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FEATURING:

BACK IN BLACK

After a four-year hiatus due to COVID-19, Exercise Pitch Black made a triumphant return to Australia in August. Khalem Chapman reports.

CRIMEA – WHAT NEXT?

Vladimir Trendafilovski asks is the 'unsinkable aircraft carrier' is about to flounder?

PELOSI'S WAR GAMES

Tension between Taiwan and China reached a new high after a controversial visit by one of the United States' most senior politicians. David Axe examines the fallout.

ON THE FRONT LINE

The crisis in Afghanistan and the war in the Ukraine have meant that United States forces in Europe's German centre have become the heart of vital operations. Ludo Mennes and Frank Visser visited the 52nd Fighter Wing at Spangdahlem Air Base for an update on their mission.

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Above: On August 18, 2022, a B-52H flew alongside a Royal Norwegian Air Force F-35A and two Swedish Gripen-Cs. Four days later, BUFFs flew over 20 different NATO countries, usually with one or two of their fighters, in a show of force aimed at deterring aggression

Royal Norwegian Air Force

THE BUFF WHAT A SERVANT!

It is amazing that 70 years after its first flight, the B-52 or BUFF as it's affectionately known, is still going strong. Even though there isn't much of the original airframes anymore, the tail number remains the same as the spotters will tell us! There are so many recent modifications to the aircraft, as Jeff Bolton explains in his epic 'Buffing Up' feature, that have enabled the huge bomber to keep relevant. Most of us have also grown up with the BUFF – just like we did with the UK's Queen until September 8, but, unlike the Queen, will outlive many of us.

The BUFF will probably outlive the B-1B Bone and the B-2 Spirit bombers also, which, back in the 1980s we thought would replace the old bomber with its modern conventional bombing role. Today, if ever the US government wants to sabre-rattle or play the psychological game with its adversaries, the BUFF is rolled out and

photographed in formation with a local fighter. Just as it has been regularly since Russia's military tried to invade Ukraine, and before that to threaten and then bomb Saddam Hussein and the Islamic State, in Iraq, and Afghanistan, where it was used both psychologically and militarily against the Taliban and other undesirable militias. We have also seen it during South Korean exercises, when North Korea looked to be on the verge of being attacked. Way in the past, we have seen footage of it carpet-bombing Vietnam, which looks terrifying – in an era where there was not so much regard for the human life.

Now the B-21 Raider has been rolled out – see our headline news – the amazing B-52 is set to have a new sixth-generation pal in the bomber stable, which will undoubtedly, like a very well-known advert, reach parts that others cannot. And on the subject of labelling bombers by generation, would we label the BUFF

a second-generation bomber? Or maybe a third, with all the upgraded kit?

So, what are your thoughts on the BUFF? Do you have your own favorite memory or memories? Why not share them with us – for our Feedback pages?

By the way – we have introduced our first Snapshot feature in this CAJ, from South Korea (pages 22-23). We would like to see more of these features, so if you are spending some time in a country or at a base, then please send in your images with good captions please.

That just leaves all of us at Key Publishing's Modern Military Aviation team, to wish you a belated Happy New Year!

Alan Warnes
Group Editor at Large



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INSIDE

IN THE NEWS

- US Army names the Valor tiltrotor as its Black Hawk successor (p10)
- Ukrainian 'kamikaze' drones strike Russia forces (p11)
- 'Flying Tigers' begin F-35B transition (p14)
- AFSOC receives final AC-130J (p21)

06 New era, new icon

The USAF has officially entered the age of sixth-generation combat aircraft with the B-21 Raider. Khalem Chapman reports on the rollout

16 Canadians on call

The RCAF at Prestwick, Scotland, is distributing hundreds of tons of aid to Ukraine. Stewart Marshall caught up with the team

22 Snapshot from South Korea

A CAJ correspondent returns from South Korea with some impressive shots of military assets

28 An abrupt beginning

Barely a month after the USAF announced that Kadena Air Base would lose its F-15C/D Eagles, they are heading home. Tom Kaminski reports

34 Missiles matter to Taiwan

With unease over China's possible invasion of its tiny island neighbour, David Axe examines Taipei's dilemma over its air-to-air missile arsenal

36 Over there

Expeditionary Advanced Base Operations is a concept that the USMC is embracing as tensions rise in the Indo-Pacific, as Roy Choo explains

