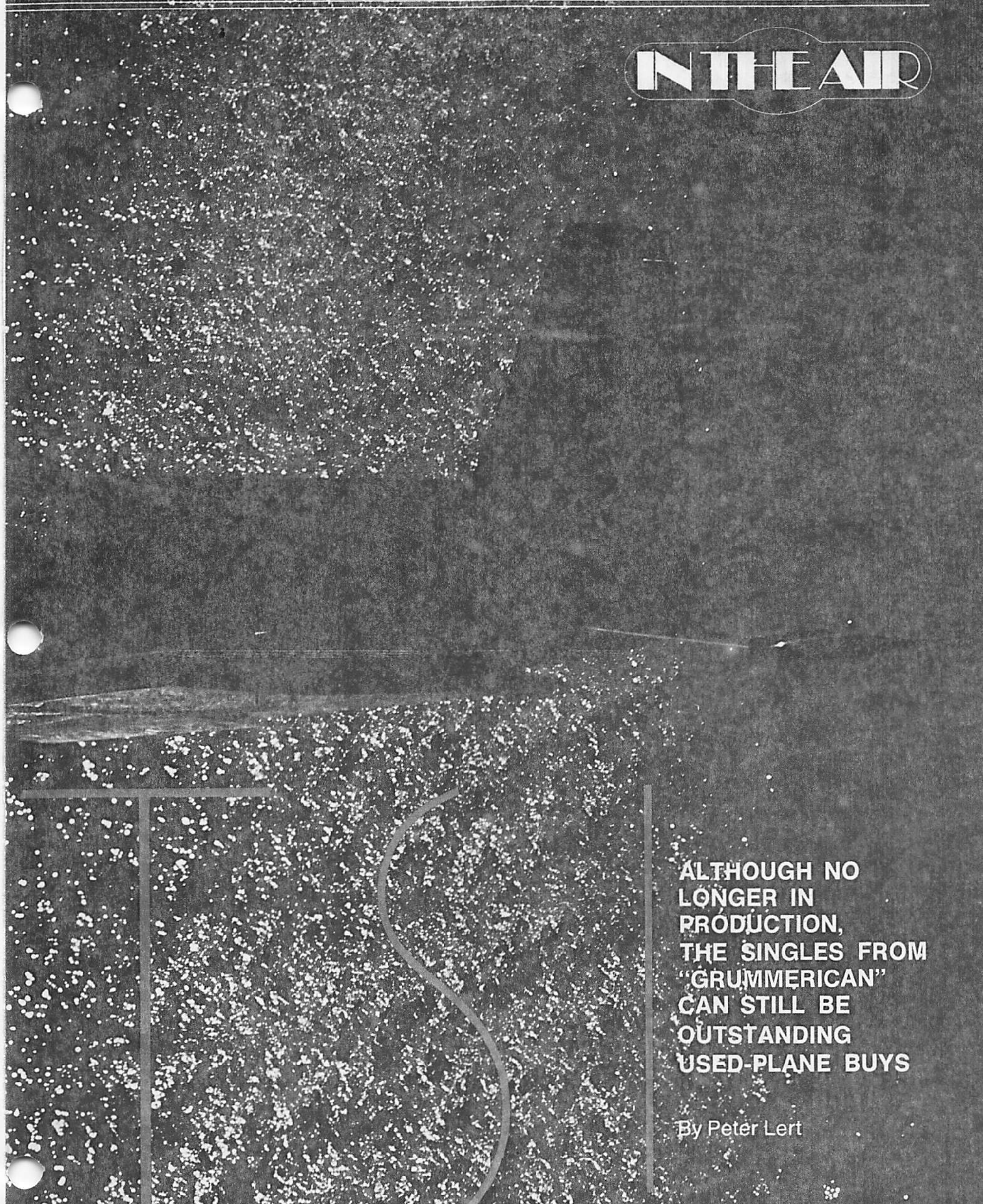
8. A tendency to be a bit of a "cork" in moderate turbulence. It takes more attention and being "on top" of the plane in turbulence, especially in an instrument approach, than in some of the other planes like big Cessnas—which in turn trade good stability for "station wagon" handling.

9. Seats that do not recline. They are comfortable as far as they go, but do not have the comfort of (heavier) seats in Bonanzas or good sportscars.

10. Engine instruments too far to the right. They're easy to read, but they are out of sight of peripheral vision, and you have to make a deliberate effort—better yet, a habit every 20 minutes—to look at them.

11. Muffler/exhaust pipe. Mine lost its innards at 400 hours, and I've heard they do the same about every 500 hours (at 980 hours, I haven't had it happen again).

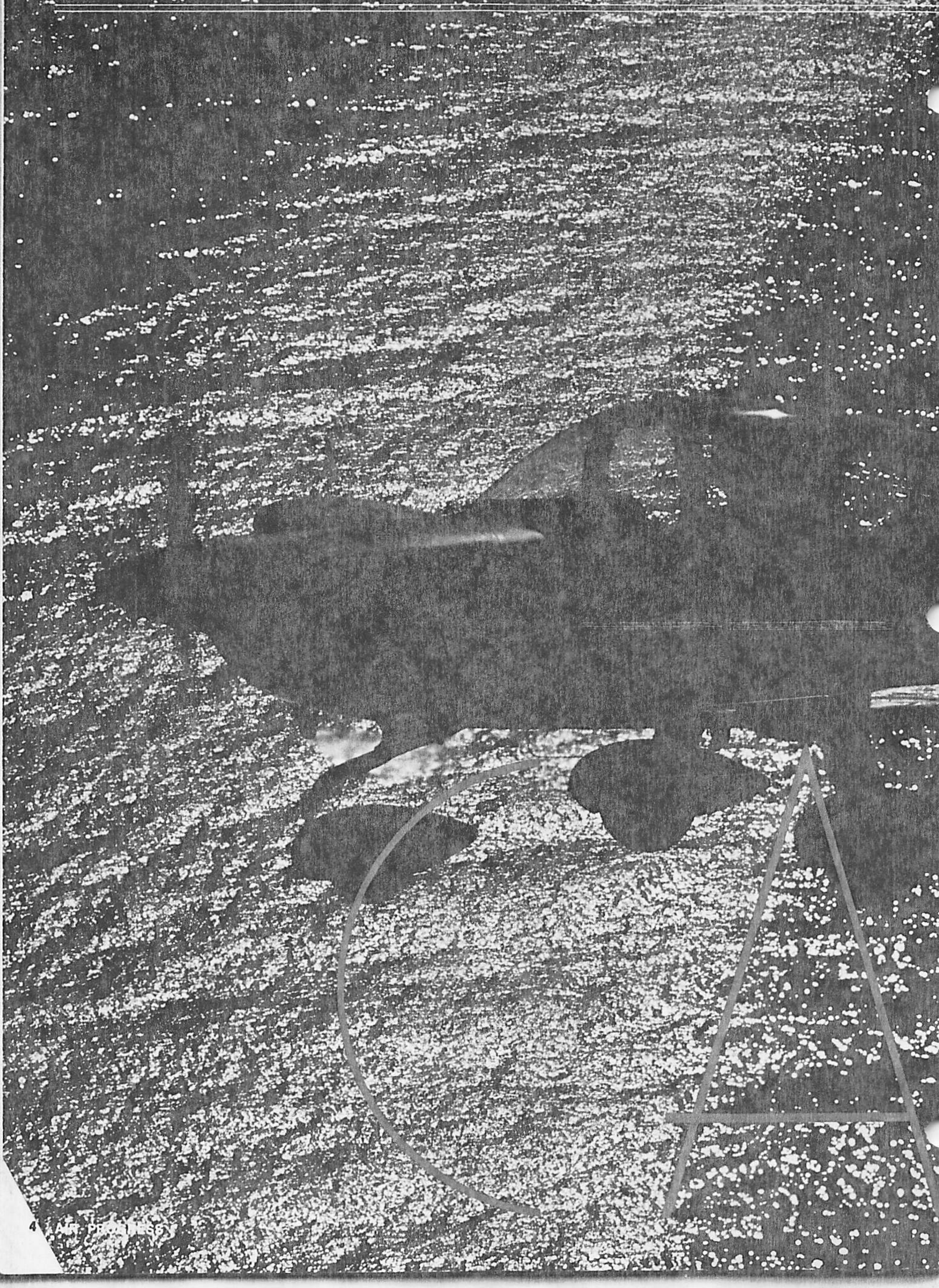
12. The seat adjustment lock can slip and the seat slide back. I've never had this happen or seen it happen, but I've heard of it happening on a friend's Cheetah. I always make sure my seat is carefully and securely locked. This probably is the most significant complaint I can think of about the plane.



TSI

ALTHOUGH NO LONGER IN PRODUCTION, THE SINGLES FROM "GRUMMERICAN" CAN STILL BE OUTSTANDING USED-PLANE BUYS

By Peter Lert


CA

It can be the best of times, it can be the worst of times . . . as, in fact, it seems to be at the moment for much of the General Aviation industry. Even during the good times, though, the manufacturers would love to be able to reach a large market . . . and even some fifteen years ago, when things were generally looking pretty good, there were the usual complaints that American light aircraft cost too much and did too little.

In those long-gone and heady times, though, we were not yet saddled with today's legal and insurance burdens, and it actually looked worthwhile for people to do something toward building better and cheaper lightplanes. One of the would-be doers was an unknown (although later to be notorious) and rotund (later to be *more* rotund) Ohio aeronautical engineer and entrepreneur, one James R. Bede. That's right—*that* Jim Bede. In those days, he was not yet installed in Kansas, but was still based in his native Cleveland, on the verdant banks of the limpid Cuyahoga river.

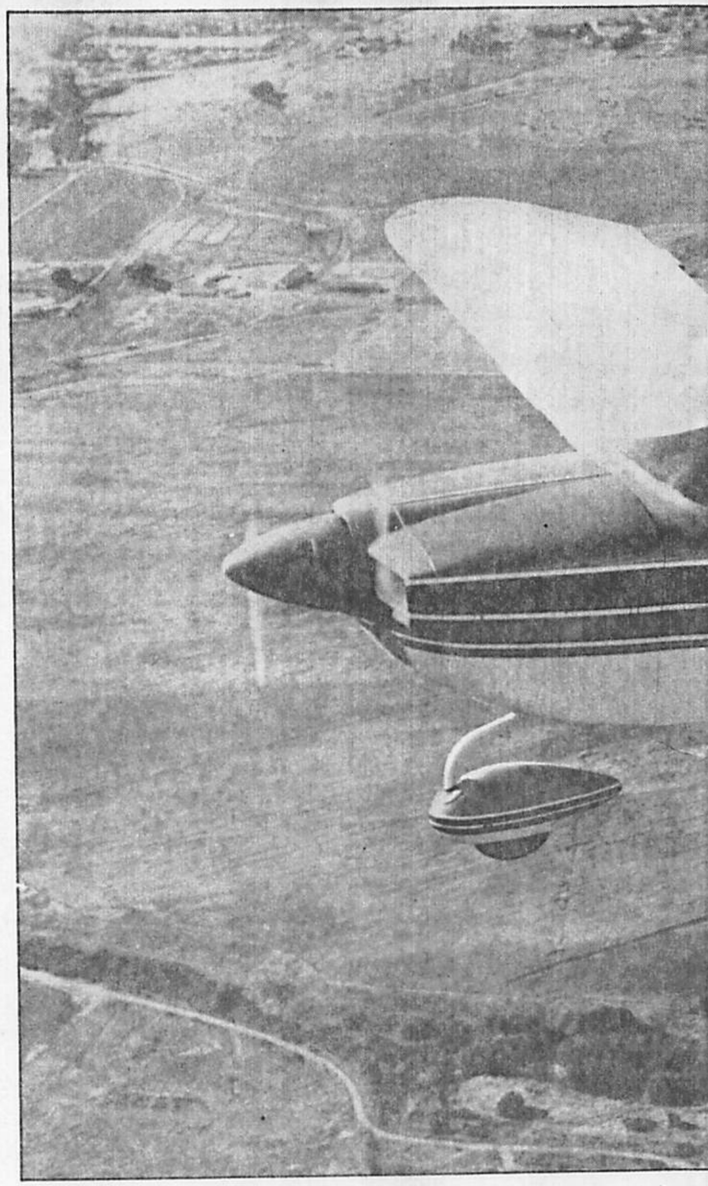
Back in the latter half of the 1960s, the BD-5 was nothing more than a sketch on a napkin somewhere. Jim's attentions were directed more toward such projects as the BD-2, an airplane based on a heavily-modified Schweizer 2-32 sailplane and designed to fly nonstop around the world, and the BD-3, a six-place twin with 300 hp engines buried in the fuselage driving a single pusher ducted fan, boundary layer control, and a projected 300 mph cruise speed.

Neither of these ambitious projects came to all that much. Jim Bede made a couple of long closed-circuit flights with it, and it has recently been bought by an airline pilot who also set a closed-circuit record; the BD-3 never got beyond a preprototype currently owned by the EAA at Oshkosh.

