

In the skies over Afghanistan, the BUFF sees action in yet another war.

# Fifty Years of the

By Walter J. Boyne

*The two B-52 prototypes—XB-52 (foreground) and YB-52—set the stage for multiple versions, one of which is still much in demand today.*

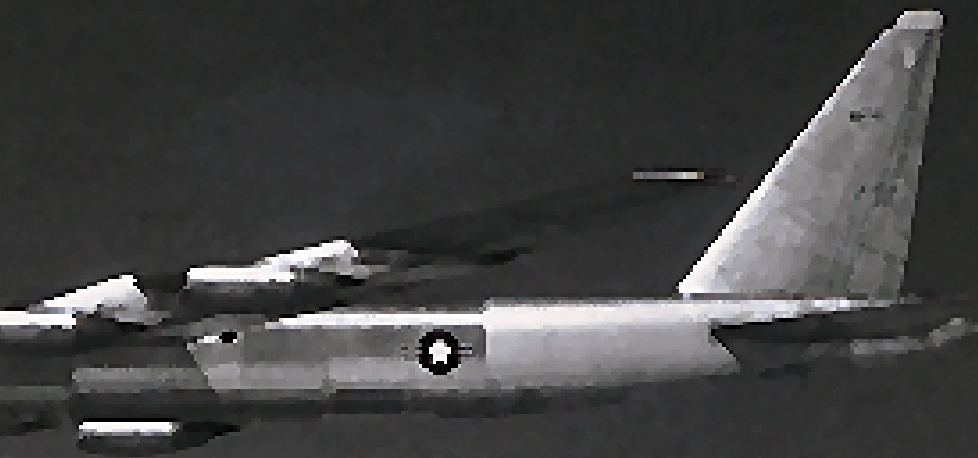
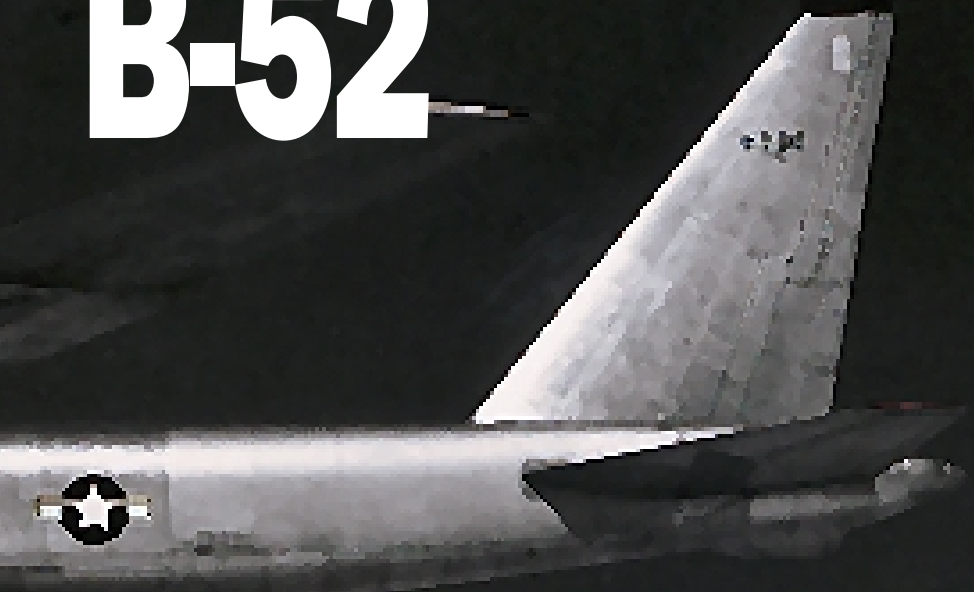
**A**PRIL 15, 2002, will mark the golden anniversary of the B-52 Stratofortress. Fifty years earlier, at Boeing Field, Seattle, the YB-52, serial No. 49-0231, took off for the first time. No one—not even pilots A.M. “Tex” Johnston and Guy M. Townsend—could have imagined that the gigantic eight-engine bomber would serve so well, so long, and in so many roles.

