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LIVING IN THE SHADOW: BRITAIN AND THE USSR'S NUCLEAR WEAPON DELIVERY SYSTEMS 1949-62

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Abstract

This thesis examines British intelligence collection efforts against the Soviet Union's nuclear bombers and long-range nuclear ballistic missiles during the period 1949 until 1962. It also analyses the serious intelligence collection problems that were encountered concerning this topic and how successful Britain's intelligence efforts were in the light of what is now known. This period of Cold War history covers from the Soviet Union's atomic bomb test through to the Cuban Missile Crisis.

The thesis commences with an analysis of the Soviet Union's nuclear bombers which posed the initial nuclear strike threat to the United Kingdom. It explores how German personnel returning from captivity in the Soviet Union were used by the West to provide information on Soviet military research and how British analysts struggled to gather intelligence on nuclear bombers in a secret police state.

The issue of the Soviet ballistic missile threat to the UK is then considered, again by initially examining intelligence provided by German returnees, through to more sophisticated intelligence collection methods such as advanced radar. The papers of the British Joint Intelligence Committee and other government departments were used to examine collection problems and assessments. The role of secret intelligence assessments in the Macmillan government's decision to cancel the British Blue Streak nuclear missile is also explored.

Aerial reconnaissance was a particularly useful intelligence asset. Britain's clandestine over-flights of the USSR and role in the U-2 programme have only been briefly discussed before. These missions and the UK's role in covert balloon operations are explored for the first time in a detailed case study. The use of satellite reconnaissance in Britain's intelligence collection efforts is also assessed.

The Colonel Oleg Penkovsky spy case is then analysed as a case study of human intelligence collection and its problems when dealing with Soviet bombers and missiles from 1961-62. This chapter uses declassified American documents to examine the nuclear material he provided, his role in the Cuban Missile Crisis and his overall value to the British and American intelligence agencies.

The conclusion is that intelligence collection and analysis evolved significantly from 1949 to 1962 from the use of basic human intelligence to the development of satellite reconnaissance. My thesis, written chronologically, demonstrates that analysts did well to overcome enormous problems when dealing with an extremely difficult intelligence target. At the end of the period they provided far better intelligence collection and analysis on Soviet nuclear weapon delivery systems to British policy makers during a critical period in the Cold War.

CONTENTS

Acknowledgements

The idea for this thesis originated from reading the book *Spying On The Nuclear Bear* by Dr Mike Goodman at the Department of War Studies at King's College London. I am grateful for the author's initial guidance which allowed me to draft the outline for my thesis. I also owe a debt of gratitude to Dr Huw Dylan, also at the War Studies Department at King's College, for sending me the relevant chapters of his own work on the Joint Intelligence Bureau which proved to be most useful.

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All errors and omissions in this paper are of course my own.

Kevin Francis O'Daly

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Declaration

I declare that all the material in this thesis is my own work.

Introduction

The detonation of the Soviet Union's first atomic bomb, (nicknamed "Joe-1" by western intelligence agencies), in August 1949 came as a colossal shock to the West. America's monopoly on nuclear weapons technology had been broken and Soviet science and espionage were shown to be terrifyingly advanced and effective. The "Joe-1" test had occurred several years before western intelligence thought the USSR would possess the atomic bomb. This revealed a misjudgement by western intelligence of the state of the USSR's progress in nuclear physics, as well as of the loyalty of some members of the allied atomic bomb programme. Owing to the USSR's hostile ideology and proximity to the UK, this dramatic event posed severe security implications for the nation. The secret test of this weapon had only been discovered accidentally due to an American WB-29 aircraft undertaking atmospheric sampling operations between Japan and Alaska on 3 September 1949.[1] Analysis of the radioactive elements its equipment picked up revealed that it was artificial nuclear material and had not come from a natural source.[2] Further flights, including one from the UK, confirmed that it had not come from an American nuclear test and that it was likely that the USSR had exploded an atomic bomb.[3]

British intelligence informed the Prime Minister of this fact and the UK'S Secret Intelligence Service (SIS) Liaison Officer with the American Central Intelligence Agency (CIA) in Washington, Mr 'Kim' Philby (later found to be a Soviet Intelligence Service (KGB) agent) likely informed Moscow that the allies were aware that the USSR had the atomic bomb.[4] Measurements of weather patterns and radioactive material also revealed the likely date and location of the explosion. The announcement of this momentous event was not made in the West until 23 September 1949 to deny Moscow knowledge of the West's nuclear intelligence capabilities and no date or location of either the explosion or type of nuclear device were mentioned in press announcements.[5] Moscow remained silent on the issue.

[1] Goodman, Michael *Spying on the Nuclear Bear: Anglo-American Intelligence and the Soviet Bomb* (Stanford, 2007) p.46.
[2] Ibid.
[3] Ibid.,p.47.
[4] Ibid.
[5] Ibid.,p.49.

It was now, however, clear that the Russians possessed a weapon of terrifying potential. In 1949 memories of the Luftwaffe's bombing campaign on British cities, as well as Germany's innovative use of V-1 and V-2 rockets, were still fresh. This wartime experience showed how vulnerable the UK was to aerial attack. The potential marrying of nuclear weapons to delivery systems now posed, for the first time, an existential threat to the UK in any future conflict. The Royal Navy (RN), traditionally the primary protector of this island nation, would be incapable of defending the realm against this type of attack and the Royal Air Force (RAF) would be unable to neutralise the USSR's considerable air assets.[6] It is ironic that the UK approved the world's first nuclear weapon programme during the Second World War, before joining America's vast effort in this field. It then subsequently found itself, before it possessed its own atomic bomb, facing potential atomic destruction from Moscow as its former wartime ally became a Cold War adversary.[7]

The first Soviet nuclear test made clear the importance of airborne intelligence collection and scientific analysis in producing assessments of foreign nuclear weapon programmes. It also demonstrated the importance of allied intelligence co-operation on a global scale and revealed the paucity of western intelligence on the USSR's nuclear weapons programme. This dramatic event further highlighted the potential dangers posed by intelligence failures against a secretive and militarised state. Without this fortuitous mission being undertaken and co-operation in intelligence collection between the United Kingdom and the United States, it could have taken much longer for the West to establish the Soviet Union's nuclear weapon capability. It thus demonstrated the need for new technical methods of collecting secret intelligence from a distance, because traditional human intelligence operations were extremely difficult to undertake in a secret police state such as the USSR. Information on Soviet nuclear weapons was also shrouded in particular secrecy, creating an intelligence target of unusual difficulty. The presence of British traitor Kim Philby further complicated the problem of collecting and using secret intelligence when those national intelligence efforts were being undermined from within. A priority target of British intelligence efforts was the delivery mechanisms for Russian warheads. After all, these weapons, however

[6] Baylis, John and Stoddar, Kristan *The British Nuclear Experience: The Role of Beliefs, Culture and Identity* (Oxford, 2015) p.13.
[7] Ibid.,p.11.

powerful, were useless unless the Russians could launch them at the United States and her allies. To assess the threat posed by the Soviet Union's nuclear bombers, and later its ballistic missiles, as well as gauging its intentions, intelligence collection and analysis were crucial. This requirement also escalated as the UK took the formal decision to build its own atomic bomb in January 1947 and later to develop the hydrogen bomb and so maintain strategic nuclear deterrent forces.[8] Such forces needed intelligence information on Soviet nuclear bombers and missiles for warning and targeting purposes.

The purpose of this thesis is to examine the UK's intelligence collection efforts against the Soviet Union's long-range nuclear bombers and ballistic missiles from the time of Moscow's first nuclear test in 1949, through to the Cuban missile crisis in 1962, arguably the most dangerous crisis of the Cold War. It is written from a British perspective and is divided into two parts. The first examines the intelligence targets and what was known about them. The second part consists of two case studies dealing with aerial reconnaissance and human intelligence, examining intelligence collection problems encountered by analysts and successes achieved in these fields. The thesis assesses what the UK thought it knew about Soviet nuclear weapon delivery systems in terms of numbers and types of systems deployed, as well as how they might be used. It uses declassified files to analyse the enormous problems intelligence agencies encountered in gathering this intelligence and how they attempted to resolve them. Particular success was achieved in the field of aerial reconnaissance and more material has been declassified about it, hence Chapter Three is presented as a special case study of this rather neglected area. Further intelligence progress occurred in the field of human intelligence in 1961 with the recruitment of Colonel Oleg Penkovsky, a Russian intelligence officer. Chapter Four is a case study assessing the importance of the material on nuclear weapons that he passed to the West. The thesis does not explore the history and theory of UK nuclear deterrence, or nuclear strategy, all of which are well covered elsewhere.[9] It also does not cover intelligence on Soviet nuclear warheads, fissile material and testing which has already been undertaken by Goodman in 2007.[10]

[8] Ibid.,p.30.

[9] See Arnold, Lorna *Britain and the H-Bomb* (Basingstoke, 2001). Baylis, John *Ambiguity and Deterrence: British Nuclear Strategy 1945-64* (Oxford, 1995). Freedman, Lawrence *Britain and Nuclear Weapons* (London, 1980). Farmilo, Graham *Churchill's Bomb: A Hidden History of Science, War and Politics* (London, 2014). Groom, AJR *British Thinking About Nuclear Weapons* (London, 1974). Navias, Martin *Nuclear Weapons and British Strategic*

The value and originality of this thesis, I believe, lies in several areas. On the issue of Soviet nuclear bombers it examines declassified material concerning debriefings of German personnel who worked on missile and aeronautical technology in the USSR. Much of this work concerned the V-1 "doodlebug" a German missile system which would form the basis for nuclear missiles later deployed on Soviet bombers. This point has not been covered by other authors who concentrate on ballistic missile knowledge imparted by the Germans. These debriefings also provided the first insights into military research and development facilities in the USSR, so forming the basis for further western intelligence collection efforts. The theme of the paucity of intelligence on Soviet nuclear weapon delivery systems runs through the thesis and I examine why this was the case and how the West's intelligence agencies tried to address it. Whilst covering intelligence on Soviet nuclear bombers, the thesis examines the problem of the West receiving so few defectors in the early Cold War period and the policy discussions surrounding this problem. This material is not cited by other authors writing about Cold War intelligence. To further explore British intelligence collection problems in the USSR, I analysed declassified material from the British Air Attachés in Moscow. These reports, which have not been used by other authors, demonstrate the oppressive surveillance environment intelligence collectors encountered and the meagre data they had available. This insight helps explain the lack of success concerning intelligence collection on the USSR that the UK enjoyed in the early Cold War period.

The examination of Soviet nuclear bombers also deals with British intelligence assessments of specific types of aircraft and missiles which do not feature in other studies. It further examines the impact of the Strath Report which assessed the possible effects of a Soviet hydrogen bomb attack, delivered by aircraft on the UK in the mid-1950s. This provides a disturbing picture of what would have happened had Soviet nuclear bombers been used in anger. The thesis also explores the differences in British and American assessments of the size of the USSR's long-range bomber fleet and emphasises that UK intelligence analysts did

*Planning 1955-58 (*Oxford, 1991). Quinlan, Michael *Thinking About Nuclear Weapons: Principles, Problems, Prospects* (Oxford, 2009).

[10] Goodman, Michael *Spying on the Nuclear Bear: Anglo-American Intelligence And The Soviet Bomb* (Stanford, 2007).

not inflate their estimates. It also examines intelligence assessments of how the USSR could mount an aerial attack on the UK and the nation's vulnerability to it. No other author has examined such attack assessments made by the British government.

On the issue of Soviet ballistic missiles, the thesis examines the intelligence debriefings of Germans who worked in this field in the USSR after 1945. It also analyses in detail the special conferences held between British and American ballistic missile experts in the early Cold War to allow the extent of western knowledge of this topic to be gauged. This again reveals the paucity of western knowledge and the acute intelligence collection problems encountered. The paper examines material from a Soviet defector Colonel Grigori Tokaev, code-named EXCISE, whose debriefing reports have now been declassified. He was the first Cold War Soviet defector who had access to information on ballistic missiles. Using pieces of intelligence from numerous Joint Intelligence Committee (JIC) files, the thesis examines British intelligence's view of the development of Soviet ballistic missile systems from medium to intercontinental range. It also examines the Templer Report which is an internal British government review analysing the UK's missile intelligence efforts.

The thesis also reveals that much of the intelligence concerning Soviet long-range ballistic missiles was gathered by special American long-range radars in Turkey and another station in the Aleutian Islands. Secret British radar efforts based on Cyprus are also examined. Britain had access to these American technical intelligence developments which improved missile intelligence collection in the late 1950s. The paper further analyses British intelligence material which suggested that the USSR had deployed nuclear missiles to East Germany in 1959. This builds on earlier scholarship undertaken by German academics. The USSR's early space programme, such as the Sputnik satellite launch, is also analysed using British intelligence assessments of its role in Moscow's intercontinental ballistic missile programme. Much of this material has not been used elsewhere and the paper explores British intelligence assessments of Premier Khrushchev's rhetoric concerning Soviet ballistic missile capabilities. The chapter concerning ballistic missiles also incorporates work from Russian scholars, so allowing the accuracy of some of the UK's intelligence assessments to be partially determined. No other author has used this approach. The thesis also links intelligence to

government policy decisions through declassified papers concerning the Macmillan government's decision to cancel the British Blue Streak ballistic missile. This is a rare occasion where a direct link between intelligence assessments and a defence policy decision can be drawn. It shows that the decision to cancel the programme was made using intelligence which was very difficult to gather and assess and later turned out to be inaccurate.

During the research it became apparent that one of the most successful fields for gathering intelligence against the USSR was aerial reconnaissance. Chapter Three of the thesis is a special study of this topic, which includes material not seen before. It analyses how a special relationship formed between the UK and the US during the war concerning imagery intelligence and how captured German material was shared after the war. A study is also undertaken using declassified papers of the destruction of an RAF Lincoln Bomber over East Germany in 1953. This was the only British aircraft lost to an attack by Soviet forces in the Cold War and demonstrates the danger of airborne intelligence collection, although it is uncertain if it was on a covert mission. The chapter on aerial reconnaissance also reveals British involvement in a covert American-sponsored intelligence collection programme to launch high-altitude balloons carrying cameras and electronic monitoring equipment across the USSR. British involvement in this once highly-classified programme is not mentioned by any other author. Material recently declassified by the CIA also allows the UK's involvement in the U-2 over-flight programme to be more fully assessed. This has not yet appeared in any research or publication and allows details of the two British covert U-2 over-flights of the USSR to be examined for the first time. Declassified British government papers also allow an analysis of the aftermath of the shoot-down of both the U-2 and an American RB-47 reconnaissance aircraft in 1960 to be made for the first time. Again, this material does not appear in any other research.

Papers declassified by the CIA also show that the UK made a covert over-flight of the USSR's ballistic missile testing facility at Kapustin Yar in 1953. This flight was the subject of rumours for several years and recent releases of papers reveal that this dangerous mission was in fact undertaken. This material is included for the first time in the thesis as well as

additional details on the highly sensitive Operation JIU-JITSU missions which involved over-flights being made of the USSR by the RAF in 1952 and 1954. The thesis also contains details of RAF electronic collection or "ferret" flights conducted against the USSR which do not appear in any publications. Some numbers, dates and locations of these missions are included to give a sense of their scale as well as the political discussions and sensitivities surrounding them.

The chapter on aerial reconnaissance further includes an analysis of the role of satellites in intelligence collection against Soviet strategic nuclear delivery systems using recently declassified American material. For many years it was unclear when, or if, the UK received imagery intelligence from these systems. During my research a document emerged from the US which shows that the UK was receiving this product from the start of the programme but detailed information on the collection systems appears to have been withheld from the British. This information does not appear in any other British academic research. The thesis also explores British theoretical work on reconnaissance satellites, material which does not appear elsewhere.

Using declassified material from the US on the Colonel Oleg Penkovsky espionage case, the thesis examines the role of human intelligence in collection operations against the USSR's nuclear bombers and ballistic missiles. Instead of concentrating on espionage "tradecraft", my unique focus is on determining what specific intelligence he passed to the West. No other author has done this and I used CIA debriefing documents to extract this material and gain an understanding of how it confirmed or disproved British intelligence's assessments of the USSR's nuclear weapon delivery systems. I also examine the latest secondary literature on the Penkovsky case to determine his role in the Cuban Missile Crisis and assess how he was captured and if he was a genuine defector.

It must be emphasised that only a small amount of literature has appeared on British intelligence collection against Soviet nuclear bombers and ballistic missiles. Zaloga, shortly after the end of the Cold War, published two works in which he used research undertaken in

Russian archives to examine the development of Soviet nuclear weapon delivery systems.[11] They are useful to measure the accuracy of what British intelligence thought it knew but they are written from a Soviet technical perspective and do not consider allied intelligence collection or policy implications. Some analysis concerning the development of the USSR's nuclear weapon delivery systems has been produced by Russian authors, the most thorough of which is by Podvig.[12] This again allows Soviet archival material and interviews with Soviet personnel to be used as a comparison to British intelligence assessments.

Hitherto, however, very little has been written from a British perspective concerning the USSR's nuclear delivery systems using archival sources in the UK. Some wide-ranging British academic studies of intelligence have been produced, notably by Aldrich, but these do not focus on intelligence concerning Soviet nuclear weapon systems or their specific intelligence collection problems.[13] Aldrich provides some analysis of Britain's intelligence collection against the USSR's ballistic missiles but does not cover its nuclear bombers. He also concentrates on the relationships between allied intelligence services, internal politics and the development of intelligence departments. More recently, Dylan produced an interesting study examining the role of the British Joint Intelligence Bureau (JIB) which contains some material on its assessments of the USSR's bombers and ballistic missiles.[14] His work, in part, examines Soviet aircraft and missile production rates as well as economic and topographical intelligence. It aids understanding of the organisation of British intelligence at this time but does not explore in detail the problems British intelligence faced when attempting to gather intelligence on Soviet nuclear weapon delivery systems. Goodman also produced a very interesting study on allied intelligence collection concerning the USSR's nuclear bomb tests and fissile materials as well as the nuclear intelligence relationship between the UK and the US.[15] This again does not provide much information on Soviet nuclear weapon delivery systems or the problems of collecting intelligence concerning

[11] Zaloga, Steven *Target America: The Soviet Union and the Strategic Arms Race 1945-64* (Novato CA, 1993) and *The Kremlin's Nuclear Sword: The Rise and Fall of Russia's Strategic Nuclear Forces, 1945-2000* (New York, 2002).
[12] Podvig, Pavel (ed), *Russian Strategic Nuclear Forces* (London, 2004).
[13] Aldrich, Richard J, *The Hidden Hand: Britain, America and Cold War Secret Intelligence* (London, 2001) and *GCHQ: The Uncensored Story of Britain's Most Secret Intelligence Agency* (London, 2010).
[14] Dylan, Huw *Defence Intelligence and the Cold War: Britain's Joint Intelligence Bureau 1945-64* (Oxford, 2014).
[15] Ibid.,Goodman *Spying On The Nuclear Bear.*

them. His study also ends at 1958 thereby not covering important developments such as the Colonel Oleg Penkovsky espionage case and the later stages of the U-2 programme. Goodman's later study, as official historian of the JIC, is a broad analysis of its work covering a plethora of global issues and ends in 1956.[16] This official history has some coverage concerning British assessments of the USSR's stockpile of fissile material as well as intelligence on nuclear missiles derived from a selection of JIC papers. It only has limited coverage concerning Russian nuclear bombers and British intelligence collection problems during the period.

There is a limited amount of literature available on British aerial reconnaissance during the Cold War, notably by Lashmar.[17] This reflects the sensitivity which still surrounds this subject and the sparse releases of documentary material on certain areas. Much secondary literature has been published on the U-2 reconnaissance aircraft programme with its covert over-flights of the USSR, but only recent releases of intelligence material in the US has allowed a fuller picture to emerge of Britain's role in the programme.[18] A particularly useful modern study concerning allied aerial reconnaissance, particularly U-2 operations, is by Brugioni, a former senior CIA photographic analyst.[19]

The Colonel Oleg Penkovsky espionage case has also generated a considerable volume of literature, the most thorough of which is by Deriabin and Schecter.[20] This study was the first one compiled using declassified CIA papers from the case. Some studies on Penkovsky recycle myths about him and tend to focus on conspiracy theories as well as the operational tradecraft of "running" a human agent. None of these works explores the intelligence on nuclear weapons that Penkovsky actually passed to the West. The release of large quantities

[16] Goodman, Michael *The Official History Of The Joint Intelligence Committee Volume 1: From the Approach of the Second World War to the Suez Crisis* (London, 2014).
[17] Lashmar, Paul *Spy Flights of the Cold War* (London, 1996).
[18] For the U-2 see Wise, David and Ross, Thomas *The U2 Affair* (New York, 1962). Powers, Gary *Operation Overflight* (London, 1971), Pocock, Chris *The U-2 Spyplane: Towards The Unknown* (Atglen, 2000). Pocock, Chris *Dragon Lady: The History of the U-2 Spyplane* (London, 1989), Polmar. Norman *Spyplane: The U-2 History Declassified* (New York, 2001). Beschloss, Michael *May Day: Eisenhower, Khrushchev and the U2 Affair* (New York, 1986).
[19] Brugioni, Dino *Eyes in the Sky: Eisenhower, The CIA and Cold War Aerial Espionage* (Annapolis, 2010).
[20] Schecter, Jerrold and Deriabin, Peter *The Spy Who Saved The World: How A Soviet Colonel Changed The Course Of The Cold War* (New York, 1992).

of material from the CIA now allows some assessment to be made of this issue for the first time and forms part of Chapter Four.

Much intelligence literature published in the UK has been popular 'spy' literature which focusses on cases of Cold War espionage and treachery rather than examining intelligence material which had been provided to policy makers. However, the declassification of intelligence material in recent years has made it possible for scholars such as Goodman and Aldrich to show what it is possible to learn by examining intelligence files released to The National Archives (TNA). This thesis was written primarily using declassified documents in the UK, particularly from the JIC and the Ministry of Defence (MOD), as well as the Foreign Office (FO) and the Prime Minister's office. American electronic resources from the CIA were also used, particularly in Chapter Three on aerial reconnaissance and in Chapter Four on the Colonel Oleg Penkovsky espionage case.

Many JIC files have been declassified since the 1990s and they proved to be of immense value in gaining an understanding of British thinking about the USSR's nuclear weapons. Based in the Cabinet Office in Whitehall, JIC acts as the highest level intelligence assessment organisation in the British government and regularly issues reports for senior government officials and ministers on topics of current interest on foreign and security affairs. It focusses on issues that Whitehall considers policy priorities or of current interest in a crisis. It also directs the use of resources within British intelligence. Initially a sub-committee of the Imperial Defence Committee from 1936 onwards, it became part of the Cabinet Office in 1957 to serve government intelligence needs on a cross-Whitehall basis as the Cold War gathered pace. JIC seeks to obtain consensus on issues it considers and no dissenting opinions are included. There is also no indication of what intelligence material or sources were used from SIS or GCHQ in its deliberations before a report is issued. JIC issued many weekly reports on the USSR from 1949 to 1962 and all declassified material was examined for this thesis. It is not possible to say what was said in JIC discussions, which papers were considered or intelligence seen, or how its decisions were made. It is also impossible to establish how individual JIC reports may have steered policy decisions in government departments because it is unclear which officials read its output or how significant any piece

of intelligence may have been in influencing recipients. Some JIC papers are still retained and Freedom of Information Act requests submitted by me failed to secure their release. As the top level national intelligence organisation it is reasonable to assume that all relevant intelligence material received by the British government was read and assessed in writing its reports so its output is a reflection of knowledge at that time.

Much atomic and scientific intelligence was assessed by the Joint Intelligence Bureau (JIB) which was a tri-service military organisation with its roots in the Second World War. Originally it dealt with topographic intelligence, mapping and economic issues but as the Cold War progressed it expanded into scientific, technical and atomic matters. It also examined strategic military intelligence and directed Air Intelligence which took the lead for intelligence assessment on Soviet nuclear bombers and ballistic missiles. JIB was eventually absorbed into the Defence Intelligence Staff in the MOD upon its formation in 1964. Reports from JIB are sparse and appear in the files of other departments with assessments being offered on topics such as missile production and Soviet warhead stockpiles. With the intelligence record fragmented, it is difficult to assess what impact JIB had but it is an early example of tri-service co-operation and centralisation during the Cold War. The impression is gained though that intelligence on Soviet nuclear weapon delivery systems gathered from human sources by the UK's SIS and electronically by GCHQ was sparse and there was only a limited amount of data to be pooled. This all had to be made available to JIC as a central organisation for assessment so nothing was missed, a joint view could be formed and resources not wasted. It is unclear what reports JIB produced in total because there is no central depository of its files in The National Archives. However, all intelligence produced by the UK on Soviet nuclear weapon delivery systems was passed to the Assessment Staff in the JIC for analysis and conclusion. This material was discussed and sifted by analysts to produce JIC assessments on ad-hoc subjects and for Weekly Intelligence Summaries. This would be distributed to key officials and politicians for decision-making, with no indication given of the intelligence sources used in the product. It is impossible to say who saw which reports and how intelligence may have influenced government policy. Some, but not all, of these JIC reports from 1949-62 have been declassified and were used to produce this thesis.

The thesis, although historical, deals with serious issues surrounding intelligence, weapons of mass destruction and political intentions which remain relevant today. Seventy years after the last use of nuclear weapons in anger, the atomic threat still remains with Iran and North Korea being current concerns. The perennial problems that British intelligence analysts grappled with concerning intelligence collection and assessment, as well as the interaction between intelligence and policy, are still pertinent. This issue was clearly and controversially examined in the Butler Report in 2004 which examined the issue of British intelligence and Iraq's weapons of mass destruction. It shows the relevance of the thesis to our current era.

The problems facing British intelligence analysts dealing with the "hard target" of the Soviet nuclear weapons programme are similar to those experienced many years later by their successors examining Iraq's covert weapons programmes. A report produced in 2004 under the chairmanship of Sir Robin Butler examined British intelligence's collection and assessment work on these covert programmes.[21] It provides the only publicly available insight into the problems faced by the JIC in dealing with collecting, assessing and using intelligence. Many of the lessons drawn can be seen to be equally relevant to the work of British intelligence analysts addressing the Soviet nuclear target in the early Cold War. It sets a framework against which their work can be assessed.

Butler examined the intelligence sources used by the JIC concerning Iraq's weapons of mass destruction programme. This was primarily HUMINT (Human Intelligence) i.e. material gathered from human sources by the UK's Secret Intelligence Service (SIS). The other major source of secret intelligence available was SIGINT (Signals intelligence) which is intelligence obtained through the interception of communications and electromagnetic emissions by the UK's Government Communications Headquarters (GCHQ). The HUMINT material collected by SIS on Iraq's secret weapons programmes was examined by Butler during the enquiry. Additionally, Butler explored how that intelligence was used and the conclusions that were drawn from it. He highlighted common errors that occurred in intelligence analysis and noted that all intelligence targets were "hard", otherwise intelligence

[21] *Review of Intelligence on Weapons of Mass Destruction* (HC 898): Report of a Committee of Privy Councillors Dated 14 July 2004. This is more commonly known as "The Butler Report".

agencies would not be needed to collect and analyse covert data.[22] Butler also highlighted that states employed formidable protective security barriers for military information, and the measures used to shield information concerning nuclear weapons and other weapon of mass destruction programmes were particularly challenging.[23] Knowledge of such programmes is limited to a few people who have a genuine "need to know" and their access is restricted to their immediate working environment. Special compartmentalisation procedures further control the issue, release, storage; development and usage of such weapons systems and only people in these chains of command may have access to information about them. This was as true for Soviet nuclear weapon programmes in the 1950s as it was for covert Iraqi weapons programmes in the late twentieth and early twenty-first century. The intelligence collection problems and issues of analysis and assessment also remain similar.

Butler also judged that intelligence analysts might seek to over-compensate for earlier intelligence errors. In 1949 western intelligence failed to predict the timescale by which the Soviet Union would get the atomic bomb and were likely to be keen to avoid under-estimating Soviet capabilities in the future. However, compensating over-estimates can also be useful for bureaucratic self-interest, through encouraging increases in budgets and support for particular programmes. A far bleaker picture of a target could therefore emerge in intelligence assessments. It is important to note however that due to the problems of dealing with a secret police Security State, it was very difficult to get accurate intelligence concerning any Soviet weapon programme. A secret intelligence picture, by its very nature, is always incomplete and Butler acknowledged that it is extremely difficult to corroborate information on a hard target.[24]

Butler also noted that in any intelligence assessment, choices have to be made about which intelligence material to include in a report and what to leave out.[25] The danger exists of a tendency to include material that supports and reinforces earlier conclusions, therefore any contrary thinking or unusual reports may not be given due weight. Again, with hard

[22] Ibid.,p.11.
[23] Ibid.,p.21.
[24] Ibid.,p.14.
[25] Ibid.,p.11.

intelligence targets it is difficult to find supporting material that can corroborate an unconventional view. There is also a danger, Butler thought, of "group-think" developing in a team of analysts whereby they develop a form of "tunnel vision".[26] A team can engage in consensus seeking behaviour whereby they believe in a conclusion because they want it to be true. Participants may also end up agreeing with one another in order not to appear to be anomalous, defying conventional wisdom, or be "rocking the boat" thereby displeasing colleagues, superiors and policy makers. Under conditions of stress and when dealing with matters of great importance, peer pressure can influence what is normally dispassionate judgement. In intelligence analysis, well-developed thinking and an open mind in dealing with the shortcomings of the intelligence under scrutiny are essential characteristics.

When assessing intelligence on a sensitive subject like the Soviet Union's nuclear weapons programmes it was important not to fall under the influence of policy branches. Butler pointed out that this was a danger in intelligence analysis.[27] Intelligence staffs could tell their political masters what they thought they wish to hear and start seeing the target, as the politicians would want them to see it, so serving their political objectives. Butler highlighted this danger in relation to Iraq, but it could also be applied to the testing and dangerous era of the Cold War from 1949 to 1962. There was a risk that intelligence analysts could be swept along on a wave of fear generated by the existential threat to the UK represented by the Soviet Union's nuclear weapons and political system. This mentality is likely to have occurred in the United States in the 1950s, resulting in the "missile gap" and "bomber gap", whereby inflated estimates of numbers of Soviet nuclear weapon delivery systems were published by the US government. However, American intelligence analysts were also being subjected to bureaucratic and political pressure to justify greater defence expenditure. The spectre of the December 1941 surprise attack on Pearl Harbor by the Japanese was also possibly a factor in their thinking, made worse by the latest adversary's possession of a substantial nuclear weapon stockpile. Analysts' lack of knowledge about the Soviet Union could also drive fear, clouding judgement and ensuring that "worst case scenarios" became the normal and only assessment. A worst case prognosis could become the central case but in the absence of accurate, or alternative assessment it could be argued that it was the most sensible course of action as national survival could be at stake.

[26] Ibid.,p.16.
[27] Ibid.,p.16.

The Soviet Union under Joseph Stalin was also an alien culture and few British people had direct experience of it.[28] Its political system was an enigma and even after the wartime alliance, Britain appears to have been left with a limited understanding of the Soviet state and society. Butler indicated that another serious problem faced by intelligence analysts is that their targets do not look like them and they may struggle to understand a foreign state or empathise with it.[29] The problem of "mirror-imaging" involves an assumption that our practices and values are universal and so are transferable onto the target. During the period under consideration British analysts looked from afar through primarily British, English speaking, democratic, male, middle-class, Civil Service, Christian, university-educated eyes at an alien, closed society. Any intelligence produced therefore ran the risk of incorporating the potential bias, foreign disinformation and lack of experience or knowledge of the analyst. Soviet society was immersed in a radical political belief enforced by an intolerant and brutal secret police system that was run as a murderous, paranoid dictatorship based on a "personality cult" in the aftermath of an appalling war.[30] To develop an understanding of such a closed society, let alone the most secret programmes that it felt were crucial to its security, was a very difficult task with arguably a very low probability of success.

Butler also makes the interesting comment that because secret intelligence material is necessarily highly classified, due to the use of special materials in its drafting; it appears to be of enormous importance.[31] This can give the material a certain mystique, prompting an exaggerated impression that intelligence agencies are all-seeing and all-knowing with unique highly accurate insights into a target. In fact, a report may consist of uncorroborated single-source material of dubious origin which may, nonetheless, be the only material that the intelligence agencies possess. It is very easy to become over-confident in what is thought to be a "good source" and to accept information without examining it critically. It is also possible to extrapolate information and take it as a "fact" when it is actually a premise. Butler

[28] See Roberts, Frank *Dealing with Dictators: The Destruction and Revival of Europe 1930-70* (London, 1991).
[29] The Butler Report p.15.
[30] See Service, Robert *Stalin: A Biography* (New York, 1998).
[31] The Butler Report p.14.

thought that an intelligence agency's confidence in a report should be made clear to users of its intelligence products to allow them to appreciate the limitations of the material.

Butler's comments in 2004 offer the only official exposition of the limitations of British intelligence gathering and the related challenges faced by analysts in the JIC and the wider intelligence establishment. The problems faced by analysts covering the well-protected Soviet nuclear target in the early years of the Cold War were similar. They struggled with partial information from limited sources to produce intelligence about the existential threat to the UK posed by the Soviet Union's nuclear weapons programmes. Additionally, there were hurdles to be overcome by the intelligence collectors who had to recruit human sources, break codes, intercept communications, conduct covert aircraft over-flights and do so in complete secrecy at a time when several traitors were active in the British government. This all had to be undertaken in the austerity years after 1945 whilst facing impressive Soviet state security. The crucially important final intelligence products helped British decision-makers to guide the nation through the perilous days of the Cold War. However, all assessments and analysis depended on the quality of the raw material received by the intelligence collection agencies.

My thesis starts with a chapter examining British intelligence's view of the Russian long-range manned nuclear bomber threat between 1949 to 1962. In 1949 this was the only way for the Soviet Union to deliver a nuclear weapon to the UK. The Second World War had shown that massed enemy bombers could overload the nation's air defences and Baldwin's adage from the 1930s that "the bomber will always get through" remained a vital cause for vigilance in the period under review. This chapter was researched using declassified files from the Air Ministry as well as the JIC's weekly and ad hoc reports. Papers relating to interviews with German scientists and engineers who worked in the Soviet Union after the war were also examined. The Strath Report which assessed the likely effects of an attack on the UK using the hydrogen bomb was also used to gain an understanding of what it was thought a nuclear strike on the UK would have involved in a worst case scenario. British Air Attaché reports from Moscow are also assessed to highlight the considerable intelligence collection problems in the USSR at this time.

Chapter Two concerns an examination of Britain's knowledge of the development of the USSR's long-range ballistic missile systems in the period. It explores the extensive, declassified debriefs undertaken in the 1950s with German scientists and engineers who worked on Soviet ballistic missile development. I also used JIC assessments and associated material, as well as reports from missile conferences held jointly with the United States in the 1950s, to determine the extent of the UK's knowledge of the USSR's ballistic missile programme. This chapter also covers the launch of the Sputnik satellite and the Soviet Union's development of the Intercontinental Ballistic Missile (ICBM). The threat this posed to the US raised the possibility of a nuclear "first strike" by the Soviet Union. No defence system existed to protect the West from ballistic missiles, other than the policy of nuclear deterrence, so developments in Soviet ballistic missiles raised serious security concerns. This was particularly pertinent to the UK which would be incapable of detecting an incoming Russian nuclear missile launch until 1963 and whose nuclear deterrent was based on manned bombers which could be destroyed on the ground in a surprise attack. Concerns about Soviet nuclear missile attack also had implications for British defence policy and was a key factor, amongst others, in the Macmillan government's decision to cancel the Blue Streak silo-based nuclear ballistic missile. This decision terminated British ballistic missile development and declassified papers on this were examined for this thesis.

Having examined intelligence targets, attention shifts in the second half of the thesis to developments in intelligence gathering, starting with the third chapter which examines photographic and electronic intelligence collection and its problems. The issue of airborne intelligence collection is explored by looking at the development of aerial reconnaissance and the capture of German wartime imagery of the Soviet Union. It also explores covert over-flights of the USSR by the RAF, as well as the extent of British involvement in the CIA's U-2 programme. This was undertaken using recently declassified American material. It also reveals a covert balloon programme for intelligence collection, run by the US in the 1950s, with British involvement examined for the first time. Declassified papers concerning the shooting down of the U-2 and RB-47 intelligence aircraft by the USSR in 1960 are also examined. Using declassified material from the US National Reconnaissance Office (NRO),

the thesis also examines the impact of satellite reconnaissance on intelligence collection. In the process, new light is cast on very early British involvement in the programme. Some information is also included concerning British electronic intelligence collection against the USSR. The chapter concludes that airborne operations using the U-2 and reconnaissance satellites helped to dismiss as myths both the bomber and missile "gaps" which prompted such anxiety in the US in the 1950s; instead it showed that the "gap" was in America's favour.

The final chapter uses secondary literature and the CIA's electronic archive to examine the controversial and famous espionage case of Colonel Oleg Penkovsky, a Russian army officer who worked for British and US intelligence from 1961-62. Using declassified documents and interview transcripts I examine both the developing espionage methods used to "run" him as an agent as well as assessing the importance of the material he provided on Russian nuclear bombers and ballistic missiles. I also research his role in the Cuban missile crisis which I demonstrate has been somewhat distorted over the years. Penkovsky provided unique insights into Soviet nuclear doctrine and strategy over many months and his case produced a plethora of official material, much of which has been released in the United States. Some of this unique material details British involvement in the case. I also examine how he was captured in the light of the latest secondary literature concerning his espionage.

This thesis was written using hundreds of government files and dozens of academic works. However, no operational material has been released from GCHQ and SIS on the topics under consideration so any study will be a partial analysis using fragmented material. For this thesis, I submitted several Freedom of Information Act requests for papers, all of which were rejected. In the future the intelligence picture will undoubtedly change as more information is released to The National Archives but the culture of secrecy still pervades government activity in the UK. However, it needs to be borne in mind that tensions still exist between Russia and the West and updated nuclear weapon delivery systems remain ready for use. We are likely to be "living in the shadow" of Moscow's nuclear bombers and ballistic missiles for many years to come, but more research may shed additional light on this topic.

CHAPTER 1 – RUIN FROM THE AIR: BRITISH INTELLIGENCE GATHERING AND THE SOVIET NUCLEAR BOMBER THREAT 1949-62

By the summer of 1949 the Soviet Union had shown that it could build and test an atomic bomb. However, to turn this capability into a credible offensive weapon, or have a nuclear deterrent, it needed the means to deliver it to a target either in Europe or North America. Until the mid-1950s, the only means that a state had to deliver a nuclear weapon to a target was by using a manned bomber such as the American B-29 *Superfortress* used in the atomic bomb attacks on Japan in August 1945. In World War Two the Soviet Union did not develop a long-range four engine strategic bomber and made few air strikes on Germany. The wartime Soviet Air Force was primarily tactical, providing air defence to the USSR and supporting Russian ground forces. Without the means to deliver the atomic bomb, its possession was virtually useless.

Introduction

The end of the war had left the United States and Britain with impressive and powerful strategic bomber forces capable of mounting devastating conventional raids, as seen by the offensives against the cities of Tokyo and Dresden. The arming of high-flying, long-range bombers with nuclear weapons capable of destroying a whole city gave war a new and terrifying dimension. Although Nazi Germany had made impressive advances in the field of rocket technology, novel weapons such as the V-2 rocket did not have the capacity to carry a nuclear warhead. Extensive testing and development needed to be done before atomic munitions could be miniaturised for use with a rocket. Additionally, guidance systems and engines of sufficient power and range were necessary for a system to be of strategic use. In 1949 therefore, the primary nuclear threat to the UK from the Soviet Union came from its development of long-range strategic bombers. At this time the devastation wrought on British cities by the German Luftwaffe was still fresh in the national mind, as was Britain's inability to completely stop bombers and rockets from penetrating its airspace. By the 1950s there were doubts in government about whether to retain RAF Fighter Command and over its ability to detect and intercept Russian bombers, some of which were jet powered. Britain did not have a supersonic fighter for air defence until the mid-1960s and

radars in the late 1940s and early 1950s had limited range. The advent of the atomic bomb, and later the hydrogen bomb, meant that potentially only a few Russian bombers flying over Britain could devastate cities, military bases and bring casualties on an unprecedented scale. As seen later in this chapter, the highly secret Strath Report, produced in 1955, assessed that even a few large-yield hydrogen bombs dropped on British cities would likely lead to governmental collapse and the nation's inability to continue fighting a war.

As the Cold War gathered momentum with the Berlin airlift, Korean War and development of the hydrogen bomb and ballistic missiles, so intelligence on the Soviet Union's nuclear weapons programme became a top intelligence collection priority. The lack of a long-range strategic bomber was a serious gap in the Soviet Union's nuclear arsenal and would have to be urgently addressed by the Soviet government. The Russians were also developing ballistic missiles in parallel to their bomber programme and this target was also competing for British intelligence resources. The ballistic missile issue is explored in Chapter Three and it is important to note that these missile programmes had to be monitored as well as other global intelligence targets.

Assisting the Russians in their development of weapon delivery systems was the fact that they, like the West, had benefited from the wartime capture and subsequent co-operation of large numbers of German scientists and engineers who had worked on Nazi Germany's advanced weapons programme. Some of these men were put to work in the Russian bomber programme. The Russians also impounded military and scientific equipment, so there was a real possibility that the Soviet Union could pull ahead of the West in military technology. Despite the fact that western aircraft were far more advanced than those in the Soviet Union and it was a major undertaking for the USSR to catch up, the Russians maintained manned strategic bomber programmes throughout the Cold War.

The Second World War had demonstrated the value of secret intelligence material, and particularly scientific intelligence.[32] The war had seen the systematic collection, analysis, assessment and dissemination of intelligence on an industrial scale. The combined secret intelligence effort undertaken by the UK and United States was an essential component in the eventual allied victory. The use of stereoscopic photography in aerial reconnaissance, the skilful use of ULTRA decrypts[33] and employment of networks of human agents in enemy territory had all contributed to the provision of early warning concerning German advances in technology and allowed prudent deployment of allied resources.[34] The organised direction and use of secret intelligence had helped policy makers to understand the thinking of the German leadership, their intentions, innovations and plans. Similar intelligence collection tools and techniques were likely to be equally important during the Cold War, where early warning and accurate information were crucial to national survival. The primary sources of secret intelligence available to the British government then, and now, were HUMINT (Human Intelligence) which is material gathered by human sources and SIGINT (Signals Intelligence) derived from the interception and analysis of communications. In the UK HUMINT is primarily the preserve of the Secret Intelligence Service (SIS)[35] also known as MI6 and SIGINT is dealt with by the Government Communications Headquarters (GCHQ).[36]

It is impossible to say with confidence how much Britain's intelligence services knew or assumed about Russian nuclear bombers. Many official papers still remain classified despite the release of large numbers of intelligence files following the 1993 Waldegrave initiative. The post-war files of the Secret Intelligence Service (SIS) are closed and the Government Communications Headquarters (GCHQ) has released nothing on the topic of its intelligence collection against Soviet strategic weapons. Select items from the Joint Intelligence Committee (JIC) are now publicly available and provide a broad assessment of the British government's view of the Soviet

[32] Jones, R.V., *Most Secret War* (London, 1978).
[33] Winterbotham, Frederick, *The Ultra Secret* (London, 1973). Lewin, Ronald *Ultra Goes To War* (London, 1978).
[34] Masterman, John *The Double-Cross System* (Yale, 1972).
[35] Jeffery, Keith *MI6: The History of the Secret Intelligence Service 1909-49* (London, 2011).
[36] Aldrich, Richard *GCHQ: The Uncensored Story of Britain's Most Secret Intelligence Agency* (London, 2010).

nuclear threat at this time. The papers of the various JIC sub-committees dealing with nuclear weapons are however still closed. The overall impression is that there was a paucity of intelligence available to the JIC, and that what was available is still too sensitive to release.[37] It is also unclear what intelligence material was compromised by traitors in British government service to the Soviet Union[38] and how much intelligence collection effort was wasted, with collection methods being revealed and incorrect conclusions drawn based on Soviet misinformation. What is certain is that early secret intelligence on Soviet nuclear bombers originated from Germans who had been held in the USSR after 1945.

German Returnees and Intelligence Collection Problems

In World War Two, Germany had led the world in rocket technology and the use of jet engines in military aircraft. The Soviet Union, from exploitation of assets likely captured in its German zone of occupation, could use this technology in their own military aircraft and missile development and production. Ironically, if German personnel who were exploited in weapon programmes were subsequently returned to Germany, they in turn could be exploited by western intelligence. However, it is also important to note that the Germans did not develop and deploy a long-range, four-engine strategic bomber in World War Two so there was no German aircraft type for the Russians to copy. The latter would therefore have to design, test and build a long-range strategic bomber themselves if they wanted to develop a strategic bombing capability.

The Russians did gain access to technology developed by the Germans for their V-2 rockets and they could exploit this for in the USSR's own missile programme (which will be examined in Chapter 2).[39] They also acquired technology, factories and engineers from the V-1 "flying bomb" or "doodlebug" programme used so effectively

[37] See Aldrich, Richard 'Did Waldegrave Work? The Impact of Open Government on British History.' *Twentieth Century British History* 9:1 (1998), pp.111-126 and Dylan *Defence Intelligence* p.7.
[38] Blake, George *No Other Choice* (London, 1990). Philby, Kim *My Silent War* (London, 1968).
[39] Pocock, Rowland F *German Guided Missiles of the Second World War* (New York, 1968).

against Britain in the Second World War.[40] The principles of this weapon would be developed over time to become the air-launched cruise missile (ALCM) used by many air forces in the conventional and nuclear role during the Cold War and beyond. The advantage of this system was that it could be launched as a fast "stand-off" weapon, fired beyond the range of a nation's air defences, with no risk to aircrew or the aircraft. The system could therefore be adapted as a rocket-powered nuclear weapon delivery system which would be hard to detect and intercept. This innovation would enhance the strike range of a nuclear force when attacking targets at long-range, or those protected by sophisticated air defences. As the Cold War progressed, technical problems encountered in developing nuclear weapon delivery systems were solved with some help, initially, from German scientists and engineers.

Due to the limited nature of Germany's long-range bomber programme there is sparse information in The National Archives (TNA) concerning the intelligence derived from post-war German scientists about Soviet bombers. The main, albeit limited, source available to British intelligence came from interviews with German scientists, engineers and prisoners of war who had worked in Soviet factories and design facilities during their captivity.[41] The information they provided on bombers appears to have been partial and terminated towards the end of the 1950s as the remaining Germans returned home.

The only real hope of gathering large quantities of reliable secret intelligence on Soviet bombers seemingly lay with the SIGINT operations of GCHQ as well as the human intelligence collection activities of Britain's SIS. The operational files of these organisations remain closed so it is impossible to gauge the state of their knowledge concerning Soviet bombers. It is probably fair to say that intelligence output was likely to be very limited. It is also highly likely that GCHQ was the biggest producer

[40] Zaloga, Steven *V-1 Flying Bomb 1942–52*, (Oxford, 2005) and Young, Richard Anthony *The Flying Bomb* (Surrey, 1978).

[41] Maddrell, Paul *Spying on Science: Western Intelligence in Divided Germany 1945-61* (London, 2005). For an early report on Soviet bomber production see The National Archives, London. (Hereafter TNA). DEFE 60/105 'The Soviet Aircraft Industry, 1910-1950', July 1949. This document reveals that studying aircraft markings (serial numbers) was used by British intelligence to calculate Soviet bomber production rates. It was an inexact process but likely the only method then available.

of secret intelligence with its constant monitoring of Soviet Air Force radio networks. It was easier to gather air-to-ground (and vice versa) communications from afar than to recruit or infiltrate human agents into the Soviet Union. A large air force would generate vast quantities of communications and radio was the only way to communicate with an aircraft in flight. Even if Soviet military codes could not be broken, much data could be derived from the analysis of types of radio traffic and engaging in direction finding and examining the volume and type of radio traffic intercepted.[42]

Interestingly, a document from a Joint Intelligence Committee branch in Germany produced in 1950 reveals that research had been undertaken by the British concerning German intelligence's wartime experience with the Soviet Air Force's communications.[43] British intelligence had tracked down a former Lieutenant Colonel in the Luftwaffe who had served as the Chief of the Russian section of Luftwaffe Radio Intelligence in World War Two dealing with the interception and analysis of Russian air communications. The type of intelligence it collected concerned the frequencies, call signs and radio nets employed by the Russians. This was subject to a process of meticulous collection and revealed the composition and location of units, which was extremely useful if the messages could not be deciphered. According to this report, the Germans had some success at breaking Russian ciphers and the Luftwaffe officer thought that the Russians did not use cipher machines, thereby making the messages easier to decode. The use of hand-ciphers would therefore have made it easier for GCHQ to attack Russian Air Force communications and derive the content of their messages.

The work this Luftwaffe officer undertook allowed Russian intentions to be determined and for unit strengths at particular airfields to be calculated and then passed to the German command in a collated form each day. He found that the best approach was to have experienced officers monitoring the same target, so they would

[42] See Aldrich *The Hidden Hand* p.254.
[43] TNA. AIR 40/2557 containing JIC Report JIC(G)(50)171 "Experiences of German Air Force with Radio Intelligence in War with Russia" 21 April 1950.

notice the slightest variation in unit behaviour and predict changes in operational patterns at an early date. The same officer also revealed that Russian bombers did not have radar and that several were shot down during a raid over East Prussia, with some intelligence having been derived from interrogating the captured air crews. He further viewed Russian Air Force signals procedures to be of a "low standard" and felt that their "training was inadequate."[44] He thought that only a few units of the Russian Air Force were good and that there had been no radical alteration in signal procedures or cipher systems during his time in post. The report concluded that if it had not been for the "considerable shortcomings" in Russian Air Force signals security then the degree of penetration of their communications security by the German Air Force "would not have been possible."[45]

This report produced in Germany by British intelligence gives some insight into the methods that GCHQ is likely to have used to collect signals intelligence on Russian bombers during the period. Britain successfully used decoded German Enigma signals to plan military operations during the Second World War and it is almost certain that SIGINT activity continued against the Soviet Union during the early Cold War.[46] The comments about poor Russian signal security are likely to have made it relatively easy for Britain to gain access to the content of some encrypted Russian Air Force signals during the early Cold War, although the extent remains unknown. Improvements in Russian communication security could have defeated this, however, as well as the activities of any traitors in western SIGINT agencies.

This SIGINT document also shows how Britain used Germany, the front line in the Cold War against the Soviet Union, in order to glean intelligence from every available source. However, returning scientists and former German officers had a limited useful life as intelligence providers. A British study of Soviet Guided Weapons noted ominously in 1949 that, "our sources of information are waning" and the value of

[44] Ibid.,p.4.
[45] Ibid.,p.6.
[46] West, Nigel *GCHQ: The Secret Wireless War 1900-86* (London, 1986). Winterbotham, Frederick *The Ultra Secret* (London, 1974).

returning Prisoners of War had "steadily declined."[47] Intelligence on Soviet bombers appears to have been sparse and, with the number of returning Germans in decline, this same report highlighted how meagre the remaining sources had become. The tone of the report suggested that the British were desperate to receive whatever intelligence they could about Soviet bombers. Much of the intelligence from German returnees apparent in declassified files concerned possible weapons carried on Russian bombers rather than information about any aircraft in service or in development.[48]

The 1949 Guided Missile Study authored by the British government, noted that the Germans had operational air-to-surface missiles at the end of the war as well as some prototypes. The authors had "reason to believe" that the Russians were interested in developing this technology and a site at Riga, Estonia was being used.[49] Another site of air-to-surface activity was thought to be at Khimiki, approximately 20km north-west of Moscow, although the amount and nature of the activity remained unknown. The limited intelligence, which appeared to come from single, uncorroborated sources (likely German scientists), was very difficult to check and it was admitted that "neither has as yet been confirmed."[50] Even intelligence on guided bombs (a technology which would later be used on Soviet nuclear bombers) was limited and the report found that "it is conceivable that the guided gravity bomb "Fritz-x" (a German weapon) could now be in production" as well as an air-to-surface missile named Hs 293.[51] This was the limit of the intelligence that was available on these systems and the report frankly admitted that "there is no evidence available on which to base any other predictions" concerning air-launched guided weapons.[52]

The 1949 Guided Missile Report further expressed concern over the Russian acquisition of German V-1 technology and the possible launch of this system from Soviet aircraft. The authors had identified a site at Ostashkov, in the Soviet Union, as

[47] TNA.DEFE 44/99 "A Study of the Soviet Guided Missile Programme" A Joint Anglo-American Conference March 1949.
[48] Ibid.
[49] Ibid.,p.vii.
[50] Ibid.
[51] Ibid.
[52] Ibid.,p.viii.

the location of the greatest single concentration of German guided missile personnel. It noted that in the Second World War the V-1 had been launched from German He-111 bombers after the allies overran launching sites in the Netherlands and France. From September 1944 to January 1945 over one thousand V-1s were launched against Britain in this way, demonstrating that although inaccurate, the technology did work and the Soviet Union could develop it.[53] It is apparent that this information came from a debriefed German because the report contained a sketch plan and map of the missile factories at Khimki. This suggests that debriefs were undertaken thoroughly and the Germans were co-operative (with both the Russians and the British). This basic intelligence could provide a basis for future intelligence collection operations, such as electronic monitoring and covert aerial over-flights. The material could also serve to corroborate other secret intelligence material collected about such missile installations.

The authors thought that the Russians were making progress with V-1 development, which they felt was impressive as "there is no indication that the Soviets had made any beginning on guided missile work before the end of the war."[54] They also thought that the Russians had received so much information from German scientists that they had reached an advanced stage where they could make progress by their own efforts and no longer needed their help.[55] In the report, British intelligence estimated that some 300 German guided weapons experts had been deported to the Soviet Union after the war and the locations of 100 had been determined through postal intercepts.[56] The interception of mail going through to families in allied-occupied zones of Germany could yield information on the location of German personnel, the work they were doing, and establish their identities for future thorough interrogation when they were released from the USSR.

The paucity of intelligence about Russian production of long-range missiles that could be carried on aircraft led the authors to conclude that, "no reliable figures (on

[53] Ibid.,p.11.
[54] Ibid.,p.169.
[55] Ibid.
[56] Ibid.

numbers of missiles) can be produced."[57] They also identified the need for "greatly increasing the quality and quantity of intelligence information on guided missiles inside the USSR."[58] They admitted that their report was the best assessment that could be produced until the "missiles in question pass into service use."[59] This was rather optimistic because only limited intelligence could be gleaned from German nationals who worked on the programmes and their usefulness to the Russians was declining. Once the weapons were deployed on bases in the Soviet Union it could be even more difficult to gather intelligence about them because there were no Germans present to gather data or make observations. It seems that there were no active western human intelligence sources in the Russian Air Force at this time. However, there was the opportunity to engage in the technical monitoring of weapons e.g. through the interception of electronic emissions or tracking the missiles on radar if possible. However, this could only occur if the missiles were being tested by the military in operations and exercises and long-range radars could be developed which could then only operate from the periphery of the USSR. It was also the case that the information derived from German nationals was a German view and not those of British or American personnel. Additionally, debriefs of Germans only provided knowledge of Soviet exploitation of these personnel and their knowledge. It did not provide insights concerning exclusively Soviet projects maintained under tight security.