You can see from the design numbers, however, that the round-the-world plane and the speedy twin weren't Jim's first designs. The first one, the BD-1, seemed considerably more attainable: a nifty little two-place homebuilt, designed for low cost and ease of construction while offering an easy-to-fly and relatively speedy runabout. Features included folding wings, allowing the thing to be kept at home in your garage, and one of the keys to low cost was to be the use of a Lycoming O-290D engine, a 125-hp four-banger then available in great profusion as cheap military surplus. (Lycoming had built thousands of them to power jet-engine starter carts for the Air Force). Only slight modification—notably the addition of a prop hub and, in some cases, a second magneto—were required to make aircraft engines out of them.

SOME THE BD-1'S DESIGN FEATURES WERE ALSO aimed squarely at ease and simplicity of construction. Instead of a built-up wing spar, for example, the design used a massive aluminum tube, accepting slight extra weight in exchange for much easier construction. Since the wing was constant-chord, all the ribs were the same, and could just be slid onto the spar and riveted in place. All three tail surfaces, including the controls, were identical. Fuselage construction was equally innovative, with the main passenger area a simple "box" built up of bonded sheets of aluminum honeycomb—the metal-airplane builder's equivalent of plywood.

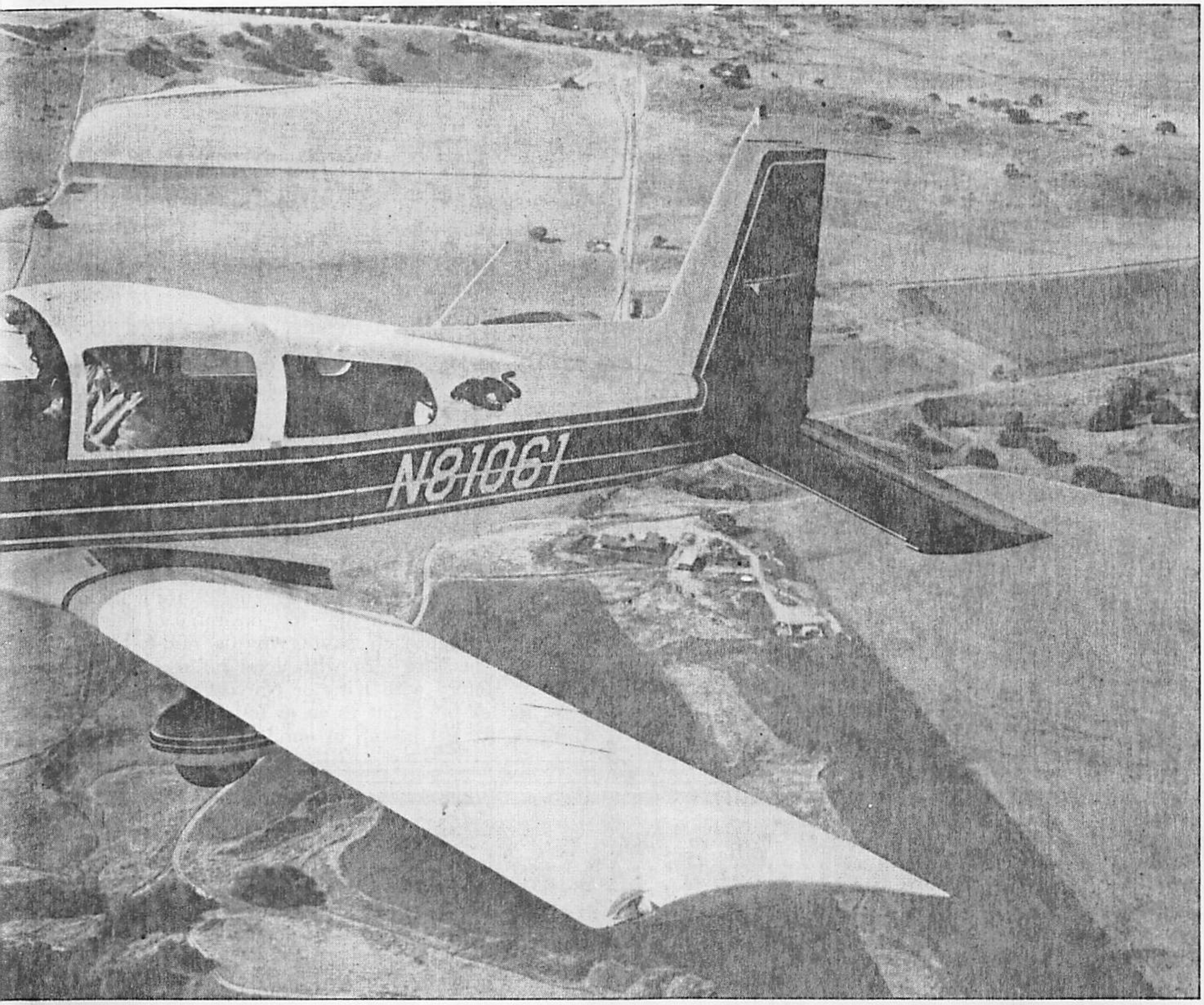
The BD-1 would probably have made a terrific homebuilt, were it not for a twist of fate in the form of some businessmen, among them Russ Meyer (now CEO at Cessna) who saw an even brighter future for it as a manufactured airplane. This marked the birth of American Aviation, whose first product, the AA-1 Yankee, was almost identical to the BD-1. About the only differences were the substitution of an O-235 for the noncertificated O-290D and deletion of the folding-wing feature.

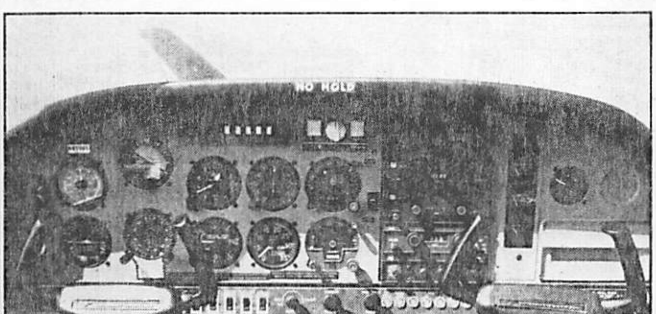


The Tiger makes an excellent cross-country machine and it will run away from the competition.

The airplane was an immeditae success, what with its sharp looks, snappy performance—a good 15 to 20 mph faster than the Cessna 150—and low price. As a basic trainer, it might have been a bit on the warm, if not hot, side, with a crisp stall and approach speeds around 80 to 90 mph; the flaps only lowered the stall speed by 4 mph. A few were lost in spins, and the ship was placarded against them; even so, pilots loved them. Part of the appeal may well have been the "mini fighter" image; not only did they have the reputation of hot airplanes, but the looks to go with them—not to mention a sliding canopy that could even be partly opened in flight!

By the time a year or so had gone by, the line had





Well-equipped Tiger panel.

already changed and grown. The Yankee had metamorphosed into the Trainer, basically similar but with a few aerodynamic changes that made it a bit tamer, at the cost of a knot or two of speed. The big news was the AA-5 Traveller, in which the fuselage had been stretched for a second row of seats, the wing area increased to match (by adding both span—easy enough, just slide on a few more ribs and skins—and area, hardly more difficult by simply putting on bigger flaps and ailerons). The sliding canopy was retained—now, alas, with a solid top rather than the see-through ones of the two-place ships. The overall result was a 150-hp four-place with a cabin only slightly smaller than that of the archrival 172, about the same useful load, and, once again, about a 15 to 20 mph speed advantage. Moreover, the two rear seats could fold flat to provide a cargo area so huge that it could also serve as sleeping quarters for a pair of six-footers.

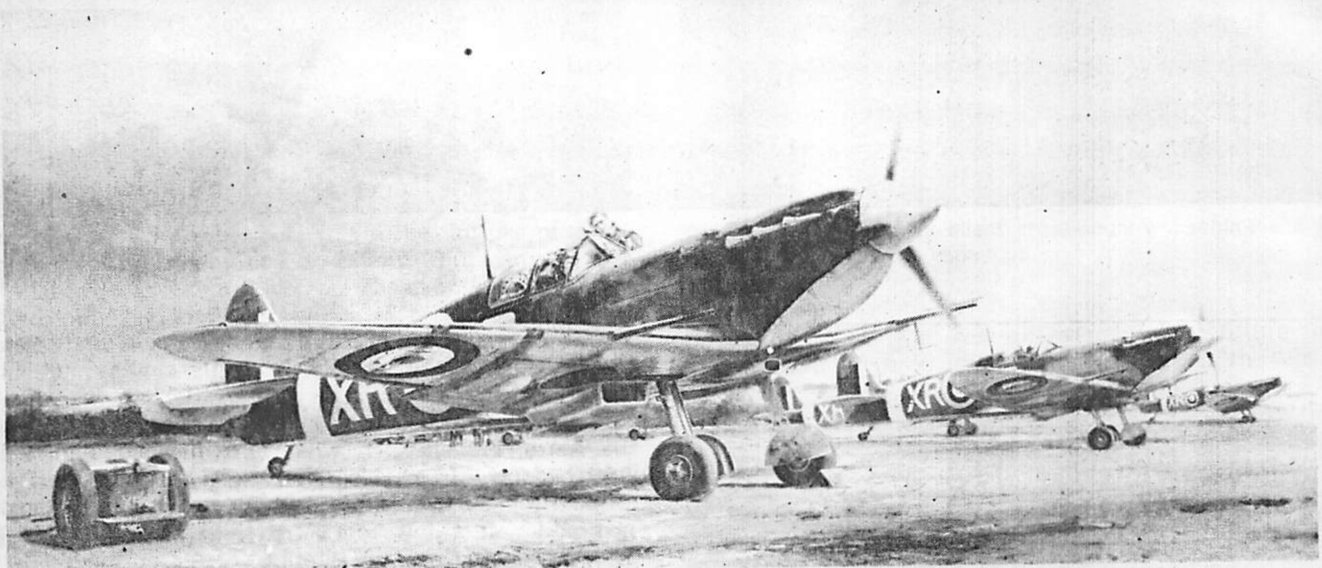
Things continued in this vein for a couple of years until American Aviation was acquired by giant Grumman. Now the line really started to blossom . . . and with Jim Bede long since out of the picture trying to build two-stroke single-place bolides in Kansas, the mantle of Chief Engineer fell about the shoulders of another then-unknown, later to hold the same job at Mooney and now at Beech; Roy Lopresti.

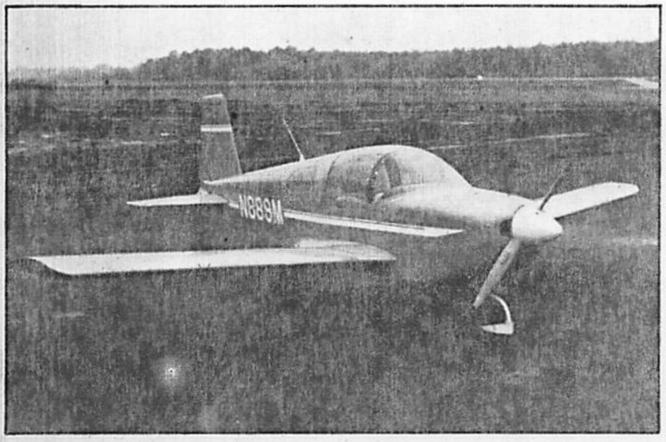
Roy's aim was a simple one: refine the design, particularly of the four-place series, as far as possible without having to design a whole new airplane. American Aircraft had already tried that in Cleveland, coming up with an all-new ship called the Patriot. When that one didn't pan out, they hung a 230-hp engine on a Traveller to produce a prototype nicknamed Fat Albert which was at once expensive, ugly, and a slug of a performer. Instead, Roy and his gnomes started tweaking and tuning on the Traveller. Power was increased, but only modestly, to a 180-hp engine with a fixed-pitch prop. The 200-hp injected Lyc was considerably more expensive and had a poor reliability record, and a constant-speed prop didn't promise enough performance increase to be worth its weight or price.

EVEN SO, ROY FOUND A GOOD DEAL TO WORK on, notably in reducing cooling drag by redesigning the INSIDE of the cowling, and in cleaning up the landing gear by redesigning the wheel pants and adding fillets where they met the gear legs and the legs met the bottom of the airplane. By now, too, the airplanes had been renamed once again to fit in with the Grumman feline fighter lineage that had included such killer kitties as the Wildcat, Hellcat, Bearcat, and, most recently, the Tomcat. Not that the general-aviation airplanes were to be called Pussycats, of course; the Trainer line had added a deluxe version, the TR-2, but that name harked back to a particularly drafty and uncomfortable English sports car, so the two-place birds became T-Cats. The 150-hp Traveller, now benefitting from most of the same aerodynamic Lopresti mods as the 180-hp ship, became the Cheetah, and the top-of-the-line model was triumphantly announced as the Tiger.

