# Combat Edge

September 2005

Combat Edge September 2005 Combat Edge Survey - Inside

Photo by MSgt Val Gempis

## Combat Edge Survey - Inside!

General Ronald E. Keys, Commander

Colonel Creid K. Johnson, Director Of Safety

Combat Edge






## Departments



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# ACCent on Safety

## *ACT!*

Serving on the ACC staff has been a very interesting learning experience for me the past 12 months, and I've learned a great deal about safety and the many different missions in ACC. Most importantly, I have a much greater appreciation of how critical each Air Force member is to mission accomplishment, and how we can ill afford to lose a single person for any reason. What makes a loss that much more tragic, is when we lose a person to a preventable mishap, it hurts our team and it hurts us personally.

As a pilot, I use Operational Risk Management (ORM) constantly as I make decisions about how to employ my F-16 to best accomplish the mission and bring my backside home safely. Before a flight I have ample time to plan and do more analysis. Once airborne, time is short, and decisions need to be made quickly, and they need to be based on prior planning and instinct. The decisions I make are based upon my experience, my capabilities, my flight's capabilities, my F-16's capabilities, the importance of the mission, and the risk involved. ORM principles and process are flexible enough to be applied to any career field in the Air Force.

It's incumbent on each of us to take responsibility for preventing mishaps by using "Operational/Personal Risk Management" (ORM/PRM) and "Checking 6" on everything we do. True, we've heard ORM/PRM over and over, and you've built safety programs, posters, tracking sheets, briefings and more for ORM/PRM. But I'm here to tell you, it can't just be a program, another "Paper Lion." ORM/PRM must be internalized to the point that they happen automatically, both on and off duty. ORM/PRM programs are based on forethought, applied common sense, and our natural instinct to analyze everything we do. That analysis can be a long drawn-out process, or it may only be a split second, but it needs to take place and it needs to be applied to our immediate and future actions.

Take the time, even if it is only a second, to ACT (Assess, Consider, Take Action) because we're all important to our friends, families and maintaining our "**COMBAT EDGE**."

**Colonel Preston B. Thompson,**
**ACC Deputy Director of Safety**

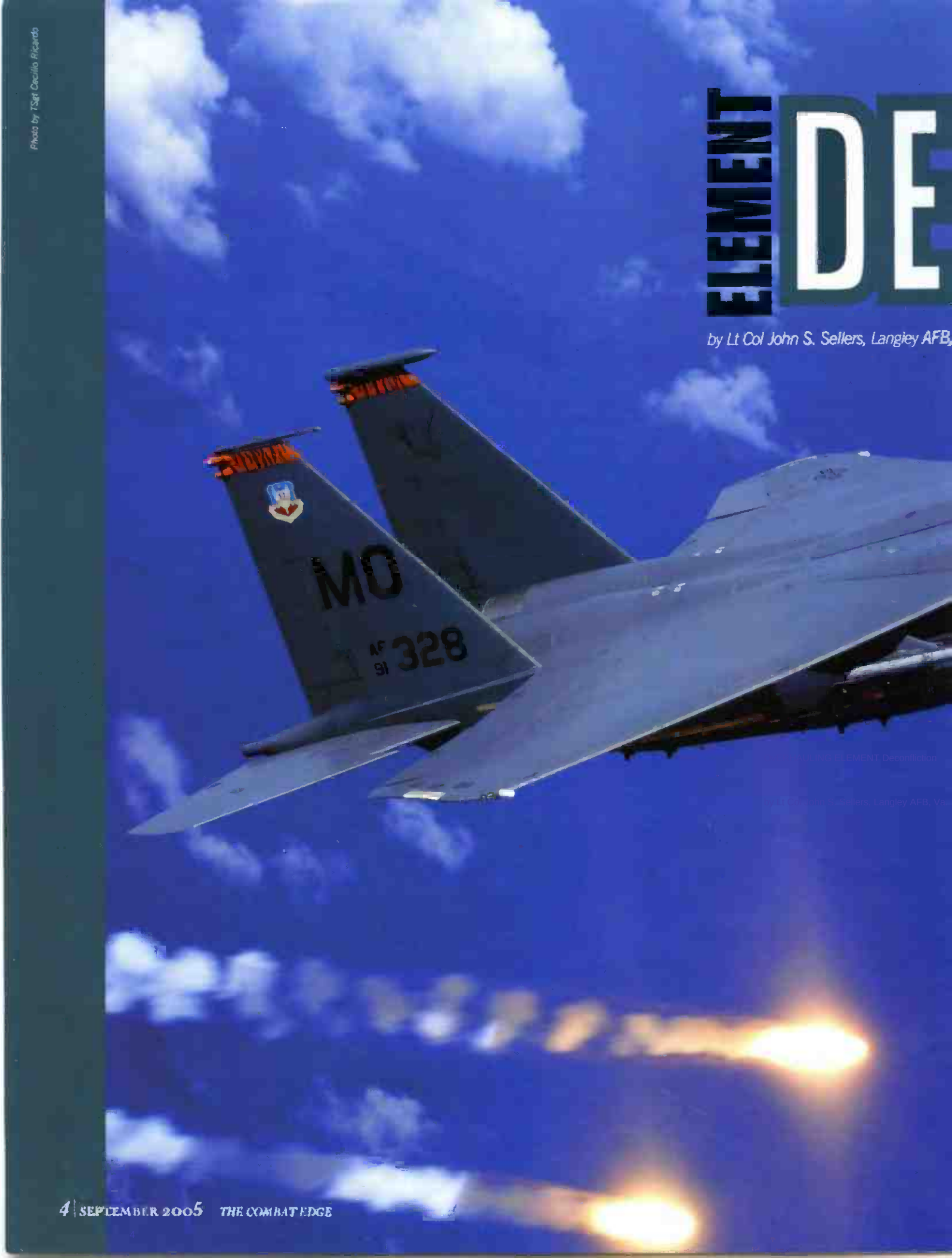



Photo by TSgt Cecilio Ricardo

# ELEMENT DE

by Lt Col John S. Sellers, Langley AFB,

# Overhauling CONFLICTION

The bandit merges at high aspect, below and between the two fighters. The element suffers a communication breakdown resulting in both fighters thinking they are engaged. Both pilots begin to focus on the bandit, and both begin flying their best Basic Fighter Maneuvers (BFM) while clearing their flight paths. Both maneuver toward the bandit's control zone, where they collide, belly to belly.

In the last 10 years, F-15s have experienced eight midairs: of these eight, one was a minor refueling incident resulting in damage to the boom, but the other seven were collisions between members of a paired element. Although there were no fatalities, six valuable combat aircraft were lost. The problem is not limited to any particular aircraft type. For instance, F-16s have experienced 25 midairs during the same time period.

These and all other element midairs have at least two things in common: one pilot makes a deconfliction mistake, and the other fails to catch the error. Our safety efforts tend to emphasize the former, and to neglect the latter – to the point that we permit an engaged fighter to "completely disregard" his wingman. The problem is that, unless we involve both fighters in the deconfliction plan, we lack the redundancy required to deal with human error. This is why a simple mistake, like the communication error above, can easily result in an accident. A compact description of the problem is:

- Our current deconfliction plan is unable to accommodate human error (Winter 1999 issue of the *Weapons Review* magazine)
- Human error is unavoidable
- Therefore, collisions are inevitable under the current plan

This article proposes a robust element deconfliction plan that provides the redundancy required to mitigate the effects of human error, versus accepting or accommodating it. I'll first look at the proposed plan and see how it applies to both formation flight and maneuvering combat. Next, I'll briefly compare the current and proposed plans. Finally, I'll cover recommendations and conclusions.

## Proposed Element Right-of-Way Contract

In an element, one pilot has right-of-way and the other will yield. Each will cross-check the other at intervals proportional to the potential for collision.

### Yielding Pilot

- Deconflict before a collision course develops
- Alter course to stop the closure or to ensure safe separation

**Pilot with right-of-way:**

- Confirm the other aircraft yields
- Deconflict if safe separation is not assured

**Transferring Right-of-Way**

During formation flight, the lead aircraft has right-of-way and the wingman yields. A flight lead transfers right-of-way by passing the lead to the wingman. During combat, the element may swap right-of-way either by passing the lead or, during maneuvering situations, by using the brevity term "Press."

The proposed plan provides an overarching framework for element deconfliction, broadly applicable to BOTH formation flight and combat maneuvering. The terms "yielding pilot" and "pilot with right-of-way" are not intended to replace any existing terms, nor are they intended to be airborne brevity words. They are simply valuable terms for discussing deconfliction during academic sessions and flight briefings.

**Formation Flight**

Formation flight is easy to explain in terms of the proposed contract. The wingman, as the yielding fighter, must make constant small course alterations to maintain a condition of zero closure in the position determined by the flight lead. Rejoins bring the potential for a close pass or collision, and the wingman must establish the correct vector to prevent this. During turning rejoins the wingman must set the plane of motion at least one wingspan's distance below the lead's aircraft (safe separation). As additional insurance against a collision course, the wingman must also ensure nose-tail separation. Finally, the wingman must stop the closure before penetrating the safe separation bubble, so they should pause en route before sliding smoothly into fingertip. During straight-ahead rejoins, the wingman must set up a slightly diverging vector, aiming at a point at least one wingspan away from the flight lead. Setting the correct rejoin vector ensures that even a botched rejoin merely results in an overshoot with safe separation, instead of a midair.

