THE NAVAL SAFETY CENTER'S AVIATION MAGAZINE

approach

May 2003

Things That Go Bump in the Night

When Is Bingo, Bingo?

approach

The Naval Safety Center's Aviation Magazine

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On the Cover	A KC-130 with VMGR-152 flies over Iwo Jima. Photo by Cpl. Glen R. Springstead.
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Mission Statement

Mishaps waste our time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness.

This magazine's goal is to help make sure that personnel can devote their time and energy to the mission, and that any losses are due to enemy action, not to our own errors, shortcuts or failure to manage risk.

We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous enough; the time to learn to do a job right is before combat starts.

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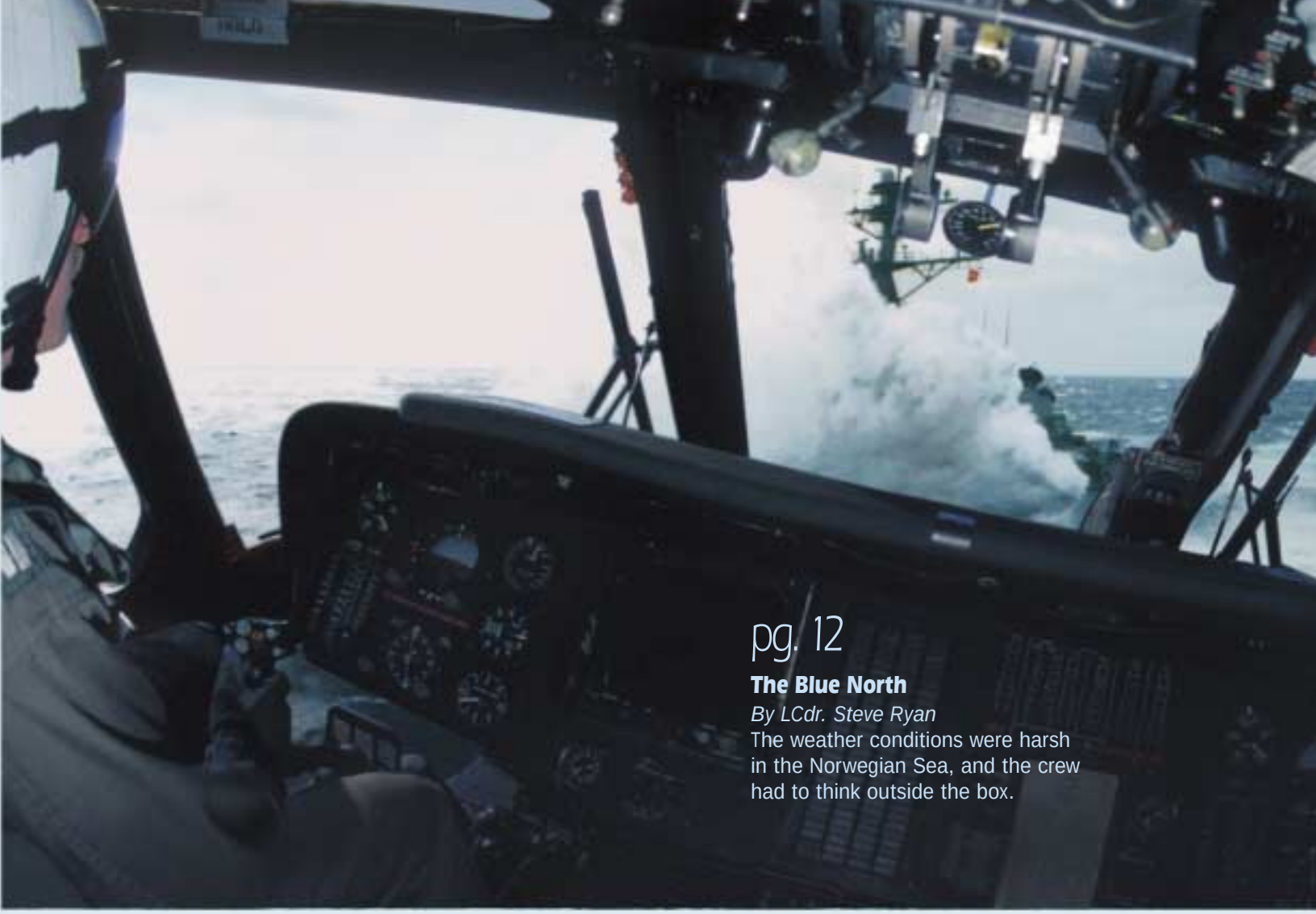
Features



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The Blue North
By LCdr. Steve Ryan
The weather conditions were harsh in the Norwegian Sea, and the crew had to think outside the box.

Departments

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May Thanks

Thanks for helping with this issue…

Capt. Matthew McGrath, VMGR-152
LCdr. Paul Olin, VFA-113
ADCS Gary Dille, NAS Corpus Christi
Lt. David Person, HSL-48
LCdr. Willard Burney, VF-2
LCdr. Rick Timms, VT-9
LCdr. Will Powers, VFA-37

By 1stLt. Timothy Humphreys, USMC

It was my first true cross-country, and I never had been to the West Coast before, let alone San Diego. So, when I was offered the opportunity to fly to Miramar for my airways navigation cross-country, I jumped at the chance. It was a glorious weekend: sun, surf, sand, and friends I had not seen in who knows how long. I doubt any cross-country could have been scripted any better. Despite it being Friday the 13th, we arrived safely and on time, and everything went well until we decided to come home.

After a weekend of relaxation, my IP and I arrived at MCAS Miramar base ops at 0900, with a plan to hit the road by 1100. However, things were not going to work out as planned. Bad weather was developing in several locations along our route between San Diego and NAS Meridian. We knew flexibility would be the theme of the day. Sure enough, after our first leg, our plans changed. Storms over Houston forced us to switch our next destination to Dallas-Ft. Worth.

Once we were on deck in Dallas, a quick visit with weather confirmed our other concerns: Weather was deteriorating around Meridian, and several sigmets were in effect along our planned

I Always Wanted to Drive a Convertible

route. We decided to delay our decision until after a nutritious detour to the local Taco Bell. When we returned an hour later to the weather office, the weather was not good—it was decision time. We decided to let prudence rule. Instead of filing for Meridian, we filed for New Orleans, where the forecasts and observations were favorable. This plan also would allow us to turn en route toward Meridian if the weather in Mississippi improved. After flying nearly 20 minutes toward New Orleans, the weather did improve, and we changed our destination to Meridian.

The events seemed to be going our way—we would not have to spend the night in New Orleans. We would arrive home within recovery hours, and we wouldn't have poor weather in our way.

The sun began to set after 30 minutes of flying. As the instruments darkened, I raised my tinted visor and turned up the rheostats. We had smooth sailing. There wasn't much traffic in the air, nor on the radio. We recalculated our fuel and continually updated our weather.

We descended from our cruising altitude to a recovery altitude over Jackson, Miss. Having penetrated a thin cloud layer and broken out around FL230, we clearly could make out the lights of the city. I got that warm feeling you get when you turn onto the road leading to your childhood home. Everything was familiar, and everything led to our backyard. While passing FL200, however, we heard the sound of rapid decompression—a noise I cannot describe accurately but one I never will forget. It was not the noise, though, that first keyed me into the situation we were entering. Instead, it was all the debris flying around the cockpit and collecting in the rear of the aircraft, where I was strapped in. Approach plates, charts, notes, anything you can imagine, bounced around my canopy like a lottery machine. I tried to lower my visor, only to discover it was in several pieces.

Elapsed time: five seconds. I realized the sound of the air stream and the engines had increased dramatically. A few seconds later, we had lost our canopy. With a death grip, I squeezed the controls and pulled back the throttles, to slow our airspeed and to shallow our descent. We were about 280 knots. I could feel the nose needed extra nose-up trim.

Elapsed time: 10 seconds. I looked at my canopy and saw splattered blood. My first instinct was that my instructor was injured. I keyed the ICS, "Sir, sir…are you still there? Sir?" As I feared, there was no immediate answer.

I contemplated reaching for the ejection-select handle to gain control in the rear.

Two seconds later, however, I heard in my headset, "Tim, Tim… are you still with me?"

I hurried to tell my instructor I was there, but my microphone didn't work. My mask was jammed into my face, with the microphone between my teeth, and the cord dangled in the breeze. I briskly pumped the controls three times. Immediately, my instructor confirmed he was taking the controls.

Elapsed time: 20 seconds. "Center, Bobcat 49, declaring an emergency...I have lost my canopy!" I was satisfied my instructor was in good shape, and the situation was, for the moment, under control. I tightened my lap belts like I never had tightened them before. I fixed my mask so I could talk with my instructor. Once I took off my mask, I realized our situation was more serious. Blood dripped profusely from my nose and mouth. I quickly wiped my face clean and reconnected my mask. Finally, I was able to tell the instructor I still was there.

Once I took off my mask, I realized our situation was more serious.

Elapsed time: 45 seconds. I began to feel the pain throughout my face, nose, mouth, jaw, and eyes. I discovered a hefty cut above my right eye that had caused it to swell. The air in the cockpit also made the blood quickly dry, and soon my right eye swelled shut. I finally dug up the courage to tell my instructor I was injured. His reaction was rather predictable, "Oh *#$%!"

Elapsed time: two minutes. It wasn't until we were 60 miles from Meridian that I felt comfortable we could bring the jet home. I maintained electrical control and activated the strobes to increase our visibility. Our lookout doctrine was altered. I continued to switch the radio freqs as needed and backed up the landing checks. I grabbed all the loose gear I could and stowed it in the map case. I removed the seat and canopy-safety pins from the map case and placed them under my leg so I quickly could get out of the plane after landing. I also wiped as much blood as I could from the gyro and canopy so I could back up on the instruments and search for the field.

Elapsed time: 10 to 15 minutes. We finally were in the terminal area of Meridian. I recognized the voices of the approach and tower controller. As we slowed, the beating I was taking from the air stream became more vicious, and the noise increased. Even lowering the seat to the deck did little to help the abuse I was receiving in our new convertible. Eventually, I had to duck my head behind the instrument panel and cover my helmet with my arms. After a debate over the radio about the virtues of taking a trap, we convinced the tower controller we didn't want to trap. We were safe on deck a few minutes later. Rescue crews were on the roll and assisted us. Medical personnel rushed us to a local emergency room. My instructor was treated and released that night; he was relatively untouched. I had two black eyes, nine stitches in my right eyebrow,

a swollen jaw, and a banged-up nose. I was released early the next morning.