When it was introduced at the end of 1974, the Tiger blew quite a few minds. Even now, some twelve years later, it still merits a lot of attention: here's an airplane with a carbureted 180-hp engine, fixed-pitch prop, and fixed gear, that will walk away from any similarly-equipped and powered competitor (admittedly while giving away a very slight edge in climb in a couple of cases). More interesting yet is that it will give most of the 200-hp constant-speed *retractables* one hell of a run for their money, while costing far less to buy, operate, and insure. In fact, it will fly right past one of them, the earlier Beech Sierra. The only 200-hp retractables significantly faster than the Tiger are the later long-wing Arrows (and, of course, the turbocharged ones) and the Mooneys . . . and why are the Mooneys so fast? Because that's where Roy Lopresti went not too long after finishing the Tiger. . . .

Since all of the Grummerican singles are generically similar, let's check out the most desirable of the lot, a used Tiger. Figure on paying in the mid-to-high 20s for a 1976 or later bird with good radios; most came from the factory with King or Narco Centerline equipment. Knock off about three or four grand, and about 20 knots, for a Cheetah of similar vintage. Notice, by





The one that started the whole line. The BD-1/AA-1 was aimed at a low-price flying market.

the way, that there's something of a price jump between "plain old" AA-5 Travellers and the later AA-5B Cheetahs, reflecting the performance jump that came from the Lopresti Treatment.

These are, at least to me, rather nice-looking airplanes despite the slightly "boxy" look to the passenger area. That look, of course, comes from the flat sheets of honeycomb used to make up the fuselage sides, and despite the large expanse of flat metal the panels are stiff enough to prevent drumming or honeycombing. The Tiger's horizontal tail is somewhat larger than those of the Traveller or Trainer to compensate for the extra weight and power of the big engine.

Preflight inspection holds no surprises; indeed, it's comparatively simple since some of the things like oleo struts, common on other airplanes, are absent here. The main gear legs are laminated fiberglass; the nose gear is a long curved steel tube, terminating in a trailing (and freely castering) wheel assembly. Getting the ship into or out of its tiedowns can require a bit of skill and the correct towbar; the nose gear, unfortunately, doesn't swivel all the way, and if you get the plane rolling backward without a towbar the nosewheel can suddenly swing out to the limit of its travel, causing a sort of slow-motion backward ground loop.

While the little two-place ships could accommodate adequate fuel inside the tubular wing spar, with a pair of thermometerlike fuel sight gauges built into the cabin walls, the larger appetite of the engine in the Tiger necessitates more conventional fuel tanks in the leading edge of the wing, with filler caps near the tips. Engine access has been improved by clamshell doors; on the first planes, you had to take the top cowl off altogether to check the oil.

GETTING ABOARD IS PART OF THE FUN. A CENter handle above the windshield unlocks the big sliding canopy, and a gentle shove slides it aft— unfortunately covering the boarding assist handles in the process—far enough for rear-seat passengers to get in. Luggage can go in either over the rear seat or through a door on the side of the airplane—and, of course, if you're only two up, or plan some plane camping, folding the back seats flat gives you over six feet of level cargo floor behind the front seats.

You can flip the front seat cushions up with your toe to reveal a step area on the main spar beneath them; this lets you into the pilot's seat without getting dirt on the upholstery. Once settled in, you can check out the controls, starting with a fairly hefty yoke for the Tiger (and a somewhat frailer-looking one for the Traveller). The throttle is a plunger type, not one of those hokey airliner-style levers, at the bottom center of the panel, together with carb heat and mixture controls. Just below is one of the better fuel arrangements: a gauge for each wing tank, with a fuel selector handle directly beneath that points at the gauge of the tank in use. Further aft on a center console between the seats are the switch for the electrically operated (and not all that fabulously effective) flaps and the trim wheel.

If it's a hot day, you can leave the canopy open for taxi; in fact, it can be opened a few inches in flight, causing not much wind but quite a bit of noise. Taxiing for takeoff is where you meet one of the Tiger's more individual traits: ground handling. With the castering nosewheel, the only way you can steer is with the brakes, and while this may seem cumbersome at first, it also lets you make remarkably sharp turns, pivoting about the inside wheel if necessary, to maneuver on crowded ramps. About the only time it becomes tiresome is during prolonged taxi in a stiff crosswind; the big tail, complete with dorsal fin, makes the plane want to weathervane, and you have to ride the downwind brake.

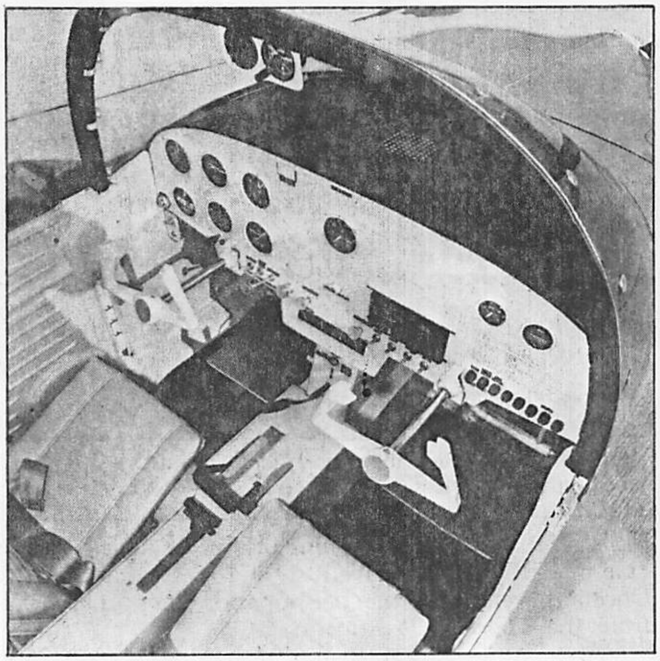
With a fixed-pitch prop, there's not much to the runup, and it's hardly worth the effort to use flaps for takeoff, so let's go. Most Tigers have cruise propellers to take advantage of their high-speed capability, so initial acceleration isn't neck-snapping, but quite adequate. Almost as soon as you have full power applied, there's enough air over the rudder to hold the airplane straight against P-factor, although once again crosswind takeoffs may require a touch of brake at first, thus artificially lengthening the takeoff roll.

As soon as you rotate, you'll understand another reason these airplanes elicit such loyalty among their pilots: one of the nicest sets of controls around. They're nicely harmonized, crisp, and *light*. In fact, pilots transitioning into a Tiger may tend to overcontrol a bit at first, until getting used to the fact that the airplane will immediately go where you point it—right or wrong. By the same token, it's stable enough to make a good instrument platform, in keeping with its cross-country capabilities. Most Tigers are fairly well equipped, with at least a couple of navcomms, an ADF, and a transponder, and quite a few have such fillips as DME, RNAV, LORAN, or autopilots nowadays. There's enough panel real estate for all these goodies if the installation is well planned.

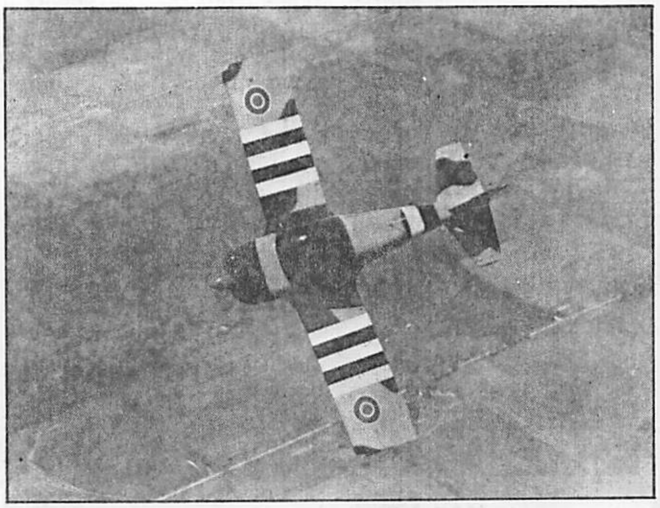
And what *are* those cross-country capabilities? In round numbers, a solid 140 knots/160 mph—in fact, most Tigers will do a bit better, but we may as well factor in maneuvering, climbs and descents, and the like. Incidentally, figure on about 850 fpm at sea level, gross weight; range, in the real world, is about 650 nm with barely legal reserves.

Stalls are on a par with the rest of the handling: crisp, but easily controlled. The ailerons remain usable throughout, and the break is straight ahead unless you have a lot of power on, as in a departure stall.

I find the Tiger a particularly enjoyable airplane in the landing pattern, due in part to the terrific visibility. The panel is low, the side windows come well down on each side, and your eye point is just about level with the leading edge of the wing. Upward visibility is inferior only to that of the smaller Grummericans, in which the one-piece glass runs all the way across, rather than being interrupted by an aluminum roof section as in the Tiger.



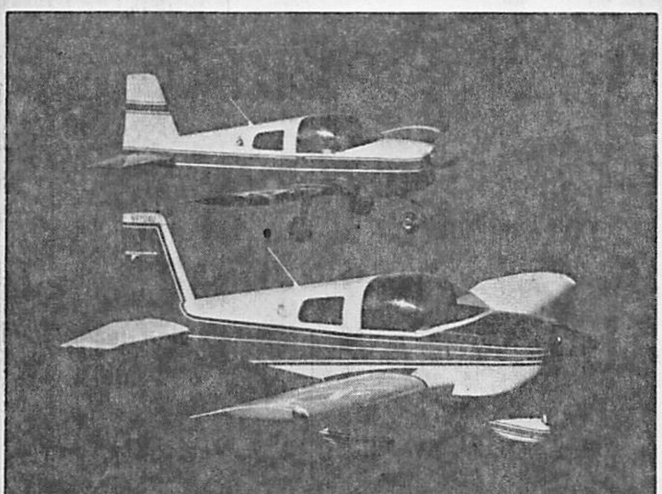
Cockpit of the AA-1.



Grumman marketed many of its light aircraft in attractive military style paint schemes such as the one on this TR-2

IN AN EFFORT TO IMPROVE FLAP EFFECTIVENESS, Grumman increased the travel of the Tiger's flaps from the original 30 degrees to 45. The surfaces themselves remain the same size, and up to 30 degrees, so does their rather modest effect. The final 15 degrees cause a strong nose-up trim change; I've found that using the last part of flap extension while slowing from cruise to approach speed lets you run the flaps out with a minimum of trim wheel action. A note of caution concerns the electric flap mechanism: rather than having a dynamic brake on the motor, early ships simply had an irreversible worm gear arrangement, and the flaps would continue to "coast" up or down for several degrees after the pilot released the small spring-loaded switch. Moreover, the switch, while it must be held in

Simply constructed, the Tiger offers excellent value for the used aircraft buyer.



Grumman American Lynx in formation with a T-Cat.

the "down" position, will stay in the "up" position by itself—and if you release its little paddle too sharply after extending the flaps, it'll spring right through the center "off" position to "up," and retract the flaps again.

Apart from that minor quirk, landings are easy and pleasant, with lots of elevator left for a good flare after a 75-80 mph approach, not much float, and that nice, compliant fiberglass gear, which seems to soak up firm touchdowns without the bouncing tendency of a spring steel leg. There's lots of aileron and rudder available for a crosswind landing, and the rudder remains effective down to a low enough speed so that the necessary transition to wheel brakes to keep straight isn't difficult.

As a used plane, any of the Grumman American singles, and particularly the Tiger and Cheetah, represent excellent values. It's interesting to note that their prices are more or less comparable to those of their competitors—Cherokee 180s, Cessna 172s and Cardinals, and so on—even though their performance is better. They've held their value well; their competitors, while they may cost about the same now, cost more to begin with, and the price-per-dollar advantage still lies with the used Grummans.

The only possible fly in the ointment is the fact that these are, to some extent, "orphans": they're no longer in production, and airframe parts can be hard to find. On the other hand, short of a prang, there's nothing much that can wear out. Moreover, when Grumman got out of the little airplane business, the enterprising folks at Wag Aero, in Lyons, Wisconsin, bought up all their parts inventory, and the firm remains the prime source of almost any part you're likely to need, at good prices. In fact, their catalog is worth having—and nowadays, quite a few homebuilts are flying with things like flap motors and even complete retractable landing gears originally destined for the twin-engine Grumman American Cougar.