40 Nightwatch out of the shadows

Chris Croot learns how the secretive E-4B Nightwatch's veil is finally being lifted

44 Team XL

Laughlin AFB plays an important role in training pilots. Frank Visser visited the base to speak with its new commander



62 Ted Carlson



36 Roy Choo

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SEE PAGE 99 FOR
FULL DETAILS

COMBAT
AIRCRAFT
SUBSCRIBER
EXCLUSIVE



50 Buffing up!

In the first in a series about the weapons of the US Air Force's Global Strike Command, Jeff Bolton looks at the mighty B-52

60 Just a Nice Pic

Robert Griffiths is the second winner of our Just a Nice Pic competition with a fabulous image of an RAF C-130J operating from South Wales

62 Topguns on target

Tom Kaminski continues our State Report series by focusing on Nevada, home to the cutting edge of frontline combat training

72 Herculean task

As the latest C-130Js start to be delivered, Dr Andreas Zeitler speaks to the commanders of the German-French unit charged with flying Super Hercules missions

78 Wings of West Point

The US Army's 2nd Aviation Detachment has a key role training officer cadets. Tom Kaminski visits the famous military academy

84 Shooting Star mystery

Igor Bozinovski reveals the truth about how a US T-33 jet ended up parked outside a castle in the former Communist state of Albania

86 Dependable performer and modern classic

The most popular Russian rotorcraft is set to enter military service in a new breed of pumped-up derivatives. Alexander Mladenov reports

50 USAF



93 Feedback **NEW**

A new monthly column where readers sound off. This month focuses on the renaming of Confederacy-affiliated US military bases

94 Demise of the Mighty Hunter

The Nimrod MRA4 is one of the UK Ministry of Defence's most infamous procurement failures, as David Willis details

96 Cutting Edge: Bombs away

Dispatches from the front line of aerospace technology by David Axe

86 Russian MOD



ON THE COVER

Cover image: An F-15C Eagle from the 18th Wing at Kadena Air Base shows off its long-range air-to-air capabilities by carrying at least six AIM-120C AMRAAMs. Kadena's Eagles started leaving Japan for the US on December 1, 2022
Jim 'Hazy' Haseltine



BUFFING UP!

In his first article of a series about the weapons of the US Air Force's Global Strike Command, **Jeff Bolton** looks at the mighty B-52

The iconic and much-loved B-52H 'BUFF' Stratofortress is receiving its most significant upgrade in more than 50 years of operation with new engines, radar, sensors, and instrumentation. With the coming technology leap she's also going from a five to four-person crew. Bob Dylan told us, "The times they are a-changin'," and the 'BUFF' (Big Ugly Fat Fella) is a poster child for the legendary lyrics.

This is the inside story of how the mother of all heavy bombers will remain lethal for another 50 years even as it heads towards 100 years of service, and what

it's like to fly her. To understand just how incredible the B-52 really is requires a trip down memory lane for some readers, or a visit to the interwebs for others.

I'll save you the time of either one. Yes, the history is obligatory and necessary to understand just how amazing and robust the 'BUFF' really is.

Consider the era when it was built:

- The last Civil War veteran was still alive
- The Chevrolet Bel-Air was the best-selling car in America
- A new house in the US cost \$10,000
- The polio vaccine was approved for use
- McDonalds built its first restaurant in the US

- The first *Guinness Book of World Records* was published
- Wow! No one could have imagined in 1955 when the B-52 first entered service in the US Air Force (now 68 years ago) that it would become a permanent fixture in *The Guinness Book of World Records* and on the ramps of US and Allied air bases around the planet. By the time Boeing delivered the last of a total of 744 B-52s in 1961 after only seven years of production, John F Kennedy was the US President, the Space Race was underway, the American



USAF 5th Bomb Wing B-52 Stratofortress approaches a USAF KC-135 Stratotanker, assigned to the 909th Air Refueling Squadron, to perform aerial refueling over the Pacific Ocean **USAF/DVIDS**

Civil Rights Movement was growing rapidly, and Martin Luther King's "I Have A Dream" speech was still in the future. To call the B-52 a miracle of longevity somehow doesn't come close to describing how exceedingly rare and unusual it is to operate a highly complex mechanical aircraft in harsh, extreme conditions for almost seven decades. So how in the world did engineers using paper, pencils, and slide rules in the late 1940s design one of the most extraordinary weapons systems of all time?

