

MEMBER SPOTLIGHT

From Ejection Seat to CAPS

U.S. MIGRATION

Register Now for
Early Bird Prices

FEATURE

The Process of Mending
a Damaged Airplane

COPA[®] Pilot



CIRRUSPILOTS.ORG

JUNE 2022

VOLUME 17 | NUMBER 6

TRAVELOGUE

A father-son adventure trip

DALE AND BLAKE KLAPMEIER » PG 54



40

34

PILOT POINTERS

What's the Difference Between Approach Speed and Threshold Crossing Speed?

BOLDMETHOD

54

TRAVELOGUE

"Let's Just Head North"

BLAKE AND DALE K LAPMEIER

40

FEATURE

Attack of the Killer Chipmunk

MATTHEW MCDANIEL

What to Do When Your Cirrus is Mauled

54



COPA PRESIDENT

SCOTT WILLIAMS

E-mail: president@cirruspilots.org

Phone: (805) 231-4965

EDITOR

KIM BLONIGEN

E-mail: editor@cirruspilots.org

ADVERTISING DIRECTOR

KATIE ROLLERT

2779 Aero Park Drive

Traverse City, MI 49686

Phone: 231-590-7845

E-mail: Katie.Rollert@vpdcs.com

ADVERTISING COORDINATOR & PUBLICATIONS SERVICE

MOLLY COSTILOW

231-674-5369

molly.costilow@vpdcs.com

GRAPHIC DESIGNER

RACHEL COON

PUBLISHER

COPA® Pilot ISSN #2578-6938 (print)

ISSN 2578-6946 (online) or USPS

#024-643, Copyright © 2021,

COPA® Pilot. It is published 12

times per year by Cirrus Owners

and Pilots Association,

500 Westover Dr #13209

Sanford, NC 27330

Periodicals postage is paid at Sanford, NC and additional mailing offices.

POSTMASTER:

Send address changes to COPA® Pilot at

500 Westover Dr #13209

Sanford, NC 27330

MEMBERSHIP AND SUBSCRIPTIONS

To join COPA® and get a subscription to

this magazine go to cirruspilots.org

ADDRESS CHANGES

Please contact the Membership

Coordinator at [Membership@](mailto:Membership@CirrusPilots.org)

CirrusPilots.org for any address

changes. Membership updates are

handled at COPA® headquarters, call

+1 (320) 999-COPA (2672)

COVER PHOTO

COPA member Tim Decker's

2005 Cirrus SR22 G2.

Tim is featured as this issue's

Member Spotlight.

Attack of the Killer Chipmunk: What to Do When Your Cirrus is Mauled

by Matthew McDaniel



MATTHEW MCDANIEL is a Master & Gold Seal CFI, ATP, MEI, AGI, IGI and Platinum CSIP. In 30 years of flying, he has logged over 19,000 hours total, over 5,600 hours of instruction-given, and over 5,000 hours in all models of the Cirrus family. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Technically Advanced Aircraft and glass cockpit instruction since 2001. Currently, he is also an Airbus A-320-series captain for an international airline, holds 8 turbine aircraft type ratings, and has flown over 90 aircraft types. Matt is one of less than 15 instructors in the world to have earned the Master CFI designation for 9 consecutive two-year terms. He can be reached at matt@progaviation.com or (414) 339-4990.

Against seemingly insurmountable odds, the diminutive mongoose can kill a deadly king cobra snake. Through a combination of lightning-fast reflexes and a skilled offensive attack strategy, the mongoose can outwit, outlast and even have cobra for dinner. Similarly, the venerable DeHavilland Chipmunk (a 2-seat World War II-vintage aircraft) can mount a sneak attack and render a Cirrus flightless and struggling for survival.

The Aggressor

The 1940s-era Chipmunk was designed as a low-powered primary trainer. In the postwar era, Chipmunks became popular for sport-flying and aerobatics. Air show pilots modified them with big engines and props, enlarged control surfaces, smoke systems and various performance and safety enhancements. Thus, the “Super Chipmunk” was developed as a crowd-pleasing air show performer; made most

famous by air show legend Art Scholl and his trusty canine co-pilot, Aileron. Eight decades after their World War II heyday, Chipmunk trainers are popular warbirds, and Super Chipmunks still appear occasionally on the air show scene.

