

# “Operation Diamond” (1966)- Obtaining the MiG-21 Jet Fighter’s Technologies

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## Abstract

*Operation Diamond was a unique and complex HUMINT (Human Intelligence) operation, in which the Israeli MOSSAD succeeded in obtaining a Russian-made MiG-21 jet fighter, whose technological characteristics were unknown to Israel and the rest of the Western world. The operation’s complexity is reflected in the way the MOSSAD succeeded in recruiting an Iraqi fighter pilot as a human source, and its uniqueness is manifested in the process of turning this source into the operation leader, who defected in 1966 to Israel with his MiG-21. The careful study of the aircraft’s technological systems, its capabilities and weak points by Israeli Air Force (IAF) experts played an important role in the grand achievements of the IAF a year later, in the 1967 Six-Day War, during which its pilots succeeded in shooting down dozens of MiG-21 jet fighters in aerial battles. Operation Diamond also contributed to the advancement of US-Israeli security and Intelligence relations following Israel’s consent to lend the MiG-21 to the Americans for enabling them to extract technological Intelligence from the aircraft too. This article portrays the chain of events that led to the successful completion of Operation Diamond, with special focus on the operation’s Intelligence and technological aspects.*

## Introduction

«We named the pilot 'Diamond'. Our challenge was to find a way to set this diamond into the alluring ring of the MiG-21 and to put this ring on our Air Force's finger» (Meir Amit, MOSSAD Director, 1963-68)<sup>1</sup>

Alongside their focus on the two main Intelligence spheres of Political and Military Intelligence, all three main Intelligence agencies in Israel - AMAN (military Intelligence), the MOSSAD (foreign Intelligence) and Shin Bet (internal Intelligence) - are also involved in collection and research of Technological Intelligence. This sub-field of Intelligence seeks to collect information on technologies - predominantly

military and scientific ones - that are possessed by the enemy, and in rare cases, even physically getting a hold of them. This information may be of great help for preparing the proper response to the enemy's capabilities in the event of a war.

The collection of Technological Intelligence can be executed by every method used by Intelligence agencies for obtaining information, including SIGINT (Signal Intelligence) and VISINT (Visual Intelligence), as well as HUMINT (Human Intelligence). Thus, human sources are extremely important not only for attaining pieces of technological information, but also for the preparation of complex operations aimed at physically attaining the technologies that are possessed by the enemy. However, most unique are the cases, in which the human source becomes the operation leader. Such was the case of the 1966 Operation Diamond (also known as Operation Blue Bird), in which the MOSSAD phenomenally succeeded in capturing an Iraqi MiG-21 jet fighter, which constituted the spearhead of all Arab air forces. This achievement granted the Israeli Air Force a clear advantage over its Arab opponents, which was well manifested, a year later, during the Six-Day War.

## Israeli and Arab Air Forces in the 1960s

The Israeli Air Force (IAF) was established piecemeal during Israel's 1948 War of Independence. At that time, it was based on a relatively small fleet of old airplanes, mainly civilian aircrafts that have been converted for military use. Although the IAF has gradually developed during the 1950s and the 1960s, it still played, at that point, a minor role in Israel's war strategy in comparison to the Israel Defense Forces' (IDF) ground and armored troops. Thus, Israel consented to join France and the United Kingdom in the 1956 Sinai Campaign against Egypt only after the two European powers promised to supply air support to the IDF<sup>2</sup>.

The Israeli-French cooperation began already before the Sinai Campaign with the French provision of the IAF's first jet fighters - the Ouragans and the Mystères<sup>3</sup>. The collaboration between the two countries has further tightened following the war, and the French supplied Israel with dozens of modern jet fighters - Vautours, Super Mystères, and the «crowning glory» of that time, the Mirage III<sup>4</sup>. The French aerial assistance to Israel, led by the supply of 72 Mirage III jet fighters during the 1960s, was extremely important to Israel also in light of the Americans' refusal, at the time, to supply Israel with any kind of offensive weapons, including strike aircrafts, as well as the Soviets' ongoing efforts to arm the Arab ground and air forces.

As part of the Cold War, the Soviet Union has become the main supplier of weapons to the Arab armies. Following the 1955 Egyptian-Czech arms deal, which was one of the key reasons that brought Israel to join the Sinai Campaign, the Soviets supplied Egypt, via Czechoslovakia, with hundreds of military aircrafts, including, for the first time, MiGs.