Photo by TSgt [illegible]

A flight lead has important deconfliction responsibilities too. Even though the lead pilot has the right-of-way, he/she must nonetheless be prepared to deconflict if the wingman fails to yield. This is indicated by the presence of closure and the absence of a line-of-sight rate. If the yielding fighter appears frozen in space and is growing larger, or if there is a small line-of-sight rate that appears insufficient to preserve safe separation, then the fighter with right-of-way must take evasive action.

The flight lead should not compound the wingman's problems and must not create a dangerous situation. For instance, it would be bad technique to call for a straight-ahead rejoin, then to initiate an aggressive turn into the wingman just as he/she was approaching the minimum separation bubble. Because the wingman sets the rejoin vector based on the flight lead's current flight path, abruptly changing that path at the wrong time can result in a close pass or midair. It would be far better to allow the wingman to complete the rejoin before smoothly beginning the turn.

Both pilots must maintain a cross-check on the other at intervals proportional to the potential for collision. A useful concept is the potential "time to impact" determined by the element's spacing and potential for closure. If the time between cross-checks exceeds this time, an undetected collision could occur. Therefore,


Photo by TSgt Cecilio Ricardo

a proper cross-check should be several times more rapid than the potential time to impact. The potential for collision and the potential time to impact are different for the two aircraft.

Consider the yielding pilot. In close fingertip formation, turbulence, small stick movements, or heading changes by the flight lead could create enough closure to rapidly result in collision. The wingman must, therefore, focus continually on the lead aircraft, with very brief glances away (to check fuel, for example). As formation spacing increases to route or spread, the wingman can take slightly longer glances away from the lead to check sensors or gauges because the potential time to impact has increased. In tactical formation, a turn initiated by the flight lead would result in a potential time to impact of about 15 seconds: several seconds to complete the turn, then an additional 12 seconds to cover the distance between the two fighters (assuming a speed of 1 mile per 8 seconds and a spacing of one and one half miles). In this example, the 15-second time to impact, divided by two or three results in a proper cross-check time of about 5 to 7 seconds.

For the flight lead, the potential time to impact is greater, because many of the factors that could create closure are under their control. During steady state formation, the collision potential is relatively low. The hazard increases when the status quo is disrupted for things like rejoins, turns, frequency changes, entering clouds, battle damage checks, or formation position changes. The flight lead should remain aware of the wingman's task loading and should closely monitor the wingman during times of increased hazard.


## Combat

The same proposed plan applies to combat situations, but safe separation increases to 500 feet for tactical formation and Air Combat Maneuvering (ACM) because of increased task loading and possible high rates of closure. During ACM, if the hazard is low (e.g., the fighters are diverging or the support fighter has exited the fight), then the support fighter as the yielding pilot may devote more time to sensors or visually scanning for additional threats. The pilot with right-of-way (the engaged fighter) can also update situational awareness on the wingman less frequently – perhaps referencing the Air-to-Air Tacan or Fighter Data Link when turning through the wingman's approximate position. When the yielding fighter re-enters, and the hazard increases, both pilots should have visual contact and should increase the frequency of the cross-check in proportion to the potential time to impact.

The support fighter must never allow a collision course to develop. If the two fighters begin to converge while attacking

"This article postulates that even the most highly skilled pilots are fallible"

a bandit, the yielding pilot must alter course to preserve the 500-foot bubble. Failure to do so is a violation of the right-of-way contract, and should alert the engaged fighter to knock-off the engagement and take evasive action as necessary.

In ACM, just as in formation flight, the pilot with right-of-way (engaged fighter) must not create a dangerous situation by changing direction into a collision course with insufficient time for the yielding pilot to react. History and the accident record contain too many examples where the engaged fighter abruptly maneuvered into the support fighter's path with 2 seconds time to impact.

## Comparing the Two Plans

The current deconfliction plan has three key components. First, the wingman or support fighter makes deconfliction the number one priority, responsible for ensuring that a collision never occurs. Second, the flight lead or engaged fighter also makes deconfliction a very high priority; usually number two or three (the number one priority normally reserved for navigation and tactics). Finally, all pilots must ensure a clear flight path at all times. Although this plan appears to provide redundancy, such is not the case. We'll examine each component in reverse order.

Clearing the flight path, while good for avoiding fixed objects, is grossly inadequate for avoiding other airplanes. To detect and prevent an impending midair, a pilot must know if another airplane will cross his/her flight path in the future. This requires a pilot to visually acquire the other airplane at its current location and assess whether its maneuvering will cause it to subsequently intersect his/her own flight path. Because the hazard can approach from any direction, a pilot who clears only in the direction of his/her own intended flight path will likely never see the danger.

Allowing one pilot to prioritize navigation or tactics above deconfliction causes three huge problems. First, the pilot's cross-check will be determined by the navigational or tactical task loading instead of by the potential for collision. The pilot's cross-check time will often exceed the element's potential time to impact, permitting an undetected collision to occur. Second, while focusing on tactics or navigation, a pilot might maneuver onto a collision course without knowing that the wingman has insufficient time to react. Third, like the example from the opening paragraph, a communication error might result in both fighters giving highest priority to tactics, each mistakenly believing the other was deconflicting.

Finally, it is unrealistic to assume that the wingman or support fighter will (or can) always avoid collision. Even highly skilled

Photo by TSgt Ben Bloker

"The Flight lead should not compound the wingman's problem and must not create a dangerous situation

pilots are fallible and have limited reaction time. These problems are exacerbated by the lack of specific guidance in the current deconfliction plan. There is no guidance prohibiting a support fighter from selecting a collision course, nor is there emphasis on preserving minimum separation. The lack of guidance leads to improvisation – which is never good for safety. However, even if we address these training deficiencies, wingman or support fighters will never be immune from error because they are human. The accident record contains examples of deconfliction errors by Weapons Officers and even Weapons School Instructors – some of the best trained pilots in the world.

The proposed deconfliction plan was designed to both accommodate and to mitigate the effects of human error. It does this in at least five significant ways. First, the plan gives the yielding pilot specific guidance that should allow him/her to deconflict more quickly and with fewer errors. Second, safe separation is emphasized to provide an additional margin for error. Third, the plan sets a clear standard by which to evaluate the yielding pilot's performance. Fourth, the pilot with right-of-way must cross-check and evaluate the yielding pilot's performance in order to detect an error and avoid an impending collision. Fifth, because they are required to maintain situational awareness of the wingman, the pilot with right-of-way will not inadvertently create a dangerous situation.

As a practical example, consider the scenario of the introductory paragraph where both fighters mistakenly believe they are engaged. Under the current plan, both pilots would consider tactics to be the first priority, and both could potentially decide to disregard the other. Both would check their flight paths and find them clear. Of course the flight paths would intersect in the future, but neither pilot would know that. The deconfliction error would be discovered at the moment of impact. Under the proposed plan, both pilots would believe they had right-of-way. Each would cross-check the other aircraft, expecting to see it yield. Each would see the other on a collision course, in clear violation of the rules for the yielding fighter. Each would then take evasive action and knock-off the engagement. So, under the proposed plan, a mistake becomes a debrief item. Under the current plan, the same mistake becomes a collision, loss of valuable combat aircraft, and potential fatalities.

While post-factual arguments are difficult to prove, it is interesting to review our accident reports to see how many element midairs might have been prevented by the proposed plan. I estimate that five of the seven F-15 element collisions mentioned in the beginning paragraphs would very likely have been avoided – a phenomenal 71 percent improvement.

## Recommendations

This article postulates that even the most highly skilled pilots are fallible, and that the current deconfliction plan lacks the redundancy required to accommodate, or mitigate the effects of human error, resulting in collisions. The accident record confirms this thesis, clearly showing that pilots do make mistakes, and that these mistakes do lead to accidents: exactly as postulated. The nature of the problem suggests two potential courses of action for those concerned with flight safety: either we eliminate human error entirely, or we adopt a new deconfliction plan strong enough to mitigate the effects of human error. Because the former is impossible, the latter looks attractive.

Implementation would require modification to our publications, formal training courses, and Fighter Resource Management (FRM) training. This would be a straightforward, if perhaps rather extensive change because the deconfliction principles apply to all aircraft that fly in pairs: from trainers to fighters to heavies.

As aircraft become more capable, more expensive, and less numerous; and as the time and expense to train qualified pilots continues to increase, we can ill-afford to lose these national assets to preventable training accidents.

Photo by SSgt Daniel M. Cullen

Pilots always want to be remembered. Most pilots want to be remembered for something great, but no one wants to be remembered as the first pilot to crash a B-2, especially a perfectly good one. I sure didn't, but if things had been a little different on a recent training sortie, that might have been my claim to fame.

Now, for those of you who don't know, there are 21 B-2A Spirit bombers. There are no plans to build anymore, and the low production numbers make for a very costly per aircraft price tag. On a good/bad scale, the loss of 1 of only 21 airplanes on a training mission, due to crew inattention would have been a bad thing!

I have about 700 hours in the B-2, which may not sound like much, but keep in mind there are only about 60 people to ever pass that mark, and only 11 to pass the 1,000 hour mark. I am a B-2 instructor pilot and attached to the 394th Combat Training Squadron, the Formal Training Unit (FTU) for the B-2. I had been assigned to that squadron as an Instructor Pilot (IP) and stayed attached to that squadron when I started my new job as the wing flight safety officer.

