ISIS Drones: Evolution, Leadership, Bases, Operations and Logistics

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The use of drones by terrorist organizations has been documented for over a decade [1,2, & 3]. During November 2004, Hezbollah used Mirsad-1, an Iranian made drone, for reconnaissance over Israeli territories, for 20 minutes without being intercepted. Hezbollah operatives managed to fly the drone back to Lebanon. It is reported that Hamas, the Palestinian terror group, had a development and storage facility for drones that were destroyed by the Israel Air Force during mid-November 2012 [4]. By mid-July 2014, Hamas also used Ababil-1, an Iranian made drone, which was shot down by the Israeli forces [5]. Furthermore, Palestinian Islamic Jihad, another designated terrorist organization, was able to hack the video feeds of the Israeli's army drones for the period from 2011 to 2014 [6].

The first successful and significant use of drones to attack rival forces by a non-state actor has only occurred recently. It was carried out by Hezbollah agents in Arsal, Syria during late September 2014 in which their aerial attack targeted and killed 32 fighters of al-Nusra Front, al-Qaeda' affiliates in Syria. More recently, ISIS began using drones to drop Improvised Explosive Devices (IEDs), most often grenades, to successfully hit enemy targets.

Rep. Duncan Hunter (R-CA) commented to The Washington Times on ISIS's use of IED loaded drones [7] [8]:

> "In the end the IEDs are the terrorist's artillery… This is not rocket science. This is a natural progression for IEDs. This isn't crazy stuff that this is happening now. We should have seen this coming."

Indeed, terrorist organizations' obsession with drones is not new.

Hezbollah, a Shiite militia, and Hamas, a Sunni jihadi group and an affiliate of the Muslim Brothers, are both supported by the Iranian regime. Their drones, both the units and the training to operate them, are also Iranian sponsored. Unlike these two terrorist organizations, ISIS developed its drone program using off-the-shelf commercial drones and there is no evidence that they relied on any state actors in improving such capabilities. As ISIS started to appear on the defeat, the group increasingly began to release materials on its drone-based operations, including surveillance, command and control, and attacks. These published pictures and videos were largely employed for propaganda purposes.

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[1] "Hezbollah says it has capability to bomb Israel from air," Haaretz, Nov 12, 2004

[2] Eugene Miasnikov, "Terrorists Develop Unmanned Aerial Vehicles," Center for Arms Control, Energy and

[2] Eugene Miasnikov, "Terrorists Develop Unmanned Aerial Vehicles," Center for Arms Control, Energy and Environment Studies at MIPT, Dec 2004, http://www.armscontrol.ru/uav/mirsad1.htm

[3] Hezbollah Mirsad-1 UAV Penetrates Israeli Air Defenses," Defense Industry Daily, April 20, 2005.

[4] Yoav Zitun, "Watch: Hamas UAV that can reach Tel Aviv," YNETNEWS, November 16, 2012, http://www.ynetnews.com/articles/0,7340,L-4306887,00.html

[5] Lorenzo Francheschi-Bicchierai"Israel Shoots Down Hamas Drone," Mashable, July 14, 2014, http://mashable.com/2014/07/14/israel-shoots-down-hamas-drone/#yAEFyiQgFgqs

[6] Yonah Jeremy Bob, "Islamic Jihad Member Convicted in Plea Bargain for Hacking IDF Drones," Jerusalem Post, January 31, 2017, http://www.jpost.com/Israel-News/Islamic-Jihad-member-convicted-in-plea-bargain-for-hacking-IDF-drones-480092

[7] Adiv Sterman, "Hezbollah drones wreak havoc on Syrian rebel bases," Times of Israel, September 21, 2014, http://www.timesofisrael.com/hezbollah-drones-wreak-havoc-on-syrian-rebel-bases/

[8] Rowan Scarborough, "How ISIS-controlled drones like this are striking new fear within the U.S. military," The Washington Times, January 24, 2017, http://www.washingtontimes.com/news/2017/jan/24/isis-drone-dropping-precision-bombs-alarms-us-mili/

By February 2017, ISIS drones became the sexy new topic among ISIS' sympathizers and nemeses, instigating the discussion, debate, and projection of the nature and employment of these weapons in potential terrorist attacks. Alarmed by the current and potential danger of drones as a tool of terror, this report is devoted to collecting intelligence on drone-related operations within ISIS-held territories in Syria. Before presenting the obtained information, a review of the jihadi group's activities and operations regarding this program is instrumental to inferring the current and future implications of ISIS' progression in this area.

ISIS' Use of Drones

In this section ISIS drones' capabilities and activities are summarized based on a wealth of available open-source information. ISIS' documented use of the technology has been covered thoroughly by commentators, analysts, and academics. The following list presents a chronological summary of ISIS' rapid progression and utilization of drones across Iraq, Syria, and Libya for the period spanning August 2014 to March 2017:

 I. *The National Defense Magazine* reported on a YouTube video showing one of the first instances of the use of drones by ISIS in late August 2014 [9]. The video showed aerial footage of army bases in the close vicinity of Raqqa city. *The National Defense Magazine* argued that ISIS' utilization of the technology would allow the jihadi group to gain situational awareness and use more advanced propaganda material.

 II. In a video released during early September 2014 [10], an ISIS operative claimed that the group used drones in surveilling and collecting intelligence on the Tabqa Military Airbase, Raqqa before they launched an assault and seized it from al-Assad's forces. A propaganda video that was released by al-I'tisam, a media company of ISIS, on the 9th of September 2014 showed some reconnaissance footage that seemed to be taken by ISIS operatives before they attacked the base [11].

 III. ShamiWitness, a major twitter account that used to spread ISIS propaganda and methods, shared a guide providing beginners with instructions on how to start building multi-copter drones during mid-October 2014 [12].

 IV. In early September 2014, ISIS captured and released aerial footage of a terrorist attack that targeted fighters in the Kurdish town of Kobane, Syria [13]. The video, taken by an ISIS drone, was used for propaganda purposes.

 V. In late January 2015, ISIS agents and/or sympathizers tweeted a link to a document that commented on the shortcoming of ISIS' drones, argued the justifications behind the downing of the drones by rival forces, recommended different commercial drones, and

[9] Yasmin Tadjdeh, "Islamic State Militants in Syria Now Have Drone Capabilities," National Defense Magazine, August 28, 2014

[10] https://vimeo.com/177453167

[11] Geoff Earle & Bruce Golding, "ISIS using surveillance drones to target Syrian military," New York Post, August 26, 2014, http://nypost.com/2014/08/26/isis-using-surveillance-drones-to-target-syrian-military/

[12] For more on ShamiWitness see Channel 4, "ISIS propagandist ShamiWitness: Man charged in India," June 1, 2015, https://www.channel4.com/news/isis-shami-witness-medhi-masroor-biswas-charged

[13] Kiran Moodley, "Isis releases drone footage of suicide bombings in Kobani," Independent, December 11, 2014, http://www.independent.co.uk/news/world/middle-east/isis-release-drone-footage-of-suicide-bombings-in-kobani-9917198.html

provided instructions and resources on how ISIS can modify and improve its current drones [14].

