AIR GUARD

America's Flying Militia

George Hall

AIRPOWER #1010

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Text and Photographs by George Hall

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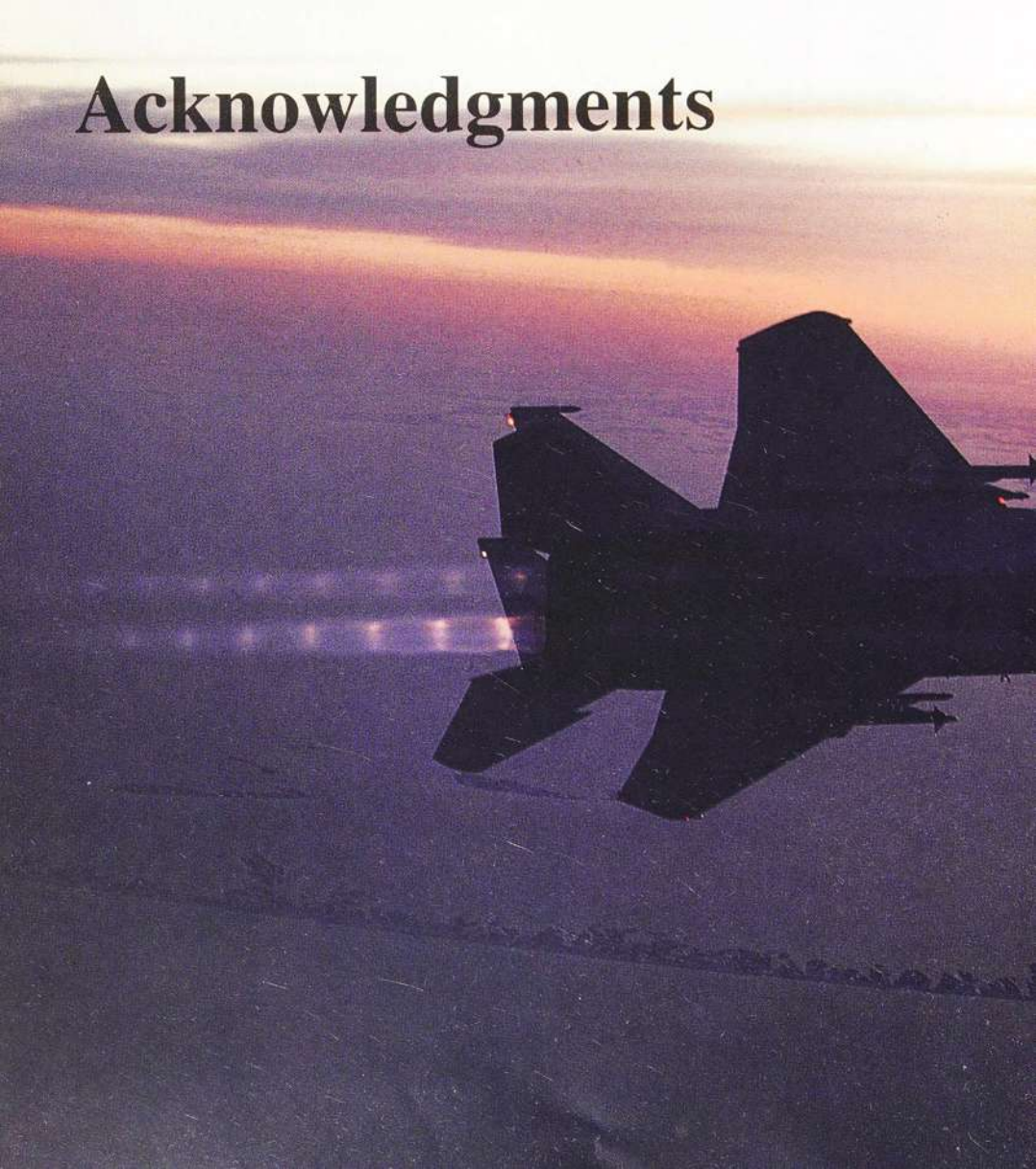


The Air National Guard is perhaps the least-understood element of today's Air Force. Not surprisingly, the folks in the Guard are enormously proud of their accomplishments and excited about having their fascinating story told. While working on this book I visited and flew with about twenty-five of the ninety-one groups and wings in the Guard, all the way from Maryland to Hawaii, from Florida to Oregon. I've photographed and written about military aviation for some fifteen years, but nowhere have I ever been dealt with more graciously and enthusiastically than with the Guard. I received assistance, anecdotes, and great rides from so many individuals that I can't possibly thank everyone here; as the old saying goes, you know who you are.

As always, a project such as this one begins with the Public Affairs Office, from which all blessings flow. The Guard Bureau has as professional and zealous a bunch of people as I've ever encountered; every request for information and approvals was met with a maximum of hustle and a minimum of red tape. I'm delighted to single out Lt. Col. Jim Ragan, Maj. John Smith (U.S. Army), and Capt. Paula Kougeas for their tireless assistance.

Our book will focus mainly on the Guard's flying missions as carried out by the ninety-one wings and groups around the country. But it's important to mention the thousand-plus support units in the Air Guard, outfits responsible for maintenance, base security, air traffic control, combat communications, medical services, repair of damaged airfields (the rapid-deployable RED HORSE and PRIME BEEF forces), and administration at the state headquarters. This is their story too.

Photographs for this book were taken on flights in F-15, F-16, KC-135, F-106, A-7, C-5A, C-130H, HC-130P, C-21, and HH-3 aircraft. A remote-controlled underwing camera pod was used to capture some of the more unusual head-on and tail-chase shots.

Thanks should go also to the folks at Presidio Press for their continuing efforts to remain by any measure the top publisher of military titles in America. My long-suffering editor, Joan Griffin, also deserves my gratitude for her unlimited cheerfulness and optimism in the face of my endless procrastinations. Let's hope it was all worth it. Countless people have assisted me on this project, but as always I insist that you blame me alone if I've gotten anything wrong.

George Hall 1990

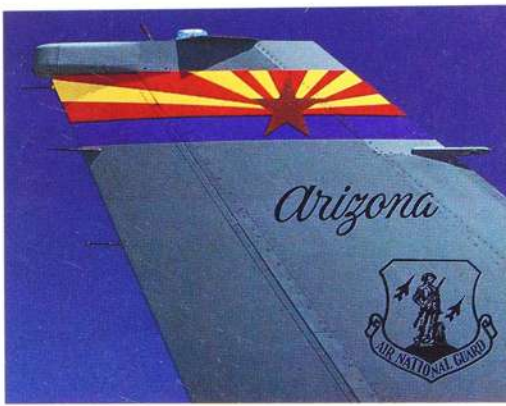
Previous pages: Louisiana Eagles light afterburners as they pull into a brilliant Gulf of Mexico sunset.

Facing page: Your faithful scribe (*left*) about to strap on a Coonass F-15B Eagle, in the reassuring company of Lt. Col. Jack "Flounder" Boh.


LT. COL. J. MATTHEWS

Glossary

AAA Antiaircraft artillery.
ACM Air combat maneuvering.
AFB Air Force base.
Afterburner System that injects raw fuel into a jet's hot exhaust, greatly increasing both thrust and fuel consumption.
AGL Above ground level.
AGR Active Guardsman in Reserve.
AMRAAM Advanced medium-range air-to-air missile.
ANG Air National Guard.
Angle of attack Angle of an airplane's wing relative to its forward motion. Any airplane wing will stall and stop flying at too high an angle of attack.
Attack jet Military aircraft specifically tasked to attack ground or seagoing targets, as opposed to fighters, which fight other aircraft in the air.
AWACS Airborne warning and control system.
Bear NATO designation for a large Russian turboprop, once designed as a bomber but currently used for long-range reconnaissance.
BFM Basic fighter maneuvering.
Black box Electronic component of a modern military jet, usually a part of communications, flight control, or weapons delivery systems. Most boxes are actually gray.
Boomer Tanker crew chief and operator of the mid-air refueling boom.
BUFF Big ugly fat fellow (or fucker)—the B-52 Stratofortress.
CAS Close air support.
CAVU Clear air, visibility unlimited.



Fin flash of the Tucson-based F-16 training wing.

CCIP Continuously computed impact point computer.
Chaff Bundles of metal slivers dropped in a jet's wake to confuse tracking radars.
Check six Refers to the clock method of calling directions from the cockpit—12 o'clock is straight ahead, 6 o'clock is dead astern where the bad guys lurk. Also a common greeting and salutation among tactical pilots.
Chobham armor Tank armor composed of ceramic materials sandwiched between layers of steel.
Comm Radio communications.
Dash Two Second plane in a two-ship formation.
Departure Out-of-control fall-off from a wing stall.

Double Ugly Nickname for the F-4 Phantom. *See also* Rhino.

Downtown Vietnam talk for the lethally defended airspace around Hanoi and Haiphong Harbor, North Vietnam.

Electric Jet The fly-by-wire F-16 Falcon.

EO Electro-optical, or television-guided, Maverick missile.

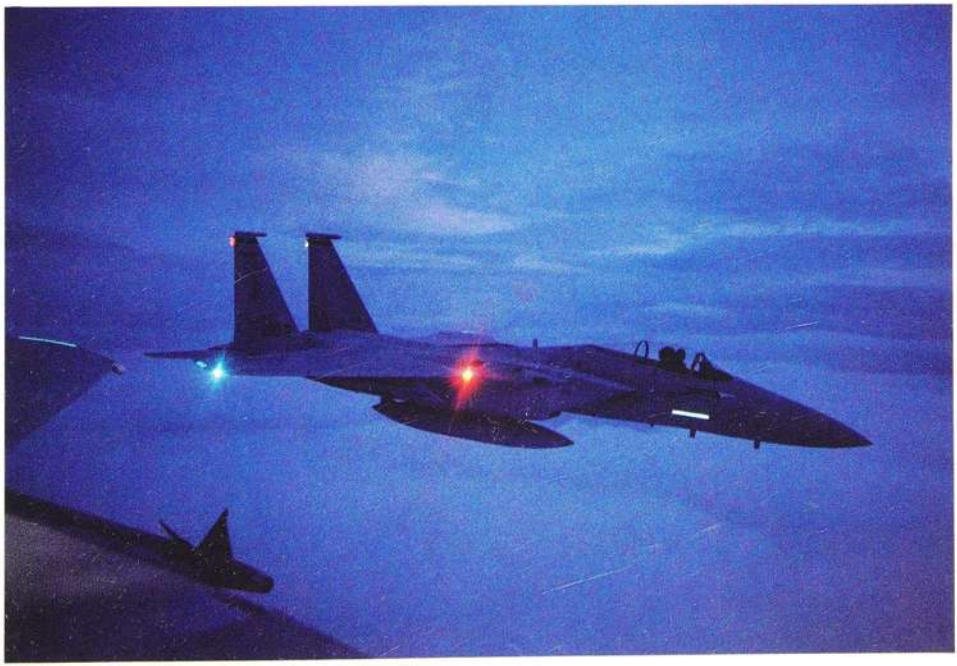
FAC Forward air controller.

FLIR Forward-looking infrared.

Fly-by-wire A system of computerized flight controls in which electronic wires and servos replace more conventional mechanical and hydraulic connections to the control surfaces.

Fourth generation The most modern fighter aircraft. The first generation were World War II–era propeller planes; the second generation were Korea-vintage jets like the F-86 Sabre and MiG-15; the third generation encompassed sixties-generation threats like the MiG-21 and

Guard Eagles execute a night instrument penetration into their NAS New Orleans base.



the F-4 Phantom; the fourth generation includes the F-16, the F/A-18, the MiG-29, and the French Mirage 2000.

GIB Guy in back. *See also* WSO.

Guard bum Affectionate term for a Guardsman employed full-time by the Air National Guard. Guard bums usually have no other job.

Gunsmoke Aerial gunnery and strafing competition held at Nellis AFB every two years.

HUD Head-up display.

Hun Nickname for the F-100 Super Sabre.

IFF Interrogation, friend or foe.

INS Inertial navigation system.

IR Infrared.

LANA Low-altitude night attack system.

LAPES Low-altitude parachute extraction system.

LASTE Low-altitude safety and target enhancement.

MCAS Marine Corps Air Station.

NAS Naval Air Station.

PACAF Pacific Air Forces.

Phoenix Long-range AIM-54 air-to-air missile, carried on the F-14 Tomcat.

PJ Pararescue jumper.

Playing the piccolo F-15 and F-16 pilots using all ten fingers to control the myriad of knobs and switches on their control sticks and throttle quadrants.

PRIME BEEF Combat runway-repair unit.

PRIME RIB Combat field mess unit.

Psyops Psychological warfare operations.

Reactive armor A network of explosive pads arrayed on the outside of an armored vehicle, designed to explode when struck by an antitank round and deflect much of the round's explosive force.

Red Flag Mock air war held quarterly at Nellis AFB, Nevada.

Rhino Nickname for the F-4 Phantom. *See also* Double Ugly.

RON Remain overnight.

Route Pack Six Air routes in and out of the Hanoi-Haiphong area during the Vietnam War.

RTB Return to base.

RTU Replacement training unit.

SAM Surface-to-air missile.

SEAL Sea/Air/Land, or Navy commandos.

Shoebox Nickname for the stubby A-7 Corsair II.

Sidewinder Short-range, heat-seeking AIM-9 air-to-air missile.

Six Nickname for the F-106 Delta Dart.

North Dakota ANG "Happy Hooligans" F-4Cs participating in the Air Force's William Tell air-intercept meet.

Hawaii Guard F-15 off the coast of Oahu.

Slats Leading-edge maneuvering devices on many modern fighters.

SLUF Short little ugly fellow (or fucker)—the A-7 Corsair II.

Smart bomb Bomb that can be guided to its target by laser or electro-optical means.

Sparrow Medium-range, radar-guided AIM-7 air-to-air missile.

Speed of heat, speed of thought Extremely fast.

StanEval Standards and Evaluation.

Team Spirit Annual mock-war maneuver in South Korea, usually with participation by American units and various Asian allies.

Technician Full-time Civil Service employee of the Air National Guard. Many wear Air Force blue.

Teen fighters The most modern American fighter aircraft—F-14 Tomcat, F-15 Eagle, F-16 Falcon, and F/A-18 Hornet.

Three-nine line Imaginary line through the pilot's shoulders. Always keep the bad guy in front of your three-nine line.

Thrust Measurement of power output from a jet engine. A pound of thrust is roughly equal to one horsepower at sea level.

Total Force Pentagon policy designed to equip and train Reserve and Guard components for maximum ease of integration into front-line action.

TOW Tube-launched, optically sighted, wire-guided antitank missile.

Tub Two-seat training version of a single-seat fighter.

Warthog (Hog) Nickname for the A-10 Thunderbolt II.

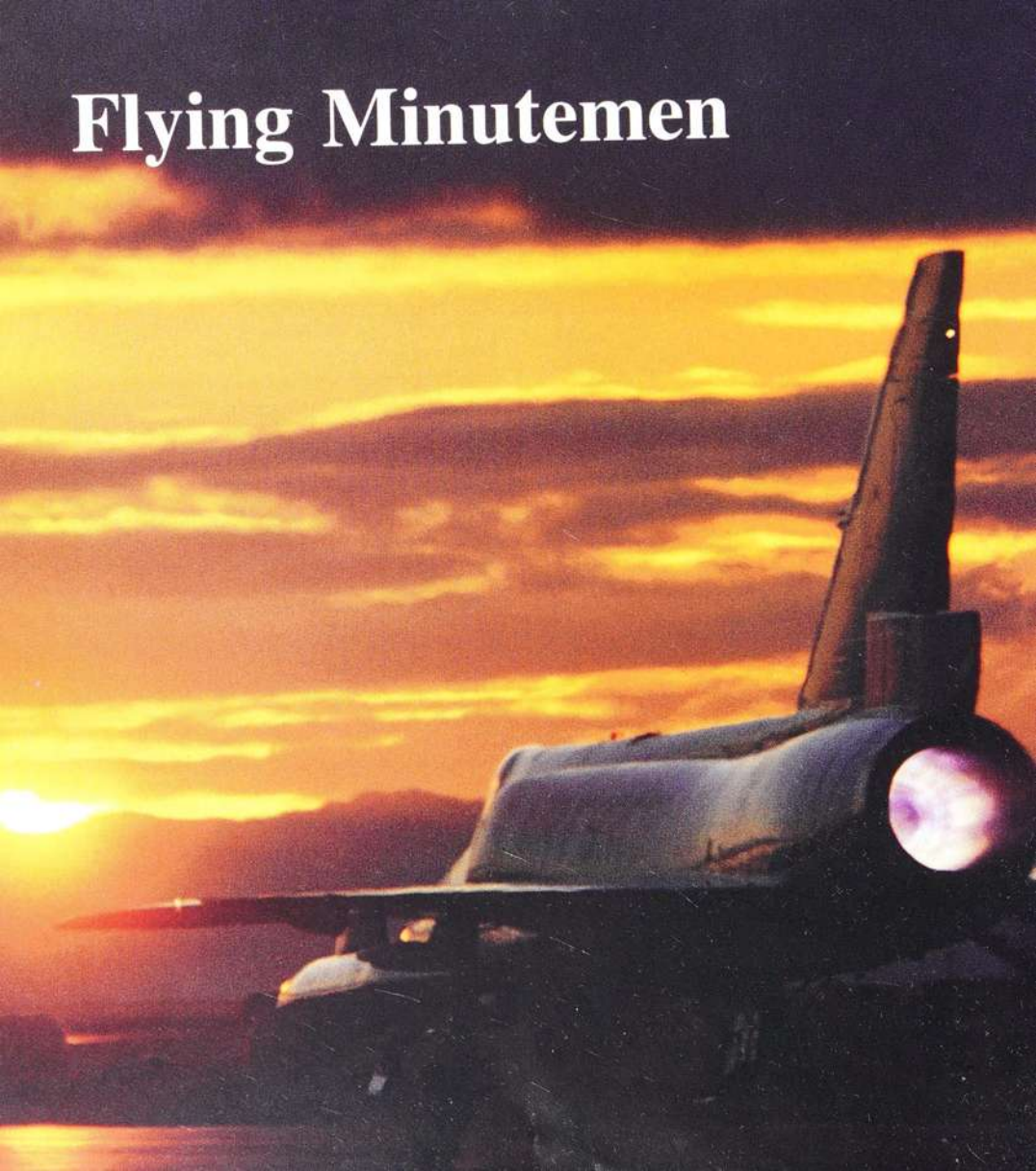
William Tell Air intercept meet held every two years (in the years opposite Gunsmoke) at Tyndall AFB, Florida.

Winchester Vietnam radio talk for "out of ammunition."

WSO Weapon systems officer, the backseater in the F-4 Phantom and the F-15E Strike Eagle. Also known as the "whizzo" or the "guy in back."

Zone V Highest afterburner setting. Fuel consumption in zone V afterburner will be ten times that of normal cruise power.

Flying Minutemen



Some years back I was photographing a book on Red Flag, the huge mock aerial war held four times a year at Nellis Air Force Base near Las Vegas. Every morning a hundred pilots and backseaters would gather for a mass briefing to take in the gouge on the day's mission. In that auditorium was a distillation of the Right Stuff—eager, young F-15 drivers on their first large-scale maneuver, professional bad guys from the local Aggressor squadrons, mud movers from Navy and Marine attack outfits, tanker crews ready to top off some sixty thirsty jets, AWACS controllers who would soon be pitting Red against Blue in the clear desert skies.

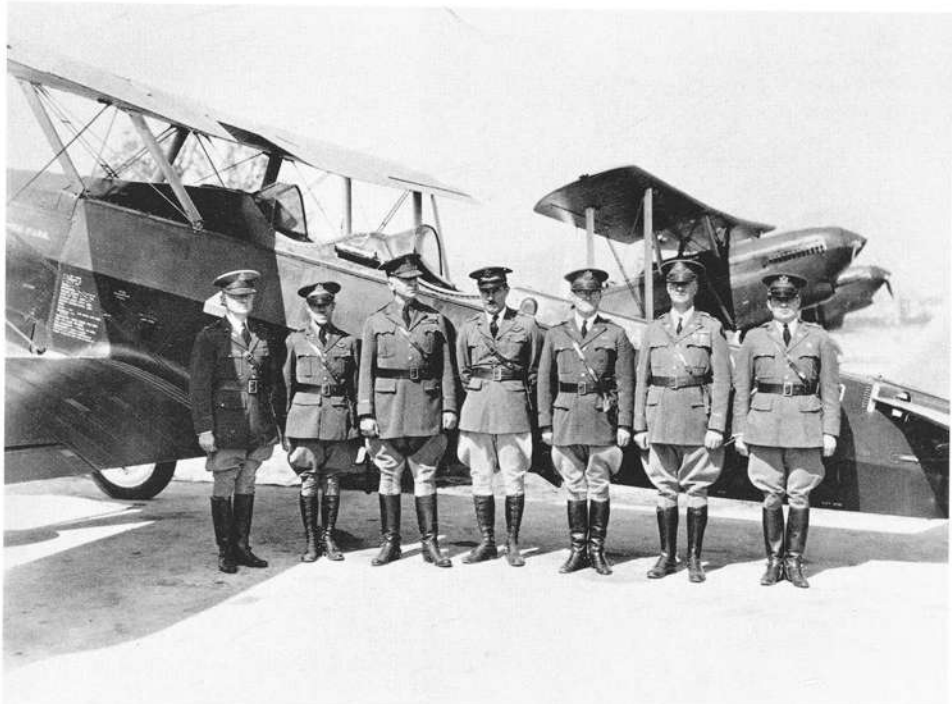
Author Mike Skinner and I couldn't help noticing a sextet of fighter pilots who sat slumped in the front row each morning. In the first place they were, well, older—downright old, in fact, with retreating hairlines, advancing paunches, and plenty of character wrinkles around the eyes. Out came the Ben Franklin–style reading glasses as the boys made notes on their frequencies and call signs. During breaks they made a beeline for the pay phones, there to harangue stockbrokers or juggle flying bids with their airline dispatchers. All in all, they seemed markedly less excited about the Red Flag experience than their younger active-duty colleagues.

Of course, the results in the air told a different story. These Guardsmen went forth twice daily, flying as spoilers on the Red side, and kicked unholy ass among the attackers. The fact that they were flying aged F-4C Phantoms with smoky engines and unslatted "stiff" wings made little difference; F-15 Eagles and F/A-18 Hornets found themselves being shot to pieces by planes and pilots a full generation older than they. Said a dazed young Marine Hornet pilot, "These guys have forgotten more about ACM [air combat maneuvering] than we're ever going to learn. They're awesome."

Mike Skinner asked one of the Guard pilots about our suspicion that he and his colleagues were, shall we say, sleepwalking through this vaunted and expensive fortnight of training for war in the air. Not so, the pilot demurred; it's an outstanding program, a great experience for young and old fighter pilots alike, a wonderful opportunity to hone your skills, blah, blah, blah. But—"Well, let's face it. When you've flown in the REAL Red Flag . . ."

Too many Americans picture the National Guard as a bunch of misfit Gomer Pyles out playing Army on the weekends. There may have been Guard units in the bad old days that met such a description, and there may be some today, although I've never visited one. America's ninety-one Air National Guard wings and groups, operating some 1,540 high-tech aircraft in all fifty states plus Puerto Rico and the District of Columbia, are the diametric opposite; they are, virtually without exception, the most experienced and sophisticated flying units in the entire American military, loaded with high-time aircrews and maintenance personnel. Looking for veterans of the epic Vietnam air war? Of the thousands who went Downtown in Southeast Asia, those still in flying billets are overwhelmingly likely to be found in Reserve and Guard outfits of all four branches of the military.

Previous pages: The much-beloved F-106 Delta Dart lights the blower at Great Falls, Montana. These beautiful interceptors have been replaced by newer teen fighters.



California Air Guardsmen and their O-25 observation planes in 1933. *Guard Bureau Collection.*

With both a state and a federal mission, the Air National Guard is unique among the air reserve forces. Air Guard units, when in a nonmobilized status, are commanded by the governors of their states; the units are represented in the military chain of command by the adjutant general. The Guard units can be called to federal service by the president, or they can be ordered to active duty by the Congress. During peacetime, all Guard wings and groups are assigned to gaining Air Force commands—the Tactical Airlift Command, the Military Airlift Command, the Pacific Air Forces, et cetera. These commands drive the Guard missions, and they also assist and evaluate

in the areas of training, readiness, and safety.

The National Guard has its roots in the citizen-soldier concept, and American militia units far predate the Revolutionary War. A unit of today's Massachusetts National Guard, the 182d Infantry Regiment, can trace its ancestry to 1636. In that year, almost a century and a half before the Constitutional Convention, several of the Massachusetts Bay Colony settlements formed our first organized military forces, the Old North Regiment and the Middlesex County Militia Regiment. The minutemen who fired "the shot heard 'round the world" while standing their ground against Lord Percy's redcoated regulars at Concord Bridge were in every sense the forebears of today's 115,000 Air National Guard men and women.

The United States has maintained large regular forces only in the second half of the twentieth century. In all of our major wars we have relied heavily on state militia forces; in the Civil War, more than 90 percent of the regiments on both sides of the conflict were state militia units federalized by the Union and the Confederacy. A bit of parenthetical Civil War trivia: The very beginnings of American military aviation can be traced to 31 May 1862, when two Rhode Island militiamen, the National Guardsmen of the time, made a balloon ascent to observe Confederate troop movements prior to the first Battle of Bull Run.

