flying

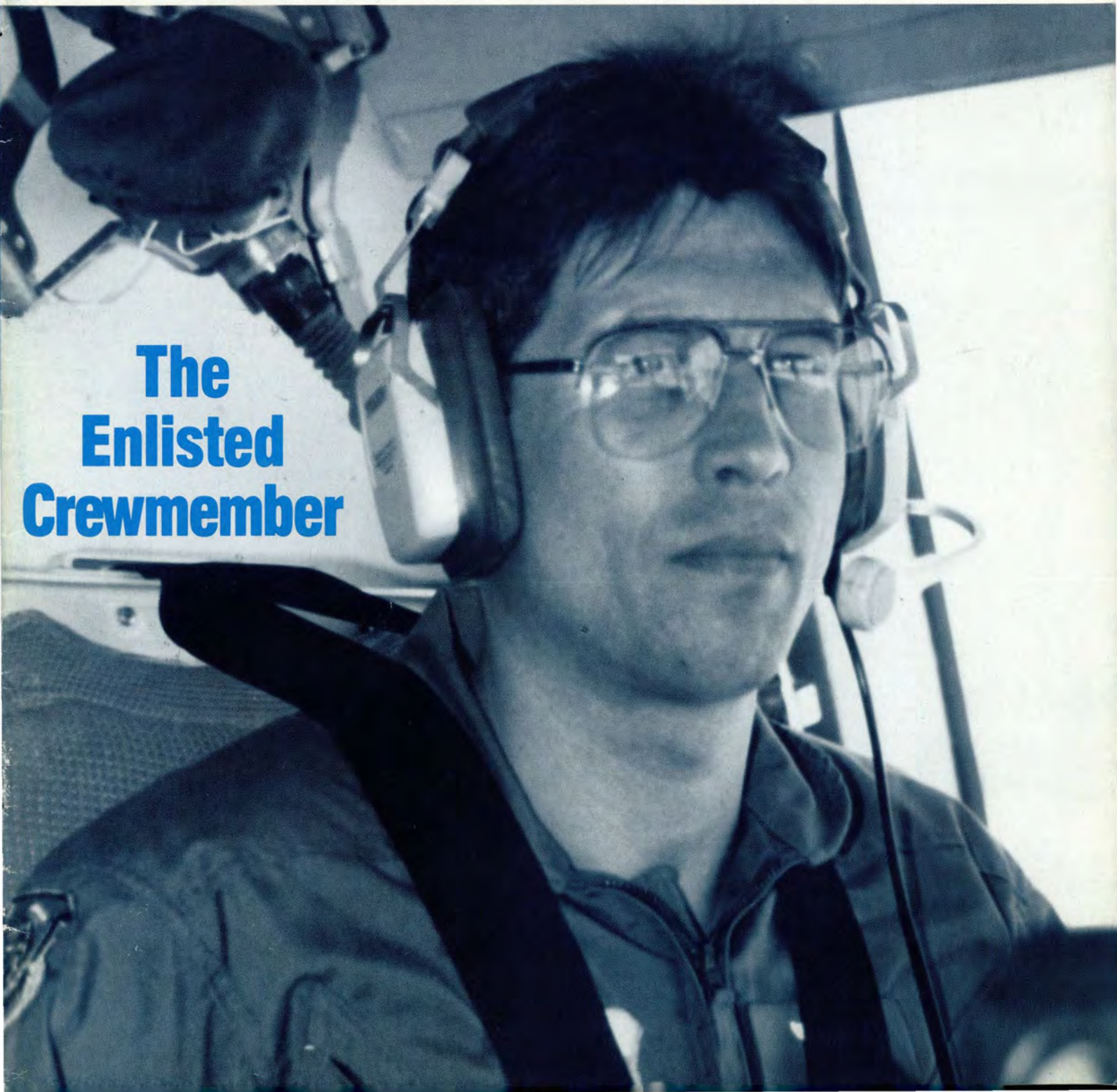
SAFETY | MAY 1991

"The *'Es'* Have It!"

The Boom Operator—Cornerstone of Safety

Knob Goblins & Slips

Spectre Gunners



The Enlisted Crewmember

THERE I WAS

■ There I was, on a hot, muggy, summer day, waiting for our load to arrive for our beloved C-130B. Our mission today was to fly shuttles for a "user unit" going home from an exercise. "No big deal," I thought to myself.

As we loaded the first pallet aboard the aircraft, I noticed it was quite hard to push on the dual rail system. As loadmaster, I thought "Warped pallet," as I doublechecked the weights. After we loaded the pallets, all of which were hard to push, I thought to myself, "BOY, ALL THESE PALLETS ARE WARPED!"

I had begun to investigate further and asked the loading agency if these were the correct weights. Then the navigator yelled down to the cargo compartment, "Come on up for the crew brief, load. We're running behind schedule." "Okay, okay," I answered, as I signed off the load. (This was another broken link in a long chain of events.)

As we began engine start, I noticed the aircraft was sitting "kind of low." I was contemplating this when I remembered we had taken on quite a bit of fuel to carry us through the day, and we were close to max takeoff weight anyway. It just didn't look right, though, when I entered the aircraft ...

As we began to taxi out of parking, the AC noted the aircraft was slow to move. Our engineer explained we were parked on an incline. Then the engineer asked me if all the cargo weights were correct. I explained everything matched on the manifest, and the weights were correct to the best of my knowledge. The engineer reassured everyone he put "a few extra thousand pounds on the TOLD (takeoff/landing data) card for MOM AND THE KIDS, so we ll be okay for takeoff if the cargo weights are off a little."

Approaching the runway, the pilot announced, "This will be a rolling takeoff, crew," as I buckled in for takeoff in my favorite position in the back of the aircraft. Our sluggish C-130B began to lumber down the runway, skybound. Sitting in the tail — I mean the last seat in the rear of the cargo compartment, I didn't feel the usual acceleration for takeoff and wondered ... Nothing was said in the cockpit except the usual stuff, and then "GO!!"

Our overgrossed C-130B slowly began to climb when I heard "Full power" come over the interphone. It seems the 50-foot pine trees at the end of the runway were getting taller instead of smaller!! After clearing the pine trees, tower called us and thanked us for the "air show." "Some airshow it almost was," I thought, as the pilot called back and asked me, "What did you say those pallets weigh?"

The crew began to investigate the slow climb, and we decided to step climb to our max cruise altitude to see if we were really overgrossed. The engineer figured max cruise altitude with the information we had and determined we should reach "about 25,000 feet." When the aircraft refused to climb any higher than 18,000 feet, we calculated we were about 25,000 pounds over our intended weight.

It almost became a BIG DEAL after all, with *all* the factors figured in. As it turned out, the pallets were not weighed, but simply tagged at about 2,500 pounds each.

Several lessons here, but the one which sticks out in my mind most is aircrews are not the only ones susceptible to get-home-itis. Anyone can catch it, especially "user units" not flying with you. However, the aircrew must remember they will always be held ultimately responsible to answer questions when something goes wrong. I just pray you never have to answer with your life. We were lucky. The next time I have a "warped" pallet, I will measure it to see how warped it really is! Finally, I don't care if "it came on a C-130" or not — if it does not look right, add up, check out, or feel good, then I'd rather *live* with a late takeoff. ■

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Front cover photo by
MSgt Ricke A. Moore

SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, OSAF

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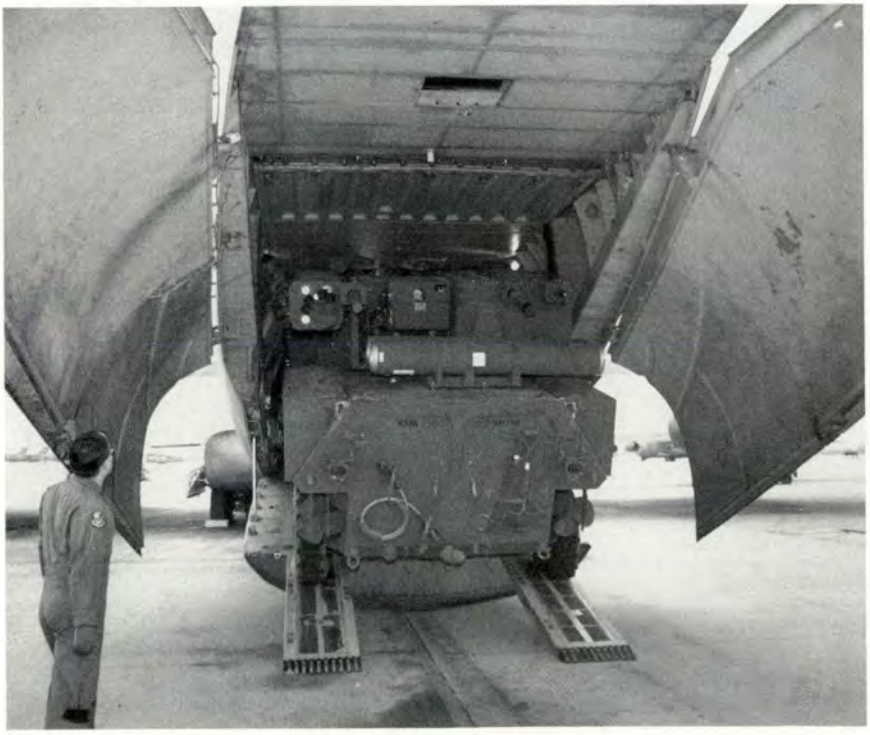
"The 'Es' Have It!"

PEGGY E. HODGE
Assistant Editor

Throughout the years, many respected Air Force leaders have recognized enlisted members as the backbone of the Air Force. Their distinguished history and the demanding and critical positions they hold in today's Air Force justify this recognition.

A trip across the Atlantic with a Military Airlift Command's (MAC) C-141B aircrew allowed me to observe two of our enlisted career positions at work — the loadmaster and flight engineer. "The 'Es' Have It!" is their story — a story of two enlisted career fields that typify a success story we can find in all of our enlisted people.

Flight engineers ensure the refueling procedure is completed safely. This is critical as any fuel leaks can cause serious problems.



Loadmasters are responsible for everything that is a part of the mission's load. Ensuring all cargo is properly secured is vital to flight safety.

■ Airlift is the vital component that gives rapid mobility to our fighting forces. Last year, during the onset of Operation Desert Shield, a MAC transport aircraft landed every 10 minutes. And, by the sixth week of this operation, the total tonnage transported equaled the 65-week long Berlin airlift of the late 1940s.

Behind MAC's success and terrific workload are aircrews dedicated to ensuring each sortie is completed safely. An integral part of their worldwide mission is the loadmaster and flight engineer. These crew positions performed critical functions in the past and continue to do so each time a MAC Starlifter takes off.

The Loadmasters Have It!

A Look Back On 24 February 1969, A1C John L. Levitow was serving as loadmaster when his AC-47 Gunship was severely damaged by

Photo by Peggy E. Hodge

82mm mortar fire over Long Binh, South Vietnam. Suffering more than 40 shrapnel wounds in his back and legs, he observed a magnesium flare amid a jumble of spilled ammunition canisters that had been caused by a mortar blast. Despite the loss of blood and partial loss of feeling in his right leg, A1C Levitow threw himself on the deadly device, hugged it close, dragged himself to the open cargo door, and hurled the flare through it. The flare ignited in the air in almost the same instant.

His selfless act saved the crew and aircraft from almost certain death and destruction. Because of his heroic efforts, A1C Levitow became the lowest ranking airman in history to earn the Medal of Honor.