Mikoyan-and-Gurevich Design Bureau (acronym - MiG) was founded in

Moscow in 1939 as a Soviet fighter aircrafts design company. Over the years, it has designed numerous models of the MiG fighter aircraft, among which the MiG-21 - a most sophisticated supersonic jet fighter which constituted, in the 1960s and 1970s, a staple of the Soviet Air Force, as well as of USSR's allies in the Eastern Bloc and the Arab world. Therefore, it was not surprising that many Western countries, and particularly Israel and the USA, were highly interested in revealing the MiG-21's technological secrets for achieving aerial superiority when engaging in dogfights with this aircraft. However, the Soviets and their allies kept these secrets close to their chest<sup>5</sup>.

Israel's efforts to put its hands on a MiG aircraft and its technological secrets began already in the late 1950s, however, these attempts were to no avail. The introduction of the state-of-the-art MiG-21 into Arab air forces from 1962 onward, turned this mission into a more urgent one. IAF's knowledge on this jet fighter was minimal and it had almost no experience in dogfights with it. IAF Commander at the time, Ezer Weizman, knew that capturing a MiG-21 may be of great help for bridging this gap. Weizman, who headed the IAF since 1958, recalled the defection to Israel of an Egyptian pilot, Mahmoud Abbas Hilmi, who unexpectedly landed in January 1964 with a Czech-built Yak training airplane in one of IAF's bases<sup>6</sup>. However, the MiG-21 was a much more sophisticated aircraft than the Yak and Weizman knew that the Arab air forces were tightly safeguarding its secrets. Nevertheless, a few months later, Weizman held a meeting with then-MOSSAD Director Meir Amit, in which he chose to challenge Amit with the mission of bringing a MiG-21 to Israel. Although Amit's first reaction - as he described it, in retrospect, in his memoirs - was that this mission is impossible, he promised Weizman that his people will do whatever they can to meet the challenge<sup>7</sup>. This was the beginning of Operation Diamond.

## Looking for a Lead

The MOSSAD, which was established in the beginning of the 1950s, earned a global reputation following two famous operations it was responsible for during its early years. In 1956 the MOSSAD succeeded in getting a hold of a copy of Nikita Khrushchev's secret speech in which the Soviet leader denounced the acts of his predecessor Joseph Stalin. Handing over the speech to the CIA opened the door to an era of cooperation between the two agencies. And in 1960 the MOSSAD succeeded in capturing the Nazi criminal Adolf Eichmann and bringing him to justice in Israel.

As any other foreign Intelligence agency, the MOSSAD has spun, throughout the years, a wide network of human sources and collaborators all around the world, whether in rival states or in friendly ones<sup>8</sup>. Until the 1979 Islamic revolution in Iran, Israel enjoyed warm relations with the Iranian Shah's regime, and the MOSSAD, as well as the IDF and Israel's Ministry of Defense (MOD), have

held offices in Tehran. Yaakov Nimrodi, who headed the MOSSAD's office in Tehran (1955-59) and later-on also served as IDF attaché (1960-69) and MOD representative in Tehran (1966-69), has established, during his lengthy stay in Iran, a network of acquaintances and collaborators. In 1965, Mimrodi was asked by Rehavia Vardi, who headed the MOSSAD's HUMINT department and was nominated to lead the MiG-21 operation, to utilize his connections for the mission<sup>9</sup>.

Thanks to his network of acquaintances, Nimrodi succeeded in contacting a Jewish Iraqi businessman named Yusuf Shamash, who was active in both Iran and Iraq<sup>10</sup>. Although Yusuf has made a negative impression on the MOSSAD's representatives, eventually he appeared to be playing a vital role in the entire operation; as retrospectively portrayed by Nimrodi in his memoirs:

«Yusuf knew how to make contacts with almost everyone, juniors and seniors alike, and how to make people with whom he met feel that they are special... On the other hand, he gave the impression of an unpleasant person. Some cringed from him or saw him as a greedy person who will not recoil from any deed for money, whereas others saw him as boastful and imaginative person and did not treat him with respect. However, in my opinion, this negative impression has done him injustice. Those who understood his way of life and knew how to approach him were able to highly benefit from him»<sup>11</sup>.

With Yusuf's connections, the MOSSAD succeeded in contacting Munir Redfa, an Iraqi fighter pilot who became deeply frustrated by the fact that his promotion was blocked due to his Assyrian Christian origin. In addition, Redfa was also experiencing feelings of remorse for bombing Iraqi Kurdish villages as part of his missions. Unlike some human sources who are willing to betray their homeland and work for the MOSSAD, or for any other Intelligence service, for greed, Redfa was mainly interested in ensuring a better future for himself and his family. The sum of money he requested from the MOSSAD for his services was relatively low - only 55,000\$.

