FIELD GUIDE

DRONES OPERATING IN SYRIA AND IRAQ

By Dan Gettinger **December 2016**

In Syria and Iraq today, there are more drones, made in more countries, and flown by more groups, than in any previous conflict. Once primarily the domain of technologically advanced militaries such as the United States, drones are being adopted by less technologically advanced militaries, militias, and non-state actors with increasing frequency, and these groups are adapting the technology to a range of operations.

This publication provides a guide to the systems that are reported to be operating in Syria and Iraq. Based on analysis of visual media, we have found that at least 32 different identifiable drone models made in six countries have been reported to be operating in the conflict. Of the 32 types of systems, 10 were made in the United States, nine in China, six in Iran, four in Russia, two in Israel, and one in Turkey. The majority of the drones are light hand or rail-launched small tactical surveillance drones. Of these, eight recreational hobby drones have been identified from the reports. A handful of other unidentified and homemade drone types have also been spotted.

The conflict represents the first known use of many of these systems in actual combat. The Iranian Shahed-129 and Chinese CH-4, two rough equivalents to the U.S. MQ-1 Predator, conducted their first known drone strikes in Iraq and Syria in 2016 and 2015 respectively. Affordable recreational drones made in China have also made their way onto the battlefield, marking a milestone in the widespread proliferation of aerial surveillance platforms among insurgent and terrorist groups. The conflict marks the first time that hobby drones have been modified with explosives and turned into flying improvised explosive devices.

This collection includes drones ranging from Turkey's Bayraktar tactical surveillance and strike drone to the DJI Phantom, a popular hobby drone. For each of the systems featured in this guide, we provide a short background, key system features and specifications, and reported users. Each platform profile is also accompanied by a photo from our collection of reports from Iraq and Syria.

SUMMARY

38 **Total Systems**

32 Identified Unmanned Aircraft Systems

6 Unidentified Unmanned Aircraft Systems

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Image via: @markito0171

REPORTED DRONES

Drone	Country of Origin	Manufacturer
Light Aircraft		
Aerosonde MK4.7	United States	Textron Systems
Desert Hawk	United States	Lockheed Martin
Eleron 3SV	Russia	ENICS
F550	China	DJI
Inspire	China	DJI
Matrice 100	China	DJI
My Twin Dream	China	MyFlyDream
Oghab	Iran	Farnas Pasargad
Orlan 10	Russia	Special Technological Center
Pchela-1T	Russia	Yakovlev Design Bureau
Phantom	China	DJI
Ptero-G0	Russia	AFM Servers
Puma	United States	AeroVironment
Raven	United States	AeroVironment
ScanEagle	United States	Insitu
Skyhunter	China	Tensho Model Co.
Skylark	Israel	Elbit Systems
Skywalker	China	Guilin Feiyu Electronic Technolog
Switchblade	United States	AeroVironment
Talon	China	HOOAH Aviation
Yasir	Iran	IAIO
Medium		
Ababil-3	Iran	HESA
Searcher/Forpost	Israel/Russia	Israel Aerospace Industries
Mohajer-4	Iran	Qods Aviation
Shadow	United States	Textron Systems
Shahed-123	Iran	HESA
Heavy		
Bayraktar	Turkey	Kale-Bayrakar
CH-4	China	CASC
Gray Eagle	United States	General Atomics
Predator	United States	General Atomics
Reaper	United States	General Atomics
Shahed-129	Iran	HESA

RESEARCH AND ORGANIZATION

The research for this publication is based on an analysis of visual media posted on social networks such as Twitter and YouTube. The images of drones in Iraq and Syria are sourced from photos and videos that are reported to be taken from the conflict zone. This guide leverages the work of numerous journalists and online weapons analysts who monitor Syria and Iraq, including @green_lemonnn, @AbraxasSpa, @Terror_Monitor, @oryxspioenkop, Hassan Ridha, Harry Boone, Haidar Sumeri, Jeremy Binnie, Adam Rawnsley, and Galen Wright. The authenticity of these images has not been independently verified. As such, this guide should be not construed as a complete list of systems currently operating in theater. Furthermore, while some of these systems appear on a regular basis, others have only been spotted once or twice. A chronological list of reports and images of drones from Iraq and Syria that formed the basis for this guide can be found on our website, dronecenter.bard.edu.

The systems are organized according to the country of origin of the manufacturer. We only note known groups using each system in Syria and Iraq, not all system users in the world. Unless otherwise noted, the specifications for each system are taken from the manufacturer.

Image credit: Wikimedia

Phantom

Description

The Phantom series drones are multirotor consumer unmanned aircraft made by Dà-Jiāng Innovations Science and Technology, better known as DJI. In Syria and Iraq, the Phantom is flown by a variety of state and non-state groups.

Sightings

In November 2013, Syrian rebels claimed to have shot down a Phantom that belonged to Syrian government forces.[1] An August 2014 video released by the Islamic State revealed for the first time that the group flies the DJI Phantom.[2]

Background

The first generation Phantom was unveiled on January 7, 2013.[3] As an affordable and ready-to-fly machine, the Phantom helped popularize drones. In 2015, DJI held 70 percent of the consumer drone market.[4] The Phantom 4 was released on March 3, 2016.[5]

Features

The Phantoms have white airframes, four rotors, skid landing gear, and green and red lights.

