

ABOVE
A 334th FS F-15E from Seymour Johnson blasts aloft in March 2012. The hooked antennas of an Angry Kitten electronic warfare pod can just be made out on the centreline station location. The pod was developed to provide adversary threat training. (Kedar S. Karmarkar)

DIGITAL CAS

The Strike Eagle's contribution to close air support was no longer defined by talk-ons over the radio. Digital CAS (DCAS) had emerged thanks to the data link and the jet's improving sensor fusion capabilities.

For WSOs, digital CAS fundamentally changed how targets were shared and confirmed, how responsibility was divided between the flight lead and wingman, and how potential errors were surfaced before weapons ever came off the jet, according to Tendall.

Digital CAS was, for me in the back seat, living on the SIT display.

I'd latch my cursors to a markpoint or a target… It would show up in the targeting pod. And I could see where the pilot's cursors were latched, too – little hashed symbols on the display.

Maybe the pilot is latched to the friendly position, because that's what he really cares about. He wants to maintain awareness of where the friendlies are, while I'm hunting for the bad guys somewhere else. I can see his cursor on that friendly markpoint while I'm slewing around looking for targets, and he can see where mine are.

At the same time, I can see where my wingman is latched. I can see his designation triangle. So, if my triangle and his triangle are right on top of each other, I know we're looking at the same thing without anyone saying a word.

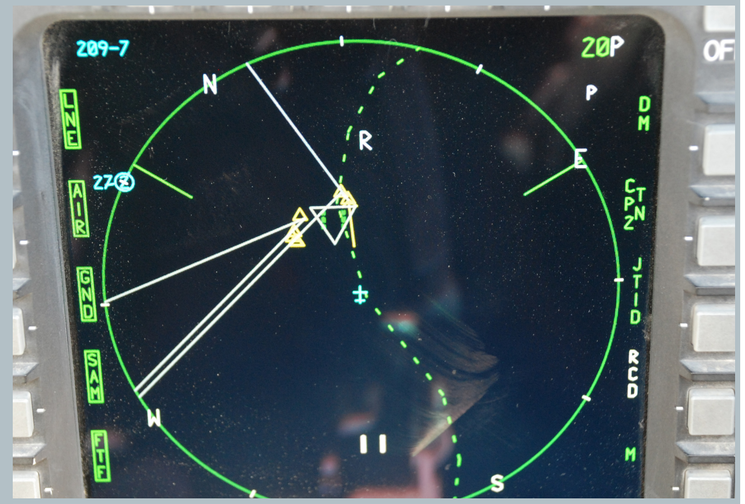
If they're not on top of each other, then something's wrong. And you know it immediately. You don't have to wait until a talk-on falls apart or someone says, 'No, I'm looking at something else.' The miscorrelation is visible.

That was the big difference. Before that, CAS was all about trusting the talk-on. You trusted that when the JTAC said 'that building,' everyone was picturing the same thing. With Digital CAS, you could see whether you were actually aligned or not.

If we weren't aligned, we'd stop right there and fix it. Maybe the JTAC was marking one thing, the pilot was latched to another, and I was slewed somewhere else entirely. Digital CAS made that obvious instead of letting it stay hidden until someone dropped a bomb on the wrong spot.

It also changed how we divided the work. The pilot could focus on maintaining visual on friendlies, airspace, deconfliction – all that frontseat stuff – while I was focused on building the target solution. But we were still connected. We weren't working separate problems anymore.

People sometimes talk about Digital CAS like it's about pushing data instead of talking. That wasn't it for me. It was about shared geometry. Everybody could see what everybody else was looking at, and you didn't have to guess.



ABOVE
SIT display from DCAS combat mission over Afghanistan. The amber triangles are mark points from other aircraft on the network, while the solid white lines lead back to aircraft latched to the mark points. At 10 o'clock position, in blue, is the PPLI popsicle for #2 in the formation (altitude readout of 27,000 feet). The blue stick aeroplane figure in the centre of the display is the ownship F-15E. The white inverted triangle is the current ownship target. The scale is set to 20 miles (top right). The R is a Roland or Rapier SAM indication, and the P (top right) indicates a Patriot SAM. The dashed green line indicates a border or geographical feature such as a river. (Author's collection)

backlog the Strike Eagle community would carry into their combat deployments in the coming years.