The Victim

In 2002, a Milwaukee business owner had a delivery slot for a new Cirrus SR22 and hoped to defray ownership costs by splitting costs with two partners. Late that year, they took delivery of one of the first production SR22s equipped with TKS ice protection (when 6-pack panels were still standard and features like turbocharging and FIKI were still years in the future). In the following years, the original partner dropped out. The remaining partners (Drs. Kaufman and Martin) carried on, giving 278CD a good home where it flew regularly and enjoyed good maintenance. In mid-2012, the aircraft was approaching

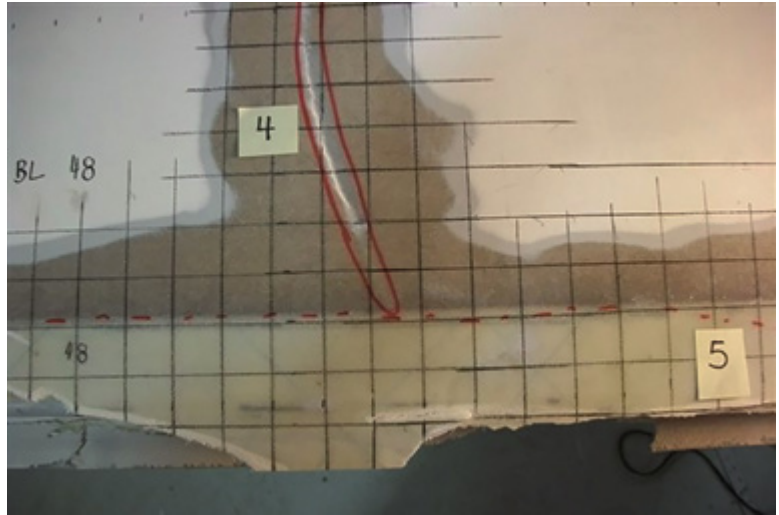


« **Three views of N278CD immediately after the Chipmunk attack.** Note the left elevator is mostly amputated, as is the trailing edge of the rudder. The rudder displays a significant bend to the right and the left half of the VOR antenna has been bent and skewered through the rudder. In one view, the left wingtip of the Chipmunk is in view.





≧ **With paint removed and a precise grid applied, the left horizontal stabilizer's damage was evaluated to determine whether it could be repaired. In the end, the assessment was that repairs were theoretically possible but uncertain enough for everyone to agree that replacement was the better option.**



≧ **The pattern used for a repair to the upper vertical stabilizer.** In the center is the new composite material that would replace the damaged area required to be cut out. The surrounding rings represent the layering required to complete the repair.

“ ... your insurance is invested in your aircraft and can advocate for their investment, too, ... ”

its 10th birthday and its first mandatory CAPS repack. As reported in these pages before, this is no minor procedure for a G1 Cirrus. In fact, it is more akin to major surgery, requiring both structural and cosmetic work, in addition to the chute replacement itself.

The airplane's annual inspection was scheduled to coincide with the chute repack to minimize 278CD's downtime. Both were to be done by Wisconsin Aviation in Watertown, Wisconsin (RYV), already an established Cirrus Service Center (CSC). When everything was completed, including blending, buffing and polishing the new and original paint, the bird looked nearly as bright and beautiful as it had a decade and 1,700 flight hours earlier. It was rolled out onto the sunny tarmac to await the owners' pickup.

Attack!

Simultaneously, the service center had just completed the installation of a new 3-bladed composite prop on a customer's fire-breathing Super Chipmunk. The Chipmunk's owner/pilot was about as far from a novice aviator as one can get, as a former Top Gun naval aviator,

retired airline captain and active air show pilot. His engine and new prop required precise tweaking to optimize their combined performance for his air show act. After each set of adjustments made by the mechanics, he would take his mount skyward to test the results. He'd push the aircraft to its limits, noting what he liked and disliked about its current engine/prop performance, then return for the next set of mechanical adjustments. This process occurred numerous times that morning. During the last sequence, the pilot stayed strapped into the cockpit while the A&Ps did their thing at the business end of the aircraft. Little did he know, while he sat, Cirrus 278CD had been declared "done," towed outside and parked one row ahead of the Chipmunk.