Images

Syria, August 18, 2015 Image via: @JulianRoepcke

Syria, September 17, 2016 Image via: @RaoKomar747

Specifications

Width	38 cm
Length	22 cm
Speed	72 km/h
Weight	1.36
Endrance	0.3 hrs
Price	$1,199

Source[6]

Image credit: Wikimedia

Inspire

Description

The Inspire series drones are multirotor consumer unmanned aircraft made by DJI. The Inspire is believed to be flown by Syrian government forces.

Sightings

An October 17, 2015 photo reportedly released by Syrian army soldiers shows one DJI Inspire among several DJI Phantoms.[7]

Background

The Inspire 1 was released in November 2014.[8] It was marketed as a mid-way point between the hobby Phantom drones and the drones aimed at professional filmmakers.[9]

Features

The Inspire has T-shaped arms that retract upon takeoff to give the camera an unobstructed view.

Images

Syria, October 17, 2015. Image via: @IvanSidorenko1

Specifications

Width	45.1 cm
Length	43.8 cm
Weight	2.94 kg
Endurance	0.4 hrs
Price	$1,400

Source [10]

Image credit: László Kübler/YouTube

F550 Flame Wheel

Description

The F550 Flame Wheel is a build-it-yourself multirotor drone kit manufactured by DJI. The F550 is believed to be flown by Syrian government forces.

Sightings

In October 2013, a F550 reportedly belonging to the Syrian Arab Army crashed behind rebel lines.[11]

Background

The Flame Wheel F550 is the largest in the F-series of drone airframes built by DJI.[12]

Features

The Flame Wheel is a hexacopter drone; it has six arms and skid landing gear. It is designed to be more durable and crash-resistant than smaller hobby drones.

Images

Syria, October 1, 2013. Image via: Hamilton's Military Channel/YouTube

Specifications

Diagonal	0.55 m
MTOW	2.4 kg
Price	$369

Source [13]

Image credit: Братья Райт/YouTube

Matrice 100

Description

The Matrice 100 is a multirotor drone manufactured by DJI. The Matrice is flown by Iraqi Federal Police.

Sightings

A November 2016 photo by Achilleas Zavallis showed Iraqi police operating a DJI Matrice 100 south of Mosul.[14]

Background

The Matrice 100 is intended to be used by academic and professional drone users. It was unveiled in June 2015.[15]

Features

The Matrice 100 has double the flight time of the Phantom and comes equipped with the automated "Guidance" obstacle avoidance system.

Images

Image available here.

Specifications

Diagonal	0.65 m
MTOW	3.6 kg
Max Speed	79 km/h
Endurance	0.6 hrs
Price	$3,299

Source [16]

Image credit: Ricom69/YouTube

Skyhunter FPV

Description

The Skyhunter is a fixed-wing hobby drone made by Tensho (Xiamen) Model Co., Ltd., a manufacturer of hobby drones based in Fujian province. The Skyhunter is flown by ISIL.

Sightings

In October 2014, the Syrian Army reportedly shot down a Skyhunter in Deir Ezzor that it claimed belonged to an ISIL.[17] Since then, multiple Skyhunter drones reportedly belonging to IS have been downed or captured.[18]

Background

The Skyhunter can be purchased from most major online hobby drone retailers and is a popular model for "first-person view" (FPV) recreational flying.[19]

Features

The Skyhunter has a twin-boom empennage configuration, twin vertical stabilizers, and a rounded fuselage nose. It has high-mounted straight-wing mainplanes.

Images

Iraq, October 17, 2016. Image via: @BeyondTheLevant

Iraq, December 13, 2015. Image via: Alqurtas News

Wingspan	2.12 m
Payload	2 kg
Price	$179*

Source [20]

Image credit: Gabor Zoltan/YouTube

Skywalker X8

Description

The Skywalker X8 is a fixed-wing hobby drone made by Guilin Feiyu Electronic Technology. The Skywalker is flown by ISIL.

Sightings

An early sighting of the Skywalker took place in August 2015 when the Kurdish Peshmerga recovered a Skywalker near Iraq's Mosul Dam.[21] In November 2016, a Skywalker was captured by Kurdish forces in western Manbij, Syria.[22]

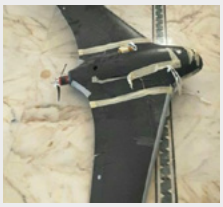
Background

Like the Skyhunter, the Skywalker X8 is a popular platform for first-person view flying.

Features

The Skywalker design is known as a flying wing or swept wing, a blended wing-body aircraft. It has a cone-shaped fuselage, and blended winglets. It is hand-launched, although some configurations have included a bungee or rail-launch system.[23]

Images



Syria, July 23, 2016. Image via: @Conflicts

Iraq, Aug. 27, 2015. Image via: @green_lemonnn

Wingspan	1.8 m
Length	0.65 m
MTOW	3.5 kg
Price	$111*

Source [24]

Image credit: RC Life/YouTube

X-UAV Talon

Description

The X-UAV Talon is a fixed-wing hobby drone made by HOOAH Aviation Technology Co., Ltd. in Jiangsu, China.[25] The Talon is flown by ISIL.

