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**Discuss the Significance of Imagery Intelligence Gathered
by the USA in the Period 1961-79**

Essay prepared for Doctor Paul Maddrell

The Past and Present of US Intelligence

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**‘Thus, what enables the wise sovereign and
the good general to strike and conquer,
and achieve things beyond the reach
of ordinary men, is foreknowledge.’**

- Sun Tzu in *The Art of War*.

**‘To lack intelligence is to be
in the ring blindfolded.’**

- General David M. Shoup,
Former Commandant of
the Marine Corps.

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INTRODUCTION

It appears today, from the ever-growing quantity of declassified documents and published literature, that intelligence has been used throughout history by decision-makers to obtain more complete and more precise pictures of specific situations. To deceive or avoid being deceived, to gain military or political advantage, to overtly monitor or secretly intercept, they sought to acquire as much information as possible to get the whole 'picture' – sometimes literally. Indeed, getting a photograph of the enemy, the target, the foreign landscape, the adversary or sometimes of the partner or ally has often been the preferred source of intelligence of these decision-makers.¹

In this essay, I will discuss the significance of the imagery intelligence gathered during the period from 1961 to 1979. Therefore, other sources of intelligence, technical aspects of imagery intelligence and changes which occurred within the agencies of the US intelligence community will not be discussed unless they had a direct impact on how important IMINT has been.

As of the concept of 'significance' itself, it is understood as meaning the degree of importance imagery intelligence had on the outcome of specific events and, more generally, on the United States in the 1960s and 1970s as a whole.

The initial assumption is that imagery intelligence gathered during that specific period was of uneven significance depending on the purpose for which it was used although it generally provided crucial, relevant and precise information in times when American national security was the most at risk. To support that statement, various episodes of American history in which IMINT played a role will be presented in three general categories. Each section will

¹ Although imagery intelligence is not limited to photography, it was the principal form of IMINT produced between 1961 and 1979. However, IMINT is also understood to include intelligence gathered from infrared sensors, lasers, electro-optics and radar sensors wherein images of objects are obtained.

try to assess how important IMINT gathered during this period was to the Americans – whether politicians or soldiers.²

1. FEARS AND CRISES

After the Second World War, two superpowers – the United States and the Soviet Union – entered into a period of intense suspicion, distrust and confrontation. This led to what might be described as enduring fears among American leaders as well as international crises involving the Soviet Union but other nations as well. This section will discuss the significance of IMINT gathered in relation with some of these concerns and crises.

The principal and visceral apprehension among Americans at the beginning of the Cold War was the fear of a ‘missile gap’ between the United States and the Soviet Union favouring the latter. This fear was born during the mid-1950s and was mainly attributable to the misinterpretation of the aggressive Soviet foreign policy which led to conclude at strong and threatening intercontinental ballistic missile (ICBM) capabilities.

The question of Soviet missiles forces emerged at the centre of the 1961 Berlin crisis.³ Indeed, during that crisis, Khrushchev used that pretended military superiority to weaken the American strategic power of negotiation and to bring the United States to sign an eventual peace treaty with East Germany. Such a treaty would have led to the withdrawal of foreign military forces in West Berlin, would have inflicted an important political blow to the United States and would have made Communist expansion easier in that part of Europe.⁴

² During that period, the American presidents were John F. Kennedy (1961-1963), Lyndon B. Johnson (1963-1969), Richard M. Nixon (1969-1974), Gerald R. Ford (1974-1977) and James E. Carter (1977-1981). The Soviet leaders were Nikita S. Khrushchev (1953-1964) and Leonid I. Brezhnev (1964-1982).

³ Curtis Peebles, *The Corona Project: America's First Spy Satellites*, Annapolis, Naval Institute Press, 1997, p. 111.

⁴ It was widely believed that if the US backed down on the issue of West Berlin by accepting a peace treaty with East Germany, then its commitment to defend Western Europe would no longer be of any value; see *Ibid.*

Knowing the *real* Soviet military capabilities was therefore of vital importance and it is where imagery intelligence played a significant role. In August 1960, the first successful photoreconnaissance mission of the CORONA programme took place.⁵ With CORONA, the Americans literally had eyes in the space to directly look at Soviet military installations and ‘[t]he most immediate impact of Corona-derived intelligence was to destroy the myth of a missile gap.’⁶ Khrushchev had bluffed and thanks to CORONA, the bluff had failed.⁷

The end of the missile gap was to be followed by the event in the Cold War which was the closest the world ever came to nuclear war: the Cuban Missile Crisis. During that very well-documented two-week crisis of October 1962,⁸ since satellites were not sufficiently advanced to provide precise and continuous intelligence on the military build-up in Cuba, imagery intelligence was acquired by U-2 spy planes flying over the island and photographing large areas with spectacular precision. The mission flown on 14 October 1962 provided the National Photographic Interpretation Centre (NPIC) with the first hard evidence of the presence of medium-range ballistic missiles (MRBMs). In that case, IMINT had set in motion the crisis and was to play a role of crucial significance in its outcome.

