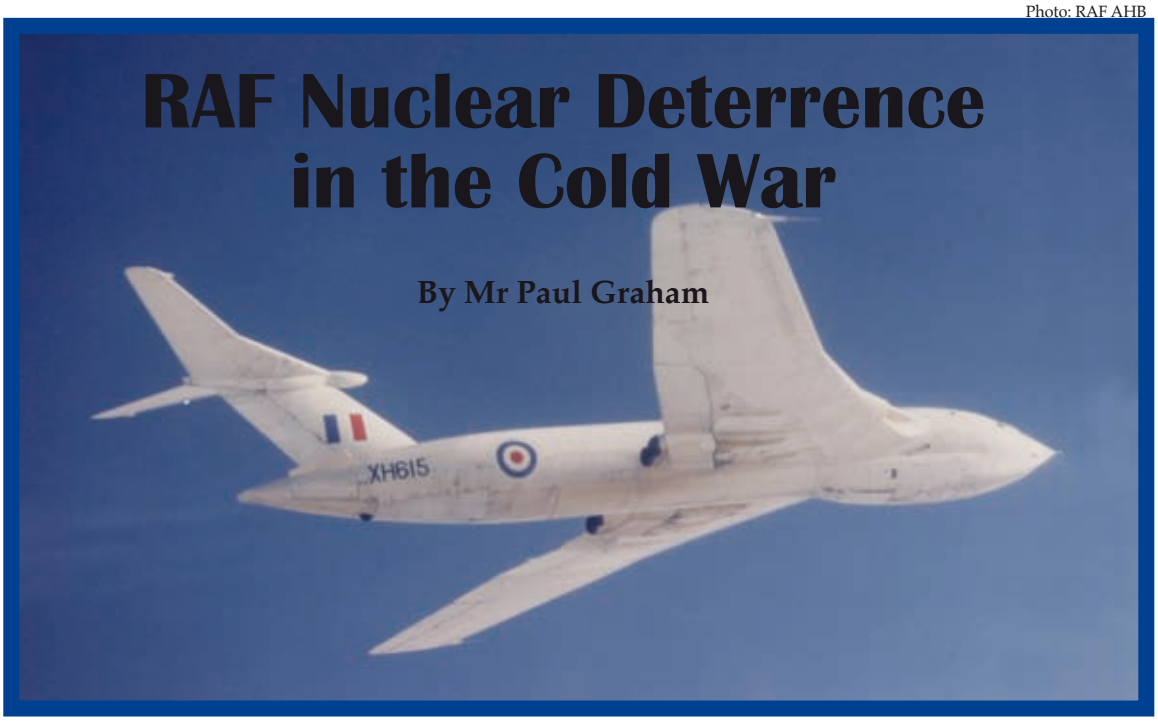
Photo: RAF AHB

RAF Nuclear Deterrence in the Cold War

By Mr Paul Graham



Handley Page Victor B1

The history of the RAF's strategic nuclear deterrent, the V-bomber force, can be said to be that of an organisation attempting to discover, justify and maintain a role within the rapidly changing environment of the Cold War. This study will provide a selective investigation and a critical look at the establishment, evolution and eventual obsolescence of the RAF's deterrent. It will attempt to assess whether the V-force was capable of fulfilling the role assigned to it, both that of providing a credible deterrent and in the event of conflict an effective retaliatory capability.

It shall cover three main areas, firstly an exploration of the rationale, requirements and history behind the creation of the British airborne deterrent, secondly an assessment of the independent nature of the deterrent, and lastly an examination of the evolving nature of the V-force during its period of active service.

The New National Deterrent

In the immediate post-war era only three nations, the United States, the Soviet Union and, less obviously, the United Kingdom were in a position to exploit the recent advances in military technology. The potential of the airborne delivery of nuclear weapons had been demonstrated in dramatic fashion by the raids on Hiroshima and Nagasaki, where a single aircraft and bomb had inflicted devastation equivalent to the massed aerial attacks previously required. Allied to the first-generation of jet engines it was apparent that the nuclear-armed strategic bomber would represent the apex of military power for the foreseeable future.[1]

Although nominally still a world power of significant standing, Britain had been economically devastated and had quickly taken the post-war opportunity to massively cut back its military forces.

The result for the Royal Air Force was a reduction in front-line aircraft from a peak of 55,000 at war's end to little more than 1000 by 1947.[2]

Despite grudging recognition of its new status as a second-tier power in the shadow of the new American and Russian 'superpowers' and economic constraints the United Kingdom was soon committed to a massive military rearmament, largely centred on the acquisition of atomic weapons and the means to deliver them. The perception of a future Russian threat with its own nuclear-armed bombers and due to the magnitude of the devastation that could be caused by even a limited assault, the belief resulted that the 'defence of the Realm' would rest on the capacity to deter such an attack from ever being attempted. This policy of deterrence could only be effective if the United Kingdom possessed, and was seen to possess, its own potent retaliatory capability.

Official estimates of the period, including the 1947, White Paper on the Supply of Military Aircraft, (Cmnd. 9388), which examined procurement philosophy for a decade hence assumed that no war was likely in the immediate future. Therefore no urgent re-equipment of the RAF would be needed before 1957, the year that the Soviet Union was expected to possess a significant stockpile of weapons and the means to deliver them.[3]

The decision to proceed with the creation of a British atomic weapons capability was taken by a small ad hoc committee of ministers, GEN 163, on 8th January 1947. Before this, on 17th December 1946, the Operational Requirements Committee had drawn up specifications for a future long-range bomber. Designated O.R. 229 it set the ambitious requirements of a cruising speed of over 500 knots and a service ceiling of 45'000 ft. It was to have no self-defence armament, the assumption being that speed and height would be protection enough, and a five-man crew to be accommodated in a pressurised cabin. The bombers commissioned to fulfil this B.35/46 specification were to become known as the Vulcan and Victor, produced by Avro and Handley Page respectively.[4] They, along with the other commissioned variant the Vickers Valiant were given their titles and the collective designation as the 'V-Force' from a remark made by Marshal of the Royal Air Force Sir John Slessor during a meeting of the Air Council to decide their names in 1952. He stated that his own inclination was '…to establish, so to speak, a 'V' class of medium jet bombers'.[5]

The parallel British nuclear weapons and 'Medium Bomber Force' (another name for the V-force) development programmes were carried out successfully over the next decade. In some respects the V-bomber program was the more complex, the theory behind the creation of nuclear weapons being well established, with much of the difficulty coming from the creation of the substantial infrastructure required to develop and produce them, in comparison the V-bomber program represented not an evolutionary but a revolutionary leap forward in capabilities from the piston-engined, propeller driven bombers of the Second World War.