Sightings

In October 2015, Iraqi Federal Police reported that they had shot down an ISIL Talon drone east of Ramadi.[26] In June 2016, the Levant Front, a rebel group in Syria, reported shooting down a Talon in Aleppo, Syria.[27]

Background

Like the Skyhunter and the Skywalker, the styrofoam Talon is a popular model for first-person view flying, widely available from online retailers.[28]

Features

The Talon has a v-tail (also known as a butterfly tail), sort of like a miniature version of the CH-4 or Reaper drones. It has a monoplane shoulder wing design and pusher configuration.

Images

Iraq, October 3, 2015. Image via: Iraqi News

Syria, June 30, 2016. Image via: @alnkba1121

Specifications

Width	1.7 m
Length	1.1 m
Weight	2.4 kg
Endurance	.6 hrs
Price	$116*

Source[29]

Image credit: alishanmao/YouTube

My Twin Dream

Description

My Twin Dream is a fixed-wing hobby drone made by MyFlyDream. My Twin Dream is flown by Kurdish Peshmerga.

Sightings

An October 2016 photo showed a My Twin Dream aircraft being prepared by Kurdish Peshmerga during the Mosul Offensive.[30]

Background

My Twin Dream is another popular remote-control hobby aircraft that is widely available. With its large airframe and twin motors, My Twin Dream is designed for long-distance flying.[31]

Features

My Twin Dream has a twin motor configuration. It has a standard tailplane and shoulder-mounted wings. The payload bay is located in the nose of the fuselage.

Images

Iraq, Oct. 17, 2016. Image via: @DrPartizan_

Specifications

Width	1.8 m
Length	1.22 m
Empty Weight	1.1 kg
MTOW	5.3 kg
Price	$159*

Source[32]

Image credit: Xinhua

CH-4 Rainbow

Description

The CASC CH-4 "Rainbow" is a medium-altitude, long-endurance surveillance and strike drone made by China Academy of Aerospace Aerodynamics. The CH-4 is flown by the Iraqi Air Force.

Sightings

Shortly after Iraq acquired the CH-4 in October 2015, it began using the system to carry out drone strikes against the Islamic State.[33] [34] In January 2016, an Iraqi CH-4 mistakenly killed nine members of an Iraqi Shi'ite militia that was fighting ISIL.[35]

Background

The CH-4 was publicly unveiled at the Zhuhai Air Show in November 2012.[36] In 2016, a CH-4 performed a live fire test via a satellite link, a first for a Chinese drone.[37]

Features

Like the U.S. Reaper remotely piloted aircraft, the CH-4 has a v-tail, a pusher configuration, and mid wing design. It has four external hardpoints and can be equipped with the AR-1/HJ-10 anti-tank missiles.

Images

Iraq, June 6, 2016. Image via: Iraqi Air Force/Facbeook

Specifications

Wingspan	18 m
Length	9 m
MTOW	1,330 kg
Endurance	38 hrs
Range	3,500 km
Ceiling	26,264 ft

Source[38]

Image credit: Farnas Pasargad

Oghab 1

Description

The Oghab 1 is a portable small tactical reconnaissance drone made by Farnas Pasargad. The Oghab is flown by the Badr Organization and/or Iran.

Sightings

In May 2015, the Badr Organization, a Shi'a militia in Iraq, published images showing what appears to be an Oghab 1 drone.[39] In December 2015, Syrian rebels reportedly shot down an Oghab over Aleppo.[40]

Background

Farnas Pasagard is an Iranian aerospace company that specializes in unmanned aircraft. A drone matching the description of the Oghab was spotted in Iran during the Iranian Army Ground Forces Muharram exercise in October 2015.[41]

Features

The Oghab has a high-mounted straight-wing design, a T-tail, and pusher configuration. It has a payload bay in the nose and fixed tricycle landing gear.

Images

Iraq, May 20, 2015. Image via: @green_lemonnn

Syria, Nov. 29, 2015. Image via: @green_lemonnn

Specifications

Wingspan	2 m
Length	1.65 m
MTOW	4.2 kg
Endurance	0.75 hr
Range	25 km

Source[42]

Image credit: Amir Pourmand/ISNA

Yasir

Description

The Yasir is a small tactical surveillance and reconnaissance unmanned aircraft system made by Iran Aviation Industries Organization. The Yasir is flown by Kata'ib Jund al-Imam, Harakat Hezbollah al-Nujaba, and/or Syria and Iran.[43] [44]

Sightings

A drone resembling the Yasir was filmed flying over Syria on November 9, 2013.[45] On December 7, 2013, another video appeared showing a Yasir that was reportedly shot down by rebels in Qalamoun, Syria.[46]

Background

The Yasir is believed to be a copy of the U.S. ScanEagle; it was unveiled by the Iranian Army Ground Forces in September 2013, around ten months after Iran announced that it had captured a ScanEagle drone.[47] [48]

Features

Like the ScanEagle, the Yasir has a payload bubble that sits below the nose and swept back wings. Unlike its American counterpart, the Yasir has a twin-boom empennage and inverted v-tail configuration.

Images

Iraq, Dec. 22, 2014. Image via: FRBIU

Syria, Nov. 9, 2013. Image via: Ugarit News -Syria/ YouTube

Endurance	8 hrs
Range	200 km
Ceiling	15,000 ft

Source[49]

Image credit: MEHR

Mohajer-4

Description

The Mohajer-4 is a tactical reconnaissance drone made by Qods Aviation Industries. The Mohajer is flown by Syrian government forces and/or Iran. The Mohajer may also by flown by Iranian units in Iraq.

