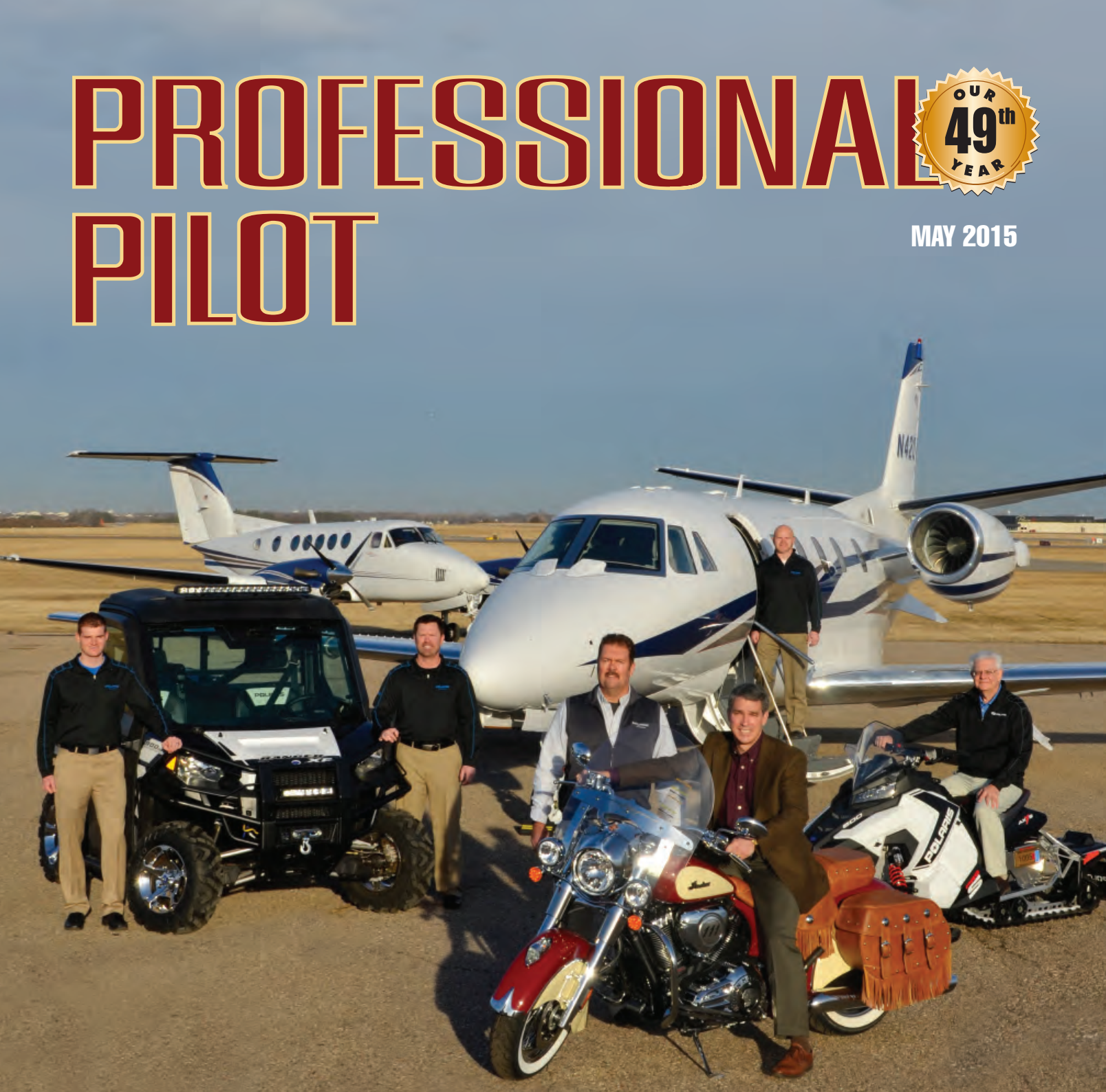
PROFESSIONAL PILOT

OUR 49th YEAR

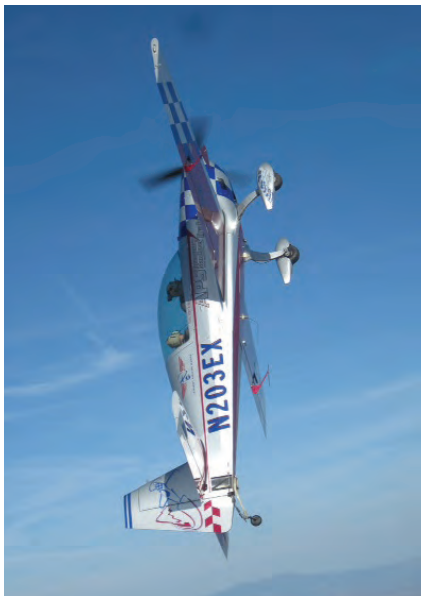
MAY 2015



POLARIS®

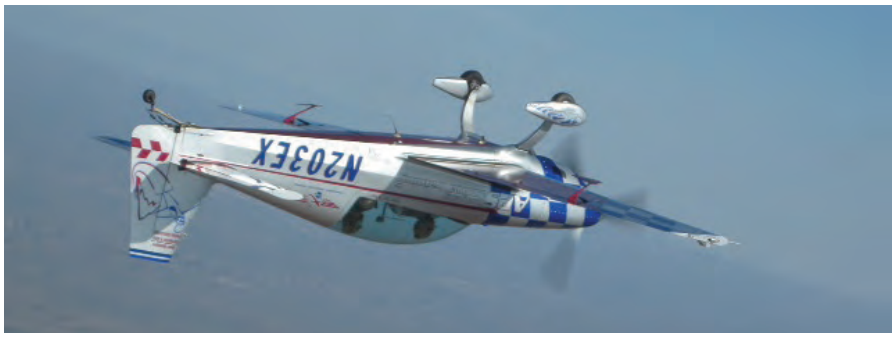
Polaris Industries operates a Citation XLS+ and 2 King Air B200s from FCM (Flying Cloud, Minneapolis) in support of its powersports vehicle business, featuring off-road vehicles, motorcycles and snowmobiles. (L–R) King Air Captains Griffin Gary and Chad Sheehan, Director of Operations & Chief Pilot Brian R Barber, Chairman & CEO Scott Wine, Senior Captain Tim Howard and Travel Mgr Jeff Schwaegerl.

PRASE winners & EBACE convention



UPRT at APS

Very thorough course includes training by highly qualified instructors in Extra 300 aerobatic aircraft topped off by recoveries done under a hood and finally augmented by sim use.



Fear of unusual attitudes can debilitate a pilot if he unexpectedly finds his aircraft has been upset. Quality UPRT training will alleviate that fear since it prepares you to successfully manage and overcome the emotions associated with these adverse situations.

By Don Witt
ATP. Learjet series, Airbus A320, Boeing 737, Boeing 757/767

Fellow bizjet pilots had given me rave reviews before I arrived at Aviation Performance Solutions in December to sample their Upset Prevention and Recovery Training (UPRT) course. There are 2 aspects to UPRT: *What to teach* and *How to teach it*. The 2nd is the more difficult.

Control inputs necessary to recover from any upset attitude are well known to the aerobatic, UPRT and fighter pilot community. The best way to teach them to apprehensive neophytes in a short period of time is another matter entirely. Not just any all-attitude instructor can properly teach efficient and effective upset recoveries to a transport category pilot.