So there I was, flying a night training mission with an initial qualification student in the most expensive aircraft ever built. It was the student's sixth flight, and I had flown with this student twice previously and was scheduled to fly his next flight as well, and I was comfortable with his progress and abilities. In fact, one of the comments on a grade sheet I had written said something about consistently exceeding expectations. It looked like it was going to be a great flight ...

We had a full day of mission planning and 2 hours of simulator time before the flight. During the flight, we were going to simulate dropping guided weapons, hit the tanker for night air refueling, and then complete night transition at home station. I'd flown a similar profile many times, and the guy in the other seat was better than the average student. Easy, right?

We took off with just enough fuel to get to the air refueling track and return home to

# FAT Finger fiasco

by Maj Shawn C. Purvis, Whiteman AFB, Mo.

Photo by MSgt Val Gempis


Whiteman with min fuel if there were any problems. Needing gas, the pressure was on for the student to perform, and he lived up to my expectations; taking on 60,000 pounds of fuel on his first contact. We were off to a great start. The bombing went well, and now all we had left was a few touch-and-go's. The B-2 is very easy to land, so I figured the rest of the flight would be uneventful – Bad assumption. We briefed a fix-to-fix with a turn in holding to fly the high penetration to a localizer final. It was a beautiful night, and the Air Terminal Information Service (ATIS) recording prepared us for a thin deck from about 1,000 to 2,000 feet. After the student displayed his fix-to-fix skills, I took over flying so he could brief the approach. I entered holding at 7,000 feet MSL. What came next could have been the defining moment in this aviator's career.

The student took over flying and I assumed pilot not flying duties. I listened to ATIS and began setting up the instruments for the approach. Our approach speed was 140 knots, so I set 140 in the Flight Data Control Panel (FDCP). The altimeter setting was 30.14, so I set that in also. These actions happened very shortly after switching roles from pilot flying to pilot not flying. We both heard an audible, "Autopilot, Autopilot" alert warning from the on-board warning system. "Bob," the male equivalent of "Betty" was telling us the autopilot had been disengaged. This is a common occurrence during Initial Qualification Training (IQT) as students often bump the stick or cause the autopilot to disengage due to their lack of proficiency and familiarity with the system. The problem on this night was that we each thought the other had bumped the stick, but neither one of us actually had. The student re-engaged the autopilot, furthering my belief he had bumped the stick and was fixing his "error."

We started our descent to the Minimum Descent Altitude (MDA) of 2,500 feet and entered a thin deck, just as advertised. Our field elevation is close to 900 feet, so the MDA was approximately 1,400 feet Above Ground Level. We broke out of the weather just prior to the final approach fix. In retrospect, this math does not compute. A 1,000 foot ceiling should have kept us in the weather until after descent out of the MDA and another 400 feet of descent. About the time we broke out and realized something didn't look right, the controller queried us on our altitude. We both looked at our instruments and saw we still had a few hundred feet until leveling at 2,500. What I quickly noticed was a radar altimeter dipping below 800 feet! We were almost 700 feet low. I told the other pilot to climb and my mind went into overdrive. It took about 2 seconds to notice my error. There, right in front of me – an altimeter setting of 31.40.

The altimeter setting looked enough like the correct setting of 30.14 that it didn't look out of place. How could this

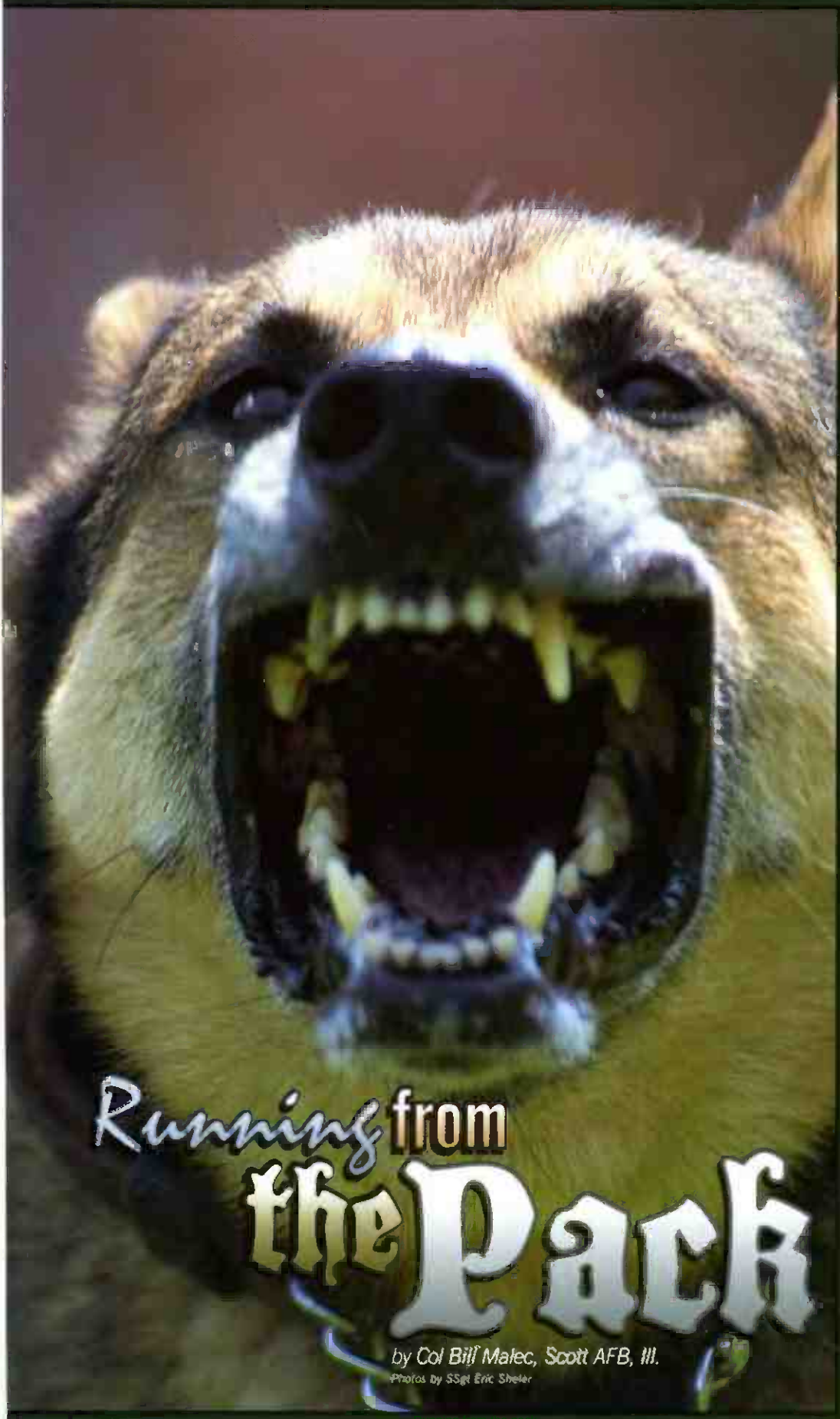
Photo by MSgt Val Gempis

have happened? We corrected our instruments (and altitude) and completed the rest of the transition with that question in the back of our craniums. How could this have happened? Why didn't one of us notice? It didn't take long to solve the mystery, and boy did I feel stupid! I just tried to drive a perfectly good B-2 into the ground. Had the weather been worse and the controller not paying attention, my story could have turned into a very perplexing safety investigation board riddle.

I had turned the cockpit lights down in preparation for the pattern work. When I switched from pilot flying to pilot not flying, I entered the required info into the flight instruments. It turns out that garbage in really does equal garbage out. When I entered 140 for our airspeed, I inadvertently pushed the Barometer or BARO button instead of the A/S Set (airspeed set). The jet was smart enough (?) to keep the "3" from the previous barometer setting of 30.14 and change the last three digits to give us a new altimeter setting of 31.40. Isn't technology great? This explains the autopilot warning while entering holding. I leveled at 7,000 feet and when I entered the wrong barometer setting, the altimeter jumped to about 8,100 feet. My training would tell me that 31.40 – 30.14 would give a difference of 1,260 feet, but due to the conditions, we were closer to 1,100 feet. The student heard the autopilot warning and saw 8,100 feet on the altimeter. He assumed we were holding at 8,000 instead of 7,000 and that I had bumped the stick and we had climbed 100 feet. He corrected back to 8,000 feet, and the proverbial accident chain got another link added.

Luckily, that chain was broken before we hit the ground (or that tower on the approach end) and our wives didn't have to open the front door that night to the commander and chaplain. So, what did I learn from trying to crash a $2 billion dollar airplane? Crew Resource Management (CRM) is great (if you use it). Don't assume the other guy knows what he is doing (we both did that). Anyone who flies a crew airplane receives CRM training and probably takes most of it for granted as stuff they already know. Had I implemented the things I already knew on this night, I wouldn't be writing this article. If you fly a smart jet that requires many button pushes over a typical sortie, make sure your intended button push gives you the result you want. Had I cross-checked my instruments after I pushed that button, I would have quickly seen my error.

The last lesson learned is pretty simple. No matter how good we think we are, we can all make mistakes. Turning the lights down in the cockpit to improve my night vision was a good idea. However, turning the lights down so low that I couldn't read the buttons anymore was not such a good idea. Did I have good night vision? Sure, but you will have great night vision when you impact the ground – probably not a good tradeoff.



# Running from the Pack

by Col Bill Malec, Scott AFB, Ill.