Indeed, in the following five days, before the crisis became public, the number of U-2 missions was increased and could provide a relatively complete picture of Soviet missile-related activities in Cuba. ‘Fortunately, intelligence analysts had discovered the missiles before they had become operational, so Kennedy had at least a few days in which to ponder his options.’⁹ The deployment of medium-range missiles in Cuba had been detected and

⁵ Len Scott, ‘Espionage and the Cold War: Oleg Penkovsky and the Cuban Missile Crisis’, *Intelligence and National Security*, vol. 14, no. 3, July 1999, p. 31.

⁶ David T. Lindgren, *Trust But Verify: Imagery Intelligence in the Cold War*, Annapolis, Naval Institute Press, 2000, p. 105. On 21 September 1961, a revised National Intelligence Estimate (NIE) called ‘Strength and Deployment of Soviet Long Range Ballistic Missile Forces’ announced in the second paragraph of its conclusions the official end of the missile gap; see Curtis Peebles, *The Corona Project*, *supra* note 3, p. 114.

⁷ Curtis Peebles, *The Corona Project*, *supra* note 3, p. 117.

⁸ On the Cuban Missile Crisis, known by the Soviets as the Caribbean crisis and by the Cubans as the Crisis of October, see Dino A. Brugioni, *Eyeball to Eyeball: The Inside Story of the Cuban Missile Crisis*, New York, Random House, 1991.

⁹ David T. Lindgren, *Trust But Verify*, *supra* note 6, p. 74.

identified in a timely way, and the nature, locations, scale and operational status of the missile deployment were accurately determined.¹⁰ When the Soviets agreed to withdraw their missiles on 28 October 1962, IMINT was used to verify the removal of the missiles and later of the light bombers.¹¹ Planes were used for that task too since satellites could only be of very limited help in such a fast-breaking situation.¹²

In conclusion, without imagery intelligence, the Kennedy administration might not have detected the Soviet missiles in Cuba before their full deployment and, as in the case of the Berlin crisis, the United States could have faced a major political blow or worse, a far more serious nuclear threat against its very own territory. Without IMINT, the United States would have been in a seriously weaker position and the rest of the Cold War would have evolved in a drastically different manner.

The missile gap, the Berlin crisis and the Cuban missile crisis were not the only fearful events or worrying crises that the United States had to deal with and in which imagery intelligence played a role. Only to mention a few, IMINT was gathered by U-2 missions during the Suez Crisis, the Lebanon Crisis, the Communist takeover of Tibet, and the China Off-Shore Island Crisis.¹³ Also, at the end of the 1970s, the Iranian Revolution and the Tehran hostage crisis showed some other limitations of imagery intelligence.

¹⁰ Raymond L. Garthoff, 'US Intelligence in the Cuban Missile Crisis', *Intelligence and National Security*, vol. 13, no. 3, July 1998, p. 28.

¹¹ *Id.*, p. 34.

¹² One reason for that was the sporadic nature of the Corona launches. They were unable to provide daily, up-to-the-minute information. The nonmaneuvering, short-lived Corona satellites would also have had difficulty covering a specific small area on the island. In fact, the Cuban missile crisis was the first indication of the limitations of satellite reconnaissance. See Curtis Peebles, *The Corona Project*, *supra* note 3, p. 140.

¹³ Dino A. Brugioni, *From Balloons to Blackbirds: Reconnaissance, Surveillance and Imagery Intelligence: How It Evolved*, McLean, The Association of Former Intelligence Officers, 1993, p. 43. The only mention found in the literature concerning the use of imagery intelligence during the Bay of Pigs invasion of 1961 was to the effect that the inventor of the Polaroid camera and member of the President's Foreign Intelligence Advisory Board (PFIAB) Edwin Land 'was particularly upset at the employment of U-2s in the Bay of Pigs disaster'; see Jeffrey T. Richelson, *The Wizards of Langley: Inside the CIA's Directorate of Science and Technology*, Boulder, Westview Press, 2001, p. 40.