One would assume a Cirrus would be difficult to hide in plain sight. But, if parked far enough ahead of a wide-nosed taildragger, a Cirrus can literally disappear inside said taildragger's blind spot, and that is precisely what happened. Upon startup for his next test flight, the Chipmunk began taxiing the same route to the runway he'd used numerous times that morning, including crossing the previously empty parking row directly ahead.

Unfortunately, that route now included a parked Cirrus. Mechanics saw it coming and screamed out in vain, while picnickers at a nearby viewing area cringed. The Chipmunk's powerful blades slashed the tail of the Cirrus, slicing through metal, tearing fiberglass, and nearly sending the newly rejuvenated SR22 to its grave.

Next of Kin

In human terms, only egos were injured. The Chipmunk's pilot quickly reigned in his machine, and none of the flying debris made human contact. Nonetheless, the next of kin would have to be informed. Wisconsin Aviation assured the owners that it would repair both aircraft if it were determined to be possible and that they would find the necessary manpower to do so. The Chipmunk's owner apologized profusely, as well. As expected, the owners were shocked and dismayed, yet thankful that no one was hurt. Of course, in the end, everything would hinge on two things: (1) the official assessment of damage and repair prognosis by Cirrus Aircraft and Wisconsin Aviation and (2) the Chipmunk's insurance company's determination of how to process the claim. Each would prove to be equally complex and time-consuming. The tenacity of the owners and the CSC would prove invaluable in both reaching resolution and ensuring execution.

Beginning the Insurance Dance

The Chipmunk's insurance company would be covering the Cirrus' claim by approving the necessary repair costs or totaling out the aircraft. They were contacted by both the Chipmunk owner and Wisconsin Aviation. The Cirrus owners immediately contacted their own insurance company, as well. Remember, your insurance is invested in your aircraft and

can advocate for their investment, too, especially if the insurance companies involved are different. When the agent representing the Chipmunk made contact, Drs. Kaufman and Martin immediately inquired and discussed three specific items:

- » Payment for repairs if the plane was deemed repairable; the greater of fair market value; or the owner's own hull coverage value, if totaled out. The latter is an area where your insurance agent can advocate for you, particularly if you carry an elevated hull value for any reason (to cover avionics upgrades, new paint, interior or other major improvements).
- » Reimbursement for "Loss of Use" to cover aircraft rental and associated costs during your aircraft's

downtime or shopping for its replacement. It was summer and prime flying season!

- » Compensation for "Decrease in Value." Aircraft purchasers understand that an aircraft with a "damage history" is not as valuable after the aircraft is repaired to airworthy condition, even if it's determined as "good as new." (More on this later.)

Damage Assessment & Repair Plan

The Cirrus' left elevator was partially amputated from the empennage. The rudder was bent and gashed. The left side of the vertical stabilizer had a small cut in the composite near the top and the adjacent VOR antenna was twisted



» A Wisconsin Aviation technician uses a Sawzall to cut off the left horizontal stabilizer after the decision was made not to attempt to repair it. Instead, a brand-new horizontal stabilizer, built by Cirrus Aircraft, would be installed.

(continued on page 46)



« **Taken within the temperature and humidity booth** specially built to complete major structural composite repairs to the aircraft's empennage. The new horizontal stabilizer is ready to be inserted through the fuselage. Note the completed composite repair at the top of the vertical stabilizer curing under a heat lamp. The CSC was careful to protect the paint, as the plane was not to be entirely repainted, but repainted only in the areas requiring it and blended as necessary.

and literally pierced through the upper rudder. A few small gashes scarred the aft fuselage and the vertical strake, which blends the fuselage into the vertical stabilizer. One item to be thankful for was the Chipmunk's new prop featured composite blades, which absorbed as much impact damage as the Cirrus tail did. Chances are, if it had been wearing its previous all-metal prop, damage to the Cirrus would have been much greater.