State Guard forces began adding "aero detachments" in the early 1900s; observation balloons were the vehicles of choice at first, with crude powered aircraft being flown by intrepid Guard pilots only a few years after the first successes of the Wright brothers. Air Guardsmen did not participate in World War I, but Guard aviation did get its first taste of federal duty in 1916 while supporting the National Guard Punitive Expedition against the Mexican raider-bandit Pancho Villa. Minnesota became the first state to establish an Air National Guard squadron, in 1921; in that same year the 104th Squadron of the Maryland National Guard was the first outfit to take to the skies in its own aircraft—a trio of Curtis Jennies.

Scores of Air National Guard units were federalized by President Franklin D. Roosevelt in the months preceding U.S. entry into World War II, and most of the outfits saw combat throughout the war in the Pacific, European, and Mediterranean theaters. Guard squadrons flew tactical fighter and heavy bombardment missions, but the most common assignments for the militiamen were in the areas of tactical reconnaissance, forward air control, and weather flights. Air Guard units were regularly and shamelessly raided of their flying and maintenance personnel by the active Army Air Corps, since Guard outfits were (as they are today) unequalled sources of skilled and experienced aircrews.

Again in the Korean conflict, the Air National Guard proved an invaluable asset in supplementing the active Air Force's meager total of forty-eight combat wings. Some sixty-six Guard squadrons were activated during the Korean "police action," some to take part directly in the air war from bases in Japan and Korea, others to assist in deterring Soviet aggression and general obstinance in Europe. In the early days of the war, Air Guard Mustangs were borrowed by the

Air Guard P-51 Mustangs were appropriated by active Air Force units for use as mudmovers in the early days of the Korean conflict. *Rene Francillon Collection.*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NY
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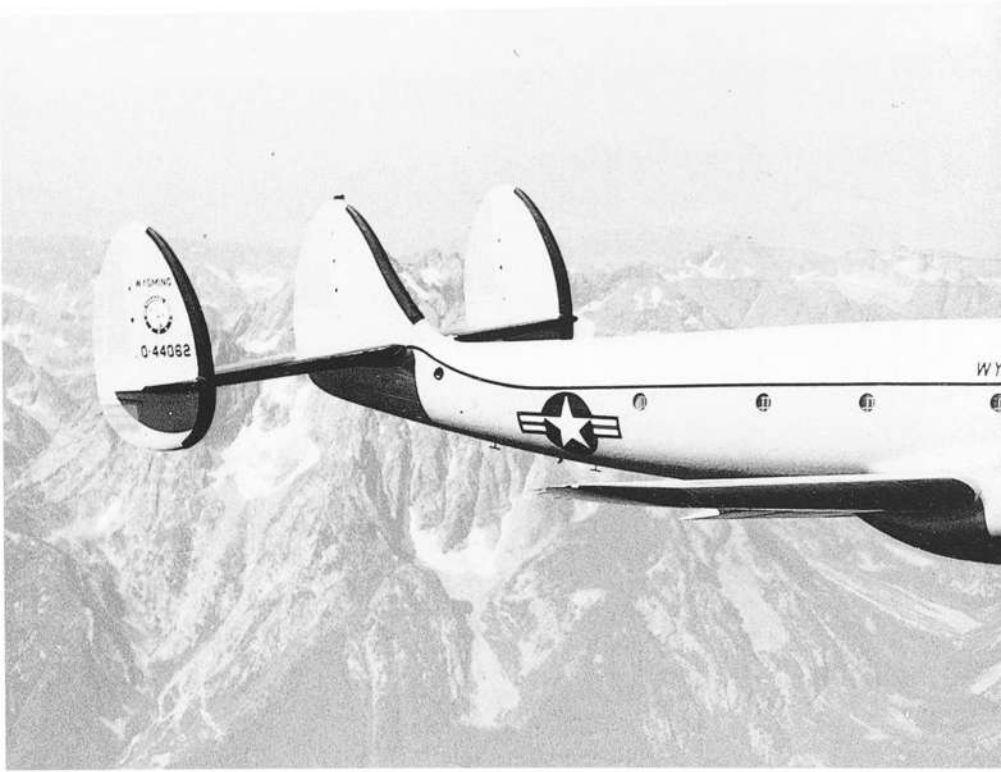


Air Force because of their ability to operate from unpaved fields in Korea. Soon thereafter the all-Guard 136th Fighter-Bomber Group, composed of Texas and Arkansas squadrons flying F-84 Thunderjets, joined the fray, operating first from Japan and later from a hastily prepared 9,000-foot expeditionary strip at Taegu, Korea. This outstanding aggregation racked up some 13,000 combat sorties before its squadrons were returned to state control in July 1952. During this same hectic period, another Guard wing, the 116th, experimented successfully with combat air refueling from KB-29 tankers.

Guard fliers were again called to active duty at the height of the Vietnam War, ostensibly as a result of the Korean detention of the U.S. Navy

Handsome C-121 Constellation flown by the Wyoming Air Guard in the mid-1960s. *Rene Francillon Collection.*

intelligence ship *Pueblo* in 1968. Guardsmen of five squadrons (Colorado, Iowa, New Mexico, New York, and New Jersey), operating F-100C Super Sabres from South Vietnamese bases, completed one-year tours in-country, each without a single accident attributable to pilot or maintenance error. Five Guard pilots were lost in combat, along with fourteen F-100 "Huns." Other Air Guard assets supplemented America's military airlift capability with their C-124, KC-97, and C-121 (Super Constellation) heavies.

Today's Air National Guard could stand alone as the world's fifth-largest air force, after the U.S. Air Force, the U.S. Naval-Marine Corps forces, the Soviet Forces of Frontal Aviation, and the air force of the Chinese People's Liberation Army. In keeping with the Pentagon's "Total Force" concept, first enunciated in 1973 and distilled into workable policy a decade later, the Air National Guard is a fully combat-ready force prepared for immediate mobilization and integration into active Air Force missions. In addition, Guard units are almost entirely responsible for an interesting collection of flying missions, among them continental air defense, coastal search and rescue, airborne psychological warfare operations, and support of the scientific facilities on the Greenland ice cap.

The Total Force concept moved from word to deed in the early 1980s, as Air National Guard (ANG) units began to be equipped with some of the most modern aircraft and gear in the U.S. arsenal. The ANG squadrons now operate the two frontline Air Force fighter aircraft, the F-15 Eagle and the F-16 Falcon. Among the Guard's hundreds of Phantom fighter-bombers are the late-model F-4E versions; the amazing A-10 tank-buster seems to be on its way toward becoming an all-Guard aircraft, as has the light-attack A-7 Corsair II. Guard transport outfits fly late-model C-130H Hercules turboprops, as well as C-141 Starlifters and the Air Force's largest aircraft, the C-5A Galaxy. The forthcoming C-17 jet transport

Air Guard convention over the Little Big Horn: "Happy Hooligans" F-4 takes on fuel from a Spokane-based KC-135 as two Montana ANG F-106s wait their turn on the boom.

Air Guard F-100 "Huns" saw their share of combat in Vietnam. These New Mexico birds were among the most active participants. *Rene Francillon Collection.*

is slated for future Guard duty, as is the MH-60 SAR (search-and-rescue) and penetration helicopter. And re-engined KC-135E tankers, powered by modern JT-8D turbofans, provide a sizable percentage of SAC's total aerial refueling capability. A complete rundown of the Air National Guard's impressive inventory is provided on page 128.

Where does the Air Guard get such terrific talent to fly and maintain its huge inventory of aircraft? Not surprisingly, there is seldom a shortage of candidates. The majority of Guard pilots have former active-duty Air Force experience; a few have even managed to weasel their way into Air Force blue after flying careers in the Navy, Army, and Marine Corps. Many have turned in two-decade careers with several thousand flying hours before switching to the Guard.

All Guard units require a bare minimum of duty, generally one drill weekend per month and a two-week summer deployment. But most part-timers put in far more days per month; in fact, many pilots happily find themselves flying many more hours per year in the Guard than they ever did on active duty. A hefty percentage of Guard fliers are also full-time airline pilots; they find it convenient to merge their two flying schedules, and they can fly to the Guard base from homes all over the country on their airline passes. This, of course, is pilot nirvana: the excellent pay and benefits of airline flying coupled with the visceral thrill of military hotshotting ten or fifteen days a month.

The guy who takes a job bus-driving a 727

around the sky soon finds that he craves the turn-and-burn, hair-on-fire side of aviation. That's where the Guard comes in—for the fortunate few who can secure flying slots.

These part-time Air Guard pilots, the so-called "weekend warriors," normally make up about half of the pilot roster in a typical Guard wing or group. Day-to-day operational continuity is maintained by a cadre of full-timers in all levels of the organization. All wear Air Force uniforms, but some are "technicians"—government civil-service employees assigned permanently to Air National Guard service. Then there are the AGRs (Active Guard in Reserve), full-time Air Force soldiers complete with green ID cards and all the benefits of active military duty. The ranks are filled out by a group affectionately known as "Guard bums," people whose only source of income is their service with the Air Guard. Even vaunted airline part-timers have found themselves bumming it in their Guard units during the all-too-frequent layoffs, furloughs, and strikes of the civilian airline world.

Is flying with the Air National Guard really all that great a deal? You bet it is. Although pride and professionalism are peerless in the Guard, there is a looseness and informality that active service can never match. People stay in Guard outfits for decades instead of moving on every two years; it's the resulting consistency that is the bedrock of Guard excellence, and it also leads to a far deeper closeness among the members of the unit. Pilots and their crew chiefs, for instance, are often on a first-name basis, an informality unheard of in the active-duty world. All in all, it's an utterly unbeatable combination: staying put with the family instead of packing the station wagon every two years, tackling interesting and vital missions with top equipment and people, and flying gobs of hours with a shit-hot bunch of guys. Active pilots are loath to admit it, but the typical active-duty squadron has a bell curve of pilot proficiency: a few guys at the top with the hands of doom, a big bunch of perfectly OK fliers in the middle, and at the bottom a couple of genuinely alarming hamburgers that have to be watched every minute. The Air Guard manages to sidestep this situation entirely, since they can be so choosy about who they let into the cockpit.

It's no wonder that the only problem is finding a unit with openings; there are several F-16 wings, for instance, that maintain lists of *two hundred* qualified Falcon drivers just waiting for a slot. Once in the cockpit, almost no one leaves until retirement.

Every so often a cloud of steam rises above the Pentagon, as active-duty Air Force generals get word of yet another Air Guard success at Red Flag, Gunsmoke (the biennial Air Force ground-attack competition), or William Tell (the air-intercept meet held in the off years between Gunsmokes). How, rail the generals, can these Guard hicks from the sticks compete so successfully and ferociously against our splendid young regulars from the Air Force Academy? If they'd stop to think for a moment, they'd realize that there's nothing particularly surprising going on here: The Guard drivers and their ground crews frequently out-experience the active guys by a factor of *ten!* As we look over the various Air National Guard units and missions in this book, just remember the Guard motto, posted in innumerable ready rooms across the country:

Youth and skill are never a match
for old age and treachery.

Teen Fighters

South toward the bayous from New Orleans, near the little Cajun town of Belle Chasse, is NAS New Orleans, a naval reserve training base since World War II. But don't let the word "reserve" throw you; this airfield is humming night and day. It boasts the most eclectic assemblage of aircraft to be found at any U.S. military base, to wit: Naval Reserve A-7 attack jets and P-3 sub hunters, Marine Corps Reserve Huey helicopters of Vietnam vintage, Air Force Reserve A-10 Warthog tank-busters, and a Coast Guard facility with its own cadre of orange-striped Herks, Falcon bizjets, and French Dolphin helos.

There's more, including an alert detachment of F-4 Phantoms from the Texas Air Guard and a Customs Service mini air force of drug-busting aircraft, some on loan from the military and others flying for Uncle Sam after having been confiscated from unlucky smugglers. And down at the east end of the ramp are the aces of the base, the 159th Tactical Fighter Group of the Louisiana Air National Guard, guilelessly known as the "Coonass Militia." The good old boys of the Coonass were the first reserve component to fly the F-15 Eagle, without question America's hottest and most capable fighter-interceptor.

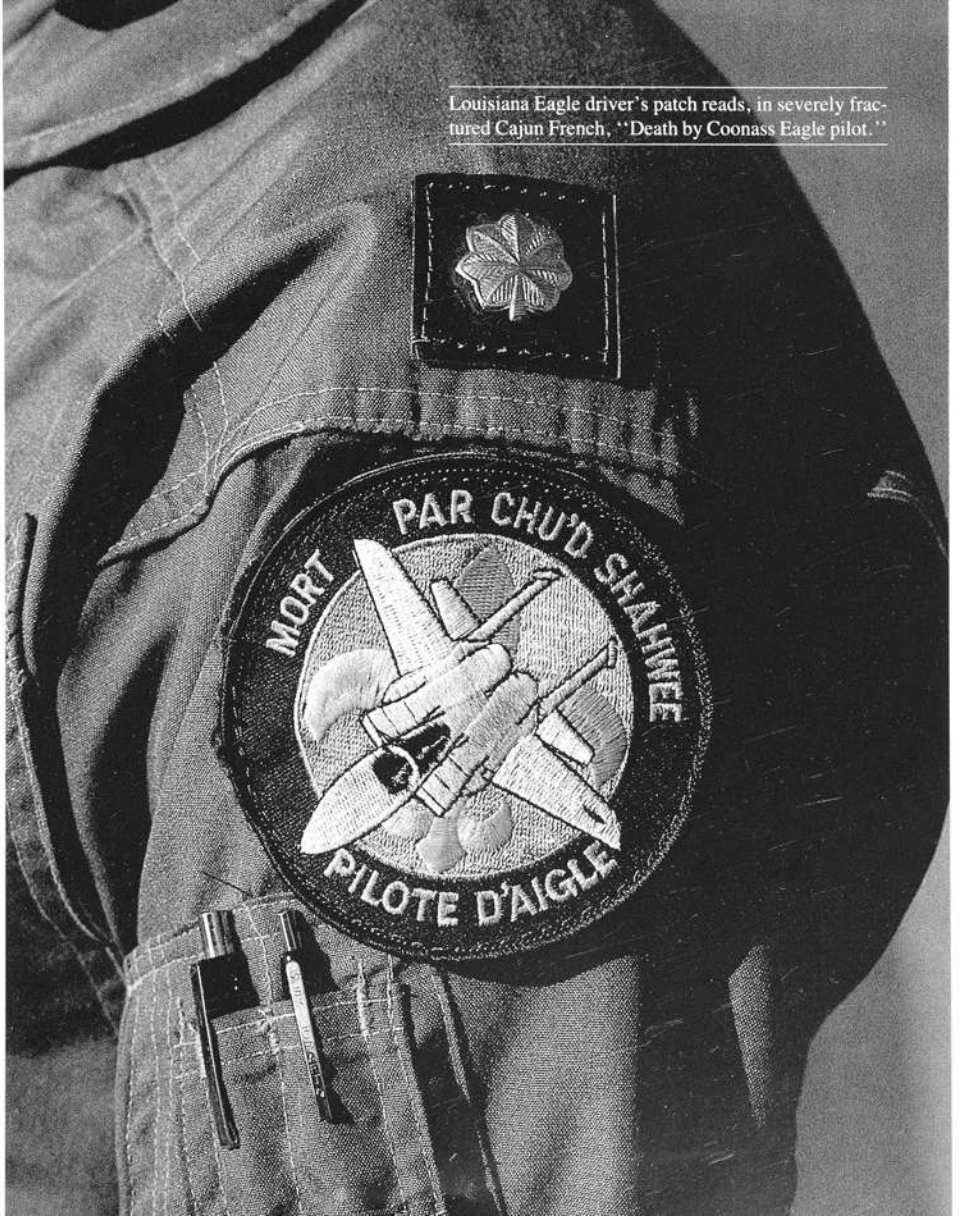
The 159th came together with the Eagle in 1985, after having flown the F-4C Phantom, the F-100D Super Sabre, and the F-102 Delta Dagger in the preceding two decades. And yes, there are some Coonass old-timers, many with Acadian names like Thibideaux, Lemoine, and Guidry,

Previous pages: Hawaii Air Guard's own dedicated combat air controllers vector the players together over the Pacific west of Honolulu.

Louisiana Air Guard F-15 at NAS New Orleans puts its wheels in the wells.

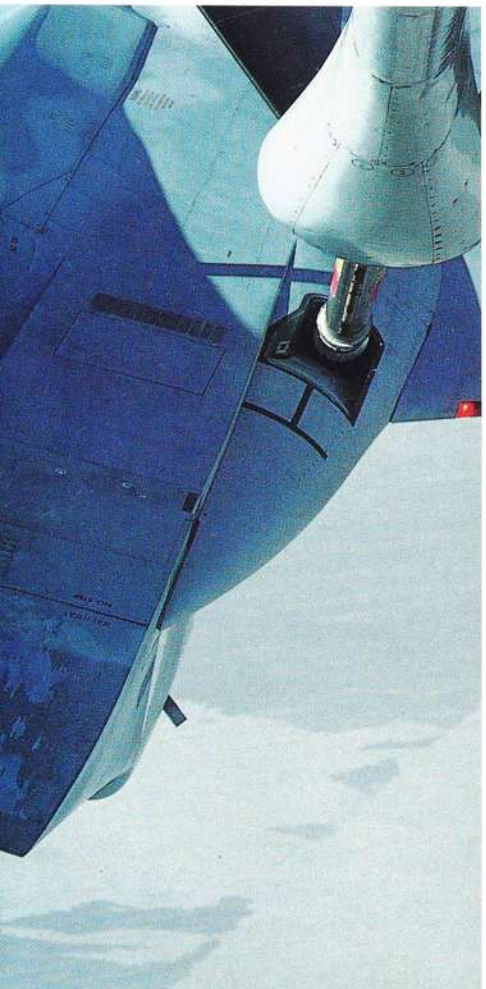
who have experience in all four fighters plus a few others as well. The thirty-eight full-time and part-time pilots of the 159th average almost 2,000 hours of fighter time apiece, garnered an hour at a time. And that's with a few relative youngsters mixed in. A handful of unit high-timers are sneaking up on 5,000 fighter hours. Most active-duty fighter squadrons don't have a single man with that kind of hard-won experience.

And though like all pilots they refuse to badmouth any plane they've ever flown (it's funny how mention of even the most appalling widowmaker can bring tears to a pilot's eyes years later), they all admit that the Eagle is infinitely more potent than anything they've had to work with. Its weapons and systems have made it awfully



Louisiana Eagle driver's patch reads, in severely fractured Cajun French, "Death by Coonass Eagle pilot."


WALKWAY
NO STEP
LT MIKE DICKEY



big—a significant disadvantage in fighters, where keeping an eyeball on the bad guy, and keeping him from eyeballing you, is everything. They've said it in a hundred languages since World War I: "Lose sight, lose the fight." But that's just about the only black mark a fighter pilot can put against the Eagle, other than its great cost and complexity, of course. What else is new?

Okay, it's big—the Aluminum Overcast, the Flying Tennis Court, the Beast. But the airplane's modern wing lets it turn with much smaller fighters, and the tremendous energy of its two afterburning Pratt & Whitney F-100 turbofans allows it to accelerate in the pure vertical when its fuel and weapons loadouts are light. Fighter pilots everywhere single it out as today's best fighter-interceptor platform. The Israelis, who've put it to some pretty strenuous real-world use, swear by it; even Navy Vietnam ace and Phantom maestro Randy "Duke" Cunningham has said publicly that if he had to go to war today, he'd want to head Downtown in the F-15.

The key to the Eagle's greatness is its combination of agility and energy coupled with its immensely powerful radar and weaponry. The APG-63 radar can sort and categorize aerial targets at ranges beyond forty miles, and with the max weapons loadout of four radar-guided AIM-7 Sparrow missiles, four heat-seeking AIM-9 Sidewinders, and an internally mounted M-61 20mm cannon, the Eagle is ready for any adversary whether he be far beyond visual range

The aviation photographer's worst nightmare: an empty backseat!

Hawaiian-named HANG Eagles taxi at Hickam AFB, Honolulu.

or squirming in the gun sight a thousand feet off the nose.

The Eagle's heft and its 50,000 pounds of thrust allow it to carry a couple of tons of drag-inducing air-to-air ordnance and fight almost as if it isn't there. Other hot teen fighters, like the F-16 and the F/A-18, can outfight the Eagle in a close-in furball, but only if they're flying light. Hang the maximum air-to-air load on these jets—two Sparrows and four Sidewinders on the Hornet, two and two on the Falcon, plus a full centerline gas tank—and they'll have a nearly impossible time sticking with the F-15. The other teen fighter, the F-14 Tomcat, is really a fleet-defense interceptor rather than a pure dogfighter, designed to lug six 1,000-pound Phoenix missiles hundreds of miles from the carrier. It actually fights pretty well with a good stick in the front seat. But it's so huge!

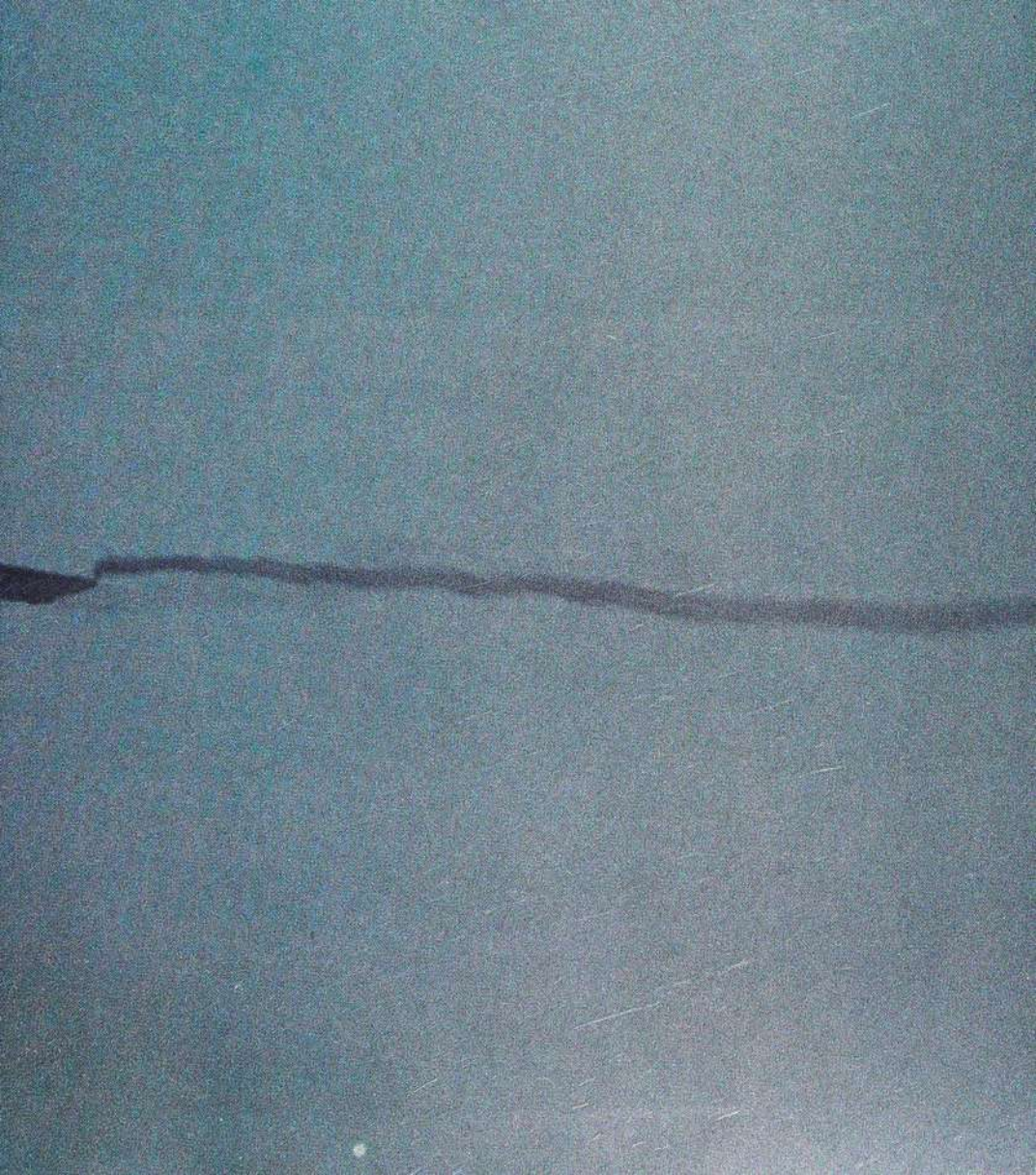
The Tomcat is the only fighter in the sky that can make the Eagle look small.

The Air National Guard is manning Eagle squadrons in Honolulu; Portland, Oregon; Atlantic City; Atlanta; and on Cape Cod, as well as in Cajun country. With the exception of Atlanta and the Coonass, the Guard F-15 units will be employing the jet in the role it handles best—air defense. These outfits will fill a twenty-four-hour alert commitment, with three fully armed jets ready to scramble at zero notice.

The 154th Composite Group, Hawaiian Air National Guard (known to the locals as "the HANG"), is tasked to the Pacific Air Forces rather than the Tactical Air Command. The HANG's F-15s are the only full-time Air Force fighters in Hawaii, and their alert force is entirely responsible for the islands' air defense. Like most Guard units the 154th is a microcosm of the local

Four-star general Augie McPeak, boss of Pacific Air Forces, borrows a HANG Eagle to keep the old fighter-pilot instincts honed.