At any rate, if you're in the market for a used fixed-gear four-place single, the Tiger bears close attention . . . and, frankly, don't dismiss it out of hand if you're interested in a light retractable. Sure, it doesn't have the *macho* of something with folding rollers—but you might be willing to forego some *macho* for the pleasure of knowing you've saved about ten grand . . . while watching those retractable Beech Sierras and Rockwell 112s go by . . . backward. ●

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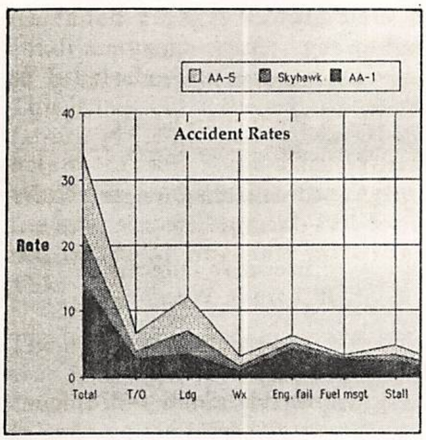
The Aviation Consumer®



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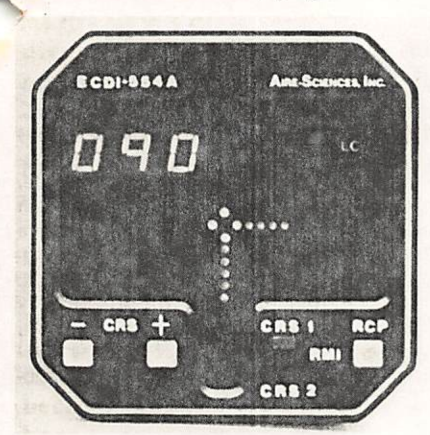


Flying the Light Bars, page 13

Christen Eagle, page 15

Crash Analysis: AA-1 and AA-5

The sporty Grumman Americans have a bad safety rap. Is it really deserved?

Grumman American owners are a loyal and vociferous lot. Criticize their beloved AA-1 two-seaters or AA-5 four-seaters, and watch out.

Last year, we published our list of "best and worst" aircraft in terms of accident records, and the AA-1 and AA-5 both got a thumbs-down as statistically the most dangerous aircraft in their categories.

Soon thereafter, the G-A owners' organization, the American Yankee Association (AYA), published in its monthly newsletter a "thumbs-down" attack on our story. Unfair, said the AYA. Old data, and too small a statistical sample, said the AYA. Figures lie and liars figure, said the AYA. It's all those damn Cessna bozos who don't know how to fly our little beauties that trigger the problems, said the AYA. Blame the pilots, not the planes, when the plane flies into a mountain after running out of gas in a blizzard at night while the pilot was smoking a joint, said the AYA.

"Your article is irresponsible and damaging to the value of my 1978 Tiger," wrote one AA-5 owner. "Inadequate instruction (for Cessna and Piper pilots transitioning to the Grummans) is a major factor. That is hardly the plane's fault."

Older Data

The AYA did have one valid point: our data was not exactly up-to-the-minute. The accident rates we published last year were based on data from the 1970's. So in response to the folks at AYA, we have now updated our accident statistics for the AA series, and done a much more in-depth analysis of the accidents to figure out *why*, in addition to how often. Are all those accidents aircraft-related, or do the AAs simply have the bad luck to be flown by lousy pilots?

(Incidentally, we want to thank Ken Blackman and Brad Brotherton of the AYA for sending us a massive NTSB computer printout of AA accidents that supplemented our own data already on hand.)

Messenger Syndrome

It's tough being the bearer of bad news. Despite the apparent opinions of some AA owners to the contrary, we didn't just make up those distasteful AA statistics out of thin air. We merely took the NTSB's number for AA accidents, divided it by the FAA's estimate for hours-flown, and published the resulting accident rate. It happened that the resulting number was higher than those of other aircraft. Those were the facts, ma'am. We certainly had no axe to grind against the Grummans.

If anything, we like the AAs—particularly the four-seaters. The author of last year's article, in fact, originally learned to fly in a Cessna 150, but quickly transitioned to a bright red AA-1A and hasn't flown a two-seat Cessna since. He put a hundred hours on 9201L, and loved every one of them. Ask the author, "If you could fly any four-place fixed-gear airplane, which would it be?" and his unequivocal answer would be the AA-5B Tiger, with its excellent performance, handling and visibility.

The Tiger is renowned for its super fast cruise speeds, but where the two-seat Grummans are sinkers, the Tigers are floaters, and overshoots are a problem, according to the statistics.

Grumman boosters have criticized our past statistics because the statistical base for the AAs is not as large as that of the ubiquitous Cessnas and Pipers. If there were 30,000 Grummans out there instead of 3,000, the accident rate would come down, they say.

Statistics Still Valid

It's true that the Grumman statistical base is not as great as the Cessnas' and Pipers'—but that doesn't mean the statistics aren't valid. And it's a fallacy that a larger base would necessarily bring the AA's accident rates down. The smaller statistical base of the Grummans merely means that the numbers are not quite as statistically significant. The accident rate of the AAs might be accurate with only, say, 95 percent certainty, while the Skyhawk's might be 99 percent.

For this article, we examined every AA-1 and AA-5 accident from 1976 to 1984, the last year for which the

NTSB has published complete accident data and the FAA hours-flown numbers.

In calculating accident rates, we did not include mid-air collisions, bird strikes and prop strikes to people on the ground. We also didn't include one bizarre accident that tops even the wildest scenario dreamed up by AA defenders: the apparently weary pilot landed late at night, parked and shut down the engine, but then fell asleep sitting up in the pilot's seat. Some time later, before dawn, he woke up, thought he was still flying, noticed the engine wasn't running, frantically went through the air-start procedure, rammed in full throttle and, much to his surprise, plowed through a row of parked planes.

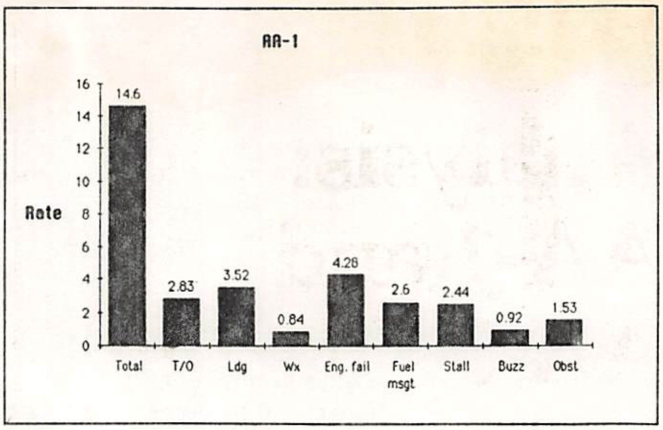
In short, we feel these numbers are the best, most up-to-date, most complete AA accident statistics available. If anybody can come up with a way to figure a more statistically significant accident rate, let us know.

Numbers, Please

We're sorry to dash the hopes of AA boosters who had hoped that more up-to-date and complete statistics would exonerate the Grummans. The updated AA-1 and AA-5 numbers, while a bit better than they used to be, are still worse than other comparable aircraft. The Grummans still get a thumbs-down for safety.

The AA-1's updated fatal accident rate is 3.2 per 100,000 hours. Its total accident rate is 14.6. Both of these numbers are higher than other comparable aircraft. The Cessna 150/152, for example, had a fatality rate of 1.1 during 1978-1979—barely a third of the AA-1's. The 150/152 had a total accident rate of 10.0.

For the updated period, the AA-5 chalked up a fatal accident rate of 2.3 and a total rate of 11.9. Again, this is an improvement over the earlier figures, but still worse that the competition. The Cessna Skyhawk, for example, scored a 1.0 fatal and 7.5 total in 1978-1979.



Accident rates per 100,000 hours for the three aircraft plotted separately.

Some Improvement

Although still bad compared to other aircraft, the AA numbers are a lot better than they used to be. In 1972-1976, for example, the AA-1 had fatal and total rates of 4.8 and 26.2—about 50 percent worse than the latest accident rates. Likewise, the AA-5 improved from 4.0/20.2 to 2.3/11.9.

Part of this improvement parallels the overall fall in general aviation accident rates during the last decade. From 1975 to 1984, the overall general aviation rate fell from 13.9 to 9.6, and the fatal rate declined from 2.2 to 1.7.

In addition to tabulating accidents to figure rates, we also did a more detailed analysis of 191 AA-1 accidents and 315 AA-5 crashes during 1976-1984. With the help of a computer, we were able to come up with some interesting accident trends and observations on pilot experience. As our baseline for comparison, we used a sample of 100 randomly selected Cessna Skyhawk accidents.

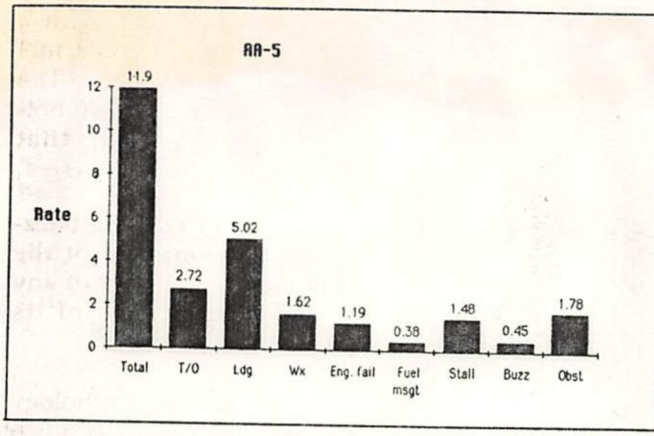
AA-1 History

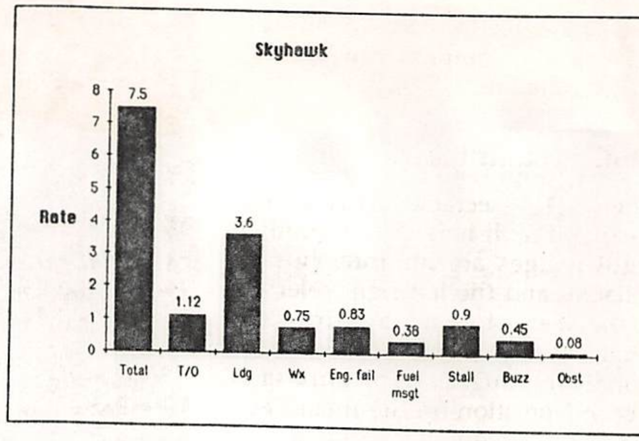
Before getting into the specifics of AA-1 accidents, a brief review of the airplane's history is in order. The AA-1 started as the BD-1, designer Jim Bede's idea of an affordable (i.e., cheap) Everyman's plane. Two primary design requirements were trailerability with folded wings and stability in a standard auto garage. These requirements resulted in a short, stubby fuselage, a small tail, and short stubby wings.

Unfortunately, all those traits are aerodynamic liabilities. A small tail at the end of a short fuselage provides poor stability, which makes it hard for the pilot to control airspeed. Short wings create a lot of drag at slow speeds and high angles of attack. As the AA-1's original factory test pilot commented, "The AA-1 is twitchy as hell and sinks like a brick."

Jim Bede ran into financial trouble, and he was kicked out of the company. Under a new name, American Aviation, the company was refinanced and went ahead with certification. Under financial pressure from stockholders to get the plane to market, American president Russ Meyer (now chairman of Cessna) rushed the plane through certification before stability improvements could be completed, according to the company's chief pilot at the time. It hit the market in 1968.

The original AA-1 Yankee had a bad accident record from the beginning. Stall/spins were a particular problem. A 1974 FAA study of AA-1 stall/spin accidents led to an FAA draft report declaring a "safety of operation problem." The phrase was expunged from the final report





after Meyer went over the report writer's head to Washington to get the report changed. The FAA eventually issued an AD requiring a no-spin placard.

In 1971, the wing was modified to improve the induced-drag problems and improve stall behavior, and the new model was called the AA-1A. In 1973, the AA-1B was introduced, which had a higher gross weight but no major design changes. In 1977, the horizontal tail was enlarged for better stability and the plane renamed the AA-1C. The line expired in 1979 after 1,774 had been built. According to FAA records, less than 600 are still active.

AA-1 Accident Analysis

We found some interesting differences in accident patterns between the Skyhawk and AA-1. The proportion of takeoff accidents was about the same for both aircraft—in the 15-20 percent range. The Skyhawk had more taxi accidents, all noseovers in high winds. Surprisingly, the Skyhawk had twice the percentage of landing accidents —about half the total, compared to about a quarter for the AA-1. More than half of AA-1 accidents were in the in-flight phase—engine failures, fuel mismanagement, buzzing and so forth—while less than a third of the Skyhawk's fell into that category.

The AA-1 had a higher proportion of fatal accidents than the Skyhawk. Twenty-one percent of AA-1 accidents were fatal, compared to only 14 percent of Skyhawk accidents.

Pilot Time In Type

One factor leaped off the pages of the AA-1 accident briefs we studied: pilots with low time in type. Pilots involved in AA-1 accidents and those in Skyhawk accidents typically had similar total pilot experience—a median 200 hours and 194 hours, respectively. But the big difference was experience in make and model: only 28 hours in the AA-1, compared to 65 hours in the Skyhawk.

Nearly a quarter of all AA-1 accident pilots had 10 or fewer hours in type. By comparison, only about 12 percent of Skyhawk accident pilots were such neophytes in type. We noticed a startling number of AA-1 accident pilots with very low time in type but lots of total experience. An amazing 17 percent of all AA-1 accident pilots had more than 100 hours total time but 10 hours or less AA-1 time. Only two percent of Skyhawk pilots fit that profile.

Here's a typical example: In September, 1984, in Pleasant Hill, Mo., an experienced pilot (1,300 hours total time, instrument rating) attempted a takeoff in an AA-1A on a 1,200-foot strip. He was well under gross weight (no one else was aboard) and there was a light breeze down the runway. With only 20 hours in AA-1s, however, he misjudged the airplane's climbing ability and it settled into some small trees at the end of the runway. He received only minor injuries.