While extensive, the damage could have been significantly worse. Elevators, antennas and hardware are relatively easy to replace. Even minor composite damage in non-critical areas is normal stuff for an experienced CSC, but repairing critical

flight surfaces is no trivial matter. Precise instrumentation was utilized to take measurements, ensuring the empennage had not been bent, as a whole or between major components. Fortunately, the nose of the Chipmunk had pushed the Cirrus' tail around (aided by the Cirrus' swiveling nose wheel), certainly sparing major structural damage to the vertical stabilizer that would have occurred had the Cirrus remained totally stationary while absorbing the impact's energy and momentum.

Equally fortunate, the cuts in the aft fuselage and strake were in areas that were considered repairable; almost any composite damage further forward would have been considered non-repairable.

Such composite damage is assessed by the CSC using a tapping procedure (aka a "penny test") over a defined grid pattern (after any required localized paint removal is accomplished). Repair procedures needed to be determined by Cirrus engineering, who would, in turn, determine the CSC's ability to carry it out – considering the CSC's facilities, equipment, staff training and experience.

The worst damage was at the left rear of the one-piece horizontal stabilizer. Composite material had been cut away at the trailing edge and bonds between the composite skin and spar had been compromised. Elevator attach points had been torqued, and the structural integrity of the horizontal stabilizer's bond to the fuselage was unknown. In theory, all of it may have been repairable. But would that require so much additional composite material to be added that it would create weight & balance issues or interfere with the required stabilizer-to-elevator clearances? It would be almost impossible to know until those repairs were completed. Cirrus engineering believed that route would have been a big gamble. Losing that bet would add thousands of dollars to the repair costs and scores of hours to the project.

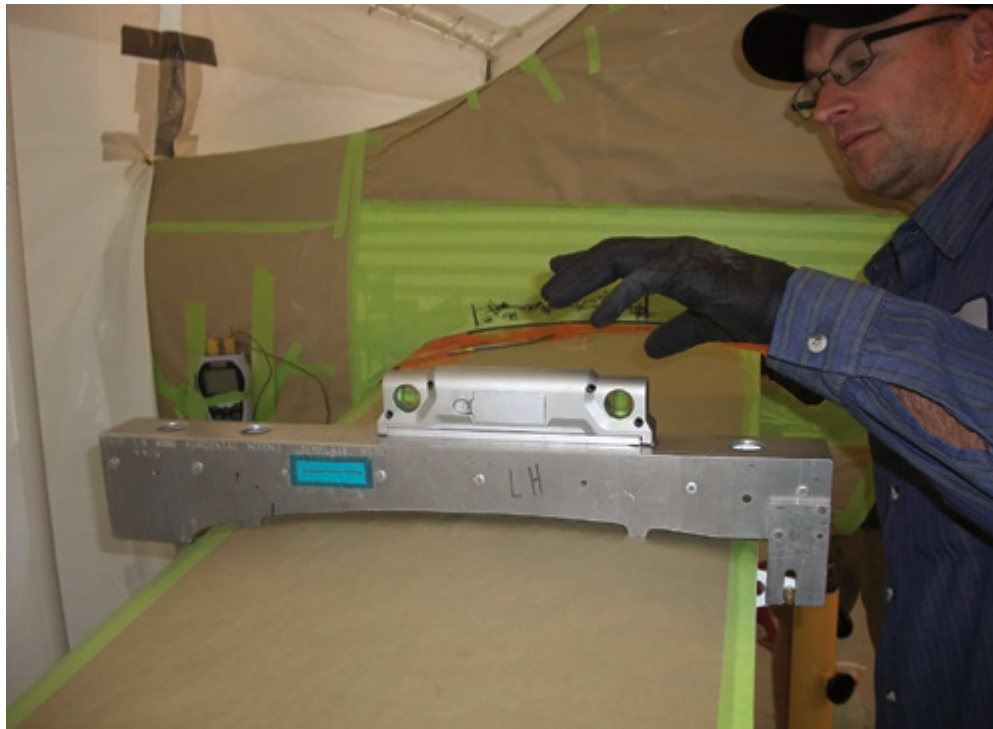
So, everyone agreed that going with a more predictable route would be best, even if that meant added complexities in the repair process. It was thought better to proceed with a total replacement of the rudder, both elevators, the entire horizontal stabilizer, and associated components rather than trying to salvage

any of them and discovering mid-repair that it was impractical to do so. Under this scenario, the insurance company determined the cost of the repair was a better value than totaling the aircraft, whereas a course correction mid-repair could have swayed that equation in the opposite direction.