Certainly no one dreamed that the B-52 would be in action over Afghanistan in the fall of 2001. But it was.

The B-52 began projecting global airpower with an epic, nonstop round-the-world flight of three aircraft in January 1957, and it continues to do so today. The original B-52 design was a triumph of engineering. However, its success has depended mostly on the talented individuals who built, flew, maintained, and modified it over the decades.

Called to combat once again in the War on Terror, the B-52 continues to give front-line service in a variety of roles. What’s more,

# B-52



its career is assured for at least 20 years more. Early in its eventful life, the B-52 was given the affectionate nickname "BUFF," which some say stands for Big Ugly Fat Fellow.

The B-52's stunning longevity is matched or exceeded by its versatility. In the early years it functioned exclusively as a high-altitude strategic bomber, built to overpower Soviet defenses with speed and advanced electronic countermeasures and deliver nuclear bombs totaling up to nine

megatons in explosive power. When Soviet air defenses improved, the B-52 broke new ground by carrying Hound Dog stand-off missiles designed to suppress enemy defenses.

However, when Soviet surface-to-air missiles downed the U-2 spyplane piloted by Francis Gary Powers, the B-52 was given new tactics; it was to evade enemy radar by skimming over the terrain at altitudes of 300 feet or less. Almost intolerable stresses were placed on the airframe and the crews in this flight regime, but the rugged B-52 just flexed its wings and pressed on with its nuclear mission.

Along the way, the B-52 was tasked with many missions that had not been envisioned, including photoreconnaissance of Soviet shipping and carriage of systems ranging from anti-ship missiles to high-speed reconnaissance drones.

### The Vietnam Shift

The Vietnam War brought another significant change to the bomber. Part of the B-52 force was serving as Strategic Air Command's long rifle aimed at the heart of the Soviet Union. However, in Southeast Asia, the big bombers became flying artillery, backing up ground forces whenever needed. Crews who had been trained in long-range nuclear penetration tactics now became the arbiters of the battlefield, called on by commanders for close—very close—air support.

After the Vietnam War, the B-52 was modified to handle new weap-

ons, including sophisticated air-launched cruise missiles and precision guided munitions, but it retained its legendary power to flatten enemy ground forces with tons of World War II-type bombs. The B-52's defensive capability received comparable upgrades so that, even in the age of stealth, it serves a major combat role.

In great part, the B-52's longevity and the versatility resulted from the actions of Gen. Curtis E. LeMay, both before and after he became the SAC commander in chief (and later USAF Chief of Staff). At the dawn of the Cold War, defense budgets were tight and long-range missiles were seen as the coming thing. However, LeMay altered the calculus. When offered a modified B-47 design that met most of the requirements for the proposed B-52 mission at far lower cost, LeMay declined angrily, insisting that he wanted an aircraft large enough to accommodate later developments, particularly in electronic countermeasures equipment.

In essence, LeMay had defined a new age in airpower, when aircraft were to be seen as "platforms" able to be modified over the years to take the systems that new weapons and new missions demanded. There were the usual protests at the time over high unit cost of the prototypes, but no one could have guessed that the costs would be amortized over no fewer than five and possibly as many as seven decades.

The BUFF's first mission was one for the ages. LeMay made it the linchpin of the American strategy to deter war by making SAC so strong that the Soviet Union would not dare launch a first strike on the United States or its allies. The quick response capability of the B-52 and the undeniable skill of its flight crews were made obvious to Soviet military and political leaders by means of its constant exercises and record-setting flights.

### Nikita's Case of Nerves

SAC and the B-52s succeeded in that mission, and never more memorably, during the October 1962 Cuban Missile Crisis. As revealed by Soviet Premier Nikita Khrushchev in his memoirs, the presence of nuclear-armed B-52s on orbit outside the borders of the USSR made him think twice and then again about the wisdom of challenging the United States. Eventually, Moscow backed down.

