Chapter 461 Newsletter

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Torlon Engine at Forefront of Pilots' Minds

It is more than likely unanimous that the highlight of our April meeting was the talk given by Ernie. John Trent and Ernie both work in Naperville's Amoco Research Center; recent discussions in our group regarding alternative powerplants have led to a search for information on advances in aeromotive engine technology—so it was natural for these two guys to step up to the plate and give us the skinny on just how advanced some of this research really is! Ernie's report centered on the revolutionary new TORLON Engine, with respect to its possible future applications for aircraft. Although the engine discussed and the engine parts exhibited at the meeting are designed and tested within automotive regimes and parameters—using specifications applicable to the automotive industry—the implications are obvious: this powerplant could prove itself in an aeronautical environment almost as easily as it has within the automotive arena, with resultant advantages over more conventional engines using conventional materials. This liquid-cooled, polymer engine, using Amoco's technology in direct materials comparison with aluminum engines:

- was sustained on a dynamometer at 14,200 RPM;
- exhibited lower inertial mass at faster response, and greater residual horsepower due to less friction and parasitic inertial forces;
- ran quieter;
- showed a definite decrease in secondary shaking;
- showed improved fuel consumption figures;
- allowed for a lighter suspension.

By any observer's estimates, this is a breakthrough in technology and a beautifully-performing powerplant. The polymeric components used can be extruded, injection molded or compression molded, and the reduction in weight of the parts now molded in TORLON show bold promise for this engine's appeal in a potentially large aeromotive marketplace. After exhaustive automotive testing has been undertaken,

TORLON

- *Minimal expansion rate and creep*
- *Excellent wear resistance*
- *Able to endure harsh thermal, chemical and stress conditions*
- *Is the highest performing, melt processable plastic in production*

Thunderstorm-related Crash Fatalities on the Rise

Two of the most ominous words found in the pilot's vernacular are *ice* and *thunderstorms*—and the latter get my vote for a timely topic.

From April through September we're inundated with "Chance of thunderstorms" and "Severe turbulence near thunderstorms" during nearly every weather briefing. From my own logbook entries to real-life statistics, hours flown are highest in the thunderstorm season. And of course, this does nothing to minimize the hazard, as the average accident rate is 80 to 90 per year as a result of convective activity. Of that figure, fatalities occur in 65% to 70% of all thunderstorm-related accidents. Overall, thunderstorms account for only 2% of total accidents, but 9% of all fatal accidents.

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Thunderstorms Cont'd

Pilots must keep a close eye on thunderstorms to minimize crashes and fatalities.

The problem is that thunderstorms are deceptive. They'll let you fly near, under and even through them innumerable times with no more than a few pats on the belly, plus a few drive-thru washes with added light show. You land, park, tie down and go home, convinced that thunderstorms are and have been grossly overrated; then, the next time you wind up inside one. . . BAM! Why? Because not all of them are killers, even though many of both the benign and the malignant bear the same marks outwardly. You just can't always tell the difference; therefore, to play it safe, a good rule is never to approach a thunderstorm closer than 20 miles.

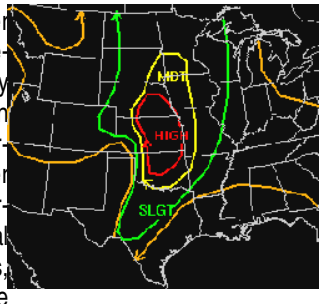
Each time we fly into an area of convective activity we take a risk. But knowing what to look for can greatly decrease the odds of flying into severe thunderstorm areas.

Archie Trammel of the AOPA Air Safety Foundation once said that after spending days talking with the likes of Robert N. Buck, who flew the first storm penetration research missions in the 40s; Jim Cook, who flew for the National Severe Storms Laboratory in the 50s and 60s; and Jerry Kaiser and Perry Deal, who flew recent lightning research missions in F-106 aircraft—he believed that these men had developed a sixth sense about thunderstorms. Archie himself flew many missions to research thunderstorms and airborne weather radar. I don't suppose a sixth sense is essential in dealing with thunderstorms, but knowledge and common sense are.

So what does a pilot need to find out before and during his first flight to ensure safety in the face of so obvious a health hazard? The following will hopefully help you out in answering this question for yourself.

Convective Outlook

First, obtain a report from the National Weather Service called the AC Note. This note outlines forecasts of severe thunderstorms and is prepared by the National Severe Storms Forecast Center in Kansas City. By NWS definition, a severe thunderstorm is one producing gusts of 50 knots or greater on the surface, 3/4 inch or larger hail and/or a tornado. These storms are, of course, the potential killers and should be avoided by at least 10 miles, preferably 20, as mentioned earlier. Non-severe thunderstorms, or those not meeting the above requirements in terrorist activity, can probably be approached more closely. If you should ever penetrate one and you are a calm, proficient instrument pilot, you will come out the other side bruised but still flying.