Now it was up to the Cirrus Aircraft engineering department to develop a detailed plan and obtain Federal Aviation Administration (FAA) approval. As the G3 models were in production at this point, no matching elevators, rudders or horizontal stabilizers were being built. It was also quickly determined that no G1-matching versions were in the current inventory. Cirrus Aircraft would need to custom-build the major components required to execute the repair plan.

Repair Process

With a Cirrus engineering plan and FAA approval in hand, the time to begin repairs arrived. Wisconsin Aviation was approved to carry out the repairs, though some items would push their facilities and staffing to the limit. First, the rudders, elevators, VOR antenna and all associated hardware were removed. Then came the scary part – the entire horizontal stabilizer would have to be cut out. That component is essentially one piece after its spars, ribs and skins have been fused together and is slid through a pre-cut slot in the aft fuselage and bonded into place. Removing it involved such high-tech tools as a reciprocating saw, commonly called a Sawzall! The left side of the stabilizer was sawed off near the fuselage, providing access to where the remainder could be cut free from its internal fuselage bonds and pulled through from the right side. Then the newly produced replacement stabilizer would be



» **A tech takes precise measurements** before the position of the horizontal stabilizer is finalized and permanently bonded in place. This process was the most critical of the project to ensure the plane conformed to factory-new standards and would fly as it had previously.

“Cirrus Aircraft would need to custom-build the major components required to execute the repair plan.”

(continued on page 50)



The author about to depart to flight test 8CD after all structural repairs were completed. That flight would validate known performance specs and handling from before the damage and repairs. The taped-on N-numbers were used because the final graphics would not be applied until flight tests were complete and the team was certain that no additional composite or paint work would be required. After this flight, the paint was prepped and the new graphics were applied.

(continued from page 47)

bonded in place, along with completing the other minor composite repairs. That was where the CSC's facilities became a problem. Wisconsin Aviation didn't have a temperature and humidity-controlled space, and during Wisconsin summers, both those environmental factors can vary greatly over small spans of time. They built an environmentally controlled booth inside their maintenance shop and sealed 278CD's entire tail section inside it. Within this work area, the temperature and humidity could be closely regulated, and the composite repairs and bonding processes carried out to the exacting standards required.

Because paint repairs and blending would require the removal of the N-numbers and most of the fuselage graphics, the owners decided to update the aircraft's graphic design scheme. After completion of structural repairs, the graphics were stripped away, and paint work began. Newly built and painted elevators and rudder were balanced, installed and rigged. Installation of the new graphics

and registration numbers would have to wait until after initial flight testing was complete, just in case any findings might require composite corrections that could lead to further paint work. Would it fly the way it had before its clash with the Chipmunk?

Flight Testing

The approved repair plan required that the aircraft be flown first by a Cirrus factory test pilot to verify rigging and handling conformed to factory standards. The Cirrus factory pilot traveled from Duluth, Minnesota, and flew the aircraft pronouncing it "conforming." The owners wanted to ensure that it not only flew safely but that it performed and handled as it previously had. They insisted it also be test flown by a Cirrus Standardized Instructor Pilot (CSIP) with ample previous experience in that specific aircraft and negotiated with the insurance company to cover that testing. Since I'd trained the three original owners in the aircraft, flown it all over the U.S., test flown the aircraft

after various upgrades were installed, and flew the aircraft for some personal use, they felt I knew their SR22 as well as anyone. We agreed upon a test profile I would fly to verify the aircraft still achieved its known performance history and handling characteristics, etc. That test flight also proved uneventful, and all that remained to return it to the skies was to install the updated graphics and registration numbers.

The Last Tango

Cirrus N278CD was repaired, signed off and again available to its owners, but the saga was far from over. Now there were further negotiations with the responsible insurance company. The owners were informed the company would only make one consolidated payment. That meant each component of their claim needed to be supported and approved. After the company made its payment, it was likely that insurance would consider the case closed, and subsequent submissions would not be accepted or processed.