Before the Iranian Revolution during which the US-backed regime of Mohammad Reza Shah Pahlavi was overthrown by Ayatollah Ruhollah Khomeini,¹⁴ no picture could have presented President Carter with hard evidence of what was about to happen. In fact, ‘Carter’s view of intelligence collection had been dominated by the high-tech wonders of IMINT and SIGINT. The Iranian crisis brought home to him for the first time the importance of political intelligence from human sources.’¹⁵ However, after the Shah left, Iran became a priority target of KEYHOLE photoreconnaissance satellites aimed at finding out whether or not American intelligence facilities had been discovered by the new regime.¹⁶

Finally, at the end of 1979, Carter was again confronted with an Iranian problem when over 50 American personnel were taken hostage in Tehran. ‘The phenomenal technology of the KH-11 satellite made it possible for him to look down on the Teheran embassy compound from above, though not to peer inside the rooms in which the hostages were being held. The fact that, unlike any previous president, he had access to real-time imagery gave the crisis and extraordinary immediacy.’¹⁷

2. IMINT AND ARMED CONFLICTS

As rightly stated by a US Army training officer, ‘IMINT is the only discipline that allows the commander to “see the battlefield”’¹⁸ since other sources of intelligence only provide indirect

¹⁴ Stanley T. Escudero provides a high-quality assessment of what is today considered as a serious intelligence failure, in a confidential memorandum from the United States of America Department of State called ‘What Went Wrong in Iran?’, pp. 30-33. See also Abul Kasim Mansur, ‘The Crisis in Iran: Why the US Ignored a Quarter Century of Warning’, *Armed Forces Journal International*, January 1979, pp. 26-33, and Gary Sick, *All Fall Down: America’s Fateful Encounter With Iran*, London, I.B. Tauris & Co. Ltd., 1985.

¹⁵ Christopher Andrew, *For the President’s Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush*, London, HarperCollins, 1995, p. 439.

¹⁶ The CIA apparently had a plan for airlifting equipment and personnel out of the TACKSMAN II site using C-130 aircraft but never got the chance to implement it. Soon the CIA’s prize telemetry intercept sites were in the hands of the ayatollahs. Kabkan was besieged by militiamen, and twenty-two US technicians were captured; see Jeffrey T. Richelson, *The Wizards of Langley*, *supra* note 13, p. 214.

¹⁷ Christopher Andrew, *For the President’s Eyes Only*, *supra* note 15, p. 449.

¹⁸ United States Army, ‘Tactical Imagery Intelligence Operations TJIDBT’, *FAS Intelligence Resource Program*, [Online], <http://www.fas.org/irp/doddir/army/tacimlp.htm> (Page visited on 22 April 2002).

and therefore often less precise information. This second section will discuss the significance of imagery intelligence gathered by the United States during armed conflicts.¹⁹

The first obvious case is the Vietnam War, a long conflict which drained a lot of energy, money, and ‘young blood’ from the American people. Like the Cuban Missile Crisis, the Vietnam War represented an indirect but yet very serious US-Soviet confrontation. Waging war on the other side of the planet, American soldiers found themselves in a difficult and hostile environment. Imagery intelligence on the enemy as well as on the geography was therefore strongly needed.

The importance of imagery intelligence in Vietnam was undermined first of all by natural factors. Cloud cover, jungle canopy and Southeast Asian seasonal monsoons²⁰ greatly affected the performance of visual and photographic intelligence-gathering, correlatively diminishing the importance IMINT had on the outcome of battles and of the conflict as a whole. Secondly, resources were limited and often hindered much-needed IMINT programs. Finally, despite the importance of overflying the Republic of Vietnam with spy planes and satellites, other priorities had to be taken into consideration. ‘[T]he Commander in Chief, Pacific, and Strategic Air Command had other priorities that precluded the allocation of all their resources to Military Assistance Command. Consequently, Vietnam was never covered to the extent desired by intelligence staff.’²¹

To gather imagery intelligence on specific targets, low-altitude reconnaissance aircraft and unmanned drones were used but their results were dependant on external factors and low-flights remained militarily risky. Satellites like CORONA could provide ‘a snapshot of North Vietnamese activities regionwide [as well as material] to produce maps of the trackless

¹⁹ Some of the conflicts presented here do not in fact involve American forces.

²⁰ Occurring from November through March of each year, the seasonal monsoons produce thick clouds and heavy rain over vast areas.