Here are three learning points I will remember throughout my career from this exhilarating and humbling experience:

• *Clear Visors.* I will wear my advertisement for clear visors—in the form of a scar over my right eye—for the rest of my life. As aviators, we need to make a conscious decision about using our visors. Too often, we view them as a hassle, a nuisance, or even an afterthought. Without a visor, you risk your safety and your career.

• *Flexibility.* Even before our incident, flexibility was a defining concept of our journey. We had to keep aware of changing conditions in our vicinity and at our destinations. Solid planning and decision-making helped us deal with the emergency. We eliminated one extra headache that may have made a tough situation unbearable.

• *Crew Coordination.* Despite the drama and the confusion of our mishap, the obvious benefits of crew coordination cannot be overlooked. Maintaining communication between crew members and balancing workloads made it easier to deal with the emergency and return home.

1stLt. Humphreys flies with VT-9.

VT-9 ASO note: *The plexiglass over the front section of canopy shattered in flight; the rear section remained intact. The injuries to 1stLt. Humphreys were caused by pieces of plexiglass traveling aft inside the cockpit and from windblast to the face. The instructor was behind the front windscreen and had no injuries, even though he also did not have his clear visor installed, and his dark visor was in the up position. This incident resulted in Class C damage to the aircraft. Extensive safety and engineering investigations were unable to find any conclusive proof that aircrew, maintenance, material, or other factors caused this mishap.*

Another View
From the Convertible

By Lt. Bruce Marsack

My Marine student never had been west of Arkansas. His friends at Miramar showed him a good time, and he discovered that there is fun beyond "Deliverance."

On the descent, 70 miles west of Meridian, all hell broke loose in our T-2 cockpit. My first reaction to the decompression, noise, wind, and confusion, was to take the controls. I closed my eyes for an instant and crouched down. I tried to get my face close to the instrument panel and out of the windblast. We still were flying, and there were no indications of an airframe failure: no unusual G's or hot, bright sensations of fire. I put down my visor, turned up my instrument-panel lights, and squawked emergency. Then I managed to get a positive ICS check with my student.

I looked at my caution panel, expecting to see a canopy unlocked light—no light. I started to sit upright and saw what looked like a crack on the canopy, but I could tell the canopy frame still was on the airplane. I stared in disbelief as I realized this "crack" actually was the jagged edge of my canopy. There had been no warning, and, in the words of Gus Grissom, "It just blew"; the front cockpit glass had failed—miserably.

Shortly after I realized nothing was between the night sky and me, I tried to savor the moment: the open cockpit, the wind, the sky; just like "back in the day." The moment was cut short as I tried another ICS check but got no response. Several more ICS checks also failed. After approximately 10 seconds, he started gently shaking the stick; apparently, he could hear me. Whew! He had been troubleshooting his mask because it also had been hit. A few seconds later, he was back on the ICS and said, "Sir, I can't see out of my right eye, and blood is everywhere." Our malfunction just turned into an emergency, and I feared my student's flying days were done.

I told him to cover his eye and to protect himself from the windblast. I later found out the wind was much worse for him in the back than it was for me, and it only got worse as we slowed. The descent to get below 10,000 feet took a while, as I tried to slow down. I should have pulled more power to get slower, but I didn't want to change something that was working, especially since I could not see the engine stack through my visor. Home plate was a little farther than the nearest suitable divert, but changing the plan would have increased the confusion and added to our problems.

Whew! He had been troubleshooting his mask because it also had been hit. A few seconds later, he was back on the ICS and said, "Sir, I can't see out of my right eye, and blood is everywhere."

Center told me to switch approach. My student had control of the radios in back, which meant I could not see which frequency was dialed in (a serious problem in the T-2 that pilots have been screaming about for many years). I was trying to feel my way through the radio switches when approach came to life and talked to me.

Although injured, my trusty Marine student stayed in the fight. He handled the frequency changes and a few other tasks with his good eye. As minimal as his help sounds, I'm grateful for his assistance because it would have taken a lot of my attention to play with the switches in the dark. Raising my visor didn't seem like a good idea since dirt and debris still were floating around the cockpit. However, I intermittently did raise my visor to make out the field, and I had the visor up for the landing.

After I pinned my seat, I turned to see how my student was doing. His face curtain had become dislodged several inches and had been mis-pinned by the crash crew. There also was a crash-crew ladder hooked over the side of the canopy rail. The ladder was close to a canopy-jettison handle that had not been pinned yet. I did not want to get in their way, but I was directive about those two items.

My student was med-up six weeks later. He now has the perfect combat scar, and I hear it's a hit with the ladies.

Is switching a visor in flight practical? Probably not. One aviator told me that he leaves the dark one down and turns up all his lights until recovery. This flight highlights the need for a solution to the visor problem that exists on day-night flights. Most aviators fly with their dark visor up after the sun sets.

If ICS is inop or degraded, think creatively about communicating with your crew. In multi-crew aircraft, it is far better to have two sets of hands on the controls than none.

Lt. Marsack is the student control officer in TW-1.

VT-31

The saying, "If something doesn't look right, it probably isn't," applies in most situations, including training command aircraft in the pattern. While watching the airfield at Cabaniss Outlying Field, ACAA Nolan Rhodes saw something unusual. Reacting quickly, he informed his supervisor and the pilot and averted a potential disaster.

Lt. Brian Anderson and his student were doing touch-and-goes in their T-44A aircraft when ACAA Rhodes saw one of the two main-landing-gear tires leave the aircraft at liftoff. This problem would have gone unnoticed by the aircrew until they tried to land.

Lt. Anderson had enough fuel to orbit the airfield while he reviewed the T-44 NATOPS manual and consulted other instructors and maintenance personnel. He then made a gear-up landing, with no injuries to the crew.

ACAA Rhodes' attention to detail broke a chain of events that could have led to the loss of aircrew and aircraft. For his professionalism and personal initiative, ACAA Rhodes received the Navy and Marine Corps Achievement Medal.

BRAVO Zulu

Sumo 17 departed Andersen AFB, Guam, en route to the Northwest Drop Zone. The KC-130 aircrew, assigned to VMGR-152, were to conduct static-line personnel drops with the Army's 1st Battalion, 1st Special Forces Group (Airborne). The aircrew made one identification pass and set up for the first drop. They began the AD pass and completed the execution checklists. The aircraft slowed to 130 knots as the ramp and door were opened. Shortly after the one-minute warning, the overheat-warning light for the No. 4 turbine illuminated. The overheat-warning light and the No. 4 fire light for the No. 4 nacelle came on moments later. The loadmaster and flight mech were in the cargo compartment and visually confirmed smoke and flames from the No. 4 engine.

Only one minute until drop time, the aircraft was low and slow. The aircrew on the flight deck was focused completely on the drop zone and was navigating to the drop point. The jumpers were standing in the cargo compartment, preparing their gear for the jump, and the aircrew in the cargo compartment was making their final preparations.

The aircraft commander called a "no drop," secured the No. 4 engine, and began a shallow left turn to maneuver over water. The loadmasters and the flight mech secured the jumpers in the cargo compartment and closed the ramp and door.

Although the engine was shut down, the fire light remained on. As the engine continued to smoke, one of the crewmembers discharged a fire bottle. Sumo 17 made a three-engine approach and landing, without incident, at Andersen AFB. The aircrew carried out an emergency ground egress.

The turbine had disintegrated. The blades had penetrated the turbine casing and had exited through the engine-nacelle panels. None of the broken blades made it to the cargo compartment. Outstanding crew coordination allowed this aircrew to handle a complicated emergency.

VMGR-152

Left to right: SSgt. Danny Day (LM), LCpl. Donald Bertsch (nav), Capt. Jon Petersen (CP), SSgt. Jeremy Nash (FE), Sgt. Michael Logan (FM), Capt. Lee Weiner (CP), Capt. Ralph Fleming (AC), Sgt. Michael Merit (LM). Cpl. Jeremy Caldwell (nav) is not pictured.

Crew Resource Management

Situational Awareness
Assertiveness
Decision Making
Communication
Leadership
Adaptability/Flexibility
Mission Analysis

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It's Getting Hot in Here

By Lt. Matt Renner

I was over halfway through my nugget cruise and starting to feel comfortable around the boat. I was pleased I hadn't been tasked with writing an *Approach* article, but, after this night, I would know the safety officer wasn't going to let me get away without writing one.

It was our first fly day after a three-day port visit in Bahrain. We had transited to the Gulf after six weeks supporting Operation Enduring Freedom. I was scheduled to lead a bomb-smoke hop on an inky-black, extremely hazy, moonless night. After successfully bombing our smokes, and not one of the countless ships or oil rigs in the water, my wingman and I headed to the marshal stack for our first night trap in seven days.

About two minutes before my push time, I felt a little cold and decided to turn up the cockpit temperature. In the process, I noticed the environmental-control system (ECS) switch was in manual, instead of auto, as it should have been. Angry with myself for missing such a simple item on preflight, I reached down and switched to auto. Almost immediately, I sensed decreased flow to my oxygen mask, so I quickly returned the ECS switch to manual. Unfortunately, that did not help. The oxygen flow still was weak, and now the ECS was blowing hot air,

accompanied by an OBOGS DEGD and an AV AIR HOT caution on the DDI.

I was a minute from my push time when I radioed my wingman to ask his opinion and his help troubleshooting. We went through the steps we could remember for the OBOGS DEGD and AV AIR HOT cautions, which included selecting emergency oxygen and turning off the OBOGS. We also cycled the bleed-air knob and switched to emergency on the AV COOL. I felt light-headed from the reduced flow, so we selected emergency oxygen and secured the OBOGS. I pulled the green ring and felt better. I told my wingman about my improved condition, and he decided to commence on time.

I told the CATCC rep about our situation before starting down. I called marshal and told them I couldn't make my push time, requested vectors, and asked to talk to a rep. I didn't realize my wingman had told me to turn off my bleeds and select RAM-DUMP on the pressurization if I still had problems. Unfortunately, I just had switched to my rep, so I never heard my wingman.

I updated my rep and told him I had OBOGS DEGD and AV AIR HOT cautions. I also told him the emergency oxygen was pulled, and the OBOGS was secured, but the AV AIR HOT light still was on. Unfortunately, I failed to tell him of the cockpit-temperature problem,

Foreground photo by Matthew J. Thomas. Composite.

instead focusing only on the two cautions. Accordingly, he had nothing to add. He only wanted to make sure I felt all right. I told him I was OK, switched to my TAC freq, and told marshal I was ready to come aboard.

