

V-Force Operations at RAF Elvington in the 1960s

by John Nottingham & Jeff Peck

The territorial waters of the [Pocklington and District Local History Group](#) end at the River Derwent. So if you're wondering what an article involving RAF Elvington is doing on the Group's website, this is explained by linking it with the World War 2 'No. 42 Base', comprising RAF airfields including Elvington, Melbourne and Pocklington, and commanded by the Great Man himself, the then Air Commodore '[Gus](#)' Walker. Furthermore, the last unit to be based at Pocklington during WW2, No. 102 (Ceylon) Squadron, was later to reform at RAF Full Sutton, again in the Group's area, but this time armed with Thor ballistic missiles in the period 1959-63.

So for these reasons, we are extending the Group's designated boundary westwards by 2.5km (1½ miles in old money), across the rickety bridge at Sutton-on-Derwent, through Elvington village and as far as the World War 2 airfield. If you've visited the Yorkshire Air Museum based there (a splendid day out for boys of all ages), you'll know where it is, and the Museum's huge Victor V-bomber/refuelling tanker XL231 '*Lusty Lindy*' is a part of the saga.



*Victor XL231 ('Lusty Lindy') at the Yorkshire Air Museum, Elvington
Originally a bomber, converted to an air-to-air refuelling tanker (refuelling pods far left and right)*

Readers of a certain age will no doubt recall the Cuban missile crisis of October 1962, arguably the most worrying event of our lives. The worst possible outcome came very painfully close but, thankfully, commonsense prevailed and World War 3 never happened. As part of the multi-national NATO forces, the RAF was of course very heavily involved in deterring catastrophe; perhaps none more so than the Thor missiles and the V-Force bombers based in the UK.



The last flying Vulcan bomber, XH558, based at Doncaster Sheffield Airport. Making like a fighter, up-close and very noisy...

They included '*Lusty Lindy*', plus the only Vulcan until recently still in flying condition, XH558, now based at Doncaster Sheffield Airport near Doncaster (previously RAF Finningley).

Vulcans used RAF Elvington as a dispersal airfield from the mid-1960s, so as XH558 was finally grounded in 2015, this is a timely opportunity to feature it in this article.

Some of you may have attended the presentation about the [Thor missiles at RAF Full Sutton](#) given by Steven Oliver in 2011, so we won't repeat much of what he said.

The missiles' greatest virtue as a deterrent to nuclear war was that, after launch, they were invulnerable to any defensive measures. Against that, there were some very significant disadvantages – by far the most serious being that, once fired, they couldn't be recalled... So of necessity, the decision to launch had to be delayed until it became *absolutely* certain that the country was under attack by nuclear weapons. But by that stage, the missiles on the ground would be extremely vulnerable to the very same attack, thus greatly impairing their deterrent value.



An RAF Thor missile being test-fired in America in 1959

In the late-1940s, the UK government decided to develop its own atomic weapons as an independent nuclear deterrent. An operational atom bomb was successfully achieved in 1952, followed by the H-bomb from 1957. In parallel, a decision was made to develop a means of delivering the weapons to strategic targets by manned bombers. A testing operational specification was issued and invitations to tender placed for a very advanced, jet-engined bomber, flying to and from the targets both at high subsonic speed and at extreme altitude, theoretically above the operating height of projected fighter and anti-aircraft missile defences.

The 3 companies selected to design, manufacture and test their own prototypes (the intention being to select the best one for production) had already brought us those World War 2 stalwarts, the Vickers Wellington, Handley Page Halifax and Avro Lancaster bombers, so their pedigree was excellent. However, the state-of-the-art complexity of the 3 designs gave no guarantee of success, plus their projected in-service dates were markedly different, so a quite extraordinary decision was made to award production contracts for all 3 aircraft types. Although in financial terms – with the country still reeling from the costs of World War 2 – this decision appeared to be profligate, in operational terms it proved to have a *very* fortuitous outcome over the next 36 years.