²¹ Joseph A. McChristian, *The Role of Military Intelligence 1965-1967*, Washington, Department of the Army, 1974, p. 96.

jungles and hills.’²² Also, as a response to natural impediments, the Americans developed new sources of imagery intelligence. Indeed, apart from regular cameras flown by SR-71 and U-2 spy planes, a variety of sensors – including radar, infrared, and rear infrared – were flown during the Vietnam War.²³

Finally, although imagery intelligence did not fully meet the expectations in providing precise and timely information to field commanders because of natural impediments, lack of resources and competitive needs, the intelligence gathered ‘provided a means of checking other reports and often produced added detailed information on a specific area of interest. All enemy activities thus needed to be examined collaterally with imagery of the particular area. Photos provided confirmation of enemy installations, lines of communication, and operational zones.’²⁴ The Vietnam War stimulated technical improvements in the field of imagery intelligence but the significance of IMINT during the Vietnam War itself is still debatable. Indeed, although aerial reconnaissance and surveillance programs played a vital role in the Military Assistance Command collection effort and were eminently successful, this collection effort suffered from significant shortcomings and limitations undermining the overall importance of the role played by IMINT throughout the conflict.

While the Americans were fighting in the jungles of Southeast Asia, the ‘third Arab-Israeli war’ literally exploded in the Middle East. From 5 to 10 June 1967, the Israelis launched a powerful and rapid offensive against neighbouring Arab countries, capturing the Golan Heights, the eastern half of Jerusalem, the West Bank, the Gaza Strip and the Sinai Peninsula. By that time, the CORONA satellite program was operational but the Six-Day War showed clear limitations of that system. As author Curtis Peebles recalls it, ‘CORONA flight

²² Curtis Peebles, *The Corona Project*, *supra* note 3, p. 232. One important project, the Photo Study Program, originated in December 1966 when the III Corps Tactical Zone imagery interpretation team was directed to make a photo study of the Lo Go area in Tay Ninh Province. This study was intended to furnish photo intelligence on an area in which elements of the Central Office of South Vietnam reportedly had been operating; see Joseph A. McChristian, *The Role of Military Intelligence 1965-1967*, *supra* note 21, p. 58 and pp. 136-137.

²³ Dino A. Brugioni, *From Balloons to Blackbirds*, *supra* note 13, p. 45.

²⁴ Joseph A. McChristian, *The Role of Military Intelligence 1965-1967*, *supra* note 21, p. 63.

117 (Mission 1041) was launched on May 9, 1967, and its two capsules were recovered on May 15 and 22, well before the war started. The day before the start of the war, the final Atlas Agena GAMBIT [KH-7] mission was launched. It remained in orbit for just over eight days, not returning to Earth until after the war was over. [...] Reconnaissance satellites thus could play no part in U.S. intelligence operations during the Six-Day War.²⁵

In the months following the Six-Day War, attention was directed on Czechoslovakia where Western countries feared a Soviet intervention of the kind seen in Hungary in 1956. IMINT was then used to monitor signs of imminent invasion that might show up in satellite photography like increased activities at airfields, troop departures, extensive logistics activities or the massing of troops near the Czech border. While the KH-8/GAMBIT satellite launched on 6 August performed badly and was lost after nine days, the KH-4B launched on 7 August returned reassuring photographs taken prior to 21 August 1967 showing no indication of Soviet preparations for an invasion. But on 20 August, ‘Warsaw Pact troops, led by those from the Soviet Union, entered Czechoslovakia and brought an end to the Prague Spring. When, subsequent to the invasion, the second and last of the CORONA film buckets was recovered and analyzed, the imagery showed “unmistakable Soviet preparations for invasion” [...]. Photointerpreters could see that the Soviets had placed crosses on their mobile equipment to distinguish it from similar equipment they had given to the Czech army.’²⁶

While IMINT proved to be of relative significance during the Vietnam War – although it did not help preventing the intelligence failure of the Tet Offensive²⁷ – the Six-Day War, the invasion of Czechoslovakia as well as the Yom Kippur War of October 1973²⁸ clearly

²⁵ Curtis Peebles, *The Corona Project*, *supra* note 3, p. 234. See also Jeffrey T. Richelson, *The Wizards of Langley*, *supra* note 13, p. 169.

²⁶ Jeffrey T. Richelson, *The Wizards of Langley*, *supra* note 13, p. 170.

