



DELTA HOTEL!' COMES the call from the range tower at the Cape Wrath Training Area as Wg Cdr Mike Sutton, Officer Commanding No 1(Fighter) Squadron, cranes his head and looks down at the impact of his Paveway IV bomb on this craggy lump of rock off the remote northern tip of Scotland. The direct hit (DH) is a poignant symbol of the culmination of a huge project to herald the arrival of the latest standard of Eurofighter Typhoon for the Royal Air Force. Phase 1 Enhancement (P1E) is the fairly anodyne nomenclature for what most recognize as the most significant upgrade for this fighter to date. It marks the start of — and the bedrock for the future of — a truly swing-role Typhoon.

Wg Cdr Sutton, followed by Sqd Ldr Adam Rogers, each pounded the remote live weapons range with a live Raytheon Paveway IV precision-guided bomb (PGB) on November 25, with the squadron completing a subsequent total of eight Paveway IV drops during that week with a mix of profiles including GPS and laser guidance; pre-planned and target of opportunity using the pilot's Helmet Equipment Assembly (HEA); and employing both impact and airburst fusing settings on the weapon.

Post-debrief, Wg Cdr Sutton told *CA*: 'Today has been a real milestone for No 1(F) Squadron. We have dropped the first live Paveway IV weapons from a front line [Typhoon]. The successful weapon drops are a reflection on the dedication and achievement of everyone who has been involved in this capability enhancement.' Wg Cdr Sutton's squadron is the lead unit for the introduction to the RAF of the P1EB-standard Typhoon and specifically the addition of the much-lauded Paveway IV.



Wg Cdr Mike Sutton, Officer Commanding No 1(F) Squadron drops the first live Paveway IV from an in-service Eurofighter Typhoon.



KINGS OF SWING

The Royal Air Force's No 1(Fighter) Squadron, based at RAF Lossiemouth in Scotland, is living up to its name in being the first to take the truly multi-role version of this fighter into service. Combat Aircraft's editor joins the squadron as it takes the Typhoon into the next generation.

report and photos: **Jamie Hunter**



Going multi-role

Although earlier RAF Tranche 1 Typhoons received a so-called 'austere' precision-strike capability as far back as 2007 to add to the Typhoon's undoubted air-to-air prowess, it was very much a bolt-on application of the Litening III Laser Designator Pod (LDP) and the older Enhanced Paveway II (EPW2) bomb. Wg Cdr Sutton was involved back then as he is now with the latest capability. 'We had EPW2 on the aeroplane and with the Litening pod we could self designate those bombs. That capability was proven over Libya during Operation 'Ellamy' in 2011.' He continued: 'The austere integration was a bit clunky and better set up to do one or the other mission.' An improved and better-honed swing-role capability was always envisaged for the newer Tranche 2 Typhoons and this is what P1EB is all about. 'What we have now is a much more potent, accurate and discriminate capability with the Paveway IV.'

Broadly, the P1EB upgrade brings a wider air-to-surface capability for the Tranche 2 Typhoon, but it goes beyond simply adding Paveway IV, it additionally injects enhancements to the Litening III and to the HEA so the two can be used seamlessly to visually identify air tracks at long range, as well as identifying, tracking and targeting points on the ground. The Typhoon can also now release four weapons on different targets in a single pass.

Flt Lt Ben Durham is a Qualified Weapons Instructor (QWI) on No 1(F) Squadron, and is part of the squadron's P1EB Implementation Team. He added: 'From someone who flew in Libya in Tranche 1 [Typhoons] with EPW2, there are some marked differences [in P1EB]. With the Paveway IV we can now select weapon impact angles and lines of attack, as well as change fuse settings in the cockpit — with that much flexibility we are much more useful to a commander.' Comparing the old standard with the new, Flt Lt Durham said: 'If we are told about a target, with P1EB I can look into the target area with my HEA, slew the pod to my helmet, use the pod to generate the target coordinates, and that is accepted straight into the jet and passed to the weapon. With P1EB we can do lots of tasks



This image: **The so-called P1EB upgrade combines a seamless integration of the Paveway IV and the Litening III laser designator pod (LDP).**

Above left: **Transiting over the Moray Firth from RAF Lossiemouth to the ranges for the first drop.**

Above: **Wg Cdr Sutton prepares to make his first run attack (FRA) on the Cape Wrath Training Area.**

Right: **Wg Cdr Sutton pre-flights the Paveway IV bomb ahead of the first mission.**



simultaneously.'

As well as the increased functionality for air-to-ground missions, the new standard brings increased air-to-air capability and genuine swing-role missions. Wg Cdr Sutton gave further details. 'You can, with the HEA, look on the ground but you can also slew the LDP to air-to-air tracks for long range VID (Visual Identification). In P1EB we have a true, proven, swing-role capability, whereas before we could to operate air-to-air and air-to-ground, with P1EB we can genuinely flick between using our AIM-120 AMRAAM and the Paveway IV — so we can switch from air-to-air to air-to-ground in a fraction of a second.'