The authors admitted that their report and German debriefs provided an "incomplete picture" of apparent activity at a few locations in the USSR."60 The information was also slightly out of date because many of the returnees were only interviewed sometime after their return from Russia and British intelligence had received no information on the main Russian experimental factories since "the middle of 1948."61 Maintaining timely intelligence concerning Soviet bombers and missiles using German returnees clearly offered limited potential, but it was all that was available at

[57] Ibid.,p.179.
[58] Ibid.
[59] Ibid.
[60] Ibid.
[61] Ibid.

the time and so more sophisticated intelligence collection methods would have to be developed.

The situation with Russian bombers and air-launched weapons had barely improved by 1952. In a report on guided weapons, British scientific intelligence officers concluded that their information concerning the main V-1 Mittelwerk Production Plant at Nordhausen in East Germany was old and limited, coming from Prisoners of War and returning German engineers.[62] They stated that it was "difficult to assess the scale of effort being put into Guided Weapons" by the USSR.[63] They thought that German work was still being exploited to the maximum and that German designed weapons were being manufactured in the USSR. They also admitted that "it is not known whether any of these weapons are in large scale production or whether native Russian weapons have been produced or which projects, if any, have been discarded."[64] The authors did point out, however, that the Germans had built 30,000 V-1s during the war and were "far advanced over all other countries in their conception, development, manufacture and operation of guided missiles."[65] This could have been of enormous benefit to the Russians and the possibility of mass production of air-launched missiles being ready for use against the UK was an alarming possibility.

The 1952 study revealed that British intelligence was using returning German workers to monitor the Russian V-1 production facility at Khimki that was known by the Soviet designator "Factory No. 456."[66] It estimated that some 1,500 V-1s or their components had been found by the Russians in Germany and sent to this factory. The report noted that there was "no evidence of large-scale manufacture" but assessed that the Russians would have no difficulty in mass producing simple V-1s.[67] The report also contains a very detailed description of the factory so German sources were

[62] TNA. DEFE 44/100 . Guided Weapons Working Party "Study of Soviet Guided Weapons" July 1952 p.51.
[63] Ibid.,p.52.
[64] Ibid.,p.53.
[65] Ibid.,p.63.
[66] Ibid.,p.66.
[67] Ibid.,p.67.

almost certainly still providing information at that time.[68] Interestingly, in Appendix 2 of this report there is a Top Secret aerial photograph of the factory that is undated.

It is unclear if this was taken during an unknown British covert over-flight of the USSR as early as 1952 or was from captured German wartime reconnaissance material available to British intelligence. The issue of aerial intelligence is examined in Chapter Three of the thesis.

The material in The National Archives on intelligence from German returnees is very limited concerning the development of Soviet long-range nuclear bombers. There is no indication that any German engineers played a major, or even a minor, role in the construction of the first Soviet long-range bomber. Where the German returnees appear to have been valuable to western intelligence was in providing information on aviation-related factories and testing facilities. They also revealed useful data concerning Russian use of, and work on, guided missiles such as the V-1 that had the potential to be modified to be nuclear armed and launched from aircraft. This limited initial intelligence alerted Britain and the West to the direction of early Russian research and their technical skills, which would develop as the Cold War progressed. These Soviet weapon programmes were clearly very hard targets. With German scientists and engineers eventually gone, there were fewer foreign prying eyes to collect even basic information about what was happening in the Soviet Union's research and development facilities. Furthermore, much experimental work on nuclear bombers and their weapons took place in remote parts of the USSR where foreigners were not permitted. This posed a major obstacle to intelligence collection. This situation can be summed up by a JIC paper from 1949 considering a possible Russian air attack on the UK by 1957 that stated, "We possess little or no information about Russia's plans regarding the future shape and size of her air forces."[69] That such a situation could exist on such an important target during a critical time in the Cold War is unsettling. These gaps required the British government to explore other avenues for collecting intelligence.

[68] Ibid.,pp.81-88.
[69] TNA. CAB 158/6, JIC(49)10 (Final) "Air Attack on the UK to 1957" 06 May 1949.

As previously stated, no material has been declassified from SIS or GCHQ concerning their operations to collect information on Soviet nuclear bombers or their weapons systems. However, one declassified report from GCHQ does show that Russian aircraft and their supporting industries were targeted for technical intelligence collection. A GCHQ report from 1950[70] reveals that a source of intelligence was available derived from intercepting the communications on "the wireless network of the Soviet Ministry of Communications."[71] These communications contained messages going to and from Soviet aviation factories. It is unclear if they were encrypted (i.e. broadcast as clusters of numbers and letters, incomprehensible to outsiders), or if they were sent *en clair* as plain text using telephonic or radio communication on an insecure circuit. The report does not reveal what type of messages these were because this information is redacted. However, the data revealed details of aircraft and instrumentation factories and Russian Scientific Research Institutes. The security conscious Russians had assigned codenames to particular pieces of equipment and British analysts did not know what they referred to. This intelligence at least provided some insight into the equipment carried on Soviet bombers and was classified TOP SECRET by GCHQ with the additional code word, COPSE, to add an extra level of security. It is unknown what this code name signifies but it is likely to refer to a particular source or SIGINT method. It is reasonable to conclude that the wireless networks of the Soviet Ministry of Defence and the Russian Air Force were similarly being monitored from GCHQ sites in the UK, Germany and elsewhere.

The GCHQ intelligence did allow an insight into the Soviet military aircraft industry and Annex A of the report showed that the British had established the names of factories with details of which bombers were manufactured in particular locations. For instance, it was determined that Russian Tu-4 bombers (the first one to carry a Russian nuclear bomb) were built at a factory in Irkutsk with the address PO Box 411.

[70] TNA. HW/160 containing GCHQ report S/ARU-E/C490 "Electronic Equipment Supplied To Soviet Aircraft Factories" 19 January 1950.
[71] Ibid.

This information was collated in Annex A of the report into a schematic detailing what equipment was supplied to aircraft factories by aviation instrumentation factories. This would be useful information for further intelligence collection and even targeting in wartime. The intelligence report shows what secret intelligence material is likely available and still retained which all fed into the (likely) limited intelligence picture available to the British government at this time.

Russian Defectors

Due to the closed nature of Soviet society and pervasive security, it seems that British official and military personnel rarely came into contact with Russians so opportunities to glean information from human sources were limited. It was clearly very difficult for any Russian who was contemplating disloyalty to be able to leave the country, let alone contact a western intelligence agency. The issue of dealing with Russian defectors to Britain had been examined in 1950.[72] This raised the problem of how to dispose of and resettle Russian defectors, "in view of the need to increase the number of defections for intelligence purposes."[73] The War Office highlighted that there was a problem of finding a method to fund defector resettlement and new identities for them, noting that the whole activity had to be done without any publicity. Britain's Security Service, MI5, had raised the issue of deserters from the Russian armed forces in a meeting in February 1948.[74] The department had evacuated Russians from Germany and Austria in the late 1940s to be "disposed of" i.e. resettled, in England. The meeting concluded that a system was needed to encourage deserters and to find them suitable employment once they had been debriefed. It should be noted, though, that early deserters were not in the Russian Air Force but were normally infantry personnel with limited access to information of intelligence interest. It was also noted that once in England "the War Office will have no further concern with them"[75] which suggests that defector handling at this time for military personnel left a lot to be desired. The defectors were handled under a government programme known as WESTWARD HO that dealt with the employment of displaced persons in the UK.[76]

[72] TNA. PREM 8/1264 "Dealing With Defectors/Refugees", MOD to PM 28 August 1950.
[73] Ibid.
[74] TNA. KV4/334. Minutes of a meeting at the Old War Office Building, 02 February 1948.
[75] Ibid.
[76] Ibid.

The meeting noted that it was considered a priority to get all the information out of deserters "without undertaking any responsibility for their safety", except for people who were considered "really big fish."[77] Any extraction of Russians from Germany was done under a programme codenamed RED CROSS. With a high level of security being required, very few people were aware of this scheme.

A British Intelligence Division at Herford, Germany also wrote a now declassified study of Russian defectors in 1951.[78] It stated that from the middle of 1945 to 1951 there had been 213 defectors from the Soviet armed forces, which also included civilians. Of these defectors, 62 were military officers and their main motivation was to seek a better life in the West or to escape purges. None of them seemed to defect with the intention of providing information to the West. Indeed the report noted than in 105 cases Russian servicemen were defecting due to an association with a German woman in the Soviet Zone of Occupation in Germany. These men had defected to avoid punishment.[79] Only seven of the defectors in Germany were thought by British officials in Herford to be ideologically motivated. In 1950 there was only one Soviet defector, who was a Russian civilian who had been having an affair with a German woman and so sought to escape.

It should be noted that all these defectors were from Germany. No Soviet strategic bombers were based there and so none of the defectors could provide information on this issue. Soviet strategic weapons were clearly going to be a hard target for British intelligence and military defectors were not intelligence providers but low-level refugees who were malcontents fleeing the constant control of the Soviet system. As one defector noted, "the idealists in the USSR are in the labour camps"[80], so apparently there would be few people coming to the West who would betray the Soviet Union for ideological reasons.

[77] Ibid.
[78] TNA. WO 216/731 "Defectors" 08 May 1951.
[79] Ibid.
[80] Ibid.

This report on defectors was nonetheless considered important enough to be addressed to Field Marshal Sir William Slim, Chief of the Imperial General Staff and circulated at a high policy-making level. It emphasised to major decision-makers the paucity of human intelligence sources and the lack of intelligence on the increasingly important target of the Soviet Union and its strategic weapons programmes. It suggested that if Russian defectors were not bringing information to Britain then, perhaps, Air Attachés behind the Iron Curtain could provide insights into Soviet bombers and strategic weapons.

British intelligence collection problems in Moscow

However, contemporary accounts suggest that the British embassy in Moscow was like a beleaguered garrison in the days of Empire, constantly under attack in hostile territory.[81] These impressions are corroborated by the few Air Attaché files from Moscow to be found in The National Archives. Soviet society under Stalin had pervasive surveillance and travel restrictions for Soviet citizens as well as for British diplomats. This ensured that the opportunities to collect intelligence and view establishments outside the Moscow area were very limited. Many towns were off-limits to westerners and a stringent visa regime with "guides" accompanying foreigners ensured that the Soviet Union in the early Cold War remained largely an enigma.

Britain had problems staffing posts in the Air Attaché branch in Moscow as early as 1950. Papers record that it was proving a major challenge to find someone of appropriate rank who could speak Russian for the assistant Air Attaché role.[82] The problem of recruiting and training Russian linguists for intelligence roles was proving

[81] See Catterall, Peter *The Macmillan Diaries Volume 2: Prime Minister and after 1957-1955*(London 2011) p.199. Macmillan describes his 1959 visit to Moscow where only one room in the British embassy in Moscow was considered secure for classified discussions. This was said to be a plastic tent with a gramophone record playing constantly to defeat eavesdropping. All other rooms in the building and any provided for British use by the Russian government in other locations were considered insecure and "wired for sound" using bugging devices installed by the KGB. See also Hayter, William *The Kremlin and The Embassy,*(London, 1966) for British ambassador view and Kelly, David *Behind the Iron Curtain,* (London, 1954).

[82] TNA. AIR 2/5787 "Appointment of Assistant Air Attaché Moscow" for papers on this problem from 1950 onwards.

to be a major problem for British intelligence at this time. The intelligence contained within the Moscow Air Attaché's quarterly reports in the late 1940s and early 1950s is also very meagre. Declassified files reveal that they were trying their best without much success in a hostile environment. The report for the last quarter of 1949 contains an assessment of the aircraft seen at the November military parade in Moscow. It reported that there were "no new aircraft and only one jet."[83] It is important to note however that all the British would see is what the Russians wanted them to see. The latter were thereby able to control the flow of intelligence and the impressions gained. Knowledge appears to have been restricted to the types of aircraft being produced, but there was no detail about capabilities and production rates from Soviet factories. The same report also stated that attempts at travel had been "particularly unfruitful" and the Soviet authorities had provided no rail or air tickets. The Soviet authorities also restricted the Attachés' travel to where there were *Intourist* hotels (i.e. those set aside for foreign use and controlled by the government) in order to curtail their movements. It was also noted that Soviet liaison staffs in the Armed Forces Department for External Relations were either unwilling or unable to help British personnel.[84]

The Air Attaché in Moscow was reduced to buying books from tightly regulated Soviet publishers to obtain information because it was reported "little of value has been gleaned from the Soviet press."[85] He also stated that he went to a cinema in Moscow and saw a film called "Air Force Day 1949" which proved to be "a very valuable source of intelligence." This appeared to be all he could collect and he went back to the cinema to see the film several times and gathered useful information on aircraft "undercarriage construction" and "other technical details."[86]

Even when travel outside Moscow was possible it did not produce intelligence because extreme restrictions were imposed. On a visit to Odessa in 1950 the assistant Air Attaché was "followed closely" and was twice prevented from leaving the town

[83] TNA. FO 371/86794. "Air Attaché Moscow Quarterly Report 1949" 12 January 1950.
[84] Ibid.
[85] Ibid.
[86] Ibid.

centre by Soviet militiamen.[87] Most intelligence on Soviet aircraft at this time appears to have been derived from observing air displays and the rehearsals for these events. The Russians were keen to keep foreigners away from facilities in the Moscow area and even the airfield at Tushino, near Moscow, where the annual Air Force Day was held was "out of bounds to foreigners."[88]

By 1952 the British Air Attaché concluded that concerning Soviet Strategic Air Power, "little information has come to hand."[89] He noted that the Russian Tu-4 bomber was still in production (this was a copy of the American B-29 *Superfortress*) and the Russians were using this as the core of a bomber force that was being built up. At the November 7th parade he counted 19 Tu-4s in a flypast. He considered this aircraft to be "obsolescent" and would make a "poor showing" against western fighters.[90] This is a pertinent comment because at this time most western air forces were being equipped with jet fighters and American piston engine bombers had incurred heavy losses against Russian jet fighters during daylight raids during the Korean War.

The Attachés did sometimes glean information from the road and air routes that they used when they did manage to leave Moscow. Particularly, they were able to note the number of airfields seen en route.[91] The Russians had placed an "out of bounds" ban on Attachés east of a line from Archangel to Astrakan and there were no observation opportunities available on the trans-Siberian air route.[92] Flying was often limited to night flights and aisle seats would be issued to British personnel thereby denying any observation opportunities to them. The Attachés also noted in the same report that no inspection of the aircraft manufacturing centres of Kazan and Kuibyshev was possible and all trips were "intensively supervised."[93] Denial of access to these two locations

[87] TNA. FO 371/86794 "Air Attaché Quarterly Report" 25 April 1950.
[88] Ibid.
[89] TNA. FO 371/100874. "Moscow Air Attaché's Quarterly Report"15 January 1952.
[90] Ibid. Also see Freedman, Lawrence *US Intelligence and The Soviet Strategic Threat* (Princeton, 1986) pp.64-65. This notes the importance of observational intelligence at this time.
[91] TNA. FO 371/100874 "Air Attaché's Quarterly Report" 15 April 1952.
[92] Ibid.
[93] Ibid.

was a crucial loss. Attachés were frequently followed by obvious security agents and sometimes turned out of hotels. One Attaché noted that "diverse types of humanity" had followed him.[94] When British military personnel met their counterparts from friendly countries, the report noted that allies faced the same problems and were unable to gather intelligence. Allied Attachés had to limit themselves to attending parades, air displays and the occasional visit away from Moscow. The Air Attaché noted that "security plays a large part in the planning of fly-pasts" and he contrasted this with the openness of the UK's Farnborough air display with photographs and detailed write-ups being available which would give the Russians "most interesting information" without even having to attend the show.[95] It was also noted that in air shows no new aircraft prototypes were seen for security reasons. With the Soviet Union being so vast, it was easy for the Russians to conceal research and development activity and aircraft deployments. Examination of peripheral information such as the number of air engineers being produced in colleges in the USSR may also have caused intelligence agencies in the West to exaggerate the size of the Soviet Union's air capability. Aircraft numbers could be extrapolated to produce erroneous assessments in the absence of other intelligence sources.

Intense Russian security gave the Attachés an impression that the Russians only had the Tu-4 bomber in their strategic bomber inventory. Interestingly, in a document from 1952 the Attaché refers to "reports of travellers" concerning aircraft in such places as Murmansk and the Black Sea, but no indication is given of who they were or what they saw. They could have been SIS contacts, tourists or businessmen or British merchant seamen; nonetheless the Attaché found the information "valuable owing to the absence of other information."[96] The campaign of harassment by Soviet security continued for the rest of the period under consideration with the assistant Air Attaché detained in July 1952 for entering a "forbidden zone." It was considered ironic by the Attaché that the Russians would not issue the British embassy with a list of these "forbidden zones" because that would highlight their sensitivity.[97]

[94] Ibid.
[95] Ibid.
[96] Ibid.
[97] TNA. FO 371/100924 "Air Attaché's Report" 12 July 1952.

Problems of intelligence collection were encountered even when an occasional high-level delegation visited the Soviet Union from Britain during the 1950s. This continued even in the new period of greater openness after Stalin's death. In June 1956 the British Secretary of State for Air, Mr Nigel Birch visited the USSR with a delegation of Royal Air Force officers.[98] The delegation visited Russian Air Force units and factories but no photographs could be taken without Soviet permission. On this occasion the Air Attaché from Moscow accompanied the group and it was noted that his "previous contacts with the Soviet Air Force have been sparse in the extreme."[99] The report noted that the delegation relied on what they observed and anything seen could not be taken as a concrete fact about the Soviet Air Force. The group were said to be "impressed by the enormous strides" made by Soviet aviation and the quantities of personnel and aircraft available.[100] It was noted during this visit that Russian security was good and the British were only allowed to see so much and no more. Soviet personnel only provided general answers to queries posed by their British visitors. They concluded during the visit that "little knowledge was gained" on the Soviet Long-Range Air Force. They also noted that in the new post-Stalin period of co-existence, the UK could not pass over intelligence collection opportunities when they occurred. However, such opportunism could lead to diplomatic incidents such as the (unrelated) disastrous Buster Crabb incident that same year when SIS put a frogman under a warship bringing the Soviet leaders to Britain in order to collect intelligence. SIS had been instructed not to mount such operations but nevertheless went ahead with it. The death of the diver and subsequent publicity was a major embarrassment to Britain and a source of fury to Prime Minister Anthony Eden.

The Secretary of State's delegation also noted that the most important information gained by the Air Attaché did not necessarily come from watching air displays in Moscow but through "painstaking observation" of the rehearsals.[101] The delegation felt that the Russian factories they visited were of little importance. Even when they were taken to the military airfield at Kubinka, near Moscow, they could only observe

[98] TNA. AIR/20/10150 covering Secretary of State's Moscow visit from 23 June 1956 to 03 July 1956.
[99] Ibid.
[100] Ibid.
[101] Ibid.

aircraft at a distance from moving cars. This was apparently the first time that they had seen some aircraft types at close hand. The report revealed that some air intelligence was gained when they flew on to Leningrad because a new airfield was observed north of Moscow. When they met Soviet personnel the replies to questions were felt to be evasive. They had little time to view equipment and asking detailed questions was said to be "virtually impossible."[102]

The report from the Secretary of State's visit also referred to a trip made to the Soviet Union by the RAF's Vice-Chief of the Air Staff in 1956 and incorporated his comments. He had also noted that the Russians went out of their way to be friendly, but again provided little information. He commented that the Soviet Union's intention was to be a first-class air power and assessed that Soviet bombers were not as good as those in the RAF, but they were in service in quantity. His opinion was that the Soviet Air Force had progressed from a tactical air force to a position comparable to a major air force in the West. Soviet aviation had high status with substantial resources devoted to it. The ultimate aim, he thought, of achieving "parity with the West is certainly not out of their reach."[103] He judged that the Soviet Union's long-term policy was to have their military aviation "second to none" and the "nuclear umbrella" could then be used to allow cuts in Russian conventional forces to free resources for economic development. The Vice-Chief of the Air Staff was not fooled by the new post-Stalin friendly approach to the UK and thought that the friendliness was simply a ruse to try to obtain reciprocal trips for intelligence purposes.[104] His sweeping overview of the Soviet Air Force and insightful opinions suggests that more detailed information was available to him that does not feature in The National Archives and that he was not just relying on Attaché reporting from Moscow.

British Assessments of Russian Nuclear Bombers

The first Russian nuclear bomber was the Tu-4 *Bull* and a British intelligence report from 1950 noted that the aircraft was a "direct copy" of the American B-29 bomber. It

[102] Ibid.
[103] Ibid. Annex to AIR/20/10150. VCAS Report to the Defence Committee 19 July 1956.
[104] Ibid.

was "definitely known" that it could achieve a speed of 199-216 knots at 10,000 feet and carry a 20,000 pound bomb load over 2583 nautical miles.[105] The British did have the advantage that the Russian aircraft could be compared with the known characteristics of an American aircraft so assessment was made easier. In 1950 the Soviet May Day parade had been observed and British intelligence concluded that forty Tu-4 bombers could be produced each month and that sixty-four had been seen in the parade.[106] Dylan notes that the Air Ministry thought the production figure was lower but, as he states, "the threat was overwhelming whichever figure was used."[107] The threat would grow as over 1,000 of these bombers would be built by the mid-1950s.[108] A steady increase in the Soviet bomber force did not however provide evidence of imminent Russian aggressive intent or a surprise attack being planned. As Dylan notes, the threat as seen by British intelligence was a large and steadily growing threat from the Soviet bomber force.[109] However, in JIC's view there would be no war until the USSR could seriously threaten the United States.[110]

Zaloga undertook some research on the Tu-4 bomber after the end of the Cold War. He noted that the Russians were denied access to the B-29 bomber under lend-lease during the Second World War because of the advanced technology it contained.[111] It is however known that during the war several B-29s mounting raids against Japan crashed in the Soviet Union. The Russians thus obtained three copies of this high-quality strategic bomber.[112] The aircraft were dismantled and examined for the Russian strategic bomber programme, which utilised 64 Design Bureaus and 900 factories to produce the aircraft.[113] The first test flight of the Tu-4 was as early as July 1947 and it was seen at an airfield the following month.[114] This meant that for the first time a foreign power could deliver an aerial bomb to the US mainland and the nascent

[105] TNA. DEFE 44/267 "WO Technical Intelligence Report No.11" January 1950.
[106] TNA. PREM 3/1357 'Production of Russian aircraft' 16 May 1950.
[107] Dylan p.116.
[108] Ibid.
[109] Ibid.,p.120.
[110] Ibid.
[111] Zaloga, Steven *The Soviet Union and the Strategic Arms Race 1945-64* (Navato, California 1993) p.68.
[112] Ibid.,p.69.
[113] Ibid.,p.71.
[114] Ibid.,p.72.

Soviet nuclear strike capability could be developed. The Soviet Union clearly realised how strategic bombing had become such an important instrument in war. The Tu-4 had limited range and would need to refuel before making a return journey from the United States and it appears that early Tu-4s did not have this capability. However, the possibility existed that the bombers could be used for one-way nuclear bombing missions against American cities. In 1949, however, the nuclear threat to the UK from the USSR was likely to have been considered as low because the aircraft were prototypes and would probably be suffering from technical problems such things as with the navigation systems and bomb sights.

Nonetheless, Russia made rapid progress with the construction and development of its strategic bomber force. The first bomber regiment was formed in 1949 and by 1953 there were 847 Tu-4 aircraft in service.[115] However, British and US intelligence assessed that the Soviet Union's nuclear bomb stockpile was small, with only some 20-30 atomic bombs in their arsenal, so a substantial nuclear attack could not be mounted on the UK.[116] It was more likely that these devices would be reserved for an attack on the United States. The limited range of the aircraft also meant that it could not reach most of the United States so the chance of a pre-emptive nuclear strike on the West at this time was arguably remote. It was highly unlikely that the Soviet Union would attack the United Kingdom without first dealing a substantial debilitating nuclear attack on the United States. The Tu-4 was nonetheless considered a threat to the UK and in a JIC assessment in 1950 it was stated that "Tu-4 type bombers based in Western Russia could operate against targets anywhere in the British Isles."[117] However, it seemed to JIC that so long as the USSR's strategic bombing capability was limited, the Soviet Union was unlikely to attack the West.

The Korean War, which broke out in June 1950, cast further light on the nature of the air threat by revealing that US B-29 bombers incurred heavy losses when trying to penetrate enemy air defences. They were instead forced to mount attacks at night. It

[115] Ibid.,p.74.
[116] Ibid.,p.77.
[117] TNA. CAB 158/6, JIC(50)31 "The Soviet Campaign In Western Europe" 28 April 1950.

was felt that an attack on the UK which would be met by jet fighters could similarly result in heavy Soviet bomber losses if they were not escorted by fighters. It could also involve the loss of the few nuclear bombs the Soviet Union possessed. The British planned to meet this threat and a 1955 British study of the Tu-4 determined the type of fuse and attack angle required to destroy one of these aircraft.[118] It used the B-29 bomber as the model to determine the thickness of the aircraft skin and its vulnerable points. Notwithstanding such flaws, the Tu-4 was proved an essential first step in the Soviet Union's attempt to obtain an airborne strategic nuclear capability. The next phase for the Soviet Long-Range Air Force was the development of the *Bison* jet bomber under the premiership of Nikita Khrushchev.

If the Soviet Union was going to mount nuclear attacks against modern air defences then it would need a high-speed, high-flying strategic jet bomber such as the American B-47 or the British V-bomber. The design bureau chosen for the work was that run by Vladimir Myasischev, who was Nikita Khrushchev's son in law.[119] The Soviet government wanted an aircraft that could carry a five tonne bomb load over a distance of 9,950 miles. Developmental work began in the early 1950s. The four engine jet bomber given the NATO designator *Bison* was first seen at the May Day parade in Red Square in 1954 and again at the Aviation Day at Tushino airfield on 13 July 1955.[120] At the latter event, the Russians engaged in a ruse whereby they used ten Bison bombers flying over the airfield several times to give an impression that they possessed far more bombers than they actually had, and that a substantial production line was in existence. They were eager to present the Soviet Union as a nuclear superpower with an intercontinental nuclear jet bomber capable of rivalling the new American B-52 bomber. The ruse fuelled speculation in the United States that a "bomber gap" existed. In fact the Russians only had ten of these bombers in their inventory in 1956.[121] In 1956 the M4A version of this aircraft was observed (presumably by Attachés) which incorporated new engines and an estimated range of 8000 miles.[122]

[118] TNA. AVIA 6/20505. "RAE Technical Note 196" January 1955.
[119] Zaloga p.82
[120] Ibid.
[121] Ibid.
[122] Ibid.

The *Bison* programme suffered from Russian inexperience and technical limitations, with jet engines incapable of high performance at high speed over long distances.[123] The designers were over-optimistic about what could be achieved and it is reasonable to say that they were disappointed, with a substantial quantity of resources being wasted on the project. Work on the aircraft was undertaken at the State Aviation Plant at Fili, near Moscow, one of the most prestigious in the Soviet Union.[124] The first prototype produced in 1953 only had a range of 5,500 miles and could not make a return trip to the United States. Furthermore no refuelling capability had been included in the design so the aircraft was flawed from the outset.[125] Despite these inadequacies, the aircraft was put into production in 1954 and was known to the West as *Bison A*. The aircraft suffered numerous accidents and in the 1960s was taken off the nuclear role and used as a tanker aircraft. At its peak in 1962 only 57 aircraft were used as bombers and the programme could be considered of limited value due to the poor reliability and performance of the aircraft.

According to Goodman the first sightings of the *Bison* bomber reached British intelligence in July 1953 but detailed information only emerged in 1955.[126] By 1956 the Air Ministry had concluded that the aircraft was in operational service with the Soviet Air Force, even though only a few sightings had been made and several variants had been noted. Intelligence on the aircraft appears to have been sparse.[127] A British intelligence study on the *Bison* in 1957 reveals that all available intelligence on this jet-powered bomber was based on the study and interpretation of photographs.[128] It pointed out that the accuracy of the *Bison's* measurements depended upon the quality and nature of the photographs. It was also seen, presumably by an Air Attaché, at an experimental airfield at Ramenskoye near Moscow in July 1953 in sufficient detail to allow the wings and body to be described. Ironically, the report stated that it was similar to the UK's Valiant bomber so Russian

[123] Zaloga p.23.
[124] Ibid.,p.24.
[125] Ibid.
[126] Goodman p.191. See TNA. AIR 40/2724 'Soviet Heavy Bomber Bison' June 1957.
[127] TNA. AIR 22/94. Air Ministry Secret Intelligence Summary (May 1956) p.15.
[128] TNA. AIR 40/2724. DDI(Tech) Paper 2/57 June 1957.

intelligence efforts may have influenced the aircraft's design.[129] The detailed information in the report concerning the *Bison's* dimensions shows that photographs taken had been carefully studied and measured.

The *Bison* production facility at Fili had also been observed according to this report. The author was able to say when series production of the aircraft had started in the plant and between January 1955 and October 1956 only 2 aircraft per month were produced.[130] They further stated that output is "now rising" and estimated that 70 aircraft had been completed by 31 March 1957. British intelligence also records information about the six different variants of the bomber. It was noted that the wings on the aircraft had been moved forward on some models and there were aerodynamic developments. However, insufficient photographic evidence meant that it was very difficult to interpret what the modifications meant. Many photographs in the report were from air shows but some had also been taken covertly of Soviet airfields and research facilities. These images were then used to produce line diagrams of the aircraft. This information was also used to determine the best way to attack and destroy a *Bison.*[131] Models of the aircraft were made with reflective surfaces and then light was shone on them to simulate radar beams and the reflections captured. The measurements could then be used to determine the radar-echo area of the full sized aircraft to devise tactics to attack them.

In 1957 the Joint Intelligence Committee noted that the *Bison* had an "in-flight" refuelling capability because photographic evidence revealed a refuelling probe. The Russians were clearly aiming to extend its range but this was likely so as to develop a capability to attack the United States. Once again, this intelligence came from observation of the rehearsals for the Air Force Day at Tushino airfield.[132] The deployment patterns of the aircraft was also monitored and in 1959 intelligence was received from "a completely reliable source" (possibly a U-2 reconnaissance aircraft

[129] Ibid.
[130] Ibid.
[131] TNA. AVIA 6/17355 'Assessment of Radar Echoing Patterns of the Russian Bison Aircraft' August 1958.
[132] TNA. CAB 158/27, JIC(57) 65 'Soviet Research and Development 1956-57' 16 August 1957.

over-flight) that ten bombers were at Soltsy airfield in the north-west Soviet Union on 16 March 1959.[133] It was assessed that a limited bomber capability had been developed at this airfield and this was the first report of *Bison* bombers using it.

In his memoirs Khrushchev commented that the *Bison* "failed to satisfy our requirements" because although it could reach the United States on a single flight it could not return to the USSR.[134] He expressed doubts about whether it could survive anti-aircraft fire and the designers thought it could only bomb the United States and then land in Mexico.[135] The Premier stated that it did not perform well in flight tests and a number of pilots were killed in accidents so the aircrew "didn't have much confidence in it."[136] Khrushchev damns the aircraft with the words "in the end we decided to scrap the whole project because it was costing us too much money and contributing nothing to our security."[137]

The Soviet Union clearly struggled with the development of a large, long-range strategic jet bomber force but was more successful with the development and deployment of medium range jet bombers which were produced in large numbers and were more likely to be used in operations against the UK. The Tu-16 *Badger* was the mainstay of this medium range force. The Soviet Union is likely to have reserved its long-range bombers for attacks on the United States but medium range bombers could have been launched in large numbers from bases in the western Soviet Union for air attacks on Britain.

The Tu-16 *Badger* was developed by Tupolev from the early 1950s as a bomber for use in theatre operations and was used by the Russian Air Force for many years, even featuring in British intelligence reports into the 1970s.[138] The aircraft was a twin

[133] TNA. CAB 179/6. Weekly Current Intelligence Report 31 March 1959.
[134] Khrushchev, Nikita *Khrushchev Remembers: The Last Testament* (Boston, 1974) p.39.
[135] Ibid.
[136] Ibid.
[137] Ibid.
[138] TNA. DEFE 44/335 'DSTI Technical Report Badger Tu-16' December 1974 (unpaginated).

engine jet with swept wings and was first seen at the Kazan aircraft plant in 1953.[139] It was of all metal construction and came in several variants. The *Badger A* was a bomber which could carry 20,000lb of bombs and the variants *Badger B* and *C* were first seen airborne in 1961.[140] These later variants carried air-to-surface missiles such as the *KENNEL* and *KIPPER* which the Russians had developed and could be used against land targets. British intelligence noted in a report that although the aircraft had been in service since the 1950s there had been no upgrade in aerodynamic performance but the weapons had been updated. The range of air-to-surface weapons had increased allowing a "stand-off" nuclear missile firing capability beyond the range of British radars and surface-to-air missiles. This reflected a Soviet philosophy of continual update and improvement and amongst Soviet systems it was felt that "*Badger* has few equals."[141] The aircraft had an assessed speed of 540knots and a combat radius of 1650 nautical miles. Whilst British intelligence had some knowledge about the missiles carried on board, such as their dimensions, there was little information concerning their performance. It was assessed that the missiles could carry nuclear warheads in the sub-megaton range over distances from 95-213km and would be a useful asset for attacking the UK.[142] Whilst Russia enjoyed success with its medium jet bomber and coped with the failure of the *Bison* project, it was known that she still sought to develop a long-range strategic bomber which could threaten the US as well as the UK.

The Tu-95 *Bear* was the first successful Soviet strategic bomber with a truly intercontinental range of some 8,000 miles.[143] A version of this aircraft is still used today and a Defence Intelligence report on it remains withheld, despite my submission of a Freedom of Information Act request. Tupolev had been working on this aircraft since 1951. The *Bear* was a hedge in case the *Bison* project failed and it relied on four turboprops for propulsion whereby jet engines provided rotational energy to the propellers. The aircraft was first displayed in July 1955 at the Aviation

[139] Ibid.
[140] Ibid.
[141] Ibid.
[142] Ibid.
[143] Zaloga p.87.

Day at Tushino.[144] It was in service in 1956 but due to its slow speed and engine problems it would be vulnerable to jet fighter and missile attack. It did however provide the Soviet Union with a long-range nuclear bombing capability to replace the Tu-4 bomber. This capability was however limited because the force was small with only 3 Aviation Divisions deployed at bases in the Soviet Union by 1960.[145]

The Soviet Air Force also had limited experience in operating strategic bombers, which hindered its effectiveness. The *Bear* did not compare well with the modern bombers of the UK's V-bomber force or America's Strategic Air Command. In wartime, it is more likely that medium range bombers would have been used to mount nuclear strikes against the UK. The JIC noted that air-to-surface guided missiles were likely to be put on the *Bear* by 1961 with a range of 350 nautical miles and capable of achieving a speed of Mach 2.[146] Although the *Bear* would struggle to penetrate modern air defences, it could carry long-range stand-off weapons which could attack the United Kingdom.

British intelligence, through unexplained means, but possibly a U-2 over-flight, was also aware of secret Russian attempts to develop supersonic bombers. In 1959 JIC noted that a medium/heavy bomber codenamed *Bounder,* which was 200 feet long and had a delta wing which was 78 feet wide, had been seen at Fili airfield near Moscow.[147] It was assessed that this was Russia's first supersonic bomber, although the aircraft was a prototype. Zaloga notes that this aircraft did not get beyond the experimental stage due to engine and aerodynamic problems.[148] It seems this was a Russian attempt to copy the American B-58 supersonic bomber but the project failed. The UK could clearly gather limited intelligence about which aircraft the Russians were developing and producing but there was very little fine detail about the weapons they carried or their performance.[149]

[144] Ibid.
[145] Ibid.
[146] TNA. CAB 158/43, JIC(61)3 'Sino-Soviet Bloc War Potential 1961-65' 14 September 1960.
[147] TNA. JIC(58) 107 'Six Monthly Intelligence Digest'14 January 1959.
[148] Zaloga p.167.
[149] Roy Braybrook "A Mighty Failure – The Bounder" *Flying Review International,* 20, No.3 pp.32-34.

The Strath Report – Possible Effects of a Soviet Nuclear Attack on the UK in 1955

British intelligence was using whatever intelligence it could gather to assess the threat posed by the USSR's airborne nuclear weapons. The crucial need to do so was emphasised by the mid-1950s through studies for the British government examining the impact that a nuclear attack would have on the UK. In 1953 the nuclear Cold War changed with the successful Soviet test of a hydrogen bomb. This shocking strategic development made it all the more important for the British to understand the effect on the UK of such a device delivered by a Soviet bomber. In 1954 British civil servant and scientist William Strath was chosen to lead a committee to examine the home defence aspects of the use of ten 10 megaton hydrogen bombs in a Soviet nuclear attack against the UK. The committee's report was presented in 1955 and painted such a disturbing picture that it remained classified for over fifty years.[150]

The Strath Committee found that it would be very difficult to determine when a nuclear attack would come.[151] When it did occur the "devastation caused by a thermo-nuclear attack would be on such a scale that the UK could not be used as a main supply base."[152] The very capability of the UK to continue fighting a war in Europe and to protect itself from further attack could well have been terminated. Strath estimated that if an attack occurred at night and no civil defence capabilities were taken then 12 million Britons would die with a further 4 million being injured.[153] In London alone there would be 4 million casualties caused by a single bomb on the city. Across the UK at least one third of the population would be killed or injured in such a nuclear attack with blast and heat being the main killers.[154] If preparations were taken

[150] Hennessy, Peter *The Secret State: Preparing for the Worst 1945-2010* (London, 2010) pp.163-178. See also Hughes, J *The Strath Report: Britain Confronts The H-Bomb,1954-1955* in *History and Technology* (2003) Vol 19(3) pp.257-275.
[151] TNA. CAB 134/940. 'Report of the STRATH Group on the defence implications of fall-out from a Hydrogen Bomb' 17 March 1955.
[152] TNA, HDC(55) 5 (Revise) 28 March 1955.
[153] Ibid.
[154] Ibid.

to limit casualties it would involve moving some 14 million people away from ports and cities.[155] The issue of the survivors of such an attack having to remain indoors (presumably in wrecked houses with no power and little food or water) for two weeks due to radiation from nuclear fallout was also examined. The picture was painted of a country which would collapse following a Soviet nuclear bomber attack. Interestingly, a later document noted that there should be "no publicity about the dangers of thermonuclear war" until the government could say what protection measures could be put in place.[156] The conclusions concerning a hydrogen bomb attack on the UK were almost too horrific for officials, let alone the public, to contemplate. There was no effective defence against such weapons, other than to maintain a nuclear deterrent. Norman Brook, Cabinet Secretary, noted that the UK was "extremely vulnerable to nuclear attack" and "there is not in sight any air defence system which could protect us effectively."[157] However, Strath could be considered a worst case scenario because a Russian nuclear bomber would likely carry a one megaton nuclear bomb rather than a weapon in the 10 megaton range such as those then being tested by the Americans in the Pacific Ocean. The estimated size of weapons used in his report does seem excessive. In the light of the Strath Report, the importance of intelligence about the Soviet Union's nuclear bombers was terrifyingly clear as were the consequences of a breakdown in superpower relations.

British estimates of Soviet Nuclear Bomber Production

In addition to the intelligence collection problem against different types of Soviet bomber, British intelligence also found it difficult to calculate Soviet bomber production. In 1949 JIC estimated that the USSR would have 1000 Tu-4 bombers and a similar number of strategic jet aircraft.[158] It further assessed that there was only one factory producing the Tu-4 at a rate of ten aircraft per month, but this would rise to 20 by the end of the year.[159] A bomber force, JIC judged, could be built up in eight years and although they knew that strategic jets were not in production, a prototype Soviet aircraft had been tested. This view was accurate in that large numbers of propeller

[155] TNA. HDC(55) 28 'Evacuation in Great Britain' 12 December 1955.
[156] TNA. HDC Notes D(55)18 12 December 1955.
[157] TNA. CAB 21/4054 Report D(55) 17. Memo Brook to MOD 8 December 1954.
[158] TNA. CAB 158/6. JIC(49) 32 (Final) 'Air Attack on the UK' 01 April 1949.
[159] Ibid.

driven bombers could be built but it did not appreciate the problems the Russians were having in developing and building strategic jet bombers. The JIC files give no indication of how production figures were derived and it seems that estimates were based on very limited information on productivity at known aircraft factories and compared to what was capable of being achieved in the West. In 1955 when the *Bison* strategic jet bomber was entering service the JIC could only say that it was in "limited production."[160]

JIC assessments of Soviet aircraft production drawn up later in the 1950s and early 1960s seem more confident that British intelligence had a more accurate view of Soviet aircraft production, likely aided by intelligence from the American U-2 over-flight programme. In 1958 the JIC concluded that there were only two factories producing *Bison* and *Bear* aircraft and they estimated that some five aircraft were produced each month.[161] JIC noted that the Russians would need to improve their production techniques to increase the number of heavy bombers but there was little evidence that they were doing so.[162] It had also recognised the technical difficulties the Russians faced in producing supersonic bombers, perhaps based on American experiences in the same field. In the same report, it had a more realistic assessment of the Russians having 100 heavy bombers in 1958, rising to 370 by 1962.[163]

The British do not seem to have been driven by the "bomber gap" mentality which was seen in the United States in the 1950s. US intelligence estimates assessed a far greater number of Soviet bombers entering service and this served the needs of the US air force and aircraft industry. Goodman's research reveals that the British appreciated that "vested interests" with budgetary motives in the United States were inflating the figures for Russian aircraft.[164] A UK intelligence assessment in 1959 conservatively estimated instead that the Russians would have 200 heavy bombers by 1961 but at

[160] TNA. CAB 158/19, JIC(55) 1/9 Periodic Intelligence Summary for NATO Commands 20 September 1955.
[161] TNA. CAB 158/29, JIC(58)7 'The Soviet Strategic Air Plan in the early stages of a Global War 1958-62' 24 February 1958.
[162] Ibid.
[163] Ibid.
[164] Goodman, *Spying On The Nuclear Bear* p.162.

least 850 medium bombers.[165] The heavy bombers posed a limited threat to the United States but the medium range bombers posed a serious threat to the UK. Despite likely having access to the same intelligence, British and American views on Soviet long-range bomber production differed.[166] According to Dylan, in 1956 the UK thought the USSR's LRAF would have 200 aircraft by mid-1957 whilst the US estimated it would be 350. By mid-1958 the UK estimated there would be 400 Soviet bombers, whereas the US thought 600 would be available.[167] They appeared to agree that a large air force would be built by the USSR but estimates of its size and the speed of production differed. The British may also have felt that Russia was taking measures to make it appear more powerful than it really was and the Americans believed them and resourced their forces appropriately.

A JIC assessment from 1962, the end of the period under consideration, stated that the *Bear* and *Badger* bombers ceased production in 1959 and that for the *Bison* in 1961.[168] The Soviet Union still had a requirement for a manned bomber force but as early as 1960 Sir Kenneth Strong, Director of the Joint Intelligence Bureau, thought that bomber production was being "cut down sharply."[169] The JIC also thought that it would "give the Soviet bomber another 5-10 years as a strategic weapon."[170] Another key intelligence question for British analysts was how the Soviet Union would use its available bombers in the event of hostilities with the West and against the UK in particular.

British Assessment of the USSR's Use of Nuclear Bombers in a Conflict

In 1958 Major General Kenneth Strong, Director of the Joint Intelligence Bureau, stated in a memo to Sir William Dickson, Marshal of the Royal Air Force, that although JIC studied the Soviet Union there was "scarcely any evidence as to how

[165] TNA. CAB 158/35, JIC(59)7 'The Soviet Strategic Air Plan in the early stages of a Global War 1958-63' 24 February 1959.
[166] Dylan p.134.
[167] Ibid.
[168] TNA. CAB 158/45, JIC(62)3 'Sino-Soviet Bloc War Potential 1962-66' 16 February 1962.
[169] TNA. DEFE 13/342. Memorandum 8 from Kenneth Strong to the Defence Minister 08 February 1960.
[170] TNA. CAB 158/31, JIC(58) 4 (Final). File note from Kenneth Strong to Marshal of the RAF Sir William Dickson 24 January 1958.

their leaders think or would act in given circumstances."[171] This made any assessment about the use of air assets extremely difficult. In 1950 the British government had even speculated that an attack might be mounted by a Soviet suicide squad detonating an atomic bomb in a low flying civilian aircraft over a target such as London.[172] The issue of limited warning of Soviet attack was still a concern in the early 1960s. In 1960, Harold Watkinson, Minister of Defence, wrote of the Soviet threat that "we would not at best get more than two days indication of forces getting into a position from which they could attack" and he even thought that "we might get none."[173] However, the JIC assessed in 1960 that they did "not expect an attack whilst there is no exceptional political tension."[174] Any air attack would likely emerge from a deteriorating global political situation with a simultaneous attack on radar facilities throughout the Western world, which would be very hard for the Soviet Union to co-ordinate due to their number and disposition.[175] However, a special British government nuclear war study group assessed in 1960 that the UK "is peculiarly vulnerable to attack" and thought that the United Kingdom "will be one of the first countries to be knocked out."[176] However, they found it difficult to believe that the Soviet Union would completely annihilate the UK but instead would seek "to take the UK over as a going concern or at least one capable of being restarted, not as a radioactive desert."[177] In the event of a nuclear attack the Russians, they thought, were likely to "only deliver as many weapons as they considered necessary to cause the breakdown of the UK."[178]

These assessments at the end of the period under consideration show the difficulty of assessing Soviet intentions concerning the air threat and how difficult it was to assess what would happen in a nuclear war. This problem frequently appeared in intelligence

[171] Ibid.
[172] TNA. AVIA 65/2055. 'Clandestine Introduction of Weapons into UK' (Imports Research Committee 1950). Ships were also considered a possible vehicle as well as detonating an atomic bomb in an embassy. This committee considered covert nuclear attack from 1950 to 1954.
[173] TNA. DEFE 13/342 'Communist Bloc Capabilities and Intentions' 19 December 1960.
[174] TNA. CAB 158/40, JIC(60)33(Final) 'Warning and Timing of a Soviet Attack on the West in Global War' 21 October 1960.
[175] Ibid.
[176] TNA. DEFE 10/402 SG(60) 15. Minutes of the JIGSAW Study Group 12 July 1960.
[177] Ibid.
[178] Ibid.

assessments from 1949 to 1962. In 1949 JIC had considered a theoretical Soviet invasion of the UK in 1949-50 and concluded that "the effect of the air attack on the UK may be serious, it will not be crippling."[179] This of course assumed that the Russians did not have the atomic bomb. Once it became clear that the Soviet Union had obtained the atomic bomb the JIC examined situations where they might use it and concluded that "we have no intelligence on this subject."[180] The subject was also examined again by the JIC in 1952 and it concluded that by mid-1953 the USSR would have 105-175 atomic bombs which would "most probably" be of the Nagasaki type.[181] At this time the JIC assessed that the Soviet Union's Long-Range Air Force had three Air Armies with two of them based in western Russia.[182] It thought that medium bombers posed the biggest threat to the UK and they were based from Moscow to Odessa. The possibility also existed that they could do "isolated attacks on the US" by "specially selected crews."[183] The JIC felt confident enough to say that Russia's bombing capabilities were "not high by comparison with the West" and they doubted their ability to "carry out effective attacks at night and in bad weather."[184]

A further JIC paper in 1952, during the Korean War and with Stalin still in power, stated that the Soviet Air Force would seek to "neutralise the UK as rapidly as possible" and to "destroy bomber bases" in the country as well as preventing a "build-up of US forces" in the UK.[185] As the Russian Long-Range Air Force could not effectively attack the United States so the JIC thought that the "main Soviet strategic air effort would be directed against the UK."[186] Instead of invading the UK, the Soviet Union might seek to knock the country out by air bombardment. A JIC study in 1951 estimated that the Russians had 500 Tu-4 bombers and could attack "anywhere in the UK from Belarus to Ukraine."[187] There was also the danger of Russian light bombers operating from East Germany and this paper noted that by 1954 the Russians could have 900 Tu-4s and 100 jet bombers. It was assessed that they would target

[179] TNA. CAB 159/5, JIC(49) 42 (Final) 'Invasion of the UK 1949-50' 12 July 1949.
[180] TNA. CAB 159/5, JIC(49) 111 'Soviet Use of Atomic Bombs' 14 March 1950.
[181] TNA. CAB 158/13, JIC(51)117(Final) 'Soviet and Satellite War Potential 1952-55' 22 April 1952.
[182] Ibid.
[183] Ibid.
[184] Ibid.
[185] TNA. CAB 158/13, JIC(51) 118 (Final) 'Soviet Strategy in the Event of General War' 04 May 1952.
[186] Ibid.
[187] TNA. CAB 158/13, JIC(51) 18 'Scale and Nature of Air Attack on the UK 1951-57' 09 May 1951.

London, bomber bases and centres of population and industry.[188] It was further assessed that there could be 410 aircraft used in one raid and 73 sorties per day could be mounted at a sustained rate which would likely put a severe strain on the UK's air defences.[189]

By 1955 the JIC assessed that the UK was still at risk of air raids as a European and Commonwealth leader.[190] As a bomber base and port for supplies supporting a European war the UK was of the "utmost importance as a target."[191] The JIC assessed that "the Soviet leaders would make an intensive effort to destroy the UK at the outset" of any hostilities.[192] It admitted however that "we have no information on Soviet planning" and highlighted the problem that "planners might well catalogue targets in a different manner."[193] The JIC thought that a surprise attack could be mounted against Europe and the UK but not against the USA. It also thought that "the Soviet leaders have placed a priority requirement for the creation of an effective intercontinental bomber force."[194] The same paper also estimated that "by 1959 the Soviet stockpile of nuclear weapons is likely to be large enough to permit them to allocate weapons to the majority of targets they would wish to destroy."

The JIC also admitted the inadequacy of the intelligence available when trying to assess the Soviet Union's intentions. In an earlier study it noted that Soviet security had "a high level of efficiency and we obtain little information directly revealing the policy and intentions of the Soviet leaders."[195] It also admitted that "we are unlikely to obtain adequate direct information of Soviet intentions from secret sources, including SIGINT."[196] British intelligence only had partial coverage of the Soviet

[188] Ibid.
[189] Ibid.
[190] TNA. CAB 158/19, JIC(55)7 (Final) 'The Soviet Strategic Air Plan in the Early Stages of a General War in the period up to 1959' 16 February 1955.
[191] Ibid.
[192] Ibid.
[193] Ibid.
[194] Ibid.
[195] TNA. CAB 158/13, JIC(51)126 (Final) 'Present State of Our Intelligence on the Soviet Union, the European Satellites and China and Measures To Improve It' 07 January 1952.
[196] Ibid.

target and lack of confirmation of the sparse data it obtained. In the JIC's own words the standard of intelligence for use in a hot or cold war "is much too low."[197] In a study of the Soviet Air Force in 1953 the JIC admitted that "we have insufficient data on which to base an estimate of the operational capabilities of the Soviet heavy bomber and medium jet bomber which we believe are likely to come into service in 1956 and 1954 respectively."[198]

Intelligence about detecting an incoming Soviet nuclear bomber attack was also seen as a problem by the JIC. It recognised in 1955, however, that "it is not easy to produce an H-bomb that can be transported in an aircraft" but that Russian developmental work would reduce its weight and complexity.[199] The JIC thought that the Russians could not attack the UK using a hydrogen bomb dropped from an aircraft "before 1958 from what we know now."[200] The Soviet Union would however be able to use atomic bombs in any attack which could devastate targets in the UK. It was thought probable that an actual Soviet bomber attack would only be detected once enemy aircraft appeared on allied radar screens.[201] Any nuclear attack would likely be delivered by aircraft flying at high altitude and the UK would detect them at a range of 200 miles with a warning time of 20 minutes.[202] However, if radars in northern Europe detected the aircraft then the UK could receive a one hour warning.[203] There was a chance that the Russians might mount a low level attack and the UK could "get only as little as 3 minutes warning" as aircraft crossed the coast. However, the JIC considered that "this technique is unlikely"[204] presumably due to the large amounts of fuel low flying would consume thereby making a return journey to the USSR difficult if not impossible.

[197] Ibid.
[198] TNA. CAB 158/19, JIC(53)39(Final) 'The Soviet Strategic Air Plan in the Early Stages of a General War in the Period up to 1956' 24 June 1953.
[199] TNA. CAB 158/19, JIC(55)12 'The H-Bomb Threat To The UK In The Event Of A Major War' 12 August 1955.
[200] Ibid.
[201] Ibid.
[202] Ibid.
[203] Ibid.
[204] Ibid.

In 1956 the JIC thought that despite Soviet nuclear missiles coming into service, "the main weight of an attack would still consist of manned bombers."[205] It assessed that the Soviet Air Force "could despatch bombers so as to catch by surprise targets in the UK."[206] However, the United States could only be attacked on "one way" missions and Russian bombers would have to deploy from the north and east of the Soviet Union. Any attack on the United States (which was likely to be done at night) would have to be co-ordinated so that Soviet aircraft penetrated all the radar chains simultaneously and the UK would be attacked in daylight.[207] The JIC thought that if the efficiency of the Soviet bomber force improved and it was kept at a high state of readiness it should "be able to carry out at a few hours notice, large-scale attacks on all the UK and allied peripheral bomber bases."[208] It further thought that the Soviet Union viewed the UK as a target of "the utmost importance" and would seek to destroy it at the outset of a war.[209] The Soviet medium bomber force which would likely have been used to mount an attack at that time was deployed on 20 airbases in Russia. However, before an attack it could deploy to 110 airfields which lay within 750-1500 nautical miles from the UK.[210]

British intelligence was aware that the Russians had been developing a low frequency navigational system, and at a distance of 1600 nautical miles it was accurate to 3 nautical miles so it was good enough for nuclear targeting.[211] However, the radars on the bombers remained an enigma as the JIC admitted that "we have little information on such equipment."[212] It judged it more likely that medium bombers would be used to attack the UK with the longer range bombers reserved for air attacks on North America.[213] The initial air attack was likely to consist of 320 aircraft bombing the UK with additional older Tu-4s being used for spoof or diversionary raids to overload the

[205] TNA. CAB 158/23, JIC(56)7 'The Soviet Strategic Air Plan in the Early Stages of a General War up to the end of 1960' 20 February 1956.
[206] Ibid.
[207] Ibid.
[208] Ibid.
[209] Ibid.
[210] Ibid.
[211] Ibid.
[212] Ibid.
[213] Ibid.

UK's air defences.[214] This was of course all speculative because no intelligence has been released, or likely even existed, concerning how the Russians planned to attack the UK.

By 1960 the JIC thought that Russia's electronics had advanced to the point that Electronic Countermeasures (ECM) such as jamming would be employed extensively in any attack on the UK.[215] This is likely to have come from GCHQ ELINT operations involving monitoring Russian electronic emissions. The JIC also noted by 1961 that missiles would play a large and increasing part in a nuclear attack on the UK and "the Soviet government could probably allocate sufficient missiles to attack their planned targets in the UK without using aircraft."[216] It was thought "that they could still use aircraft to ensure the destruction of individual targets."[217] Soviet bombers could be used to penetrate UK radar cover some 30-60 minutes after missiles had impacted so it was assessed that there was still a role for Russian nuclear bombers despite the advent of missiles.