VI. In early April 2015, ISIS released a video of an archaeological site, claiming the site had pagan idols, which they intended to destroy [15]. An ISIS drone took the opening footage. On two other separate occasions during early April 2015, ISIS claimed, through a released video and a picture, to have used its drones in reconnaissance missions to coordinate its attacks on an oil refinery in Baiji Iraq [16] and Ain Sheep checkpoint in Idlib governorate [17].

VII. In mid-December 2015, ISIS used a drone to film a suicide mission in Anbar province, Iraq [18].

VIII. In early January 2016, an ISIS-released pictorial report surfaced online [19]. That report showed footage taken by an ISIS drone that was used to plan an attack on an Iraqi militia camp in the close vicinity of Fallujah. Moreover, during early January 2016, ISIS released a video captured by drones showing suicide missions in al-Anbar, Iraq [20].

IX. In late January 2016, ISIS released a video of the Benghazi battle in Libya. The video was largely used to threaten forces fighting ISIS and other Islamists factions [21]. In the video an operative appeared to be using a smartphone to control a drone that captured footage of the battle.

X. In late February 2016, ISIS launched a Telegram channel to connect to and use the knowledge of scientists and engineers who sympathize with the militant group [22]. That channel discussed topics related to the assembly and development of ISIS' drones, including remote control of missiles.

XI. In mid-May 2016, ISIS released a picture taken by a drone that captured an attack in the close vicinity of Ramadi, Iraq [23]. In late May 2016, a photo of ISIS's operatives using a computer to control a drone during an attack on Iraqi forces in Fallujah surfaced in an

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[14] Justpaste.it/jnabi7

[15] Steven Stalinsky & R. Sosnow, "A Decade Of Jihadi Organizations' Use Of Drones – From Early Experiments By Hizbullah, Hamas, And Al-Qaeda To Emerging National Security Crisis For The West As ISIS Launches First Attack Drones," MEMRI, February 21, 2017, Inquiry & Analysis Series No.1300, https://www.memri.org/reports/decade-jihadi-organizations-use-drones-%E2%80%93-early-experiments-hizbullah-hamas-and-al-qaeda#_edn135

[16] Ralph Avellino & Gilad Shiloach, "Video: ISIS Uses Drones In Oil Refinery Assault," vocative, Apr 17, 2015, http://www.vocativ.com/world/isis-2/isis-using-drones-in-iraq/

[17] Steven Stalinsky & R. Sosnow, "A Decade Of Jihadi Organizations' Use Of Drones – From Early Experiments By Hizbullah, Hamas, And Al-Qaeda To Emerging National Security Crisis For The West As ISIS Launches First Attack Drones," MEMRI, February 21, 2017, Inquiry & Analysis Series No.1300, https://www.memri.org/reports/decade-jihadi-organizations-use-drones-%E2%80%93-early-experiments-hizbullah-hamas-and-al-qaeda#_edn135

[18] Justpaste.it/pm4r

[19] Justpaste.it/q47o

[20] Shamikh1.biz/vb/showthread.php?t=253023,Ia601506.us.archive.org/35/items/azmulkumah2/azmulkumah2.mp4

[21] Shamikh1.biz/vb/showthread.php?t=253858.Ia801507.us.archive.org/19/items/BangazeeAlThbat2/bangazee%20al-thbat%202.mp4

[22] MEMRI Cyber & Jihad Lab, "ISIS Engineers And Scientists Collaborate On Projects In Telegram Channel," March 21, 2016, http://cjlab.memri.org/lab-projects/tracking-jihadi-terrorist-use-of-social-media/isis-engineers-and-scientists-collaborate-on-projects-in-telegram-channel/

[23] Justpaste.it/u80v

announcement made by A'maq, ISIS' news agency [24]. Moreover, ISIS also released a video that had scenes that had been captured by a drone [25]. The footage featured the assault on Peshmerga forces in the north of Mosul, Iraq on the 3rd of May 2016. During that attack Charles Keating, a U.S. Navy SEAL, was killed. In addition, during late May 2016, ISIS released a picture that included drone footage of its attack on Peshmerga forces in Ninawa, Iraq [26].

XII.   In early July 2016, the Pentagon reported that ISIS was using drones equipped with full-motion cameras and IEDs [27].

XIII.   In late September 2016, ISIS released a video of a suicide attack on an Iraqi military base that shows drone footage of Belgian ISIS militants before carrying out the mission [28]. The video shows a Belgian jihadi, among others, calling for European Muslims not to fear death and to conduct similar attacks in the name of ISIS.

XIV.   In early October 2016, the Iraqi forces announced that they downed a drone belonging to ISIS in the south of Mosul [29]. The drone was reported to be carrying out a reconnaissance mission to surveil Iraqi forces' advancement towards ISIS strongholds.

XV.   In mid-November 2016 ISIS released a video showing its operations against Iraqi forces that were advancing to retake Mosul [30]. The film is full of drone footage that capture ISIS' suicide attacks.

XVI.   In early December 2016, a video released by ISIS showed a more systematic and professional use of its drones in a raid in the close vicinity of Mosul, Iraq [31]. During that period, ISIS released drone footage of two operations, one that captured footage of an attack on Turkish and Syrian rebel forces around al-Bab Aleppo [32] and the other against the Iraqi Popular Mobilization Forces west of Mosul [33]. Moreover, in mid-September 2016, a pictorial announcement of suicide attack in the vicinity of Benghazi, Libya was released. That image showed drone footage of the operation [34].