Operation Odyssey Dawn (OOD), which played out primarily over a two-week period in March 2011, would also see both the re-emergence of SCAR as a subtype of dynamic targeting, and the decentralisation of control of assets over the target. In this conflict, Strike Eagle crews became their own release authority.

The biggest change in dynamic targeting was not simply speed, but the gradual compression of the kill chain that the Strike Eagle's improving sensors, data sharing and systems mechanisation enabled.

Cooper explained that while Suite 6's moving target mechanisations were excellent, he and his fellow WSOs still spent significant time over Libya building targeting solutions manually. Finding a target, confirming identification, generating coordinates and handing that information to another aircraft often required a mixture of radar mapping, pod work, and verbal coordination. Aircraft frequently operated as ad hoc sensor-shooter teams, with one jet pushing closer to threats to refine coordinates while another remained outside the missile engagement zone carrying weapons and fuel.

Despite this, the Libya experience validated the direction of travel the Strike Eagle was taking and would function as a solid primer for combat operations against ISIS in the years that lay ahead.

F-15E RMP APG-82(V)1 – THE FUTURE IS NOW

In 2010, Raytheon delivered the first APG-82(V)1 active electronically scanned array (AESA) radar to Boeing for testing under the F-15E Radar Modernization Program (RMP).

RMP would yield a sensor with roughly 20 times the reliability of the APG-63, double the target detection range against a fighter-size target, patch maps at scales down to 0.08 nm (compared to the APG-70's 0.67 nm), and electronic attack programmes to jam threat radars. Notwithstanding processor limitations in the host platform, it could do these things so rapidly that they appeared to be happening at the same time. RMP also offered better target identification, improved tracking and engagement performance, and superior ground moving target indications.

The APG-82 capitalised on experience with earlier AESA systems. Its antenna and power supply were derived from the F-15C's APG-63(V)3, while its radar receiver-exciter and Common Integrated Sensor Processor were derivatives of the Super Hornet's APG-79.

Integrating the new radar into the F-15E required a more capable environmental control system (ECS), updates to the aircraft's OFP and EW software, and a new radio-frequency tunable filter. Structural modifications included a wideband radome and ESA IFF system (both from Raytheon), and wiring changes. The radome – with its characteristic narrow conductive strips – is the only external indication that an APG-82 is installed.

Instead of a planar array mounted on a hydraulically powered, mechanically steered gimbal, the AESA's beam was steered electronically from a fixed face containing hundreds of transmit/receive (T/R) modules. This configuration enabled a host of performance improvements that some have described simply as magic.

Mike "Grease" Panarisi reflected:

> People say AESA is evolutionary. Not to me. The sensitivity you get, the processing you get, the ability to make multiple beams and do different things at the same time while you do other stuff, and do true simultaneous multi-mode actions with a sensor… Sorry, dude, but that is revolutionary.
>
> One of the most challenging computational tasks on the radar was generating synthetic aperture radar maps. There's just gigabytes of math going on behind the scenes to make that picture. With APG-70 on the Strike Eagle, if you were in the order of 20 miles out and you did your offset turn and had that radar do its thing to create that image, it took six to ten seconds depending on a lot of things. This thing – you pulled the trigger to command the map – and, boom, there it was.

IWSO and Weapons School graduate, JP "Wham" Reasner, observed that the APG-82 produced a categorical shift in what the Strike Eagle could do in the air-to-air fight, too. He had flown the APG-70 exclusively until he attended Weapons School in 2015, describing the older radar's limitations unsympathetically: "If you wanted to target more than one jet, you had to be in TWS [track while scan], which was pretty trash".

The new radar could simultaneously maintain weapons-quality tracks against manoeuvring targets, support multiple engagements against multiple groups, and allow the crew to scan other sectors for new threats. "That capability alone was a revolution on the air-to-air side", Reasner noted.

