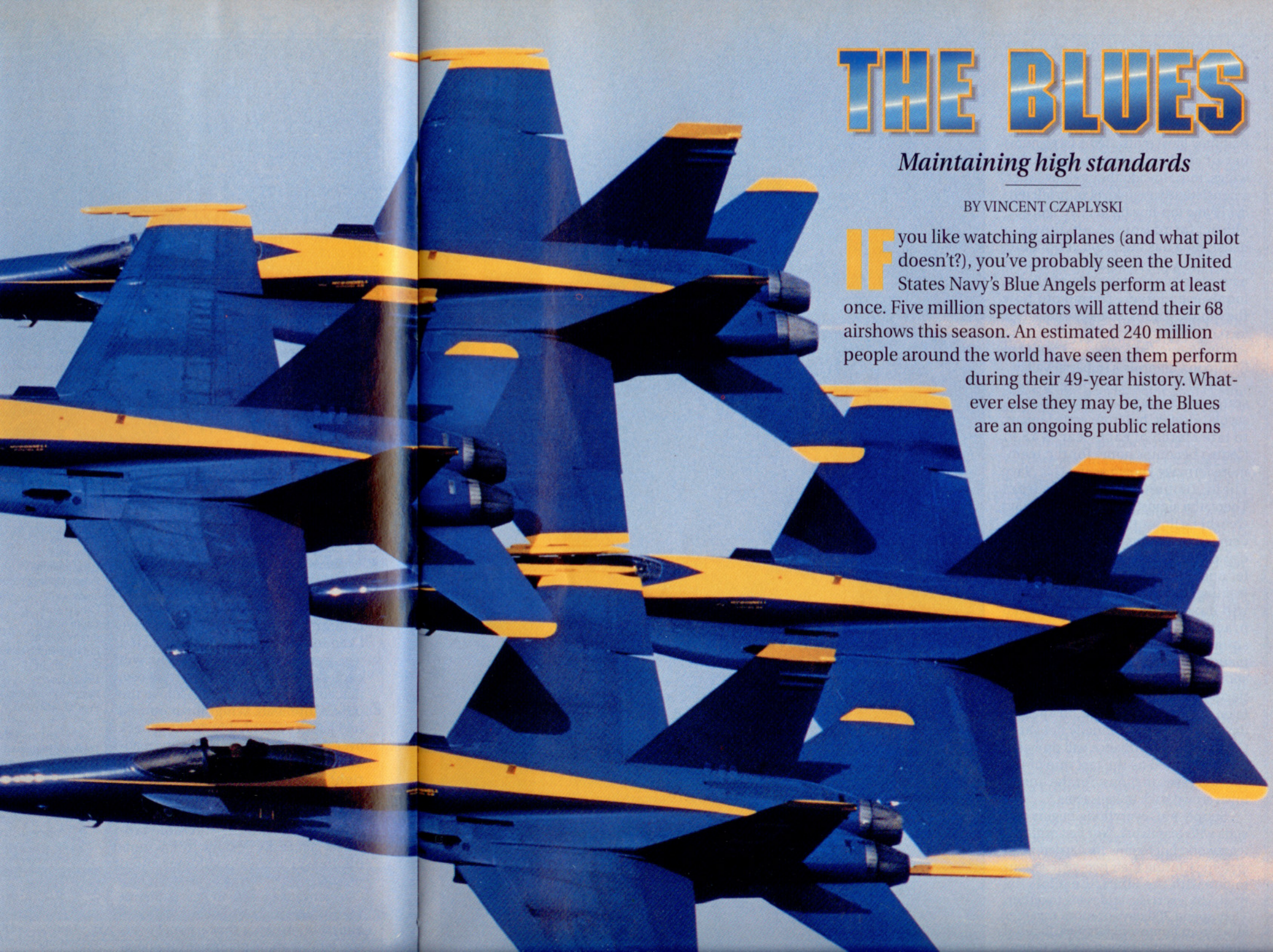

# THE BLUES

## *Maintaining high standards*

BY VINCENT CZAPLYSKI

IF you like watching airplanes (and what pilot doesn't?), you've probably seen the United States Navy's Blue Angels perform at least once. Five million spectators will attend their 68 airshows this season. An estimated 240 million people around the world have seen them perform during their 49-year history. Whatever else they may be, the Blues are an ongoing public relations

tions success story for the Navy, their primary peacetime mission being to attract future naval aviators. While the team's performances have done exactly that for Uncle Sam, it's a fair bet that they have motivated a large number of civilian pilots to earn their wings, too. How do they achieve such a consistently high level of proficiency? Flying top-line fighters in tight aerobatic formation is obviously a demanding business. And considering that each year a certain number of new pilots join the team, the challenge looms even larger. To find out how they make it look so easy year after year, *Pilot* visited the Blues during winter training at Naval Air Facility El Centro in California's Imperial Valley.

