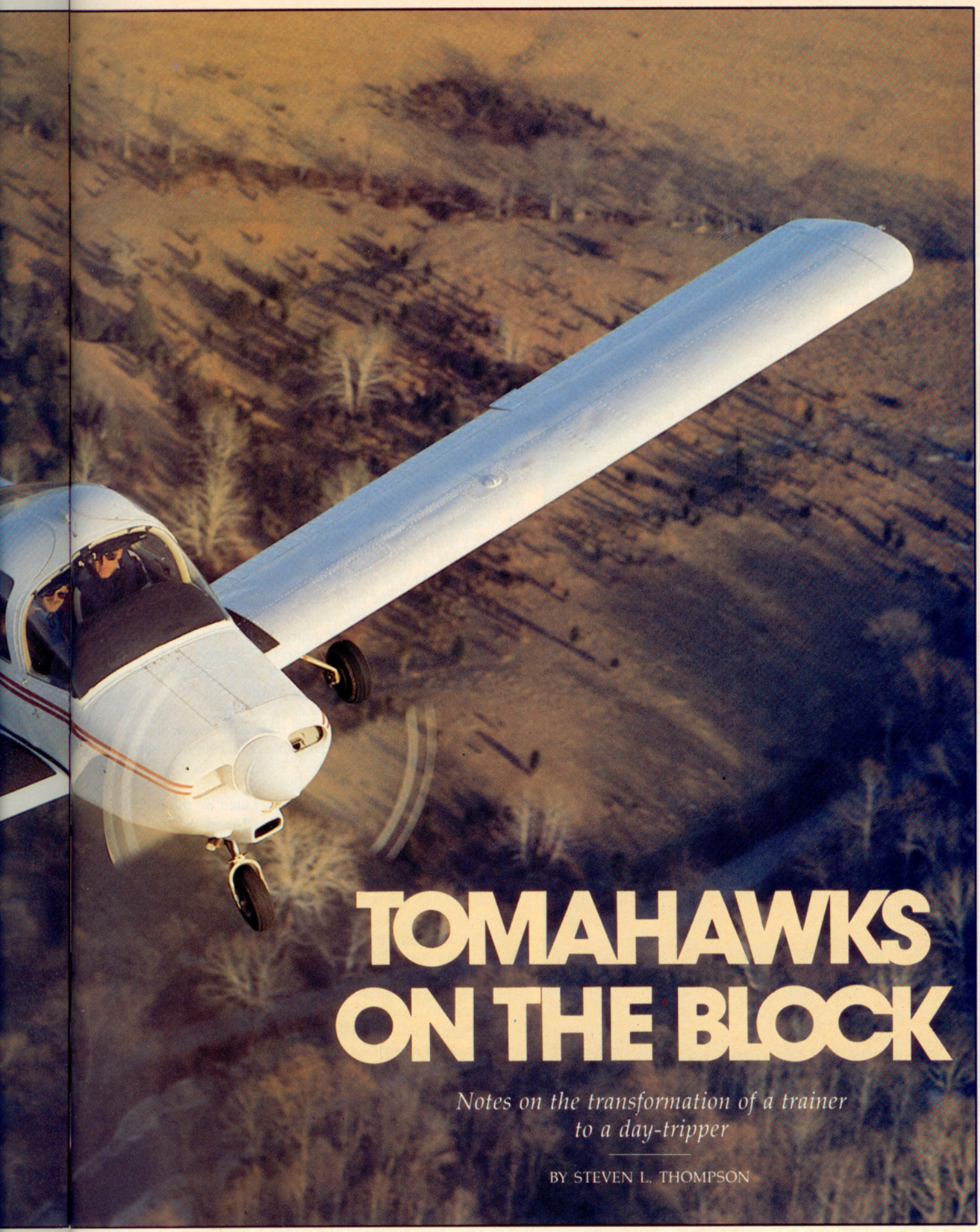


TOMAHAWKS ON THE BLOCK

Notes on the transformation of a trainer to a day-tripper

BY STEVEN L. THOMPSON

PHOTOGRAPHY BY ART DAVIS

continued

Weekend sightseeing is the Tomahawk's best role, courtesy of its superb visibility, wide-track gear and easy entry/exit.

