

CODE ONE[®]

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Yes, that was an AIM-9, not an AIM-7, on page 24 in the January issue. We appreciated the numerous calls and letters from our most vigilant readers. Though inaccurate, the caption was true, as this photo shows. Last December, the 125th FIG in Jacksonville, Florida, and the 144th of Fresno, California, became the first F-16 units to sit alert with the AIM-7 Sparrow – an all-weather, all-aspect, radar-guided missile.

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ABOUT OUR COVERS

Front: Lt. Scott "Scruffy" Gierat, Lt. Mike "Troll" Hoepfner, and Capt. Jan "Tav" Tavrytzky (left to right) of the 17th FS brave some cool weather at Shaw AFB in South Carolina to show off their new weight set for photographer Lans Stout. These F-16 pilots put the weights to use on page 16.

Back: Maj. Mike Clemovitz of the 944th TFG hits his afterburner and climbs into the early evening desert sky in his US Air Force Reserve F-16C. Photo taken by Joe Towers from an F-16D flown by Maj. Pat Shay, also of the 944th.

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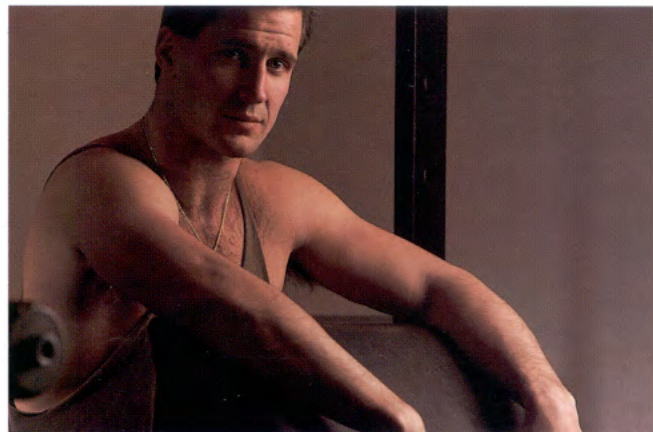
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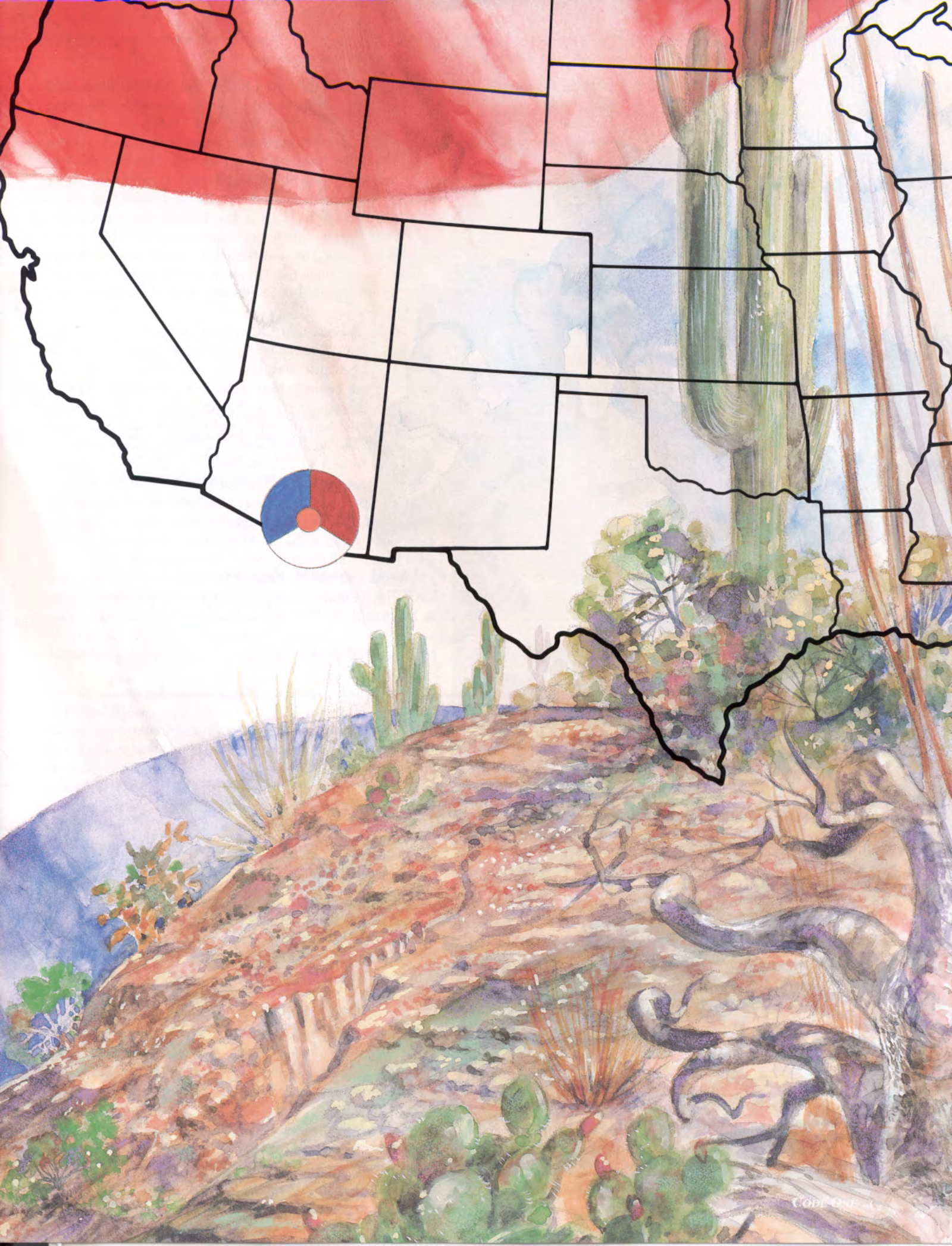


DUTCH **IN THE** **DESERT**

BY DOUGLAS RITTER

An unfamiliar tri-color flag flaps in the desert breeze in front of the headquarters of the Arizona Air National Guard in Tucson. The unfamiliar banner is foreign – Dutch. And it is about the only visible clue of an unusual and unique training mission performed by the 162nd Tactical Fighter Group. Members of the 162nd train future F-16 pilots for the Royal Netherlands Air Force.

The international training program is a first for the Air National Guard. But what really makes the program unique is the manner in which the program integrates Dutch F-16s and Dutch instructors into the Guard unit's regular operations.



With the largest force of F-16s outside the United States, the RNLAf demanded major pilot training. "As the number of students in our program increased, scheduling became a nightmare," explained Lt. Col. Hans Smit, the Dutch Detachment Commander in Tucson. "Graduation dates were constantly being pushed back to cope with the load." Moreover, the limited and frequently unpredictable flying weather in Holland made matters worse. So a few years ago the RNLAf started looking for other options. They found an alternative in the United States.

Their decision to train in the United States coincided with USAF active-duty forces transitioning to F-16C and D models. All the F-16A and B models were being transferred to ANG units. Since the Dutch fly F-16A and B models, a Guard unit appeared to be the most logical choice for pilot training.

And the Guard unit best suited to do the job was the 162nd TFG at Tucson International Airport in southern Arizona. The unit was already operating as an ANG Replacement Training Unit with the F-16A and B Block 10 models – the same version the RNLAf flew for training. The 162nd also had an established reputation for innovation and quality, both of which would be required for the job.

Col. Glen Van Dyke, commander at Tucson, welcomed the new mission. (Yes, the commander is of Dutch descent, but he insists that his ancestry has nothing to do with his enthusiasm.) "This international military student program gives our people a chance to use their imagination and to grow in new and exciting areas," the commander said.

The base is ideally located for pilot training. The area has plenty of military airspace and some of the finest ranges in the world. In fact, the military airspace near the base would geographically consume the entire country of Holland. The weather is close to perfect, with year-round sunshine.

Traditionally, training programs use the host country's aircraft exclusively. Circumstances, however, forced the Dutch to take an untraditional approach for their training in Tucson: By the time the RNLAf realized that it needed to find better training conditions for their new F-16 pilots, it already had the aircraft needed for the training. What the Dutch needed then was a better place to fly them.

The Dutch F-16s presented an ideal opportunity for the 162nd. Because the ANG unit was in the middle of transitioning from the A-7 to the F-16, it didn't have the aircraft available for the extra training mission. In fact, their F-16 utilization rate was already at record levels. The additional aircraft could fill that need. Furthermore, the additional tasks associated with the Dutch training program helped the 162nd maintain full staffing during its transition period. The untraditional approach turned out to be a perfect fit for both parties.

Originally, the RNLAf gave the 162nd two years to implement the training program. Then, the RNLAf politely inquired if the schedule could be accelerated a bit – by a year. One year later, everything – including facilities, manpower, course materials, logistics, tons of requisite paperwork, you name it – was in place. Plus, the parties had worked out all the complicated accounting and logistical



Dutch Lt. Kjeld Gunderson and his USAF instructor pilot discuss Gunderson's first solo F-16 flight.

PHOTO THEO VAN GEFFEN, IAAP

details of an unprecedented program that used a mix of foreign and US aircraft. "We received outstanding support from the Dutch government," recalled Col. Ron Kurth, Vice Commander of the 162nd. "They gave us things on a handshake that we later got the paperwork on."

All the Dutch equipment and the eleven Dutch F-16s that would be coming to Arizona were ready to go in anticipation of the formal arrangements. The equipment was being loaded on transports as the final bilateral agreements were en route between the two capitals. Within days, eight RNLAF single-seat F-16As and three two-seat F-16Bs found themselves in Tucson, basking in the Arizona sun.

For the maintenance personnel in Tucson, the Dutch aircraft were a real treat. Except while flying, they had always been kept in NATO shelters. "From a country where the people scrub their sidewalks," noted Kurth, "you could expect their airplanes to be exceptionally clean. And they are." The RNLAF F-16s also had about half the hours of the Guard's planes, which had been inherited from regular Tactical Air Command units. The Guard intends

to keep both sets of planes in the best possible shape. According to Smit, the ANG is doing a great job. "They are as well or maybe even better maintained than they were at home," Smit said. "These Guard people are good."

Accompanying the aircraft were five Dutch instructor pilots, including the detachment commander and one master sergeant, to help keep everything working smoothly. The first class of six student pilots began on schedule 3 April 1990, only a year after the commitment was made.

"The program was well-planned from the start," Smit explained, "but we made some changes as we gained experience." According to Kurth, the changes have been relatively minor and easily implemented. "We have worked closely with the Dutch government to make whatever adjustments that either party feels have been necessary," Kurth said. "But, all in all, there have been only minor changes. The quality has been high from the start. The Dutch seem very pleased with the results."

"Our program shows how well the Guard and the NATO alliance countries can work together," Kurth continued. "It was easy for the Dutch government to work with the Guard because the Guard's structure is similar to the RNLAF's. Like us, they have civilian employees. This is one of the few times that the Guard has had a long-term, close working relationship with a NATO country. Our experience confirms that the Guard is a real part of the Total Force."

The Dutch instructor pilots and planes are thoroughly integrated into the Air Guard's operations. With few exceptions, both planes and pilots are considered interchangeable with their American counterparts. The only visible indication that differentiates a Dutch F-16 from an ANG F-16 is a small red, blue, and white trisected rondel on either side of

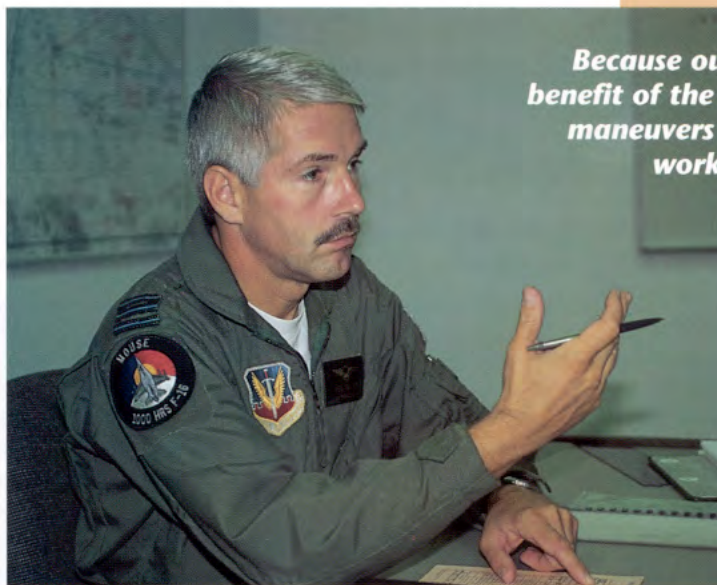


PHOTO DOUGLAS RITTER

Because our pilots do not have the benefit of the training in basic fighter maneuvers at Holloman, they must work extra hard to complete the training here in the allowed time.

— Lt. Col. Hans Smit



PHOTO THEO VAN GEFFEN, IAAP

the engine air inlet. The Dutch planes even carry the Arizona Air Guard's distinctive tail flash. As far as the Air Guard's maintenance and scheduling people are concerned, the Dutch planes are just another eleven F-16s to support and fly for everyone's benefit.

Part of the Dutch instructor pilots' responsibilities includes keeping an eye on their Dutch students. Normal scheduling ensures they regularly fly with them. So, the Dutch instructors are well aware of how their Dutch students are doing and whether anyone needs special attention. In all respects, the Dutch instructors are treated as fellow instructor pilots by the Guard schedulers. This integration benefits everyone.

Overall, the integration allows for considerable flexibility that directly contributes to controlling expenses and getting the mission done. The Air Guard's reputation for "doing more with less" jibes neatly with the Dutch penchant for thriftiness. The use of the Dutch aircraft especially contributes to the cost-effectiveness of the program. "We are a small country," remarked Gen. Cees Barendregt of the RNLAF. "We must spend our defense resources wisely."