²⁷ See Christopher Andrew, *For the President's Eyes Only*, *supra* note 15, pp. 341-344, Joseph A. McChristian, *The Role of Military Intelligence 1965-1967*, *supra* note 21, p. 78, and Ronnie E. Ford, ‘Intelligence and the Significance of Khe Sanh’, *Intelligence and National Security*, vol. 10, no. 1, January 1995, pp. 144-169.

²⁸ The ‘fourth Arab-Israeli war’ involved a surprise attack by Egypt and Syria against Israeli forces. Although satellite imagery was of no practical value, spy planes ‘provided the intelligence community with up-to-date knowledge of the disposition of Arab and Israeli forces’; see Christopher Andrew, *For the President's Eyes*

showed that ‘the delays inherent in a capsule-return satellite made CORONA ill-suited to the kind of dynamic crises that now posed the major threat to the United States.’²⁹ That very shortcoming stimulated technological research and development in the field of imagery intelligence.

3. MONITORING ARMS DEVELOPMENT

Uncertainty was probably the most painful syndrome of the Cold War – especially when related to nuclear programs of foreign countries. The United States, in the period 1961-1979, apprehended to be taken by surprise by unexpected Chinese and Soviet nuclear capabilities. Whilst China came under the scrutiny of spy satellites, the Soviets negotiated arms limitations with the Americans while spying on each other with ‘National Technical Means’. This section will discuss the significance of IMINT in the task of monitoring Chinese arms development as well as Soviet arms limitations agreements.

‘Keeping an eye’ on Chinese nuclear and missile programs was among the top priorities in Washington and imagery intelligence was seen as a formidable means to gather intelligence on that inaccessible, really foreign ‘mystery’. Generally, IMINT gathered from U-2 and CORONA missions was very good and the Americans could benefit from extraordinary photographic coverage of Communist China. However, not only did the Americans know very little about China and its military capabilities but their limited knowledge was also flawed by preconceptions and misinterpretations. In the early 1960s, the US thought that China was working on the development of a plutonium nuclear weapon and that their first bomb would not be ready before 1968 or 1969.³⁰ They came to these wrong

Only, supra note 15, p. 392. After the war, the United States proposed that U-2s could be used to monitor the truce agreed upon by Egypt and Israel; see Dino A. Brugioni, *From Balloons to Blackbirds, supra* note 13, p. 44.

²⁹ Curtis Peebles, *The Corona Project, supra* note 3, p. 236.

³⁰ Jeffrey T. Richelson, *The Wizards of Langley, supra* note 13, p. 76.

conclusions despite photographic reconnaissance which provided, during the first half of 1963, images of the Lanzhou Gaseous Diffusion Plant, a nearby hydroelectric plant, and a nuclear facility at Baotao. Finally, on 16 October 1964, 'China announced the detonation of its first atomic device. On October 20, the same day a CORONA satellite snapped a picture of ground zero showing clear signs of the detonation, Atomic Energy Commission chairman Glenn Seaborg told a presidential cabinet meeting that analysis of the debris from the radioactive cloud confirmed that the bomb had employed uranium, not plutonium, and that it "had been more sophisticated in design than our own Hiroshima [uranium] weapon.'"³¹

IMINT played a significant role in alerting the Americans of arms development in China but could not provide, at that time, the kind of information only human sources could provide. Preconceived ideas on the Chinese nuclear program led the Americans to 'miss the boat'. 'An article in the CIA's in-house journal, *Studies in Intelligence*, concluded that "there was a preconception of the likely Chinese approach, and a failure to consider seriously alternative options.'"³²

However, imagery intelligence in the 1960s and 1970s was to play a fundamental, irreplaceable role in monitoring compliance to arms-related treaties between the two nuclear superpowers. That was true first in 1963 following the conclusion of the Limited Test Ban Treaty (LTBT) between the United States and the Soviet Union. Signed in October of that year, 'it restricted nuclear testing to underground explosions. While various seismic and air-sampling devices would help monitor compliance, photographic reconnaissance satellites would monitor test preparations [...]'³³ This was the first use of space-based systems of verification and that premiere was to pave the way for more far-reaching accords.

These far-reaching accords came into being in the 1970s following rounds of negotiations between the two countries known as the Strategic Arms Limitations Talks

³¹ *Id.*, p. 78.

³² *Ibid.*

³³ David T. Lindgren, *Trust But Verify*, *supra* note 6, p. 92.