Another example: in June, 1983 in Mechanicsburg, Pa., a 6,000-hour-plus ATP with just three hours of AA-1 time tried to take off on a rough grass runway. He, too, overestimated the Yankee's takeoff abilities and failed to get airborne, crashing through a pile of logs off the end of the runway. He received minor injuries and a lesson in the idiosyncracies of the AA-1.

It appears that the AA-1 really eats up pilots without much experience in the type, and that experience in Cessnas or Pipers doesn't help much. Moral: if you're transitioning to an AA-1, get a good checkout and be damn careful for the first 50 hours.

Engine Failures

The prime cause of AA-1 accidents was engine failure, both due to mechanical failure and fuel mismanagement. In 29 percent of AA-1 crashes—and 25 percent of the fatals—the engine wasn't running properly when the plane hit the ground. This was the case in only 11 percent of Skyhawk accidents.

About 12 percent of AA-1 accidents were engine failures for mechanical or undetermined reasons, double the Skyhawk ratio. Leading cause of known mechanical failures was broken or stuck valves. This should come as no surprise to AA-1 mechanics; the tightly-cowled O-235 engine tends to run hot in the AA-1, which puts extra stress on the valves.

Fuel mismanagement was a real AA-1 bugaboo. Nearly one in five (18 percent) AA-1 accidents were from either fuel exhaustion or starvation. The comparable figure for Skyhawks was just five percent, and not a single Skyhawk in our 100-accident sample crashed from fuel starvation.

Fuel System Flaws

The AA-1's execrable fuel system is clearly at fault here. The primitive sight gauges are notoriously unreliable, and the left-right selector makes it easy to run a tank dry. The

Skyhawk, by contrast, has conventional fuel gauges and an ultra-safe "both" position on the fuel selector, which requires no pilot action to use the full fuel capacity.

Obstacle Takeoffs

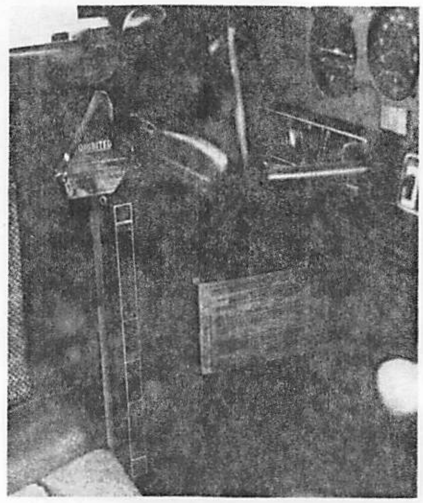
We noticed one other big difference in the AA-1 and Skyhawk accident patterns: failure to clear obstacles on takeoff, which accounted for seven percent of AA-1 accidents—but just one percent of Skyhawk crashes. The AA-1's low wing area, low aspect ratio and high induced drag at high angles of attack make it a ground-lover—particularly on a hot day, with a heavy load, or on a grass runway. Also, many AA-1s came from the factory with cruise props, which helped top speed, but hurt takeoff performance. "That cruise prop was a joke," commented one former Grumman dealer. "I don't know how they ever got it certified."

One other possible factor in the AA-1 obstacle takeoff equation: use of flaps. The AA-1 manual expressly forbids them for takeoff, but several AA-1 veterans have told us they prefer a third or half flaps for short or soft takeoffs.

Weather

AA-1 boosters keep saying that you can't blame the plane if the VFR jerk pilot flies into bad weather. Surprisingly, though, weather plays a miniscule role in AA-1 accidents. Only six percent of AA-1 crashes involved bad weather. Clearly, AA-1 pilots are crashing for other operational- or aircraft-related reasons.

Look at fatal weather accidents. Fully two-thirds of the fatal Skyhawk accidents we sampled in-



The vertical tube next to the pilot's knee on the Grumman Yankees and Trainers showed the fuel level. Though it was conceived as a starkly simple system that could not go wrong, it has proven to be involved in a high rate of fuel mismanagement accidents.

volved weather. But only three out of 48 AA-1 fatals were weather-related. It's not those big black clouds that are killing AA-1 pilots. What is?

Buzzers Beware

Of the fatal AA-1 accidents, one category stood out: buzzing. Of the 48 fatal AA-1 crashes we studied, 10 came as the result of buzzing. In some cases, the plane hit obstructions; in others, it stalled and/or spun during the maneuver. Only two of 14 fatal Skyhawk accidents were buzz jobs.

Here's an example: In June, 1983 in Lagrange, Tex., a 25-year old student pilot repeatedly buzzed the area in his AA-1A, performing some roller-coaster and figure-eight maneuvers. During one of them, he stalled and spun into a barn. The pilot was killed, a passenger seriously injured. The pilot's blood alcohol level was found to be 0.15 percent, enough to be declared legally drunk in most states.

Is the AA-1 more dangerous in a buzz job, or does it somehow attract the reckless cowboy bent on impressing his girlfriend with a roof-raising low pass? Both factors come into play, we believe. The AA-1 is undeniably a sporty hot-rod, with crisp handling that arouses fighter-pilot fantasies.

We have no doubt that the buzz-job-per-100,000-hour rate of the AA-1 is among the highest of any aircraft, simply because of its sporty aura.

But there's more than psychology at work here. The AA-1 has much trickier stall characteristics than a Skyhawk—particularly the accelerated stall that might occur in a sudden pullup after a buzz job. The plane itself deserves some of the blame for the high fatal buzz accident rate.

Stalls

Stalls also played a big role in AA-1 fatals. Nearly a third—15 out of 48—involved stalls. Some came after engine failures or during buzz jobs. Only 14 percent of Skyhawk fatals involved stalls.

The original AA-1 Yankee had a very sharp stall, far too much for the average pilot—not to mention the student—to handle. Later models had a reshaped wing with better stall traits, but even the AA-1A, -B and -C have dicier stall traits than other two-seat airplanes.

Model Variations

For the years 1978-1983, the FAA tabulated hours-flown data for two categories of AA-1 series: the AA-1 and -1A in one category; and the -1B and -1C in a second slot. Therefore, we were able to figure accident rates for the two flavors of AA-1 for these years.

We found not much difference. The -1 and -1A scored 4.0 fatal /15.1 total, while the -1B and -1C scored 3.4/18.8.

We checked the proportion of stall accidents of all four models to see if the wing design makes a noticeable difference in the stall accident rates. The answer is no. The proportion of stall accidents in all four models was very close. In fatal stalls, the AA-1A had a higher ratio than the other three models, but the number of accidents was too small for the difference to be statistically meaningful, we believe.

AA-1 Summary

After weeks of plowing through AA-1 accident reports, here are our conclusions:

• The AA-1 eats up pilots who don't know it well. It's especially tricky for pilots transitioning from other aircraft. Get a thorough checkout from a knowledgeable AA-1 instructor, and fly very, very cautiously for the first 50 hours or so.

• The primitive fuel system contributes directly to many accidents. AA-1 pilots should read the gauges with skepticism, allow big fuel reserves and pay extra attention to fuel switching.

• The low-speed/high drag traits of the AA-1 trigger a number of takeoff accidents in which the plane fails to get out of ground effect or clear obstacles. Allow huge safety margins for takeoff, particularly with heavy loads, on hot days, at high elevations, on grass fields, or with strong crosswinds. Also, make sure the airplane has a climb prop.

• Tricky stall traits (compared to other basic aircraft, at least) contribute to a high rate of stall accidents, even in the modified-wing AA-1A, -1B and -1C models. Accelerated stalls are particularly dangerous. The stall problem is probably related to the poor climb problem.

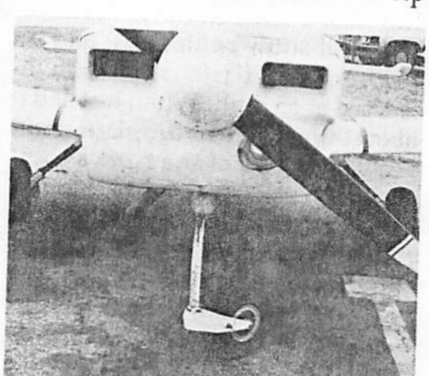
• Exhaust valves are the weak link n the AA-1 engine. Valve failures ıre by far the leading cause of nechanical engine failures in AA-1s.

• AA-1 pilots seem to suffer from a ıot-rod show-off syndrome that enourages buzzing and aerobatics. At he risk of sounding like your mom, ll we can say is, cool it, guys.

The faired, slicked-up Lynx version of the Trainer. Watch out for porpoises.

AA-5 Series

The AA-5 four-seater is the AA-1's big brother, a stretched, souped-up version that displays strong family ties, but is mostly a different airplane. The first American AA-5 Traveler appeared in 1972 with a 150-hp engine, bigger fuselage, tail and wings. In 1975, shortly after American Aviation was sold to Grumman and renamed Grumman American, G-A's Roy Lopresti (later to achieve fame and fortune at Mooney and, recently, Beech) redesigned the cowling and cooling baffles, improved the horizontal stabilizer and applied his aerodynamic cleanup magic to create two new models: the AA-5A Cheetah, with the same 150-hp engine as the Traveler, and the AA-5B Tiger, which had a 180-hp engine.



Castoring nosewheel and differential brake steering makes for a radical change in runway handling characteristics over conventional Cessnas and Pipers. Novices run afoul of this problem at a high rate.

The planes had a few idiosyncracies, like their sliding canopy and steer-by-brakes system, but both proved quite popular, particularly the Tiger, which had a retractable-like cruise speed of 160 mph. More than 3,000 AA-5s were built before the line was discontinued in 1979 (just in time, it turns out, to avoid the Great Aviation Depression). Thereafter, they were in high demand on the used-plane market until word of their high accident rate started getting out.

AA-5 Accident Analysis

The poor accident record of the two-seat AA-1 series never surprised us much. It is a twitchy, marginally stable airplane with a high sink rate, a tendency to flat spin, and a terrible fuel system, and we would expect a bunch of accidents from such a craft.

But the high accident rate of the AA-5 series was a puzzle. The AA-5, although derived from the AA-1, has improvements that would seem to mitigate most of the AA-1 problems. Wingspan is much longer, so the AA-5 doesn't sink like a brick at low speeds—in fact, it's known as a floater. The fuselage is longer and the tail is bigger, two factors that should theoretically improve stability and spin recovery. The fuel system is one of the best on any lightplane.

And from the left seat, the AA-5 doesn't *feel* like the sensitive little sucker that the AA-1 does. The Tiger in particular feels much like other four-place airplanes in the air, although the controls are generally more responsive. So why should it's accident rate be more than twice as bad as the Skyhawk's?

In perusing over 300 AA-5 accidents to try to answer this question, we found some surprising similarities to AA-1 accident patterns. We also found some important differences.

Time in Type—Again

Once more, the AA-5 accident pilots' low time-in-type stuck out like a sore thumb. Median TIT was an astoundingly low 20 hours —even less than AA-1 accident pilots. (The Skyhawk, remember, had a median TIT of 65 hours.) Yet their median total time was 155 hours, only a bit less than the Skyhawk pilots' 194 hours.

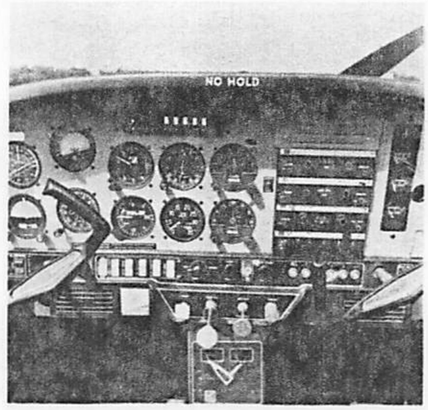
Twenty-six percent of the AA-5-crunchers had 10 hours or less in type. Only 12 percent of Skyhawk-crunchers were such type tyros.

In fatal accidents, the difference was not so glaring. Median TIT for AA-5 pilots was 56 hours, compared to 75 for the Skyhawk jocks and 43 for AA-1 pilots.

Obstacle Problems

Another AA-1 accident pattern echoed by the AA-5 is the obstacle crash. AA-5s—even the 180-hp Tigers—just don't seem to be able to clear obstacles as well as the

Load the Cheetah moderately at your peril when attempting short-field obstacle climbouts. Use of partial flaps is recommended, even though the manual says no.



The AA-5s were given an ergonometrically neat fuel selector system that coupled the selector to the fuel gauge it was turned to, mounted in plain sight of both pilots underneath the throttle quadrant.

Skyhawk, both on takeoff and in cruise flight. Fully 12 percent of AA-5 accidents—37 in all—resulted from an inability to climb out of ground effect or clear an obstacle. Just one percent of the Skyhawks we sampled met that fate.