Vickers Valiant, the first V-bomber to enter RAF squadron service (1955)

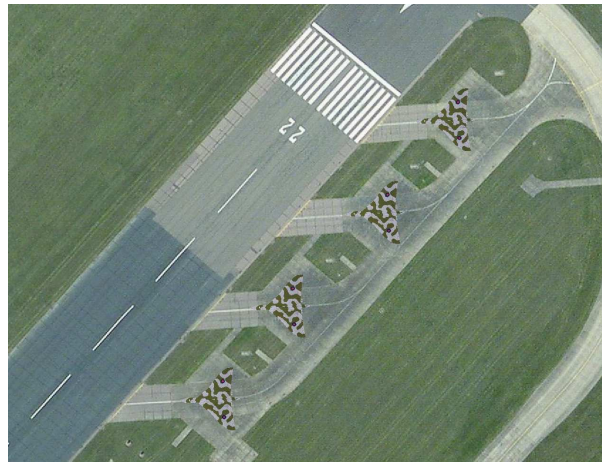
The RAF brass were naturally all in favour, and it was they who selected the 'V' names for the 3 bomber types: the Valiant (the first to come into service from 1955), the Victor and the Vulcan. All three types were in squadron service by the late-1950s and the Victors and Vulcans were later developed further to become the more capable Mark 2 variants, with some also being modified to carry and launch the *Blue Steel* missile with a nuclear warhead (more on that anon).

At the V-bomber bases, defence against a surprise missile attack – even in day-to-day 'peacetime' conditions – was assured by all squadrons providing at least one aircraft each on 'Quick Reaction Alert' (QRA), armed, fully fuelled, 24/7/365, and with the aircrews at 15 minutes readiness to scramble. The crews wore full flying clobber and lived, worked, fed and slept mostly in the nearby Operations centres, a short drive from their aircraft by Humber estate car, one for each crew. They would routinely spend typically 48 hours on QRA duty before being replaced – by which time conditions had become, frankly, seriously niffy; hot showers were provided and *very* welcome.

The term “15-minutes readiness” came from the initial warning time of a suspected missile attack provided by the Ballistic Missile Early Warning System (BMEWS), a local part of which is sited on Fylingdales Moor between Pickering and Whitby, although the warning could come equally from Fylingdales and/or the other 2 similar bases in Alaska and Greenland. Once alerted, the crews would man their aircraft, with electrical power connected and basic systems running (radios, etc), at cockpit readiness. The so-called “4-minute warning” was final confirmation that a missile attack was *absolutely* confirmed by BMEWS, giving the crews ample time to scramble by starting the engines, taxiing a short distance onto the runway, opening the taps and taking off, climbing steeply to gain sufficient altitude to avoid the blast effects of nuclear explosions.

No-notice QRA practice scrambles were called regularly although, in Britain, the armed RAF V-bombers never actually took off; a practice scramble would involve starting up, taxiing onto and along the runway, then returning via the taxiway to the QRA dispersal for a fuel top-up.

Very fast scrambles were assured by having a 4-pan Operational Readiness Platform (ORP) sited at one end of the main runway at each of the V-bombers’ 10 main bases. This allowed up to 4 aircraft to be pre-positioned on the ORP, requiring only a very short taxi onto the runway. During the frequent exercises, it was routine practice for the crews of the 4 (unarmed) aircraft on the ORP to be brought to cockpit readiness, held there for some time, then scrambled.



*V-Force Operational Readiness Platform (ORP)
4 Vulcans are pre-positioned for a fast scramble*

Each bomber had a superb ‘simultaneous start’ system whereby pressing a single button in the cockpit caused all 4 jet engines to spool up together and the 4 engine-driven alternators to come on line automatically, as did the engine-driven hydraulic pumps to supply the powered flying controls and other systems. All this took only 20-30 seconds – but within that time the first aircraft could already be taxiing forward onto the runway and, after a final double-check that all the engine, electrical, hydraulic, flying control and other warning lights had extinguished, it was time to open the throttles and start the take-off run – very closely followed by the other aircraft.

Officially, there was no minimum spacing between the aircraft on a scramble take-off and the unofficial record was at a Battle of Britain Day display at RAF Finningley in the mid-1960s, with 4 Vulcans at cockpit readiness on the ORP. From the scramble message being received (engines off), to the fourth and last aircraft’s wheels leaving the ground, was clocked at only 66 seconds.



A Vulcan 4-ship demonstration scramble. On this occasion the aircraft delayed their steep climb so as not to disappear into the ‘clag’ and ruin the whole effect!

The sight – and sound – of a multi-aircraft V-bomber scramble always left an indelible impression on those who saw and heard one; even the banshee howl of the last airworthy Vulcan [XH558 taking off](#) rattled your ribcage and [triggered car alarms](#).

In theory, this well-organised and frequently-practised scramble procedure would ensure that none of the QRA aircraft would be caught on the ground in the event of a surprise missile attack. However, clearly it would not suffice for getting all the remaining bombers at the 10 main bases airborne within the notional 4-minute warning.