Photos by SSgt Eric Shelor

The big "101 Critical Days of Summer" clock had barely started ticking when I became an early statistic. As is my custom, I had read the summer safety articles and messages from the senior leaders, cautioning on the dangers of summer and encouraging one and all to "be safe." Somewhere in the back of my mind I probably thought, "... but not me!"

Admittedly, 101 Critical Days was not the first thing on my mind, as I set out for an early Sunday morning bike ride on the largely deserted streets and roads around O'Fallon, Illinois. A long bike ride is a great way to clear your head and contemplate the day and week ahead.

Fortunately for me, over the years I've picked up some of the planning and organizing skills that are key to effective operational risk management. I didn't actually pull out and run my ORM checklist during my pre-departure phase, but I did run down a mental list of what to take on my ride.

I had figured out long before the Air Force and the DoD mandated it, that a bicycle helmet was absolutely essential to any bike ride. I added biker gloves and safety glasses to keep dirt and bugs out of the eyes. The mouth tends to get pretty parched out there so I took along a bottle of my favorite sports drink and a wash cloth for occasional brow wipes. Last but not least, I hooked my cell phone to my waist band just in case I needed comm connectivity while out and about.

As I pedaled away I had no inkling of the unexpected adventure that waited just ahead. It's funny how stuff can happen so quickly and have such a potential long-term impact.

One minute I was pedaling contently down a quiet paved country road and the next ..." trouble." Trouble appeared in

the form of three dogs that came running through an open area off to the right headed toward me. This was quite unexpected since I had been down this same road the day and week before with no dogs sighted.

"Danger Will Robinson!" Personal risk management kicked in and the acronym A-C-T with it: Assess your environment for hazards; Consider your options; and Take action to live.

As I said, it was a pretty tranquil environment until Fido and his pals showed up. The trio consisted of one large Lab-like mutt and two smaller white and black bundles of fur still headed my way, barking as they came. I immediately reviewed my options.

I never considered stopping, as I wasn't feeling the love, and figured I had the superior speed and agility necessary to make a successful escape. I shifted into overdrive and pedaled my old Schwinn for all she was worth. The dogs gave chase! As I transitioned into super drive I must have looked like a modern-day Headless Horseman of Sleepy Hollow fame.

Once I reached warp speed, I never saw two of the dogs again but one of the white and black mutts was persistent and kept up an impressive pace. He positioned himself just forward off my left handlebar in the center of the road, periodically glancing back and yapping as he raced all out.

Even at this point I thought I was home free, thinking I was just seconds away from leaving the pooch in my dust. What happened next still causes me to wake up at night with cold sweats. Instead of breaking off the chase, Bowser abruptly angled right and slid up under my front tire in a canine "hara-kiri."

SPLAT! One second I was cruising along in getaway mode like Bonnie and Clyde and the next I was sitting in an ugly heap. "Take action to live" kicked right in. Bowser beat feet back where he came from and left me screaming like a banshee in front of his neighbor's farmhouse.

It happened so fast that I still can't replay the tape in my mind with any detail. I must have landed pretty hard on my left shoulder 'cause when I stood up my whole left side seemed to be compressed down about 6 inches lower. Even with adrenaline pumping my breathing was labored and my left side, from ankle to shoulder, was reminiscent of the old Beatles' tune, Strawberry Fields Forever.

My "brain bucket" had done its job ... it shattered into pieces but there was nary a scratch on my cranium.

It was obvious that I needed to get to a hospital real soon and wasn't going to be riding my bike there. Despite my loud wailing, no one ever emerged from the farmhouse to see what was the clatter or call 9-1-1. Fortunately my wife was just a cell phone call away.

Bless her heart, within a few long minutes she swooped down on me like Florence Nightingale in our Ford Explorer turned "Jolly Green." She quickly loaded bike and me, and hustled without delay to Scott Air Force Base Hospital ER.

My left lung was collapsed, probably pierced by one of my two broken ribs. The left clavicle was broken right through in two places, necessitating two surgically inserted stainless steel screws to get the shoulder lined back up. They put a drain tube in my chest cavity that stayed in place 3 days, and a brace around my neck that hampered my movement and vision for 2 weeks. No skull damage was found, a testament to helmet wearing. Five days post-accident I went home.

The moral to my story ... plan for the worst. Bad, life-altering, things can happen P-D-Q so you've got to be ready. A little attention to detail up front, and a little applied Personal Risk Management can save a lot of pain, agony, or worse later. Your very life could depend on it!

# What is large, yellow and holds the future of America?

**After a long, hot summer, *The Combat Edge* and ACC Ground Safety are issuing a BOLO (Be On the Lookout) for school buses in your neighborhood and on your local streets.**

*- Every year, approximately 440,000 public school buses travel more than 4 billion miles and daily transport 24 million children to and from schools and school-related activities.*

*- School buses account for an estimated 10 billion student trips each year.*

*- When comparing the number of fatalities of children ages 5 through 18 during "normal school transportation hours," in the 1989 through 1999 school years, school buses were 87 times safer than passenger cars, light trucks, and vans.*

*- By all measures, school buses are the safest motor vehicles on the highways.*

*– The National Highway Traffic Safety Administration*

# TRAINING in the DARK

by Lt Col Rick Turner, Pope AFB, N.C.

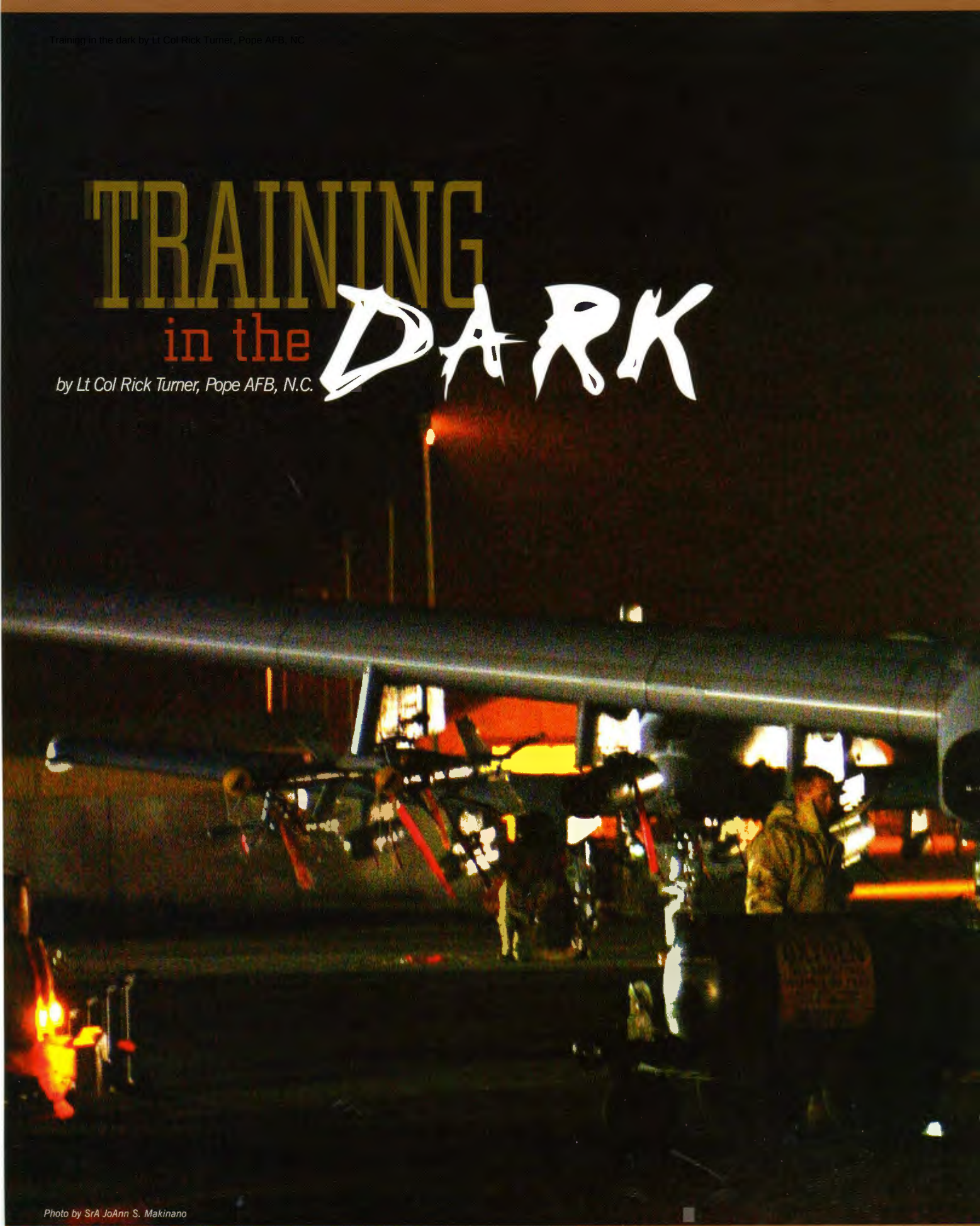


Photo by SrA JoAnn S. Makinano


949

Photo by SSgt Justin D. Pyle

The sortie was briefed as a night two ship to the local conventional bombing range with a high-time wingman. We each planned to drop six BDU-33 inert training bombs and shoot 100 training practice (TP) rounds using night vision goggles (NVGs) because of the high-illumination night. Our jets were not ready when they were suppose to be. The number 2 aircraft then ground aborted due to an engine problem, so I made a single-ship takeoff and headed to the range. Range operations were going smoothly until the 45-degree High-Angle Strafe (HAS).