"Traumahawks" they were called at the FBO where I received most of my primary instruction, and for good reason. Like most flight schools that operated Piper PA-38-112s, the FBO had been hit hard by the unforeseen blemishes that had scarred the "new-look" trainers. Piper said that the Tomahawk had been designed around the comments of the 4,000 or so respondents to the 10,000 queries sent out to America's certified flight instructors. Maybe so, would have been the grunt of the FBO manager who had to bear the brunt of an avalanche of airworthiness directives and quality-control problems; maybe so, but design is one thing, and construction another.

Certainly the PA-38 was designed to be the best trainer ever. At least, if that meant a trainer with superb visibility, two doors, a wide cockpit, common-sense panel layout and wide-track landing gear married to an airframe tuned to demand attention from the student pilot, or else. And it is the "or else" that makes Tomahawks into Traumahawks for students as well as FBO money men, because the airplane's behavior in a stall perfectly defines the concept of "departure."

But even to say "the airplane" demonstrates another problem with the Tomahawk. I flew four of them for nearly 50 hours and found few areas of common response. One wouldn't trim at all. Another was as stable as a Cherokee. A third fell off so quickly to the left in a power-off stall that my first thought was that the wing itself had departed. And the fourth broke to the right, slowly but stubbornly.

But what else, I thought, can you expect from flight school aircraft? After all, was I not guilty myself of bouncing the little devices onto and off of assorted runways with grim regularity? Was I myself not guilty of shock-cooling the engine in a too-eager pullback of the power? Sure. And so, like many another Traumahawk trainee, when I finished my FAA license checkride (shortened somewhat when the examiner cocked his head and announced that he felt "something like a shudder" in the tail), I climbed out and swore that the PA-38-112 had seen the last of me.

Brave words, but not terribly smart. Lured by the Ferrari-like noise and arrogant stance of a well-used Bellanca Viking, I waded deep into the idea of buying it before sanity struck home. An hour with a calculator does that, every time. Maybe something more like a Cherokee 180. . . .

And here we are back at Flying Costs Money. Sure. But renting forever is a mug's game, just as uneconomic as buying too much airplane. Too bad a man can't find a sort of just-right, two-seat intermediate step. Too bad a man can't buy a Cub without hocking his home and kids. Too bad a man can't turn back the clock to 1947 and buy a Stearman, dirt cheap. Too bad the really great bargains are gone. Everything costs too much these days, even (sigh) a Cherokee 180. The real bargains are gone. Just look at *Trade-A-Plane*.

There isn't much for less than 10 grand. Beat-up 172s, worn-out Cherokees, rotting taildraggers that "need work." Not much else. Except. . .Tomahawks.

Two whole columns of Tomahawks. Dozens of the things. Average price around $7,500, a couple of years old, most being sold off just before the expensive AD—81-23-7, the one that mandates replacement of the engine mount "to prevent possible nose-gear failure"—comes effective at

around 1,000 hours total time in service. If this were a Real Airplane being sold rather than a Traumahawk. . . .

But it is. In fact, with a slight shift in attitude, you can see this airplane as the inheritor of the Cub mantle. Granted, the thing has compiled an awful record for ADs. Granted, it is likely to have been beaten-up by bungling students. Even so, it may be a better deal than even the cherriest Cub.

Consider today's environment. We are not confronting 1947's airspace or airport life, but 1983's. That means a lot of concrete to land on and a lot of ATC demands to meet. Thus the simplicity and performance of the Cub is just not germane; today's performance parameters mandate something more like an avionics carrier with good visibility to see and avoid traffic. And if it's like that today, what will Mode S life bring? Increasingly constricted airspace, with a concomitant increasing demand for radio communication, points toward a reliable radio stack as being as important as soft-field landing capabilities. Thus the Tomahawk-as-Cub.