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[24] Steven Stalinsky & R. Sosnow, "A Decade Of Jihadi Organizations' Use Of Drones – From Early Experiments By Hizbullah, Hamas, And Al-Qaeda To Emerging National Security Crisis For The West As ISIS Launches First Attack Drones," MEMRI, February 21, 2017, Inquiry & Analysis Series No.1300, https://www.memri.org/reports/decade-jihadi-organizations-use-drones-%E2%80%93-early-experiments-hizbullah-hamas-and-al-qaeda#_edn135

[25] Elizabeth Mclaughlin, "New Video Shows Intense ISIS Battle That Killed a US Navy Seal," ABC News, May 5, 2016, http://abcnews.go.com/International/video-shows-intense-isis-battle-killed-us-navy/story?id=38896834

[26] Justpaste.it/ung5

[27] Bloomberg News, "Islamic State fighters using drones with IEDs and spy cameras, says Pentagon," Telegraph, July 7, 2016, http://www.telegraph.co.uk/news/2016/07/07/islamic-state-fighters-using-drones-with-ieds-and-spy-cameras-sa/

[28] MEMRI, "Jihad and Terrorism Threat Monitor (JTTM) Weekend Summary," MEMRI, Special Announcements No.486, https://www.memri.org/reports/jihad-and-terrorism-threat-monitor-jttm-weekend-summary-215

[29] AlALAM, "Iraqi Army Targets ISIS Drone near Mosul," ALALAM, October 03, 2016, http://en.alalam.ir/news/1868370

[30] MEMRI, "ISIS Video Documents Group's Military Response To Campaign To Retake Mosul, Promises Resilience And Victory," Jihad & Terrorism Threat Monitor, November 13, 2016, https://www.memri.org/jttm/isis-video-documents-groups-military-response-campaign-retake-mosul-promises-resilience-and

[31] https://twitter.com/memrijttm/status/805404027198590980?lang=en, December 4, 2016

[32] Twitter.com/memrijttm/status/806811378543493121, December 8, 2016

[33] Justpaste.it/e_makhmor, posted December 8, 2016

[34] Justpaste.it/11iqe, December 19, 2016

XVII.   In early January 2017, ISIS released a film that contained drone footage [35] praising the suicide missions that were carried out by foreign and local jihadis during the battle for Mosul. In late January 2017 ISIS released a propaganda video showing its drones dropping grenade-sized munitions on Iraqi soldiers and tanks [36]. The video captures the damage caused by the bombs and claims that ISIS drones have become a nightmare for the forces battling the militant jihadi group. Moreover, during that period ISIS released another video showing an operation in which a drone dropped a bomb on a military site in Iraq [37].

XVIII.   In early February 2017 ISIS released propaganda posters on Telegram and social media platforms. One of the posters features ISIS drones attacking and destroying U.S landmarks [38]. During early and mid-February 2017, ISIS released a flood of images of the damage caused by its combat drones across Iraq and Syria [39, 40, & 41], using them as propaganda material. In mid-February 2017, ISIS operatives or sympathizers started to call for the use of drones to target civilian populations, places of worship, and infrastructure (e.g., power grid), among other targets, in the West, Middle East, and North Africa [42]. This is no small thing given that when ISIS called for use of vehicular rammings and knife attacks a spate of them followed across Europe and elsewhere. Similarly when al-Qaeda and later ISIS repeated instructions for pressure cooker bombs and other homegrown attacks these calls were also heeded, although to a lesser extent.

XIX.   Moreover, ISIS also released a video using areal footage taken by its drones [43]. That video featured Iraqi and Syrian ISIS bombers, including two Yazidi children, carrying out suicide missions. In addition, ISIS operatives or sympathizers shared photos on Telegram that featured ISIS combat drones carrying out attacks during night time [44]. In February

[35] Multimedia, "IS Video Shows Several Suicide Bombings in Ninawa Recorded by Drones, Execution of Spy by Drowning," SITE Intelligence Group, January 03 2017, https://ent.siteintelgroup.com/Multimedia/is-video-shows-several-suicide-bombings-in-ninawa-recorded-by-drones-execution-of-spy-by-drowning.html

[36] https://vimeo.com/200866575/29d47a4f02

[37] BCNet Staff, "ISIS Dropping Bombs with Drones in Iraq," Boston Commons High Tech Network, March 2, 2017, http://bostoncommons.net/isis-dropping-bombs-with-drones-in-iraq/

[38] Steven Stalinsky & R. Sosnow, "A Decade Of Jihadi Organizations' Use Of Drones – From Early Experiments By Hizbullah, Hamas, And Al-Qaeda To Emerging National Security Crisis For The West As ISIS Launches First Attack Drones," MEMRI, February 21, 2017, Inquiry & Analysis Series No.1300, https://www.memri.org/reports/decade-jihadi-organizations-use-drones-%E2%80%93-early-experiments-hizbullah-hamas-and-al-qaeda#_edn135

[39] S02.justpaste.it/files/justpaste/d389/a14419344/9.jpg

[40] S04.justpaste.it/pdf/1396s-justpaste-it-647309.pdf

[41] S04.justpaste.it/pdf/137uq-justpaste-it-638825.pdf

[42] MEMRI, "Private Pro-ISIS Telegram Channel Promotes Use Of Weaponized Drones Against Targets In West," Jihad & Terrorism Threat Monitor, February 16, 2017, https://www.memri.org/jttm/private-pro-isis-telegram-channel-promotes-use-weaponized-drones-against-targets-west

[43] MEMRI, "ISIS Video Features Drone Footage Of Martyrdom Operations, Including Ones Carried Out By An Iraqi Man Who Returned From Europe And Two Yazidi Children," Jihad & Terrorism Threat Monitor, February 14, 2017, https://www.memri.org/jttm/isis-video-features-drone-footage-martyrdom-operations-including-ones-carried-out-iraqi-man-who

[44] Steven Stalinsky & R. Sosnow, "A Decade Of Jihadi Organizations' Use Of Drones – From Early Experiments By Hizbullah, Hamas, And Al-Qaeda To Emerging National Security Crisis For The West As ISIS Launches First Attack Drones," MEMRI, February 21, 2017, Inquiry & Analysis Series No.1300, https://www.memri.org/reports/decade-jihadi-organizations-use-drones-%E2%80%93-early-experiments-hizbullah-hamas-and-al-qaeda#_edn135

2017, ISIS released a video showing their operatives in Salah Al-Din, Iraq learning how to modify and weaponize drones [45].

XX. In late March 2017, an Arab media outlet released an original file, which had been obtained from a hard a drive taken from ISIS headquarters in northern Syria, that showed Fadhel Mensi, a Tunisian national known in ISIS circles as Abu Yusri Al-Tunisi, who is an ISIS engineer working on increasing the weight that the drones could carry to 20 kilograms [46] increasing the damage they could do by dropping larger payload IEDs.