HANG ten, brah! Hawaiian Eagle pulls violently vertical at the end of the Hickam runway.



population: Hawaiian-speaking natives, lots of Japanese-Americans, and a handful of haoles (plain old white folks) who somehow managed to wangle a slot flying Eagles in paradise. Many of the part-timers also work as pilots for the two interisland airlines. Hawaiian touches are everywhere: There's a luau every Friday afternoon for unit members and their families, the jets are christened with Hawaiian names, and salutes between pilot and crew chief before each hop are likely to take the form of a fist held aloft with thumb and little finger extended and wiggling—an island greeting that means *no ka oi, brah* (lookin' good, brother).

The HANG's alert commitment is a relatively small part of their work load, as real-life intruders have been rare in local airspace ever since 7 December 1941. The pilots busy themselves practicing ACM and long-range radar intercepts with the assistance of their own Guard-manned combat

Good-looking Coonass six-ship delta formation at the annual NAS New Orleans open house and air show.

control center at nearby Fort Wheeler. They're also much in demand as dissimilar adversaries: the Marines are worthy opponents in their F/A-18 Hornets based at MCAS Kaneohe, and a Navy aircraft carrier with full air wing is usually in the area looking for an argument. Hickam AFB (the Guard shares the field with the active Air Force and with all Honolulu-bound commercial flights) is also a popular destination for mainland Guard fighter squadrons anxious to make a complex long-range deployment. Several squadrons visit every year, towed by their tankers, for two-week stints of dissimilar ACM, intercepts, refueling, and fun in the Hawaiian sun.

The next time you're waiting in line for takeoff out of Hickam/Honolulu International, take a look out of your 747 window for a glimpse of a taxiing HANG four-ship. If you're lucky they'll treat you to their patented "HANG ten" departure: the four jets rolling at perfect ten-second intervals, after-

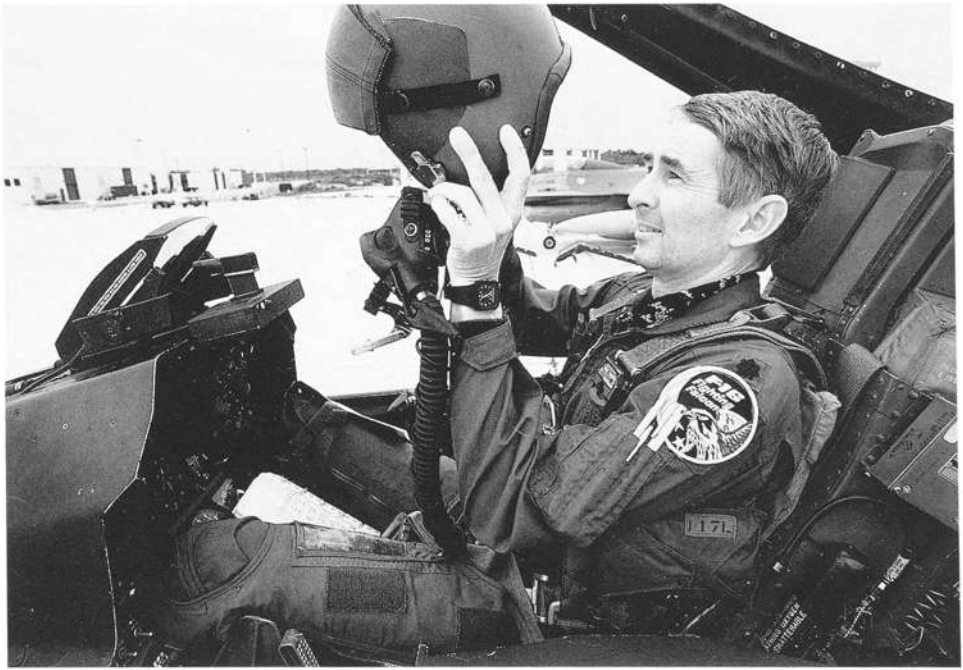
Coonass Eagle flown by Cpt. Joe "Nine Fingers" Tumminello shows the big jet's amazing turning abilities.

burners pouring out 50,000 pounds of thrust. After lift-off they'll hold each jet on the deck to 300 knots, pitch the nose back in a vapor-puffing seven-g pull, and climb out in the pure vertical until they disappear into the ever-present cumulus puffies. No ka oi, brah! For my money it's the best tourist attraction in paradise.

The other teen fighter that's electrifying the Air National Guard—pun intended—is the F-16 Fighting Falcon, the stupendous little fly-by-wire hummer that's rapidly replacing the Phantom. Most Guard air defense units that were flying the F-106 have already converted to the Electric Jet, and the Phantom interceptor outfits are making the switch. All of the Guard's air defense Falcons will be converted to carry the AIM-7 Sparrow

Jacksonville-based F-16 interceptor poses for photographer over the Atlantic.

radar-guided missile for the air-to-air shot beyond visual range; at present the Falcon can handle only a close-in ACM situation with its gun and Sidewinder heat-seekers. The Guard interceptors at Jacksonville will be America's first Sparrow-capable F-16s, receiving the appropriate hardware in summer 1989. And they'll also be geared up for the smaller but much more potent AMRAAM missile when the test boys finally get it working. In addition to the added missile wiring, the F-16's air defense mod includes an HF radio for long-distance communication and a side-looking



Old-time fighter pilot Lt. Col. Rob Parr of the San Antonio–based Texas ANG Falcons.

spotlight of several million candlepower for visual ID of bogeys at night.

The mecca for Guard Falcon pilots is the 162d TFG at Tucson airport; the 162d is one of two RTUs, or replacement training units (the other is at McConnell AFB, Wichita), for Air Guard fliers transitioning into the F-16 from the F-4, the F-106, the A-7, or whatever. The Tucson base is also home to a gaggle of green A-7s, since it's also the RTU for that aircraft and home of the A-7 Fighter Weapons School.

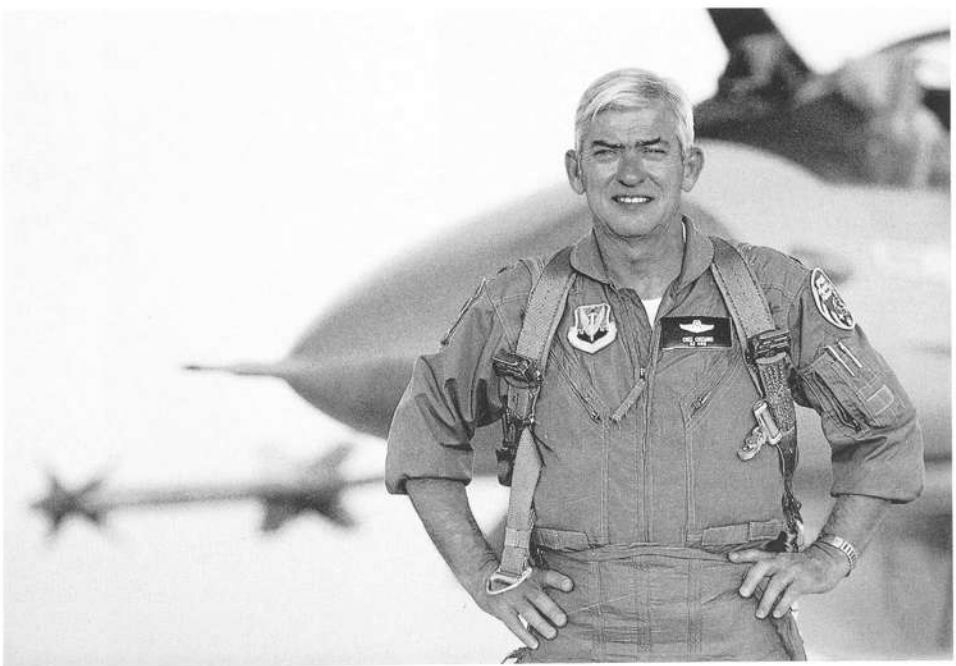
There are fifty-five Falcons and Corsairs lined up at the big desert base, and these days a constant stream of Guard pilots moves through the facility for training periods ranging from a few days to four months. Training of new A-7 people has slowed to near motionlessness, but the F-16 pipeline is all but bursting as more than a dozen Guard

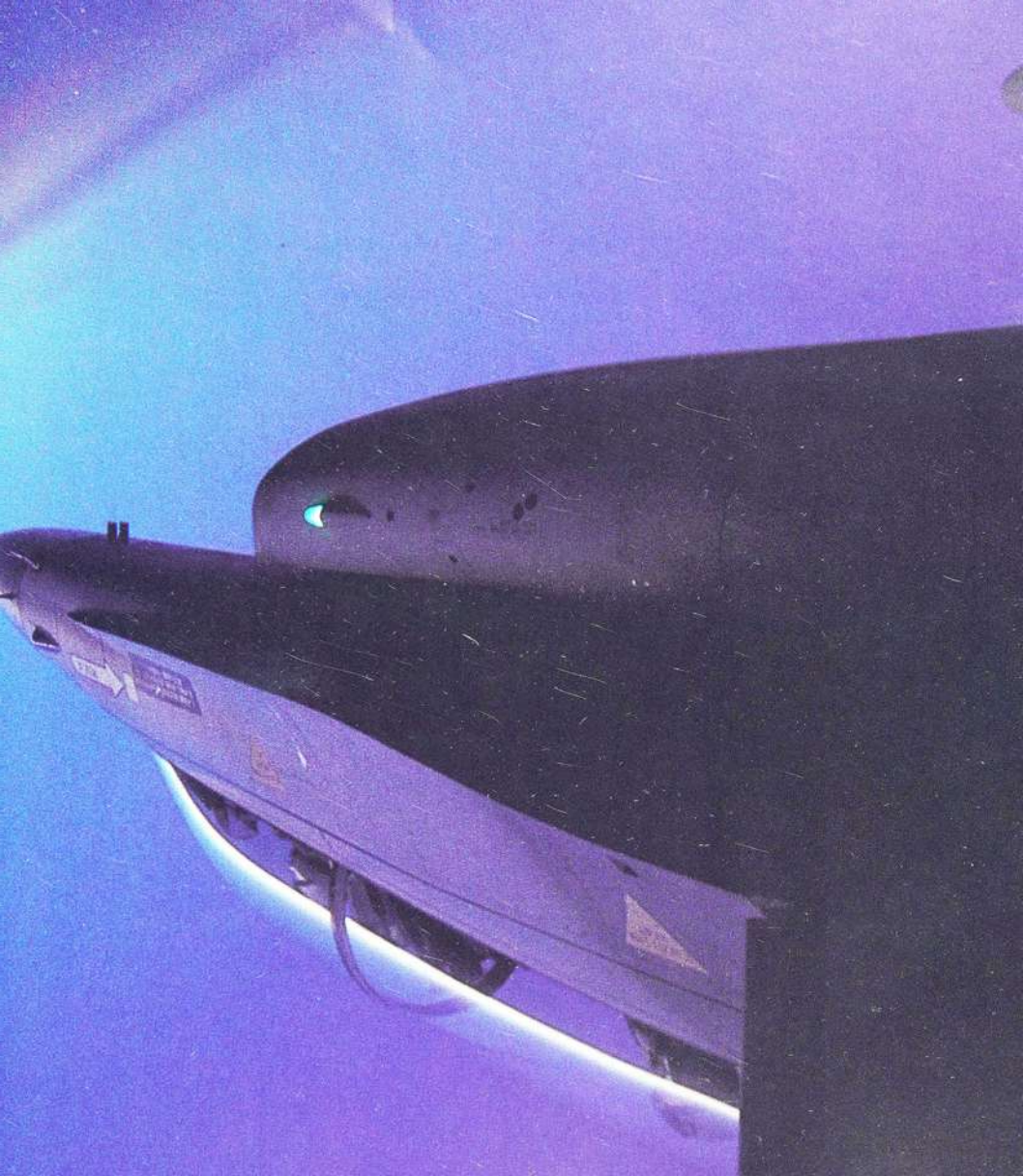
units make the switch. Offices and classrooms cluster in temporary prefabs around the handsome ops building, known as the "Pizza Hut," since its architect appears to have saved no end of time and trouble by simply copying the building design of his favorite fast food franchise.

Pizza is also a popular radio call sign for Tucson training flights, especially when the backseat instructor is multithousand-hour fighter pilot (and peerless Italian chef) Jim "Fio" Fiorelli. Guard call signs often reflect the regional flavor of the unit: Jazz for the Coonass, Kahuna for the Hawaii F-15s, Colt for the Baltimore Warthogs (what, you've already forgotten the Baltimore Colts?), and Taco for the New Mexico A-7s.

The breadth of experience among the Tucson F-16 and A-7 instructors is astonishing. A couple of really decrepit old-timers, Harv Damschen and Cass Cassaro, are thought to be the oldest active F-16 pilots (around age fifty-seven) in the busi-

Tucson's Lt. Col. Cass Cassaro, thought to be the oldest Falcon driver in captivity.





Author's camera pod looks forward as a Jacksonville F-16B two-seater chases the Florida sunset.

Author catches a self-portrait before mixing it up with several Jacksonville Falcons.

ness. Both flew F-100s in Southeast Asia, as did Fiorelli. Fio commented that the Falcon possesses all of the very best qualities of all the jets he's flown—F-5, F-100, F-102, F-104, and A-7—with none of their varied inadequacies and general naughtiness. Cassaro, whose jet experience goes back to F-86 Sabres, probably summed it up best when he said, "I've been an F-16 pilot for thirty-two years. They just hadn't invented the damn thing yet."

The F-16 manages to be both easier and harder to fly than the Air Force fighters that have gone before it. It's easier because so many basic flight functions are automated and cleaned up. The plane is a big flying autopilot; the pilot flies the plane by constantly discussing options with the computer. HAL makes most of the little decisions, moving the fly-by-wire surfaces, deploying and retracting the leading-edge slats, trimming the

ship, and generally flying the whole mission in accordance with instructions programmed into the computer and the INS before takeoff. This degree of automation is more than a luxury; the F-16 would be unflyable without it. Like many modern fighter designs, the Falcon is a fundamentally unstable aircraft on the surface: Among other things, it's "aft CG loaded," or tail-heavy, and that's why it has such awesome nose authority, why it's such a little monster in the turns. The computer fights the constant tendency of the nose to pitch up; an angle-of-attack (AOA) limiter keeps the jet from exceeding twenty-five units AOA, no matter how hard the pilot bends the sidestick controller back. This can be frustrating to a gonzo dogfighter, but HAL knows best: The result could otherwise be an accelerated stall and a sickening falloff departure from which there would be no possible recovery. Earlier jets, like the F-4, would permit an unwary pilot to make such an error and then laugh at him all the way down as he fought to regain control.

The F-16 control systems are truly wondrous, just as long as all those little trons are running around in the right direction. Unlike some other fly-by-wire designs, the Falcon has no manual backups; if your computer flips out, you might just have to step outside. The F-16 is a one-holer (the engine in the Guard birds is the same Pratt F-100 that the F-15 has two of), and loss of engine power, while a major eye-opener, is not necessarily disastrous. Control power can be maintained for about ten minutes by a hydrozene-fueled emergency power unit, and the little jet glides better than one might expect. A young Air Force pilot recently dead-sticked a Falcon into a commercial field near Chicago after losing all thrust over Lake Michigan. A quick-thinking controller in the Chicago Center (an Air Guard guy, by the way) gave the pilot fast and accurate vectors to a good runway, and he put it down with a little energy to spare and without injury or damage.

Jax interceptors carry dual AIM-9 Sidewinders for alert scrambles. Birds will soon be fitted with radar-guided AIM-7 Sparrows as well.

The plane isn't really hard to fly, but employing it successfully as a weapon is another matter. The amount of gadgetry in the F-16 cockpit is indeed daunting, especially to a pilot used to far simpler apparatus. And for everything to work at full potential during the mission, the computers have to be set up and aligned precisely before takeoff. The sidestick controller (right hand) and the throttle quadrant (left hand) are both studded with knobs and switches, at least one lurking under each finger. Some switches perform one function in flight and another on the ground. For example,

Falcon driver's left hand controls engine throttle and ten other switches. "Dog fight" button flips radar back and forth between air-to-air and air-to-mud.

Coonass Eagle maestro Dohrm "Crawfish" Crawford has trouble playing the piccolo without sheet music!

your right forefinger either steers the nose wheel, fires the gun, or disconnects the probe after aerial refueling. The left thumb sets the radar antenna elevation, works the cursor that slews the antenna, pops the speed brakes, and arms the missiles and gun when going into the dogfight mode. Longtime fighter pilots transitioning to the F-16—a typical situation in the Guard today—feel comfortable flying the jet after only a couple of hours, but they struggle for weeks with the computer programming, the switchology, and the fingering. Falcon and Eagle pilots refer to this latter talent, central to their profession, as "playing the piccolo." There's a Coonass Eagle driver whose call sign is Nine Fingers; I always meant to ask him how he copes!

The Falcon plays hell with part-time pilots, because it makes enormous physical as well as mental demands. The plane's radical horizontal turn rate plus its tremendous sustained energy equals g's, lots and lots of positive g's. The jet is stressed for nine g's positive, and it can cheerfully take a lot more. The human body cannot. Even a young stud in terrific shape will be squashed like a grape by more than a few seconds' worth of eight or nine g's. And to put it kindly, lots of the Air Guard pilots coming into the F-16 aren't as young and tough as they once were. The difference is particularly noticeable for the guys transitioning from the elegant and gentlemanly F-106. The Six was fast and classy, but it was a leisurely turner utterly incapable of the high-g

onset so common in the Falcon. There were some Six pilots who even flew the jet without g suits until the TAC safety mavens yelled at them.

All of the new F-16 trainees have to do a couple of sessions in a centrifuge to get a taste of high g and the "gray-out" semiconsciousness that overtakes the brain after a few seconds. But the centrifuge builds up the g's slowly and artificially, whereas the Falcon can be yanked from one to nine g's in one second.

The result—and a common one in the Falcon, even among young and in-shape pilots—is g-LOC, or g-induced loss of consciousness, which can sneak up at the worst times, usually during the first max-effort turn after the merge. All F-16 trainees are shown a chilling videotape, shot by a HUD (head-up display) camera during a routine training flight in an F-16B. A student is up front with an instructor in the pit, and the

Beautiful and much-missed F-106 shows off its limited roll rate for the photographer.

order of the day is ACM. The jet is tootling along level and up high; the bad guy flashes past in the opposite direction, co-altitude. Go get him, kid, says the instructor. The student puts The Big Move on the bogey: hard right turn, ninety degrees of bank, nine g's on the HUD. A few seconds later, still turning like mad, he begins to go low on his adversary. And then the jet is unloading, rolling out of the turn, plummeting straight for the New Mexico desert. The instructor finally gets the picture, mutters the fighter pilot's prayer ("well, shit"), and yanks another nine g's worth to pull the plane out well below the hard deck. His student had gone under less than *five seconds* after loading the jet up to its nine-g limit. It can happen that easily, and it's known to have killed more than a few F-16 drivers.

Most F-16 pilots will, if the mission permits, warm up to the g's, just as a runner will stretch before moving out. This is particularly important for the part-timers. The norm is a series of five- to six-g turns before anyone calls "fight's on." Cass Cassaro (now retired from the Guard and teaching active Air Force pilots at Luke AFB) used to insist on loading himself up to eight g's on every single F-16 hop, even a short test flight or an orientation ride for a visiting writer (me). Builds character, said he.

Of course when the amazing Electric Jet is up and working, and when its driver has learned his stuff, there's simply nothing to touch it. The Air Guard will soon have hundreds of F-16s in service, each flying one of three missions. The air defense units will use the F-16 (or the F-15) as an interceptor, maintaining a full-time alert force of three jets armed with two Sparrow missiles on wing pylons and two Sidewinders on the wingtip rails. All Guard Falcons also carry a Vulcan 20mm rotary cannon. The AMRAAM, a small, fire-and-forget radar missile, will eventually replace the Sparrow. Most fighter pilots will shed no tears at the Sparrow's passing; the big, expensive missile has never lived up to its promises. During the recent tussle between two Navy F-14s and a dynamic duo of hapless Libyan MiG-23 Floggers, many Americans were asking themselves why those Navy guys had to shoot three Sparrows to get one good hit from five miles. I have a feeling that the Tomcat boys were rather profanely asking themselves the same question. Thank goodness for the Sidewinder, a cheap, no-brain heat-seeker that never seems to miss.

Guard air defense squadrons are now pulling alert with F-16s in Jacksonville, Atlantic City, Fresno, and Great Falls, Montana. Happily, encounters with enemy intruders are virtually unheard-of. The Jacksonville boys, and their companion three-plane det at Homestead AFB in southern Florida, do get to catch the occasional Soviet Bear out over the Atlantic; the huge bombers fly recon deployments to Cuba every now and then. Only the active-duty F-15s in Iceland and Alaska get more real-life intercepts than the Gators.

Duty in the alert shack is usually boring and uneventful. Honest-to-god intercepts are rare events, although weekly practice scrambles do liven things up a bit. Let's hang out awhile in the Gators' alert facility, adjacent to their modern Guard base at Jacksonville airport, to see if we can get lucky. Word has it that "the Bears are running"; the idea of a Havana deployment can sound pretty appealing when the February ice fogs descend on Olenegorsk, the Bears' lovely northern base.

Southeast Sector Control, operating a radar net

Scramble! Jacksonville alert pilot mounts up to check out a possible intruder.

out of Tyndall AFB on Florida's west coast, picks up an unidentified target on a southbound heading some 300 miles off the Carolinas. Requests for authentication are broadcast on several internationally recognized frequencies. The controllers need to receive a coded IFF (identification friend or foe) squawk in addition to verbal assurances. But there is no answer. The call goes out to the Jax alert for the immediate launch of "Alert Five," a pair of loaded and cocked F-16s parked in firehouselike hangars.

The alert pilots, lounging in g suits and harnesses, sprint for the jets, fly up the ladders, and start on their switchology even as their crew chiefs are strapping them in. The longest wait in the frantic sequence, some ninety seconds, passes while the inertial nav systems get themselves or-

Old but spotless TU-95 Bear recon bomber, primped and polished as if expecting photographers, motors toward Cuba off the Florida Keys. *Tom Twomey photo.*

ganized. Then it's straight out of the box and onto the active; the wheels go into the wells less than five minutes after the call.

The jets blast toward the intercept in visual fingertip formation; they'd adopt a radar trail departure at night or in the weather, but today it's strictly CAVU—clear air, visibility unlimited. Tyndall GCI (ground-controlled intercept) provides updates on the bogey's course. Alert lead soon has the target on his radar, and the two jets slide left for a stealthy approach from the right rear. It's a Bear, all right—no mistaking that enormous silver fuselage, even at ten miles. Tyndall reports his wingman another ten miles farther east, but our flight will concentrate on the closer-in Ivan. He's motoring along calmly at 35,000 feet and almost 400 knots—the Bear is showing its stuff as the world's fastest turboprop. Suddenly the gap begins to close a bit too rapidly. The Bear driver is flattening the pitch of his immense counterrotating props, and the huge plane is slowing like crazy while retaining its altitude. He seems to be inviting the Falcons to tighten it up. Soon Gator lead is in trail two miles back. The Bear's twin tail guns are pointing heavenward, a little bit of international etiquette designed to reduce the chance of accidental nastiness. Sometimes, when the tail gunner is feeling somewhat more hostile, he'll uncage his very accurate radar-controlled guns and lock up the interceptors. Just for practice, of course.

The element of surprise is past; Ivan has definitely picked up his tail. The lead Falcon moves up and to the right for some air-to-air photography, his Dash Two sliding in tight to join the Bear in the pictures. The big Russian bomber may be old and obsolete, but it looks primped and polished, as if expecting to be photographed. The red star is plainly visible on the gigantic vertical tail; the rear gunner can be seen flashing the V-for-victory sign from his blister window. Or is it perhaps the peace sign? Everything is proceeding in a most gentlemanly fashion. The Russians are, after all, well out in international airspace, more than 200 miles off Florida. And no one wants to be part of an international incident; think of the paperwork!

But Ivan isn't quite through playing around with the Gators. Just as lead gets ready to snap his pics, with his dwarfed wingman tucked in below the Bear's huge swept wing, the playful Russkie puts the bite to his props. Ugly brown exhaust pours from the turbines as the bomber accelerates like an air-to-air missile; both fighters have to select afterburner to catch up! With things stabilized back up around 400 knots, the boys take their hero photos and prepare to break off. The Russians are about to start their descent into Cuban airspace, and the interceptors have made their point. Lead slips in toward the Russian cockpit for a smart but friendly salute, and the Russian right-seater fires back with a universal sign at least as old as ancient Rome—thumbs-up. A lot better than another upraised digit I could name!

When the air defense squadrons aren't sitting alert, they take the Falcons out to the area to practice radar intercepts, basic fighter maneuvers (BFM), and good old air combat maneuvering. Sparring partners are never hard to find; in a target-rich environment like northern Florida, the Jacksonville Gators have more fight requests than they can handle. Within a hundred miles are Navy F-18s at Cecil Field, Marine F-18s at Beaufort, South Carolina, Air Force F-15s at Eglin, Guard Eagles out of Dobbins near Atlanta, and the occasional carrier with a whole air wing looking for

trouble. The well-flown F-16 is just about everyone's favorite adversary, the theory being that if you can defeat it, you can defeat anyone anywhere.