The cockpit started to get a bit warm, but the approach went fine. At a mile and a half, the emergency oxygen ran out, and my situation got worse. I reached up to release my mask, so I could breathe again. I could have discontinued the approach, but I wanted to get aboard. I still felt confident. At three quarters of a mile, I held the mask to my face to make the ball call. As I did, I drifted to the right and settled, but I quickly got my hands back on the controls and tried to salvage the pass. I found myself low-in-the-middle to in-close, with a couple of power calls from paddles; I inevitably boltered.

The situation wasn't getting better. Off the bolter, I started to feel uncomfortable. The cockpit now was extremely hot. I called my wingman, who was on deck, and told him I felt lightheaded. He immediately declared an emergency for me on my approach frequency and urgently requested someone to join up on me.

About this time, approach gave me a harried, "301 check your altitude!"

That call got my wingman's attention. He yelled on aux radio for me to climb. He also asked me about the situation, as I continued to 2,000 feet. I told him the emergency oxygen had run out, and hot, pungent air was coming out of the ECS. He recommended I put the cockpit-pressurization switch to RAM DUMP, clear out the air in the cockpit, and turn off the bleeds—which I did.

Then, a Super Hornet, which I had tanked from earlier, joined on my right wing. Fuel was not my major concern; I had about 4,200 pounds remaining—enough for at least one more pass before needing to tank. I had to work hard to maintain airspeed and altitude, and I wasn't doing a very good job. Fortunately, we weren't flying formation, but at least I had someone on my wing to check on me.

Photo by PH3 William K. Fletcher. Modified.

I gave my fuel state and a situation update to my new wingman and asked him to call the ball for me. I felt better after dumping the air in the cockpit; it was hot and getting hotter, but, mentally, I felt more with it.

At 10 miles, I came left to the final bearing and put down the gear. My scan was slow at first, but it picked up as I flew the approach. I tried to put my physical discomfort out of my mind. At three quarters of a mile, my wingman called the ball for me, and I flew a nice pass—with a great talk down from the LSOs—to an OK 3-wire. I taxied clear of the landing area, drenched in sweat and rather drained, but happy to be on deck. When I shut down and went to get out of the jet, every surface in the cockpit was hot to the touch. My original wingman waited for me at the bottom of the ladder, relieved to see me safe and sound.

Most of the lessons learned involved communication and decision-making. Initially, I had focused my attention—and that of my wingman and CATCC rep—on the obvious problems, the ones that had produced cautions: OBOGS DEGD and AV AIR HOT. I had not communicated my other problem: the hot, pungent air coming out of the ECS. When I switched to the CATCC rep, I missed my wingman reading an important action item in the AV AIR HOT procedure.

While we had gone through the steps for the two cautions, we had not reviewed the steps for two other procedures: cockpit smoke, fumes, or fire, and cockpit temperature high. Either or both might have helped fix the problem.

My wingman and I allowed the recovery time to drive our decision-making. Had the two of us simply asked for vectors and a delayed recovery, we could have troubleshot the problems. My wingman tried to help me troubleshoot; he read PCL steps while shooting a CV-1 approach. This error was the biggest one we took away from the flight.

Other decisions, however, went very well. My wingman's quick decision-making and assertiveness in declaring an emergency for me was critical. The decision to have someone join on me and allow me to keep the lead was a good decision, as well.

Some people in CATCC wanted the Super Hornet to fly the approach and drop me off on the ball. Although my wingman and I wanted someone to join up and monitor my altitude and make sure I didn't fly into the water, the assumption of many in CATCC was I would fly on the Super Hornet's wing. I did not want to fly formation, and I wouldn't have done a very good job. Scanning instruments and trying to fly a good approach helped refocus my mind. The decision to have someone else call the ball for me was important. Fumbling with my mask and taking my hands off the controls had screwed up my first pass, and I didn't want to repeat that mistake.

Single-seat crew coordination on the radio initially was insufficient. But, between my lead on deck and the Super Hornet pilot on my wing, crew coordination worked well, once we realized the seriousness of the situation.

As anyone who has experienced oxygen problems in the air can tell you, hypoxia never is a minor problem. The effects are insidious, and you're not sure if you're feeling strange or not. What helped me assess the situation was the hypoxia training we all have received—the feeling was very much the same. However, my problem likely was a combination of hypoxia and heat stress. The hypoxia initially was brought on by the bad OBOGS air and, later, by the bad cockpit air. The heat stress resulted from the high cockpit temperature.

If you ever have something wrong in the aircraft, be sure to tell paddles about it, so you can get the upgrade. If anyone deserves an upgrade, it's the guy with hypoxia, right?

Lt. Renner flies with VFA-113.

Squadron maintenance note: *The aircraft was found to have a broken OBOGS supply line. Since that time, a bad avionics ram-air check valve and a bad secondary ejector valve were found.*

The Blue North

By LCdr. Steve Ryan

We were two months into a Standing Naval Forces Atlantic (SNFL) deployment and heading north from Lisbon, Portugal, to participate in Exercise Strong Resolve 02 off the coast of Norway. We left the temperate, southern European, winter weather for the cold Norwegian Sea. I had 3,200 hours in three different aircraft in a variety of environments. Four of the seven ships I had deployed on were frigates. I had been an OinC on three ships before USS *Samuel B. Roberts*, so I felt comfortable in my role as OinC, but that changed when we hit the great blue north in late February.

To prepare for the winter conditions, I had my detachment review cold-weather-operations procedures from NATOPS, MIMs and NWPs. We briefed maintenance requirements, flight limitations, flight-deck safety, and required

Photo by Matthew J. Thomas

clothing for cold weather. Three days before pulling into Trondheim, Norway, for presail briefs, we felt ready to handle anything—we were wrong.

We flew our first cold-weather flight off the southern coast of Norway the day before pulling into port. We wore dry suits, with the water temperatures in the 40s, air temperature in the 20s, clear skies, smooth seas, and scattered snow showers. The morning was beautiful. We landed aboard the *Sammy B* just before lunch, after a 3.5-hour SSC hop.

Because the RAST had problems, we didn't straighten the aircraft until 1430—when Old Man Winter arrived. At landing, the deck was pitch two, roll five. Our NATOPS day limit for free-deck landings is pitch three, roll eight. By the time we were able to straighten, the deck was pitching to seven and rolling 20, with an occasional roll to 30 degrees. The conditions were way out of limits to safely straighten the aircraft, and it was getting worse by the minute. We double-chained the tail and high points, tied down the blades, and watched. We even left the nets down because of the risk of losing a man overboard.

I'm not a person who worries much, but I was up most of the night watching my helicopter in the hangar. We saw it all, a 47-degree roll and numerous pitches that exceeded 10 degrees. Green water splashed over the bow, spraying the bridge 40 feet up. Waves from following seas rolled onto the flight deck. Fortunately, green water didn't hit the aircraft, and the rain, with the temperature now 30 degrees, rinsed the saltwater spray off the helicopter. After a tense night, we survived with no damage to the aircraft. However, this close call was the first of many.

Every aircraft move for the next two weeks required a khaki present, as a safety observer. We decided many times to leave the aircraft in the hangar, because there was a higher risk of the rotor blades hitting the hangar face during the traversing. When we did traverse the aircraft, it took a thorough brief and exact timing of the pitch and roll of the ship.

Even raising or lowering the nets was a challenge. Frigate flight-deck nets, like most ships, only lock in place in the up position. When they are in the down or flight-quarters position, during high winds and rough seas, they don't stay down. The heavy seas and high winds continually raised the nets, only to have them slam back down. The abuse to the nets was so bad one day we thought we would lose some of them. We outfitted four people in rain gear, float coats and safety harnesses. We had them work in two-man teams, hooked into pad-eyes, methodically working down the side of the flight deck, raising the nets and securing them in place.

Another challenge for us was spreading and folding the rotor blades. The blade spread fold limit in the SH-60B NATOPS, is 40 knots. After a post-phase FCF, we safely landed the helicopter with a 20-knot true wind. Not a big deal, right? Thirty minutes later, the true wind was 65 knots. Fortunately, the aircraft was straightened, and the seas still were relatively calm.

We wondered how to safely fold the blade as the weather got worse. I talked to all the experts, and then I briefed the captain. Our team of 10, on the deck, would walk each blade around, with one person guarding the blade while a second person spotted him near the edge of the deck. Once the blade was in the fold position, we immediately would put a crutch on it. It was not the fastest fold evolution we ever had, but it was the safest, considering the weather.

We quickly learned to think outside the box to determine hazards. We gave extra attention to FOD walkdowns on the O2 level, the deck above the hangar. Water got underneath the nonskid and froze, breaking large sections—up to a foot square—of nonskid. A chunk of nonskid in the rotor arc would have been a disaster. We inspected the ship's antennas and mast for melting ice that might become FOD. In those two weeks, we went through our entire deployment allotment of alcohol to remove ice from the flight deck and aircraft. Every maintenance procedure was reviewed thoroughly to see how the unfamiliar environment would affect its outcome.

For the two weeks of Strong Resolve, my detachment only flew 32 hours. It was the most intense ORM training I ever have experienced. Here are a few things I learned over those two weeks:

- Waiting will not kill you, but pushing the limit may.
- Let your people know anyone can speak up and say, "This is stupid," or, "I don't think this is safe," without fear of retribution.
- Watch the weather, it will change. It is tough to forecast weather in open water and tougher in cold-winter climates. Train your bridge crews to keep you informed.
- ORM works. Use it! It may take time, but it will save lives.
- Know the books. Until this exercise, I did not know NWP 3-59.4, U.S. Navy Cold Weather Procedures for Surface Ships, existed. It was indispensable.
- If you're the person who makes the calls, make sure your people thoroughly brief you, and you thoroughly brief your boss. Some decisions you usually make during normal operation should be deferred up the chain of command in extreme environments.
- Every NATOPS has a clause allowing actions to prevent damage to personnel and their aircraft. A thoroughly briefed, well-thought-out plan is a must when going against the book. In any case, it is preferable to damage an aircraft than to injure your people.

These lessons may seem like common sense. That is what ORM is, a process to instill common sense, to make sure the safest outcome while enhancing operational readiness. The first step in the ORM process, identify hazards, may be the most difficult. Think outside the box. You never know what the next few minutes may bring.

LCdr. Ryan is the OinC for HSL 48 Det 1.

Letter to the editor

The cover photo on the December 2002 issue shows an FA-18 launching from the USS *Kitty Hawk*. The caption incorrectly stated the aircraft was from the VFA-195 Dambusters. Actually, the aircraft was from the VFA-192 Golden Dragons. The telltale "golden legs" give away the squadron, and the dragon head and the side number also identify the unit.

If this photo was taken in late 2001 during deployment to the North Arabian Sea, it's possible the photographer misidentified the squadron. The FA-18 component of the airwing consisted of a joint detachment from both squadrons. Each sent four jets and about 25 people. We all worked out of the same spaces and shared parts, problems, and the success of the detachment under the name "Hornets."