As mentioned earlier, ISIS developed its drones program without any support from state actors. That sets the jihadi militant group apart from terrorist organizations sponsored by Iran. Moreover, the program has been used to improved ISIS' effectiveness on the battlefield since August 2014. The brief summary of ISIS' employment of drones indicates that the group has rapidly improved its experience in using drones and has managed to improve its combat experience through use of the technology in surveillance missions, command and control, and in carrying out attacks against rival forces. The above review shows that the program has been largely used to harm the enemies of ISIS, but even more so to produce propaganda material to make ISIS look strong versus weakened under enemy assault and to instill fear in its rival forces, boost the morale of its own fighters and supporters, improve its brand, and increase recruitment. The material was also employed to provide its sympathizers across the globe with the knowledge required to use a cheap, non-suicidal tool of terror. The odds of drones being used by lone wolves in the West should alarm many [47]. There is a wealth of guides and instructions online, distributed by ISIS, for beginners to modify and weaponize off-the-shelf commercial drones and as stated earlier, ISIS's calls for homegrown attacks and instructions on how to carry them out has been heeded in the past.

February 2017 marked a spike in ISIS' use of drones and the release of propaganda associated with the program by ISIS media operatives and sympathizers. ISIS is on the defeat in Iraq and Syria and such deployment might enhance their chances of slowing the advancement of Syrian, and Iraqi forces and their American allies. Alerted to the danger of ISIS' surveillance and combat drones, the Iraqi forces are now using the Raysun MD1, a Taiwanese made multicopter jammer, to neutralize this danger [48]. During late July 2016, the American forces were also seen in Iraq using a new technology known as DroneDefender (i.e., an assault-rifle-like device that functions as a frequency jammer to down ISIS drones [49]. Reports that a drone flew over the American Embassy Baghdad were also circulated of late. Some analyst argued that the aforementioned measures were not

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[45] https://player.vimeo.com/video/205103463

[46] Anthony Kimery, "Identity Of ISIS Drone Engineer, Plan To Improve Drones' Ability To Carry Explosives," Homeland Security Today, April 04, 2017, http://www.hstoday.us/single-article/identity-of-isis-drone-engineer-plan-to-improve-drones-ability-to-carry-explosives/ba7f425aa5de23cdc850dac0a72de0ec.html

[47] Ahmet S. Yayla & Anne Speckhard (Feb 28, 2017) The Potential Threats Posed by ISIS's Use of Weaponized Air Drones and How to Fight Back. ICSVE Brief Reports http://www.icsve.org/brief-reports/the-potential-threats-posed-by-isiss-use-of-weaponized-air-drones-and-how-to-fight-back/

[48] Tom O'Connor, "ISIS has no Air Force, but it has an Army of Drones that Drop Explosives," NEWSWEEK, April 17, 2017, http://www.newsweek.com/isis-air-force-army-drones-drop-bombs-585331

[49] Brendan Mcgarry, "Drone-Killing Gun Spotted at US Base in Iraq," Defense Tech, July 26, 2016, https://www.defensetech.org/2016/07/26/drone-killing-gun-spotted-at-us-base-in-iraq/

enough to tackle this sort of threat. For instance, Peter Singer, the New America Foundation's analyst, reported [50]:

> *"The drone defender gun is not part of the regular kit,"* implying it should be, and continued that American soldiers are *"going to face this potential threat across the world, in anything from battles to doing an embassy evacuation. And that's not good. We should have seen this coming and developed a plan and equipment, not just for us, but for allied forces."*

Furthermore, talking to reporters during the Air Force Association's Air Warfare Symposium, Maj. Gen. Jay Silveria, deputy commander of U.S. Air Forces Central Command, argued that it's critical to go after ISIS logistics, finance, leadership, and storage when it comes to the jihadi group's drones program:

> *"Find how ISIS is training the pilots, where they're storing the aircraft—not just wait until the thing shows up and then shoot it down."*

Indeed, if the group uses a swarming technique in a surprise attack it might be difficult to do so and jamming the drones could end up in them simply falling from the sky and exploding their payloads in any case.

In attempt to understand ISIS' leadership, logistics, finance, storage, and training relating to the militant group's drone program, the *International Center for the Study of Violent Extremism (ICSVE)* tasked a number of sources on the ground to collect intelligence. Constrained by the duration of data collection and resources, this report does not provide exhaustive details on the aforementioned aspects of ISIS' drones program. However, information was obtained that was related to the leadership, development facilities, training centers, operations, logistics, and the interaction between different entities involved in the program. The following section presents the information obtained by ICSVE. The details are compared to data released by researchers and analysts, when possible, to present a clear picture and to carry out analyses.

Bases, Leadership, and Logistics

The data obtained by ICSVE related to ISIS' drone activities within its territories in Syria. Trusted sources reported that they first saw ISIS drones during mid-January 2017. Previous reports show that ISIS has been actively using the technology at least since August 2014. As of mid-January 2017, ISIS had moved over 200 young militants known as Ashbal al-Khilafa ("Cubs of the Caliphate" in English) from the city of Raqqa to the town of Maadan. Members of the Cubs of the Caliphate were armed and equipped with suicide vests. A militant led the Cubs of the Caliphate by the name Harith al-Shmari (a.k.a. Abu al-Bara). The Cubs of the Caliphate shipped 12 small multicopter drones, each equipped with a small bomb using pickup trucks. Trusted sources connected the shipped drones to Abu Ukba al-Marakshi, one of ISIS' key engineers. Al-Marakshi, a French national, who use to operate from al-Bab, Aleppo appeared in Raqqa during late December 2016. He was seen with Ali Juma Al-

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[50] Ben Watson, "The Drones of ISIS," Defense One, January 12, 2017, http://www.defenseone.com/technology/2017/01/drones-isis/134542/

Shwakh (a.k.a. Abu Luqman, the emir of Emni [the director of ISIS security forces]).[51] Abu Luqman attended an exercise in the use of combat drones. Al-Marakshi was reported to be the one testing the drone and it was reported that he demonstrated the use of the technology to Abu Luqman. Al-Marakshi took part in the modification and weaponization of multicopters. In late January 2017, he moved with the Cubs of the Caliphate to Maadan, Raqqa.