Roger Ferguson, a B-52 navigator during the crisis, recalls that the mission briefings were deadly serious and that plans called for B-52s to enter Soviet airspace at a given point every 12 minutes. Security was suffocating. When Ferguson's crew raced out to their loaded B-52 to launch, they were forced to hit the deck, spread-eagled, by an eager rifle-toting airman. The BUFF commander had forgotten the countersign. It was funny—but not until much later.

There are many apocryphal stories about aircraft being designed on the back of envelopes, but it is absolutely true that the original design for what became the B-52 was created over one weekend in the Van Cleve Hotel in Dayton, Ohio.

On Thursday, Oct. 21, 1948, a group of highly talented Boeing engineers, including George Schairer, Vaughn Blumenthal, and Art Carlsen, were gathered to present the latest version of a straight-wing turboprop bomber design to Col. Henry E. "Pete" Warden, a project officer at Wright-Patterson AFB, Ohio. Unknown to them, acting on his own authority, Warden had been urging Pratt & Whitney to build the J57 jet engine. Warden suggested to the Boeing engineers that they scrub the turboprop bomber and come up with a swept-wing pure jet engine aircraft using the J57.



*Initial details for the B-52 that went to production were worked out one weekend in a Dayton, Ohio, hotel room by Boeing engineers, including (from left) Schairer, Blumenthal, Pennell, Wells, and Carlsen.*



The Boeing engineers were not exactly starting from scratch. They had learned much from the six-jet-engine, swept-wing Boeing B-47 and were aware that there would soon be major improvements in in-flight refueling systems, including what would become the KC-135 jet tanker and the Boeing flying boom in-flight refueling system.

The team members notified Warden that they would be ready with a presentation on Monday morning. Their boss, Edward C. Wells, arrived from Seattle, and with two other Boeing employees, H.W. Withington and Maynard Pennell, in town on other business, they worked continuously, with plenty of telephone calls to Seattle, and succeeded. In addition to three-view drawings and a 35-page proposal, they presented to Warden a silver balsa wood model of the new bomber, carved by Wells himself.

The proposed aircraft bristled with advances over the B-47. The earlier aircraft had a thin, narrow-chord wing, bicycle landing gear, and a structure designed using World War II criteria. The B-52's huge wing featured 4,000 square feet of wing area, but it was flexible enough to deflect through a 32-foot arc. It had an ingenious and top secret crosswind main landing gear that allowed landing in a direct crosswind of 43 knots. It also made use of the most modern construction techniques available.



**Members of a SAC B-52 combat crew race for their bomber. During the Cold War, the airplanes were kept "cocked" and ready. An experienced crew could have their BUFF taxiing within five minutes.**

Boeing built two prototypes—first the XB-52 and then the YB-52. The second prototype was actually the first to fly because the XB-52 had suffered damage in a full pressure test of its pneumatic system. The test ripped out the wing's trailing edge. Production approval preceded the first flight, however, and the first batch of 13 B-52As were ordered in February 1951. These differed from the prototype aircraft in a number of ways, the most obvious being the change from the B-47-style tandem cockpit layout to conventional side-by-side seating for the pilots. Only

three B-52A models were built, the remaining 10 being completed as RB-52Bs. (The RB-52 was a dual-role aircraft, designed to have a reconnaissance capability gained from a two-man pressurized capsule in the bomb bay.) The third of the A models, #52-003, would have a distinguished career as a mother ship for the North American X-15 and many other test vehicles. Designated NB-52A, it served until 1968 and is now at the Pima Air and Space Museum in Tucson, Ariz.