Raves about APS were not about the equipment (they use an Extra 300Ls) or the maneuvers (Weee). They were about the quality of the instruction. Several pilots from my former flight department had put it the same way to me: "This was the best instruction I ever got!" I see why. APS created a very well thought out syllabus and they know how to execute it well.

Standardized syllabus from expert instructors

APS instructors have rich resumes. Those I worked with had flight experience from 3 very different disciplines: As military fighter pilots, as airline or 135 pilots, and civilian aerobatics. Each was a Master CFI Aerobatic. As APS instructors, they had to learn the flight syllabus and the academic instruction guidance "to a T."

A classroom PowerPoint presentation precedes each flight lesson. APS instructors do not specialize in just academics or flight—they do both. An APS flight instructor will present the classroom session that precedes each of your flights.

APS President Paul "BJ" Ransbury wanted me to see as many of his instructors as possible so I flew with 3 of them: Scott "Bonsai" Deiringer, Marty "JD" McDonough, and Karl ''Schlimmer" Schlimm. These instructors were consistently expert and skilled and, just as important, they're positive and supportive.

Let me put it this way: Walking out to the ramp with each of these fellows did not feel like going to be evaluated and stressed. I felt very relaxed and I anticipated fun! And why not enjoy this flight? Acceleration for takeoff with the 300 hp Lycoming powering the sprightly Extra felt like that of a 20 series Learjet with half fuel and empty of passengers! And you'll probably never fly a civilian aircraft more responsive than the Extra.