Cub fanatics will find the comparison insulting, even preposterous. Their favorite airplane is a simple joy, they'd maintain, while the Tomahawk is simply junk. They'd unreel tales of horror from flight instructors who could not get their spinning aircraft to recover with the handbook's procedures, who'd watched, horrified, as the tail waggled like a puppy's while the airplane wallowed in a stall. They'd talk about the double magneto failure that killed a high-time instructor, or the unusally high number of fatal stall-spin accidents about which *The Aviation Consumer* and *Aviation Safety* directed concern in recent articles on the aircraft.

As one who swore never to ride in, let alone fly, another Traumahawk, I can understand the viewpoint. But the view from a taildragger is not what should determine the view of a Tomahawk. Airplanes like the Cub and the Super Cub are immensely fun, but with their cramped, uncomfortable cabins, awful seats, stone-age avionics capacities and separate-the-men-from-the-boys undercarriages, they are not in the same league as the Tomahawk. Whether they are better or worse is a never-ending debate, but, they are different.

Miffed tailwheel wags would be the first to snipe that the difference is in quality, but it isn't so, as the act of climbing into a Tommie will show you. All the ergonomics of the PA-38 are "user friendly," to borrow an awful if descriptive term from the computer world. No elaborate rituals are required; you unlock the doors, flip the top latch (unless, as is all too likely, it is worn out or broken) and step down and into the cockpit. In front of you is a simple matte panel, fully IFR capable. With the door closed, your view is impeded only by the door posts and the tubular rollover braces behind you. Tiny armrests are set into the doors. Map pockets and small ashtrays are just ahead of both doors. The seats in standard vinyl form are neither very supportive nor texturally comfortable, but extra contouring and fabric inserts are Piper options. Carpets in early models usually tore easily from their fasteners, but still the overall feeling in the cockpit is not wholly Spartan. A certain awkwardness is evident in some cabin features, such as the shoulder harnesses and baggage and towbar tiedowns; using any of them requires some patience, since the harness strap does not have an inertial reel, the tiedowns for the towbar are hook-and-loop and snarl easily, and the baggage straps usually are hard to cinch properly. These, however, are minor concerns compared with the major problems highlighted by the airplane's awful record of ADs and service difficulties—not to mention the irritants built in by Piper's need to keep production costs down.

Federal Aviation Regulation 43.13 tells a pilot like me what I can and cannot do with a wrench, and the leeway available is enough to reduce the complaints I have about the comfort of the airplane. The 1978 and 1979 models, built in a rush, were poorly finished; but there are fixes, and I would undertake them, doing whatever work I could myself and contracting out the rest to an A&P. Soundproofing falls under this heading, as does upgrading the seats, which are better on the 1981 and later Tomahawk IIs. Even doing

continued

the work myself, of course, turning a weary trainer into a two-place cruiser would not be cheap.

But after spending unknown dollars chasing optimization of the design, what would I find when I finished? What would a "perfect" Tomahawk be like? Would the result of all this effort be worth it?

Judging from the flying qualities of the little fleet whose tricks I came to know so well, the answer would have to be "maybe." Away from the edges of the envelope, it is not a terribly twitchy airplane, as some folks would have one believe. There is marked sensitivity in pitch, to be sure, and this calls for careful trimming before rotation or flare, but the one airplane I flew that was rigged properly was a delight enroute, flying hands-off without constant attention. The immense rudder is not cockpit-adjustable for trim, so the tab must be set correctly on the ground—and even then, the smallest movement of a rudder pedal will result in immediate yawing. Roll response is not so crisp, so it takes some time to get used to control harmonization.

A Cessna-single pilot coming to the "perfect" Tomahawk probably would find he had the most to get used to, primarily because of the flaps. This is not because the Piper's flaps are actuated mechanically by a handle between the seats (while the later Cessna singles' are electrically commanded by a panel-mounted toggle), but because using flaps results in very little pitching compared with the Cessnas.

