

**SS. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE
FACULTY OF PHILOSOPHY**

SCIENCE AND SOCIETY: CONTRIBUTION OF HUMANITIES AND SOCIAL SCIENCES

**Proceedings of the International Conference
on the occasion of the centennial anniversary
of the Faculty of Philosophy
2-5 September Struga 2020**

Skopje 2021



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FACULTY OF PHILOSOPHY



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USE OF WEAPONIZED UNMANNED AERIAL VEHICLES (UAVs) SUPPORTED BY GIS AS A GROWING TERRORIST THREAT

Abstract: *Unmanned Aerial Vehicles (UAVs) are one of the most advanced achievements of modern technology widely used by contemporary states. They have developed as an important tool for national security and commercial industries. Although they offer immense security benefits, UAVs can also open up new threats and opportunities in conducting terrorist attacks. The increased use in both state and private sectors reduces the cost of the UAVs therefore making them easily accessible tools for terrorist organizations. The pioneering attacks conducted by Islamic State of Iraq and Syria – ISIS (2016) have highlighted the capability of terrorist organizations and individual terrorists to deploy commercially available UAVs in order to attack their state adversaries.*

Even though the first ISIS UAV operations focused on conducting reconnaissance operations in Iraq and Syria, the organization continued further and started using them to attack Kurdish, Iraqi and Turkish forces. This is only an isolated case and so far these type of terrorist attacks have not happened on the scale that can terrorize a big mass of people or cause greater civilian or military damage. However, ISIS is not the only user of UAVs. Their use by Hezbollah and alleged assassination attempt on Venezuela's president Nicolás Maduro (2018) proved that other terrorist organizations and militant groups have also adopted the use of UAVs. They could further use weaponized UAVs to achieve even worst scenarios than the assassination of a country leader, in terms of possible conduct of chemical or biological attacks by home-grown terrorists on numerous public venues in contemporary states. The factors affecting the expansion of the weaponized UAVs supported by GIS and the risk of their use as a growing terrorist threat will be examined in this paper.

Key words: UAV, GIS, threat, terrorism, security.

Introduction

The use of UAV's by terrorist or militant Islamist organizations is not a new phenomenon. Following the September 11, 2001, terrorist attacks, the UAV's were viewed not only as a weapon but as a real threat to the security of Western allies and their installations in the current regional conflicts. In its

2006 National Strategy Against Terrorism, the US State Secretariat states that terrorists are effective in adapting modern technology to carry out terrorist attacks with massive consequences and effects[1]. As a rising terrorist threat, the proliferation of UAV's was the subject of the 114th US Congress held on June 24, 2015, and resulted in a directive to the Secretary of Homeland Security - processed by the Secretaries of Defense, Transportation, Energy and Regulatory Affairs. Nuclear Energy Commission - to make an appropriate security assessment. The focus of the said directive is on how commercially available UAV's could be used in an attack, as well as the ability to prevent and reduce the risk of such and similar attacks.

As a rising terrorist threat, the proliferation of UAV's was the subject of the 114th session of the US Congress held on June 24, 2015, and resulted in a directive to the Secretary of Homeland Security - working with the Secretariats on the potential threat of the European continent in question. The best indication is the incident that occurred on September 15, 2013, during the pre-election campaign in Germany. Standing in front of its own supporters and supporters in Dresden, the UAV's - previously flipping the rally - literally collapsed at the feet of German Chancellor Angela Merkel and Defense Minister Thomas de Mezir. Although UAV's was driven by members of the opposition Pirate Party - in protest against the national surveillance program using UAV's, Euro Hawk - the event itself more than realistically presented potential security implications and limited opportunities. to prevent terrorist attacks of this or similar type. As Merkel followed the event with a smile for the global security community, the incident was a warning that the use of UAV's, posed a new and serious threat to public security. This thesis was confirmed on August 4, 2018 when the first attempted assassination of a state leader using a commercially available UAV's with a previously well-prepared and analyzed GIS mission was recorded in Caracas. According to official reports, shortly after the first explosion that interrupted Maduro's speech, Venezuelan security forces reportedly shot down two more armed UAV's in an attempt to liquidate the President. Immediately after the attack, the little-known group "National Movement of Soldiers in T-shirts" claimed responsibility. Through several posts on social networks, the group reportedly planned to use two UAV's that were disabled and shot down by sniper fire.