The secret – one that has proven amazingly serendipitous for the US Air Force (USAF) – is found in the annals of Cold War history.

Cold War and armageddon

As the US and the USSR inched closer to nuclear confrontation in the aftermath of World War Two, the need to carry very large, very heavy nuclear weapons thousands of miles into enemy territory became paramount. These were the days before intercontinental ballistic missiles

(ICBMs) existed and aircraft engineers on both sides of the Iron Curtain began to design fancifully huge bombers to carry fancifully huge atomic weapons.

The size of these new bombers dwarfed the famous B-17 and B-29 bombers of the prior conflict. The B-52's predecessor, the B-36 (followed the B-29) was gargantuan, dwarfing even the B-52 and every other heavy bomber since. But its piston engines left it not only under-powered, but also miserably slow. The B-36 became a virtual relic after only a few years of service, growing obsolete as the jet age dawned fully in the 1950s with the likes of the B-52's eight turbojet engine design.



“B-52 LOSSES BECAME AN ENDURING EMOTIONAL WOUND DURING THE VIETNAM CONFLICT”

When the ‘BUFF’ entered service, it was an operational and technical marvel: an intercontinental range of around 9,000 miles, 500+ mile per hour speeds, a 50,000-foot operating ceiling, a cavernous bomb bay, and six wing hard points that could carry a 70,000-pound mix of weapons, jet fuel, and other stores. In a wildly ambitious mission titled ‘Chrome Dome’, USAF Strategic Air Command (SAC) B-52 aircraft began flying airborne-alert nuclear armed missions near USSR borders in 1960. These flights were the symbol of American strength during the time when Pax Americana was ascendant but also fighting off the influence of the Soviet Bear around the world.

The statistics the jet compiled in its early years are mind-bending even by modern standards. During the heat of the Cold War in the late 1950s, SAC kept 12 B-52s always armed with thermonuclear weapons aloft, 24 hours a day, on individual missions that lasted around 24 hours each. Think about that for a moment: billions and billions of gallons of gas from the massive USAF tanker fleet keeping a dozen ‘BUFFs’ with nuclear

weapons aloft for almost ten years straight without pause, 24/7, 365 days a year. During the Chrome Dome mission years, five B-52s were lost to accidents with the loss of ten B-52 crew members. While some nuclear material was released during those mishaps, there was never a nuclear reaction from any of the fallen weapons; a fact that is considered miraculous today.

In the late 1960s, as intercontinental ballistic missiles began to populate the American plains in large numbers, the B-52’s airborne-alert nuclear mission was changed to a nuclear armed ground-alert, waning the jet’s visible presence with the end of the Chrome Dome mission. There was already a new replacement bomber for the B-52 on the horizon: the B-70 Valkyrie that would fly at an incredible Mach 3 at 70,000ft. But the advent of new surface-to-air missiles (SAMs) in the late 1950s would both doom the purchase of the B-70 and set the stage for the ‘BUFF’s bloody introduction to the airspace over southeast Asia.

Amid the constant, ongoing Cold War with the Soviet Union, the US military





Above: The new 'BUFF' cockpit is digital heaven for flight crews **Boeing**

Left: Boeing's rendered vision of the modernized 'BUFF' **Rolls Royce**

Right: The B-52 artwork featuring new Rolls-Royce F130 engines

Below: An iconic image of the B-1B, B-2A, and B-52H in formation **USAF**



presence was increasing in Southeast Asia as the nation grew more deeply involved in the Vietnam war. With the enormous number of B-52s produced in the prior ten years, USAF leadership had many of them modified to accommodate non-nuclear conventional bombs. Hundreds of these 'BUFFs' were sent into the combat theater where their payload could devastate the North Vietnamese battlefield with up to 24 wing-mounted 750-pound iron bombs, and 84 internally mounted 500-pound iron bombs. When a cell of three B-52 bombers in formation dropped their payloads together they left an extraordinary path of destruction more than a mile long and half a mile wide. Video footage from Vietnam showing these large formation carpet bombing runs is a staggeringly violent sight. The massive, concussive destruction is frightening. But as the 'BUFF' came to the battlefield in its lethal, non-nuclear role, it was flying into dangerous skies that would change 'BUFF' operations forever.