My first HAS pass was planned as a short 20- to 30-round "sighting burst" to establish a combat offset for the next pass. The unlit target was situated in the center of a 600-foot diameter circle marked by four lights positioned on the edges at the 12, 3, 6, and 9 o'clock positions. The first pass bullets generated a lot of "sparkles" as they chewed into the standard "painted bus" target. The Range Control Officer (RCO) enthusiastically called, "Hit, One," as I maneuvered for the second and final pass.

I planned to shoot the remaining 70 to 80 rounds on this pass. The resulting longer burst also created a lot of "sparkles," but in a larger area than the bus should have occupied. I reasoned that they must be hitting the hundreds of near-hit BDUs (inert practice bombs) scattered near the target. Again, the RCO called, "Hit, One," as I safed the gun and flew to a base position for my last bombing event. As I approached base, the RCO radioed, "You sure that's TP you're shooting there, One?"

"That's all they'll load," I replied. And then that sinking feeling hit me as the RCO said, "Well, I've never seen flashes that bright from TP before."

The bullets looked TP blue on my preflight inspection ... hadn't they? I did not use a flashlight, but they definitely weren't yellow ... or were they? Besides, maintenance is not allowed to load High-Explosive Incendiary (HEI) rounds and park the jet on the normal parking ramp ... are they? And, even if that were legal, I would have seen something about HEI in the aircraft forms, and I had reviewed those thoroughly ... hadn't I? No, I told myself; these HAVE to be TP rounds loaded in my jet! The remainder of the sortie was uneventful as I dropped my last two BDUs, made a half-dozen dry Maverick passes, and then departed the range for home. But just to ease my nagging suspicion, the first thing I did after shutting down in the chocks was to open the gun bay and re-check the bullets with a flashlight.

Upon further inspection, they were not blue TP but yellow HEI! Most safety officers will compare the events leading up to an incident/mishap to the links in a chain, and this one was no different. I will trace the origin of each link in the safety chain so that you, the reader, can hopefully see how dozens of small mistakes and rushed decisions resulted in the temporary loss of a valuable training range and cost hundreds of man-hours in Explosive Ordnance Disposal (EOD) cleanup efforts. We were very fortunate that no one was hurt ... or worse.

It all began at 8 p.m. on Thursday, the week prior. It was then that the aircraft was loaded with HEI and two MK-82 general-purpose bombs on the hot cargo pad for an Army live fire exercise. During the pre-flight engine intake and exhaust inspection, the crew chief noticed feathers in the exhaust. A borescope inspection was accomplished, and two fan blades were found to be damaged beyond limits. The determination was made at that point that the engine would have to be changed. Maintenance supervision canceled the sortie and requested that the weapons troops come out and download the MK-82s so the jet could be towed back to its normal parking spot. There was no immediate requirement to download the HEI prior to repositioning the aircraft, so it was held until later (link one).

After the aircraft had been towed back to its normal parking spot on the flight line side of the ramp, the crew chiefs began dropping the engine for replacement. They worked until their shift was over but were not able to complete the job they had started. Electrical and hydraulic power could not be applied to the aircraft while there was ongoing major engine maintenance; therefore, without aircraft power, the weapons load crew was unable to download the HEI ammunition from the jet so the task was delayed further (link two).

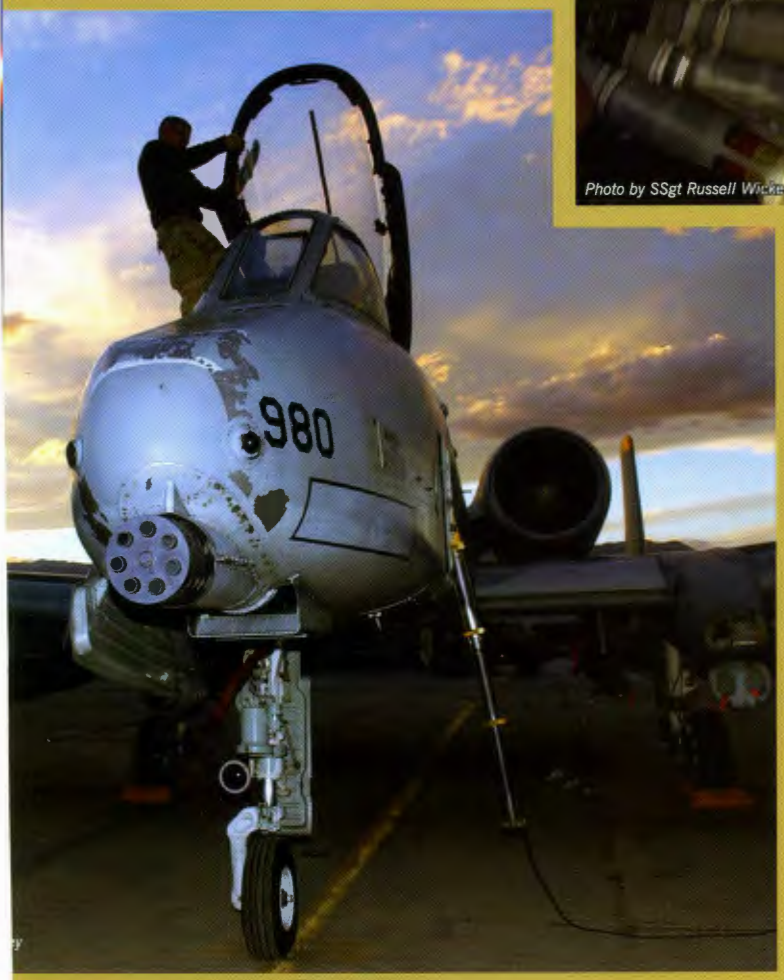
Photo by SSgt Jennifer L

Ironically, Friday was a group Safety Day and no maintenance was performed. On Saturday, the weekend duty crew came in to finish installing the engine. It was installed and operationally checked without event. The aircraft was pronounced Fully Mission Capable (FMC), but it was late in the day. Because maintenance had already produced sufficient FMC aircraft for all of Monday's scheduled sorties, the weekend duty crew made the decision to wait and download the HEI ammunition first thing Monday morning (link three).

On Monday morning, one of the scheduled aircraft was discovered to have a liquid oxygen problem and the spare aircraft was substituted in its place. The production superintendent (pro-super), in conjunction with the squadron senior supervisor (Top-3), agreed to add this particular aircraft to the lineup as a spare for a sortie that didn't require the use of the gun. The day shift Top-3 was reminded about the HEI and he agreed to brief all pilots.

There were more than 25 pages of information notes in the aircraft forms because of the engine change. The crew chief reviewed these and carried forward all the outstanding write-ups; however, he overlooked the note about the aircraft being loaded with HEI (link four).

Photo by SSgt Russell Wicke




There is usually no need to carry information notes forward on a day-to-day basis. The two information notes usually found in the forms are for ammo/chaff/flare and Mode IV. The ammo/chaff/flare note is recorded by weapons personnel during the weapons post-load, and the Mode IV note is written by communications and navigation troops before the exceptional release (ER) is signed. Both are on a computer-generated sheet that is replaced daily. When the pro-super signed the ER for this aircraft, he failed to notice that the HEI information note had not been carried forward to the new set of forms (link five).

Weapons safety procedures dictate that all aircraft loaded with HEI ammunition must prominently display an orange, X-shaped "2" fire symbol to easily identify the presence of explosives to emergency response personnel. The placard was properly affixed to the aircraft nose wheel by a bungee cord at the time of the ER, but was not noticed by the pro-super nor pointed out to him by the crew chief (link six).

One of the first launch aircraft returned Code 3. A system on the aircraft was nonoperational and the aircraft could not be used for the next sortie. Now designated as the spare aircraft, the HEI-loaded jet was flown in the second launch without event. That pilot was briefed several times that the jet was loaded with HEI and the "2" placard was properly displayed when he arrived to preflight the aircraft. After recovery, between the second and third launch, for unknown reasons, the "2" placard wasn't placed back on the jet (link seven).

Between the second and third launch, there was a complete shift change between the crew chief, pro-super, and Top-3 supervision. The new Top-3 was briefed about the HEI ammunition and he, in turn, briefed the pilot scheduled to fly that aircraft. Due to the timing of the pilot-ready jets and the mission priorities, the Top-3 made a

change in the planned aircraft line-up. My wingman was unknowingly scheduled to fly the HEI-loaded aircraft. When my flight arrived at the operations desk to get a "step brief" from the Top-3, we were told that the jets were not yet ready. We were also told that number 2's aircraft was one of the new Embedded Global Positioning system/internal (EGI) navigation system modified aircraft. The modified aircraft had an improved navigation and weapons delivery system that was procedurally very different and difficult for an inexperienced pilot to use properly. My wingman had never flown in an EGI jet and did not want to make his initial EGI familiarization flight at night. The Top 3 approved the jet swap at the duty desk. My wingman would then fly an unmodified jet and I unknowingly acquired the HEI-loaded aircraft (link eight). We waited at the operations desk with the Top-3 for 20 minutes before we received our "step brief." In all that time, the Top-3 made no additional mention of any of our jets carrying HEI or any other nonstandard configuration (link nine).