(SALT) which started on 17 November 1969 in Helsinki, Finland. US President Nixon had made it clear from the beginning: 'If you can't verify an arms control treaty, we're not going to have any arms control negotiations. Period.'³⁴ The verification came from imagery intelligence, the only truly reliable source of intelligence on the vast police state that was the USSR, where on-site inspectors would never be allowed to go. IMINT proved to be of vital importance since it could 'police a treaty limiting ICBMs, long-range bombers, ballistic missile submarines, and ABMs [antiballistic missiles]. All these were large objects which required large, distinctive, support facilities.'³⁵ The Americans were then better at recognizing 'signatures' than in the early 1960s but satellite imagery was still producing low-resolution photographs which impaired the monitoring process.³⁶

On May 1972 in Moscow, the first SALT agreements were signed, putting a stop to what would have become, in Nixon's words, 'a defensive arms race, with untold billions of dollars being spent on each side.'³⁷ Imagery intelligence was to play the role of monitoring compliance to the agreements 'from above'. That crucial role was expressly stated in the text of the interim agreement on strategic offensive arms by using the euphemistic concept of National Technical Means (NTMs).³⁸ Also, on 1 July 1972, 'representatives of the CIA, NSA, DIA, NRO, and the service intelligence departments formed the Steering Group on Monitoring Strategic Arms Limitations under the chairmanship of the DCI, Richard Helms.'³⁹

³⁴ Curtis Peebles, *The Corona Project*, *supra* note 3, p. 240. The president was then discussing with Director of Central Intelligence Richard Helms.

³⁵ *Id.*, p. 240.

³⁶ See David T. Lindgren, *Trust But Verify*, *supra* note 6, p. 122.

³⁷ Christopher Andrew, *For the President's Eyes Only*, *supra* note 15, p. 384.

³⁸ See Article V of the interim agreement on the limitation of strategic offensive arms presented in Appendix 3. See also Curtis Peebles, *The Corona Project*, *supra* note 3, p. 242, and Dino A. Brugioni, *From Balloons to Blackbirds*, *supra* note 13, p. 47.

³⁹ Christopher Andrew, *For the President's Eyes Only*, *supra* note 15, p. 384. The acronyms stand for Central Intelligence Agency (CIA), National Security Agency (NSA), Defence Intelligence Agency (DIA), National Reconnaissance Office (NRO) and Director of Central Intelligence (DCI). See also David T. Lindgren, *Trust But Verify*, *supra* note 6, p. 130. Alongside the Steering Group existed the Standing Consultative Commission Working Group of the NSC Special Coordination Committee; see Jerome Leo Everard, 'Arms Control Discourse: The SALT Standing Consultative Commission 1975-1985', *Mindsigh*, [Online], <http://www.anu.edu.au/english/jems/lb/majorwriting/Thesis/chapter2.html> (Page visited on 28 April 2002).

Imagery intelligence was to reaffirm its predominant role in the second round of SALT. Although the SALT II treaty was never ratified,⁴⁰ both countries agreed to respect its conditions. When SALT II was signed the United States already had the KENNAN KH-11 satellite operational. Both the flaws of CORONA and previous KH satellites were overcome by that new generation of satellite: not only could it provide real-time motion pictures of what it could 'see' from above but the resolution of the images displayed was spectacular. This was a much-needed improvement especially after the United States lost its listening SIGINT stations in Iran in early 1980. The significance of imagery intelligence therefore increased and although the KH-11 could probably not detect every violation, 'the Carter administration considered America's verification methods to be "adequate," by which it meant that any significant violation would be detected before it could affect the strategic balance [...].'⁴¹

CONCLUSION

The imagery intelligence gathered by the United States in the period 1961-1979 played a very significant role in stabilizing the Cold War (1960s) and monitoring arms limitations (1970s). However, like any source of intelligence, the significance of IMINT was dependent on the use made of it by the American decision makers. And to fully use the intelligence gathered by the fantastic collection capabilities of the United States, one has to understand their capabilities and just as important their limitations.⁴²

The significance of imagery intelligence during that period has been somehow irregular in the sense that expectations were high and that technical developments could hardly match what was expected from spy planes and satellites. It is not because of failures in

⁴⁰ Mainly because of the 'discovery' of a Soviet brigade in Cuba in July 1979 and the Soviet invasion of Afghanistan in December of the same year. See David T. Lindgren, *Trust But Verify*, *supra* note 6, p. 8, and Christopher Andrew, *For the President's Eyes Only*, *supra* note 15, pp. 444-448.