Circumstances like grassy or snowy runways, high density altitude and snow-covered wings played a big role in this type of accident. One very experienced pilot with 2,000-plus hours in AA-5Bs, for example, crashed his Tiger when he attempted a takeoff on a runway covered with a quarter-inch layer of slush. Snow stuck to the wings during the takeoff roll (he had been careful to clear the wings of snow before taxi) and the plane didn't lift off when he rotated at 65 mph. When he tried to abort, the Tiger hydroplaned and ran off the end of the runway.

One *Aviation Consumer* editor experienced the AA-5's scary lack of climb first-hand. Taking off in an AA-5A with comfortable margins —fairly long runway, mild temperature, low field elevation, well below gross weight—he found himself bearing down on a line of trees several miles off the end of the runway. Even at best-angle-of-climb speed, it was clear the Cheetah was not climbing well and might clip the top of the trees. Deciding that a turn would do more harm than good, as a last resort he hit the flap lever, hoping the aircraft wouldn't simply balloon and then sink back down again. With half flaps, "It went up steadily like an elevator," he reports, and the trees were cleared easily.

A less experienced pilot who blindly followed the book (which calls for the use of flaps only on landing) might well have ended up in our AA-5A fatal accident printouts.

Once again, we must ask why Grumman American didn't recommend partial flaps for takeoff and/or obstacle clearance. Many experienced AA-5 pilots use them as standard procedure in any short/soft runway takeoff situation.

Landing

AA-5 pilots seem to have more trouble landing than AA-1 drivers. Landing prangs accounted for 42 percent of all AA-5 accidents (but only nine percent of the fatals). The proportion of porpoises, hard landings and ground loops was about the same for the AA-1 and AA-5; the big difference was overshoots. There was only one overshoot accident among 191 AA-1 crashes, but we counted 30 AA-5 overshoots—nearly 10 percent of the total.

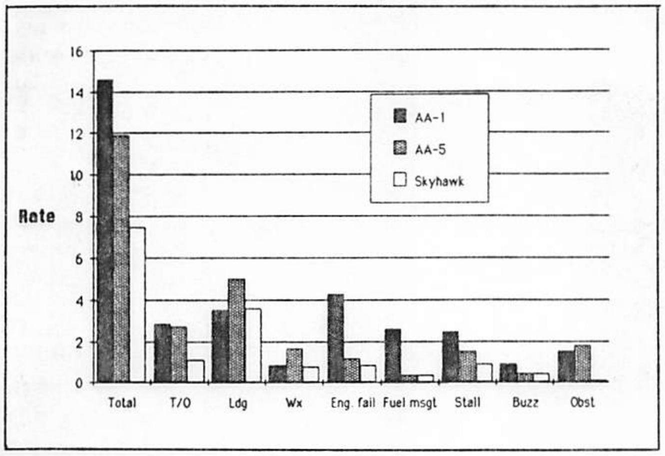
Unlike the AA-1, the AA-5 has a good glide ratio and tends to float. Newcomer AA-5 pilots tend to bring them in fast ("I'll add a few knots just in case...") and float forever. Obviously, this trait is triggering numerous porpoising and overshoot accidents.

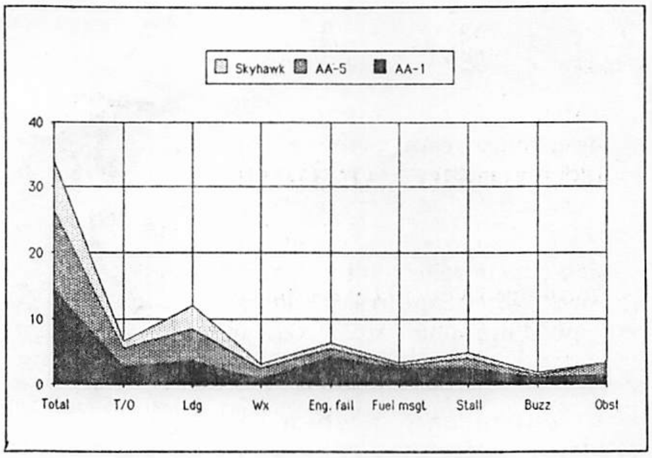
Buzzing

AA-5 pilots are apparently less cowboyish than their AA-1 compatriots. Busted buzz jobs account for only 14 percent of AA-5 fatalities, compared to 21 percent for the AA-1.

Weather

Unlike AA-1 pilots, AA-5 drivers blunder into their share of bad





This chart gives a comparison of accident rate per 100,000 hours for the two main classes of Grummans and the Cessna Skyhawk. Note how the AA-1 rate sticks up above the others in takeoff, engine failure, fuel mismanagement, stalls and buzzing accidents.

This chart shows the accident rate of each aircraft piled incrementally one above the other. The fatter layers belong to the Grummans, the thinnest to the Skyhawk. It also shows how landings dominate the accidents overall, with weather a smaller menace.

weather. Clouds, fog and rain figured in 14 percent of AA-5 crashes, making it the leading cause of accidents, barely ahead of obstacle impacts. Nearly half (29 of 64) AA-5 fatalities came in bad weather. (Only six percent of AA-1 fatals were weather-related, remember.)

The AA-5's weather-accident pattern roughly parallels that of the Skyhawk, which scored 10 percent of total accidents and 63 percent of fatals.

Engine Failures

While engine failures—from both mechanical causes and fuel mismanagement—were the leading cause of AA-1 accidents, they played a much smaller role in the AA-5 crash picture. Only 11 percent of crashed AA-5s were gliders when they hit the ground—same as the Skyhawk, and barely a third the share of the AA-1. Only one AA-5 engine failure accident was fatal over the nine-year period we studied.

Chief reason is the AA-5's excellent fuel system. Although it doesn't have a "both tanks" position like the Skyhawk, the AA-5 has a big fuel selector right under the pilot's nose on the center console. Better yet, the selector points right to the gauge for the tank it's drawing from. In nine years, only two AA-5 pilots managed to mishandle the selector and starve the engine of fuel—an extraordinarily good record. Eight others managed to run out of gas, however, but nobody died as a result. (The Skyhawk was also superb in this regard, with no case of fuel starvation and only five of fuel exhaustion in our 100-accident sample.)

The stark contrast between the AA-1 and AA-5 in fuel mismanagement accidents—18 percent of total/15 percent of fatal for the AA-1, compared to three percent/0 percent for the AA-5—is striking evidence that a badly designed fuel system can be a major killer.

AA-5 Summary

Here are the major conclusions we reached about the AA-5 after studying nine years worth of accidents:

• As with the AA-1, the transition period from other aircraft into the AA-5 is critical. Newcomers have serious problems in this plane. Our advice echoes that for aspiring AA-1 pilots: get a thorough checkout from a knowledgeable AA-5 instructor and be ultra-cautious for the first 50 hours.

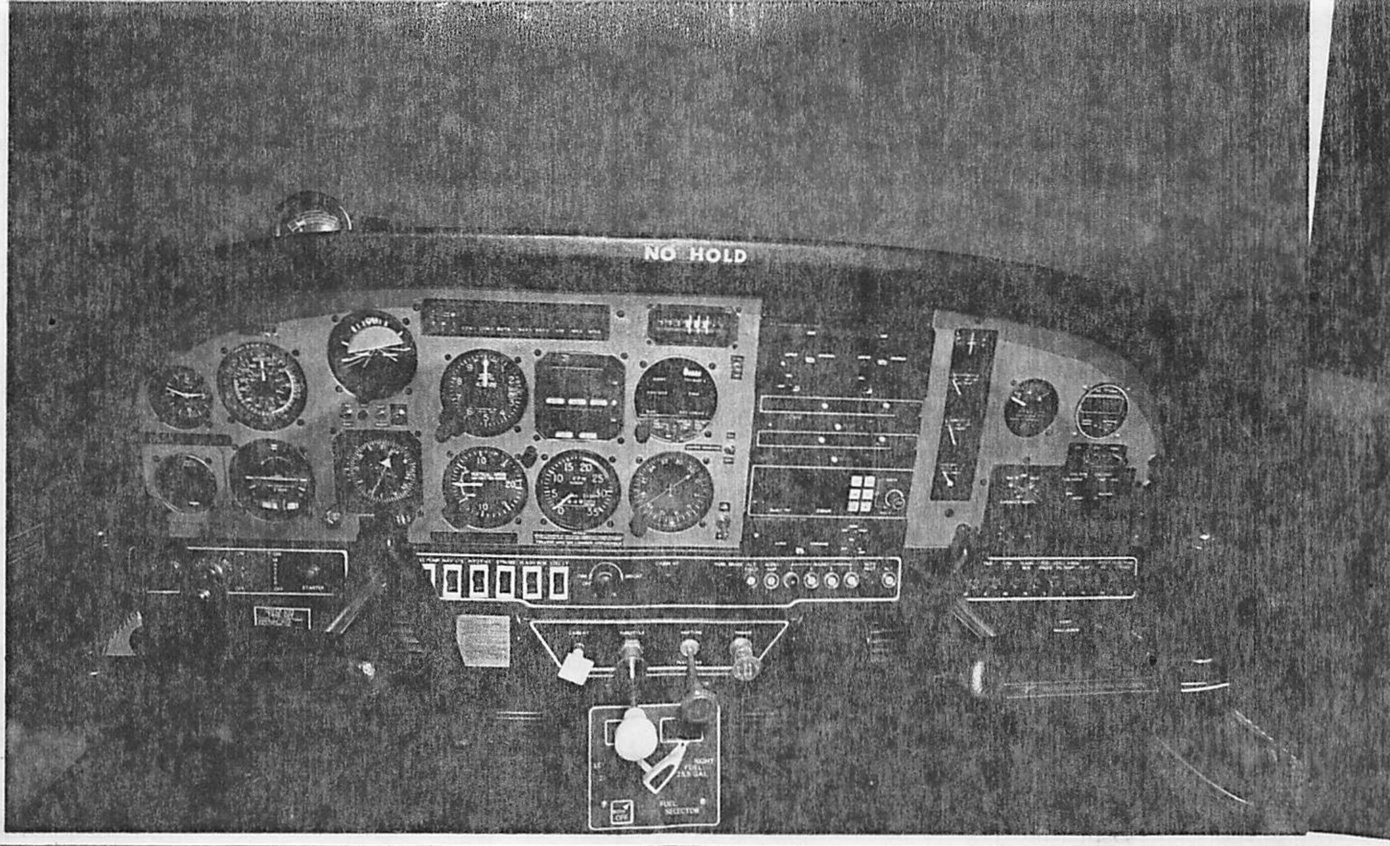
• The takeoff performance of the AA-5s is poor. Heavy, hot, high, soft or snowy, it's awful, particularly the original 150-hp Traveler. The AA-5 struggles more than comparable aircraft to get off the runway and out of ground effect, and it climbs at a flatter angle, at least if flown according to the book with flaps up. Don't count on book takeoff performance; leave yourself much bigger margins than you might with a Skyhawk or Cherokee.

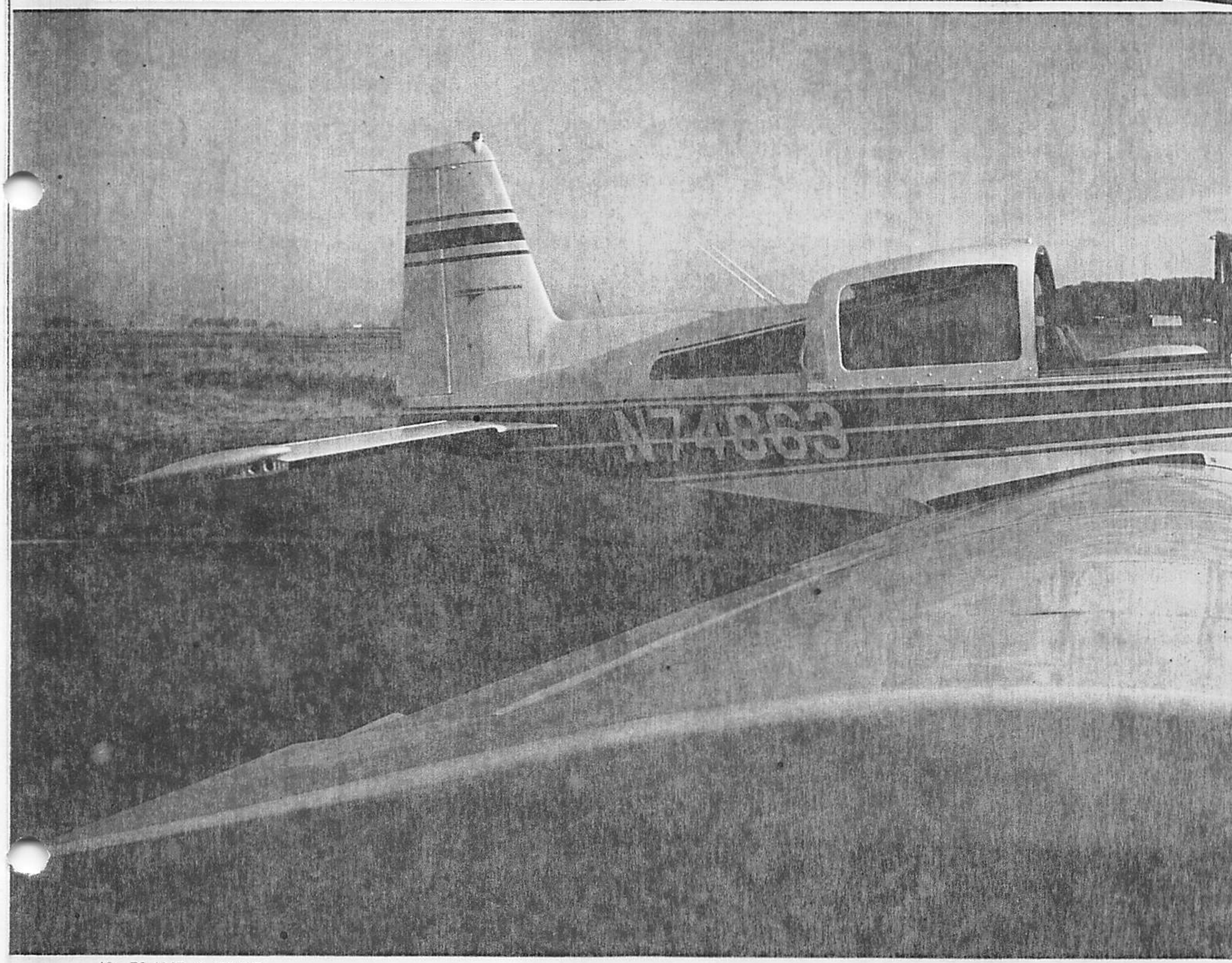
• Airspeed control on final approach is critical. The AA-5 is a floater. Most canny AA-5 pilots use 75 mph as their normal approach speed; 80 mph is the highest over-the-fence speed you'd ever want to see, and 65 mph is fine at light weights in stable air. Otherwise, you may join the dozens of sadder-but-wiser AA-5 pilots who have porpoised their brains out or run off the end of the runway on landing.