ATC(AW) Michael Schumacher, AIMD Atsugi, Japan

Thanks for clarifying the rightful owner of the golden legs. We were impressed with the photo and the eye-catching struts, and knew it would make a great cover. A few of our maintainers reviewed the regs governing paint schemes, and we trust the squadron has the paint-scheme waiver readily available.—Ed.

Mishap-Free Milestones

HSL-44	15 years	(125,300 hours)
VAQ-135	7 years	(11,100 hours)
HS-6	14 years	(47,500 hours)
VFA-81	9 years	(36,900 hours)
VS-29	11 years	(36,000 hours)
HS-6	14 years	(47,500 hours)
VF-11	9 years	(30,002.7 hours)
VAQ-138	21 years	(36,000 hours)
VFA-131	15 years	(64,000 hours)
HC-3	29 years	(180,000 hours)
VP-46	39 years	(273,000 hours)

Nugget Test Pilot

By Lt. Anthony Farrugia

Flaps, engines, flight controls, DDIs all set, and here are my external lights for the catapult shot. Wow, it's dark! Lean back into the headrest as the holdback fitting breaks, and it feels like a good catapult shot…

After spending a year in my fleet squadron, I finally had learned about midrats, tank states, and the horizontal-time luge. We were three days into our JTFEX at-sea period, finishing our busy, interdeployment-training cycle. I was scheduled to drop a laser-guided training round during a 10-plane, night-interdiction mission.

As I rotated at the end of the catapult stroke and climbed, a master-caution tone jolted me. I raised the gear and flaps, peeked at the left DDI, and saw the nosewheel-steering and flight-control-system caution lights. I had a flight-control problem, and the flaps had not retracted as commanded.

I asked departure to have my squadron rep contact me. As my rep and I troubleshot the problems, we realized the flight-control problem would prevent normal nosewheel steering after landing. We were confused, though, why the flaps had not retracted as commanded.

The rep said I would land early, with the ongoing recovery. I had plenty of fuel, and, as I later learned, this would have been a good time to start adjusting my fuel state. I was vectored overhead the ship to wait my turn. Approach sent me downwind and asked me to switch to my squadron rep to continue trouble-shooting the flap and flight-control problems.

I still hadn't adjusted my fuel when approach vectored me to final bearing. I was rushed and way behind getting the aircraft ready for a night-carrier landing. I turned final and finished coordinating with the rep; we agreed on a half-flap, 33,000 pound, gross-weight landing.

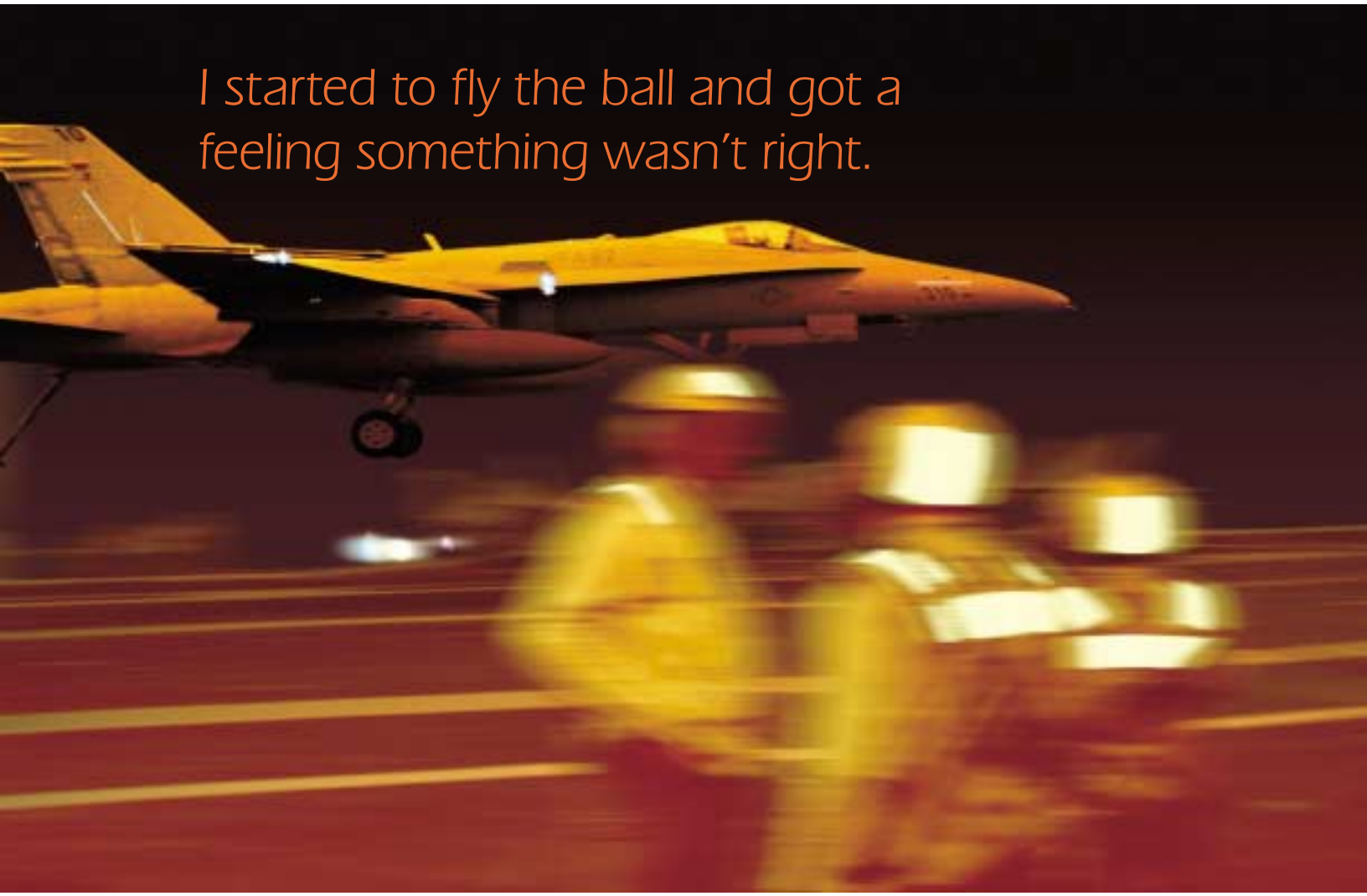
Before I knew it, I was at eight miles, landing gear retracted, with paddles verifying my aircraft problems and gross weight. At six miles and dirtied up, I needed to dump 4,000 pounds and finally began adjusting my fuel state. I was more preoccupied with getting on final bearing than accomplishing checklist items. I stopped dumping fuel a mile out.

I started to fly the ball and got a feeling something wasn't right. As I approached the in-close position, the ball started to settle. Paddles helped with a strong power call. I crossed the ramp and lit the afterburners to avoid the 1-wire.

As I rotated at the end of the catapult stroke and climbed, a master-caution tone jolted me.

"Rats, the 1-wire," I thought, while being retracted. I saw a tow crew crossing the foul

Photo by PH2 Robert McRill. Modified.



line toward my jet to assist with the nosewheel-steering problem. As I took a deep breath, happy to be aboard, the mini boss came on the radio.

"310, did you raise your flaps after touchdown?" He asked.

I looked down at my flap switch, and replied, "Negative sir."

"310, your flaps are up," he said.

A look over my shoulder confirmed the sinking feeling in my gut: I had landed no-flaps. After I exited the aircraft, I stayed on the roof, debriefing the troubleshooters. I wanted to give them as much information as possible, but I also wanted to delay my inevitable return to the ready room.

Once there, I thought about the events of that night and the lessons learned. Fortunately, no one was injured, and the aircraft wasn't damaged. Landing aboard an aircraft carrier at 176 knots is not something I would like to repeat.

I had plenty of time and gas but allowed myself to get rushed. Instead of asking for a longer vector to final or extra time to prepare for the night landing, I had tried to hack it. In my haste, I failed to accomplish those critical checklists that were written in blood—the ones meant to prevent similar occurrences.

When something doesn't feel right, it probably isn't. The higher-than-normal airspeed stared me right in the face, and a look at the FCS page would have confirmed my flap setting.

CRM is not just a boring lecture topic. A poor job of CRM caused me to rush my handling of the aircraft's problems, and I didn't accomplish critical checklists. Oops! Gotta run—the skipper just told me I have the mail-buoy watch for an important bag of mail.

Lt. Farrugia flies with VFA-37.

Between Lone Roc

By Cdr. Doug Denneny

When I was an instructor at Top Gun, I got an up-close and personal view of the hazards of aft-wingsweep landings.

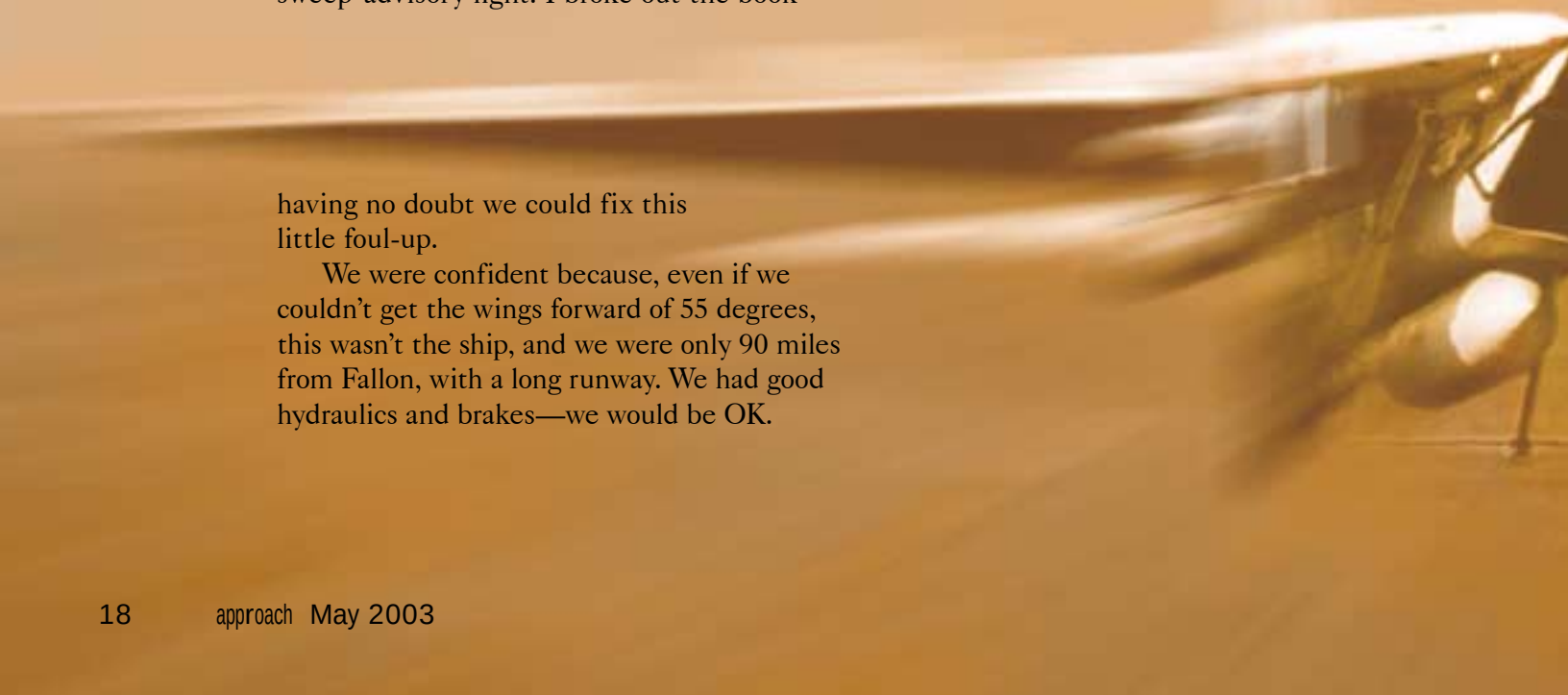
I had manned-up with the commanding officer for what I thought was one of the most boring missions in the old power-projection course: Simulating a friendly Tomcat on a return-to-force (RTF) profile. Our mission was to test the class fighters on their enemy-aircraft-deconfliction plan. We ended up being the guys who were tested.