Other F-16 wings in South Carolina, Texas, Vermont, and Arkansas carry on the fighter-bomber mission formerly handled by the F-4 Phantom. The F-16 was designed to be a true dual-role combat aircraft, equally at home in either the air-to-air or the air-to-ground regime. And sure enough, it's a superbly accurate bomber as well as a nearly unbeatable close-in dogfighter. Its computer puts iron bombs on target, from any of several delivery profiles, with a degree of precision that was unimaginable in the F-4 or earlier fighter-bombers. Newly transitioned F-16 pilots, including some who had never bombed before, find themselves scoring effortless bull's-eyes on their very first air-to-ground hops. The biennial Gunsmoke bombing and gunnery competition has been dominated by the F-16 teams ever since the airplane's first appearance in 1983. And unlike the typical attack bomber, the F-16 coming off the target can flick the radar back to dogfight mode and duke it out with the best fighters the enemy has.

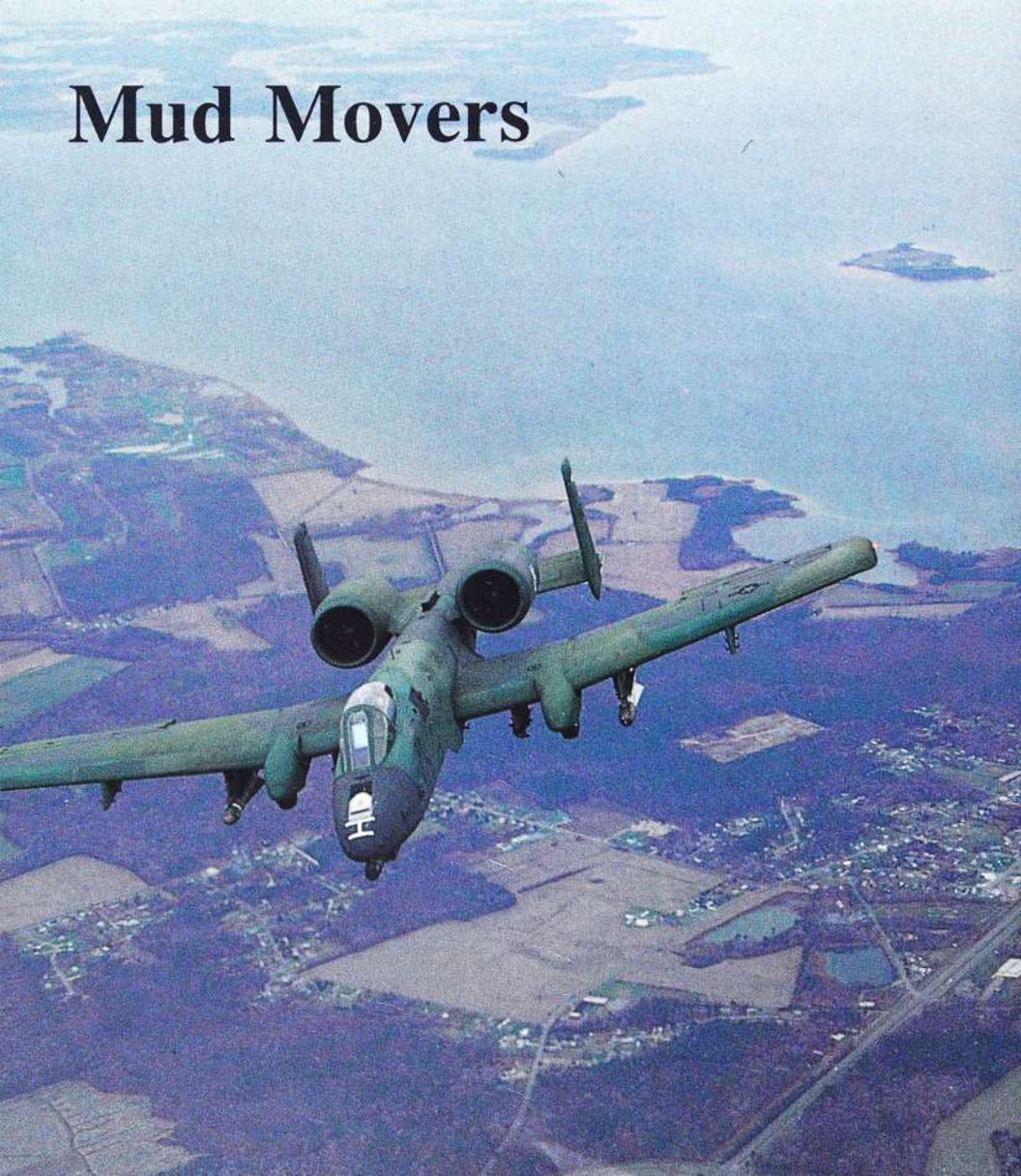
A third F-16 mission is now being gingerly explored by the Air National Guard. The 174th TFW, a former A-10 unit from Syracuse, is now flying the F-16 and developing a close air support role for the jet. This outfit was famous for thinking up ways to stretch the capabilities of the Warthog, and they've been tasked with figuring out how best to support troops in the field with a fast mover like the F-16. The heart of the A-10, its 30mm antitank gun, can be transplanted onto the F-16 in the form of a pod-mounted gun hung on the centerline station. This GAU-5 cannon carries far

Coonass F-15 carries towable target dart for gun practice. Device can be pulled a half mile behind; an internal microphone records hits and near-misses.

fewer rounds, but it spits out the same huge spent-uranium bullets that can penetrate practically any armored vehicle. The folks at General Electric swear it works, and the Guard guys are in the early stages of trying it out on the newly designated F/A-16.

The Air Force's two finest fighters, the F-15 Eagle and the F-16 Fighting Falcon, are finding their way into the Air National Guard in far from token numbers. Said Guard Brig. Gen. Joe Engle, famed shuttle astronaut and longtime fighter pilot, "It's what the Total Force concept is all about. These guys have fighter experience to burn, and they run fully combat-ready outfits with top-notch maintenance and support. They ought to have the best current gear, just as fast as we can get it to them." Of course, the general's enthusiasm was a bit biased: He was checking out in the F-16 at the time, and like all the other students in the "Pizza Hut," he was having a hard time wiping the smile off his face.

Mud Movers



From *Dawn Patrol* to *Top Gun* it's been the fighter pilots who get the glory. But the main job of the fighters is to gain air superiority, to sweep the skies clear of enemy aircraft so that the attack jets—the mud movers—can deliver ordnance on target. Forget about those fighter pukes, the attack pilots say; the real men fly ground-pounders. It all comes down to three little words: bombs on target.

The Air National Guard is heavily committed to attack aviation, with twenty-two wings and groups in seventeen states (plus Puerto Rico) dedicated to light attack, close air support, and forward air control. This total doesn't reflect a number of F-4 and F-16 outfits that handle various fighter-bomber missions. All Guard attack units are under the control of the Tactical Air Command.

The Air Guard's principal earth mover is the LTV/Vought A-7D Corsair II, a chubby subsonic jet that performed to great effect in Southeast Asia. The plane is affectionately named after another superb Vought fighter-bomber, the F-4U "hose nose" of Black Sheep Squadron fame. Of course, as is often the case with ugly airplanes, no one actually calls it the Corsair II; it's always the SLUF (for short little ugly fucker) or the Shoebox.

The plane actually evolved from the Navy's hottest carrier fighter of the early sixties, the F-8 Crusader. The Corsair is still in service with the Navy as the light-attack bomber in several carrier air wings, although it is rapidly being replaced by the much more capable F/A-18 Hornet. The Hornet, like the F-16, is a true dual-role jet that is equally adept at ground attack and dogfighting.

Previous pages: Baltimore-based Warthogs form up behind the open ramp of a C-130 Hercules over eastern Maryland.

Tucson A-7 trainer lugs practice bombs to the Gila Bend range.

The active Air Force has gotten completely out of the A-7 business; the Air National Guard has all of the green SLUFs these days—fourteen wings of them, including the instructional RTU at Tucson. The twenty A-7K two-seaters assigned to the RTU are completely combat capable, although they're used only for instruction and certification.

The A-7s are getting a bit tired and outdated, but in the formative years the airplane's capabilities were revolutionary. Nothing in Vietnam could bomb with the precision of the A-7. The

Tucson provides training in both the A-7 and the F-16.

secret was its continuous-solution navigation and bomb-delivery system, a computerized marvel that still yields results that only an F-16 can match. The head of the A-7 Fighter Weapons School at Tucson, Lt. Col. Mike Shira, was in the first Air Force A-7 class, and he was in the first squadron to see combat. He remembers, "The FACs [forward air controllers] would get so excited when we'd check in over the target; it was, oh boy, the A-7s are here! The system was so accurate, they'd come back with one-meter corrections. It was ridiculous; the damn crater was fifty feet across. It drove the F-4 guys crazy; they just couldn't believe what we could do with the airplane. I've been flying the F-16 lately, and it's a better bomber—but not much better."

Three Guard wings are now flying the LANA (low-altitude night attack) version of the A-7, with a much more modern computer, forward-looking infrared (FLIR) for night vision, and terrain-following radar linked to the autopilot. It turns the SLUF into a true day-night, all-weather attack bomber, a mini F-111 if you will. The other Guard wings expect to receive the LANA mods for their birds in the next few years. And if the people at LTV/Vought have their way, the Air Force A-7s will be further upgraded into an "A-7 Plus" configuration, with a stretched fuselage, the afterburning F-100 engine from the F-16, and redesigned intake and maneuvering surfaces that will permit supersonic dash speeds and greatly enhanced maneuverability. Flight testing kicked

Four Tucson A-7K "tubs" form smartly behind KC-135 tanker. Backseaters are Air Guard tanker boom operators getting a rare chance to view their handiwork from the receiving end.

Stubby A-7 isn't much on looks, but as an attack bomber it stood unequalled until the arrival of the much more modern F-16.

off at Edwards AFB in late 1989, but the shrinking Pentagon budget may doom the effort.

Surprisingly, the Guard A-7 drivers are only lukewarm about the supersonic A-7 Plus idea. The Plus would relinquish one of the A-7D's greatest attributes—its incredible "legs," or range. The current engine, the English-designed Allison TF-41 (not-so-lovingly known as the "Detroit Diesel," even though it's not from *that* Allison), is a high-bypass turbofan that combines great thrust—14,000 pounds without an afterburner—with truly amazing fuel efficiency. Guard A-7s routinely fly two-hour strike missions at Red Flag and break over Nellis with several thousand pounds remaining; many of the other players will have had to tank twice—once right after their afterburner takeoffs and then again coming off the target. "These other guys get real

used to their tankers," says Mike Shira. "What do you think is going to be Target Number One in an all-out air war?"

The A-7 is a great little bomber, but it isn't much of a fighter; it doesn't have that brute-force energy, and it doesn't go around the corner very well. The SLUF drivers do practice ACM, but they usually know better than to try going vertical (not enough poop) or to let things degenerate into a turning fight. The plane has a gun, and it can carry a pair of Sidewinders on rails below the canopy. But its only hope is the snap shot. The SLUF pilots do have their bag of defensive tricks, most of them related to groveling in the weeds and hiding behind terrain features until the bad guys run out of gas, as they almost certainly will before the wily A-7s do.

Air National Guard A-7 outfits are big on de-

Looking better than the day they were built, Colorado ANG Corsairs await their pilots at the biennial Gunsmoke bombing and gunnery competition.


GULF OF MEXICO
500 MISSIONS
YACHT CLUB
OVER MISSISSIPPI
"COMEBACK"
BOWBACK
CV62
CENTURION
500
AMRON 12
1000 HRS
CORSAIR II
A-7E
ECHO-DRIVER
U.S. NAVY
U.S.S. INDEPENDENCE CV-62
MED. CRUISE 1977
CVW
CORSAIR III
HOOK ASSOCIATION

Left: Helmet bag of former Navy A-7 driver who has found a happy home in the Arizona Air Guard.
Above: A-10 Thunderbolt II shows its huge straight wing as it pulls off the target.

ployments; usually every squadron will make a long-distance hop once a year as a real-time test of unit mobilization skills. Some of the units have unofficial colocation bases abroad. For instance, the three Ohio Guard squadrons go with a few of their Dayton-based tankers (someone recently calculated that the Ohio Air National Guard is the world's eighth-largest air force) to England and Germany; Iowa goes to Japan and Korea; the New Mexico Tacos and the Colorado Mile-Highs are part of the Rapid Deployment Force; and the Tucson instructors make a det to Hawaii every couple of years to drink chi-chis and get beat up by the HANG Eagles. And all of the A-7 units take turns manning the six-plane alert detachment in Panama. Treaty provisions prohibit the introduction of more modern fighter aircraft into Panama's U.S. Southern Command.

Baltimore A-10 lugs an infrared Maverick antitank missile on an underwing station.

The Air Guard's other mainstay attack weapon is the amazing Republic A-10 Thunderbolt II. The ugly-airplane rule applies again: It's doubtful that anyone anywhere ever referred to the bird by its given name. Of course the original Thunderbolt was the barrel-chested Republic P-47 from World War II. Back during the flight test program it picked up the nickname "Warthog," and Warthog it's been ever since. The name is all too apt; the jet is so plug-ugly it makes the A-7 look like the Concorde.

But the Hog was well thought out, and it works like crazy. After decades of effort among aerospace manufacturers to design multirole weapons systems, most of them doomed to limited success at best, the folks at Republic decided to build an airplane that would do just one job—close air support of troops in battle.

The Hog was literally designed around its principal weapon, the awesome GAU-8 Avenger cannon. This enormous gun, as big as a car, spews out two-pound armor-piercing projectiles at speeds as high as sixty-five rounds per second. The bullets are filled with depleted uranium, nonradioactive but extremely heavy. The colossal kinetic energy produced by such a heavy round traveling so fast allows the bullet to spall its way through almost any kind of armor plate. The guts of the gun and its 1,100-round ammo drum sit just behind the pilot; the seven rotating barrels poke out of the A-10's blunt nose almost ten feet to the front of the breech.

The gun is incredibly accurate at ranges up to two miles. It is so powerful that there is almost no falloff in trajectory; test tracers streak away from the plane in a laserlike line. The gun is linked

Warthog was literally built around the awesome GAU-8 30mm rotary cannon.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The A-10's twin engines are widely separated to minimize the chance of losing both to a single hit.

Hog lets fly with the big gun. (Author's camera can be seen under the left wing.)

to a dirt-simple gun sight that makes it hard to miss. New pilots on their first gun runs frequently score 90 percent bull's-eyes with no practice. The cannon is so powerful that it blows out almost 20,000 pounds of reverse thrust, about the same as a J-79 engine in afterburner! The plane can actually be slowed to a wing stall if the hammer is held down too long.

The A-10 can also carry a wide variety of ordnance on its nine underwing stations—dumb iron bombs, gliding or laser-guided smart weapons, and Maverick antitank missiles. The Maverick is a sophisticated standoff weapon that is locked onto its target via a television camera in its nose. Once locked up and turned loose, the missile is fire and forget; it will streak down the line toward the doomed image locked in its implacable TV memory. The first Mavericks were electro-optical (EO); they "saw" a conventional image like a black and white TV signal, and they were very susceptible to confusion in rain, fog, or the smoke that's common over a battlefield. Also, contrast-reducing camouflage could readily fool the EO Maverick. The newer versions carry an infrared (IR) seeker head that homes on radiated heat rather than visual contrast, and these Mavericks are far more reliable in real-war conditions. Turning off the tank engine won't be sufficient to dodge the IR Maverick; the nasty little kamikaze can lock onto a vehicle that's been shut off for hours.

The Warthog is a dream weapons platform because of its great aerodynamic stability and slow airspeed. The plane is powered by two big turbofan jets, but its normal speed over the battle area is only 300 knots—slow enough to eyeball ground targets and assure good hits. It has a huge straight wing that affords great low-speed maneuverability. The airplane is far easier and more tractable to fly than most tactical warplanes—so much so, in fact, that no two-seat trainers exist. That's not exactly true: Republic did build one A-10B two-place prototype, in the hope of getting the Air Force to buy it, but when last seen it was moldering away unwanted at Edwards AFB. A pilot's first flight in the A-10 is a solo hop. In fact, some Guard A-10 drivers with extensive active-duty experience in other fighters first jumped into the Warthog after nothing more than a couple of sessions in a simple cockpit switchology simulator.

Right: Bull's-eye! Hog driver yanks bird away from the ground as his practice bomb explodes.

A General Electric mod called LASTE (low-altitude safety and target enhancement), now being fitted to Guard A-10s, is a stability augmentation system linked to the plane's INS and gun sight. It used to be hard to miss a vehicle target; with LASTE it's just about impossible. The mod also includes a talking radar altimeter to help prevent unpleasant contact with the ground, and a CCIP (continuously computed impact point) bombing computer similar to that in the F-16 and A-7.

The A-10's slow speed and multihour loiter ability make it a devastating CAS (close air support) weapon, but these things cut two ways. Speed is life, and slow planes and helicopters make easy targets for ground AAA guns and shoulder-fired missiles. The Hog is going to cut an impressive swath on a mechanized battlefield, but it's going to take hits—lots and lots of hits.

A look at the plane makes it clear that it was designed to absorb battle damage and keep flying. It's heavily armored in key areas of vulnerability, and its pilot sits surrounded by a "bathtub" of titanium steel that can supposedly deflect hits up to 37mm, not coincidentally a popular Soviet caliber. All of the airplane's control systems are triple redundant for extreme reliability. The main wheels retract only partially, like those of the DC-3, so that the plane can plunk down wheels-up. And the two tail-mounted engines are far enough apart that damage to one hopefully won't affect the other.

A-10 rolls away from the Hercules photo plane, an electro-optical Maverick on one side and a newer IR version on the other.

Guard A-10 drivers don't want to wish a war on anyone, but they'd love to see their Hog get a real-life trial. (It came along too late to see service in Southeast Asia.) They're convinced that although the A-10s would undeniably suffer casualties, the ugly hummers would be among the most successful and devastating weapons on the modern battlefield. The weapons-delivery systems, particularly the gun, are potent and accurate beyond belief. And the A-10 is a dirt-simple airplane, with manual controls, minimal electronics, and ultrasimple maintenance procedures; crews practice complete battlefield engine changes in about an hour. Its pilots are used to old-fashioned VFR (visual flight rules) flying by terrain features; there is no autopilot. And the Hog, with its self-starting engines, can operate in and out of unimproved strips or highways, a drill that A-10 squadrons routinely practice in Germany and Korea.

Tom Clancy, king of the military techno-thriller, has given the A-10 more than a few neat licks in his several hugely successful war-scenario novels. In *The Hunt for Red October*, Guard Warthogs based near Baltimore (and near Clancy's eastern Maryland home) readily take on a mission never before attempted: a lengthy open-water strike to menace a Soviet surface fleet sailing belligerently near the East Coast of the U.S. Nary a 30mm round is fired, but one can imagine that the Russians got the message; the A-10's cannon could devastate and even sink most of today's lightly armored naval vessels. In *Red Storm Rising*, the A-10s and their big guns repeatedly shred Soviet armored units advancing across Germany, although their own losses to ground fire are severe. The ravaged Russians, harassed on all sides by the deadly Hogs, come up with their own nickname for the ungainly straight-wing planform: the Devil's Cross.

The A-10 holds yet another ace should we ever become involved in all-out hostilities. America's stockpile of expensive smart ordnance and missiles is so small that in a serious conflict we (and probably the enemy) would be "winchester" in only a few days. For instance, the A-10 can carry six Mavericks, but there aren't enough in the whole American inventory to put a half dozen on every one of the 700-plus A-10s in the Air Force. The Hog's cannon, with bullets that cost around thirty dollars each, will be throwing black trash at enemy troops and armor long after everyone has run out of the fancy stuff.

And then there's the matter of reactive armor. This interesting English invention has been embraced by the Soviets, who are still in love with tanks. The Russian T-80 and other new-generation armored vehicles are festooned with rows of explosive pads that detonate when hit by antitank weapons like the TOW, the Maverick, or rounds from other tank guns; the reactive charge is shaped to explode back toward the incoming round, deflecting its penetrative power and protecting the tank. But the Warthog's GAU-8 cannon deluges the tank with not one round but hundreds in a stream. If one should happen to explode a reactive charge, the others will be along a nanosecond later to exploit the resulting weak spot. It's just a theory at present, but the Guard A-10 guys are anxious to try it out.

There's another new development on the armor front, again from England, known as Chobham armor. This is a complex laminate of a ceramic substance sandwiched between layers of cold steel. America's newest main battle tank, the M-1A1 Abrams, relies on this armor technology,

as does the excellent British Chieftain heavy tank. Chobham armor will turn away the A-10's spent uranium rounds, but even the best-armored tank is still vulnerable to hits from the sides, top, and rear. The Warthog's gun can make salad of any tank's running gear — the driving wheels, treads, and linkages. And a tank that has been stopped dead on the battlefield is no longer a deployable or defensible weapon.

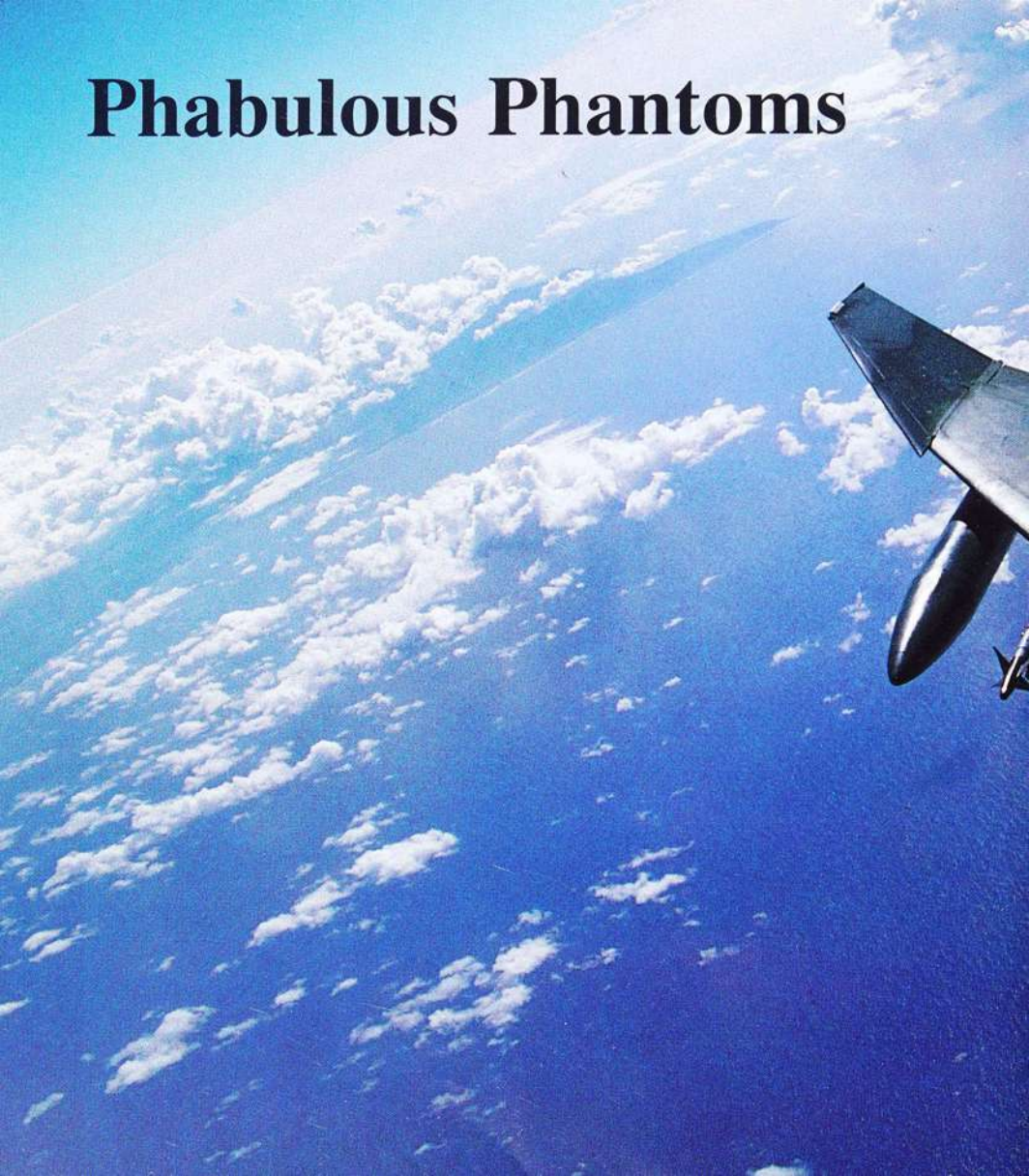
Several Air Guard A-10 wings are switching over to a new mission, from close air support to forward air control. It recently occurred to the Pentagon planners that with the addition of a couple of Fox Mike air to ground radios the A-10 could become the OA-10, the perfect target spotter. Previous Guard FAC aircraft have included the O-2, a militarized Cessna push-pull twin, and the OA-37B Dragonfly, another Cessna bird originally designed as a twin jet primary trainer. Both are thought to be unsurvivable when loitering over the modern battlefield; the last O-2s have been retired, and the OA-37 units are in the process of transitioning into the OA-10. The little OA-37 "Tweet" is actually a relatively competent light-attack bird, able to sling such an amazing amount of junk on its wing stations that you'd swear it couldn't clear the runway. But it's clear that the Warthog will make a much stronger and safer FAC aircraft.

The FACs have traditionally flown low and slow, daring the enemy to take his best shot and expose his position. The FAC then marks the target with some kind of smoke round while talking the circling attack jets onto the target. The only potential problem with the OA-10 FAC is that the heavily armed Hog might just as well blast the target as mark it. Active duty OA-10s training at Davis-Monthan AFB, Tucson, have been doing the obvious: marking targets with the big gun instead of fooling around with 2.75 inch smoke rockets. At the least, the bullets will kick up well-aimed dust, and as often as not the target will be perforated by the hail of bullets the size of Coke bottles. The attack birds can then roll in and finish things off.