Sightings

Mohajer-4s have been seen in Syria on a regular basis since as early as February 2012, when a drone matching its description was spotted flying over the Damascus suburb of Kafr Batna.[50]

Background

The Mohajer series is the longest running family of Iranian drones, dating back to the mid-1980s.[51] It was first used in the Iran-Iraq War.[52]

Features

The Mohajer-4 has a rocket-assisted launch system and skid landing gears. The M4 has a twin-boom empennage, a push propeller, mid wings, and an angular box-shaped fuselage. Some may have winglets.

Images

Syria, Feb. 25, 2012 Image via: The Aviationist

Iraq, Nov. 11, 2014. Image via: @green_lemonnn

Wingspan	5.3 m
MTOW	175 kg
Endurance	3-5 hrs
Range	150 km
Ceiling	4,500 ft

Source[53]

Image credit: IRNA

Ababil-3

Description

The Ababil-3 is a tactical reconnaissance and surveillance unmanned aircraft made by the Iran Aircraft Manufacturing Industrial Company. The Ababil-3 is likely flown by Syrian government forces and/or Iran, as well as by Iranian forces in Iraq.[54]

Sightings

Most sightings of the Ababil-3 have taken place over Syria, although several have also crashed in Iraq. In March 2012, a video was released that appeared to show an Ababil-3 taking off from Hamah Airbase in Syria.[55] In December 2015, an Ababil-3 crashed near Tikrit, Iraq.[56]

Background

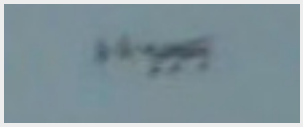
The Ababil-3 is thought to have become operational as early as 2008, when an Ababil-3 was spotted flying over Sudan.[57] In 2009, the U.S. military reported to have shot down an Iranian Ababil-3 drone north of Baghdad, Iraq.[58]

Features

The Ababil-3 bears a strong resemblance to the Mohajer-4, with characteristics like a slender fuselage and twin-boom empennage. Two factors that distinguish the Ababil-3 from the Mohajer are its fixed-tricycle landing gear and high wing configuration.

Images

Iraq, Oct. 13, 2015. Image via: @green_lemonnn



Syria, Mar. 24, 2012. Image via: The Aviationist

Specifications

Wingspan	5 m
Length	3.5
Speed	200 km/h
Endurance	4 hrs
Range	100 km
Ceiling	16,000 ft

Source[59]

Image via: Uskowi on Iran

Shahed-123

Description

The Shahed-123 is a tactical unmanned aircraft system made by the Iran Aircraft Manufacturing Industrial Company. The Shahed-123 is likely flown by Syrian government forces and/or Iran.

Sightings

A Shahed-123 was reportedly shot down in Iraq's Nineveh Governorate in February 2016.[60] A drone that could potentially be an S123 was shot down by Turkish jets in May 2015 near the Turkish-Syria border.[61]

Background

The Shahed-123 is an older, smaller variant of the Shahed-129.

Features

Like the Shahed-129 it has a v-tail and push propeller configuration. The S123 is smaller than the S129 and has a more angular fuselage. As Adam Rawnsley notes at Bellingcat, the S123 has appeared equipped both with skid and wheeled landing gear.[62]

Images

Iraq, Feb. 15, 2016. Image via: @CTstudies

Syria/Turkey, May 16, 2015. Image via: @HussamAlMarie

Specifications

Specifications not available.

Image via: Fars News

Shahed-129

Description

The Shahed-129 is a medium-altitude long-endurance surveillance and strike drone made by the Iran Aircraft Manufacturing Industrial Company. The Ababil is likely flown by Iranian forces in Syria.

Sightings

The first Shahed-129 spotted in Syria was filmed flying over the East Ghouta neighborhood in Damascus in April 2014.[63] In February 2016, Iran released a video showing a Shahed-129 striking targets in northern Syria.[64] It was the first known wartime drone strike by Iran.[65]

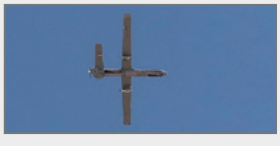
Background

The Shahed-129 is the most advanced of the Shahed line of unmanned aircraft and is believed to be the most capable drone in Iran's arsenal. It was unveiled in September 2012.[66]

Features

The S129 has a v-tail and a long, narrow fuselage. The Shahed-129 is armed with an anti-tank missile, likely the Iranian-made Sadid-1 anti-tank missile. Most images of the S129 show it carrying up to four of these missiles on two hardpoints.