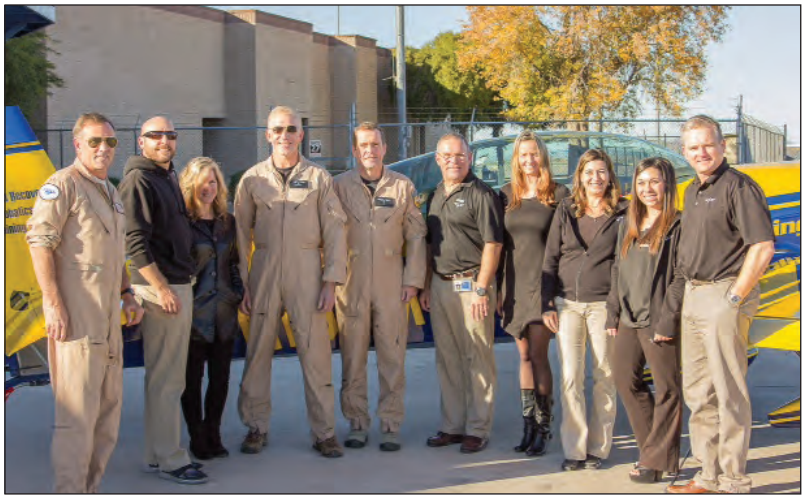
APS instruction is very standardized. I received exactly the same takeoff briefing from each of the 3 instructors and when the syllabus repeated a particular maneuver on a subsequent flight, it was introduced in exactly the same way and flown to almost exactly the same attitudes and speeds.

Strategy of Push, Roll, Power, Stabilize

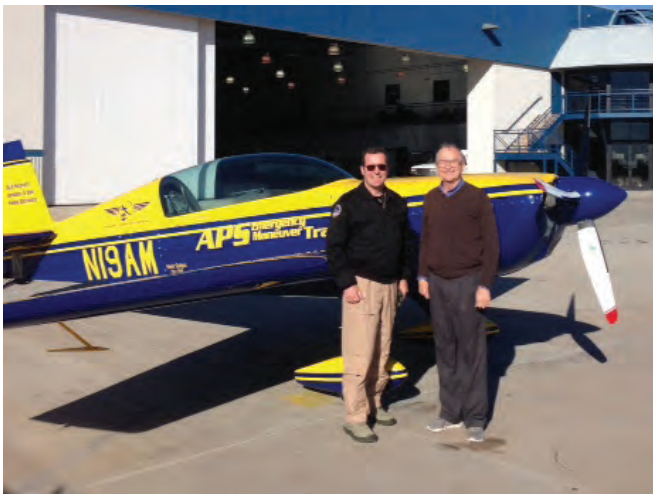
APS has spent a great deal of time developing its product. Length of a UPRT course is generally constrained to just a few days, and so APS has worked hard to efficiently convey understanding and recovery skills to clients in minimal time.

APS has also worked to keep their syllabus aligned with the several guidance documents that exist now worldwide such as FAA's *Airplane Upset Recovery Training Aid* (AURTA) and the new ICAO *Manual on Upset Recovery Training*. APS was a member of ICATEE, the International Committee for Aviation Training in Extended Envelopes when it laid the groundwork for the ICAO upset manual, and has been at the forefront of many industry UPRT working groups.

Is it possible to reduce upset recovery to a few simple steps? Being in the business a long time, APS has evolved their training to what is called a "strategy" of upset recovery, the All Attitude Upset Recovery Strategy" (AAURS). This strategy consists of a sequence of 4 steps: Push, Roll, Power and Stabilize. This is a strategy which directs our attention



From the front desk to ground crew to flight instructors to President Paul Ransbury (far right), APS personnel are uniformly friendly, extremely helpful and very competent.



APS Flight Instructor Marty McDonough and author Don Witt get ready to enjoy another lesson in the Extra 300.

to what needs to be addressed, and when (there is an alternate strategy for such cases as extreme nose high upsets in aircraft with underwing mounted engines such as a Boeing or Airbus airliners).

For example, if UPSET, we start the recovery with PUSH. And this PUSH means enough of a forward push on the controls get to about 1/2 G, or just to get light in your seat, but not to a negative G that would float loose items or potentially reek havoc with fuel, hydraulic systems and passengers. We push whether we are nose high or nose low, right side up or inverted. How we execute the push varies. The "push" may mean pushing forward on the stick or yoke, or just releasing back pressure. It could also mean pushing vigorously and running trim nose down. It all depends on the aircraft you would be flying and the circumstances.