A MOSSAD HUMINT operator, who previously served as an IAF pilot, began meeting with Redfa periodically in European capitals<sup>12</sup>. His first mission was to verify that Redfa was indeed a pilot and not a charlatan. In view of the high importance of the matter-at hand, MOSSAD Director Amit decided to observe Redfa in person, without his knowledge, in one of the first meetings with him that took place at a café in Rome in January 1966 (with the attendance of Yusuf Shamash, the contact person). All the participants in the meeting agreed that Redfa, whose nickname in the MOSSAD was «Diamond», was trustworthy and was not operating as a double agent. They also assessed that Redfa had a potential to «deliver the goods», although, at the time, he was not yet positioned in a MiG-21 squadron<sup>13</sup>.

During the periodic meetings the MOSSAD held with Redfa, which was also attended by a representative from the IAF Intelligence, the Iraqi pilot exposed important pieces of information on the Iraqi army in general and more specifically on its air force. In addition, Redfa estimated that a request by him to his supervisors to be transferred to a MiG-21 squadron may be approved, and expressed to his Israeli operators his willingness to defect to Israel with a MiG-21, on condition that the MOSSAD will help his family to escape too. Although Redfa's operators were under the impression that his intentions were serious, they also noticed that he still had doubts concerning the entire endeavor.

In order to allay Redfa's fears and to increase his confidence in Israel and in his planned mission, the MOSSAD brought him to Israel - under an alias - for a preparatory one-day visit in January 26, 1966, during which he was trained by the IAF in landing an aircraft in Hatzor Israeli Air Force Base in south-central Israel. The decision to let Redfa fly an Israeli aircraft, accompanied by an Israeli pilot, was not taken lightly, and the aircraft was escorted by Israeli Mirages to be prepared for any unexpected scenario, such as an Iraqi conspiracy to take an Israeli pilot captive with his aircraft<sup>14</sup>.

Redfa returned to Iraq and started preparations for D-day. At this stage, MOSSAD Director Amit chose to inform, for the first time, the Israeli Prime Minister at the time, Levi Eshkol, about the ongoing operation for the capture of a MiG-21. Although the MOSSAD's code name for the aircraft was 'penicillin', Eshkol preferred to refer to it as 'the blue bird'<sup>15</sup>.

Before leaving Israel, the MOSSAD instructed Redfa on the different ways, including encoded letters, he should use to inform his operators of any development, particularly concerning his planned transfer to a MiG-21 squadron. And indeed, on April 29, 1966 a letter from Redfa has reached a MOSSAD European mailbox, in these words: «I have asked for a transfer from the hospital [code word for the Kirkuk air base in Northern Iraq] which I currently attend to the internal ward [meaning, Rashid air base near Baghdad] and they have approved it, but the transfer will be executed in July... In the same month I will bring the penicillin [meaning, MiG-21] from the pharmacy...<sup>16</sup>». The following letter that was sent by Redfa in mid-July announced on his upcoming arrival to Israel.

During the next few weeks, both the MOSSAD and the IAF finalized their preparations for the D-day, involving only a handful of officers, due to the top secrecy of the operation. As promised to Redfa, the MOSSAD arranged for the departure of his family from Iraq to an intermediate stay in Europe. At this stage, Redfa's family did not know yet about the entire operation and what will be the final destination of their journey. In addition, Yusuf Shamash and his family were also transferred to Europe. When all preparations have been completed, Israeli radio station in the Arabic language - whose broadcasts have also reached Iraq - played, at

a specific date and time, the song «Marhabtain Marhabtain» (a welcome greeting in the Arabic language), which has been agreed upon, in advance, with Redfa as a sign that Israel was expecting him.

## The Arrival of the Blue Bird

IAF was expecting Redfa to arrive on Sunday, August 14, 1966. Early that morning, Mordechai («Mottie») Hod, Ezer Weizman's successor as IAF Commander since April 1966, asked Ran Pekker, one of the most decorated IAF fighter pilots who, at the time, commanded over a Mirage squadron, to hold two Mirage fighters on alert at the start of the airstrip. For reasons of information security, neither Pekker nor the second pilot has been informed on the nature of the mission for which they were asked to wait. Retrospectively, Pekker described, in his memoirs, the long hours of waiting in the small and dense Mirage's cockpit, which also repeated itself in the following day, as both boring and frustrating<sup>17</sup>. Later on, it turned out, that Redfa did set out for the mission on Sunday, as agreed, but after flying almost half of the way he chose to turn back following an unexpected technical failure in his MiG-21.