A Look Today Loadmasters of this caliber are very much a part of today's Air Force and continue to perform critical tasks. Their responsibilities are great and their reputation deserved. "We could not do our job without the loadmasters," said Major Steven Hosterman, Aircraft Commander. "They are the ones who run the back of the aircraft, and their responsibilities on the ground and in the air are many," he said.

The loadmaster is the first crewmember out to the aircraft. "We are responsible for everything and everyone that is a part of the mission's load," explained MSgt Edlon A. Erb, flight examiner loadmaster. "We are most often at the aircraft much prior to our scheduled alert time. The demands of the load and necessary configuration of the aircraft often require extra time," he explained.

"Our primary responsibilities are to ensure the load is tied down properly and that it is secure. We must ensure the aircraft is within proper parameters of weight and balance for a safe takeoff. **The load must be secure, and it must be balanced,**" MSgt Erb emphasized.

It is the loadmaster who begins the calculations for an accurate takeoff. After they secure the load, they must calculate all weights and figure a center of gravity.

The proper security of the load and an accurate center of gravity is critical to flight safety. "It must be tied down properly," explains MSgt Erb. "This will prevent any of the load from coming loose in flight which could be catastrophic. If this should happen, the center of gravity could change so quickly the pilot may or may not be able to accurately and safely compensate for any shift in weight."

If the loadmaster allows too much of the load's weight to be placed forward of the aircraft, it could make the aircraft nose heavy making a safe takeoff improbable. Even more serious is too much weight allowed too far to the rear of the aircraft. This could cause the aircraft to stall after takeoff. Consequences of inappropriate security or inaccurate center of gravity calculations can range from annoying to causing a fatal crash.

"The loadmaster is also designated the primary egress manager when there are passengers on board,"* explained MSgt Bruno Gutierrez, mission loadmaster. "If we must deplane during an emergency, I am responsible to direct this activity. I also coordinate all emergency procedures with passengers in the cargo compartment in conjunction with flight deck communication. And, it is the loadmaster who physically jettisons all of the cargo in flight out the side or petal doors, if necessary."

And their responsibilities don't stop there. The loadmaster supervises passengers ensuring their safety and comfort. They sign for secret material and registered mail, and take care of customs and agricultural requirements for the entire aircraft and crew.

After landing, the loadmaster's job is not over. They are most often

continued

* When more than 40 passengers are on board, two loadmasters are required.

"The 'Es' Have It!" continued

Flight engineers know what the aircraft can and can't fly with and determine any deficiencies before and after flight.

required to assist in offloading the cargo. This, at times, takes up to several hours after the other crewmembers have departed the area.

The Flight Engineers Have It!

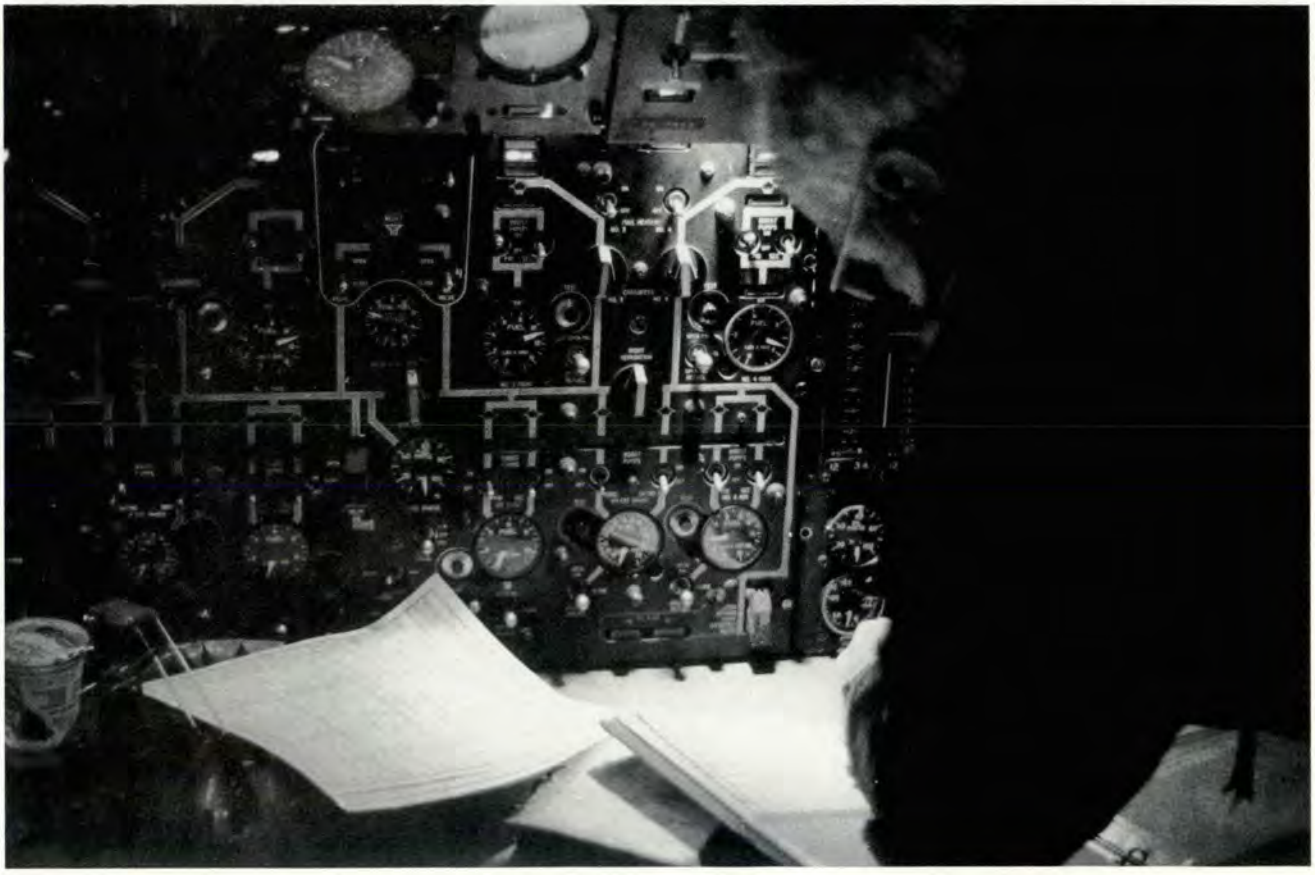
A Look Back SSgt Archibald Mathies, a flight engineer, also earned a Medal of Honor while on duty over occupied Europe with the Eighth Air Force's 351st Bomb Group on February 1944. When the aircraft on which he was serving as a flight engineer was severely damaged, the copilot killed, and the pilot wounded, he managed to fly the aircraft with the aid of the navigator. Had he bailed out of the crippled bomber, the pilot would have surely died. Although the plane was marginally flyable, SSgt Mathies tried to bring it back safely. On the third attempt at landing, the aircraft went out of control and all three were killed.

A Look Today And the caliber of the engineers proves the same. "The engineers are the ones who keep that aircraft ready. Not only do they know how to accomplish this task very well — they know what the aircraft can and can't fly with," says Major Hosterman. Let's look at what their job entails.

Behind the pilots sit two engineers skilled in all the workings of four engines and all aircraft electrical, pneudraulic, and fuel systems. "We monitor all of these various systems for proper operation," explained TSgt Andrea W. Richter, mission flight engineer. "In addition, we provide the pilots with aircraft performance data which is critical for each phase of flight." (These include takeoff, climb, cruise, descent, and landing.)

The engineers report to the pilot on the condition of the aircraft. They also perform the aircraft checklists and fulfill the duties of "scanner," who determines deficiencies before and after flight which could render the aircraft unsafe. Examples are broken components or leaks.

Flight engineers are skilled in all the workings of four engines and all aircraft electrical, pneudraulic, and fuel systems. In addition, they must provide the pilots with critical performance data for the takeoff, climb, cruise, descent, and landing phases of flight.



"When I do a full preflight," explained TSgt Richter, "I check all the flight controls to make sure they're doing what they are supposed to, ensuring there is no binding. I also make sure the hydraulic systems are working properly. I make sure all of the system warning lights are working, and functionally check the brakes for their proper application sequence."

As the engineer in the cockpit runs the appropriate system checklist items, the scanner is outside checking for any malfunctions. For example, as the engineer at the controls moves the control wheel, the scanner checks for proper response. The scanner is also a qualified flight engineer and relieves the primary flight engineer at the panel during periods of prolonged flight.

SMSgt Herbert C. Guinn, a flight engineer who served as scanner on this mission, further describes his duties. "I often occupy a seat on the flight deck during takeoff or landing. I am responsible for accomplishing a walkaround prior to takeoff to make sure everything is clear of the aircraft. I also ensure each of the engines start rotating when the pilot initiates ignition. I am outside the aircraft until right before taxiing to make sure everything is clear and stowed including chocks and pins.

"If there is an in-flight emergency, the scanner is the one who accomplishes the necessary items in the back of the aircraft. For example, we manually lower the gear, if necessary. If there are any other problems downstairs, like a fire, I assist the loadmaster. We work as a team to ensure everything goes well."

Their Teamwork Has It!

The "Es" on this mission worked well as a team. They helped each other out and backed each other up. In a time when human factors contribute to the majority of our mishaps, this type of teamwork and crew coordination cannot be overemphasized. It is a must!

MAC's capability to perform its missions safely is a result of their professional aircrews — aircrews, such as this one, who know the value of discipline and work together as a team. Last year, Operations Desert Shield and Desert Storm further confirmed teamwork, professionalism, and discipline are an unbeatable combination.

MAC's mission takes a hardworking, dedicated, and well-coordinated crew to bring it all together. Good Show!

"The 'Es' Have It!"

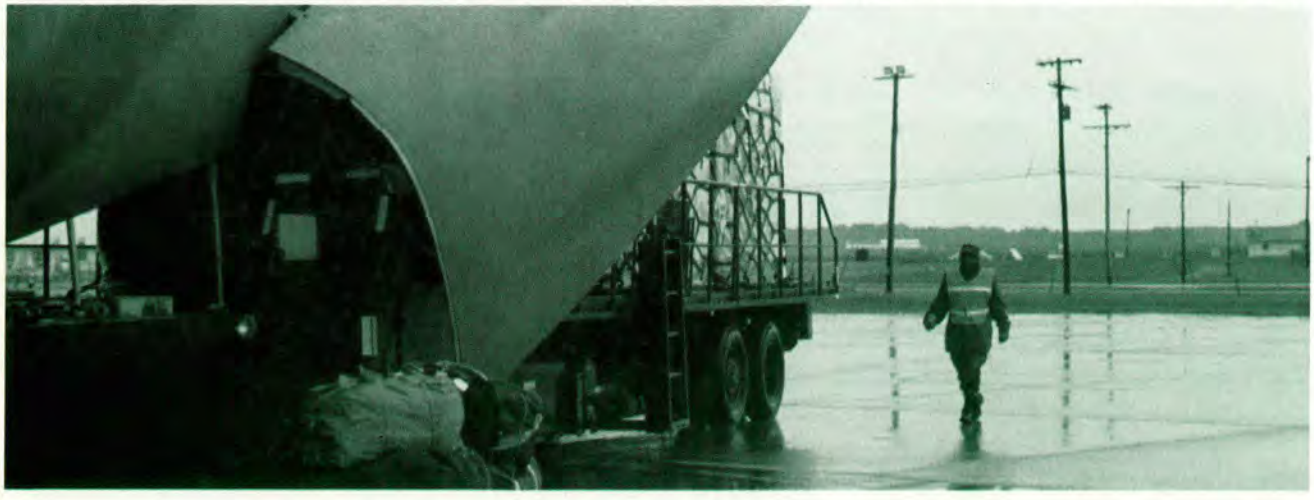
- Talk about good reputation — the "Es" have it!
- Talk about responsibility — the "Es" have it!
- And talk about a necessary safety approach — the "Es" have it!