Although AESA radar management was extensively automated, he explained that the crew still had to actively manage it if they wanted to extract full value from it. Elevation, azimuth, and bar settings remained available to both cockpits, allowing the crew to tailor the radar's focus. In situations where the pilot or WSO designated a radar track file as being of interest, and when their subsequent inputs



ABOVE
Both afterburners are lit as this Bolar Strike Eagle executes a max performance climb, with a veil of condensation forming around the wing roots, an indication of the sheer power of the moment. (Ben Smith)

the winds were good, and that we wanted to loiter over Kirkuk and attack military targets on the airfield. At the time we were thinking that the people below did not even seem to know a war was underway.

The northern AWACS contacted the CAOC. As we moved out of radio range and headed to the tanker, we had the southern AWACS relay messages. While we were refuelling, the response came back – we were cleared to strike any military target within the perimeter of the base. That was the moment when it became real.

We headed back north, flying right over Baghdad in the weather. By then we had realised that the SAM threat was largely ineffective if we stayed high, and we pressed on. As we approached Kirkuk, clouds began to encroach again, so we descended to ensure positive identification. We knew there were no friendly forces in the area, but we descended anyway to be certain.

The first time we had been over the area, as we left to get gas, I thought I had seen something out of the corner of my eye. I assumed that number two had dropped a flare. On the second pass it became clear that we had taken a pot shot as we departed earlier.

We divided the targeting between the two WSOs. I assigned 2 Bravo everything south of a large structure in the centre of the airfield, while I took everything north of it. We made our first run and released. As soon as the bombs impacted, the response was immediate. They opened up with every 57mm gun they had. The scene looked exactly like the descriptions from previous wars. We were above most of it, as if they had expected us to come in lower, so it was not a significant factor, but it was visually overwhelming.

I hoped we could take out some of that AAA, as it was exactly the kind of threat that would need to be removed if anyone was going to operate there later. On the third run, they fired a Roland at us. That immediately got my attention. Cowboy saw it at the same time and reacted without hesitation. The next thing I knew, my face was buried in my lap and we were pulling significant G. In training we practiced threat calls that sounded calm and professional, but under G all I managed was 'mrph, mrph, mrph'. It was far from heroic.

At that moment we still had a bomb in flight with less than five seconds to impact. We hoped it would land close enough to be effective. Knowing the Roland was a fast missile with a short time of flight, Cowboy came out of the break turn and immediately pulled back toward where we expected it to be. Moments later it detonated behind us at a safe distance.

Once we exited the threat area and climbed above the Roland's envelope, I asked Cowboy whether it made sense to go back with our final bomb. He answered immediately that we had to. He was right.

We completed our remaining attacks from higher altitude, then jettisoned our external tanks on the outskirts of Kirkuk and headed south. As we departed, I saw an AAA piece firing from the middle of a housing development well away from the airfield.

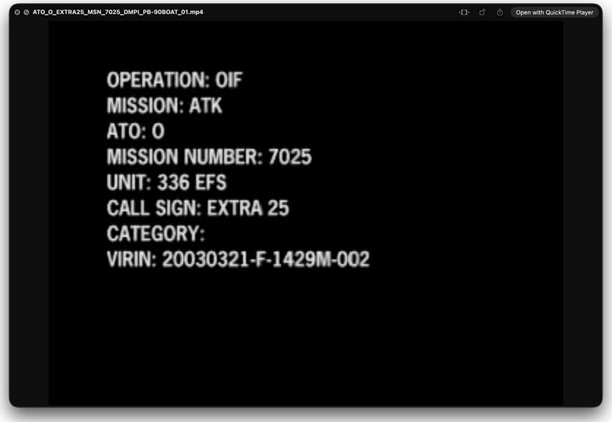
That was the day the war reached Kirkuk. The Iraqis there had assumed they would be untouched once Turkey refused coalition operations from the north. They were mistaken.