It was a beautiful day at NAS Fallon, and, with a lot of experience in the front seat, I settled into the back for the demanding task of making sure our hunk of metal appeared at the right time on the RTF corridor.

The class fighters sorted out the picture and quickly killed the simulated bandits who were running us down. After the knock-it-off, the skipper noticed the wings were stuck at 50 degrees, with only the standard F-14 wingsweep-advisory light. I broke out the book—having no doubt we could fix this little foul-up.

We were confident because, even if we couldn't get the wings forward of 55 degrees, this wasn't the ship, and we were only 90 miles from Fallon, with a long runway. We had good hydraulics and brakes—we would be OK.

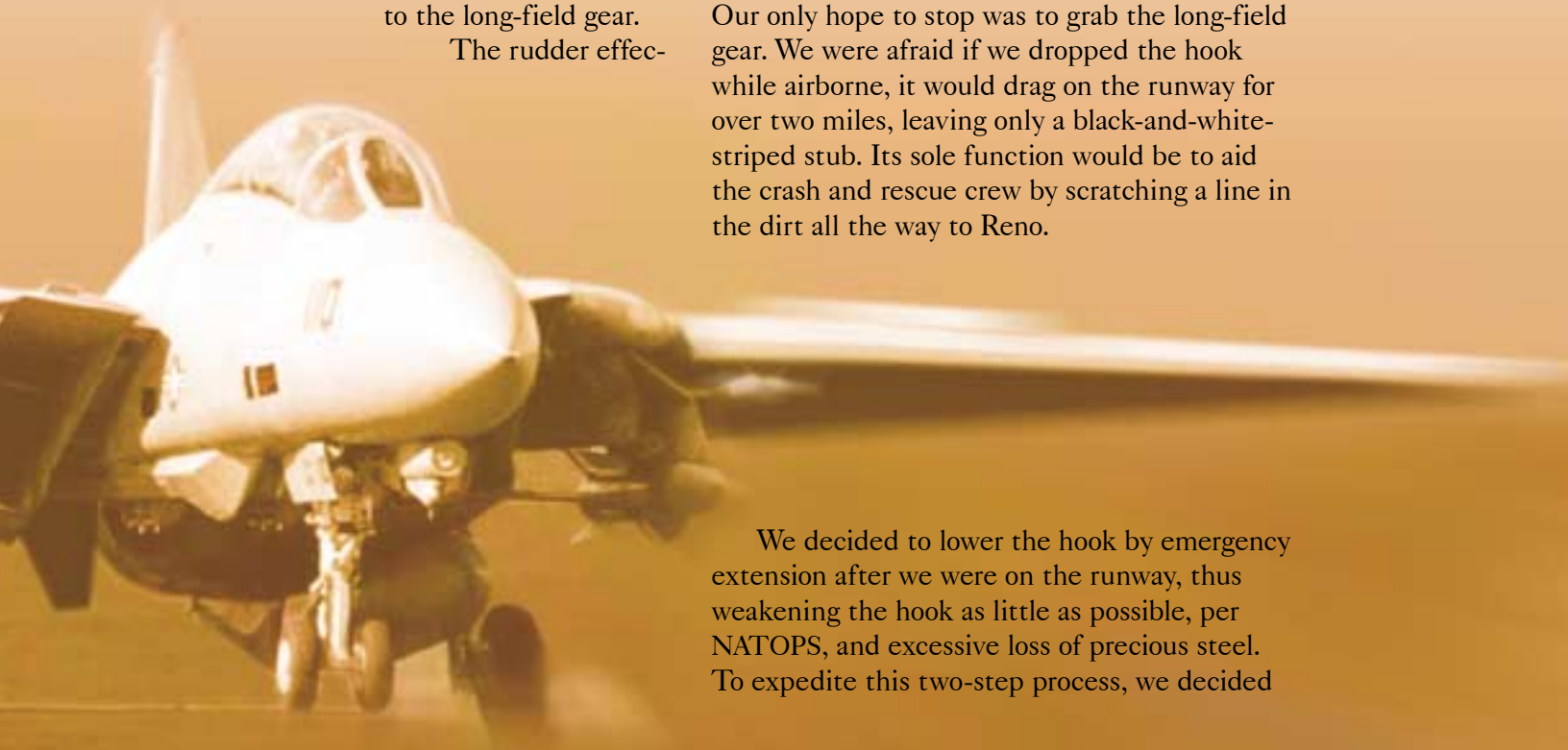
We went through the listed procedures in the PCL. We spent a few minutes of troubleshooting, and then the left wingsweep motor catastrophically failed, dumping every ounce of our combined-side hydraulic fluid over the Gabbs South MOA. Fortunately, the flight-side hydraulics held. It was time to use the E-word and prepare for a high-speed (185-knot) landing. Our plan was to touch down, aero brake, and apply the auxiliary brakes to stop before the end of the runway. We had the long-field gear way down at the end to stop us if we needed. With combined pressure at zero, we had no nosewheel steering or normal brakes—only emergency-hook extension, no hook-retraction ability, and a manual blowdown of the gear.



k and a Hard Place

While poring over our numerous checklists, aviating, navigating and communicating, we quickly found out the latest in a series of bad news: Our previously in-the-green auxiliary brakes were now in the red—not good. If we touched down at the end of 31L at Fallon at 185 knots, there was no way we could engage the short-field gear, which has a maximum engage speed of 165 knots. With the wings back, we had no flaps-slats, no brakes, no spoilers, no speedbrakes and limited aero braking to slow us. We knew we would be cooking all the way to the long-field gear. The rudder effectiveness eventually would be lost, along with the nosewheel steering, so we had the potential of blowing a tire at touchdown. Just keeping the jet on the runway long enough to reach the long-field gear would be a crapshoot, at best. If we skipped the long-field gear, we would be testing the high-speed off-road characteristics of the 50,000-pound, 140-plus-knot Tomcat. Fondly recalling K=1/2 MV squared, I realized we had enough K to make it past the Midnight Roper, and, if we made the jog, we probably could roll all the way to the Bird Farm.

We discussed tailhook-point-ablation rates. Our only hope to stop was to grab the long-field gear. We were afraid if we dropped the hook while airborne, it would drag on the runway for over two miles, leaving only a black-and-white-striped stub. Its sole function would be to aid the crash and rescue crew by scratching a line in the dirt all the way to Reno.



We decided to lower the hook by emergency extension after we were on the runway, thus weakening the hook as little as possible, per NATOPS, and excessive loss of precious steel. To expedite this two-step process, we decided

to pre-lower the hook handle, saving the final twisting and cable-releasing action for rollout. After lowering the handle on long final, our wingman reported the hook still was up, and we were relieved something finally was working right.

At two miles, our wingman passed more bad news. The hook had come down on its own because a small amount of combined fluid was left in the system, which allowed the hydraulically controlled valve to open. We were not happy. All of us who have seen the aftermath of blown main tires know that steel doesn't like to drag along cement for two miles. The situation looked grim. I took off my kneeboard and retightened my straps.

We touched down at 185 knots, giving the on-station LSO a dramatic view of sparks coming off our hookpoint.

We decided to ride the Tomcat out if we skipped the gear, unless it approached an object that would endanger us. The F-14 has an amazing record of remaining upright off the runway. I never will forget, as a RAG student in 1985, seeing the dump-truck-sized block of earth an off-road Tomcat's wingtip caused next to Fentress Field in Virginia. The wing dug in after the aircraft departed the runway, spun, imbedded itself, and stayed upright—truly, a tough, all-metal airplane.

We touched down at 185 knots, giving the on-station LSO a dramatic view of sparks coming off our hookpoint. As we headed down the runway, the skipper said he felt one aux-brake application. Residual combined fluid also slowed our aircraft a couple of knots. The aircraft's fuselage and wings still were providing lift, so the skipper applied small amounts of backstick during the rollout. When he felt the jet get light, he programmed it forward, repeating the cycle as we rolled down the runway. The runway-remaining markers passed quickly until, all too soon, the long-field gear appeared.

The reassuring tug of this gear was a very pleasant feeling. We engaged the gear at 135 knots, which means we only slowed 50 knots during our two-mile roll down the runway. We avoided a Class A mishap by a hookpoint, a little bit of luck, and a lot of pilot skill.

There are several lessons that all Tomcat aviators can take away from this incident. Our wing-sweep motors are getting old and are prone to failure. You should think about what you are going to do at all times with an aft-wingsweep emergency. Blue-water ops equates to an ejection if the wings are aft of 40 degrees—35 degrees max for a barricade—and you can't get the gas to take you to a bingo field. Immediately get out your probe if combined pressure starts to go.

Practice slow-flying the aircraft at altitude with the wings aft. You someday may have to fly a flawless approach to the boat with the wings between 20 and 40 degrees.

Consider not putting the wings back in the break, and limit maximum-airspeed operations when a divert is not available.