This is where the routine use of ‘dispersal’ airfields came in. In a more likely scenario, with the political situation deteriorating over a period of time (and the Cuban missile crisis was a perfect example), training flights would cease, any aircraft abroad would be recalled and all the bombers would be prepared for World War 3; that is, they would be made ready for flight, each armed with its nuclear weapon, taken over by its nominated aircrew and, in all respects, be made ready to go. In Britain, this also involved the majority of the V-Force aircraft flying to their designated dispersal airfields, leaving only the QRA aircraft and perhaps a few others at each of the 10 main bases.

On arrival at their dispersal airfields, the bombers would be checked, refuelled and, for all practical purposes, prepared and set up just as if they were on QRA at their home base, ready for immediate scramble. They were in direct landline and radio communication with the Bomber Controller, deep underground at the V-Force headquarters in High Wycombe, Buckinghamshire, and from where the scramble message would come.

In the UK, there was a choice between some 29 *dispersal airfields*, ranging from Cornwall in the south-west up to northern Scotland. Those used at any one time were frequently swapped around, giving any attacker a huge problem of having to cover all possibilities, thus further enhancing the likelihood that the majority of the bomber force could be airborne well within 4 minutes and survive an air attack.

V-Force dispersal airfields might already be fully-operational; maybe a fighter base such as RAF Leconfield near Beverley but which was provided with a standard, 4-pan V-bomber ORP. Others might be ‘second-string’ airfields such as RAF Elvington, where operating and support facilities could be relatively basic, but nevertheless perfectly adequate for the purpose. Where a dispersal airfield had no standard 4-pan ORP, typically only 2 bombers would be sent there.

So this is why, from 1963 (coincidentally around the time that the Thor missiles at RAF Full Sutton were decommissioned), RAF Elvington came to be used as one of the many V-Force dispersal airfields around the UK. Elvington was allocated to the 3 Vulcan squadrons based at RAF Scampton, north of Lincoln – including No. 617 Squadron. That number may ring a bell: it is better known as ‘The Dam Busters’, formed with Avro Lancasters at Scampton in 1943, specifically to attack the Ruhr dams in World War 2. So exactly 20 years later, their descendants came to use RAF Elvington, flying the next-generation Avro Vulcan bombers, with much longer range and *far* more heavily armed – but this time to reinforce NATO’s nuclear deterrent force.



The single-pan ORP at RAF Elvington

Elvington airfield had been hugely expanded in the 1950s by the USA for the B-66 bombers and others of Strategic Air Command. It was never used for the purpose but the American legacy was an extremely long runway – almost 2 miles – with a 50-acre (!) hardstanding for the B-66s.

This hardstanding was too far from the runway to ensure the Vulcans could still achieve their ultra-fast scramble times however, so a single-pan ORP was provided alongside the runway for one aircraft, the other using the taxiway immediately adjacent to the runway.

From then on, V-Force exercises invariably involved 2 Vulcans from RAF Scampton dispersing to Elvington where they might stay for a few days and nights, taking part in normal training flights, exercising all the war procedures (especially confirming that the crucial communications with the Bomber Controller at High Wycombe were 100% reliable), being brought to various states of readiness and, finally, performing a no-notice scramble before returning to Scampton. The air- and groundcrews remained on readiness throughout – there was no question of cycling to Betty’s in York of an evening... This routine was repeated at intervals until 1966 when, following a swap-round of dispersal airfields, Elvington was no longer used by the V-Force.

Taking all these procedures into account, and should there be a further emergency like the Cuban missile crisis, the V-Force was confident it could get the majority of its bombers airborne in good time to avoid an incoming ballistic missile attack. Even in the event of an absolutely no-notice strike, the QRA aircraft were still expected to survive. The enormous advantage of this system was that the politicians of both sides would then have a further 2-3 hours to seek an outbreak of commonsense, before the bombers were committed to attacking their targets. Unlike ballistic missiles, the aircraft could still be recalled, right up to the last moment.

The mention of *Blue Steel* on page 2 refers to the air-launched missiles, each with a 1 megaton nuclear warhead, carried by the Victor squadrons at RAF Wittering near Stamford and the Vulcan squadrons at RAF Scampton. The idea behind this was ‘the best of both worlds’. Each aircraft would carry their 8-ton missile most of the way to the targets – but could still be recalled at any stage. Furthermore, the missiles could be released generally before the aircraft needed to penetrate the defended areas en-route to their targets.

Each missile’s built-in inertial navigation system was not started up until after take-off (so not adding to scramble times), then continuously monitored, refined and any errors progressively removed, right up to the point of launch. Once released, the 2 rocket motors fired up, the missile climbed to 70-80,000 feet, it then ‘cruised’ at supersonic speed towards the target before nosing over and diving down at 2-3 times the speed of sound, detonating overhead the target. Meanwhile, the parent aircraft would have turned away and, hopefully, returned to friendly territory unscathed. Practice ‘releases’ in day-to-day training (without physically dropping the missile), then tracked by ground-based radars, showed the average accuracy to be an order better than that expected of Thor.