We finally stepped out the door 20 minutes later than we had planned. The parking locations given to us were situated on opposite ends of the ramp and somehow had been reversed. This made us later still as we each walked first to the wrong jet, then all the way across the ramp to the correct one. My aircraft's forms were cluttered, and after reviewing 10-15 pages of information notes, I discovered that the intake and exhaust inspection (red X) had not been properly annotated and carried forward. The crew chief made the appropriate changes to the forms before I made my final review. The ER was not signed by the pro-super, which is not uncommon for second or third flights. I felt comfortable with my thorough review of the forms and signed my own ER (Red Dash) instead of delaying even longer to wait for the pro-super to come out and sign it off (link 10). There was no mention of HEI anywhere on the forms, the orange "2" placard was nowhere in sight, and the new crew chief never mentioned anything about the type of ammunition loaded.

The sun had just set about 10 minutes prior, but there was still plenty of ambient light to do a visual walk-around without using a flashlight. In order to check the bullet type in an A-10, you have to open a 5-by-7-inch access door under the nose of the jet and look up about 2 feet into the ammo feed mechanism. There is usually enough daylight reflected off the parking ramp into this area to easily distinguish bullet colors, but the sun had already set. I was late, in a hurry, and didn't use my flashlight because I thought there was still enough natural light to determine color (link 11).

I had been flying at this particular base for more than a year and a half and had never seen anything other than TP rounds loaded in the gun for local area sorties. We had only recently completed the approval process for live ordnance, and I knew that there were specific restrictions on where these jets could be parked. I was under the impression that if HEI rounds were loaded in a jet, then that jet would have to be parked in the live load area, not on the regular parking ramp (link 12). I was in a rush to meet my takeoff and range time and as I looked up into the gun bay, I saw dark colored bullets in the feeder mechanism that appeared blue because that was what I was expecting to see. At that moment, I became link 13, the last link in this long "safety chain."

The final result of this long chain of events was 100 rounds of 30mm high-explosive incendiary ammunition, a few which undoubtedly did not explode, spread across the training range and an out-of-cycle range cleanup costing hundreds of EOD man-hours. Everyone who participated in this chain of events had at least one chance to prevent this incident. They could have followed tech order guidance to the letter, paid closer attention to the details, applied sound common sense and/or operational risk management principles, or just had the presence of mind to ensure that important details were communicated properly and timely.

The breaking of any one of the 13 links of this chain would have prevented this mishap. In the grand scheme of life, our actions at any given time may seem insignificant; however, the cumulative effects of those actions, along with the actions of everyone around us, can easily lead to a mishap or to the prevention of a mishap. The links in a chain that can lead to a mishap must be proactively identified at every level before it is too late to turn back. In this case, the bullets were already on the target before the links became obvious. This was definitely too late. Don't get caught as one of those links in a mishap chain the next time you find yourself training in the dark.

Photo by TSgt Kevin J. Gruenwald

CUT ON THIS LINE

# Combat Edge Reader Survey

I know what you're thinking, "Great, another survey." Trust me; I don't care for them either, mainly because you never seem to get feedback on the results. But as I see it, if you the reader, take the time to respond, the least I can do is respond in kind. I will print the results and your comments in December or January, or sooner depending upon the response. I promise not to "pull punches" as long as you won't and print the good along with the bad. Simply fill out the survey, (no names please) remove it from the magazine, fold it on the lines so that the mailing address shows, and then tape (no staples please) it closed. Send it to us through your official mail channels, or place first class postage on it and drop it in you local mailbox. You can make copies of the survey so others can chime in.

Branch of Service/Agency _____ Rank _____ AFSC _____ Age _____ Sex: M F
Job title/description _____

1. How often do you read this magazine?
   a. Very often (every issue)
   b. Often (most issues)
   c. Sometimes (some issues)
   d. Seldom (in fact, this is the first time I've seen it)

2. The best change implemented to the magazine this past year is:
   a. The cutting-edge, high speed, swoopy F/A-22 inspired logo
   b. The cutting-edge, hard hitting, eye-catching Safety Posters
   c. The cutting-edge, use of color and photos to illustrate stories
   d. The articles provide safety policy and information with a bit of humor / magazine doesn't take itself too seriously, I like that

3. How much of each issue of this magazine do you read?
   a. All (I just love it, can't get enough of it, give me more)
   b. Most (I read what affects me - flight, ground or weapons)
   c. About half
   d. Some (defined as less than half and more than a little)
   e. A little (read Fleagle - that crazy bird, when will he learn?)
   f. Look at the pretty pictures of airplanes but seldom read
   g. None (a trick question, if you read this, you cannot answer "g")

4. How many other people read/share the copy of this magazine you receive?
   a. None, I want to be the only one on my block to have it
   b. 1-3 We're a small organization
   c. 4-6
   d. 7-9
   e. 10 or more (you like to share and you have a ton of friends)
   f. Don't know, and I'm too afraid to ask anyone

5. After reading this periodical, what do you do with it?
   a. Keep it for future reference
   b. Discard it / use it to wrap fish
   c. Pass it on or put it where others can pick it up and read

6. How soon after the first of each month do you get your hands on a copy of this magazine?
   a. One week or less
   b. One to three weeks
   c. A month or more
   d. I'm at a deployed location and just happy to get a copy

*We are interested in your assessment of* ***The Combat Edge*** magazine. *When choosing an answer, write in the number corresponding to the extent you agree or disagree with each statement.*

| *Strongly Agree* | *Agree* | *No opinion* | *Disagree* | *Strongly Disagree* |
|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* |

8. **The Combat Edge** satisfactorily presents safety information.
9. **The Combat Edge** is as interesting as other publications I've read.
10. **The Combat Edge** is as informative as other safety publications I've read.
11. **The Combat Edge** should continue to print the safety posters like the ones I've seen this past year.
12 The articles in **The Combat Edge** are technically accurate.
13. Overall, the appearance of **The Combat Edge** is good.
14. Coverage of flight safety issues is adequate.
15. Coverage of ground safety issues is adequate.
16. Coverage of weapons safety issues is adequate.
17. The number of photos, illustrations and charts in **The Combat Edge** is suffucient.
18. **The Combat Edge** articles are informative.
19. **The Combat Edge** articles are interesting.
20. **The Combat Edge** magazine is useful to me personally.
21. Article topics are in tune with important trends.
22. **The Combat Edge** is an effective mishap prevention tool.

| *Poor* | *Fair* | *Satisfactory* | *Good* | *Excellent* |
|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* |

23. Covers
24. Layout (professional appearance)
25. Article quality
26. Photographs
27. Illustrations
28. Information value
29. Use of color
30. Thought provoking nature
31. Type (size and style)
32. General interest / entertainment value
33. Article thoroughness
34. Article variety
35. Awards coverage
36. Usefulness in my job
37. Timeliness of articles / issues
38. Accuracy
39. Usefulness in increasing professional expertise
40. Attractiveness
41. Overall value

Official Business

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FOLD ON THIS LINE

FOLD ON THIS LINE

42. Has a **Combat Edge** article ever saved your life or kept you from doing something dangerous? If so, briefly describe the situation.

43. How would you rate this magazine in comparison with other publications dealing with the same or similar subject matter?

a. The best
b. The worst
c. Average
d. Better than most
e. Worse than most
f. The most

Please tell us how you would improve **The Combat Edge**:

What kinds of articles should we print more of? Less of? Additions?

Other comments: (i.e., "editor, I found an error in the magazine, there isn't a question 7 in this survey, it jumps from question 7 to question 8 ...)

Photo by A1C Trina Flannagan

# GUN POWDER

by TSgt Henry J. Pacheco Jr., Hill AFB, Utah

Photo by A1C Trina Flannagan

Photo by AMN Kendra N. Fulton

There was a time less than 14 years ago when the term "weapons safety" was nothing more than a passing thought in this young Airman's mind. With one stripe, I was more concerned about how long my crew chief was going to make me push a broom, pick up trash or worse, empty the shop chief's ash tray. The one thing I did enjoy in the Air Force was listening to stories, and I had a great supervisor who was king of the "back in my day" stories. Unfortunately, he didn't realize how much I looked up to him or how easily influenced I was.

His story about how he and a buddy used to collect gun powder out of damaged 30mm rounds and light it off while on swing shift to pass the time really intrigued me. Being the unwise young man I was, I started collecting gun powder from damaged 20- and 30mm rounds for the next couple of weeks. When I had filled at least a gallon-sized bag, I could hardly wait for the perfect time to light it off. The opportunity finally came about a week later when the shop chief let half the shop go home a little early on a Friday afternoon.

As I headed to the back of the shop, I didn't have the slightest concern about weapons safety. The only thing going through my very young and inexperienced head was how cool my supervisor's story had been. As I lit the gun powder though, I found out that my supervisor had left out a really important detail: the rate at which gun powder burns. It doesn't burn slow like you see in the movies. It was like taking a trash bag full of gasoline and placing it on a bonfire a mere foot away or holding about 60 road flares in my hand and lighting them all at the same time. What happened next? Try a huge cloud of smoke billowing up from behind my shop that was seen by everyone throughout the bomb dump, including my "older than water" Ammo chief.

After an hour of watching my chief turn 20 shades of red, I was sent out to ensure that every leaf was removed from his entire bomb dump fence for the next 2 weeks. I learned a couple of valuable lessons during that time. Supervisors have a very influential role in the lives of their young troops, and it is a task that should be taken very seriously. I also learned that weapons safety is not just about keeping the weapons safe. It's about keeping the people who work with weapons safe. This is done by not only ensuring our young troops handle weapons correctly, but also letting them know what can happen if they don't.