Like the security services, UAV's has always been the subject of analysis by the global academic community, especially today when market availability has greatly increased the risk of being used as a key weapon in future terrorist

attacks. Starting with the 1991 Gulf War, continuing with NATO intervention in Bosnia and Herzegovina (1995), the Federal Republic of Yugoslavia (1998), and especially in the war on terror in Afghanistan and Iraq, the UAV's received a firearm that significantly changed the concept of warfare. In addition to their use as an effective tool for gathering intelligence, identifying, and marking military objectives in the above conflicts following prior GIS analysis, UAV's have also been used to destroy strategic installations or terrorist leaders with specific GIS information obtained. The first armed bomb attack was registered on 04 February 2002 in Pakita province, Afghanistan, where the target of the attack, near the city of Kost, was then al-Qaeda leader Osama bin Laden.[2]

In fact, UAV's opened a new chapter in the concept of warfare. We have seen above that the UAV's initially allowed conventional armed forces to carry out surveillance and combat missions from a safe distance, but we also saw that in the following period the UAV's would be similarly used by terrorist and militant organizations. The fact that the UAV's has the potential to carry out a terrorist attack with the worst possible scenario has resulted in new security threats and challenges for Western allies. In this context, in the remainder of the text, we will first analyze the genesis of the threat in question, look at the factors that contributed to its mass proliferation by analyzing the use of GIS, and finally see the risk of this threat to the security of the Western Allies.

The genesis of the threat

As we have already pointed out in the introductory section, ID is not the first and only terrorist or militant organization to have used armed UAV's in pursuit of its own goals. In fact, terrorist and militant Islamist organizations have been using UAV's for more than a decade. Beginning in 2004, Hezbollah begins using the UAV's in Israeli airspace to gather intelligence and attack various targets[3]. In November 2004, using a Mirsad-1 type UAV's, Hezbollah for the first time succeeded in conducting a reconnaissance mission over the city of Naharia in Western Galilee, without being intercepted by Israeli anti-air defenses[4]. Similarly, in April 2005, using the same type of UAV's, Hezbollah is conducting its second successful scouting flight in Israeli airspace[5]. Unlike the first two, in April 2006, Hezbollah made its third flight, also the first attempt to attack strategic targets in Israel. Namely, Hezbollah launched three Ababil-type[6] UAV's, each armed with 25-30kg of explosives and metal fragments that would enhance the killing effect on the target. One UAV's managed to break into the suburbs of Haifa - a Mediterranean port city

with a population of about 300,000 - before being located and shot down by Israel aviation.

Although abruptly discontinued in 2006, Hezbollah's campaign to disrupt Israeli airspace was renewed in October 2012. Namely, the Ayub-type[7] UAV's after launching from Lebanon, across the Mediterranean, the Gaza Strip and the Negev Desert, covering an area of about 300km a previously well-analyzed GIS route following, penetrated the city of Dimona where it was intercepted and destroyed by the Israeli Air Force. Weeks after the event, an Iranian official released photos of the Dimona nuclear complex and linked them to the recently used Hezbollah UAV's. From a labor point of view, this example is extremely important because Hezbollah first searched the Israeli nuclear facility at a nuclear facility, near the city of Dimona. At the same time, the event is a strong propaganda victory for Iran, but also a message that Hezbollah has cutting edge technology that can be used to attack targets of strategic importance to Israel. However, Hezbollah's first successful armed attack on Hezbollah was not aimed at Israel but in Syria. According to available information, on September 21, 2014, Hezbollah carried out a successful attack with an armed UAV's on the positions of the Jabhat al-Nusra / al-Nusra Front in the Lebanese border town of Arsal, killing 23 militants from the militant Islamist group. This example will go down in history as the first attack on an armed UAV's by a non-state actor, but at the same time an event that has hinted that the technological gap between Western allies and militant groups is gradually diminishing. Two years later, this thesis was backed up when Hezbollah launched its first armed UAV's attack outside Lebanon, more precisely in the northwestern Syrian province of Aleppo. On August 9, a media outlet close to the organization released a video showing an attack on a command post by opposition forces in the city of Kalsa, using an unknown type of armed UAV's with complete control and maneuvering by GIS coordinates[8].