The largest unresolved question was the “Loss of Value.” In short, the insurance company admitted they’d previously agreed to such compensation but now stated that since the aircraft was fully repaired and functional, there was no loss of value. The owners, in contrast, defined their aircraft’s value as now being diminished due to its significant damage history. This led to months-long negotiations, countless emails and calls. Meanwhile, Wisconsin Aviation was getting understandably anxious about being paid for their work. Fortunately, the owners and the service center were able to arrange a payment plan between them while the insurance issues were concluded.

The question was how to quantify the diminished value. The owners obtained estimates from three well-known Cirrus brokers, who estimated a value decrease of 15% to 25%. The owners offered to accept a 25% decrease in value (and were willing to negotiate as low as 18%). The insurance company flatly refused to accept that decrease in valuation on the grounds that the brokers were not “certified appraisers.” In Wisconsin, no state “certification” for aircraft appraisers existed, and while the local appraisers were well versed in the value variations of Cessnas, they were unfamiliar with Cirrus (there being far fewer of them in the market back then).

Through various COPA/Cirrus contacts, Dr. Kaufman learned of an NBAA-certified aircraft appraiser with extensive Cirrus sales knowledge. The owners and insurance company agreed to have an NBAA-certified appraisal completed, splitting the costs evenly, with all parties accepting that valuation, whatever it might be. The appraisal was comprehensive and completed promptly. It included a complete aircraft logbook assessment, plus reviewing photos of the aircraft

throughout its life, its damage, and its repair to airworthy status.

But a final valuation was not reported for several more months. The appraiser was looking for any situation(s) involving a Cirrus that would be considered “comparable.” He recalled one that was remarkably similar and searched to find the details. An SR22 of the same vintage had been struck in the tail by a truck, undergone similar repairs, and had then been sold. It took some time to track down the details of that sale, but the resulting data was almost impossible to dispute. The NBAA appraisal, factoring in all the above and the damage history, assessed a 40% loss of value! Both parties had gambled by agreeing to accept the NBAA appraisal, but the owners’ patience and perseverance had paid off. Soon after, a single payment was sent to the owners, which covered all repairs, rental costs during their loss of use period, and the decreased value amount (the latter well above the owner’s initial offer of settlement).

Then Versus Now

What has changed since 2012 in how a situation like this might unfold today? Cirrus no longer has the tooling jigs to build major structural components or control surfaces for the G1 series. Today, the same accident would be a total loss event or require those parts to be scavenged from other G1 airframes. There are Cirrus shops that have rebuilt older Cirrus aircraft from conditions far worse than what happened to 278CD. If an owner cannot bring themselves to accept a total loss declaration, most insurance companies will happily negotiate the owner buying back the aircraft as salvage so that they can pursue repairs independently.

In 2012, the airplane still ended up white despite the ‘graphics’ update. Today, we

all see the various paint schemes that are splendid in detail and color!

Loss of value would certainly only apply when a third party is involved (in this case, the Chipmunk). This can be a tricky number to nail down and will likely require expert input from one or more aircraft brokers or assessors. It is critical to get this point in writing early in the process.

In such cases, the owner of the damaged aircraft has every right to seek such compensation, although it may not be openly offered without you advocating for it. No insurance company is likely to pay its own policyholder for loss of value in an accident the policyholder was at fault for.

The ‘single-check’ policy varies among carriers, making it vital that you understand whether they will accept multiple reimbursement requests, and any limitations therein, before finalizing your submission(s). Some may pay the repair shop(s) directly, while most prefer to pay the policyholder only, making it the owner’s responsibility to ensure said shops are paid in full thereafter.

In the end, most owners tend to dote on their aircraft and would be crushed to see it destroyed. But, if something bad does befall your beloved, there will likely be repair options and compensations that might not be easy to see in your hour of grief. Let the smoke clear, your mind quiet and then decide ... and don’t give up until it’s been executed to your satisfaction. ☺

Copyright 2022, Matthew McDaniel
First publication rights granted to the Village Press, for COPA Pilot magazine.

All other rights reserved by copyright holder.