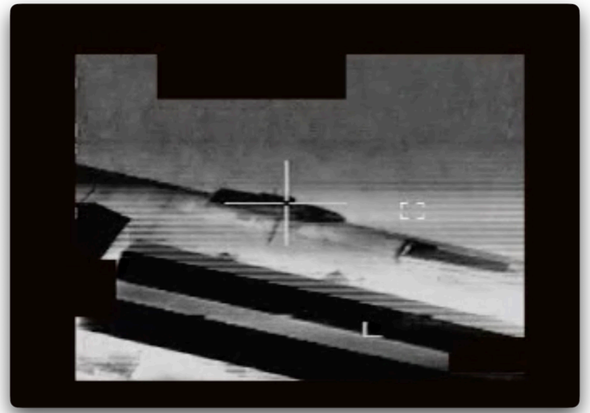
MOVING TARGETS

From the first night of hostilities, the Chiefs and Rocketeers flew KI/CAS and SCAR missions against both fixed and mobile targets. Fixed targets, typically engaged with laser-guided bombs such as the GBU-10 and GBU-12, were generally straightforward to destroy. Mobile targets, by contrast, proved far more demanding.

Strike Eagles routinely engaged vehicles moving at speed, travelling unpredictably, or racing along the arterial highways radiating out from Baghdad. Experience gained during OEF had already demonstrated the jet's suitability for this type of work, and crews from the Chiefs – along with the Bold Tigers augmenting the deployed force – were mentally prepared for the task.

Before the arrival of Suites 5E and 6E and the automatic leading of moving targets, engaging a moving target with a 500 lb GBU-12 was conceptually similar to leading a clay pigeon with a shotgun. The WSO assessed the target's speed and direction, then placed the laser spot a calculated distance ahead of the vehicle. This generated the required lead so that, once released, the bomb possessed sufficient energy to intercept the target as it continued to move. With the weapon in flight, the laser was typically fired eight to ten seconds before impact, allowing the bomb to begin guiding onto the spot. If the initial lead proved excessive, the WSO could ease the laser back toward the vehicle, tightening the weapon's trajectory. If insufficient, additional lead could be applied by walking the laser further ahead. As the time-to-impact counter counted down, the laser spot was gradually brought onto the target itself, resulting in a direct hit when done correctly. This technique was employed not only from fore and aft aspects, but also from acute angles relative to the vehicle's direction of travel. "The video of hitting moving









OPPOSITE

EXTRA 25, mission 7025, was flown by the 336th Expeditionary Fighter Squadron during Iraqi Freedom. Stills from the pod video show two GBU-12s (the appearance of four bombs is a video artefact) striking an Iraqi Navy patrol boat. Note the poor quality of the AAQ-14 FLIR image and the washing out of the screen when the weapons detonate. (USAF via Author)

trucks with GBU-12s from ninety degrees of heading difference was eye-watering," Haskin recalled.

When a target became sufficiently alert or evasive – often after witnessing nearby vehicles being destroyed – crews adapted by forcing the target into predictable behaviour. In such cases, the lead jet might place a bomb slightly ahead and offset to one side of the vehicle, anticipating that it would react by turning away from the impact. Once the expected reaction was confirmed, the wingman released his weapon at the moment lead's bomb struck. If the vehicle turned as predicted, the second bomb was already committed and well positioned to intercept. Variations of this technique were used against columns, either by dropping unguided weapons into their path or by striking the head and tail vehicles first. This forced the remainder to scatter off-road into unsuitable terrain, slowing movement and increasing vulnerability.

Within weeks of the start of OIF, the squadrons began receiving the MAU-169J/B seeker for their GBU-12s. Siberski immediately noticed the improvement.

> They were upgraded seekers that came into the inventory as we burned through the older bombs. The guide was noticeably better. It was like driving nails with those things. From the cockpit nothing changed – we employed the bomb the same way – it was just more precise.

The consumption rate of GBU-12s was so high that the Rocketeers and Chiefs quickly exhausted stocks of the new seeker and reverted to older variants. With the ability to carry up to nine GBU-12s per jet, a two-ship of Strike Eagles could service as many as eighteen targets in a single sortie. The weapon became the Strike Eagle's staple munition – employed in greater numbers than even the much-vaunted 2,000 lb GBU-31 JDAM – and stood as one of the defining tools of the F-15E's air war.

TASK FORCE TAWNY

The special forces campaign in Iraq was conducted under the anodyne title, Task Force Tawny. The Chiefs provided the bulk of the F-15E airborne support, with the Rocketeers contributing as required. The most sensitive of these sorties were the so-called TF-20 lines – dedicated special operations support missions flown by a very small cadre of aircrew. Only ten pilots and WSOs from the 335th were read in on these operations, which were tightly compartmentalised and planned, briefed, and debriefed separately from the rest of the squadron.