Images



Syria, Sept. 2, 2016. Image via: @green_lemonnn

Syria, Apr. 10, 2014. Image via: Oryx Blog

Specifications

Wingspan	10.5 m
Length	6 m
MTOW	990 kg
Endurance	24 hrs
Range	1,700 km
Ceiling	24,000 ft

Source[67]

Image credit: Wikimedia

Image credit: Wikimedia

	Skylark	Searcher/Forpost
Description	The Skylark is a small fixed-wing reconnaissance drone made by Elbit Systems. It is not clear who is flying the Skylark in Syria and Iraq.	The Forpost is a fixed-wing tactical drone made by Israel Aerospace Industries and assembled in Russia. The Forpost is flown by Russia.
Sightings	In December 2015, an ISIL media outlet released a video that appears to show a downed Skylark that was downed west of Mosul, Iraq.[68] Reports from February 2016 also suggested that a Skylark was found crashed in Ninevah province, Iraq.[69]	In February 2016, Syrian photographer Ahmad Al Khayer spotted a Forpost flying over Syria.[73] In July 2016, Russian photographer Alexei Kitaev took a photo of a Forpost that was reportedly located at Hmeyim airbase in Latakia, Syria.[74] In September 2016, satellite images appeared to show a Forpost drone at Aleppo airport.[75]
Background	The Skylark is designed to be carried by infantry and quickly assembled and launched for close-in surveillance and reconnaissance, artillery spotting, and perimeter security.[70] Since it entered service with the Israel Defense Forces in 2004, several countries including Canada have purchased the Skylark.[71]	The Israeli Searcher is one of the oldest drones still in service; it first became operational in 1992 and is operated by at least 10 different countries.[76] The Ural Factory of Civil Aviation in Yekaterinburg began producing Forposts under license in 2012.[77]
Features	The Skylark features a nose-mounted tractor propeller and a payload pod that is attached below the propeller. It has a high-mounted wing placement and polyhedral wing design.	The Forpost has a stand-up communications antenna and radome that extends above the fuselage, as well as its twin-boom tail and sloped nose.
Images	 Iraq, Feb. 26, 2016. Image via: @CTstudies  Syria, Aug. 22, 2016. Image via: @AbraxasSpa	Image available here.

Specifications	Skylark	Searcher/Forpost
	MTOW: 7.5 kg Payload: 1.2 kg Endurance: 3 hrs Range: 40 km Ceiling: 15,000 ft	Wingspan: 8.55 m MTOW: 450 kg Speed: 203 km/h Endurance: 18 hrs Range: 250 km Ceiling: 23,000 ft
	Source[72]	Source[78]

Image credit: Wikimedia

Orlan 10

Description

The Orlan-10 is a small fixed-wing reconnaissance unmanned aerial vehicle made by Special Technological Center in St. Petersburg, Russia. It is flown by Russian forces in Syria.

Sightings

In October 2015, Turkey claimed to have shot down a Russian drone that had reportedly strayed over its border with Syria.[79] The drone appeared to be an Orlan-10. In September 2016, Jaish al-Izzah rebels claimed to have shot down an Orlan-10 near Hama, Syria.[80]

Background

Production of the Orlan-10 began in 2010.[81] In February 2016, Russia unveiled the newest variants of the Orlan—the Orlan-30 and -50—which have similar physical dimensions, but improved performance specifications.[82]

Features

The Orlan-10 is catapult-launched and recovered by parachute. It features swappable payload modules. It has a high wing monoplane design, a conventional tailplane, and a tractor configuration.

Images

Syria, Sept. 16, 2016. Image via: YouTube

Turkey, Oct. 16, 2015.

Specifications

MTOW	14 kg
Payload	5 kg
Speed	150 km/h
Endurance	16 hrs
Ceiling	16,000 ft

Source[83]

Image credit: Wikimedia

Eleron 3SV

Description

The Eleron 3SV is a small fixed-wing reconnaissance drone made by ENICS, a Russian manufacturer based in Tatarstan. It is Syrian government forces and/or Russia.

Sightings

In July 2015, Jabhat al-Nusra reportedly shot down an Eleron 3SV near Latakia, Syria.[84] An Eleron 3SV apparently belonging to the Syrian army appeared in an image from November 2016.[85]

Background

In mid-2013, Russian state media reported that ENICS had delivered a shipment of the Elerons to the Russian military.[86] In 2015, the Associated Press reported that Russia would deploy the drones to monitor the Kuril Islands near Japan.[87]

Features

The Eleron has a blended wing design similar to China's Skywalker X8. It is rail-launched and has a pusher configuration.

Images

Syria, July 20, 2015. Image via: @oryxspioenkop

Syria, Sept. 16, 2016. Image courtesy of Ivan Sidorenko

Specifications

Wingspan	1.47 m
Weight	5.5 kg
Speed	130 km/h
Endurance	1.8 hrs
Ceiling	16,400 ft

Source[88]

Image credit: Wikimedia

Pchela-1T

Description

The Pchela-1T is a small reconnaissance and surveillance drone made the Yakovlev Design Bureau. It is flown by Russian forces in Syria.

Sightings

An image from September 2015 appeared to show a Pchela flying near Russian manned fighters.[89] Since then, there does not appear to have been any sighting of the Pchela.

Background

The Pchela is intended for short-range tactical reconnaissance. It is one of Russia's oldest drones. It was designed in the mid-1980s and used in the First Chechen War.[90]

Features

The Pchela has high-mounted wings and a ducted fan pusher configuration. It also uses a booster rocket-assisted rail launch and parachute recovery system.

Images

Syria, Sept. 3, 2015. Image via: @Charles_Lister

Specifications

MTOW	138 kg
Speed	180 km/h
Range	60 km
Max Op Altitude	8,200 ft

Source[91]

RUSSIA

Image credit: Alexey Ptero/YouTube

Ptero-G0 UAV

Description

The Ptero is a small reconnaissance drone made by AFM Servers. It is flown by Russian forces in Syria.