The active Air Force has a dim opinion of the A-10s; it's always been biased in favor of high flying gray fighters instead of any sort of camo green mud mover. Look for many, many more of the active A-10s to be moved into the Air Force Reserve and the Air National Guard, as the active boys pursue their dream of turning the speed of heat F-16 into a battlefield interdiction bomber. They'll be missing a great bet: If any balloons go up, the amazing Warthog will be a major player, flying and fighting long after more cosmic systems have gone tits up. The Guard is lucky to have it.

The view the Warthog no hostile grunt ever wants to see.

Phabulous Phantoms



It has been a staple of free world military aviation for a quarter century, and it's nearing the end of its useful life as a viable weapon. Still, there remains no more stirring sight and sound in all aviation than an F-4 Phantom taking off in full zone V afterburner, twin gouts of flame lashing out half a plane length behind the huge exhaust nozzles.

The Air National Guard is one of twenty friendly (and a few not so friendly) air forces still operating the McDonnell Douglas F-4 Phantom in a number of variants and missions. Like most branches of the U.S. military, the Guard is on the way out of the Phantom business; the plane will see ANG service for only a few more years. The Navy and Marine Corps have already left it completely behind, except for a couple of forlorn Marine Reserve squadrons, and the active Air Force will undoubtedly follow in the early nineties.

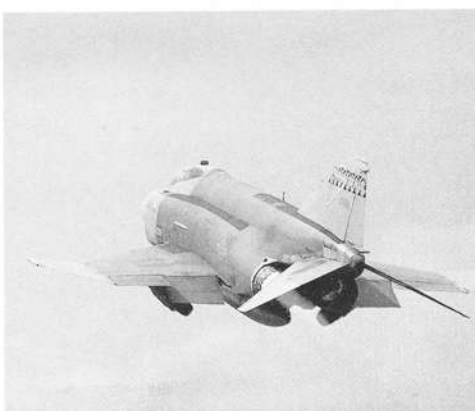
Eleven Air National Guard wings are flying Phantoms in ten states. Six fly the F-4D and F-4E fighter-bombers with a mission profile that is roughly 60 percent air-to-mud and 40 percent fighter tactics. The other five units operate the RF-4C, the tactical reconnaissance version that is armed only with its tremendous low-level speed; it's able to make intelligence-gathering passes over the battlefield at altitudes of only a few feet and speeds beyond Mach 1. If everything goes as planned, the bad guys will see nothing of the RF-4 but its two glowing tail pipes in the distance.

Previous pages: Chicago-based KC-135 tanks an Illinois ANG F-4D Phantom during a trans-Pacific deployment.

The Guard has enjoyed a highly successful decade of Phantom employment; the big jet, known more often than not as Double Ugly or the Rhino, is well suited to Guard talents because it takes lots of experience to fly it well, use it well as a weapons platform, and keep it up and flyable. The new teen generations of fighters replacing the Phantom are expensive and complex in the extreme, but they have enormous advantages that outweigh the downside. In the first place, of course, they are a whole lot more capable in the fighter, attack, and recon roles than the F-4—that should go without saying. Other advantages are less obvious at first blush.

For my money, the biggest plus among the teen fighters is their ease of employment; in other words, they're flat-out easy to fly. I get to dabble

Hawaii has traded its F-4Cs for newer Eagles, so Hickam no longer suffers the aural abuse of the Phantom in full zone V takeoff mode.



Oregon ANG Phantom positions itself below KC-10 tanker for top-off.

Great-looking helmets worn by Texas Air Guardsmen at Ellington AFB, Houston.

in the backseat on most of my photo hops, and as a result I have a few hours' stick time in something like seventy-five different military types, including the Phantom and the Air Force teens. One doesn't have to be a rocket scientist, or a fighter pilot for that matter, to notice the difference. The highly automated F-15, F-16, and F/A-18 give the pilot no end of help with the basic stick-and-rudder side of flying; in fact, you can practically forget the rudder pedals and fly with your feet flat on the floor in the F-16 and F-18.

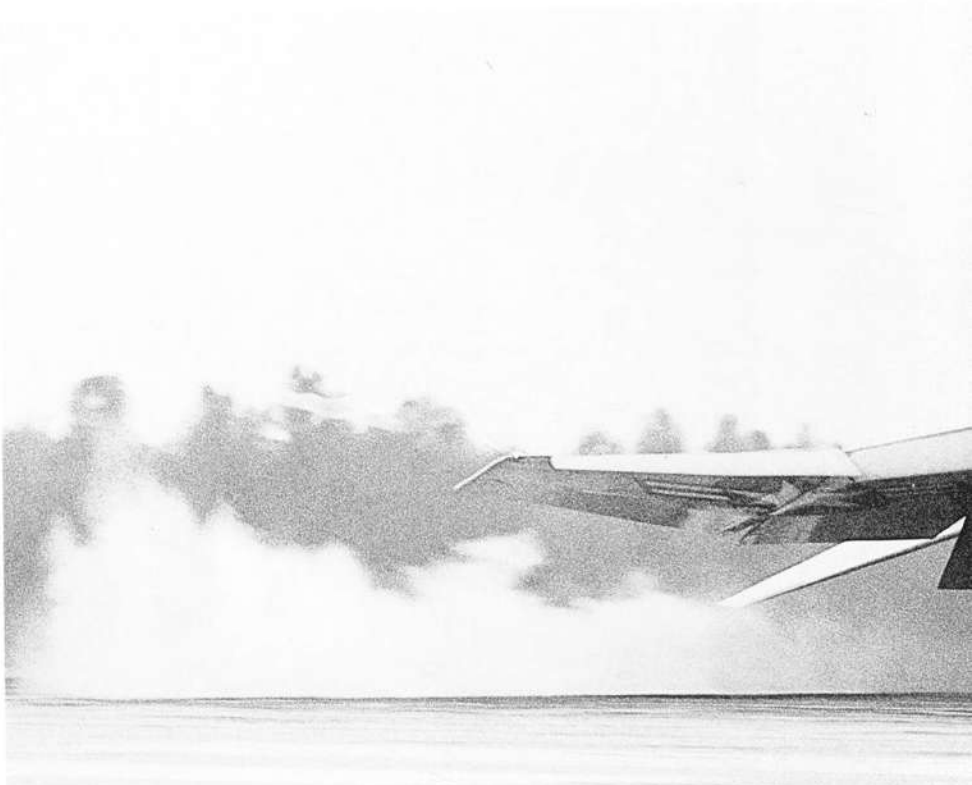
Coordinated turns, with the little ball centered, are the bane of the student pilot's first few flight hours; in these jets, it's almost impossible to crank out a turn that isn't coordinated. The right things just seem to happen by themselves in these airplanes. It's hard to explain, but any private pilot could take the controls in one of the teen fighters

and he'd see immediately what I'm talking about.

Not so with the Phantom, pal. It was the third or fourth try with the backseat stick before I finally got the airplane to settle down on a heading and altitude. On my first ride, in a Birmingham Guard RF-4, I was all over the sky for a half hour, sweating like a diamond miner and almost wearing a hole in my right Nomex glove from working the thumb trim on the stick—and that was just to get us out to the area at our assigned altitude and vector! Pilot Tom Sabo actually complimented me after the hop on my "good hands," high praise indeed in the fighter pilot's world. I'm pretty sure he was kidding.

Falcon and Hornet pilots barely out of basic pilot training, some with only 500 hours of total flight time, can fight, strafe, and bomb very convincingly in these amazing jets; a guy can get really good in them that fast. In the F-4 it takes years to make it talk. There aren't any shortcuts.

Attractive air defense paint scheme favored by Phantom phlyers at Montgomery, Alabama.



And then there's the usually unpleasant subject of maintenance. The F-4 simply wasn't designed with ease of maintenance in mind. The new fighters are loaded with modular black boxes (they're really gray most of the time) that contain all the secrets of their cosmic abilities. The various elements of the flight-control, weapons, navigation, radar, communication, and engine-monitoring systems can be pulled out and replaced in minutes if a glitch shows up. The Phantom unfortunately preceded this quantum leap in solid-state technology. Need to change a comm radio in the Phantom? Start by removing the ejection seat. No, I'm not kidding. You get the idea.

"Happy Hooligans" F-4C drops in for William Tell meet lugging an SUU-16 pod cannon under the wing. Only E-model Phantoms have an internal gun.

Guard F-4s, all of them more than twenty years old and many of them bearing the scars of Vietnam combat, need an average of forty-odd man-hours of maintenance for every hour flown. The figure for current F-18s is about a fifth of that. Of course they're a lot newer, but that's only a partial explanation for the huge difference. In a sense, then, the Phantom is a perfect Guard jet, because the Guard is famous for its legions of high-ranking enlisted [illegible] nance types who can frequently

boast a decade and more of experience working on the very same airplanes. There is no doubt that the ANG Phantoms are the Air Force's best-kept-up F-4s; even active-duty maintenance officers would grudgingly agree. A pilot with the 196th TFS Grizzlies, California ANG, couldn't keep from boasting about their recent one-month deployment with twelve F-4Es to Osan, Korea, for the annual Team Spirit exercises. Their jets shared the ramp with twenty-four active-duty F-4Es out of Clark AFB in the Philippines. During the month-long mock war, the Guardsmen put up more total sorties with their dozen planes than the actives could manage with twice as many. To rub it in, the Air Guard maintenance types offered to give the Clark boys some help with their jets, passing on their favorite Phantom maintenance tips.

The Phantom is tough to keep up, but it can still do the job. The latest and most sophisticated

A look at the whizzo's office in the F-4D.

Guardsmen load live air-to-air missiles—four Sparrows and four Sidewinders—onto F-4s at William Tell.

variant, the F-4E, boasts several major improvements over the C and D models. The E can be easily identified by its elongated nose, which contains a much-improved radar and an internal M-61 Gatling gun. Earlier Air Force Phantoms, and all Navy versions, were built without a gun, although a pod-mounted cannon was often carried on the centerline. The F-4E is also a much better fighter than its predecessors, with its stronger GE J-79-17 engines putting out almost 5,000 pounds of additional thrust and its automatic maneuvering wing slats that bend it around the corner a lot more tightly. The E's carry the Pave Spike laser designator, which is used in conjunction with smart air-to-ground ordnance.

More modern fighters can give the Phantom an awfully rough time in a dogfight, and that's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probably as it should be: After all, the original F-4 blueprints date from the mid-1950s. But it still carries a secret weapon that has been all but abandoned in the new-generation teen birds. He's known as the pit boss or the GIB—short for guy in back—although his official title is weapons systems officer. At the very least the whizzo is another pair of eyeballs in the fight, not an inconsiderable element in itself. The norm for Phantom fighter crews is to divide the heavens into two hemispheres, with the pilot looking out forward of the imaginary "three-nine line" through his shoulders, and the whizzo taking the rear quadrant. But beyond his duties as a lookout, the backseater can make a big difference in the employment of the F-4 as a bomber and a long-range aerial interceptor. His office contains the radar, the weapons-release computer, the laser designation system, and the inertial nav system. He'll usually handle routine radio communications as well.

Ironically, as the Guard moves away from the two-seat fighter—the F-15 and F-16 units usually have a couple of two-seat "tubs," but they use them only for certification and training—the active branches are moving gingerly in the reverse direction. The Air Force is now fielding the F-15E dual-role Strike Eagle, a battlefield interdiction fighter-bomber that will take over some of the long-range ground-attack duties of the aging F-111. The Marines are moving toward a mix of single-seat fighters and two-seat bombers in all

Beautifully maintained Oregon F-4Cs over the Columbia River.

One of the most exciting sights and sounds in all aviation—a Phantom in full takeoff heat.

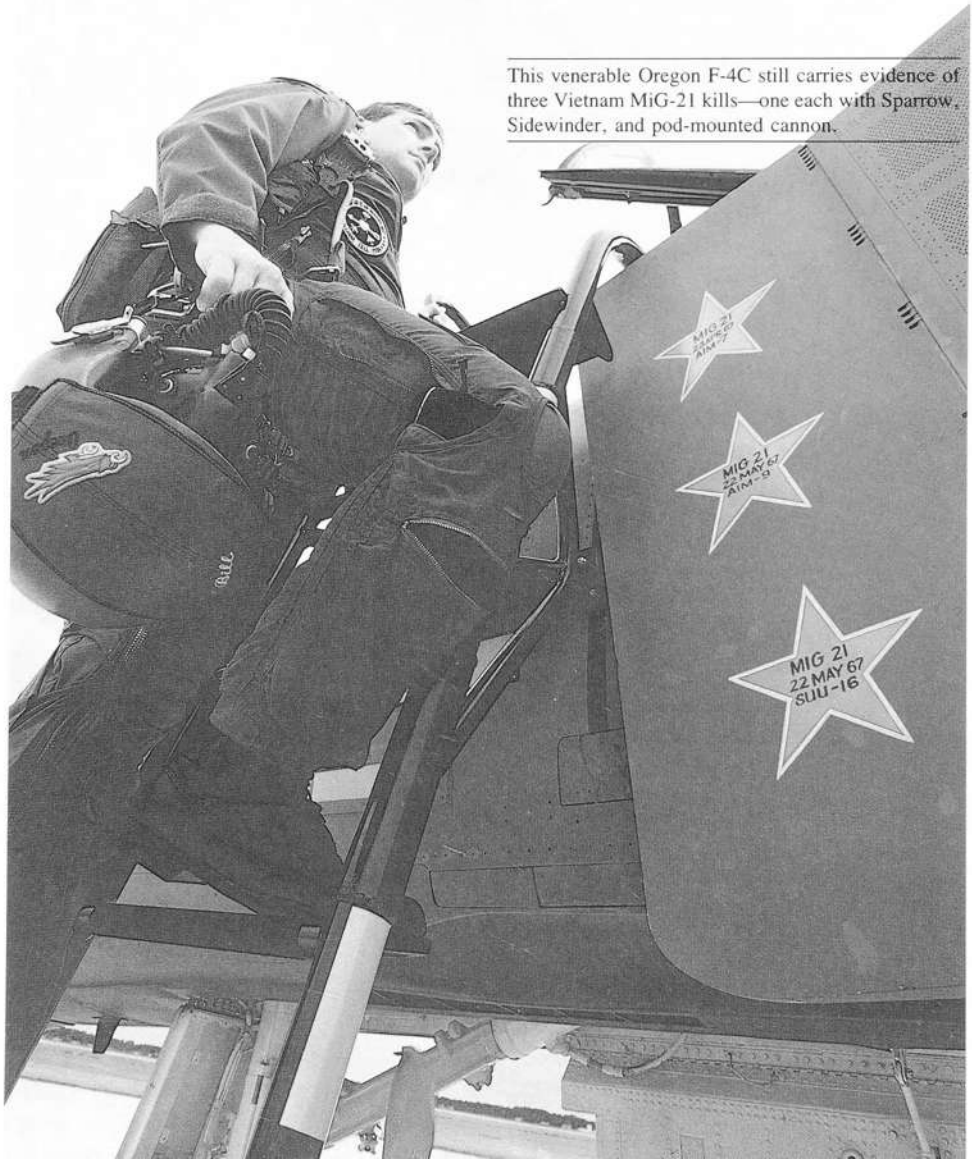
of their F/A-18 Hornet squadrons. And the Israelis, who have a pretty good real-world grasp of what works and what doesn't, bought the majority of their American-made F-16s with a backseat set up for a combat bombardier. Most Phantom pilots feel that a good backseater is invaluable, and they admit to missing him when they switch over to the single-seat teenagers and get a taste of the incredible work load in these new jets.

The Phantom has two decades of remarkable soldiering under its belt, and Phantom stories are rife in the worldwide F-4 community. I even have a few of my own to sling around. I've lucked into a total of about ten hops in various F-4s and RF-4s, most of them Guard birds; although I've enjoyed lots of great rides in the most modern fighters, I can safely say that I've never had more airborne fun in any other military type.

The big Rhino somehow lends itself to gonzo, hair-on-fire flying. In Hawaii, back before the HANG boys traded in their F-4Cs on their Eagles, I went along on an air-combat 2 V 2. I did a pretty respectable job of flying on the way to the area, and my pilot asked if I'd like to take a crack at our opponent the next time he flashed by. Why not, I figured, without having the faintest idea what to do. Don't worry about it, said the front-seater; just wait until he goes past and then hammer him. What the hell. He cooked by, at a combined closure speed up around 1,000 knots, and I threw subtlety to the breeze—throttles into full burner, stick hard left, and a little bit of nose-low for want of a better idea.

We screamed around the bend, me looking like crazy for my bad guy. I never even felt the seven-plus g's that had made me so miserable on other fighter hops. When we slid through the sound barrier on the way down, my unnerved pilot

Montana Sixes take turns on the pipe with a "Happy Hooligans" F-4C out of Fargo, North Dakota.



This venerable Oregon F-4C still carries evidence of three Vietnam MiG-21 kills—one each with Sparrow, Sidewinder, and pod-mounted cannon.

thought better of this little adventure and took over the controls. Relax, he said; this is only a game! And the bad guy? After the first pass I never saw him until we were forming up for the landing break.

A few months later and I was up on a 4 V 4 against some active F-15s. I went in a ninth ship, ostensibly to take photos for this book. I was with the oldest guy in the squadron, a twenty-year Phantom vet only a couple of weeks from retirement. We'll just get our shots, tank with you guys, and then RTB (return to base), he said languidly in the brief. I should have gleaned from his tone that he had something else in mind.

The photography and refueling went fine, and we pulled off the tanker, supposedly to fly home, while the other guys headed into the area for their fight. But my wily driver had other plans. He pushed up the speed and blasted around the side of the fight; we hurtled through from the far corner, speed up around Mach 1.4, with the amateur

HANG Eagles join visiting Springfield, Illinois, F-4Ds at the gas station.

backseater calling shots on everything that blipped on the radar.

Oh, but the Eagle hotshots were pissed off in the debrief! My Vietnam-vet pilot felt obliged to remind the active youngsters of the tale of Colonel Tomb, the notorious Communist ace credited with some thirteen American kills, who used to tag along solo behind North Vietnamese four-ships in search of American wise guys who weren't expecting the unexpected. I think the lesson stuck.

Speaking of Communist aces, Guard F-4C jocks out of Portland, Oregon, recently scored a truly amazing first when they gave a backseat ride to Russian MiG-29 test pilot Roman Taskaev at Airshow Canada 1989 near Vancouver. The Russians, the new darlings of the international trade show circuit, had been talking for months about trading rides in their Fulcrums for some hops in fourth-generation American fighters. Negotiations went on all weekend at the Abbotsford show, but the American and Canadian pilots were ultimately unable to secure the necessary permissions for the epochal switcheroo. Thunderbirds boss Steve Trent spent hours haranguing Air Force higher-ups on his portable cellular phone; he wanted in the worst way to offer a ride in his plain vanilla F-16B two-seater in return for a crack at the Fulcrum. But in typical Air Force fashion too many brass hats got into the loop, and at least one said no way. So much for that idea. Trent was furious at the thought of this astonishing opportunity slipping away, but orders are orders. The gentlemanly Russkies even offered a Fulcrum hop without a trade, but Trent felt that that was patently unfair.

Enter those wild and crazy Guard bums from Portland, present at the Abbotsford show with three Vietnam-vet F-4Cs. While the Thunderbirds

California F-4D unit at March AFB will soon transition to the OA-10 Warthog FAC.

CO was still burning up the phone wires, Maj. Bill Jorgens stuffed Taskaev into a borrowed g suit, gave the test pilot a quick ejection seat brief, and stuck him in the pit for their earsplitting flight demo before a crowd of 125,000 people. In yet another ironic twist, the old jet chosen for Taskaev's wild ride bore a big red star on its left flank, painted there to commemorate the downing of a North Vietnamese MiG-17 in 1967. The Oregonians capped off the afternoon by popping a few post-flight beers and inviting the Commies to come down to Portland with four Fulcrums to try out a little American-style ACM! Language posed a bit of a barrier, but I think they accepted. In the immortal words of Bette Midler, "Who woulda thunk it?"

Air Guard F-4D and F-4E units with fighter-bomber missions anticipate conversion in the next couple of years to either the F-15, the F-16, or the A-10. Undoubtedly the last ANG Phantoms will be the recce variants, the unarmed RF-4Cs. If the Air Force has a follow-on tactical reconnaissance aircraft in its future, it isn't talking; the RF-4 is going to have to hold down the job for some years to come, in the active Air Force, the Marine Corps (they fly the RF-4B model without dual flight controls), and the Air National Guard.

The RF-4 mission is simple and hair-raising: Make a single mad dash across the battle area, as low and fast as possible, to gather photographic intelligence on enemy positions, capabilities, and battle damage. In the windowed chin beneath the recce Phantom's elongated nose are several camera systems rigged to fire simultaneously during the high-speed pass. A couple of them shoot relatively conventional black and white film through lenses ranging from three inches to eighteen inches in focal length; they can be set up to take matched photogrammetric images straight

MiG-29 test pilot Roman Taskaev joins Portland, Oregon, Guardsmen after history-making Phantom ride at Abbotsford, Canada, air show.

down, panoramic shots as wide as 180 degrees, or high-speed snapshots at oblique angles. Recce units have their own personnel waiting back at the base to develop the film, produce large prints, and then analyze the often conflicting information that the images contain.

Also mounted up front is an infrared land-scanning camera, which produces a digitally assembled image. This camera records information beyond the human visual spectrum; it can detect patterns of latent heat, human movement, and recently turned earth in all weather, night or day. In a unique peacetime use of this system, a two-ship of RF-4Cs of the 152d TRG High Rollers out of Reno recently assisted the FBI in their search for several missing children in the foothills east of San Francisco. The jets made several photo runs over an area where informants had indicated

the children's bodies might be buried; film from both the conventional and infrared cameras was then examined for signs of disturbance in the ground. Unfortunately, no conclusive evidence emerged.

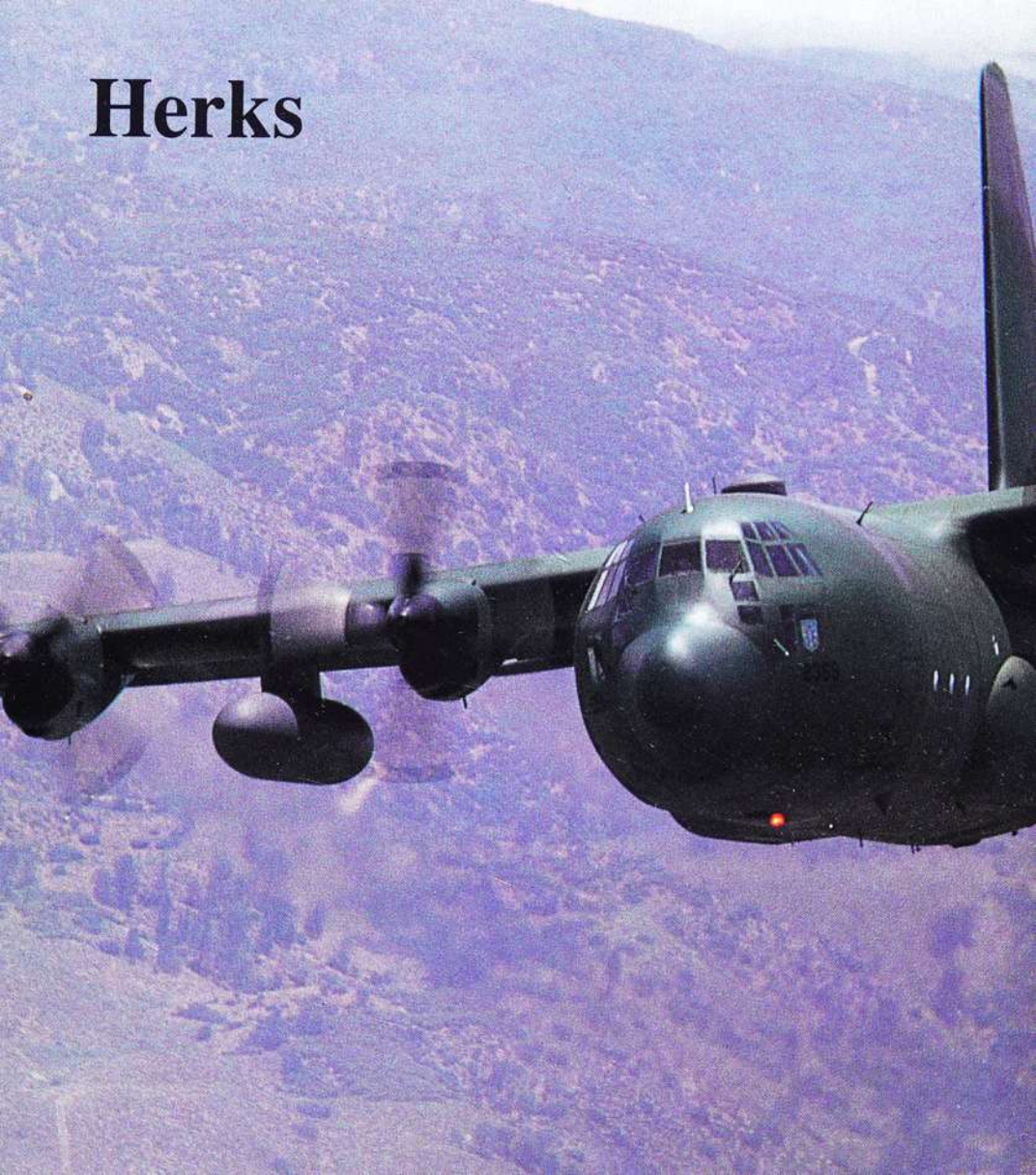
The RF-4C is normally unarmed except for some defensive trickery: terrain-following radar, chaff and flares to ward off antiaircraft missiles, and the tremendous low-altitude dash speed of which a clean Phantom is capable. The jet can easily exceed Mach 1 on the deck, a feat that the newer teens have trouble matching. If the recce crew plans and executes its mission correctly, the enemy ground gunners will be left contending with nothing but a world-class sonic boom. The RF-4 can carry Sidewinders on underwing rails, and Guard recce squadrons do practice ACM within their units and with dissimilar adversaries. But normally there will be no dallying and dicing over a high-threat battlefield; the drill is in and out at the speed of thought. The tactical recce motto says it all: "One pass and haul ass."