By far the greatest area of concern for any pilot new to the Tomahawk would, of course, be its stall habits. A good deal has been said, written and done about the airplane's stall, from Piper's tuning of the wings with inboard and outboard flow strips to a National Transportation Safety Board recommendation that the FAA reevaluate the airplane's stall characteristics, a recommendation upon which the FAA is now acting. So notorious has the PA-38's stall become that some flight schools won't even teach primary students full stalls in the airplane—a negation, if ever there was one, of what the airplane was designed for. All this is good cause for unease in someone considering the airplane as transportation and fun rather than training, especially given the always-harrowing statistics that mercilessly point out that the

TALES OF TROUBLED TOMAHAWKS

One hangar wit, surveying the 827 service difficulty reports and 20 airworthiness directives accumulated by the PA-38-112 by Christmas Eve 1982, summarized what had happened with the Tomahawk by suggesting that Piper's intention was simply to "finish the job in the field." A prospective buyer looking over the dismal records finds little amusement in the analysis.

For instance, perusal of the inch-thick sheaf of SDRs reveals such things as 53 reports of cracked spinner bulkheads and 62 notations of elevator trim mechanism problems, from cracked pulley brackets to tangled cables.

Not all of the 20 ADs are Tomahawk-specific, of course, and it is worthwhile to note that the tide of ADs is receding a bit; in 1978, 1979 and 1980, the airplane collected five ADs per year; but in 1981, four; and in 1982, only one. Apprised of this, the above-mentioned wag noted that, at last, the Tomahawk was nearing completion. —*SLT*

AD 78-23-9: pilot and copilot control wheels jamming or binding in flight.

AD 79-13-8: Airborne dry vacuum pump failure.

AD 79-17-5: faulty instrument ground wires.

AD 80-25-2 R1: mushroomed engine push rods and deformed push-rod tubing.

AD 80-25-7 R1: leaking Stewart-Warner oil coolers.

AD 78-25-1: failure of Slick magnetos.

AD 80-6-5: flawed heat treatment for Slick magneto impulse coupling assembly rivets.

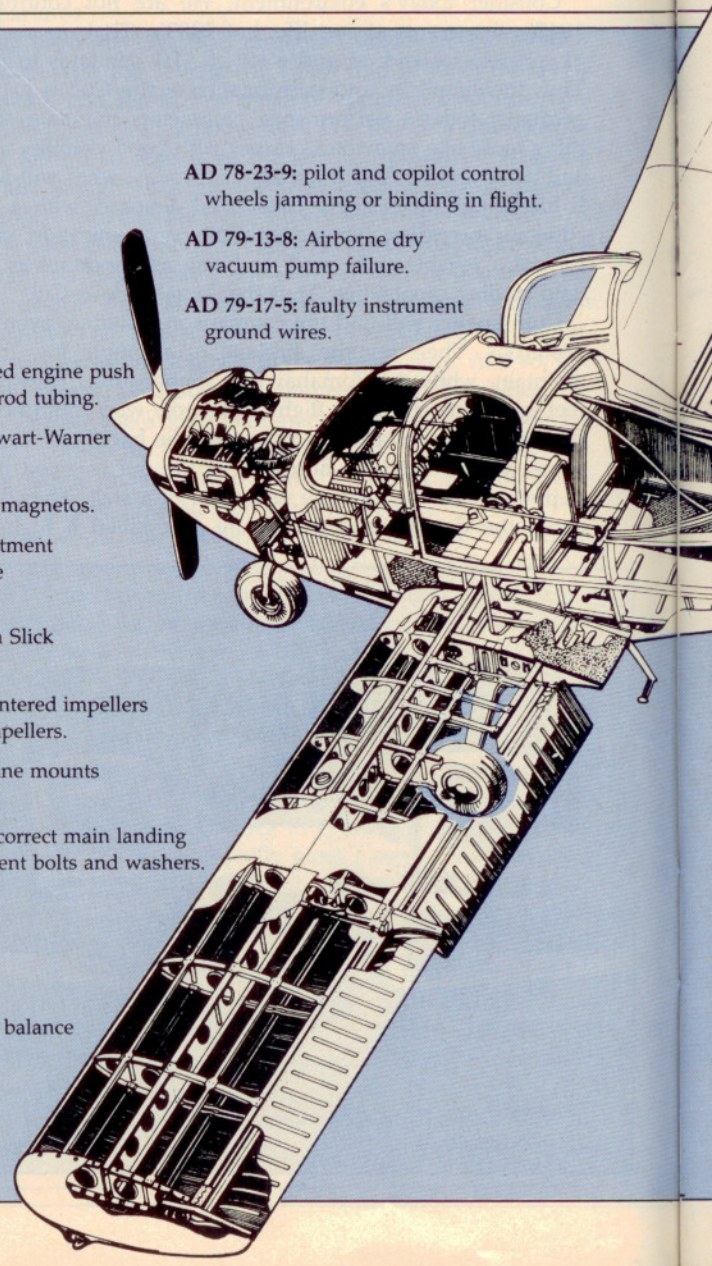
AD 81-16-5: cracked coils in Slick magnetos.