The Dutch instructor pilots bring with them a wealth of experience from their operational units in Europe. "We're seeing high-quality pilots coming from the Dutch," Kurth said. "They're sending us instructor pilots with a lot of F-16 time, pilots with exceptional air-to-air skills. Their experience has been a real benefit to our group in many areas. They've given us some insight into NATO training that we were not familiar with."

The Guard instructor pilots, like most Guard pilots with considerable time in the cockpit, bring to the job years of flying time and a wide range of flying experiences. As a result, American and Dutch students and instructors are exposed to a much broader base of experience. This exposure helps turn out better pilots. "There is much give and take between us," observed Smit, "and this is good for us all, especially for the students."

Through September 1991, forty-three pilots have graduated from the course. This figure already represents nearly twenty percent of the RNLAF F-16 pilots. The training agreement runs for five years and is renewable yearly thereafter. Annually, approximately thirty Dutch students are trained in Tucson. Each class consists of two to eight pilots. Typical Dutch student pilots are twenty-two at graduation, a few years younger than their American counterparts.

Most of the Dutch students come to Tucson with just over 300 total flying hours. They receive forty to fifty hours of primary training at Woensdrecht, Netherlands, in the

Swiss Pilatus PC-7 turboprop trainer. From there, they travel to Sheppard AFB in Wichita Falls, Texas, for their undergraduate pilot training in USAF T-37 Tweets and T-38 Talons. The course at Sheppard takes about twelve months, during which they log another 260 hours of flight time. From Sheppard, they move directly to Tucson to transition to the F-16.

The F-16 training course for the Dutch consists of fifty-six hours of flight time. Students also spend at least sixteen hours in simulators. The basic syllabus is similar to that used for American students, with only a few minor differences in training philosophies. For example, Dutch students are expected to wear full flight gear for their simulator sessions, something not required of their US counterparts.

Unlike USAF pilots, Dutch pilots receive no lead-in training in basic fighter maneuvering in the T-38 after undergraduate training and before transitioning to the F-16. The two major syllabus differences are less total flying – fifty-six as compared to seventy-five hours – and a much greater percentage of dual instruction (i.e., backseat flight time). Dutch students receive twenty sorties of



PHOTO JIM TUNNEY



PHOTO JIM TUNNEY

dual instruction in the B model, almost half of their instruction. This compares to thirty-seven percent for the standard US course.

“Because our pilots do not have the benefit of the training in basic fighter maneuvers at Holloman [AFB, New Mexico],” Smit explained, “they must work extra hard to complete that training here in the allowed time. The dual instruction is most beneficial under these circumstances.”

The lack of lead-in training makes the instructor’s job a bit harder and pushes the students to their limits. “The first BFM [basic fighter maneuver] training mission is especially difficult,” commented Maj. Toine Brekelmans, one of the Dutch instructor pilots. “It’s difficult because the students have never encountered it before in any other airplane. The F-16’s speed and agility add to that difficulty.” According to Kurth, the situation may change. “The current Dutch syllabus moves much quicker than the American,” he explained. “The Dutch plan to add lead-in training next year, and that will be a big help to the students.”

To take advantage of the ideal flying weather in Arizona, the Dutch students spend virtually no time on instrument flight instruction. “They will have plenty of time to get used to flying in lousy weather at home,” said Capt. Peter Schmidt Crans, another Dutch instructor pilot. So on their return to Holland, the pilots can expect to spend about three months familiarizing themselves with European flight conditions and procedures.

After three weeks of classroom and simulator training in Tucson, it’s time for the student’s first flight in the F-16. “It was so easy,” recalled Marc Keultjes. “The F-16 does exactly what you want it to do. You don’t have to practice for hours. It just works.”

“A lot of guys had a few problems with landings at first,” noted 2nd Lt. Wim Janssen. “But landings are always the most difficult. You gain confidence pretty quick in this plane, and then it is no longer a problem.” A good thing, too. After three dual conversion rides (soon to be four, one of those minor tweaks to the program mentioned by Smit), the student solos. “Going up alone in an F-16 for the first time was a tremendous rush,” 2nd Lt. Johan van Deventer remembered not too many days after the experience.

Dutch students have praise for both their Guard and Dutch instructor pilots. “They are all very good,” commented 2nd Lt. Marcel Kammelar. “The Guard’s instructors know exactly how to explain every concept. It is also important that we have the Dutch instructors as well,” continued Kammelar, “because they can explain more difficult concepts in our native language. They can also explain how we might do something differently back home. The combination is very good for learning so much so quickly.”

This echoes the feelings of Smit who noted, “The Guard pilots are good teachers. We learn a lot about our own teaching by watching them. Yet, there are times when we can help a student through a problem quicker. We make a good team.”

■ *Douglas Ritter is a freelance writer in Tucson, Arizona.*





#673

Arizona



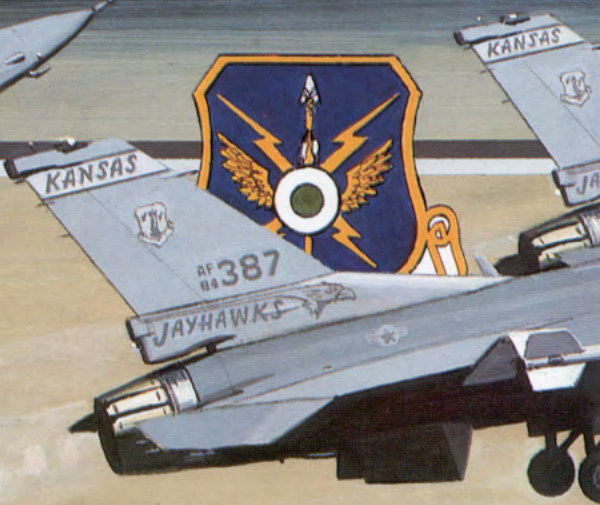
AF 81 760



SOUTH CAROLINA

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WORLD CLASSIFIED



KANSAS



AF 09 387

JAYHAWKS

KANSAS



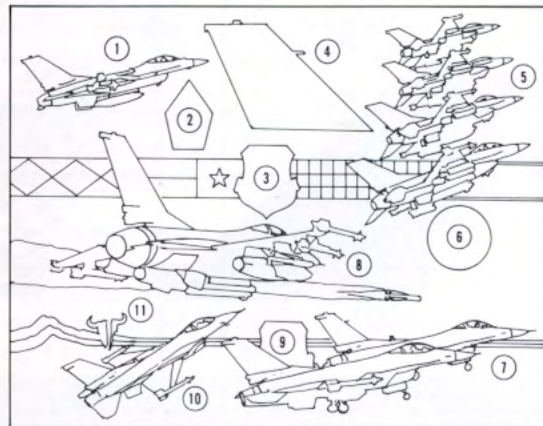
This second installment of F-16 finflashes covers Air Force Reserve and Air National Guard units activated as of December 1991. The first installment [October 1991 issue] generated a healthy response from aircraft “spotters” – aviation enthusiasts who spend an astonishing amount of their free time peering through fences near air force runways around the world, collecting (photographically) aircraft tail numbers. This catalog will be followed up with foreign paint schemes and finflashes in a future issue of *Code One*.

FIN FLASH

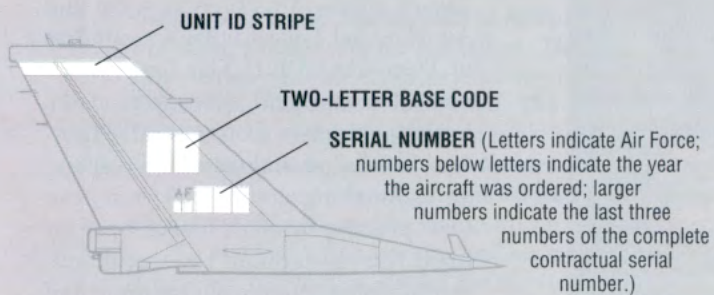
OPENING ART BY K. PRICE RANDEL
ILLUSTRATIONS BY DOUG MOORE

Legend

- (1) ADF from the 125th FIG, Florida ANG.
- (2) Patch of the 114th TFTS, Oregon ANG.
- (3) Insignia of the Alabama ANG.
- (4) Finflash of the 162nd TFG, Arizona ANG.
- (5) Desert Storm strike package from the 174th TFW, New York ANG (Syracuse).
- (6) Insignia of the 113th TFW, Washington, D.C. ANG.
- (7) F-16Cs of the 184th TFG, Kansas ANG.
- (8) An F-16A of the 169th TFG in action during Desert Storm.
- (9) Insignia of the 301st TFW, Texas AFRES in Fort Worth.
- (10) F-16C from the 944th TFG, Arizona AFRES.
- (11) Stylized finflash of the 120th FIG, Montana ANG.



READING FINFLASHES



169th TFG (ANG)
Columbia, SC



419th TFW (AFRES)
Ogden, UT



120th FIG (ANG)
Great Falls, MT



944th TFG (AFRES)
Phoenix, AZ



184th TFG (ANG)
McConnell, KS



177th FIG (ANG)
Pleasantville, NJ



174th TFW (ANG)
Syracuse, NY



482nd TFW (AFRES)
Homestead, FL



144th FIW (ANG)
Fresno, CA



906th TFG (AFRES)
Dayton, OH



119th FIG (ANG)
Fargo, ND



191st FIG (ANG)
Selfridge, MI



148th FIG (ANG)
Duluth, MN



107th FIG (ANG)
Niagara Falls, NY



149th TFG (ANG)
San Antonio, TX



162nd TFG (ANG)
Tucson, AZ



158th FIG (ANG)
Burlington, VT



125th FIG (ANG)
Jacksonville, FL



188th TFG (ANG)
Fort Smith, AR



187th TFG (ANG)
Montgomery, AL



507th TFG (AFRES)
Oklahoma City, OK



114th TFTS (ANG)
Klamath Falls, OR



183rd TFG (ANG)
Springfield, IL



113th TFG (ANG)
Washington, DC



147th FIG (ANG)
Houston, TX



127th TFW (ANG)
Selfridge, MI



301st TFW (AFRES)
Fort Worth, TX



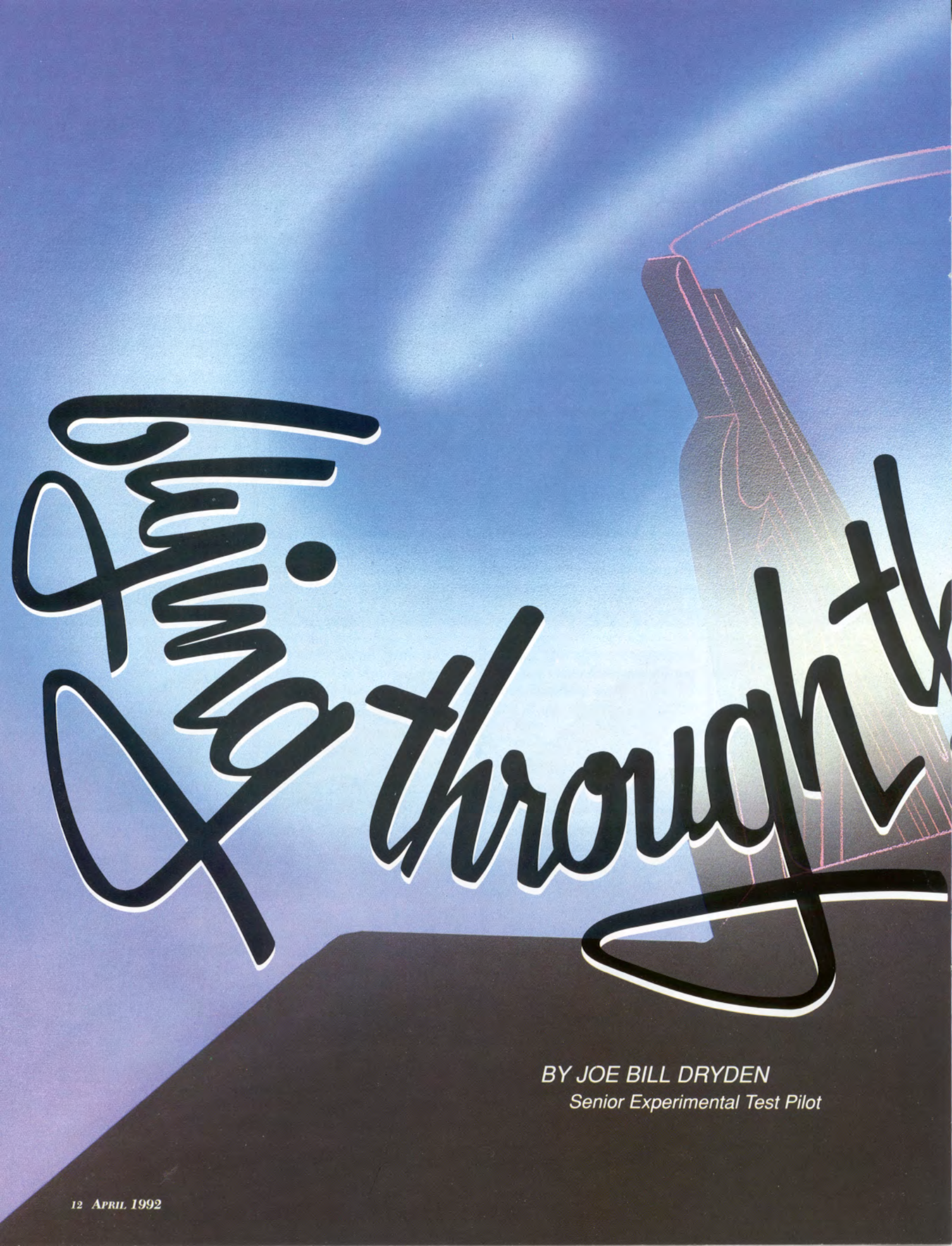
924th TFG (AFRES)
Austin, TX



192nd TFG (ANG)
Richmond, VA



181st TFG (ANG)
Terre Haute, IN



Flying through the

BY JOE BILL DRYDEN

Senior Experimental Test Pilot

The background of the page is a stylized illustration. On the left, a large, dark, angular shape represents a cockpit instrument panel or HUD, with a glowing blue outline. The words "The glass" are written in a large, dark, cursive font across this shape. In the upper right, a white paper airplane is shown flying against a blue sky with a bright light source. A thin red line arcs across the top of the instrument panel.