Logically the next generation of bomber aircraft should have been reliant on the turbo-prop variant of propulsion. The British Air Ministry however took the risky strategy of commissioning three separate variants of medium-range bombers to be powered by the relatively immature technology of the jet engine. A fourth variant, the Shorts Sperrin, was initially ordered as a fallback in the prospect of the more advanced variants

failing to materialise. Nicknamed the 'Insurance bomber' its more achievable specification, B.14/46, was cancelled by the Air Staff after the testing of two flying prototypes.[6]

The background to the development of the V-force is worth describing in some detail, as it remains a matter of controversy and speculation even today. On 9th January 1947, in an apparent coincidence, one day after production of the atomic bomb had been approved (although according to Paul Jackson the date was 7th January) the Ministry of Supply sent letters to four British aircraft companies for the advanced B.35/46 specification; these were Armstrong Whitworth, Avro, English Electric and Handley Page. Vickers and Short Brothers made unsolicited tenders and Bristol also expressed an interest. A Tender Design Conference held on 28th July 1948 decided in favour of the Avro delta-winged proposal with Armstrong Whitworth and Handley Page as runners up. On 19th November the Handley Page crescent wing HP.80 was declared joint winner and also sent an ITP (Instruction to Proceed but not a contract).[7]

Increasing international tension in the late 1940s and the unexpectedly rapid detonation of a Soviet atomic bomb on 29th August 1949, resulted in an accelerated re-armament programme and the Air Staff asked for another medium bomber proposal designed to the lower specification, B.9/48, with the expectation of earlier service entry. This was the Vickers Type 660, later named the Valiant, and issued with an ITP on 16th April 1948.[8]

This Byzantine procurement process raises the question as to why the United Kingdom was willing to make such a large expenditure on three, four if the abortive Shorts model is included, medium bombers from different companies. A possible explanation is that the British government wished to retain its world-leading aerospace industry, in danger of stagnating in the post-war economic malaise, or that they simply did not comprehend the economic expenditure required in the development of complex modern aircraft. A further consideration is that both Handley Page and Avro assumed that the RAF would order only one B.35/46 contender into large-scale service and so were spurred to ever greater efforts to beat the competing design on performance and delivery.[9] This assumes, however, a Machiavellian scheme on the part of the Ministry and it is more likely to have been simply an unexpectedly advantageous by-product. As it transpired both designs were ordered and operated in parallel.

The most likely explanation, however, is simple government indecision. Due to the uncharted aeronautical realms that were now being explored there was a fear of committing the RAF to a single design, which might later prove to have fatal flaws. This was partially justified by the eventual premature retirement of the Vickers Valiant due to airframe fatigue. This, however, was no reflection on the original design; the airframe was subjected to an operational environment of extended low-level flight for which it was never intended, for reasons explored later.

The procurement process could be succinctly, if cynically, summed up by stating that the Air Ministry and Ministry of Supply could not decide between the different aircraft and simply opted to 'have them all'. The Ministries seemed to favour the prospect of world-beating designs in limited numbers at a later date rather than the, perhaps more suitable, option of a considerable number of slightly inferior bombers at an earlier date. In justifying their decision, Duncan Sandys of the Ministry of Supply asserted

that, '…in equipping an air force, as in racing, it is risky to put all your money on one horse, or to try to guess the winner too long before the race'.[10]

In the event all three V-bomber variants compared favourably with their contemporaries of other nations, and in some respects were markedly superior, the Vulcan for example was famed for its 'fighter-like' handling, especially at high altitude.[11] Comparison is often made with the American B-47 Stratojet. However, although they represent each nations first-generation jet-bomber project and the V-bombers were qualitatively superior, with service entry dates years apart, '…the thousandth B-47 was delivered before either of the British bombers was cleared for service'.[12] A more accurate American comparison, in terms of timing, would be with the B-52 Stratofortress and B-58 Hustler of which the former boasted massive range and the latter extremely high speed. While the V-bombers still compare favourably the difference is much less marked.

different operational niches. However it does illustrate that in all major areas the V-bombers compared favourably with their contemporaries and marked a quantum leap in performance over their Second World War predecessors.

Despite British expectations, instead of concentrating on manned aircraft as delivery platforms, by the mid 1950's the USSR had begun to focus on long-range surface-to-surface ballistic missiles as the primary means of nuclear deterrence.[14] This was to prove a shrewd move on the Soviet's part and would present substantial problems to the United Kingdom and its airborne deterrent in later years.

The British bomber and atomic weapons programmes ran in parallel and the close relationship can be established by the fact that the physical nature of the British atom bomb was based on an Air Staff Operational Requirement, O.R.1001, issued on the 9th of August 1946 which outlined the prerequisites for an air-delivered weapon.[15]

Aircraft	Nation	Service Entry	Number Built	Thrust (lb)	Range (km)	Max speed (knts/mach)	Service Ceiling (ft)
B-29 Superfortress	USA	1943	c.3000	n.k	5260	575	31850
Avro Lincoln	UK	1946	804	n.k.	3600	404	22000
Boeing B-47	USA	1950	2041	6x7200	5800	964	40500
Tupolev Tu-16 Badger	USSR	1951	c.2000	2x20550	4800	945	49215
Myasishchev M-4 Bison	USSR	1955	n.k.	4x19190	11000	900	42650
Vickers Valiant	UK	1955	104	4x10000	8340	912	54000
B-52 Stratofortress	USA	1956	744	8x9000	12900	883/0.84	45000
Tupolev Tu-20/95 Bear	USSR	1956	c.300	4x14795	14800	970/0.79	41000
Avro Vulcan B Mk1	UK	1957	45	4x13000	6450	0.84	48000
Victor B Mk1	UK	1958	80 mk 1&2	4x11090	9856	0.98	55000
Victor B Mk2	UK	1960	80 mk 1&2	4x17250	9765	0.96	60000
Avro Vulcan B Mk2	UK	1960	89	4x20600	5550/7400 (high)	0.96	65000
Convair B-58 Hustler	USA	1960	116	4x15600	3219	2215/2.1	63400
Mirage IVA	FRANCE	1962	33	2x14990	1426	2.2	c.50000

Table 1.1. Statistics of Contemporary Bombers[13]

The above table is intended only to give the most cursory comparison of strategic bombers of the period. Bare statistics cannot be used to conclusively determine relative merit as each aircraft may be intended for substantially

The two programs were however not inextricably entwined, even without nuclear weapons research the RAF still required a new heavy bomber, although it is likely that in this case the procurement programme would have

been much more modest in ambition and scale.[16]