The Blue Angels are permanently stationed at Naval Air Station Pensacola, Florida, but from early January to late March of each year, NAF El Centro becomes home for the team, more formally known as the U.S. Navy Flight Demonstration Squadron. There, the almost always perfect flying weather allows them to carry out a demanding training schedule. Twice a day, six days a week, the Blues practice for opening day. By the end of winter training, the six demonstration pilots will have flown a minimum of 120 practice airshows. The rest of the squadron, numbering nearly 100 maintenance and other support personnel, also will have rehearsed their parts over and over. When the new team debuts for the public on opening day, at a show traditionally held at El Centro, the performance will probably be as polished as the last one of the previous season, flown for the hometown crowd back in Pensacola.

Simply put, everything begins and ends with teamwork. Not just ordinary teamwork, but teamwork carried to an extreme. During their two-year assignments with the Blues, the pilots fly, brief, eat, exercise, and relax together. They spend 300 days or more together away from home and families, focused almost continuously on trying to perfect what they do. They critique each flight in minute detail, openly discussing every mistake, without regard to rank or ego. This intense regimen is intended to forge the close individual bonds that, in turn, make for a powerful team synergy.

The team approach carries to everything, from deciding which maneuvers to fly at an airshow to


*A day at the office for the Blue Angels consists of maintaining position a few feet from teammates while hanging from the seat harness (above). Performances are well-rehearsed (below). Solo performers demonstrate the capabilities of the F/A–18.*

PHOTO BY MIKE FIZER


selecting replacement pilots for departing team members. For the simple reason that they are in the best position to know what the job demands, the Blues choose their own replacements from the hundreds of Marine and naval aviators who volunteer each year. A candidate must receive a unanimous vote of approval from all 16 squadron officers; otherwise, he is turned down. To be a contender, one needs to be a career-oriented pilot with at least 1,500 hours of tactical jet experience and qualified to land on aircraft carriers. The typical résumé of this year's team reveals closer to 2,500 hours of fighter time and 300 or so carrier landings. Most have 10 years or more with the military. The strict application process ensures that replacement pilots come on board from day one with extremely strong credentials, another key to maintaining team consistency.

There are three distinct aircraft elements that make up a Blue Angels flight demonstration. The core is the four-ship Diamond formation, led by the flight leader (traditionally known as "the Boss"), flying aircraft number 1. He is joined by the right and left wingmen, in aircraft 2 and 3 respectively, and the slot pilot in aircraft number 4. Airplanes in the Diamond formation perform a variety of close-formation precision maneuvers. The lead solo, flying aircraft 5—and the opposing solo in aircraft 6—show off the high performance characteristics of the McDonnell Douglas F/A–18 Hornet. All six aircraft join up at times to form the Delta formation, the third basic show element.

To ground-bound spectators, the Diamond appears to be four aircraft and pilots flying as one. To achieve that look, however, each pilot in the Diamond performs a distinctly different function. The boss is tasked with flying every maneuver as exactly and consistently as possible. He is the team metronome, the standard that the other pilots aim to replicate. He must fly the same way today as he did yesterday and the day before. When he calls "adding power now," the others know from experience exactly how far he will move the throttles on the "n" in "now," and they do the same. When he turns, climbs, or increases Gs, he announces each change in the same measured, chant-like way, and the others strive to do likewise at the


same instant. In this way, the formation responds as a single entity. If the other pilots simply waited for the boss to make a change before following, the Diamond would be marred by a ripple effect as it maneuvered. The boss comes to the team with the most overall experience, often having double the flight time of the other pilots.