The enlisted crewmembers are, without a doubt, a great group of professionals — *Flying Safety* salutes you, and I am very proud to do the same. ■

The loadmasters own the back of the aircraft! Their primary responsibilities are to ensure the load is secure and tied down properly.

Teamwork and crew coordination are a must in a time when human factors contribute to the majority of our mishaps.

After landing, the loadmaster's job is not over. They are often required to assist in offloading the cargo, which can take up to several hours.



The Boom Operator — Cornerstone of Safety

LT COL JAMES P. BRONOWSKI
452 AREFW, Chief of Safety
March AFB, California

■ Every year in Atwater, California, at Castle AFB, one of the Air Force's tightest fraternities has its annual reunion. For 3 days, stories, enhanced and somewhat enlarged by time, fill the air. Hands are shook, backs patted, and old friends are reunited at the place they all began. Every boom operator, past and present, trained at this location and began boom life here.

At this symposium, experienced and older boom operators instill in the younger ones the pride and professionalism of their craft — for it is a unique and special job they do, requiring a sharp mind combined with hand-eye dexterity and coordination. Along with "Whatever happened to . . ." and "There I was . . ." comes a wealth of experience that is passed around and on to the boomers in the field.

The boom operators will be the first to tell you, tongue in cheek, they really enjoy having the officers drive them to work and then bring them home. In fact, the boomers are an integral part of the KC-135 and KC-10 flightcrew from mission planning to the final paperwork. But more importantly, the boom operator is a key ingredient to mission accomplishment and flying safety.

The Boomer's Job

The boom operator's primary job, as the name implies, is to operate

A B-52G receives fuel from the boom of a KC-135 tanker.

the air refueling boom and accomplish in-flight fuel transfer.

The boom is flown using an aircraft-type "stick" which controls ruddervators attached to the boom. It is maneuvered and extended into the receiver aircraft's air refueling receptacle while the receiver maintains position approximately 30 feet behind the tanker. This requires not only a delicate touch on the boom controls, but an accurate eye and sound judgment.

The boomers refer to the refueling operator's compartment in the rear of the tanker as the "boom pod." They also consider it the "business end" of the aircraft. Once in the "boom pod" and lying prone (KC-135) or seated in an armchair (KC-10), the boom operator is the critical element in the safe accomplishment of this mission.

They are alone in the back as the receiver aircraft inches closer to the tail of the tanker. From the time the receiver aircraft looks bigger than a bread box in the boom operator's sighting window until it disappears from view, the boom operator is the key to safely completing this most difficult and demanding task. Their decisions and skills are crucial to the safety of both crews as the two aircraft touch while racing across the sky at over 400 knots.

Up front, the pilots maintain a steady platform and get updates from the boom operator over the interphone on the progress and position of the receiver aircraft. Hands grip throttles tighter and thumbs rest on autopilot disconnect buttons if the boom declares, "We've got a real cowboy back here!" Everyone in

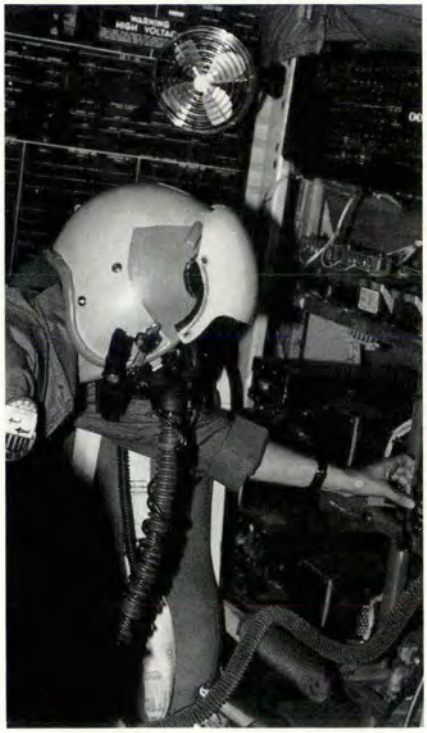
continued

The boom operators' primary responsibility is to operate the air refueling boom and accomplish in-flight fuel transfer. Whether lying prone, as in the KC-135, or seated in an armchair, as in the KC-10, this transfer is a critical element to safely completing the mission.

Photos by MSgt Ricke A. Moore

The Boom Operator — Cornerstone of Safety continued

The boom operator has many other responsibilities during the flight. Anything that goes on aft of the cockpit including emergencies is the boomer's theater of operations.



the cockpit realizes the boom operator will be working extremely hard in this situation.

Using the utmost finesse, the boom operator gently guides the air refueling boom into the receiver's receptacle, constantly monitoring the gauges to ensure the receiver stays within the refueling envelope. A lot can happen while the aircraft are in close proximity, and the boom operator must be constantly alert for any possible problem.

In any situation during air refueling, where there is imminent danger, the boom operator initiates an emergency breakaway. This is the safety valve procedure where the tanker goes to full power and climbs while the receiver aircraft immediately comes to idle and descends. It is used for system failures or to avert a possible midair collision. A breakaway can be called by any crewmember. However, the boom operators are on the scene, and it's normally their judgment which is the determining factor in preventing bent metal.

The boom operator gets extremely busy during air refueling operations, and prolonged refueling with several receivers can be exhausting, especially at night when depth perception becomes much more difficult. There is, however, no time to

Cargo loading and briefing all passengers on the safety features and procedures are also the boomer's responsibilities. The welfare of the passengers is a critical aspect of the boomer's duties.

Photos on these pages by MSgt Ricke A. Moore

rest as this is one crewmember who has multiple other responsibilities throughout the flight.

From mission planning on, the boom operators are an integral part of the crew. They are responsible for all cargo loading and computation of the aircraft weight and balance. They brief all passengers on the safety features of each aircraft and on all emergency egress procedures. In the event of an emergency, they look to the welfare of the passengers.

Anything that goes on aft of the cockpit during flight is in the boomer's theater of operations, and come fire or flood back there, they respond and handle the situation.

The boom operator's other seat is up front in the cockpit. This is the boomer's in-flight crew position unless they are in the "boom pod," monitoring passengers or running checklists in the cabin and cargo compartment.

The boom operators on the KC-135s have an additional duty in the cockpit during celestial navigation. They operate the periscopic sextant and take celestial observations for the navigator.

The Boomer's Safety Role

The cockpit is where the boom operator becomes extremely valuable as the safety monitor. They add not only a fourth set of ears and eyes but, more importantly, they are a catalyst for situational awareness. The boomer monitors the air traffic control instructions on the radio and lets the pilots know immediately if they are varying from the clearance.

The boom operator is always watching for other air traffic, especially when the pilots are concentrating on their instruments. From the boom's vantage point in the cockpit, a good scan of all the cockpit instruments and indicators can be made. In fact, in the KC-135, the boom operator will normally be the first to see an engine fire indication if the pilots are on instruments.

It would be hard to estimate how many times in the past the boom operator heard or saw something no one else in the cockpit noticed, and their alertness resulted in averting a major mishap. I do know, from my 22 years of tanker experience, if it weren't for heads-up boom operators in the cockpit, there wouldn't be many tankers left to fly, nor me around to write this article.

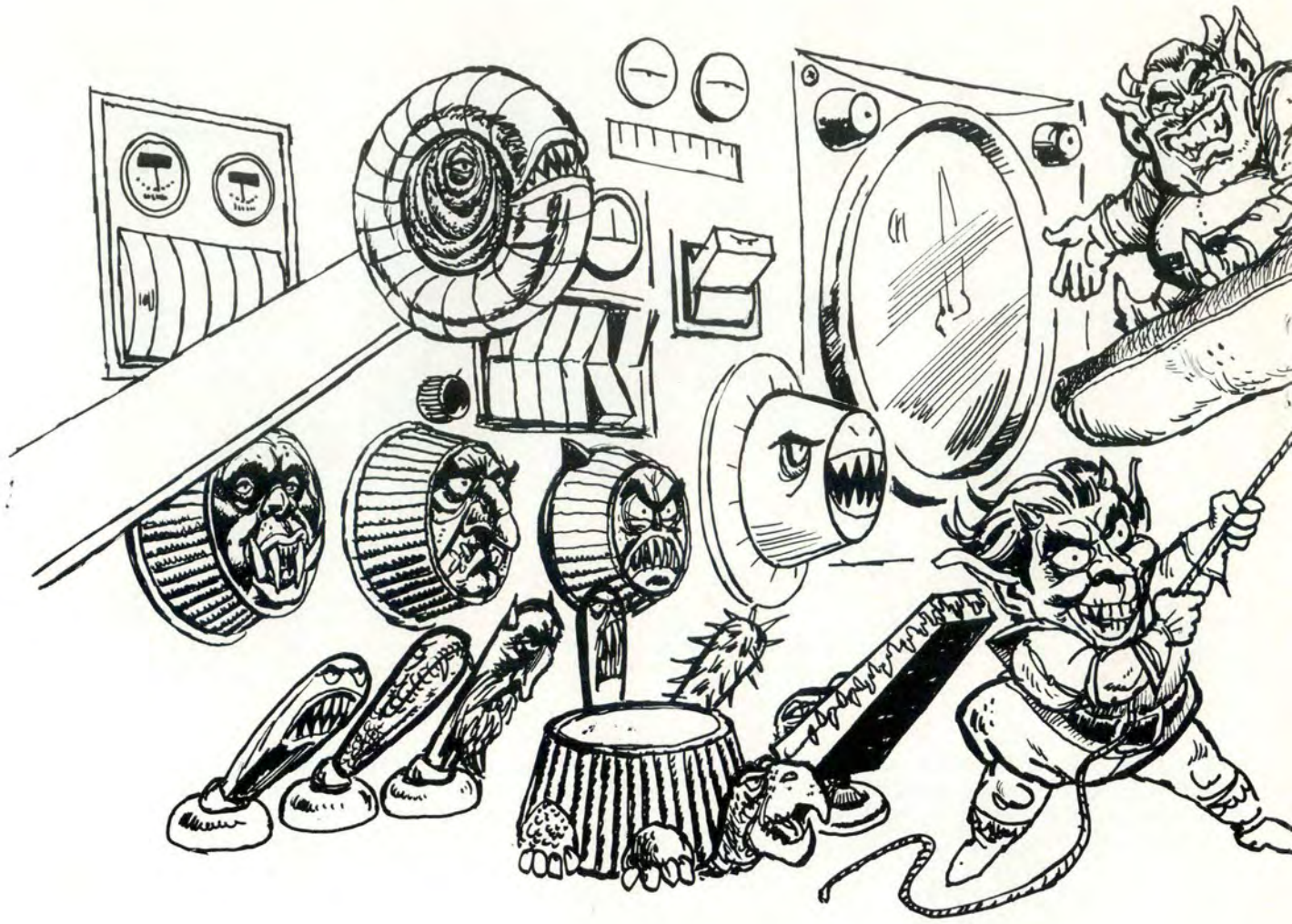
From the preflight to annotating aircraft discrepancies, the KC-10's boomer is responsible for multiple other duties during the mission.

"Well Done, Boomer!"

The boom operators all have a real sense of accomplishment in their job and a tremendous pride in their career field. They are special people doing a special job with excellence as their hallmark.

So from this pilot to all of our boom operators, past and present, a sharp and sincere salute. But, most of all, from me to you: "Well done, boomer!" ■

The boomer ensures all emergency equipment is secure and ready if required.