The glass

Last issue, I pointed out that looming budget cutbacks may force us to take a serious look at modifying existing aircraft rather than buying new ones. My purpose was to make sure that the people writing the specifications for these mods would come up with more realistic requirements for night-vision goggles and forward-looking infrared systems. This time, in the same vein, I want to address head-up displays.

Before I get started on HUDs, however, one final word on night-vision goggle systems. The switch I mentioned for turning the NVG-compatible cockpit lighting on and off should be a hands-on switch. The folks in our cockpit lighting lab have developed several options – the leading candidate being a switch on the underside of the throttle. It works smoothly and makes switching the appropriate lights on and off a completely subconscious act by the pilot. Now, on to HUDs.

We should quit trying to make HUDs more complicated than they have to be. We should figure out what is truly needed, provide that - and nothing more.

If you have been following my journalistic endeavors here in *Code One*, you know how I feel about HUDs. (HMDs fall into the same category.) They are superior instruments for flying under instrument conditions. With this said, their acceptance has been unnecessarily delayed by the myopic attitudes of a few individuals who have not taken the time to understand the slightly different technique necessary to take advantage of their clear superiority. Strangely enough, although the edict remains on the books, to wit, "the HUD shall not be considered the primary flight reference," both the F-15E and the new C-17 have completely glass cockpits with none of the "classic" head-down flight instruments. Hummm.

I can't say that we haven't tried to change the situation. Working with the Instrument Flight Center at Randolph AFB, our human factors section has invented a superior means of displaying information to the pilot necessary for using the HUD as the primary flight reference. But when it came time to implement the changes, self-proclaimed experts stepped in and undid our efforts. So, once again, the powerfully uninformed are attempting to carry us head-long back into the dark ages.

These experts have failed to grasp the following: **As soon as science can provide pilots with the sensor/computer combination to display a velocity vector (whether on a HUD, HMD, or a head-down display), you can radically improve your ability to control an aircraft on instruments.** Until this fact sinks in, those ignoring it will continue to delay the acceptance of an excellent approach to flying when pilots are deprived of a visible horizon. I can't say it any plainer than that.

Perhaps a flashback will make things even clearer. Until the first true HUD became available, cockpit instruments were simply a continuation of efforts started by Gen. Jimmy Doolittle several decades ago, when he guided his plane with needle, ball, and airspeed instruments.

Before HUDs became available, pilots had to control their planes, under instrument conditions, with what was described as *control instruments* (the attitude director indicator or ADI and the tachometer) and *performance instruments* (essentially, the rest of the cockpit). The plane was controlled by making the "picture" on the ADI agree with what was necessary to maintain that desired flight condition. But that was only the first step. Pilots had to check all of the performance instruments visually and then mentally integrate all this information to make sure that the airplane was truly doing what they wanted it to do.

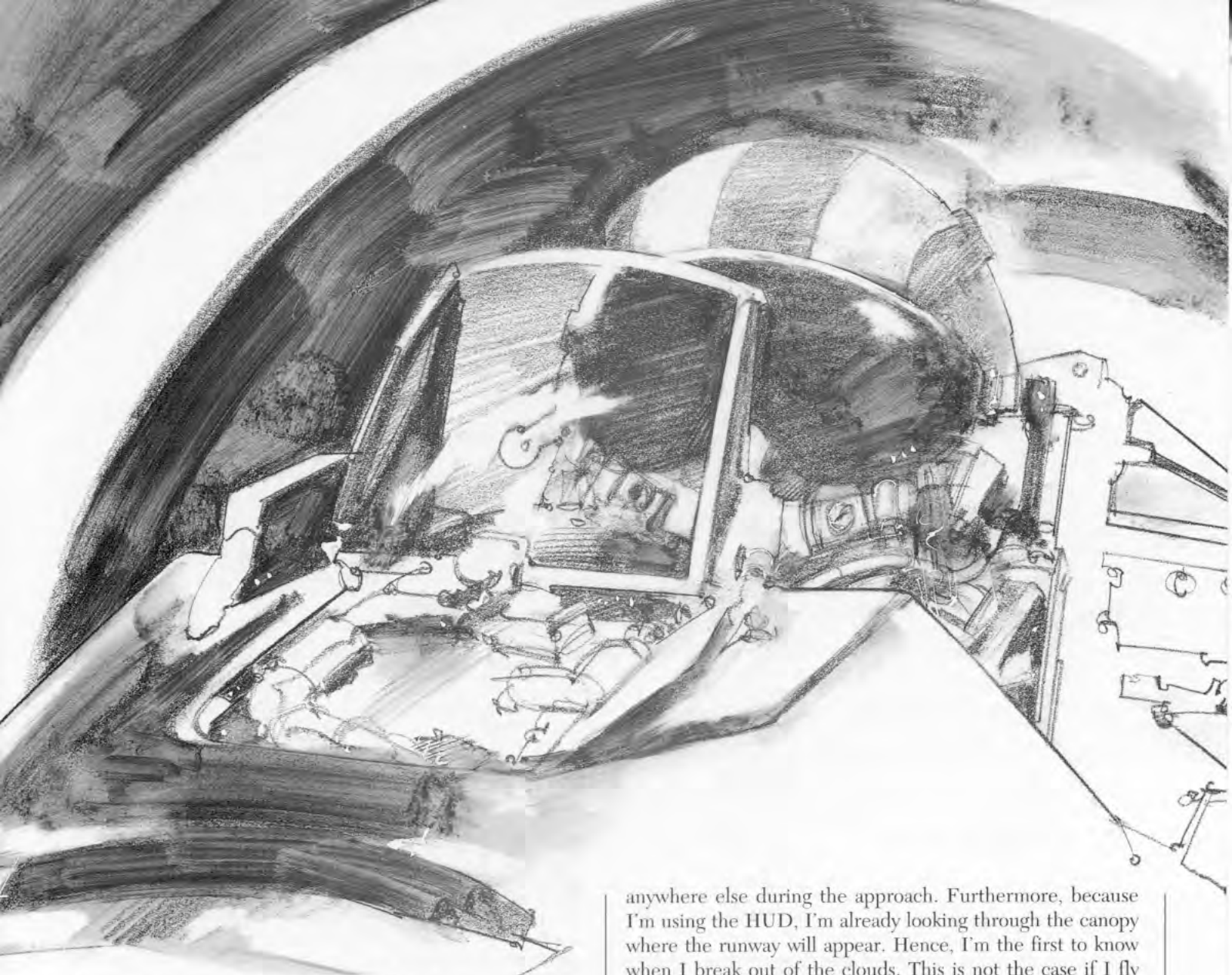
A velocity vector display - whether it's on a HUD, an HMD, or a head-down, monochromatic or multicolor multi-function display - drastically simplifies this operation because it provides in one place *both* the control instrument aspect and the performance information. You control the airplane with the velocity vector and its relationship to the pitch ladder. At the same time, you receive nearly instantaneous feedback on most of the airplane's performance. As a result, the amount of information required from what used to be called performance instruments is drastically reduced.

With one quick look in a very narrow area around the velocity vector, you know immediately if you are maintaining level flight, climbing, diving, or turning. Again, all this information appears in one place. No need to look elsewhere. As a result, the velocity vector diminishes the importance of the airspeed, altitude, and heading. It eliminates the significance of vertical velocity entirely. You have no need to know the rate you are climbing or diving. All these rates have been converted into the angles they have been all along and then displayed directly. As a result, you can fly more precisely, more safely, and more easily - all at the same time.

Here's a specific example. In the F-4, as I entered the glide slope in a GCA (that's short for ground-controlled approach: the ground controller is using a radar to help me land), I normally lowered the nose about one-eighth of a bar width on the ADI. At the same time, I made about a two percent reduction in power, tried to hold that picture on the ADI, and waited for the vertical velocity to settle down. With some luck, the vertical velocity ended up where I intended when I started the process - about 750 feet per minute rate of descent.

Even if I was successful the first time, if one - and only one - variable changed, I had to detect it first by integrating all the info from the performance instruments and then by trying to correct the situation by changing the picture on the ADI (usually with a power change as well) and hope, once again, that this was now what I needed. It seldom was.

A velocity vector greatly simplifies the procedure. Let's assume I have done my homework and know the glide slope angle. (They are all published in the approach books.) When it comes time to enter the glide slope, I simply push the velocity vector down to that value. This is nominally a minus two-and-one-half degrees. From this point on, all I should ever hear from the controller is "on glide path." The same is true of instrument landing systems, microwave landing systems, or even a self-contained radar, GPS, or DTS approach. (For those of you who have not been keeping up with your



flying magazines, GPS stands for global positioning system and DTS for digital terrain system.) Notice that I didn't mention power, or airspeed, or vertical velocity.

In the F-4, I had to go through the mental gymnastics of combining ground speed and vertical velocity to maintain that two-and-one-half-degree glide slope. With a HUD, I can see the results of those calculations directly without straining my brain. Within reasonable limits, all the other variables can change without having to change the position of the velocity vector at all. Consequently, my approach has to be easier and safer.

While I cannot completely ignore airspeed, it is no longer a key factor. In fact, if I already have the drift angle killed (that is, no further heading changes) before entering the glide slope, the HUD is the only place I have to look – to ensure that the velocity vector is superimposed on the two-and-one-half-degree down mark and to consider the angle of attack bracket (close to the velocity vector), which I've already checked against the airspeed.

Now, with an occasional glance at the altitude to see how I'm progressing toward decision height, I don't have to look

anywhere else during the approach. Furthermore, because I'm using the HUD, I'm already looking through the canopy where the runway will appear. Hence, I'm the first to know when I break out of the clouds. This is not the case if I fly with my head down in the instruments.

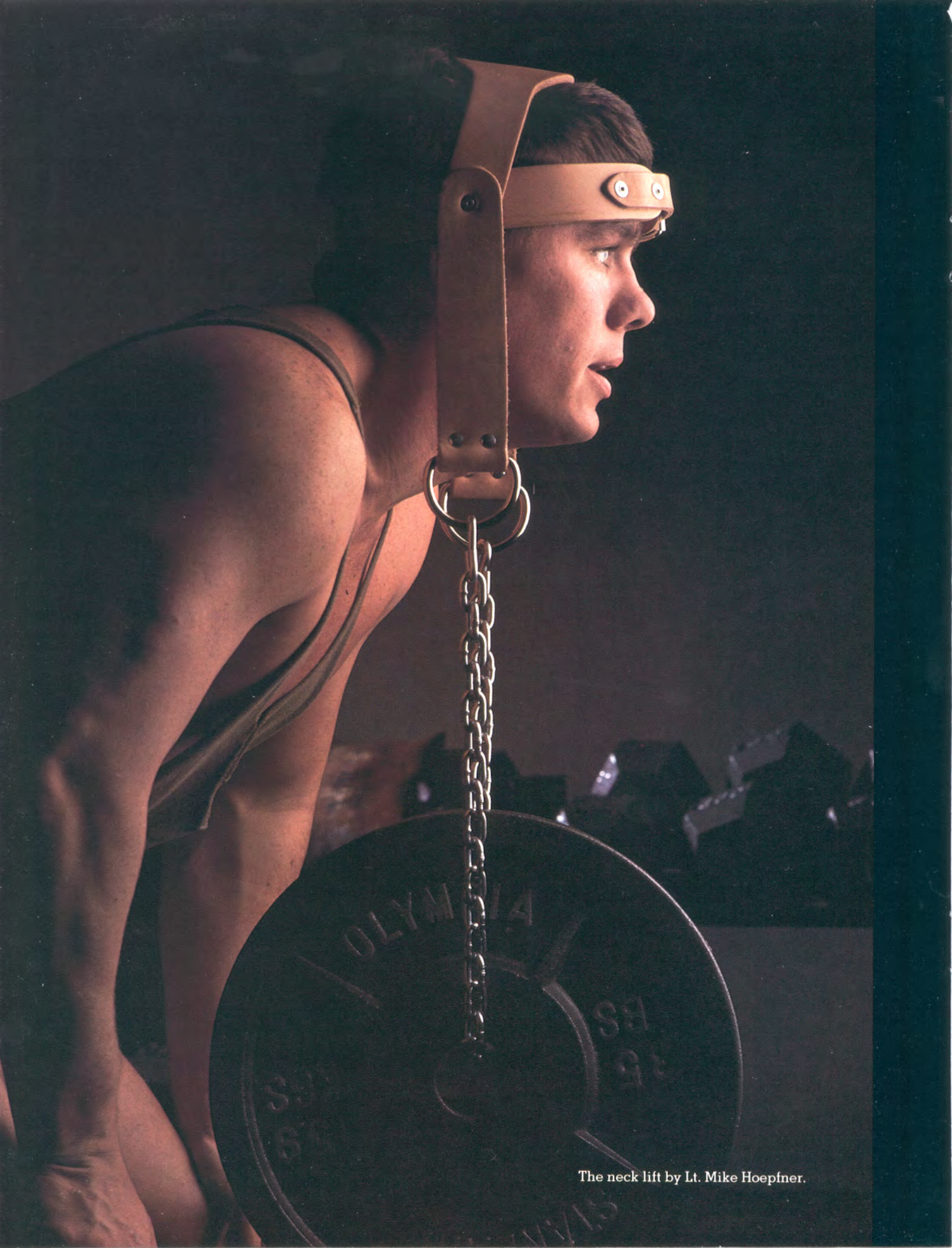
I am not suggesting a cavalier approach to flying instruments. I do look at other information on the HUD. The point I'm trying to make is that I *could* accomplish the approach in exactly the manner described. Further, a velocity vector obviates the need to cram all the information into the HUD or a head-down display that was spread over the entire panel in the past. The information is no longer required in the same format as it was before we had velocity vectors. Nor is all the information considered on the same level.