Conclusion

In conclusion, British intelligence analysts faced an extremely difficult task in attempting to determine the threat from Soviet bombers, their numbers and how an attack might be implemented. The primary certainty was that the USSR could annihilate the UK in the event of a nuclear war. As the bomber was the only way to drop a nuclear bomb on the UK until the late 1950s, British assessment of this subject was of crucial national importance. The assessments about bomber production seem measured and in line with the limited intelligence available, which did apparently improve from the late-1950s likely because of imagery intelligence from secret U-2 over-flights of the USSR becoming available. There was no apparent inflation of figures to produce estimates similar to those seen in the "bomber gap" period when the US Air Force and aircraft industry sought to justify expanding budgets and high

[214] Ibid.
[215] TNA. CAB 158/40, JIC(60)34 'Scale and Nature of an Attack on the UK in the early stages of a Global War up to 1964' 29 July 1960.
[216] Ibid.
[217] Ibid.

levels of aircraft production. However, the UK's nuclear deterrent was exclusively held by the RAF which was an established service rather than a fledgling organisation suffering inter-service attack like America's Strategic Air Command.

The JIC also recognised that the UK was very vulnerable to nuclear attack and it would be possible for Soviet aircraft to bomb British cities as the Luftwaffe had done during the Second World War. The consequences would however be far more serious and the UK would struggle to protect itself. However, a Soviet nuclear attack on the UK was unlikely until it could destroy the United States in a pre-emptive nuclear strike. Throughout the 1950s and 1960s America's arsenal of nuclear weapons, submarines, aircraft and missiles grew to such a formidable level that the Soviet Union could never hope to achieve a "nuclear Pearl Harbor." Any Soviet military move against Europe or nuclear attack on the UK would likely result in American nuclear destruction of the Soviet Union and the underlying assumption by the JIC was that a war with the Soviet Union was unlikely. This did of course assume that Moscow's leaders behaved in a sane and rational way.

The JIC's assessments of possible Soviet air attack options against the UK do seem reasonable but are speculative. There was the possibility that hostilities could lead to such an attack but a "bolt out of the blue" was considered unlikely. Britain was building a nuclear deterrent at this time to prevent such an eventuality (and as a matter of national pride) but the UK's striking power was marginal compared to that of the United States. The UK could be sheltered under America's "nuclear umbrella" and it is interesting how the factor of the UK being safe from attack so long as the United States could not be successfully attacked features prominently in JIC papers. There is however the unstated possibility that once the United States could be attacked with Soviet nuclear weapons it could be reluctant to use its nuclear forces against the USSR so the 'nuclear umbrella' could not be guaranteed.

This chapter highlighted the problems faced by British intelligence whilst trying to collect and analyse intelligence on Russian airborne strategic weapons. Many books

draw attention to the paucity of intelligence available to the British government on Soviet nuclear weapons but this chapter demonstrates in detail the problems intelligence collectors and analysts faced. This material shows the very difficult working environment these personnel had to operate in and their output has to be considered in this light. The sparse intelligence sources provided only limited insights into the workings and development of the Soviet Union's strategic bombers and their weapons. It should be borne in mind that we cannot know what information SIS and GCHQ were providing to the British government on Soviet bombers at this time. It is however unlikely that this will be released in the near future, if ever. It is also unclear how intelligence influenced policy makers as political and economic factors play a major part in decision-making. German scientists clearly provided limited insights into certain equipment and programmes and British Air Attachés tried their best, through personal observation, to collect intelligence under the constraints of the most oppressive secret police security state at that time. It was only in the late 1950s when the U-2 over-flights commenced and more powerful radars were developed that a better idea was gained of the size of the Soviet Union's nuclear bomber force. This of course did not provide data about capabilities, intentions or future plans.

It was reasonably assessed by the British government that the Soviet Union had built up a competent nuclear bomber force by the end of 1962. The Soviet Union was considered by the JIC as unlikely to attack the UK until it had the capability of annihilating the United States in a pre-emptive attack, but that capability would not emerge for many years. An attack on the UK was therefore unlikely and the horrors explored by Strath and his committee thankfully never became a reality.

Meanwhile the advent of Intercontinental and Medium Range Ballistic Missiles meant that Moscow had new and more effective ways of attacking the UK. Their development also made it likely that nuclear bombers, such as the UK's V-Force, could be destroyed on the ground thereby undermining their value as a deterrent. Such systems also posed a threat to other missiles and heralded the demise of the UK's *Blue Streak* Intermediate Range Ballistic Missile programme, whose missiles were thought to be vulnerable to attack whilst still on the ground. Advances in radar,

jet fighters and missiles had also made it unlikely that Second World War style armadas of bombers would be relied upon to penetrate hostile air space. A new threat came from nuclear armed ballistic missiles, which is the subject of the next chapter.

CHAPTER 2 – A BOLT FROM THE BLUE: BRITISH INTELLIGENCE GATHERING AND THE SOVIET BALLISTIC MISSILE THREAT 1949-62

This chapter examines the threat to the United Kingdom that British intelligence assessed as emanating from the Soviet Union's ballistic missile force; primarily its Intermediate Range Ballistic Missiles (IRBMs) and Medium Range Ballistic Missiles (MRBMs). It also analyses the considerable problems encountered in collecting intelligence on this target between 1949 and 1962. Towards the end of the Second World War the UK became the first country in history to be attacked with ballistic missiles. This new and terrifying weapon which the UK was incapable of intercepting and destroying was made even more potent by the advent of nuclear weapons. Ballistic missiles offered the potential for an enemy to deliver an undetected and devastating surprise attack from extreme range. With the advent of more powerful thermonuclear warheads in the 1950s, these innovations threatened to make the UK's air and civil defence forces useless.

Introduction

Both the Soviet Union and the United States adopted and developed ballistic missile technology acquired from Nazi Germany and it became a key component in the arms race. For the Soviet Union it offered an opportunity to compete evenly with the West as both sides regarded the ballistic missile as a novel technology with enormous developmental potential. It also allowed the Soviet leadership to demonstrate how far the Soviet Union had progressed after the Second World War, a conflict which showed that they did not have the power to strike at the heart of an enemy state except by using land forces. In the early Cold War years the West possessed a large nuclear bomber fleet but both sides had sparse missile resources so each started from the same technological point to develop their capabilities. Each had access to German technology and personnel, and with substantial resources devoted to missile projects, Soviet rocket advances would become a key intelligence target for the United Kingdom and the United States. The UK encountered similar intelligence collection problems against missiles to those it had faced with Soviet strategic bombers as discussed in Chapter One. The problem was made more urgent from the mid-1950s by the UK having a nuclear deterrent based on jet bombers which became increasingly vulnerable to missile attack. The UK was close to Soviet-occupied Eastern Europe, where ballistic missiles could

be based, although the Soviets claimed to have no nuclear weapons deployed outside their territory. The UK also did not have a ballistic missile early warning radar until 1963, so the possibility of such a deployment fuelled the UK's fear of potential vulnerability to a pre-emptive nuclear attack. It is now known that the USSR deployed medium range ballistic missiles in the GDR for a short time in 1959 but soon withdrew them.[218]

The UK had limited knowledge of ballistic missile technology at the end of the Second World War. Britain's experience of such systems was as a victim of c.1115 German V-2 ballistic missiles causing c.2855 fatalities; along with c. 6184 fatalities caused by the V-1 "doodlebug" from 1944-45.[219] The UK struggled to deal with the ballistic missile onslaught which fortunately only occurred towards the end of the war. These missiles could neither be intercepted nor tracked, their launches went undetected, and there was no way to provide early warning of attack. The only realistic defence was to locate and destroy launching and production facilities in occupied Europe and Germany. This was possible because such facilities were in France and Germany where the UK had some intelligence coverage and military assets could attack them. However, to repeat this in the Soviet Union, a country further away, and about which the UK knew little, would be extremely difficult. The Soviet Union was a closed, secret police state with rigid security surrounding its weapons programmes and posed a very difficult intelligence target so every collection opportunity had to be exploited. In 1959 for instance, the JIC discovered from a press report that a British firm was to build a textile factory at Dnepropetrovsk, Russia. This town housed a Soviet ballistic missile factory and the JIC thought it "might provide an opportunity for gaining intelligence."[220]

The West was also starting its own ballistic missile programmes so not only were both sides attempting to learn about each other, they were also trying to build the weapon systems and develop a technology which only a few years earlier had belonged to the realms of science

[218] Matthias Uhl and Vladimir Ivkin, "Operation ATOM": The Soviet Union's Stationing of Nuclear Missiles in the German Democratic Republic, 1959" *Cold War International History Project Bulletin,* 12/13 (Winter/Fall 2001).
[219] Stocker, Jeremy *Britain and Ballistic Missile Defence 1942-2002* (London, 2002) p.18.
[220] TNA. CAB 159/31. JIC(59) 35 21 May 1959 p.3.

fiction.[221] As with the atomic bomb, novel weapons technology using innovative scientific concepts would require new intelligence collection techniques, such as the interception and analysis of telemetry, satellite reconnaissance and a radical review of current intelligence sources and methods.[222] Little has been written concerning the UK's efforts to collect and analyse data on this topic. Some material on this issue is provided by Aldrich in his work on allied intelligence collection as well as Goodman in his study of British intelligence collection against the USSR's nuclear bomb tests.[223] These works do not examine the Soviet ballistic missile issue in depth nor explore some of the intelligence collection problems faced by the UK. Dylan provides the most comprehensive account of the ballistic missile intelligence issue from a UK perspective and does some exploration of intelligence collection problems but the focus of his analysis is on the history and work of the Joint Intelligence Bureau.[224]

Ballistic Missile Intelligence Problems and the Early Cold War Years

From 1949 to 1962, the Soviet Union's long-range ballistic missile programme offered a unique challenge as an intelligence target. As Allen Dulles, the CIA Director observed, 'In the first decade after the war we had only scant knowledge of Soviet missile progress. Drawing boards are silent, and short-range missiles make little commotion.'[225] In the Second World War, the UK had been able to mount over-flights of hostile territory to examine suspected missile sites and production facilities, but in peacetime engaging in such activity over the Soviet Union would be a major challenge. During the war, there was also human intelligence available from resistance workers who helped build, or worked in, rocket facilities. In the early years after the war, there were no reconnaissance satellites, tracking radars or electronic interception sites capable of monitoring missile tests and the U-2

[221] Gantz, Kenneth *The United States Air Force Report On The Ballistic Missile: Its Technology, Logistics and Strategy* (New York, 1958).
[222] TNA. CAB 159/31. JIC(59) 35 21 May 1959 *Soviet Research and Development to 1958.* A working party was examining using a satellite to collect SIGINT on the USSR and it was to be "thoroughly explored" with GCHQ.
[223] Aldrich, Richard J, *The Hidden Hand: Britain, America and Cold War Secret Intelligence* (London, 2001). Goodman, Michael *Spying on the Nuclear Bear: Anglo-American Intelligence And The Soviet Bomb* (Stanford, 2007).
[224] Dylan, Huw *Defence Intelligence and the Cold War: Britain's Joint Intelligence Bureau 1945-1964* (Oxford, 2014).
[225] Dulles, Allen *The Craft of Intelligence* (New York, 1963) p.46.

intelligence collection aircraft had not yet been designed.[226] The West was still gearing up its intelligence collection towards the eastern bloc as the Cold War progressed. The Soviet Union was also a vast country in which it would be possible to conceal substantial military and industrial infrastructure without other states being aware of it. However, new techniques would be developed to intercept and interpret telemetry i.e. electronic data transmitted by experimental missiles in flight concerning their speed and performance. Special radars would also be designed, tested and constructed in friendly states to track missiles and monitor their performance when they were not transmitting data. These, and electronic intelligence facilities, were installed in obscure parts of the world to be in close proximity to their targets. The intelligence requirements also produced closer intelligence relationships between states, and the globalisation of allied intelligence collection, as the quest for vital intelligence gathered pace.[227]

As discussed in Chapter One, the Soviet Union in 1949 was seen by the UK intelligence community as a sinister and enigmatic security state. It was a difficult place for intelligence agencies to operate and much of the testing of ballistic missiles (for reasons of safety and security) took place in remote areas of the USSR. The missile systems produced were only rarely seen and then only briefly in military parades. Whilst military aircraft would be flown from a factory or displayed in fly-pasts in Moscow, few of the missile systems were seen in public. If the missile system was not monitored in the experimental stage then it was highly unlikely that it would be seen at all before its deployment to secret, remote locations where it would be stored out of sight. Despite the technical intelligence innovations that occurred during the period, such as more powerful radars and the U-2 aircraft, there was still a role for the traditional human agent. However, the problems in collecting intelligence on Soviet nuclear bombers recurred with the ballistic missile target. Significantly from 1961 to 1962, the West fortuitously recruited and "ran" the Russian army spy Colonel Oleg Penkovsky but

[226] See Dylan p.109. He notes little information being available on the UK's intelligence sources and its paucity likely reflects the absence of high-quality intelligence.

[227] See Aldrich *The Hidden Hand* and particularly Richelson, Jeffrey and Ball, Desmond, *The Ties That Bind: Intelligence Cooperation between the UKUSA Counties-The United Kingdom, the United States of America, Canada, Australia and New Zealand* (London, 1990).

he appears to have been a unique case.[228] The most important initial information on the Soviet ballistic missile programme once again came from German scientists.

German Returnees and Ballistic Missile Intelligence

A key source of intelligence concerning Soviet work on ballistic missiles in the early Cold War period was German scientists and engineers who had been taken to the Soviet Union after 1945. By the 1950s, many had returned to Germany and, as seen in the previous chapter, were then interviewed by western intelligence agencies under the DRAGON RETURN programme.[229] German ballistic missile knowledge in the 1940s was epitomised by the V-2 rocket, a system no other state then possessed or even planned. Any personnel who had worked on this programme were therefore highly desirable intelligence targets, but it appears that the Soviet Union did not acquire anyone of the stature of Professor Werner von Braun, who went on to be a key figure in the American space programme. It should also be noted, however, that the V-2 testing facility at Peenemunde on the Baltic coast of Germany and the underground German rocket factory at Nordhausen both lay inside Soviet-occupied East Germany. Both acquisitions undoubtedly assisted Russian developmental work on rockets.

The USSR sought to move beyond simply having a V-2 rocket as an artillery system and worked towards a long-range system capable of attacking the UK and ultimately the United States. In the late 1940s and early 1950s, nuclear weapons were enormous devices, but over time they were miniaturised to be able to fit into the nosecone of a rocket. Importantly, although released Germans could provide some intelligence, for security reasons they had been compartmentalised by the Russians and kept away from purely Soviet developmental work. Additionally, by the time they were released back to Germany much of their information was out of date.[230] The declassified files indicate that they worked on purely German projects for the Russians, such as solving technical and engineering problems, and had little knowledge of Russian domestic rocket programmes. However, this was apparently the only human intelligence source the UK had available in quantity so it was better than

[228] Schecter, Jerrold and Deriabin, Peter *The Spy Who Saved The World: How A Soviet Colonel Changed The Course Of The Cold War* (New York, 1992).
[229] Goodman pp.23-25.
[230] Dylan p.112. Data collected were forwarded to the JIB for analysis.

nothing and was subject to a thorough study by Maddrell.[231] Some material on Russia's rocket programme was also publicly discussed in books by the German scientists as interest in this topic gathered pace in the 1950s.[232]

In the late 1940s and early 1950s the UK and USA held a series of conferences on Soviet guided weapons attended by rocket scientists and intelligence experts. These sessions, designed to pool data and assessments as well as co-ordinating intelligence efforts, showed how close the relationship between the two countries had become in the intelligence field. This now extended to intelligence on guided weapons. The meetings revolved around information provided by German personnel in DRAGON RETURN and this data formed the core of what intelligence was available to the allies. There is no mention in the declassified files of other human intelligence, covert over-flights or electronic intelligence collection. Whether papers on these topics are retained or never existed remains unknown. What operations were running produced material with a short useful life and sources would eventually extinguish. The final report of the Joint Anglo-American Conference, held in March 1949, concludes that "our sources of information are waning" and "activity in the Soviet zone of Germany is almost at an end."[233] This likely reflects the fact that few Germans would have returned home from the east by this date as the Russians retained them to ensure that their knowledge would have less intelligence value if they were debriefed in the West. With few Germans present during missile tests and developmental work, this made it harder to collect intelligence. In the 1949 conference it was admitted that the value of the returning prisoners of war had "steadily declined" and the "meagreness of other sources becomes increasingly apparent."[234] The inadequacy of the intelligence available to the allies prompted thinking about future collection methods and the conference concluded that western intelligence needed "channels into the USSR."[235] They also thought that the Soviet Union wanted guided missiles as a matter of priority and would develop their own systems quickly to show the world that they could produce modern weapons.[236] In 1949 western intelligence had only been able to establish the existence of one missile proving ground at Nikolskoe in

[231] Maddrell, Paul, *Spying on Science: Western Intelligence in Divided Germany, 1945-1961* (Oxford, 2006).
[232] Parry, Albert *Russia's Rockets and Missiles* (London, 1960) pp.111-130.
[233] TNA. DEFE 44/99 "*A Study of the Soviet Guided Missile Programme*" A Joint Anglo-American Conference March 1949 p.ii.
[234] Ibid.
[235] Ibid.,p.iii.
[236] Ibid.,p.iv.

the Soviet Union but they knew, likely from German returnees, that the German centre at Peenemunde on the Baltic coast had been stripped of equipment.[237]

The Conference had established that some 300 German guided missile specialists had been deported to the USSR after the war with 100 of them located by intercepting post as it came to their families in the West.[238] It was also noted that many of the German engineers and researchers were not full scientists but rather people who were involved with testing and experiments; collectively though, they had much experience.[239] It was also thought that this group was not substantial enough to support a large missile development programme. The Conference concluded that the USSR was "substantially worse-off than the West" in terms of research facilities and really needed such equipment as wind-tunnels and early computers.[240] By interviewing Germans, western intelligence had established that the main missile proving ground in the USSR was in the lower-Volga area, near Stalingrad.[241] This was useful knowledge because it identified an area that could be monitored by radio, radar and perhaps covert over-flights. This area was likely chosen because it was desert, near the Caspian Sea, sparsely populated and had industrial areas not too far away.[242] However, the Conference could offer no method to determine how many ballistic missiles would be produced by the USSR over five years.[243] This was a problem which would haunt western intelligence for many years. The Conference appears to have been a useful session for the allies because it provided valuable opinions from the Germans and an insight into Soviet exploitation of their knowledge. The impression is that allied knowledge was very broad but superficial. However, as the USSR's rocket work was moving further east the Conference concluded that it had "a very incomplete picture of the apparent activities at a few locations in the USSR."[244]

[237] Ibid.
[238] Ibid.,p.169.
[239] Ibid.
[240] Ibid.,p.173.
[241] Ibid.,p.175.
[242] Ibid.
[243] Ibid.,p.178.
[244] Ibid.,p.179.

A later Conference in April 1954 benefitted from more Germans having come back from the east and being interviewed by western intelligence.[245] This gathering established that between 1945 and 1953, 150 German scientists had been employed by the Russians on ballistic missile work at Bleicherode in East Germany and then transferred to Russia.[246] In the Soviet Union they were divided between a site called NII.88 at Podlipki some 18km north-east of Moscow and the rest were on an island at Gorodomlya some 250km north-west of Moscow.[247] This again provided western intelligence departments with information on sites involved in the Russian rocket programme for further examination. Until 1950, the Germans were under the direction of a German named Helmut Groettrup and they were mainly involved with theoretical work and limited experiments.[248] The impression gained by the Germans was that there was a native Russian rocket development programme underway concerning a missile named R-14. The Russians sought to improve a German V-2 rocket to ultimately carry a 3000kg warhead some 3000km.[249] This requirement clearly showed Russian interest in long-range missiles and in 1947 the Germans had been brought to the secret Russian testing ground at Kapustin Yar to witness rocket tests; some 20 German V-2s were launched there.[250] This again gave western intelligence some insights into a new Russian testing facility. Interestingly, the Russians kept the Germans solely on design work and the Germans in turn were keen to do as little as possible to minimise their value to the Russians so that they would be sent home to Germany as soon as possible.[251] During their stay in Russia they met few Russians, rarely travelled and tended to be kept with other Germans.[252] Ominously, one German source had reported that the Russians saw guided missiles as "a bringer of disaster to the capitalists."[253]

The DRAGON RETURN programme selected key people for further interview and Mr Groettrupp (mentioned above) was selected for re-interrogation at home in Germany.[254]

[245] TNA. DEFE 44/2 *"USSR – Guided Weapon Development"* April 1954.
[246] Ibid.,p.2.
[247] Ibid.
[248] Ibid.
[249] Ibid.
[250] Ibid.,p.5.
[251] Ibid.
[252] Ibid.
[253] Ibid.,p.49.
[254] TNA. DEFE 44/101 "*USSR Guided Weapons Development – Re-interrogation of Helmut Groettrup*" September 1954.

According to his declassified file, he was able to provide additional information on the function of each member of staff in the missile programme, thereby identifying further personnel for future exploitation. He described the design of the Russian R-10 rocket which had a range of 910km and more advanced rockets up to the R-15 version.[255] His debrief provided information on rocket trials, technical systems and facilities he had visited in the Soviet Union.[256] Groettrupp also revealed information concerning Mr Korolev, the Chief Soviet Rocket Designer and his design bureau at NII.88, as well as lists of Russians in the missile team.[257] This information could guide future targeting of intelligence assets.

Further DRAGON RETURN reports indicated that the Germans "had been quite well treated in Russia" and, ironically, they had to sign a declaration before leaving that they would not disclose any information about their time in Russia.[258] They were paid three to four times what Russian engineers received but resented being deported to Russia in October 1946 and detained there once the job was finished.[259] Apparently the Germans limited themselves to their own work and sought no extra knowledge; otherwise there was a danger that the Russians would keep them for a longer period on the project.[260] The Germans further noted the "water tightness of the organisation at all the establishments" and even other Russians did not know what went on in other sections.[261] This ensured that western intelligence would only be able to glean limited information from the Germans and any potential Russian defectors would likely only have sparse knowledge of ballistic missile projects.

By 1953 the Joint Intelligence Committee (JIC), in a study of Russian Research and Development, confidently stated that concerning Soviet ballistic missiles, "there is in existence a planned programme of native developmental work."[262] It thought that the Russians had their own programmes and "have gone beyond the stage of mere reconstruction

[255] Ibid.,p.7.
[256] Ibid.,p.22 for a description of KAPUSTIN YAR and its static test areas for rockets. There is also a diagram.
[257] Ibid.,p.43.
[258] TNA. DEFE 41/153 "*JTIC Report on German Scientists Returning from Russia"* 27 April 1951 p.2.
[259] Ibid.,p.2.
[260] Ibid.
[261] Ibid.
[262] TNA. CAB 158/15. JIC(53)34 "*Russian Research and Development"* 20 March 1953 p.6.

of German war-time projects."[263] By 1959 the JIC noted that all the Germans had departed from Russia's guided missile programme and that "further major new intelligence from this type of source is unlikely."[264] The information British intelligence possessed was dated but it was "valuable in deciphering the creation and expansion of a major research establishment in Moscow."[265]

At this stage only human intelligence sources in Russia could provide really detailed or high-level information on the Soviet ballistic missile programme. These appeared to be non-existent because German returnees did not have access to this level of information. As Dylan states, by the early 1950s the British did not have a good understanding of the Soviet Union's missile programme or its intentions.[266] This meant that the numbers, types, accuracy and rate of development of Soviet ballistic missiles could not be gauged, nor could Moscow's intentions. The threat to the UK was therefore very difficult to assess with any accuracy. The substantial output of Soviet industry seen in World War Two however, indicated it's potential. This lent urgency to acquiring intelligence as production rates of ballistic missiles increased in the USSR. The intelligence gap concerning ballistic missiles, however, could only be addressed through better intelligence sources to generate more data for analysis.

A Russian Defector

The first Soviet defector with real knowledge of its rocketry was apparently Colonel Grigori Tokaty-Tokaev (Codenamed EXCISE), who defected to the British from Berlin in the summer of 1948. He is described by Dorril as a "godsend" and "a genuine ideological defector" who switched sides after a crisis of conscience.[267] He had worked on the Soviet State Commission on Missile Development as well as lecturing on jet engines and rocket technology at the Soviet Air Force Academy at Zhukovsky near Moscow.[268] Tokaev had some knowledge about policy discussions and strategic rocket programmes from the middle of 1947 but, as Dorril points out, the detail of what he told British intelligence is "a matter of

[263] Ibid.
[264] TNA. CAB 158/36. JIC(59)29 *"Soviet Research and Development Up To The End of 1958"* 25 May 1959 p.13.
[265] Ibid.
[266] Dylan p.122.
[267] Dorril, Stephen *MI6: 50 Years of Special Operations* (London, 2000) p.148.
[268] Ibid.

conjecture."[269] Some material provided by Tokaev has now been declassified and it appears that he was the last major defector with knowledge of rockets for many years.[270] Maddrell points out that he may have exaggerated his role in Soviet rocketry and much of his information was hearsay; however, it appears to have been accurate and useful hearsay.[271] Even though he was a Soviet defector, much of his information came from his time serving in Germany rather than the Soviet Union and he appeared to have been exploiting his German wartime experiences and some of his information was unconfirmed. Being in Germany also meant that he had little idea about what was happening in the Soviet Union at the time when he defected.[272]

Despite his shortcomings, he was likely the only Soviet human source the British had at this time so his information was of importance. His debriefs offer insights into Soviet rocketry, but Tokaev's depth of knowledge appears to have been limited and no information was provided concerning future plans.[273] He was however able to confirm that Soviet missile work only started when Germany was overrun and the Russians quickly realised the advanced nature of German armaments, thus prompting them to initiate a programme quickly.[274] Soviet intention at the time was to develop an improved version of the German V-2 rocket. However, he had no information on longer-range systems or of the resources available to the Soviet rocket programme. Tokaev was only able to provide information on Soviet rocket projects which used German technology, though this was a useful addition to material received from returning prisoners of war. This nonetheless provided a distorted and limited picture of Soviet work, but it was all that was available to the UK and the capabilities of the Soviet Union's missile engineers were likely underestimated. After all, the Soviet Union subsequently proved able to design and launch its own ballistic missiles, build the first Intercontinental Ballistic Missile and orbit the *Sputnik* satellite.

[269] Ibid.
[270] TNA, DEFE 21/40 *USSR: Special Visitors* and DEFE 40/25 *USSR Scientific Intelligence: Aeronautical* for Tokaev's debriefing reports. See also Tokaev, Grigori *Comrade X* (London, 1956). His memoirs unfortunately contain little information on rockets.
[271] Maddrell p.70.
[272] Ibid.
[273] TNA, DEFE 21/40 USSR: *Special Visitors.*
[274] Maddrell p.71.

Tokaev alerted the West that Stalin was interested in developing long-range missiles both as a high status, modern weapon and to counter superior western air power. He was also useful in providing scientific Order-of-Battle intelligence on areas of interest, such as data on a rocket research facility in Leningrad and the Kapustin Yar missile range. He had only overheard information about the missile range, but provided enough information for it to be located.[275] Tokaev also provided information on the shortcomings of the Soviet rocket programme, which lacked trained rocket scientists and equipment such as wind tunnels. He noted how the Soviet bureaucracy and high security regulations impeded scientists who expedited work so as to avoid being accused of sabotaging projects by slowing down progress.[276] His case also highlighted to the British the value of scientific defectors, particularly if they had worked at the heart of Soviet science for many years and could be persuaded to remain as agents in place. Despite efforts being made, it appears though that no such sources existed in the 1950s. It should be remembered, however, that Soviet penetrations of British intelligence existed at this time. Kim Philby, a senior SIS officer responsible for anti-Soviet operations in SIS and later the liaison officer with the CIA in Washington, and George Blake, who betrayed SIS operations in the GDR and any other classified data he had access to, would likely ensure that if such sources existed they would have had a short lifespan.

Although not mentioned in declassified files it emerged in a British newspaper article in 2001 that a chance may have been lost for British intelligence to recruit another Soviet rocket source.[277] In early 1950 a Russian named Alexander Orlov entered the British embassy in Moscow offering documents on Soviet rocketry including a report highlighting plans for the next 15 years. Within four days of the visit, and before any data were passed, he was arrested by the secret police and executed a year later according to Soviet secret police files mentioned by Warren. His recruitment as a junior member of a highly sensitive research centre could have been a great asset to the West. As Oleg Gordievsky, (KGB defector in the 1980s) commented, "… if you study what the West knew about the Soviet Union in the

[275] Ibid.,p.74.
[276] TNA. DEFE 21/40 *USSR "Special Visitors" 1947.* Tokaev had also provided notes on Politburo meetings concerning rockets from August 1947.
[277] Warren, Marcus; "The Soviet spy who was left out in the cold", *Daily Telegraph* 28 April 2001. For my research I contacted Mr Warren who could provide no further information for the story, which had come from a Russian source.

Forties and Fifties, it was amazingly little. This would have been a great coup for Britain."[278] The case, of which the British Foreign Office said it had no record, does not appear in any intelligence literature or memoirs. It clearly showed the dangers faced by human agents or would-be defectors in the Soviet Union and the pervasive nature of Russian surveillance at that time.

Continuing Intelligence Collection Problems

The problem of intelligence collection against Soviet ballistic missiles and Moscow's intentions is a constant theme during the early Cold War. As early as 1949, after a Joint Anglo-American Guided Missile Conference, British intelligence concluded that collecting intelligence on ballistic missiles was as difficult as determining Soviet intentions. The final conference report said that "…short of obtaining access to the proceedings or directives of the Politburo, there is no infallible method of determining the aims of Soviet guided missile policy".[279] This was reinforced in 1958 in a statement by Major General Kenneth Strong, Head of the Joint Intelligence Bureau, examining how the Soviet Union would fight a war in the 1960s which concluded "…there is scarcely any evidence as to how their leaders think or would act in given circumstances."[280] Lack of intelligence on high-level decision making was also reflected in the dearth of intelligence about Soviet rocket programmes, testing and deployments. In 1954 a study of Soviet guided weapons concluded that "information on the Russian native development of a ballistic rocket is scanty, but such a project is now known to exist."[281] Its progress and performance could however only be the subject of conjecture. The same report also admitted that there was a "complete lack of positive information on actual large-scale production of surface-to-surface missiles, including the ballistic rocket."[282] What form any project would take remained obscure but British intelligence assessed that the Russians did not lack the ability to undertake a rocket production and testing programme.[283] This seems slightly better than a previous British assessment from 1952 which concluded that, "in the absence of any real knowledge about any Russian development, the only safe

[278] Ibid.
[279] TNA. DEFE 44/99 *"A Study of the Soviet Guided Missile Programme: Joint Anglo-American Conference"* March 1949.
[280] TNA. DEFE 13/342 *"Soviet and Communist Bloc Capabilities and Intentions."* Memorandum by Major General Kenneth Strong 04 February 1958.
[281] TNA. DEFE 44/3 *"Study of Soviet Guided Weapons Part II"* September 1954 p.3.
[282] Ibid.,p.36.
[283] Ibid.

course was to assume that a potential enemy could do at least as well as ourselves."[284] This seemed to run the risk of the UK "arms-racing" against herself prompted by the problem of "mirror imaging" raised in the introduction to this thesis.

Technical solutions to the ballistic missile intelligence problem were being considered in 1954. It was however, found that "Turkey offered little hope of obtaining ELINT information on Soviet rocket firings" because interception facilities needed to be closer to the ranges.[285] This would only likely be achieved by aircraft penetrating Russian airspace. The UK Ministry of Defence also considered that for ELINT, "the Baltic area might produce the best results."[286] It was also noted that GCHQ had a Guided Weapons COMINT programme and "they were putting a big effort into this intelligence field" and "had formed a team of ten people."[287] By 1957 the situation had improved, likely aided by the U-2 over-flight programme which started in 1956, and by developments in SIGINT.[288] A JIC report in 1957 noted that "intelligence independent of German sources continues to increase rapidly" and "a large part of the current offensive guided weapons programme is known."[289] It is unclear though how this was achieved and what the JIC thought it knew. The JIC did however admit that "we do not know the location of all major research and development establishments."[290]

Interestingly, an intelligence report from 1959 stated that British intelligence could monitor static rocket engine test firings which had been "heard since 1953" at Kaliningrad near Moscow.[291] It had logged 116 firings and there had been "continuous cover" between March-October 1958 of firings of 40, 120 and 180 seconds. These engine firings "have been recorded" but it is unclear if this was done by equipment located nearby, a seismic monitoring station in a nearby country or if there was a human source in close proximity to

[284] TNA. DEFE 10/38. Memorandum DRP/M(52)7 01 April 1952.
[285] TNA.,DEFE 10/497. Joint Technical Committee Meeting of 07 September 1954 p.2.
[286] Ibid. It is unclear though what progress was made and which Soviet facilities were targeted.
[287] Ibid.,p.5.
[288] Freedman, Lawrence *US Intelligence and the Soviet Strategic Threat* (Princeton, 1986) p.69. Freedman lists the main intelligence sources re: Soviet ballistic missiles as a US radar station at Samsun, Turkey and later radars in the Elburz mountains and Meshed, Iran.
[289] TNA.,CAB 158/36. JIC(59)29 *"Soviet Research and Development Up To End of 1958*" p.13.
[290] Ibid.
[291] Ibid.,p.16.

this facility.[292] Such declassified details make it highly likely that much more detail of obscure technical intelligence collection operations remains to be released from archives. Aldrich notes that the allies used powerful "Over the Horizon" radars codenamed SANDRA and ZINNIA. The former was a British system and was based in Cyprus to monitor Russian missile tests from 1961.[293] During research in The National Archives, I gathered more information on this highly-sensitive operation which does not feature in any other literature.

A Special British Project

The British had been experimenting with long-range high frequency radar since 1955 and had managed to detect aircraft at ranges of 1000nm.[294] From October 1959 until January 1960, experimental ZINNIA radar was used in the US under Project BART to track American missile launches at Cape Canaveral, Florida from a site in the American north-east.[295] This was undertaken because the UK did not launch ballistic missiles and a "live" target was needed to develop the ZINNIA technology to monitor Soviet missile tests. This novel and highly-secret technology, which involved bouncing high-frequency radio signals off the ionosphere, offered the potential to see beyond the horizon and monitor targets at extreme range. During Project BART the radar was able to detect a Boeing 707 aircraft at ranges of 1400km and 2300km and ballistic missiles to a range of 1800km.[296] ZINNIA technology was again developed with the help of the Americans and help and guidance was provided by the CIA. Another secret radar system codenamed CHAPLAIN was also developed as a missile detection system by the Americans with British participation. Experiments using the system were undertaken from Horsea Island, UK and Somerton, UK in 1959 to establish if it could monitor activity at Russian missile ranges from a base in the UK.[297] A trial was also mounted from Slough, UK to aim a radio beam at the Russian missile testing facilities at Tyuratam and Kapustin Yar to gather data for when CHAPLAIN deployed operationally.[298] The results of these secret endeavours are unknown but American personnel visited the Royal Aircraft Establishment at Farnborough in 1960 to be briefed that the CHAPLAIN system was

[292] Ibid.
[293] Aldrich, Richard *GCHQ: The Uncensored Story of Britain's Most Secret Intelligence Agency* (London, 2010) pp.322-323.
[294] TNA. DEFE 44/93. *"ZINNIA Trials in the United States"* p.3.
[295] Ibid.
[296] Ibid.
[297] TNA. DEFE 21/8. "*Scientific Intelligence Projects, CHAPLAIN, ZINNIA and SANDRA 1958-60" p.3.*
[298] Ibid.

"yielding limited results."[299] Collaboration on these top secret projects demonstrates the close relationship between the two states on missile intelligence. British personnel noted that "our modest programme is held in high esteem" and the Chief of the Defence Staff was briefed that the "Americans have made information on CHAPLAIN freely available to us only because of our own successes with ZINNIA."[300]

British development of ZINNIA was driven by Air Intelligence's assessment that there would be a serious threat to the UK from Soviet Intermediate Range Ballistic Missiles with 2-3 years.[301] The Ballistic Missile Early Warning Station at Fylingdales in the UK was not due to enter service until 1963 and the two other stations in the system in Greenland and Alaska did not have the range to detect shorter range missile launches against the UK. The ZINNIA system could offer a limited basic early warning system to close this temporary vulnerability and in an emergency could monitor some Soviet missile sites.[302] A version of ZINNIA called ZINNIA 2 could detect a disturbance in the ionosphere caused by the passage of a ballistic missile and this capability could be exploited for early warning purposes as well as intelligence collection.[303] ZINNIA 1 was designed by the UK to detect and track aircraft and ZINNIA 3 was to track ballistic missiles.[304]

The ZINNIA system was a useful covert capability for aircraft and missile intelligence. It used a "continuous wave" of high frequency radio energy directed towards a target area. The continuous nature of its signal, rather than regular pulses emitted by conventional radar, was designed to obscure its purpose. Using longer range high frequency signals meant that the Doppler shift of the returning signal could be examined when the signal was reflected off a moving target.[305] CHAPLAIN was a similar American system which was used to monitor Soviet missile launches and nuclear explosions and the UK used a version of this as well.[306] The theory of the systems was apparently sound but the new technology needed to be

[299] TNA. DEFE 21/9. *"Scientific Intelligence Projects CHAPLAIN, ZINNIA and SANDRA 1960-63".*
[300] Ibid. Briefing to the Chief of the Defence Staff 14 November 1960.
[301] TNA. AIR 20/11427. Letter from Air Ministry to MOD 900/28 30 January 1961.
[302] Ibid.
[303] Ibid. Letter from VCAS to SofS 16 January 1961 concerning trials of ZINNIA 2.
[304] TNA. AVIA 6/21476. *"RAE Trials in the USA of ZINNIA Ionospheric Reflection Radar" July 1960.*
[305] TNA. DEFE 44/90. *"Further Report on ZINNIA"* September 1959.
[306] Ibid.,p.1.

developed; events could be picked up 2-3,000 miles away during experiments but their nature was unclear.[307] By 1960 the RAF wanted funding to urgently deploy a ZINNIA system to Cyprus to monitor Soviet missile and aircraft activity. The transmitter was based at Akrotiri and the receiver at Pergamos, both in Cyprus. This meant that a justification for it had to be prepared and details of the system articulated which have now been declassified. The RAF facility was assigned the codename SANDRA and was an operational version of ZINNIA 3.[308] The high frequency transmitter would reflect signals from the surface of fast-moving objects at a distance of 1200 miles and it was described as "invaluable to confirm information."[309] This could refer to material gathered from electronic intelligence collection or other radar sources. The data gathered could reveal the nature of missile firings, their frequency and state of development. Tests with SANDRA were reported to be "very satisfactory" and the transmitter was "very difficult to detect in use."[310] The British used a clever and covert method of aiming the radio beam to bounce on either side of a target and some distance away from it so that the USSR would not know that its bases were being targeted. When ZINNIA was tested in the US against the Atlantic Missile Test Range, the American missile firers had not known that they were being monitored so its covert nature was proven.[311] The Americans used a pulse radar system and were content to allow the British to develop their 'silent' system.

The Treasury allocated one million pounds to build the facility in Cyprus and the project was deemed a success as it allowed disparate data to be fused together, although its nature has not been revealed.[312] SANDRA was also built because British intelligence thought that intelligence "collateral would diminish greatly" over the next couple of years.[313] It is not clear what this finite collateral material was, whether radar or signals intelligence or even material from Colonel Oleg Penkovsky who is discussed in Chapter Four. SANDRA was also useful in providing data on the intensity of missile firings which could show whether a missile was in the test stage or being proved before deployment. It should be noted though

[307] Ibid.
[308] TNA. T225/2198. *"RAF Requirements of Radio Equipment for the Surveillance of Missiles and High Speed Aircraft at Long Ranges (SANDRA).* Memorandum from Air Ministry to Treasury 11 October 1960.
[309] Ibid.
[310] Ibid.
[311] Ibid.
[312] Ibid.
[313] Ibid.

that SANDRA could monitor known missile testing facilities and firings being undertaken in a particular direction but would not be much use for providing early warning to monitor missiles launched from unknown launching bases in the USSR or mobile systems. The SANDRA system apparently continued to be used until the 1970s. The CIA's history of its Office of Special Activities also reveals that the special long-range "back-scatter" radar system called CHAPLAIN was deployed and operated near Karachi, Pakistan in 1960.[314] This was used to monitor Soviet missile launches covertly with unknown success as much of the document is redacted. It is likely that data from this facility would have been shared with the UK just as the Americans would have benefitted from SANDRA. Many documents on these projects are withheld or redacted and much material is likely still to be released. Sensitivity still remains likely because Cyprus is to this day a major intelligence collection facility for the UK.

In 2014 information was also made public about the secret role of the radio telescope at Jodrell Bank in the UK during the Cold War following the death of its founder Sir Bernard Lovell and the release of his papers.[315] An operation codenamed CHANGLIN (previously LOTHARIO and VERIFY) was run from Jodrell Bank in the early 1960s which involved Fighter Command installing equipment to use the telescope to transmit radar signals and provide warning of a Soviet nuclear attack. It emerged that even before the Cuban Missile Crisis the RAF had sent personnel and equipment to the facility every six weeks to undertake training and make radar scope observations.[316] In an emergency, RAF personnel would have been stationed there permanently. Interestingly, many papers have been removed from the file and are retained for decades so establishing Jodrell Bank's exact role in any intelligence collection role is not yet possible. It is likely though that this unique facility was used in a collection role against Soviet space and missile launches. A memorandum is on the declassified file, sent from the Air Ministry to GCHQ in 1962 which mentions "GCHQ experimental equipment" being in the operations building.[317] It is possible that GCHQ were using the telescope to collect radio signals which were bouncing off the surface of the moon or monitoring transmissions from Soviet satellites and space activity or may even have

[314] See www.http://Cryptome.org/2016-00038. "CIA History of the Office of Special Activities 1969". Chapter 5 p.11.
[315] TNA. AIR 20/12162. *"Sir Bernard Lovell Papers (Secret Role")*
[316] Ibid. See *"Op CHANGLIN - Fighter Command Regulations and Procedures"* dated 29 October 1962.
[317] Ibid. See Memorandum from Air Ministry to GCHQ c.110374/2798 dated 01 November 1962.

engaged in other esoteric intelligence collection activities using Jodrell Bank's new technology.

The Templer Report – Missile Intelligence

British intelligence had difficulty establishing how many ballistic missiles the USSR had produced and deployed. In 1958 an intelligence report stated that "there has been no evidence which confirms that there are missile sites in the Soviet Union."[318] This did not of course prove that they did not exist but highlights the severe intelligence problems faced by British intelligence in locating and identifying Russian ballistic missiles. An overview of the problems posed by this issue became apparent in the Templer report of 1960 which examined the UK's military intelligence organisation and explored whether the process of intelligence assessment should be centralised.[319]

The review conducted in 1960 by Field Marshal Sir Gerald Templer, Chief of the Imperial General Staff, was the first study that considered, in part, intelligence collection against ballistic missiles. It also examined the general organisation of intelligence collection and analysis within Britain's armed forces. Templer noted that "scientific and technical intelligence is increasing in importance both on account of the nature of modern weapons and because our intelligence about those held by our potential enemies is largely obtained through scientific means."[320] This insightful comment from a leading figure in the British military showed how dependant the UK had become on scientific and technical intelligence and the recognition of its importance by decision-makers. He further commented that "the assessment of the long-range missile threat poses the issue in its acutest form at present."[321] This demonstrated the urgency of the problem and the security implications if intelligence could not be gathered.

[318] TNA.,CAB 158/32. JIC(58)48 "*Likely Scale and Nature of an Attack on the UK in the early stages of Global War"* 12 June 1958 p.5.
[319] TNA.,AIR 8/1953 "*Review of Intelligence Organisation"* By Field Marshal Sir Gerald Templer 16 December 1960.
[320] Ibid.,p.14.
[321] Ibid.

The Templer report generated controversy within the intelligence community because it questioned the best way to assess intelligence on ballistic missiles. The Joint Intelligence Committee had the Guided Weapons (Scientific and Technical) Working Party, the Electronics (JIC sub-Committee) Working Party and the Guided Weapons (Orbat and Production) Working Party all reporting to it on ballistic missiles. Templer noted that the Joint Intelligence Bureau liked a "group" estimate due to the complexity of the issues and also having several parties of experts reporting to it.[322] He further found that the Air Ministry did not favour a group estimate and regarded themselves as the experts on missile intelligence as they "owned" the UK's air weapons systems.[323] The report became more controversial when Templer said that "no air force can be expected dispassionately to assess the effect of rockets on their very raison d'etre."[324] This comment by an army officer about the Royal Air Force implies that the Royal Air Force would underestimate the Soviet missile threat in order to prolong the life of its bomber squadrons. This was regarded by staff in the Air Ministry as a slur and was totally rejected. As the Chief of the Air Staff's office noted, "it cannot be argued that the RAF feel that the advent of missiles will spell the end of its career."[325] They also noted that the process of examining intelligence issues in the Joint Intelligence Committee would "expose any bias to challenge."[326] The Air Ministry was not happy with the Templer Report and thought that it "treats the problem of missile intelligence somewhat superficially."[327] Instead of examining the best approach to ballistic missile intelligence, the major participants seem to have spent more time complaining about the content of the report and trying to protect their reputations and the needs of their respective services.

Correspondence generated by the Templer Report provides insights into the problem of ballistic missile intelligence at that time. The Chief of the Defence Staff (CDS) noted that the main sources of intelligence on Soviet ballistic missiles were "GCHQ, radio-proving flights, air photographs, MI6, Air Attachés and Service Technical Intelligence."[328] These were likely to have been the same sources that existed from 1949 onwards. However, the validity of this statement cannot be judged because material from SIS and GCHQ has not been released to

[322] Ibid.,p.15.
[323] Ibid.
[324] Ibid.,p.3.
[325] Ibid. "Missile Intelligence" note by CAS 07 March 1961.
[326] Ibid.,p.3.
[327] Ibid.,p.4.
[328] TNA. AIR 8/1953 *Review of Intelligence Organisation* CDS Memorandum to PS CAS 17 March 1961.

The National Archives but the issue of aerial reconnaissance is dealt with in Chapter Three. The issue of SIS's success in recruiting Colonel Oleg Penkovsky as a human source in Moscow is also examined in Chapter Four. CDS thought that the main ingredient in threat assessment was "the application to the intelligence of up-to-date professional military "know-how" and concept."[329] This assumed of course that the data being examined was accurate and enough of it was available to make deductions about the target. It should be noted that the UK did have some experience with ballistic missiles from developmental work on its own *Blue Streak* ballistic missile system and managing the deployment of American-supplied *Thor* ballistic missiles to the UK from 1959 until 1963. Scientists and engineers dealing with these issues would likely have been able to help with British government intelligence analysis.

The Joint Intelligence Bureau, after the Templer Report, seemed content with leaving ballistic missile intelligence arrangements as they were. They noted that "the bulk of the intelligence on Soviet scientific research and development on missiles comes from GCHQ intercepts which is processed by Air Intelligence (Tech) and in the past from air reconnaissance (U-2).[330] The loss of the U-2 on 1 May 1960 appears to have terminated this source and showed the close relationship between the intelligence services of the two countries. It is also unknown whether the GCHQ intercepts were of telemetry, speech communications or decoded communications. This reveals the major intelligence sources at this time and Joint Intelligence Bureau thought that assessment and analysis were best done by "RAF experts liaising with the missile industry."[331] It further noted that "nearly all the intelligence we get is on technical development trials and training firings" and precise intelligence was not available with any assessments being the product of "opinion, experience and judgement."[332]

The Danger of Ballistic Missile Attack and Improvements in Technical Intelligence

By 1958 the JIC had concluded that the Soviet ballistic missile programme was advancing and it was "evident that considerable manufacturing is taking place" but "we have as yet no

[329] Ibid.,p.2.
[330] Ibid.,Memorandum from JIC to ACAS(I) 09 September 1960.
[331] Ibid.,p.13.
[332] Ibid.,p.21.

proof that any weapon is in service."[333] This showed the difficulty of detecting if and how many missiles existed and where they were based. Any intelligence seemingly had to be collected during the research and development phase because collecting intelligence as a missile passed through the industrial production phase and later into military service was too difficult to achieve through remote observation. This was a serious issue because a later report noted that Soviet ballistic missiles featured on the JIC's "Red List" for the highest priority of intelligence targets. The key intelligence requirement was on "bringing to an increased state of readiness the strategic missile units in the USSR or in Soviet-controlled territory."[334] This would be difficult to achieve as the UK did not know how many missiles the Soviet Union had, if they were deployed or where they were based. In 1958 the JIC continued to take the view that the defeat of the UK would be a top Soviet military priority because this could lead to a collapse in NATO's war fighting capability in the event of conflict.[335]

The JIC further assessed that Russia's priority was the security of the USSR and to destroy the UK's nuclear bases (aircraft and missiles), the air defence system and the Centre of government. Ballistic missiles had a key role to play in this and the JIC thought that the USSR would likely mount an "all out air and missile attack on the UK's will to fight and war potential."[336] However, the JIC could not estimate the number of ballistic missiles the Soviet Union might use in an attack on the UK; they assessed that it was likely to simply supplement an air attack.[337] It assessed that by 1961 the USSR was likely to have an IRBM with a one megaton warhead and "the scale of ballistic missile attacks might be considerable."[338] The danger of attack also included the limited warning time the UK might receive of a Soviet ballistic missile attack. A JIC report from 1958 had assessed that if the Soviet Union placed 650 mile range ballistic missiles in East Germany then the UK might get 24 hours notice that they were being prepared for firing.[339] The weapons would have to be removed from storage,

[333] TNA. CAB 158/31. JIC (58) 7 *The Soviet Strategic Air Plan in the Early Stages of a Global War* 24 February 1958 p.9.
[334] TNA. CAB 158/31. JIC (58) 17 *Indicators of Soviet Preparations for Early War* 02 May 1958 p.3.
[335] TNA. CAB 158/32. JIC (58) 48 *Likely Scale and Nature of an Attack on the UK in the Early Stages of Global War up to 1962* 12 June 1958 p.2.
[336] Ibid.,p.2.
[337] Ibid.,p.5.
[338] Ibid.
[339] TNA.CAB 158/32. JIC (58) 50 *Warning of Soviet Attack on the West using Guided Weapons up to the end of 1957* 20 June 1958 p.1.

matched with a nuclear warhead and then deployed to a firing site. The weapon would then have to be fuelled with liquid fuel after orders had been given to undertake these actions. Monitoring communications or human intelligence would be the most likely means of detecting such a ballistic missile deployment. In the event of a ballistic missile actually being fired from East Germany there would be less than ten minutes warning of attack. This warning would likely have come from radars on the continent.[340] The JIC thought that an attack would be timed to hit the UK in the early hours of the morning and would likely be in April to October so that Soviet air defences would be operating in favourable weather.[341] The USSR might also have attacked over a holiday period or the weekend when alertness in the UK would be at a lower level.[342]

However, the British military did seem optimistic about dealing with an attack by Soviet nuclear bombers. The Chief of the Defence Staff wrote to the Chief of the Air Staff to comment "that the Soviets should feel compelled to face the problems of developing and deploying ballistic missiles against the UK is in itself a tribute to the value of our fighter defence."[343] It also reflected the fact that advanced technology was being developed by the USSR against which the UK could not defend itself and would have very limited warning in the event of a missile launch. This also posed a threat to the UK's bomber-based nuclear deterrent because there would be several hours warning of a Soviet bomber attack but likely none if ballistic missiles were used. The shorter range ballistic missiles were also the prelude to longer-range systems designed to strike the United States. The development and deployment of one technology would lead to another.

In 1958 the Chief of the Defence Staff stated that "today the threat is solely from manned bombers"[344] but this was a threat the UK was aware of whereas intelligence on Soviet ballistic missiles remained limited thereby making its assessment difficult. A JIC memo circulated in early 1958 concluded that "we believe that the Soviets can make available the

[340] Ibid.,p.2.
[341] Ibid.,p.3.
[342] Ibid.
[343] TNA.DEFE 9/970 *Air Defence of Great Britain* CDS Memorandum 2810 29 October 1958 p.2.
[344] Ibid.,p.2.

industrial capacity to manufacture whatever quantity of missiles they may need."[345] However, there was no evidence of the intentions for their missiles' use, their production rates, locations or the existence of units.[346] The JIC concluded that the USSR could develop a "complete family of missiles" to take "advantage of complete surprise" in order to destroy the West's retaliatory capacity.[347] This was a sombre assessment that the Soviet Union could build and deploy systems with the UK having very limited knowledge of them. However, it thought that the USSR would be unable to destroy all western retaliatory capacity due to American ballistic missiles being kept in hardened silos and allied nuclear bombers being dispersed.[348]

By 1959 more intensive technical efforts had been made to collect intelligence on Russian ballistic missiles and their testing facilities were being monitored either by radar or SIGINT collection.[349] During my research I discovered a United States Air Force intelligence briefing film which described its intelligence collection methods in 1960.[350] This brief states that the United States used unspecified low technology capabilities to monitor Soviet missile tests before 1955 but in that year it installed powerful AN/FPS-17 radar at Diyabakir in south-eastern Turkey as well as new ELINT equipment to monitor Soviet ballistic missile tests. In 1958 the brief states that the radar was upgraded to increase its range from 1000nm to 2000nm using extra beams to cover the Kapustin Yar missile range. The film states that generally all missile firings beyond 600nm range could be monitored. The USAF then added powerful radar at Shemya Island in the Aleutian group from February 1959 to monitor ICBM and space launches from Tyuratam. The brief revealed that since January 1960 "several hundred" missile firings had been made from both locations at various ranges to test equipment. Tyuratam was said to have been discovered in "early 1957" and although unstated, this was likely to have been through a U-2 over-flight. No ELINT coverage of Tyuratam was available until late 1957 but then good coverage was made available of missile firings from there to the Kamchatka Peninsula in the Soviet Far East. Good telemetry was

[345] Ibid.,Memorandum from the JIC to Prime Minister 28 December 1957 p.2.
[346] Ibid.
[347] Ibid.
[348] Ibid.
[349] Goodman, Michael *Spying on the Nuclear Bear: Anglo-US intelligence and the Soviet bomb* (Stanford, 2007) p.196. Goodman describes the use of SIGINT and radar facilities in Turkey at this time.
[350] See https://www.youtube.com/watch?v=REUnol4yLgg entitled "ICBM: Development of the Soviet Ballistic Missile Threat 1960." This is a secret USAF Air Intelligence briefing from 1960.

also available on any tests made after January 1958 and 21 ICBM tests had been monitored revealing problems with re-entry vehicles and components. The Americans assessed that the USSR would use experience with shorter-range missile systems to feed into the ICBM programme and then make advances. This data was highly likely shared with the UK.