The strategy directs the attention to what needs to be addressed in a particular sequence. It does not specifically tell you what to do. Take for example the 3rd step, the POWER step, where you may need full throttle if you are nose high, or reduced power if nose high at low airspeed in a Boeing 737 with its underwing mounted engines. Specifics of what to do are learned in the classroom and in the aircraft. This "strategy" idea sounded suspect to me when I first read about it. But it became clear to me during the actual training that it works well for a pilot new to UPRT.

APS is big on the "Say, then Do" method. Each step of the strategy is done separately and in order. First the pilot says it aloud (PUSH! for example) and then he does it (meaning he pushes the stick forward.) When that is done he goes to the next step and says that word out loud (ROLL) and then he rolls his wings level... and so on. This naturally takes a little time. The Extra aircraft are very strong (+/-8 Gs with 2 pilots) and it has high limit speeds (Va 158, Vne 220 kts). That means you can relax and have plenty of time to execute recoveries. There is time to gain a clear understanding of what you are doing without being rushed. During the APS flights you will say and do the PUSH, ROLL, POWER and STABILIZE steps over and over. In fact, a training pilot is told to repeat that mantra over and over 300 times before even showing up at APS. Why? Because fear can instantaneously drive human arousal to such a level that fine motor skills break down. "Too scared to think" is a colloquial description of that.

Reducing fear of upset

UPRT providers will tell you that many client pilots come to upset training in a very apprehensive state of mind. Although APS teaches to your airplane's specific G and performance capabilities, the Extra 300 G limitation with 2 pilots on board is +/-8 Gs and its wing spar went to more than 3 times beyond that before the test rig itself failed! You're not going to break it.

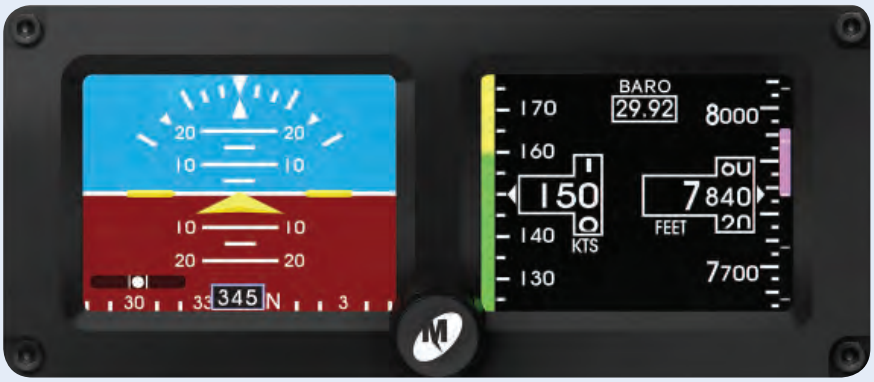
If a typical CFI, for example, is unsure of himself or of a particular maneuver (spins?), he may signal that to his client in a number of ways, staying on the controls when the client is flying, conveying tension or even anger in his voice (his fear escaping as anger). You won't get any of that at APS. Instructors keep a calm and informative commentary going while they—or you—maneuver. The confident and cheerful delivery of an APS instructor is likely to be contagious.

In Phoenix-Mesa (IWA), the UPRT practice area is east of the airport in the lee of the Superstition mountains. Airline traffic into the Phoenix area generally passes high above to clear the Superstitions. The Extras have an ACAS displaying in the back (instructor's) cockpit to help locate collision hazards. All told, this is as safe and comfortable as UPRT is likely to get.

But if you are indeed one of the fearful, join the club. Eddie Rickenbacker, the ace of aces, had been a racecar driver and at first he was afraid to fly at all—even as he risked his life regularly in the (then) truly deadly sport of auto racing. Bear in mind that an aircraft upset is a situation where your own fear can actually kill you with a panicked, incorrect reaction, or no reaction at all if you freeze up. If your fear keeps you from attending the very training that would cure it, then it threatens you twice over, doesn't it?

Spins and spin recovery

In the last Extra flight you make with your instructor, spins are addressed. The APS syllabus is flexible and can be completed without training in spins if there is a good reason. But even pilots of Part 25, or spin resistant Part 23 aircraft, will greatly benefit from it. Part 25 aircraft can certain-



APS uses Mid-Continent MD302 SAM (Standby Attitude Module). To recover from an upset in IMC it goes without saying you should have an ADI that functions thru 360° of both pitch and roll, accurately and with little lag. The MD302 SAM installed in APS front cockpits fits the bill. Passing thru 90° of pitch nose up or nose down it will roll 180° as most ADIs will, in order to come down or go up the other side. After that rotation it stabilizes in about 1 or 2 seconds. This 180° roll of the display could be interpreted as a gyro tumble if you didn't know it was coming, but it is common to most 360° pitch and roll capable ADIs.

ly spin. They are just not required to demonstrate a recovery! The emphasis at APS is spin awareness training to further motivate pilots to not end up in the spin through timely and effective stall prevention and recovery.