The Navy and Marines are moving away from dedicated, one-mission recon aircraft, switching over to various pod-mounted recce systems that can be hung on fighters or bombers. Air Guard reconnaissance units will probably head in the same direction in the early nineties. The latest of these systems have a huge technological advantage: They can transmit their information digitally to ground stations in real time, rendering their intelligence usable only seconds after the mad dash. No more waiting for the plane to RTB; no more waiting for the film to be souped, printed, and delivered to the combat intelligence types.

The F-4 Phantom in its various configurations has been the standard Air Force workhorse since the early sixties, but its days are clearly numbered. Tears will indeed be shed when the last Guard Rhino heads off to the Tucson boneyard, there to be mothballed, converted into a remote-controlled target drone, or stuffed and mounted on a display pedestal. But let's face it: The new-generation jets are hotter fighters, more accurate bombers, and easier machines to maintain, as they damn well should be. Dick Nester, director of operations of California's F-4E outfit and a 3,500-hour Phantom pilot, spoke to that point: "Sure, we'll all get drunk and tell stories at the last-Phantom party, and I'll be leading the way. I've flown it for twenty years; I went to war in it; I wouldn't have missed it for the world. The ugly sonovabitch has been very good to me. With a good crew it can still kick its share of butt, especially the E model. But if I can switch into a better, more modern jet, I'm outa here in a minute. That little F-16 has beat me up a few times, and I'm ready to be on the other end of that argument."

A "Recce Rebel" out of Birmingham, Alabama. Recon Phantoms can be spotted by chin bulges and camera ports in the nose.

Herks



If the Air National Guard can indeed be thought of as a self-contained air force in its own right, it is only one of some sixty around the world that operate the amazing Lockheed C-130 Hercules. The stubby turboprop, one of a handful of truly classic aircraft designs in all of aviation history, has been in continual production since 1954, and the assembly line will undoubtedly remain open for business into the next century.

The Air National Guard operates a very large chunk of America's 2,000-odd Herks. A total of twenty-three wings and groups in eighteen states fly variants of the bird, and their missions range far beyond typical trash hauling. Several tactical airlift outfits are cross-trained and equipped to operate as fire bombers; their aircraft can be quickly rigged to carry and spray several thousand gallons of chemical fire retardant per hop. Units from Wyoming and North Carolina joined their California colleagues in fighting immense fires in that state during the summer of 1988. Civilian-contract firebombing crews, at first unnerved by this incursion of military equipment and talent onto their turf, were later unsparing of their praise for the capabilities of the big Guard planes and their highly experienced aircrews.

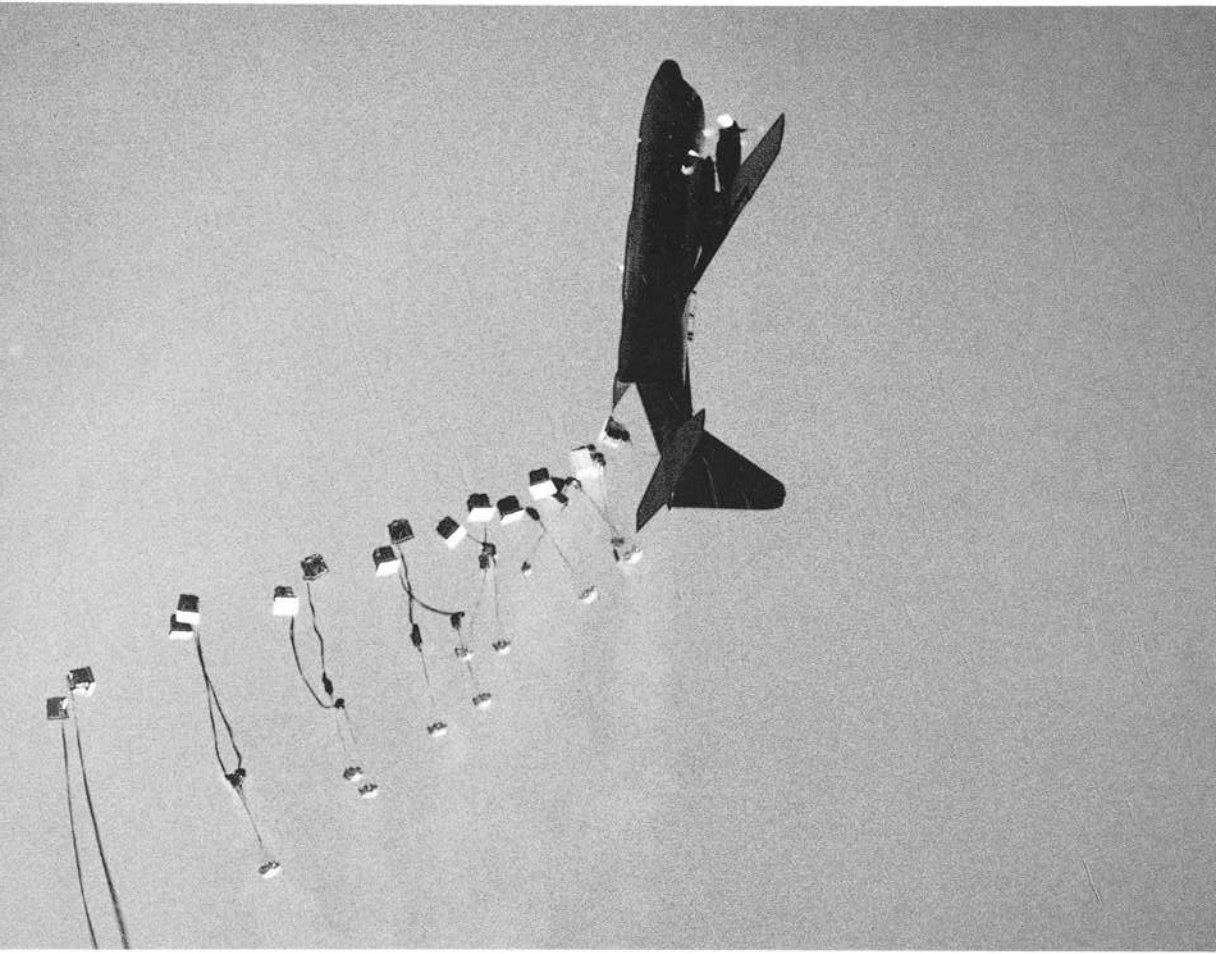
Other Guard units stretch the acknowledged war-fighting abilities of the Herk in several intriguing directions. The 109th Tactical Airlift Group flies the defense department's only ski-equipped LC-130Hs out of Schenectady, New York, in support of American and European scientific expeditions on the Greenland ice cap and

Previous pages: California ANG Hercules out of NAS Pt. Mugu.

Odd antenna fins identify EC-130 Psyops Hercules, shown here in low-level pass near Harrisburg, Pennsylvania. *Photo: MSgt Wayne Isett, PA ANG.*

elsewhere in the far north. These snow bunnies made their first flight to Antarctica in January 1988, a familiarization deployment (they've been down under, and I do mean down under, several times since) to prepare them for assumption of all Antarctic resupply and SAR missions in the early nineties. These flights have been handled for many years by Navy-crewed Herks on loan to the National Science Foundation, but the Air Guard will soon carry the ball with rotating detachments out of Christchurch, New Zealand.

Another unusual mission is handled by the 193d Special Operations Group in Harrisburg, Pennsylvania. Four of their eight EC-130E Herks are equipped as the free world's only flying broadcasting stations. The birds are crammed with



Above and previous page: Herks demonstrate LAPES (low-altitude parachute extraction) techniques at different altitudes.

transmission equipment that can broadcast live, real-time radio or television. One of these Coronet Solo II aircraft made a number of psyops flights in support of Operation URGENT FURY, the rescue mission on the Caribbean island of Grenada in 1983.

The remaining four Harrisburg Herks are set up for another semisecret mission, this one code-named Comfy Levi. A slide-in crew module converts the plane into an airborne emergency reaction system staffed by operators from the Electronic Security Command. Order-of-battle information can be gathered and updated from this flying listening post. All of these electronic Herks are set up with the Dash-15 engines found on the newest H models, and they carry large redundant generators on each engine to provide

the millions of watts of juice required. The planes can also be refueled in flight from Air Force KC-135 and KC-10 tankers.

The 193d has long had the reputation as the most-deployed outfit in the Air National Guard; no one in the unit could remember the last time all eight Herks shared the ramp simultaneously. Their services are much in demand for multi-branch exercises in Europe, Central America, and the Far East.

Speaking of Central America, the Guard constantly rotates a quartet of Herks through Howard AFB, Panama Canal Zone, in support of the U.S. Southern Command. This deployment, run directly by the Joint Chiefs of Staff and code-named Volant Oak, taps Guard airlift wings all over the country for support. A companion Guard program, Coronet Cove, provides similar rotating contingents of A-7 Corsair attack jets for air de-

Herk shows unmistakable high-wing form in this head-on view, taken from the open ramp of another C-130.

California ANG Herks spend the majority of their tactical training hours over the nearby desert ranges.

HC-130 SAR (search and rescue) Hercules refuels HH-3 "Green Giant" helicopters via hose and drogue.

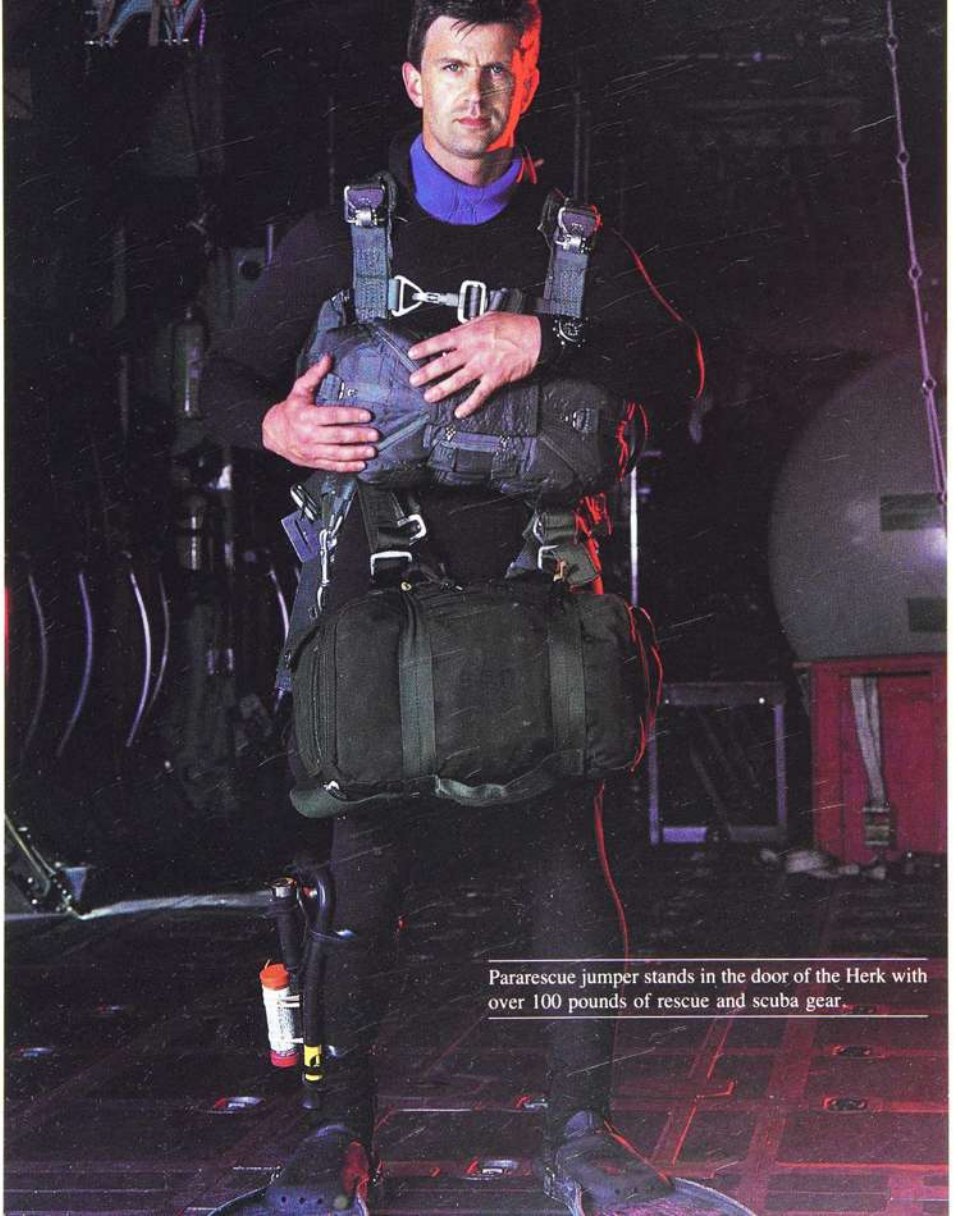
fense in the canal zone. The increasing hostility and harassment directed at American forces by Panamanian dictator-criminal Manuel Noriega have rendered these dets ever more nerve-racking in recent months.

Even the plain-vanilla Guard transport wings, tasked to the Military Airlift Command, take on their share of down-and-dirty combat training. Herk crews practice tactical employment of the airplane—takeoffs and landings on small, unimproved strips; LAPES (low-altitude parachute extraction) supply runs; precision combat drops of airborne troops; yanking and banking at sagebrush level to avoid SAMS and aerial attackers. I've flown at one time or another in practically every military jet with more than one seat, and I don't mind admitting that I've gotten sick in

Old HH-3 Green Giant will soon be replaced by much more capable MH-60 Pave Hawk.

most of them. But if I had to single out the roughest, most terrifying hop of all, it would have to be a three-hour Herk ride over the sizzling California desert. The order of the day, between jarring short-field landings on various dry lake beds, was avoidance of some Guard Phantoms tasked to shoot us down. They ultimately got the goods on us, but the Phantom drivers admitted in the debrief that we had presented a much tougher target than they had expected. We seemed to spend most of the afternoon sideways, alternating positive and negative g's with abandon, not once climbing above 300 feet AGL with mountains on all sides. I couldn't walk straight or think about eating for a day and a half.

The Guard's two Aerospace Rescue and Recovery Groups, one based on Long Island and the other in northern California, fly modified Herks



Pararescue jumper stands in the door of the Herk with over 100 pounds of rescue and scuba gear.

on some of the most complicated and compelling missions in the whole American military. Like many Guard outfits, these groups have regular responsibilities in the civilian sector as well as their military duties. Their specialty is the difficult rescue: The more dangerous and complicated, the better. These units trace their evolution to the vaunted Air Force SAR outfits in Vietnam. In fact, they still operate the rescue workhorse of Southeast Asia, the HH-3 "Jolly Green Giant" helicopter; the old bird is a bit tired and outclassed, but it's still doing the job. The current Guard Jollies have been modified with aerial refueling probes, and their companion HC-130Ps carry dual refueling tanks and reels under their wings.

The two ARRG groups are more or less on constant alert for the unusual rescue mission, and both have had their share. The aircrews of the Herks and Jolly Greens are chauffeurs for a small

Baltimore-based C-130 crew chief SMSgt George Warfield gets traditional ice-water dousing from fire truck after retirement flight. Warfield put in forty-two years aboard various MAC transports.

HC-130 SAR rescue bird honks into steep turn over disabled vessel.

group of specialists who are probably the most highly trained and motivated professionals in the entire Air National Guard. They're known as pararescue jumpers—PJs for short. These enlisted Guardsmen, most of them full-timers in their units, are intensely trained as precision parachutists, open-water divers, and emergency paramedical technicians; they are also trained as worst-case survivalists, able to make light of the most inhospitable desert, mountain, cold-weather, and jungle environments.

The various military branches each have their magnum-caliber snake eaters: the Navy SEALs, the Army Green Berets, the Marine recon boys. The Air Guard PJs, and their colleagues in the active and reserve Air Force, are easily on a par with these zombies, and they might even go them one better. Their training regimen makes Marine boot camp look like a two-week vacation at Club Med.

First comes an indoctrination course at Lackland AFB in Texas. It's eight weeks of physical and mental hell, almost twenty-four hours a day. The victims can expect to run miles every morning, swim countless hundreds of laps, and crank out thousands of push-ups, all while enduring the constant psychological torment of the most monstrous drill instructors this side of the Foreign Legion. The washout rate for the course normally exceeds 90 percent!

The six or seven graduates—the classes start with seventy-five hopefuls—go on to even more intense training. There's the four-week combat

Ski-equipped LC-130s visit Greenland and Antarctica from their Schenectady, New York, base. *Photo: Don Hudson, NY ANG.*

divers' school, run by the Army Special Forces in Key West, Florida. Then it's up to the mountains of Washington State for aircrew survival school—another four weeks chowing down on savory insects and experiencing a harrowing session in an all-too-realistic POW camp. Next comes Army jump school, three weeks at Fort Benning, Georgia. I still have nightmares about my jump training in 1963, but to hear the PJs tell it, this is a vacation compared to the four months that have gone before. Their training winds up with a six-month emergency medical education at the pararescue center at Kirtland AFB in New Mexico. Of course, the rescue units continue the training of their new arrivals in the specifics of their missions, techniques of high- and low-altitude precision parachuting, and basic aircrew qualification in the Herk and the Jolly.

Each of the Guard rescue groups has about twenty PJs on the roster; most are full-time Guardsmen who work a full week and share a twenty-four-hour call-up schedule for emergency runs. They practice their exotic skills constantly; they normally kick off the workday with three hours of running, swimming, and pumping iron. You might think you're in pretty good shape until you start hanging out with these guys.

Let's fly a typical rescue mission with the PJs and aircrews of the 129th ARRG, based at NAS Moffett Field in California, a Navy facility famous as the base of the immense dirigible *Macon* in the years before World War II. The unit works out of one of the three gigantic hangars built to house the *Macon* and her sister nonrigid blimps. All around are the noisy comings and goings of a hundred P-3 Orion subhunters, the principal tenants of this historic base.

The word comes in just after two in the morning, relayed to Moffett from the national Rescue Coordination Center at Scott AFB near St. Louis. An oceangoing tug has suffered an engine-room explosion; the 150-foot ship is dead in the water some 600 miles due west from San Francisco. Three crew members have been seriously burned; another has suffered smoke inhalation and a mild heart attack. Only the tug's captain speaks English; he's radioing frantically for assistance.

Two hours later, an HC-130H roars out of Moffett, carrying a crew of five, a flight surgeon, and three pararescue jumpers. If the navigator does his job, the Herk should come upon the burning tug shortly after sunrise. Like Lindbergh sixty years ago, the Herk crew relies on dead reckoning and an occasional star shot with an old-fashioned nautical sextant. What, no INS? The boys could just dial in the ship's reported position, punch in a few waypoints, and flick on the autopilot. Sounds great, but it's a few years down the road; all Guard HC-130s will receive up-to-date inertial nav setups when they go in for overhaul.

Fortunately our nav is on the stick; we pick up the boat on radar from about a hundred miles out, and from there on in it's a snap. The tug crew has a lifeboat in the water, waiting to pick up the three PJs. After a quick observation pass over the tug, it's time for the PJs to lumber out of the left paratroop door, each carrying more than a hundred pounds of scuba gear, parachutes, radios, and medical supplies.

After a few minutes, the PJs report in from the boat on VHF radio. The flight surgeon hooks up his headset to get in the loop. The word from below is grim: two critical burn cases, one man less seriously injured, the elderly first mate unconscious after an apparent heart attack. The PJs set about stabilizing the patients, with the doc

coaching and prescribing over the VHF.

Now the rest of our rescue team checks in on the long-range HF radio net. An HH-3 Jolly is on the way, accompanied by an HC-130-P tanker loaded with 70,000 pounds of fuel. Two more PJs are aboard the chopper, and another flight surgeon is on the tanker. When they arrive on the scene, after a five-hour flight, the first Herk will head back toward the beach. The Herks can refuel the choppers, but they can't refuel each other.

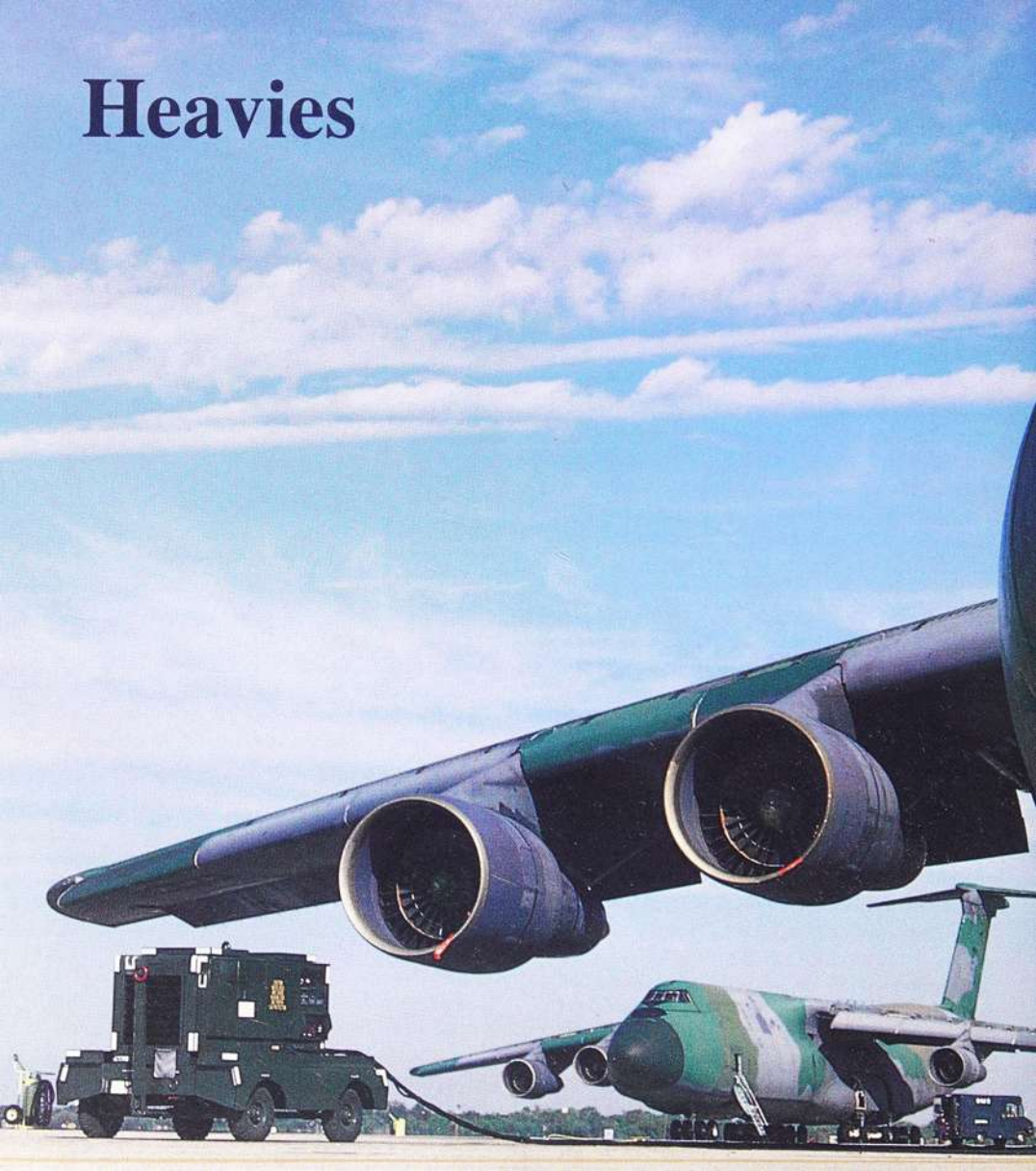
Soon the HH-3 is hovering over the burning tug; it has completed two in-flight refuelings on the trip out, but it's now low on fuel, the better to handle some tricky sling work. The PJs winch themselves down to the tug with several Stokes litter baskets, and soon the critically injured victims are being brought up one at a time into the Jolly. Three of the PJs accompany the victims back while the others remain aboard the stricken ship. The copter and tanker climb out on an easterly heading, ahead of them a five-hour flight to the Army's Letterman Hospital at the San Francisco Presidio. First order of business: Plug into the bouncing basket for another 3,000 pounds of jet fuel, since the twin-turbine Jolly is almost down to the fumes.