We should quit trying to make HUDs more complicated than they have to be. We should figure out what is truly needed, provide that – and nothing more.

As I said last time, if we are going to add new capabilities to the airplane or improve existing capabilities, we need to make sure that we give the operators the benefit of the doubt and understand what it is that we are trying to improve.

End of sermon. Again. ■

Check Six!



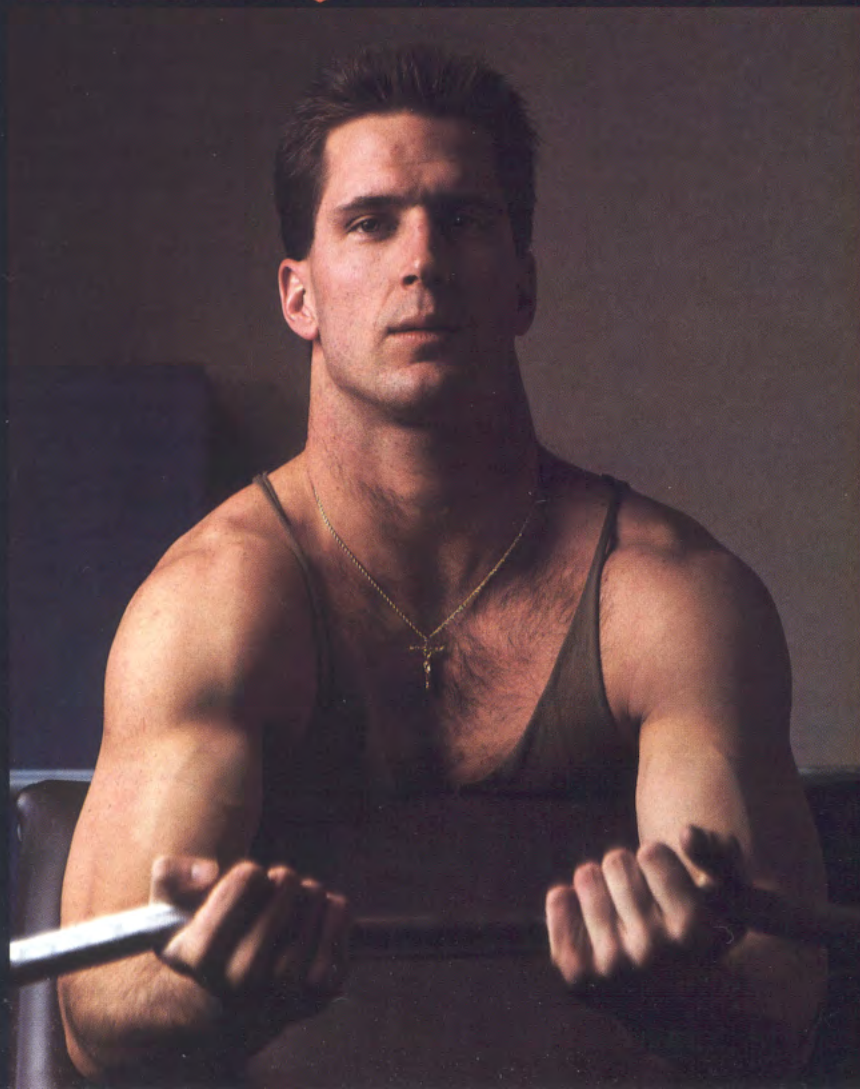
The neck lift by Lt. Mike Hoepfner.

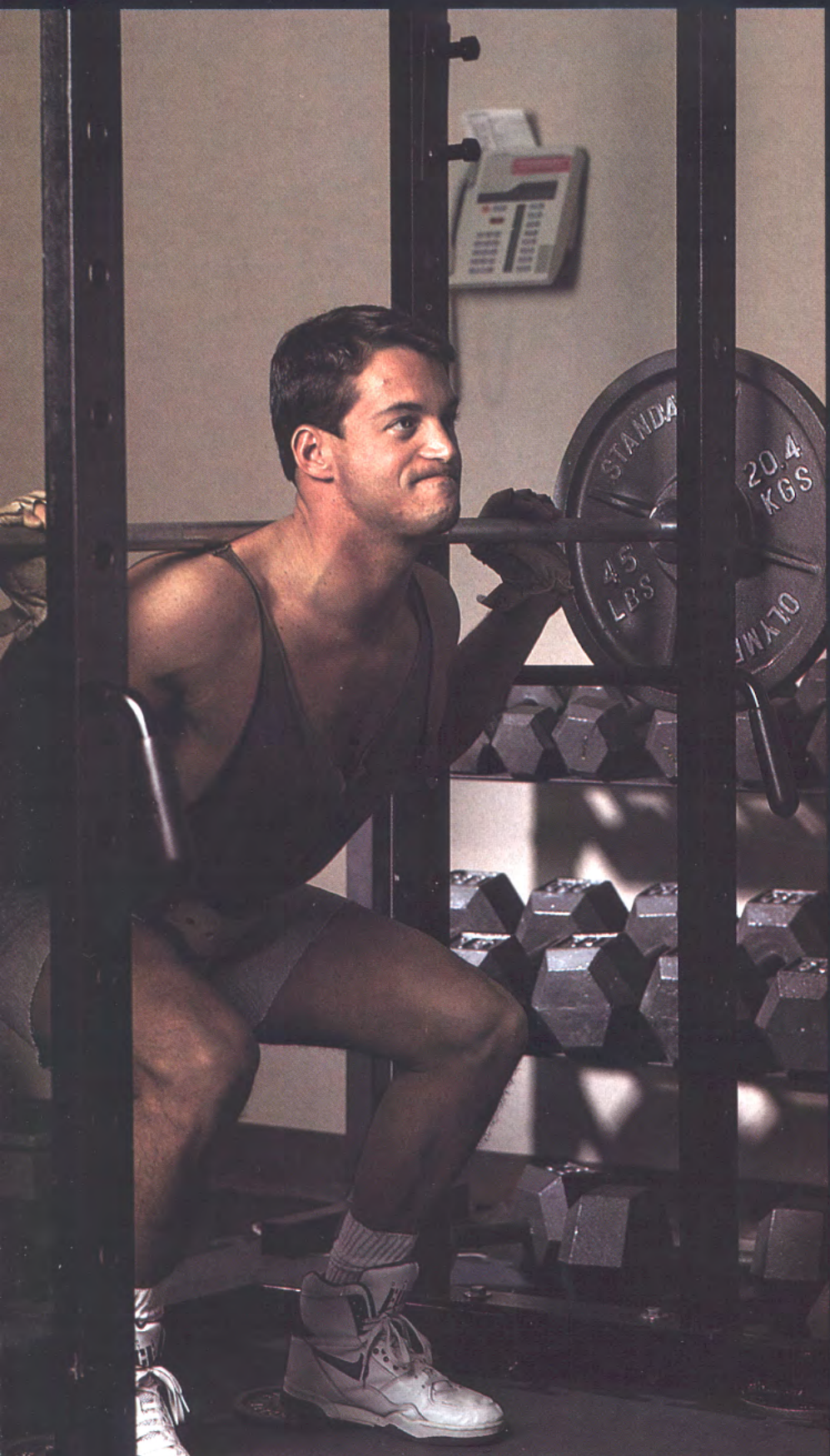
HEAVY LIFTING REQUIRED

Biceps are bulging at F-16 squadrons around the world as more and more pilots realize the benefits of weight training. The increased acceptance of pumping iron is attributable, in part, to a larger health-consciousness trend in the United States. It can also be viewed as a reaction to the physical demands of a modern fighter aircraft. High-G flight takes a toll on your body. Hard bodies, it seems, can fly harder. Pilots who can swivel their heads to check six on successive six-G turns without losing concentration from fatigue may gain a tactical edge over those who can't. And fighter pilots are always looking for an edge.

Whether weight lifting improves pilots' physical tolerance to single, rapid exposures of G forces is a subject of medical debate. However, when it comes to sustained exposures to high-G forces or multiple exposures to moderate G forces, the importance of physical strength and endurance becomes more apparent. Furthermore, focusing on the science of sustaining G forces ignores more subjective – less easily measured – benefits of increased alertness, decreased likelihood of sustaining an injury or of getting sick, and decreased times for recovering from an illness or injury. It's also no secret that people who are physically fit just feel better about themselves.

Pilots of the 17th Fighter Squadron, the Hooters, of the 363rd Fighter Wing at Shaw AFB in South Carolina have enthusiastically embraced this philosophy of fitness. Their enthusiasm can be traced to Col. Billy Diehl, the squadron's former commander. During his tenure, Diehl – a consummate weight lifter – encouraged his pilots by setting a strong example. When it came time for the 17th to pack essential items and head to the Middle East for Operation Desert Shield, Diehl made sure that the airlift included a set of weights. Not only were the pilots physically ready for the grueling nonstop seventeen-hour flight to the Middle East (a record flight at that time), they would also be well-prepared for the rigors of wartime: three-sortie days, flying up to ten hours a day, missions lasting eight hours.





The leg squat by Capt. Jan Tavrytzky.

Since the war, Diehl has packed his personal weight set and headed to Langley AFB in Virginia. But, as our cover photo shows, his fitness legacy remains. What follows is a description of a weight-training regimen of Capt. Jan "Tav" Tavrytzky, the athletic officer of the 17th Fighter Squadron.

Weight training is most effective when part of a total fitness program that includes a healthy diet and moderate amounts of aerobic exercise. For fighter pilots, *moderate* means twenty to thirty minutes of aerobic exercise at a time. More than that amount can lower blood pressure to levels unacceptable for high-G flight. It is worth noting that none of the F-16 pilots at Shaw AFB smoke. Those who imbibe refrain during the week.

Ideally, fighter pilots should work out at least three times a week. Consistency and frequency (i.e., dedication) count more than setting Olympic records. An effective workout begins with a few minutes of aerobic exercise to get blood flowing followed by stretching to loosen up tight muscles and to prevent injury.

After warming up and stretching, start slow and work with lower weights and more repetitions. A general rule: fewer repetitions and more weight increase strength, while more repetitions with less weight improve endurance. Pilots should seek an effective median between strength and endurance, which translates into eight to ten repetitions per set. These sets should be preceded and followed by warm-up and cool-down sets at lower weight (and a few more reps). Each set should be followed by a thirty-second to a minute rest period. A total workout time of between a half- and a full-hour is recommended. ■

E. Hehs

Disclaimers/warnings: This article describes, not prescribes, a pilot weight-training program. You should always consult with your doctor or a qualified trainer before beginning any physical fitness program.



The leg lift by Lt. Scott Gierat.



The bench press by Capt. Tavrytzky.



ARMS AND SHOULDERS

Moving around in the cockpit involves a lot of pushing and pulling. Strong arms make it a lot easier. A **military press** (make sure to wear a weight belt) builds the shoulders. **Curls** – standing with a curl bar or dumbbells or sitting at a preacher bench – build the biceps. Work the triceps by lying down on a bench and extending weights from behind the head.

STOMACH AND BACK

Strong stomach muscles produce a more effective straining maneuver. Both stomach and back muscles are important for turning the upper body in the cockpit. Well-developed stomach muscles also help prevent back injuries.

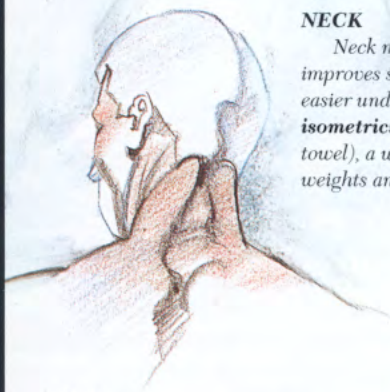
Two or three twenty-rep sets of **leg lifts** work the stomach muscles and get the back in shape. Accompany this exercise with two sets of thirty to fifty reps of **stomach crunches**, which are best described as partial sit-ups. Muscles on the side of the stomach can be hardened by crunching across the chest (with hands behind head, rotating the elbow to the opposite knee). **Back extensions** and **deadlifts** will strengthen muscles in the lower back.



LEGS

Under high-G forces, blood collects in the lower parts of the body. The G-suit works to counteract this. Flexing makes the G-suit more effective by getting the muscles working with (or against, depending on how you look at it) the air bladders of the suit, thereby pushing blood to the upper part of the body.

Three sets of **leg squats** with free weights work the quadriceps, gluteals, and hamstrings. **Leg curls** work the hamstrings and lower leg. Calf muscles can be strengthened with **calf raises**.



NECK

Neck muscles are critical for fighter pilots. A strong neck improves situational awareness by making head movement easier under high Gs. The neck can be strengthened with **isometrics** (working neck muscles with clasped hands or a towel), a weight machine designed for the neck, or with free weights and headgear (as shown).