Former Tornado GR4 pilot Flt Lt Dan 'Danjo' Jones echoed the positive sentiments on the

swing-role attributes of the Typhoon. 'Coming from the GR4, the integration (with P1EB) is logical and intuitive. You can have the LDP looking at a [ground target], confirming what it is, plus you can be in air-to-air mode monitoring and manipulating the radar. It's one button to transition between the two.'

Testing the technology

Of course, bringing the advanced swing-role capability online and also ensuring the Typhoon Force is ready to make full use of it is a complex business. With fighter assets in short supply, the RAF's senior officers are all too aware that this is a matter of national interest. Getting the Typhoon and its team just right is what this is all about, and it's all about

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Wg Cdr Mike Sutton

building the force for the future.

With P1EB ready on an industrial level by the four partner Eurofighter nations, it was pushed over the wall to the RAF to set about testing, proving and evaluating this bedrock for the future of the Typhoon Force as a swing-role platform. Wg Cdr Sutton explained. 'We have been working closely with No 41(R) Test and Evaluation Squadron (TES) who have been doing trials and tactics work out in the USA with our own pilots embedded, plus working with industry — this has been a real joint effort between those communities.'

This effort culminated in Exercise 'Cerago' in November 2014 ahead of the live drops in Scotland. This included a combination of flight trials in an academic environment at NAWS China Lake, California, with 'very specific trials points' and a subsequent period of operational evaluation (OPEVAL) of P1EB at Nellis AFB, Nevada, working alongside the US Air Force's elite 422nd TES and against the Nellis-based aggressor squadrons to see how the P1EB-standard Typhoon worked and interacted with — and stacked up against — other types to effectively rubber stamp the new standard.

Flt Lt Durham was part of the team detached to the US. 'P1EB is quite rare in that the front line took delivery at roughly the same time as the TES. We were also exposed to the initial P1EA standard, which was an interim standard that didn't go into OPEVAL, but that we on the front line were exposed to for about 12 months.

So, pilots from our squadron's P1EB Implementation Team had the privilege

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Flt Lt Ben Durham



Armourers load insert Paveway IV bombs for the subsequent releases in November.





Sqn Ldr Adam Rogers makes final checks to his flying kit and HEA as he prepares for a Paveway IV mission.



Pilots outbrief at the engineering control desk at No 1(F) Squadron for their first Paveway IV releases.

of joining the TES to support them during their trials in the USA — focusing on P1EB air-to-surface weapon employment, and enhancements to the subsidiary systems such as the DASS (Defensive Aids Sub-System).’

‘Once the academic trials were completed at China Lake, the time spent flying on the Nellis ranges tied it all together,’ Durham added. ‘We were flying in composite air operations (COMAOs) to evaluate if we could fight with the aircraft, drop a bomb, defeat a SAM (Surface to Air Missile) — to effectively stamp

the aircraft standard for the front line.’ Clearly by bringing all different parties together the time spent in the USA was hugely productive. ‘There were things happening that we’d already experienced on No 1(F) Squadron but that the TES hadn’t seen.’ Durham said. ‘Likewise it was good for us to work with industry, the very people who designed it, to answer any of our questions. Everything we needed was right there.’ Indeed, during the detachment Flt Lt Durham and his team wrote up the RAF’s new P1EB tactics manual!

The final proving ground

‘We are exposing as many pilots as possible [to P1EB],’ said Wg Cdr Sutton during the Paveway IV drops in November at Lossiemouth. ‘We have proved that the front line is capable of employing the Paveway IV and now over the coming weeks we are going to give as many people on the Force as much exposure as possible.’

The squadron rolled straight into Exercise ‘Tartan Flag’ during the first two weeks of December, the final work up before deploying to the USA in January for the ultimate test of the new-standard Typhoons — a full-up ‘Red Flag’ at Nellis.

‘Tartan Flag’ follows hard on the heels of our first Paveway IV drops and there is a real sense of momentum on the squadron and we’re looking forward to what will be the pinnacle of the squadron’s development on Typhoon to date,’ commented Wg Cdr Sutton. ‘[During ‘Tartan Flag’] we are flying large 20 vs 20 missions; eight Typhoons from Lossiemouth plus other aircraft from Coningsby, USAF F-15s from Lakenheath and the RAF Sentinel R1s from Waddington. It is as close as we can get to ‘Red Flag’ — true swing-role training — an air-to-air sweep, fighting to our targets, dropping multiple weapons and fighting our way out.’