The atomic weapons program was first to bear fruit with the initial test at Monte Bello on 2nd October 1952. Codenamed 'Operation Hurricane' it was the 33rd nuclear weapon to be detonated since the war and the first by a third nation. From the start of the programme to its successful conclusion took just over five years, a significant achievement. It was to be more than a year after this test, November 1953, before the RAF began to receive its first atomic weapons, designated Blue Danube. However it was over another year before Bomber Command took delivery of the first of the airplanes that were to carry them.[17] In the mean-time technology had progressed from the atomic-bomb to the massively more powerful Hydrogen – bomb, and so, with governmental approval, the British development programme continued. This resulted in the first British thermonuclear detonation, during the 'Grapple' series of nuclear tests, an air-burst delivered from a Valiant bomber over Malden Island in the Pacific on 28th April 1958.[18] The British nuclear weapons program had 'proceeded through a series of exotically named weapons'. With the original Blue Danube representing a moderate 20 Kt (kiloton) yield. This was followed by Violet Club, intended to give the RAF a 'megaton' capability at the earliest date. It was a complicated and sensitive device which required construction by specialists on-site before being loaded on to the aircraft. Only five were produced and the more viable Yellow Sun Mk 1 entered service in 1960 with the definitive British weapon Yellow Sun Mk 2 becoming operational in 1962.[19]

Although none of the V-bombers suffered from insurmountable technical problems their design and production was a lengthy process, as Humphrey Wynn describes, '…the biggest problem, as far as the Air Staff was concerned, in a period when the Bomber Command front-line was being sustained by borrowed [American] B-29's (designated 'Washingtons' in RAF service) and Lincolns with inadequate range, was the length of time to get the new bombers into service'.[20] Until 1955 the British deterrent was mostly based on the English Electric Canberra, a light bomber which, although nuclear capable, was not suitable for use in the strategic role, at least if the pilot wished to fly a two-way mission.

The interim Valiant was not received by the RAF until February 1955, the Vulcan in August 1956 and the Victor until November 1957, from the award of contract until service entry was therefore seven years for the Valiant, 8.5 for the Vulcan and ten years for the Victor.[21] This has led to suggestions that the British aviation industry was somehow remiss in delivering the bombers so long after the original commission.

This, however, is to ignore the fact that when the initial proposals were drawn up and disseminated there was a general belief that no large-scale conflict could be expected before 1957 and so procurement was centred around that target date. Despite all three V-bombers being afforded 'super-priority' status, (whereby named projects had foremost access to scarce resources) by Prime Minister Churchill in March 1952, planning had been projected for a much later date of delivery and development and production could only be brought forward to a limited extent.[22]

With the touch-down of the first Vickers Valiant at RAF Gaydon on 8th February 1955 the development period could be said to have ended, although the V-bomber force would not reach full operational capacity until 1957. From that date until 1963 Bomber Command

was to receive a steady influx of V-bombers and build up squadrons with them, creating the United Kingdoms airborne strategic deterrent. Developing and producing the V-bombers up to the end of the first era, that is with the three Mk 1 types in service and the first Mk 2 variants, cost £119 million at contemporary values.[23]

Despite the substantial costs involved, most of the nations leadership considered the outlay entirely justified, with the Minister of Defence stating, 'In terms of military and political value for money, the V-Bomber Force is the cheapest element in the defence program'.[24] Furthermore, it was also the base on which the nation's Cold War defence policy would be built, and therefore, 'If we do not provide an adequate deterrent, then the rest of the defence programme is an utter waste of money and manpower'.[25]

The Air Staff had originally predicted that there would be 200 medium bombers by the end of 1957 with an ultimate strength of 240. As we shall see, for various reasons, the final figure was significantly below this early estimate.[26] The post-1957 period also saw the move from isolation and independence to collaboration and interdependence, most particularly with the United States, as the newly functioning V-force sought to discover its place within the wider defence of the West. This is the subject of the next section.

In summary, for Britain the philosophy behind the acquisition of the V-force can be aptly described by the famous dictum of Flavius Vegatus Peratus, 'Qui desiderit pacem, praeparet bellum'.

The Independent Deterrent?

The British deterrent did not exist in a vacuum. Alongside France and West Germany the United Kingdom ranked as a secondary power in western defence, however unlike those two nations Britain was in possession of a nuclear capability. It would not be until 1966 that France would have an operational deterrent and until then the United Kingdom remained the sole European nuclear state. France also lacked the 'special relationship' established between the UK and the United States, a central component of which was built on each nations nuclear capability. During the period under study a recurrent debate centred on the issue of British nuclear independency, or the lack of it. Regarding the importance of martial prowess in determining world standing, Williams has stated that, '…military power is regarded as an index of world status'. And that the former requires, 'a largely self-sufficient weapons base and a sophisticated technological capability'.[27] In nuclear matters the United Kingdom's technical competency has rarely been seriously questioned, however its self-sufficiency has often been a matter of heated debate.
The earliest debates questioned whether the United Kingdom required an independent nuclear capability at all. It was suggested that instead of pursuing an expensive and time-consuming atomic weapons program Britain could instead rely on the extended 'nuclear umbrella' of America. This possibility was dismissed by the Chiefs of Staff, who declared that:

> Britain, as a great world power could not leave her security in the hands of the Americans who, however friendly, could veer so unpredictably from generous international collaboration to self-centred isolationism.[28]

This summary also illustrates the prevalent belief that, despite economic reality, Britain remained a 'great power' and as such it was only fitting that she gain access to the unparalleled might of atomic weapons.

Despite this it was believed that the close wartime relationship between Britain and America in nuclear research and development would continue. This expectation was shattered by the unilateral termination of existing and potential arrangements by the American Atomic Energy Act, more commonly known as the McMahon Act in 1946.[29] This was imposed, at least partially, due to American fears of laxity in British security, a fear later justified somewhat by the unveiling of several British spies, including the infamous 'Cambridge Five', in the early 1950's. The UK was therefore forced into the pursuit of a deterrent capacity by its own efforts. Attempts to restore links with America were continuous however and it was believed that if Britain could show substantial progress in nuclear development this would reassure the USA that a mutually beneficial relationship could be re-established. This policy was seen to bear fruit after the initial British nuclear test in 1952, when restrictions were eased, and more importantly after the 'Grapple' tests in 1957, by the signing of the Agreement for Cooperation on the uses of Atomic Energy for Mutual Defence Purposes on 3rd July 1958.[30] Ironically this rehabilitated Anglo-American collaboration was to directly lead to the eventual end of the RAF's role as primary provider of the British deterrent.

Bomber Command had been lobbying persistently for the proposed Douglas AGM-87A 'Skybolt', an American ALBM (Air Launched Ballistic Missile – to be tipped with a British warhead), which, with its thousand-mile reach could be launched from outside the range of Soviet air defences.[31] Its acquisition was expected to extend the lifespan of the British bombers, which were being faced with ever-greater difficulties in fulfilling their operational mission, a subject covered in the next chapter.