⁴¹ David T. Lindgren, *Trust But Verify*, *supra* note 6, p. 152.

⁴² United States Army, 'Tactical Imagery Intelligence Operations TJIDBT', *supra* note 18.

imagery intelligence collection that the Americans could not see under the Vietnamese jungle canopy or inside the Chinese nuclear scientists' laboratories. Better imagery would not have necessarily prevented the Shah from being overthrown in Iran, the Israelis from destroying their neighbours' armed forces in the Six-Day War or the Soviets from invading Czechoslovakia. The same human flaws that repeatedly undermined the importance of intelligence throughout history appeared in the period of 1961 to 1979, namely the inability to 'think with the enemy's mind', the ignorance of well-documented historical mistakes and failures, and the aversion to bad news and to intelligence contradicting the decision maker's preconceptions.

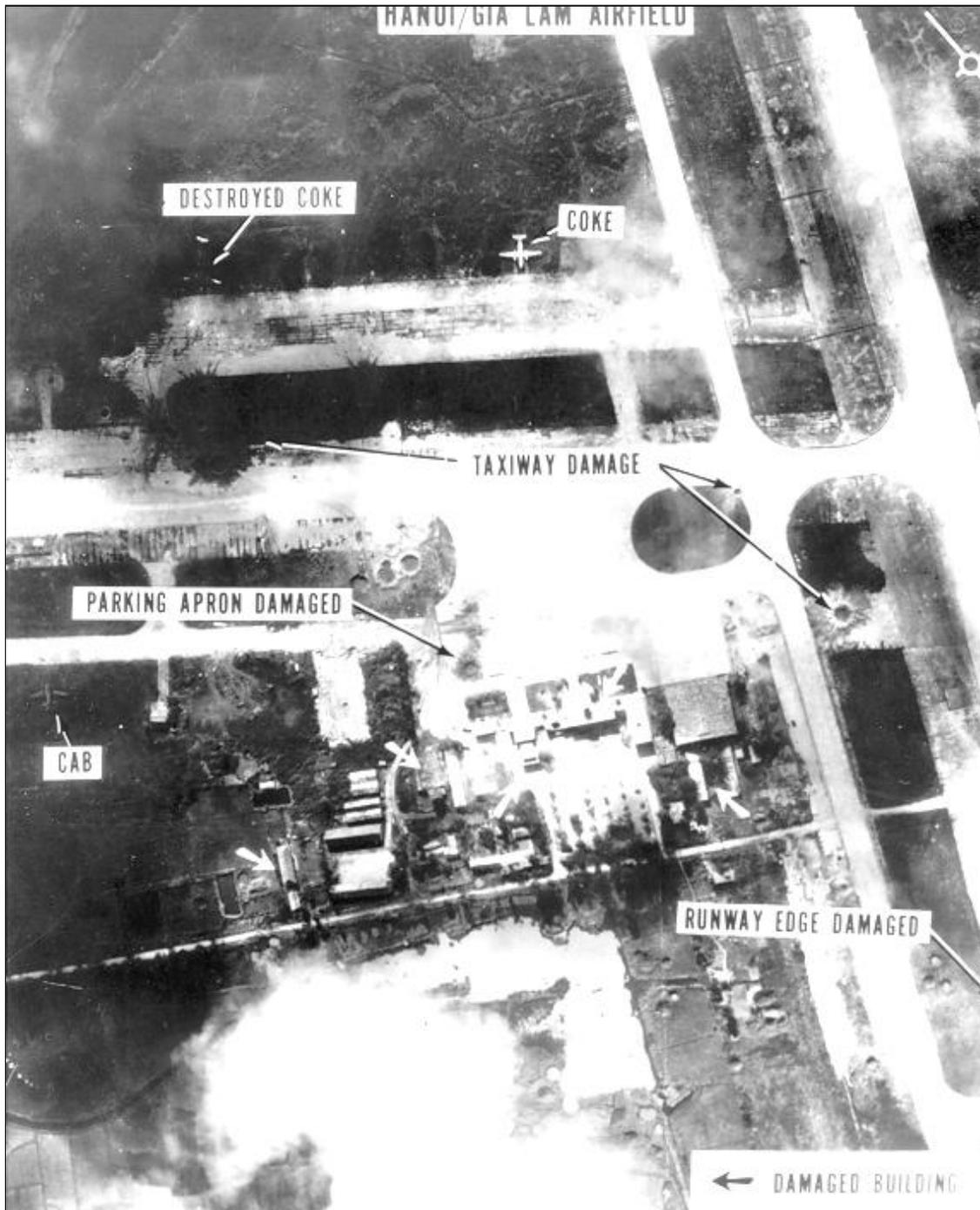
Imagery intelligence gathered by the Americans during that period changed the course of the Cold War almost the same way signals intelligence changed the course of the Second World War. This essay presented how imagery intelligence was used in various events of American history and can only conclude by recognizing its exceptional importance during the period of 1961 to 1979.