The North Vietnamese military – backed by the might and technology of the Soviet Union in the proxy war – immediately

began using recently developed, highly sophisticated weapons systems to counter the high-flying B-52s. Both advanced SAMs and fighter jets were employed against the B-52, and the SAMs were devastatingly effective. The North Vietnamese set up hundreds of SAMs to counter the bomber streams and the searing images of massive 'BUFFs' falling broken in flames from the skies was a shock for the American public.

B-52 losses became an enduring emotional wound during the Vietnam conflict, which saw a reported loss of 31 'BUFFs': 17 in combat, 12 in airborne or ground/take-off accidents, and two that were scrapped on the ground after extensive battle damage. Still, even with those sustained losses, the USAF recorded that the 'BUFF' fleet flew an astounding 126,615 missions from June 1965 to August 1973. But as the Vietnam war ended, the 'BUFF' looked vulnerable (too old and too slow) and seemed destined to meet the fate of its B-36 predecessor. The B-52's replacement – the B-1A Lancer, known affectionately as the 'Bone' (B-One) – was already on the drawing board and receiving



“THE GOAL OF RE-ENGINEING ISN’T TO GIVE THE ‘BUFF’ GREATER THRUST OR SPEED (OR STRESS) ON ITS ALMOST 70-YEAR-OLD AIRFRAME, BUT TO MAKE A BIG LEAP IN FUEL EFFICIENCY AND A HUGE REDUCTION IN MAINTENANCE”

developmental funding. With a planned purchase of 244 airframes, the ‘Bone’ would combine the qualities of two bombers: the high-altitude Mach 2 supersonic performance of the 1950s’ B-58 Hustler and the massive payload capacity of the B-52. But fate intervened for the ‘BUFF’ in two very different ways.

First, the AGM-86 ALCM (Air-To-Ground-86 Air Launched Cruise Missile) was developed as a long-range standoff missile and was perfect for the B-52 weapons truck. The AGM-86 featured new technology nuclear warheads that were

Above: Faded, but glorious. The *Memphis Belle*, 60-001, the oldest B-52 in the USAF fleet **USAF**

Below: This B-52H on display on a row away from the others at the area 24 and named *Global Reach and Power* with serial 60-0014 and msn 464379 was retired to AMARG in December 2008 with inventory number AABC0488. It belonged to 2nd Bomb Wing

much smaller and lighter than previous generations, and the B-52 would carry a whopping 20 of the nuclear missiles. The missile could fly at extremely low level to avoid enemy missile defense systems, had a range of more than 1,500 miles, and flew at more than 500 miles an hour. Now, instead of being forced to drop conventional gravity nuclear weapons and expose itself to sure destruction, the ‘BUFF’ could stay well away from the heavily defended Soviet Union airspace.

Fate also intervened for the ‘BUFF’ in a second, much quieter fashion. The

US government’s DARPA (Defense Advanced Research Projects Agency) ushered in the age of stealth with the ultra-secret development of the first two stealth test aircraft in the mid-1970s. The stellar promise of these two aircraft laid the groundwork for both the F-117A stealth fighter and the B-2A Spirit stealth bomber. When briefed about the development of both the AGM-86 and the stealth aircraft, President Jimmy Carter canceled the purchase of the B-1 bomber even before any of the 244 planned operational aircraft had been





Above: A B-52 Stratofortress with the 307th Bomb Wing, Louisiana, over southern USA on July 9, 2022 **USAF/Staff Sgt Tiffany A Emery 914th Air Refueling Wing**

Below: The B-52s (G and H models) are located at parking areas 24 (26 B-52s) and 26 (66 B-52s) at Davis-Monthan, Arizona **Javier Rodriguez**



built. With these two developments, the B-52 had earned a second retirement reprieve, but seemed destined for the long, dusty runway of the Davis-Monthan Air Force Base boneyard when the B-2A began significant production.

Only a few years later, Ronald Reagan swept into the White House after defeating Carter in the 1982 presidential election. President Reagan promised a massive resurgence of the American military to counter the ever-present menace of the Soviet Union. He pledged a 600-ship navy, resurrected the B-1

bomber by approving the purchase of 100 re-designed and more capable B-1Bs, and approved the development and purchase of the B-2A stealth bomber. Seemingly, the B-52's days were numbered again... right? Nope! Not so fast. The 'BUFF' had a few other tricks up its weathered old sleeves that no new bomber platform could offer.