The Palestinian Islamic Resistance Movement - Hamas - is the second militant Islamist organization that not only implemented the use of Iranian UAV's but went on to develop its own program and production. In November 2012, the Israeli Air Force attacked eight sites in the town of Khan Younis in the Gaza Strip, destroying operational and UAV's in the process of development and testing. According to official reports, the destroyed UAV's had an operational radius of 10km from the Gaza Strip, making Tel Aviv a relatively easy target. In 2012-2014, more attempts were launched to launch an Hebron-launched UAV's and attack targets in Israel that were timely prevented

by the Israeli security forces. In July 2014 in the Gaza Strip, Hamas launched for the first time two Ababil-1 type armed UAV's fully backed by guided missile flight through previous GIS, which were intercepted and destroyed by Israeli air defense shortly before the attack. near Ashdod and Ashkelon. Armed with four air-to-ground missiles, the main objective of the UAV's was the Israeli Ministry of Defense headquarters in Tel Aviv[9]. After claiming responsibility for the planned attack, Hamas for the first time publicly acknowledged that it had its own production UAV's, which were publicly presented in December 2014 during a parade organized on the occasion of the 27th anniversary of the organization. However in December 2016, Hamas's UAV's development program suffered a serious setback when Tunisia killed Muhammad Al-Zorai - a Tunisian UAV's engineer and expert - one of the founders of the UAV's Technology Development Program in the Gaza Strip.

As of October 2016, when the ID was first using armed UAV's, besides Hezbollah and Hamas, no other militant organization had carried out a similar attack. For example, the Palestinian Islamic Jihad, the Taliban, and al-Qaeda have primarily focused on developing strategies and technologies for defense against the armed UAV's. On the other hand, the Front al-Nusra, Ajnad al-sham and the ID, using UAV's, have documented a growing number of battles and individual suicide attacks on targets of government forces in Syria. Unlike the first two, ID continues to follow in the footsteps of Hezbollah and Hamas and not only launches reconnaissance missions and target attacks in Syria and Iraq, but launches its own armed UAV's development program as a new tactic to carry out terrorist attacks globally level.

In October 2016, in the fight against Kurdish forces north of Mosul, the ID for the first time used an armed UAV's, killing two Kurdish fighters and wounding as many French soldiers. According to agency reports, convinced that it was another of the large numbers of UAV's used by IS to search the area north of Mosul, after the aircraft was shot down, Kurdish forces transported it to their base, in an attempt to further investigate it, plane exploded. The intensity of the ID Campaign against the Iraqi Armed Forces increased significantly in January 2017, when through its own online media, the ID officially unveiled a program to use the UAV's as an innovative tactic in the fight against Iraqi and Kurdish forces in Iraq. The video "Knights of the Dawawin" aired on the Shumoukh Al-Islam internet forum shows more attacks by armed IDBs on Iraqi positions at various locations . Interpreting them as a "nightmare"

for "unbelievers", ID shows GIS-backed attacks on military equipment and personnel, while emphasizing the murderous effect on the targets selected.