APPENDICES

Appendix 1. MRBM launch site in Sagua la Grande, Cuba, 23 October 1962.



Appendix 2. Gia Lam airfield in Hanoi, Vietnam, 5 April 1973.



Appendix 3. Interim agreement on the limitation of strategic offensive arms.

**Interim Agreement Between the United States of America
and the Union of Soviet Socialist Republics on Certain Measures
with Respect to the Limitation of Strategic Offensive Arms**

The United States of America and the Union of Soviet Socialist Republics, hereinafter referred to as the Parties,

Convinced that the Treaty on the Limitation of Anti-Ballistic Missile Systems and this Interim Agreement on Certain Measures with Respect to the Limitation of Strategic Offensive Arms will contribute to the creation of more favorable conditions for active negotiations on limiting strategic arms as well as to the relaxation of international tension and the strengthening of trust between States,

Taking into account the relationship between strategic offensive and defensive arms,

Mindful of their obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons,

Have agreed as follows:

Article I

The Parties undertake not to start construction of additional fixed land-based intercontinental ballistic missile (ICBM) launchers after July 1, 1972.

Article II

The Parties undertake not to convert land-based launchers for light ICBMs, or for ICBMs of older types deployed prior to 1964, into land-based launchers for heavy ICBMs of types deployed after that time.

Article III

The Parties undertake to limit submarine-launched ballistic missile (SLBM) launchers and modern ballistic missile submarines to the numbers operational and under construction on the date of signature of this Interim Agreement, and in addition to launchers and submarines constructed under procedures established by the Parties as replacements for an equal number of ICBM launchers of older types deployed prior to 1964 or for launchers on older submarines.

Article IV

Subject to the provisions of this Interim Agreement, modernization and replacement of strategic offensive ballistic missiles and launchers covered by this Interim Agreement may be undertaken.

Article V

1. For the purpose of providing assurance of compliance with the provisions of this Interim Agreement, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.

2. Each Party undertakes not to interfere with the national technical means of verification of the other Party operating in accordance with paragraph 1 of this Article.

3. Each Party undertakes not to use deliberate concealment measures which impede verification by national technical means of compliance with the provisions of this Interim Agreement. This obligation shall not require changes in current construction, assembly, conversion, or overhaul practices.

Article VI

To promote the objectives and implementation of the provisions of this Interim Agreement, the Parties shall use the Standing Consultative Commission established under Article XIII of the Treaty on the Limitation of Anti-Ballistic Missile Systems in accordance with the provisions of that Article.

Article VII

The Parties undertake to continue active negotiations for limitations on strategic offensive arms. The obligations provided for in this Interim Agreement shall not prejudice the scope or terms of the limitations on strategic offensive arms which may be worked out in the course of further negotiations.

Article VIII

1. This Interim Agreement shall enter into force upon exchange of written notices of acceptance by each Party, which exchange shall take place simultaneously with the exchange of instruments of ratification of the Treaty on the Limitation of Anti-Ballistic Missile Systems.

2. This Interim Agreement shall remain in force for a period of five years unless replaced earlier by an agreement on more complete measures limiting strategic offensive arms. It is the objective of the Parties to conduct active follow-on negotiations with the aim of concluding such an agreement as soon as possible.

3. Each Party shall, in exercising its national sovereignty, have the right to withdraw from this Interim Agreement if it decides that extraordinary events related to the subject matter of this Interim Agreement have jeopardized its supreme interests. It shall give notice of its decision to the other Party six months prior to withdrawal from this Interim Agreement. Such notice shall include a statement of the extraordinary events the notifying Party regards as having jeopardized its supreme interests.

DONE at Moscow on May 26, 1972, in two copies, each in the English and Russian languages, both texts being equally authentic.

FOR THE UNITED STATES OF AMERICA:

RICHARD NIXON
President of the United States of America

FOR THE UNION OF SOVIET SOCIALIST REPUBLICS:

L.I. BREZHNEV
General Secretary of the Central Committee of the CPSU

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