Spin recovery is again taught using the "Say, then Do" method. For recovery from a developed spin, the APS strategy uses the PARE acronym for the NASA standard spin recovery as described by Rich Stowell in his text *Stall/Spin Awareness*. P stands for Power (idle), A for Aileron (neutral), R for Rudder (hard against the spin), and E for Elevator (forward thru neutral). Again, each of these steps is done 1 at a time—first spoken, then done—then the next one and so on. Although the recommended spin technique can vary from airplane to airplane, the PARE technique is a proven strategy. APS recommends following the aircraft manufacturer's recommended technique while implementing a disciplined and purposeful approach to its application.

Doing the recovery maneuvers under the hood

Whether or not spins are flown in the last flight lesson, the client pilot will fly the other maneuvers previously flown in lessons 1 through 3 over again, this time under the hood—which is Foggles. I found it difficult to make the Foggles work well with my prescription trifocals (yes, I'm old). Just focusing on the instruments worked.

The instruments available to you in the front cockpit consist of a Mid-Continent SAM mini standby EFIS. APS found the Mid-Continent SAM works just great. It shows very little lag—if any—in the super rapid rolls the Extra is capable of. During spins it will tumble after 3 or 4 rotations but erects itself post haste. It has everything you need in a very clever package and includes a good slip indicator. The slip indicator is necessary because the skidding and slipping turn departures into a post stall gyration are repeated under the hood.

Many APS clients say the skidding turn stall demonstration (from controlled flight) was the most valuable experience of the entire course. It certainly demonstrates that a skid is not the way to tighten a turn to final, as a skidding airplane departs from a stall with a rapid roll to the inside (downhill) part of the turn. The other big trouble from the skid is that the downhill rudder application holds the nose down on the horizon so that the pitch attitude does not look steep, even when the angle of attack is! Many pilots have a habit of skidding the final turn, which is a very dangerous habit.

Sim for CRM and close-to-ground

In the standard APS syllabus, the last flight is flown in a simulator. The sim currently used in Phoenix is a Citation 550. At the Dallas APS location there's a Boeing 737NG, a CRJ, and a Nextant 400XT simulator—each available for this flight. APS Europe primarily integrates the Boeing 737NG. I and Eric Jungck, a Falcon 50 chief pilot, flew the Citation simulator session along with Instructor Karl Schlimm. One of the reasons for using the simulator is to practice crew coordination and CRM during upsets. The other advantage of the sim is that its control forces are heavier, so roll and pitch rates are closer to those of the aircraft a client will actually fly. We practiced scenarios where each pilot performed as he should. We also practiced scenarios where the PNF must take control of the aircraft from the PF during an upset because the PF is either frozen or doing the wrong things. It was an eye opener.

Fear is the biggest roadblock to successful recovery from an actual upset. That's why training in actual aircraft is so important, since it is the only way to reduce the fear of extreme attitudes.

However, the simulator can play a part in the reduction of this potentially immobilizing fear that the aircraft cannot. That is by introducing wake turbulence upsets close to the ground, something that absolutely would never be done during UPRT sessions in a real aircraft. Both the aircraft and the sim can work together to prepare a pilot to do his best if the worst happens.

It was interesting to me that our APS sim instructor, Schlimmer, made liberal use of the simulator "freeze" function to allow us time to observe and to think about what was happening at various stages of an upset. Obviously you can't do that in the Extra. During simulator sessions in typical initial or recurrent PIC bizjet 142 school training sessions, "freeze" is seldom used as it is strongly discouraged by the FAA. In fact, the FAA prohibits its use during simulator ATP or Type checkrides. FAA feels that realism is compromised by use of such sim tools as "freeze" and "reset." Maybe so, but in our upset training, freezing the simulator was very useful tool! Like our previous aircraft training, our sim training once again showed just how well thought out and effective the APS syllabus is. They are certainly a leader in UPRT.

Don Witt was a USAF F-4 pilot and holds a DFC. He is a retired B767 and A320 United captain and former safety manager for a large corporate flight department. He is presently a Learjet instructor and has been a long time aerobatic instructor.