The JIC noted in 1959 that the Russians had launched 350 ballistic missiles with ranges of up to 1000 miles and achieved vertical firings of up to 250 miles.[351] It noted that "a large number of telemetry intercepts had been made" and some data had been intercepted "during the motor cut-off phase" indicating that SIGINT was used to collect the intelligence and records had been built up which were being interpreted.[352] The JIC did not have "reliable evidence of surface-to-surface Guided Weapon operational sites."[353] They did however assess that ballistic missiles with a range of 700 miles "are, or could be, operational now" and noted that in the 1957 Moscow military parade a Russian missile with the NATO codename SS-3 SHYSTER was seen and "may have been launched to 650 nautical miles."[354] This shows that visual observation by personnel was still important and this material was then collated with data from other intelligence sources. The JIC noted that "the appearance of rockets on the 7 November parade indicated that some guided weapons now have operational status."[355] It also noted that the Russians may have been matching nuclear weapons and ballistic missiles as there was a "single indication of surface-to-surface missiles and nuclear tests in 1956."[356] By 1955 the USSR had a usable hydrogen bomb but there are no reports available concerning British assessments of the possibility or impact of these weapons being fitted to ballistic missiles.[357] It is unclear how long it took the Russians to reduce the size of a thermonuclear weapon to be fitted into the nose-cone of a rocket or if they used atomic bombs for many years instead.

The JIC explored the possibility of the Soviet Union possessing mobile nuclear missile systems and thought that missiles with a range of 650 nautical miles could be "securely based

[351] TNA.CAB 158/35. JIC (59) 3 *Sino-Soviet Bloc War Potential 1959-63* 11 February 1959 p.21.
[352] Ibid.
[353] Ibid.
[354] Ibid.
[355] TNA.CAB 158/36. JIC (59) 29 *Soviet Research and Development up to the end of 1958* 25 May 1959 p.3.
[356] TNA.CAB 158/35. JIC (59) 3 *Sino-Soviet Bloc War Potential 1959-63* 11 February 1959 p.43.
[357] Dylan p.126.

in the USSR and moved to previously surveyed launch points in the satellite countries with little or no warning."[358] Such a move would make the UK vulnerable to pre-emptive attack. It noted that in September 1959 a "reliable source" had observed a Soviet military train at Frankfurt/Oder carrying eight long trailers. The agent had photographed these trailers and they were assessed as being the same as those carrying SHYSTER ballistic missiles at the November 1957 Moscow military parade.[359] It is unclear who this "reliable source" was, but it appears that either British or allied intelligence services were able to maintain surveillance on railway lines either using human sources working on the railways or living in close proximity to major transit points.

The JIC noted that there had been earlier reports of trailers used for Soviet missiles being seen in East Germany on another train but there were no reliable pictures of ballistic missiles in East Germany.[360] British intelligence was also likely relying on the British Military Mission to East Germany (BRIXMIS) to gather some intelligence. The JIC noted that "82 special wagons" and liquid oxygen wagons had been noted in 1959 and photographs taken in the "Zossen Training Area" which could indicate the presence of ballistic missiles.[361] They calculated that there was enough liquid oxygen present to operate 100 SHYSTER missiles and thought that this system was available in "considerable numbers", possibly 700-800 depending on the warhead size and weight.[362] The presence of trailers and movement of other equipment associated with the 650 nautical mile range SHYSTER missile led the JIC to conclude that "there are indicators of an intention to equip the Group of Soviet Forces Germany with SHYSTER surface-to-surface missiles."[363]

The prospect of an attack at short-notice was viewed seriously by British intelligence. The JIC noted that "we have virtually no chance of intercepting either the policy decision to go to war or the operational orders for the attack."[364] They further noted that "the present allied

[358] TNA.CAB 158/35. JIC (59) 3 Sino-Soviet Bloc War Potential 1959-63 11 February 1959 p.43.
[359] TNA.CAB 197/7. *Annex to Review of Current Intelligence as at 20 October 1959.*
[360] Ibid.,p.6.
[361] Ibid.
[362] Ibid.
[363] Ibid.
[364] TNA.CAB 158/36. JIC (59) 33 *Warning of an attack on the West in Global War up to the end of 1960* 01 April 1959 p.1.

radars could provide about 90 minutes warning against bombers; but none against missiles."[365] A 650 nautical mile range missile could easily hit the UK from East Germany and it could be semi-mobile. The JIC thought that deploying this system by road or rail would be hard to conceal (perhaps due to agent coverage) but movement by air would be difficult for the UK to detect.[366] It also admitted that it did not know the "firing requirements" of the missile i.e. the facilities needed and preparatory work required before launch, although they estimated some 24 hours was required before it could be fired.[367] It was also feared that if the USSR forward-based ballistic missiles in East Germany then the systems could merge into normal Soviet activity and "battle deployment would become harder to detect."[368] An increase in their alert state or preparations for a pre-emptive strike would likely remain undetected. The JIC also noted that if long-range ballistic missiles remained based in the USSR then the UK was "unlikely to obtain warning of Soviet preparations to launch an attack with these weapons."[369]

In 1959 the UK Chiefs of Staff also noted that the Russians' "missile programme seemed to be going well"[370] and Soviet forces had been training on missiles with a range of 650 nautical miles for two years. Some analysts assessed that the ballistic missile threat "would equal or exceed" the manned bomber threat in 1960-61 and that the missile threat would dominate by 1964-65.[371] However, other analysts thought that missiles would gradually become more important over a longer period of time and "it was accepted that we could not defend the UK."[372] The priority was to become the defence of the UK's deterrent bases using surface-to-air missiles or the nuclear deterrent would have no credibility. Rather than defend the population, the UK's nuclear weapons would be defended instead in order to stop the USSR from attacking the country in the first place.[373] The Chiefs of Staff thought that by 1965 the missile threat would dominate but the UK would still need air defences or the Russians could use bombers against the UK unopposed.[374]

[365] Ibid.,p.2.
[366] Ibid.,p.4.
[367] Ibid.
[368] Ibid.,p.5.
[369] Ibid.
[370] TNA. DEFE 4/123 *COSCOM Committee Confidential Annex - Meeting* 22 December 1959.
[371] Ibid.
[372] Ibid.
[373] Ibid.
[374] Ibid.

From 1960 onwards the JIC still continued to pay close attention to Soviet ballistic missiles. They assessed that "the Soviet Union is unlikely to start a global war as a deliberate act of policy" but rather the danger lay in "political miscalculation between the Soviet Union and the West" or "incorrect appreciation by one side that an attack had been launched by the other."[375] The JIC thought that if a war did start then the USSR would seek to "neutralise the UK and to occupy Europe."[376] They further assessed that by 1963 the USSR would have sufficient missiles to attack targets in the UK without the use of aircraft although it was likely that they would still be used and "bombers would arrive 30-60 minutes after the initial missile attack."[377] There was clearly still a role for bombers although the JIC thought that submarine-launched ballistic missiles would not be used against the UK but instead would be saved for attacks on North America.[378] Only very limited information was available on Russia's submarine-based nuclear weapon systems and little information has been declassified on the few Soviet boats deployed by 1962.

The JIC also noted the formation of the new military command controlling the Soviet Strategic Rocket Forces on 7 May 1960. It found that "the responsibilities of the Command are not yet clear" although intelligence had picked up that "missile insignia of several types have been seen worn by both ground and air force troops."[379] The importance of ballistic missiles was shown by the Commander of the new force being made a deputy Defence Minister. It was during 1960 that the JIC first observed "the testing of a 2000 nautical mile ballistic missile has begun and has provided the first evidence of an IRBM development."[380] This important milestone would enable long-range rocket attacks to be made on the UK from inside Soviet territory. However, the JIC also had to admit in 1961 that "it is not possible to give a detailed estimate of numbers, types and yields of warheads in the Soviet stockpile."[381] Although it knew that progress with ballistic missiles was being made, there was little idea of numbers manufactured or where they were deployed. The Soviet policy on the allocation of fissile material to make warheads was unknown therefore making it hard to determine how

[375] TNA. CAB 158/30. JIC (60) 34 *Scale and Nature of Attack on the UK in the early stages of Global War up to 1964* 11 April 1960 p.1.
[376] Ibid.,p.2.
[377] Ibid.,p.4.
[378] Ibid.,p.5.
[379] TNA. CAB 158/42. JIC (61) 3 *Sino-Soviet Bloc War Potential 1961-65* 14 September 1960 p.65.
[380] Ibid.,p.65.
[381] TNA. CAB 158/44. JIC (61) 74 *The Nuclear Threat to CENTO* 13 October 1961 p.2.

many missiles would be built. The JIC stated that the USSR "may have a total of a few thousand."[382]

By 1962 intelligence appeared to have improved on Soviet ballistic missiles and this likely reflects data provided by Colonel Oleg Penkovsky and early spy satellites. The JIC was able to assess that in a nuclear attack on the UK, a 1000 nautical mile range missile was likely to be used and of 200 available launch pads "at least 100 are likely to be targeted against the UK."[383] The knowledge of how many launch pads were available to the Russians suggests that they had been seen and the JIC estimated that 350 launch pads would be available for IRBMs and MRBMs and this number was likely to increase.[384] It continued to assess that the Russians would seek to destroy bomber and missile bases in a surprise attack and as their missiles were inaccurate they would use high-yield warheads in the megaton range.[385] The JIC now thought that the Russians had enough missiles to allocate one to each target in the UK and thermonuclear warheads were fitted to them.[386]

Looking ahead to 1966, the JIC in a report from 1962 concluded that "it has now become possible to estimate the Soviet missile threat with some confidence, at least up to the end of 1963."[387] The tone of reporting became optimistic and confident and may reflect intelligence gathered by satellites or be the product of the Soviet intelligence insider Colonel Oleg Penkovsky. The JIC assessed that the Russians had 280-310 IRBM/MRBMs and this estimate agreed with that of the United States likely because they were working off the same basic data generated by Penkovsky and satellite collection.[388] This threat assessment was drawn up using information about the probable extent of missile site construction, although it was possible that a second missile could be fired from a pad after 24 hours.[389] The JIC concluded

[382] Ibid.,p.2.
[383] TNA. CAB 158/46. JIC 62 (37) *Likely Scale and Nature of Attack on UK in the early stages of Global War up to 1966* 31 May 1962 p.2.
[384] Ibid.
[385] Ibid.
[386] Ibid.
[387] TNA. CAB 158/45. JIC (62) 28 *The Soviet Missile Threat up to the End of 1966* 12 April 1962 p.1.
[388] Ibid.,p.2.
[389] Ibid.

that Soviet IRBM and MRBMs posed a "very severe threat" to Western Europe's capacity to wage war.[390]

The Soviet ICBM, Space and Khrushchev's Statements

There are few mentions of Soviet ICBMs in JIC papers during the period under examination. The UK's main concern was likely the Soviet programme to develop IRBMs and MRBMs because they posed the greatest threat to Britain. These systems were also of interest to the United States as well because they would provide the developmental work which would contribute to the ICBM programme. Shorter-range ballistic missiles also posed a threat to Strategic Air Command (SAC) bases in Europe and Asia. Crucially, by building the ICBM, for the first time, a foreign power would have the means to strike deep into American territory unopposed and the United States would be unable to prevent this nuclear attack.

After the spectacular launch of the Soviet satellite *Sputnik* in October 1957 the United States felt an increasing sense of vulnerability and an impression was emerging that they were falling behind the Soviet Union in terms of science and technology. This feeling was made worse by statements from Soviet Premier Nikita Khrushchev boasting in public about the number and quality of nuclear missiles the Soviet Union possessed. This was the era of the "missile gap" as the United States' intelligence departments and the armed forces inflated their estimates of the size of the Soviet Union's nuclear missile arsenal. Britain did not develop a missile gap 'mentality' and its intelligence assessments did not seem to be heavily influenced by bureaucratic interests and the needs of the military or industry.[391] However, Russian possession of ICBMs did raise the question about whether the United States would use its nuclear weapons in defence of Europe if it risked nuclear annihilation in response? This perhaps increased the case for an independent British nuclear deterrent but this interesting and uncomfortable possibility was unlikely to be raised in public.

[390] Ibid.,p.5.
[391] See Freedman pp.62-80 for the Missile Gap. Also Preble, Chris *JFK and the Missile Gap* (Illinois, 2004) and Roman, Peter *Eisenhower and the Missile Gap* (Cornell, 1995).

British intelligence found that, as with shorter-range missile systems, ICBMs were being developed in remote areas which were difficult to monitor. Again, there were serious intelligence collection problems against this target. As far back as 1956 the JIC had assessed that the Soviet Union could have completed flight trials on an ICBM that could reach the United States in 1960/61.[392] In 1957 the JIC noted that two missile firings had occurred from the Kapustin Yar missile range in August and September 1957 which were "believed to be the start of the ICBM programme."[393] This intelligence came from SIGINT collection directed at the missiles' telemetry, with the interception being done against two systems carrying data on channels discovered by western intelligence. ICBMs needed new collection and analytical techniques which were then being developed. The JIC noted that "the information these (channels) contain has not yet been fully interpreted" so it took many months to derive intelligence from these obscure and novel signals.[394]

The JIC further assessed that the ICBM programme was being run alongside the Soviet Space programme and had to compete with it for resources. It had "most important intelligence" that the "ICBM programme was being slowed up to give priority to space vehicles."[395] It is unclear what this source was but it suggested that the space programme was favoured for its propaganda value rather than the USSR pressing ahead urgently with the development of ICBMs. This assessment conflicted with press reports that appeared in the Soviet Union at that time that Russia possessed, and was producing, missiles with a range of 8000 nautical miles. Concerning these missiles, the JIC concluded that "our evidence, of which we are confident, does not confirm this."[396] It is interesting, as Dylan notes, that the JIC examined open source material from academic literature and government sources to glean intelligence about Soviet missile programmes.[397] In 1959 the JIC assessed that the Russian ICBM did have a propulsion system which, in theory, would allow a satellite to be launched and could carry a 5000lb nose-cone to a range of 5000 nautical miles.[398] British intelligence also knew that the Soviet Union had encountered problems with the ICBM's re-entry vehicle which

[392] TNA. CAB 158/24. JIC (56) 23 *US/UK Guided Weapons Intelligence Conference* 02 February 1956 p.1.
[393] TNA. CAB 158/32. JIC (58) 42 *Soviet Research and Development 1957* 14 April 1958 p.3.
[394] Ibid.
[395] TNA. CAB 158/37. JIC (59) 51 *Soviet Research and Development 1958* 26 May 1959 p.1.
[396] Ibid.
[397] Dylan p.137.
[398] TNA. CAB 158/35. JIC (59) 3 *Sino-Soviet Bloc War Potential 1959-63* 11 February 1959 p.43.

detached from the missile and carried the warhead to the target.[399] It is unclear how this was known but it was likely through the analysis of telemetry by GCHQ and the JIC does not specify intelligence sources. This failing was a serious issue because without a terminal phase delivery system the ICBM would be useless. The JIC further assessed in 1959 that the Soviet Union could have a 3500 nautical mile range ballistic missile available in 1961-63 and it was likely to have a 1 megaton warhead and be able to land within 3-5 nautical miles of a target at that range.[400] It thought that such a system could be deployed as a limited "political" threat as early as 1959.[401] This deployment would enable a message to be sent to the United States that the USSR could hit targets there with impunity. There was no evidence however, of large scale production and deployment of ICBMs in the USSR, nor any indication of a covert build-up for a pre-emptive first strike.

By 1960 more data from unspecified sources had become available to the JIC. British intelligence concluded that ICBMs with a range of 3500 nautical miles "are in an advanced state of development" and "may be in limited series production."[402] There was no Order of Battle information available but the JIC assessed that ICBMs could be operational in 1961-62, although they shared the American view that a few currently available developmental missiles could be fired using range crew.[403] In terms of quality, the JIC thought that "all the types of missile can carry nuclear warheads, and all types are at least as reliable and accurate as similar types being developed in the West."[404] British intelligence had noted several ICBM firings since 1957 to a maximum range of 3500 nautical miles.[405] The JIC estimated that the system might be operational by 1961 and even "hundreds" might be available by 1962.[406] It stated that the American view was that by the end of 1960 ten ICBM prototypes might be available for firing.[407] Importantly, the JIC admitted that it was still unknown if the nose-cones of Soviet ICBMs could reach their targets intact and so it was unclear if missiles were

[399] Ibid.
[400] Ibid.
[401] Ibid.
[402] TNA. DEFE 13/342 *Soviet and Communist Bloc Capabilities and Intentions* Enclosure 14 05 April 1960.
[403] Ibid.
[404] Ibid.
[405] TNA. CAB 158/36. JIC (59) 35 *Current Soviet Capability to Attack the West with Manned Aircraft and Missiles* 26 May 1959 p.3.
[406] Ibid.
[407] Ibid.

actually available for use or still bogged down in developmental problems.[408] When deployed, the JIC estimated that the Russian ICBM under development would have a 3500-5000 nautical mile range and was fifty per cent reliable after launch and could get within 3-5 nautical miles of its target.[409] It noted however that the prototype missile, which could be fired in an emergency, was less reliable and accurate and the JIC did "not envisage ICBMs being employed in attacks against the UK or Western Europe."[410]

British intelligence often appeared to be working with meagre data on ballistic missiles.[411] Comments made by Russian officials or in the Russian media were carefully reported and scrutinised. Mr E C Williams, Scientific Advisor (Intelligence) at the Ministry of Defence attended a Conference in Geneva in 1958 where he met Russians. He reported to the JIC that the Russians had told him that ICBMs were in "mass production" and "in service" as well as being "quite accurate."[412] He stated that the Russians knew that they could not match the United States with bombers but with ballistic missiles they thought "at last we have a key to the American door."[413] The JIC asked Technical Intelligence branches to examine these statements.[414] By 1962 the JIC noted that a test site at Tyuratam/Baiknonur in the Soviet Union was being used for ICBM tests with launches of 3500-6000 nautical miles occurring into the Pacific Ocean.[415] They admitted that they had no details of how the missiles were guided, but speculated it was by radio and they lacked data on the fuel used for Soviet long-range rockets.[416] By 1961 the JIC had access to data provided by Colonel Oleg Penkovsky as well as material from reconnaissance satellites. This material helped to end the "missile gap" controversy and allowed the JIC to assess that by 1962 the USSR would have 12-20 ICBMs available with perhaps 85-100 in 1963.[417] It did note, however, that these missiles would be vulnerable as they were slow to fuel, were stored on the surface and it would take some time for crews to train and familiarise themselves with the systems.[418] As Dylan notes, UK

[408] Ibid.
[409] Ibid.
[410] Ibid.
[411] Dylan p.140.
[412] TNA. CAB 159/31. JIC (59) Meeting on 01 January 1959.
[413] Ibid.
[414] Ibid.
[415] TNA. CAB 158/45. JIC (62) 3 *Sino-Soviet Bloc War Potential 1962-66* 16 February 1962 p.84.
[416] Ibid.
[417] Ibid.,p.85.
[418] Ibid.

assessments on the missile threat were not as pessimistic as those produced in the United States as they generally thought that there would be a longer time lag between testing and deployment so posed little immediate threat.[419] There was also no evidence that ICBMs were in serial production.[420] The West also enjoyed overwhelming superiority in nuclear bombers so this would serve to act as a deterrent to the USSR.

The launch of Sputnik in 1957 did not generate a national security panic in the UK, likely in part because of the nation's experience of German V-2 bombardment in 1944-45 and the realisation that any deployment of Soviet missiles in Eastern Europe could make the UK vulnerable to rocket attack. This was in contrast to the United States where Allen Dulles, CIA Director, called for a period of "national emergency".[421] The JIC recorded that Sputnik "demonstrates considerable rocket prowess" by the Soviet Union.[422] It also admitted that "the Russians are still ahead of the western powers in the development of ballistic rockets."[423] In a study of the Soviet Space Programme late in 1959, the JIB concluded that Sputnik was a "tremendous technical achievement in all the fields concerned with rocketry."[424] It thought it was important though to be cautious in how this was used to measure Russian proficiency with ICBMs. The JIC admitted that it was "still in the dark about the engines" and thought that the rocket used to launch Sputnik could carry a 5000lb warhead some 5000 nautical miles.[425] The Russians also used the satellite Lunik II to hit the moon as the first man-made object to do so on September 13 1959. However, the JIB noted that hitting the moon was a lot easier than hitting a target thousands of miles away from the Soviet Union.[426] It could not be assumed that the Soviet Union possessed similar prowess with military missile systems. Nevertheless, the JIB concluded that the Russians possessed accurate launching systems and good components.[427] The USSR also launched Lunik III on the second anniversary of the launch of Sputnik 1, so it could clearly programme launches and complete technical work on

[419] Dylan p.141.
[420] Ibid.,p.142.
[421] Quoted by Dylan p.140.
[422] TNA. CAB 158/36. JIC (59) 29 *Soviet Research and Development Up To The End of 1958* 25 May 1959 p.3.
[423] Ibid.
[424] TNA. DEFE 44/91 *Soviet Space Programme November 1959* November 1959 p.1.
[425] Ibid.
[426] Ibid.
[427] Ibid.

time. Lunik III also photographed the far side of the moon for the first time and this revealed that the Russians could track objects and receive data.[428]

These space programmes had good propaganda value but likely delayed the development and deployment of Russia's ICBMs as resources and personnel had to be used on them. The JIC noted in 1961, after the Soviet Union put the first man in space, that it was of limited importance and added "little in our estimate of Soviet military strength" but showed that the Soviet Union could carry the arms race into space.[429] Soviet space achievements such as the first animal in space, satellite in space, man in space, man-made object landed on the moon, satellite in orbit round the moon and photographs of the dark side of the moon were a great propaganda victory for the Soviet Union but did not mean that war was more likely or the West was heading for any kind of defeat. It did give the USSR propaganda victories and created opportunities for Premier Khrushchev to make public statements about rockets which were sometimes rash and dangerous.

In 1960 Khrushchev announced to the Supreme Soviet that he intended to replace aircraft "almost entirely" with rockets.[430] The JIC assessed that this was not true but that missiles would be the priority for Soviet procurement and further noted that the Soviet leader "frequently exaggerates" progress in the missile field to project Soviet power and intimidate the West.[431] The JIC examined statements made by Khrushchev to the US ambassador and the Austrian Foreign Minister at a New Year's Eve party in 1959 where he stated that missiles would be a priority item for Soviet defence spending.[432] However, there was no sign at this time that the Soviet Long Range Air Force would reduce in size. Khrushchev may have boasted that the Soviet Union had 50 nuclear bombs ready for use against the UK, though the JIC thought that, if true, most of these would be delivered by bomber and in 1960, the USSR would achieve the capability to attack the UK with IRBMs.[433] Although Khrushchev said that the USSR had enough nuclear weapons and rockets to "wipe attackers

[428] Ibid.
[429] TNA. DEFE 13/342 *Soviet and Communist Bloc Capabilities and Intentions.* Enclosure 33 17 April 1961, memorandum from JIC to Defence Minister.
[430] TNA. CAB 158/39. JIC (60) 2 *Khrushchev Statements on Strategic Attack Weapons* 29 January 1960 p.3.
[431] Ibid.,p.1.
[432] Ibid.,p.3.
[433] Ibid.,p.6.

off the face of the earth", they were not able to annihilate the United States at this time. Khrushchev referred to missiles as "the centre of gravity" and he thought other arms of the Soviet armed forces had lost importance, seeing warships for instance as only suitable for "goodwill visits."[434] The JIC noted that Khrushchev, in front of the Supreme Soviet, stated that the USSR may "even cease production of bombers and other obsolete equipment" and he boasted that there were "more terrible" weapons to come.[435]

The production of bombers did continue though and the statements the JIC examined did seem to be Khrushchev's bombastic rhetoric, but still interesting for intelligence purposes. A previous implied threat to the UK from Soviet ballistic missiles during the Suez Crisis in 1956 had also been dismissed by the JIC as political posturing.[436] With an apt reference to the problems faced by British intelligence, Khrushchev noted that "the territory of our land is vast; we are able to disperse our rockets and camouflage them well."[437] Major General Kenneth Strong, Head of the JIB, noted that Khrushchev exaggerated when he stated in November 1959 that one Soviet factory had produced 250 long-range rockets per year and that their ICBMs would be mobile.[438] Statements made by other leading Soviet military figures were also analysed by the JIC such as from Marshal Malinovski, Defence Minister, who stated that Russia's nuclear missiles could wipe an aggressor "off the face of the earth, wherever he might be" and Marshal Yeremenko, Senior Soviet army officer, noted that his troops could "hit any point of the globe."[439] These statements could however be picked up by people in the West who were keen for arms contracts and sought to promote the "missile gap." Additionally, there was a psychological effect on the West derived from the USSR's possession of long-range rockets because it threatened to create obsolescence in the West's main strategic nuclear delivery system at a time when vast resources were being put into building up the allies' nuclear bomber fleets.

[434] Ibid.,p.8.
[435] Ibid.,p.9.
[436] Benjamin Cole, 'British Technical Intelligence and the Soviet Intermediate Range Ballistic Missile Threat 1952-1960', *Intelligence and National Security*, 14(2) (1999) p.80.
[437] TNA. CAB 158/39. JIC (60) 2 *Khrushchev Statements on Strategic Attack Weapons* 29 January 1960 p.10.
[438] TNA. DEFE 13/342 *Soviet and Communist Bloc Capabilities and Intentions* Enclosure 13. Memorandum by Strong to Minister of Defence 08 February 1960.
[439] TNA. CAB 158/45. JIC(62) 26 *Statements on Soviet Armed Forces Day* 08 March 1962.

In his memoirs, Khrushchev's bellicose rhetoric continued into retirement. He stated that "only by building up a nuclear missile force could we keep the enemy from unleashing war against us."[440] Missiles were clearly of vital importance to the USSR to "grind our enemies into dust" and to "destroy the principal cities of the United States."[441] He also admitted that the United States was so far away that "we couldn't have reached him with our air force", hence the eagerness to acquire nuclear missiles.[442] Khrushchev was proud of the nuclear advances that occurred during his tenure and thought that Russia's enemies "knew that they had lost their chance to strike at us with impunity."[443] This view was arguably correct when some of the discussions amongst the senior American political and military leadership during the Cuban Missile Crisis are considered.

The Blue Streak Cancellation

The development of Soviet IRBMs and MRBMs also had policy implications for the UK as its nuclear bombers approached obsolescence and Britain's own IRBM project, Blue Streak, had to be cancelled in 1960 in part due to the Soviet missile threat and the possibility of a first-strike destroying the missiles in their silos.[444]

The Blue Streak IRBM was Britain's only ballistic missile project and involved deploying a ballistic missile with a 2,500 mile range in underground silos in southern England.[445] Each missile was to be deployed well away from the others. For this force of some 100 missiles to be destroyed, an attack from several hundred accurate Soviet missiles would be required. The force could be held at a few minutes readiness for several hours, thereby satisfying the British strategic requirement that they could survive a pre-emptive nuclear strike and then be launched. This ensured that the UK did not have to "launch on warning" which could lead to a catastrophe in the event of erroneous missile attack data being received during a period of crisis. Crucial to the procurement issue were assessments of how large the Soviet IRBM/MRBM force was, how accurate the missiles were and the yield of their warheads. It

[440] Khrushchev, Nikita *Khrushchev Remembers* (Boston, 1970) p.512.
[441] Ibid.,p.517.
[442] Ibid.,p.516.
[443] Ibid.,p.517.
[444] Hill, Nicholas *A Vertical Empire: The History of the UK Rocket and Space Programme 1950-71* (London, 2001).
[445] Menaul, Stewart *Countdown: Britain's Strategic Nuclear Forces* (London, 1980) p.103.

also had to be noted that missiles based in Eastern Europe and the western Soviet Union would have a very short flight time.[446] As seen earlier in this chapter, information on all these key elements was sparse and subject to conjecture.

Harold Macmillan, British Prime Minister, states in his memoirs that the decision to cancel Blue Streak was strategic.[447] This is also supported by the then Defence Secretary Harold Watkinson.[448] The issue of Soviet IRBMs is mentioned in passing in other accounts of the time discussing the cancellation of Blue Streak, and the impression is given that it was terminated primarily on grounds of cost.[449] It would have been a hugely expensive project, due mainly to the construction of numerous underground silos, assuming that enough Members of Parliament could persuade their constituents to accept the missiles in their localities. Their acceptance in a locality would of course guarantee their rapid demise in the event of a nuclear war. The cancellation decision was contentious with argument and counter-argument in Parliament and the media either that the project should never have been commenced, it should have been halted earlier or that it should have proceeded as the missiles were not vulnerable to a pre-emptive strike.[450] This also seems to reflect certain nervousness in dealing with novel technology which seemed to belong to the "space age."

The UK had first looked at building Blue Streak in 1952, at a time when the first reports were being produced by the JIC using data from German engineers about the Soviet rocket programme.[451] There were doubts about building powerful engines and how to guide the system to the point where it was questioned whether a military ballistic missile was feasible.[452] Only developments in technology and the miniaturisation of nuclear weapons would make such systems possible; however, analysis of Soviet progress in this field showed that long-range systems and matching nuclear weapons to them was possible. British intelligence were also noting Russian developments in surface-to-air missiles, radars and

[446] Benjamin Cole (1999): 'British Technical Intelligence and the Soviet Intermediate Range Ballistic Missile Threat, 1952-60' *Intelligence and National Security,* 14:2, pp.70-93.
[447] Macmillan, Harold *Pointing The Way* (London, 1972) pp.251-253.
[448] Watkinson, Harold *Turning Points* (London, 1986) p.123.
[449] Clark, Ian *Nuclear Diplomacy and the Special Relationship: Britain's Deterrent and America 1957-62* (London, 1994). Wyn, Humphrey *RAF Nuclear Deterrent Forces* (London, 1994).
[450] Cole p.71.
[451] Ibid.,p.73.
[452] Ibid.

fighter aircraft which raised questions over the UK's manned bomber programme so new nuclear weapon delivery methods would have to be explored.

As more intelligence became available about Soviet ballistic missile programmes in the 1950s, so the threat to the UK was being appreciated with the transition made from artillery rockets based on the German V-2 to the USSR's SS-3 and SS-4 ballistic missiles which posed a real threat to the UK, especially after the Soviet hydrogen bomb test of August 1953.[453] If a hydrogen bomb with a large yield was fitted to a missile then it severely reduced the problems posed by lack of accuracy due to its increased blast effects. Soviet IRBM/MRBMs would have to be considered in nuclear weapon procurement decisions and they raised questions over the credibility of the nuclear deterrent. In 1954 the Air Ministry noted that to discourage such a Soviet attack "it is vitally important that this country should develop an offensive missile of its own."[454] Looking forward into the future, British planners, although working on sparse data, had to confront the likelihood that the Soviet Union would mass produce ballistic missiles and arm them with thermonuclear warheads. Blue Streak would enhance the UK's offensive nuclear capability at a time when ballistic missile technology was advancing and the need to deter Soviet ballistic missile attack was increasing. Blue Streak was supposed to enter service in 1963, with full deployment in 1965, fulfilling the primary deterrent role until 1970.[455] However, the USSR, by 1965, would have had IRBMs deployed against the UK for several years so there would have been a "window of vulnerability" with no UK ballistic missile deterrent, with cover provided instead by nuclear bombers.

These factors likely gave added impetus to the negotiations which led to the deployment of US supplied Thor IRBMs which were based in the UK from 1959-63. It seems that weapons procurement and intelligence assessment were not synchronised on this issue. The timescales also did not seem to take account of potential developmental problems which plagued major British defence projects at that time. As Soviet technology advanced there was a risk that Blue Streak would be obsolete before it entered service and cancellation could occur after

[453] Ibid.,p.74.
[454] TNA. AIR 2/13206. *Note on the Ballistic Rocket* 08 August 1955.
[455] Cole p.78.

considerable resources had been expended. This had the potential to lead to great uncertainty in defence planning and poor decision making. To this was added, as mentioned earlier in the chapter, the fact that sparse intelligence was available on high-level Soviet strategy and intentions. Such uncertainty led the RAF to consider the vulnerability of their nuclear bombers and introduce new procedures to disperse aircraft away from their main bases to airfields all over the UK in a crisis and to hold them on a few minutes readiness to launch on "Quick Reaction Alert."[456] Blue Streak was also to be deployed in hardened underground silos (as seen later in France and the United States) and this policy, combined with new tactics for deploying RAF bombers, is a direct effect of intelligence assessments about Soviet IRBMs on the workings and deployment of the British nuclear deterrent. The issue of the cost of Blue Streak was still being raised but with Duncan Sandys as the Defence Minister (and an advocate of missiles) research and development on ballistic missiles continued.

It should also be remembered that there was no Ballistic Missile Early Warning radar in the UK until 1963 so it is hard to see how a decision to launch Blue Streak could have been taken. Consideration would be needed of the missile reaction time, strength of the silo, warning time, accuracy and yield of Soviet missiles in order to determine when the UK's missiles should be fired. An attack might not destroy all the Blue Streaks and a retaliatory strike could have been launched, but if insufficient data was available on Soviet ballistic missile capabilities then the UK's nuclear deterrent force could be lost. There was, as Cole points out, "a complete lack of certainty about the majority of the critical variables involved."[457] The key factor in destroying a nuclear missile silo is warhead accuracy and this was impossible to determine for Soviet ballistic missiles as the sources did not exist to measure it. As previously seen, the SS-3 Soviet ballistic missile was thought to have an accuracy of three nautical miles which would make it unsuitable for attacking a missile silo. However, the Sputnik launch showed that the Russians were capable of great technical achievements so many of the West's assumptions about their missiles could have been wrong. As Cole notes, the UK started to assume that the Soviet Union's missile accuracy was as good as the West's unless there was evidence to the contrary.[458] This could have formed the basis for further inaccurate assessments as the West waged an arms race against itself.

[456] TNA. AIR 41/87 *The RAF Strategic Nuclear Deterrent Forces.* See also Wynn, Humphrey *RAF Nuclear Deterrent Forces* (London, 1994).
[457] Cole p.82.
[458] Ibid.

The Soviet Union would have needed to deploy hundreds of SS-3s and SS-4s against Blue Streak silos to guarantee their destruction, depending on the accuracy and reliability of the Soviet systems.[459] It is now known that the USSR did not have this number of missiles available and the JIC did not produce papers on how many SS-3s or SS-4s might be used to attack the UK or how they would be deployed.

Cole notes that critics of the project within government such as the War Office and the Admiralty (rival services to the RAF) sought the cancellation of Blue Streak on grounds of cost to free resources for other defence projects.[460] The finance issue seems to have dominated discussions during the latter phases of the project, championed by the Treasury. Challenge would also have been difficult on technical grounds because the JIC and Air Ministry had control of the information and expertise on rocketry, silo construction and missile vulnerability. The Royal Navy was interested at that time in seizing the nuclear deterrent from the RAF by introducing the Polaris submarine system so they had a vested interest in cancelling the project. The Chief of the Defence Staff was also Admiral Louis Mountbatten, a naval officer and shrewd political operator, who would likely have primary loyalty to his own service.[461] Despite bureaucratic in-fighting and rivalry, the officials involved seem to have carefully weighed the issues and data concerning Blue Streak before making a decision about its fate.

As Cole indicates, by 1959 the Air Ministry assumed that after 1965 Soviet IRBMs would carry 1 megaton warheads and be able to land within 4-5,000 feet of a target.[462] To ensure the destruction of the Blue Streak force it would take at least 8 warheads to be fired at each silo so the size of the Soviet IRBM force became an issue in the calculations. The Air Ministry believed that the Blue Streak force would survive an attack and appeared to believe that the Soviet Union would not deploy a large force of IRBMs to mount a saturation attack. The papers generated at this time reveal a mass of figures with different assumptions about the number of warheads needed to destroy Blue Streak silos and in mid-1959 the British Nuclear

[459] TNA. AIR 2/13769. *Vulnerability of UK Deterrent Forces on the Ground* 29 October 1958.
[460] Cole p.84.
[461] See Ken Young, 'The Royal Navy's Polaris Lobby, 1955-62', *Journal of Strategic Studies*, 25(3), 2002, pp.56-86.
[462] Cole p.86.

Deterrent Study Group (BND (SG)) was formed under the MOD Permanent Secretary Sir Richard Powell to resolve the issue.[463]

The Powell Group considered the vulnerability of Blue Streak and, importantly for the IRBM project, it was assigned terms of reference to work on worst case assumptions.[464] Its formation reflected the considerable amount of uncertainty concerning the Soviet threat to the deployment of the system and a desire to resolve the Blue Streak issue before an enormous financial investment was made in the project. In a field with a mass of assumptions and limited data, this was ideal for bureaucratic opportunists who sought to terminate a project. It also had authority to overturn the Air Ministry's huge influence over assumptions and was a fresh look at the issue, evaluating the threat from SS-3s and SS-4s. The Committee assumed that an SS-3 could carry a three megaton warhead and an SS-4 a 1-8 megaton warhead but these yields were unconfirmed and their accuracy was assumed to be no better or worse than western missiles.[465] Using a three megaton warhead and western levels of accuracy, Powell thought that 95 per cent of the Blue Streak force would be destroyed in an attack of 300-400 missiles. He felt that by 1965 the USSR would have this number of missiles and the Blue Streak force could only survive if it was held at 30 second constant readiness (which was impossible) and the UK would only get three and a half minutes warning of an attack.[466] The force stood a greater chance of survival against the SS-4 because it was fired from further away and there would be more warning time, but even then if the missile was fired on a low trajectory the warning time would be limited and few British missiles would survive.[467]

The potential number of Soviet ballistic missiles, their accuracy and lack of warning time, would ensure that the UK would have to adopt a dangerous "launch on warning" policy whereby missiles fire in the event of a nuclear attack being perceived. This raised the possibly of an appalling accident but Powell thought that the USSR might still be able to pre-empt a Blue Streak launch if the UK used this system. Powell's conclusion was that Blue Streak would always be vulnerable to a pre-emptive strike as it was land-based and would

[463] TNA. AIR 2/17371 *British Nuclear Deterrent Study Group.* Some of its files are still closed.
[464] Cole p.87.
[465] Cole p.88.
[466] Ibid.
[467] Ibid.

only likely be useful if the West fired first as a response to a Soviet land invasion of Western Europe for instance.[468] However, it is now known that the Soviet Union only deployed 48 SS-3 missiles and such a small force was a very limited threat to the Blue Streak system.[469] This was of course unknown at the time. The warhead yield of the 608 SS-4s deployed by the USSR is still unknown but was unlikely to have been between 3-8 megatons; most Soviet nuclear weapon studies put the yield at c.1 megaton.[470] The SS-4 is also now known to have an accuracy of 1.24 nautical miles, double what Powell was using.[471]

Furthermore it seems that the SS-4 was not designed to attack nuclear missiles in the West. A covert attack requires a missile to be fired on a depressed trajectory thereby decreasing its range and if fired in such a way from the USSR it may not have been able to reach the UK. There was no evidence that the SS-4 was based in Eastern Europe so the UK would likely have had more warning time of an attack as the launch would have been done from Western Russia and on a high ballistic trajectory. The UK could therefore have fired its Blue Streak missiles on warning rather than firing them before the Russians had used their nuclear weapons. Many of Powell's worst case assumptions appear to have been quite different from the Soviet Union's then capabilities and his report appears to be flawed; it did however carry considerable weight. It is now known that in 1965 the Russians had deployed 608 SS-4s so if the missiles were accurate and reliable enough then in theory they could have mounted a serious saturation raid on Blue Streak.[472] The UK Air Ministry appeared to believe that such a large force of IRBMs would not be built up. Powell worked on a worst-case basis, but in order to maintain high levels of credibility in the UK's nuclear deterrent this was essential. His report was based on inaccurate assumptions but that simply reflected the fragmented nature of the UK's intelligence on Soviet ballistic missiles.

The Powell Report showed Blue Streak in such a poor light that it could not survive as a project and the UK sought to acquire instead the American *Skybolt* air-launched ballistic

[468] TNA. DEFE 7/1328 *BND(SG) (59) 19 (Final) British Controlled Contribution to the Nuclear Deterrent* 31 December 1959.
[469] Zaloga, Steven *Target America: The Soviet Union and the Strategic Arms Race* (Washington, 2004) p.190.
[470] Podvig, Pavel *Russian Strategic Nuclear Forces* (London, 2004) p.112.
[471] Cole p.88.
[472] Ibid.,p.89.

missile as an alternative nuclear delivery system. This system was also to be cancelled due to technical difficulties. Blue Streak was meanwhile cancelled in April 1960 "on the unanimous advice of the Chiefs of Staff", including the Chief of the Air Staff as it was "vulnerable to forestalling attack."[473] British intelligence on Soviet MRBMs and IRBMs was seemingly inadequate for planning the nation's nuclear deterrent during the period under consideration. The sparse information available ensured that decisions were made on assumptions rather than accurate data but this reflected the difficulty of the target that was being monitored. Analysts could use western achievements as a basis for assessments but this was dangerous because it was unknown how far the Soviet Union had advanced. The launch of Sputnik and Yuri Gagarin showed that great achievement was possible from the Soviet Union in the field of rocketry with little prior indication that it was going to happen. The limited data available on Soviet missiles made planning very difficult and projects could take on a life of their own, carried by bureaucratic interests. Worst case scenarios could be used for planning but this ran the risk of exaggerating the threats the UK faced.

The JIC alerted decision-makers to the Soviet ballistic missile programme but never produced anything to cause a "missile gap" mentality to build up amongst policy makers. Intelligence could not accurately determine how vulnerable Blue Streak was and so the project rumbled on and reflected the interests and assumptions of the bureaucratic players. With Blue Streak, the Air Ministry was determined to have ballistic missile technology and the nuclear deterrent remain in the hands of the RAF, just as the Navy were determined to have Polaris submarines. On balance a submarine-based deterrent was arguably better for the UK to avoid a Soviet pre-emptive saturation attack from ballistic missiles in close proximity to the UK. Blue Streak would likely have worked and was used to launch satellites later on but would have been enormously expensive as a weapon system and soon be obsolete. Macmillan and other senior figures thought that Blue Streak could meet Britain's strategic nuclear needs, was modern, prestigious and homemade. To some in Whitehall it seemed preferable to other nuclear weapon options available to the UK in the mid-1950s. Thankfully the issue of whether it could have survived a pre-emptive attack was never put to the test. The cancellation of the project ensured the UK's nuclear deterrent remained with "vulnerable" bombers until 1968.

[473] TNA. AIR 19/998. Memorandum by the Minister of Defence dated 23 February 1960 p.2. This stated that Blue Streak would not be deployed but experimental work on rockets would continue in the UK.

Research from Russia on Ballistic Missiles

In recent years, some research has been done in Soviet archives on ballistic missiles. The research is limited because the topic is still subject to security restrictions and those engaged in developing these systems have either passed away or are reluctant to disclose information. Podvig wrote a study of Soviet nuclear missiles in 2004 but apparently the original draft was seized by the Russian authorities showing the sensitivities of this topic.[474] This is the best analysis of this subject from the Soviet side in the English language. Zaloga also wrote two studies of the topic from the American side using Soviet archives and interviews with Soviet personnel.[475]

From Zaloga's research it is now known that the Russians had matched a nuclear warhead to an SS-3 MRBM in February 1956 under an operation called Operation BAIKAL.[476] If these missiles had been mass produced and moved forward to Eastern Europe then the Soviet Union could have threatened the UK much earlier than previously thought. They would not have had to wait for the development of IRBMs. Zaloga also noted that Russian programmes were driven by the need to innovate and develop because the pace of technical change was so great that the Soviet Union would permanently lag behind the West if it always relied on espionage and copying western developments.[477] On the ICBM programme Zaloga recognised the serious technical problems the Soviet Union faced with this new technology. The first Russian ICBM codenamed SS-6 SAPWOOD by NATO had to be designed around a Soviet hydrogen bomb that weighed 4.5 tons[478] and had an unrefuelled weight of 23 tons which increased to 267 tons when the fuel was inserted.[479] It was a massive object to launch which was then tracked on Soviet radar with radio signals sent to it to correct its course; when on the right trajectory its internal guidance system would take over.[480] These signals would have been intercepted by western intelligence agencies but internal guidance would

[474] Podvig, Pavel *Russian Strategic Nuclear Forces* (London, 2004).
[475] Zaloga, Steven *Target America: The Soviet Union and the Strategic Nuclear Arms Race 1945-64* (Washington, 2004) and *The Kremlin's Nuclear Sword: The Rise and Fall of Russia's Strategic Nuclear Forces 1945-2000* (Washington, 2002).
[476] Zaloga *Target America* p.139.
[477] Ibid.,p.xiii.
[478] Ibid.,p.140.
[479] Ibid.,p141.
[480] Ibid.

ensure that nothing else was transmitted thereby denying additional intelligence so western intelligence had to rely on intelligence collected by radar.

Western intelligence was correct when it assessed that ICBM activity took place at Tyuratum/Baikonur because it was isolated and sparsely populated. The Russians also used telemetry from the missile to monitor its sub-systems in flight, make corrections and determine what went wrong in order to improve their programme.[481] This data was intercepted by western intelligence agencies. Powerful radars were used to track the flight as well as optical sensors.[482] According to Zaloga's research the Soviet Union felt under considerable pressure to develop the ICBM as costs rose and the American Atlas ICBM programme advanced.[483] Zaloga noted that the first Soviet ICBM launch was on 21 August 1957 from Baikonur to the Pacific and all the systems worked with a dummy warhead.[484] Moscow announced this on 26 August 1957 followed by another successful test on 7 September 1957 and the launch of Sputnik on 4 October 1957.[485] As Zaloga notes, Sputnik caused the acceleration of American weapons programmes as the United States was humiliated and regarded it as a technological Pearl Harbor.[486] It should also be noted that the flight of Sputnik across the United States also created a precedent because it allowed future flights by US spacecraft across Soviet territory in order to take photographs.

Zaloga further notes that the Soviet Union built its main ICBM base at Plesetsk in north-western Russia, and called it Leningrad-300.[487] This facility does not appear in JIC papers and work started on its four remote launch pads in July 1957.[488] The base was chosen to be close to the United States, allowing missiles to be fired over the North Pole but it should be noted that it took some 20 hours to assemble an ICBM there for launch.[489] It is likely that little signal traffic was generated in the construction phase so western intelligence was not aware of the installation until it was detected later by a U-2 flight or from an ICBM launch on

[481] Ibid.,p.142.
[482] Ibid.
[483] Ibid.,p.145.
[484] Ibid.
[485] Ibid.
[486] Ibid.
[487] Ibid.,p.150.
[488] Ibid.,p.151.
[489] Ibid.

15 December 1959.[490] It should also be noted that by the end of 1960 the United States had 142 Atlas ICBMs, 62 Titan ICBMs and 20 Minutemen ICBMs whereas the Soviet Union only had four SS-6s ready at Plesetsk.[491] There was a missile gap in ICBMs but it was in America's favour and hard intelligence helped to expose that gap just as sparse intelligence helped to create it. To the Russians, ballistic missiles were a driving force and showed that the Soviet Union had recovered from the war and could overtake the West. During the war the Russians could not strike at the heart of Germany and sought to resolve their deficiency in long-range strike capability in case of future conflict.

Zaloga's research also highlights an incident which does not feature in any released UK government papers. On 24 October 1960 during the test launch of a new SS-7 Saddler ICBM, the missile blew up at Tyuratum.[492] These missiles were to replace the SS-6 and were lighter with a smaller warhead, being designed to be the first Soviet ICBM to be deployed in large numbers. The disaster killed Marshal Mitrofan Nedelin, Soviet Assistant Defence Minister for Armaments and Strategic Rocket Forces Commander, as well as over 200 other personnel.[493] Fuel and nitric acid exploding killed many of the missile design team with most bodies completely destroyed. The team had been under pressure to test the missile quickly before the November military parade in Moscow and an electrical malfunction caused the rocket engines to fire and the missile to explode.[494] No official announcement was made about the disaster until 1989 and it seems that Britain only became aware of it when informed by Colonel Oleg Penkovsky (See Chapter Four). Tests of the new missile did not resume until 1961 so the disaster was apparently a setback to the Russian ICBM programme.[495] When it was deployed in 1962 the SS-7 was housed in groups of three on the surface (to save on costs and on fuel pumps) and remained a vulnerable system until underground silos could be built for it in the late 1960s.[496] The Soviet Union got the idea for underground silos from German engineers who had used hardened firing sites for their V-2 rockets from 1944-45. The cover-up of the missile disaster shows how effective Soviet security was concerning their missile programme and the difficulties facing intelligence collectors.

[490] Ibid.
[491] Ibid.,p.191
[492] Ibid.,p.195
[493] Ibid.
[494] Ibid.
[495] Ibid.,p.197
[496] Ibid.,p.198

Research by Podvig also reveals that the Soviet Union regarded the SS-3 MRBM as its first strategic missile as it could destroy strategic targets in Europe.[497] This, and the SS-4 missile, formed the core of the Soviet Union's theatre nuclear force for many years until scrapped after the INF Treaty in 1988. The JIC papers do not mention it, but in April 1962 the Soviet Union started work on the SS-9 Scarp ICBM which was a very heavy missile with a large nuclear warhead and based in a silo.[498] According to Podvig, it seems that after the construction of the IRBM/MRBM force the Russians sought to concentrate on their ICBM assets, developing underground silos and solid fuel for the missiles. He also mentions that the early ICBM suffered from the problem of the warhead colliding with the missile body after separation during tests which the JIC thought the Soviet Union was experiencing; it was solved by reshaping the re-entry vehicle.[499] He also notes that the USSR planned a long-range cruise missile called *Burya* to be developed in case the ballistic missile programme failed but this was cancelled. The JIC was aware of the project but had limited information on it.[500] Recent research does provide some insights into the problems and policies of the Soviet Union concerning ballistic missile development but much remains to be uncovered. Even in the UK many papers concerning assessments of ICBMs and other nuclear delivery systems by the JIC remain closed and several Freedom of Information Act requests were turned down during the production of my paper.

Conclusion

In conclusion, the Assistant Chief of the Air Staff (Intelligence) wrote to the JIC in 1960 to say that "there is no magic in missiles which puts them in a class by themselves requiring special intelligence treatment."[501] In this chapter, despite only fragmentary records being available, it can be seen that there was a certain magic in missiles as intelligence was elusive and they posed a very difficult intelligence target. The advent of nuclear missiles in the period 1949-62, with their unprecedented destructive capabilities, meant that they did require

[497] Podvig, Pavel *Russian Strategic Nuclear Forces (*London, 2004) p.121.
[498] Ibid.,p.7.
[499] Ibid.,p.182.
[500] Ibid.,p.121. This obscure project was cancelled due to the missile's slow speed and vulnerability. See also Zaloga, Steven 'Most Secret Weapon: The Origins of Soviet Strategic Cruise Missiles, 1945-60' *The Journal of Slavic Military Studies* Vol.6, No.1(June 1993) pp.262-273.
[501] TNA. AIR 8/1953. Memorandum ACAS(I)/65A/60 16 September 1960 p.3.

special treatment and a whole range of new collection methods to deal with them. British intelligence struggled to deal with this issue, according to the material that has been released, but did not cease its efforts. Intelligence personnel dealt with problems of novel, complicated technology that the UK did not possess, and faced a closed secretive hostile state. The JIC appears to have made a balanced assessment using the limited information they had available. Britain did not get swept up by a wave of "missile gap" hysteria and its assessments of Soviet ICBMs and the strategic threat were more realistic than those produced in the United States. The assessments do not portray alarm or exaggeration, despite Khrushchev's rhetoric, but instead a realisation of the intelligence problems the UK faced and the dangers Soviet strategic nuclear delivery systems posed. The UK still faced a bomber threat during the period 1949-62 and ballistic missiles just added another dimension to the hostile nuclear attack options the nation faced.

Britain collected and exploited the limited information from German returnees because this was all that was available at that time to establish the nature of Russian ballistic missile programmes. New techniques in SIGINT and airborne intelligence collection as well as radar were later devised and this improved intelligence collection. With the enormous technical challenges that were presented and the secrecy surrounding Soviet developments, it is remarkable that useful intelligence was gathered on missile systems under development during this most difficult and dangerous time. Recent research shows that there were some areas of which the UK remained unaware, such as missile accuracy, warhead yields and numbers of weapons produced. However, it is easy to be wise after the end of the Cold War and fail to appreciate the enormous problems, outlined in this chapter, that intelligence collectors and analysts faced. Much material however still remains in archives to be exploited by future researchers.

Assessments on Soviet ballistic missiles also influenced policy as the operational deployment of British bombers and the cancellation of the Blue Streak IRBM were influenced by the UK's view of Soviet ballistic missiles. Before 1963 and the advent of Ballistic Missile Early Warning Radar, the USSR could have mounted a pre-emptive nuclear strike against the UK without detection and likely eliminated most of its nuclear deterrent and population. This was unlikely to have happened though, due to Russia's inability to destroy the United States'

nuclear forces as they were deployed globally and securely. Thankfully the deterrent never had to be used but undoubtedly the prospect of nuclear annihilation weighed heavily on the minds of the Soviet leadership, especially during the Cuban Missile Crisis of October 1962, which is examined in Chapter Four as part of the Penkovsky case. It is a matter of speculation whether, if the UK possessed no nuclear deterrent, it would have made any difference to the security of Europe because it existed under the protection of America's "nuclear umbrella." The possession of a nuclear deterrent did nevertheless allow Britain to continue to play a world role as a senior partner of the Americans. Lack of nuclear weapons would have diminished the UK's perceived role in the world and Europe at that time. The reality of imperial greatness was diminishing but its mentality seemed to live on. The bigger global picture has to be considered in the Cold War rather than the risks faced solely by the UK. Confidence only grew in western intelligence about its knowledge of Russia's nuclear weapons from 1960 onwards due to Colonel Oleg Penkovsky's material and aerial intelligence collection systems. The next chapter will look at the key role played by these airborne collection systems.

CHAPTER 3 – LOOKING BEHIND THE CURTAIN: AERIAL RECONNAISSANCE AND SOVIET NUCLEAR DELIVERY SYSTEMS

This chapter examines the role played by aerial reconnaissance in Britain's attempts to gather intelligence on the Soviet Union's nuclear bombers and long-range ballistic missiles. The Second World War had demonstrated the crucial importance of photographic intelligence in wartime and particularly in the battle against German cruise and ballistic missiles. From 1949 to 1962, various methods were implemented by the United States and Britain to use airborne systems to gather intelligence behind the Iron Curtain. Some of these projects would result in the loss of aircraft. Others led to the production of systems that did not work, as well as spectacular successes. Remarkable, revolutionary innovations such as reconnaissance satellites and U-2 aircraft produced an unprecedented quantity and quality of intelligence but with risks. The close collaboration built up between Britain and the United States from 1941-45 would continue into the Cold War with photographic intelligence being shared between the countries and joint projects being undertaken. This collaboration continues to this day.

Introduction

Britain's impressive and vital aerial reconnaissance efforts during the Second World War involved the adaptation of aircraft such as the Spitfire and Mosquito to the reconnaissance role. Also crucial was the systematic skilled analysis and dissemination of intelligence reports by experts in dedicated organisations. In the words of Lord Tedder, Marshal of the Royal Air Force, it represented "British genius at its best."[502] It should be remembered though that from 1939-45, reconnaissance missions could be mounted against an enemy just a short flight across the English Channel. The Soviet Union after 1945 had the benefit of buffer-states in Eastern Europe between it and the allies. Additionally, many of the nuclear weapon-related facilities of interest to the UK such as missile testing and developmental sites as well as nuclear bomber bases were deep inside the Soviet Union and therefore immune to observation from peripheral border areas. It was also unknown how the USSR laid out its facilities, such as nuclear missile bases, so identification would be difficult for imagery analysts who would have to learn about their targets as more intelligence was gathered.