Sightings

The only known sighting is from October 2016, when photos emerged showing a Ptero-60 that reportedly crashed in Syria's Latakia province.[92]

Background

The Ptero-G0 is designed for short-range reconnaissance and mapping missions. In April 2015, Russian media reported that AFM Servers was planning to export the drone to countries in Asia.[93]

Features

The Ptero has shoulder-mounted wings and a tractor propeller configuration. It is launched using a pneumatic catapult and can be recovered by parachute.

Images

Syria, Oct. 29 2016.
Image via: @AbraxasSpa

Specifications

Weight	5 kg
Payload	2 kg
Range	800 km
Endurance	8 hrs

Source[94]

TURKEY

Image credit: Wikimedia

Bayraktar

Description

The Bayraktar TB2 is a medium-altitude long-endurance unmanned aircraft system made by Kale-Baykar. It is flown by Turkish Air Force.

Sightings

In August 2016, a Turkish military Bayraktar reportedly took part in the Turkish-backed operation to retake the Syrian town of Jarablus.[95] On August 25, 2016, a Bayraktar reportedly crashed outside of Sanliurfa Airport in southern Turkey.[96]

Background

The Bayraktar made its first flight in 2009 and was delivered to the Turkish military in 2014.[97] [98] The Bayraktar can be armed with the UMTAS anti-tank missile.

Features

The Bayraktar has a twin-boom empennage with an inverted v-tail. It has a pusher propeller configuration, mid-mounted straight-wing mainplanes, and wheeled landing gear.

Images

Turkey, Aug. 25 2016.
Image via: @M3t4_tr0n

Specifications

Wingspan	12 m
Length	6.5 m
MTOW	650 kg
Payload	55 kg
Max Speed	130 km/h
Endurance	24 hrs

Source[99]

Image credit: AeroVironment

Switchblade

Description

The Switchblade is a loitering munition made by AeroVironment. It is operated by United States special operations forces.

Sightings

One of the first reports of Switchblades in Syria was in October 2015, when a crashed drone matching the characteristics of a Switchblade was found near Daraa.[100] Another Switchblade was found near Syria's Izraa city in November 2015.[101]

Background

The Switchblade is meant to provide infantry with a precise stand-off munition that is light enough to be carried in a backpack. On November 10, 2016, the Obama administration requested $46.5 million in funding for 535 Switchblades as part of a larger funding package for counter-ISIL operations.[102]

Features

The Switchblade is designed to fit inside a tube for transport. The four wings unfold when launched. The warhead is equivalent to a 40mm grenade. It has twin vertical stabilizers.[103]

Images

Syria, Nov. 3, 2015. Image via: @green_lemonnn

Syria, Oct. 12, 2015. Image via: @Terror_Monitor

Specifications

Speed	157 km/h
Endurance	10 min
Range	10 km
Op Altitude	500 ft

Source[104]

Iraq, April 6, 2016. Image via: @trbtc

Iraq, Aug. 10, 2016. Image via: @JakeGodin

Image credit: Sgt. Hillary Rustine/U.S. Army

Puma

Description

The RQ-20 Puma AE is a fixed-wing small tactical reconnaissance drone made by AeroVironment. It is flown by United States special operations forces and Kurdish Peshmerga.

Sightings

In February 2016, the Islamic State group claimed that it had downed a Puma drone near Al-Baghdadi, Iraq.[105] An August 2016 video released by ISIL claimed that a crashed Puma drone had been operated by the Kurdish Peshmerga.[106]

Background

The Puma began its service in 2008 when the U.S. Special Operations Command selected the system for the All Environment Capable Variant program.[107] The U.S. Army ordered the Puma in 2012.[108] The Puma is designed to be used for both land and maritime missions.[109]

Features

The Puma system has a polyhedral wing design in which the end two-thirds of each wing extend upward at a slightly higher angle than the first third. It has a tractor propeller configuration and conventional tailplane.

Wingspan	1.4 m
Length	0.9 m
Speed	81 km/h
Endurance	1.5 hrs
Range	10 km
Op Altitude	500 ft

Source[110]

Image credit: Wikimedia

Raven

Description

The RQ-11 Raven is a hand-launched small tactical surveillance and reconnaissance drone made by AeroVironment. It is flown by the United States and Iraq.[111]

Sightings

An October 2016 video by the BBC showed Kurdish forces shooting down a Raven drone during the Mosul offensive.[112]

Background

The Raven was designed as the successor to the AeroVironment FQM-151 Pointer UAV.[113] The Raven system conducted its maiden flight in October 2001.[114] The Raven remains one of the most popular military unmanned aircraft ever produced and has been exported widely.

Features

The Raven has a tubular tail boom and pusher configuration. Like the Puma, the Raven has a high-wing placement and polyhedral wing design.

Images

Image available here.

Wingspan	2.8 m
Length	1.4 m
MTOW	6.3 kg
Speed	83 km/h
Endurance	3 hrs

Source[115]

Image credit: U.K. Ministry of Defence

Desert Hawk III

Description

The Desert Hawk III is a fixed-wing small tactical reconnaissance drone made by Lockheed Martin. It is flown by the United Kingdom.