Two days later, on August 16, Redfa took off for another supposed routine flight, when suddenly he made an unexpected turn westward, ignoring the Iraqi air traffic control's radio calls. After a nerve-racking one hour of low-altitude flight over the territories of Iraq and Jordan, Redfa's MiG-21 approached the Israeli airspace. At that point, IAF Commander Hod ordered Pekker and his fellow-pilot to take off southward and prepare for an air battle, but at the same time they were also instructed to hold their fire. The two Mirages approached the target, which, much to their surprise, turned out to be an Iraqi MiG-21. With no direct radio contact with Redfa, Pekker signaled him, with nods and hand gestures, to follow him until their safe landing, as planned, in Hatzor Air Force Base<sup>18</sup>.

The world was astonished when IAF Commander introduced - in a press conference held on the same day - the Iraqi pilot and his MiG-21, while deliberately keeping the MOSSAD involvement undisclosed. For this purpose, the MOSSAD has fabricated a letter which had been supposedly sent by Redfa to the IAF Commander, informing him on his plans to defect to Israel with a MiG-21 and asking for a safe landing<sup>19</sup>. This cover story, which was aimed at safeguarding the involved MOSSAD collaborators, seemingly worked so well, that even most of IAF's senior officers were under the impression that Redfa defected to Israel of his own accord<sup>20</sup>. The MOSSAD's major role in Operation Diamond has become publicly known only years later.

## Technological Analysis

Redfa had brought with him to Israel another small yet valuable gift - the

aircraft's manual - which helped IAF's technological experts to carefully study all its systems, explore its capabilities and learn about its weaknesses.

Arie Hillel, then-head of IAF's equipment department, was thrilled by the opportunity to directly examine a MiG-21:

«It was a unique experience for me. Throughout the years we have compiled and learned every available piece of information regarding this aircraft, which posed one of the major threats to our hold in the skies. We have learned about its designers Mikoyan and Gurevich and made efforts to get to know all the aircrafts they have designed and their unique characteristics. In this way we have tried to draw a picture of the MiG-21's characteristics and performances. And here we were standing, my colleagues and I, next to the aircraft and actually able to touch it, examine it and get to know it physically and not only in theory»<sup>21</sup>.

In addition, IAF's chief test pilot, Danny Shapira, took the MiG-21 to several test and training flights, simulating dogfights with Israeli Mirage aircrafts<sup>22</sup>. Contrary to similar cases of a physical capture of enemy weapon systems, IAF's technicians did not deconstruct the aircraft to its parts for examining it - using the Reverse Engineering method - due to a lack of spare parts in case of a technical failure<sup>23</sup>; as retrospectively described by Shapira in his memoir:

«The MiG-21 interested us as an aerial combat system, and we did not ask to understand its structure or the materials from which it was built. And even if we were interested in these technical details, we could not have done much to explore them since we did not have any spare parts in case of a damage that may have been caused during such examination. This was also the reason why each flight was prepared and carried out as if it were the last MiG-21 flight, adding to the already strict atmosphere and to the careful utilization of time»<sup>24</sup>.

During the MiG-21's test flights, Shapira had the opportunity to explore the aircraft's capabilities and reached the conclusion that its legendary image as an undefeated aircraft was not entirely correct. Moreover, Shapira identified the rear part of the MiG-21 as its Achilles heel, due to a design flaw that placed the aircraft's gas tank and its compressed air and oxygen's tanks together<sup>25</sup>.

Ran Pekker, who simulated several dogfights with his Mirage against the MiG-21, shared Shapira's impression on the surprising inferiority of the Soviet jet fighter in comparison to the French fighter:

«I flew against Danny [Shapira] several times and enjoyed every second. In conclusion, we have realized that the Mirage was a more sophisticated and effective weapon system than the Russian MiG. The Russian aircraft's main disadvantages were the fact that it was equipped with only one 37 millimeters cannon, in addition to limited visibility from the cockpit, difficulty in high speeds, an unorganized and cluttered cockpit,

an inferior and limited ejection seat, and a deficient maneuverability in low speeds. However, with every passing day we were more surprised from its high usability levels. It reminded us of a reliable 'fuel and go' Volkswagen car»<sup>26</sup>.