# Monthly Award Winners

## Aircrew Safety
### Award of Distinction

During a combat mission, in support of Operation ENDURING FREEDOM, a Global Hawk aircraft experienced multiple system faults. The fault indications showed a low engine oil level, high engine oil temperature, and an abnormal change in engine fuel flow. With a 4-hour flight required to return to the normal launch and recovery base, the decision was made to execute an emergency landing on a 9,800-foot runway at a Forward Operating Location (FOL). Unable to contact air traffic controllers, the Mission Control Element (MCE) crew informed the Global Hawk Operations Center (GHOC) by telephone that they would be executing an emergency landing to an FOL. Unable to further contact the GHOC due to busy phone lines, the MCE instructor pilot directed two assigned systems operators to communicate the divert plan to other agencies involved with the mission. One sensor operator was sent to the GHOC to coordinate air traffic control and transient alert personnel at the FOL. The other systems operator assisted the pilot by communicating critical information through secure chat reports to other agencies. The GHOC personnel contacted radar and tower controllers on the phone at the FOL to advise them that a large aircraft would be landing at their base in approximately 30 minutes with zero souls on-board. The crew's next concern was to ensure the airspace and runway was clear. With clearance to land, the aircraft descended on a pre-programmed emergency landing route, but failed to land on the first attempt due to excessive altitude and steep descent rate for the planned flight profile. The MCE crew commanded the aircraft to turn away from the runway and climb, but due to a computer software anomaly, the aircraft would not accept the command to climb to the Minimum Safe Altitude (MSA). With rising terrain in all quadrants, the MCE crew quickly commanded the aircraft to fly to a waypoint that ensured an altitude higher than the MSA. After the aircraft attained the commanded waypoint and altitude, the MCE pilot directed the aircraft to a normal descent and a safe landing. This first-ever deployed Global Hawk emergency landing was a true success due to the crew's timely decisions, knowledge of systems, crew resource management, and disciplined actions to prevent a mishap and save a $45M YRQ-4A aircraft – and they did it all from 6,500 miles away.

**Col Greg A. Kern, Lt Col Donald M. Corley, Maj Ed C. Maraist, MSgt Eric C. Muntz, SSgt Sean T. Kelly, 12th Reconnaissance Squadron, 9th Reconnaissance Wing, Beale AFB, Calif.**

## Flight Safety
### Award of Distinction

SSgt Davis, SSgt Priemer, SrA Smart, and A1C Magnie were performing an engine run on an F-15 aircraft to troubleshoot a #1 engine no start. All indications on the initial start of the JFS were normal until the #2 engine was engaged for start. The #2 engine was spinning up normally during start when the JFS exploded with a loud bang. SSgt Kelley and A1C Hoffman were working on a nearby aircraft and heard the explosion. They immediately responded with a fire extinguisher; A1C Hoffman charged the bottle allowing SSgt Kelley to extinguish the fire. SSgt Priemer notified the flight line expediter of the emergency and directed them to dispatch the fire department. SSgt Davis initiated emergency shutdown procedures and was assisted out of the cockpit by A1C Magnie. SrA Smart evacuated all unnecessary personnel from the area and allowed emergency personnel to respond without interference. Upon arrival of the emergency personnel, SSgt Kelley supervised the removal of panels by SSgt Priemer and A1C Hoffman to verify the fire was extinguished and helped assess whether any aircraft damage occurred. They determined the JFS experienced an uncontained failure of the turbine section during the attempted start. Hot melting turbine blades had exited the JFS case, and the jet exhaust had blown hot metal fragments everywhere. The decisive actions and teamwork, inspired by excellent training, allowed SSgt Kelley, SSgt Davis, SSgt Priemer, SrA Smart, A1C Hoffman, and A1C Magnie to act without delay to ensure no one was injured and prevented the potential loss of the aircraft.

**SSgts David W. Kelley, Lorian Davis, Kurtis Priemer, A1Cs Russell S. Hoffman, Harlen W. Magnie, and SrA Steven L. Smart, 4th Aircraft Maintenance Squadron, 4th Fighter Wing, Seymour Johnson AFB, N.C.**

## Crew Chief Safety
### Award of Distinction

During a launch of a U-2 aircraft, A1C Kristunas discovered the upper Q-bay hatch unsecured. A keen eye enabled him to discover the red vertical line indicator on the locking mechanism was slightly angled; an inspection that was overlooked during the production superintendent's and mobile officer's walkaround. He quickly terminated the engine start sequence and coordinated with his crew to secure the hatch. Had the hatch come loose in flight, it may have severely damaged the vertical stabilizer – outstanding catch! On two occasions, while performing pogo supervisor duties, emergency aircraft stopped on the runway and closed the airfield. Due to the low five-level manning in his unit, A1C Kristunas was called upon to perform tow vehicle driver duties for an in-flight emergency, as he was the only tow-qualified person available. A1C Kristunas coordinated with the maintenance operations center and ground control to "break red" and negotiate the control movement area in order to sign out the tow vehicle from support. His quick action enabled the emergency aircraft to be removed from the runway and the airfield was re-opened in 15 minutes with no ground movement violations. On another occasion, after a weekly oil sample of the aircraft engine oil carts was completed, Non-Destructive Inspection (NDI) flight called and reported that one of the carts had been contaminated by an unknown source. A1C Kristunas had the contaminated cart delivered to the NDI shop, whereupon he volunteered to stay and assist with the cleaning processes. He helped drain, wipe the interior, replace the filters, service, and resample the cart. His dedication ensured the safe and reliable operation of all assigned U-2 aircraft engines valued at $3.1M each. A1C Kristunas' commitment to safety averted potential Class A mishaps and ensured the safekeeping of valuable government equipment. Well done!

**A1C David F. Kristunas, Jr.,**
**9th Aircraft Maintenance Squadron,**
**9th Reconnaissance Wing, Beale AFB, Calif.**

## Ground Safety
### Award of Distinction

As the Unit Safety Representative for the 2nd Civil Engineering Squadron, TSgt Schneider expertly directed an ambitious multi-faceted safety program for over 500 active duty personnel and civilians in 24 sections. During his annual program assessment, Sgt Schneider demonstrated complete mastery of Occupational Safety and Health Administration, Department of Defense, and Air Force safety standards, confined space safety, fall protection and lock out/tag out procedures. Sgt Schneider completely turned around the safety program by aggressively promoting Operational Risk Management (ORM)in all unit operations. Sgt Schneider required every person in the unit to complete the Air Force ORM computer training and documented completion, easily establishing his ORM program as the wing benchmark. His motorcycle safety program was also among the best in the wing, incorporating a detailed rider's database and complete records of Motorcycle Safety Foundation training, motorcycle license endorsements, and commander's counseling for every rider. His safety training program included an exceptionally detailed projection of all safety training and materials required, a training schedule, and meticulous documentation of all training completed. He provided continuous updates and assistance to every shop in the unit, helping them maintain lockout/tagout, confined space, and fall protection programs in strict compliance with governing directives. Sgt Schneider developed a detailed monthly self-inspection checklist for every section and tracked progress on a quarterly basis, ensuring all hazards were highlighted and corrected. He also inspected all section and flight safety binders repeatedly to ensure standardization and rapid dissemination of safety policy letters, Job Safety Training outlines, and governing Air Force Instructions. Sgt Schneider's proactive efforts ingrained a rock-solid culture of safety awareness and risk management in the squadron and serves as a shining example for the entire command.

**TSgt Patrick Schneider,**
**2nd Civil Engineering Squadron, 2nd Bomb Wing,**
**Barksdale AFB, La.**

# Monthly Award Winners

## Pilot Safety
### Award of Distinction

While serving as an instructor pilot in the two-seat TU-2S, Maj Donald Temple's aircraft encountered a complete loss of hydraulic pressure following a routine touch and go. The flight was the student's first syllabus sortie in the U-2 Basic Qualification Course. Maj Temple exhibited superb use of crew resource management, by assuming control of the aircraft and having his student run the appropriate checklists while he maintained aircraft control. Maj Temple flew a flawless no-flap, no-hydraulic pattern and landing with a less than optimal pitch trim configuration and a questionable emergency lift spoiler system. Landing the aircraft in a hydraulic out configuration is extremely challenging even in the most optimum conditions, as the landing distance can exceed 13,000 ft with inoperative brakes, flaps, and no headwind. The flight path approach must be extremely shallow and flat to cross the runway threshold 4-to-6 ft high and exactly on speed in order to touch down in the first 3,000 ft of the runway. After executing a textbook landing, Maj Temple discovered that his emergency brakes were not functioning. With no lift spoilers, no emergency braking and idle thrust, landing distance could easily have exceeded the available runway. Maj Temple expeditiously shut down the engine to reduce landing roll distance. Realizing the aircraft would probably not stop within the runway available, he attempted an unorthodox and very demanding maneuver by lowering one wingtip to the runway to increase drag and further shorten the landing rollout. Maj Temple's gambit was a success and he brought the aircraft to a stop on the runway, with only 1,200 feet of runway remaining. Maj Temple safely recovered a valuable national asset through quick thinking, outstanding airmanship, and efficient use of crew resources.