As Peter Malone has stated in his study of the British deterrent, 'Skybolt was an airman's dream, combining the high-technology of the missile age with a continuing role for bombers and pilots', it was also however, 'a systems analyst's nightmare, as it combined the bombers' disadvantages of vulnerability and slow response with the mobile missiles' drawbacks of low payload and unimpressive accuracy'.[32]

The British military and political establishment had based all future plans for the United Kingdom's deterrent on the successful development and delivery of the missiles, cancelling plans to build and deploy a British MRBM (Medium Range Ballistic Missile) Blue Streak in 1960 and proposed indigenous weapons upgrade programs for the V-bombers themselves.[33]

This was considered possible because the British believed that there was a tacit understanding that if Skybolt should not materialise the new sea-borne 'Polaris' ballistic missile carrying submarine system would be provided as an alternative.[34] On 11th December 1962 however, US Secretary of Defence, Robert McNamara, informed the British Minister of Defence, Peter Thorneycroft of his decision to cancel Skybolt. As a result, '…both Anglo-American relations and British nuclear policy were thrown into crisis'.[35]

Photo: RAF AHB

An Avro Vulcan B2 carrying Skybolt trials rounds, 1962

The junior position of Britain can be established by the fact that the decision was taken unilaterally by the American leadership, albeit with prior heavy hints that the program was not progressing to plan.

At the pre-scheduled meeting at Nassau in the Bahamas held a week later proceedings were dominated by the Skybolt debate. Prime Minister Macmillan rejected the offer of the lesser 'Hound Dog' system, concentrating on securing Polaris instead.[36] This was eventually granted by President Kennedy despite the vocal reservations of some sections of the US defence industry. With the subsequent signing of the Nassau Statement on Nuclear Defence Systems and the later, and more detailed, Polaris Sales Agreement Macmillan had, in the words of Colin McInnes, '…secured for Britain the most advanced strategic weapons system available at that time', and furthermore that, 'it had been done at an extremely low cost, and with a negligible loss of political control'.[37] While the latter assertion is contestable what was certain was that the supply of Polaris signalled the end of Bomber Commands pre-eminence.

The Nassau Agreement raised the spectre for some that Britain had lost political control over its deterrent, with the Polaris force to be assigned to NATO and pressure to fully commit the V-force as well. In the event a proportion of the Valiant fleet was assigned to SACEUR's command, with however the provision that it may be withdrawn in a case of 'supreme national interest'. There was also the proposal of a new multilateral force (MLF), pushed mainly by the Americans, who were understandably uneasy at the existence of national deterrents outside of their direct control.[38] The ambiguous reference to the proposed MLF in the agreement made it unclear whether it was to be multilateral or multinational in make up. In the event the question would gradually fade from prominence and by the mid-1960s the entire concept of a joint NATO nuclear force had been permanently sidelined.[39]

It had sparked debate over the question of the independence of the national deterrent among the countries military, political and intellectual centres. Sir John Slessor remained one of the most outspoken critics of the concept of an independent deterrent, believing that it could only prove effective within the network of an alliance such as NATO and with close links to the much larger American national deterrent. In other words he was a proponent of interdependence as opposed to independence. On the matter of the assignment of the V-force to NATO after Nassau he was unreservedly positive. Comparing NATO strategy to lessons learned in the Second World War he enthused, 'The tendency of history to repeat itself is a reason to welcome one of the decisions agreed at Nassau… namely the agreement to assign Bomber Command of the RAF to NATO'.[40] He remained a proponent of the MLF concept stating that:

> We British and French should assign our Bomber Commands unreservedly to NATO, to form the hard core of an allied nuclear strike force under the command of SACEUR, with the primary role of defence against invasion.[41]

The history of the French deterrent shows the unlikelihood of this occurring. The French had been forced by circumstance to create a national deterrent capability entirely in isolation. Becoming fully operational in 1966 it was reliant on the Mirage IVA bomber as a delivery platform and a low-yield sixty – kiloton bomb.[42] The French leadership, unlike the British, had few reservations about a smaller state owning a national

deterrent. Their attitude was succinctly summed up by the, possibly apocryphal story, of General de Gaulle's response when challenged on the point by the Soviet ambassador, he is said to have replied, 'It is true that we cannot beat you but we could, perhaps, tear off one of your arms'.

Illustrating his belief that there was no foreseeable scenario in which the United Kingdom would wish to commit its deterrent unilaterally into action, Sir John Slessor gave the following intentionally implausible example, ironic in the light of later events:

> …some day in some part of the world (and some politicians have even mentioned Kuwait in this connection) a situation may arise in which the United States would say it is no concern of their's, but we should regard the issue as being so nearly supreme a national interest that we should go it alone.[43]

In summary he states that for an independent deterrent to be worthwhile it must be, 'truly independent', and a 'credible deterrent'.[44] Criteria which, in his opinion, both the British and the newly emergent French deterrent failed to satisfy as they were unable to inflict 'equivalent' damage on the USSR in a retaliatory strike and that it was impossible to determine what level of damage would be considered unacceptable by the Soviet leadership in any case.[45]

In response to this issue of 'equivalence' it was the opinion of MRAF Sir Dermot Boyle, among others, that the British deterrent would not have to inflict equal damage on the USSR in retaliation but merely enough to make the Politburo reconsider the wisdom of launching an offensive against the UK that could only result in limited gain for unacceptable damage, in other words '…a much smaller retaliatory force can give us as much, or greater security than the U.S.A. with their vast nuclear capability'.[46] This assumption does of course still rest on the virtually impossible task of determining what level of damage Russia would consider unacceptable. For their part, in January 1960, the Joint Intelligence Service Group for the Study of All-out Warfare (JIGSAW) outlined its views on the three essential requirements for an effective deterrent:

> (a) Western Forces must be capable of inflicting on the Soviet homeland a level of damage unacceptable to Soviet leaders;
>
> (b) The Soviet leaders must believe that the West is technically capable of inflicting this level of damage in spite of any Soviet countermeasures;
>
> (c) The Soviet leaders must believe that the Western powers would, in the event, order their forces to make this attack.[47]

As regards to the question of what level of damage the Soviet Union's leadership would consider unacceptable, this was defined elsewhere as, '[The] degree of damage from the United Kingdom as would severely reduce the Soviet Union's economic and military strength in its struggle to overtake the United States and dominate the world'.[48]

In stark contrast to the strains apparent in the wider defence relationship between the United Kingdom and America, the 'post-Grapple' thaw had enabled a close working association to be quickly re-established between the RAF and the USAF. In his forward to Wynn's *The RAF Strategic Nuclear Deterrent Forces*, Air Chief Marshal Sir Kenneth Cross, the Air Officer Commanding-in-Chief RAF Bomber Command between 1959 to 1963, notes enthusiastically:

> [SAC and Bomber Command] alone provided the Western deterrent in the

> nineteen fifties and sixties; theirs was a great working partnership based on a common aim, a mutual respect for each others professional capabilities and, as time went on professional friendship at all levels.[49]

Even during the earlier isolation on nuclear matters, 'SAC had encouraged the RAF to build the V-bomber force, had provided substantial assistance in interdepartmental and inter-service disputes, and took part in many interesting and useful discussions on operating procedures and future developments'.[50]

> On the initiative of Bomber Command a series of exploratory talks and meetings were held to establish areas of mutual interest and benefit. After one such meeting the opinions of both organisations were summed up as follows:

S.A.C. impressed by:
(a) Nuclear capability
(b) Aircraft and crew standards
(c) Reaction potential of 'V' Force
(d) Dispersal concept
(e) U.K. geographic position
(f) R.C.M. Equipment
[Radio Counter-Measures]
(g) Similar target philosophy

Bomber Command impressed by:
(a) Co-operation
(b) Freedom in discussion
(c) Target and intelligence resources
(d) Effective control
(e) Alert force concept[51]

As a consequence a Memorandum of Understanding was drawn up outlining future co-ordination of strike plans and the supply of American nuclear weapons to the RAF in the event of general war.[52] In addition the V-force was incorporated into the USAF strike plan from 1st July 1958.[53] As highlighted by Peter Malone, it was in the realm of 'Collaborative strategic targeting…where the two most important and 'special' Anglo-American relationships – nuclear and intelligence collaboration – commingled'.[54]

It had quickly been established that many potential targets had been 'doubled-up', and so taking this and other factors into consideration a new joint targeting plan was established. The allocation of particular targets between SAC (Strategic Air Command) and Bomber Command would be determined by considerations of timing, tactics, aircraft performance, weapon availability, national doctrine and particular interests.[55]

A primary aspect was that due to Britain's geographical position the V-force would reach the Soviet borders several hours before the SAC bombers, even if both air forces took off at the same time. Because of this the Chiefs of Staff noted that, 'A fully integrated plan has now been produced taking into account Bomber Command's ability to be on target in the first wave several hours in advance of the main S.A.C. force from the United States'.[56]

The smaller scale of the V-force meant that it had to be targeted more carefully on areas of direct interest to the defence of the United Kingdom, namely Soviet nuclear infrastructure such as LRAF airfields and bases. The Strategic Target Policy approved by the Chiefs of Staff designated targets as follows:

> (i) Centres of Government and military control
> (ii) L.R.A.F. [Long Range Air Force] Headquarters and bases
> (iii) The Soviet Air Defence Systems.[57]

It was hoped that with this integration of planning and targeting procedures the V-force would act as a partial 'force-multiplier' for the main SAC thrust, destroying Soviet defences and

time-sensitive targets in advance of the SAC bomber fleet. It could be argued therefore that Bomber Command would have been faced with the more difficult task, 'clearing the way' for the follow-on forces. The implacable reality of simple geography dictated that this would have to be the case however because of the United Kingdoms relative proximity to the Soviet Union. This is often cited as a positive characteristic, as Sir John Slessor explained, 'Owing to its location close to its potential targets, Bomber Commands military value is out of all proportion to its minimal strength'.[58] Although this would have provided a more direct route, and therefore a shorter flight time, a less discussed consideration, certainly in official Air Ministry documentation, is that to reach the Soviet border the V-force would have been forced to over-fly the heavily defended airspace of the Warsaw Pact nations first. That the potential difficulties were recognised by the bomber-crews of the era is made clear by the words of former Vulcan crew-member, Bobby Robson, as he recalls, 'The satellite countries had left alleyways between the SAM sites exactly where we would go. I thought they would be killing fields'.[59] Although the polar route taken by the SAC fleet would have been longer it may have been significantly less hazardous.

It was also recognised that British estimates could not be entirely reliant on integration with American war-plans, as was made clear, 'target selection [should] cover two eventualities' that of, 'Co-ordinated action with the U.S.A.F'., and, 'Action on an emergency basis in a situation in which the United Kingdom was forced into unilateral action'.[60] This second national targeting plan became operational in November 1957 and was updated in 1958.[61] The V-force became an integral part of the American SIOP (Single Integrated Operations Plan) from December 1960.[62]

A further aspect of collaboration was the holding of regular joint exercises, including the large-scale, Exercise Skyshield, a test of the SAC/NORAD air defence system with a number of Vulcan's attempting to penetrate American airspace.[63] The mutual training benefits of such episodes however are obvious.

A US Mk 43 2,100lb nuclear weapon

Photo: RAF AHB

One of the most significant consequences of renewed cooperation was the provision of nuclear information and weapons to the UK by the United States. In a program known as 'Project E' a number of US Mk 5 thermonuclear weapons were supplied to meet RAF requirements until sufficient British 'megaton weapons' were available. Mk 28 and Mk 43 weapons were also supplied for the tactical Canberras and Valiants.[64] These weapons reached the RAF in October 1958 and remained operational until 1962.[65] Although they were stored on British bases, by US law, they had to be protected and maintained by USAF personnel and could only be transferred to British use on a direct order of the US president. This obviously raised many difficulties in regards to the survivability and reaction times of the V-force, especially when the issue of force dispersal was taken into consideration, something 'the inflexible US custodial and release procedures were not designed to cope with'.[66] Furthermore they could not be released for training purposes with consequences that can be imagined.[67]

As mentioned previously, one of the areas of closest collaboration was in the realm of intelligence. In regards to the British and American nuclear deterrents this alliance took the form of intelligence gathering operations about, within and over the USSR. These were intended to discover, designate and prioritise potential targets, necessary if the bombers were to be capable of reaching and striking their targets effectively. In 1951, during the 'freeze' in Anglo-American nuclear relations, the Commander of SAC, General Curtis Le May, persuaded the American Chiefs of Staff to invite the RAF to participate in a joint reconnaissance project with the intelligence product being shared between both parties.[68] From the American perspective this collaboration was necessary because although President Truman had prohibited US over-flights of Soviet territory the original Cold Warrior, Prime Minister Churchill, had no such qualms.

Designated Operation Ju Jitsu the six flights were flown at night in RB-45 reconnaissance aircraft with RAF markings and crew. As well as radar-derived imagery the British electronic intelligence gathering 'Y force' network and USAF ELINT (Electronic Intelligence) aircraft monitored the response of the Soviet air defence system. The first mission took place late in 1952 but the unexpectedly rapid evolution of the Soviet air defences is made evident by the fact that a flight commanded by Flight Lieutenant Crampton on 28th April 1954 was forced to abort after encountering heavy Russian resistance. On a flight conducted two years previously, and following a similar route, virtually no opposition had been detected at all.[69] These dangerous, but productive, missions furnished both Bomber Command and SAC with a wealth of information on the Soviet target and enhanced ties between the two organisations. The surprisingly swift development of the Soviet air defences however provided the unwelcome message that the projected window of effectiveness of manned bomber aircraft may have been overly optimistic. The new bombers were in a race against time before the advent of missiles en masse made them obsolete. This, and the tactics employed to ensure a useful operational life span for the V-force is the subject of the final section.

Threat and Response, The Evolving Deterrent

As mentioned previously, three technologies which emerged during the Second World War were to have profound implications for the subsequent development of national defence. The first of these were the jet engine and nuclear weapons, but the conflict also saw the earliest use of militarily viable surface-to-surface ballistic missiles, in the form of the German V-2 rockets used to bombard England and Europe. Why the British military and political leadership of the post-war era chose to ignore this obvious precedent remains an unanswered question.