### **The Coming of the BUFF**

The first operational aircraft was an RB-52B, delivered to the 93rd Bomb Wing at Castle AFB, Calif., by its commander, Brig. Gen. William E. Eubank Jr., on June 29, 1955. The 93rd transitioned from B-47s to B-52s and at the same time established the 4017th Combat Crew Training Squadron for B-52 crew training.

The sight of the first operational B-52 coming in to land brought mixed emotions. It was a beautiful airplane, but qualifying for even a copilot position required a minimum flying time of 1,000 hours. As partial compensation, junior pilots often flew a Lockheed T-33 as chase aircraft on early B-52 missions. During one of these, the right outrigger gear of a landing B-52 failed to extend. After exhausting all the in-flight emergency procedures, the tip gear stayed up and the BUFF came in to land. Determined that no incident would



**Only three A model B-52s were produced. One—designated NB-52A—served as the mother ship for the X-15 research aircraft and other test vehicles until 1968. After that a B model—NB-52B—took over.**



now the only BUFF in active service.

It still demonstrates the versatility of the basic design. The B-52H has been modified to accept the new AGM-154 Joint Standoff Weapon and AGM-158A Joint Air-to-Surface Standoff Missile, upgraded AGM-86C/D Conventional Air Launched Cruise Missiles, and an offensive avionics system fitted with new computers. The old Inertial Navigation System is being upgraded with the Ring Laser Gyro INS, and the electronic countermeasures equipment is getting color touch-screen technology.

The buildup in numbers of the B-52 came as SAC was in a period of profound transition. In 1958, the B-47s

occur, Eubank was driven in a jeep alongside the landing aircraft and personally grabbed the wingtip to make sure that it did not touch the ground.

The B-52C, D, E, and F models followed in quick succession. These were similar in external appearance and differed primarily in the engine series, fuel capacity, and the bomb-navigation and fire-control systems.

During the first years of the Vietnam War, the Air Force deployed only B-52Fs to the theater. The B-52Fs could carry 51 of the standard 750-pound bombs—27 internally and 24 on pylons. In time, the demand for B-52 bombing sorties became so great that the entire B-52D fleet was prepared for conventional warfare by means of a high-density bombing system modification called “Big Belly.” This increased the bomb bay capacity to 42 separate 750-pound bombs or 84 500-pound bombs. It could still carry 24 bombs externally, for a maximum bomb load, internal and external, of 108. The nuclear bombing capability was retained.

The B-52 G and H models differed significantly in appearance from their predecessors, having a shorter vertical fin and rudder. The G was designed especially for flight at low levels and was considered by pilots to be more difficult to fly than others in the series because the ailerons had been removed and lateral control was by spoilers only. Unlike all previous models, which used conventional fuel bladders, both the G and the H models had wet-wing fuel tanks, greatly



**Above, BUFFs line up for takeoff circa 1969. Here, during Linebacker II in 1972, a poststrike photo of the Kinh No rail yard, about seven miles north of Hanoi in North Vietnam, shows the destructive power of the B-52s.**

increasing their internal capacity. This was a disadvantage in combat; during Linebacker II operations in 1972, nine Ds were hit by SAMs but were still able to land. More vulnerable because of the wet wing, all but one of the six B-52Gs hit by SAMs crashed.

### More Power

The H model was modified to be easier to control and was easily distinguished by powerful new TF33 turbofans. Compared to power plants on the G models, these offered about 30 percent more power. The 744th and last B-52, an H model, was delivered Oct. 26, 1962. The B-52H is

had reached a peak with about 1,360 in operation, but their numbers declined rapidly thereafter, and most were out of operational use by late 1965. While original plans had called for a fleet of only 282 B-52 aircraft, the demand built steadily, and by 1962, the Air Force had deployed no fewer than 639 operational B-52s.

As B-47 and B-36 units converted to B-52s, there were some unusual personnel problems. Some combat crews with years of service together, many with individuals who had earned spot promotions, were broken up and spot promotions lost. Some especially skilled crew members had “spots on spots”—two spot promo-



tions. When the spots were taken away, lieutenant colonels became captains overnight.