Training Center

In early March 2017, ICSVE learned that ISIS ran a center to train militants on the use of drones in surveillance and combat capacities. During that period, ISIS trainees were seen flying multicopters in the city of Raqqa. To be exact, the drones flew over the intersection of 23 Shbat and Tal Abyad Streets in Raqqa. Sources traced the drones to their launching point. In mid-March 2017, a number of trusted sources reported the location of ISIS' drone training center (see map below). The center used to be a female clothing outlet by the name Banat al-Yawm (translates literally to *Today's Girls* and loosely to *Modern Girls*). Other sources obtained information on the individuals running the center. These members are as follow:

i- Ahmad Banawi (a.k.a. Abu Uqba), a Syrian national from the Idlib governorate, is in charge of the center. Ahmad Banawi was seen in public, teaching ISIS operatives how to use surveillance drones. He instructed the operatives in the area opposite the center. He is reported to have a degree in aerospace engineering.

ii- A Libyan national by the alias Abu Amarah al-Libi reports to Ahmad Banawi. Al-Libi coordinates with other centers that are involved in ISIS' drone program.

iii- A French national by the alias Abu Muawia al-Faransi used to be connected to the training center. He is reported to be in France as of mid-March 2017. Sources could not obtain much on al-Faransi except that he is tall and blond.

iv- An Iraqi national by the name Jibril (a.k.a. Abu Suhil) reports to Ahmad Banawi. He coordinates with entities that oversee ISIS' drone program in Iraq. Jibril originates from Rawa, Iraq.

Map 1. Drones' training center (latitude, longitude): 35.9514406, 39.0125906

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[51] Speckhard, A., & Yayla, A. S. (2017). The ISIS Emni: The Origins and Inner Workings of ISIS's Intelligence Apparatus. *Perspectives on Terrorism, 11*(1). Retrieved from http://www.terrorismanalysts.com/pt/index.php/pot/article/view/573

In mid-March 2017, ICSVE received information indicating that individuals running ISIS' drone training center in Raqqa were in constant contact with operatives who were affiliated with three other entities. The aforementioned entities were believed to be handling a number of drone-related operations. Data obtained at later dates uncovered that the three operational bases and the training center work closely with each other under one leader.

Initial Modification and Maintenance

After obtaining commercial drones, ISIS moves them to a base close to Panorama Park in Raqqa. The facilities used to be the headquarters of the environment directorate in Raqqa (see map below). This base is in charge of initial modification and the maintenance of ISIS' drones. It is noteworthy that the base is not exclusive to drone-related operations. It was reported that other electronic and mechanical operations are also carried out from that base. Some information regarding the names and nationalities of engineers and technicians who operate from that base was obtained by ICSVE. Their details are as follow:

i-   A Jordanian national by the alias Abu Azam.
ii- A Syrian national by the alias Abu Saad.
iii- A Syrian national by the alias Abu Usama.
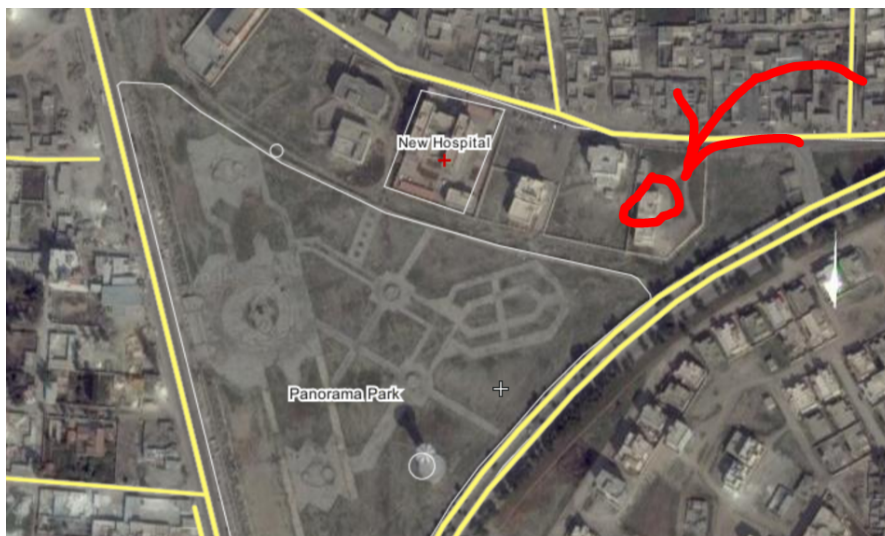
Map 2. Initial Modification and Maintenance Base (latitude, longitude: 35.9415194, 38.9928067)

IEDs and Weaponization

The entity that handles the initial modification of the drones works closely with another base. That base receives modified surveillance drones to weaponize them. This weaponization base's key operation is to produce IEDs, be they airborne or otherwise. According to sources close to ISIS, a man by the name Umar (a.k.a. Abu al-Zubair) is in charge of this base. He is an Iraqi national from Diyala, Iraq. He was an Emni (security forces) operative before being reassigned to his current position. His second in command is a Moroccan national by the alias Abu Yazid. Umar and Abu Yazid commute using a black Jeep. Sources reported the address of this weaponization and IED development base (see map below). The weaponization of drones is carried out from the basement of that building. Engineers, technicians, and IED experts cooperate to equip drones with bombs. In late

March 2017, sources reported that operatives working from that base tested a drone carrying an IED weighing almost 5 kilograms. However, this center does not store weaponized drones. All operational drones are sent to a storage and distribution center. Drones that malfunction or have defects are sent back to the modification and maintenance center.

Map 3. IEDs and Drones' Weaponization Base (latitude, longitude: 35.9427865, 39.0200579)

Storage and Distribution

The storage and distribution center receives weaponized and surveillance drones from the former operational base. This entity also receives surveillance drones from the modification and maintenance center. The location of this base was reported in late March 2017 (see map below). Requests for combat drones from militant ISIS members are received by operatives managing storage and distribution. Combat and surveillance drones are provided
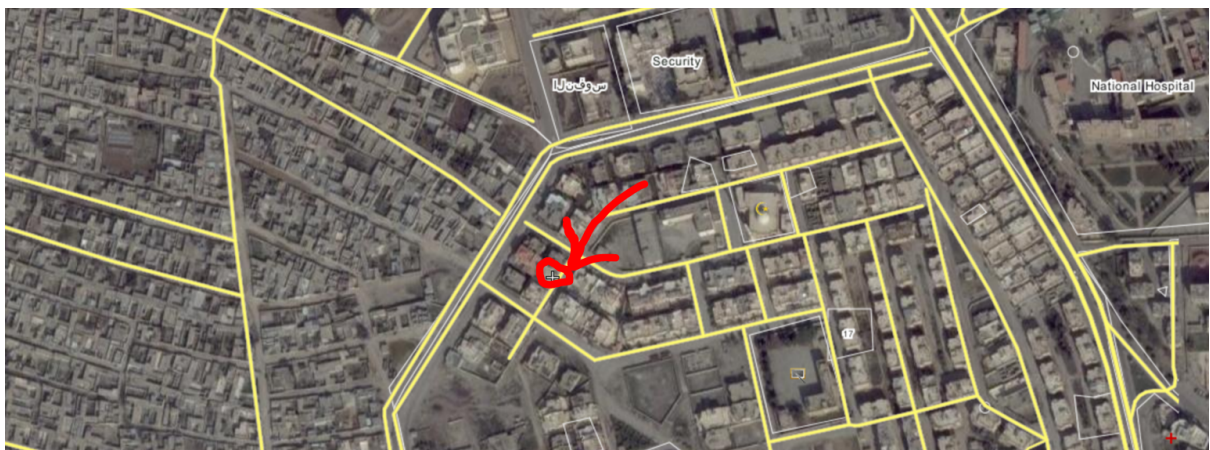
Map 4. Storage and Distribution Base (latitude, longitude: 35.948772, 38.9979565)