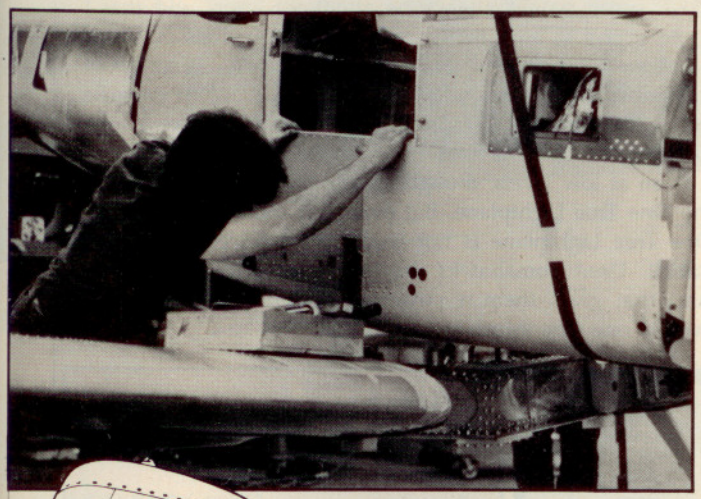
AD 81-18-4 R2: failure of sintered impellers in oil pumps with iron impellers.

AD 81-23-7: weakened engine mounts causing nose-gear failure.

AD 80-11-9: incorrect main landing gear attachment bolts and washers.

AD 82-2-1: cracking aileron balance weight rib flanges.