As a result, there were often unseemly scrambles among aircraft commanders to select the best talent for their new crews. In SAC, promotions depended in great part upon crew performance, and every new B-52 crew wanted the best people at each of the six positions—aircraft commander, pilot, radar/navigator (essentially, the bombardier), navigator, Electronic Warfare Officer, and gunner. (A great and honorable tradition ended in 1991 when USAF eliminated the B-52 gunner's position, a victim of new technology that made aerial gunnery passé.)

Introducing the B-52 entailed far more than teaching crews how to fly a new aircraft. The wingspan of 185 feet and a gross weight reaching 488,000 pounds on later models meant that new runways, taxiways, hangars, refueling facilities, and maintenance docks had to be provided at many bases. The planning problem was increased in 1957 when the threat of Soviet missile attack made it imperative to disperse B-52s to a larger number of bases to complicate Soviet targeting.

### On Alert

By Oct. 1, 1963, there were 42 B-52 squadrons stationed at 38 bases. The dispersal made it easier for SAC to try to reach its goal of having one-third of its force on ground alert at all times, but the new situation imposed severe problems on training, maintenance, and logistics.

SAC was without question the most influential component of United States armed forces, and it routinely received a large share of the military budget. But even a large budget and good management could not solve all the problems, and the usual last resort was to take a solution out of the hides of the crews. The alert system was one of these last resorts, intended to solve the problem of maintaining a large proportion of the force instantly ready for war.

While the alert system was undeniably effective, it was also cruel to family life. The ordinary working week lasted 60 to 80 hours, and there were lots of temporary duty separations. The alert system added to these hardships. Sometimes the stress of life in SAC became too much and



Staff photo by Guy Aceo

*The Cold War meant 24-hours-a-day alert for B-52 crews, who were required to be in the air within 15 minutes of a go order. These crews are "relaxing" in the dining area of an alert facility.*

divorces resulted, but for the most part, wives and children pulled their "tours of duty" with the same courage as did the crew members.

The alert concept was introduced on Oct. 1, 1957. Under its terms, B-52s were required to get airborne within 15 minutes of the order to take off. At the time, it was widely accepted that the USSR had a great advantage in ballistic missiles that could strike US targets within 30 minutes of launch. With immediate warning, a 15-minute alert meant that the B-52s would just have time to get off to retaliate for the missile attack.

Crews on alert status were expected to remain together and be close enough to meet the 15-minute demand. Aircraft were "cocked," that is, ready for engine start, and experienced crews could have the engines running within two minutes of an alarm and be taxiing within five minutes.

The alert plan contained an unacknowledged problem that was unique in warfare: a warrior's family was in greater danger than the warrior himself. The chances were that the warrior would return from a combat mission only to find that he had lost his family to the enemy attack. There were evacuation plans, but civil defense was never really embraced by the United States as it had been in the Soviet Union. Tension remained high throughout the Cold War despite the frequency of training alerts,

for the crews never knew which one might be the real thing.

The routine and schedule of alert duty varied from base to base and over time, but a crew might expect to pull one week of alert out of the month, in addition to all their other many training requirements. In the early days, the "alert shacks" were improvised, but later they were well-built and relatively comfortable. In their "free" moments the crews could use the usually Spartan recreational facilities or work on correspondence courses, but much of the time was spent in studying their Positive Control Procedures and their specific war plan mission. The crews had to be as concerned about Positive Control Procedures and the associated paperwork as they were about the war plan mission, for any failure with the procedures—or loss of the paperwork—meant serious disciplinary action.

The B-52 did not go to war for nearly 10 years after it entered service, but its entry into the Vietnam War would have a drastic impact on SAC's ability to maintain a substantial percentage of its force on alert.