to militants in areas of heavy fighting. In addition, this center cooperates with the training center to provide militants with trained members to operate surveillance or combat drones if needed. Moreover, this base handles the distribution of the drones within ISIS-controlled

territories in Syria and Iraq. A number of Europeans operate from base. Their details are as follow:

  i- A British national by the alias Abu Jarir is the director of the base.
  ii- A French national by the name Muhammad Jalalia reports to the director of the base. He oversees operations related to the storage of the drones.
  iii- A Swedish national known as Islam reports to the director of the base. He is in charge of the distribution of the drones.

Leadership

In mid-April 2017, sources reported to ICSVE that the highest ranked ISIS operative who is in charge of their drone program is a militant by the name Muhammad Islam. He is in his thirties and holds a degree in information technology for a British University. Muhammad is a European citizen of Malaysian descent. This suggests that he does not have Malaysian citizenship as the Malaysian government does not allow dual citizenship. In ISIS' ranks, Muhammad has the title of Emir that could refer to manager, director, or minister. He oversees drone-related operations. In late April 2017, ICSVE learned that a Syrian national by the name Yahia al-Abdullah was the second in command for Muhammad Islam, the Emir of ISIS' drone program. Al-Abdullah was born in 1987. He holds a degree in software engineering from Aleppo University. Based on information obtained by ICSVE, the organizational structure that governs the operational interaction between members involved in ISIS' drone program was inferred.
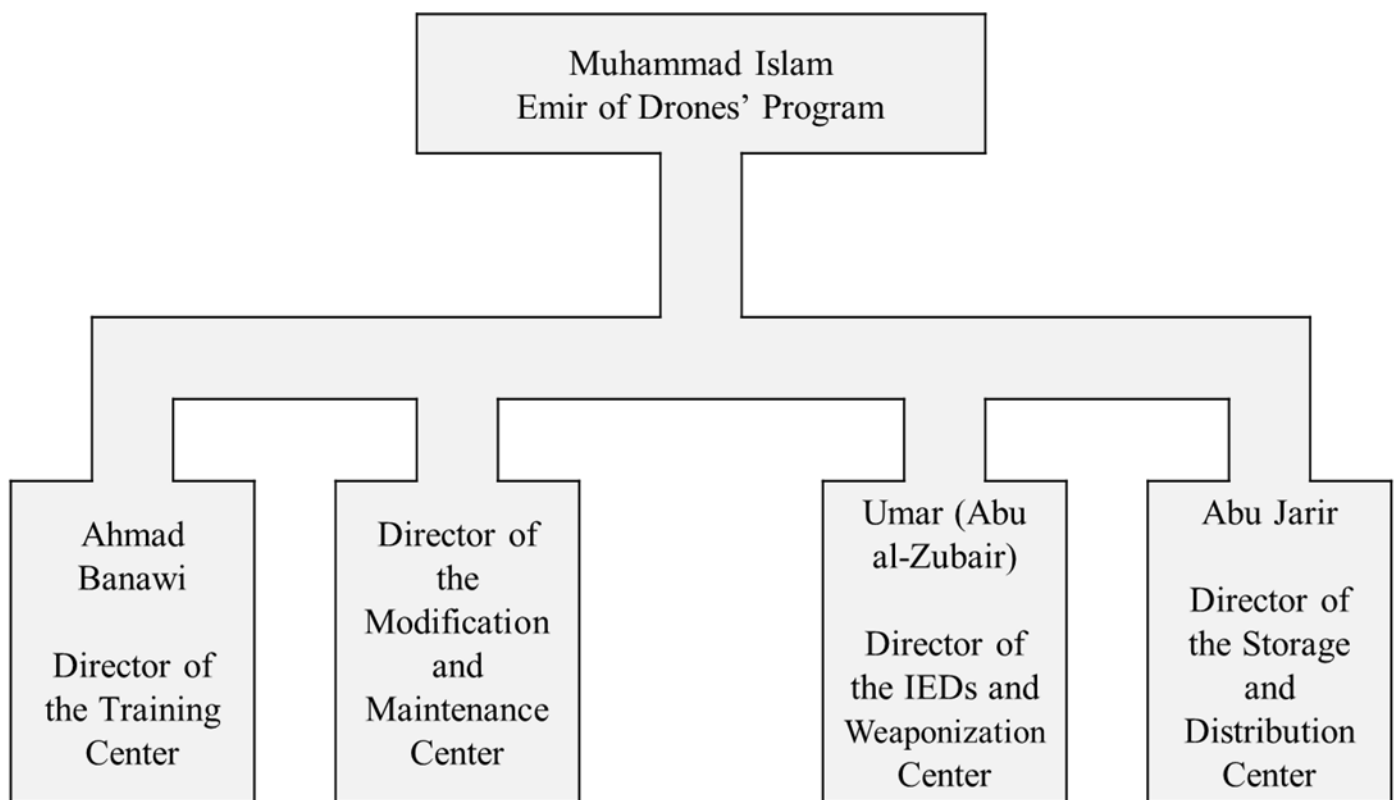

Figure 1. The Organizational Hierarchy of ISIS' Drone Program

Recent Operations and Logistics

Information obtained from trusted sources indicates that in mid-April 2017, Muhammad Islam, the Emir of ISIS' drone program, directly supervised a joint operation between the modification and maintenance center and the IED and weaponization center. Muhammad was overseeing the operations, started sometime before March 2017, to modify commercial drones to increase their operational time, distance and flying capabilities, and the IED load they could carry. The new design was modified for drones to be equipped with 6 small IEDs. Moreover, the modification and maintenance center was working on the inclusion of a solar panel on top of the drone body to further increase its operational life. The drones were also painted with a wax-like coating. Twenty-seven drones were reported to be subjected to this modification. They were all small drones; their diameter being less than 70 centimeters.