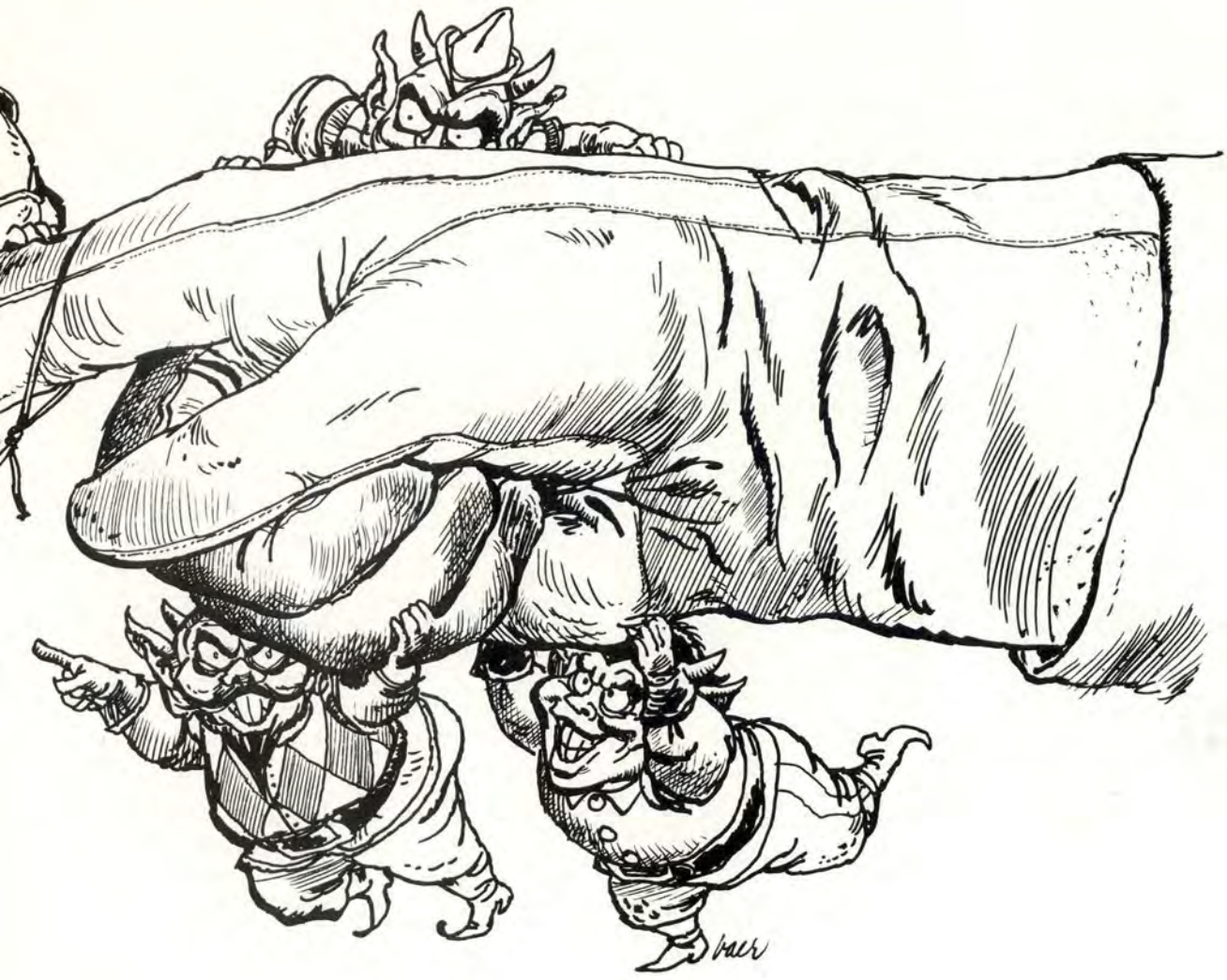


Knob Goblins & Slips

AL DIEHL, PH.D.
Directorate of Aerospace Safety

■ Cockpits are sometimes haunted by strange "goblins" and "gremlins." These critters seem to get involved with our knobs, switches, and buttons. Improperly activating such controls can lead to unpleasantries, ranging from system or structural damage to disaster. Human factors specialists are often asked why such errors occur and how they can be minimized.

These problems also bedevil airline crews such as the recent British flightcrew which crashed after suffering an in-flight engine failure. In a hurry to "fix" the problem, they shut down the *wrong* engine. Then there was the U.S. crew who tried to take off without setting their jet-



liner's flaps/slats.

When national TV broadcast their preflight cockpit recording, this crew's apparent complacency was widely criticized.

When Errors Occur

These two airline mishaps illustrate the two very different conditions under which such errors are likely. First, they occur when crews are inattentive, such as during routine, low-stress operations; that is, when they're *bored* stiff. Secondly, these errors are common at the other end of the arousal spectrum — when crews are totally saturated, behind the power curve, going Mach 3 mentally. Here, they're about to push the *panic* button — which is the wrong button to push in a panic.

Incidentally, *"slips"* is the term which psychologists currently use for mental errors. The classic study in the field was done in 1947[1]. Researchers looked into hundreds of "critical incidents" involving the USAF aircraft of that era and identified many causes and cures for such errors. Their research went a long way in reducing such mishaps. Over the decades, our overall Class A mishap rate went down by 97 percent, while the civil rate went down 95 percent. Today, our USAF cockpit controls generally are shape-coded, properly guarded, and arranged in logical and standardized locations. Some unfortunate exceptions to these rules are noted below.

The ways which poor design can contribute to human errors was also documented by the NTSB in 1980. They examined all inadvertent landing gear retraction mishaps in light planes. One particular company located their gear and flaps control switches in exactly the opposite positions from the rest of the manufacturers. Their aircraft comprised only 16 percent of the fleet, but they had 54 percent of these gear-versus-flap mishaps.[2]

Obviously, cockpit design has a lot to do with these mishaps. But, guess what? If the designer overlooks some potential problem, we have to learn to cope with the glitch. Some examples of where our guys didn't cope are worth reviewing.

[1]P. M. Fitts and R. E. Jones, "Analysis of Factors Contributing to 460 Pilot-Error Experiences in Operating Aircraft Controls." Memorandum Report TSEAA-694-12 Aero Medical Lab, WPAFB, July 1947.

[2]A. E. Diehl, "Design-Induced Landing Gear Retraction Accidents in Beachcraft Baron, Bonanza, and Other Light Aircraft," NTSB-Special Investigation Report SR-80-1, June, 1980.

continued

Knob Goblins & Slips

continued

Some Examples

Case in point: An F-4 landing on a wet runway when the drag chute fails to deploy. The pilot quickly informs the WSO his pedals are "all the way to the floor" and calls for emergency brakes — welcome to adrenaline aerodrome! Now the F-4 emergency brake handle is located directly adjacent to the emergency landing gear extension handle. Both controls are identical in size, shape, and color. This WSO panicked and grabbed the wrong knob, and the taxpayer picked up the tab for another runway excursion mishap.

The knob goblin also paid a visit to an F-16 jock recently. His engine ate a couple of birds just as he was about to take off. Our guy slapped the tailhook knob down ASAP, stood on the binders, and took the barrier — very hot. Unfortunately, his tires blew, and the centerline tank ruptured, spilling fuel on his hot brakes and wheels, frying his Falcon. The pilot had bumped the antiskid switch off when he grabbed for the hook. They noted this toggle switch is located adjacent to the tailhook knob. Furthermore, the switch is unguarded and is not a positive action lift-lock design.

Unfortunately, these slips don't occur just during such high-stress situations. When they get us during routine operations, it is even more embarrassing. One story from our multimotor prop days told of a crew beginning takeoff roll when the AC noticed a depressed look on his young copilot's face. The AC allegedly turned to the kid and said, "Cheer up." Without batting an eye, the distraught guy flipped the landing gear knob upwards and responded, "Roger, gear up" — at which time the AC also became very depressed. We need to realize poor communications, as well as equipment design, can contribute to such errors.

Furthermore, experience, it seems, provides no guarantee against making knobology errors for the inattentive. Case in point: A senior T-38 instructor was watching his trainee repeatedly screw up pattern approaches. The bingo fuel light came on, so he told the student they had gas for just one more attempt. Once again, even with constant coaching, the student was overshooting. The IP then decided to take control and really *show* how to grease one on. Concentrating . . . wow! a squeaker . . . stick back, aerobraking, one more mission is done, the IP exhales . . . and *raises* the gear handle. Ouch! A very short landing "roll" was followed by a quick step over the side — no need to wait for the ladder. Now the hard part — explaining what happened. Maybe he was thinking about a go-around. The complacency gremlin struck again.

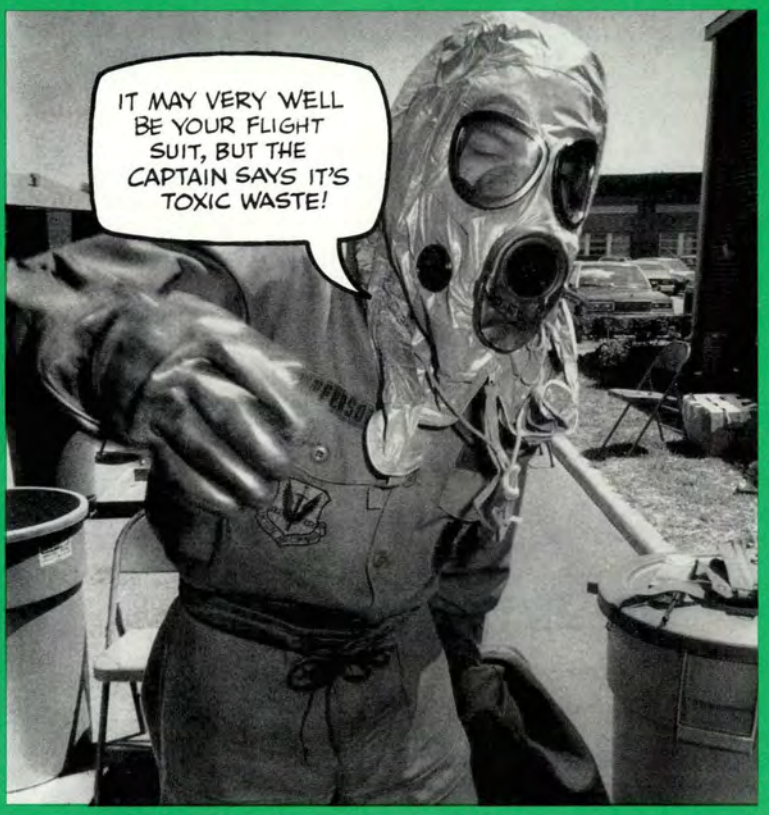
Another experienced pilot also learned about slips a few years ago. This F-15 pilot was engaging a target drone, and everything was fine until a small telemetry problem occurred. He entered a tight turn to maintain visual contact with the target. He was also attempting a radar lock on with the Eagle's radar autoacquisition function using the super search button — a piece of cake for a guy of his experience. Unfortunately, he inadvertently hit the weapon release button instead, launching a sidewinder. The two buttons are located a couple of inches apart on the control stick.

To Avoid a Slip

It is easy to understand how these folks got bitten by the knob goblins. Before going up again, it's worth studying the control layout in the Dash 1 and thinking about how some of these controls can hurt us, especially under those high-stress emergency conditions. Then, too, we need to realize these slips are also known to occur when everything is going smoothly and we become a little less attentive. Remember the "goblins" and "gremlins" are always hanging around. ■

Once Again, Thanks For Your Support!

AND THE WINNER
FOR THE JANUARY 1991
DUMB CAPTION CONTEST IS . . .