CHEST

Besides playing a key role in the straining maneuver, chest muscles form the foundation of upper body strength. Furthermore, future G-suits may incorporate air bladders across the chest. Four eight- to ten-rep sets on the **bench press** will get the chest in shape. Don't forget warm-up and cool-down sets.



Gulf War Journal

Part II



Capt. William F. Andrews

After transcribing and editing this second part of Capt. Bill Andrews' Gulf War Journal, we knew that it would be a tight fit for the allotted eight pages. When the final type arrived from our typesetter, we had a problem. The text would require eleven pages.

What to do? Expanding the column width would not gain enough space. We then considered deleting some passages and called Andrews for his recommendations. These turned out to be some of our favorite, most insightful parts. Cutting any more detail than had already been cut, it appeared, would degrade the whole.

Instead, we opted to print it all at the expense of the Events section. For those of you who were anticipating an announcement for your F-16 activation or maintenance award, we apologize and ask you to be patient. (We'll play catch-up in July.) We know that you will understand the deletion after reading this vivid account of one soldier's adventure in the desert.

The first installment of Capt. Bill Andrews' journal ended in suspense. Andrews, on his back in the Iraqi desert with his right leg broken, had just raised his hands in surrender. Several Iraqi soldiers were approaching, the barrels of their AK-47s still hot from firing at him. Part II opens with two aerial perspectives of Andrews' fateful mission – one from Lt. Joey "Boo Boo" Booher, the other from Capt. Evan "Ivan" Thomas. We rejoin Andrews' first-hand account, on the ground, from there.

27 February 1991 [Lt. Joey Booher†]

The weather was low, about 8,000 to 13,000 feet over the target area. Capt. Bill "Psycho" Andrews elected for Numbers 1 and 2 to recon while 3 and 4 remained high, ready to come down at any time. Psycho and I went down to check the cloud tops and to look for holes. The tops stopped us around 12,000 feet with no holes in sight. We rooted around a bit until I noticed a hole about five miles to the north. We circled once and then zipped through the hole under the clouds onto our target area.

Because of the weather, we chose a trail formation. We flew a wheel over the area, looking for targets. It was tough seeing anything on the ground because of the low ceiling, which was now 7,000 to 9,000 feet. Smoke from oil well fires further reduced the visibility. We made about two circuits around our center reference and pointed out several sights, none of which were of real military significance.

Soon I spotted a military vehicle moving on the highway and pointed it out to Psycho, who wanted to take a look. At that instant, the sky filled with puffs of white smoke from AAA fire. The lateness of the day and the smoke helped to highlight every shot. The sky looked like a fireworks finale on the Fourth of July. I immediately selected mil power and jinked about

Editorial Correction: Lt. Booher, not Capt. Thomas, was Andrews' wingman when flying below the clouds on 27 February. Thomas and Capt. Pete McCaffrey stayed above the clouds initially. Also, Thomas, not Booher, appeared on the right in the photo on page 15 of Part I.

† Used with permission.

forty-five degrees nose high with chaff and flares pouring out and headed into the clouds. I was still taking AAA as I broke through the tops at 12,000 feet. I did not see Psycho above the clouds, so I called for his position. There was no reply. I made a second call. Again, no reply.

27 February [Capt. Evan Thomas†]

I heard Joey explain that there was AAA all around him and that he was climbing up into the clouds. From the excited tone of his voice, I knew the flak had been close. I waited for Psycho to answer that he, too, was climbing into the clouds, but nothing came. Joey was talking again, still with AAA exploding around him. Still no call from Psycho. When Joey was finally on top of the clouds and out of the flak, he asked Psycho for a radio check. (I found out later that he asked me too, but I never heard it on my radio.) I felt a sick feeling deep in my gut. Psycho should have answered. Something must have happened to him.

My fears were soon confirmed by an unusual voice over the radio. It was not the clear voice from an oxygen mask mike, but the voice from a walkie talkie on a windy day. "I'm in my chute," the voice yelled. It was Psycho. He had been shot down.

Psycho was talking on Guard, the emergency frequency, so everyone nearby could hear. Trying to be helpful, numerous flights started crowding the frequency, asking for Bill's position. I was fifteen miles away and above the clouds and didn't know where he had gone down in relation to the coordinates we had. I tried to get an accurate fix on Psycho's position from Joey, but he could only describe a rough position from a factory down below. In his chute, Psycho was trying to describe where he was coming down. I was torn between getting his position for AWACS and going under the clouds to find and help him. He was floating down into the Republican Guards we'd been bombing for a month.

"They're shooting at me," I heard in my radio. "They're shooting at me in my chute!" That was it. Enough radio chatter; there'd be time for that later. Abner, my wingman, and I had been looking for a hole in the clouds without luck. So I lined us up for a straight run at the target coordinates right through the clouds. As we dived in tactical formation, the world outside went from the brilliant blue of the sunny sky to the white nothingness of the clouds. Lower. Lower. The clouds turned a brownish black. Any second now and I'll break out, I thought. Any second now. Abner was out there somewhere off my wing, shrouded by the sooty smoke.

The smoke ended abruptly, revealing a flat, brown landscape right out of Dante's Inferno. The black sky blocked out the sun, creating a dusky gloom. The earth below was smeared here and there by the blackened aftermath of many bombs.

Psycho was still talking, trying to tell us where he was. I was trying desperately to find him, so much so that I misunderstood what he said and concentrated my search on the wrong side of my plane. To slow down would make us nice targets, so we had to race over the area then turn and come back. As we started our second run, I saw two lines of fire streak off the ground to my right. "Break right! Flares!" I yelled to my wingman, calling the launch location out as I hit my own flares and climbed into the clouds.

The streaks had to be heat-seeking SAMs. They were moving incredibly fast, towards Abner. "Break right! Flares! Flares!" I heard again, this time from Psycho who by now was on the ground with a broken leg. I learned later that Abner had not heard my call. But Psycho's call from the ground warned him in time to escape into the cloud deck, spewing bright flares behind him.

What a nightmare! I was relieved to hear Abner on the radio. Soon we were both on top of the clouds trying to get back together.

Things were getting worse for Psycho. On his last radio call, he said that soldiers were coming and that they were attacking him. Pete and I lined up again, this time from a different direction, and plunged into the clouds again.

...We didn't speak much that night, to each other or to anyone else. We sat alone with our thoughts. Bill's last words hadn't sounded good. When Spike Thomas had gone down, we knew he was in a remote area. Bill had landed right amongst a lot of scared, tired, and desperate troops.

We tossed restlessly in our cots all night. In the morning came the news that we were ceasing our attack. The war was over. News that should have had me jumping for joy left me, instead, saddened and bitter. It was too terrible, too tragic that Bill had been killed on the last afternoon of the war. I feared that the Army would stop short of his crash site. It was impossible to feel the happiness everyone else felt. We merely nodded and said, "Yeah, great," when confronted with relieved shouts and large victory grins.

Many days later, we learned that Bill was alive. What a relief. When we eventually got word that he was in safe hands, I finally let my doubts drop away and began enjoying the feeling of victory.

† Used with permission.

AAA – Antiaircraft artillery.

Mil power – Military power. Highest power setting without afterburner.

Abner – Capt. Pete McCaffrey.

Thomas and McCaffrey made three passes under the clouds to look for Andrews. They had to end their search when their fuel ran dangerously low. Later, an Army helicopter was shot down in the same area on a rescue attempt.

Spike Thomas' ordeal was described in the October '91 edition of *Code One*.

As it turned out, Bill had quite an adventure in Iraq. But that's a whole different story, ain't it now?

27 February [Capt. Andrews, continued from Part 1]

When the soldiers were very close, I saw an IR SAM launch behind them, to my northwest. An eastbound F-16 was in its path. Although I had already surrendered, I couldn't stand the idea of them shooting down a buddy so I snatched my radio from the ground and called for a right break and flares. The plane turned and spewed about nine flares. The missile missed. What an awesome sight!

The soldiers, however, weren't so pleased with the display. They began to shoot at me again – this time from a very close range. I tossed the radio to the ground. One soldier ran up to me, shooting at the ground the whole way. He blew my radio into little pieces. The other soldiers took the cue and blasted everything in sight, including my raft and survival kit.

The soldiers grabbed me and started pulling off my gear. They were particularly interested in my pistol and knives. They tore through my survival vest to get at them. I saw my watch and Swiss army knife go. When they stopped, I was surprised that I still had my glasses and wedding ring. They tossed me into a broken-up jeep, and off we raced across the desert. My leg dangled loosely, but I felt no pain. I moaned and groaned, though, to emphasize the injury. They drove to a CP – possibly for a company or battalion.

I got out of the jeep and was told to sit in the dirt. I asked for a doctor, and they said okay, but took no action. I was piled back into another jeep and taken to the headquarters of the next echelon. An officer, a driver, and a guard accompanied me. The officer, a thin lieutenant, carried a paper bag with all my stuff. The guard had cleaned me out earlier for fifty-four dollars and some of my equipment, all under the nose of his not-so-observant officer. I came to refer to him as "the thief." He hid his booty in the door frame of the jeep. He got some satisfaction out of making me aware of his AK-47, which he kept pointed at me inches away. Having that loaded gun pointed at me was itself uncomfortable. My discomfort worsened as the jeep bumped and jolted across the many tank tracks crisscrossing the desert. My leg didn't appreciate the bumps either.

At the next CP, I again sat outside the door on the ground. The commander at this CP was a tall, slender, greying young man who coolly observed me from the corner of his eye. Around us, many AAA guns fired.

Soldiers, mostly enlisted men, began gathering around me. The officers appeared interested, but kept their distance. The skinny young lieutenant had taken the bag with my equipment inside the CP dugout. My personal guard stayed close, watching me intently and brandishing his AK-47. He looked on while one soldier shouted at me, spit on me, and hit me in the face. Other soldiers pulled the man back and rebuffed him.

An officer asked in English if I wanted some food. I said, "Yes, but I would like to see a doctor right away." He gave me what would become the patent answer: "Diktor? Yes, fifteen minutes." He disappeared inside the bunker and reappeared with a can of what he called cream and some pita bread. He opened the can and handed it to me. I ate everything they gave me to keep up my strength. I dipped the bread in the flavorless white substance in the can. I ate most of it with the bread and then handed the can to some of the soldiers around me. They snatched at the can and hungrily scraped out what was left with their fingers.

After a while, most of the onlookers drifted off. Several staff officers came and went from the bunker. A soldier came out of the bunker and set down a plate of dates in the sand in front of me. He also handed me a small, clear glass of what he called "chai," which turned out to be tea with lots of sugar. The dates were good – sticky and sweet.

I continued to hear jets flying overhead. Several light and medium AAA guns in the area fired most of the time. I saw a ZU-23 about a quarter mile away. A heavier gun, probably a 57mm, fired occasionally nearby. The larger gun shot shells that made a swish-swish-swish sound before exploding high above. The frequency of the fire would increase whenever jets were heard. Their shots could not have been very accurate. Without a jet in sight, the ZU-23 operator would open fire with a big stream of tracers and swing the guns around in almost a 180-degree arc, blasting away the whole time.

As I sat there, I wondered whether my captors were Republican Guards. I remembered the intel maps showing two or three of their infantry divisions in the area. I looked closely at their uniforms for signs. Most had deep green fatigues. The officers' uniforms were well kept. A few soldiers wore uniforms with a broken grey-green camouflage pattern. I had heard stories of the conscript infantrymen having no boots and of soldiers surrendering in dress shoes. Here, all the soldiers had boots, and the leather seemed to be in good condition. I saw no distinguishing marks or badges on their uniforms except for their normal rank

CP – Command post.

ZU-23 – a twin-barrel, pedestal-mounted 23mm gun.

insignia. On the basis of their location and personal equipment, I felt that they were members of the famed Republican Guards.

After an hour or so, my original captors rounded me up, and we squeezed back in our jeep. I asked again if I was going to see a doctor. "Diktor? Yes, fifteen minutes." I wasn't, however, holding my breath. As we drove, I was trying to maintain a sense of direction, but it was hard to get a good heading because the setting sun was masked by a thick overcast. We seemed to be heading east on a good, hard-surfaced road, which made me happy because my leg was now hurting like hell.

I rode in the back seat behind the driver. The thief and his AK-47 rode next to me. The skinny lieutenant was up front with the paper bag containing my gear. My chute, harness, and survival kit were still in the back. Occasionally, the thief would reach into the door frame and pull out a piece of his personal booty, stealthily study it, and then return it to his secret spot.

We drove past a group of burning buildings. In front of them was a sign in Arabic with something like "Project No. 11" in English across the bottom. The buildings looked like they might be an oil pumping station. Big supply and fuel trucks rumbled by in both directions every few minutes. I saw no combat units on the move. After fifteen minutes of driving, we had to stop because the road was blocked by a brightly burning convoy of three or four trucks. The lieutenant and the driver decided to turn around. We ended up doubling back, passing by the headquarters we had just left. By this time, the sun had set and darkness was closing in.

We soon came to a modern autobahn overpass. It crossed an equally modern four-lane divided highway, complete with blue autobahn signs like you see in Europe. The next sign offered two choices: Nasiryah or Basra. We chose the easterly route to Basra. The jeep got up to about forty-five miles per hour and then sputtered and died. The driver pulled to a stop, got out, and fiddled with the carburetor while the lieutenant held a flashlight for him. They got back in after a minute and we pressed on. It wasn't long before the engine stalled again. The driver put it into low gear, and we lurched to a halt.

Just as the driver opened the door to get out, a hellacious noise erupted in front of the jeep. A huge burst of bright gold and orange sparkles shot across the highway no more than 1500 feet away. Some pilot high in the sky had pulled some lead on us and would have scored a shack if the jeep hadn't crapped out.