Sightings

In December 2014, a drone matching the description of a Desert Hawk was reportedly shot down in Iraq's Diyala Governorate.[116] A second apparent sighting of the Desert Hawk took place in June 2015 in Iraq.[117]

Background

The Desert Hawk made its first flight in 2003 and was initially deployed with the USAF to Afghanistan.[118] Lockheed Martin delivered the Desert Hawk to the British Army in 2007 for use in Iraq to replace the Phoenix system.[119]

Features

The Desert Hawk has tractor propeller configuration, teardrop-shaped fuselage, high-wing design, and single vertical tailfin. An optics payload can be found at the aircraft's center of mass. The Desert Hawk is hand-launched and is recovered by a skid landing.

Images

Iraq, Dec. 27, 2014. Image via: @green_lemonnn

Iraq, June 15, 2015. Image via: @green_lemonnn

Specifications

Wingspan	1.5 m
Weight	3.72 kg
Endurance	1.5 hrs
Max Speed	92 km/h
Range	15 km
Ceiling	17,000 ft

Source[120]

Image credit: Wikimedia

ScanEagle

Description

The ScanEagle is a small tactical reconnaissance drone made by Boeing Insitu. It is flown by the United States and Iraq.

Sightings

A video released by the Islamic State group in November 2016 appeared to show a ScanEagle that came down near Mosul, Iraq.[121]

Background

The ScanEagle was deployed for the first time in 2004, when it was sent with U.S. Marine Corps to Iraq.[122] In August 2016, the Department of Defense announced an $8.3 million contract for ScanEagles for Iraq, a sale that was three years in the making.[123]

Features

The ScanEagle has swept-back wings, winglets, a pusher configuration, and a cylindrical fuselage. It carries a transparent sensor bubble beneath the nose that can be fitted with swapable payloads. The ScanEalge is rail-launched and recovered with the SkyHook system.

Images

Iraq, Nov. 4, 2016.

Specifications

Wingspan	3.11 m
Length	1.71 m
MTOW	22 kg
Endurance	24 hrs
Max Speed	148 km/h
Ceiling	19,500 ft

Source[124]

Image credit: Wikimedia

Aerosonde MK 4.7

Description

The Aerosonde MK 4.7 is a small surveillance drone made by Aerosonde, a division of Textron Systems. It is flown by U.S. special operations forces.

Sightings

In March 2015, IHS Jane's reported that SOCOM was flying Aerosonde drones out of a base in Lebanon for operations over Syria.[125] In February 2016, a drone matching the description of an Aerosonde was downed in near Damascus, Syria.[126]

Background

In March 2012, the U.S. Special Operations Command chose the Aerosonde for the Mid-Endurance UAS II program.[127]

Features

Like the RQ-7 Shadow, the Aerosonde has a twin-boom empennage and an inverted V-shaped tail. The fuselage of the Aerosonde is more rounded and less angular than the RQ-7 Shadow. It employs a net recovery system.

Images

Syria, Feb. 1, 2016. Image via: @CTstudies

Specifications

Wingspan	3.6 m
MTOW	36.4 kg
Payload	9.1 kg
Endurance	14 hrs
Range	140 km
Ceiling	15,000 ft

Source[128]

Image credit: Wikimedia

Image credit: Wikimedia

Image credit: Wikimedia

	Shadow	Predator	Gray Eagle
Description	The AAI RQ-7 Shadow is a tactical reconnaissance and surveillance drone made by AAI Corporation, a unit of Textron Systems. It is flown by the United States Army.	The MQ-1 Predator is a medium-altitude long-endurance surveillance and strike drone made by General Atomics Aeronautical Systems. It is flown by the United States Air Force and the Italian Air Force.	The MQ-1C Gray Eagle is a medium-altitude long-endurance surveillance and strike drone made by General Atomics Aeronautical Systems. It is flown by the United States Army.
Sightings	In January 2016, ISIL claimed to have shot down a U.S. drone in Fallujah, Iraq that appears to be a Shadow.[129] A December 2016 report by Flanders News visited a U.S. Shadow troop at Qayarah Airbase near Mosul.[130]	In March 2015, an MQ-1 Predator crashed in northern Syria.[134] In December 2015, the Italian magazine L'Espresso published video imagery from an Italian Predator drone that was monitor ISIL fighters.[135]	In July 2015, a Gray Eagle drone crashed near the southern Iraqi city of Samawah.[139] In April 2016, a Gray Eagle was spotted flying over Anbar, Iraq.[140]
Background	The RQ-7A was first fielded by the U.S. Army in 2001 and by the Marines in 2007.[131] In 2012, Textron began flight testing the latest Shadow variant, the M2.[132]	The Predator was first deployed to support U.S. operations in Bosnia in 1996. It successfully launched a Hellfire missile for the first time in winter 2001.[136] Although the Air Force plans to phase out its MQ-1B fleet by 2018, the Predator's cousins—the Gray Eagle and the Predator B (Reaper)—will remain in use.[137]	The Gray Eagle is derived from the MQ-1 Predator drone. The U.S. military's Gray Eagle acquisition program began on April 20, 2005 after the drone—then known as Sky Warrior—won an Army competition to replace the aging Hunter drone.[141]
Features	The Shadow has a twin-boom empennage, an inverted v-tail, and a pusher configuration. It has a high-wing monoplane design. The aircraft is rail-launched and equipped with tricycle landing gear for runway landings.	The Predator has an inverted v-tail, mid wings, and a pusher configuration. It has two hardpoints and can carry two AGM-114 Hellfire missiles.	The Gray Eagle has the same inverted v-tail as the Predator, although it is heavier and has a longer wingspan than its predecessor.