**Maj Donald Temple, 1st Reconnaissance Squadron, 9th Reconnaissance Wing, Beale AFB, Calif.**

## Unit Safety
### Award of Distinction

The #3 engine and tailpipe were removed from a B-2 aircraft as part of scheduled maintenance for the aircraft entering programmed depot maintenance. Evidence of heat damage was discovered on: the tailpipe, the electromagnetic foam (e-foam) coating covering the tailpipe bay, and the aircraft composite structure in the tailpipe bay. The 509th Aircraft Maintenance Squadron (AMXS) maintainers worked with other experts on base and determined that loose, or damaged e-foam, which had subsequently become oil soaked during normal aircraft operations, appeared to be the cause of the heat damage to the tailpipe and the aircraft composite structure. The squadron coordinated with the B-2 program office, Northrop Grumman, Air Force Engineering Technical Service, the 509th Quality Assurance office, and the 509th Maintenance Squadron to develop a local One-Time Inspection (OTI) of e-foam in the exhaust tailpipe area to identify and remove damaged e-foam material; preventing any future heat damage to the tailpipes and the aircraft composite structure. The immediate OTI was developed and issued. Due to the limited access and visibility of the exhaust area, the OTI called for crew chiefs and jet troops to conduct the inspection using a bore scope, or by opening the engine/airframe mounted accessory drive doors, and then removing the tailpipe nozzle bay access panels to do a visual inspection with a flashlight and mirror. The OTI was accomplished on all assigned aircraft within 3 days after the initial discovery. Over 136 man-hours had been expended to identify a total of 21 of 68 tailpipe bays had damaged e-foam. The AMXS inspected 11 of 17 aircraft assigned (including all aircraft at a forward operating location) as well as coordinating to ensure the OTI was complied with, and status was received for one test and three depot maintenance aircraft located off station. In the 3 weeks that followed, AMXS expended 288 man-hours to remove and seal e-foam to ensure no further heat damage occurred to a $2.2 billion asset.

**509th Aircraft Maintenance Squadron, 509th Bomb Wing, Whiteman AFB, Mo.**

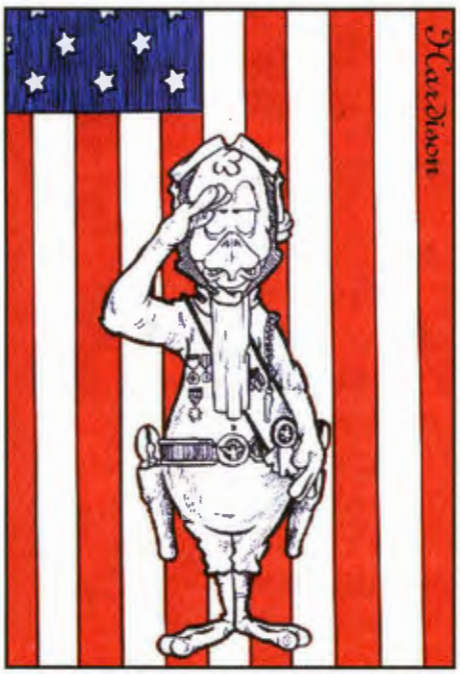
## Weapons Safety

**Award of Distinction**

A1C Hamilton was inspecting 10 MHU-141 trailers used to transport and load Air Launched Cruise Missiles and Advanced Cruise Missiles on B-52 aircraft for compliance with a recent Time Compliance Technical Order (TCTO). After conducting this inspection, Airman Hamilton noticed something unusual with the MHU-162 adapters designed to connect missile stands to each trailer. Each adapter includes a retaining pin, and the part numbers on these pins did not match the T.O. Airman Hamilton cross-checked the packaging and found that the package reflected the correct number, even though the actual part inside did not. Realizing that the incorrect number meant that the parts may not have undergone the required testing for compliance with exacting nuclear surety standards, Airman Hamilton immediately elevated the issue to his supervisor and drafted a Product Quality Deficiency Report to highlight the problem to Air Combat Command. This report and Airman Hamilton's accompanying photos quickly convinced the Air Combat Command weapons logistics staff to remove the part listing from Federal Logistics Database Log and purge the supply system of any remaining pins. Airman Hamilton's keen eye for the finest detail, relentless research, and dogged pursuit of perfection eliminated any possibility that rigorous nuclear surety standards might be compromised through the use of unproven parts.

**A1C Gavin B. Hamilton, 2nd Munitions Squadron, 2nd Bomb Wing, Barksdale AFB, La.**

# ACC SALUTES SUPERIOR PERFORMANCE




**Capt Chadwick D. Greer**
Pilot
34th Fighter Squadron
388th Fighter Wing
Hill AFB, Utah

**Capt Andrew P. Stockman**
Pilot
34th Fighter Squadron
388th Fighter Wing
Hill AFB, Utah

**Capt James F. Ross, Jr.**
Aircraft Commander
**Capt Nathan P. Rowan**
Copilot
**Capt Christopher J. Buechler**
Offensive Systems Officer
**1Lt Nicholas M. Kotch**
Defensive Systems Officer
37th Bomb Squadron
28th Bomb Wing
Ellsworth AFB, S.D.

**Capt David M. Lercher**
Predator Instructor Pilot
**SSgt Adam F. Fields**
Sensor
11th Reconnaissance Squadron
57th Wing
Nellis AFB, Nev.

**SSgt Justin R. Falcon**
Weather Journeyman
509th Operations Support Squadron
509th Bomb Wing
Whiteman AFB, Mo.

**SrA Nathan D. Krueger**
Assistant Dedicated Crew Chief
4th Aircraft Maintenance Squadron
4th Fighter Wing
Seymour Johnson AFB, N.C.


Fleagle
BUS
THEY'RE MOTHERS. SCHOOL STARTED.
YES, IT'S THAT TIME AGAIN. THE LITTLE ONES WILL BE OUT AND ABOUT EARLY ON THEIR WAY TO SCHOOL. LET'S DO OUR PART TO MAKE THIS MOST IMPORTANT TRIP A SAFE AND HAPPY ONE..
WHY SHOULD THE PARENTS BE THE ONES HAVING ALL THE FUN?
HARRISON

## FY05 Aircraft

As of July 31, 2005

| | Fatal | Aircraft Destroyed | Aircraft Damaged |
|---|---|---|---|
| 8 AF | | | |
| 9 AF | | | |
| 12 AF | | | |
| AWFC | | x5 | |
| ANG (ACC-gained) | | | |
| AFRC (ACC-gained | | | |

## FY05 Ground

As of July 31, 2005

| | Fatal | Class A | Class B |
|---|---|---|---|
| 8 AF | | 4 | 1 |
| 9 AF | | 4 | 1 |
| 12 AF | | 7 | 1 |
| DRU's | | 1 | |

## FY05 Weapons

As of July 31, 2005

| | Class A | Class B |
|---|---|---|
| 8 AF | 0 | 0 |
| 9 AF | 0 | 0 |
| 12 AF | 0 | 0 |
| AWFC | 0 | 0 |

## Aircraft Notes

ACC had one Class A in July involving two tethered Aerostats. Both Aerostats were destroyed by Hurricane Dennis while moored in the Florida Keys. The crew on the ground did a great job preparing for the storm, preventing the loss of high value equipment. In June we lost a valuable warrior and member of our team due to CFIT at night. It is a tragic reminder to all of us how quickly "Terra-Firma" can be met. The loss of perceptual cues at night, coupled with any distraction, can quickly turn an emergency into a disaster. That kind of experience is tough to prepare for in the sim. It can be even tougher in the air. Remember, "Check Yourself before you Wreck Yourself!"

## Ground Notes

ACC experienced one PMV4 mishap during the month of July. The command has lost five individuals so far during the 101 Critical Days of Summer. There are 35 days left. We are now equal to the FY04 talley of five Class A mishaps. Lack of seat belt use and the use of alcohol continue to be factors in many mishaps.

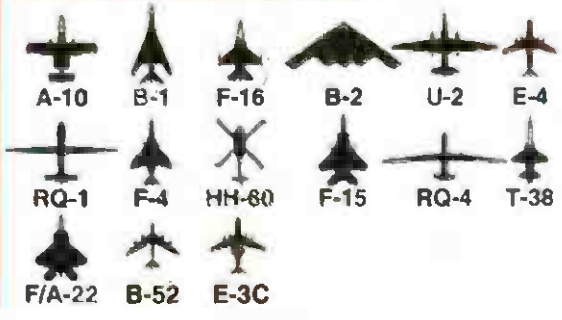
## Weapons Notes

Another good month for those of us in the weapons safety community. While we didn't go completely "unscathed," we only experienced two minor mishaps. They both involved handling of munitions and occurred when downloading from trailers. Let's evaluate handling operations as part of the spot-inspection program to ensure we're taking every precaution to make explosive handling operations as safe as possible. An area to focus on is to try to eliminate handling operations on inclines. In both mishaps, the forklift operator experienced difficulty controlling the forklift due to the steepness of the area he was maneuvering in. Thanks for all you do to enhance weapons safety every day!

### Legend

Class A - Permanent Total Disability; Property Damage $1,000,000 or more
Class B - Permanent Partial Disability: Property Damage between $200,000 and $1,000,000
Class C - Lost Workday; Property Damage between $20,000 and $200,000
*Non-rate Producing

### Symbols for Mishap Aircraft



# GLOBAL REACH, GLOBAL POWER, GLOBAL PRESENCE

global reach, global power, global presence


Senior Airman Mindy High, (extreme left) together with Capt. Justin Amann, a B-2 pilot, and Airman 1st Class Dustin Spring, conduct pre-flight checks of their aircraft before a mission at Andersen Air Force Base, Guam. The B-2s were deployed from Whiteman AFB to Andersen as part of a rotation to provide U.S. Pacific Command a continuous bomber presence in the Asia-Pacific region, enhancing regional security and the U.S. commitment to the Western Pacific. Bomber aircraft from ACC have had an on-going presence on the island since February 2004.