The right wingman's job is to set the separation standards for the formation, based on existing conditions. Ideally the Diamond is flown at a wingtip-to-canopy separation of just 36 inches. However, turbulence or other factors may require a looser formation, and it is Blue Angel 2's job to decide what that will be on each flight. By tradition, this position is held by the team's lone Marine Corps pilot.

Blue Angel 3, the left wingman, sets the balance for the formation. He must exactly match whatever separation distance the right wingman has set for the Diamond, thus assuring a symmetrical look to the formation.

The slot pilot, tucked in behind the boss, and sandwiched between 2 and 3, has some special responsibilities. According to this year's team narrator, Lt. Ryan Scholl, "Blue Angel 4 sees a lot of things from the slot that the others can't. He looks through the boss and watches for the ground. He can see the solo aircraft at times, and how well the formation is holding. While everyone has a say in the kind of show we'll do that day, he's the first one to decide 'this is what we're going to do.' He's the backup man, the team safety observer, so to speak." Because he can see the rest of the formation, he acts as a second pair of eyes for the boss—who, for the most part, never sees the other aircraft close behind him. The slot pilot also helps the boss scan for the visual checkpoints that mark maneuver boundaries.

***The Blues follow a highly ordered rotation of pilots from year to year, a key to their consistency.***

*The Blue Angels' two solo airplanes are photographed exactly as they cross in a head-on, opposing maneuver.*

Meanwhile, back on the ground, Blue Angel 7 announces the show for the crowd. The narrator is the only pilot who gets to serve three years with the Blues. After a year as narrator, he moves into one of the flight demonstration positions vacated by an outgoing team member. Blue Angel 8, the event coordinator, is charged with handling the logistics of each airshow. He remains event coordinator during his time with the team.

The Blues follow a highly ordered rotation of pilots from year to year, another key factor in maintaining consistency. "We never change out more than 50 percent of the Diamond or Delta from one year to the next," says Scholl. "Every two years, the boss changes; and in alternate years, number 3 moves to the slot. The opposing solo becomes the lead solo in his sec-

ond year." The remaining open positions are filled by pilots new to the team. The resulting lineup makes maximum use of team experience from year to year, which helps replacements get up to speed more quickly.

But no matter how the deck is reshuffled, each year's team is different from any before it. Winter training is the crucible where the newest mix of individuals must learn to become more than just the sum of their talents, and there are no shortcuts to getting there. A typical day starts at 5:30 a.m., when the maintenance crew begins preflighting the aircraft. The pilots hold their first preflight briefing soon thereafter, and by 7:45 the first practice airshow begins. A detailed debriefing follows, and the process repeats for the second flight of the day, which launches at noon. Practices commence in January with comfortably wide separation margins, and maneuvers gradually edge closer together and lower to the ground as pilot confidence levels grow. Although the Hornet is chock full of high-tech

avionics, the Blues perform all maneuvers visually, referencing checkpoints and timing as needed. It is through such old-fashioned pilotage skills that maneuvers like the Six Plane Cross—where all aircraft converge simultaneously from different directions over the show center point—are possible.

According to one former Blue Angel, winter training is decidedly stressful at times. When rough spots are encountered, as they inevitably are some days, he says, the pilots need to recognize what the problems are, address them objectively, and move on. Scholl echoes that sentiment. "Nobody holds back in the debriefs. We go around the table, and everyone—the ground observers, the pilots—all are free to bring up 'safeties,' anything that wasn't performed to our standards. When you've spoken your piece, by tradition you finish up by saying, 'I can fix that, boss, and I'm glad to be here.'"

Marine Corps Capt. Ben Hancock, this year's right wingman, underscores the importance of this and other kinds of team self-help. "Sometimes you can hear in a guy's voice over the radio that he's feeling down on himself. Maybe he didn't fly a maneuver as well as he wanted to. You try to say something positive to get him right back into it. We all help each other in any way we can."

During our visit to El Centro, the Blues were less than a month away from opening day and obviously hustling to be ready. The first training session was treated exactly as if a large summertime crowd were in attendance. In reality, there were only a few former Blue Angels (known simply as "ex's") and several other observers on the tarmac. Narrator Scholl announced the show over an industrial-strength public address system, while in the nearby communications booth, the team's official observers videotaped the proceedings for the next debriefing. The left wingman happened to be grounded by a cold; but otherwise, everyone was in place to put on an airshow.