As the B-1 and B-2 bomber lines ramped-up production, three major issues confronted both programs putting their existence at risk: their new, complicated technologies and associated costs; the demise of the Soviet Union; and the onset of the first Gulf War. Both new bombers struggled to reach initial operational capacity (IOC). The 'Bone' was first to reach IOC in October 1986, but with only a nuclear weapons delivery capability it had to sit out the conventional weapon warfare of the Gulf War from late 1990 to early 1991. The B-1 was later converted to a conventional platform because of New START treaty negotiations with the Russians in 1995. Unfortunately for the B-1, the jet was also stripped of its nuclear capability during the same treaty negotiations, leaving it in a permanent non-nuclear role.

The B-2 reached IOC in January 1997 when President Bill Clinton's peace dividend was still very much alive, and the future of the jet was in serious jeopardy. While the B-2 could drop conventional and nuclear gravity bombs, it had no standoff missile capability, nor had it been tested in combat.

BUFF UPGRADE

New radar, new standoff capability

For all its incredible virtue and Swiss army knife versatility, the 'BUFF' can never venture into modern contested air space. Never. It's simply too big a target for modern air defense systems on the ground and in the air.

Therefore, improving its long-range situational awareness to maximize its strengths is vital to its usefulness for the next 30-plus years. The 'BUFF' desperately needs a new radar as the language used in the radar upgrade contract from 2009 about the B-52's current radar makes painfully stark: "The AN/APQ-166 Mechanically Scanned Array (MSA) radar system currently installed on the B-52H fleet was originally fielded in the 1950s, last upgraded to its present configuration in the early 1980s and is approaching the end of its useful life. The antenna assembly has corrosion issues, and several components of the radar system are experiencing diminishing manufacturing source/material shortage (DMS/MS) situations. Forecasts indicate that the B-52H radar system will become unsupportable beginning in the 2016 timeframe." Ugh.

After another recent competition called the Radar Modernization Program (RMP), Raytheon Technologies was awarded a contract to develop a radar from their AN/APG-79/82 family of active electronically scanned array radars (AESA) for the 'BUFF' fleet. According to Raytheon, the AESA radar will lead to better mapping and detection range, an increase in the number of targets it can simultaneously engage, improved capabilities to help crews see further and more accurately, and greater reliability than the current system. All possible because it has no moving parts and uses modern operating software.

Different versions of Raytheon's AESA radars have been used for years in both the air force F-15 Eagle and the navy F/A-18 Super Hornet fleets. The new radars will be installed on the 'BUFF' as each aircraft makes its way through the Tinker heavy maintenance depot in the coming years. The radar will see through a new nose that will enable full aperture for the new radar. Subsequently, the B-52 will need modifications to its cooling systems to accommodate the new radar system. Two new hand controllers and two large, high-definition, electronic touch screens will be installed in the cockpit along with new display sensor systems to connect the new AESA radar to other systems in the jet. According to Boeing, the technology will add enhanced navigation accuracy, high-resolution mapping, target detection, tracking, and the ability to engage multiple targets simultaneously. Eleven B-52s are expected to be operating with the new radar in 2026.



A Czech Air Force Saab JAS-39C Gripen escorts a United States Air Force B-52H Stratofortress assigned to the 69th Expeditionary Bomb Squadron (EBS) at RAF Fairford, England, April 5, 2022. The Czech Gripens escorted the 69th EBS on the way to the Mediterranean region, part of a pre-planned Bomber Task Force Europe series of missions **USAF/Airman 1st Class Zachary Wright**

BUFF UPGRADE

New cockpit displays replace steam gauges

If there is one area of the 'BUFF' that simply screams "OLD!", it must be the instrument panel. Think of that guy walking around on Halloween with the Steampunk outfit that's festooned with all types of mechanical protuberances. He's a walking B-52 instrument panel.