Following the inevitable publicity of the Israeli capture of a MiG-21, international pressure on Israel has begun to build up in two different avenues: On the one hand, Iraq and the USSR demanded from Israel, via the United Nations, to hand back the aircraft to its owners. This demand was also aided by members of Mapam, the Israeli pro-Communist political party. On the other hand, a few allies of Israel have asked to send their experts to Israel in order to join in the MiG-21's technical examination. Thus, due to the long border Iran shares with the USSR, Iranian experts have arrived to Israel to explore the aircraft<sup>27</sup>. In addition, German and other Western Intelligence agencies have received, via the MOSSAD, the IAF's technological analysis of the MiG-21.

Most heavy was the pressure placed on Israel by the Americans who asked to receive the Russian-made aircraft for a careful examination in the USA. Despite the MOSSAD's and the IAF's resistance, then-Israel's Prime Minister Levi Eshkol has chosen to consent to the American request and ordered to lend the MiG-21 to the US for a short term of one month. Eshkol's decision appeared to have had most important implications.

## Implications of Operation Diamond

The Americans' opportunity to explore the MiG-21's technologies and capabilities - which was awarded the name «Project Have Doughnut», carried out in the US Air Force's Area 51 facility in Nevada<sup>28</sup> - has helped improve the performance of American combat pilots in the Vietnam War<sup>29</sup> and launched a new era of national security cooperation between the US and Israel. As part of this cooperation, the American embargo on the supply of offensive weapons to Israel was lifted, and the IAF was awarded, for the first time, American strike aircrafts - A-4 Skyhawks and F-4 Phantoms<sup>30</sup>. This change in American policy appeared to be extremely important for Israel in light of the embargo that was imposed by the French on Israel following the 1967 Six-Day War and brought about the halt in the supply of Mirages to the IAF.

The IAF's careful examination of the MiG-21's technologies and capabilities gave Israeli jet fighters a significant advantage over their Arab opponents, as manifested during the June 1967 Six-Day War, as well as during the weeks that preceded it. Thus, on April 7, 1967, during aerial battles over the Golan Heights, the IAF brought down no less than 6 Syrian MiG-21s without losing any one of its Mirages. At the same time, the captured MiG-21 - whose original Iraqi 534 serial number was changed by the IAF to 007 (as the famous movie character James Bond, in reference to the secret operation in which the aircraft

was captured) - was put into operational readiness in the southern Israeli border with Egypt, as described by IAF's test pilot Danny Shapira:

«During May 1967, there were several cases in which the Egyptians have sent their MiG-21 jet fighters for a mission of aerial photography of IDF troops which were deployed in the Israeli Negev desert... IAF Mirages that were launched against the MiGs usually failed to intercept them due to issues of time and space... I have raised the idea of intercepting the invading MiGs using our captured MiG-21... My idea was approved, and we installed two modern Israeli-made Shafir missiles under the aircraft's wings... I spent many hours, day by day, sitting in the MiG-21's cockpit and waiting for the Egyptian aircrafts, but they did not come again... Meanwhile, the Six-Day War erupted and turned the tables»<sup>31</sup>.

The Six-Day War between Israel and the Arab coalition of Egypt, Syria and Jordan began on the morning of June 5, 1967 with Operation Moked - a surprise IAF attack on eleven Egyptian military airfields, followed by a similar attack on Syrian airfields<sup>32</sup>. Subsequent to IAF's airstrikes during the first day of the war, hundreds of the enemies' aircrafts, constituting 70% of their entire fleets, were destroyed already on the ground, and most of their airfields became inoperative<sup>33</sup>. The remainder of the Egyptian and Syrian air fleets encountered in the skies Israeli aircrafts, whose pilots - thanks to Operation Diamond - knew well the technologies, capabilities and weak points of the enemy's MiG-21s. Therefore, it is not surprising that during the six days of fighting, IAF pilots have succeeded in shooting down dozens of Egyptian and Syrian jet fighters, including many Mig-21s, in aerial battles. These IAF's phenomenal achievements played a major role in Israel's astonishing victory at the end of the war<sup>34</sup>.

## Epilogue

Until today, Operation Diamond is considered one of the MOSSAD's most successful operations, which brought the agency enormous prestige among its allies (and rivals) worldwide. The operation, which was the subject of several popular books and films<sup>35</sup>, served as an important boost for the MOSSAD's morale, especially after the capture and execution of the agency's agent, Eli Cohen, in Syria a year before<sup>36</sup>.