***By tradition you finish up by saying, 'I can fix that, boss, and I'm glad to be here.'***

*After a show, the Blue Angels autograph programs and other memorabilia for enthusiastic fans.*

PHOTO BY MIKE FIZER

Because the flying weather was excellent, the Blues flew what they call their "high show." This includes a variety of vertical maneuvers that can't be performed when cloud decks hover too low over a show site. Weather minimums for a high show are an 8,000-foot ceiling and three miles visibility. The team has two other standard show types—a "low" show and a "flat" show. A low show is called for when conditions drop to 3,500 feet and three miles. At 1,000 feet and three miles—absolute minimum weather conditions to put on a flight demonstration— the only option short of canceling is a flat show.

Earlier, Scholl had described for us exactly what goes on in the cockpits as the Blues begin their trademark high show opener, the Diamond Loop on Takeoff. "The boss calls for power to 85 percent and waits for a thumbs up from each of the others to verify that everyone's power is within limits. Then he says, 'Smoke on; off brakes now; burner ready now.' At the burner stop, he announces, 'Power set,' and by then they are rolling."

The four aircraft, in a line-abreast formation, lift off. Immediately, Blue Angel 4 slides into the slot position,

while the wingmen tuck in close alongside the boss. When the slot pilot sees that the Diamond is complete, he calls, "Gear, flaps up." All gear and flap movements must occur simultaneously in order for the formation to hold, and only the slot pilot is in position to make that call.

With speed building rapidly in afterburner, the boss begins the loop entry at 270 knots with the words, "Comes the pull." The rest of the Diamond follows, the pilots in lockstep with the boss. According to Scholl, the wingmen and the slot pilot are now flying by reference to "visual gouges," paint details and markings on adjacent aircraft that they must maintain in certain positions. "The aircraft are meticulously painted for this reason, so that the markings are exactly the same distance apart on each one," says Scholl. The pilots rest their forearms on their thighs to steady each control stick better. Stick forces are preset to a forward trim pressure of about 35 pounds, which allows the pilots to make more precise control inputs than would a neutral trim setting, especially during high G loads. (The Blues don't wear G suits, because the suit's constant inflation and deflation could cause small, unintentional stick movements, a big problem when flying in such close formation.)

As the Diamond passes the vertical, the boss calls "Burner ready now," and throttles are simultaneously reduced from afterburner to the military power detent. With burners off, the smoke trails appear, tracing the loop for the spectators. Until now, the afterburners have superheated the smoke-producing oil sprayed in the number one engine exhausts, causing it to burn invisibly. As the Diamond comes over the top, 7,000 feet above the crowd, the boss calls "Easing power," and the throttles are further retarded. He makes several more power reduction calls, then announces "Comes the pull," as he increases G loading again to round out the loop over the runway. The maneuver completed, the Diamond moves off behind the crowd as the solo aircraft lift off.

The practice began with the Diamond Loop on Takeoff, flown just as Scholl had described it. For the next 45 minutes, the Blues went through their paces. All too soon the six aircraft touched down and the team was off to the debriefing. For me, the perfor-

mance had generated the same thrill a Blue Angels flight demonstration always does. But for the Blues it was time to sweat the little details and figure how to make them better. In Scholl's words, "The Blue Angels have never put on the perfect show, and we probably never will. But we keep trying."

If you haven't seen them lately, check out the Blues soon. And bring along a non-flying friend. Who knows? If a flying tour with the Navy doesn't strike his or her fancy, maybe learning to fly the general aviation way will. □

# VERY IMPORTANT PILOT

One of the ways that the Blue Angels carry out their mission of attracting new naval aviators is through the squadron's VIP Orientation Ride program. Three times a week during winter training, and three times during each show weekend, the team's narrator takes some lucky individual along for a ride in Blue Angel number 7, the two-seat version of the McDonnell Douglas F/A–18B Hornet. To qualify as a Very Important Person, one must be a well-known celebrity or, lacking the required notoriety, a media representative—the category I fell into. The Navy figures that enthralled back-seaters will relate the flight experience to others, some of whom might pursue the idea of flying hot fighters for a living. Fair enough.