### First Blood

The BUFF entered combat from Andersen AFB, Guam, on June 18, 1965. Some 27 B-52Fs of the 7th and 320th Bomb Wings were ordered to attack Viet Cong forces about 40 miles north of Saigon. It was the first Arc Light operation.

## When a BUFF Went Down

The story of Linebacker II has been told many times, but the cold statistics conceal the human drama faced by every bomber crew on every mission. Lt. Col. George Larson provided the following excerpt of an interview with Maj. John Wise, 28th Bomb Wing, to give some insight into just how demanding these missions were and how harrowing they could be. All six crew members of Ash 02 survived.

"I flew my 295th combat mission on Dec. 27, 1972. We were to attack the Van Dien Supply Area. We were Ash Cell. I flew Ash 02, aircraft No. 56-05999, not a good position to be in, because the North Vietnamese were using the lead aircraft to set up on the following cell's aircraft.

"At the IP [Initial Point], I believe there were five to six SA-2s fired at us. At bombs away, we were level for dropping our bombs, which were salvoed in 1.5 seconds. I put the B-52D into a 90-degree wingover when—wham!—we were hit in the left side [wing]. All four engines on that side were finished. There were lights blinking all over the cockpit. We were later told by USAF intelligence that the fatal hit was from SAM Site VN 549.

"All the crew was OK. We had no engine power on the left side. It was 250 miles to reach friendly territory. Aircraft control was terrible, trying to make course on an exit heading to U Tapao. We were at 30,000 feet, and as the aircraft slowed, I would dive down, picking up speed, slowly climbing, but not making up all lost altitude. I could only steer a course of 190 degrees, but we were getting out of the North by using this roller coaster maneuver. However, we were slowly losing precious altitude.

"We crossed the 15,000-foot-altitude bailout decision point, but I looked down and there were lights. These lights were coming from a firefight below between Communist troops and US backed forces in Laos. I decided we would not jump into the middle of a war. We crossed the Mekong River at 12,000 feet, all the time keeping in constant communications with the Air Force rescue helicopters then airborne.

"We had been in the air nearly 45 minutes after being hit by the SAM and it was time to bail out. I called the gunner to go first. However, unknown to me at the time, the gunner did not go out on the first try, requiring a second attempt. The gunner eventually went. The navigator attempted to go, trying to blow the hatch below, but it did not open, probably jammed from the SAM hit in the left wing. The radar navigator ejected. I told the navigator to jump out the open radar navigator's hatch. The EWO then ejected.

"Well, the navigator's microphone pulled loose as he jumped and I did not know he had gone. I told the copilot to eject and—boom—he was gone, filling the cockpit with insulation. I kept calling the navigator. I was not going to eject until I knew he had gone safely out of the wounded bomber.

"At 3,000 feet, I heard the Air Force rescue boys indicate that it was time for me to get out of the aircraft. Well—boom—the hatch above me was gone and then I squeezed the ejection handle. Then, up and out I went. I was uncertain if I would separate from the seat. However, once in the wind, the seat was gone and I was floating free. The chute opened with a jerk. I looked down to see the bomber hit the ground with a huge fireball, turning night into day."

The results were tragically disappointing. Two B-52s were lost in a midair collision during a 360-degree timing adjustment turn. Eight crew members lost their lives. A third aircraft was diverted. The remaining BUFFs dropped their bombs on an area that the Viet Cong had just vacated.

Despite the inauspicious beginning, the Arc Light campaign proved to be so valuable that the demand for sorties went up from an initial rate of 300 per month at the beginning of 1966 to a peak of 3,150 per month in 1972, in the successful effort to contain the North Vietnamese spring offensive. The effectiveness of the force was enhanced with the introduction of the B-52D as the standard bomber and the introduction of the Combat Skyspot radar-assisted ground-directed bombing system.

U Tapao Royal Thai Air Base was brought into operation, enabling the Air Force to conduct B-52 missions with greatly reduced en route times. Sorties were extended beyond Vietnam to Laos and Cambodia. The strategic nuclear bomber had been turned into a flexible, on-call tactical bomb delivery system.