It's a very large panel in a very small area and every square inch is absolutely covered in analog gauges (or "steam gauges" as they are often referred to because of their resemblance to actual steam gauges of old... go figure!), buttons, switches, levers, and handles of all types including the eight that comprise the Edward Scissorhands-looking throttle body. As seen in a recent photo from Boeing, lots of new digital glass and instruments will populate the panel in the modernization process. The photo shows four color MFDs (multi-function displays) that will aggregate, and display information about the jet's engine performance, communications, radar, sensors, datalinks, and weapons.

Sharp-eyed assessors will note a new throttle body that looks a lot like the old one; Boeing calls it a hybrid mechanical-to-digital throttle system.

The instrument panel upgrades promise to reduce the pilot workload while presenting far more information for deeper situational awareness.

The purchase numbers of both jets had also been greatly reduced from their initial projection. From an original estimate of 240 B-1s, only 100 would be purchased, and from an initial 165 B-2s, only 21 would be purchased. You can almost see the grizzled 'BUFF' crews looking at the new bomber fleets skeptically, comparing them with the 700-plus 'BUFFs' that were built and in service for more than 30 years at that point and saying: "So whatcha gonna do with those, Sonny?" After excruciating development cycles, the two bombers would eventually become highly effective in their conventional roles, but lack of airframe numbers, bad timing, complicated systems, developing technology – all a confluence of unforeseen events – would forever limit the B-1 and B-2 fleets.

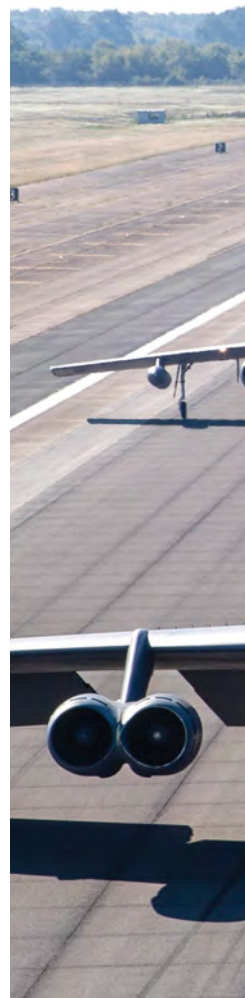
In the meantime, with both its nuclear standoff and conventional capabilities well established and growing, the 'BUFF' went to the Middle East in the first Gulf War. The solid and reliable aircraft yielded an exemplary performance, taking credit for having dropped more than 40% of all coalition forces weapons. 'BUFF' crews also flew the opening missions of the war in Operation Senior Surprise (nicknamed Secret Squirrel by the crews) when seven of them flew their B-52s from Barksdale Air Force base in Louisiana to strike

targets in Iraq. The 35-hour, 14,000-mile round trip set the record at that time for the longest distance, longest duration combat missions in history. In the 30-plus years since, the B-52 has participated in every major US military action including Kosovo, the second Gulf War, Afghanistan, and Syria.

Today's B-52 weapons arsenals are the most extensive in the entire air force and include nuclear bombs, precision and non-precision guided bombs, cluster bombs, precision guided missiles, and sea mines. The jet also has Sniper and Litening optical/infrared targeting pods to direct those weapons. For a little more perspective on the payload, 35 tons of weapons is equal to five or six fully grown African male elephants or, say, 20 automobiles. It's a massive combat load, and to carry that kind of weight the aircraft was built to match every adjective equal to "sturdy" and "strong" that can be found in a dictionary.

But surely, it's too slow, too old, and will soon be supplanted by the stealthy B-21 Raider, right? Think again.

Upgrades in the last 20 years from the CONECT, ESP, and SWING programs dramatically improved the jet's communications, datalinks, sensors, targeting pods, and bomb bays. In uncontested airspace, the 'BUFF' can still





USAF pilots assigned to the 20th Bomb Squadron pull the throttle back during take-off in a rainstorm on a B-52 Stratofortress from Barksdale Air Force Base on August 23, 2022 USAF/Staff Sgt James R Crow

“TODAY’S B-52 WEAPONS ARSENALS ARE THE MOST EXTENSIVE IN THE ENTIRE AIR FORCE AND INCLUDE NUCLEAR BOMBS, PRECISION AND NON-PRECISION GUIDED BOMBS, CLUSTER BOMBS, PRECISION GUIDED MISSILES, AND SEA MINES”



B-52H Stratofortresses from the 2nd Bomb Wing line up on the runway at Barksdale Air Force Base during a readiness exercise USAF/Senior Airman Tessa B Corrick

carpet-bomb or smart-bomb the living daylights out of targets; there’s simply no other platform that can deliver the abundance of different weapons the B-52 can. Although stealth aircraft rule the modern contested battle space where the ‘BUFF’s non-stealth design doesn’t allow it to fly, operating as a standoff heavy weapons truck is where the jet truly shines in the current era. With new technologies and weapons that are often far more capable than legacy systems but far smaller in size, the jet strikes fear into enemies now more than ever and makes a statement wherever it is seen around the globe.