But if you should penetrate a severe thunderstorm, you will likely become a statistic. The AC Note will tell you where severe storms are most likely to occur.

The AC Note, formally called the Convective Outlook, is a simple message easily copied during a weather briefing. It will always begin with the phrase, "There is a . . .risk of severe thunderstorms to the right of a line. . ." It then lists several geographical locations by station identifier. To use it, just draw a line on your map through the listed stations. It will normally encompass an area; be extremely careful when flying through that area. As a matter of fact, try to go around if you can--find a safer route, just as John and the gang did on their way down to the

Temperature/Dewpoint

You'll no doubt remember your weather lectures during ground school courses and classes for your private pilot and instrument training, and how significantly the temperature/dewpoint spread figures into your flying. Basically stated, when the spread is small, moisture is present in the air and when temp/dewpoint are the same, visible moisture, such as clouds and fog, will be in the area.

Temperature/dewpoint is another place to look for convective activity, since moisture fuels thunderstorms. This subject, by the way, is covered in depth in Dennis Newton's book, SEVERE WEATHER FLYING. If you haven't read this publication and you think you'll be doing the type of flying that will take you into areas of convective activity, I urge you to pick up a copy and digest its contents, especially during this time of year.

During your preflight briefing ask for temps/dewpoints along your entire route of flight and at stations to either side of it. If any station is reporting a dewpoint of 55°F or higher, look out. This tells you that there's a lot of moisture present; if the temp/dewpoint spread at those stations showing 55°F or

Calendar of Events

- **May 20** Carbondale – Ch. 277 Fly-In Breakfast. 618/549-4064
- **May 21** Romeoville—Ch. 15 Annual Pancake Breakfast. 312/735-1353 (> 6 pm)
- **May 21** Mt. Morris—Fly-In Breakfast. 815/734-4320
- **June 2-4** Aurora—Illi-Nines Air Derby. 708/729-1309
- **June 3** Olney— Annual Fly-In Breakfast. 618/393-2967
- **June 4** DeKalb—EAA Ch. 241 Annual Breakfast. 815/286-7818
- **June 4** Lostant—EAA Ch. 948 Breakfast. 815/882-2371
- **June 10-11** Kankakee—AirFest '95. 815/932-5125
- **June 11** Rock Falls —EAA Ch. 410 Fly-In/Drive-In Breakfast. 815/626-0910

What Our Members are Building

In December I had the opportunity to visit Red Launius at his home in Hillside, and see his creation in the making. This is the first *Dragonfly* aircraft I've seen under construction, and it was an education just talking to Red and getting some facts about this great design. During the earlier years of the 2-place *Quickie*-types, the majority of industry hype seemed to be aimed at the Tom Jewett-Gene Sheehan-Garry LeGare design, the *Q2*. Concurrent with that ship's design and creation, Bob Walters of Viking Aircraft introduced his version of the 2-place Quickie which he named the *Dragonfly*. Soon thereafter, Bob and his wife, Ching, sold the concern to Rex Taylor, whose *HAPI Engines, Inc.* of Eloy, Arizona, had gained a reputable name for itself. Since then, the *Dragonfly* has seemed to gain wider recognition than the Q2 and its big brother, the *Q-200*, with the obvious exception of Gene Sheehan's participation in the CAFE Races. Be that as it may, *Dragonfly* has undergone some modifications and gained some options (such as the tri-gear and conventional-gear mods), and offers a full-blown builder support program under the direction of Rex Taylor. Rex has done his homework, and after seeing the ship in Red's garage a few weeks ago, I'm convinced that this bird will be beautiful, fast and comfortable.

When I arrived, I saw the Dragonfly fuselage, complete with bulkheads, resting on a pair of sawhorses. Not without a bit of humor, Red told me that he'd already crashed the plane, explaining in detail how it had slipped from its perch but was, thankfully, none the worse for wear. Red explained that the main wings and canard were also complete, but I didn't get a chance to see them because they're secured behind the garage, out of sight. The cockpit area is almost 44" or about as wide as the cockpit of a Cessna Skyhawk, so there will be no cramped pilot/ passenger scenarios in this airplane. Red then showed me the instrument panel layout he designed, and intends this to be a fully-instrumented, capable IFR platform. As a matter of fact, one of the radios he installed is the RST marker beacon receiver I constructed, tested and later sold to him. Red also intends on obtaining a good amount of instrument refresher time, plus an IFR competency check, once he's finished wringing out his aircraft during its FAA-mandated, 44-hour test period. The airplane has been found to be as stable an instrument ship as could be had for this size and configuration, notwithstanding the painstaking weight considerations during and after the building process that Red has to take into account.

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