It is likely that the true significance of missile technology was simply not recognised and, in any matter, it was believed that it would not be a mature area of military technology until after the V-bombers had been in service for some time. The result of this myopia meant that by the time the Medium Bomber Force was deployed in strength it had, to an extent, already been superseded.

In the late 1940's, and into the early part of the next decade, Soviet air defences were believed to be totally inadequate, with radars susceptible to jamming, surface-to-air weapons ineffective over 30'000 feet and with no all-weather interceptors.[70] This being the case it

is perhaps not surprising that British planners believed that the advanced V-bomber fleet would not be unduly troubled for the foreseeable future. Stalin however, quickly set out to remedy this unacceptable situation, ordering that the Soviet Air Defence network be given high priority. Known as the National Air Defence Command, or PVO Strany, it became an independent branch of service in 1954, which is in itself indicative of the importance placed upon it.[71] Although all three aspects of an effective air defence system, comprising interceptors, AAA (Anti-Aircraft Artillery) and communication and detection systems were substantially overhauled it was in the emerging realm of missile technology that the Soviet Union was to become the premier exponent.[72] The increasingly lethal nature of Soviet airspace was made evident by the shoot-down of the previously invulnerable American U-2 reconnaissance aircraft piloted by Francis Gary Powers on 1st May 1960, while deep inside Russian territory. It was believed to have been brought down by the new two-stage SA-2 'Guideline' SAM which could reach 80'000 ft at a range of roughly 27 miles.[73] As the V-bomber fleet had an average service ceiling of approximately 50'000 ft the problems posed become apparent.

Events were also unfolding at home which would have major consequences for the V-force. The pivotal episode that would determine the later evolution of the V-bomber force came in the form of the Defence Ministers, Mr Duncan Sandys, 1957 White Paper, Outline of Future Policy on Defence, presented to the House of Commons on 13th February of that year.
Based on the assumption that the advent of the hydrogen bomb, which with its vastly superior power had rendered early defence planning, centred as it was around the atomic bomb, irrelevant, it outlined the future shape of Britain's defence policy.[74] While reiterating that the primary means of homeland defence would be the retention of a potent national deterrent the method of delivery would change dramatically. Due to the new hazard posed by Soviet thermonuclear tipped ballistic missiles and the unexpectedly rapid obsolescence of manned bombers, future development in the field was to be built upon ballistic missile technology.[75] Although the White Paper marked a Rubicon in the history of Bomber Command, confirming that the era of the manned bomber, at least in a strategic role, was now in sight, for the immediate future British defence policy would remain based on the nuclear deterrent power of the V-force.[76]

Nevertheless, the RAF's anticipated next generation aircraft, the Avro 730 supersonic bomber, was cancelled in favour of the abortive Blue Streak ballistic missile, itself subsequently cancelled on grounds of cost and vulnerability.[77] In an effort to maintain operational viability the V-bomber fleet was to be equipped with the Blue Steel stand-off missile which could be launched from outside of the range of Soviet defences, and was intended to, '…ensure penetrative capabilities into the mid-60s'[78] In the event it was to serve until the end of that decade.

The reaction to the report with the RAF was mixed, although it would retain its major responsibilities it was expected that the role of national deterrence would eventually pass from manned bombers to a ground based missile system. This was to prove only partially correct; the RAF would indeed lose the role of national deterrence but that duty would pass, not to ballistic missiles under its own command, but to the Polaris submarines of the Royal Navy. In one sense the Sandys' White Paper of 1957 only confirmed what was already known, in order to maintain a viable

airborne deterrent the means of delivery would have to undergo substantial upgrades and changes of doctrine. That such changes were necessary is made apparent by Air Chief Marshal Sir Edmund Huddleston who lamented in 1962 that:

There is now no area within range of Bomber Command aircraft which is not defended by numbers of efficient supersonic fighters and no worthwhile target which is not defended by Surface-to-Air missiles…the last two years have seen considerable advances in the air defences of the USSR.[79]

The first method of upgrading the V-force was by the introduction of more advanced Mk 2 variants of the Vulcan and Victor. These had more powerful engines, an upgraded airframe, sophisticated electronics and counter-measures and increased payload. Ironically, in the light of subsequent developments, detailed below, in setting out the rationale behind the development of the Mk 2 variants the Ministry of Supply stated that:

> The Air Staff say that, on current assessments of enemy defence capabilities, as many as possible of the medium bombers must be able to fly at over 50'000 feet towards and over their targets; and, since fighter performance falls off sharply at such altitudes, the higher the better.[80]

Some observers questioned the necessity of these improved versions of the basic bomber, believing that the expenditure would be more profitably directed towards improved armaments for the aircraft itself. Unfortunately these developments, including engine upgrades which practically doubled available thrust over earlier models, arrived in concert with a dramatic change in V-force operations, from the highest attainable altitude to the lowest.[81] As Soviet defences were much more effective at high altitude due to operational constraints of Soviet missiles and radar this created the possibility of enabling penetration by operating the V-force at extreme low level on approach to and over enemy territory.

While this would significantly reduce the V-bombers range they would still be able to, 'cover all the 40 targets arbitrarily selected by the British Nuclear Deterrent Study Group'.[82] The move to low-level operations in March 1963 also created significant problems with delivering high-yield freefall nuclear weapons, such as the Yellow Sun Mk 2. This required a 'pop-up' to at least 12'000 feet for release, leaving the aircraft exposed during the most dangerous part of its mission. This problem was not solved until the final clearance of the specially designed WE177B 'lay-down' bomb for operations in September 1966.[83] Furthermore, the range of the Blue Steel powered bomb, which had only entered service one month before, was reduced from the standard 115 miles (185 km) by almost three-quarters, which restricted its use to peripheral targets.

The new mission profile also created substantial strain on the bombers airframes, due to the thicker and more turbulent atmosphere at low level. The discovery of cracks in the fuselage resulted in the early retirement of the Valiant fleet, a decision taken in December 1964. As a consequence the Valiant refuelling and strategic reconnaissance aircraft were also lost.[84] The subsequent gaps were not filled until the hasty conversion of several Victors in late 1965. That this was not simply a concern of the British, or any flaw in the planes original design, is made clear by the fact that the American B-52 fleet had to undergo a $300 million upgrade programme for similar reasons.[85]

A further area of controversy concerned the size of the V-bomber fleet. From initial expectations of a total force of 240 aircraft this upper estimate was inexorably whittled down until questions began to be raised about at what minimum level the force would become entirely ineffective. As a result the Cabinet Defence Committee decided

Avro Vulcan B1s Photo: RAF AHB

in August 1957 that the V-force should consist of 144 aircraft, 104 of them Mk 2 Vulcans and Victors.[86] The RAF and the British aircraft industry must have envied Boeing and SAC whose B-47's were ordered in batches of 100.[87]