[502] Quoted in Babington-Smith, Constance *Evidence in Camera: Photographic Intelligence in World War Two* (London, 1974) p.6.

Despite wartime successes with aerial reconnaissance it was almost certain that, as in other intelligence collection areas, the Soviet Union and its nuclear weapon delivery systems would be a very difficult target.

The Royal Air Force already had experience of covert aerial reconnaissance. Before the Second World War the Secret Intelligence Service had used Aerofilms, a company based in Wembley, Middlesex, to undertake covert reconnaissance of Nazi Germany.[503] Civilian aircraft with hidden cameras were flown across Germany on "business trips" in order to photograph airfields and factories. The Lockheed 12A aircraft were painted 'duck-egg green' to blend into the sky on their covert reconnaissance missions.[504] The aircraft had to be fast, high-flying and stripped of armaments to fly these dangerous operations which operated from Heston in west London.[505] The British had clearly heeded the advice of German army officer General Werner Freiherr von Fritsch who said in 1938 that "the military organisation which has the best photographic intelligence will win the next war."[506] Its importance was shown by the fact that within one hour of war being declared a Blenheim bomber was flown from RAF Wyton, near Huntingdon, to Wilhelmshaven, Germany to photograph the German fleet.[507] Aerial reconnaissance would continue to play a crucial role in the intelligence war against Germany and lead to the accidental discovery of the V-weapon research centre at Peenemunde on the German Baltic coast and fulfil a crucial role in the battle to destroy these weapons.[508]

However, success against rocket systems in Nazi Germany would not necessarily translate into success against the Soviet Union's weapons systems. The latter were carefully concealed in a highly secure, 'closed' country and located a considerable distance from the UK in the vast land mass of the USSR. Even locating experimental rockets, testing facilities and their eventual deployed locations would be a major undertaking and intelligence on the USSR in the early 1950s, as seen in Chapter One, was sparse. This situation was not helped by the

[503] Ibid.,p.19.
[504] Ibid.,p.24.
[505] Ibid.,p.32.
[506] Quoted in Nesbit, Roy *Eyes Of The RAF: A History of Photo Reconnaissance* (Stroud, 1996) p.241.
[507] Babington-Smith p.24.
[508] Ibid.,pp.199-232.

likely presence of traitors in western intelligence during the Cold War in addition to those publicly exposed such as SIS officers George Blake and 'Kim' Philby. It should also be noted that in the post-World War Two demobilisation, many RAF strategic reconnaissance squadrons were disbanded and analytical and technical experts returned to civilian life. British reconnaissance systems and methods used during the war had been very capable and remained in use for some time. The Mark XIX Spitfire for instance could still undertake high-altitude reconnaissance missions and remained in service until 1954 and the Mosquito bomber, when equipped with a 200 gallon drop-tank had a 2500 mile range.[509] However, the ample reconnaissance personnel and considerable resources available to the national survival effort from 1939-45 were not available in the post-war austerity years. This posed a serious problem because to deal with aerial intelligence collection on the USSR, constant innovation, investment and imagination would be required.

More Intelligence From Germany

As with intelligence on Russian ballistic missiles, the UK again received crucial early help on the Soviet reconnaissance problem from Germany's intelligence efforts in World War Two. Much of its military photographic intelligence material on the Soviet Union was captured by the allies after the war with collections discovered at such places as Berchtesgarden, Germany which proved to be invaluable. This also revealed the superior quality of allied photographic intelligence efforts during the war, such as the fact that the Germans did not use stereoscopic photography.[510]

Research done by Aldrich and documents released to the National Archives highlights the importance of this material in the early years of the Cold War, notably a covert operation called DICK TRACY.[511] Aldrich notes that inter-service rivalry in the United States, whereby the other services resented the formation of a separate United States Air Force (USAF) in 1947, pushed air intelligence closer to the British as the new service sought collaborators. The USAF looked to the UK for support and the use of airfields in East Anglia for emergency deployment of bombers and atomic weapons. This ensured that there was

[509] Nesbit p.239.
[510] Babington-Smith p.251.
[511] Aldrich, Richard *The Hidden Hand: Britain, America and Cold War Secret Intelligence* (London, 2001) pp.206-213.

increased joint planning and sharing of intelligence between the two countries.[512] The role of the UK as an 'unsinkable aircraft carrier' ensured that it had a good bargaining asset to secure intelligence co-operation with the United States. The expansion of atomic arsenals also ensured that there would be co-operation on target and aerial intelligence which exploited the DICK TRACY product.

In the DICK TRACY operation from June 1945 onwards, Britain and the United States shared captured Luftwaffe photographs of the USSR produced during German operations on the eastern front.[513] This material was used by the allies for over 20 years and was circulated under the designator GX. The product was brought from all over Europe for analysis and sorting at Pinetree in Essex at the Anglo-American Central Interpretation Unit.[514] The haul contained valuable maps and photographs covering the Soviet Union all the way to Siberia.[515] The Luftwaffe had mounted over 8000 sorties to collect this material and produced some 800,000-1,000,000 prints providing unprecedented intelligence on the Soviet Union.[516] Such was the volume of material that it was still being sorted at the RAF's main reconnaissance intelligence centre at Nuneham Park, Oxfordshire from 1947 to January 1949 with key material being forwarded to air intelligence in Whitehall.[517] The Air Ministry bought special cameras to photograph much of the collection before it was sent to the United States. In May 1957 the collection was moved to the Joint Air Reconnaissance Intelligence Centre at Brampton Park, Cambridgeshire.[518] This operation was a major intelligence coup and provided critical photographic intelligence on the USSR as late as 1960 on a scale not seen until the inauguration of the reconnaissance satellite programme in the early 1960s.[519]

Material was still emerging and being added to this archive for years after the war. In March 1954 the RAF received German photographic material from "two gentlemen of a European

[512] Ibid.,p.207.
[513] Ibid.
[514] Ibid.,p208.
[515] Ibid.
[516] Ibid.
[517] Ibid.
[518] Ibid.
[519] Ibid.,p.210. See also TNA AIR 14/4104 "GX Photography." This contains a JARIC unofficial history of the collection entitled "Berschesgarten to Brampton – The History of German Air Intelligence Photography" by David A. Paine.

country" which proved to be of "considerable intelligence value to the British."[520] Who provided this material and its nature remains unknown but it was of areas "where no other coverage is available."[521] Activity like this served to cement the UK/US intelligence relationship and also extended to locating German intelligence analysts who had studied imagery of the Soviet Union with a view to undertaking debriefs with them.[522] It should also be stressed that co-operation was needed between the UK and the United States because much of the intelligence material was buried or stored in the British zone of occupation and former intelligence personnel were located in these areas.[523] The British noted that the Germans also obtained much of their intelligence on the Russian Air Force from multiple sources such as wireless intercepts and interrogations of prisoners of war.[524] They tended to use photo reconnaissance missions when targets were out of range or there were no communications to intercept.[525]

Some intelligence was also passed to Berlin by the Finns during the war and the Germans found that being in close proximity to Soviet forces in combat meant that intelligence could be gathered on aircraft and factories.[526] This of course was an advantage denied to the West in the Cold War. After 1943 improved Russian air defence and limited reconnaissance assets available to the Germans meant that air intelligence collection activity decreased.[527] The Germans used photo reconnaissance to check other intelligence sources on the Soviet Union because agents' reports were of no use for intelligence work on its order of battle."[528] The Germans apparently suffered from the same problems that the British had with penetrating the security of the Soviet Union and collecting intelligence, particularly in the field of human intelligence.

[520] TNA. AIR 14/4104 "GX Photography" Enclosure 17c. p.11.
[521] Ibid.
[522] Aldrich p.211.
[523] Ibid.
[524] TNA. AIR 40/2597 "German intelligence work on the Russian Air Force Order of Battle" (Undated).
[525] Ibid.,p.4.
[526] Ibid.
[527] Ibid.,p.6.
[528] Ibid.,p.4.

The Early Post-War Years

Air power was a central component of Cold War strategy and the air intelligence co-operation formed during the Second World War continued throughout the Cold War. Aldrich notes that in 1946 a formal secret deal was agreed on the sharing of global imagery between the British and Americans with conferences held on targeting to discuss how to destroy facilities of interest in wartime.[529] One of these conferences was held at RAF Benson, Oxfordshire on 4 October 1950 and the cover of the programme even shows a cartoon of a British reconnaissance aircraft pulling back the Iron Curtain to get a better view of the Soviet Union.[530] A priority of these sessions was to examine ways to obtain photographic evidence of the ability of Soviet Long Range Aviation to attack the UK.[531] Details of the over-flights and peripheral air collection missions undertaken at this time remain sparse. There is little material in the National Archives and it is likely that much has either been destroyed or not committed to paper at the time. Aldrich notes that in the early 1950s, the United States discovered that the British were undertaking photographic reconnaissance missions around the Caspian Sea with operations run from Crete and aimed at gathering intelligence on Soviet missile development.[532] He also speculates that Sweden may also have been used for these missions because reports had been received of Soviet experimental rockets flying over the country and crashing on its territory.[533] By 1950 the Americans were also running reconnaissance missions in Europe and on 8 April 1950 a US Navy PBY-42 Privateer aircraft was shot down off Latvia by the Russians. This was the first casualty of the programme.[534] Aldrich states that this aircraft was launched from the UK but my research shows that it was actually despatched from a base at Wiesbaden, Germany.[535]

A secret RAND study from 1955 also shows that RAF reconnaissance aircraft were shot at off the coast of Hong Kong by the Chinese but no disclosure was made of this.[536] The nature

[529] Aldrich p.213.
[530] Ibid.,p.395.
[531] Nesbit p.241.
[532] Aldrich p.215.
[533] Ibid.
[534] Ibid.,p.398.
[535] Declassified RAND Study "Case Studies of Actual and Alleged Over-flights 1930-53" by A L George August 15 1955. Available http://cryptome.org/20/3/07/US-USSR-Overflights. See also Burrows, William *By Any Means Necessary: America's Secret Air War* (London, 2001) pp.104-106.
[536] Ibid.,p.45.

or number of any allied over-flights of the Soviet Union at this time remains obscure but it appears that the UK was prepared to break international law by mounting illegal over-flights for intelligence collection. For instance, in 1950 the RAF mounted a special reconnaissance operation for naval intelligence collection over Valona Bay in Albania in order to photograph Russian submarines.[537] Approval for this mission was sought from the Prime Minister and it was judged acceptable due to the absence of Albanian air defence radar and fighter aircraft.[538] Whether approval would have been given for a regular programme of over-flights by the UK against the Soviet Union in the early Cold War is unclear and the danger of provoking war would likely have been uppermost in allied minds. However, Dino Brugioni, former senior CIA photo-interpreter, notes that the USAF was undertaking over-flights of Siberia in 1952 to photograph airfields.[539] Due to the secrecy of such operations there are few surviving records and because different American military commands were involved in over-flights, it is very difficult to determine the scale and nature of allied aerial intelligence activity at this time. If any imagery was produced it was difficult, according to Brugioni, to determine where it had come from and the veil of secrecy on this topic still remains.[540]

The Lincoln Bomber Incident

The dangers of mounting sensitive aerial intelligence collection operations can be seen by the shooting down of an RAF Lincoln bomber over East Germany in March 1953. This was the only time an RAF aircraft was destroyed by the Russians in the Cold War. Aldrich highlights this obscure and tragic incident but it remains unclear if the doomed flight was an intelligence collection mission.[541] On 12 March 1953 an RAF Lincoln bomber was on a training sortie from RAF Leconfield, UK to Germany. For reasons which remain unclear, the aircraft flew 50 miles inside East German airspace. The aircraft was intercepted by a Russian MiG-15 fighter and shot down resulting in the deaths of its seven aircrew.[542] The aircraft crashed back over the border near Boizenburg in West Germany and it was noted that ammunition from the Russian fighter was found on the western side of the border.[543] This indicated that the Russians had pursued the aircraft and destroyed it. The Russians stated that the Lincoln had

[537] TNA. AIR 19/1107 "Reconnaissance Flight Policy". Memorandum to PM 17 March 1950.
[538] Ibid.
[539] Brugioni, Dino *Eyes In The Sky: Eisenhower, The CIA and Cold War Aerial Espionage* (Annapolis, 2010) p. 67.
[540] Ibid.,p.68.
[541] Aldrich p.399.
[542] TNA. AIR 19/675 "Lincoln Aircraft Incident" 12 March 1953.
[543] Ibid.,FO memorandum to Air Ministry of 25 June 1953.

opened fire first but this was denied by the British who determined that the aircraft was not even carrying ammunition in its guns.[544] It appeared that the aircraft was over the GDR due to a navigator over-compensating for an easterly wind which then resulted in its destruction. The British decided that in future all training aircraft were to be fully armed when flying over Germany with guns loaded and cocked but should fly no closer than 10 miles to the inner German border.[545] Interestingly on the same day this incident took place, another Lincoln bomber strayed 30 miles into East German airspace some 45 minutes earlier which Aldrich does not mention.[546] The second aircraft was not shot down but was instead escorted out of the GDR's airspace. It does seem a coincidence that two bombers with experienced war-veteran crews should both over-compensate for the easterly wind in broad daylight and fly into the GDR within one hour of each other on the same day. Aldrich is likely correct to say that allied SIGINT facilities in Germany were tracking the flights and the Russian response, but it remains unclear if the aircraft deliberately flew into the GDR to generate an air defence response for intelligence collection purposes. If they did, it was a terrible price to pay to collect intelligence and showed the dangers that were potentially faced by allied aircrew engaging in aerial intelligence collection. At this time the United States also experimented with the use of unmanned high-altitude balloons to access the Soviet Union's airspace, with no risk to life. This programme could reduce the problem of confrontation and it was another opportunity for the UK to covertly participate in airborne intelligence collection efforts, revealed here for the first time.[547]

British Involvement in the Covert Balloon Programme

From 1950, the CIA and the USAF experimented with novel high-altitude balloons to gather imagery in a covert photographic programme against the Soviet Union. Balloons provided a stable platform for photography and their origin could be concealed because sophisticated launching bases were not required. This classified programme was known by several codenames such as WS 119L, MOBY DICK and GENETRIX.[548] The hydrogen-filled balloons were launched to rise into the jet-stream in the upper atmosphere carrying a camera and recovery devices and would drift from Europe eastwards across target areas. The camera

[544] Ibid.,CAS minute of 26 March 1953.
[545] Ibid.,Memorandum from CAS to PM 27 September 1953.
[546] Ibid.,Memorandum from PM to CAS 23 March 1953.
[547] Peebles, Curtis *The Moby Dick Project: Reconnaissance Balloons Over Russia* (Washington, 1991).
[548] Brugioni, Dino "GENETRIX-The Intelligence Balloon" *Military Intelligence January-March 1989.*

could take 500 photographs from 40-60,000 feet in daylight.[549] When the balloon reached the Pacific Ocean a beacon would activate and an aircraft be despatched to meet it. A radio signal would be broadcast to burst the balloon and the camera package would drop by parachute to be retrieved in mid-air by an American aircraft or by boat if it landed in the sea.[550] Despite the danger of Russian reaction and protest, President Eisenhower approved the project and during 1954-55 the United States undertook tests in the UK, the results of which were briefed in the White House.[551]

Declassified files on this obscure, important and highly secret operation described as "USAF Special Meteorological Experiments" show that experiments were mounted from Edzell, Scotland from December 1954; approved by the Secretary of State for Defence and the Chief of the Air Staff.[552] The latter noted that these operations had a "very high priority" and the operation was expected to continue for two years.[553] The RAF provided ten personnel at Edzell and had "indoctrination" into the project in the United States as well as practical training on balloons in Hawaii for 30-60 days.[554] It was also stipulated that there was a "high degree of secrecy attached to these experiments."[555] The first experiments from Scotland were conducted from 29 November 1954 to 6 December 1954 with eight balloons released, but only one launch was successful, later being picked up in Okinawa.[556] This showed that balloons could operate from the UK, transit the USSR and then be successfully recovered. On 24 January 1955 there were eight more balloon launches from Edzell.[557] The British government also asked the Americans if there had been any Russian reaction to the operation because there were concerns that the balloons could be tracked by radar and traced to their point of departure.[558] In a letter of 4 August 1955, the operation in the UK was assigned the codename GRAYBACK and was to be run from a former Royal Navy Fleet Air Arm base at Evanton in Scotland.[559]

[549] Ibid.,p.26.
[550] Ibid.
[551] Ibid.,p.27.
[552] TNA. AIR 2/17902 "USAF Special Meteorological Experiments." See minute from CAS 10 November 1954.
[553] Ibid.
[554] Ibid.
[555] Ibid.
[556] TNA. AIR 2/17902. Memorandum from A/ACAS(Ops) to CAS 18 January 1955.
[557] Ibid.
[558] Ibid.
[559] Ibid.,USAF letter 04 August 1955 to MOD.

The Americans agreed to supply 100 personnel and all the equipment for the operation with the RAF supplying 73 staff.[560] All the launchings needed approval and were determined by weather conditions at the time. This was an urgent project and the RAF had to be ready to begin operations once it was approved by Washington.[561] Security was paramount but the base was in a remote location and required five million cubic feet of hydrogen per month to maintain operations.[562] Gas could be supplied from a plant in Scotland without attracting attention. The Americans wanted no press releases about the activity. Any photographs taken or released concerning the activity had to be solely of the balloon and not the gondola it carried which contained the camera and electronic intelligence equipment.[563] There was also to be no mention of the flights being long-range and personnel had to maintain that the balloons were solely for the collection of data on local weather. Any press enquiries were to be told that it was an RAF/USAF experiment to explore atmospheric conditions above 40,000ft to examine clouds, wind and turbulence with the data sent by radio to a ground station.[564] The operation at Evanton was only one small part of the entire operation and a memorandum noted that the USAF were also running similar operations in Turkey, Germany and Norway and planned to launch 600 balloons from the UK.[565] Such was the secrecy surrounding the operation that the Royal Navy was not told the true nature of the operation on its base; a memorandum noted that the Admiralty is "unaware of the true nature of the proposed operation."[566] It also noted that the Americans wanted to launch 3000 camera-carrying balloons from 1 November 1955 and sought to launch them all from the UK but weather conditions meant that other countries had to be used.[567] The British government was only prepared to continue its approval if launches were successful and balloons went over Russia.

The results from the operation were not encouraging with only four out of 16 launches successfully reaching altitude and going east.[568] Only one balloon passed over Russia and

[560] Ibid.
[561] Ibid.
[562] Ibid.,Memorandum from Air Ministry to Secretary of State 21 July 1955.
[563] Ibid.,Memorandum from US Third Air Force to Air Ministry 01 July 1955.
[564] Ibid.
[565] Ibid.,Memorandum from ACAS(Ops) to CAS 22 June 1955.
[566] Ibid.
[567] Ibid.
[568] Ibid.

most UK balloons failed near 8000ft.[569] GCHQ also had an involvement in the project during 1955, monitoring any Russian air defence reaction and tracking signals from the balloons, but it could only do so at short-range.[570] A report to Assistant Chief of the Air Staff (Intelligence) noted that "the whole operation was a fiasco" with eight balloons having been launched, two ended up in the North Sea and the rest burst on ascent.[571] In January 1955, all eight balloon launches failed due to weather conditions in the UK; in the United States they had been successful, leading a senior officer to speculate that "large scale balloon launchings from the UK with the existing equipment are unlikely to be successful."[572] By 1956 the project's codename had changed from GRAYBACK to Project 119L and some $68 million had been spent on 3500 balloons.[573] Lack of success in the UK meant that sites were examined in Germany, Turkey and Norway.[574]

The poor success rate, complaints from the Russians and platforms such as the U-2 starting to enter service meant that the balloon programme and launches from the UK were terminated on 29 February 1956. The Americans asked the UK to ensure that, despite its termination, secrecy remained paramount on the project.[575] The RAF noted that 461 launches of balloons were undertaken from sites across the world, with 88 being launched from Scotland over two years with half of the programme's balloons having reached Russia; 42 having been recovered from the Pacific Ocean.[576] The RAF were disappointed that the recovery rate was only 10 per cent of all successful launches when it had been thought that it would be three times that rate.[577] Peebles states that some 379 balloons actually crossed the Soviet border and of these 235 were lost with only 44 gondolas having been successfully recovered in the Pacific, only one of which originated in Scotland.[578] Limited information is available on the intelligence produced but of the gondolas recovered, there were 13,813 exposures and some

[569] Ibid.
[570] Ibid.,Memorandum to ACAS(I) 14 February 1955.
[571] Ibid.
[572] Ibid.,Memorandum from Director of Air Ops to ACAS(Ops) 08 February 1955.
[573] TNA.,AIR 2/17903 *Project 119 L*. Memorandum from Air Minister to CAS 30 December 1955.
[574] Ibid.,Enclosure 16.
[575] Ibid. USAF memo to Air Ministry 02 March 1956.
[576] Ibid. Minute from ACAS(Ops) to S of S 28 February 1956. Peebles notes that 88 balloons were launched from Scotland, 162 from Turkey, 32 from Norway and the remainder from Germany. Turkey was the most successful launching site for balloon launches and their eventual recovery.
[577] Ibid ACAS(Ops) minute of 28 February 1956.
[578] Peebles *Moby Dick* p.186.

"pictures of excellent quality" were received but it is unclear if there were valuable results.[579] It was often difficult to establish where the balloon had gone and what it had photographed and most of the retrieved pictures were from balloons launched in Turkey meaning there was scattered coverage of European Russia and Central Asia. However, at least some areas were photographed which were not covered by German wartime photographs or from post-war reconnaissance flights along the Soviet border.[580]

Overall it appears that only limited intelligence was produced by the balloon programme but it showed that Britain and the United States could work together on a covert aerial collection programme and maintain its secrecy. The project seems to reveal desperation to gather intelligence, trying any available method until technological progress produced a more viable system. Russian reaction to aerial intrusion was tested and knowledge gathered concerning high-altitude photography and equipment retrieval. All of this proved useful in the U-2 and satellite reconnaissance programmes. The Russians did however protest about the balloons, showing that they could detect and resented high-altitude espionage.[581] Captured balloons were also put on display in Moscow as part of a propaganda exercise to expose US "aggression" against the Soviet Union; there is no indication that the Russians knew where the balloons had been launched from.[582] This exhibition of western espionage, eerily replicated after the downing of the U-2 aircraft in May 1960, seemed designed to undermine Eisenhower as a peacemaker and to show that Russia would protect its secrets. At about the same time as the balloon programme was being undertaken, another covert operation was being planned in Washington and London. This one involved the dangerous use of fast jets undertaking over-flights of the USSR.

Covert British Over-flights – Operation JIU-JITSU

Research by Lashmar in the 1990s revealed information on covert deep penetrations of Soviet airspace by the British and led to the BBC producing a *Timewatch* programme on the

[579] TNA. AIR 2/17902. Memorandum from ACAS(Ops) to CAS 03 February 1956.
[580] Peebles *Moby Dick* p.187.
[581] Ibid.,p.180.
[582] Ibid.,p.183.

subject.[583] The problem faced by Britain and the United States was that if they had to attack Russia's strategic nuclear forces they would need to do so from high altitude and likely in poor weather or at night, thereby making visual identification of airfields or missile bases extremely difficult. Electronic navigation aids did not extend far into the Soviet Union so targets would have to be recognised from radar images used by navigators.[584] The problem was how to obtain such images. President Truman had prohibited Strategic Air Command from overflying the Soviet Union to photograph radar screen images of potential targets.[585]

Due to post-war cuts in the RAF the British were still using propeller-driven aircraft such as the Mosquito and the Spitfire for photo-reconnaissance. However, if they could obtain access to American equipment, they had the drive and political approval to undertake more hazardous missions into the Soviet Union. This data could then be passed to the Americans to avoid White House restrictions, allowing a greater understanding of Russian nuclear forces and installations in European Russia. This would then allow the production of target plans for wartime use. According to Lashmar, the US Joint Chiefs of Staff decided to ask the British for help. In austere times, the British were likely to be keen to prove their value as a useful and trusted partner in the Cold War "special relationship."[586] Propeller driven aircraft such as the Lancaster or the Lincoln would not suffice but modern American jets with advanced radar equipment could be loaned to the RAF to undertake the missions. Lashmar notes that the British Joint Services Mission in Washington had been in discussions with the Americans about over-flights but only a few very senior people knew about it.[587] In the UK Air Chief Marshal Cochrane, Vice-Chief of the Air Staff was put in charge of the operation with Squadron Leader Micky Martin of wartime 'Dambusters' fame tasked to select personnel to form a top secret unit to run the operation.[588] When Lashmar undertook his research the project was still classified but some material has now been released to the National Archives on these highly sensitive operations which were run under the code name JIU-JITSU.[589]

[583] Lashmar, Paul *Spy Flights of the Cold War* (London, 1996). BBC *Timewatch* documentary "Spies in the Sky" broadcast in February 1994.
[584] Lashmar p.62.
[585] Ibid.,p.63.
[586] Ibid.,p.64.
[587] Ibid.,p.65.
[588] Ibid.,p.66.
[589] TNA.,AIR 19/1126 "Operation Jiu-Jitsu". This file contains some papers on the operation.

The aircraft chosen for the covert over-flights was the American RB-45C Tornado which was fast, high-flying and could be refuelled in mid-air thereby extending its range. Some of these aircraft were already temporarily based in the UK at RAF Sculthorpe, Norfolk with the 91st Strategic Reconnaissance Wing. This unit undertook mapping of Western Europe to update intelligence records and to aid planning but stayed 100 miles away from the Eastern European border.[590] Any covert over-flights using these aircraft would take place at night because if radar pictures were taken then natural light was not needed. The RAF sent nine men to join a secret unit based at Sculthorpe which needed pilots, co-pilots and navigators. They were subsequently sent to the United States for training on the RB-45C.[591] In October 1951 as well, Winston Churchill returned as Prime Minister, a wartime leader the RAF apparently found more amenable than Attlee and who subsequently authorised the covert over-flights from Sculthorpe.[592] A trial run was undertaken on 21 March 1952 in the Berlin air corridor to test Russian reactions to a medium jet bomber flying at high altitude transiting sensitive air space but it is unclear what the reaction was or if GCHQ detected any alert being raised.[593] The following month, a crew was briefed at Bomber Command Headquarters in High Wycombe to be told the real nature of its mission by the Commander-in-Chief of the RAF.[594] Three missions were planned to the Baltic States, one to Moscow and one to Ukraine.[595] A cover story was also provided in the event of a crash or if an aircraft was shot down stating that it had got lost and flown into the Soviet Union. False navigation charts were also provided as corroboration.[596] The aircraft also had RAF markings painted on them with any American insignia having been removed.[597]

Declassified papers show that the object of the first mission was, in the view of the Air Ministry, to "reduce the atomic air threat." [598] It stated that the mission took place from 17/18 April 1952 and consisted of three simultaneous over-flights in the Orsha and Poltava areas of the Soviet Union; refuelling over Denmark was provided by the Americans.[599] The Air

[590] Lashmar p.66.
[591] Ibid.,p.67.
[592] Ibid.,p.69.
[593] Ibid.
[594] Ibid.
[595] Ibid.
[596] Ibid.,p.70.
[597] Ibid.
[598] TNA. AIR 19/1126. Air Ministry briefing paper 22 February 1954.
[599] Ibid.

Ministry concluded that "valuable results were obtained" and that 20 out of 35 suspected or known Long Range Air Force bases were identified.[600] The over-flights also provided knowledge of Soviet air defences whose reaction time was slow. The Russians also appeared to have no night-fighter capability.[601] The aircraft were flying at 40,000 feet and Russian fighters could not reach them despite attempts to upgrade Russia's air defences. This was crucial knowledge in the event of an atomic war occurring. The RB45Cs got back safely with one aircraft having done a ten and a half hour mission. The photographs of the radar screens were taken to be analysed and the crews received Air Force Crosses for bravery, which required no citation to be written.[602] According to Lashmar the Russians had detected the flights and were furious, forming a commission which reviewed and upgraded Soviet air defences.[603]

The declassified file also reveals that a second JIU-JITSU mission was planned for April 1953.[604] The British wanted the Americans to undertake it but there was no political authorisation forthcoming when the British Foreign Secretary discussed it with President Truman.[605] The President thought that it was "not propitious" due to the political situation in the aftermath of Stalin's death but he would review it with the Joint Chiefs of Staff and the Air Force.[606] An American scientist also visited the United Kingdom at this time to see if the new Comet jet aircraft could be used for deep-penetration missions against bomber bases.[607] The Americans were concerned that the intelligence material they had was "confined almost solely to old German photographs."[608] The Air Ministry was alert to the fact that it had to gather as much intelligence as possible because in wartime there would not be the time to collect enormous amounts of intelligence. It noted that "this information can only be obtained by previous air reconnaissance" and can be made "by night at the present time with slight risk of Soviet interception."[609] It was also thought that the capability to enter Russian air space might not last if Soviet air defences improved and an early decision on future missions

[600] Ibid.
[601] Ibid.
[602] Lashmar p.71.
[603] Ibid.
[604] TNA.,AIR 19/1126. Air Ministry briefing paper 22 February 1954.
[605] Ibid.
[606] Ibid.
[607] Ibid.
[608] Ibid.
[609] Ibid.

needed to be made because the "no moon period" would only last from 26 April – 1 May 1953 and the mission had to be undertaken in complete darkness.[610] If it was not undertaken in the spring then a delay would occur until winter 1954 and the RAF even considered doing an independent over-flight mission with a new Valiant bomber.[611] Conversations were held on this topic between the US President, Prime Minister Winston Churchill and the British Foreign Secretary Anthony Eden with telegrams on it being held only by the Chief of the Air Staff.[612]

Eden's concerns about a second mission were of the "grave political repercussions which might result from a mishap."[613] A second mission was considered more dangerous because additional time would be spent over Russian territory and it would go deeper into the country, notably around the Moscow area.[614] The first mission was primarily to collect intelligence on bomber bases with the UK, rather than the United States, accepting the risks. The second mission was to collect intelligence for a general atomic attack on the Soviet Union and not for special attacks on its bomber bases, which had been important for the defence of the United Kingdom.[615] The feeling appeared to be that responsibility for a general atomic attack against the Soviet Union rested with the United States and it should take the risk for collection on this target. Eden could not understand "why it is thought right, that in the interests of collecting intelligence for this offensive, we should accept risks which the Americans will not accept."[616] He also saw a danger that each operation alerted the Soviet authorities and "increases the possibility that the Soviet government may conclude that the western powers are definitely planning to attack them and may therefore make them decide to attack the western powers first."[617]

[610] Ibid.
[611] Ibid.
[612] Ibid.
[613] Ibid.,Memorandum from Eden to Churchill 9 December 1952.
[614] Ibid.,Memorandum from Eden to Churchill 28 November 1952.
[615] Ibid.
[616] Ibid.
[617] Ibid.

According to Lashmar, a second mission, scheduled for late 1952 was cancelled apparently due to a possible security breach.[618] However, the mission was re-instated on 28-29 April 1954 with three longer routes than the previous operation and the whole undertaking was monitored by GCHQ to test Russian reactions.[619] This mission was approved by Winston Churchill who asked to be informed when it was being undertaken.[620] Even if the primary mission of obtaining photographs failed, at least intelligence would be gained about Russian communications and air defences which would be useful to the allies. The aircraft had RAF markings; no serial numbers and the longest route went 1000 miles into Russia and covered some 30 targets.[621] The Soviet air defence system went on alert during the second mission and one Russian commander even ordered his pilots to try to ram one of the RB-45Cs.[622] One British pilot also recalled encountering anti-aircraft fire on the return journey.[623] A handwritten (undated) file note states that it would be several days before the mission could be declared a success because radio and radar traffic would need to be examined.[624] It is unknown what intelligence was collected or how successful the final mission was; no other missions were undertaken in this series as far as is known.

These controversial and highly dangerous missions were considered important to the British, who were prepared to take extreme risks to gather intelligence. A support paper in the declassified file on the missions emphasises that British aircraft in wartime would have to attack Russian bomber bases at night with no fighter escort.[625] This could only be done if they had radar pictures taken previously, without snow on the ground; otherwise days would be lost gathering intelligence in the crucial early stages of a war.[626] It argued that there was "a strong military necessity for this radar reconnaissance to be undertaken in peace" when the nights were not too short.[627] It also appreciated that the Americans would not do it for political reasons due to Presidential elections being held and they had previously lost a reconnaissance aircraft in the Baltic; destroyed in daylight at low altitude and monitored on

[618] Lashmar p.72.
[619] Ibid.,p.73.
[620]. Ibid.,Memorandum from PM to Air Ministry 03 March 1954.
[621] Lashmar p.73.
[622] Ibid.,p.74.
[623] Ibid.
[624] TNA. AIR 19/1126. "The Counter-Offensive Against The Soviet Long-Range Bomber Force" February 1952.
[625] Ibid.
[626] Ibid.
[627] Ibid.

radar.[628] Interestingly, the paper also noted that three "special flights" using slow transport aircraft on a moonlit night had previously flown over Russia with no reaction noted.[629] This is likely to be a fleeting reference to allied agents being parachuted into Russia. The support for the over-flight operations has a tone of "now or never" because Russian air defences were advancing and it would become difficult and risky to run such missions in the future. It also noted that Fighter Command could not hope to defend the UK against a Russian air strike and attacking Russian bomber bases was "the most effective means of reducing the scale of attack on this country."[630] Such was the sensitivity of the issue that it was noted in a memorandum between the Chief of the Air Staff and the Secretary of State that it is "highly undesirable to discuss a matter of this extreme secrecy in Cabinet."[631]

Very few papers have been declassified concerning the JIU-JITSU operations but it is clear that the flights were an enormous gamble which needed approval at the highest level. They perhaps reflect the character of Churchill whose wartime experiences gave him an acute appreciation of the importance of intelligence. What would have happened in the event of an aircraft crashing in the Soviet Union can only be imagined and perhaps it would have led to the U-2 over-flight programme not being undertaken? There was also a risk at this tense time that a group of allied aircraft might have been mistaken for a pre-emptive nuclear attack on the USSR or the missions could have been betrayed by Russian sources in western intelligence. However, the extreme security measures surrounding the project likely prevented leakage of information. New Russian fighter aircraft and radars being introduced as well as the RB-45C becoming obsolete prevented further missions but the advent of the British Canberra bomber raised new possibilities for covert aerial reconnaissance.

The British Covert Mission To Kapustin Yar

In his work on aerial espionage, Lashmar wrote about a clandestine mission allegedly mounted by an RAF Canberra aircraft in the early 1950s which involved a covert over-flight of the Kapustin Yar missile centre in the Soviet Union.[632] This mission had originally been

[628] Ibid.
[629] Ibid.
[630] Ibid.
[631] Ibid., Memorandum from CAS to SofS 06 February 1952
[632] Lashmar pp.76-83.

mentioned by Robert Amory, retired CIA Deputy Director of Intelligence in the 1950s, who was interviewed for an American University oral history project.[633] This assertion had originally appeared in a book on the CIA published in 1968.[634] In particular, doubts have been cast about the credibility of this allegation and debate ensued about which aircraft or squadron flew the mission and why no official documentation or statement by the participants has been released.[635] Doubts have been cast about Amory's memory and if he was confusing the alleged over-flight with Operation JIU-JITSU as well as technical information about which camera system might have been used. Pocock reviewed Lashmar's evidence and after an examination of RAF operational record books in the National Archives could find no flights which matched this alleged covert operation.[636] However, such a sensitive operation would likely, like Operation JIU-JITSU, be Top Secret and concealed for security reasons so would be unlikely to feature in operational record books or RAF station flying logs which are limited to secret level.

Amory and Lashmar pointed out that western intelligence was aware of the Kapustin Yar facility from debriefs of German returnees and it was a national priority to secure intelligence about it.[637] Amory stated that the United States could not undertake the mission due to a ban on over-flights imposed by the Truman administration; instead the RAF flew a mission from Germany to the target and "got some fair pictures."[638] He further asserted that the British did not want to do it again due to the high level of risk and the Russians having detected the flight but then making no public comment.[639] The Canberra was an ideal platform for such a mission having set the world altitude record at 63,668 feet on 4 May 1953.[640] Lashmar thought that the single operation referred to by Amory was called Operation ROBIN but my research reveals that ROBIN was the codename for a US supplied 240 inch focal length camera which was used for oblique photography and could achieve a resolution of 20 feet

[633] Ibid.,p.77.
[634] Alsop, Stewart *The Center* (New York, 1968) p.194.
[635] See Pocock, Chris "Operation "Robin" and the British over- flight of Kapustin Yar: A Historiographical note" *Intelligence and National Security* 17:4 (2002), pp.185-193.
[636] Ibid.,p.191.
[637] Lashmar p.77.
[638] Ibid.
[639] Ibid.
[640] Ibid.,p.78.

from 46,000 feet at a range of 40-50 miles.[641] Such a camera would be unsuitable for direct overhead photography and it could photograph from a greater distance without overflying the site. Operation ROBIN instead appears to have been a programme of cross-border photography using a Canberra aircraft to photograph denied areas but does not seem to be the cover name for a covert operation to photograph the Kapustin Yar missile testing facility.[642] In the ROBIN project nine aircraft sorties were flown along the German border to photograph East Germany from 1954-55 but there is no mention of any aircraft entering Soviet airspace.[643] However, many papers on this project, which used a powerful American camera, are retained and a special mission may have used the programme as cover.

With no written records available in the UK and the aircrew from the time gradually passing away, it seems unlikely that hard evidence about Amory's alleged over-flight would emerge. Lashmar does note however that Soviet aircrew from the era recall attempting to intercept Canberra aircraft inside Soviet airspace.[644] Colonel Aleksandr Orlov of Soviet military intelligence noted that at Kapustin Yar the British and Americans "carried out reconnaissance all the time" using aircraft "especially the English Canberra."[645] A Russian fighter pilot, Lieutenant Mikhail Shulga also recalled intercepting a high-flying Canberra near Kapustin Yar in the 1950s but it was flying at such altitude that his engines stalled and he could not reach it.[646] After publication of his book Lashmar received letters from readers alleging that Canberras had taken off from the UK painted black or sky-blue with minimal identification for secret missions but these reports are unconfirmed.[647] However, it has been well quoted that on 24 June 1956 Premier Khrushchev said to General Nathan Twining, Senior United States Air Force Officer, who was visiting Moscow for the Armed Forces Day, that the "Canberras" entering Russian airspace would be turned into "flying coffins."[648]

[641] TNA.,DEFE 10/34. "DPRC Long Range Reconnaissance and Development." DRP/P(55)64 p.13 05 November 1955.
[642] TNA. AIR 19/1106 "Project ROBIN" for some details of the programme.
[643] Ibid.,p.1.
[644] Lashmar p.82.
[645] Ibid. Orlov was interviewed in 1993.
[646] Ibid.
[647] Ibid.,p.83. The over-flights were also discussed at the RAF Historical Society in its journal in April 2008. See Pocock, Chris "Reconnaissance Canberras – Some Untold Stories" *RAF Historical Society Journal* Vol. 43a April 2008. Pocock remained sceptical about the mission.
[648] Quoted by Nesbit p.258.

This circumstantial evidence implies that a covert over-flight was indeed undertaken of Kapustin Yar by the British in the early 1950s to undertake photography. During my research two stronger pieces of evidence came to light from the United States. Dino Brugioni, former senior CIA imagery analyst wrote a book about photographic reconnaissance which mentions his experience of the Kaputin Yar mission.[649] He notes that the CIA was under pressure to complete National Intelligence Estimate 11-6-54, "Soviet Capabilities and Probable Programs in the Field of Guided Missiles" which was due in October 1954 and aerial images were required of Kapustin Yar.[650] According to Brugioni the USAF was preparing for the mission but the RAF flew it instead in August 1953 as part of a burden-sharing reconnaissance effort.[651] Robert Amory apparently informed a few CIA officers about the mission, which is still shrouded in mystery, but it was apparently undertaken in daylight using a 100-inch focal length camera and flew from Giebelstadt airfield in West Germany.[652] Brugioni asserts that the aircraft approached the range but did not overfly it and was damaged by gunfire from Russian aircraft and had to land in Iran.[653] Brugioni interpreted U-2 imagery of the site later on and requested the 1953 images taken by the British but was informed that they were "badly smeared and of no value."[654] Brugioni was the second American official to mention the covert British mission to Kapustin Yar and later on in my research some American documentary material emerged to confirm the flight.

In 2013 the CIA released its official history of the U-2 program which had previously been released in heavily redacted form. The new document reveals British involvement in the U-2 over-flights and some details of the RAF's Kapustin Yar flight.[655] The CIA noted that the RAF had mounted Operation ROBIN since 1952 which involved using Canberra aircraft for high altitude reconnaissance operations because they had been fitted with more powerful Avon-109 engines and fuel-filled "wet wings."[656] This extended the aircraft's range to 4,300 miles and increased altitude to 65,880 feet.[657] The CIA confirms in its report that in the first

[649] Brugioni, Dino *Eyes in the Sky: Eisenhower, The CIA and Cold War Aerial Espionage* (Annapolis, 2010) p.86.
[650] Ibid.
[651] Ibid.
[652] Ibid.,p.87.
[653] Ibid.
[654] Ibid.
[655] See http//:www.2.gwu.edu/nsarchiv. Welzenbach, Donald E and Pedlow, Gregory W *The CIA and Overhead Reconnaissance: The U2 and Oxcart Programs 1954-74* (CIA Washington, 1992).
[656] Ibid.,p.23.
[657] Ibid.

half of 1953 the RAF sent a Canberra aircraft to Kapustin Yar but it was chased by Russian fighter aircraft and nearly shot down.[658] The CIA mused that either a traitor had revealed the flight details to the Russians or it had been detected on radar.[659] The Americans found out about the flight in the summer of 1953 and the British formally confirmed it to Washington in February 1954.[660] Despite the close relationship between the two states, this was such a sensitive operation that the Americans were only told about it months later and do not seem to have been involved in its planning. American personnel received a more in-depth briefing on the operation in the UK from 22-23 March 1954 and then reported back to Washington.[661] The CIA authors stipulate that there was no evidence that the United States was involved in the operation and few people in the United States knew about it.[662] This is the only official document which has been released which confirms this operation which presumably had to be authorised personally by Prime Minister Winston Churchill. The attack the aircraft suffered might explain the smearing of the photographic product and it seems to have been a considerable risk for possibly little gain. Nobody states that further missions were undertaken to Kapustin Yar but this remains a possibility. The Canberra was a very competent and useful intelligence platform and Riste speculates that RAF aircraft deployed to Norway in the 1950s may have been used for collection against the Soviet Union.[663] Norwegian radar personnel noted that "British pilots took greater risks" in intelligence collection and flew directly at Soviet radar stations to test their reactions when gathering ELINT.[664] It is unclear if any covert over-flights were taken in north-west Russia but the presence of the Soviet nuclear missile base at Plesetsk and naval facilities at Murmansk would have made this area a valuable target.

Additionally, a report produced by Air Intelligence in 1954 speculated about the purpose of several strange facilities in the Moscow area.[665] The Air Ministry had identified 19 unidentified complexes in the vicinity of Moscow in July 1954. One had been observed by a British diplomat travelling by aircraft from Berlin to Moscow, revealing that air travel by

[658] Ibid.
[659] Ibid.
[660] Ibid.
[661] Ibid.
[662] Ibid.
[663] Riste, Olav *The Norwegian Intelligence Service* (London, 1999) p.65.
[664] Ibid.
[665] TNA.,DEFE 44/298. "Interim Report on Complexes in the Moscow Area." DDI(Tech) Paper 6-54 November 1954.

British personnel was being used to supplement aerial reconnaissance at this time.[666] In September 1954 the crew of a British Hastings transport aircraft delivering supplies to Moscow was also briefed to try to observe these complexes, utilising a routine delivery for intelligence collection.[667] The file contains diagrams and locations of 19 complexes of unusual layout and the buildings and roads were reportedly seen by "various observers" which is curious because some of the complexes on the map appear to be many miles from Moscow.[668] Analysts looked at the size of the living accommodation to determine the number of staff at each location and a "source has supplied some very useful details."[669] It is unclear what, or who, the source was but they noticed smoke "changing colour before fading away" coming from one complex as well as possible air venting from a bunker.[670] Information on two sites came from the USAF which appears to have used its transport deliveries to Moscow to photograph the sites from aircraft windows with images available on the file.[671] A human source known as "the observer" was also questioned but it is unknown who they were or their nationality.[672] The UK likely had human intelligence sources in the USSR who remain unknown or who were later betrayed.

The Air Ministry also sought to have travellers flying from Stalingrad and Voronezh to Moscow look out of the port-side of their aircraft approximately 30 minutes before landing at Moscow.[673] British intelligence could not determine the purpose of these facilities but speculated that they were missile related. It seems they were air defence installations but it shows the supplementary use of ordinary air travel to gather intelligence and of unknown human sources to verify the data. Information on bomber or nuclear missile bases may also have been gathered in the same way. Diagrams were produced from material "sketched from memory" obtained through "oblique views" as well as grainy black and white photographs of roads in forests photographed through cockpit windows.[674] It is likely that more intelligence was obtained from pilots and passengers travelling over the Soviet Union and being debriefed by their governments. However, such intelligence was likely piecemeal and the biggest

[666] Ibid.
[667] Ibid.
[668] Ibid.
[669] Ibid.
[670] Ibid.
[671] Ibid.
[672] Ibid.
[673] Ibid.
[674] Ibid.

intelligence coup came in 1955 with the advent of the U-2 reconnaissance aircraft which, it has emerged in recent years, had covert British involvement.

The U-2 Programme and British Involvement

The U-2 has held a fascination for the public since it first appeared in the mid-1950s and achieved spectacular notoriety when an aircraft was shot down over the Soviet Union on 1 May 1960 thereby wrecking the superpower summit in Paris that year. The CIA's own secret internal history of the aircraft has gradually been released since 1998 and allows a fuller picture to be drawn about the aircraft, its significance and the UK's secret role in the project. Numerous works have been produced on the U-2 but my research had the benefit of being able to access Welzenbach's virtually un-redacted CIA internal study of the programme, including its British aspect, which was released in 2013.[675] Further information concerning the UK's involvement in U-2 operations emerged in March 2016 when the internal history of the CIA's Office of Special Activities (OSA) was declassified.[676]

The U-2 was a remarkable piece of aeronautical engineering and was in essence a jet powered glider designed to operate at 70,000 feet to perform imagery and electronic intelligence collection over the USSR. At this altitude it was beyond the reach of Soviet jet fighters, anti-aircraft guns and the earliest type of Soviet surface-to-air missiles. Initially it was also unclear if it could fly above Soviet radar cover but any Soviet protests received about over-flights would reveal their detection capabilities. The balloon over-flight project mentioned earlier, showed Russian reactions to western intrusions into its airspace and revealed they could detect and track high-flying foreign objects in their airspace. The key question was if President Eisenhower was willing to take the risk to mount illegal over-flights into the sovereign air space of another state at a particularly dangerous and tense period in the Cold War. A cost and benefit analysis had to be undertaken to weigh damage to international relations against the possible intelligence yield. Eisenhower, with his military background,

[675] For the U-2 see Wise, David and Ross, Thomas *The U2 Affair* (New York, 1962). Powers, Gary *Operation Overflight* (London, 1971), Pocock, Chris *The U-2 Spyplane: Towards The Unknown* (Atglen, 2000). Pocock, Chris *Dragon Lady: The History of the U-2 Spyplane* (London, 1989), Polmar. Norman *Spyplane: The U-2 History Declassified* (New York, 2001). Beschloss, Michael *May Day: Eisenhower, Khrushchev and the U2 Affair* (New York, 1986).

[676] See www.http://Cryptome.org/2016-00038. "CIA History of the Office of Special Activities 1969". It was released on 20 March 2016 and hereafter referred to as CIA OSA History.

was involved in some of the key decisions of the Second World War and so was well used to making such judgements. Interestingly, in 1955 he had proposed the *Open Skies* initiative to Khrushchev, whereby both sides would be allowed to fly reconnaissance aircraft over each other's territory to examine factories and military facilities to prevent surprise attack and increase knowledge of strategic capabilities. Khrushchev rejected the proposal as a "bald espionage plot against the USSR"[677] but in the light of the U-2 project it can be seen that Eisenhower could offer this as a statesmanlike, but cynical, gesture for world peace knowing that the U-2 was entering service and could provide unprecedented access to intelligence on Russian military facilities whether the Russians agreed to the proposal or not.[678]

With pressure mounting on American intelligence due to the on-going debate about the "bomber gap" and the "missile gap", the need for hard intelligence on the Russian target became more acute and risks needed to be taken to gather it. In his memoirs, Eisenhower noted the "critical importance" of determining what equipment and capabilities the USSR did and did not have.[679] The covert balloon project had gathered data on weather in the upper atmosphere which helped in the design of the U-2 and cameras had been developed which could perform at high-altitude. The Hycon-B camera carried on the U-2 had five times the resolution of cameras used in the Second World War and Kodak had developed a special thin film which allowed 10,000 feet of film to be carried for longer reconnaissance missions.[680] The organisational skills, imagination and resources of the CIA, combined with the technical prowess of the Lockheed Aircraft Corporation resulted in the first test flight of this innovative aircraft on 4 August 1955.[681] It also led, due to its unusual shape and enigmatic aura, to the first disclosures about the aircraft from aircraft magazines and ubiquitous, inquisitive aircraft enthusiasts.[682]

Despite its technical brilliance, the U-2 suffered from limited range and could not operate from the United States on missions over the USSR. It also needed very good weather

[677] Quoted in Polmar p.86.
[678] See Rostow, Walt W *Open Skies: Eisenhower's Proposal of July 21st 1955* (Texas, 1982).
[679] Eisenhower, Dwight D *Waging Peace: The White House Years 1956-61* (New York, 1965) p.217.
[680] Nesbit p.258.
[681] Lashmar p.140.
[682] Ibid.

conditions to take off and fly straight and level both at its operating base and over the target area. The literature on the U-2 is rife with stories about how difficult it was to land the aircraft due to its glider-like wings which kept it aloft. The aircraft was also notorious for having its engine stall due to "flame-outs" at high altitude and if it went too fast or slow it could go into a dive and lose its wings so it had to be flown at precisely the right speed to avoid "coffin corner" as it was known by the pilots. All of this had to be borne in mind by Eisenhower if he was to approve flights over the Soviet Union; even if the aircraft was not shot down, there was always the danger of an accident and losing an aircraft or pilot over hostile territory; a nightmare which would become reality in May 1960.