However, even after the successful completion of Operation Diamond, the agency still had some loose ends to tie up, as mirrored in the words of MOSSAD Director Meir Amit:

«We, the Mossad people, still had much 'cleaning up' to do, in taking care of the pilot's problematic family and more. We have worked hard, far from the media spotlight and the glory. After the guests leave, we stay behind to wash the dishes...»<sup>37</sup>

The problems with Redfa's family have indeed surfaced immediately after their arrival to Israel, the same day Redfa landed in Israel with his MiG-21. Redfa's wife was greatly disappointed to discover that the final destination of their journey was Israel rather than Western Europe, while other family members were furious with Redfa for his betrayal of his Iraqi homeland. Though the MOSSAD helped Redfa find a job as a commercial pilot in a local Israeli airline, his family members came across difficulties in adjusting to their new life. A few years later, most likely following heavy pressure from his wife, Redfa decided to leave Israel with his family and the MOSSAD arranged their relocation to a foreign country under an alias.

As any Intelligence agency, the MOSSAD makes efforts for rehabilitating its human sources who have been exposed. The reasons behind this policy are either moral or practical, led by the drive to be able to further recruit human sources. Although some writers argue that Redfa was disappointed from the assistance, especially the financial one, that he has been given by the MOSSAD<sup>38</sup>, the agency kept in touch with him, mainly out of concern to his safety<sup>39</sup>. Redfa also maintained personal contacts with a few MOSSAD and IAF officers whom he got to know during Operation Diamond, including Danny Shapira and Ze'ev Liron. The two indicated that Redfa and his family continued to experience difficulties in their new location too, while living under constant fear for their lives and suffering from a severe mental condition. These difficulties may have been the reason behind Redfa's sudden death from heart attack on August 1998, 32 years after his defection to Israel with the 'blue bird'.

In 1999, a year after Redfa's death, the MOSSAD organized a closed event for the commemoration of Operation Diamond in general and the late Redfa in particular. The special event was attended by Redfa's family, as well as MOSSAD and IAF officers who participated in this complex and unique HUMINT operation for obtaining the MiG-21 and revealing its technologies.

## Endnotes

- 1\_ Meir Amit, *Head On...* (in Hebrew; Or Yehuda: Hed Arzi, 1999), pp. 181-182.
- 2\_ On the IAF's early years see: Shlomo Aloni, *Arab-Israeli Air Wars, 1947-82*, Osprey Combat Aircraft 23 (Oxford: Osprey Aviation, 2001), pp. 6-28.
- 3\_ Both the Ouragans and the Mystères were manufactured by the French Dassault Aviation Company; see their technical specifications in the company's website - <http://www.dassault-aviation.com/en/passion/aircraft/military-dassault-aircraft/md-450-ouragan/?xtmc=ouragan&xtmc=0>; <http://www.dassault-aviation.com/en/passion/aircraft/military-dassault-aircraft/mystere-iv/?xtmc=mystere-iv&xtmc=10>
- 4\_ The Super Mystère and the Mirage III were manufactured by the French Dassault Aviation Company too, while the Vautour was a product of the French Sud Aviation Company; see their technical specifications - <http://www.dassault-aviation.com/en/passion/aircraft/military-dassault-aircraft/super-mystere/?xtmc=mystere&xtmc=0>; <http://www.dassault-aviation.com/en/passion/aircraft/military-dassault-aircraft/mirage-iii/?xtmc=mirage&xtmc=0>
- 5\_ For further elaboration on the characteristics of the MiG aircrafts in general and the MiG-21 in particular see the following books, which were written well after Operation Diamond

took place: Bill Gunston and Yefim Gordon, *MiG Aircraft since 1937* (London: Putnam, 1998); Anna Slomovic, *MiG-21 Fishbed: A Case Study in Soviet Weapons Acquisition* (Santa Monica, CA : Rand Corporation 1987).

6\_ Hilmi was interrogated by officers from both the MOSSAD and IAF's Intelligence department and provided a great deal of information on the Egyptian Air force, including its squadrons, regulations and combat doctrine. For elaboration on the Mahmoud Abbas Hilmi affair see: Thomas Van Hare, «Defection to Israel», *Historic Wings*, April 13, 2015 - <http://fly.historicwings.com/2015/04/defection-to-israel/>

7\_ Meir Amit, *Head On...*, pp. 180-181.