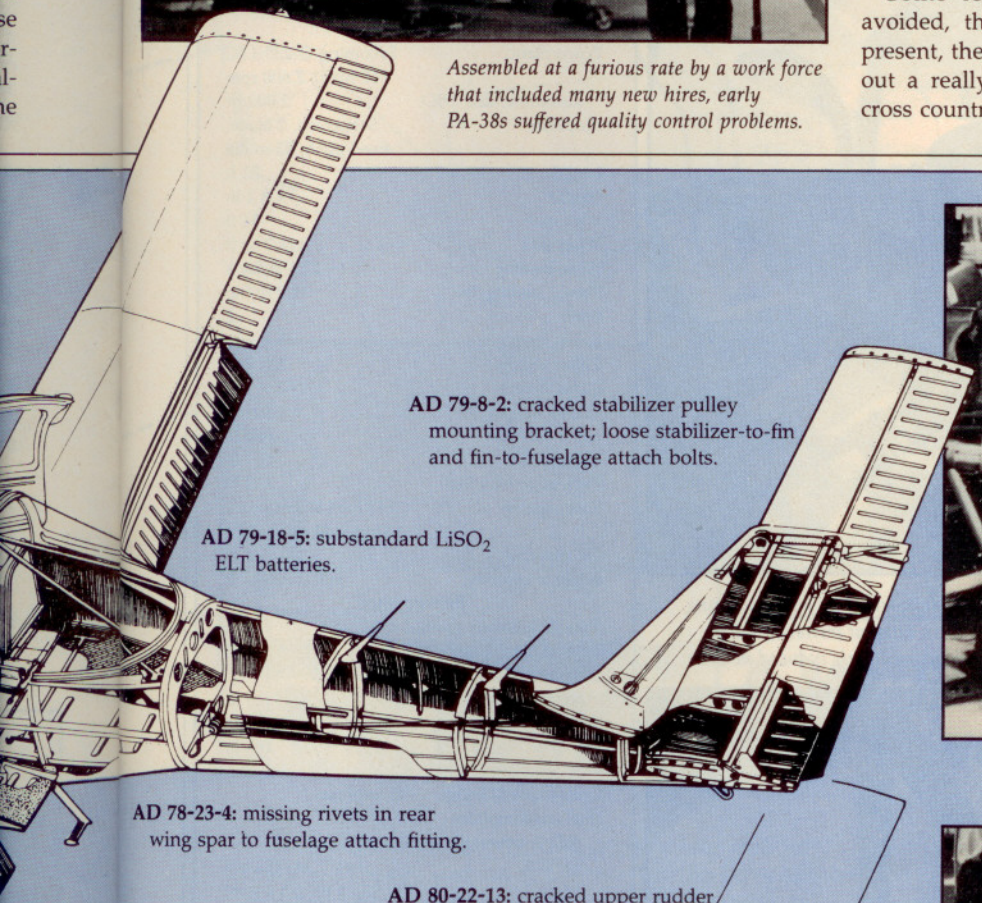


Assembled at a furious rate by a work force that included many new hires, early PA-38s suffered quality control problems.

skidding, stalling turn from base to final leg is the VFR pilot's number one enemy. It would be easy to leap to the conclusion that all this uproar about the Tomahawk's stall means that it is most likely to kill you in that turn, that if not flown perfectly, it will snap over and dive into the trees.

The FAA undoubtedly will emerge with its own answer. Having stalled, skidded and spun them, though, having noted each one's peculiarities and having been trained to avoid them, I feel that the airplane always gave me enough warning of its aerodynamic intentions—either by buffeting or sounding its klaxon—that the issue may belong with the matter of whether or not a V-tail Bonanza is a deathtrap. Moreover, stalls and spins are maneuvers that I would strive to avoid with a Tomahawk bought and refurbished to become a cruiser rather than a trainer.

Some features of life with a Tomahawk cannot be avoided, though, and because some of them are always present, they are mighty irritating. Noise, for instance. Without a really first rate noise-attentuating headset, any long cross country in a Tomahawk I is likely to be a semi-deafen-



AD 79-8-2: cracked stabilizer pulley mounting bracket; loose stabilizer-to-fin and fin-to-fuselage attach bolts.

AD 79-18-5: substandard $LiSO_2$ ELT batteries.

AD 78-23-4: missing rivets in rear wing spar to fuselage attach fitting.

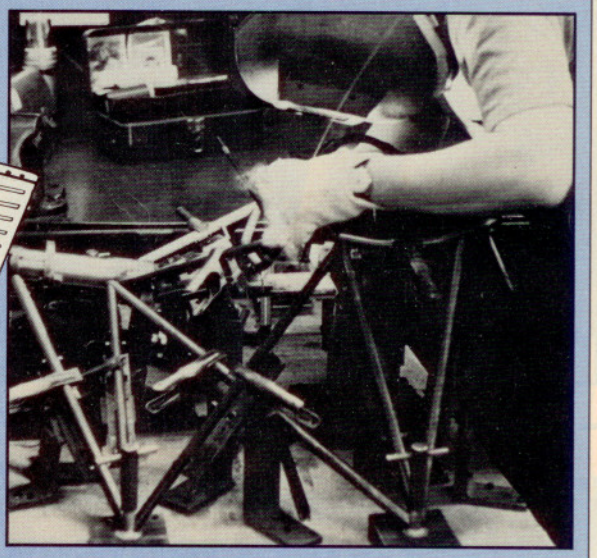
AD 80-22-13: cracked upper rudder hinge brackets.

AD 78-22-1: insufficient clearance between rudder leading edge and fin trailing edge.