Limited range and lack of proximity of Soviet reconnaissance targets to the United States meant that foreign bases had to be used for U-2 operations and during the programme Turkey, Germany, Iran, England, Pakistan and Japan were all used as forward operating bases. The first overseas operating base where the U-2 was to be deployed was in the UK, reflecting the close relationship which existed between the two counties; US Strategic Air Command already had a base at Lakenheath in Suffolk.[683] Allen Dulles, CIA Director, had discussed the U-2 deployment to the UK with British Foreign Secretary Selwyn Lloyd on 2 February 1956 and although he was in favour of the project, emphasised that Prime Minister Anthony Eden had to agree it.[684] Richard Bissell, CIA Deputy Director Operations, was in overall charge of the U-2 programme and in spring 1956 he visited the UK to meet Prime Minister Anthony Eden to secure the use of the base to install a special aircraft hangar there.[685] Bissell emphasised the value of the intelligence which could be collected by the U-2 and played down the danger which existed. Correspondence declassified in 2016 also reveals that Bissell did not emphasise the danger in order to "minimize the incentive on the part of the British to try to maintain a tight control over operations."[686] The special relationship had limits as the U-2 was an American aircraft working to an American government department. Bissell also met the SIS Chief on his visit and the Deputy Chief of the Air Staff was also approached; both expressed strong support for the U-2 programme. Agreement was reached and four aircraft and pilots were sent to Lakenheath starting on 29 April 1956, with all aircraft in place by 4-5 May as the "1st Weather Reconnaissance Squadron (Provisional)",

[683] Brugioni p.146.
[684] CIA OSA History. Chapter 1 p.9
[685] Bissell, Richard *Reflections of a Cold Warrior: From Yalta to the Bay of Pigs* (Yale, 1996) p.110.
[686] CIA OSA History. Chapter 11 p.10. Memorandum by Bissell to Dulles dated 06 January 1956.

known under the CIA cover as "Detachment A".[687] As the unit was "provisional" it meant that it did not have to report to a higher command thereby ensuring it was more secure and run on a "need to know" basis, operating under cover as a unit providing a weather information service concerning the upper atmosphere.[688] The new aircraft naturally attracted the attention of aircraft enthusiasts with the magazine *Flying Review* noting unnervingly a few months later that "it is possible that U-2s are flying across the Iron Curtain taking aerial photographs or probing radar defences."[689]

Bissell wanted the first over-flights of the USSR to be undertaken from the UK and some practice missions were undertaken over Eastern Europe.[690] However, the politics of the Cold War overtook the CIA's planning activity. Eden was attempting to improve relations with the USSR in the post-Stalin years and SIS had mounted a dangerous clandestine mission in 1956 to use frogman Commander Lionel "Buster" Crabb to gather intelligence by diving beneath the Russian warship in Portsmouth harbour which had brought Khrushchev and other Soviet leaders to the UK on an official visit. The political fallout from this debacle, the unauthorised nature of which infuriated Eden, resulted in his writing to Eisenhower demanding that any over-flights mounted from Lakenheath should be postponed.[691] The possible delays to the planned flight schedules were unacceptable to Bissell and prompted him to seek a new base for the aircraft. A U-2 had also recently triggered an air defence alert in the UK with RAF fighters being scrambled to try to intercept it as an unidentified aircraft.[692] Bissell was also reportedly unhappy that the State Department had told Eden that there was only one U-2 aircraft at Lakenheath when in fact there were four.[693] To avoid further problems and to start the over-flight programme against the USSR, the decision was taken by the CIA to move the aircraft to Wiesbaden, Germany on 11 June 1956.[694] Some intelligence literature gives the impression that Eden banned U-2 over-flights from being launched from the UK or expelled the U-2s, but it was clearly American eagerness to start their covert operation and their appreciation of British sensitivities concerning relations with the Soviet Union that prompted

[687] Welzenbach p.94.
[688] Ibid.
[689] Quoted by Jackson, Robert *High Cold War: Strategic Air Reconnaissance* (London, 1996) p.236.
[690] Bissell p.115.
[691] Welzenbach p.94.
[692] Ibid.
[693] Ibid.
[694] Ibid.

the move. My research in The National Archives did not reveal any documents about U-2s at Lakenheath undertaking over-flights or British involvement in these covert operations due to the extreme sensitivity of the topic. Further security concerns later prompted the Americans to again move the U-2s from Wiesbaden to a base at Giebelstadt in West Germany.[695]

Covert U-2 over-flights of the USSR launched from Germany finally started on 4 July 1956.[696] All missions depended upon Eisenhower's personal authorisation of the route and weather conditions at the base and the target. The first mission covered Leningrad and notably the bases where Bison bombers were thought to be located, clearly showing the importance of Soviet nuclear bombers to western intelligence.[697] On 5 July another over-flight of the USSR was undertaken covering more alleged Bison bomber bases as well as the Fili aircraft plant where the bomber was built and Ramenskoye airfield where it was tested.[698] The operation also covered the Kaliningrad missile plant and the Khimki missile facility which had both been mentioned in debriefs by German returnees.[699] These missions clearly emphasised the importance of Russian missile and bomber facilities to western intelligence and the potential threat they posed. The over-flights also included the Leningrad and Moscow areas which likely reflected the CIA's intention to undertake the highest risk missions early on in the programme as these would most likely cause offence to, and provoke a reaction from, the Russians. Interestingly, the cancelled American balloon programme had yielded information about Soviet air defence radars and the weather which was useful to the U-2 programme.[700] It had also provided data concerning Russian fighter aircraft intercept altitudes and reaction times. The CIA had noted Russian protests and sought to cancel the balloon programme lest it prejudice the White House against the U-2 over-flight programme in the future.[701]

The U-2 could fly at extreme altitude and the CIA initially thought that the Russians could not track it on radar so the White House would not have to deal with any protests. However,

[695] Lashmar p.141.
[696] Welzenbach p.105.
[697] Ibid.
[698] Ibid.
[699] Ibid.
[700] Ibid.,p.87.
[701] Ibid.

unexpectedly, the Russians lodged protests about the initial U-2 over-flights thereby confirming that they could be detected and tracked, much to the CIA's consternation.[702] However, the Russians did not appear to know what sort of aircraft it was and described it as "a twin engine USAF medium bomber" or even a Canberra.[703] This could be denied because the U-2 was not a bomber, had only one engine and was not even a military aircraft as the programme was run by the CIA with civilian pilots on contract. Russian protests caused Eisenhower to halt further over-flights; meantime analysis of the pictures obtained by the first U-2 missions was found to be "generally good."[704] The results showed that at nine Soviet bomber bases there were no Bison aircraft and subsequent missions would show that the "bomber gap" was a myth.[705] The images were held in a secure room in the United States with only the chosen few with the right security clearances being allowed to see them.[706]

Russian protests and the U-2's operational stand-down from flights over the USSR caused Bissell to seek other ways to run missions without seeking White House approval. The UK was again his first choice to help in this matter and the 2013 release of the CIA's history of the U-2 provides new detail on this. The UK had previously hosted a U-2 detachment and received imagery from the aircraft since September 1956 in a special UK control system which was later merged with the American one.[707] In spring 1957 Bissell decided that the political risks of the programme could be reduced by using non-US personnel thereby increasing the over-flights' plausible deniability.[708] At a meeting on 6 May 1957, Eisenhower approved the use of foreign personnel and CIA Director Dulles and Bissell met SIS and RAF Intelligence personnel shortly afterwards to discuss it.[709] Eisenhower also consented to the resumption of U-2 over-flights and ten were undertaken in the second half of 1957.[710] In early 1958 the UK was pressed by the Americans to train RAF personnel to fly the U-2 and it was agreed, after Air Ministry personnel visited Washington in June 1958, that a small contingent of British pilots should be based at Adana, Turkey under the operational control of

[702] Ibid.,p.109.
[703] Ibid.
[704] Ibid.,p.108.
[705] Ibid.,p.111.
[706] Ibid.,p.112.
[707] Ibid.,p.153.
[708] Ibid.,p.154.
[709] Ibid.
[710] Ibid.

the CIA.[711] British participation in the over-flights was originally to have been codenamed KEEPER but this was later changed to OLDSTER.[712]

Four British officers were trained at Laughlin Air Force Base in Texas to fly the U-2; one, Squadron Leader Christopher Walker died in a training accident over Texas in July 1958 generating media interest.[713] British participation in the programme caused the CIA to change the over-flight programme codename from AQUATONE to CHALICE.[714] By November 1958, the RAF had three pilots and a flight surgeon in place in Turkey with the agreement of the Turkish government. Prime Minister Harold Macmillan formally agreed to RAF personnel over-flying the USSR on 27 August 1958 whilst retaining the right to approve or veto the flights.[715] The aircraft were not permitted to have RAF markings on them and the pilots had to pose as civilians. Eisenhower formally agreed the co-operation and Bissell was delighted that he now had an additional source of over-flight authorisation to facilitate operations "at times or under circumstances beyond the scope of authority accorded by US political authorities."[716]

This process was to make over-flight approvals easier because each decision was made independent of the other state.[717] Eisenhower liked the system because it would confuse the USSR over which nation approved the over-flight and spread the risk if an aircraft was lost.[718] He also saw it as a natural extension of the special relationship which had developed between the two countries and key individuals during the Second World War.[719] The British also benefited because the U-2 could be borrowed for use in the Middle East where the UK had particular interests and providing pilots and sharing risk ensured that the UK could access the imagery output.[720] When an operation was mounted, the aircraft would be signed over to

[711] Ibid.,p.155.
[712] CIA OSA History. Chapter 1 p.20.
[713] Welzenbach p.155. Pilots were Sqn Ldr Christopher Walker, Flt Lt Michael Bradley, Flt Lt David Dowling, Flt Lt John MacArthur.
[714] Ibid.
[715] Ibid.
[716] Ibid.
[717] Bissell p.116.
[718] Welzenbach p.155.
[719] Ibid.,p.156.
[720] Ibid.

the UK and any operation became the responsibility of the British Prime Minister and fell under his authorisation.[721] Eisenhower saw the relationship as "two complementary programs rather than a joint one."[722] From the newly declassified record in 2013 it is now known that in late 1959 and early 1960, the RAF ran two "highly successful" missions over the USSR covering missile testing facilities at a time when Eisenhower had not authorised a mission for six months.[723] The rest of the UK's activity consisted of 27 missions over the Middle East over two years.[724] In the UK, RAF participation in the programme was described as "high-altitude weather sampling" and a U-2 was sent to RAF Watton in Norfolk, described as an "Experimental Meteorological Research Unit" in May and October 1959 to fly weather missions to reinforce this cover story.[725]

Eisenhower only started to authorise more over-flights in 1959 after the "missile gap" controversy gathered pace.[726] Prime Minister Macmillan was adamant during the programme that no over-flights would take place during his visit to the USSR, during State visits or international meetings.[727] Revealed in 2013, the first mission he authorised was Operation HIGH WIRE flown on 6 December 1959 from Pakistan to Turkey and covered the Russian nuclear bomber base at Engels and the Kapustin Yar missile range, which produced "excellent" photography.[728] The second mission was Operation KNIFE EDGE which was undertaken on 5 February 1960 and overflew the Russian ICBM test facility at Tyuratum, which was not covered by Operation HIGH WIRE.[729] This mission also had to photograph the USSR's rail system which usually provided clues about the locations of other missile sites. However, despite "excellent photography" no missile facilities were found but a new bomber was seen at a factory in Kazan.[730] The UK's two missions generated no Russian protests which meant they either went undetected or the Russians chose to remain silent.[731] This success may have prompted Eisenhower to authorise more American missions which led

[721] Ibid.
[722] Ibid.
[723] Ibid.
[724] Ibid.
[725] Ibid.,p.157.
[726] Ibid.,p.159.
[727] Ibid.,p.164.
[728] Ibid.,p.164. A flight plan and photo of Engels air base appears in this report.
[729] Ibid.,p.167.
[730] Ibid.
[731] Ibid.

to the fateful mission when Gary Powers and his U-2 were brought down by a Russian surface-to-air missile on 1 May 1960.[732]

The final U-2 over-flight mission, codenamed Operation GRAND SLAM, was the most ambitious and longest U-2 mission ever undertaken. It involved the first transit right across Russia, at the limit of the aircraft's range, flying from Pakistan to Norway to photograph several installations. Interestingly, Welzenbach notes that the American Air Technical Intelligence Centre had assessed in spring 1960 that there was a "high probability of successful intercept at 70,000 feet" by the new Russian SAM-2 *Guideline* missile of a U-2 aircraft.[733] The desire to collect intelligence on important targets, generated by pressure in Washington, likely overcame good judgement so the twenty-fourth, longest and deepest penetration of the Soviet Union ended in disaster and the collapse of the Paris Superpower summit on 16 May 1960. When news of the shoot-down was released RAF personnel were evacuated from Turkey immediately to protect information concerning the UK's involvement. British pilots never again conducted an over-flight of the USSR on a CIA U-2 aircraft according to the official record.[734] Interestingly, when captured U-2 pilot Gary Powers returned from captivity in Russia he revealed that his interrogators never asked him anything about British involvement in the U-2 programme.[735]

Macmillan first heard about the U-2 shoot-down only on 7 May 1960 at Chequers as a result of a speech made by Khrushchev, rather than being informed by the Americans.[736] He thought that "the Americans have created a great folly" and noted the pilot "had not poisoned himself (as ordered)."[737] He also admitted in his diary that the "UK had done some successful ones (with aeroplanes which the Americans gave us") and referred to the operation as Exercise OLDSTER.[738] This was the British codename for its participation in the U-2 programme and Macmillan then cancelled any further British U-2 activity against the USSR

[732] Ibid.
[733] Ibid.
[734] Ibid.,p.181.
[735] Lashmar p.156.
[736] Horne, Alistair *Macmillan 1957-1986 Volume 2 of the Official Biography* (London, 1989) p.225.
[737] Ibid.
[738] Ibid.,p.226.

noting with relief that "nothing has yet come out about British flights into Russia."[739] A British MP, Stephen Swingler, did however allege that British pilots had been engaged in over-flights but this generated no official or major media reaction.[740] Macmillan's sense of relief seemed apparent and British involvement in the U-2 programme remained hidden for many years, not even being raised in Powers' trial. Macmillan's feeling was however balanced by the collapse of the Paris summit which he saw as "the most tragic moment of my life."[741]

In June 1960 the JIC was asked to examine the aftermath of the U-2 shoot-down following threats made by Soviet leaders to attack bases which supported U-2 operations.[742] In a speech made on 30th May 1960, Marshal Rodion Malinovsky, Soviet Defence Minister, threatened to attack airfields where the U-2 was deployed and this was amplified by a speech made by Khrushchev on 3 June 1960.[743] They stated that "crushing blows" would be inflicted on bases in the UK, Italy, France, Pakistan, Turkey and Norway through the use of rockets. The USSR clearly knew some of the bases that were involved in U-2 operations but did not mention Japan or the United States. The JIC said that if an attack was launched then it was aware that the Russians had a 650nm range rocket but did not know where the launch sites were or how they were deployed.[744] It could not say if a conventional or nuclear weapon would be used in an attack on a U-2 base but assessed that the latter was more likely due to the inaccuracy of long-range missiles.[745] It also thought that the Russians would know if a U-2 mission had been launched but Moscow would need to be confident that a conflict would not turn nuclear if the USSR attacked a western base.[746] The danger of miscalculation in this situation was considerable because US nuclear doctrine was based on "massive retaliation" and one bomb on one western base could trigger a nuclear war.

[739] Ibid.
[740] *Empire News* July 10, 1960.
[741] Quoted by Aldrich p.561.
[742] TNA.,CAB 158/40. JIC(60)43 "Soviet Threats Against Reconnaissance Flight Bases Following The U-2 Incident" 16 June 1960.
[743] Ibid.,p.3.
[744] Ibid.
[745] Ibid.
[746] Ibid.

The JIC considered that a Soviet rocket attack on a U-2 base would cause minimal damage if done conventionally but would have a severe psychological effect on the West; Russia would likely view it as a half-way position between global war and doing nothing.[747] The JIC assessed that the threat of a Soviet attack was a bluff, made for rhetorical effect and to deter future intrusions by reconnaissance aircraft.[748] The JIC also noted that the Russian government was "angered and disturbed" that the U-2 was able to reach Sverdlovsk and the extent of the information it obtained.[749] It felt that Moscow was "determined that these flights should not be resumed" and its dramatic threats were to deter other missions but the JIC was not certain if the aircraft had been hit at maximum altitude and if there was a risk to other flights.[750] The threat was also to frighten allies into not providing U-2 bases and Norway and Pakistan had already spoken to Washington about the U-2 being on their territory.[751] The threats were also thought by the JIC to be for consumption by the Soviet population showing Moscow being tough in protecting the nation's interests and having the capability to hit enemies.[752] It concluded that Moscow might consider destroying a reconnaissance base as a "show of force" without triggering a global war but its main objective was to prevent over-flights, frighten the West and separate the United States from allies.[753] The Russians likely thought they would not have to carry out their threats but there would be an issue if their bluff was called.[754] The fact that this JIC paper was produced shows the tension that existed at the time between East and West and how real the threat of conflict or miscalculation was. It also showed the high risks involved with reconnaissance operations and the importance of intelligence collection.

The partial declassification of the CIA's internal history of the Office of Special Activities in March 2016 yielded further information about British involvement in the U-2 programme. Both governments received the entire output of all the missions mounted over the USSR which would have been enormously beneficial to the UK as this data could not be gathered

[747] Ibid.
[748] Ibid.
[749] Ibid.,p.4.
[750] Ibid.
[751] Ibid.,p.5.
[752] Ibid.
[753] Ibid.
[754] Ibid.

independently.[755] The RAF base at Kinloss in Scotland was also allocated as an emergency operating base for the U-2 before or during hostilities with the USSR if Turkey or another location could not be used.[756] Such was the closeness between the US and UK on this project that the British were allowed to base an RAF liaison officer in the CIA project office in Washington.[757] This was unprecedented and the first incumbent, Wing Commander Norman Mackie, was instructed to behave as a "patriotic American" and not a British subject.[758] There were American sensitivities about his presence due to the number of sensitive projects in his office, notably the development of satellite reconnaissance capabilities.

Interestingly this new documentary release reveals that the British government deceived the President of Pakistan about the nature of British U-2 operations from the base at Peshawar, Pakistan. The British High Commissioner in Islamabad sought permission from Pakistan's President for U-2 flights from the base but maintained that the missions would be for the peripheral gathering of electronic intelligence.[759] In fact the British missions were covert over-flights of the USSR as mentioned earlier. It is also revealed for the first time that British personnel remained in the U-2 programme after 1960 and the codename for the UK's participation in it was changed from OLDSTER to JACKSON.[760] RAF involvement consisted of over-flights of the Middle East and training in order to maintain a capability for emergency, wartime use. It was also revealed for the first time that further U-2 over-flights of the USSR were considered after 1960. In 1962 a JACKSON mission was proposed by the Americans to be launched from Pakistan to overfly Sary Shagan, a missile testing facility in the USSR.[761] The UK was encouraged by Washington to lobby Pakistan and the electronic intelligence collection mission was given the codename Operation ADVENTURE. The RAF was due to give a presentation to Macmillan about the proposed operation on 10 July 1962 but the US postponed it, preferring a different collection method.[762] It is unclear if the RAF were to fly this mission or US personnel were to be used. It is important to note that not all U-2 missions were photographic intelligence operations. Five reconnaissance missions run

[755] CIA OSA History. Chapter 13 "CHALICE/OLDSTER Op Plan p.3.
[756] Ibid.,p.4
[757] Ibid.,p.14.
[758] Ibid.,p.15.
[759] Ibid.,OLDSTER Cover Story p.3.
[760] Ibid.,Chapter 13 p.19.
[761] Ibid.,p.21.
[762] Ibid.

along the USSR's periphery by the RAF in Operation OLDSTER were electronic intelligence collections.[763] The U-2 could operate at extreme altitude and collect signals across a wide area and range of frequencies. The new documentary release shows that on 9 June 1959 a U-2 flying on electronic intelligence collection duties at 65,000 feet intercepted missile telemetry from a Soviet ICBM during a launch.[764] This consisted of thirty seconds of crucial data broadcast eighty seconds after its launch allowing analysts to draw conclusions about the type and size of its engines.[765] Further information was collected on the launch of a Soviet lunar probe on 2 January 1959, all of which would have been shared with the UK.[766] The extent of the U-2's electronic collection activities remains unknown.

In conclusion, the U-2 operation was a highly risky and bold programme which reflected the extreme tension that existed during the Cold War and the remarkable use of technical capabilities to gather intelligence for policy makers. British involvement showed that the UK was prepared to share the risks and saw the collection of intelligence on Russian nuclear bombers and missiles as a top strategic intelligence priority.[767] British personnel were given access to U-2 product, flew covert missions, regularly visited the United States and subsequently briefed Macmillan and senior officials on the output.[768] Whilst there is nothing about this in The National Archives it is fair to say that U-2 intelligence is almost certain to have influenced defence policy and planning at this time but its total contribution cannot yet be judged. It will also likely have swelled the list of nuclear targets for Britain's growing V-force carrying the nuclear deterrent. In the words of Dulles, former CIA Director, in terms of reliability and access to inaccessible facilities "its contribution has been unique."[769] Bissell thought that the U-2 "proved that there was neither a bomber gap nor a missile gap" and the aircraft "changed intelligence collection forever." [770] Eisenhower had to suffer having his reputation for honesty damaged when the United States was caught engaging in aerial espionage and the U-2's cover-story about being a weather aircraft was found to be threadbare. It cannot be judged whether the Paris Summit would have reduced the momentum

[763] Ibid.,p.13.
[764] CIA OSA History. Chapter 1 p.23.
[765] Ibid.
[766] Ibid.
[767] Brugioni p.159 for Soviet bomber bases surveyed.
[768] Ibid.,p.170.
[769] Quoted by Brugioni p.357.
[770] Bissell p.131.

of the Cold War or led to greater trust between the superpowers but it seems likely that the U-2 made a major contribution to western and global security. The aircraft did demonstrate American technological ingenuity and skill and may therefore have helped enhance the nation's deterrent posture. The last words on the U-2 programme should perhaps be left to Eisenhower who wrote in his memoirs that "I know of no decision that I would make differently, given the same set of facts as they confronted us at the time."[771] He used to ask people who questioned the wisdom of the U-2 programme if they would "be ready to give back all of the information we secured from our U-2 flights over Russia if there had been no disaster to one of our planes in Russia?"[772] He never had an affirmative answer.

In July 2015 the CIA declassified its internal history of HT/AUTOMAT, its Photographic Intelligence Center which provided additional information about the U-2 programme.[773] This study emphasised the importance of the July 1956 over-flight of the USSR because its priority was to photograph Russian nuclear bomber bases.[774] The mission allowed nuclear weapon storage facilities at nine bases to be seen for the first time and not one Bison bomber was found.[775] This allowed the myth of the bomber gap to be exposed in the first intelligence reports issued using the flight's imagery in the winter of 1956-57.[776] The delay in issuing these reports was caused by intelligence support the intelligence centre had to give during the Suez crisis and the photographic interpreters not knowing what to look for at the Soviet air bases because they were unfamiliar with the facilities.[777] The missions did however allow knowledge to be built up which would aid future analysis. Bomb stores were identified at several bases and politicians could see that the U-2 had a unique capability to penetrate the secrecy surrounding Soviet nuclear weapons.

The over-flights also allowed intelligence to be generated on Soviet nuclear missiles. A Military Scientific Branch was established at HT/AUTOMAT to produce reports from the

[771] Eisenhower *Waging Peace* p.558.
[772] Ibid.,p.559.
[773] Available at www.http://cryptome.org October 4 2015. The document is "National Photographic Interpretation Center: The Years of Project HT/AUTOMAT, 1956-1958, 6 Volumes, Directorate of Science and Technology Historical Services, NPIC-3, 1974".
[774] Ibid.,p.23.
[775] Ibid.
[776] Ibid.,p.80.
[777] Ibid.

imagery derived from twenty-seven over-flights of the USSR mounted from July 1956 to May 1960.[778] It is highly likely that this material would have been shared with the UK although the report does not state this and it contains many redactions. It notes the importance of U-2 missions mounted over Central Asia under Operation SOFT TOUCH which provided the first views of Soviet missile testing facilities.[779] The study highlights that this material occupied imagery analysts for many years as they sought to glean intelligence about Soviet ballistic missiles. In August 1957 the first reports on Kapustin Yar and Tyuratam were issued and the HT/AUTOMAT history contains photographs and analyses of these facilities.[780] This is likely to have been extremely useful to the British government and could be added to radar and SIGINT data. Interestingly for the first time, the study reveals that the CIA had photographs taken using civilian airliners flying from Iran over Soviet territory to add to U-2 imagery.[781] This dangerous covert programme could have helped to plan future U-2 missions and locate particular installations in the south-west of the USSR. It is unclear if the covert photography was undertaken by aircrew or CIA operatives flying as passengers on the aircraft. It also raises the question of how many more covert operations concerning the U-2 and other over-flight programmes have yet to be revealed and whether this data was shared with the UK. However, only a few months after the U-2 shoot-down Eisenhower had to cope with another incident involving reconnaissance aircraft which had British involvement.

The RB-47 Affair

In 1960 the Americans had RB-47H *Stratojet* reconnaissance aircraft based with Strategic Air Command at RAF Brize Norton in Oxfordshire. On 1 July 1960 one of these aircraft had to fly a mission to Murmansk in order to collect electronic intelligence.[782] It was a twelve hour mission and at no time was it to enter Soviet airspace. As the aircraft was starting to turn north away from the Kola Peninsula in north-west Russia it was attacked by a Russian fighter and shot down by cannon fire.[783] The aircraft had to be abandoned but only two out of six crewmen survived and they were later picked up by a Soviet trawler and then sent to

[778] Ibid.,p.157.
[779] Ibid.,p.160.
[780] Ibid.,pp. 208-215 and pp.217-239.
[781] Ibid.,p.252.
[782] Lashmar p.165.
[783] Ibid.

Moscow.[784] The Russians attempted to generate the same outrage which had occurred during the U-2 affair but in this case the aircraft was in international airspace. Eisenhower had suspended U-2 flights after May 1960 but in July 1960, electronic intelligence flights along the periphery of the Soviet Union continued.[785] The United States was not informed that the aircraft had been shot down for 10 days and at first thought it was lost by accident. Eisenhower knew by radar tracking that the aircraft had stayed at least 30 miles from the Soviet coast and was heading away from the Soviet Union when it disappeared.[786] The United States released a statement stating that the aircraft was over international waters and Eisenhower saw it as a "deliberate and reckless attempt to create an international incident."[787] Washington further threatened "serious consequences" if it was repeated and Eisenhower found it "difficult to discover any logical motive for the barbaric Soviet actions."[788]

Eisenhower was determined to continue such missions, using the UK and other countries as a base because of their value and to assert the right of the West to use international airspace.[789] The aircraft was likely destroyed because the Soviet Union took a robust stance against aircraft going into what it considered to be "sensitive areas" with Russian pilots facing sanctions if they did not shoot down intruders. This policy was revealed through interviews undertaken by Lashmar with Soviet air commanders of that era.[790] Despite the indignation the USSR attempted to generate about the incident at the United Nations, its call for a UN Security Council resolution against the United States was rejected. Cabot Lodge, US ambassador to the UN, did a presentation using a chart showing where the aircraft was and further revealed that Russian aircraft had penetrated US airspace twice in 1960 and four times in 1959, each time to within 25 miles.[791] The United States noted that it photographed these aircraft rather than shooting them down and on three occasions the aircraft came within five miles of American territory.[792]

[784] Ibid.
[785] Eisenhower p.549.
[786] Ibid.,p.568. See also Burrows *By Any Means Necessary* pp. 249-266.
[787] Ibid.,p.569.
[788] Ibid.
[789] Ibid.,p.571.
[790] Lashmar p.161.
[791] Eisenhower p.570.
[792] Ibid.,p.571.

Macmillan strongly defended the right of the United States to fly aircraft in the Barents Sea and wrote to Khrushchev to tell him so.[793] The delay in reporting the shoot-down by Moscow was likely to see if the Americans released another false cover story, similar to that used in the U-2 incident which the Russians could use for propaganda purposes. According to Ambrose, Eisenhower was so annoyed by the RB-47 shoot down that he said to Christian Herter, Secretary of State, that if the aircraft was destroyed over international waters they would "break relations."[794] The aircraft was destroyed over international waters, as Ambrose points out, but the American evidence was from secret radar coverage of the crash area and US intelligence did not want to reveal their surveillance capabilities.[795] Lodge was able to disguise the source of such knowledge when he appeared at the UN. At this time, Khrushchev also threatened the UK with "great danger" for allowing "aggressive actions" by the Americans from a British airfield.[796] This seems to have been an attempt to drive a wedge between the allies and to deny the Americans forward operating bases for electronic intelligence collection aircraft. His efforts failed and Eisenhower thought that Khrushchev's attempt to make the RB-47 shoot-down the "little brother to the U-2" was a "miserable failure."[797]

The RB-47 affair showed the dangers attached to reconnaissance operations at this time and the close relationship in intelligence that the UK had with the United States. Political sensitivities were paramount as Macmillan was concerned about the cover-stories for intelligence flights. The Foreign Office noted to the British Embassy in Washington that Macmillan "is anxious to do this in a way which will neither upset the Americans nor imperil security."[798] The British were kept aware of the details of US electronic intelligence flights as "the programmes of these flights are agreed each month in Wiesbaden between the USAF and the RAF."[799] During the RB-47 shoot-down the "technical department" of GCHQ had also known exactly where the aircraft was according to declassified papers in the National Archives which were put together into a report for the JIC.[800] This shows that the UK tracked

[793] Ibid.,p.570.
[794] Ambrose, Stephen *Eisenhower: The President Volume 2 1952-69* (London, 1984) p.585.
[795] Ibid.
[796] Ibid.
[797] Ibid.,p.570.
[798] TNA.,PREM 11/3324. FO telegram to Washington 17 July 1960.
[799] Ibid.,Foreign Office telegram from Washington to FO 20 July 1960.
[800] Ibid.,Note of 15 July 1960. Papers were classified as TOP SECRET GAUNT.

American intelligence collection and almost certainly benefited from the intelligence derived from these missions. The JIC noted in a memorandum to Macmillan that "the Russians will take any opportunity we may give them to shoot down our aircraft…if they think they can get away with it."[801] This showed the extreme risks that were taken in mounting airborne intelligence collection operations although the JIC noted that missions were covered by stringent safeguards and subject to final Prime Ministerial approval.[802] Each operation would be examined in the prevailing circumstances and the Government Legal Advisor had advised that the operations were acceptable under international law.[803] So long as hostile territory was not over-flown or its airspace violated then it would not be considered as espionage but the dividing line between this and reconnaissance was very fine.[804] The JIC also noted that after the U-2 and RB-47 shoot-downs, cover-stories were "no longer likely to carry much weight."[805] This was even more difficult when crews were captured and interrogated. Interestingly, the JIC noted that American intelligence operations were done on a greater scale and "as far as we can discover they have not been as cautious as we have since the U-2 and RB-47 incidents."[806] This suggests that the United States was not totally frank with the UK about its intelligence collection activities so it was not possible to say what operations were run from bases in the UK and how they were undertaken. It also suggests that the UK was more cautious following the shoot-downs because it was unknown if the USSR had introduced a new policy of destroying reconnaissance aircraft coming near its airspace. As Macmillan noted to the Foreign Secretary "it seems to me that these incidents may become very dangerous."[807]

Airborne Electronic Intelligence Collection

Despite the danger involved in electronic intelligence collection operations they had to be run as a means to collect technical data and augment photographic material. It is unclear what data was collected but it is likely that some data on bombers and missiles was collected by various platforms. Little has been released to The National Archives and Freedom of Information Act requests submitted for this thesis were all rejected. Referred to as "Radio

[801] TNA.,PREM 11/4721. PM/60/107 13 September 1960.
[802] Ibid.
[803] Ibid.
[804] Ibid.
[805] Ibid.
[806] Ibid.
[807] Ibid. Minute from Macmillan to Foreign Secretary 01 August 1960.

Proving Flights" it is known that the RAF used Canberra, Comet and Washington aircraft to fly close to Soviet border areas. Declassified material indicates that Russian radars were investigated near the Baltic and Barents Seas but the comment is recurrently made that Soviet territory was not penetrated.[808] However, if war was imminent then over-flights would be permitted to "obtain intelligence which other methods, up to that time, have been unable to produce."[809] The priority was intelligence on airfields, missile bases and targets vital to war potential.[810] Interestingly, the report noted that "a small number of special sorties will be necessary at the highest priority to secure information relating to nuclear weapons."[811] The targets are not listed but would require sorties penetrating Russia by 2000 nautical miles. In peacetime electronic intelligence collection operations were conducted by the RAF against the Soviet Union along the Iranian border, Turkey and the Black Sea as well as the Baltic, where aircraft were not allowed to get closer than 30nm to the Russian coast.[812] Aircraft such as Washingtons and Canberras would operate in pairs at night with the latter approaching the Soviet Union's airspace whilst equipment on the Washington would monitor any Soviet air defence reaction.[813]

In 1957 Macmillan was adamant that all electronic collection flights over Turkey to the Black Sea had to be done under cover of darkness and needed Turkish approval with the UK Foreign Office needing to know the dates which it could change or cancel if it wished.[814] In the first six months of 1956 it is now known that 36 intelligence flights were planned on 13 nights with a further 27 planned from October 1956 to March 1957.[815] The flights were conducted when there was no moon and they "provided intelligence which cannot be obtained by other means."[816] The Chief of the Air Staff mentioned to the Secretary of State for Defence that he "may care to let the Prime Minster and the Foreign Secretary know how much valuable information we have gained from these flights."[817] Earlier declassified

[808] TNA.,AIR 19/1105 "Radio Proving Flights" for details of some flights.
[809] TNA.,CAB 158/18. JIC(54) 97 "Requirements for British Strategic Air Reconnaissance Intelligence during the First 3 Months of a War against Soviet Russia 1954-1957" 02 December 1954.
[810] Ibid.
[811] Ibid.
[812] TNA.,AIR 19/1105 "Radio Proving Flights". Memorandum from VCAS to SofS 06 December 1957.
[813] Ibid.
[814] Ibid.,PM Minute to Air Ministry 25 April 1957.
[815] Ibid.,Memorandum from Cabinet Secretary to PM 14 September 1956.
[816] Ibid.
[817] Ibid.,Memorandum CAS 1260 F.54/2 from CAS to SofS 02 May 1956.

correspondence from the Air Ministry notes that these flights are the "prime source of accurate information on the order of battle and development in the technical field, particularly guided weapons."[818] Despite the benefits from these flights the Foreign Office banned them for a few months after the Commander Crabb "frogman incident" in 1956 and wanted RAF aircraft to "keep well away from Soviet territory."[819] The potential intelligence yield from these missions prompted their resumption a few months later under Eden but only with risk assessment and political approval.

By 1959 many "Radio Proving Flights" were undertaken in daylight when there was more Soviet air activity and the collectors could be concealed amongst other air traffic.[820] These aircraft would fly 60 nautical miles parallel to the Soviet coast at 40,000 feet, and not towards it, in order to monitor radio and radar transmissions after the Foreign Office had approved the mission.[821] However, there was the possibility of 'special missions' because "proposals for individual penetration flights will be handled between ACAS(Int) and the Chairman (JIC)."[822] This suggests that the Soviet Union's airspace may have been entered on occasions, perhaps to monitor nuclear weapons' tests. A JIC memorandum notes that "UK operations are mainly aimed at strategic electronic intelligence"[823] suggesting that more important high-level communications were monitored by certain flights. However, the details of the targets and what was gained from these missions remain classified.

The fact that electronic intelligence and other airborne missions continued after the U-2 and RB-47 shoot-downs shows the importance of their work and the risks that the British and American governments were prepared to take to acquire intelligence. Macmillan in classic Edwardian understatement noted that they were "no doubt disagreeable to the victims."[824] However, advances in technology meant that airborne intelligence would move into space where Russia's launch of *Sputnik* had established a precedent of over-flying another state's

[818] Ibid.,Memorandum from SofS to PM 06 July 1955.
[819] Ibid.,Memorandum from PM to Air Ministry 16 May 1956.
[820] TNA.,AIR 19/1108 "Reconnaissance Flights – Policy" Memorandum from Air Ministry to PM 23 April 1959.
[821] Ibid.
[822] Ibid.,Memorandum from FO to Admiralty 08 July 1957.
[823] TNA.,AIR 19/1108 "Reconnaissance Flights – Policy". Memorandum from JIC to CAS 22 July 1960.
[824] Ibid.,Minute from PM to Foreign Secretary 01 August 1960.

territory in 1957. The potential of intelligence collection from space had also attracted the British government's attention.

Intelligence Collection From Space

The British government was acutely aware of the inadequacy of reconnaissance assets for dealing with a vast, secretive landmass like the Soviet Union in the post-war years. The Defence Policy Research Committee noted in 1954 that "we are strongly impressed by the present day disparity between the knowledge of the enemy we need for military planning purposes, and the amount that we actually possess."[825] Aerial observation of the USSR had been limited to a narrow strip around the periphery of the country and they sought to "investigate machines which attract little attention, possibly by using speed and height to reduce the chance of detection."[826] A later report from 1955 stated that intelligence was inadequate for providing "the location and description of strategic targets."[827] It also admitted that "there are large areas of the Sino-Soviet bloc about which we have virtually no knowledge."[828] It recognised the political problems of aircraft over-flights and avoiding detection but thought that satellites, high-speed aircraft or rockets might provide a solution.[829]

The UK's work on reconnaissance satellites was however limited to theoretical work and no space-borne intelligence system was developed or deployed by Britain during this time. The Air Staff, under Operational Requirement 9003, examined development of a satellite reconnaissance system in 1962 and considered it feasible to survey the Soviet Union at a resolution of 25 metres using a single television satellite or several film satellites.[830] The Royal Aircraft Establishment concluded that the major targets would be missile sites and airfields but the satellite would need to be able to see objects a few feet across.[831] The cost of such a system and its technical challenge appears to have precluded developmental work,

[825] TNA.,DEFE 10/33 DPRC Paper 17 "Long-Range Reconnaissance Research and Development" 09 June 1954.
[826] Ibid.
[827] TNA.,DEFE 10/34. DRP/P(55) 64 "Long-Range Reconnaissance Research and Development" 05 November 1955.
[828] Ibid.
[829] Ibid.
[830] TNA.,AVIA 6/25034 "Report of the Working Party on Satellite Reconnaissance Systems" 10 December 1962.
[831] Ibid.,p.4.

although at that time the United States had established a working system. The UK government did examine the idea of a "satellite-borne listening device" which appears to have been an electronic intelligence collection system.[832] The ideal system was thought to be one that combined signals and imagery collection and that information could be obtained within hours rather than days; advice was sought from GCHQ about this.[833] Such a system would be designed so that its nature and existence could remain undiscovered and any downloads of data would have to be undertaken over friendly countries to prevent interception.[834] The paper looked at the problem of developing cameras, film retrieval and protection from radiation which would be very expensive and time-consuming to overcome. It did however recognise that satellites were a good reconnaissance vehicle offering endurance, predictability, speed and invulnerability.[835] The coverage they offered was wide and the craft lay beyond the sovereignty of a state and their early warning capability helped to provide a deterrent. However, daylight was needed for imagery and the cameras suffered from poor resolution and were vulnerable to cloud cover.[836] An examination of all the problems indicated that the UK could not develop its own satellite reconnaissance systems but could assist with analysis of American material, provide ground stations and launchers.[837]

In 1960 the UK sought to be involved in the American MIDAS satellite system which was part of the early warning system to detect a Russian nuclear attack but could provide a limited intelligence collection capability via space-borne infra-red sensors.[838] The UK was to have provided a "readout" communications station at Kirkbride in Cumbria manned and paid for by the RAF.[839] There would have been eight satellites operating at an altitude of 2000 miles which could detect the flame of a rocket engine 90 seconds after launch.[840] The theory was good but the technical problems experienced in the United States were enormous and the system was never operationally deployed.[841] It could have helped to monitor Russian missile tests and provided Bomber Command with extra warning time for the V-force before missiles

[832] Ibid.,p.5.
[833] Ibid.
[834] Ibid.,p.9.
[835] Ibid.
[836] Ibid.
[837] Ibid.
[838] TNA.,AIR 2/15781 "Project Midas" for papers on this project.
[839] Ibid.
[840] Ibid.
[841] Richelson, Jeffrey *America's Space Sentinels: DSP Satellites and National Security* (Kansas, 1999) pp.11-32.

were detected on radar in the event of a nuclear attack. As Professor Sir Solly Zuckerman, Chief Scientific Adviser to the Government said "the simple fact is that MIDAS does not work."[842] This project showed that the UK was eager to join the United States in any space project which offered intelligence collection opportunities. The greatest potential for intelligence collection from space at this time came from photographic reconnaissance satellites.

During research, no British document from the JIC or other government department's files was found stating that the UK knew about the American satellite reconnaissance programme or was receiving its output. There is a possible oblique reference to it in a report issued after the U-2 shoot-down which commented on the loss of intelligence. The JIB noted that "a substitute for this lost source of intelligence might be available by the end of the year."[843] With the U-2 having been lost in May 1960 and American experiments with satellite film capsule retrieval becoming successful in August 1960, this is likely a reference to the programme and confirmed that the UK knew about it. Another confirmation came from a document declassified in 2013 from the American National Reconnaissance Office (NRO) which has run the US satellite programme since 1960. This document was written in 1963 and concerns a US satellite reconnaissance system called LANYARD.[844] This letter discusses the "Accessibility of the LANYARD take to the British" and reveals that analysts at the UK's imagery intelligence centre (JARIC) had been receiving satellite products for some time, but the tone of the note implies that the UK had not yet been told about the new LANYARD system.[845] Renowned intelligence historian Richelson states in his notes that the UK had received imagery from the US satellite programme since its inception in 1960.[846]

Assuming that the UK had early access to the US satellite reconnaissance programme, the "take" available to the British intelligence community would have been considerable. It

[842] AIR 2/15781 "Project Midas". Memorandum from Zuckerman to MOD Press Office 16 May 1962.
[843] TNA.,DEFE 13/342 "Soviet and Communist Bloc Capabilities and Intentions." Memorandum from JIB to Defence Minister 29 August 1960.
[844] See http://www2.gwu.edu/nsarchiv. Electronic Briefing Book No.225 *Secrecy and US Satellite Reconnaissance 1958-76 e*dited by Dr. Jeffrey Richelson. Document 19 is a memorandum from NRO Acting Assistant Director to the Special Requirements Staff on 31 January 1963 concerning UK access to satellite intelligence material.
[845] Ibid.
[846] Ibid.

should be noted, as Aldrich points out, that even before photographic intelligence satellites were successfully launched from August 1960, the US Navy had launched even more secretive electronic reconnaissance satellites.[847] The existence of these systems called GRAB and POPPY was only revealed in the 1990s but it is unknown if the data they collected was shared with GCHQ.

Several studies have been written on the first US photographic reconnaissance satellites due to declassifications of documents by the NRO and the detail is beyond the scope of this thesis.[848] However, Bissell notes that Eisenhower thought that reconnaissance satellite development was "a national security objective of the highest order" and the success of the CIA's U-2 project led it to be a key responsibility of the CIA.[849] The CIA hid the development of reconnaissance satellites, under the codename *Corona,* inside the *Discoverer* programme which was a civilian satellite research and development programme.[850] The operation was run under very tight security and suffered numerous setbacks with rockets exploding and camera capsules not deploying. It was only on the thirteenth attempt in August 1960 that a capsule was successfully retrieved from space.[851] Bissell described the whole process as "heart-breaking and frustrating" as well as "hideously expensive."[852] The first successful retrieval of film from a reconnaissance satellite was achieved on 18 August 1960 with *Discoverer XIV* delivering 3000 feet of film weighing 20lb and covering 1,650,000 square miles of the Soviet Union.[853] Once the techniques of mid-air recovery of film capsules using aircraft, inventing better cameras and stronger polymer photographic film had been refined, intelligence could flow regularly and be shared with the UK. The United States had developed a wide-angle panoramic lens for a satellite which could survey a large area without

[847] Aldrich, Richard *GCHQ: The Uncensored Story of Britain's Most Secret Intelligence Agency* (London, 2010) p.208.
[848] Peebles, Curtis *The Corona Project: America's First Spy Satellites* (Annapolis, 1997) and Richelson, Jeffrey *America's Secret Eyes In Space: The US Keyhole Spy Satellite Program (London, 1990).* See also Taubman, Philip *Secret Empire: Eisenhower, the CIA, and the Hidden Story of America's Space Espionage* (London, 2004). Ruffner, Kevin *CORONA: America's First Satellite Programme* (Washington, 1995).
[849] Bissell p.135.
[850] Ibid.
[851] For more detail on the numerous failures and development of *Corona* see CIA historical film *A Point In Time: The Corona Story* now declassified and available on http:www.youtube.com/watch.
[852] Bissell p.137.
[853] *A Point in Time.* Interview with Arthur Lundahl CIA Photographic Interpretation Centre Director.

vibrations and would orbit the earth over the poles at an altitude of 100 miles photographing swathes of the USSR.[854]

Discoverer XIV flew for one day and made eight passes over the USSR which resulted in the production of 130 pages of analytical text being issued seven days after the mission.[855] This one satellite mission gathered more material than all the previous U-2 over-flights of the USSR combined and covered areas which the aircraft could not reach.[856] It also could not be shot down and cause international incidents. However, satellite cameras only had a level of resolution of 25 feet whereas the U-2 could see objects two feet across. With further technical development, by the late 1970s *Corona* could see objects only five feet across.[857] Ironically, when Khrushchev visited the USA in 1960, his train passed close to the *Corona* launching site in California.[858] There is no indication that the United States thought that the USSR had knowledge of the programme. The CIA was able to assess "with high confidence" the number and types of missiles the USSR possessed and expel the idea of "a missile gap" because Russia's missiles were based on the surface rather than underground, thereby making them vulnerable to surveillance.[859] Further developments in February 1962 such as mounting two cameras on the satellite meant that targets could be photographed in stereo so more technical information could be obtained.[860]

By the time *Discovery XVIII* was launched in 1961 a thin, strong film was being used (developed by Kodak), which allowed 39lbs of film to be carried so more pictures could be taken and longer missions run.[861] The UK is likely to have had access to the product arising from these developments. By 1962 however the "cover" of "scientific missions" was wearing thin so after 18 April 1962 all launches were described as "secret air force missions" and no details of launch times and dates were released.[862] Until the end of 1962, only seven *Corona* missions returned films but photographed 25 million square miles of the USSR and "all areas of interest."[863] The material produced by the satellites would have been of great use to the

[854] Ibid.
[855] Ibid.
[856] Ibid.
[857] Ibid.
[858] Ibid.
[859] Ibid.
[860] Ibid. See also Brugioni *Eyes In The Sky* p.407.
[861] Ibid.
[862] Ibid.
[863] Ibid.

UK because, as Bissell points out, it was bombers and missile bases which were the highest priority and the CIA was able to image locations anywhere in the USSR and provide intelligence on numbers, types as well as technical information on aircraft and missile systems.[864] Bases such as Tyuratum and Kapustin Yar which required constant monitoring could also be covered regularly instead of relying on dangerous sporadic U-2 over-flights. Satellites were ideal for repetitive and extensive coverage of a country and flew a regular orbit and path with less risk than a U-2 mission, so good in fact that *Corona* continued in use until 1972.[865] Peebles notes that the CIA was able to state with confidence in September 1961 that the USSR only had 10-25 ICBMs and 250-300 MRBMs, shorter range systems being of particular interest to the UK.[866] Satellite imagery was able to confirm the locations of missile bases and the type of systems based there because the USSR normally laid out bases in a particular way thereby making identification, and targeting for attack, easier.[867] The CIA assessed that there were 75 MRBM missile bases with at least 200 missiles in a belt from the Baltic to the Ukraine by the summer of 1961; very useful information to the UK for threat assessment and targeting purposes.[868] This information also had the potential to allow attacks on military rather than civilian targets and likely influenced UK nuclear targeting policy.

Conclusion

Aerial reconnaissance was demonstrated to be a crucial method for collecting intelligence in the Second World War and fostered a close relationship in this area between the United Kingdom and the United States. This continued into the Cold War as seen by the sharing of the DICK TRACY material which revealed that Germany was again a key provider of intelligence on the Soviet Union arising from its wartime intelligence collection activities on the eastern front. However, this material was limited and the United States in particular had an interest in the Far East and Siberia, which were not covered by German intelligence collection activities. German material did provide insights into potential targets and military installations but facilities such as Kapustin Yar and Tyuratum were not included in German archives due to their locations and post-war construction. The Soviet Union also built new bomber, missile and research facilities after the war which had to be located. Secondary

[864] Bissell p.139.
[865] *A Point In Time.*
[866] Peebles *The Corona Project* p.115.
[867] Ibid.
[868] Ibid.,p.116.

literature from Lashmar and Brugioni reveals that Britain and the United States mounted covert over-flights of the USSR in the early Cold War in addition to the U-2 programme. However, it is unclear to what extent the records of these missions have been retained, destroyed or even existed in the first place.

The use of intelligence collection balloons launched in the UK to overfly the Soviet Union again shows the close relationship in covert operations that existed with the United States and the lengths that the intelligence services were prepared to go to in order to collect intelligence on the Soviet Union. Whilst not a success, this programme helped to gather information on the Soviet Union's air defences and to develop high-altitude photography in preparation for the U-2 programme. The later use of loaned American aircraft by the RAF in Operation JIU-JITSU showed the extreme risks the UK was prepared to take to gather information on targets and the Soviet Union's nuclear delivery systems. There was a risk that Moscow could have misinterpreted this operation as a pre-emptive nuclear attack but the Prime Minister was willing to authorise it on two separate occasions in the UK's quest for intelligence and to demonstrate solidarity with the Americans. The later solo flight of a Canberra over Kapustin Yar, whose existence is supported by the 2013 release of the CIA's history of the U-2 aircraft, again shows the extreme risks the UK took to collect intelligence. There is no evidence that more such missions were undertaken in the early 1950s because they were highly sensitive and illegal. The US may have continued with occasional over-flights of the USSR with the UK perhaps receiving the data. For instance, the March 2016 release of the CIA's Office of Special Activities history reveals Project BLACK KNIGHT which was mounted on 18 December 1956.[869] This covert operation involved three US Strategic Air Command RB-57D reconnaissance aircraft mounting intelligence collection over-flights of the Soviet Far East as a unique operation. It can only be guessed what was collected if any more such missions were flown and what revelations may emerge in the future.

The best aerial intelligence pre-1960 came from the U-2 aircraft and this daring programme again had covert British support, proven by declassified CIA material building on research undertaken by Lashmar. The UK had access to the U-2's product which showed that there

[869] CIA OSA History. Chapter 1 p.15.

was no “bomber gap” and provided information on ballistic missiles and aircraft which could target the UK. This undoubtedly helped to form the intelligence picture of the USSR and influenced policy, but British files give no indication from the time of what material was produced or that over-flights were being undertaken. It likely enabled more targeting materials to be produced and confirmed locations and status of military installations. The U-2 also performed signals intelligence, which is rarely mentioned, but it is unclear what technical data were collected. It is important to note that only 23 over-flights were undertaken of the USSR and much of the country remained out of range so its coverage was limited but better than what had gone before.

The advent of satellites revolutionised aerial intelligence collection and the sole declassified NRO paper I discovered proves that the UK received output from this innovative programme but did not have all the technical details of the systems. The UK’s own efforts in this field were limited to studies and by this time it was apparent that the major technical means of intelligence collection would be built and funded by the United States. Britain declined relatively both economically and militarily so could not bear the increasing costs of large-scale intelligence projects. However, the UK could still provide bases and analytical support and act as a useful “second opinion” on intelligence issues. Britain also gained access to aerial intelligence coverage of the entire Soviet Union to monitor targets such as airfields and missile bases which could threaten it. Satellite coverage also proved there was no “missile gap” which had so gripped the United States and highlighted Britain’s more nuanced analysis of the issue. Despite the breakthroughs that aerial reconnaissance provided, the Soviet Union remained a closed country with its military facilities, nuclear weapons delivery systems and higher leadership still a hard and obscure target. Little progress had been made in human intelligence and a real benefit would have been “an agent in place” in Moscow. In the 1950s such an asset was simply an unattainable dream until the remarkable and dramatic case of Russian army officer Colonel Oleg Penkovsky achieved notoriety around the world and shed an unwelcome light on western espionage.

CHAPTER 4 – AN AGENT IN PLACE: THE PROBLEMS OF HUMAN INTELLIGENCE COLLECTION AND ITS VALUE IN THE CASE OF COLONEL OLEG PENKOVSKY

Intelligence gleaned from intercepted Soviet electronic transmissions and from overhead systems collecting imagery provided valuable but only partial information on Russian nuclear bombers and ballistic missiles. Ideally, a well-informed and trained human source in close proximity to such weapons could yield intelligence which was not broadcast through the ether or exposed to observation via photography. Such a person is potentially in a position to close gaps in knowledge on current and future production plans, quality of equipment, personalities and inadequacies in system performance, strategy, tactics, deployment and training.

Introduction

A human agent can provide expert first-hand views from inside a target country or government and may also be in a position to act as an 'agent of influence' to help steer policy in a particular direction or even sabotage programmes. They may comment further on such things as key personalities, internal politics and problems with secret programmes; intangibles which technical intelligence may not cover. The source can also be tasked to try to collect data from outside their area of work and as a trusted employee with likely a wide range of contacts in the closed world of Soviet government, may be in a position to collect and pass on gossip concerning areas beyond their remit and security level.

To the CIA and SIS, having such an asset in the USSR seemed an unrealisable dream due to stringent Soviet security and the enormous problems of handling such an individual based in Moscow. However, in 1961 the dream turned into reality in the form of Soviet army Colonel, Oleg Penkovsky. This chapter will focus on the difficulty of recruiting and "running" an agent in the USSR, showing the enormous problems surrounding human intelligence collection on the Soviet target. It will also examine the neglected area of what material concerning Russian long-range ballistic missiles and nuclear bombers he passed to the West as well as his observations on these forces. My research drew upon declassified material from

his CIA and SIS debriefs in London and Paris and secondary literature. No official Soviet reports or manuals that he passed to the West have been declassified.

Much has been written about Colonel Oleg Penkovsky, an officer of the GRU (Soviet military intelligence), who approached western intelligence in 1960 offering to work as an agent inside the Russian military in Moscow. Some material is a myth and his status as a Cold War secret agent has reached legendary proportions as more material on his case has been revealed in recent years. Much of the secondary literature focusses on the glamorous and clandestine field of the tradecraft used to "run" him as an agent. Some of it would not seem out of place in a fictional "spy thriller." His case shines an uncomfortable yet revealing light on the methods used to service and communicate with an intelligence asset in the USSR. The case revealed the identities of British and American intelligence personnel and showed quite clearly that the UK engaged in espionage, despite official denials that SIS even existed. It also highlighted the key role that SIS played in the case through Penkovsky's debriefings and covert meetings with its personnel in Moscow. Further exposure came from the arrest, trial and imprisonment in 1962 of British businessman (and secret SIS courier) Greville Wynne who acted as a link between SIS and Penkovsky.

The joint "show-trial" of Wynne and Penkovsky in Moscow publicly linked the British government to espionage and followed the similar earlier trial of U-2 pilot Gary Powers. Moscow used the Wynne and Penkovsky case as a propaganda ploy to portray the western powers as engaging in sinister plots against the USSR. The CIA and SIS were portrayed as actively recruiting "degenerate" Soviet citizens who were willing to betray their country and using people like Wynne as 'pawns' in a bigger, more dangerous game. The case was also used by Moscow to justify the oppressive security measures then in place in the USSR.

Despite many of the myths which exist about Penkovsky, his intelligence did play a key role during the Cuban missile crisis in October 1962. A unique aspect of the case is that intelligence from a single, key human source was used by decision-makers during a Cold War crisis. It is also interesting to try to determine what the JIC thought about Soviet nuclear bombers and ballistic missiles in the light of Penkovsky's Moscow-insider views. In this

chapter I will explore the problems in running Penkovsky as a covert human source in the USSR because it highlights the enormous ingenuity and skill required to succeed in this undertaking. Using memoirs and declassified CIA documents I will also assess what material concerning Soviet ballistic missiles and nuclear bombers he passed to the West.

With Penkovsky, it is often difficult to separate fact from fiction, which is of course a perennial problem in the "wilderness of mirrors" as the intelligence world is sometimes described. It is important to emphasise that some material written about him is a myth, repeated by authors until it became accepted unquestioningly as "fact." Ironically, this is also a problem in intelligence assessment. In 1962 the UK government neither confirmed nor denied allegations of espionage so any errors of fact remained uncorrected and events surrounding the case were subject to speculation.

The Literature Concerning Penkovsky

An early work on the Penkovsky affair was his published "memoirs" which were actually constructed by the CIA using the transcripts of his debriefs with western intelligence agents. This interesting, best-selling work was "ghost-written" by a CIA officer in 1965 and released as a 'journal' Penkovsky had purportedly secretly written in his Moscow flat over several years. It was then reportedly 'smuggled' to the West for publication after his demise. The document was officially sanctioned by the CIA as useful, factual anti-Soviet material.[870] The book was used by the American government to alert the world to the danger posed by the USSR's government, nuclear weapons and extensive intelligence collection apparatus. It provided derogatory insights into the Soviet leadership, its lifestyle, personalities and hypocrisy as well as details of its military capabilities and aggressive nature. The memoirs belied the indignation expressed by Moscow about covert American U-2 over-flights and western espionage because the USSR clearly had enormous military capabilities, aggressive intent and did itself engage in extensive espionage activity against the West.

[870] Deriabin, Peter (Ed) *The Penkovsky Papers* (London, 1965). Also see TNA FO 371/182816 on *The Penkovsky Papers*. The USSR warned the BBC not to broadcast material from the book on the Russian language service of the BBC World Service. They were clearly concerned about the unflattering light in which the Soviet leadership was portrayed.

Greville Wynne also wrote his own rather boastful (and factually dubious) memoirs in 1967 which provided a personal (and not officially sanctioned) view of the case, seemingly to the annoyance of the British government.[871] Penkovsky does not feature highly in the major works on the Cuban missile crisis but mainly inhabits the "spy" literature genre which emerged from the 1980s onwards. In academic works on international relations and Cold War history he is often relegated to a footnote. At his trial, the emphasis in Moscow was on portraying Penkovsky as an immoral degenerate and drunkard with nothing being said to the press or audience of "concerned Soviet citizens" about his GRU membership or Soviet nuclear or military information having been compromised. It was only in the 1990s that the CIA declassified documents on his case and a greater appreciation of his importance during the Cold War could then be made.

Additionally, and to add complexity to the case, the quality and quantity of his information on topics that western intelligence then urgently needed and the fact that he survived in the centre of Soviet power as an agent for two years, acted as a magnet for conspiracy theorists. If he was such an immoral, unstable character, why was he in the GRU and why did the KGB not detect him earlier and remove him? Was he left in place to sow disinformation to the West, either wittingly or unwillingly? Additionally, some western intelligence officers thought he had been planted on the British and Americans from the start of the operation. Former MI5 counter-espionage officer Peter Wright expresses doubts about Penkovsky's bona fides in his infamous autobiography, *Spycatcher*, which the UK government failed to suppress in the 1980s.[872] Further studies commenting on Penkovsky are eulogies which also highlight his bravery and the sterling work done by SIS and the CIA in successfully running a vital case in a hostile environment as well as studying agent psychology and motivation.[873]

[871] Wynne, Greville *The Man From Moscow* (London, 1967). See TNA PREM 13/1791. The government described the book in internal correspondence as "a mixture of fact and fiction" and it should "treat this book with the contempt it clearly deserves." In a memo to the PM from the Paymaster-General, Wynne is described as "a wet" and his book as "silly". The author also comments that "the only thing that puzzles me is how he ever came to be employed in a delicate operation."