Soon the patients are being off-loaded at Crissy Army Airfield adjacent to Letterman; the Jolly then turns south for the thirty-mile hop back to Moffett. The big helicopter settles at home base around six in the afternoon; its two pilots have been flying without relief for more than twelve hours. Much as they love their rock-solid Jolly Green Giant, they're looking forward to taking delivery in 1990 of the state-of-the-art MH-60 Pave Hawk, the Air Force SAR version of the Sikorsky Black Hawk troop helicopter. It will make their jobs a lot easier, what with lots more power, stability augmentation, and a coupled autopilot.

Noble Herks will undoubtedly see Air Guard service well into the 21st century.

Our sample rescue mission may sound excessively arduous; it was not. In June 1988 the 129th pulled off a similarly tough at-sea rescue, except there were six burn victims rather than three, and the burning tug was almost 1,200 miles west of Moffett—more than halfway to Hawaii. It is thought to have been the longest overwater rescue in the history of American military aviation, but it was just a walk in the park for these amazing combat SAR professionals. Still, as any of them would cheerfully admit, it would have been mission impossible without the capability, flexibility, and dependability of the amazing C-130 Hercules.

Heavies



On 12 December 1988, a powerful earthquake devastated thousands of square miles of Armenia, a Soviet republic in the southwestern USSR. As earthquakes go, this one was sizable but not enormous; the 1989 San Francisco quake was more potent. Yet the damage in Armenia was colossal. Whole cities of substantial size were little more than dust, and tens of thousands of people were dead, injured, or trapped beneath millions of tons of rubble.

As a function of warming relations between the United States and Russia, the American people showed an instant and heartfelt willingness to help out, and the Soviets were atypically quick to accept offers of assistance from the West. Air Force transport aircraft were diverted from other missions to fly personnel and supplies into Armenia as rapidly as possible.

The first U.S. Air Force aircraft to arrive on the scene, and undoubtedly the first Air National Guard plane ever to land in the Soviet Union, was a C-141B Starlifter from the 172d Military Airlift Group, Mississippi ANG, based in the state capital of Jackson. At the time of the quake the aircraft was in Europe on a cargo mission for the Military Airlift Command; it was quickly diverted to Incerlik Air Base in Turkey, where the plane was loaded with medical supplies, tents, and earth-moving implements. From there it was a two-hour hop to the Armenian city of Yerevan.

Operating conditions were confusing and perilous. In the first place, the weather was dismal—December snow and rain with low ceilings and minimal visibility. The hostile sky was filled with relief aircraft, and the air traffic controllers in this remote corner of Russia spoke little English. Once on the ground, aircraft from twenty countries jammed the ramp as vehicles careened dangerously between them. The 141's twenty-four-ton cargo had to be manually unloaded, since forklifts were unavailable—the few in Armenia were being used in rescue efforts at collapsed buildings.

The Mississippi Guardsmen flew back to Incerlik the same day, where they found a fully loaded active-duty Starlifter whose crew had reached maximum flight hours; they had no choice but to settle in for a twelve-hour crew rest. The Guard crew volunteered to take the plane back to Yerevan. The MAC schedulers in the States

C-141B Starlifter is the first jet transport designed specifically as a military platform.

Previous pages: Massive C-5A Galaxies based at Stewart ANGB near West Point, New York.

Soviet troops guard Mississippi ANG Starlifter on the ramp at Yerevan, Armenia. *Photo: MSgt Bob Mason, MS ANG.*

grudgingly agreed. This time things on the chaotic ramp went a lot better. The Red Army had arrived in force to manage airfield operations; parking was more orderly, and hundreds of Soviet troops were on hand to do the unloading. The Russians were friendly, helpful, and obviously touched by the massive infusion of Western aid.

On 19 December the Mississippians put together yet another mission, this one a five-day hop from home base via McGuire AFB in New Jersey and Rhine Main Air Base in Germany. The plane carried, among other things, 100 plastic housing units newly invented by Union Carbide and Film Applicators of Springfield, Pennsylvania; employees of both companies made the flight, as did Maj. Leonid Kondratiuk, a Russian-born officer in the Kansas National Guard. Major Kondratiuk's fluency in Russian would come in handy, but the flight crew found, to its pleasant surprise, that skilled controllers speaking excellent English had been transferred into Yerevan to help with the tremendous surge of Western air traffic. A Cable News Network film crew captured a sight that had not been seen since the end of World War II: Soviet soldiers and American airmen working cheerfully together to unload the huge jet.

These were by no means normal-profile missions for the 172d MAG, at that time the Guard's only C-141 outfit (another has since tooled up in Memphis, Tennessee). But the airplane's impressive strategic-airlift capabilities make it pos-

Immense flight deck of the Galaxy is four stories above ground.

sible to mount such a mission to any corner of the earth. The C-141 has been the mainstay of the Military Airlift Command since its introduction in the mid-1960s, and the Guard expects to see many more Starlifters moved into their air-transport units in the 1990s.

The C-141 is another superb product of Lockheed-Georgia, the folks who brought you the C-130 Hercules. The jet-powered 141 shares considerable design commonality with the Herk: high wing, four close-coupled engines on the wings, tough fuselage-mounted main landing gear for rough-field landings, and low ground clearance for easy loading through the rear ramp. It was the first jet aircraft specifically designed from the wheels up as a military troop and cargo carrier, earlier jets in the 135 series having shared their engineering with the highly successful Boeing 707 commercial design.

The C-141 has been an excellent performer for the Air Force, with a superb safety record and a reputation for great operational dependability. It still operates with its original Pratt & Whitney TF33 engines; this early turbofan design, although not as fuel-efficient as various late-1980s-model engines, nevertheless puts out all the power the Starlifter can use. The jet can take off at gross weights exceeding 325,000 pounds, including 150,000 pounds of fuel and 70,000 pounds of cargo.

These figures are for the B model, a stretched mod of the original Starlifter with an elongated fuselage and in-flight refueling capability. Since the C-141B can be refueled in flight, its strategic range is limited only by considerations of crew fatigue. In lieu of cargo the jet can carry 200 troops (or 160 paratroopers, who weigh more than troops without gear) or 100 wounded patients in litters. And those 160 paras can jump from the 141 through rear troop doors. In a combat pinch (although this sort of thing isn't practiced in peacetime), the C-141 can take off with light fuel and cargo loads up around 50 tons; it can then hook up with a tanker after takeoff, take on a full load of gas, and thus exceed its max designed takeoff weight.

If the Herk is an easy plane to fly, the Starlifter almost flies itself. In fact, the pilots manage systems rather than fly in the hands-on sense. The plane has a complex autopilot with dual inertial nav systems that can store up to thirty waypoints. There is a vertical navigation system with autothrottles; after reaching about 1,500 feet, the climbout to the desired altitude will be accomplished automatically at the best rate, the four throttles magically sliding themselves back and forth. Same thing on the way back down. Takeoffs and landings are still handled the old-fashioned way; there are new airliners that can crank out a complete flight from taxi to shutdown under automatic control, but the 141 doesn't boast quite that degree of automation. Still, it's a very sophisticated and reliable strategic performer considering the age (some twenty-five years) of the system.

Guard operations with the Starlifter take the form of long hops, with five days away from home usually the minimum. Often the flights will proceed under the control of MAC, the gaining command for Guard strategic airlift units. But a more normal scenario is the all-Guard mission of ferrying some of the thousand-plus nonflying Air Guard units on detachments around the world. I recently caught up with a Mississippi 141 during a brief stopover at NAS Moffett Field, an hour south of San Francisco. The crew, under the com-

Air show crowd gets an up-close idea of just how gigantic the C-5A really is.

mand of the group's StanEval (Standards and Evaluation) chief, Rob Cox, had been on the road for three days, with three more to go. They had flown from Jackson, Mississippi, to Kingston, Jamaica, to pick up two Air Guard civil engineering (PRIME BEEF) outfits that had been helping out with reconstruction projects in the wake of that country's terrible spring hurricane. After dropping off the PRIME BEEF boys in Vermont and South Dakota, they were loading yet another PRIME BEEF and PRIME RIB (food and personnel support) outfit that was about to start its own two-week det in Jamaica. At the same time, another Mississippi Starlifter was somewhere in the South Pacific, ferrying an Army band to performances in several Southern Cross countries, including Australia and Singapore.

Pilots report the Galaxy is surprisingly agile and light to the touch in flight.

Galaxies have successfully lifted off at gross weights over 900,000 pounds.

"We ask a lot," admitted Lieutenant Colonel Cox, "because 90 percent of our aircrew people are part-timers with other jobs. It's tough to fit these week-long dets into any sort of civilian work schedule. Needless to say we have some terrifically supportive employers in Jackson.

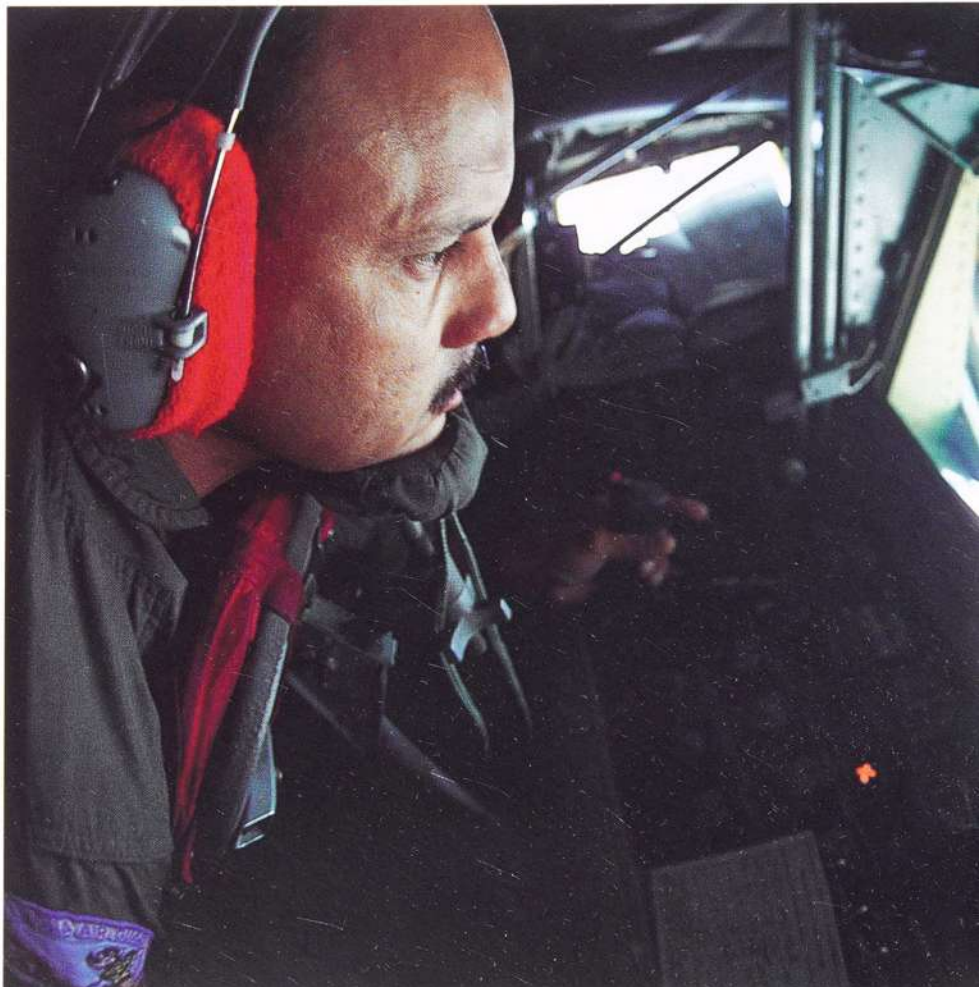
"There's a big difference between a Guard airlift outfit and, say, a fighter squadron. There the part-timers can come in for a four-hour stint—that's one fighter hop with the briefings. We have to ask our people to hit the road for days on end. But hell, they line up to go. I can safely say that every single person in the unit wanted to make those Armenia earthquake hops, even though it was right before Christmas. Same with these flights we're making into Jamaica; they've suffered terribly down there, and the Guard is really

helping them out. This is real-life stuff! Who wouldn't want to be in on it?''

The other Guard strategic airlifter is the gigantic C-5A Galaxy, the free world's largest aircraft. The Soviet Galaxy clone, the AN-124 Condor, is about two feet longer and a bit heavier. The C-5A is flown by the 105th Military Airlift Group, New York Air National Guard, out of Stewart ANGB near the military academy at West Point.

The Galaxy in flight looks a lot like the C-141, until you see the two in the pattern at the same time. Both share the hunchbacked, high-wing profile that began with the C-130; both have the high tail, four wing-mounted jet engines, and the main gear tucked under the fuselage. But the C-5 is twice the size of the Starlifter, and the Starlifter is not a small airplane. On final for landing, the C-5 appears to hang almost motionless in the air,

KC-135 Stratotanker shares its design ancestry with that of the first American commercial jetliner, the Boeing 707.



its great size confusing the eye despite its 125-knot speed over the fence.

The Galaxy was designed to carry outsized cargoes anywhere in the world, and quickly. Its four enormous General Electric TF39 high-bypass turbofans drive the aircraft along at cruise speeds of 500 miles per hour. Since the plane is air-refuelable, it can deploy anywhere in the world with tanker support. The C-5 can carry the bulkiest combat equipment—M-1 tanks, a four-pack of Apache or Blackhawk helicopters, even a mobile scissors bridge that weighs seventy-five tons. Like the C-130 but unlike the C-141, the Galaxy can airdrop loads out the rear cargo doors; in the latter days of its test program the C-5 dropped four twenty-ton pallet loads—that's 160,000 pounds—in a single pass over the drop zone. Unlike both the Herk and the 141, the Galaxy can load and unload simultaneously from nose and tail ramps, and it can "kneel" to facilitate loading directly from truck beds. It was not designed to be used as a troop carrier except in emergency situations, although it is usually set up with about seventy-five seats for crew and operators accompanying its combat loads.

The Stewart Guardsmen employ the Galaxy much the same as the Mississippians and their 141s, while carrying much larger loads, of course. Much of their work is controlled by the Military Airlift Command, whereas other missions are controlled by the Guard Bureau. A single C-5 hop can provide total support for a very sizable de-

Phoenix ANG boom operator MSgt Jorge Escobar lies on his stomach while successfully plugging a Tucson F-16.

ployment—an eight-plane det of Guard fighters to Korea, for instance. The 141 unit would have to dedicate two aircraft to perform the same mission.

Galaxy pilots, including some with serious fighter time in their logbooks, report that the big plane possesses surprisingly light and elegant handling qualities, in much the same way that fat men are often oddly graceful and light on their feet. The plane is capable, when lightly loaded, of popping off the runway (particularly on a cold winter day at Stewart) in only a thousand feet, and its rate of climb can shame much smaller jets. And it can land in amazingly short distances.

Although the Galaxy is unbelievably capable, the Guard has mixed feelings about employing it. The plane is extremely complex and expensive to maintain, for one thing; mission-capable rates have never been much to brag about. The Air Force Reserve currently operates six squadrons

Boomer's view of an active-duty Phantom gassing up.

of Galaxies, and they may well be getting more. But the Air National Guard has no plans to bring more of the huge jets into their inventory.

The most numerous heavy in the Air Guard is the KC-135-E Stratotanker, one of the most successful aircraft programs in Air Force history. The C-135 program dates to the late 1950s, when Boeing got the job of developing a jet tanker and transport to replace the prop-powered KC-97. The result was not only a multirole military transport but the seminal commercial jet airliner as well, the Boeing 707.

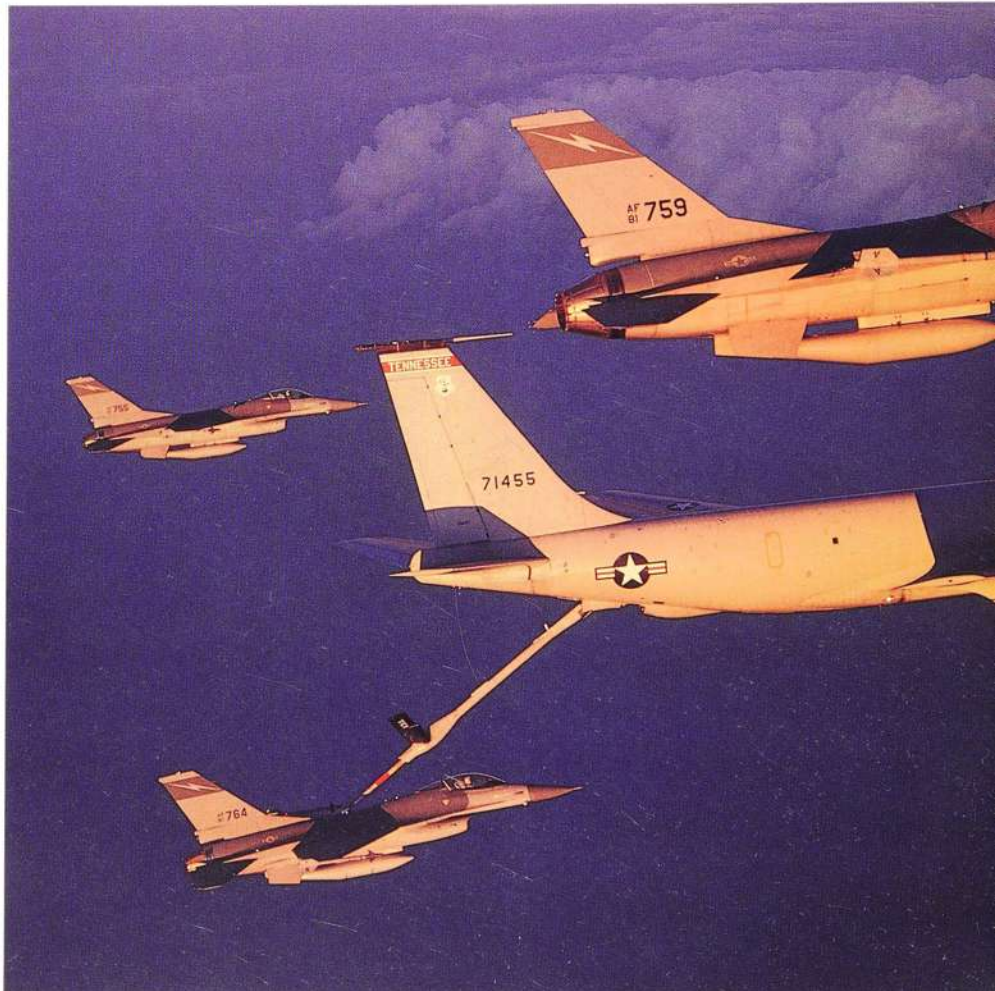
Twelve Guard wings in as many states operate 150 KC-135s; that's about one fifth of the total Air Force tanker assets. All Air Force tankers are directed by the Strategic Air Command, and the Guard birds are routinely tasked to refuel SAC bombers, active-duty fighters, and even Navy or Marine jets as well as National Guard aircraft.

The last KC-135s were delivered to the Air Force in 1965, so even the newest planes are approaching the quarter-century mark. But the active Air Force and the Guard fully expect to continue flying most of the Stratotanker fleet well into the next century. The airframes are holding up well, and the main impediments to modern-day operation, the outdated turbojet engines, have been replaced on all Guard tankers by much more fuel-efficient Pratt JT3D turbofans acquired on the surplus commercial market. The resulting E models also have a feature common on airliners but rarely found on Air Force heavies: thrust reversers. The military has long displayed an aversion to reversers, principally because they are a high-maintenance item. But the Guard tanker pilots, many of them part-timers who also fly airliners, are big supporters of thrust reversers. In particular they permit much shorter and straighter stops on wet or icy runways. Of course, many Guard maintenance types are themselves part-timers with regular airline jobs, and thrust-reverser maintenance is business as usual for them.

The normal crew on a Guard KC-135 is four: pilot, copilot, navigator, and loadmaster/boom operator/crew chief. Like most modern heavies, the Stratotanker is equipped with INS for long-range navigation and a good three-axis autopilot, but the airplane is hand flown during the always-tricky refueling sessions. The boom operator controls the flow of fuel from his position in the rear; he (or she) lies facedown on a couch, gazing out through a large picture window and "flying" the telescoping boom into the receiver's open fuel receptacle. This domain is also mine when I'm up in a KC-135 or KC-10 tanker. Many of my best air-to-air photos have been shot out of that big, optically perfect boomer window.

The KC-135E's stats remain impressive. The jet can take off at gross weights exceeding 300,000 pounds, and it can carry 185,000 pounds of JP-5, almost all of which can be pumped to receivers through the tanker's flyable boom. The tanker can also trail a hose-and-drogue system for topping off jets with male refueling probes; all Navy and Marine aircraft, plus most NATO types, fall into this category. High-speed pumps can move more than 1,000 gallons a minute through the KC-135's plumbing and into the receiving jet. Outfits like the 161st Copperheads out of Phoenix will typically off-load 2 million gallons of jet fuel per year into more than 3,000 aircraft.

The KC-135 was designed primarily as a tanker, but it can also carry a fair cargo load on the wide, flat floor above the fuselage tanks. The cargo goes in and out through a large swing-up door behind the cockpit on the left side.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The Guard tanker missions differ little from those of the active SAC units. Every tanker wing—active-duty, Air National Guard, or Reserve—maintains at least one jet on twenty-four-hour alert, its crew on hand to fire up and taxi only minutes after the horn blows. Like SAC's nuclear bomber alert, the tanker crews are subject to frequent heart-stopping drills. But the bombers and tankers on alert don't actually get airborne; the crews just sprint to the plane, run the barest of checklists, start engines, and taxi to the runway before rolling back to the highly secure alert area.

Guard refueling missions run the gamut: fighters, attack jets, heavies, SAC bombers, and aircraft from other branches of the service. Geographical location is the prime factor in determining receivers; the Phoenix Copperheads gas lots of fighters because of their proximity to Luke, Nellis, Williams, and Tucson, whereas units in the upper Rockies or the Midwest can expect lots of SAC bomber work. Deployments of up to two weeks are common in the Guard tanker world, since the tankers either accompany fighters on detachment or simply work out of the tanker pools run by SAC in the U.S., Europe, and the Far East. A thirsty receiver coming into precontact position for a fill-up won't know until the last moment whether his tanker is active, Guard, or Reserve, and what's more, he won't care.

Although nothing is written down, many Air Guard fighter and attack units have unofficial re-

KC-135 out of Knoxville, Tennessee, fuels a gaggle of Jacksonville Falcons off the Carolina coast.

lationships with tanker wings nearby. The Tucson F-16 and A-7 trainers are tight with the Phoenix Copperheads, the Montana and Oregon interceptors rely on the Spokane group, and Guard fighters all over the south—Jacksonville, Atlanta, Montgomery—get plugged regularly by the Volunteers out of Knoxville, Tennessee. It's a matter of work schedules fitting together as much as anything else. The active units lean toward a normal eight-to-five workday, whereas Guard units with all their part-time pilots tend to do a lot of late-day and night flying. Guard tankers occasionally come into the receivers' base for debriefs, and some units even put together orientation flights for dependents so that the wives and kids can peek out the boomer's window to watch Dad get tanked. There's even a reciprocal: The backseaters in those four Tucson A-7s pictured on pages 58–59 are Copperhead boom operators getting a rare chance to watch a refueling from the other end.

The tanker crews fly lengthy missions of great potential difficulty and danger. It doesn't take a military strategist to figure out some of the key targets in any future air war: The tanks are going to top the list, along with the AWACS control aircraft and other equally hard-to-defend assets. One still hears high praise for the KC-135 crews in Vietnam; the Hanoi/Route Pack Six attacks by Thailand-based F-105 Thuds wouldn't have been possible without them, and there are countless tales of tankers putting their virtually defenseless heavies in harm's way to help out Thuds that were doomed without the tankers' lifesaving fuel. Famed Thud driver Jack Broughton, author of the excellent and moving *Thud Ridge* and *Going Downtown,* is fearless when it comes to lambasting the pusilanimous support elements that combined to make the North Vietnamese air war all but unfightable. He has kind words indeed, however, for two groups of guys who could always be counted on: the SAR crews in their Spads and Jolly Greens, and the blessed gas-passers in the KC-135s.

I recently accompanied a four-tanker det of the 161st AREFG, the Phoenix Copperheads of the Arizona Air National Guard. The SAC tanker boffins had asked them to participate in the third Red Flag exercise of 1989, and they responded by sending a quartet of E models over to March AFB near Los Angeles. March calls itself "Tanker Town USA," and it always serves as the staging base for the Red Flag refuelers.

Joining the Copperheads for the two-week det were three planes from the 101st AREFW, the Bangor Maineiacs, and a single ship from the 151st out of Salt Lake City. Most of the tankers flew two hops per day, over to the tanker tracks in the Nellis range north of Las Vegas, there to pass gas for the eighty participants flying in this exceptionally large Red Flag war. The participants were all active-duty fliers—F-15 and F-16 fighters, RF-4C recon Phantoms, EF-111 radar jammers, B-52 BUFFs, a couple of E-3A AWACS birds, some Navy F/A-18s flying adversary, and even an eight-ship of RAF Tornados (call sign Limey, of course) that had tanked nonstop from England.

The refueling pace was frantic: Planes waited impatiently on each of the tanker's wings as one after another slid into position for top-off. Guard boom operators Jorge Escobar and Sharon Abraham plugged fifteen to twenty jets on each hop, coolly handling the impolite, adrenaline-charged fighter pilots with professionalism and humor (plus one instance of bird-flipping that was entirely called for). The Maineiacs slung hose-and-

Detachment One of the Washington, D.C., Air National Guard operates the C-22 out of Andrews AFB. It is actually a Boeing 727 purchased on the used airliner market.