TF-20 crews were granted an unusual degree of autonomy. They were given broad latitude to plan their own sorties and were provided with whatever weapons and assets were deemed necessary to accomplish the mission. According to those familiar with the work, the AAQ-28 targeting pod and the GBU-24 were used extensively. In total, twenty-four GBU-24s were dropped by F-15Es during the war, the majority in support of these missions.

The sorties typically involved loitering within designated "black" kill boxes and communicating directly with special operations teams on the ground via secure KY-58 radios. Operators often carried infrared strobes that allowed Strike Eagle crews to acquire them visually using night vision goggles. On some occasions, ground teams employed their own laser designators to buddy-lase targets for the F-15E's laser-guided bombs. More commonly, however, they used advanced laser rangefinders to generate accurate target coordinates that were then passed to the aircraft.

Special operations forces were most heavily concentrated in northern and western Iraq, where the Chiefs spent much of their time. During these missions, the pilot's or WSO's eyes were usually talked onto the target in a process that was not always straightforward. On one occasion, a special forces team came under fire from Fedayeen fighters. On foot and unable to pursue them, the ground commander requested an attack on "a white Toyota Corolla with tinted windows." From medium altitude, the Strike Eagle's sensors simply could not resolve that level of detail. With no immediate danger to friendly forces, the crew declined to descend below the wing-imposed minimum altitude of 10,000' to find it.

When the situation demanded it, crews descended as low as 7,500' – deep inside the MANPAD threat envelope – to achieve positive identification, but then climbed back into the mid-teens to employ weapons from a height that balanced survivability with responsiveness.

For danger close work, the F-15E's M61A1 Vulcan cannon was used. For years, students at Seymour Johnson were told bluntly that "Strike Eagles never strafe." That assumption had already been overturned in Afghanistan, where the Bold Tigers and Chiefs had repeatedly used the gun to protect troops on the ground, including during the battle for Roberts Ridge. Those experiences drove an increase in gun training in the year that followed, but even then leadership regarded the M61A1 as a weapon of last resort. Pilots were told it could only be used if coalition forces were in contact. In at least one instance during OIF, an F-15E flight lead obliged a ground commander's request for gunfire, only to be criticised in the debrief because the situation had not met the troops-in-contact criteria.

On other occasions, special forces requested shows of force to flush hidden loyalist fighters. These demanded hazardous low-altitude passes, sometimes down to 300 feet at night, flown directly over suspected enemy positions while dispensing flares. Many of these missions involved direct coordination with ground operators, though there were also instances where special forces passed tips via the CAOC or AWACS, prompting Strike Eagles to be re-tasked in flight to prosecute time-sensitive targets.

Among the few accounts to emerge from the special operations work, one stood out. Near Tikrit, a US Army unit had somehow overturned an M1A1 Abrams tank. Four Chiefs F-15Es had just left the area when a secure call came in from a SOF team that had made its way to the Abrams but had been ambushed by Iraqi forces. Their vehicle disabled, and now under heavy fire, the team had been forced to flee on foot and were now isolated and vulnerable.

The Strike Eagles immediately returned to the team's last known position and provided support until they could reach a friendly element. While all this was happening, AWACS tasked two of the F-15Es to strike a nearby airfield. They complied, releasing GBU-12s, but with less than ten seconds to impact, their targets suddenly exploded.

Only later, during the debrief, did analysis of FDL reveal what had happened. A B-52, cruising at 42,000 feet, had passed directly over the Strike Eagles and dropped a string of JDAMs through their formation and onto the airfield. It was not the first time F-15Es had narrowly avoided friendly bombs from aircraft unable to see them on data link. Similar incidents had occurred during Enduring Freedom, reinforcing the belief among Strike Eagle crews that equipping heavy bombers with Link 16 was not merely desirable, but essential.

The TF-20 missions required Strike Eagle crews to suppress deeply ingrained instincts. There were many occasions when F-15Es descended directly into SAM threat envelopes, including the Roland MEZ, to provide support. There was an unspoken contract between aircrew and operator – when one was in trouble, the other would do whatever was required to help.