The Stateside deployment to ‘Red Flag’ is seen as the final stage in rolling out this latest standard of jet to fulfill an Interim Force 2015 (IF15) milestone. Plans are afoot for the squadron to release a further 25 Paveway IVs during their deployment to the USA as the



This image: **Golden winter sunlight bathes this No 1(F) Squadron Typhoon on the flight line at RAF Lossiemouth.**

Above: **Mission accomplished. A No 1(F) Squadron Typhoon skirts the beautiful beaches of Northern Scotland as it heads back to RAF Lossiemouth.**

Left: **Flt Lt Ben Durham is a qualified weapons instructor on No 1(F) Squadron.**



Lossiemouth Wing's Tranche 2 Typhoons conduct the first fully swing-role training sorties, day and night, as they pave the way to full multi-role declaration on April 1. 'We will take a representative cross section of the front line into a heavily contested, degraded, environment to prove we can operate at this high standard so the Force Commander can declare, with confidence, that both the aircraft and the squadrons are ready,' said Flt Lt Durham.

Swing-role to the fore

The ever-increasing range of missions conducted by the Typhoon squadrons is

set to grow further in the future as the type effectively replaces the Tornado GR4 by the end of the decade. This in itself presents challenges for the men and women flying and maintaining these complex aircraft. Not since the F-4 Phantom has the RAF been flying multi-role fighters, and now its pilots are moving away from single role types such as the retired Harriers, Jaguars and Tornado F3s, to the single seat Typhoon, with a raft of missions and roles.

Wg Cdr Sutton commented: 'While the Typhoon has been doing the core role of QRA and multi-role sorties for a number of years, we now have a true swing-role fighter.'

Swing-role competency is challenging; we cannot dedicate as much time to a single skill set as dedicated legacy platforms. So there is a lot for the pilots to learn, and multiple skill sets to remain current on — from offensive counter air (OCA), though air combat, to close air support (CAS); day and night, and in all weathers. This is a challenge and while we have to be comfortable operating the aircraft in all environments, one of the keys to successful swing-role competency is to reduce unnecessary complexity where we can. The benefits are clear, and with a single aircraft we can exceed the combined capability of what a Harrier and Tornado F3 used to do, and due to the advanced avionics of the Typhoon, we can operate in a contested environment. But while this is impressive, we must also remember that the threat aircraft are evolving too, and our capabilities must be seen in that context — there is no room for complacency. As a result we have to continually evolve both tactical competency and our weapons systems in order to remain at the leading edge.

‘We have to be ready to conduct QRA missions one day and drop a Paveway IV the next and then roll into an 8-ship night OCA mission. While the Typhoon is a much easier aircraft to fly than say a Jaguar or a Harrier, the complexity comes with operating it tactically. In the RAF we tend to think of swing-role as being new, and it is new to us, but a number of countries across Europe have been doing it for years — this has been core business for them — but we in the RAF are in that game

now, and it requires a lot of training to remain competent.’

Flt Lt Jones added: ‘The knowledge base is encyclopedic; you have to keep reading up on the jet and memorizing it. By the time you’ve memorized it all chances are it has all changed again. We are constantly spinning quite a few plates.’

Synthetics clearly have a large part to play in keeping operational costs down, whilst maintaining an ever-increasing core set of skills. ‘It’s not a case of what we can do in the simulator, it’s what we should do,’ comments Sutton. ‘Synthetics are at the level of maturity to enhance and augment, but not to replace, live flying completely. Air forces do not go to war synthetically, although simulators are a vital tool and we look forward to them continuing to improve over the next few years.’ As well as the simulator hours, live flying is healthy at the two current Lossiemouth Typhoon squadrons. The pilots of Nos 1(F) and 6 Squadrons here are reportedly averaging around 17 hours per month. ‘The Force Headquarters mandates a Typhoon training syllabus, and we manage that very carefully,’ comments Wg Cdr Sutton.

Looking further ahead, things can only become more complex as much more is on the cards for the Typhoon. The Storm Shadow cruise missile is now in flight test, with the advanced Meteor BVRAAM and Brimstone anti-armor weapon also planned — not to mention a potent new Active Electronically Scanned

Array (AESA) radar now in long-awaited development.

‘When the GR4s are retired the Typhoon needs to be able to pick up the slack,’ says Sutton. ‘The AESA is going to be critical to the Typhoon, that’s how the Meteor will operate best and it is how we will also have our greatest effect in the SEAD (Suppression of Enemy Air Defenses) role as well. Commenting on whether the RAF should maybe look at cheaper, low-end, combat platforms, Wg Cdr Sutton said: ‘Something like a Super Tucano for example is just not survivable in the modern threat environment. A Typhoon gives a commander options, it dominates in both air-to-air and air-to-ground roles — this is setting us on the right course for the future.’

The future at Lossiemouth looks bright. No II(AC) Squadron is set to stand up as the third Typhoon unit here as these words were written, and is expected to declare full capability by the end of 2015. As for No 1(Fighter) Squadron, its Officer Commanding is clear. ‘P1EB is all about technology. But the true essence of a fast jet Squadron runs much richer and deeper than that. I value the Squadron culture and the teamwork as vital. We have a superb set of talented and dynamic individuals, and it’s about working together and keeping that ethos alive and thriving: the intangibles, the pride in the squadron, and the drive to innovate and succeed. If you get that right, then you truly have a battle-winning capability.’ 