My ride was preceded by a detailed safety briefing, given by Sgt. James Driscoll, crew chief for the Blues. He began by handing me a release form, intended to relieve the Navy of liability, should things go awry. I considered the document's implications carefully—for about a nanosecond—before signing. Next, he described the cockpit and the preflight checks and flight maneuvers that the pilot, Lt. Ryan Scholl (call sign "Doc"), would probably perform. He then coached me on the "hook." This is a technique in which one tightens the muscles of the abdomen and grunts "hoooo-ka" aloud when pulling Gs. It helps keep blood flowing to the brain and mitigates the adverse effects of excessive G forces, such as tunnel vision and loss of consciousness. Loops can reach 7.5 Gs during some of the team's more aggressive maneuvers, so a good command of the hook technique is an essential safety tool. He concluded with a rundown on the aircraft's Martin-Baker ejection seat and what I could expect, should its use be required.

Minutes later, Driscoll was strapping me into the F/A–18B's nine-point safety harness as Scholl settled into the front seat. During engine start and taxi out, Scholl gave me a thumbnail sketch of the aircraft's control systems and cockpit layout. The Hornet has a glass cockpit, with all essential flight instruments and systems indications displayed on three Digital Data Indicators, or DDIs. Critical flight information is repeated on a head up display for the front seater. All aircraft and weapon system controls are located on the stick and throttle. This arrangement allows the pilot to fly by using the "hands on throttle and stick" method, never taking his or her eyes away from the action outside the cockpit.

The ATIS was reporting the temperature as 84 sunny degrees. Although the cockpit is pressurized and air conditioned, I was already sweating from the greenhouse effect under the canopy as Scholl took the runway. Our first maneuver, he explained, would be a "low transition takeoff to a high performance climb." He pushed up the throttles, engaged the afterburner, and released the brakes. Acceleration was extremely rapid, with rotation occurring at 130 knots. Scholl leveled at 30 feet and brought up the gear. Reaching 270 knots a few seconds later, he called, "Steady, steady, pull." On "pull" he rotated to the vertical and, as rehearsed, I performed the hook maneuver during the sudden but momentary increase to 4.5 Gs. A few seconds later, Scholl rolled into a wingover at 4,000 feet, directly above the departure end of the runway, and we were on our way to the practice area 30 miles to the east.

*U.S. Navy Lt. Ryan Scholl (left) and the author prior to a VIP orientation ride aboard a Blue Angels F/A–18B. Sustained inverted flight and a negative pullot nearly led to a power yawn.*

Scholl prefers to progress from low-G maneuvers to more demanding ones during VIP rides, to gauge his guest's tolerance to aerobatics. We therefore began our series with a simple pair of wingovers, flown at 350 knots from 1,000 feet over an airstrip. Next up was a slow roll, a maneuver flown by the four-ship Diamond formation at all shows. Scholl approached the runway at 400 knots, turned on the smoke, and began rolling. We reached the inverted position exactly over the show center point, right in front of our imaginary audience. Since I showed no ill effects from the benign 2 to 2.5 Gs pulled in these first maneuvers, Scholl set us up for something stronger. He began with a constant 4-G turn, giving me a chance to practice the hook technique again. Satisfied that I was still enjoying myself, he aligned the aircraft over the runway center line and began a loop. In the Hornet, this consumes about 7,000 feet of altitude and reaches 4 Gs during entry and pullout. An Immelman, and then a split S, followed in short order. Next came some sustained inverted flight, ending with a negative-G pullout. This last was hands down the most uncomfortable sensation of the flight.

VIPs so inclined are usually invited to try their hand at flying, an offer I eagerly accepted. After a series of aileron rolls, steep turns, and my version of a loop ("... a combination loop and tactical split S. . ." as Scholl later described it), we headed back to NAF El Centro. By now I was noticing a troubling nauseous feeling that wasn't going away, despite my best mind-over-matter efforts. I reluctantly reached for the sick sack but then remembered the video camera that was recording my reactions to the entire flight. No, I will not power-yawn on camera, I told myself, and the thought of family and friends watching the replay seemed to do the trick.

Climbing out of the cockpit, I was drenched with sweat and feeling pretty tired. In a little less than an hour I had experienced the airplane ride of a lifetime, witnessing a whole different side of flying. I was most surprised by what hard work it is. —*VC*