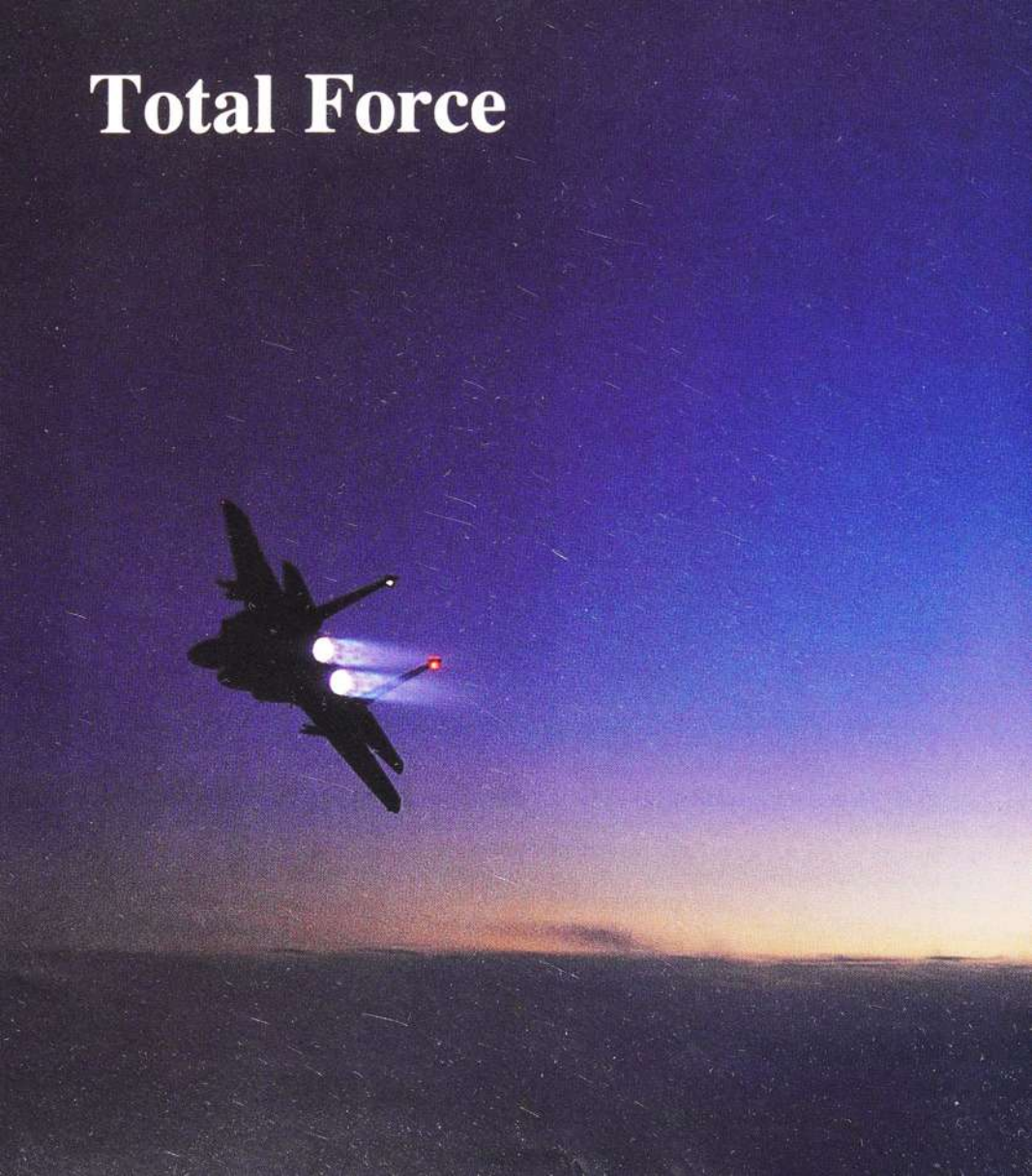
The C-21 is another civilian jet used by Det One; it's an off-the-shelf Gates Lear-jet 35.

drogue rigs on two of their ships to accommodate the Hornets and the Limey Tornados with their male refueling probes.

The Air National Guard flies one more heavy transport, a type it has all to itself. The C-22B is nothing more than a commercial Boeing 727 bought on the used airliner market and painted in a handsome scheme similar to the Washington VIP fleet. The Guard has five, all based with Detachment One of the DC National Guard at Andrews AFB outside the nation's capital. The jets are used to ferry Guard units on training deployments; two of them have been specially modified with extra fuel tanks and nav gear for intercontinental flights. This same outfit also flies a quartet of C-21A Lear-jets for time-sensitive movement of people, cargo, and Guard bigwigs around the United States. The Lears are military versions of the 35A business jet, leased to replace the gas-guzzling T-39 Sabreliners.

The Air Guard's heavy-lift aircrews are top-heavy with decades of flight experience; the units are full of multithousand-hour military pilots, navs, and crew chiefs. Many of them have additional thousands of hours in the cockpits of commercial and corporate aircraft as well. With pilot retention such a critical problem in the active Air Force—SAC and MAC have been especially hard hit in recent years as airline hiring has spooled up—this amazing pool of talent in reserve takes on all the greater importance in the maintenance of the Total Force.

Total Force



The halcyon days of nearly unlimited military spending are behind us, and none too soon. The people elected President George Bush in 1988 with the clear understanding—read my lips—that federal spending and the deficit would be attacked mercilessly whereas income taxes would not be increased. It was clear that the Pentagon would be called upon, along with the other government departments, to budget better and spend less—lots less.

At the same time we've witnessed the astounding changes shaking the Soviet Union since the ascension of Mikhail Gorbachev. The changes go far beyond deft public relations and democratic elections for the Moscow City Council. The Russians, for a variety of reasons including their own economic and cultural crises, are less and less fascinated with military adventurism and ideological expansionism. They're figuring out that the wars of the next century, the ones they must somehow learn to fight, will be among international economies rather than armies, navies, and air forces. They have as much as admitted that the cold war is over, and that they have lost. Or, as the current joke goes, that Japan has won.

The farsighted Total Force concept, aimed at modernizing reserve forces to bring their capabilities in line with those of the active branches, couldn't have been promulgated at a better time. Reserve units are far cheaper to operate than their active counterparts; training costs are close to zero, and the overall experience level permits part-timers to maintain mission-ready status with fewer man-hours expended. The Pentagon planners have already gotten the picture: We'll undoubtedly see many active-to-reserve unit conversions in the nineties, and existing Reserve and National Guard units will enjoy further modernization.

New H-model C-130s are now being delivered to Guard units around the country.

Previous pages: Louisiana ANG Eagle lights full burners after a gulf sunset.

The Air National Guard will not see substantial gains in total units or manpower, but it will probably take on new and enhanced missions, both military and otherwise. If our active forces do indeed decrease, Reserve and Guard elements will have to shoulder an even greater burden of real-world training exercises and overseas deployments in support of our forces remaining abroad. And involvement in civilian disasters—floods, blizzards, oil spills, earthquakes, forest

Reserve and Guard units will inherit practically all A and B model F-15s as the active Air Force wings get the new Cs, Ds, and Es.

fires, hurricanes—will remain commensurate with need. No one in the Air Guard expects the incidence of humanitarian missions to slacken off; it never has in the past.

And then there's the continuing hemorrhage of illegal drugs into the United States, a situation many Americans consider more serious and life-threatening than anything the Communist world is likely to throw our way. More and more politicians, including the president, are calling for some sort of military response to the problem, and the National Guard expects to find itself on the front lines before long. Guardsmen are frankly uncomfortable about involvement in this battle,

F-16B training hop blasts out of Tucson International at sunset.

although they understand the gravity of the problem and they'd like to help. It's just that it's easy in a free society to sound the clarion call for a military response, but it's tough to mount one that will be both effective and respectful of individual rights. The founding fathers were clearly uneasy about military involvement in civilian police actions, and most modern-day soldiers, whether active, Reservist, or Guardsman, are just as uncomfortable with the idea today.

Many Guard units boast experienced maintenance types like Montana's CMSgt Bill Coffman, who worked more than 20 years on the F-106s of the 120th FIG.

Some small steps have already been taken: Army Guard helicopters are working the borders in the Southwest, and Louisiana Air Guard F-15s have been practicing Gulf of Mexico radar intercepts, both air to air and air to ship, in conjunction with the Customs Service surveillance aircraft that share their NAS New Orleans home base. In addition, a fair percentage of the real-life intercepts handled by the coastal air defense fighters are possible drug runners. Stay tuned for further developments in this difficult, murky area.

In the closing days of 1989, as the long-oppressed peoples of Eastern Europe were taking such delight in throwing out the Communist rascals, the United States took a shot of its own at the criminal regime of Panamanian dictator Manuel Noriega. The action at its peak involved more than 25,000 American servicemen, including a

goodly representation of Air National Guard units. The Mississippi C-141s and the New York C-5s were among the first MAC aircraft to move troops and equipment into Howard AFB, the Mississippians also flying a load of seriously wounded troopers directly to Kelly AFB in San Antonio.

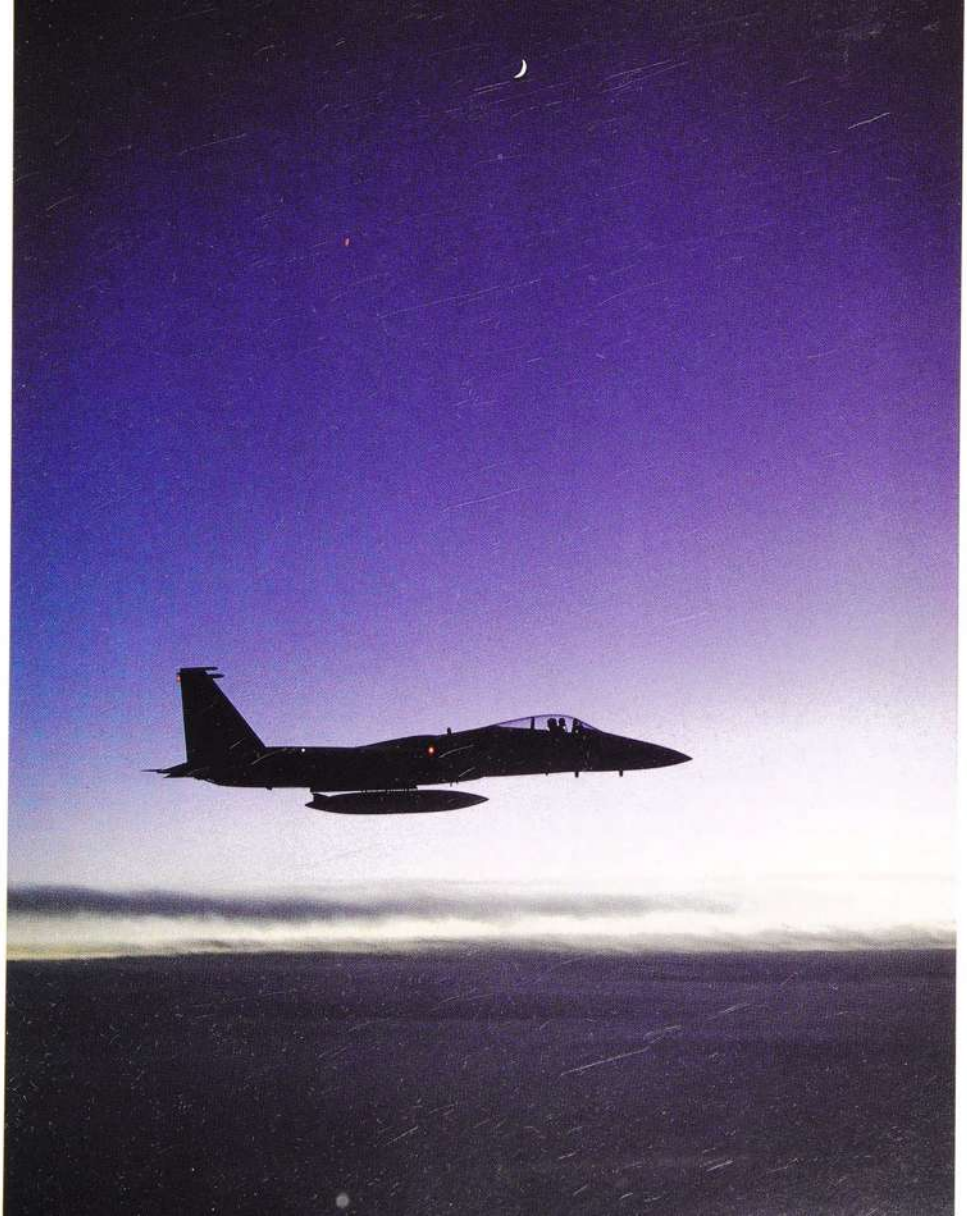
The Guardsmen with the best seats in the house, however, were the rotating Volant Oak and Coronet Cove detachments who found themselves on duty in Panama when the word came to saddle up. Present for the event were four C-130Hs from Texas and six A-7s of the 180th TFG, Toledo, Ohio. The SLUF drivers and their ground crews shifted in a matter of hours from training mode to a war footing; detachment leader Lt. Col. Charlie Vaughn first learned of the planned midnight attacks during a late-afternoon briefing for all commanders, and only a few hours later his jets were in the air with bombs under the wings and real 20mm in the guns. As of this writing, the

Powerful and exotically instrumented MH-60 Pave Hawk helicopters will soon replace the Air Guard's exhausted HH-3 Green Giants.

Maintenance hogs like the Phantom are ideal Air Guard birds, thanks to the experience and consistency of ANG service personnel.

Guard A-7s have been the only Air Force fighter-bombers involved in the fray, with the veiled-in-secrecy exception of a flight of F-117A stealth fighters that flew down from their Nevada base to support a large 82d Airborne paradrop. The Air Guard Herks shuttled back and forth across the country, ferrying soldiers and conducting LAPES drops of vital supplies.

Lieutenant Colonel Vaughn had the highest praise for his weekend warriors, none of whom had previous combat experience. "We were naturally a bit nervous at the jump-off," he remembered, "but we had trained hard for years in Panama, and the lessons kicked in. I'm not sure a combat-hardened outfit could have handled things much better. We put ordnance on target, we took some hits, we brought everyone home in one piece



The F-16 will become the Guard's dominant fighter in the '90s, finding its way into former F-106, F-4, and A-10 units.

after the South Dakota det took over on 23 December. I know the people on the ground appreciated our support."

Equipment modernization will continue apace in the Air Guard. Virtually all of the A and B versions of the active-duty F-15s and F-16s will find their way over the next five years into the Reserve and Guard; the active-duty squadrons are taking delivery of the new C and D versions, which boast uprated General Electric engines, better computer software, and improved HUD systems. (The Bs and Ds are two-seat "tubs.") The Plus variant of the A-7 is still down the line, but the LANA mod for all-weather terrain-following will hopefully find its way into all Guard A-7s. And of course many more active A-10s will be switched over to the Guard and Reserve.

New H-model Herks will come off the Georgia line and fly off to Air National Guard units for several more years at least. The C-130 assembly line recently surpassed the Douglas DC-3/C-47 line as the longest-running aircraft assembly program in American history, and there is no end in sight. In addition, selected Guard fighter and air defense groups will receive one Herk apiece to replace ancient recip-powered C-131 Convairs that are used for admin and parts runs. These planes will be crewed by full-time Guard technicians, and in each squadron a few of the fighter jocks with airline experience will also receive turboprop cross-training. The birds will be equipped with an extra suite of HF, VHF, and UHF radios so they can be employed in the ABCCC (airborne command, communication, and control) role during big Red V. Blue aerial engagements.

The anxiously awaited Douglas C-17, the expensive next-generation military airlifter for the Air Force, will soon appear simultaneously in active, Reserve, and Air Guard transport squadrons, provided the program's horrendously high funding levels are maintained intact. Look also for more movement of C-141s into the Guard; several more Herk units will probably make the conversion. And the KC-135E tanker wings are being boosted from eight planes apiece to ten.

The high-powered Aerospace Rescue and Recovery Groups (a third one set up shop in Alaska in late 1989) will soon be retiring their HH-3 Green Giant helicopters in favor of the New MH-60 Pave Hawk, a beefy derivative of the Sikorsky Black Hawk troop carrier. This ship is smaller than the Jolly, but it's much more powerful, and it's loaded with state-of-the-art avionics and navigation aids for rescue and penetration flights in the worst imaginable conditions. The Jollies did a superb job in their heyday, but they're

outmoded, exhausted, and long overdue for replacement.

Sometimes it seems as though not all active-duty types have sat through the Total Force briefing. Pilot and aircrew retention is a continuing problem for the Air Force, and lots of high-ranking lifers look upon the Guard as one of the key villains in the worsening struggle to keep good young pilots. They've got something: Flying with the Guard can look pretty good after seven or eight years of the blue-suit bureaucracy for which the Air Force is infamous. The Guard affords the best of several worlds—quality military flying with experienced professionals, plus the stability and financial rewards of civilian life. No wonder the Guard is no longer the best-kept secret in military aviation.

But the Guard's detractors are missing a key point, of course. The pilot who resigns from the actives and signs on with the Reserves or the Air Guard isn't an expensive asset lost to the Air Force; in fact, he's quite the opposite. He'll be maintaining his proficiency—expanding it, actually—in the company of the most accomplished and experienced fliers he'll ever meet. It's not surprising that there are so few openings in Air Guard flying billets.

One last Guard secret: Air National Guard squadrons hire and train pilots with no previous military experience, although the chances are slim of getting into the cockpit via this route. Still, the possibility exists, and few people know about it. Most units limit their new hires to one or two per year; people are occasionally signed up off the street, but the more normal procedure is to favor men and women who have already put in some time with the unit in an enlisted capacity. There's also an understandable tendency to look for people who have as much civilian flying time as possible;

Active F-111 drops away satisfied from an Arizona ANG tanker. A high percentage of active-duty aerial refueling is from Reserve and Guard assets.

they'll have a tremendous advantage in undergraduate pilot training. Sound interesting? Check with your nearest Air National Guard recruiter.

Young Guard bums love to recount their delight in explaining their unique position to the other active-duty types during pilot training. Their fellow students, whether graduates of ROTC, the Air Force Academy, or Officer Candidate School, are all sweating bullets about their future: Will they be aces of the base in the F-15 Eagle, or will they wind up flying B-52s out of North Dakota? They have no way of knowing. But what's the deal with these Guard guys? *They know!* All they have to do is pass all courses and check-rides; then it's straight back to their home unit for a citizen-soldier career in the plane they signed on to fly—F-15, A-10, C-130, or whatever. Who can blame them for being just a little bit smug?

Appendix: The Air National Guard by Major Command Assignment (as of January 1, 1989)

STRATEGIC AIR COMMAND

KC-135E Stratotanker

101st Air Refueling Wing	Bangor, Me.
126th Air Refueling Wing	Chicago, Ill.
141st Air Refueling Wing	Fairchild AFB, Wash.
171st Air Refueling Wing	Pittsburgh, Pa.
128th Air Refueling Group	Milwaukee, Wis.
134th Air Refueling Group	Knoxville, Tenn.
151st Air Refueling Group	Salt Lake City, Utah
157th Air Refueling Group	Pease AFB, N.H.
160th Air Refueling Group	Rickenbacker ANG Base, Ohio
161st Air Refueling Group	Phoenix, Ariz.
170th Air Refueling Group	McGuire AFB, N.J.
190th Air Refueling Group	Forbes Field, Kan.

TACTICAL AIR COMMAND

A-7D/K Corsair II

121st Tactical Fighter Wing	Rickenbacker ANG Base, Ohio
127th Tactical Fighter Wing	Selfridge ANG Base, Mich.
132d Tactical Fighter Wing	Des Moines, Iowa
140th Tactical Fighter Wing	Buckley ANG Base, Colo.
112th Tactical Fighter Group	Pittsburgh, Pa.
114th Tactical Fighter Group	Sioux Falls, S.D.
138th Tactical Fighter Group	Tulsa, Okla.
150th Tactical Fighter Group	Kirtland AFB, N.M.
156th Tactical Fighter Group	San Juan, Puerto Rico
162d Tactical Fighter Group*	Tucson, Ariz.
178th Tactical Fighter Group	Springfield, Ohio
180th Tactical Fighter Group	Toledo, Ohio
185th Tactical Fighter Group	Sioux City, Iowa
192d Tactical Fighter Group	Richmond, Va.

F-16A/B Fighting Falcon

149th Tactical Fighter Group	Kelly AFB, Tex.
169th Tactical Fighter Group	McEntire ANGB, S.C.
184th Tactical Fighter Group*	McConnell AFB, Kan.
187th Tactical Fighter Group	Montgomery, Ala.
188th Tactical Fighter Group	Fort Smith, Ark.

A-10A Thunderbolt II

128th Tactical Fighter Wing	Truax Field, Wis.
174th Tactical Fighter Wing	Syracuse, N.Y.
103d Tactical Fighter Group	Bradley, Conn.
104th Tactical Fighter Group	Barnes, Mass.
175th Tactical Fighter Group	Baltimore, Md.

F-4D Phantom

113th Tactical Fighter Wing	Andrews AFB, Md.
183d Tactical Fighter Group	Springfield, Ill.

F-4E Phantom

108th Tactical Fighter Wing	McGuire AFB, N.J.
122d Tactical Fighter Wing	Fort Wayne, Ind.
131st Tactical Fighter Wing	St. Louis, Mo.
163d Tactical Fighter Group	March AFB, Calif.
181st Tactical Fighter Group	Terre Haute, Ind.

RF-4C Phantom

117th Tactical Reconnaissance Wing	Birmingham, Ala.
124th Tactical Reconnaissance Group	Boise, Idaho
152d Tactical Reconnaissance Group	Reno, Nev.
155th Tactical Reconnaissance Group	Lincoln, Neb.
186th Tactical Reconnaissance Group	Meridian, Miss.

OA-37 Dragonfly

110th Tactical Air Support Group	Kellogg, Mich.
111th Tactical Air Support Group	Willow Grove ARF, Pa.
182d Tactical Air Support Group	Peoria, Ill.

* Replacement Training Unit (RTU). The 162d TFG serves also as an RTU for the F-16 Fighting Falcon.

F-15A/B Eagle

116th Tactical Fighter Wing	Dobbins AFB, Ga.
159th Tactical Fighter Group	New Orleans, La.

AIR DEFENSE UNITS (TAC)

F-15A/B Eagle

102d Fighter Interceptor Wing	Otis ANG Base, Mass.

F-4C Phantom

142d Fighter Interceptor Group	Portland, Ore.

F-4D Phantom

144th Fighter Interceptor Wing	Fresno, Calif.
107th Fighter Interceptor Group	Niagara Falls, N.Y.
119th Fighter Interceptor Group	Fargo, N.D.
147th Fighter Interceptor Group	Ellington Field AGS, Tex.
148th Fighter Interceptor Group	Duluth, Minn.
191st Fighter Interceptor Group	Selfridge ANGB, Mich.

F-16A/B Fighting Falcon

120th Fighter Interceptor Group	Great Falls, Mont.
125th Fighter Interceptor Group	Jacksonville, Fla.
158th Fighter Interceptor Group	Burlington, Vt.
177th Fighter Interceptor Group	Atlantic City, N.J.

MILITARY AIRLIFT COMMAND

C-130 Hercules

118th Tactical Airlift Wing	Nashville, Tenn.
123d Tactical Airlift Wing	Louisville, Ky.
133d Tactical Airlift Wing	Minneapolis/St. Paul, Minn.
136th Tactical Airlift Wing	Dallas, Tex.
137th Tactical Airlift Wing	Oklahoma City, Okla.
146th Tactical Airlift Wing	Channel Island, Calif.
109th Tactical Airlift Group	Schenectady, N.Y.
130th Tactical Airlift Group	Charleston, W.Va.
135th Tactical Airlift Group	Baltimore, Md.
139th Tactical Airlift Group	St. Joseph, Mo.
143d Tactical Airlift Group	Quonset Point, R.I.
145th Tactical Airlift Group	Charlotte, N.C.
153d Tactical Airlift Group	Cheyenne, Wyo.
164th Tactical Airlift Group	Memphis, Tenn.
165th Tactical Airlift Group	Savannah, Ga.
166th Tactical Airlift Group	Wilmington, Del.
167th Tactical Airlift Group	Martinsburg, W.Va.
176th Tactical Airlift Group	Anchorage, Alaska
179th Tactical Airlift Group	Mansfield, Ohio
189th Tactical Airlift Group	Little Rock, Ark.

HC-130 Hercules/HH-3 Jolly Green Giant

106th Aerospace Rescue & Recovery Group	Suffolk, N.Y.
129th Aerospace Rescue & Recovery Group	NAS Moffett, Calif.

C-141B StarLifter

172d Military Aircraft Group	Jackson, Miss.

C-5A Galaxy

105th Military Airlift Group	Newburgh, N.Y.

EC-130E

193d Special Operations Group	Middletown, Pa.

PACIFIC AIR FORCES

F-15A/B Eagle

154th Composite Group	Hickam AFB, Hawaii

About the Author/Photographer

George Hall is one of the world's premier photographers of military aviation. His work has appeared in scores of books including STRIKE: U.S. NAVAL STRIKE WARFARE CENTER; USAFE: A PRIMER OF MODERN AIR COMBAT IN EUROPE; MARINE AIR: FIRST TO FIGHT; CV: CARRIER AVIATION; and also in the annual AIRPOWER calendar. Hall is author of the bestselling POWER book, TOP GUN: THE NAVY'S FIGHTER WEAPONS SCHOOL. He lives in San Francisco.