The accident record of the AA-1 and AA-5 seems to be improving as the years go by. This is probably because the Grummans are now settling into the hands of long-term owners who have learned their idiosyncracies. With no advertising and reduced magazine reportage about the AAs, it's likely that fewer and fewer novices are flying them—and it is the Grumman novices who clearly have the most trouble.

We hope the trend continues.

Dave Noland


NO HOLD
STARTER
FUEL SELECTOR
OFF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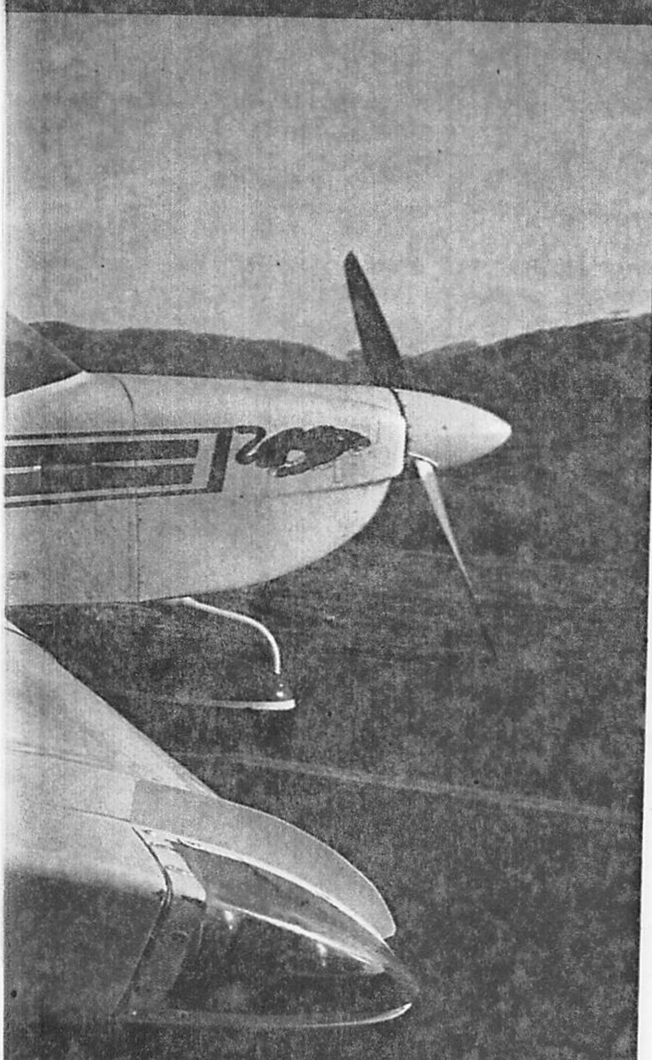


Tiger Tale

The family of Grumman cats was disinherited, but many are now finding happy homes with pilots who can appreciate their special features and favorable price. Here's case in point.

By Keith Connes

As an aviation writer, I get to borrow all kinds of planes. But there is one problem: I always have to give them back.

It was early in 1984 that I began to think seriously about buying a plane of my own. You might think that a person who has been privileged to fly nearly every piston-engine plane that's been produced since World War II wouldn't have a problem selecting his own aircraft. Wrong. I wasn't at all certain of what I wanted.

TIGER TALE

Grumman American AA-5B Tiger

SPECIFICATIONS

Engine make/model:
Lycoming 0-360-A 4K
Horsepower @ rpm @ altitude:
180 @ 2700 @SL
Horsepower for takeoff: 180
TBO hours: 2000
Fuel type: 100/100LL
Propeller type: McCauley fixed pitch
Landing gear type: Tricycle fixed
Gross weight (lbs): 2400
Max landing weight (lbs): 2400
Empty weight (std) (lbs): 1294
Equipped weight (as tested) (lbs): 1470
Useful load (std) (lbs): 1106
Useful load (equipped) (lbs): 930
Equipped payload (full std fuel) (lbs): 624
Fuel capacity (std) (gals): 52.6
Usable fuel (std) (gals): 51
Oil capacity (qts): 8
Wingspan (ft): 31.5
Overall length (ft) : 22
Height (ft): 8
Wing area (sq ft): 140
Wing loading (lbs/sq ft): 17.1
Power loading (lbs/hp): 13.3
Wheel size: mains 6.00 x 6, nose 5.00 x 5
Seating capacity: 4
Cabin doors: canopy
Cabin length(in): 85
Cabin width (in): 40
Cabin height (in): 45
Baggage capacity (lbs): 120

PERFORMANCE

Max level speed (kts): 147
Turbulent air penetration speed (kts): 113
Cruise speed (kts):

	Altitude	Best Power
75% power:	8,000	139
65% power:	10,000	131
55% power:	12,000	122

Max range (reserve) (nm):

75% power:	8,500	552
65% power:	11,500	578
55% power:	12,000	592

Fuel consumption (gph):

75% power:	10.8
65% power:	9.7
55% power:	8.5

Estimated endurance (65% power) (hrs): 4.5
Stall speed (flaps up) (kts): 56
Stall speed (flaps down) (kts): 53
Best rate of climb (fpm): 850
Service ceiling (ft): 13,800
Takeoff ground roll (ft): 865
Takeoff over 50-ft (ft): 1550
Landing ground roll (ft): 410
Landing over 50-ft (ft): 1120

In many of my articles on aircraft and equipment, I have stressed the wisdom of basing one's choice largely on the kind of flying one intends to do, and can afford to do. I expected to fly mostly short trips, with an occasional long one, and wanted IFR capability. My budget dictated that the plane be fairly inexpensive to buy and maintain. That pointed inexorably to a well-cared-for, used single.

At first I considered a Cherokee 140. I anticipated that most of the time only my partner Anne and I would be aboard, and the little Cherokee is one of the most versatile planes in its modest price class. But after considering the likelihood of at least a few cross-country flights, I upped the ante to something faster and began looking at some of the older Arrows. There were some tempting buys out there, but I kept on looking.

I'd once found great pleasure in flying an F33A, so I decided to flirt with some venerable Bonanzas—the newer ones being well beyond my budget. But as I leafed through the logbooks and talked to the owners, all I could see were dollar signs for maintenance.

Then I thought about the Grumman Americans. I didn't have much time in them, but they had always been fun to fly, the visibility they offered was outstanding (sightseeing is a big part of flying for me, and so is safety) and I liked the canopy. The major question in my mind was the availability of parts and knowledgeable service for a product line that had been out of production for five years.

I contacted a man named Ken Blackman of the American Yankee Association, a club devoted to all the models in the G/A line. After some conversation, Blackman—who makes his living by modifying Grummans—invited me to speak at their annual convention in Delavan, Wis. I agreed and, during my visit, got to fly all manner of Grummans, including Blackman's 150-hp Yankee.

Early into my one-day visit at Delavan, I began to think about one of the sprightly two-place Grummans. Why not a Cheetah, I thought? But every Cheetah owner I talked to expressed a desire for the extra oomph and useful load of a Tiger. I asked Blackman to give me a holler if he came across a clean Tiger.

A few days later, Blackman called to tell me about my plane. It was a 1976 Tiger, eight years old, with only 290 hours total time. Two men had bought it new from Blackman when he was a Grumman American dealer, and neither owner ever got beyond the student pilot stage. The plane had been hangared all that time and was exceptionally clean. I bought it over the phone —something I had never done before.

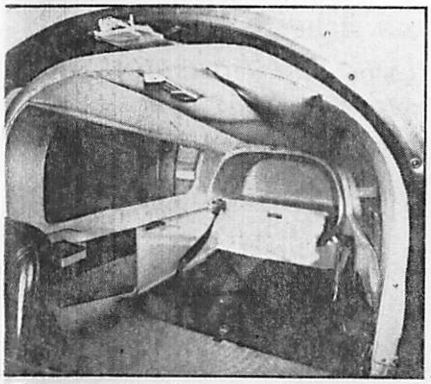
I've owned N74863 for nearly 15 months now and have put 150 hours on it, and the plane has lived up to my expectations in every way.

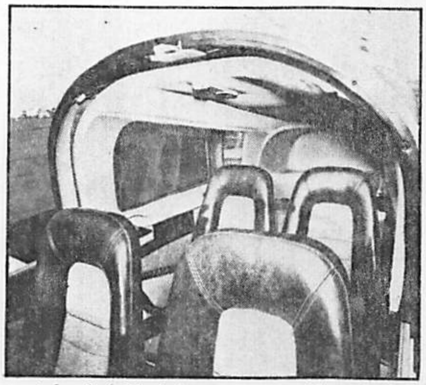
In my view, the Tiger is very different in appearance from its heftier-looking counterparts produced in Wichita, Vero

Aircraft Comparison Chart

Aircraft make/model:	Grumman American Tiger	Piper Archer	Cessna Cutlass	Beech Sundowner
Gross weight (lbs):	2400	2550	2550	2450
Standard useful load (lbs):	1106	1145	1072	950
Cruise 75% (kts):	139	129	124	123
Stall (kts):	53	49	48	51
Max range 75% (nm):	552	600	620*	533
Fuel 65% (gph):	9.7	9	8.8	8.8
Best climb rate (fpm):	850	735	680	792
Service ceiling (ft):	13,800	13,650	17,000	12,600
Takeoff 50 ft (ft):	1550	1625	1690	1955
Landing 50 ft (ft):	1120	1390	1335	1484
Power loading (lbs/hp):	13.3	14.2	14.2	13.6
Wing loading (lbs/sq.ft.):	17.1	15.0	14.7	16.8
Engine horsepower:	180	180	180	180
Propeller type:	Fixed	Fixed	Fixed	Fixed
Landing gear type:	Fixed	Fixed	Fixed	Fixed
Usable fuel (gals):	51	48	50/62	57.2
Seating capacity:	4	4	4	4

With optional fuel tanks





The rear seat cushions can be removed and the seat back folded down to provide a large area for hauling bulky items or even sleeping in the plane

Beach and even Kerrville. The plane has a boxy-yet-sleek look you'd expect to find in a good experimental or foreign design, where simplicity of construction and performance efficiency head the list of priorities.

Construction of the plane is quite different from that of its competitors. The Tiger's fuselage is made up primarily of aluminum honeycomb sandwiched in sheet aluminum. This drastically reduces the number of drag-producing rivets. Furthermore, the wings are bonded and totally rivet-free.

The wings are supported by a tubular spar, which doubles as the fuel tank in the two-place Grumman Americans. The Tiger has two conventional fuel tanks with a total capacity of 52.6 gallons, of which 51 are usable. There are also two sump tanks—one in each wing root fairing—resulting in four rather inconvenient drain locations for fuel contamination inspection.

The upper portion of the cowling unlatches at two points on each side for easy inspection of the engine. However, the latching mechanism is a little tricky, and more than once I have found it improperly secured after maintenance.

The main landing gear struts are made of laminated fiberglass. The nosewheel is not connected to the rudder pedals, but instead casters freely 90 degrees to either side of center. This saves parts and weight (the entire plane has a relatively low parts count and is lighter than others in its class) and makes for unusual ground maneuverability. In fact, you can turn the plane 180 degrees in the same spot, simply by walking the wingtip around. Backing up is another story; that takes *practice*. Also, a little extra technique is needed when taxiing, taking off and landing in a crosswind.