8\_ All three main Israeli Intelligence agencies operate HUMINT sources, according to the following distribution of responsibilities: Shin Bet recruits human sources within Israel and the Palestinian Authority (PA); AMAN's 504 HUMINT unit recruits sources in the PA and in Israel's neighboring states; and the MOSSAD is responsible for Israel's HUMINT activity worldwide; see: Avner Barnea, «The Unique Nature of HUMINT», in Amos Gilboa and Ephraim Lapid, eds., *Israel's Silent Defender: An Inside Look at Sixty Years of Israeli Intelligence*, translated from Hebrew by Elizabeth Yuval (Springfield, NJ, Jerusalem and Ramat Hasharon, Israel: Gefen and Israel Intelligence Heritage and Commemoration Center, 2012), pp. 207-216.

9\_ It should be noted, that the MOSSAD simultaneously examined at least two other channels for capturing a MiG-21, but these attempts did not materialize; see: Meir Amit, *Head On...*, pp. 182.

10\_ All MOSSAD's meetings with Yusuf were held out of his Iraqi homeland, in order to avoid putting him at risk. MOSSAD Director Amit indicated that this guideline led the agency in all its meetings with Jewish collaborators and agents abroad; see: *The Blue Bird* (in Hebrew), a film directed by Shmuel Imberman for the Israel Intelligence Heritage and Commemoration Center and Channel 1, 2007.

11\_ Yaakov Nimrodi, *My Life's Journey* (in Hebrew; Or Yehuda: Ma'ariv Book Guild, 2003), p. 245.

12\_ Redfa's operator, fighter pilot Ze'ev Liron, was «borrowed» from the IAF to the MOSSAD in the years 1966-1973, during which he served as a HUMINT operator for the purpose of attaining information on Arab countries' air forces; see in Liron's biography: Moshe Ronen (Rainish), *Takeoff from Hell* (in Hebrew; Tel-Aviv: Miskal - Yedioth Ahronoth Books and Chemed Books, 2013), pp. 195-224.

13\_ Meir Amit, *Head On...*, p. 183.

14\_ Cases of human sources who double crossed their operators are well known to every Intelligence agency, including the MOSSAD. In 1972, only a few years after Operation Diamond, a MOSSAD HUMINT operator, Baruch Cohen, was killed in Madrid in an ambush set by a Palestinian source whom he operated.

15\_ Meir Amit, *Head On...*, pp. 186-187.

16\_ *Ibid*, pp. 188-189.

17\_ Ran Ronen (Pekker), *Operations Log* (in Hebrew; Tel-Aviv: Miskal - Yedioth Ahronoth Books and Chemed Books, 2013), p. 136-138.

18\_ *Ibid*, pp. 139-142.

19\_ Meir Amit, *Head On...*, pp. 190-191.

20\_ See, for instance, former senior IAF pilot Eliezer «Cheetah» Cohen's account on this matter which was written in 1993 and fully accepted the formal Israeli narrative on the affair: Eliezer Cohen, *Israel's Best Defense: The First Full Story of the Israeli Air Force*, translated from Hebrew by Jonathan Cordis (New York: Orion Books, 1993), pp. 186-187.

21\_ Arie Hillel, «...And They had the Hands of a Man under their Wings» (Ezekiel, 1:8): *Israeli Air Force Material Command from its Beginning to the Yom Kippur War* (Tel Aviv: IAF, IDF - Ma'arachot and the MOD publications, 1999), p. 140-141.

22\_ Danny Shapira's first test flight with the MiG-21 was captured in a few video clips that have been recently released by the Israel State Archives and the IDF and Defense Establishment Archives - <https://www.youtube.com/watch?v=o-gRZgvC0IA>; <https://www.youtube.com/watch?v=FT8XzTayqx4>; <https://www.youtube.com/watch?v=IRTbgf1aa50>

23\_ The Only spare parts that were needed for the routine maintenance of the aircraft were MiG-21's tires, which used to wear down quite rapidly. The MOSSAD succeeded in attaining such tires

in one of the Eastern European countries; see: Ran Ronen-Pekker, Operations Log, p. 144.

24\_ Daniel (Danny) Shapira, Alone in the Sky (in Hebrew; Or Yehuda: Ma'ariv Book Guild, 1994), p. 252.

25\_ Ibid, p. 253.

26\_ Ran Ronen-Pekker, Operations Log, p. 144.