I had often wondered what exploding CBU sounded like, but I never wanted such a personal demonstration. Pulling out of a dive in my insulated cockpit at 10,000 feet, I could see the sparkles of my CBU, but I heard nothing. Fighter pilots might compare the sound to that of a 20mm gun firing, only about twice as loud with a bit more bass. For someone who doesn't fly fighters, it sounds like a very loud, slow-running chainsaw.

Nobody dove for cover. We all froze like deer caught in the bright headlights of an oncoming truck.

The close call made me more sensitive to the burned out vehicles we had been passing along the side of the road. I wanted to get the hell away from the autobahn. The lieutenant had the same idea. Once they got the jeep running, we backtracked to a spot where the highway divider was crushed, crossed the westbound lane, and headed north back into the desert.

Soon our jeep became critically ill. The driver stopped dozens of times to make adjustments under the hood. After each adjustment, the jeep would creep along for fifteen seconds at best and then break down again. We were back in tank track country, so my leg was really hurting. I still had on my G-suit, which was mostly unzipped. I started to zip it down my right leg as a makeshift splint. My movements panicked the thief, so I stopped until he got a flashlight pointed at me. My right calf was extremely tight and swollen. The firm pressure from the G-suit helped. I thanked God that my leg was not bleeding, but I sure didn't want to see what it looked like below the skin.

The officer eventually became disgusted with the jeep. He said a few curt words to the other two soldiers, got out, and started on foot across the desert. The driver decided to get serious about the carburetor. He pulled it off the engine, sat in the front seat, and performed open-heart surgery on it with a knife.

The officer's absence offered my guard an opportunity to scrutinize his booty. There in the jeep's door frame he had two of my flashlights and my survival knife from my G-suit pocket. He pulled out one flashlight and examined it. The thief couldn't figure out how to work its sliding on/off switch. I motioned to him to give it to me, but he wouldn't trust me with it. He fiddled with it for some time without success, eventually returning it to the door frame. He then pulled out the pocketknife and studied it for a while before returning it to the door frame. Finally, he retrieved the other flashlight. After a few minutes, he figured out how to turn it on and off by twisting the lens. He said something in Arabic, and I replied with "light" as I pointed to the flashlight. He repeated "light" and we both nodded. He seemed to

Shack—a direct hit.

CBU—Cluster bomb.

be delighted by the device and switched it on and off incessantly. I became irritated about the whole thing because every time he turned it on he shined it in my eyes.

By this time, the driver had the carburetor back together and installed. After a few tries, the engine started and seemed to be running well. Before moving, both soldiers called into the night, presumably for the officer. There was no reply. They both got into the front of the jeep, which gave me room to place my leg more comfortably across the back seat. We drove for about a half-mile and stopped. The soldiers once again called out into the night. Again, there was no reply. We drove on into the desert.

The moon was full and kept the desert well illuminated. Though the driver made almost no use of the jeep's headlights, he seemed to be doing a good job navigating. The windshield was dirty, though, and he had to throw the door open and stick his head out to see better.

We stopped when we reached an area deeply rutted with mechanized tracks. The two Iraqis got out and motioned for me to do the same. I was rather comfortable in the back seat, so I refused. They insisted. But I remained in the jeep. They then tried to persuade me by repeating, "Diktor," over and over. I knew that was BS. Eventually, they grabbed my arms and pulled me out of the jeep. I hauled myself around the backside of the jeep to a spot where they wanted me to sit. I sat there for about an hour with my guards waiting about fifteen feet away, keeping an eye on me in the moonlight.

Eventually, sounds from another jeep approached from the distance. My driver flashed his headlights towards it and honked the horn. The jeep arrived, with the skinny lieutenant among its passengers. My driver, guard, and I climbed back into our jeep. The other men attached a tow rope and towed our jeep (I never understood why) further into the Iraqi desert.

We pulled to a stop at the entrance of a small infantry dugout. Two soldiers carried me from the jeep and down a short ramp that led to the entrance, which was covered by a blanket.

The dugout was about ten by ten feet and three feet deep. A tin roof held about two feet above the ground by sandbags covered the dugout. Inside, blankets attached to the roof formed the walls. One wall sloped inwards and was covered with a tarp. Blankets and plastic covered the floor. Military equipment lined the walls. A small cooking fire kept the room pleasantly warm. A television set occupied a ledge dug into one wall. The set wasn't connected to power or to an antenna. It and other items in the dugout appeared to be looted from Kuwait.

The soldiers put me on top of a long piece of foam rubber and indicated for me to lie down. The foam rubber was comfortable. It was the choice spot in the dugout. I felt fairly safe from air attack. The light from the fire was dim and shielded by the blanket in the doorway. I knew from experience that these infantry positions were virtually invisible from the air, particularly from the altitudes our planes operated.

Two soldiers were in the dugout when I was carried in; three or four followed my bearers inside. My guard took up a position beside me. The soldiers stood around and gawked at me for a while. Then an officer came in and squatted beside me. He was a captain, with broad features and a little heavysset for an Iraqi soldier (most were thin).

The captain spoke a little English. He asked me my name and how my leg was. I told him that I wanted to see a doctor. He smiled and said "Diktor? Yes, fifteen minutes." He had a friendly manner and, like the soldiers around him, seemed curious about me. He asked me if I had a family. In training, we had been told to avoid telling captors anything that could be used against us. I told him that I didn't want to discuss whether I had a family. He seemed a bit surprised by the answer and pressed me on the issue. But I continued to resist. He asked what type of plane I flew. I replied that that was military information and I could not discuss it. Overall, he seemed more curious about my home life than about my aircraft or mission.

After a few more unanswered questions, the captain told a man tending the fire to give me some food. The man handed me a spoon and a big bowl of rice scooped from a large pot over the fire. The rice was seasoned with small rocks. Every third spoonful or so contained a crunchy surprise. The captain offered me a box of dates. Though I wasn't that hungry, I tried to eat everything anyway.

US intelligence briefers had told us the Iraqi army was starving and surviving on a daily ration of a spoonful of beans and a little water. While the soldiers here looked thin, they seemed to have all the rice and dates they wanted. (I didn't see any beans.) Our intelligence probably applied to Iraqi troops on the front line in Kuwait, troops fed by a much more tortured supply chain than those dug in on their home soil. The soldiers around me also seemed to be in fairly high spirits.

Soldiers began to come and go from the dugout. Two or three stayed with me at all times. One visiting soldier absent-mindedly propped his AK-47 against the wall next to me and walked to the other side of the dugout to talk to another soldier. After a minute, his comrade

noticed the rifle and scolded him. The thought of shooting them never entered my mind. I wasn't going anywhere without help.

Some soldiers tried to communicate with me. Most wanted to know if I had a family. I resisted the temptation to talk about my wife and children.

Later, another soldier sat beside me and indicated that he wanted to help. I had to do something about my leg. Though it did not hurt a lot, my lower leg could move freely in all directions with my knee stationary. My foot could rotate outwards past ninety degrees. I could feel and hear the ends of the broken bones rub against each other inside my leg. I decided to get the soldier to help me fashion a splint.

I made gestures with my hands along the side of my leg where the splints would go and pointed at wood and metal objects in the dugout. I made a wrapping motion around my leg. The soldier understood and located a length of bamboo. We held it against my leg. I held the bamboo where I wanted it cut and made a sawing motion. The soldier nodded and tried cutting the bamboo with an old saw. He didn't make much progress, so he tried a meat cleaver. The cleaver worked nicely, and he cut two pieces. The soldier located some gauze and wrapped it around both my leg and the bamboo splints. I tied the gauze tightly and felt much better that my leg wasn't moving around so much anymore.

At Hahn, before the war, all the pilots had to attend a first-aid course called "self-aid buddy care." I was the biggest joker in the class. Now, three months later, I was showing an Iraqi soldier how to put on my splints. The part I hated most about the course, the hands-on practice, turned out to be the most valuable. I was thankful that I didn't have an open fracture and didn't have to deal with a bleeding injury.

The captain checked in on me a few times. Each time I'd say I was okay. He replied with cheery smiles and told me that I would be all right. I closed my eyes intermittently and slept. During one such nap, I was awakened by the soldiers moving about excitedly, yelling, and throwing on their gear. At first I thought they were changing sentries or going out on patrol. Then, two soldiers came in and motioned for me to get up. They helped me up and out of the doorway. They set me down outside and handed me a blanket. Soldiers everywhere were packing their equipment on jeeps and light vehicles. Apparently, the order to pull out had come.

Vehicles began driving away. The dugout was stripped. The soldiers who had carried me out were several yards away, securing equipment to a jeep. No one was watching me. I was not sure what they had planned for me. Figuring that this might be my only chance to escape, I dragged myself back to the dugout and slid under the tarp against the far wall. I made sure I was completely covered and laid as still as I could. My heart raced as I listened for reactions to my disappearance.

Several minutes passed. Then I heard some soldiers shouting and running around. No one came back into the dugout. I kept absolutely quiet and still. After several more minutes passed, I heard the last two vehicles drive away. I listened hard, but heard nothing but the sound of the vehicles in the distance. I decided to stay in my hiding place for a couple of hours before moving.

As time passed, I grew in confidence that my escape had worked. My new freedom delighted me. I knew that the 18th Airborne Corps was moving rapidly eastward towards me. I remembered seeing friendly brigades close by from the ground liaison officer map in intel. My biggest hope was that the US Army would advance into my area, and I would surrender to the good guys. The Iraqi retreat was a good sign that the US Army was near.

I decided to sit tight and wait for Uncle Sam. My first priority was to find water. I also wanted to find some material for a white flag to wave at the Army. I didn't want to get shot by my own guys. I remembered books about downed World War II Luftwaffe pilots Rudel and Hartmann having harrowing times getting through their own front lines in Russia. Since so many Iraqi soldiers were surrendering, the US Army would not be too surprised to see another white flag.

As I waited, I wondered if I would be able to distinguish US armored vehicles from Iraqi vehicles. I knew if I could see them, I'd be okay because my visual recognition is pretty good. But if I were hidden or if it were dark, I might have to go by sound. I knew the M-1 Abrams is turbine powered, so it would have a distinctive sound. I also knew that we ruled the skies. If I heard a helicopter, I would try to get its attention. But what about the M-2 Bradley units? They, like the Iraqi tanks and APCs, were diesel-powered.

During my first hour under the tarp, several light vehicles drove by. Some sounded their horns. Two stopped in my vicinity while their occupants called out into the desert in Arabic. After that, I heard no other vehicles for about an hour. I pulled myself out from under the tarp and wrapped myself in a blanket. I was cold from lying so long on the damp ground.

Some heavy-caliber AAA was going up in the area from the northeast and going off right over me. It reminded me of a fireworks display. It would flash on the horizon when fired and then burst bright white overhead. A few seconds later, I'd hear the sound of it being fired,

APCs – Armored personnel carriers.

swishing overhead, and then the sound of the shell going off. The short delay between the sights and the sounds told me that the Iraqi soldiers were still close, within a few miles.

I listened carefully for more vehicles, but heard none. I decided to go above ground for a look around. I crawled out the doorway. The full moon was bright. I kept low to avoid making a large profile. I saw no signs of life or motion. The AAA fire slowed and eventually stopped. Maybe the Iraqis had pulled back.

An amazing amount of junk cluttered the area near me. The Iraqis left behind everything from living room furniture and televisions to military hardware. I found my foam rubber mattress from the dugout and a pitcher of liquid. I tested the contents of the pitcher and discovered that it was water – about a liter and a half. The discovery made me very happy. I then found a five-gallon jerrycan full of liquid. The contents smelled a little like gas, but tasted like oily water. I found a shovel and tried using it as a crutch. It didn't work. I realized that I was stuck. My right leg was worthless. It hurt like hell when I moved.

Moving the foam rubber and the blanket took a huge effort. I crawled to a position ahead, then picked up the bedding and shoved it ahead of me. I then crawled past it and repeated the process until I got where I wanted to go. I had to rest several times during this operation because my leg was making me really tired. I brought the pitcher of water over and placed it in a protected place so I couldn't accidentally knock it over.

I set up an observation post beside the bunker. I chose a spot shielded from three sides. I stayed beside the bunker on my back. The bunker itself was to my left. To my right was a sofa. On another side was a three-foot mound of dirt, probably from the excavated bunker. From miscellaneous junk that was within reach, I erected a low wall. I laid on the foam rubber behind the wall and covered myself with the blanket. Next to my hiding spot, I found a large white sack full of nails and screws. I emptied the sack so I could use it as a surrender flag.

I wondered how long I'd have to wait. I thought of ways to help the allies find me. Once the sun came up, I could use the shovel I'd found to scratch out a recognition signal I had been given. However, I panicked when I realized I had erased the signal with all the other codes from the back of my hands when I was captured. I hadn't kept it because I figured it was useless since I was in enemy hands. Instead of the signal, I'd have to rely on something like "SOS" or "USA."

My thoughts were interrupted with sounds of artillery fire. This time it was closer and to the southwest, probably the big guns of the 7th Army Corps pounding the Republican Guards around the northwest corner of Kuwait – a dozen miles away. Then I heard artillery fire from the west. It sounded very close. Seconds after the guns fired, shells whooshed through the air directly over my head. Their flight ended with tremendous explosions to the north and northwest of me. The sound of that first volley terrified me.

The blast of the next volley sent me for the dugout. Halfway over the lip of the pit, I reconsidered. The three-foot fall to the floor would probably completely ruin my right leg. I started to drag myself around the dugout to the door. Before I got there, the shells had already passed overhead and landed in about the same place as the first volley. I was probably not the target. Since any movement of my injured right leg was very painful, I decided to stay above ground.