[872] Wright, Peter *Spycatcher* (Australia, 1987) pp.204-212.

[873] Deacon, Richard *"C" A Biography of Sir Maurice Oldfield Head of MI6* (London, 1985) pp.130-137. Also Bower, Tom *The Perfect English Spy: Sir Dick White and the Secret War* (London, 1995) and Brook-Shepherd, Gordon *The Storm Birds: Soviet Post-War Defectors (London, 1989).* For a CIA view see Hart, John *The CIA's Russians* (Annapolis, 2003). Hart was given access to the CIA's Penkovsky files and wrote profiles of other Soviet defectors.

New and insightful official disclosures about Penkovsky were gained in the early 1990s when the CIA made an unprecedented release of hundreds of pages of debriefs and internal correspondence about its handling of the case into an electronic archive.[874] This provides the most detailed exposition of a Cold War spy case to be made public and is an incredible asset to researchers. For this chapter all of this primary source material, including declassified Soviet military articles produced by the General Staff as well as transcripts of Penkovsky's debriefs with the CIA and SIS in Paris and London were examined. The voluminous, high-level internal CIA correspondence on this case was also analysed. These unique papers, from which information on Soviet nuclear weapon systems can be gleaned, offer a remarkable insight into the running of a major espionage case in the Cold War as well as, for the first time, documentary references to an operational SIS case. No similar operational material has been released by the UK government to The National Archives.

The problems and tensions between the CIA and SIS are revealed from Penkovsky's recruitment to his detection. This plethora of documents makes this the most well documented Cold War espionage case ever to enter the public domain. The release also led to the publication of what is arguably the most thorough (but hyperbolically titled) book written on the case by Schecter and Deriabin[875] (the latter also edited *The Penkovsky Papers)*. The case was further examined by Corera in his 2011 study of SIS[876], drawing on the CIA archive. In 2013 the latest book on Penkovsky was produced by Duns and offers a new theory about how Penkovsky was detected, drawing on interviews with KGB personnel.[877]

Recent academic work was also undertaken on Penkovsky in 2014 by former CIA operations officer David Gioe for a PhD at Cambridge University and presented at an academic seminar

[874] See www.cia.gov/coll/penkovsky. The papers are available in the Electronic Reading Room. Hereafter referenced as "CIA Documents".
[875] Schecter, Jerrold and Deriabin, Peter *The Spy Who Saved The World: How A Soviet Colonel Changed The Course Of The Cold War* (New York, 1992).
[876] Corera, Gordon *MI6: Life and Death in the British Secret Service* (London, 2011).
[877] Duns, Jeremy *Dead Drop: The True Story of Oleg Penkovsky and the Cold War's Most Dangerous Operation* (London, 2013).

in Wales in 2012.[878] His work examines the tradecraft used by SIS and the CIA to run the Penkovsky case as well as relations between the two organisations and differences in operational techniques. He identifies weaknesses in tradecraft as the main reason for Penkovsky's demise. None of the studies cited above examines what material was passed to the West by Penkovsky concerning Soviet bombers and ballistic missiles. I would like to start by briefly examining Penkovsky's background and recruitment because this whole saga was initiated by one man, in the right place at the right time. It reveals the quirky hand of fate in history and luck in secret intelligence collection; a field where truth can be stranger than fiction.

Penkovsky's Background

Penkovsky's future troubles apparently started from the time of his birth in 1919 because his father was a serving officer in the Tsar's army who fought against the Bolsheviks.[879] He later maintained that his father had disappeared when he was a child and stated that his mother had said that he was dead. However, when the KGB made enquiries about Penkovsky's background and family (because he needed to be 'vetted' to deal with westerners and was travelling abroad), the death remained unproven and ensured that Penkovsky was ideologically 'suspect.' It was considered by the KGB that his father could still be alive and living in exile, perhaps with an anti-Soviet émigré group, so effectively Penkovsky's career progression was halted. This ensured that after he joined the army, and despite a successful war in the Red Army's artillery, it was impossible for him to reach the rank of General or be posted abroad permanently. This would deny him a key, prestigious rank and the privileges that went with it and this failure, along with personality issues, appears to have been a key motivator in his treachery.[880] Penkovsky's family had owned land in pre-revolutionary Russia and its loss and their reduction in social status may also have caused him to resent the Communist Party. A bourgeois lifestyle and assets may disappear but their mentality can live on and foster resentment which could be accentuated by every perceived personal 'slight' and failure.

[878] Gioe, David, Scott, Len, Andrew, Christopher *An International History of the Cuban Missile Crisis: A 50 Year Retrospective* (London, 2014) pp.135-175. Gioe's PhD on UK/US intelligence relations published in 2014 is not yet available electronically but two chapters are devoted to SIS/CIA tradecraft concerning Penkovsky (whose CIA codename was HERO and SIS codename was YOGA) were examined for this chapter. I am indebted to Dr David Gioe for sending me a copy of his thesis and answering some of my queries.
[879] Schecter p.50.
[880] Ibid.,p.62.

During Penkovsky's war service from 1939-45, a senior Russian Army officer, General Sergey Varentsov, acted as his patron and helped him to advance his career.[881] Penkovsky later married a Lieutenant-General's daughter and he was one of the youngest Colonels in the Red Army, being wounded in action during the conflict. A close relationship to such an individual as Varentsov, who headed the Red Army's artillery branch, gave him access to a network of other senior officers. They in turn could help his advancement and be used as unwitting sources of gossip and access to intelligence when Penkovsky decided to contact western intelligence. Penkovsky, through Varentsov, was acquainted with General Ivan Serov (KGB Chairman and later GRU chief) and via him to Premier Nikita Khrushchev. Perusal of CIA debriefing notes indicates connections to numerous prominent Soviet figures and senior officers who would be of interest to western intelligence. It is curious that with his background, his access to these social circles had not been restricted but conversely, being close to such people may have made the KGB reluctant to take action against him.

Penkovsky would have become known to western intelligence in 1955 because he was posted to Turkey as an undercover GRU officer, the acting Military Attaché, following special training in the prestigious Frunze Military-Diplomatic Academy (an intelligence training school) which his patron helped him to enter.[882] He had problems with his superior in Turkey, a general who was later appointed as the full-time Military Attaché in Ankara. Penkovsky thought his superior was stupid, sub-standard and, as he considered himself to be of high-intelligence, deeply resented his superior. Penkovsky later reported him to the Supreme Soviet, via KGB channels, for an operational intelligence transgression which later saw the general dismissed. Reporting a GRU senior via KGB channels to Moscow was a major *faux pas* as the rival civilian intelligence organisation was seen as an "enemy" and this act was regarded as treachery by his colleagues and nobody would likely want to work with Penkovsky. In a CIA debrief, Penkovsky admitted having contacted Turkish intelligence anonymously at this time to compromise a fellow intelligence agent whom he sought to

[881] Ibid.,p.60.
[882] Ibid.,p.61.

remove and to undermine his superior.[883] This was his first contact with western intelligence and an early act of treachery.

It is noteworthy that Penkovsky was very status conscious, needed praise, approval and resented someone else taking the top position in the GRU in Turkey. He knew that a general would take the post eventually yet seemed to take this as a personal 'slight' when it occurred. By his own admission he was vain, egotistical and spiteful, often seeking revenge if he felt that he had been let down. He was also clearly impulsive and rather unstable; an individual who liked the 'limelight' and would not share it with others. Such a 'prima donna' did not think through the consequences of his actions and sowed the seeds of his own destruction. There is extreme arrogance in his actions and in his debriefs Penkovsky came across as reckless and a gambler; supremely confident in the rightness of his actions and his ability to handle any situation by correctly calculating risk. This would give him the courage to act as a spy but not to do so safely and eventually his luck would run out. This was clearly a person who would not take advice or orders and would pursue his own course, regardless of the consequences. It is also significant that the Turkish incidents were his first furtive acts of betrayal and contact (albeit anonymously) with western intelligence long before his approach to the CIA. Penkovsky was clearly a disgruntled military intelligence officer with significant access to secrets and his report of a superior via KGB channels to Moscow for misconduct was done even though it would make him a pariah.[884]

Unsurprisingly, he was recalled to Moscow but used his connections through his patron Varenstsov, to get on a missile course at the prestigious Dzerzhinsky Military Academy in 1958.[885] He spent a year at this institution learning about the latest developments in Soviet rocketry and missiles; a good source of valuable information for a future defector.[886] As a student he had access to classified libraries and started copying material with a view to giving the data to the Americans at some stage in the future.[887] After graduation, Penkovsky was assigned to the State Committee for the Coordination of Scientific Research Work (GNTK).

[883] Ibid.,p.65.
[884] Ibid.,p.64.
[885] Ibid.,p.68.
[886] Ibid.,p.69.
[887] Ibid.,p.73.

This organisation was responsible for sending Russian scientific delegations abroad with a view to collecting intelligence and dealing with incoming foreign groups to prevent them from collecting intelligence.[888] Penkovsky had been assigned to the Army Reserve (another perceived slight) and was working at GNTK when he decided to approach the Americans and offer to work for them. This decision would have far reaching consequences for him and the West.

Penkovsky Approaches the West

Penkovsky was not sought out in Moscow or abroad by western intelligence services and 'pitched' for recruitment but rather attempted through non-official contacts to establish a communications link with the Americans. Any approach to him in Moscow by western intelligence would likely have been detected due to pervasive Soviet security and sparse contacts existing between Soviet citizens and westerners. His official work made him well placed to act as an agent because he retained access to classified material, could speak English and he interacted with foreign visitors, both official and private. It is also curious that he could speak English and it is unclear from the literature on the case, where and when he received tuition in the language. He was also one of the few Soviet officials who could travel abroad in Soviet delegations. This again does seem unusual because he was clearly temperamental, vengeful and insubordinate and had been sent home from Turkey after "betraying" the GRU. He also had a 'suspect' family background but his survival likely reflected his connections and the power of patronage in the USSR.

Penkovsky's first approach to the United States occurred in August 1960 when he intercepted two Russian-speaking American students in the street in Moscow; he had previously encountered them on a train journey earlier in the week.[889] To convince them he was genuine, he revealed classified information, in English, concerning the 1960 shoot-down of the U-2 and RB-47 aircraft which could only have come from an intelligence insider.[890] He asked them to take a package of documents to the US embassy in Moscow and one student, Eldon

[888] Ibid.,p.84.
[889] Gioe *International History* p.138.
[890] See CIA electronic document (undated) of transcript of Cox/Bulik interview. Mr Cobb, the second student, was interviewed by CIA officer Joe Bulik on 28 September 1960. Penkovsky said he had seen the two students on a train journey from Kiev. He proposed communicating with the CIA via a 'dead-letter-box' in Moscow.

Cox, agreed to do so at considerable personal risk because Penkovsky could have been part of a KGB 'sting' operation to entrap an American.[891] From the embassy, the packet was sent to the CIA in Washington with a personal letter from Penkovsky offering to work for the United States and some clues as to his identity.[892]

The CIA believed that the approach was authentic but had the problem that it had no personnel in Moscow who could establish contact with Penkovsky via the clandestine method he proposed. Llewelyn Thompson, US ambassador to Moscow had prohibited CIA operations from being run from the embassy.[893] This was an enormous constraint because the CIA had a seemingly willing, highly-placed Russian agent and no means to contact him. It did however insert an agent into the embassy in autumn 1960 under the codename COMPASS but he, through fear and surveillance, was unable to establish workable contact with Penkovsky.[894] The CIA was running a risk that Penkovsky would become frustrated and might decide not to pursue a covert career with them and an intelligence bonanza would therefore be lost. This situation shows the extreme difficulty in running human intelligence operations in Moscow at this time and the operational immaturity of the CIA. The Penkovsky case would be a major learning exercise for all the participants.

Penkovsky was indeed feeling frustrated and, with nobody from the CIA having contacted him by early 1961, approached William Van Vliet, a Canadian official in Moscow to forward another letter to the US embassy. He attempted to pass information on Soviet ballistic missiles but the Canadian, fearing entrapment, gave the material back to Penkovsky.[895] The diplomatic signal the Canadians forwarded from their embassy to their foreign service in Ottawa also actually named Penkovsky as "Pankovski" and noted that he wanted to defect, had financial problems as well as likely being a "disgruntled citizen" and "dangerously talkative."[896] His second approach also meant that more people knew about Penkovsky's attempted treachery as the signal was likely seen by several people in Canada. It is possible to

[891] Gioe p.138.
[892] See Schecter pp.1-3 for a copy of the letter in English and Duns p.137 for the original Russian version.
[893] See CIA document (undated) *Reflections on Handling Penkovsky* by Leonard McCoy.
[894] Gioe p.140.
[895] CIA documents. Canadian Foreign Service Signal 13 January 1961.
[896] Ibid.

speculate that if there were any Russian intelligence sources in the Canadian government they might hear about Penkovsky's attempted treachery. Also, if the Russians were intercepting and decoding Canadian diplomatic radio traffic, there was enough information in the diplomatic signal to identify him. His approach was also likely discussed inside the Canadian embassy which, if the rooms were bugged, would further alert the Russians that they had a potential traitor. The Canadians passed details of Penkovsky's latest approach to the CIA.

Penkovsky was clearly determined to make contact with the CIA and in mid-December 1960 it emerged that he had approached a British businessman in Moscow called Mr Merriman.[897] In his hotel room, he tried to pass documents to Merriman and gave him a telephone number which he asked the Americans to call. Merriman refused the documents but approached the American embassy in London and gave them this information; he was later interviewed by the CIA.[898] With nobody having successfully contacted him, Penkovsky made another attempt to establish contact with the Americans by approaching British commercial traveller Greville Wynne who was visiting Moscow in the spring of 1961.[899] The exact intelligence-status of Wynne is unclear, but his extensive travels in the Soviet bloc would likely have made him of interest to SIS. He passed details of Penkovsky's approach to SIS who may have assumed that he was a CIA asset who had lost communications with his handlers. The British informed the Americans of the encounter and were subsequently briefed into what was known about the case.[900]

Running Penkovsky

Co-operation between SIS and the CIA was considered the best approach to running the case because Penkovsky had approached both countries and the British knew that he had been issued a visa to visit the UK as part of a scientific delegation in April 1961.[901] Penkovsky had also suggested in a letter sent via Wynne that he would like to work for both countries.[902] Both intelligence services formed a joint unit to handle Penkovsky with George Kisevalter

[897] Ibid.,CIA Memorandum 30 December 1960.
[898] Ibid.
[899] Gioe p.141.
[900] Ibid.,p.142.
[901] Ibid.
[902] Ibid.,p.143.

and Joe Bulik representing the CIA and Michael Stokes and Harold Shergold representing SIS.[903] In a small team personal relations are crucial and throughout the case relations rose and fell. Mid-1961 was also a difficult time for both intelligence services because the CIA's Bay of Pigs operation had just failed spectacularly and SIS officer George Blake had been jailed for an unprecedented 42 years for spying for the KGB. An intelligence success was crucial to repair reputational damage to both services in their respective capitals.

Penkovsky could not approach foreign embassies in Moscow directly and would have to assume that he was being watched at times because of his GRU service, the debacle in Ankara and on-going doubts about his background. The Americans had secreted agent COMPASS in their embassy for several months but he had not been able to get instructions to Penkovsky. The use of "dead drops", whereby information was left in a secure space and retrieved later, was not thought feasible in Moscow because there was such intensive surveillance on westerners that the drop sites would be detected and raided and any personal meetings in the city could be observed and Penkovsky lost.

There was always the danger that Penkovsky could have been planted on the West to pass disinformation because Russian intelligence likely appreciated the West's desperation for information on nuclear weapon delivery systems. The UK also had run the "Double-Cross" system in the Second World War whereby German intelligence agents in the UK were used to sow confusion at crucial times. SIS likely feared they could fall victim to a similar ploy run from Moscow. After the George Blake case they may have wondered how many more assets and operations had been compromised or how many more traitors existed in the West. After Blake's treachery the KGB would likely have a good insight into the UK's intelligence gaps and vulnerabilities and so could devise fiendishly clever operations to confuse London and Washington. If Penkovsky was sent to the West then the KGB may also have calculated that SIS and the CIA would be prepared to take risks and want to believe any intelligence they received because it could be all the human intelligence they had on the USSR, apart from what was received from émigré groups for instance. Even intelligence from such groups was suspect because they were vulnerable to manipulation and penetration by the KGB. A new

[903] Ibid.

high-quality Soviet source would also enhance the prestige of an intelligence service and provide customers with useful products thereby enhancing the department's status. It would also make Penkovsky's product more likely to be believed, because the intelligence agencies would want to believe it. If he was eventually exposed as a deception operation then it would cause more humiliation for SIS in front of Whitehall. No doubt the CIA and SIS considered these issues. Only the agent's product and the case officers' assessment of him, which could be checked against other sources, would establish his *bona fides*. However, in intelligence work, topicality is always suspicious and when supply precisely meets demand and Penkovsky approached the West rather than the other way round, there would be lingering suspicion. Also, his approaches to the West did not seem to have been detected by the normally pervasive and alert KGB.

When Penkovsky came to the UK in April 1961 he was met at the Mount Royal Hotel in London by the joint SIS/CIA team. Declassified CIA documents reveal the elaborate precautions taken to book a hotel room for the team close to his so that he could meet the group unobserved.[904] There were 50 hours of meetings over several days planned around Penkovsky's 'normal' duties in London.[905] The transcripts for these sessions reveal that the team sought information on his background, job, motivation and what he could provide. This also gave the team a chance to determine whether he was authentic because he was away from his home territory and alone with a foreign intelligence team with no way of knowing what areas he would be asked about and could hardly decline to answer their queries. His reactions and demeanour could also be closely observed by experienced case officers. The debriefing of Penkovsky was a team effort and seems very impressive when a detailed reading is done of the declassified papers released by the CIA. The sessions were held in Russian and led by a CIA officer who was a fluent Russian speaker. Co-operation between the British and Americans was vital because the CIA clearly didn't have assets to manage Penkovsky when he was back in Moscow whereas the UK did have personnel there who could retain contact. The translation, processing, analysis and dissemination of his material would also be an enormous task which would require a joint effort. The CIA officer who co-ordinated the intelligence requirements visited British government departments to collect the

[904] See CIA Electronic Reading Room website documents for meeting transcripts which are a remarkable and unprecedented insight into the running of a Cold War espionage operation.
[905] Gioe p.145.

intelligence queries to put to Penkovsky each day so Defence Intelligence analysts could ask him about ballistic missiles and nuclear bombers.[906] Penkovsky was given training in covert photography and espionage tradecraft and SIS helped obtain gifts from his 'shopping list' for colleagues in Moscow.[907] These items such as cosmetics, cigarette lighters and clothes could be used to ingratiate him with senior officers and contacts so allowing further intelligence collection opportunities. However, a cascade of expensive gifts which exceeded his budget could be another security concern if anyone got suspicious about their origin or funding.

The team seemed to realise that Penkovsky felt he had an important mission in life and worked to boost his already inflated ego. He had expressed a desire to be "your soldier", working for the West. The decision was taken to grant his wish and obtain British and American army uniforms in the rank of Colonel and to photograph him wearing them.[908] When Penkovsky went back to Moscow a team was established in Washington to process his material with SIS officer Michael Stokes as the deputy leader.[909] The British appeared to believe totally that Penkovsky was a bona fide defector but the CIA still had some doubts about the case at this early stage.[910] Co-operation between the UK and USA was apparently good in their first major venture in 'running' an agent in the USSR. However, cosy debriefing sessions with wine held in a hotel on friendly territory were one thing, managing such an operation in the hostile environment of Moscow would be quite another. With sparse assets available, the CIA had to rely on SIS to help in a very hostile surveillance environment to ensure that instructions were passed safely to Penkovsky; intelligence materials passed back securely to London and Washington and the KGB remain oblivious to the operation.

To maintain contact with Penkovsky in Moscow, SIS used the wife of the SIS station head, Ruari Chisholm. Janet Chisholm had children and her normal domestic routine in Moscow could be used as cover for meeting Penkovsky such as family walks in the park, attending ballet classes or shopping.[911] She had been given additional training for the role of

[906] Ibid.,p.146.
[907] Ibid.
[908] Duns p.136 for copies of the photos of Penkovsky in British and American uniforms.
[909] Gioe p.147.
[910] CIA documents. Memorandum of 13 July 1961 expresses some reservations about Penkovsky's bona fides.
[911] Duns p.100.

Penkovsky's 'street agent' and could pass instructions to him or receive material in return such as notes and microfilms. Material was taken back to the British embassy and then by diplomatic courier to the UK for SIS to examine and disseminate. This avoided customs checks or anyone being arrested at border crossings. However, a risk existed in this ploy. Ruari Chisholm and his wife had served in Berlin in the 1950s at the same time as SIS traitor George Blake; he was acquainted with them and no doubt compromised their identities to the KGB.[912] Her "blown" identity, which SIS were aware of, would mean that if she was placed under close surveillance then her covert liaisons with Penkovsky could be observed and lead to his downfall. This was further security vulnerability for Penkovsky and Janet Chisholm would only have a legitimate reason to travel to a few places in Moscow in her normal routine, thereby making the KGB's surveillance task easier. This decision perhaps reflects it being the "least bad" option available because "dead-drops" and "safe-houses" were likely considered too dangerous to use in Moscow at this time. SIS and the CIA were also still developing their techniques for running covert human sources in the USSR in the early 1960s so it was a 'learning exercise.'

SIS may also have felt that the KGB had neither the resources nor desire to follow a diplomat's wife walking in the park, with children in tow, on a Sunday jaunt. SIS may also have calculated that the KGB would think SIS unlikely to use a 'compromised' individual in broad daylight in the middle of Moscow in crowded areas close to government buildings to support an intelligence operation. However, Penkovsky could still be contacted by Wynne on his trips to Moscow with microfilms and instructions being exchanged on the journey in a car from the airport to the centre of Moscow. Wynne could then pass any material to SIS at the British embassy. Wynne and Penkovsky had a legitimate reason to meet and Penkovsky could get him through customs without any searches by using his official Soviet government pass. This was a good technique which kept the flow of information going from Moscow to London without the KGB being aware of it or witnessing the exchange of information. Wynne even brought a photo of Janet Chisholm to show Penkovsky as the planning was undertaken to continue 'running' him in the USSR.[913] Janet Chisholm met Penkovsky in

[912] Corera p.172.

[913] Gioe p.149. See TNA FO 181/1155. Memorandum to HM Ambassador Moscow from Mr H.W.King 12 December 1962. Wynne's visits were described as "ludicrously worthless from a commercial point of view" and he was described as a "silly ignoramus". The KGB may have found his "pointless" trips to be suspicious and therefore he attracted surveillance.

Tsvetnoy Park, Moscow on 2 July 1961 and this venue was used several times, disguised as a chance encounter.[914] Some books maintain that Penkovsky used dead-drops for communications but declassified CIA records show that this was not the case. His communications with the British were always through personal contact involving passing packets of sweets or cigarettes containing microfilms and notes to Janet Chisholm. Necessity seemed to determine these risky face-to-face meetings which ostensibly seemed to be chance encounters. Use of the same venue such as a park or entrance to a building could also have attracted KGB attention and meetings in central Moscow occurred close to several Russian government buildings.

In July 1961 Penkovsky came to London again with a delegation visiting the Earl's Court exhibition centre and he travelled to Leeds and Birmingham where covert meetings occurred. This provided opportunities to review intelligence material sent on microfilm via Janet Chisholm and Greville Wynne and to determine future tasking. This was an essential part of the intelligence cycle and would also enable questions to be answered arising from customers concerning nuclear bombers and ballistic missiles. These questions could arise from assumptions being challenged, material being unclear or data being checked against other intelligence sources such as SIGINT. It would also allow rapport to be built with the agent and training to be given in tradecraft techniques. Penkovsky stayed in a hotel in Kensington, close to the Russian embassy and was met at nearby SIS 'safe-house' in Kensington. This again was a point of vulnerability because many Soviet officials would be in the Kensington area and the possibility of Penkovsky being seen by Russian security officers would be high. There was also a chance of him being followed to a meeting and the distance from the hotel to the 'safe-house' was so short that it would be hard to detect any surveillance. As a GRU officer working abroad and one whose parentage was under scrutiny, who had come home from Ankara "under a cloud", it is reasonable to assume that he would attract some level of KGB scrutiny.[915] However, proximity meant that Penkovsky could visit the SIS 'safe-house' when he had time during the day and it would be normal for him to be seen walking around Kensington. A judgement had to be made between Penkovsky's security and operational needs and SIS likely felt reasonably safe on its own territory.

[914] Ibid.
[915] Gioe p.151.

By the time of his second London visit, the team seemed to completely trust Penkovsky. The CIA's desire to administer a polygraph or "lie-detector" test had been dropped after SIS objections which had gone up to Sir Dick White, the Chief of SIS.[916] Such a test could shatter faith in the agent and damage his morale. Transcripts of his debriefs reveal that he was very keen to be trusted and be the "greatest secret agent ever" in order to "save the world" with almost messianic zeal. His credibility was such that his reports had their own codenames and were being sent to the White House and circulated in Whitehall.[917] Also, in the meetings with Penkovsky it is noticeable that SIS and the CIA showed him hundreds of photographs from allied security agency files of known and suspected KGB and GRU personnel. Penkovsky frequently provided information on colleagues and this practice would severely damage Russian intelligence operations by compromising human assets. If Penkovsky was a planted agent it seems unlikely that he would have revealed this data because it would operationally damage Russian intelligence for years to come, help western security and represent a colossal waste of resources for Moscow. The Russians would also be suffering a severe loss with no apparent gain. Further, this activity would potentially allow Western intelligence to learn of the motivation, vulnerability as well as personal circumstances of numerous Soviet military and intelligence personnel. This in turn could lead to the development of many more Penkovskys in the future as his operational life (as is that of all spies) would be finite.[918] If recruitments were made, they remain secret and it is possible that some of his colleagues in Soviet rocketry may have been targeted, thereby yielding more information on nuclear delivery systems. Shortly after his return to Moscow he was sent abroad again with a delegation to Paris in September 1961, which afforded another opportunity but generated the security problem of meeting in a third country. Whether France could be seen as friendly or unfriendly territory is of course subject to long-running debate.

The CIA recognised that in Paris the British had assets such as safe-houses, personnel and vehicles which far exceeded anything available to them; there was also the proximity of the

[916] Bower p.279.
[917] Gioe p.152. CIA codename IRONBARK referenced Penkovsky's documentary product and CHICKADEE covered gossip and his personal observations on Soviet personnel. SIS named his product ARNIKA for intelligence material and RUPEE for details about his identity. Few people in the UK were aware of his identity.
[918] CIA documents. London meeting 12 of 02 May 1961 where "mugshots" of Soviet personnel from MI5 and the FBI were shown to Penkovsky.

UK.[919] This was another British contribution to the joint running of the case and demonstrated that although the United States had the U-2 aircraft, satellites and other technology, in the low-technology, traditional sphere of human intelligence the UK could still play a key role. Technical intelligence had changed out of all recognition since 1945, but the techniques used to 'run' Penkovsky would be familiar to SIS personnel from the Second World War. A human agent could still perform a key role in undermining national intelligence and defence efforts, whether Oleg Penkovsky or George Blake.

Security in Paris was paramount and the presence of this covert operation on French soil was not declared to the French government. The fewer people who knew about it the better and there was a possibility that French intelligence could have been penetrated by the KGB.[920] Well-planned tradecraft was used to conceal meetings with Penkovsky such as having him cross a bridge whilst under observation and then met in a car to be driven by a complicated route at speed to another location in the city for a meeting. Counter-surveillance was also mounted to ensure that he was not followed. There is a possibility that the French may have monitored Penkovsky as a Soviet official and his meetings with US and British personnel noted. Any Soviet source inside French security may then have been in a position to alert Moscow about a western penetration of the GRU. This was another possible source of compromise and demonstrates the extreme risks posed to Penkovsky. However, at this time French security were likely pre-occupied with political unrest, coup plots and the Algerian terrorist problem as they drifted towards ejection from North Africa in the early 1960s.

CIA officer George Kisevalter, a loud, gregarious Russian, also committed a security breach in Paris when he went to a bar one night with SIS officer Michael Stokes and proceeded to tell strangers in the bar that he was meeting a Russian and discussed some of the things he had revealed.[921] Stokes reported this because remaining under 'cover' and concealing the purpose of being in the city were crucial to protect security. CIA headquarters were informed and Kisevalter's lack of judgement scrutinised thereby resulting in him being removed from

[919] Gioe p.154 quoting a 1966 CIA internal review of the Penkovsky case.
[920] Ibid.
[921] Gioe p.157.

the case.[922] Despite the "special relationship" between the two countries, close confinement for days on end resulted in declining relations inside the team with frequent arguments over trivial matters.[923] As with agent recruitment and running, human intelligence is personality driven and it would have been ironic if one of the twentieth century's most sensitive intelligence operations had been damaged by rows between team members over whose turn it was to empty a Paris hotel room's rubbish bins. There may also have been rivalry between individuals and intelligence agencies because careers are "made" on such important cases whose output attracts high-level political interest. Major Soviet defectors were such a rarity that dealing with Penkovsky would be a once in a lifetime opportunity for a case officer. The Paris meetings yielded more military information and internal Soviet political analysis. Paris was however Penkovsky's last trip abroad. Meeting an agent across the English Channel was one thing; continuing to run the operation in the 'lion's den' of Moscow was quite another.

Driving around Moscow and using safe houses to conduct meetings was not an option in Moscow. The KGB had vast surveillance resources in the city and official areas, embassies and locations where westerners congregated could be subject to hard-to-detect surveillance. Janet Chisholm from the British embassy met Penkovsky twelve times in the busy Arbat shopping street in Moscow over several months following his return from Paris.[924] Chisholm had a legitimate reason to be there but KGB Headquarters and the British and American embassies were also close by so KGB surveillance coverage would have been likely and could be concealed in the crowds. The chance of detection was therefore increased and it would be hard to tell if the case had been compromised. It was likely judged an acceptable risk by the British, and the Americans had no alternative plan because the CIA's assets in Moscow were negligible. In mid-1961 the Americans even considered using an Italian citizen to load a drop-site in Moscow for Penkovsky, informing him that it was "for an important internal asset working for the West."[925] With the short distance between embassy, accommodation and meeting site, it would be difficult for Chisholm to detect surveillance and the crowds would also prevent this. During a debrief, Penkovsky had actually warned

[922] Ibid. Also for more information on Kisevalter see Ashley, Clarence *CIA Spymaster* (Gretna, 2004).
[923] Gioe p.157.
[924] Ibid.
[925] CIA documents. Memorandum of 03 May 1961. The Italian was met in Helsinki and may have been a diplomat. He was not used operationally and this plan is not mentioned in any book on the case.

that the Arbat district of Moscow was monitored by the KGB because they thought it was an area used for clandestine meetings by British and American intelligence services.[926]

Penkovsky's Demise

This period in Moscow would be the final chapter in the case. In a letter to the CIA, Penkovsky noted that he thought that Janet Chisholm was under surveillance due to the presence of a suspicious vehicle after a meeting in January 1962.[927] He stopped attending meetings with her but it is likely that the KGB now connected the two of them and were aware of covert meetings in the lobby of an apartment block in central Moscow.[928] Photographs of these meetings (if genuine) show Chisholm in Russian clothes rather than fashionable western designs. This may have alerted the KGB that she was 'operational' and wanted to blend into the crowd whilst engaging in covert activity.[929]

Gioe notes that the pressure was really increasing on Penkovsky because he continued to meet SIS and collect intelligence whilst knowing that the KGB likely knew about his espionage.[930] At this time it might have been better to relegate Penkovsky to 'sleeper' status, cease all operational activity and dispose of any incriminating material such as codebooks and micro-cameras. Penkovsky was storing secret material in a hidden drawer in his desk at his home and this 'smoking gun' could lead to his downfall if a covert KGB search was made of the premises.

Given Penkovsky's almost messianic zeal to please the West, SIS and the CIA could likely not have persuaded him to stop his espionage. A CIA memorandum in January 1962 nevertheless noted the risks of frequent meetings, the large backlog of material awaiting translation and evaluation that had developed and consumers struggling to digest all the

[926] CIA documents. London meeting 2 of 21 April 1961.
[927] CIA documents. Letter of 28 March 1962.
[928] See Schecter p.335 photo section for alleged KGB surveillance photos of the Chisholm/Penkovsky meeting.
[929] See Duns p.217 for photos of Janet Chisholm and key personnel in the case.
[930] Gioe p.160. Also CIA documents. Memorandum of 11 January 1962. Penkovsky met Janet Chisholm ten times in eleven weeks.

material.[931] They felt time should be given for things to "cool off" and to re-evaluate the case to determine its future pace and direction. It was even felt that they could "well afford to call a halt to photography for a few months" and noted ominously that Penkovsky "was not a good judge of what risks he can and should take."[932] Examining Penkovsky's declassified material on the CIA website, particularly the secret Soviet journal *Military Thought,* it is noticeable that some of the data consists of low-grade articles on army tactics; it is bizarre that Penkovsky was risking his life for this. Perhaps a better approach would have been for him to conserve his intelligence on ballistic missiles, nuclear weapons and high strategy for perhaps one clandestine meeting every six months in Moscow or when he was able to travel abroad. He would also have been very useful as a long-term asset as part of an "early warning" system to alert the West of a possible Soviet attack. It seems however that SIS did not want to decrease the operational tempo and covert meetings continued when Penkovsky was ready to pass material. It seems SIS had grown used to high-grade, high-volume output and it would have been hard to close things down even temporarily. Long term intelligence advantage and security were apparently sacrificed for short-term gain.

Importantly, Penkovsky's personality likely meant that if he stopped spying it could damage his morale so he continued at his zealous pace, ultimately to his own destruction. He was impulsive and reckless, as seen by his recruitment attempts when he reached out to the CIA. He would do what he wanted to do, regardless of the risk; an indicator of a large ego and dangerous arrogance. As SIS Chief Sir Dick White said, "We had very little control over Penkovsky."[933] He wanted to be the West's "soldier", the "greatest spy ever" and a real success to compensate for the 'slights' he had suffered in the USSR so his "controllers" could not really control him. He appears to have become his own case officer. SIS and the CIA were likely 'addicted' to his product at a critical time in the Cold War and seemed to defer to him as he thought he knew what was best in his home territory of Moscow. If 'dead-drops' and alternative tradecraft had been used to run him instead of more personal meetings then he might have survived.

[931] CIA document 11 January 1962.
[932] Ibid.
[933] Bower p.282.

The case produced a mass of correspondence and meetings between SIS and the CIA with the relationship becoming tense due to competing operational styles and personalities. Security was not helped when the Chisholms were posted back to London in the summer of 1962. The replacement Moscow 'street agent' was Pamela Cowell, the wife of Gervase Cowell, the new SIS station head.[934] The same system of the 'SIS wife' was being used and the KGB would just need to move surveillance onto the new couple and look for any links with Penkovsky who was now apparently under suspicion. If the KGB closed in, SIS had no escape plan for Penkovsky, likely because his data was too valuable and he would be 'run' right up until termination; a seemingly callous decision likely reflecting the high-stakes in the Cold War and the difficulty of arranging an extraction for him from the USSR.[935] No SIS papers have been released on the case so the British government's reasoning about dealing with Penkovsky's capture is unknown.

An operational change occurred in mid-1962, likely reflecting Penkovsky's concerns about detection. There were no further meetings in public with him, instead his handlers switched to diplomatic receptions as a venue to pass information. Penkovsky could attend these in his official role and by June 1962 the CIA had an officer, Rodney Carlson, in post in Moscow.[936] It is noteworthy that it was only at this late stage that the CIA had support in the city and at a reception Penkovsky could identify his western contact with a special phrase and a tie-clasp.[937] This was good use of 'natural' cover with a plausible reason available for meeting foreign officials. However, any activity risked observation because Penkovsky would not attend a meeting with foreigners on his own. By this time his situation was nevertheless hopeless and he was seen for the last time at the British Embassy on 6 September 1962.[938] A CIA memorandum noted that he missed a meeting on 13 September but they were not sure why.[939] It is now thought that Penkovsky was arrested on 22 October 1962 during the Cuban Missile Crisis.

[934] Gioe p.163.
[935] Ibid.
[936] Ibid.
[937] Ibid.,p.164.
[938] Ibid.
[939] CIA documents. Memorandum of 14 September 1962.

A final twist to the saga was that Penkovsky had been given an emergency signal codenamed DISTANT to be used in the event of a Soviet nuclear first strike or other dire emergency.[940] This consisted of him dialling a telephone number and making three breaths into the handset and hanging up. A 'dead-drop' would be made by Penkovsky containing further details of the emergency which would be cleared by a CIA or SIS officer. On 2 November 1962 DISTANT was activated by someone in Moscow. It is unclear if Penkovsky told the KGB the meaning of the message under duress or that he sought to start a nuclear war in the tense atmosphere of the time. It may have been a final grand "Samson bringing down the temple" gesture from the melodramatic Penkovsky; if he could not 'save the world' then he would drag it down into the flames with him. If the KGB knew DISTANT's meaning then it took an enormous risk in the tense period after the Cuban Missile Crisis by activating the procedure to see who came to clear the drop and thus link Penkovsky to western intelligence.

Gervase Cowell, SIS station chief, did not pass this information to London because he felt it was not legitimate and likely forced out of Penkovsky under duress.[941] The CIA did however decide to examine the drop site and their operations officer Dick Jacob was apprehended by the KGB when he went there on 2 November 1962.[942] Much confusion was generated because the KGB thought that Penkovsky was working for the British yet they had apprehended a CIA officer.[943] It soon became clear to them that he was jointly run in an unprecedented operation. SIS courier Greville Wynne was also arrested in Hungary in November and was tried jointly with Penkovsky in a show-trial in May 1963. Wynne received an eight year sentence and was later exchanged for Soviet spy Gordon Lonsdale, who was imprisoned in England and Penkovsky was reportedly shot on 16 May 1963.[944]

Penkovsky's Intelligence On Nuclear Weapons

The spy who sought to save the world could not save himself, nor could western intelligence. He could have defected on one of his overseas trips but likely wanted to see his mission through to the end and take 'centre stage', letting his Soviet superiors and the world see what

[940] Duns p.119.
[941] Hennessy, Peter *The Secret State* (London, 2010) p.44.
[942] Duns p.173. KGB surveillance photo on p.216 shows Jacob at the drop site.
[943] Gioe p.165.
[944] Schecter p.335 for a copy of his death certificate.

a great intelligence asset he had been. CIA officer Joe Bulik had argued for a deal to be done to retrieve Penkovsky and SIS had been approached about it but the scheme came to nothing.[945] The CIA was adamant that it did not want to approach the KGB/GRU to make a deal and discussions were held with SIS which produced no result. Penkovsky had been supplied with a false Soviet passport in the name of Mr Butov and use of a US submarine was mooted to help in his extraction from the Baltic States but it never went beyond the planning stage due to the risks involved and lack of political support.

The bewildering array of material declassified by the CIA makes the Penkovsky case the most officially well-documented espionage case of the Cold War. What becomes apparent is the enormous amount of covert work that went into generating information for the intelligence reports being produced in the CIA and SIS as well as the risks involved. The many books and articles written about Penkovsky tend to dwell on the tradecraft and clandestine activity, which is absorbing and is like something from a "thriller." For the remainder of this chapter I will examine the material he passed on nuclear delivery systems which does not feature highly in secondary literature. To do this I examined every declassified page and transcript in the Penkovsky collection on the CIA's website and his "memoirs." No official Soviet documents such as rocket manuals and internal Russian military correspondence have been released. However, the Soviet journal *Military Thought* and transcripts of meetings in Paris and the UK as well as official internal CIA correspondence were available for analysis.

From his initial contact with the two American students in Moscow, Penkovsky was able to establish his *bona fides* by offering genuine information such as that concerning the shooting down of the U-2 and RB-47 reconnaissance aircraft. He noted that he was in "an excellent position to acquire information" and informed the Americans that fourteen SAM-2 missiles were launched to bring down the U-2.[946] Penkovsky had been the GRU duty officer when the U-2 shoot-down occurred and was aware of previous U-2 over-flights near Kiev but he stated that no missiles were available to destroy them.[947] Apparently Penkovsky, as an English

[945] CIA documents. Memorandum of 10 December 1962.
[946] Deriabin *Penkovsky Papers* p.264.
[947] Ibid.

speaker, was meant to interview Gary Powers, the downed U-2 pilot, but the KGB got to him first. The aircraft also did not receive a direct hit but was apparently destroyed by the blast wave of a missile launched from a missile site the U-2 flew over by chance.[948] The use of so many missiles revealed that the air defence system was not as good as Khrushchev maintained; likely a relief to the UK which had a bomber-based nuclear deterrent. The RAF needed to avoid such missiles if it had to attack Soviet cities and military installations using its bombers. Penkovsky also revealed that a MiG-19 fighter was destroyed by one of the missiles and the pilot died as the aircraft tried to intercept the U-2.[949] Penkovsky confirmed that the American RB-47 aircraft shot down over the Barents Sea in July 1960 was not flying over Soviet territory and Khrushchev apparently said "well done boys that will keep them from flying too close."[950] Soviet military leaders thought of issuing an apology over the incident but Khrushchev overruled them to "let them know we are strong."[951] This confirmed British and American intelligence assessments that the aircraft was not over Soviet territory when it was destroyed.

During his time as an agent, Penkovsky passed sixty-one issues of the secret version of the General Staff Journal *Military Thought* to the West and several issues of the Top Secret version produced since 1960.[952] These were issued by the CIA under the IRONBARK code word to specially cleared readers under Top Secret classification. These theoretical military studies formed a special collection in the GRU and an examination of the articles reveals studies of the Control of Missile Units, Nuclear Armaments, Air Force Development and destroying Hardened Targets with nuclear weapons.[953] Ironically, some of these articles were authored by Chief Marshal of Artillery Varentsov, who was Penkovsky's mentor and who helped him in his career. Helping to research and write some of these articles in army libraries and GRU archives allowed Penkovsky to gain access to more missile and military material for SIS and the CIA. He could lock himself in a room to photograph or make notes on files thereby providing unprecedented access to Soviet thinking on nuclear bombers and ballistic missiles. The CIA worried in the early stages of the operation that Penkovsky would

[948] Ibid.
[949] Ibid.,p.266.
[950] Ibid.,p.263.
[951] Ibid.
[952] CIA documents. Memorandum of 14 June 1962 concerning distribution of reports under IRONBARK code word.
[953] Ibid.

be "apprehended and played back" and he could have "personal bias" against the Soviet system and "over-read" the hearsay he picked up. However, the documents he passed on gave the CIA "every confidence in him."[954] This was endorsed at high levels in the Pentagon when senior US Army officer General Maxwell Taylor, having read a selection of Penkovsky's material concerning ICBMs, the death of Marshal Nedelin in a rocket accident and the U-2 and RB-47 shoot-downs stated that the CIA "ought to brief the President on this."[955] Material going to the Oval Office was perhaps the ultimate endorsement of Penkovsky's *bona fides*.

In a later case review the CIA stated that eight issues of the Top Secret version of *Military Thought* were used to produce seventy-four reports and two secret versions resulted in fifty-six reports being issued.[956] Of these reports, eighty-nine were passed to a deleted country, which was likely the UK, with sixty-one sent to NATO countries.[957] It is interesting that if the deleted country was the UK then some material was held back, unless the state in question was Canada. Penkovsky's material was also later sent to NATO countries but at that time, he would have been dead. Any downgrade of the material for further release had to be co-ordinated with SIS and the CIA noted that Penkovsky had a 98% success rate with his photos and that SIS held the negatives for his pictures.[958] This showed what an effective agent he was and the joint nature of the operation.

In the early days of the operation the CIA noted that not everyone in Washington was willing to regard Penkovsky as a reliable source until he had established a good reporting record. For the National Intelligence Estimate dated 11 August 1961 for instance, the authors would not change the assessment concerning Soviet ICBMs on the strength of material from a source "about whom they knew nothing" which does show natural caution and scepticism.[959] However, as the case progressed, the volume and quality of material grew with documents being passed, observations made and Moscow gossip recorded. In an undated later, the CIA noted that material due to be processed included data on the Soviet R-1, R-2, R-3 and R-11

[954] Ibid.,Memorandum of 13 July 1961
[955] Ibid.,Memorandum of 22 July 1961
[956] Ibid.,Memorandum of 29 November 1963
[957] Ibid.
[958] Ibid.
[959] Ibid.,Memorandum of 07 June 1961

guided rockets as well as their accompanying ground equipment.[960] This was vital information for imagery analysts and technical intelligence specialists who sought greater understanding of nuclear weapons systems and how to collect intelligence about them. Papers reveal that through Penkovsky's personal connections he was also able to gather information via "avenues of access" to named individuals of interest such as Sergei Korolenko, the famous senior Soviet missile and space expert as well as military officer Lt Col Igor Melekh, a lower ranking source who worked at the missile facility at Kapustin Yar.[961] Friendships and social occasions could yield information beyond Penkovsky's normal access and information from Korolenko would be an enormous asset to western intelligence. In the event of Penkovsky's detection, the KGB could establish what papers he had access to but it would be hard to determine how much gossip and loose-talk he revealed to the West. Only Penkovsky could reveal that, but no interrogation details have been revealed by the Russians so the accuracy of their damage assessment is unknown.

None of the manuals or internal Soviet government papers Penkovsky passed has been declassified by the CIA but transcripts of his meetings with the CIA and SIS are available. In London in April 1961 Penkovsky revealed that the Sputnik rocket was a two-stage liquid fuelled rocket, weighing 100 tons and contained sixty-eight tons of fuel. He obtained this information from the rocket academy where he made over one hundred pages of notes from his time as a student undertaking a course.[962] His value was also as a first-hand source giving a personal view on missiles which was a useful addition to the photographs, radar plots and radio intercepts that western intelligence would already have through technical intelligence collection. He was also able to relate information about German scientists working in the USSR on rocketry so if they returned to the West they could be interviewed.[963] At the same meeting he discussed ICBMs and was able to confirm that the current Soviet system had two stages. He had never studied these missiles closely but their electronics were revealed to be "far behind" where the USSR wanted them to be and Moscow was "struggling with this." This confirmed UK assessments that the ICBM programme was in difficulty and why so few tests had been observed of long-range missile systems.

[960] Ibid.,Undated letter "Materials and Documents to be Sent"
[961] Ibid.
[962] CIA documents.,London meeting of 20 April 1961
[963] Ibid.

The Russians were also trying to gather intelligence on western ballistic missile systems to help reduce the delays in their programme.[964] Penkovsky was unable to give precise locations for Soviet ICBM bases in existence or being planned because the extensive building programme was shrouded in secrecy. However, he had heard a rumour that missile bases for the destruction of the UK were "north of Leningrad" in Murmansk Oblast.[965] This was useful for the UK to know in order to direct further intelligence collection and to target such facilities if conflict arose. It is also noteworthy that even a major intelligence agent with good access such as Penkovsky did not see all nuclear weapon material and serious intelligence gaps would still exist in western knowledge despite his best efforts. The exposure of Penkovsky would also likely lead to enhanced security measures within the Russian government which would compound the problem of covert human intelligence collection against the nuclear target. Exposure of western covert human intelligence methods would also facilitate the Russians planting agents on the west or detecting on-going operations.

In his debriefs, Penkovsky did sometimes come across as erratic and unstable. He proposed blowing up the Russian Ministry of Defence building with a small 2 kiloton nuclear bomb before a western nuclear strike.[966] He mused that the same fate should befall the Russian Strategic Rocket Force Headquarters whose location he revealed to be at Perkhushtovo near Moscow.[967] Information on nuclear infrastructure was useful data for allied nuclear target lists and further intelligence collection. In London, Penkovsky also provided details concerning the death of Marshal Nedelin, Chief of Strategic Rocket Forces, discussed in Chapter 2, the true nature of which had been concealed to cover-up a rocket accident.

In London, Penkovsky further revealed that the USSR was experimenting with "atomic energy" as a rocket fuel which was being used when Marshal Nedelin was killed.[968] He was also able to confirm that the USSR had no solid fuel for its ballistic missiles, unlike the Americans, which meant that their rockets needed to be filled with liquid fuel which was time

[964] Ibid.
[965] Ibid.
[966] Ibid.
[967] Ibid.
[968] Ibid.

consuming, dangerous and made its weapons vulnerable to attack. The death of Nedelin occurred whilst the Russians were pursuing the use of Boron as a possible high calorie fuel. Penkovsky revealed that many scientists died in this tragedy which caused delays to Russia's ballistic missile programme.[969] The USSR was keen to have smaller fuel compartments in its rockets, meaning a smaller and lighter rocket body could be used and a bigger nuclear warhead deployed. This was all useful background material for western rocket engineers and enabled an understanding to be gained of the Soviet missile programme's current state and how long it would take to progress.

Penkovsky was also able to provide information on future rocket tests and experimental work. This would ensure that western intelligence collection could be primed to gather material and to understand which systems were being tested in advance. The articles he provided from *Military Thought* did not contain anything on ICBMs because the systems were Top Secret and so particularly sensitive. Penkovsky had to rely on personal contacts to glean information on this area. In London he revealed an experimental rocket being tested at Kapustin Yar called the RK-74 which had a range of 1000km, although he had no data on it. This sort of information was helpful for SIGINT operations against Soviet rocket activity as well as photographic material gathered on test areas by satellite reconnaissance systems which were then being launched. Penkovsky was able to obtain some information on ICBMs from his patron, Marshal Varentsov, who saw him as a 'son' and trusted family member; never guessing that he was a covert western intelligence asset. Penkovsky noted that Khrushchev frequently spoke about the USSR's ICBM capability but discussions with Varentsov made it clear that it was a vain boast to impress the West. Penkovsky commented that Khrushchev "either does not have them at all, or has only a few" ICBMs.[970] He also noted that Varentsov thought that the USSR's few ICBMs could hit the United States but not with any accuracy. The missiles had been tested by mid-1961 but they were not yet deployed operationally as far as Penkovsky could tell. Only a very limited strike could therefore be mounted on the United States, not the "rain of fire" that Khrushchev threatened.

[969] Ibid.
[970] Ibid.,London meeting 10 of 30 April 1961.

Penkovsky was also important because he could reveal Russian shortcomings through his political reporting. This belied Khrushchev's public bluster and he reported that the Soviet leader was just trying to intimidate the West. In the London debrief, the ICBM programme was described by Penkovsky as "one failure after another" and he thought that it would be 2-3 years before functioning ICBMs would be ready as part of a credible force.[971] He also revealed that the ICBM did not have a perfected electronic guidance system. This would likely have been reassuring for western intelligence agencies and leaders because Penkovsky felt confident that the USSR had no capability for mass attack using ICBMs and therefore surprise nuclear attack was unlikely. It would also mean that strategic nuclear facilities in America such as command centres, bomber and missile bases could not be destroyed in a first-strike. America's nuclear deterrent would therefore continue to function because retaliation against the USSR could still be achieved. However, Penkovsky's material warned that in the future it would be a different picture because the USSR was putting great effort into developing its rocket programme and solving its myriad problems. Another of Penkovsky's great benefits was his commentary on future Soviet intentions and had he survived, he could have provided "early warning" well into the future, as a Russian commenting on Russian affairs with a good range of contacts. Such was the importance of his insights that Sir Dick White, Chief of SIS, met him and conveyed a personal message of thanks from Lord Mountbatten, Chief of the Defence Staff, stating that his material "would be of the highest value and importance to the Free World."[972] This meeting was held instead of agreeing to his request to meet the Queen to pledge his allegiance to her; a session which could have had security implications for this most sensitive of covert operations.

Some of the information Penkovsky provided was of particular interest to the UK due to its proximity to Soviet forces in East Germany. He revealed that there were two brigades of Soviet nuclear missiles in the GDR whose presence was officially denied by the USSR. Penkovsky was unclear if these were battlefield nuclear weapons or ballistic missiles targeted on the UK.[973] This was an interesting comment because, as seen in Chapter Three, the JIC had some evidence of possible Soviet nuclear weapon deployments to the GDR. It was generally assessed in 1961 that the USSR did not deploy nuclear weapons outside its

[971] Ibid.
[972] Ibid.,London meeting 14 of 03 May 1961.
[973] Ibid.,London meeting 2 of 21 April 1961.

territory; a position terrifyingly disproved in the Cuban missile crisis the following year. However research from 1998 reveals that long-range nuclear missiles were deployed temporarily to the GDR in 1959.[974]

Penkovsky was also able to provide personal, professional observations because he was a Russian artillery officer as well as a trained intelligence collector seeing events and equipment through Russian eyes. He knew what information would be useful to the West and how to collect it. It is ironic that the skills he developed for service with Russian intelligence were used to such adverse effect against them. He reported having seen the Russian R-5 ballistic missile, described by him as a "huge rocket", whilst on a course but had not had the chance to study it, in addition to describing the prototype R-7 and R-9 missiles.[975] He could confirm sizes and shapes of equipment which could clarify data picked up from photography and he had the benefit of seeing systems close-up at ground level. This information later helped with imagery intelligence analysis during the Cuban missile crisis in October 1962. Proximity also aided intelligence collection of data which could not be gained from SIGINT or photography, such as his observation in London that the USSR struggled with the production of high quality metal. He revealed that the Russians could not increase the thrust of rocket and aircraft engines because their metal could not withstand the temperatures and stresses involved, thereby limiting power, range and warhead payload.[976] He also revealed during a debrief in Paris in September 1961 that a special coating had been developed for missile fuel tanks allowing them to store their fuel for a longer period and so increase the amount of time that a system could be held at readiness during a crisis. This again was very useful inside information and would help develop more accurate western intelligence assessment and aid decision-making during a crisis. It could also influence export controls from the UK through prohibiting the sale of certain materials and equipment to the USSR to prevent their use in its weapons programmes.

Penkovsky was also able to provide data concerning the spectacular Russian propaganda coup of the Sputnik launch. He noted that it would be hard to develop Sputnik as an atomic

[974] See "Operation ATOM": The Soviet Union's Stationing of Nuclear Missiles in the German Democratic Republic, 1959" in Issue 12/13 of the *Cold War International History Project Bulletin (2001)* .
[975] CIA documents. London meeting 2 of 21 April 1961.
[976] Ibid.

weapon delivery system due to its high speed and problems with accurately aiming it at great distance. However, he noted that the Russians were working on this problem.[977] He also revealed in London that the models of Sputnik that the Russians sent for an exhibition in London were false, designed to mislead western intelligence if they were covertly examined by experts. The USSR had also appreciated the use of space for intelligence collection because Penkovsky reported that Yuri Gagarin's April 1961 journey into orbit had resulted in photographs being taken and Sputniks had been equipped with various special sensors for intelligence collection.[978] This is ironic in view of America's efforts in this field outlined in Chapter Three. Penkovsky further revealed that the Soviet General Staff was "livid" when they found that American satellites had been launched over the USSR and described them as "Spy Sputniks."[979] It is ironic that by launching Sputnik as a propaganda device, the USSR overflew the United States thereby creating a precedent that it was acceptable to fly satellites over another country. The USSR could then hardly complain if American intelligence collection satellites traversed the territory of the Soviet Union.