In late April 2017, the storage and distribution center received a number of drones matching the description of the drones that were undergoing modifications through the aforementioned joint operations. Each drone was equipped with a solar panel. Full motion, high resolution cameras were installed on the lower and middle sections of the drones' bodies. However, no IEDs were installed. It is not clear whether the drones were only modified to carry out surveillance operations. It can be safely argued that those drones could be weaponized before being deployed to the battlefield. That said, that center also received drones of a different design in late April 2017. These drones were equipped with two small IEDs. The drones of this type were quickly distributed, only staying in the storage facilities for a few days. Drones that resemble the two above-described designs were seen in the training center slightly earlier than the documentation of them in the storage facilities. That suggests ISIS might have tested and trained its operatives using these drones.

In addition, sources reported to ICSVE that in early March 2017, the storage and distribution center shipped a number of surveillance and combat drones from Raqqa to the city of Mayadin, Deir ez-Zor. Those drones were carried using pickup trucks. This move corroborated an earlier report that argued an increasing significance of the city of Mayadin in the fight against ISIS [52].

Furthermore, as of early March 2017 ISIS' agents were reported to have obtained commercial drones from Lebanon and then shipping them to ISIS held-territories in Syria. A recent study on tracking the supply of components used by ISIS showed that ISIS was able to obtain detonating cords and detonators through an intermediary, Maybel, based in Lebanon [53]. This corroborates the information received from ICSVE's sources. Moreover, in late April 2017, it was reported that the Emir of ISIS' drone program, Muhammad Islam, used his second in command, Yahia al-Abdullah, to procure commercial drones and electronics required by the modification and maintenance centers. Based on information obtained from trusted sources, the procurement is not exclusive to the needs of ISIS' drone program. That said, ICSVE learned that ISIS trades antiquities and artifacts to pay for purchases made in

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[52] Almohammad, Asaad & Speckhard, Anne (April 3, 2017) Is ISIS Moving its Capital from Raqqa to Mayadin in Deir ez-Zor? *ICSVE* Brief Reports, http://www.icsve.org/brief-reports/is-isis-moving-its-capital-from-raqqa-to-mayadin-in-deir-ez-zor/

[53] Conflict Armament Research, "Tracing the Supply of Components used in Islamic State IEDs: Evidence from a 20-month investigation in Iraq and Syria," Conflict Armament Research Ltd., London, UK, February 2016, file:///C:/Users/Asaad/Downloads/Tracing_The_Supply_of_Components_Used_in_Islamic_State_IEDs.pdf

Beirut, Lebanon. Al-Abdullah was reported to be a key operative in such dealings. The purchased products then get shipped to Homs, Syria. From there, ISIS agents smuggle them to Raqqa. To that end, extrapolating on information obtained by ICSVE, the procurement and logistics operations of ISIS drones program are illustrated in the following figure.
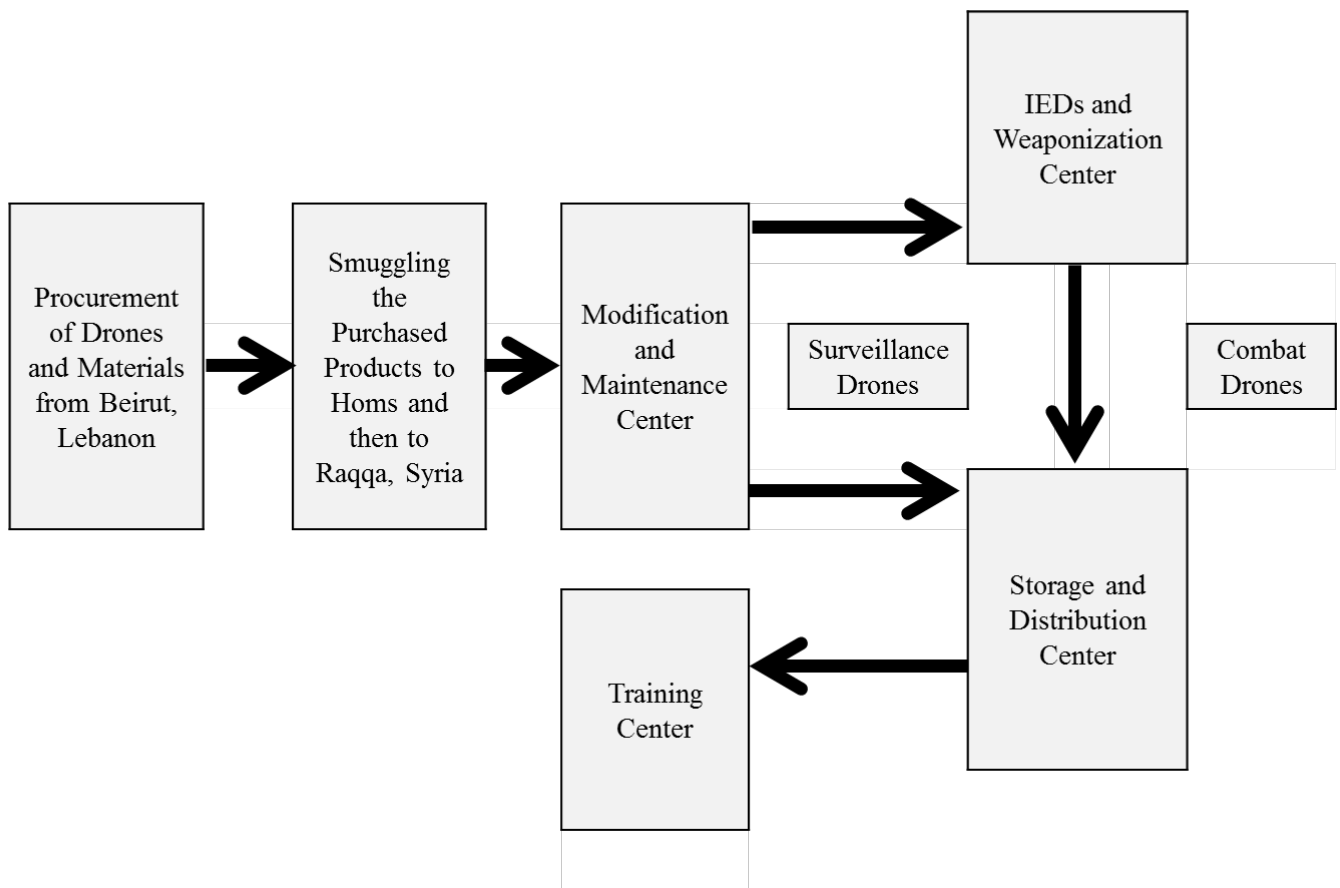
Figure 2. ISIS Drones: Procurement and Logistics