However, losing control of the occupied territories in Iraq, ID lost the initial momentum that resulted in a reduction in the intensity of the use of armed UAV's. However, ID has put UAV's in the focus of its propaganda policy, massively displaying video clips of armed UAV's attacks or suicide operations whose primary purpose is not only to promote but also to encourage future suicide attacks. In this context, on February 1, 2017, the Internet media site "Sawa'eq" published a poster showing IDs of attacking and destroying more American landmarks, including the Statue of Liberty in New York and Congress Capitol headquarters in Washington. Similarly, on February 12, 2018, using the social platform Telegram, ID supporters called for the use of armed UAV's to attack "apostates and infidels" in the Arab world and the West. In the appeal, ID supporters are urged to procure any explosive-carrying UAV's that can be used to attack a factory, police car, gas stations, warehouses, shopping malls and energy facilities[10]. On October 13, 2018, the online media outlet Al-Ansar published a threatening poster titled "Await for our surprises". The poster showing the Eiffel Tower as a target, besides a gunman with ID, also shows a UAV's carrying additional load, possibly explosive or any weapon.

Not with standing the dwindling operational opportunities and heavy international pressure it was exposed to in 2017, ID continued to improve its UAV's and offensive attacks in Iraq and Syria. In March 2018, Arab media published original documents seized from an ID headquarters in northern Syria, according to Fadel Mansour (known as Abu Yusri Al-Tunisi) - a Tunisian-born engineer - working to increase the weight of the IDB's cargo can carry up to 20 kg. Furthermore, on October 24, 2017, the ID attacked and completely destroyed a Syrian Army ammunition depot located at the football stadium in the city of Deir ez-Zor. According to the effect achieved, this attack is probably the greatest achievement that ID has been able to achieve since the use of armed UAV's so far. Among other things, it is obvious that the UAV's program is also a propaganda tool that shows as a strong and ruthless adversary, thereby boosting the morale of its own fighters, attracting more supporters and recruiting more fighters.

Factors

To determine the factors that influence the expansion, we need to answer the question of what makes the UAV's attractive to terrorist and militant Isla-

mist organizations? The answer to this question is simple because the reasons are the same for both state and non-state actors. For both of them, armed UAV's are a cheap and safe method of attacking various targets without risking the safety of the personnel who manage them. While the effects of the above examples are incomparably small compared to the effects that terrorist and militant Islamist organizations achieve in suicide attacks, nonetheless armed UAV's offer a wide range of purposes in a variety of environments - including urban areas - without unnecessarily sacrificing staff. Similar to suicide attacks and other innovations in terrorism, the use of armed UAV's is highly likely to be widely accepted by terrorist and militant Islamist organizations globally, especially given the mass use of commercially available UAV's. According to some estimates, in 2016 around 2.2 million GDP were sold globally, while by 2020 this figure is expected to increase threefold and reach 7 million[11].

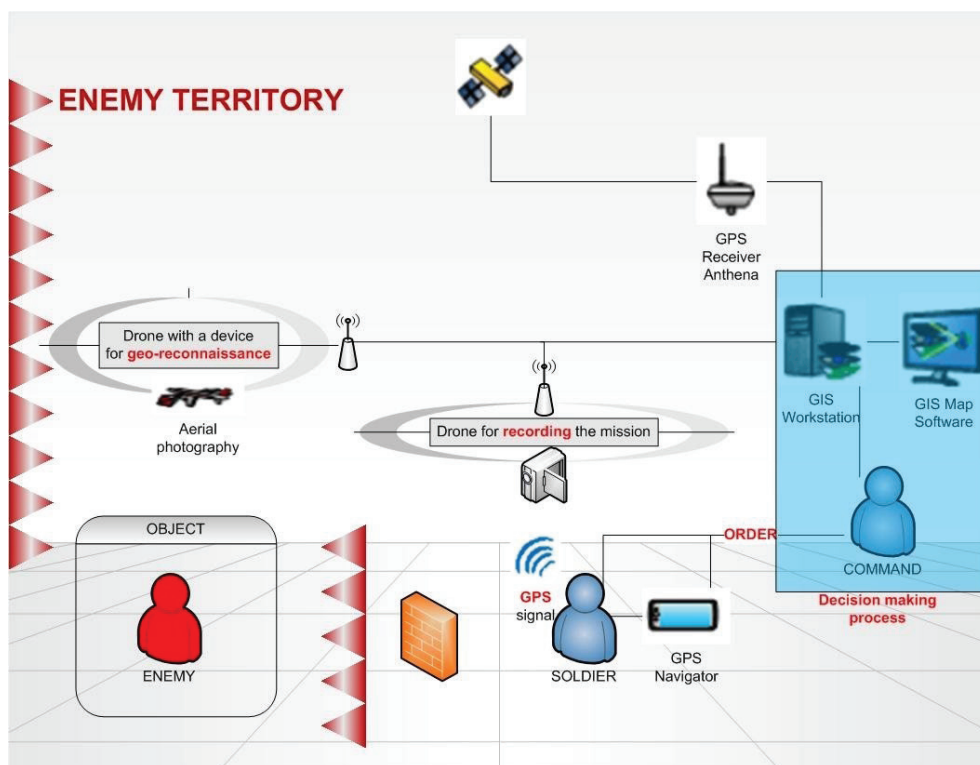
Regardless of the fact that these numbers refer to small UAV's - most commonly multicopters - it should still be taken into account that they are quite sophisticated, with various types of built-in sensors, advanced satellite navigation systems supported by modern GIS that allow them to be programmed to fly on a pre-planned route and carry an additional load of 0.5-20 kg. In terms of labor, it is interesting to note that Amazon's largest online store offers commercial UAV's that can carry up to 10 kg[12]. With UAV's of this kind available, terrorist or militant Islamist organizations and individuals can easily arm them, program them for the intended purpose without being directly exposed to the action of the embedded explosive device.