While in most respects the V-force was a quantum leap in capability over their Second World War predecessors the actual method of delivering weapons had remained unchanged, that of free-fall delivery over the target, until the advent of the indigenous Blue Steel powered bomb. While revolutionary in capability, the V-Force was merely an evolution of existing technology and doctrine. The Blue Steel concept however contained a, carefully concealed, fundamental weakness. Although unarmed and un-refuelled missiles were fitted to QRA aircraft (Quick Reaction Alert, see below) from August 1963, due to safety considerations at least thirty minutes work was required to make them operational. In the event of a deteriorating political situation they would, of course, have been armed but they were entirely impotent in the face of surprise attack, for which the expensive alert procedures had been instituted in the first place. It must have come as a great relief when new safety procedures introduced a year later enabled them to be armed within ten seconds.[88]

It was not only in defensive capability that the Russian lead in missile technology was to prove problematic. The increased accuracy and power of Soviet IRBMs (Intermediate Range Ballistic Missile) targeted on known British V-bomber bases raised the spectre of the entire fleet being destroyed on the ground in the opening stages of any conflict. As stated by T.C.G. James, 'A deterrent strike force would be no deterrent at all if it could be destroyed on its bases before it could be launched'.[89]

To counter this an Air Staff Requirement for a ballistic missile early warning system (BMEWS) was issued in 1958 whose sole purpose was to provide adequate warning of attack to enable the deterrent to be launched. As it transpired the United States was seeking a European location for the third site in its extended BMEWS network. In a further example of Anglo-American collaboration it was finally emplaced at Fylingdales in North Yorkshire. The US government provided the radars and associated equipment and the UK was responsible for the building and staffing. When it became operational in

1964 the UK had been able to acquire a BMD (Ballistic Missile Defence) asset at modest cost.[90] However as N.J. McCamley noted in his study of the British passive defence network, '…[BMEWS] would give a whole four minutes warning of annihilation by Russian nuclear missiles'.[91]

The possibility of a surprise attack with such short notice led to two main measures, that of dispersal and the imposition of a Quick Reaction Alert (QRA). The MBF had in fact a measure of dispersal from its inception in 1955, with the three initial squadrons being formed at three different bases, (Wittering, Wyton and Marham) but over the subsequent years a much more comprehensive system of UK wide dispersal airfields was created.[92]

The dispersal concept contained its own inherent dangers, the Kremlin could interpret its initiation as heralding an imminent British offensive and so precipitate the very attack that it was designed to protect against. As such it was not a measure to be taken lightly in times of international tension.[93]

The high-intensity QRA was introduced early in 1962 and involved one aircraft in each squadron being at fifteen minutes notice twenty-four hours per day, 365 days per year. Thirty percent of available aircraft should also be able ready to deploy within four hours and 100 per cent within twenty hours.[94]

In situations where war appeared imminent at least one aircraft from each squadron would be at Cockpit Readiness, with the crew strapped in.[95]

The innovations of bombers parked on operational readiness platforms (ORPs) by the runways edge and the 'Simstart' engine-start system, introduced in 1963, enabled the four aircraft on QRA to be, '…well away within the 'four-minute warning' of a pre-emptive missile attack'.[96] Humphrey Wynn has described the QRA procedures as, '…the ultimate expression of strategic nuclear deterrence by bombers and the operational embodiment of an alert and readiness posture'.[97]

As a result of the Nassau meeting it had become inevitable that the role of primary provider of the British nuclear deterrent would pass from the RAF to the Royal Navy. It was always expected that Polaris, or an equivalent system, would eventually be necessary if the UK was to retain a deterrence capacity when, '…the V-bombers [could] no longer penetrate Russian defences without prohibitive loss'.[98] It was simply how early this transition would now take place that was unforeseen.

During these earlier debates the BNDSG (British Nuclear Deterrent Study Group) Technical Study Group assessed the relative merits of ballistic missile armed submarines and aircraft, having initially dismissed all alternatives such as mobile land based missiles. While no clear recommendation was made in favour of submarines the implication was that Polaris was preferred to the V-force / Skybolt combination.[99] Their arguments hinged on the question of vulnerability, with the V-force, even if an airborne alert was instituted, being considered too vulnerable to a pre-emptive nuclear attack partially because early warning was reliant on successful detection by Fylingdales BMEWS station.[100] A further consideration was that as BMEWS was directed eastwards it could not provide warning of a Soviet SLBM attack launched close off the western shores of Britain. This potentiality was however assessed as unlikely, as the Russians would wish to preserve their scarce submarine assets for use against American targets due to the short flight time of their missiles. In addition Admiral Sir Caspar John noted that he considered a surprise attack unlikely, stating '…personally I find it

difficult to envisage a genuine bolt from the blue, completely disassociated from any political crisis'.[101]

Perhaps this assumption that a sudden Russian pre-emptive attack was unlikely to occur led directly to the extraordinary laxity in British command-and-control procedures for nuclear retaliation, certainly in comparison to the American system. Until a comprehensive review of release procedures under GEN 743 in 1962 the Commander-in-Chief of Bomber Command (in the late 1950's Air Marshal Sir Kenneth Cross) had the power to launch the V-force on his own initiative, under 'positive control', that is in the expectation that by the time the bombers reached their 'start-line' on the borders of Eastern Europe (approximately ninety minutes later) a 'go/no go' confirmation signal would have been received from the nations political leadership.[102] It is not difficult to imagine how easily this system could break down under the extraordinary strains of an actual Russian surprise attack.

It was recognised that the Polaris system possessed all the qualities that were considered essential in a British nuclear deterrent, i.e.:

> …the system should be invulnerable to pre-emptive attack without strategic warning, [retaliation] should be seen to be inevitable, [it] should give time for operational and political decisions and should be capable of posing a threat against any country in the world.[103]

However Sir John Slessor's belief that the acquisition of the deterrent role by the Royal Navy was unfortunate and unwanted because, '[they] would rather be spending scarce resources on other things', did indeed reflect a majority of the opinion in the Royal Navy who feared that the outlay on a ballistic missile armed submarine fleet would result in a cutback on conventional expenditure, such as new aircraft carriers, and that it was the RAF and not the Royal Navy that had the relevant prior experience.[104]
Nevertheless the first British Polaris submarine, HMS Resolution, was commissioned in 1967 with two other boats following in 1968 and one in 1969. The entire program had cost £330 million, unusually, slightly less than predicted.[105] At midnight on 30th June 1969 QRA was discontinued and the Royal Navy's Polaris fleet assumed the obligation of deterrence. The Chief of the Air Staff, Air Chief Marshal Sir John Grandy, sent a message to AOC in C Strike Command (which had formed with the amalgamation of Bomber and Fighterr Commands in 1968), Air Chief Marshal Sir Denis Spotswood acknowledging the transfer of responsibility and stating:

> I think it appropriate to remember that this task has meant maintaining at all times throughout the seven years the highest state of readiness which the Royal Air Force has known in peacetime. The way in which this has been performed…has been an unsurpassed demonstration of professional skill, dedication and tenacity…I send my congratulations to you.[106]

Conclusion

In retrospect the V-force could be said to have had experienced three major eras; a decade long development period (1947 – 1957), a six year period of increasingly intricate collaboration with America, which also marked its apex of power and capability (1957-1963) and finally a further six years of slow decline and final obsolescence (1963-1969) concluding with the advent of the British Polaris programme.