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Academic Training, Bldg 1824
NAS Corpus Christi, Texas

Due to continuing, and false, accusations by the United Organization of Dumb Caption Writers of America (UODCWA), we have chosen to take a little time to explain the judging process for the internationally famous Dumb Caption Contest Thing. We feel this explanation is necessary since this month's winner is, once again, Jim Burt.

Jim is not a professional, despite his many successes. He simply believes in the Dumb Caption credo, "You've gotta write 'em to win 'em."

All entries, including Jim's, are electronically scanned into the latest state-of-the-art desktop computer. Then, any identifying marks are electronically removed, and an invisible code is embedded into the drawing for future identification. The entries are then reproduced on a UNIMAC 9000 digitally interfaced laser printer. (And if you believe all that, we've got some stock in the UODCWA we'd like to sell you.)

Now, completely anonymous, each entry is judged by our select panel on Dumb Caption humor. As you can see, unless the entry is submitted on the back of large cashier's checks (heh, heh, heh), there is no way for anyone to influence the judging. So, congratulations to Jim and all the others who sent in an entry. Keep writing, because even Jim can be beaten, it says here. Besides, we've heard rumors he's being approached by Byron Q. Lackluster with an offer to extend to him a free lifetime membership in the UODCWA so they can gain a winning member. If he accepts it, he'll probably never win again since that bunch of losers' influence is sure to cancel out any dumb humor genius no matter how good they are. Besides, he hasn't even sent us a single check with any of his entries.

Honorable Mentions

1. **That was wild, Charlie, the way you took your mask off in there! You sure are . . . Charlie? . . . Charlie?**
   Jim Burt, Training, Bldg 1824, NAS Corpus Christi, Texas
2. **Uh-oh! Nice bee. Don't get mad now — Daddy's going to let you out of the bad old face mask. Good little bee! That's it, stay calm nice little bee . . .**
   Jim Burt, Training, Bldg 1824, NAS Corpus Christi, Texas
3. **Ah . . . Ah . . . Ah . . . AACHOOO — oh boy —.**
   Jim Burt, Training, Bldg 1824, NAS Corpus Christi, Texas
4. **I remember the boss saying the "stuff" would roll downhill . . . but, I swear he never said anything about cleaning it up!**
   SRA Kris Roth, 56 TIW/MAME, MacDill AFB, Florida
5. **"Why do I always catch K.P. when they serve spareribs and sauerkraut?"**
   Frank C. Hill, P.E., Safety Tech/QCE, Wake Island AFB, Hawaii

Safety Warrior

The last D model to fly, no. 60676, was the first B-52 to down an enemy aircraft. Its gunner, Samuel O. Turner (inset), was the first enlisted gunner of the Vietnam War with a confirmed enemy aircraft kill.

MiG KILLER ONE

CMSGT ROBERT T. HOLRITZ
Technical Editor

B-52 Photo by Major Peter Hughes

■ When the 1972 Paris peace talks failed, President Nixon ordered the execution of Operation LINEBACKER II, the massive bombing of military targets in North Vietnam.

LINEBACKER II began at sunset on 18 December 1972 when 21 B-52D bombers from the 307th Strategic Wing (SW) launched from U-Tapao Airfield in Southern Thailand. In 2 hours, they would join with 21 B-52s of the 43 SW from Andersen AB, Guam, over Hanoi, the North Vietnamese capitol. Together, they would form the first wave of the most intensive bombing campaign since World War II.

The Tail Gunner

Separated from the rest of the B-52D crew by 30 tons of bombs, tail gunner Samuel O. Turner had plenty of time to reflect on the mission. Their call sign was Brown III, and their target was Hao Lac Airfield in the heart of Hanoi. Until now, B-52s had flown throughout the Vietnam theater virtually unopposed. In fact, in their 7 years operating in the theater, not one of the bombers was lost to enemy fire. But at the mission briefing, they were warned the skies of Hanoi were well-defended, and the bombers could expect heavy surface-to-air-missile (SAM) and MiG activity over Hanoi.

In later models of the aircraft, the gunner's station was moved to the forward compartment in tandem with the EWO, leaving only the fire control system's radar screen to watch the rear of the aircraft. But the D model B-52 had the advantage of an extra set of eyes. From the greenhouse-like canopy of the gunner's compartment, SSgt Turner had an unrestricted, 270-degree view from which to spot enemy aircraft or upcoming SAMs.

Brown III was right on schedule. At exactly 1945 hours, the pilot banked the aircraft toward the northeast. They were now committed to their bombing run and, in spite of the peril, they would not deviate from course until the bombs were released. The first cell of bombers enjoyed the element of surprise, but Brown III was the sixth aircraft over the target, and by now, SAM crews had a good idea of the bombers' course and altitude.

As they approached the target, Turner could see SAMs coming up

Inset and photo below courtesy of Enlisted Historical Hall, Gunter AFB, Alabama

like flying telephone poles. Some flew past, others exploded dangerously near. The closer to the target the more intense the SAM launches.

Although the bomb run lasted for only 2 minutes, to the crew of Brown III it seemed like an eternity. Finally, Turner heard the clicking of the A-6 release mechanisms and felt the aircraft leap skyward, freed of the weight of 108 bombs. Their mission accomplished, the pilot immediately turned the bomber westward on their outbound course. Turner reported over the intercom he could see the last few bombs exploding on Hao Lac Airfield.

On Christmas Eve, 1972, A1C Albert Moore became the second enlisted gunner to score a confirmed MiG 21 kill.

It Was Like a Duel!

The USS *Long Beach*, call sign Red Crown, was on patrol in the Gulf of Tonkin, monitoring the air operation on its radar. No sooner had Brown III completed its departure turn than Red Crown transmitted a warning of MiG activity. Brown III's navigator verified the coordinates were in the general area. Turner doublechecked the fire control system and fixed his eyes on his radar screen. Then the EWO warned the MiG had Brown III on its radar. A few seconds later, he announced the fighter had now locked on the bomber. As the enemy jet came within a few miles, Turner's radar began to track it. Turner couldn't believe it! It was like a duel. The MiG pilot had to be crazy to attack a B-52 from the rear!

As Turner locked on the MiG, a second target appeared on his screen. It was verified as another MiG came at them at 8 o'clock, but didn't approach any closer than 7 miles, as if to keep clear of the other fighter's path. As the attacking fighter came into range, Turner fired a short burst from the bomber's four 50-cal machineguns. Suddenly, there was a bright fireball followed by a terrific explosion. When Turner looked back at his scope, "except for one airplane at 8 o'clock, there was nothing." Within a few seconds, the second aircraft broke off and also disappeared from Turner's scope.

SSgt Turner Makes History

That night, SSgt Turner earned his way into the history books. In the entire 20 years of the B-52's service, SSgt Turner was the first gunner to fire a shot at an enemy, much less shoot one down. He was also the first enlisted person to claim an enemy aircraft during the Vietnam War. Turner's victory was witnessed by another gunner, MSgt Lewis LeBlanc, who confirmed the kill.

In all, there were five MiGs claimed by B-52 gunners during LINEBACKER II, but only two were confirmed. The other confirmed kill belongs to A1C Albert E. Moore, who bagged a MiG-21 on Christmas Eve. Turner's aircraft, number 60676, was stenciled with a red star and nicknamed MiG Killer One. When it was retired in October 1983, it was the last B-52D still flying. ■

Avoiding Fuel Coupling Problems Part II

By **CURT ALTHAGE**
F/A-18 Technical Data Engineer
LASZLO HERTELENDY
F-15 Technical Data Engineer
NEAL ODER
AV-8B Senior Technical Data Engineer
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F-4 Section Manager, Technical Data Engineering
with
MARK FLORETTA
Technical Editor, Product Support DIGEST

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DIGEST

All fuel couplings are designed to do the same job—join fuel lines together. However, all fuel couplings are not mechanically similar. Good maintenance practices, coupled with the knowledge of coupling installation techniques, are the keys to preventing fuel leaks and loss of valuable Phantoms, Eagles, Hornets, and Harriers.

This is the second in a series of articles on aircraft fuel system couplings. Part 1 covered basic couplings systems and packings. Part 2 will discuss F-15 coupling systems and electrical bonding.

F-15 Coupling Installation Techniques

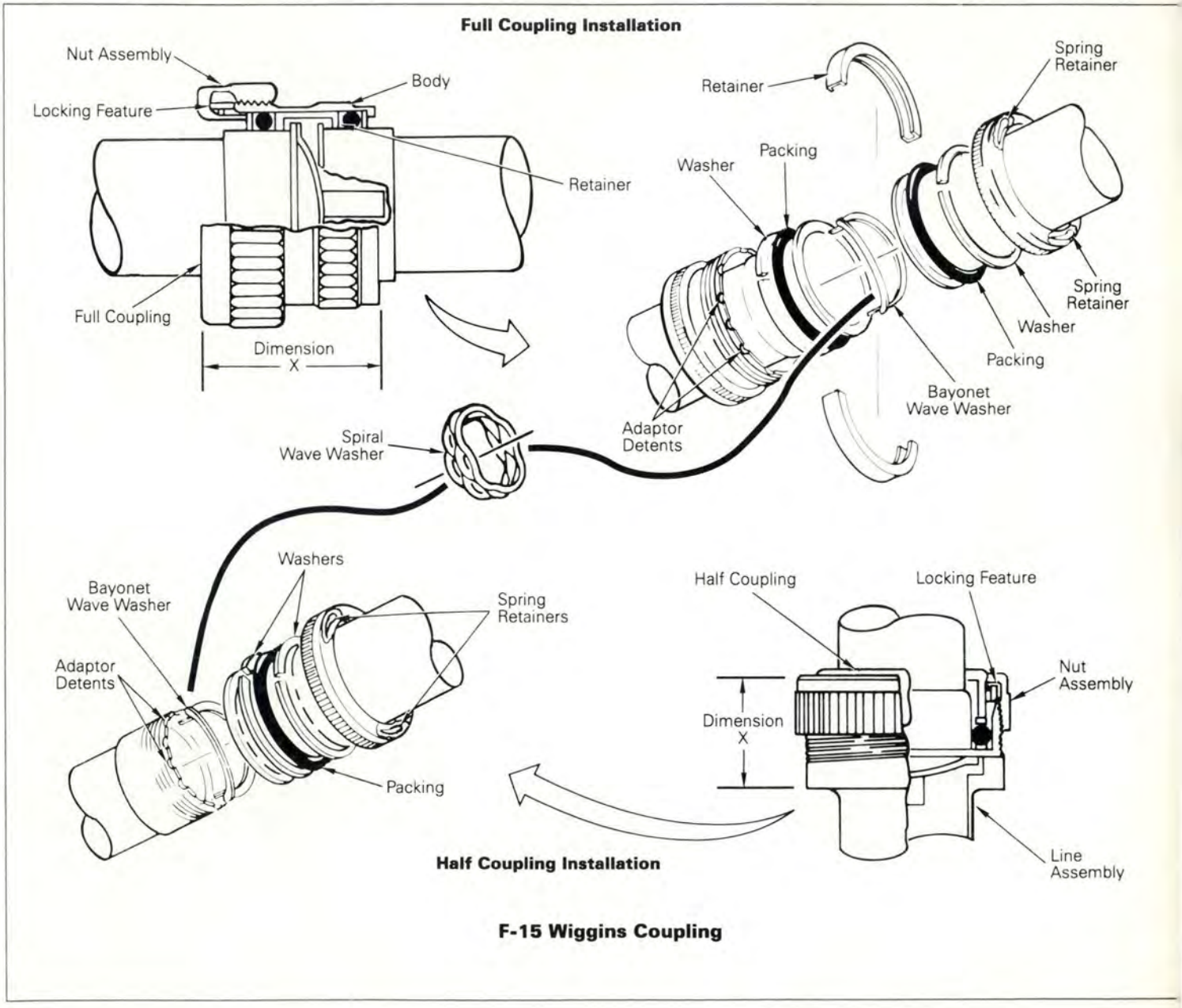
■ When the Eagle was designed, the Wiggins coupling was selected because it can be installed without tools, requires only hand tightening, and has an internal self-locking feature which eliminates the requirement for safety wire. A problem (maintenance induced) with this type of coupling occurs when packings are not replaced. A used

F-15
Coupling Installation Techniques

packing may not allow the self-locking feature to engage. There's a good chance the coupling could eventually back off. Also, failure to properly install packings into the appropriate recesses produces pinched packings and/or cracked and warped flanges.