The control surfaces are conventional and are operated by a combination of torque tubes and cables. The flaps are electrically actuated.

As I mentioned before, I like the sliding canopy. Entry is easier than crouching through the customary low-wing door, and the canopy can be left open for plenty of ventilation while taxiing. It can also be opened partway in flight, at speeds up to 113 knots.

The canopy arrangement has some disadvantages, however: Opening it for entry or egress in the rain results in a wet interior. Also, the canopy lock tends to leak. And the rails must be kept clean and lubricated, or the canopy will stick.

The Tiger has a nice arrangement for carrying bulky cargo. The rear seat cushions can be removed and the seat back folded down to provide a flat deck. I'm told you can camp out in it, but I haven't tried that. I do sometimes carry two "bumble bikes" (motorized folding bicycles), but find that they are loaded more easily with the rear seats upright. There is a rather small outside baggage door.

The airplane has a couple of recurring ADs (Airworthiness Directives). One requires that the ailerons be removed and inspected every 100 hours. Another necessitates the removal and inspection of the McCauley propeller every 200 hours, although a factory service bulletin recommends this procedure every *100* hours. Also, there is a cautionary yellow arc on the tach between 1850 and 2250 rpms, and prolonged operation within that range is to be avoided.

The propeller situation can be taken care of via an STC (Supplemental Type Certificate) that involves installation of a Sensenich prop and a new spinner. This wipes out both the inspection AD and the yellow arc.

Another mod that alters parts of the engine baffling to reposition the oil cooler and thus improves engine cooling. In addition to these mods, I installed a full-flow oil filter kit from Wag-Aero, which has resulted in an extension of oil changes from 25 to 50 hours.

Since taking possession of the plane, I have stuffed the panel—which was very sparse—with all manner of avionics and instrumentation. (See accompanying box for details.)

The Aircraft Comparison Chart pits the Tiger against the other 180-hp planes with fixed-gear and fixed-pitch props. Interestingly, of the four models shown, only the Piper Archer is still being produced. (A new competitor, the Aerospatiale Tobago, is in process of U.S. certification. See the January issue of *PLANE & PILOT*.)

The Tiger handily outperforms all of its competition in all major parameters, with the exception of the Cutlass' higher service ceiling. In fact, the Tiger will keep pace with the normally-aspirated Arrow, a plane that has the advantages of retractable gear, a constant-speed prop and 20 more horses.

I usually fly my plane about 300 pounds under gross. At its best rate-of-climb speed of 90 knots, I'll get about 1200 fpm at sea level. I use a cruise climb speed of 105 knots, resulting in an average r/c of 800 fpm. Unless I'm in a hurry, I cruise at about 68-percent power and get a true airspeed of approximately 133 knots, burning a little under 10 gph block-to-block.

(Cont'd on page 61)

The Face Of The Tiger

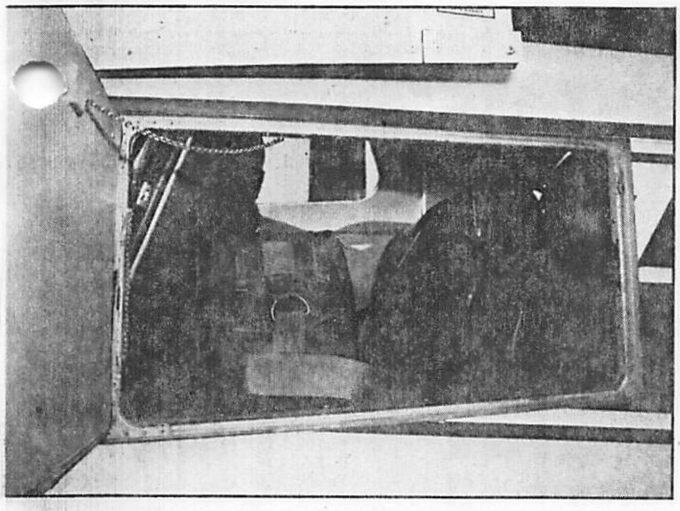
When I purchased N74863, it was equipped with a King KX 170 navcom and KT76A transponder and a Century I autopilot. I have since added the following:

- Narco Mark 12D navcom
- Narco 841 ADF
- II Morrow 614P Loran
- Terra Tri Nav C electronic CDI
- Sigma-Tek HSI
- S-tec 2-axis autopilot with altitude pre-select
- Sigtronics SPA 400 intercom and headsets
- Insight Graphic Engine Monitor
- Electronics International carburetor and outside air temp gauge
- Huntington Lift Reserve indicator

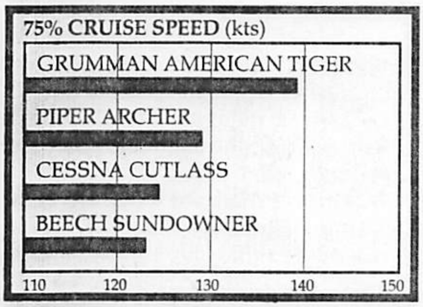
They are all working beautifully, and I plan to report on these very useful accessories in the future. Note: Sharp-eyed readers will observe two other pieces of equipment in the photo of my panel. One is a TKM MX-170 navcom, on loan for evaluation and temporarily replacing the KX 170 (see the January *PLANE & PILOT*). The other is a Shadin Miniflo fuel computer; its transducer is not installed, pending an STC for the Tiger.

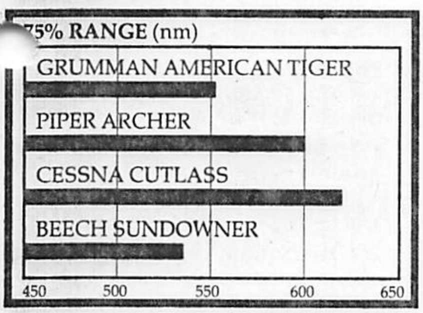
TIGER TALE

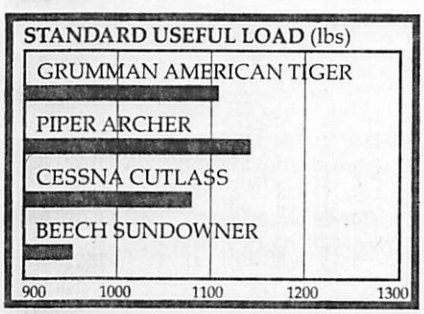
(Cont'd from page 43)

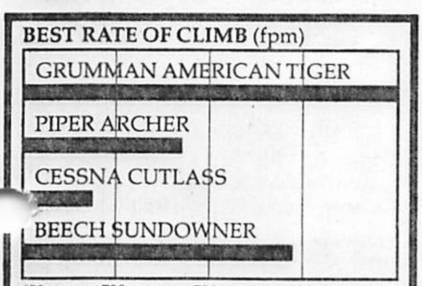


As with most four-place singles, the baggage door is small. However, baggage can be loaded from inside the cabin.









Since most of my flying is local, with occasional trips of 500 to 1000 miles, this performance suits me fine. I would have to pay a lot more to get another 20- to 30-knot cruise, and it just wouldn't be worth it. I would like to have more range, especially for extra margins in IFR weather, but the occasional added fuel stop is no big deal.

I love the way the Tiger handles. Airborne, the control feel is light and the plane is extremely responsive. It handles well in the slow flight regimes, but does not want to come down. Deploying flaps causes a pronounced pitch-up, but it takes a while for the plane to get the message that it's time to land. Approaches are made at 65 to 70 knots. Straight-ahead stalls are very gentle with the flaps down; with the flaps up, there is a sharper break, but nothing scary. Spins are prohibited, as are other aerobatic maneuvers.

My home base airport is known as "the crosswind capitol of the West," and it's no novelty to see the sock standing straight out at a neat right angle to the active, but the Tiger is quite controllable despite its castering nosewheel.

The visibility is superb. Some of this, alas, is at the expense of panel space; the panel is certainly adequate for IFR equipment, but has presented some problems for this gadget-crazed author.

The cabin is snug, and two large people sitting side-by-side might feel cramped, but Anne and I are of moderate size and feel quite comfortable. The seating is not luxurious, but I am not fatigued even after long trips.

The noise level in the Tiger is about average for a plane of this type; I measured it at 90 db/A. However, "average" is still too high for comfort and preservation of hearing, so we use headsets and an intercom.

The plane was manufactured from 1975 to 1979. In 1977, a so-called "Quiet

TIGER TALE

Nine Lives Of The Cat

The Tiger traces its lineage to Jim Bede, a man who thrilled some and disappointed many with his interesting designs and partly-fulfilled schemes.

His first plane was the two-place BD-1. It was innovative for its time, using a considerable amount of bonding instead of the riveted skin that was the standard of the industry. The concept was good, but Bede's ability to produce wasn't, and he was ousted by his stockholders. The new management changed the company name from Bede Aircraft to American Aviation, and in 1969 produced the AA-1 Yankee.

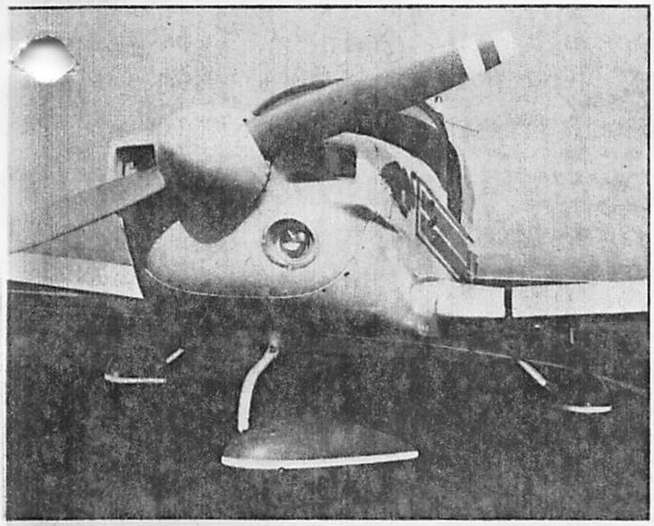
The little plane, with its laminar flow wing, turned out to be too hot in training situations, so the wing was modified and the Yankee was renamed Trainer. Later versions were dubbed the Tr2, Lynx and T-Cat. Each had the Lycoming 0-235, with horsepower ranging from 108 to 115.

The four-place 150-hp Traveler made its debut in 1972. American Aviation was then bought by Grumman, and its name was changed to Grumman American. The man hired as chief engineer was Roy Lopresti, who later became chief engineer and president of Mooney and is now chief engineer at Beech.

Lopresti developed the design of the Tiger, which was basically a cleaned-up Traveler with a 180-hp engine.

His changes were also incorporated into the Traveler, which then became the Cheetah. Thus, the Cheetah and the Tiger have similar airframes. However, in addition to having 30 more horses than the Cheetah, the Tiger has a beefed-up belly section, resulting in a 200-pound higher gross weight, of which 157 pounds is translated into additional useful load.

A final bit of history: Grumman American was "thrown in" as part of the purchase of the Gulfstream line by a company that became known as Gulfstream Aerospace. The purchaser, Allen Paulsen, had no interest in small aircraft, and the plug was pulled on the piston-engine planes in 1979.



The original McCauley prop has an AD that requires its removal and inspection every 200 hours. However, there is an STC for a Sensenich prop that does away with the AD.

Please'' package—consisting of extra soundproofing and thicker Plexiglas—was installed at the factory, and corrosion-proofing became standard. Also, the tubular nosegear strut got a shock absorber. The '78 model was given a redesigned interior with more comfortable seating, plus a separate hydraulic parking brake system and an improved over-voltage protection circuit. For '79, the simple twist-type fuel caps were replaced by those of ''flip-top'' design—not a real improvement, since the latter are less rainproof.

For my money (literally, this time), the Tiger is an excellent choice for someone who wants a used airplane whose performance is close to some of the retractables, but whose purchase and operating costs reflect its fixed-gear, fixed-pitch-prop design. There is the matter of spare parts for an airframe that is no longer being manufactured but—knock aluminum—I have not been faced with that problem to date. I have heard that parts from Gulfstream Aerospace (recently bought by Chrysler) can be outrageous, but other vendors are competing on some items, and there are always the aviation wreckers.

According to the *Directory of Aircraft Prices*, retail prices run from $18,250 for a '75 Tiger to $24,000 for a '79 model. A recent issue of *Trade-A-Plane* listed 15 Tigers at asking prices that ranged from $15,900 to $24,950, with the majority of them below $20,000.

If you are interested in a Tiger or other Grumman American model, you should consider joining the American Yankee Association. Membership is $20 a year plus a $5 initiation fee. The address: P.O. Box 3052, Everett, Wash. 98203. Ken Blackman (who is editor of the AYA newsletter) is a goldmine of information. He can be contacted at Air Mods N.W., P.O. Box 8, Snohomish, Wash. 98290, (206) 691-7634. Air Mods offers a number of modifications for the Grumman Americans, as does Ameromod: Building C-64, Paine Field, Everett, Wash. 98204, (206) 353-3559.

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