So how does the already lethal ‘BUFF’ fleet of 76 aircraft get better? It’s not more speed or even power the ‘BUFF’ fleet needs, but more efficiency from its components, starting with new engines.

Powering the ‘BUFF’

The B-52 has been powered by the Pratt & Whitney TF33 turbofan engine since the early 1960s. These engines, the last of which were built in 1985, are now long past their planned usage and will be unserviceable in a few years. Enter the B-52 Commercial Engine Replacement Program, or CERP in government-speak.

This program recently pitted three aircraft engine manufacturers in competition to supply new engines for the B-52. Rolls-Royce North America in Indianapolis, Indiana, won the coveted contract in 2021 with its F130 engine entry. The goal of re-engining isn’t to give the ‘BUFF’ greater thrust or speed (or stress) on its almost 70-year-old airframe, but to make a big leap in fuel efficiency and a huge reduction in maintenance.

Early tests indicate that the F130 engine will fully accomplish the air force’s goals in the B-52 re-engining effort: greater fuel efficiency resulting in greater mission range; greater loiter time on station in combat; and reduced tanker refueling support. An increase of 20% fuel efficiency would extend the jet’s base fuel range beyond 10,000 miles and allow it to strike targets virtually anywhere on Earth. Reducing the number of airborne refueling sessions for the pilots is a win also: the jet is unwieldy and challenging in the tanking environment and shaving off one or two of those evolutions during a mission is no small thing.

The air force’s choice of the Rolls-Royce F130 engines was certainly influenced by their current use in a variety of other aircraft around the



world, including several already in the US military. They are a known quantity with an outstanding performance history that records more than 27 million hours of successful operation.

The F130 engine is similar in size and thrust to the TF33, but offers a far more advanced design, materials, and efficiency. It is digitally controlled, and that quality alone is a quantum leap for the 'BUFF' fleet. Rolls-Royce will supply 650 engines from its Indianapolis plant for the B-52 CERP program. It estimates that under normal operation the engines will never have to be removed from the wings of the 'BUFF' for the remainder of the aircraft's service life, now projected into the 2050s.

Let that sink in: Never have to remove the engines from the aircraft until it's retired in the 2050s.

The new engines also obviate the current need for a start cart or gunpowder cartridges. Outside of the Rolls-Royce scope of work, Honeywell will supply a new Auxiliary Power Unit (APU) with an on-wing Auxiliary Starter Air Unit (ASAU) that will enable the 'BUFF' to quick-start without ground support. Finally, unlike the TF33 engines that were built for either the left or right side of the aircraft, the F130 engines may be installed on either side of the 'BUFF'. That feature vastly reduces the cost of the overall program by removing the need for a warehouse full of left and right engines. Both Cold War B-52 maintenance chiefs and the current

Above: A view B-52 maintainers hope to never see again when the Rolls Royce F135 engines are installed
USAF

Below: Old and new for 'BUFF' crews. Analog switches and LED headlamps
1st Combat Camera Squadron

crop of wrench-turners are shaking their heads in wonder at the future.

B-52/F130 Program Manager Scott Ames, a Rolls-Royce veteran who previously directed the company's JSF F-35 LiftSystem program, described the digital engineering advantages the Rolls-Royce team brought to the process: "The US Air Force greatly values digital engineering for many reasons including cost savings and design advantages, and we believed the already developed F130 digital twin would give us a significant

advantage in the selection process. We also knew the engine was the perfect choice for the B-52 even before the re-engining effort was approved.

"Being able to add the digital component to our effort took us over the top. We're deeply honored to be a part of the CERP program for the iconic jet and we're excited to work closely with the air force and Boeing to give the B-52 fleet the most modern capabilities we can for the men and women who fly and maintain her."