The F-14 NATOPS manual, under Long Field Arrestment, states, "Do not lower the hook too early and weaken the hook point." We found that a Tomcat hook, even after being dragged for 10,000 feet, has plenty of metal and strength left to stop a 48,000-pound aircraft.

When operating at high-altitude airfields, like NAS Fallon, the altitude and high temperatures make indicated airspeeds different than true airspeeds, which are used as limitations for the arresting gear and tire speed. The tire ground speed for the Tomcat's nose tires is 190 knots. We were way over that speed, but fortunately, the tires stayed together.

The F-14D PCL does not cover aft-wing-sweep-landing procedures thoroughly. No chart shows what the estimated on-speed will be; slow flight alone shows you what you are going to get.

Cdr. Denneny is the executive officer of VF-2.

When Is Bingo, Bingo?

By LCdr. Ken O'Donnell

I was an experienced TA-4J SERGRAD (with a whopping 400 flight hours) and a lieutenant junior grade, to boot. I believed I could fly the mighty Skyhawk to any limit, maximum or minimum; the books told me I could.

One of the no-brainer minimums is the 200-foot-minimum ceiling for a precision approach. I never could figure out why the instructors, who already had done a fleet tour, would complain about flying when the ceilings got below TACAN mins. Didn't they know flight time was the most important thing in the world? I figured they were wimps, who had been spoiled with things like multiple radios, INS and radar. The TA-4J had been flying safely for years with a single radio (hey, it monitored guard), TACAN, VOR, and no radar. Surely, any winged naval aviator could fly down to PAR minimums—a good pilot probably could go lower.

On one, nasty, Mississippi day, with all of the MOAs clobbered, the only chance of getting Xs for the day was to send air-nav flights out-and-in. It still was cool to me that you could fly hundreds of miles away, have dinner, and be back home a few hours later to crack open a cold one. Besides, if your jet broke while there, the old $38-a-day per diem would kick in. That much money was a lot to a lieutenant junior grade 15 years ago—it seems like a lot yet today when we earn PMR in Fallon. So, off I flew with my instrument student, along with a fleet-experienced Marine instructor in another jet, out-and-in to Cecil Field.

The weather was much improved in Cecil. We shot our multiple approaches, landed, grabbed some sliders, and briefed for our air nav back to Meridian. My student was on his last two radio-instrument (RI) flights. Upon successful completion of a TACAN and two PARs

Photo by PHAN B. K. Vogel

back at Meridian, he would be RI complete and eligible to move on to the airway-navigation (AN) phase. The weather brief for our return flight forecasted 400-foot ceilings, twice the PAR minimums—"should be a piece of cake," I thought. We selected Columbus AFB, only 60 miles away, as our alternate, with a forecast of 1,500-foot ceilings. As we launched on satisfied stomachs, my confidence and pride were intact.

We commenced our TACAN approach shortly before 2200 and comfortably broke out at mins, meaning the PAR would be no problem. We went around the GCA box and broke out at 300 feet on the first PAR, then headed for a last PAR. Meanwhile, our second jet was just behind us on their approaches. As we turned downwind for our last approach, the other instructor, who had fleet experience, called me on approach frequency and said he had broken out at 200 feet and chose to full stop.

He recommended I full stop on my next approach. He sounded concerned, which bothered me a bit, and the thought I should fly the next approach came to mind. If I flew it, though, the student would be one approach away from completion, and it would require another flight before he could start his next-phase simulators. I decided to let him fly it to 400 feet. I then would take over, put it on deck, and hit the club for that cold one.

I don't know if the student was getting the leans or what, but he started going farther and farther left. A couple of pimps from me weren't helping him correct. Finally, at 500 feet, when the controller stated, "Going too far left for a safe approach," I took the controls.

I made an aggressive correction and got it back to on-and-on at 200 feet—and still IFR. As I started adding power, the rabbit lights broke out underneath me. With about a 15-degree cut from runway heading, I wouldn't be very comfortable with 150 feet of altitude to make a major play for the runway. Taking the waveoff, I would come around for a rails PAR and set up in a better position to land. Come on, I had 1,800 pounds of fuel left—enough for at least two more passes, probably three.

As I turned downwind, approach said, "Your duty officer wants to know what your fuel state is."

"1,600 pounds," I replied.

"Still above bingo to Columbus," I thought. About a minute later, approach told me that my duty officer was directing me to divert to Columbus. I felt perturbed someone else was making decisions for me, but the idea of a 1,500-foot ceiling sounded good. I started a bingo profile with 200 pounds over bingo-fuel state, declared minimum-fuel state with center, and headed toward Columbus.

The squadron SDO, another fleet-experienced Marine, called ahead to Columbus to let them know I was on my way. Shortly afterward, I received a call from Meridian tower, on guard, asking me to contact them. I let center know I was going to switch off frequency for a minute; I then switched tower to find out what was up.

Meridian tower said Columbus had dropped below minimums and was closed. I was directed to divert to NAS Memphis, now Millington municipal, over 200 miles away from my present position. I immediately switched back to center, declared an emergency, climbed to 37,000 feet, and asked my student to look up bingo fuel. We were about 500 pounds below bingo.

If you've ever flown a bingo profile for real, you know the worst part is wanting to get on deck as soon as possible but having to fly incredibly slow. Over the next hour, we had time to talk about every possible scenario, including a detailed discussion of ejecting if the engine flamed out. Note that I still was IFR, from 200 feet to 37,000 feet, and we had been solid IFR. We began our idle descent with 600 pounds of fuel remaining, eventually breaking out at about 3,000 feet and instantly realizing it was pouring rain. Those who have flown the mighty Skyhawk, with it's narrow stance, know heavy rain means standing water, which means taking an arrested landing.

Memphis approach asked if I would rather land at Memphis International, which was about 10 miles closer. I asked if there was standing water. Yes. Arresting gear? No. Because I was familiar with NAS Memphis, I chose the arrested landing there.

We were switched to the GCA controller, who told us at 10 miles they were having problems with the runway lights: Only the first and last 1,000 feet were lit. Considering the mental state I was in, this problem didn't make sense to me

until I saw the runway lights at about three miles. For 1,000 feet, you had runway-edge lights. Then you had 6,000 feet of blackness, followed by another 1,000 feet of edge lights but no centerline lights. The arresting gear was at 1,750 feet. Because none of the lights were working in that area, including the yellow A-Gear lights, trucks were parked on each side, with their headlights shining on the gear.

I thought a little rain removal might help me see—nope. All it did was blur the windscreen even more. I gave up on flying the ball and aimed for the center of the edge lights. As quickly as I landed, I rolled into blackness. Fortunately, I saw the centerline with my taxi light and just waited for the tug of the arresting gear. I never saw the trucks or their headlights—probably because I was too focused on centerline.

When we had stopped, I sat there for a few moments, enjoying the relief. The GCA controller asked how much fuel I had trapped with, and I reported the gauge showed 300 pounds. As I tried to remember what the fuel-gauge error was at 300 pounds, they asked me another question, "Sir, for controller training, if you had waved off, how many more passes could you have made before flaming out?"

Funny how your mind works at times like that. I instantly recalled a story of an F-4 pilot at the boat, who went around numerous times one night. Finally, he was told if he did not trap on his next pass, he was to steer clear of the carrier and eject. Shortly after trapping on that next pass, the boss yelled, "Lights on deck!" To which the quick-witted pilot responded, "Boss, I don't bother you when you're taking a s***!"

I don't know if that story is true, or if it's an urban legend, but, man, I wanted to give the same response. Instead, I told him, "Once, if I was lucky."

The crazy thing is that the story isn't quite over. After parking and shutting down, we walked into base ops, where all the controllers were waiting to meet us. They told me the field was supposed to have closed about a half-hour earlier. But, thanks to my duty officer—there's that experience thing again—they had been given a heads up and had stayed late to catch me. After I thanked them, they told me the rain was so heavy they could not see any of my lights from the tower, and the first visual they had on me was the sparks from my tailhook dragging down the runway.

Last, they told me about the runway-light problems. They had tried everything but shutting them down and recycling the on switch. They decided to wait to recycle the switch until I had landed and taxied in. None of the runway lights came back on.

By now I was dying for that cold one I had thought about earlier. "A quick call to the SDO and we will go find one," I thought.

The SDO said, "Good job, O.D. Now, get the jet back as soon as you get your minimum crew rest; we need the jet for tomorrow's flight schedule." So much for the cold one.

I now sit here with over 3,000 hours and haven't had to bingo since. I also haven't heard of too many other pilots who ever have flown a no-kidding bingo profile, at or below bingo fuel. I have seen situations where pilots put themselves into a box, where the only choice was but to land where they currently were.

I talked to one single-seat pilot who landed his fighter with 900 pounds of fuel remaining during a fly-in from the CV to a Far East NAF. I asked what his plan would have been if the nearby divert field hadn't reopened. He replied, "I don't know. I guess I would have headed out over water and ejected." He was serious. He didn't consider pressing to the next divert over 200 miles away. I don't know if I ever would have made such a decision on that stormy Mississippi night.

What's the moral of this story? Keep your options in mind when things aren't as you expected. If you are the one standing the duty, remember you have a lot more information available, along with phones and usually other aircrew around you, to help the boxed-in aviator make the best decision. If it hadn't been for that experienced SDO watching out for this inexperienced instructor, I probably would be writing about my first parachute ride.

By the way, I'm now one of those wimps, with a special-instrument rating, who bring up excuses like ORM when there is no operational necessity. Minimums are one edge of the envelope that doesn't have to be pushed to be one of the best.

LCdr. O'Donnell currently flies with VAQ-139.