Often, the tension in a ground commander's voice was all the cue a crew needed to discard the rulebook. On one occasion, a commander called an F-15E to strike a position they believed was firing mortars at them. When the rounds failed to land nearby, the operator paused and then came back on the radio. "Oh," he said, "I'm good. He's actually firing 57 mm AAA at you."

HUNTING SCUDS, SEERSUCKERS AND TBMS

Significant effort was devoted to the anti-theatre ballistic missile (TBM) mission by the wing, particularly within the Operations Group. With weapons of mass destruction a central concern – and preventing their use by Saddam Hussein's forces an overriding priority – dedicated sorties to police likely or suspected launch areas were tasked from the very start of the war.

The term "SCUD" was often used generically to describe Iraqi theatre ballistic missiles, but in reality there was a broader family of systems that required attention. In addition to SCUD variants, Iraqi forces were known to possess the FROG-7A and the Ababil-100 (Al Fatah) short-range ballistic missile, both of which posed a credible threat if allowed to operate unchallenged. During these patrols, Strike Eagles from the Rocketeers destroyed several such launchers, as well as SCUD missiles located in fixed storage sites.

Another system of concern was the Chinese-built HY-2 Seersucker cruise missile, a large weapon capable of delivering a warhead powerful enough to severely damage a 3,000-ton-class cruiser. As a precaution, the Chiefs and Rocketeers flew anti-Seersucker patrols along the northern Kuwaiti border, though it remains unclear whether any of these systems were located.

The hunt for mobile SCUDs provided a marked contrast to the steady rhythm of KI/CAS and SCAR sorties. These missions were typically focused on western Iraq and required crews to operate in unfamiliar airspace using different search techniques. Since the start of the war, western Iraq had generally been off-limits to Strike Eagles, likely due to the sensitivity of operating near the Syrian border and the presence of special operations forces in the region. But when permitted, these sorties made full use of the radar's ground moving target mode, which was well suited to detecting the large MAZ-543 transporter vehicles against the flat desert terrain.

On one occasion, Siberski detected what appeared to be two SCUD launchers using radar cues. Subsequent visual investigation with the Litening pod revealed them to be civilian tractors towing flatbed trailers. Sensing an opportunity for mischief, he radioed a two-ship ahead equipped only with LANTIRN pods and suggested he had two SCUDs he could not positively identify. The resulting excitement – and eventual disappointment – provided some brief

to reduce uncertainty. Libya's integrated air defence system remained only partially understood. Fixed sites could be identified from intelligence reporting, but mobile threats presented a more difficult problem. Coalition planners expected a mix of Soviet-designed systems, including SA-2s, SA-3s, SA-5s, mobile SA-6s and shorter-range tactical systems such as the SA-8, but little confidence existed regarding what remained operational or how effectively Libyan crews might respond.

"Any time you go into enemy territory, you don't exactly know where all the threats are," Donberg said. "You'll never find all the SA-6s in Libya."

The operational objective for the opening strikes was relatively straightforward. Gaddafi's forces were threatening Benghazi, and coalition aircraft were tasked with stopping the advance while simultaneously establishing the conditions required to enforce a no-fly zone. This required strikes against tactical air defence systems, command and control nodes and airfields, while suppressing any remaining threats to coalition aircraft.

"Our night one mission was primarily to stop his forces from heading into Benghazi," Donberg explained. "It wasn't really a peel-back-the-onion operation where you're rolling back the threats."

Instead, coalition planners built a package designed to address multiple problems simultaneously. F-16CJ Wild Weasels and EA-18G Growlers would suppress enemy air defences. Tomahawk cruise missiles launched from ships and submarines would target fixed strategic sites. Strike Eagles would attack tactical threats and military targets supporting regime operations on the ground. All of this had to occur within a relatively compressed time period and over a battlespace that was entirely new.

Donberg said, "the plan 72 hours out was: how do you put however many F-16s, F-15Es and everybody else in the same piece of sky to do all that?"

The challenge of course extended beyond target allocation. Aircraft deconfliction, tanker scheduling, weapons loads, and routing all required attention. Questions also existed about divert airfields, their availability during overnight operations, and the practical implications to a crew unable to recover to home base. Even before combat operations began, uncertainty had become the norm.