The intensity of the barrage increased. Shells passed overhead almost continuously. They sounded like freight trains. Some of them made a loud tearing sound as they ripped through the sky to their targets. I was soon able to distinguish the sound of a shell that would land nearby. Even though nothing hit within a few miles of me, I cringed and hunkered down at the sound of every big blast.

The sounds of the impacts were most terrifying. Mixed in with the booms of conventional artillery rounds were those chainsaw sounds of CBU-87 explosions I had encountered earlier. The cluster bomb explosions probably came from the Army's MLRS rockets, which carried the firepower of several of our CBUs. Their bomblets were just as lethal. Each CBU bomblet is designed to destroy armor with a shaped charge, soft targets with a fragmentation section, and flammable targets with incendiary material. Each MLRS rocket carries hundreds of these bomblets. One barrage can destroy one square kilometer of ground. I read later that the Iraqis referred to the MLRS rockets as "iron rain."

The impacts of these rockets roared for six seconds. The rockets kept flying in, one after another. I was thankful to be alone and away from their target. If I had not escaped, I'd probably be buried in a stalled convoy being obliterated by that firepower. I couldn't imagine what a nightmare the roads and bridges to the north must be. The Iraqi soldiers were probably bunched up trying to get through to the few remaining bridges on the Euphrates and being savaged by our artillery.

To the northwest, I could see a faint orange glow from the barrage. As more rockets and shells passed overhead, I imagined that this is what it must have felt to be in "no man's" land during World War I. Maybe this was what the night before the big push sounded like

MLRS – Multiple-launcher rocket system.

to my grandfather, who fought as a doughboy in the Meuse-Argonne offensive. The barrage went on for hours.

The barrage finally lessened in intensity, and I was able to get some sleep. I covered myself completely with the blanket; I didn't want to be seen in case I overslept. I also slept on my side to keep from snoring. I woke up every twenty or thirty minutes because I was too afraid to sleep longer. Every time I awoke, I remained perfectly still and listened for anything nearby. If I heard nothing unusual, I'd sit up and look for movement.

28 February

In the morning, the desert became suddenly visible, almost as if someone had flipped a switch. Two or three bunkers like mine, invisible at night, all appeared within fifty meters of me. Abandoned vehicles cluttered the landscape nearby. A city bus stood motionless about a hundred meters away. Half a mile away, I saw two heavy artillery pieces hitched to two large army trucks, similar to our deuce-and-a-halves. If the Iraqis were leaving heavy equipment like that behind, they must have been pulling out to save their skins.

The area had the look of defeat. An astonishing amount of junk littered the desert. There were mountains of things that must have been looted from Kuwait – living room furniture, couches, chairs, shelves, television sets. Scattered about the battlefield were pots and pans, dishes, utensils, lamps, blankets, tools, and boxes full of equipment.

I sat up and looked around every ten minutes or so. After about a half-hour, my heart froze when I spotted a man standing above a bunker about fifty meters to my northeast. I immediately dropped below the sofa, to my right, hoping that he hadn't seen me. I looked again and he was gone.

For the next few hours I saw no one. Then I saw the man in the nearby bunker again. This time he was talking to a companion. Perhaps they were deserters. Since several vehicles had come by during the pullout, honking their horns and rounding up soldiers, I doubted these men were just left behind. Deserters or not, I didn't want them to discover me. When the two men started scavenging through the mounds of junk, I became terrified that they might come upon me. They stopped looking around after ten minutes and walked over to the abandoned bus and boarded it. They tried to start it without luck. Then they walked over to one of the trucks attached to the artillery pieces and managed to start it. One man kept the engine running while the other went to the back of the truck and unceremoniously ditched the big gun. They drove off to the southwest towards the US forces.

The deserters were not gone long before squads of infantry retreating on foot came along the road to my south. They were traveling eastbound in groups of five to ten, carrying their weapons but not much else. I remained concealed and watched the retreating parade pass within seventy-five meters of me.

In the early morning, I had heard some jet noises and some sporadic artillery fire. As the morning wore on, the skies began to clear. The sun broke through the overcast. It appeared to be a glorious day for airpower. I expected to see many fighter bombers as the clouds cleared. But the jet noises never came. I wondered if the battle had moved across the Euphrates and was now out of earshot. I became more concerned than ever that the US Army might not pass near my position.

Soon, a pair of Iraqi army trucks approached from the north. They stopped close to the abandoned artillery pieces. About two dozen soldiers hopped out of the trucks and fanned out in groups of three or four. They appeared to be either foraging for food and supplies or looking for stragglers and deserters. The soldiers went into each bunker for a few minutes and then moved on. A few soldiers headed in my direction. The fear of discovery and recapture shot through me. I hid as well as I could in my little junkyard. I piled a few blankets I had found on top of me. I hid tightly against the back of the sofa. I tried to conceal the shape of my body as much as possible by piling things around and on top of me.

Within a half-hour, I heard footsteps close by. One pair of boots walked right up to my hiding place. As I heard things rustling around right next to me, I felt my chances of remaining a free man slip away. I stayed perfectly still. I kept my breathing shallow and silent. A minute later, my blanket was pulled away. I looked up and saw two soldiers standing above me. I could see their shoulderboards. One was a captain, the other a lieutenant. We stared at each other. I think they were surprised to see me. One said to the other, "Ameriki pee-yosh," which meant American pilot. The other nodded. The captain asked me "American?" I answered, "Yes, I'm an American." My answer was followed by a lengthy, studied pause. The captain then said in English: "The war, it is over."

I did not believe him. I thought the fighting would surely go on for at least another week, maybe a month. I queried him: "The war is over? Peace?"

"Yes, peace," he replied. "No fighting anymore."

Deuce and a halfs – two-and-one-half-ton trucks with eight wheels in back and two in front.

"Will you take me to Kuwait, to the Americans?" I asked.

"No," he calmly answered. "We cannot do this."

I tried again: "Please take me to the Americans."

"No," he insisted. "You will go to Baghdad."

These last words filled me with disappointment. I was so close to my comrades, yet so far. Since the war was over, my best chance for freedom was a POW swap. First, I would have to join the other allied prisoners. My greatest fear now became getting sidetracked and disappearing in Iraq. There might never be a prisoner swap.

The lieutenant walked off and blew a whistle, which sent the other patrols back towards their trucks. I pointed to my leg and told the captain that I was hurt and needed a doctor. He had seen the splints and seemed to understand. He said he would take me to a doctor. While waiting on the trucks, the captain rummaged through the trash and found some boxes of dates. He ate a few from one and offered me a box. I ate some of the syrup- and sesame-covered fruits. He offered me some water from his canteen. Since I had been conserving the water I had found, I was thirsty. The water from his canteen tasted dirty, like all the other water I had drunk in Iraq.

The trucks pulled up and several soldiers lifted me and my rubber mattress onto a bedframe they had found. About eight soldiers then carefully slid me and the bedframe into the back of one of the trucks. I helped support my weight by grabbing the frame of the canvas canopy that covered the truck.

Three soldiers sprawled out over the equipment in the back of the truck with me. After the others climbed into the other truck, we started off. As we moved, my mattress listed slightly to the right. My right foot, on my broken leg, hung over the tailgate.

Even though we traveled at a walking pace, the drive through the desert was painful. The truck's rigid suspension transmitted every little bump and jolt directly to my right leg. Deep ruts and tracks left by armored vehicles sent me bouncing high above the mattress. Every major jolt was accompanied by screams through my gritted teeth. I tried to lessen the pain by grasping the wooden frame that held up the canvas top and pulling myself up. (My arms were sore from this the next day.) The soldiers around me were sympathetic. They could see my pain during the rough parts. They tried to steady me and hold me in place. This didn't help much because they'd bounce just as high as I did when we hit a rut.

After about an hour of this torture, we reached paradise – a hard-surfaced, two-lane road. I smiled broadly, and the soldiers smiled back. One offered me a cigarette. Being a non-smoker, I refused. They seemed bewildered at the refusal. They couldn't believe that I didn't smoke. Everyone in Iraq smokes.

Once on the paved road, the soldiers tried to start up a conversation. One spoke a little English. Between his English and some improvised sign language, we managed to discuss a wide range of topics.

The conversation invariably drifted to family. The men asked me if I was married and had children. I still refused to discuss the subject. I managed to resist their questions for some time but relented when they noticed my wedding ring. They were most interested in my children. I eventually told them that I had two. The information seemed to make them really happy. I never felt that my treatment got worse when I mentioned my family. If anything, I was treated better.

I learned later that another POW, Maj. Jeff "Tico" Tice, was treated very badly by Bedouins when he was first captured near Tallil Airfield. One of the captors traced lines on Tice's face with a bullet from an AK-47. The man then chambered the bullet and placed the end of the barrel against Tice's head. The group's chieftain eventually got around to going through Tice's belongings, which included a photo of his wife and kids (which was against all military advice). The chief studied the photo for some time and then gently kissed it before placing it in Tice's lap. The American pilot was untied and asked to dine with the chief that evening as his special guest.

Eventually, the soldiers with me got around to asking about the type of plane I flew. I made it clear that I couldn't talk about military information. That didn't keep them from trying. They really kept after me, reminding me of little kids whining for something. I figured that they were just curious, but I didn't want to say anything about my mission in case they might pass on the information later. Their questions showed that they knew very little about the coalition airpower. They knew I was an American, but they asked me if I flew a Tornado or Jaguar. They eventually asked about F-15s and F-16s. I always refused to answer.

As we drove, the soldiers kept saying something that sounded like "bosch." For some time, I couldn't figure out what they meant. But each time the word was mentioned, the speaker would have a real nasty look on his face. Then one man in the truck stared at me intently, giving me a thumbs down and saying "jorsh bosch." I figured out then that they were

Tice's rescue attempt is mentioned in the February/March issue of *Smithsonian Air&Space*.



McCaffrey, Thomas, Booher, and Andrews (left to right) pose in front of a specially labeled Desert Storm (DS) F-16.

referring to George Bush. Apparently they didn't think much about our President. They seemed to think that Bush alone was responsible for the war and for their hardships. They assumed that the US government was like their own – autocratic, with one leader calling all the shots.

The group kept asking me, "Why does Bosch fight us?" I was in no position to argue with them. Instead, I kept quiet and let them tell me what they thought. They seemed to agree that we were fighting over Kuwait. One soldier said that we were fighting for oil. He summed up the war: Kuwait has the oil. Saddam wanted it. The USA didn't want him to have it.

They couldn't understand why we were fighting in Iraq. This and questions about why we were hitting water, oil, and electricity got tense. They were angry about the state of their country. I was worried a few times that they were going to take it out on me. When they pressed me with their questions, I'd shrug and blankly shake my head. The English speakers were eager to point out to me which men had lost relatives, families, or homes from the bombing.

The Iraqis had definitely taken a beating. Bombed and burned-out vehicles ranging from cars to main battle tanks were scattered along the road. The surrounding terrain looked like the high desert plains in the Western United States – flat with prairie vegetation. We were still south of the Euphrates River and west of Basra. Along the road, government projects were introduced with big portraits of a benevolent, smiling Saddam Hussein and signs with Arabic writing, a project number, and dates. Many of these buildings had been hit. Some were burned out; others looked like junk piles. Of those that were standing, most of the windows were broken or blown out.

Military equipment, soldiers, and supplies clogged the road in both directions. Because of my experience from hiding in the desert, I paid attention to the sounds of Iraqi tanks. They have a loud staccato-sounding engine. Up close, they sound like a deep bass jackhammer. The treads squeak loudly and can be heard far away. I recognized numerous squat-looking T-72s and the more rounded T-62s. The tanks traveled in both directions in total disarray.

I saw all sorts of Soviet hardware on the trip and tried to memorize everything. Most numerous were armored personnel carriers. I also saw Soviet-built BMPs, BTRs, MTLBs, and PT-76s parked along the road and in transit. There were also some western military vehicles. One platoon of tracks appeared to be US-built ITVs. I saw many batteries of 57mm towed anti-aircraft guns unlimbered along the road. Their concentration would increase near important locations like bridges and causeways.

The 57mm can shoot to fairly high altitudes and could reach us at our normal operating altitudes. The bursts looked a lot like the flak bursts of old World War II movies.

T-72s, T-62s – Soviet-made tanks.

BMPs, BTRs, MTLBs, PT-76s – Soviet armored vehicles.

ITVs – Improved tow vehicles. TOW missiles mounted in special launchers atop an armored personnel carrier.

Fortunately, the 57mm could not shoot very fast, so the gunner could not simply direct a stream of shells at a target. To shoot down a fast-moving plane with these guns, the operator would need an awfully lucky shot. Though most of the 57mm were barrage fired over our target areas, we would occasionally encounter motivated gunners who could be fairly accurate. On one of our early missions against the Republican Guards, my wingman had a tough time getting in the proper position for a bomb drop. It took him two extra passes to get his bombs off. On his last pass, one of these 57mm operators almost got everything right. As the pilot pulled off target after releasing his bombs, I saw a large flak shell burst about 500 feet behind his jet. It was on course, on altitude, but just a half-second late.

The smaller 23mm and 37mm AAA had a much higher rate of fire, but they had a lower maximum altitude. Most of the time, we worked above their maximum altitude. The 23mm guns had two or four barrels mounted on a pedestal or on an armored vehicle. They could put up a lot of lead at once. When a battery opened up, it looked like the sky was filled with white popcorn. Most of the 23mm was barrage fired. The gunners would fire into the sky whenever they heard aircraft or after the first time a bomb went off. The gunners probably never knew we were in the area until then. Our Wild Weasels and F-111s had effectively shut down the Iraqi radars, either through denial or through intimidation, so the ground forces had to rely on their eyes and ears. From the ground, however, it is virtually impossible to spot an F-16 above 10,000 feet. The plane's small size and its paint scheme make it disappear against the background. The A-10s had a tougher time because their combat loads forced them to work at lower altitudes. They are also bigger and their forest green paint jobs were much easier to see.