When I Was at

By LCdr. Christopher B. Walker

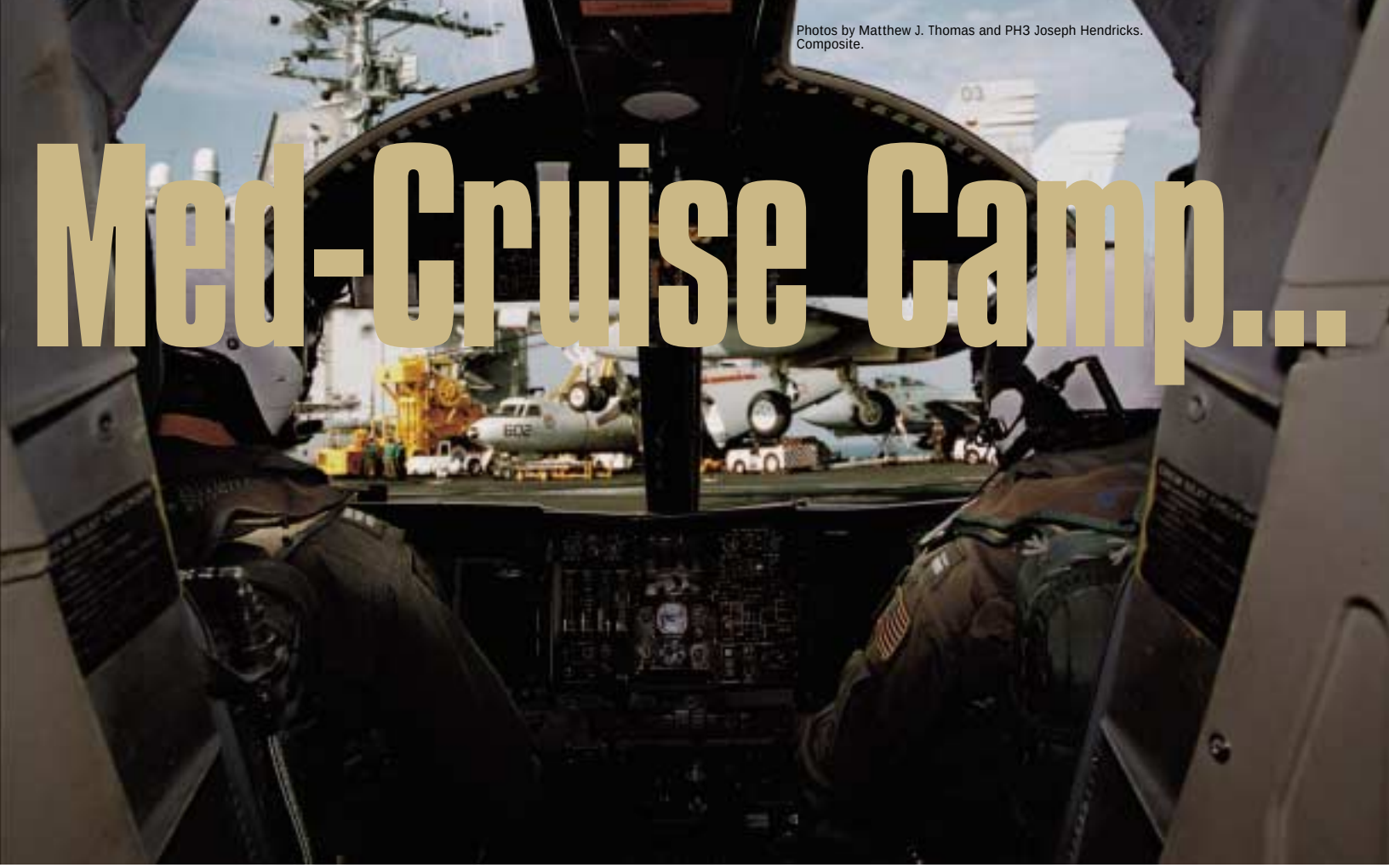
I was angry at myself for not taking a stand when I should have.

Sooner or later, you will ignore or violate NATOPS. The circumstances that tempt you may vary, but the situation always arrives unannounced and uninvited. This is my story of poor decisions and even worse ORM.

I was a nugget S-3 NFO, four weeks out of the RAG and on my first Med deployment. My pilot was the squadron CO, and we were scheduled for a day-recovery-tank mission. The flight seemed straightforward, and I was excited to go.

Preflight and man-up were uneventful. About five minutes before breaking down for launch, I noticed the No. 1 oil pressure had dropped to zero. I told the skipper and expected him to shut off the motor, call for a troubleshooter, pat me on the back, and tell me what a good boy I was for noticing the problem. Those things didn't happen, though.

Instead, the CO leaned over, tapped the gauge, rubbed his chin, and asked me for a screwdriver. My head started to swim. "Zero oil pressure, and the PCL says shut it down," I



Photos by Matthew J. Thomas and PH3 Joseph Hendricks. Composite.

Med-Cruise Camp...

thought. "What in the world does he want with a screwdriver?"

Instead of saying, "Skipper, shouldn't we shut it down?" I handed him my Swiss army knife. I figured his 4,000-plus hours of flight time allowed him to know something obviously I did not. He quietly and methodically used the screwdriver to swap out the No.1 gauge with the No. 2 gauge. We now had a reading of zero psi on the left oil pressure.

I was relieved the gauge was OK, and the problem was identified. I was sure the CO quickly would bring the left throttle to the off position, just like NATOPS says, but he didn't.

The yellowshirt signaled to break us down. The skipper looked at me and said, "I'm certain what we have here is a popped breaker; I've seen this before. We don't have time to unstrap now, so let's take a look at it on the cat when we go into tension."

What I should have said was, "Sir, how about if I get out while you take it to the cat with someone else in my seat," or words to that effect, but with less sarcasm. I didn't say anything, though. I went to the cat with it, and we ran it up, with no indications of a problem, and off we went.

The problem was with the breaker, but that knowledge didn't make me feel any better. I still was upset. I was angry at myself for not taking a stand when I should have. I vowed never again to let anyone talk me into doing something dumb, no matter how much they outranked me by pay grade or flight time.

To his credit, my CO apologized for putting me in such an uncomfortable position, and admitted what he did was wrong.

My intent in submitting this story is to get all aviators to think about similar scenarios now, instead of waiting until one happens. I urge senior aviators to do the right thing. You may have tremendous pressure to complete each sortie, but you also are responsible for mentoring junior aviators. I likewise urge junior aviators to stand up for what you think is right. Do it respectfully, and any good leader will listen.

LCdr. Walker flies with VS-22.

ORM Corner

COMBAT ORM

By LCdr. Jim Hawkins

The smell, similar to a burnt marshmallow, was not overpowering but definitely was noticeable throughout the aircraft.

The sea state and swells had been large and unpredictable the previous few days in the North Arabian Sea. The ship's navigator continued to search for calmer seas, but, with up to 20 feet of vertical-deck movement and an impressive Dutch roll, the recoveries continued to be challenging during the day and extremely colorful at night.

I was scheduled as the air-control officer for a 4.8-hour day mission in support of Operation Enduring Freedom (OEF). This flight was a nice change of pace for me because I was scheduled as a crew member, instead of the mission commander.

The skipper was the pilot and aircraft commander. He decided a departure from our standard, single-engine-emergency plan was warranted because of the 10 to 12 feet of deck movement and the hot, humid weather. For the three months we had been on station, we always planned to bring back a single-engine E-2C to the carrier; we already had done it numerous times.

Today was different. With the unpredictable seas, pitching deck, and limited single-engine climb, we briefed to divert a single-engine aircraft if it occurred before feet wet on our return to the carrier. Once we were feet wet on our return, and, because of our finite amount of fuel and no airborne-refuel capability, our options were to trap on the carrier or bail out.

We noticed an odd odor immediately after launch. The smell, similar to a burnt marshmallow, was not overpowering but definitely was noticeable throughout the aircraft. As we continued the climb, we checked all indications and quickly, yet thoroughly, checked the crew cabin for any source of smoke—nothing abnormal was found. We decided to don oxygen masks, leaving selected members connected to only one fitting to act as the smell checker. Meanwhile we tried to locate the source.

We narrowed our search to the air-conditioning system, specifically, the left bleed air feeding the system. When we had secured the left bleed-air switch, the odor dissipated. Confident

we had isolated the problem, we kept the switch secured.

Approximately two minutes later, we got to the caution in the "Smoke or Fume From Air Conditioning System" procedure that states odors from the air conditioning can indicate a propeller or engine problem. Coincidently, the master-caution and port main-prop-pump lights suddenly illuminated. The largest concern with these indications is the possibility of degrading to a pitchlocked propeller. Because the E-2C uses variable-pitch propellers, with constant-engine rpm, a pitchlock limits power adjustments to rpm changes only, which is not how the system was designed.

The skipper advanced the power lever to max power, in accordance with NATOPS. The port engine rpm was steady at 105 percent. The port main-prop-pump light remained illuminated, and then, suddenly, the port engine produced a massive surge of power. The increase in rpm, followed by a surge, is the final sign of an inevitable pitchlock. The skipper feathered the prop and shut down the engine. After shutdown and confirmation, the propeller feathered with no pitchlock, and the pilots completed the emergency procedures.

Once established in a stable, single-engine profile, we tried to contact CAG, but he was flying. We eventually spoke with the captain and the battle-group commander, and both initially approved the briefed divert plan. We had plenty of gas and started to the divert on a heading of 120 degrees.

We had been established on the 120-degree heading for a few minutes when the radar officer, a first cruise JO and the crew's junior member, pointed out, "We're going the wrong way."

The mission commander and I stopped what we were doing and looked at him as if he was wearing his helmet backward.

He said, "We are going the wrong way. The divert is 240, we are heading 120."

We all double-checked our scopes and navigation and found he was correct; we were going the wrong way. The mission commander told the pilots, then gave an updated position and divert heading. We had an incorrect point on our standard TACADMIN card; the divert field—which no one in the squadron had been to—was entered incorrectly. We had been heading to the correct waypoint, but it was at the wrong location.

We had been established on the 120-degree heading for a few minutes when the radar officer, a first cruise JO and the crew's junior member, pointed out, "We're going the wrong way."

As we turned to the correct heading, we heard CAG's familiar voice on the radio asking for the details of our problem. CAG still was airborne but had returned overhead when he heard about our situation. The skipper described the issue and told him of our divert plan. CAG listened, asked a few questions, and, after some thought, asked us to consider a single pass at the ship. He wanted us to evaluate the current state of the pitching deck and, if able, to land on the carrier.

We all paused for a moment and thought about the request. The skipper, knowing we all had a vested interest in the outcome, asked for our "no kidding" thoughts on a single attempt at the ship. We began to discuss and to evaluate the main issues:

• Crew: experienced. The pilot at the controls is the most experienced pilot in the squadron.

• Fuel: enough. We have enough fuel to make a single pass and still make it to the divert.

• Pitching deck: unpredictable, but it has been stable for long periods.

• Single-engine approach: current. The skipper had a single engine at the ship earlier in the deployment. He was, for lack of a better term, current.

• Benefit versus risk: assessed. Even though we had briefed a divert plan for this situation, our direct chain of command was willing to accept a greater risk than we had calculated initially. We were in combat operations, and a higher level of risk was appropriate and acceptable. The maintenance support to change the propeller and maintain a full complement of E-2s to support OEF was an important benefit.

After discussing and analyzing the risks, we agreed a single pass was reasonable, as long as we all were clear on the controls and limits we set for ourselves, and we did not exceed them. Here are the controls and limits we included:

• Be max trap at the ramp; nothing less is acceptable.

• Coordinate with the LSOs early and throughout the entire approach for deck movement. If we got to three-quarters of a mile and the deck movement still was unpredictable, wave off and head to the divert.