The AOC commander's pre-mission guidance on rules of engagement was, if anything, even more memorable for what it did not say. Ashmore recalled:

> She got up and said: if it's a valid military target west of this lat-long, you guys hit it – I've got your back. I remember just being like, 'Okay, whoever this wing commander is, she has got our back.' That was very powerful.

The commander, who was more accustomed to managing humanitarian work in Africa than full-on air combat operations, had produced targeting instructions that were, in Ashmore's recollection, essentially blank beyond the tanker tracks. They were spectacularly light on detail.

Ominously, Bolar squadron commander, Mikey Whitehead, issued an unambiguous warning: "He specifically said, 'Guys, we're going to lose an airplane on this deployment,'" Joe "Funkle" Esler recalled. "Coming out of Iraq and Afghanistan, everyone's mind was like: 'Nah, there's no way. This is going to be just like that war.'" They were wrong.

INTO THE MIRE

Eventually, the order came to launch combat operations. The first mission, on 19 March, was to strike a large convoy of pro-Gaddafi forces that were heading north towards the rebel stronghold, Benghazi.

Donberg reported that even while crews stepped to the first mission brief, intelligence reporting continued to change.

"I remember intel in the back of the room, and we're getting word from the JFACC that there are active SA-5s and it's going to push all the tankers back."

The opening package changed repeatedly before launch. Aircraft dropped from the lineup, timings shifted and crews adapted accordingly. What had been planned as a large, multi-wave effort shrank through a series of complications: the lead crew ground-aborted after discovering they had no aircraft forms in the cockpit. "Seven became five, five became three, three became one," Donberg revealed.

Eventually, a harried collection of four Strike Eagles departed Aviano in the dead of night and climbed south across the Mediterranean under blackout conditions. Aircraft lighting was extinguished and crews clipped NVGs to their HGU-55 helmets as they began their long transit toward an uncertain threat environment.

Aboard the lead jet, "Shifty" – the pilot credited with actually taking charge on the night – found himself on the tanker calling out to the assembled strike package to identify themselves. "All right, everyone say who you are and what squadron you're from," Cooper remembered. "Because we'd moved jets around so much, no one knew who was who."

With the package administration taken care of,



ABOVE
The AN/AAQ-33 Sniper pod took time to arrive in significant numbers. This meant that stocks of the pod were kept at Kandahar and uploaded to the jets when a squadron arrived on a new deployment, and downloaded from their jets before they left. This was still going on when the 492nd FS took part in Operation Odyssey Dawn. (Randall Haskin)



ABOVE
Loaded with GBU-39 on both CFTs, a Strike Eagle gets gas from a KC-135 Stratotanker somewhere in the Middle East. (USAF)

The F-15E joined the campaign, including the opening strikes in Syria on 23 September. The initial Iraq strikes were not yet part of a named operation, but the objectives were clear: blunt the momentum of a fast-moving insurgent army, halt a group that had seized large areas of Iraq and Syria after emerging from the remnants of Al-Qaeda in Iraq, and prevent further exploitation of the disorder coming out of the ongoing Syrian civil war.

Two months later, on 15 October, the Department of Defense formally named the operation Operation Inherent Resolve (OIR). On 17 October, the Combined Joint Task Force – Operation Inherent Resolve (CJTF-OIR) was established under US Army Forces Central Command.

From that point forward, the Strike Eagle would operate as part of a campaign that fused Western and Arab coalition airpower with host-nation ground forces and a limited special operations presence across the Syria-Iraq border.

PHASES

The campaign took place in four phases.

Phase I, running from August 2014 through early 2016, focused on degrading and blunting ISIS's advance, particularly around Kobani and in northern Iraq. Coalition aircraft flew tens of thousands of air-to-ground sorties in the first twenty months, launching more than ten thousand strikes and releasing over forty thousand weapons as ISIS formations were attrited in the open. For Strike Eagle crews, this meant long kill box interdiction sorties, and dynamic targeting against ISIS formations and vehicle columns, taking full advantage of lessons already learned in Libya and of a jet whose digital transformation was taking great shape.