Boeing is responsible for the integration of the engines and new systems in the 'BUFF's modernization effort. Placing the new F130 engines onto the 'BUFF' will necessitate new engine nacelles, pylons, generators, cockpit display systems, and new wiring for the engine's digital controls. The heavy lift of rewiring the jets will begin at Boeing's hangars in San Antonio, Texas. Eventually, full integration of all new B-52 systems will be completed at the air force's heavy maintenance depot at Tinker Air Force Base, Oklahoma.

Flying the 'BUFF'

"You don't rotate at take-off speed... it's more like you levitate..." one of the B-52 pilots told me over the intercom as we waited at the end of the departure runway for clearance to take off from Barksdale Air Force Base. We were aboard the oldest B-52 in service: the *Memphis Belle*, tail number 1001, from the more than 100-year-old 96th Bomb Squadron. I was flying in the flight deck jump seat as an observer with an active-duty B-52 squadron, whose mission was to complete a training evolution – they would simulate firing a full complement of 20 nuclear-tipped AGM-86 cruise missiles. As promised, the levitating take-off was remarkable.

As I watched the mission unfolding while moving between different crew positions I was struck by the quiet, calm demeanor of the crew members. Despite the significant noise inside the

jet, the crew maintained an even tone. When it came time to fire the simulated missiles, I had a literal chill down my spine as the radar navigator repeatedly pressed the red-glowing launch button under the 'Nuclear Enable' panel. Add to that the visual of the pilots wearing the flash-blindness goggles on their flight helmets (an Ant-Man helmet!) and the authenticity of the entire nuclear training mission came sharply into focus.

I had the opportunity to fulfill a childhood dream of hand flying the 'BUFF' from the right seat. It was a goal that had been a long time coming. When I was nine years old, I was mowing an open ten-acre field one day on a tractor with a loud shredder attachment. From behind me I heard a massive shriek. I thought the shredder was breaking and as I turned sharply in the tractor seat a B-52 flew over my head at just 300ft and scared the living hell out of me. I'm sure that crew had a good laugh, but it was a sight a boy could never forget. Much later I learned those flights were common in that area; it was a low-level navigation training route originating at Barksdale Air Force Base in Bossier City, Louisiana, that passed directly over the small farm we had recently bought in East Texas.

Flying the airplane was amazing with one glaring issue: I wasn't very good at it. The 'BUFF's old school flight controls are heavy, and I was behind the jet with my inputs the entire time I was in the seat. Both pilots smiled knowingly, saying:

BUFF UPGRADE

Beefier weapons pylons and deadlier munitions

The current 'BUFF' external weapons pylons are limited to 5,000 pounds each. New, larger-capacity, external weapons pylons with a capacity of 20,000 pounds each are being developed that will allow the jet to carry weapons like the GBU-43/B Massive Ordnance Air Blast (MOAB or Mother Of All Bombs as it is known more commonly). Raytheon is developing the nuclear-armed Long-Range-Stand-Off (LRSO) missile that will replace the current nuclear-tipped AGM-86. The B-52 will also be the first aircraft in the US inventory to carry the Lockheed Martin hypersonic AGM-183 Air-launched Rapid Response Weapon (ARRW) that is currently under development.

"She's a different beast but you get used to her. And then you love her."

I watched the pilots use the 'BUFF's famous crosswind crab system to perfection during landing and the sortie was complete.

B-52 crews in Minot, North Dakota, and in Barksdale, are walking tall with the modernization of the jet and the last 'BUFF' pilot hasn't been born yet. Maybe he or she will be in an open field in the coming years like I was to witness the majesty of the legendary B-52 as it roars overhead. Long live the 'BUFF! 🇺🇸

Below: A weapons load crew from the 5th Aircraft Maintenance Squadron prep an inert bomb to load on to a B-52 Stratofortress for an upcoming mission at RAF Fairford, England
USAF/Tech Sgt Joshua J Garcia

"BUT SURELY, IT'S TOO SLOW, TOO OLD, AND WILL SOON BE SUPPLANTED BY THE STEALTHY B-21 RAIDER, RIGHT? THINK AGAIN"



Special thanks to the men and women of the USAF's Global Strike Command, 2nd Bomb Wing, and 96th Bomb Squadron.