Nut threads have a relatively thin wall; using strap wrenches or other gripping tools is *not* authorized because they cause galling and/or distortion of couplings — you are not assembling steam pipes or 3,000 psi hydraulic fittings! Unfortunately, strap wrenches have been an acceptable tool for several years, but because of damage they have inflicted on couplings, all references to them are being deleted from your maintenance procedures. Why the concern? Overtorquing can easily

continued



F-15 Wiggins Coupling

AVOIDING FUEL COUPLING PROBLEMS continued

damage — if not destroy (break) — the internal locking feature of a coupling. If this occurs, a coupling nut could easily vibrate loose, resulting in a massive fuel leak.

Whenever you work on large diameter coupling fittings, cross-threading is something which can easily happen. If you notice the nut appears to be binding, stop and investigate. Maintenance procedures specify when you are installing a coupling, tighten it hand tight, then back it off one full turn to ensure correct engagement, then retighten. When you hear or feel the *clicking* which occurs when the coupling face engages the retainer of the nut, the nut is near full travel. (See the figure.)

One way to ensure couplings are installed correctly on the F-15 is to check the coupling width with a threaded coupling gauge set. The tool is designed to check full, half, and bulkheaded couplings to ensure the adaptor detents reach the spring retainers on the edge of the coupling body. If the gauge wet will not slip over the coupling, it is incorrectly tightened. To correct this condition, tighten the coupling until the X-dimension that is called out in your maintenance instructions is obtained.

Tools should no longer be used to tighten F-15 couplings.

Last, we would like to discuss another area which doesn't really apply to coupling installation techniques, but it is as important as the coupling itself: *Bonding* — a way to dissipate static electricity within a fuel system.

Internal electrical bonding devices used on F-15 couplings have eliminated the extensive use of external bonding straps except where they are stipulated to be used. However, the F-4 still requires extensive use of bonding straps.

There's a military specification requiring fuel lines to be electrically bonded to ensure static- and lightning-generated electrical energy is passed to the airframe. You may ask yourself: "Is bonding really that important?" YES! Because jet fuels are *poor conductors* of static electricity but *good generators* of static electricity. Their movement through pumps, plumbing, and explosive suppression foam, etc., causes electrostatic charges. If fuel components have a high electrostatic charge, a spark can occur. If these discharges have sufficient energy capable of igniting a flammable fuel/air mixture, an explosion or fire can result.

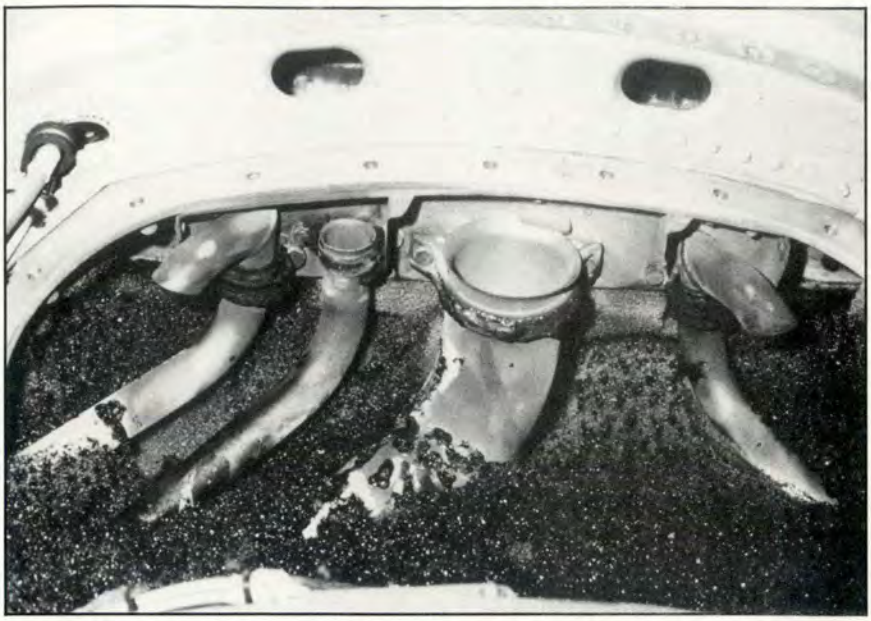
When electrostatic charges are not controlled, an in-flight fuel tank fire may occur. Bonding is the key to eliminating the differential electrical charge that can exist or be generated between fuel components. In other words, bonding keeps static electrical charges moving, preventing them from accumulating between fuel system components and the aircraft structure.

Bonding is accomplished between two or more fuel lines/components through the use of a bonding wire or an internal bonding device, such as a wave washer on the F-15. If you have ever worked on aircraft such as the F-4 Phantom which required the early type of bonding technique, you will appreciate the latest type of internal bonding devices. The F-15 uses two different types of bonding devices — a bayonet wave washer for larger diameter lines and a spiral wave washer on smaller

Electrical Bonding

lines. Spiral washers should never be used on large refuel system lines because they may dislodge and jam the refuel shutoff valve. Regardless of the type of bonding devices used, make certain they are properly installed and the contact surfaces are properly prepared per your maintenance instructions. An incorrect installation may cause static electricity to build up which could result in an electrostatic discharge.

Be aware there are some requirements for checking the conductivity of fuel lines and components in specific fuel system areas. Whenever this check is required, it will be called out in your maintenence instructions. If there is any doubt whether it is a good bond or not, use an ohmmeter to ensure electrical conductivity between components or to ground exists. Never use an ohmmeter inside a fuel cell or tank unless it is approved for fuel system maintenance. ■



F-15 Fuel Tank No. 1 — Facts uncovered during the investigation indicate that the fire was not caused by a failure in one of the fuel tank's components. It was concluded that the inflight fire was the result of static electrical discharge in the vicinity of the four vent lines located in the forward portion of fuel tank. The fire was successfully contained by the suppression foam in the tank, damage was minor, and there was no apparent impairment of fuel system operation.

Sealing Your Knowledge

■ The following is fact: Fuel couplings are needed and are ingenious devices. They are forgiving to a point, but they require some basic know-how to avoid coupling failures. Just because the couplings can function up to 4 degrees of axis angular deviation and can retain or allow for in-line expansion movements of ¼ inch, there is no reason to accept these abnormal conditions prior to assembly. Adjust the fuel line support clamp to produce near-optimum alignments. This will prevent a malfunction later in service life due to the couplings being subjected to forces and loads for which they are not designed. Remember:

■ Check for the correct packing part number.

■ Apply an ample coating of petroleum lubrication to packings and their slide surfaces, but never fill the packing groove(s) with lubricant.

■ Ensure proper bonding devices are installed, and

■ Make sure the couplings are securely locked. Unless the locked position is reached, *the coupling is not locked.* Remember — complete separation of a fuel coupling is not a drip — it's an uncontrolled loss of fuel and usually places the aircraft and crew in jeopardy. ■

Just The Facts

CMSGT ROBERT T. HOLRITZ
Technical Editor

■ Two billion dollars! That's what an ad hoc committee of the HQ USAF Scientific Advisory Board estimates inappropriate **FACTS** cost the Air Force each year. **FACTS** is an acronym for fasteners, actuators, connectors, tools, and subsystems. As a result of the advisory board's report, the USAF Chief of Staff directed the establishment of a joint systems/logistics command office to deal with **FACTS** maintainability and reliability problems.

The FACTS Mission

The **FACTS** office officially began operations in January 1990 and is planned to be phased out in 1998. Their 8-year mission is to:

- Identify problems and potential solutions with acquisition and supply processes from the designer to the flight line.
- Procure good **FACTS** by improving existing acquisition processes.
- Improve **FACTS** reliability and maintainability. Encourage **FACTS** research and development and ensure the technology is designed into new acquisitions.

To put it simply, their mission is to get quality parts, tools, and equipment into the field in a timely, no-hassle manner. According to the **FACTS** people at Wright-Patterson AFB, Ohio, their philosophy is to make small changes to the processes at the lowest level rather than try to make one massive "top down, fix-everything-at-once" change. This gets people at all levels involved.

Reporting a FACTS Item

How do you report a deficient **FACTS** item? When you find a fastener that continually fails or a ratchet wrench which comes apart like a $2 watch, contact your unit's **FACTS** monitor. This is usually the same person who handles standard QDR/MDR programs in the quality assurance shop. The **FACTS** monitor will ensure the report goes up the chain to the MAJCOM **FACTS** POC, who prepares a list of top 10 problems for the **FACTS** office to work. The **FACTS** office will investigate the problem and propose a solution. If the system or item manager agrees, the **FACTS** office either fixes it or "goes back to the drawing board."

FACTS Will Help

The **FACTS** office is also there to help when the process fails. If you have been waiting too long for a mission-essential part and nothing seems to be happening, call the **FACTS** office for help. They will not only work the problem but will also keep you advised of their progress. The same applies for a new piece of equipment or hardware you've heard about or an idea you may have to improve the process.

The program is really about improving the processes (system) so you can have quality **FACTS** when and where you need them.

Have a problem? Contact:

ALD/FA Wright-Patterson AFB, Ohio 45433-5001

Projects: DSN 785-2421

Process: DSN 785-7043

Technical: DSN 785-9343 ■

The C-130 helical spring is an integral part of the rail assembly (left-hand detente latch). The spring was made 180° backwards due to an incorrect drawing. Without the spring, cargo airlift capability is extremely limited (three pallets which must be offloaded by hand vs seven pallets for airdrop or system offload).

WRITE A DUMB CAPTION CONTEST THING

We think we may have a problem here. It seems every single entry to the January Dumb Caption Contest was sent to us in an envelope sealed with transparent tape. Even more suspicious is the fact every entry provided to us by the United Organization of Dumb Caption Writers of America (UODCWA) was nearly identical to the entries *you* all sent in. Had the UODCWA turned their entries in to our judges on time, we would have had a real problem. As it is, we think we smell a rat.

Mr. Byron Q. Lackluster, Esq., President and Tactics Planner of the UODCWA, has vehemently denied tampering with our in-baskets, but there are some condemning bits of evidence. For example, none of our staff smokes, but every entry had ashes in the envelope which smelled as bad as the cheap, imported cigars used by Gascon Martine't. However, nicotine-stained fingers leave a clear fingerprint on transparent tape, and we are prepared to send one of the suspect envelopes off for analysis.

Please don't let this blatant attempt at destroying the integrity of the Dumb Caption Contest stop *you* from sending in an entry to this month's contest. We ask all entrants to avoid the use of transparent tape on their envelopes so that we may keep the UODCWA honest (well, at least not so crooked).

Write your captions on a slip of paper and tape it on a photocopy of this page. DO NOT SEND US THE MAGAZINE PAGE. Use "balloon" captions for each person in the photo or use a caption under the entire page. Entries will be judged by a panel of experts on humor. All decisions are open to bribes in excess of $100,000. In fact, make it big enough and we'll go back and make you the winner of previous contests. Hey, we're flexible, gang, and we've still got to feed all these dumb caption writers.