When ISIS adapted – abandoning large convoys, blending into civilian infrastructure, decentralising its command nodes – the fight changed. Phase II in 2016 therefore shifted attention toward the group's infrastructure and finances, with deliberate strikes against cash storage facilities, oil infrastructure, and revenue nodes. Such pre-planned strikes had always been the bread-and-butter mission of the F-15E and its wide arsenal of SEEK EAGLE approved munitions meant its crews could effortlessly go from carrying heavy precision-guided munitions one night, then returning to armed overwatch the next.

By Phase III, culminating in 2019, the Strike Eagle had become the lynchpin in the urban fight that was now compressing a weakened ISIS into the cities of Mosul and Raqqa, and along the Euphrates River Valley. The territorial caliphate was dismantled block by block, and the F-15E was heavily leaned on to provide close air support, taking full advantage of its ability to identify, maintain track of, and strike targets in dense urban environments. Although deep strategic strikes continued, they were often subordinated to the demands of partner forces fighting street by street.

Phase IV focused on stabilisation.

The United States' determination to limit its liabilities while maximising operational effect made airpower the primary instrument of intervention, and the Strike Eagle was indispensable in that effort.

Coalition basing spanned the Middle East, from Turkey to Jordan and beyond, and F-15Es routinely flew extreme distances into Iraq and Syria. Tanker sorties numbered in the tens of thousands during OIR's early years, sustaining the long-duration orbits that allowed Strike Eagles to provide persistent overwatch. Without tankers, none of it would have been possible.

Choosing ground partners in Syria added complexity to the air tasking. Militias already fighting IS offered an expedient solution, including the Kurdish YPG, which rebranded as the Syrian Democratic Forces (SDF) to ease tensions with Turkey. For Strike Eagle crews, this meant integrating closely with non-US ground elements, building trust through repetition, and delivering effects under intense legal and political scrutiny. As a result, F-15E sorties were weighted heavily toward close air support and non-traditional ISR, with deep strike missions occupying a smaller share of the total.

Airpower also provided an asymmetric counter to ISIS's operational doctrine. The group relied heavily on psychological warfare – terror, extortion, taxation – to consolidate control and intimidate local populations. Persistent ISR coverage and rapid precision strike from aircraft like the F-15E disrupted that model.

In the first ten months of OIR, the United States flew 5,574 ISR sorties. In the following ten months, that number rose to 8,104. Remotely piloted aircraft were in constant demand for full-motion video, but manned platforms such as the Strike Eagle contributed significantly to pattern-of-life development and time-sensitive targeting. CENTCOM policy required a prescribed number of uninterrupted video hours before certain strikes could be approved, a measure intended to mitigate civilian casualties in an increasingly urban battlespace. The F-15E's ability to remain on station, integrate sensor data, and deliver precision munitions when cleared meant that it would be more likely to satisfy such stringent ROE.

As ISIS's territorial control receded in 2016, the Strike Eagle's mission set expanded beyond close air support to include DCA, protection of coalition forces, and deterrence operations against other actors in the theatre. In fact, in 2016 through 2017, F-15Es were flying heavy DCA lines over Syria, escorting high-value assets, and operating in airspace that was now being contested by Russian and Syrian regime aircraft.

AT THE CAOC FOR THE KICK-OFF

When Jeremy "Maestro" Renken arrived at the CAOC in April 2014, the war he expected to support was the one that had defined most of his generation: the steady but persistent air operations in Afghanistan.

At that time, Iraq was largely in the rearview mirror, and while ISIS was operating in Syria and certainly presented the possibility of dragging America into combat, it was not yet central.

Within weeks, that changed. Mosul fell, and what had been a violent extremist organisation operating in eastern Syria became an entity seizing major Iraqi cities with captured Iraqi equipment (which had been provided by the US), driving columns of armoured vehicles across open terrain, and presenting itself as a functioning state.

The CAOC did not – could not – adapt to that rapid change overnight. It was built to produce airpower at scale, to convert national guidance into daily ATOs, to manage fighters, bombers, tankers, ISR and coalition aircraft across a vast area of responsibility. It was superb at running air campaigns against known problem sets. But what ISIS represented was not yet known. Renken said later:

> When crisis actions occur, the [CAOC] takes a little bit of time