Images

Iraq, Jan. 30, 2016. Image via: @Mr_Ghostly

Iraq, Jun. 16, 2016. Image via: @green_lemonnn

Iraq, Oct. 16, 2015. Image via: @green_lemonnn

Iraq, July 24, 2014. Image via: @Julian-Roepcke

July 25, 2015. Image via: @TRACterrorism

Specifications

Wingspan	6.2 m
Payload	43 kg
Weight	212 kg
Range	125 km
Endurance	9 hrs
Ceiling	18,000 ft

Source[133]

Wingspan	16.8 m
Length	8.22 m
MTOW	1,020 kg
Speed	217 km/h
Range	1,239 km
Ceiling	25,000 ft

Source[138]

Wingspan	17 m
Length	9 m
MTOW	1633 kg
Speed	311 km/h
Endurance	25 hrs
Ceiling	29,000 ft

Source[142]

Image credit: Wikimedia

Reaper

Description

The Reaper (also known as Predator B) is a medium-altitude long-endurance surveillance and strike drone made by General Atomics Aeronautical Systems. It is flown by the United States and the United Kingdom.

Sightings

In October 2015, the Russian Ministry of Defense published a video showing a Russian fighter intercepting a Reaper over Syria.[143] In July 2016, a Reaper crashed in northern Syria after operators lost control of the aircraft.[144]

Background

The U.S. Air Force Air Combat Command initiated the MQ-9 Reaper program on May 2, 2002. The first Reaper unit, the 42nd Attack Squadron, was activated on November 6, 2006 and became operational in 2007.[145]

Features

The Reaper has a v-tail and a larger airframe than the Predator and Gray Eagle. The Reaper has four hardpoints and can carry up to 1,361 kg of external payload.

Images

Syria, October 2015. Image via: Russian Ministry of Defense/ YouTube

Iraq, Feb. 9, 2015. Image via: @IraqiSecurity

Specifications

Wingspan	20 m
Length	11 m
MTOW	4763 kg
Speed	445 kph
Endurance	27 hrs
Ceiling	50,000 ft

Source[146]

UNIDENTIFIED DRONES

Besides the 32 identifiable drones that have been spotted in Iraq and Syria, there have been other reported sightings of drones that have not yet been identified. These drones are either homemade or highly modified. One drone in particular has appeared in multiple images. This drone, which social media reports suggest is an Iranian-made aircraft operating in Syria, looks like a miniaturized version of the Iranian Shahed drones. It is used for over-the-hill reconnaissance missions.[147] Other drones, particularly those that have been found in ISIL workshops, appear to be homemade. A 2016 investigation by Conflict Armament Research into one ISIL workshop in Ramadi, Iraq found that some of these home-made ISIL drones could potentially be armed.[148]

Syria, Aug. 31, 2016. Image via: @Terror_Monitor

This drone, with its v-tail and high-mounted straight-wing design, resembles a variant of the Iranian-made Shahed drones, albeit on a significantly smaller scale. It appears to be roughly the size of a U.S. ScanEagle. Several social media reports suggest that this drone is Iranian-made and flown by Syrian government forces.

Iraq, March 24, 2015. Image via: @SerioSito

This drone, which was shot down by ISIL fighters in Sinjar, Iraq, reportedly belonged to the Kurdish Peshmerga. It is a highly-modified hexacopter multirotor drone similar to the DJI F550 Flame Wheel. It was likely originally designed for advanced hobbyists or commercial drone operators.

Iraq, Nov. 4, 2015. Image via: @green_lemonnn

This is a home-made fixed-wing small reconnaissance drone. It has repeatedly appeared in images of ISIL drones in Iraq. The aircraft pictured above was captured by Kurdish forces near Mosul in November 2015. In November 2016, Iraqi forces in Mosul discovered several of these drones in an ISIL workshop; one of which appeared to contain a space large enough to carry a small quadrotor.[149] In December 2016, the Syrian army discovered a variant of this type of drone along with several RPG-7 rounds, suggesting that this type of drone could be armed.[150]

Syria, Dec. 10, 2016. Image via: @MinsterTX

Syria, Dec. 10, 2016. Image via: @MinsterTX

This homemade quadrotor drone was reportedly discovered by Syrian government forces in Deir ez-Zor in December 2016. It was apparently capable of carrying a small PG-7 HEAT warhead.

Syria, June 25, 2016. Image via: @JeremyBinnie

This drone appeared in an ISIL propaganda video in June 2016. It reportedly shows a drone captured in Manbij, Syria. It is the only known single-rotor drone operating in Syria or Iraq.

Iraq, Jan. 11, 2016. Image via: Heavy.com

This fixed-wing reconnaissance drone is the largest unidentified unmanned aircraft believed to be operating in Syria and Iraq. The drone pictured reportedly belonged to ISIL before being shot down by Iraqi security forces in January 2016.

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The Center for the Study of the Drone at Bard College is an interdisciplinary research institution founded in 2012 that examines the novel and complex opportunities and challenges presented by unmanned system technologies in both the military and civilian sphere.

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