External logistical and technical assistance is another factor influencing the expansion of the threat in question. Thanks to the support of Iran, Hezbollah and Hamas have not only succeeded in carrying out armed UAV's combat missions in Israel and the Lebanese border area to Syria, but have also developed their own production facilities located on safe locations in the Gaza Strip and Lebanon. Furthermore, the war in Syria enabled Hezbollah to not only continue to use armed UAV's but, thanks to Russian and Iranian experts, to refine this innovative tactic. In this context, in a February 2017 interview with Middle East Eye, a Hezbollah official said that working with Iranians and Russians, the organization is daily refining the tactics and techniques of applying UAV's to Syria's battlefields to the most up-to-date GIS available [13].

GIS is widely used in almost all the branches of the modern armies, but this is available and for almost every terroristic organization online. So, one of the ways of data gathering is by aerial photographs and space images.

Advantage of these kind of collecting data is the possibility of gaining information without getting any contact with the earth surface directly, but with contacting a mediatory unit carrying information about the surface. As that kind of mediatory unit which carry an assessing equipment to gain information are today's popular unmanned aerial vehicle (UAV's) commonly known as a drone. With a proper equipment they can be used to observe and make a live photographs of the terrain of interest which is part of crisis area. This method will reduce the usage of people risking their life for the purpose of collecting information.

Image 2: Model of Geo-reconnaissance and commanding (GRC) information system which is used by the terroristic organization with online information[14]



Unlike Hezbollah and Mossad, ID has developed its own program to use UAV's without external, or state, support. In addition to simplicity and creativity in terms of engineering design, another key factor that influenced the development and refinement of the IDU's UAV's program was the takeover and control of large territory in Iraq and Syria. Controlling several key cities, military bases, and production facilities - civilian and military - IDs gained space and opportunity for their own and cheaper production of various

program support components that was further supported by the purchase of commercially available UAV'Ss and spare parts. Based on documents seized by Iraqi forces in the vicinity of Mosul, ID attempted to standardize operations and institutionalize data related to the development plan of the UAV's. For illustration only, one of the documents contained a checklist of pre- and post-flight procedures, mission data, team composition, location and trajectory of UAV's. Among other things, the program envisioned the procurement not only of multicopters but also of fixed-wing UAV's that have a higher operating radius and greater payload than multicopters.