An RAF Scampton Vulcan carrying the Blue Steel air-launched missile

Although *Blue Steel* was planned to be replaced by the American *Skybolt* missile, the latter was cancelled and the missile-carrying Victors and Vulcans continued with *Blue Steel* until, in 1969, the relatively invulnerable Royal Navy submarines, armed with American *Polaris* inter-continental ballistic missiles, took over the V-Force’s responsibility for the UK’s strategic nuclear deterrent.

After a high-flying American U2 spy plane had unexpectedly been shot down in 1960, it was realised that, to remain relatively invulnerable to defensive missile fire, the V-bombers would need to approach enemy territory ‘under the radar’, at very low level, and the aircrews began training for that rôle. However, the aircraft had not been designed to withstand the battering in the turbulent air at low level and the Valiants soon suffered severe metal-fatigue problems and were grounded permanently. The Victors (including ‘*Lusty Lindy*’) were also affected but were converted to become excellent air-to-air refuelling tankers, transforming RAF fighter capabilities as they could now stay on patrol for many hours, air-refuelling typically once or twice per sortie.

The Vulcans fared rather better at low level and the aircraft soldiered on through the 1970s as long-range ‘tactical’ nuclear bombers, finishing their operational lives with a flourish in 1982 by dropping 21 conventional 1,000lb high-explosive bombs on Port Stanley airfield during the Falklands conflict. This was something which could never have been contemplated back in the 1950s and was made possible only by the considerable air-to-air refuelling support from their previous stablemates the Victors. Indeed, the Victors continued to give splendid service in the air refuelling rôle for several more years but, finally, ran out of fatigue life and were grounded in 1993.

Considering that, by their very nature, military aircraft operations have an element of risk attached, particularly in low-level flight, Britain’s V-bombers flew for far longer than was ever intended or anticipated, thankfully without suffering more ground or in-flight disasters than was the case. This is a testament to the design and reliability of the aircraft and their systems, the safety procedures and the sheer professionalism of the groundcrews and aircrews.

Inevitably however, over the decades there were several ‘incidents’, especially during the adrenalin-powered scrambles, but happily without known injury. Here are some which may raise a smile:

- ❑ As a precaution to ensure the aging 1960s Humber estate car engines would actually start during alerts, the high-tech solution was to have the batteries trickle-charged 24/7/365 by being plugged into a 12V power supply receptacle mounted on a wall of the Operations centres. However, on a QRA practice scramble, the aircrew piled aboard, started up and drove away – but the 12V supply cable failed to unplug from its receptacle and gallant crew were followed closely by a sizeable section of brick wall. *Humber 1 : Operations centre 0...*
- ❑ The jet efflux from a *single* Vulcan engine caused a carelessly-parked Humber to get airborne for some 30 yards from a standing start. The parking brake was on – but 10 tons of jet engine thrust *Vs* 2 tons of Humber was simply no contest. *Vulcan 1 : Humber 0...*
- ❑ During a practice scramble from an ORP, a Victor taxied away before the groundcrew had time to disconnect the 3-ton mobile Houchin diesel-electric generator (plugged in to provide electrical power during cockpit readiness). Fortunately the Houchin unplugged itself – on the move at speed – before the aircraft took off. *Victor 1 : Houchin 0...*
- ❑ Another Vulcan scrambled before the crewchief seeing it off had time to unplug his headset. The aircraft took off, still trailing the headset – fortunately *without* the crewchief still attached. *Score draw...*

The crucial question always was (and still is): What happens if nuclear deterrence fails? In the very worst scenario, with the UK receiving multiple nuclear strikes, how would Pocklington and the local area fare? We can only conclude that – certainly in the 1960s – the Warsaw Pact did not have enough missiles to consider targeting the V-Force main bases plus all the likely dispersal airfields (plus the Thor sites up to 1963), whilst long-range missile accuracy at the time simply wasn’t good enough to support attacking ‘point’ targets such as an air base. So in



Vulcan XH558 still thinking it was a fighter and making an exhibition of itself over RAF Elvington (September 2011)

all probability, it would be cities which would be targeted. Our problem then would be the fallout as the prevailing winds could well bring a radioactive cloud our way.

But in the 1962 Cuban missile crisis – and throughout the Cold War – the nuclear deterrent worked as intended and, thankfully, has since endured to everyone’s benefit. Let’s hope that it continues to do so – indefinitely.

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