It has been suggested, correctly in this writer's opinion, that the British airborne deterrent was created as much for political as military reasons and as such

it did indeed help to, '[provide] the British state with a tinge of great power standing, in times when it…had few other such tinges'.[107]

Despite this it did not entirely fulfil expectations, at least politically, as James Spigelman asserts:

> The program never produced the strategic and diplomatic dividends the British leaders felt the new weapon could secure. They had sought the weapon to enhance national prestige, but they found the Empire nevertheless continued to disintegrate along with Britain's position as a world power.[108]

Nevertheless, in many respects the programme was almost a complete success with the United Kingdom becoming the world's third nuclear power with only the two superpowers as contemporaries. The V-bombers themselves were comparable, and in some respects superior, to any of those fielded by other nations. They began entering service within the ten-year 'period of grace' initially predicted, a remarkable achievement considering their ambitious specifications and the nations post-war economic state.

Despite this, the Medium Bomber Force was overtaken by events somewhat out of the early planners control or reasonable prediction. Only in 1961, with the peak force of 180 bombers armed with thermonuclear weapons, did the deterrent become fully operational. Unfortunately by this time they were already extremely vulnerable to Soviet air defences, with some estimates putting penetrative capability as low as 3%.[109] Against the rapid advances of technology, such as the advent of viable ballistic missiles and nuclear submarines, the manned bomber began to appear increasingly outmoded. This of course raises the question as to why this eventuality was not foreseen, as the V-2 rocket had already set an unmistakable precedent. It must be considered likely that the sheer pace of technological advance, which was to a large extent spurred by international Cold War tensions, simply took British planners by surprise. By the time the situation was fully comprehended the V-bomber development programme had already been set to a relatively inflexible time-table, all that could be hoped for was that the V-force would have a useful operational lifespan before its inevitable obsolescence. In his study of the relationship between British planners and ballistic missile technology, Jeremy Stocker is much less forgiving, stating that, 'Threat assessments that were both late and over-optimistic seem to have been a consistent feature of British defence planning in respect of missiles throughout the 1950s'.[110] In fact, a 1949 joint Anglo-American intelligence report concluded that despite the USSR's access to captured German missile technology an operational Soviet ballistic missile was unlikely before 1955.[111] As it transpired the first Russian SS-1 and SS-2 (Surface-to-Surface) missiles were in service as early as 1951 and Sputnik was launched on a converted IRBM only six years later. While the unexpectedly rapid advance of Soviet technology can perhaps be understood, even taking the reports initial estimate of 1955 would mean that Russia was expected to have functioning ballistic missiles before the earliest predicted V-bomber delivery. This systemic myopia was to have a major impact on the British airborne deterrent, resulting in massively increased expenditure in an effort to maintain its effectiveness. This was a Sisyphean struggle at best and one which ended with the unexpectedly early transfer of the primary deterrent role to an unappreciative Royal Navy. Ironically in spite of Mr Sandy's earlier concerns during the V-force's procurement about not, 'putting all your

money on one horse', with the Skybolt debacle the RAF and Air Ministry proceeded to do exactly that. As Paul Jackson states, 'There might have been no Polaris had not the RAF backed a loser when looking for a second air-launched strategic missile', with its cancellation, '…the whole future of the RAF's airborne deterrent was swept away'.[112]

Photo: RAF AHB

Valiant crew scramble

As regards the independent nature of the British deterrent this could best be described as 'paradoxical'. Over time the United Kingdom became increasingly dependent on hardware supplied by the United States while still proclaiming flexibility of use, as is evidenced by the insertion of the 'supreme national interests' clause in the 1962 Nassau Agreement. Though it is difficult to envisage under what other circumstances the deterrent could be used. In the 1966 report, Command and Control of Nuclear Weapons by the Ministerial Committee on Nuclear Policy, it was stated that:

> …we have assigned the V-bomber force and shall assign our Polaris force to NATO for targeting in accordance with NATO plans… except where Her Majesty's Government may decide that supreme national interests are at stake'. As a result, '…in emergency Her Majesty's Government are free to use British nuclear weapons anywhere in the world.[113]

However, a trace of envy is perhaps detectable in their final point that, 'French nuclear weapons are under the independent custody and control of the French Government, and their use is untrammelled by any international agreement or understanding'.[114] Nevertheless, even including limited aberrations such as the Suez misadventure, it is difficult to imagine a situation where the United Kingdom would have embarked upon such a course of action without at least the blessing of the United States itself. Furthermore, the relationship between the United Kingdom and United States was not simply one of dependence but an interdependent relationship. The United States desired to prevent the United Kingdom being forced into unilateral retaliation as much as Britain itself. Even during periods of seemingly complete dependence on American hardware, such as during the four year 'Project E' period, such technologies were only required to be maximally effective. In extremis the V-force could have been committed to the attack using indigenous atomic weapons and the limited stock of British thermonuclear warheads. Therefore by giving up limited concessions, mostly revolving around flexibility of use, Britain received in return a deterrent capability more potent than that achievable by its own means, a measure of political influence, both of world standing and in influencing the United States and the reassurance that America remained committed to the defence of Europe. As summarised by Peter Malone, '…neither 'integration' with American forces in 1958 nor 'dedication' to NATO in 1962 imposed conflicting missions upon Britain's strategic forces. In both their NATO and national missions these forces were to be employed only at the final hour and only with the deadliest effect'.[115]

The wisdom of the deterrence strategy itself can perhaps be established by the fact that during the Cold War there was no open conflict between the competing ideological opponents, fulfilling Winston Churchill's hopes when, in 1955, contemplating the coming age of mutual deterrence, he stated '…we shall, by a process of sublime irony, have reached a stage…where safety shall be the sturdy child of terror, and survival the twin brother of annihilation'.[116]

During its operational lifetime the V-force was beset by many difficulties, of varying severity, such as the initial problems with the Blue Steel stand-off missile, which potentially rendered a substantial proportion of the force entirely impotent. During such periods of vulnerability we are fortunate that the V-force was not called upon to fulfil its duty.

However in the realm of deterrence perception is at least as important as reality, the mere existence of the British airborne deterrent must have given the Soviet leadership pause and undoubtedly complicated Soviet planning with the 'second-centre of nuclear decision-making' (to use the contemporary phrase) that the United Kingdom represented having to be taken into consideration.

In the final analysis what counted was what the Politburo and any other potential enemies believed. The view from Moscow would have been of an extremely potent and efficient British retaliatory capability and in most respects this was unquestionably what the V-force represented during the twelve years when it carried the burden of providing the British national deterrent. In respect of the V-force Cold War Bomber Command could more than justifiably display its proud motto, 'Strike Hard Strike Sure'.

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