• Fly a "touch" fast for the approach to keep extra energy on the aircraft for single-engine climb. Do not get slow.

• Brief the CAG, the captain, and the LSOs on our plan, including the limits and controls in place.

When the landing area was ready, we pushed out of 10,000 feet for a straight-in. We checked off our "go" criteria until the critical LSO deck update on the ball. The LSOs held the deck predictable and steady, so we continued. The pass from inside and outside the aircraft looked good. The skipper flew the ball to the deck and the trap; it was a challenging pass.

In the crew debrief, we reviewed ORM. We answered various risk-related questions that focused on the decisions we had made:

Why did we change what was briefed? We considered changing what was briefed because we had been given more guidance on what an acceptable level of risk was for our situation.

Did CAG convince us to make a bad decision? No. We evaluated the risks and never relinquished the opportunity to go to the divert. We were clear if the single pass did not look good, we were diverting.

Did we take an unreasonable risk? No. The chain of command trusted the skill of the pilots and the judgment of the entire crew. We agreed to a greater but calculated and acceptable level of risk. We evaluated our limits and set greater controls. We were not going to get painted into a corner with nowhere to go.

Did the end justify the means? We accepted a challenging situation, but we also knew how we were handling it. We initially briefed a conservative plan. Once airborne, we received more information and reevaluated the situation, hazards, and risks. Then we set controls and briefed contingencies. We made the right decision, the right way.

Did we exercise ORM? Yes. Evaluating risk in combat operations is no different than in peacetime, but the level of acceptable risk may be different. If we had not been in a combat situation, or if we had had a less experienced pilot, poor visibility, darkness, or any other mitigating factors, I know we would have diverted. We all should remember that the O in ORM is for operational, and the M is for management.

LCdr. Hawkins is a mission commander and safety officer in VAW-121.

Things That Go Bump in the Night

A dull, orange fiery glow came from the cockpit area as their Intruder began a slow left roll and steepened its dive.

By Cdr. Tom Lalor

Do you remember that opening scene in the classic movie "Twelve O'Clock High," where the old guy with the spectacles rides his bike into an overgrown English airfield that used to be his B-17 base during World War II? As he stops and looks around, a faint echo of the old sounds of life in the 8th Air Force gradually fills his ears. I learned how that old guy felt, when I recently flew back to Nellis AFB for the first time in almost 10 years. However, my memories, though just as vivid, are from one tragic night there.

Crossing the desert at altitude, it you easily can spot Las Vegas. From more than 100 miles away, the million-watt column of light from one of the casinos pierces the night sky like a beacon. The Luxor was not built 10 years ago, but the beacon of what seemed like dozens of USAF crash and rescue vehicles that marked runway 21L was no less mistakable.

We were in the middle of a good-deal, weeklong, six-plane, A-6E detachment to Nellis, supporting early AMRAAM testing. Always a thinking man, our Ops O had set it up so everyone would get max flight time while still having plenty of opportunity to "roll the bones" in town. I was in the sweet spot of a JO's career: several hundred hours in the Intruder and crewed with a senior JO bombardier-navigator who was money in the cockpit. We were scheduled to lead a section on a low-level, terrain-following mission as part of a night strike into the Nellis ranges. Well-rested and eager to go, we knew this was going to be good. We were employing the A-6 at its best, with the MO and the XO as his BN on our wing.

The overall brief for everyone ran long because of all the admin stuff, such as training rules and SPINS, which had to be covered. As a result, our section had just a few extra minutes to run through details once the large gaggle split up. Among other items, we quickly discussed NVG procedures because Dash 2 would be using them. My BN and I were not yet low-altitude qualified and had to do it the hard way. When the subject of aircraft lighting came up, the MO told us to turn off all the lights once we pushed out on our low-level. Once any aircraft was "shot down," they were supposed to kill-remove by turning on all external lights and departing the problem. Beyond that, we did not cover the specifics of lighting, particularly for the rendezvous portion of our hop.

We took off just as the sun was setting, and, by the time "fight's on" was called, the rugged peaks of the southern Nevada desert were pitch black. Our time came to descend, and I began to ease the old Intruder down. Funny how hard it is to push the stick forward to descend into the dark abyss when you know there's cumulo-granite just a few hundred feet below.

The MO, a veteran of almost 200 hours of NVG time, followed us into the blackness. Not feeling sure he comfortably could fly off us, using only the glow of our exhausts as a visual cue, I left on the switch to the little, white taillight. Approaching the IP, we thought we had it made when the voice of "God" called us dead and told us to egress. Our wingmen pressed on, apparently spared the simulated AMRAAM shot from an unseen

F-15C. We turned on our lights and flew to our rendezvous point with our tails between our legs to wait for Dash 2 to join us.

We orbited at 14,000 feet and heard Dash 2 call "off-target." We eventually spotted him as he approached for the rejoin and the trip back. Dash 2 crossed in front of our nose from right to left and started a hard left turn to complete their rendezvous. As we neared the course back to Nellis, we rolled out of the left turn, set 250 knots, and told Dash 2 to pick up a running rendezvous. The XO acknowledged my BN's call, and I observed their lights deep over my left shoulder as they rolled out in trail.

I waited until they were stabilized at about the same tac-wing position they had on the low-level, which was about 1,500 feet aft. I again secured all our lights, except the green strip lights and the white taillight. With things apparently suitcased and ready for the return leg, we turned our attention to checking out with Nellis range control and making our way back for a few cold ones at the blackjack table.

About 15 seconds later, a violent bang brutally interrupted our tranquility, followed by a momentary pitch nose-down and a whoom as the engines surged. My initial thought was that we had smacked the top of one of the peaks. I quickly ruled out that thought when I recalled nothing in the area reached as high as 14,000 feet. In that instant, we came to the horrible conclusion our wingmen had collided with us. As my BN exclaimed over the ICS, "Oh my God, they just hit us!"

I gently rolled on the right wing to see their stricken aircraft passing underneath, ahead, and to the right of our flight path. A dull, orange fiery glow came from the cockpit area as their Intruder began a slow left roll and steepened its dive. My BN called out for the crew to eject, but it fell on deaf ears, because the underside of our fuselage had sliced off most of their cockpit. A few seconds later, the desert floor lit up in a brilliant yellow and orange explosion, as the aircraft hit, going almost straight down at 500 knots, with no apparent ejection attempt.

As the BN got out the Mayday call and started the SAR effort for the other jet, I inventoried the condition of our aircraft. It still was flying good and had no major controllability issues. I scanned the instruments and saw we had lost our combined hydraulics. Some of the lines must have been cut. Fortunately, we still had the flight-hydraulics side to power the flight controls. We took out the PCL and started going through the procedures for lost hydraulics.

A combined-hydraulic failure in the A-6 meant we had to blow down the gear and electrically lower the flaps. We debated moving the flaps at all, since neither of us knew if the wings had been hit. On the other hand, I feared some of our horizontal stabilizer might be damaged, giving us reduced authority in the dirty configuration. We elected to run the flaps down electrically until we felt any degradation in control. Fortunately, they came down just fine. As we slowed to do a controllability check, I needed almost the entire amount of available up trim to hold the jet level, but things still were manageable.

We had no problem finding the field as we turned our attention to our final approach at Nellis. The flashing emergency lights lining either side of the runway made it stick out like a sore thumb, even against the background of the brightly lit Vegas skyline. We put down the hook, and took an uneventful short-field arrestment. Once the aircraft was shut down, I cracked the canopy a couple of inches with the remaining hydraulic pressure. I heard the crash-and-rescue chief standing at my boarding ladder exclaim in a classic Southern drawl, "Sir, you oughtta see what happened to this here airplane. I don't know how you got it back."

Once on the ground, we saw what he was talking about. Half the port stab had been sliced off, and the port aft side of the fuselage had

extensive damage, including an indention of the wingmen's refueling probe on our aircraft's skin. A piece of the BN's headrest later was found lodged in our fuselage. The engineers said it was a miracle the tailhook didn't pull out of the fuselage on the trap—it probably would have on a carrier arrestment. Fortunately, the bulkhead, on which the hook mounts, took most of our wingmen's impact. A hit any other place likely would have taken off the tail. As it was, our A-6 sustained strike damage.

Two lives and two aircraft later, what did we learn? Among other things, we relearned some hard lessons about briefing and flying with NVGs, flight-crew coordination, and adherence to SOP.

We spent too much time occupied with the big-picture strike brief. We did not allow time to discuss one of the most important aspects of the mission: how we were going to fly an NVG section without hitting each other. In absence of any other guidance from our wingmen, we assumed they wanted our lighting configuration the same way it had been set before we kill-removed. With no discussion on rendezvous lighting, I just did what made sense at the time. Had we taken 30 more seconds to brief the NVG rendezvous, this midair never would have happened.

Even though I was told to be lights-out on the low-level, I elected to turn on the white taillight for a warm fuzzy—without telling our wingmen I was doing it. They did not object at the time, and I found out later the reason why: The bulb filament had broken, and the light wasn't working. I left the green-formation lights on for the rendezvous as well, but from the deep, 7 o'clock, stepped-down position, it was unlikely they would have seen the strip lights, either. As a result, I assumed our aircraft was better lit during the rendezvous than it really was. Had our flight coordination and communication been better, our wingmen would have been able to clue us in that our jet nearly was invisible from behind.

Another lesson we relearned was why we have an SOP. Our squadron's maximum allowed closure during running rendezvous was 50 knots. The TACTs pod our wingmen were carrying had them hitting us at 350 knots, or 100 knots of closure. Those who have flown NVGs know how hard it can be to judge distances away from lighted aircraft. Assuming they expected our airplane to be lit completely, it is possible they fixated on someone else, thinking it was us. Frustrated with their inability to close the big distance, they sped up to expedite the rendezvous. In the TACTs reconstruction, it was apparent the MO saw our aircraft at the last instant and tried in vain to stuff the nose, then pass under us. Had he been going slower, he likely would have had the reaction time to avoid a collision.

I since have flown many hours on night-vision goggles, but I never again have allowed myself to be lulled into a sense of complacency when using them. My flight members and I always leave a brief with a clear understanding of the aircraft-lighting plan for each phase of flight. NVGs are just another sensor—no more. They are not a substitute for a good instrument scan, and they certainly do not turn night into day—even though we sometimes seem to fly as if they do.

Cdr. Lalor flew A-6Es with VA-34 at the time of this mishap. He is currently the commanding officer of VFA-105.

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Learning the secret of flight from a bird was a good deal like learning the secret of magic from a magician. After you know what to look for you see things that you did not notice when you did not know exactly what to look for.

— Orville Wright