Send your entries to "**Dumb Caption Contest Thing**" • *Flying Safety* magazine • HQ AFISC/SEPP • Norton AFB, CA 92409-7001

Spectre GUNNERS

MAJ DALE PIERCE
919th Special Operations Group
Eglin AFB, Florida

■ Many have heard of the AC-130 Gunship. Some people have seen one at an air show. A few have seen one in action from the ground, and fewer still from the air. But only an elite few have held the business end of SPECTRE in their hands to the tune of over 500,000 munitions items each year, just for local training. The few who have are called aerial gunners, those men responsible for the "care and feeding" of the direct-fire weapon systems aboard the most awe-inspiring conventional weapon system in the Air Force inventory.

What is SPECTRE?

To understand the mission of the aerial gunner, you must understand what SPECTRE is and how it works.

Inset photo by SSgt William McIntire, 919 Special Operations Maintenance Squadron.

The AC-130A SPECTRE is a C-130 aircraft with a 17,000-pound modification. The mod added to the basic airframe is a weapons suite, a set of sensor systems, a fire control system, enhanced navigation and communications equipment, electronic combat equipment, and some light armor.

The AC-130A SPECTRE weapons suite includes two 7.62mm Gatling guns, two 20mm Gatling guns, and two 40mm Bofors cannons. The 7.62mm guns are sometimes called miniguns and have seen service in helicopters. The 20mm guns are identical to the ones used in the nose of the F-4E Phantom and on the Army Vulcan antiaircraft system. The 40mm guns are those used as antiaircraft guns during World War II, and can be seen on the late show firing at attacking Japanese aircraft from decks of Navy ships. On SPECTRE, the combined rate of fire of these guns is 17,200 rounds per minute.

Are they accurate? A few years ago I was in a SPECTRE working the Avon Park Range from a mile up. One of the sensor operators announced that one of the new targets was an old bus and that the windshield was still intact. The pilot announced that on the next orbit we would shoot out the windshield. We did.

The Aerial Gunner's Mission

To fly the aircraft, operate all the equipment, and perform the mission requires a crew of 14. This includes two pilots, a navigator, a fire control officer, an electronic warfare officer, a flight engineer, two sensor operators, an illuminator operator, and five aerial gunners.

Briefly, to put rounds on target, a sensor operator tracks a target with his sensor equipment. The pilot then flies through the fire control system using guidance provided by the sensor. When the aircraft is on nominals and the indices in the "gunsight" are superimposed, the pilot presses the trigger switch. If the guns are armed and ready, the selected gun fires. Obviously, there are a lot of other things going on, but that's the short of it. The mission of the aerial gunner is to ensure the guns are armed and ready when needed.

The in-flight care and feeding of this awesome weapons suite is performed by five aerial gunners. It sounds simple enough, but let's look at what caring for and feeding this equipment include.

Preflight

After the mission briefing, the aerial gunners proceed to the aircraft to perform preflight duties. These include a complete checkout

continued

Pictured are aftgunners tending 40mm Bofors. The gunner feeds four-round clips of ammunition into the loader on top of the cannon while it is being fired.

SPECTRE GUNNERS

continued

of each of the six gun systems, making appropriate adjustments to elevation and azimuth settings and uploading the munitions required for the mission.

The usual training load of munitions includes 100 40mm rounds, 1,200 to 1,500 20mm rounds, and 1,500 7.62mm rounds. That's 2,800 to 3,100 munitions items, and the aerial gunners consider each one of these an opportunity for an explosives mishap.

After the munitions are uploaded, the 20mm and 7.62mm rounds, in munitions handling cans, are carefully strapped down in the aisle between the booth and the left main landing gear well. The 40mm rounds, delivered in four-round clips, are placed in a specially designed storage rack. Each round is checked for security in the clip, and each clip is then checked for security in the storage rack. This is done by two different aerial gunners, the one who places the rounds in the rack and then by the lead gunner.

Prestrike

After takeoff, the aerial gunners proceed to load the guns. As they move about the cargo compartment connecting belt after belt of ammunition, hauling the rounds from the aisle to the appropriate gun, and loading those rounds, the aircraft continues to climb out, fly to its alignment point, perform sensor alignment, and proceed to the range. Throughout this phase of flight, the aerial gunners are walking, bending, carrying, and working together as a team to safely ready the munitions for proper employment.

Strike

Once on the range, the guns are armed. When the 7.62mm gun is fired, the spent brass is directed down a brass chute to the brass bin. After loading and arming, this gun requires little attention from the aerial gunners unless it malfunctions. If this happens, it's a scramble to correct the problem quickly and safely.

The 20mm gun is similar in function to the 7.62mm gun, but is much larger. To minimize weight for the 20mm gun, the engineers elected to omit a brass handling system and

All ammunition must be tended to very carefully. To minimize weight for the 20mm gun, the engineers elected to omit a brass handling system. The forward gunner stands in the brass box and shovels spent brass and links as they roll out of the guns.

gave the aerial gunner a shovel and a brass box. The forward gunner stands in the brass box and shovels spent brass and links as they roll out of the guns at up to 10,000 items per minute. During training flights, the brass is shoveled into the munitions-handling cans from which it came.

The care and feeding of a 20mm can be fairly exciting when you are standing within 3 feet of all that fire power in action, with only a flack curtain between you. It's even more exciting if a barrel blows, a gun jams, and a cookoff sends gun parts ricocheting around the cargo compartment, or a hangfire round rolls into the brass box and explodes at your feet. These are not common hazards, but have all occurred at least once when I was flying.

To help protect aerial gunners from these and the hazards associated with not being strapped in from after takeoff until just before landing, they fly wearing a helmet with the clear visor down. No *experienced* aerial gunner has to be told why he wears his helmet with the visor down.

The 40mm gun is a cantankerous old beast that can thread the eye of a needle. To feed the 40mm gun, one gunner extracts a four-round clip from the storage rack on the starboard side of the aircraft, passes it to a second gunner on the portside of the aircraft, who places the four-round clip in the loader on top of the gun. Sounds simple enough. But they are both standing, the aircraft is varying its angle of bank from 20 to 40 degrees, and occasional rudder inputs provide little surprises. Dropping a round is never done. Carelessness is not tolerated. A sure grip and careful handling are musts, and the rule is, "It's better to let the gun stop than risk dropping a round."

How good do they get? A proficient gun crew can keep up with a 40mm gun, consuming rounds at a rate of two per second, for as long as the pilot elects to hold down the trigger switch. That amounts to one four-round clip in the loader every 2 seconds.

Poststrike

During poststrike, the aerial gunner dearms the guns and performs safe and clear procedures. These are accomplished while the aircraft remains on the range. Each gun is cleared and checked by at least two aerial gunners to ensure it is free of rounds. At this time, the lead gunner informs the pilot the "guns are safe and clear." The aerial gunners then secure the spent brass, links, clips, and equipment for landing.

After Landing

Once in the chocks, the aerial gunners download all spent brass, clips, links, and any unexpended ordnance, make any necessary writeups, and debrief maintenance personnel.

Safety First, Last, and Always

Since the 919 SOG began flying SPECTRE, we've expended over 7.5 million munitions items, with only an occasional minor injury or mishap. Why? Because among munitions maintenance personnel, the aerial gunners are among the most safety conscious. Their lives, and the lives of their fellow aircrew members, depend on it, their professionalism demands it, and nothing less among them is tolerated.

When I was a young man, I failed my first check ride as an aerial gunner for what I then thought was a "minor" safety infraction. Busting that check ride hurt my ego a lot. Later, I came to understand no safety infraction is minor when handling high explosive munitions in flight. They were right then, and they are right now. As their FSO, their "can-do-safely" attitude is like manna from heaven. I'm proud to have been a member of their ranks. ■

It's time to get S.T.A.R.T.ed

Near midair collisions are on the increase, and the FAA is doing something about them.

MAJOR ROY A. POOLE
Editor

■ In the United States, it happens 1.5 times every day. It happens 88 percent of the time in clear weather. And the odds are it will happen between 0600 and 1800. "It" is a Near Midair Collision (NMAC). That's right — 1.5 NMACs occur *every day.*

The most sobering fact is the "near" part gets dropped every 24 days in the U.S. According to the Federal Aviation Administration (FAA), one midair collision occurs every 24 days. In the month of February 1991, two happened on the West Coast. These two incidents are part of a larger problem with close encounters between aircraft flying in the Los Angeles basin which is why the regional FAA developed the Safe Terminal Area Route Training (S.T.A.R.T.) Program.

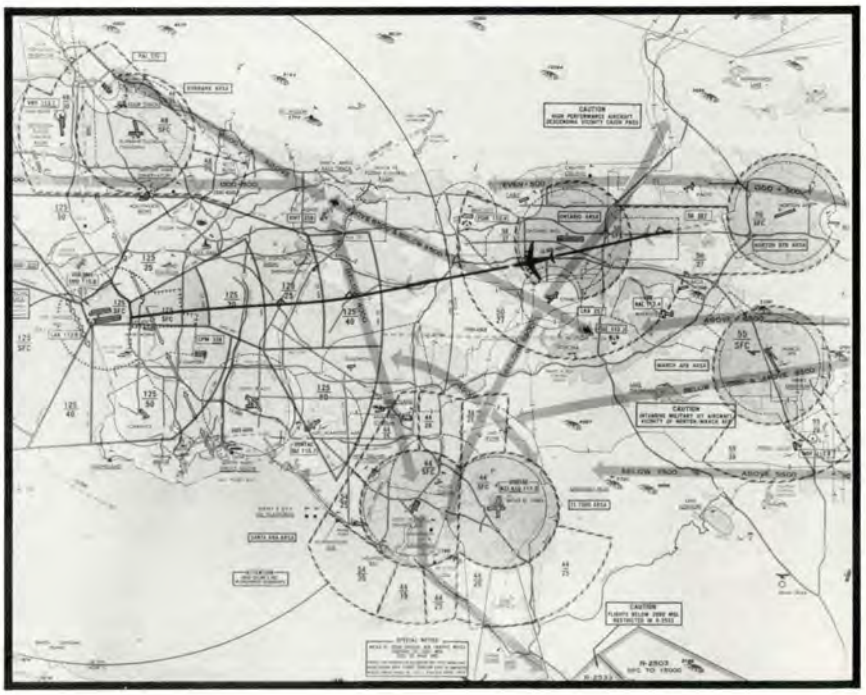
S.T.A.R.T. began as the accident prevention specialists of the regional FAA examined both FAA and NASA aviation safety reporting system NMAC reports. One of the first things which became apparent was the level of activity in the area. A General Accounting Office study of airport usage revealed 4 of the nation's top 12 busiest airports are located within 25 miles of Los Angeles. And while they account for 25 percent of the airports, the area they serve accounts for 37 percent of the Nation's NMAC reports.

The analysis began to show a pattern of locations within the area where NMACs were likely to happen. Every place three or more NMACs were reported became an area for extra study. There are currently 12 areas in the greater Los Angeles basin which are described as high potential areas (see figure).

The next step was to figure out why these areas had more problems than others. To put it simply, major IFR arrival and departure routes were conflicting with common VFR routes. Pilots who used IFR charts and aids were rarely shown the nature of VFR traffic in the area. Similarly, VFR pilots had little information about IFR procedures which might cross their planned flightpaths. The accident prevention specialists reasoned that if both types of pilots could be made aware of the others' routes through the basin, neither would be "surprised" with an NMAC.