Many times during the ride, I was confronted with the hardships and suffering imposed on the Iraqis by the war. The soldiers pointed out casualties and the destruction in their country. I showed that I understood, told them that war is a terrible thing, and that I was just a soldier and doing what I'm told. They suggested that I was paid money from the King of Saudi Arabia, that I was bombing them for profit. I explained that I was there under orders from President Bush in support of the United Nations. I don't think the common Iraqi soldier understood how strongly the world community had condemned the invasion of Kuwait, that it was truly a world coalition against them.

To see if the soldiers supported Hussein, I posed their thumbs up/thumbs down question back to them. A young enthusiastic soldier gave an emphatic thumbs up. One of the older soldiers looked around the truck warily and gave a disgusted thumbs down. The others were unwilling to commit. They just looked around cautiously and shook their heads.

I could tell by the position of the sun that we were heading east towards Basra. I entertained thoughts of a POW swap between Basra and Kuwait since they were so close. But I wasn't holding much hope for that possibility. ■

Wild Weasels – F-4G Phantoms equipped to knock out surface-to-air missile installations.

Follow Up

Capt. Andrews' war journal ends on that truck ride towards Basra. He was taken to Basra, where he saw a doctor the next day. On 2 March he was placed on a bus with other POWs and driven to Baghdad, where he was interrogated at length and placed in a small jail cell. He and most of the other POWs in the jail were released to the Red Cross on 5 March and flown to Saudi Arabia the next day. He arrived at Andrews AFB on 10 March.

Upon his return to the United States, Andrews received but turned down interview requests from a variety of publications and television shows, including *20/20*, *Larry King Live*, and *Nightline*. He did, however, grant interviews to media from his hometown and his father's hometown. "I didn't want to talk about my ordeal," Andrews explained. "I wanted to get the message to the folks back home that I knew they were praying for me. I knew that because there is no other way to explain a motor stalling five seconds before a bomb hits in front of you. I just wanted to tell those people that their prayers worked."

Andrews carries two and a half pounds of metal in his right leg, including a steel rod through his tibia. He returned to flying status last June, several months earlier than doctors predicted. Andrews, who once flew EF-111s at Mountain Home AFB in Idaho, now flies as an F-16 LANTIRN instructor pilot with the 310th Fighter Squadron of the 58th Fighter Wing at Luke AFB in Arizona.

"I feel glad to be alive every single day," Andrews told *Code One*. "My experience over there is a closed chapter. It feels now like it was a tough week at work. While I don't relive it every moment, the experience did change my perspective on some things. My family is more important to me. I realize now that being a dad is more important than being a fighter pilot."

Capt. Andrews received the Air Force Cross, the Purple Heart, and the Prisoner of War Medal for his mission of 27 February. He later received the prestigious Jabara Award for Airmanship for his actions during missions of 24 and 27 February.



LETTERS

We'd like to hear from you. Send letters to Editor, *Code One* Magazine, Mail Zone 1793, General Dynamics, PO Box 748, Fort Worth, Texas 76101.

Close, But No Qatar

Your magazine is the best! Capt. Andrews' journal is a wonderful tribute to F-16 drivers everywhere. Having had no opportunity to fly in the Gulf because of RTU IP [replacement training unit instructor pilot] duties at MacDill [AFB, Florida] this journal will be as close as I get. I don't ever want to be shot down, but we are all prepared. The very human touches in *Code One*, like the journal, make your magazine the best in the entire military-industrial complex. Thanks.

Maj. Steve Lowery
F-16 Pilot by nature
HQ PACAF Planner by timing

Spiked In North Korea

I particularly enjoyed the article on the downed pilot in your October [1991] issue. It took me back almost forty years to a very similar incident, including the media's fictional coverage. They reported me bailing out, landing in the water, inflating my rubber dinghy, and being picked up by a helicopter when in fact the first time I even saw water was when a third helo took me to Chodo Island off the west coast of Korea, after spending some four hours in North Korea. A major difference between my story and Spike Thomas' was, of course, that my engine was up front.

James H. McGee
Ltc. USMC (Ret)
Reston, Virginia



Heads Bowed, Hands Clasped

After reading and thoroughly enjoying the interview with Harry Hillaker, I thought you might find "An Airplane's Prayer" of interest. The poem was born when Mr. Ed Heinemann was developing what became the A-1 "Spad."

*O Lord, please guide each engineer
that works on me, to persevere
in paring off each idle pound—
I want no extra weight around!
I must be light so I can fight
and come back home to roost at night!*

*I pray that they will keep me clean,
aerodynamically, I mean.*

*For every curve and every line
owes its success to good design.*

*I don't deny that I rely
on engineers to simplify!*

*A lot depends upon their speed
to finish me while there is a need
for me to really do my stuff.*

I can't get out there fast enough.

*So grant them every little trick
to make me fast and make me quick!*

by Irene Maarsingh

William F. Smith, Jr.
Santa Monica, California

Technical Excitement

I am continually looking for examples that will show my students that technical writing is not the lifeless writing they assume it to be when they sign up for the course. *Code One* will make an excellent addition to my collection. Since I also teach a survey course that includes a section on ancient Greek drama, I was immediately drawn to your article "The Wings of Daedalus." I enjoyed both the lively style and the history lesson.

Ron Smith
Department of English
University of North Alabama
Florence, Alabama

That's Sixteen Per Country

The University of Southern California has been under contract to the US Air Force to provide safety education courses to military pilots for nearly forty years. We currently instruct over 400 students from twenty-five countries. Having recently reviewed *Code One*, it was obvious we needed copies for our students and faculty.

James G. Stone
USC, Institute of Safety
and Systems Management
Los Angeles, California

Setting Examples

We enjoy *Code One*. Other faculty and I use the publication frequently in our technical writing and publication design classes as an example of excellent publication techniques.

Tom Brownell
Ferris State University
Big Rapids, Michigan

Mythical Revisionism

Your article about the HAF and the fine illustration of Daedalus reminded me of an interesting sidelight on the myth. While trying to escape with his son, Icarus, from the Cretan labyrinth, Daedalus warned the young man to avoid flying too high. Icarus, an impetuous youth, ignored the advice and ascended too close to the sun, where the heat melted the wax holding his wings together. Icarus fell into the sea and drowned.

A few years ago I read a paper in a learned journal which offered an alternative theory. This researcher, after analyzing the probable atmospheric conditions of the flight, suggested that solar heat did not cause the structural failure. He posited that the colder air encountered at high altitudes caused the wax to become brittle and fracture, precipitating the crash. Seems logical.

Rex Hardy
Monterey, California

Editor's note: Some have suggested that Icarus exceeded the design G limits while carrying four Mk-84s and an ECM pod.

Geographically Nervous

Rumor has it that *National Geographic* is shaking in its boots. The reason is the outstanding quality of *Code One*. From the exceptional photographs to the quality paper, this is one high-class magazine. Keep up the good work.

I couldn't help feel a special link to the January cover. As a member of the Air National Guard (soon to transition to the F-16C) and an airline pilot, I found the article "Scramble!" to be quite impressive. I particularly enjoyed the tri-perspective introduction. Many of us fly fighters one day and "heavies" another. Seeing these two professions displayed so well on your cover, and detailed so well in the article, only reinforced my impression of what a fine publication you have.

Bill Rodway
Albuquerque, New Mexico

Hiding Out With *Code One*

I came across a *Code One* recently in reference to creating a squadron stripe. I had to hide just to finish reading it. Your magazine is informative, interesting, and entertaining, with fine pictures.

I am a technician with the 706th TFS "Cajuns." We are converting from A-10s to F-16s in June, and are all very excited. We would be ever so grateful if you could get us on the mailing list. Here on the flight line, the crew chiefs seem to be the last ones to get any goodies, but we are surely the most enthusiastic about our aircraft. Next to the pilots, we are the best promoters of our air vehicles. One day maybe we will be featured in *Code One*. We're looking forward to the future in the F-16.

Jay Finch
926th TFG
New Orleans, Louisiana

Extra Meanings

As a former F-16 driver turned airline pilot, your January cover photo carries extra meaning for me. I work with four other former F-16 pilots (all now airline pilots) as a part-time consultant on F-16 matters. Fortunately, our office carries a subscription to your fine magazine, so I haven't missed an issue. I really enjoyed "Gulf War Journal" and look forward to Part II. Ernest Hemingway's quotation in "The Wings of Daedalus" really hits home when it comes to the F-16. I enjoy reading about the jet, so keep up the good work!

David Busheme
FlightSafety International
Colleyville, Texas

Got A Job For Capt. Thomas?

While a couple of us were out on a recent cross-country flight, we happened to find a copy of *Code One* amongst many other magazines. Yours is clearly a superior product. Since the majority of us in this office aspire to fly the Viper someday, we would really appreciate receiving the magazine. Keep up the good work, and if you hear of anybody (especially an Air National Guard or Air Force Reserve unit) who would like to hire a pilot who would kill to fly an F-16, please give them my name. Thanks a million.

Capt. Craig Thomas
Chief, T-38 Branch
82nd FTW
Williams AFB, Arizona

Spotlight On Joe Bill

First, I want to congratulate you on a terrific magazine. I enjoyed your January issue. "Out of the Dark" by Mr. Joe Bill Dryden is of specific interest to me and my colleagues. I would like to reprint the article and distribute it to the attendees of a seminar sponsored by the Aerospace Lighting Institute to be held in Los Angeles. Since the seminar deals with cockpit lighting, this article from a pilot's perspective will be of special interest.

George Godfrey
Executive Director
Aerospace Lighting Institute
Oldsmar, Florida

Stealth Readers

I recently received a copy of *Code One* and found the articles and graphic quality to be outstanding. I feel very honored to be included on the mailing list and have circulated my copy to all the Northrop B-2 test pilots.

I thoroughly enjoy flying the F-16 as our chase plane. It is a beautiful engine/airframe combination that General Dynamics should be extremely proud of.

Calvin F. Jewett
Manager, Flight Test Operations
Northrop
Hawthorne, California

Friendly Feelings From Japan

Congratulations on your seventh year of *Code One*. My initial encounter with the F-16 occurred many years ago with a mock-up of the cockpit displayed at the Tokyo Air Show. Through the years, I've kept up with the plane. And today our JASDF [Japan Air Self-Defense Force] and our engineers are working with you on the FSX program.

A scale model of the F-16 occupies the center of my model fleet display case, where your bright *Code One* provokes a friendly feeling.

Noboru Suzuki
Utsunomiya, Japan

Dale Doesn't Share?

I am a research assistant to the best-selling fiction novelist, Dale Brown. He receives *Code One* each quarter on a complimentary basis. I would like to receive my own copy if you would be so kind. I have found much interesting information in *Code One*. I have

conveyed this information on to Dale for his novels, but often I do not see each and every copy that comes to Dale since we do not work in the same office. I look forward to reading my own copies.

Dennis Hall
Folsom, California

Useful In Singapore

The Republic of Singapore is developing a new and prestigious military academy for officers—the SAFTI Military Institute. The institute will have an open-campus concept inspired by places such as West Point, Annapolis, and Sandhurst.

Integral to the Institute will be the SAFTI Exhibition Center. With state-of-the-art education and display systems, the centre will cover issues on our military heritage, Singapore's chosen strategies for security, defence technology, and tactics.

The centre promises to be much more than a specialized campus museum. As a national project, we want it to appeal to the everyday person. As you may be aware, our small country requires a commitment from its citizens to what we term "total defence." Ours is a conscript armed forces with employers, family, and friends playing key roles.

It is with this communication mandate in mind that I have great interest in your publication. I thoroughly enjoy your broadly based editorial policy and the way you slant your features and make them accessible to the enlisted as well as to the uninitiated.

I would be most delighted if we can be placed on your mailing list. *Code One* is an excellent publication and an ideal way for my researchers and copywriters to learn from the best in the business.

Col. Kwan Yue Yeong
Director, SAFTI Development
The Ministry of Defence
Republic of Singapore

Familial Responsibilities

The 132nd TFW is scheduled to convert to the F-16 in the near future. The entire unit has been making serious preparations for this event for nearly six months and with the passing of each conversion milestone, the anticipation is increasing. Similarly, the receipt of each edition of *Code One* makes abundantly clear the fact that each member of the General Dynamics Falcon family needs to read *Code One* regularly and completely.

Brig. Gen. Donald W. Armington
Commander, 132nd TFW
Iowa ANG



50

YEARS
OF
BUILDING
THE
BEST



TER-BOMBER •
• F-111 FIGHTER
8 HUSTLER • F
MAKER • B-58

1942 - 1992

GENERAL DYNAMICS
Fort Worth Division

AKER • B-58 H
-36 PEACEMAK
MINATOR • B-3
R • B-32 DOMI

B-36 PEACEMAKER • B-58 HUSTLER • F-111 FIGHTER-BOMBER • F-16 FIGHTING FALCON B-24 LIBERATOR

DOMINATOR • B-36 PEACEMAKER • B-58 HUSTLER • F-111 FIGHTER-BOMBER • F-16 FIGHTING FALCON B-24

TOR • B-32 DOMINATOR • B-36 PEACEMAKER • B-58 HUSTLER • F-111 FIGHTER-BOMBER • F-16 FIGHTING

B-24 LIBERATOR • B-32 DOMINATOR • B-36 PEACEMAKER • B-58 HUSTLER • F-111 FIGHTER-BOMBER • F-16

**CODE
ONE**

LOOKING
OUT FOR
AMERICA