Conclusion

This report provides a brief review of ISIS' use of drones. The review outlines the operations the terrorist organization has carried out using off-the-shelf commercial drones. Noticeably, ISIS' capabilities and expertise in using drones in surveillance, command and control, and attacks have improved. It is noteworthy that in February 2017, ISIS' use of drones and release of material documenting such employment had increased dramatically. It appears that ISIS is on the defeat in both Iraq and Syria. ISIS' deployment of drones and disbursement of associated propaganda could have been to reinforce its brand as a terrorist organization and to do as much damage as possible while losing on the battleground. Through its recent propaganda ISIS claimed that its drones are eliciting fear and hysteria in its enemies. Moreover, the group is capitalizing on the technology and their employment of it, in claiming revenge, improving their credibility in the eyes of sympathizers, increasing the recruitment of new members, and positing drones as a cheap tool of terror to be used outside the Syrian and Iraqi theaters as well. Its sympathizers were called to use drones to inflict substantial damage and cause horror in civilian populations across Europe, the United

States, and MENA. That turn of events is alarming and has multiple implications for national security.

Civilians are increasingly using drones in the public domain (e.g., taking aerial pictures and footage, mail delivery, etc.). This growing use of drones by the general public provides an opportunity for terrorist organizations to adapt methods they previously employed, which used other tools of terror such as delivery trucks, to drones. There seems to be a pattern in ISIS' encouragement of using tools unlikely to raise an alert, when attacking civilian populations. For instance, the approach of ISIS' new magazine, *Rumiyah*, towards the use of trucks as a tool of terror was justified in the following [54]:

> *"Though being an essential part of modern life, very few actually comprehend the deadly and destructive capability of the motor vehicle and its capacity of reaping large numbers of casualties if used in a premeditated manner" P. 10.*

Modified and weaponized off-the-shelf commercial drones might present a less dangerous tool of terror for wannabe terrorists that prefer an alternative to suicide missions. Such uses could be hard to detect in urban settings, yet could lead to devastating aftermath if not intercepted. Compared to the delivery trucks, all this method requires is to get hold of instruction manuals that are available online, and ammunitions.

ISIS managed to disburse a large number of guides and instructions on the modification and weaponization of drones and ISIS-inspired lone wolves might be able to get hold of material required to produce IEDs through criminal networks [55]. Moreover, this new tool is likely to complicate the work of law enforcement agencies that are trying to prevent acts of terror. Giving that the use of drones for commercial and personal purposes is expected to increase in the future, policy makers may need to consider passing regulations. They could enact policies to restrict the sale of commercial drones without digital identification numbers. Police officers may then need to be equipped with the technology required to identify the number of operational drones. Such a numbering system could be linked to the identity of the operator. Police officers may need to be equipped with frequency jammers to down suspected drones although if they are loaded with explosives that is not always a good solution. Notwithstanding that the suggested measures might cause certain inconveniences for operators using drones for legitimate commercial and personal reasons, these measures are intended to allow law enforcement agencies to intercept and down drones that might target civilian populations.

This report used intelligence information that focused on operational bases, leadership, activities, procurement, and logistics. That knowledge, if confirmed, is expected to allow forces fighting ISIS to strategically disrupt and neutralize ISIS' drone operations. An earlier report presented evidence indicating that ISIS is highly bureaucratic when it comes to its

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[54] Rumiyah, "Just Terror Tactics," Rumiyah, Issue 3, 2017, http://qb5cc3pam3y2ad0tm1zxuhho-wpengine.netdna-ssl.com/wp-content/uploads/2014/09/Rumiyah-ISIS-Magazine-3rd-issue.pdf
[55] Ahmet S. Yayla & Anne Speckhard (Feb 28, 2017) The Potential Threats Posed by ISIS's Use of Weaponized Air Drones and How to Fight Back. ICSVE Brief Reports http://www.icsve.org/brief-reports/the-potential-threats-posed-by-isiss-use-of-weaponized-air-drones-and-how-to-fight-back/

drones program [56]. Based on information obtained by ICSVE, ISIS' bureaucracy regarding its drones program is task specific, systematic, and complex. The data shows a top to bottom organizational flow that pervades ISIS's operations and upholds it's "hear and obey" philosophy.[57] The Emir of ISIS' drone program, Muhammad Islam, oversees the operation of four entities that are involved in the program. These entities are, namely, the centers for modification and maintenance, IEDs and weaponization, storage and distribution, and training. The centers were reported to cooperate in joint missions and to carry out task-specific operations.

Furthermore, this report provides some details on a number of individuals who are involved in the program. This includes the program's top leader, his second in command, the directors of three out of the four centers, engineers, technicians, and operatives tasked with managerial functions. This endeavor also presented details on the interaction between operatives involved in the drones program. That glimpse allowed for the deduction of the organizational hierarchy of ISIS' drone program.

Through the second in command, of the Emir of the program, Yahia al-Abdullah, the leadership of the four entities procures from Beirut drones and the materials required for modifying them. ISIS agents were reported to trade artifacts and antiquities to pay for the purchased products. Those products get smuggled to Homs, Syria by ISIS operatives. ISIS' agents in Homs handle transporting the shipment of the products to Raqqa, Syria. Once the drones and technology required to modify it get to Raqqa, they get delivered to the modification and maintenance center. At most this center produces surveillance drones. It was reported that this center cooperated with the entity tasked with weaponizing the drones, the IED and weaponization center, to develop and improve ISIS combat drones. Commonly, the IED and weaponization center works on equipping the drones with airborne IEDs. The storage and distribution center receives surveillance drones from the entity in charge of modification and maintenance and combat drones from the one tasked with weaponizing them. ISIS militants submit forms requesting drones at the storage and distribution center. When needed, the storage and distribution center communicates with the drones' training center to provide militants with operatives trained in using the drones. The training center also teaches militants who are assigned to drone-based tasks. Using that insight, ICSVE was able to infer the procurement and logistics involved in ISIS' drone program.

Reference for this article: Almohammad, Asaad & Speckhard, Anne (May 4, 2017) ISIS Drones: Evolution, Leadership, Bases, Operations and Logistics, *ICSVE Research Reports http://www.icsve.org/research-reports/isis-drones-evolution-leadership-bases-operations-and-logistics/*

About the Authors:

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[57] Speckhard, A., & Yayla, A. S. (2016). *ISIS Defectors: Inside Stories of the Terrorist Caliphate*: Advances Press, LLC.

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