S.T.A.R.T. is the last step in educating local pilots. It is a 3-hour

More than 37 percent of the Nation's near midair collisions occur within 25 miles of Los Angeles.



seminar, sponsored by the FAA, and held at various locations throughout Southern California. The first hour is a description of the problem areas and a review of effective scanning techniques. The next hour is led by a captain from an airline which uses the airspace. And the last hour is led by a controller from the local TRACON. Attendance at any S.T.A.R.T. program also counts for credit toward the FAA's "Wings" program as well.

A typical evening seminar will have 75 to 100 pilots in attendance. They are provided handouts which clearly highlight the problem areas. They are also shown the reasons *why* these areas are problems. A free pamphlet, "How to Avoid a MidAir Collision" (FAA-P-8740-51) is available to everyone. At each step of the program, the audience is encouraged to ask questions of the FAA specialists, the airline pilot, and the air traffic controller. Needless to say, some of the questions can get quite pointed, but the answers were always sincere and always complete.

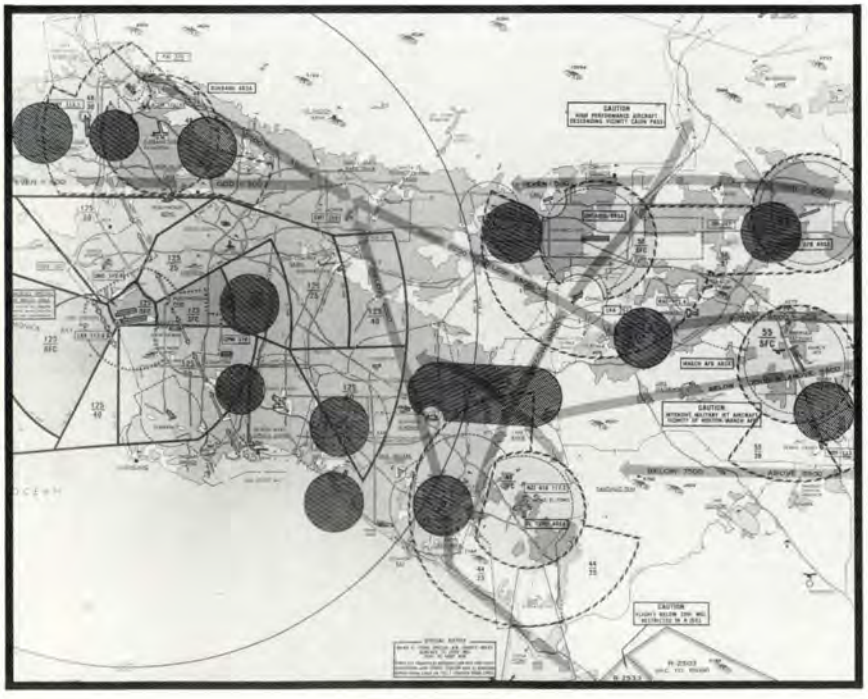
In addition to sharing a view from the cockpit of a 737, the airline pilot also talked about his, and other commercial pilots', frequent use of NASA's Aviation Safety Reporting System forms. These forms are available from any FAA office, or directly from NASA by writing to ASRS, P.O. Box 189, Moffett Field CA 94035. They provide the pilot with immunity from punitive action if submitted within 10 days of the incident. For pilots who even *think* they might have been too close to another aircraft, the NASA forms provide a means to document the circumstances without fear of punishment. The forms can be used by anyone — pilots, controllers, and others to report actual or potential safety problems.

The controller from the local TRACON offered even more views of the potential midair problems. A new term, "skirters," was given to describe pilots who "skirt" the edges of the TCA or ARSA to avoid talking with controllers. The controller made it very clear, however, the IFR traffic does not fly only inside the boundaries of special-use airspace.

Although the top of the ARSA is depicted at 5,400 feet MSL, arriving overseas airlines come in at 7,500 feet; and departing traffic from the international airport leave the area at 6,500 feet. Even staying low and trying to fly around the lateral edges isn't the safest idea. Radar vectors for the major instrument approaches can often take traffic just past the lateral boundaries.

The easiest, and safest, way to avoid all these headaches is to contact the local air traffic control facility and ask for flight following. Except at the busiest times, there should be no delay getting VFR traffic (when equipped with Mode C transponders) into the ARSA. If you still think "skirting" is a safe practice, consider the words of the airline captain, "If I'm at the bottom of the block and you're only 100 feet below me, what's going to happen when I put the landing gear down?"

The S.T.A.R.T. Program began in the Los Angeles area, but it is beginning to spread. The San Jose, California, region will be hosting its version of S.T.A.R.T. by April, and the FAA is anticipating the program spreading to major areas across the nation. When S.T.A.R.T. comes to your area, take the time to attend. It doesn't matter whether you are a civilian or a military pilot. The information about potential NMAC areas is well worth the time spent. From all accounts, a midair collision can ruin your whole day. ■



Making IFR and VFR pilots aware of each other's routes will help prevent midair collisions.

OPS TOPICS

A Hot Pattern

■ Okay. Quick! What's number one on your list of things you'd rather not have to do on the downwind leg of your traffic pattern? How about this answer from a C-130 crew.

After more than an hour of flight, the C-130 entered the VFR traffic pattern for some work on landings. Once established on downwind, the interphones began to buzz (literally), and smoke began to fill the cockpit. Sure enough, where there's smoke, there's fire, and it was coming from the essential AC bus panel.

The crew donned oxygen masks and then went to work. The engineer set the air-conditioning to "vent" and started to open the panel. The loadmaster used first one, and then a second fire bottle to put out the fire. The engineer then shut off all generators, and the pilots flew an uneventful electrical power-out approach and a successful landing.

All in a day's work, right? Yes ... if the crew has had a good briefing, the checklist procedures are followed, and flight crew discipline is successfully maintained.

Abort!! Abort!! Abort!!

Did you ever notice how the tone of your voice rises when you have to call for an abort of the takeoff? It's probably related to some Doppler effect of the human emotions as they interact with the larynx. Most of the time, this rise in pitch is limited to your voice, and not to your actions. Most of the time ...

During the takeoff roll of a routine training flight, the pilot noticed a nose compartment door beginning to open. There was still time to abort so the pilot immediately began max braking.

Although the aircraft was slowing, the pilot's emotions had shifted into high gear. Maximum braking was begun with the throttles still at "military" power.

When the jet began to skid due to the overly aggressive braking, the pilot failed to release brakes, and eventually began to drift off the right edge of the runway. To stop the drift, the nosewheel steering was engaged (with the rudder pedal deflected full left), and the aircraft swerved sharply back onto the runway. The aircraft continued across the runway until stopping 6 feet off the left edge. Sometime, in a cloud of dust, the throttles were brought to idle and eventually cut off during the ground egress.

Of course, aborts are not to be taken lightly. But you should review the procedures often enough to make your next abort a "routine" maneuver, not a comedy of errors. ■

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UNITED STATES AIR FORCE

Well Done Award

Presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Mishap Prevention Program.

CAPTAIN
Michael A. Sully

CAPTAIN
Mark A. Buccigrossi

35th Tactical Fighter Wing
George AFB, California

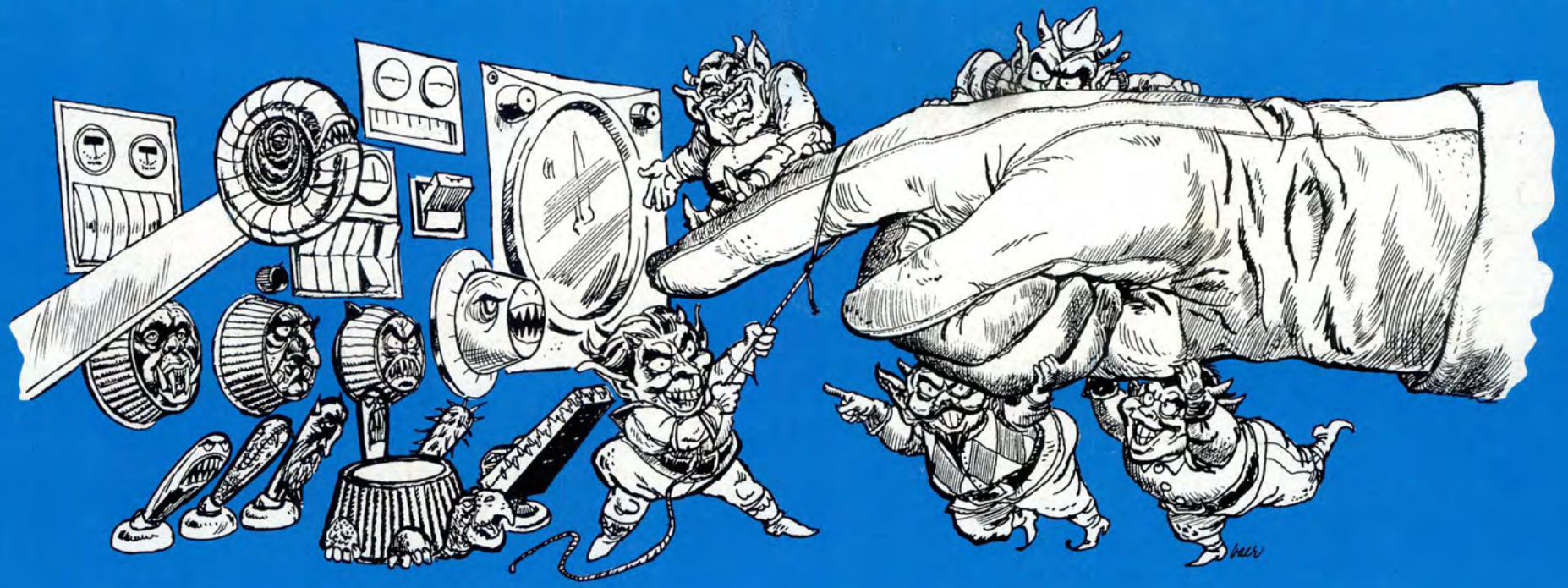
■ Captain Michael Sully, pilot, and Captain Mark Buccigrossi, Instructor Electronic Warfare Officer, were returning an F-4G to George AFB when their aircraft experienced a total utility hydraulic failure. Due to the nature of the emergency, they coordinated for a BAK-14 barrier engagement on runway 17 at George AFB. Capt Sully configured the aircraft and flew a flawless emergency approach. The aircraft touched down on-speed, on centerline, approximately 500 feet before the BAK-14 barrier on the approach end of runway 17. The Phantom engaged the cable at approximately 38,000 pounds gross weight and 150 KIAS. As the aircraft engaged the BAK-14 cable, the east side tape connector assembly failed. The cable subsequently failed, entangling the aircraft arresting hook. The aircraft's nose was forced about 45 degrees right, causing the aircraft to begin fishtailing left and right. Capt Buccigrossi advised Capt Sully to go around. The aircraft attained takeoff speed and got airborne again.

Short on fuel, Capt Sully set up for an opposite direction landing to engage the BAK-12 arresting gear on the approach end of runway 35. The aircraft touched down approximately 700 feet before the cable at 140 KIAS and 34,000 pounds gross weight. As the aircraft engaged the cable, the arresting hook shaft failed and broke off. The hook ripped through the drag chute, causing it to collapse. A radio call informed the pilot of the "streamlined" drag chute condition. Capt Sully called for emergency brakes and used differential braking to keep the aircraft on the runway. He was able to stop the aircraft with approximately 1,000 feet of runway remaining without blowing the tires. Aircraft damage was limited to the broken arresting hook and the two main tires.

Superior airmanship and crew coordination by Capts Sully and Buccigrossi prevented possible loss of life and a valuable aircraft.

WELL DONE! ■

Beware The Knob Goblins...



They're Out To Bite You!!