The B-52 distinguished itself many times during the Vietnam War, but two efforts stand out above all. The

first is the battle of Khe Sanh, where new tactics devastated the North Vietnamese besiegers in 2,548 sorties that dropped 59,542 tons of bombs and, in the words of Army Gen. William Westmoreland, "broke their [the enemy's] back."

The second was Operation Linebacker II, when in 11 days of bombing, B-52s smashed the defenses of Hanoi and Haiphong and forced

North Vietnam to negotiate peace in Paris. The B-52s flew 729 out of 741 planned sorties and dropped 15,000 tons of bombs. Fifteen BUFFs were lost—about two percent of the force. The action proved that the B-52, supported by tactical air assets, could meet and defeat the enemy. The results have caused many to wonder what the world might be like if the B-52s had been unleashed in 1965,



*As large as the B-52 is, crew stations, like the offensive and defensive positions here, are cramped. To keep BUFFs viable after Vietnam, they were modified for new precision weapons and enhanced defensive capability.*

Photo by Paul Kennedy





when the target areas were virtually undefended.

All told, the BUFF force flew 126,615 sorties during eight years of Arc Light. The B-52, initially a desperation weapon thrown in when there was nothing else available, grew to become the final instrument of the war.

After Vietnam, the B-52s returned to service in the Cold War. As the years passed, attrition and economics pared the B-52 fleet down until, by 1991, only B-52Gs and Hs remained in service, with the exception of an NB-52B serving as mother airplane at Edwards Air Force Base in California.

### Desert Duty

Operation Desert Storm called the old warrior into action once more, with about 80 B-52Gs operating from the United States and four overseas locations. History was made on Jan. 17, 1991, when seven B-52Gs from the 2nd Bomb Wing at Barksdale AFB, La., completed what was then the longest combat mission in history—35 hours. The bombers flew from their US base to attack Iraqi targets with 35 AGM-86C Conventional Air Launched Cruise Missiles. Poststrike reconnaissance revealed that 33 CALCMs found their target.

The B-52 missile attack was followed up with the first low-level



**The B-52G was retired after Desert Storm. The B-52H (here and above), which was introduced in 1962, continues to serve, and during Allied Force B-52H crews flew 270 sorties, dropping 11,000 bombs. They are heavily engaged once again in the War on Terror.**

attack in SAC history. After three decades of practice, B-52s swept in at less than 300 feet above the ground to bomb four Iraqi airfields and an important highway. Then, after these glamorous forays, it was back to textbook duties from the Vietnam War era, with three-ship cells of B-52s bombing from above 30,000 feet. The B-52s would put down about 150 bombs in a tight, devastating pattern that killed troops in the tar-

get area and demoralized those adjacent to it. The B-52s were assigned other missions as well, but the main thrust of their attacks was the decimation of Iraqi troops with conventional M117 750-pound bombs and cluster bomb units. All told, the BUFFs flew more than 1,600 sorties and dropped more than 25,000 tons of ordnance. No B-52s were lost to enemy action, but one crashed in the Indian Ocean on its way back to Diego Garcia, with the loss of three crew members.

The BUFF, now a hardened combat veteran, returned to war in February 1999, in Operation Allied Force. Aircraft were sent first from Barksdale and later from Minot AFB, N.D. Combat operations be-

gan in late March, with six B-52s launching CALCMs. Heavy raids by B-52s on Yugoslav army units in Kosovo were one factor in Belgrade's decision to throw in the towel. B-52s had flown 270 sorties and dropped 11,000 bombs.

After 50 years and hundreds of thousands of sorties, B-52 crews have lots of tales to tell, some hair-raising (landings with four engines out on one side, for example). No matter what the subject, however, the story is always filled with affection for an airplane that just keeps going on, year after year, decade after decade, always taking on new tasks, and always on the first team. ■

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