27\_ MOSSAD Director Amit was convinced to allow the Iranians access to the captured MiG-21 only following heavy pressure from Yaakov Nimrodi, IDF attaché in Tehran, who recognized the high importance of this Israeli gesture for the relationship between the two countries; see: Yaakov Nimrodi, My Life's Journey, p. 250.

28\_ The US findings regarding the MiG-21's technological characteristics, strengths and weaknesses were briefed in the following classified report, which was later approved for public release: Rob Young, «Project Have Doughnut: Exploration of the MiG-21», National Air and Space Intelligence Center, Foreign Technology Division - [https://upload.wikimedia.org/wikipedia/commons/8/8f/Project\\_have\\_doughnut\\_area51\\_49.pdf](https://upload.wikimedia.org/wikipedia/commons/8/8f/Project_have_doughnut_area51_49.pdf)

29\_ Robert K. Wilcox, Scream of Eagles: The Dramatic Account of the U.S. Navy's Top Gun Fighter Pilots and how they Took Back the Skies Over Vietnam (New York: Pocket Star Books, 2005), pp. 75-77.

30\_ Both the A-4 Skyhawk and the F-4 Phantom were manufactured by the US McDonnell Douglas Corporation, which later on merged with the Boeing Company; the latter's website elaborates on the aircrafts' technical specifications - <http://www.boeing.com/history/products/a4d-a-4-skyhawk-light-attack-bomber.page>; <http://www.boeing.com/history/products/f-4-phantom-ii.page>

31\_ Daniel Shapira, Alone in the Sky, p. 256.

32\_ The same day, IAF aircrafts also struck Jordanian military airfields, as well as Iraqi ones, following the participation of Iraqi strike aircrafts in the Arab aerial efforts.

33\_ For more elaboration on Operation Moked (Focus in Hebrew) see: Michael Oren, Six Days of War: June 1967 and the Making of the Modern Middle East (Oxford: Oxford University Press 2002), pp. 170-178; Lon Nordeen, Fighters over Israel (New York: Orion Books, 1990), pp. 66-87.

34\_ It should be noted, that a year following the Six-Day War, on August 1968, the IAF was awarded another «gift» - two Syrian MiG-17s whose pilots have mistakenly landed in an abandoned runway in Northern Israel. Similarly to the captured MiG-21, these aircrafts were also carefully examined by IAF's technicians and experts, and their findings truly contributed to IAF's pilots in future air battles with Arab MiG-17s. See the account on this affair by Danny Shapira, who had the opportunity to take these captured aircrafts as well for test flights and air battle simulations: Daniel Shapira, Alone in the Sky, p. 274-277.

35\_ Such as the 1988 American movie «Steal the Sky» starring Mariel Hemingway, or the Hebrew book «MiG 21 Lands»: Steal the Sky, directed by John D. Hancock, Home Box Office - HBO, 1988 - <https://www.youtube.com/watch?v=inc0b2QtHso>; M.P. Gal, MiG 21 Lands (in Hebrew; Ramat Gan: Masada, 1968).

36\_ Eli Cohen was a secret MOSSAD agent, who, in the beginning of the 1960s, succeeded - under an alias - in developing close contacts with high-ranking political and military officials in the Syrian regime. In 1965 he was exposed by the Syrians and executed following a short military trial. Cohen's tragic end deeply demoralized the Israeli public in general and the MOSSAD in particular.

37\_ Meir Amit, Head On..., p. 203.

38\_ Sara Leibovich-Dar, «Broken Wings» (in Hebrew), NRG-Maariv, June 2, 2007 - <http://www.nrg.co.il/online/1/ART1/588/674.html>. Complaints for alleged financial deprivation on behalf of the MOSSAD were also raised by Yusuf Shamash, who helped recruiting Munir Redfa. Despite the recognition of Rehaviva Vardi, the MOSSAD senior who headed Operation Diamond, that «if it were not for this Jew [meaning, Yusuf], this operation would not have taken place» (as he stated in Shmuel Imberman's film The Blue Bird), Yusuf accused the MOSSAD of abandoning him; see: Yaakov Nimrodi, My Life's Journey, pp. 250-251, 381-391.

39\_ This was a lesson learned from the tragic end of Mahmoud Abbas Hilmi, the above-

mentioned Egyptian pilot who defected to Israel with a Yak aircraft, on his own initiative, two years before Operation Diamond took place. Hilmi, who found it difficult to adapt to life in Israel, chose to leave to Argentina, where the Egyptian security services located him and smuggled him back to Egypt. Shortly thereafter, an Egyptian court convicted him of treason and he was executed.