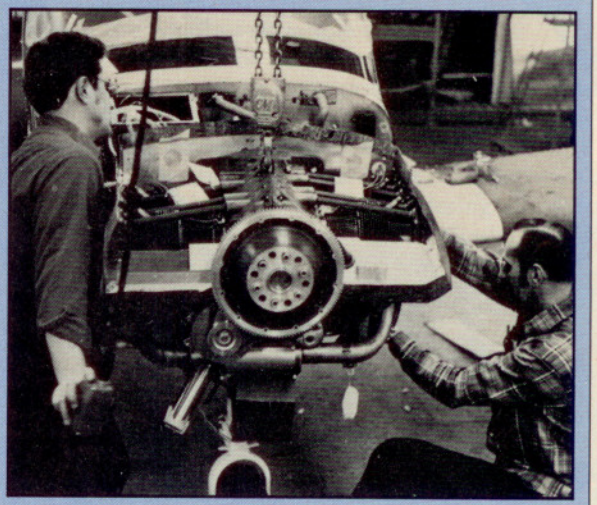
AD 78-26-6: vertical fin forward spar attachment plate cracked.

AD 81-4-7 R1: cracked fin forward spar attachment web fitting.

AD 79-3-2: loose bearing in bottom rudder hinge bracket.



The most expensive AD is 81-23-7, which requires replacement of the engine mount before 1,000 hours.



ILLUSTRATIONS COURTESY PIPER AIRCRAFT CORPORATION

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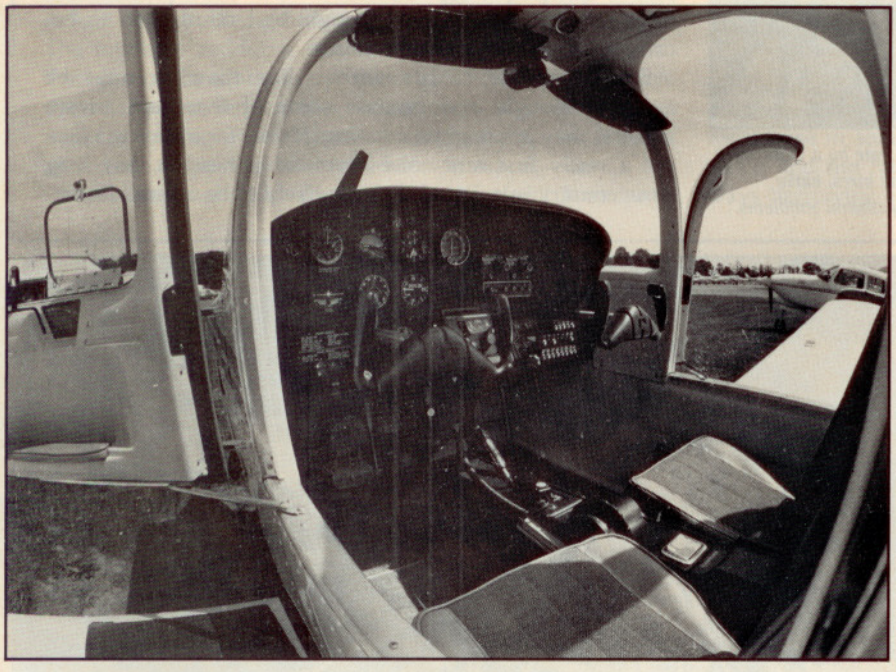
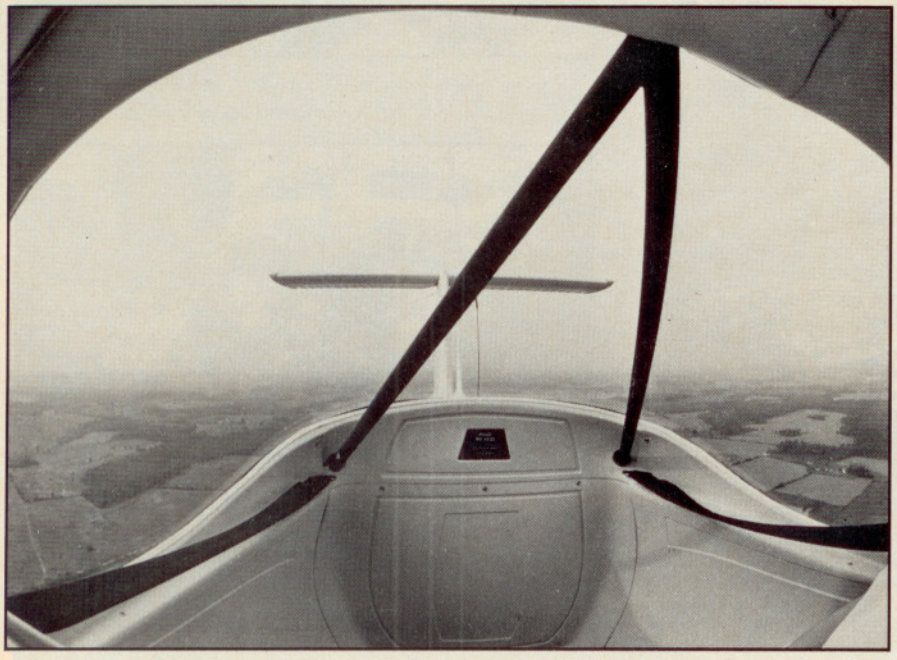
ing experience. (Tomahawk IIs, built since the 1981 model year, have more soundproofing, but still suffer from the malaise.) Do-it-yourself retrofit soundproofing will help, certainly, but the airplane just was not built with maximum silence as a goal. Achieving that goal oneself might bring with it unacceptable effects on useful load; and with that hovering around only about 560 pounds to begin with, every pound of insulation means a cargo penalty.