Contacts with other military and intelligence officers, as well as officials, also yielded information especially if Penkovsky ingratiated himself by presenting gifts. The CIA wryly noted that they would "automatically be valuable, unwitting informants."[980] In the event of a leak of information from the case it would also be very difficult for the KGB to trace where the West's covert source was located. Unlike a classified report being circulated in Moscow whose movement and handling could be traced by the KGB, Penkovsky's reports produced from gossip, meetings and conversations were compiled from multiple human sources so their origin would be difficult to trace. His circle of contacts at different levels in the Soviet hierarchy provided access to intelligence on subjects he did not normally deal with. As a trusted officer he could undoubtedly ask probing questions without drawing undue attention as he was known to be keen and ambitious. He could then reveal any intelligence so gleaned in future debriefs; in London in 1961 he clearly had several years of first-hand information to divulge from handwritten notes and his impressive memory. For instance, he revealed the existence of a secret rocket launching base on Novaya Zemlya Island constructed by the USSR to fire R-12 and R-14 ballistic missiles during wartime. The island was already used

[977] Ibid.
[978] Ibid.
[979] Ibid.
[980] Ibid.

for nuclear tests. The USSR had detected a western submarine in the area so they knew that intelligence agencies were interested in this obscure, barren island.[981] This intelligence was of interest to the UK because it indicated that the Russians could hit Britain by launching ballistic missiles from the north from a secret, unexpected location.[982] This in turn could provide a future targets for intense intelligence scrutiny and for bombing missions if war occurred. Penkovsky obtained this information from another officer called Colonel Buzinov who also revealed that the R-12 missile was being serially produced but the R-14 was not yet in large-scale production, the latter having a range of 4,500 km; both systems had atomic warheads.[983] Penkovsky also revealed the construction of several secret dispersed sites where ballistic missiles were due to be stationed in the north and south of Russia but he could not confirm the precise locations.[984] Any speculation about the location of missile launching sites would of course provide further intelligence collection opportunities through satellite surveillance and observation of construction techniques and layout of facilities before they were concealed by camouflage. Without advance warning, ballistic missile facilities might have remained undetected but knowledge of their location and nature would allow allied targeting in wartime.

Penkovsky also helped to confirm intelligence collected from other sources and aided analysis as his crucial data flowed into the intelligence pool available through allied co-operation. For instance, in a Paris debrief he revealed an R-12 ballistic missile test was undertaken with a high-yield nuclear warhead on 8 September 1961 from Kapustin Yar with a detonation point in Central Asia.[985] This was a test of a nuclear bomb on a missile which was detonated high in the atmosphere and Varentsov had witnessed it, later discussing the event with Penkovsky.[986] This material could be matched with SIGINT and radar plots to understand what had occurred thereby aiding analysis of flight profiles and rocket performance. As an artillery specialist, Penkovsky was able to explain that conventional rockets were often launched before a nuclear test to confirm accuracy and trajectory and once

[981] Paris meeting 22 September 1961.
[982] Paris meeting 20 September 1961.
[983] Ibid.
[984] Ibid. At Paris meeting 38 on 5 October 1961 Penkovsky revealed that sites at Nikolayev and Shkloyaur in Ukraine had been selected for ballistic missile installation. Also in wartime he stated that the Kapustin Yar testing site could launch ballistic missiles.
[985] Ibid.
[986] Ibid.

accuracy was determined then a nuclear warhead would be used on the missile.[987] Many tests were undertaken involving rockets, Penkovsky revealed, because Khrushchev insisted on it, seeing it as a means to demonstrate Soviet power. As an 'insider' Penkovsky could reveal real intentions such as tests being undertaken for reasons of prestige and propaganda rather than military necessity or technical advancement. This would not be apparent to outside observers using technical intelligence collection methods so it filled an intelligence gap. Penkovsky also stated that nuclear weapons were occasionally taken out of storage under strict security and moved to missile bases to increase readiness states and this was done during the Berlin crisis.[988] This again was important information for intelligence analysts to gauge Soviet nuclear readiness states and could reveal when a nuclear strike was imminent, how angry or threatened the USSR felt or even determine whether the allies should mount a nuclear strike before Soviet nuclear weapons were deployed.

Penkovsky obviously had an intense dislike of Khrushchev which comes across during his debriefs in London and Paris. Penkovsky appeared to be impulsive and was likely unstable with grievances having accumulated over many years. In Paris he said that the Soviet leader was "a maniac" and even mused that it would be "worth while to assassinate him" before he makes a "tremendous attack."[989] He even encouraged the West to "invoke a small local conflict with the Soviets in some remote area" to test their resolve and perhaps inflict a defeat on them, so deterring future aggression.[990] He further referred to Khrushchev as an "atomic Hitler" but thought that he "does not want a world war" but perhaps "if he feels he has sufficient strength to knock out the USA and England" then "it is possible that he may strike first."[991] Penkovsky was obviously concerned about growing Soviet nuclear strength and the personality and intentions of its leader. He also felt that he had a unique and crucial role in doing something about this.

[987] Ibid.
[988] Ibid.
[989] Ibid. Paris meeting 32 of 22 September 1961. In Leeds on 23 April 1961 he also recommended using 1-2Kt nuclear bombs to blow up the KGB HQ in Moscow and the Strategic Rocket Force HQ at Perkhushkovo.
[990] Ibid.
[991] Ibid.

The CIA had a particular interest in ICBMs and pressed Penkovsky on this issue. They dwelt on his time at the Soviet Missile Academy and the debriefing notes state that he "reported in detail" about the different systems he studied during the nine month course.[992] He was also able to reveal budgetary problems with the rocket programmes and conflict between the ground forces and the newly formed Strategic Rocket Forces.[993] His course had only given him limited access to information on ICBMs but he was able to confirm that the missile under development had two stages and was liquid fuelled; the fuel was also dangerous and unstable but solid and nuclear fuels were being explored.[994] The ICBM he knew about was experimental and so beset with problems that it could not be considered a front-line operational weapon. Only 5-6 people had access to location maps for ballistic missile bases and Penkovsky sought to access this information from conversations with others, particularly his father-in-law.[995] Varentsov was quoted to the CIA by Penkovsky as saying that "with respect to ICBMs, up to now we don't have a damn thing" and "everything is on paper." However, with the lower-range systems which could target the UK, "we can fulfil the missions."[996] This confirmed the vulnerability the UK felt from shorter-range Russian ballistic missiles in the event of conflict and the threat to the UK's bomber-based nuclear deterrent. In Paris, Penkovsky further revealed that strategic missile bases were defended by SAM2 missiles; one of which shot down the U-2 aircraft in May 1960.[997] Despite the shortcomings of Soviet missile programmes, Penkovsky sounded a note of caution with the comment that "Khrushchev and the General Staff can leave you behind" and they were "throwing together these rockets and can do terrible damage with them."[998] He also warned about ballistic missile development that "according to powerful people in the leadership, he (Khrushchev) will need two or three more years. But not longer, gentlemen, not longer believe me."[999]

In addition to information on ballistic missiles, Penkovsky also provided information on nuclear bombers; a topic the UK had a particular interest in. He confirmed during a meeting

[992] Ibid.Leeds meeting of 23 April 1961.
[993] Ibid.
[994] Ibid.
[995] Ibid.
[996] Ibid.
[997] CIA documents. Paris meeting of 10 October 1961.
[998] Ibid. Leeds meeting of 25 April 1961.
[999] Ibid.

in London that Russian bombers carried cruise missiles with a 25 kiloton nuclear warhead and a 50 kiloton free-fall atomic bomb was available but the hydrogen bomb carried on Soviet aircraft had an unknown yield.[1000] This was useful information concerning the Soviet armoury and confirmed British assessments that 'stand-off' nuclear weapons were carried on Soviet bombers. He also confirmed that Long Range Aviation units were small and "there never was a programme to make large numbers of long-range aircraft."[1001] This showed that the 'bomber gap' was a myth, as exposed by U-2 over-flights, confirming more conservative British estimates of Soviet bomber assets. Penkovsky, whilst in the army, was using an unwitting officer friend in the air force called Major General Pozovnyy for information on aircraft. Penkovsky confirmed, as the UK assessed, that new ballistic missile units would "under no circumstances" replace the Long Range Air Force.[1002] He was adamant that long-range aviation would be maintained but production would be at a slow pace. Penkovsky stated that "Stalin had been all for aviation" but Khrushchev assigned it a less important role; bombers would however continue to be produced and improved.[1003] To help damage the Soviet Air Force, Penkovsky also corrected the CIA's intelligence about the location of the Aviation HQ in Moscow so the Americans could be assured of destroying it in wartime.[1004] He was also able to confirm that no work was being undertaken on atomic powered aircraft.[1005]

Reading through the declassified CIA files on Penkovsky's debriefings, it is remarkable how much material was passed to the West and the insights he provided. Most of the thousands of pages of documentary material he revealed have not been released. However, the CIA personnel running the case thought that the breadth, quantity and quality of the materials provided indicated that he was a genuine defector. No intelligence organisation could have afforded to lose such priceless material in a deception operation and receive nothing in return. Much of the material could not have been gathered from any other technical source. If Penkovsky had not passed this material on nuclear bombers and ballistic missiles then the West would not have had any of these insights and would have been left with conjecture

[1000] London meeting 14 of 03 May 1961.
[1001] Paris meeting of 05 October 1961.
[1002] Ibid.
[1003] CIA documents. Leeds meeting of 23 April 1961.
[1004] Ibid.
[1005] Ibid.

based on partial information. The material was also received at a crucial time in the Cold War. Penkovsky proved to be of value during the Cuban missile crisis in October 1962, although his role remains controversial and has become part of the mythology of the Cold War. This was a potentially apocalyptic event when theories about nuclear bombers, ballistic missiles and attack strategies threatened to turn into horrifying reality.

Penkovsky and the Cuban Missile Crisis

In some popular literature Penkovsky is credited with alerting the West to Khrushchev's plan to send nuclear missiles to Cuba in the autumn of 1962. However, from the declassified transcripts of his debriefings with the CIA and SIS it is clear that he did not know that such a plan was being implemented. Within the Russian government only a few people knew about the forward deployment of nuclear weapons to the Caribbean. The movement of ballistic missiles and all the naval and ground assets that were required to mount Operation ANADYR (its Russian code name) remained unheard of by Penkovsky. This reveals the dangerous limitations of human and technical intelligence when a crucial national security event was missed despite all Penkovsky's contacts and access. However, if the agent does not have access to specially compartmented information and security is too rigid then they cannot alert their controller.

This communications problem with Penkovsky had been seen earlier in August 1961. He had learned that the Berlin Wall was about to be constructed but due to the absence of an urgent communications system for contacting his controllers, he was unable to alert the West.[1006] This momentous event can be seen as an intelligence failure and it is a terrible 'if' with perhaps the history of the Cold War being rather different if President Kennedy had known about the wall's construction in advance. However, had the West known about it there was probably little it could have done in the face of Russian intentions to close off the city and prevent the exodus of citizens from the east. Instead the city was divided for 28 years by the Cold War's most potent symbol and western access to the east denied. Western intelligence then struggled to recruit, contact and 'run' sources in the east thereby losing intelligence data.

[1006] Duns p.113.

Declassified CIA material shows that early indications of the Cuban crisis did not come from Penkovsky. The Americans thought that the Russians might move nuclear weapons to Cuba as early as August 1962.[1007] In a memorandum dated 10 August 1962, the CIA had noticed surface-to-air missiles and support personnel deploying to Cuba from the USSR and it was assessed that they were going there to defend high-value targets from air attack or U-2 surveillance.[1008] CIA Director John McCone briefed the President about his suspicions that Russian MRBMs were to be deployed to the island at a meeting on 22 August 1962 and U-2 over-flights increased.[1009] The CIA also stepped up debriefings of Cuban refugees via its Opa Locka centre in Florida in the coming months with authentic reports of mysterious construction sites and vehicle movements on Cuba emerging in September 1962. On 12 September for instance a canvas covered lorry was seen and the interviewee thought its cargo resembled a rocket; later identified as a likely SS-4 Shyster missile.[1010]

The CIA also had intelligence that on 9 September 1962 President Castro's pilot Claudio Morinas, said that there were "mobile ramps for intermediate range rockets" on the island.[1011] Cuban refugee reports also indicated that vehicle convoys had been seen with unusual trailers 65-70 feet long and eight feet wide.[1012] A rocket with four fins was seen on one trailer and the witness drew a sketch and later identified the object as a ballistic missile from a photograph.[1013] A CIA memorandum of 16 October 1962 identified a Soviet missile site south-west of Havana complete with trailers for SS-3 and SS-4 missiles.[1014] The CIA knew with high confidence, due to Soviet missile manuals passed to them by Penkovsky, that these systems could be deployed with no heavy construction work at the site. The missiles also had a single-stage with a 3000 pound warhead and needed liquid oxygen for fuel whereas the SS-4 had storable propellant.[1015] From Penkovsky, the CIA also knew about the communication

[1007] Allison, Graham *The Secret Cuban Missile Crisis Documents: CIA* (London, 1994) p.13.
[1008] Ibid.
[1009] Ibid.
[1010] Ibid.,p.101.
[1011] Ibid.,p.102.
[1012] Ibid.,p.107.
[1013] Ibid.
[1014] Ibid.,p.139.
[1015] Ibid.

systems used in conjunction with these ballistic missiles, their support vehicles and what they all looked like as well as the time to reach operational readiness being "quite short."[1016]

From 16 October 1962, the code word IRONBARK appeared on reports going to the Chairman of the United States Intelligence Board, identifying that it was produced using Penkovsky's material.[1017] A memorandum compared what was seen at Cuban ballistic missile sites to satellite and U-2 imagery taken of the USSR; all intelligence sources were clearly coming together in assessments. The types of missiles on Cuba had yet to be determined at this stage. The CIA noted that "valid clandestine sources" confirm a 1020 nautical mile range for the SS-3 missile which can be readily deployed to a site in six hours.[1018] Another report of 18 October 1962 revealed that the SS-4 missile "could be launched within eighteen hours after the decision to launch" and a reload undertaken of its launcher "within 5 hours after the initial firing."[1019] The SS-5 missile was said to have a 2200 nautical mile range and the CIA stated it knew what its warhead stores looked like and analysts were currently searching for the command and control links for the launch sites, whose nature they were clearly familiar with.[1020] It should be noted however that it is now known that the USSR had deployed tactical nuclear weapons to Cuba which remained undetected, which again shows the limitations of intelligence. Nevertheless, many of the intelligence reports produced during the Cuban Missile Crisis show a level of detail indicating that it was Penkovsky's material that was being used.

Daily reports issued during the crisis regularly used IRONBARK material to assess the layout of missile sites and to estimate how soon they would be operational. Identification of missiles was done by size and shape, vehicles, position and spacing of equipment. Some of this had been seen in Moscow military parades but the CIA noted that "the spacing of launchers corresponds to that discussed in secret Soviet military documents."[1021] This is likely a reference to Penkovsky's documentation covertly passed in meetings, debriefs, Greville

[1016] Ibid.
[1017] Ibid.,p.175.
[1018] Ibid.,p.179.
[1019] Ibid.,p.188.
[1020] Ibid.
[1021] Ibid.,p.255.

Wynne's visits to Moscow and Janet Chisholm's pram. It was now being used practically in a crisis to aid decision-makers at a crucial time when nuclear war was a real possibility. Penkovsky had been able to supply data on ballistic missiles which aided identification of systems, their deployment and usage but many intelligence gaps remained. For instance, the CIA did not know if nuclear warheads were actually in Cuba stating that "we are not likely to get any" evidence of this.[1022] The CIA would get no further help from Penkovsky because he had been caught at some earlier date and spent the crisis in custody. However, he had been very helpful through providing intelligence which assisted during the crisis. It is questionable how useful he would have been in providing data during the crucial days of October 1962 due to communications problems. Also, a man with messianic zeal, advocating the nuclear destruction of his own country, could have been most dangerous if he was influencing decision-makers at this time.

In the UK it is hard to discern if Penkovsky's material helped London's decision making. Nothing in JIC files gives a hint that Penkovsky existed or that any of his special code-word information was circulated in Whitehall. His material may have been incorporated into intelligence reports as "read-only with no quote or action-on" giving no indication that it was used. It would perhaps have allowed more confident decisions to be made but 'insiders' gave no hint of the existence of a special human source.[1023] JIC papers on the Cuban Missile Crisis only mention photos of Cuba received from the United States (likely U-2 imagery) but nothing is revealed concerning human sources.[1024]

President Kennedy's initial reaction to finding Soviet nuclear missiles in Cuba was to mount an air attack but as the crisis progressed, he developed a more sober attitude. How valuable Penkovsky's information was and his role in the crisis depends on how Kennedy and the rest of America's senior leadership viewed the issues. Only the people who were in the EXCOMM can say what happened during the crisis and many smaller groups broke off to hold separate discussions. The main participants are also now dead so it is very difficult to determine what intelligence was used at which stage in the crisis and how influential it was at

[1022] Ibid.,p.257.
[1023] Dover, Robert and Goodman, Michael *Learning From The Secret Past: Cases In British Intelligence History* (Washington, 2011) pp.239-264.
[1024] TNA., CAB 182/11. JIC(62)93 "Cuba: Threat Posed By Soviet Missiles" 26 October 1962.

different times. Intelligence may also have been circulated as part of broader assessments without it being necessarily attributed to Penkvosky so again, his value as an agent cannot be accurately gauged.

Penkovsky, assuming he was genuine and remained undetected, was a highly successful deep penetration agent inside Soviet military intelligence with some access to figures around the senior Soviet leadership. However, it should be remembered that when the crisis in Cuba was underway, Penkovsky was under arrest by the KGB. Also, he gave no warning about nuclear missiles being sent to Cuba thereby raising the question of how useful he would have been in this situation. Further, how would he have been contacted, what access would he have had to relevant intelligence and could he have passed information to the West without being detected? Also, if Penkovsky had been an agent controlled by the KGB, would it be more likely that they would have left him in place to help Moscow once their nuclear missiles in Cuba had been discovered? An agent assumes supreme importance during a crisis and the fact that he was arrested tends to suggest that he was a genuine Russian defector. Additionally if the Russians, to their horror, realised the scale of his betrayal and the nuclear secrets he had revealed, they would then realise that the Americans knew that Khrushchev's boasts about Russia's ICBMs and military prowess were hollow. The USSR was then not in a position to threaten the United States during the crisis and would either be forced into a humiliating 'climb-down' or face a war and obliteration.

It is likely that an assessment of Penkovsky's role in the Cuban missile crisis will only be achievable if it is known exactly what was passed to the West, how it was interpreted and inserted into the decision-making process and influenced decisions at vital points. This would require Russian and American archives to be fully opened but this in unlikely in the near future, if at all. The issue will be constantly re-interpreted and assessed as more data emerges. We are left with sparse declassified documents and the comments of those who participated in the crisis. Horne, in his biography of Macmillan notes that Penkovsky was "the most important agent within the Kremlin since 1945."[1025] However, as assets were sparse there was little competition and Penkovsky never worked in the Kremlin. He does however think

[1025] Horne, Alistair *Macmillan 1957-86: Volume 2 of the Official Biography* (London, 1989) p.369.

that Penkovsky had "supreme importance" during the Cuban missile crisis and "it was a view consistently shared by Macmillan."[1026] Richard Helms, CIA Deputy Director Plans, thought that Penkovsky's technical intelligence on Russian MRBMs was of great importance because it provided Kennedy with "three extra days" from 16-19 October 1962 to decide what to do about the weapons.[1027] In this period Kennedy went from belligerence to implementing the 'quarantine' against Cuba, but the intelligence did not stop the MRBMs from being prepared. Even when the USSR knew that the United States had intelligence about the deployment its activities did not stop.

However, McGeorge Bundy, Kennedy's Special Assistant for National Security Affairs noted that "Penkovsky had no discernible relation to the real assessments and actions of the US government in the missile crisis."[1028] Former CIA analyst Raymond Garthoff noted that Penkovsky's military material was "useful background information"[1029] which does seem rather bland. These comments may reflect what access the individual had, because very few people would have had the complete picture of what Penkovsky provided for both security reasons and because of its quantity. Sir Nicholas Henderson, JIC Chairman, stated that Penkovsky's material "was of crucial importance to us in assessing the state of Soviet preparedness and intentions" and senior SIS officer Maurice Oldfield, in Washington at the time, said it had "supreme importance."[1030] Evidence in the declassified British files about how Penkovsky's material was used is negligible and participants may have received it for intelligence purposes only but not for inclusion in any released reports. The importance of intelligence is likely derived from how it is integrated with other material and then used by those who have to make decisions. Sir Frank Roberts, former UK ambassador to Moscow, notes that Penkovsky's intelligence "was an important factor which must have influenced Kennedy's thinking" and "the West knew the limitations of Soviet nuclear re-armament and

[1026] Ibid.,p.370.
[1027] Quoted by Gioe and Scott in *An International History of the Cuban Missile Crisis* p.29.
[1028] Scott, Len *Macmillan, Kennedy and the Cuban Missile Crisis: Political, Military and Intelligence Aspects* (London, 1999) p.120.
[1029] Ibid.,p.121.
[1030] Ibid.

Khrushchev knew that we knew."[1031] Sir Frank believed that Penkovsky's information "ensured that Khrushchev could not indulge in diplomatic nuclear blackmail."[1032]

It should be remembered that Penkovsky's data on missiles also enabled the United States to gauge the operational nuclear threat it faced. Washington calculated that the SS-4 MRBM, if fired from Cuba, could hit seven Strategic Air Command bases in the United States whereas the SS-5 missile could hit eighteen bomber bases, one ICBM base and fifty-eight cities with more than 100,000 people in them. However, the operational state of the missiles did not equal the political intention to use them and without very accurate intelligence this is impossible to measure, thus adding to the danger of the crisis. Attitudes would likely be guided by psychology not logic. If so, this is alarming when Kennedy's poor decision-making during the Bay of Pigs operation in April 1961 is examined and Penkovsky's description of Khrushchev as an "atomic Hitler" and "a maniac" are recalled from the CIA's debriefing notes. If the Cuban Missile Crisis had escalated then both the UK and the US could have jointly found themselves in a nuclear war, the ultimate price of the "special relationship." In conclusion, I would like to examine the end of the Penkovsky case which is still the subject of controversy.

Theories Concerning The Capture Of Penkovsky

In secondary literature and in the CIA's debriefing reports, Penkovsky was clearly a fanatical character who took considerable risks approaching western intelligence services. The risks were enhanced through operating as a double agent for a little less than two years in a pervasive surveillance environment where exposure and death could occur at any time. Could any normal, stable, rational human voluntarily undertake and thrive in this role? Some commentators, such as Gioe, believe that if better tradecraft had been used then he might have survived longer. However, in the extreme operating conditions imposed by the Soviet Union's security apparatus it is remarkable that he survived at all. It is also curious that a man who had been sent home from Ankara, betrayed his own supervisor and the GRU, as well as having questionable issues about his parentage had not been denied any sensitive role by the

[1031] Roberts, Frank *Dealing With Dictators: The Destruction and Revival of Europe 1930-70* (London, 1991) pp.220-221.
[1032] Ibid.,p.221.

security-minded Russians. But, it is ironic that just as the 'old boy network' had aided the Cambridge spies in the UK during the early Cold War period, so the patronage of General Varentsov, family connections and the support of some colleagues in the GRU enabled Penkovsky to survive with his sensitive access intact.

After a review of the current literature, it is hard to say definitively how the Penkovsky operation failed but then all intelligence operations are finite and the issue has acted as a magnet for conspiracy theorists. If Penkovsky's approaches to the West had been detected by the KGB in 1960 then perhaps it is highly likely that he would have been arrested before he did any damage to Soviet security. The tradecraft that was used to protect him in London and Paris, as shown by Gioe's analysis, was good by the standard of the time. However, in Moscow, the numerous personal meetings in an environment with pervasive security with the wife of the SIS station head whose identity had been revealed to the Russians by SIS traitor George Blake was perhaps a risk too far. At that time though, she was the only asset available to the operation permanently based in Moscow; it may have been considered as an unlikely communications arrangement that the KGB may have discounted it. Duns also speculates, with limited evidence that a close friend of the Chisholms, Moscow *Daily Telegraph* correspondent Jeremy Wolfenden may have been working for the KGB perhaps after being blackmailed over his homosexuality.[1033] He could have picked up comments or indications that the operation was running, or even informed on the Chisholms which led the KGB to Penkovsky. In Moscow it might have been better if only occasional meetings had been held and dead-drops used to communicate with Penkovsky as he had initially suggested when he approached the CIA. The operation could have been suspended and intelligence conserved until he could travel abroad. The use of Wynne as an intermediary was a good tactic because he had a legitimate reason to go to Moscow and with Penkovsky's help could get through Russian customs without a search whilst carrying secret materials. However, as a westerner he would be under KGB scrutiny, having travelled to Moscow several times for a commercial purpose which did not seem to generate much business. Interestingly, DP4, the SIS department which dealt with British businessmen and frequent travellers to Russia, had George Blake on its staff before Penkovsky was recruited. Wynne's initial contact date with SIS is unknown but if Blake was aware that Wynne was being used as a courier or source

[1033] Duns p.232.

then he could have been put under extra surveillance and his covert relationship with Penkovsky established.[1034] Penkovsky, during his debriefs, had also told SIS and the CIA that the KGB paid particular attention to foreigners in restaurants so any meetings held there would be closely monitored.

The reason for Penkovsky's capture and the termination of the operation will likely only be known if the KGB opens its archives, but if it did would they be believed? In the current political climate, it is unlikely that such an event will occur. Disinformation would likely be used to conceal the existence of any possible undisclosed "mole" that existed in the West. It seems unlikely that George Blake was the only traitor in SIS in the Cold War and the CIA did seem suspiciously "spy-free" at that time. Blake was only caught due to a defector from Poland who provided crucial clues to his identity and questions raised about Blake's time in Berlin.[1035] If there had been no defector then he could likely have remained undetected for years. It is noteworthy that in the Blake case, the Russians allowed a CIA/SIS telephone tapping tunnel in Berlin to remain in place for years to protect the fact that he revealed it and allowed the USSR to suffer damaging losses of intelligence. It is however unlikely that Penkovsky was allowed to continue to operate and inflict such severe losses of intelligence on the USSR.

Reading the declassified material Penkovsky passed during meetings in the West (which excludes retained documents) any 'mole' that existed would have needed to be extremely valuable. The losses of such nuclear material for the USSR at such a crucial time would likely have been intolerable and highly dangerous as the weakness of the USSR was revealed. Penkovsky was also undermining Khrushchev's propaganda and showed the Soviet leadership in a really unflattering light. However, if Penkovsky was genuine and survived for so long then there may not have been a 'mole' in the West. The ideas of Peter Wright and the hunt for a traitor in MI5 must therefore be called into question.[1036] Wright doubted Penkovsky's *bona fides* and suspected that he was either planted on the West or had his identity revealed by an unknown 'mole' although only a few people knew his real name or

[1034] Ibid.,p.223.
[1035] Ibid.,p.41. The Polish defector was Colonel Mikhail Goleniewski who defected to the CIA in January 1961.
[1036] Wright, Peter *Spycatcher* (London, 1988) pp.205-212.

what material he provided. In the UK his material was distributed under the codenames ARNIKA and RUPEE.[1037] Wright appears to have been under the influence of KGB defector Anatoli Golitsin who was a propagator of theories concerning KGB plots and disinformation whereby any Russian defector was an agent controlled by Moscow to sow confusion. However, there was a chance that a source in the UK could have betrayed Penkovsky because according to Wright over 1,700 people received his output.[1038] Wright also heavily criticises the tradecraft used to run Penkovsky and is suspicious of the timeliness of the nuclear material he provided, which was just the sort of intelligence the West needed in 1961-62. It should be remembered though that Wright was a disgruntled MI5 officer who had his own agenda.

With so much intelligence produced by Penkovsky, numerous reports were created and circulated because intelligence is only useful if it gets into the hands of policy makers who have to make decisions. The circle of access therefore widens and the chance of a security breach increases. If material is fed back to KGB counterintelligence then the presence of a Russian traitor is confirmed and an investigation may lead to his detection. Bower points out that at this time there were several Soviet penetrations in place in American intelligence such as Jack Dunlap, a courier at the National Security Agency and Lt-Col William Whalen on the intelligence staff of the Pentagon's Joint Chiefs of Staff.[1039] During my research I found an interesting CIA memorandum for the Director of Central Intelligence from Richard Helms, CIA Deputy Director Plans. He noted that the CIA still had no definitive explanation for Penkovsky's loss but the previous week the CIA met an agent (deleted name) for a debriefing.[1040] This unknown source, not mentioned by any authors, stated that "our people in the US realized that some important information was leaking out of the USSR" and a process of elimination led them to Penkovsky.[1041] The document is heavily redacted and the source of the information, possibly a KGB officer, is unknown but it appears that Soviet personnel gathered this information in the United States; whether this is genuine data or Soviet disinformation is unclear. The source also revealed that in December 1962 Khrushchev made

[1037] Ibid.,p.208.
[1038] Ibid.
[1039] Bower p.283. See Duns p.204. Low-level Penkovsky material was reportedly found at Dunlap's home by the FBI after his detection. Lt Col Whalen also handled sensitive code-word intelligence information in the Pentagon which may have included assessments based on Penkovsky's material.
[1040] CIA documents. Memorandum for DCI of 08 July 1963.
[1041] Ibid.

a speech in Kiev admitting that Penkovsky "had done a lot of harm" but some good, as the United States now knew the strengths and advances made by the USSR.[1042] This does seem to be more of Khrushchev's rhetoric because Penkovsky revealed much about Soviet weakness. Far more controversial is an undated memorandum from CIA Director John McCone to the United States Intelligence Board which states that Penkovsky provided 8,000 pages of reporting and he was thought to be authentic but was caught by "a penetration in the British government who saw Wyn (sic) and Penkovsky together."[1043] How the CIA Director came to this conclusion, blaming the UK for the failure of the operation and what the source of this uncorroborated information was, remains unclear.

Despite doubts expressed by some authors about whether Penkovsky was genuine, both SIS and the CIA appear to believe that his material was genuine, even when he knew he was under suspicion. CIA Director John McCone wrote in a memorandum to the President's Foreign Intelligence Advisory Board in a case review in 1963 that deception was "something that we always feared" but Penkovsky's *bona fides* had been checked "extremely carefully" and the dissemination of his reports was held up to ensure their validity.[1044] After examining his data alongside other intelligence sources it was concluded that "this was authentic."[1045] It should also be borne in mind however that after all the authentications and assurances given by senior intelligence personnel, it would be really humiliating and cause reputational disaster if it was found that the whole Penkovsky case was an elaborate deception. Having read the declassified notes and a wealth of literature I would say that he was a genuine defector and a provider of much crucial intelligence at a dangerous, tense time in the Cold War. He was however largely motivated by revenge, money and driven by ego rather than solely noble aims to build a better, safer world.

Penkovsky ended up as his own controller and case officer. In his recruitment letter he had described himself as a "good friend" and "a soldier for the cause of truth" but when he asked the CIA and SIS to "protect me" they let him down and his own zeal escalated his

[1042] Ibid.
[1043] Ibid. Undated memorandum from CIA Director McCone to USIB.
[1044] Scott, Len *Macmillan, Kennedy and the Cuban Missile Crisis* p.129.
[1045] Ibid.

downfall.[1046] At a meeting in Birmingham on 27 April 1961 he told his controllers that "I did not come to you to do little things" but "I am capable of great things."[1047] In a memorandum in 1963 CIA Officer Joe Bulik said Penkovsky made a "tremendous contribution" to the West and more like him were needed.[1048] The Chief of the CIA's Soviet Division also noted Penkovsky's "unique and outstanding value" and he was "by far the most productive intelligence operation he had ever known" and with "the possible exception of technical sources, nothing else had ever produced materials of such concern to the national interests."[1049]

Conclusion

In conclusion the Penkovsky case is the most fascinating, well documented and important human intelligence operation for the West during the Cold War. The depth, importance and breadth of information provided suggests that Penkovsky was a genuine defector whose vital revelations informed the British and Americans about Soviet nuclear weapon delivery systems at a crucial time. He added unique material to the intelligence gained from SIGINT operations, covert over-flights and other intelligence collection activities discussed in previous chapters. In the 'wilderness of mirrors' of the intelligence world it was natural that the West would be suspicious of him but, on balance, it seems that he was not sent by Moscow or was under their control. Many unanswered questions remain however and it is unlikely that they will be resolved for many years, if at all. His material provided insights into Soviet intentions as well as capabilities, data unavailable from other sources at the time due to the intelligence collection problems previously highlighted. Penkovsky's case is a testament to the enormous intelligence hurdles the UK and America faced when working against the Soviet nuclear target. He does seem to have been the fortuitous right man in the right place at the right time with the right access. His recruitment and running showed that successful espionage operations could be mounted, albeit temporarily, in the USSR and human intelligence remained a vital element of the total amount of data available to policy makers. It is unknown if his counter-intelligence information led to further recruitment of Soviet personnel but he may have inspired other disaffected Russians to switch sides. His "show-trial" and reported execution may have been Moscow's attempt to deter future

[1046] CIA documents. Letter of 19 July 1969.
[1047] Ibid.,Meeting 7 Birmingham of 27 April 1961.
[1048] Ibid.,Memorandum of 10 May 1963.
[1049] Ibid.,Memorandum of 03 April 1962.

Penkovskys. Gioe examined the private papers of SIS Soviet Department Head and Penkovsky's case officer, Harold Shergold. Shergold wrote, "We always had agents in Eastern Europe producing first class intelligence" and "we were very successful, which is what people don't realise because we never told anybody."[1050] Whether this success included the Soviet Union, and Penkovsky's espionage inspired other Russians, remains unknown, but what was possible had been demonstrated.

[1050] Gioe and Scott, *An International History of the Cuban Missile Crisis* p.145.

Conclusion

This thesis examines what the British government knew about the Soviet Union's nuclear weapon delivery systems and the problems it encountered in attempting to gather intelligence on them. It is clear that despite the difficulties they had to overcome, British intelligence analysts provided a reasonably accurate assessment of the Soviet Union's nuclear bombers and its ballistic missile forces from 1949-62. Their job was to collect and analyse information fused from multiple sources and assess it to establish the discernible facts about these forces. Their conclusions, with caveats, then had to be promulgated in a way which was useful and understandable for policy makers, suitably nuanced and with value added through assessment and comment.

It is important to caveat any conclusions on this topic with the observation that full details of the intelligence assessments made at this time are unlikely to be released and the source material used to write the reports remains classified. Many papers will have been destroyed, personnel are now deceased and much material may not have been committed to paper at the time. Any documents in The National Archives are also deposited because the British government wants them to be released, so the possibility of 'hidden agendas' and security considerations still exists. The revelations about the RAF's involvement in the US-sponsored covert balloon programme, participation in the U-2 over-flights and the covert radar facility in Cyprus shows that there are likely to be many more intelligence collection activities which remain concealed. The exact level of success by the allies in breaking Russian cryptographic systems and the possible existence of deception operations undertaken by the USSR and the West will likely remain obscure. Limited information is available concerning the UK's covert over-fights of the USSR under Operation JIU-JITSU but the participants in such undertakings are likely now deceased. However, newly declassified material does confirm the long-rumoured covert over-flight of Kapustin Yar by the RAF.

No operational papers from SIS or GCHQ concerning the USSR's nuclear weapon delivery systems have been declassified so it is impossible to say how successful these organisations were in collecting and analysing material or what their conclusions were. However, the

Penkovsky case shows how human intelligence developed from debriefing German scientists to successfully 'running' an agent in place in Moscow by the end of the period covered by my research. Clearly, much benefit was derived from a well-placed human source but it is unknown if he had contemporaries in the USSR or further sources were developed using the material he provided. It is also unknown what the exact scale and nature of British technical intelligence collection operations were in locations such as Cyprus. Russian archives concerning nuclear weapon delivery systems have also not been opened and only a few Russian writers have published material on the subject which makes forming a conclusion about their nuclear weapon delivery systems difficult. The current nature of the Putin regime and relations between Russia and the West will also make substantial releases of material on Soviet nuclear weapons unlikely in the near future. It is also difficult to assess the role of western intelligence service traitors such as George Blake and 'Kim' Philby who provided highly sensitive intelligence about sources, methods and assessments to the USSR and how much disinformation could have been passed to the West to give a distorted impression of the USSR's nuclear capabilities.

Despite the enormous problems in trying to collect intelligence on the USSR, the UK's intelligence analysts appear to have adopted a measured and dispassionate approach to their task. They were working with partial information on new fields such as atomic energy, nuclear weapons and ballistic missiles and had to develop techniques to work against these targets. They apparently made good use of whatever data they had from all sources, both overt and covert. This material could never provide definitive analysis on their targets. Reading through hundreds of JIC and other intelligence assessments from 1949-62, the reader is struck by the lack of emotion and exaggeration in their output. The analysts must have been subject to the stresses and fears of their dangerous era from the first Soviet atomic and hydrogen bombs, through the Stalinist period, the Korean War, McCarthyism, espionage scandals, the Berlin Wall's construction and the Cuban Missile Crisis. It is impossible to say how much political influence may have occurred in intelligence assessments, but the authors of the documents I examined seemingly gave honest, frank appraisals of the intelligence material they assessed. There is no evidence of the sort of distortion and exaggeration seen in certain American intelligence assessments from that period. It was common in JIC assessments on the USSR for the authors to admit that intelligence was limited on Soviet

intentions in certain areas such as targeting, nuclear strategy and the number of nuclear warheads they held. Analysts were aware of the limitations of intelligence and seemed willing to admit these shortcomings to policy branches and their senior customers. Although apparently honest, it is alarming that it was impossible to accurately assess the capabilities of a state which could potentially have annihilated the UK. However, this is the nature of intelligence assessment, not a science but the art of forming caveated judgements backed by experience and whatever limited information is available from whatever sources. I believe that the analysts succeeded in providing the best assessments they could from the partial material they had available during the period 1949-62.

British analysts appreciated, and nobody disputes, that the USSR could have obliterated the UK with its nuclear arsenal during this period, as Russia can today. The reports produced helped policymakers to guide the country through a difficult and dangerous time. The UK was able to construct and test nuclear weapons in the austerity years after the Second World War and intelligence assessments helped to design and operate the impressive airborne nuclear deterrent forces built up by Britain from the mid-1950s. Analysts and policy makers also faced up to the fact that there was no weapons system which could guarantee the UK protection from a large Soviet nuclear bomber attack or one involving ballistic missiles. At the end of the period of this study, it was clear that advances in Soviet nuclear weapon technology rendered the RAF's nuclear bomber force vulnerable to pre-emptive missile attack and undermined plans for the UK's Blue Streak land-based ballistic missile. From examining many intelligence and policy papers, it was clear that the British government believed that the only hope of survival for the UK and the West was to deter a Soviet nuclear attack. The cost of solely conventional defence to match the Soviet military would have been vast and nuclear weapons acted as the 'ultimate weapon' to deter a hostile state, assessed as unlikely to risk escalation and nuclear conflict. Without nuclear weapons it would have been more likely that the USSR could have attempted aggression or intimidation against Western Europe. The real measure of intelligence success is that nuclear war did not occur and no nuclear weapon was used in anger after 1945. However, conflict over Berlin or an escalation during the Cuban Missile Crisis could have resulted in catastrophe.

The JIC assessed that the UK would remain relatively safe from pre-emptive nuclear strike or conventional war as long as the US could not be 'decapitated' in a Soviet nuclear first strike. With the US having nuclear missiles in hardened silos in America, shorter-range Thor and Jupiter nuclear missiles based in Europe, long-range nuclear bombers on alert in America and its nuclear bombers in the UK, Spain, North Africa and the Pacific, it made it extremely difficult for the USSR to co-ordinate a pre-emptive catastrophic attack on American nuclear forces. By the early 1960s, Ballistic Missile Early Warning radar was entering service and Polaris submarines were being deployed, thereby complicating the USSR's attack planning and ensuring that an American second-strike capability remained. In JIC and MOD policy discussions, the theme of the UK remaining safe so long as the US was able to retaliate after a Soviet nuclear first-strike is apparent. British intelligence could help to reinforce this assessment by showing that the USSR was struggling to produce long-range bombers which could attack the US and return home as well as identifying problems with Russian development of its ICBMs. However, it should be remembered that the USSR could have devastated the UK and Western Europe with short range nuclear bombers and missiles, but it would be well into the 1960s before it could inflict such damage on the US.

Concerning nuclear bombers, British intelligence in the 1950s appreciated the danger from a growing Soviet Long-Range Air Force armed with nuclear weapons. Analysis of Attaché files shows that the British government was trying to use all intelligence sources it had available and to develop new ones. Sources were limited in the early 1950s, with heavy reliance on returning Germans who had worked in the USSR, open literature and Attaché reports. To their credit, British analysts, unlike politicians, never got caught up in the 'bomber gap' controversy seen in the US and the assessments I examined were normally nuanced with acknowledgment of limited sources and knowledge. The assessments of the number and types of Soviet nuclear bombers were generally more conservative than those of the US. The American 'bomber gap' appears to have resulted from a United States Air Force keen to expand in the face of opposition from the other two services and an aircraft industry seeking contracts. The American estimates for the Soviet Air Force seem to have expanded as a result of this bureaucratic pressure whereas the British assessments were more measured and realistic. The UK of course had its nuclear deterrent solely in the hands of the RAF rather

than a new service struggling for recognition against the other armed forces who also sought to maintain America's nuclear deterrent.

However, the British government assessed that Soviet nuclear bombers could overload the UK's air defences if they were determined, and the Strath Report revealed the horror of what would happen if a nuclear strike occurred. Despite this nuclear sword of Damocles hanging over the nation, it did not generate terror or hysteria in intelligence analysts and assessments apparently remained balanced and dispassionately conservative. Intelligence assessment was neither alarmist or dismissive of the risks the UK faced. The intelligence picture improved in the latter half of the 1950s as long-range radar, aerial reconnaissance and satellites came into service in intelligence operations thereby allowing observation of the USSR's aircraft testing facilities, factories and airbases. No Russian bomber entered service that the West was unaware of and the UK correctly assessed that the Soviet bomber force would not be run down once ballistic missiles entered service. The Soviet Long-Range Air Force would continue to enjoy limited expansion once ballistic missiles were developed and to receive modern aircraft and missiles for the rest of the Cold War. It remained a parallel threat to ballistic missiles to this day.

With the USSR's acquisition of ballistic missiles, the UK faced a difficult challenge because they were developed as a new technology in remote areas of Russia amid great secrecy. New techniques had to be developed to collect and analyse intelligence on these programmes. The UK, as with bombers, had experience of the power of missiles as it was the first nation in history to suffer a missile attack from 1944 onwards. The UK had also faced serious problems in the war collecting intelligence on, and destroying, German rocket sites and factories. This was despite occupied Europe being close to the UK; the secret police state of the USSR was further away and a more difficult intelligence target. British analysts highlight these collection problems in many of their reports.

As with bombers, the best initial intelligence came from skilfully and systematically debriefing returning German scientists and engineers. However, this information was

exhausted by the mid-1950s, with the return of some Germans delayed to ensure that their information had less value to western intelligence. The volume and type of data in the files concerning this operation is impressive and was highly likely useful to British analysts to confirm or refute assumptions. Developments in radar and SIGINT provided more intelligence data on Soviet weapons from the mid-1950s as intelligence agencies planned their collection against the elusive target of Russian ballistic missiles. Later in the period, Colonel Oleg Penkovsky helped to add considerably to intelligence knowledge with personal observations and the numerous documents such as missile manuals that he passed to the West. Several conferences were held between American and British specialists in the 1950s which acted as useful sessions to clarify thinking on Russian ballistic missiles. Although there was a 'missile gap' controversy in the US there did not seem to be much discussion of it amongst British intelligence analysts who likely viewed it as another American 'myth'.

The UK's main concern was with ballistic missiles which could hit Britain from the USSR or Eastern Europe rather than the longer-range systems which could target America. This became a key element in the Powell Report which led to the cancellation of the UK's Blue Streak ballistic missile and was an occasion where intelligence estimates had a direct impact on defence policy. Even though the UK was assessed as vulnerable to Soviet nuclear attack, the US becoming vulnerable to a pre-emptive nuclear strike would undermine the security of the UK. However, it was thankfully many years before the USSR had sufficient numbers of high-quality, accurate long-range ballistic missiles to pose a threat to American strategic nuclear forces. Throughout the period, intelligence analysts assessed that the USSR could annihilate the UK but at no time did they assess that they were likely to do so; they had the capability but not the intention.

By 1962, advances in SIGINT, radar, aircraft such as the U-2 and the *Corona* satellite programme as well as Penkovsky's espionage had given the UK and the US a better understanding of Russian bomber and missile strengths, capabilities and programmes. The close intelligence relationship between the two states also allowed maximum benefit to accrue from these operations. Radar and ELINT surveillance of the Kapustin Yar and Tyuratam missile ranges allowed ballistic missile information to be exchanged which the UK

would have struggled to gather by itself. Some of this data concerned shorter-range missile systems which posed a direct threat to the UK. The UK also benefitted from American experience with its space and ballistic missile programmes, using such knowledge in intelligence assessment. No ballistic missile system apparently entered service in the USSR which the West was unaware of due to surveillance of testing facilities by various sources. The British seemed to appreciate Russian developmental problems with bombers and ballistic missiles and thought that systems would not be operationally deployed straight after testing and therefore did not pose an immediate threat. In the US the opposite view seemed to be held, thereby 'justifying' greater defence expenditure. This is ironic because UK intelligence assessments suggest that the threat to the US was limited by the USSR having too few long-range bombers and nuclear missiles whereas the UK was under greater threat posed by the proximity of shorter range nuclear bombers and missiles. The development of missile intelligence also provided the UK with a firm base for more intelligence developments during the rest of the Cold War and its intelligence position was better than it had been in 1949.

In the field of aerial reconnaissance, British intelligence again built on its wartime experience and close ties to the Americans throughout the period 1949-62. German photographic material from the war was very useful during the 1950s to gain an understanding of Russian geography and military and industrial facilities. As ground penetration of the USSR was difficult to achieve, so aerial systems seemed to offer a partial solution to the intelligence collection problem. In addition to mounting surveillance from border areas, the RAF undertook hazardous over-flights of the USSR, using American supplied aircraft, under Operation JIU-JITSU which could have caused major political problems if the aircraft had crashed or been shot down. These missions, which the US thought too hazardous for it to undertake, show the lengths that the UK was prepared to go to in its intelligence collection activities and to increase its standing in the wartime 'special relationship' which grew stronger in the Cold War. From the declassified CIA history of the U-2 aircraft, it is also clear that the RAF mounted a dangerous independent covert over-flight of the Kapustin Yar missile facility, reportedly with the aircraft nearly being shot down in the process. The UK also had a previously undisclosed role in the release of intelligence collection balloons, sent over the USSR. This operation provided useful data for the future American U-2 programme.

The American U-2 programme initially sought to launch missions from the UK and this shows the closeness of the relationship between the two states on covert intelligence issues. Examination of the recently released CIA history of the programme shows that RAF pilots mounted some over-flights of the USSR and the UK was a beneficiary of the vast amounts of photography which was gathered and helped in its interpretation. British involvement in this programme remained hidden for many years; especially in the aftermath of the 1 May 1960 shoot-down of one of the aircraft. The UK also had to deal with the fall-out from the destruction of the American RB-47 intelligence aircraft in July 1960, an aircraft which had operated from the UK. From 1961, satellite imagery came on-line with the *Corona* programme and the UK had access to some of its output, as proven by a document found in the National Reconnaissance Office files. This programme and the U-2 missions showed that the missile and bomber 'gaps' did not exist and the West could be more confident about accurately assessing the USSR's nuclear capabilities and intentions. Their output also provided numerous extra targets for the West's growing nuclear arsenal. Knowledge of nuclear forces and being able to verify their size and nature would ultimately lead to nuclear agreements between the superpowers such as SALT, START and INF so there was a long-term 'peace dividend' from the development of technical intelligence collection. In the early 1960s this knowledge also helped to deliver the Partial Test Ban Treaty which was a considerable issue for the British Government and Harold Macmillan. This was the first treaty to be concluded with the USSR on nuclear weapons and was also the last nuclear agreement for many years.

The UK had been involved in human espionage for many years and the successful 'running' of Colonel Oleg Penkovsky showed what was possible with an agent in the right place at the right time. His recruitment, management and the processing of his material was a product of the 'special relationship' between SIS and the CIA. The CIA had the resources to maintain the operation and the SIS had the assets in place in Moscow to run the case. A plethora of books and comments indicates that Penkovsky was a valued agent who produced material of enormous value on bombers, missiles and Soviet politics. He also confirmed British intelligence assessments that the Soviet Union had problems developing ballistic missiles, did not have many long-range nuclear missiles and that the bomber programme was still underway with new aircraft being produced. Whilst his role in the Cuban Missile Crisis may

have been exaggerated, he did provide material of great value to aid the West's understanding of the deployment and use of Soviet nuclear weapons and Moscow's intentions. The declassified CIA material I examined shows the involvement of SIS in the operation in unprecedented detail and comments made in documents demonstrates the first-hand knowledge he passed on concerning Soviet nuclear bombers and missiles. His overall importance is hard to judge because none of the official documents such as Soviet missile manuals have been released. His success as an agent 'in place' did show that Soviet security was not invincible and successful covert operations could be run in Moscow. This could provide valuable experience for further operations, perhaps with Russians who were recruited after being identified by Penkovsky.

Overall, my research showed a secret coterie of British intelligence analysts in various departments working with American colleagues, but not dominated by them, dealing with sensitive and highly dangerous issues during the most terrifying stand-off in modern history. They had gaps in their coverage which caused tremendous difficulties in trying to come to a balanced view but there is no evidence I could find of exaggeration of the threat posed by the USSR's nuclear delivery systems or any attempt to avoid uncomfortable conclusions. Intelligence analysts could not see into the future and their sources could not produce a definitive assessment on what events would unfold. They worked on partial intelligence and the rest was assessment and judgement. Analysts could not precisely determine Soviet intentions but they could attempt to measure Moscow's nuclear weapon capabilities. It is not possible to say how much influence their assessments had on policy-makers because they are not reflected in policy documents, except for the Blue Streak missile cancellation. The few released documents on the Cuban Missile Crisis in The National Archives for instance, give no hint that Penkovsky existed. JIC papers do not mention intelligence sources and methods and this made assessing the importance of intelligence during the period 1949 to 1962 even more difficult. It is unknown how each intelligence report may have influenced a particular decision or what the policy branches thought of any assessments they read or if they used the material simply as background reading.

The thesis shows that in the early years of the Cold War intelligence about the Soviet Union's nuclear weapon delivery systems was sparse, but it must be emphasised that the USSR was a particularly difficult intelligence target. Technological innovation, originality, imagination and skill all helped western intelligence agencies to overcome some of these intelligence challenges. It also drew the United States and the United Kingdom closer together in the intelligence field with co-operation on highly sensitive projects. The exigencies of intelligence gathering prompted the use of unlikely collection methods such as balloons, jet-powered gliders and novel radar systems. Western governments were also prepared to break international law, deceive other nations and take considerable risks which could have led to conflict in order to collect intelligence. This thesis helps to add to our knowledge of how the Cold War was fought through the medium of intelligence collection and analysis. It places particular emphasis on the UK's role in previously hidden aspects of secret intelligence collection during this difficult and dangerous time.

The UK's assessments of Soviet ballistic missiles and long-range bombers appear measured and reasonable during the period with no major errors which noticeably damaged national security. Analysts were caught by surprise when Sputnik was launched in 1957 and they had sparse information on Soviet deployment of nuclear missiles on submarines, but the latter was an extremely difficult target. There were some errors concerning the short-term deployment of Soviet nuclear missiles to the GDR in 1959 and the accuracy of, and date by which, a ballistic missile could hit the UK when launched from the USSR. However, these reflect the difficulty of the target that the UK faced rather than the shortcomings of the system and the people working within it. Miscalculation over Soviet missiles also led to the cancellation of Blue Streak but this project was also enmeshed in inter-service politics and rivalry rather than being the product of overly pessimistic intelligence assessments. British involvement in over-flights was also dangerous but arguably worth the risk in view of the intelligence it collected, which was unavailable from any other means. Overall, UK intelligence assessments gave a stark and broadly accurate insight into the threats the country faced at that time from Soviet nuclear weapon delivery systems. It is a measure of success that the UK and the West survived this dark chapter in their history and we are still here today without nuclear weapons having been used in anger since 1945.

GLOSSARY

ACAS (Int)	Assistant Chief of the Air Staff (Intelligence)
ALCM	Air Launched Cruise Missile
AN/FPS-17	Missile Detection Radar (US)
BND (SG)	British Nuclear Deterrent (Study Group)
BRIXMIS	British Military Mission to East Germany
CAS	Chief of the Air Staff
CDS	Chief of the Defence Staff
CIA	Central Intelligence Agency
COMINT	Communications Intelligence
DPRC	Defence Policy Research Committee
DSP	Defence Support Programme
ELINT	Electronic Intelligence
EXCOMM	Executive Committee of the US National Security Council
FO	Foreign Office
GCHQ	Government Communications Headquarters
GDR	German Democratic Republic
GNTK	State Committee for the Co-ordination of Scientific Research Work (USSR)
GRU	Soviet Military Intelligence
GX	Captured German Wartime Aerial Intelligence
HUMINT	Human Intelligence
ICBM	Intercontinental Ballistic Missile
INF	Intermediate Nuclear Forces Treaty
IRBM	Intermediate Range Ballistic Missile
JARIC	Joint Air Reconnaissance Intelligence Centre

JIB	Joint Intelligence Bureau
JIC	Joint Intelligence Committee
KGB	Committee on State Security (USSR)
KT	Kiloton
LRAF	Long-Range Air Force (USSR)
MI5	British Security Service
MI6	British Secret Intelligence Service
MIDAS	Missile Defence Alarm System
MOD	Ministry of Defence
MRBM	Medium Range Ballistic Missile
MT	Megaton
NATO	North Atlantic Treaty Organisation
NRO	National Reconnaissance Office (US)
ORBAT	Order of Battle
OSA	Office of Special Activities (US)
PM	Prime Minister
RAF	Royal Air Force
RAND	Research and Development Corporation (US)
RN	Royal Navy
SAC	Strategic Air Command
SALT	Strategic Arms Limitation Treaty
SAM	Surface-to-Air Missile
SIGINT	Signals Intelligence
SIS	Secret Intelligence Service
SofS	Secretary of State (UK)
SS-3	SHYSTER Medium Range Ballistic Missile (USSR)
SS-4	SANDAL Intermediate Range Ballistic Missile (USSR)

SS-6	SAPWOOD Intercontinental Ballistic Missile (USSR)
SS-7	SADDLER Intercontinental Ballistic Missile (USSR)
START	Strategic Arms Reduction Treaty
TELINT	Telemetry Intelligence
TNA	The National Archives
U-2	Utility-2 Aircraft
UK	United Kingdom
US	United States
USAF	United States Air Force
USSR	Union of Soviet Socialist Republics
V-1	German Wartime “Doodlebug” Cruise Missile
V-2	German Wartime Ballistic Missile
WO	War Office

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