Risk

From the examples given in the genesis of the threat in question, we have seen that Hezbollah, Hamas and even IDs have already used their own fleet of UAV'S outside the territory they control. While it is purely an opportunistic attack and the reconnaissance of military targets in conflict areas, any public place, element of critical infrastructure, public institution or state leader in modern states could be considered as a potential target[15]. The risk of such a scenario has never been ruled out by the Western Allies' security services. In 2015, US and UK intelligence provided evidence that terrorist organizations were planning to launch a bomb attack on public places such as football matches or festivals. In this context, the discovery of the abandoned fixed-wing UAV's ID workshop in Ramadi in February 2016 is additional evidence that only confirms the risk of the above scenarios. In July 2016, active members of the al-Minbar al-I'lami al-Jihadi jihadist forum claimed that ID members had informed them that the organization had developed a UAV'S armed with rockets and other explosive devices.

As for possible attack scenarios, there are various methods that depend primarily on the type of weaponry (conventional/unconventional) and the technical characteristics of the UAV's used by terrorist and militant Islamist organizations and individuals. In this regard, Hezbollah and Hamas use partially more advanced UAV's than IDs and have greater capacity to launch a planned attack at a greater distance. However, taking into account the creativity of ID and its globally distributed propaganda, in addition to explosive devices, the UAV'S that the organization uses can easily be adapted to attack various radioactive, chemical and biological (RFB) agents in the form of so-called. "Dirty bomb". In this context, in June 1994, the Japanese sect Aum Hin-richiko had its first unsuccessful attempt to release a nerve agent Sarin using

a remote-controlled helicopter equipped with an interrogation mechanism [16]. A similar or similar scenario for the use of armed UAV'S should not be ruled out today, especially given the examples and experiments with the use of chemical weapons by ID, and especially its interest in the production of biological agents. Despite the fact that no mass effects have been registered, a number of media outlets have proliferated reports that ID in Syria is not only using blunt poisons, but also has developed its own chemical weapons production program, backed by engineers with extensive experience. The most notable among them is Abu Malik, a chemical weapons expert who, before joining al-Qaeda in 2005, worked on Saddam Hussein's chemical weapons development and production program. He was killed in January 2015 during an air strike by coalition forces in Syria.

The liquidation of Abu Malik is not the only obstacle to the ID for the use of chemical, radiological or biological weapons against Western allies. Their storage and transport to potential targets without the use of dedicated containers and special premises that provide stable conditions for agents. It is for this reason that IDs are more likely to use radiological, chemical and biological (RFB) weapons with the use of UAV'S immediately after its production in the immediate vicinity of the potential target. All of this initiates additional logistical requirements such as procuring the necessary materials, proper UAV'S and, of course, recruiting local experts, but also an increased risk of intelligence being detected by the intelligence services. However, the ID's readiness to use RSD weapons poses a real risk to the Western Allies' internal security. Immediately after the second terrorist attack on ID in Paris in November 2015, the risk of this threat was highlighted by French Prime Minister Manuel Valls. Addressing the French Parliament, Val touched on a wide range of possibilities for the use of weapons of mass destruction by ID, particularly emphasizing the risk of chemical and biological attack. At the same time, his statement calls into question the effectiveness of long-running paradigms that cannot be dealt with by the innovation of IDs and which in a very short time can become obsolete and not deliver the desired effects in the fight against terrorism.

Conclusion

The development and advancement of 21-st century BPM technology has offered them an alternative method and a perfect opportunity to achieve the goals of terrorist and militant organizations. Recent advances in state-of-the-

art technology have allowed UAV's to operate autonomously and perform a wide range of conventional and unconventional operations without the involvement of manpower. Hezbollah and Hamas 'pioneering efforts, as well as ID's ability to develop its own UAV'S production program, showed that states' monopoly on the use of force is slowly eroding and that modern technology is reducing the gap between state and non-state actors. Although UAV's ID development program has been under pressure from coalition forces and suffered serious consequences, its achievements described above testify to the organization's ability to make use of commercially available UAV's and adequate expert support.

Unrestricted access to up-to-date UAV's at affordable prices and the online proliferation of information on armaments not only do not exclude them, but also pose a serious threat to the security of Western allies that have the potential to cause significant harm. Identifying the risk, Western Allied state leaders emphasized the need for urgent security policy reforms, necessary to suppress armed UAV's as a growing terrorist threat.

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