Useful load even in a perfected Tomahawk highlights the other built-in limitation of the airplane. Put simply, it will not haul very much very far at a very high speed. My experience left me with the conviction that a Tomahawk block speed would always be about 90 knots and that I could expect to burn between five and six gallons of 100LL per hour to achieve it. Furthermore, I could expect about five hours' maximum endurance, and, if I expected to cruise around 10,000 feet msl, I also could expect to take a long time to get there. The Tommie is happiest at low levels.

Even at low levels, though, the Tomahawk will never be the One True Lightplane. But even if it could be found, the One True Lightplane is not likely to be priced like a VW Rabbit. Used Tomahawks, however, *are* priced like VWs. And that gives them a powerful, undeniable attraction—even to one who swore to avoid them. □



The Tomahawk's cockpit is a classic example of a fine design compromised by manufacturing. With a toolbox, patience, a little money and a lot of time, a diligent owner could reduce the annoyance caused by such things as ill-fitting doors and their induced noise.



PIPER TOMAHAWK PA-38-112 (1979)

Base price $16,840

Current market value $6,000 to $10,000

Specifications

Powerplant	Lycoming O-235-L2C 112 hp @ 2,600 rpm
Recommended TBO	2,000 hr
Propeller	Sensenich, 2 blade, fixed pitch, 72-in dia
Length	22 ft
Height	9 ft 1 in
Wingspan	34 ft
Wing area	124.7 sq ft
Wing loading	13.4 lb/sq ft
Power loading	14.9 lb/hp
Seats	2
Cabin length	5 ft 2 in
Cabin width	3 ft 8 in
Cabin height	3 ft 1 in
Empty weight	1,109 lb
Gross weight	1,670 lb
Useful load	561 lb
Payload w/full fuel	369 lb
Fuel capacity	192 lb (180 lb usable) 32 gal (30 gal usable)
Oil capacity	6 qt
Baggage capacity	100 lb, 20 cu ft

Performance

Takeoff distance, ground roll	820 ft
Takeoff distance over 50-ft obst	1,460 ft
Max demonstrated crosswind component	15 kt
Rate of climb, sea level	718 fpm
Max level speed, sea level	109 kt
Max level speed, 6,000 ft	108 kt
Cruise speed/Range w/45-min rsv (fuel consumption) @75% power, best economy 7,000 ft	102 kt/452 nm (33.6 pph/5.6 gph)
Service ceiling	13,000 ft
Absolute ceiling	14,000 ft
Landing distance over 50-ft obst	1,465 ft
Landing distance, ground roll	525 ft

Limiting and Recommended Airspeeds

Vx (Best angle of climb)	61 KIAS
Vy (Best rate of climb)	70 KIAS
Va (Design maneuvering)	103 KIAS
Vfe (Max flap extended)	89 KIAS
Vno (Max structural cruising)	110 KIAS
Vne (Never exceed)	138 KIAS
Vs1 (Stall clean)	48 KIAS
Vso (Stall in landing configuration)	47 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted.