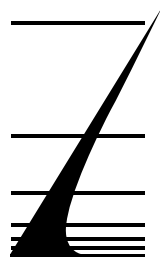


The Market for UAV Reconnaissance Systems

Product Code #F662

A Special Focused Market Segment Analysis by:



FORECAST INTERNATIONAL

Analysis 1

The Market for UAV Reconnaissance Systems 2010-2019

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PROGRAMS

The following reports are included in this section: (**Note:** a single report may cover several programs.)

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Raven
Eagle Eye
Fire Scout VTUAV
German VTOL UAVs
HALE UAVs
Hellstar
Hunter
Hypersonic Drones
Indian UAVs
J/AQM-2 & J/AQM-4
KG-135 Sky Robot
Korean UAV Programs
Mirach Series
Pioneer
Predator
Ranger ADS 95
RQ-3A Darkstar
RQ-4A Global Hawk
Searcher
Shadow 200 TUAV
Sky Warrior
South African UAVs
Sperwer
Swedish UAV Programs
Watchkeeper

Introduction

In the Beginning. Flight has long fascinated mankind. For hundreds of years, generals have marveled at the ease with which birds hovered over a battlefield, taking everything in but sharing that knowledge with no one.

Political leaders and soldiers have long attempted to harness technology to give them an advantage on the battlefield, with varying degrees of success. Take, for example, the first unmanned air vehicle: the kite. These "stealthy" aerial systems, remotely controlled via a physical tether, were used to drop bombs, check weather and wind changes, and signal other elements of a widely dispersed army. Although these systems had some successes, usually they caused more problems than they were worth.

However, from this beginning some 1,500-plus years ago, mankind would eventually produce what is today known as an unmanned air vehicle, which is part of an unmanned aircraft system.

The First Modern UAVs. World War I, with its stalemated trench warfare and horrendous casualties, was the catalyst behind the initial development of a wide range of weapons aimed at ending this impasse. Among the new weapons were the first unmanned air vehicles.

Trench warfare had come early to the land portion of this conflict, but the various national air arms began to face steadily mounting casualty rates. Although infantry could be replaced relatively quickly, trained combat pilots were always in short supply, and often, even the best of them perished. (Manfred Richthofen, Edward Mannock, James McCudden, Erich Lowenhardt, Georges Guynemer, Werner Voss, and Albert Ball were among the top aces of World War I, but none survived the conflict.) Drones were to come into service as military leaders began to realize the growing hazards associated with flying and the extreme danger in attacking certain targets (observation balloons in particular). In 1914, a British engineer tried to build a radio-controlled airplane, designed to reduce casualties over France. This project met with little success.

One of the first remotely piloted combat vehicles was designed near the end of the war. Known as the Kettering Bug after its designer, Charles Kettering, this was to be a flying bomb made from a reconfigured biplane.

The Kettering Bug measured just 6 feet across and 5 feet long, and was powered by a small two-stroke engine built by the Ford Motor Company. The aircraft had enough lift to carry a 250-pound warhead.



Kettering Bug

Source: U.S. Air Force

The bug was very rudimentary, since it depended on a great many prelaunch calculations to put it on course and on exact measurements of fuel so that the engine would cut out over the objective.

The design theory was sound, but too far ahead of the technology available in 1918 to exploit. The U.S. Army pushed ahead and later built about 50 of the planes. The war ended before they could be used in combat. Some 35 years later, this idea would be put to a more destructive use in the form of the German V-1 Buzz Bomb program.

A U.S. unmanned air vehicle built for the military resulted from a joint venture between the U.S. companies Sperry and Curtiss. Lawrence Sperry made unmanned flight viable with the development of the world's first automatic pilot (a gyrostabilizer), which was incorporated into a Curtiss biplane in 1913. Until this time, unmanned aircraft were highly erratic and undependable unless controlled via a tether that limited their overall range. The variant constructed by Curtiss/Sperry in 1917 was to be an aerial torpedo, but never saw service since the First World War ended before it could be used.

Despite these setbacks, research into unmanned flight continued between the world wars.

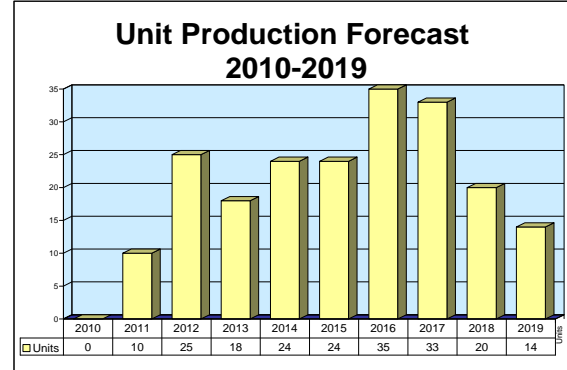
World War II. It is unlikely that Lawrence Sperry or Charles Kettering fully realized what they had started with their "flying torpedoes and bombs," nor the extensive use such systems would see in another conflict some 50 years later and halfway around the world.

During World War II, each side experimented with unmanned air vehicles. However, it was Germany that **Continued...**

Hellstar

Outlook

- Research continuing
- Original Hellstar program was terminated
- Israel will outfit some surface warships with a helicopter-like unmanned air vehicle
- U.S. and Israel showing interest in UAVs for resupply and medical evacuation missions
- A cargo-carrying unmanned helicopter will enter service with U.S. forces in Afghanistan during 2010



Orientation

Description. Vertical takeoff and landing (VTOL) mini remotely piloted vehicle.

Sponsor. Israeli Ministry of Defense through the Israel Defense Forces.

Status. The program has been placed on hold by Israel Aerospace Industries (IAI) due to the Israeli Navy's decision to forgo purchases of this system. In 1992, Hellstar flight testing continued despite the crash of the first prototype. The Hellstar was to be integrated with Israeli Navy surface combatants during the second half of the 1990s. In 1988, a land-based vertical takeoff and landing remotely piloted vehicle was under consideration by Mazlat. In late 1989, an additional program called Hellstar appeared, aimed at providing an

unmanned air vehicle system for naval vessels. The Hellstar could yet have land-based mission applications, and a parallel VTOL development program remains a possibility.

Total Produced. Production has not begun. Only two developmental models are known to have been completed.

Application. Remotely piloted vehicle for over-the-horizon battlefield/shipborne target identification, electronic warfare missions, and surveillance/reconnaissance.

Price Range. Each fully equipped Hellstar is expected to cost \$2 million to \$4.5 million.

Contractors

Prime

IAI Military Aircraft Group - MALAT Division	http://www.iai.co.il , Dpt 2711, Ben Gurion Int'l Airport, Tel Aviv, 70100 Israel, Tel: + 972 3 935 7349, Fax: + 972 3 935 7349, Prime
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Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800. Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Hellstar

Technical Data

Design Features. IAI sources have stated that the remotely piloted vehicle has a greater payload than the HH-65A Dolphin helicopters, and is equipped with two contra-rotating rotors, each 2 meters in diameter. The air vehicle is equipped with a forward-looking infrared

(FLIR) ball and a belly radome housing a radar with 360° coverage. The search radar is being developed by Elta Lantern, a subsidiary of IAI. The Hellstar can be deployed from vessels with a displacement of as little as 40 tons.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Length (fuselage)	3.3 m	10.83 ft
Rotor diameter	6.1 m	20 ft
Weight		
Payload (max)	205 kg	451 lb
Payload (typical)	160 kg	350 lb
Fuel load	409 kg	900 lb
Max TO	1,110 kg	2,442 lb
Performance		
Speed	60 kt	60 kt
Speed (max at sea level)	100 kt	100 kt
Ceiling (hover)	1,524 m	5,000 ft
Ceiling (operating)	3,049 m	10,000 ft
Range (at 5,000 ft)	732 km	400 nm
Endurance	4.5-6 hr	4.5-6 hr

Propulsion. Prototype Hellstar air vehicles were equipped with the original QH-50 270W (365-shp) Boeing T50-12 turboshaft engine. This has been replaced by the Rolls-Royce 350W 250-C20B turbo-shaft propulsion system.

Control & Guidance. The Hellstar is believed to be remotely operated via a command radio link and is equipped with a dual-channel multimode digital flight computer. The air vehicle's landing sensor system provides it with an all-weather day/night operating

capability. The air vehicle will be equipped with a surveillance radar and a FLIR sensor, in addition to a laser rangefinder/designator. The flight control system is being developed by MBT, a subsidiary of IAI.

Launcher Mode. The Hellstar is vertically launched from a surface ship's deck and lands in a similar fashion. The air vehicle will be equipped with an automatic takeoff/landing system developed by Elta. The air vehicle would be compatible with frigates, destroyers, and patrol craft.

Variants/Upgrades

Currently, only one Hellstar variant is being developed, although follow-ons are likely to appear after production commences. The company is also researching heavier, longer range UAVs such as the

IAI Hauler-LR. This UAV will possess an endurance capability of 48 hours at a height of 18,000 meters while carrying a large payload.

Program Review

Background. In May 1988, Mazlat officials revealed that the firm was considering the development of a vertical takeoff and landing air vehicle. The firm was looking for an air vehicle that could be easily maintained and operated by frontline soldiers and from small surface ships. Mazlat had stressed the need for commonality, and for a system smaller than a mini remotely piloted vehicle. In August 1989, the first photographs appeared of a new Israeli VTOL remotely

piloted vehicle called Hellstar (Heliborne Loitering System with Thermal-Imager and Radar). This system was expected to be used on Israeli naval vessels for over-the-horizon targeting and electronic warfare operations. The Hellstar uses two contra-rotating rotors, each 2 meters in diameter.

The Hellstar, which was to be employed by the Israeli Sa'ar 4 (Reshef) and Sa'ar 4 Improved (Aliya) classes of missile fast attack craft (FAC), as well as by the future

Hellstar

Sa'ar 5 missile corvettes, was intended for reconnaissance and target acquisition, identification, and designation roles. It was to act as a radar platform that would considerably enlarge the area the vessels could control, and allow the use of anti-ship missiles against targets beyond the ship's own radar horizon.

Israel Wants to Extend Surveillance Horizon of Naval Surface Combatants

Although the operational principle was not new (some surface vessels already carry a helicopter and anti-ship missiles), the Hellstar was to provide this capability to smaller FACs. The Israeli Aliyas are already fitted with a flight deck (they currently operate Bell Kiowa and Aerospatiale Dolphin helicopters), while the Reshefs may have had the aft 76mm turret removed to embark the Hellstar. The Hellstar is based on the U.S. GH-50 Dash anti-submarine drone, developed in the 1960s for use aboard frigates but subsequently abandoned (after some 2,000 had been built) because of then-insurmountable radio-control problems. The original GH-50 transmission, with counter-rotating two-blade rotors, is being used.

In 2004, IAI said it was working on a new VTOL unmanned air vehicle. This UAV is primarily for use on warships but could have land-based applications. No further information on this UAV was provided.

Unmanned Resupply. Israel is not the only nation studying the possible development of unmanned helicopters for resupply and medical evacuation (medevac) missions. The United States is also pursuing similar research.

The U.S. Marine Corps is leading an investigation into the use of an unmanned helicopter to perform resupply missions in Afghanistan. The U.S. Marines became interested in acquiring a cargo-hauling unmanned air vehicle due to the danger of resupplying isolated bases located in harsh terrain by road.

The Marines' request includes:

- the ability to deliver 10,000 pounds of cargo over a round-trip distance of 150 nautical miles within a 24-hour period.
- a minimum lift of 2,500 pounds of cargo in six hours is required.
- the ability to hover out of ground effect at a 12,000-15,000-foot density altitude
- and the capability to fly at 18,000-20,000 feet with a full cargo load.

The new cargo UAV must be able to operate autonomously beyond-line-of-sight and be controlled

remotely at the cargo delivery location, according to the Marine Corps announcement.

Bidders for this contract included Boeing's A160T Hummingbird, Lockheed Martin/Kaman's unmanned K-Max, the Mist Mobility Integrated Systems Technology Inc. CQ-10A SnowGoose UAV, and Northrop Grumman's Fire Scout. Only Boeing and the Lockheed Martin/Kaman team received demonstration contracts.

Kaman Aerospace won an \$864,000 contract from the U.S. Marine Corps in 2009. Lockheed Martin will integrate a beyond line-of-sight datalink and unmanned aerial system mission management system with Kaman's K-MAX.

Technical Data*

	A160	K-MAX
Length	10.7 m	12.73 m
Rotor Diameter	11.9 m	14.73 m
Weight, Takeoff	1,815 kg	2,948 kg
Weight, Payload	136 kg	2,721 kg
Speed	260 kmph	185 kmph
Altitude	91,40 m	4,572 m
Range	4,600 km	556 km
Endurance	20 hours	2.5 hours

**Information for UAVs is that available prior to modifications to meet U.S. Marine Corps requirements.*

Boeing, with its A160T Hummingbird, successfully completed a cargo delivery demonstration under a U.S. Marine Corps Warfighting Laboratory contract in March 2010. The A160T completed seven test flights during the demonstration.

The U.S. Marines could deploy a prototype UAV to perform resupply missions in Afghanistan in 2010. A production version might be available within two or three years, but it might take as long as five.

Air Vehicle Models. There are various VTOL unmanned air vehicles in development in Israel and elsewhere.

Hellstar. Israel worked on the Hellstar in the 1980s. The intention of this program was to provide a UAV for use on Israeli warships and perhaps certain ground units. Israel Aerospace Industries used a Gyrodyne QH-50 as the basis for the Hellstar. The development program was terminated after the first prototype was damaged in a hard landing.

The cancellation of this program did not end Israeli interest in VTOL UAVs or work by local defense firms on such systems.

Helivision. In 2002, Israel revealed that it was once again interested in outfitting the Israel Defense Forces with a remotely piloted helicopter (RPH) system. Instead of the Navy, Israel would arm its ground forces

Hellstar

with this autonomous helicopter to meet an emerging tactical UAV requirement.

The RPH is being developed by Steadicopter of Israel. The air vehicle is optimized for urban warfare, anti-terrorist operations, and search-and-rescue duties. Israel Aerospace Industries will provide the air vehicle's payload.

Steadicopter is designing two versions of this air vehicle. The military version will measure 1.5 meters in length and have a payload capacity of 9 kilograms. The other version, a multirole air vehicle, will be 2 meters long and have a payload capacity of 13.5 kilograms.

The air vehicle that could be procured by Israel is known as Helivision. The Helivision will have a maximum range of 100 kilometers and an endurance of up to eight hours. The air vehicle will be capable of speeds up to 50 kilometers per hour at an altitude of 3,000 meters. Total payload capacity of the Helivision will be 20 kilograms, and overall takeoff weight is expected to be 35 kilograms.

Per-unit cost of the Helivision air vehicle will be about \$125,000, depending on the electronic equipment installed.

Picador. Aeronautics Defense Systems is offering the Picador VTOL unmanned air vehicle.

<u>Technical Data</u>	
Length	6.58 m
Height	2.58 m
Width	2 m
Rotor Diameter	7.22 m
Weight, Maximum	720 kg
Weight, Payload	180 kg
Speed	203 kmph
Altitude	12,000 ft
Range	200 km
Endurance	5-8 hours

ADS flew a half-scale model in 2009. This UAV is based on the Dynali H2S kit helicopter. ADS owns a major stake the Belgian firm that designed this kit helicopter. The helicopter uses the Subaru EJ 25 2,500cc engine.

Steadicopter Black Eagle. Steadicopter of Israel has developed the Black Eagle 50 rotary UAV. The company began operations in 1999. The unveiling of the Black Eagle 50 UAV occurred at the 2009 Israel Defense International Army & Police Exhibition.

The Black Eagle 50 uses an 116cc water-cooled engine. This UAV was in its final stage of development in late 2009.

Technical Data

Length	2.3 m
Rotor Diameter	2 m
Weight, Maximum	35 kg
Weight, Payload	3 kg
Speed	126 kmph
Altitude	9,000 ft
Range, Datalink	10-150 km
Endurance	3 hours

In addition, the company is working on the Black Eagle 60. This air vehicle can carry a 10-kilogram payload for four hours.

V-STAR. Frontline Aerospace Inc has designed the V-STAR VTOL unmanned air vehicle. This UAV is intended to provide rapid, flexible logistical support for troops needing critical supplies at the front line.

	<u>V-STAR</u>	<u>V-STAR ER</u>
Length	21.5 ft	21.5 ft
Width	16.5 ft	24.5 ft
Weight, Maximum	2,360 lb	2,460 lb
Weight, Payload	400 lb	400 lb
Speed	400 kt	400 kt
Altitude	16,000 ft	35,000 ft
Range	2,650 nm	3,400 nm
Radius	1,325 nm	1,700 nm
Endurance	15 hours	24 hours

The V-STAR uses twin Rolls-Royce Model 250C20W turboshaft powerplant. This UAV can also carry air-to-surface weaponry to provide ground troops with support.

X-Hawk. Urban Aeronautics is offering the X-Hawk, a ducted-rotor unmanned air vehicle. This UAV has twin turboshaft engines. The X-Hawk is for civilian use. There is an option for this platform to have an onboard pilot.

X-Hawk – Technical Data

Length	8.1 m
Width	3.4 m
Height	3.5 m
Rotor Diameter	2.5 m
Weight, Maximum	3,042 kg
Weight, Payload	863 kg
Weight, Fuel	817 kg
Speed	110 kt
Altitude	12,000 ft
Endurance	2 hours

Another version of this UAV is the AirMule. This VTOL unmanned air vehicle is designed to transport cargo and perform medevac missions. This UAV successfully completed the first phase of flight testing in by January 2010. The AirMule uses a Turbomeca Arriell 730 hp turboshaft engine.

Urban Aeronautics is privately funding the AirMule program but is looking for partners. The company wants to put this UAS into production by 2014.

AirMule – Technical Data

Length	5.9 m
Width	2.15 m
Height	1.8 m
Rotor Diameter	1.80 m
Weight, Maximum	1,089 kg
Weight, Payload	247 kg
Weight, Fuel	247 kg
Speed	180 kmph
Altitude	12,000 ft
Endurance	2-4 hours

Related News

Kaman Aims to Provide Unmanned Helicopter to U.S. Marine Corps – The U.S. Marine Corps is looking to acquire an unmanned helicopter to perform battlefield resupply missions to remote bases. Kaman Aerospace is competing for this contract against competitors such as Sikorsky Aircraft and Boeing. Kaman is months ahead of its rivals. Now, an unmanned version of the K-Max will deploy to Afghanistan later this year. If its performance is good, Kaman could win a production contract.

Kaman is teamed with Lockheed Martin. The Marine Corps Systems Command put out a Request for Proposals for an unmanned resupply helicopter in 2009. Kaman and Lockheed Martin won a \$860,000 contract to demonstrate K-Max's ability. Kaman later received another \$3.2 million development contract. There are three K-Max helicopters available for immediate conversion. Production of an unmanned resupply helicopter may not occur in any significant number. The K-Max concluded a successful demonstration for the Marines in February at a Utah testing site.

Boeing is offering a version of its A160 Hummingbird unmanned helicopter to the Marine Corps. The A160 is lighter and faster than the K-Max. Boeing received \$500,000 to demonstrate the Hummingbird's capability. Sikorsky's bid is based on a modified version of its Black Hawk transport helicopter. (*Hartford Business Journal*, 3/10)

VTOL UAVs to Meet Niche Missions for U.S. Army – The U.S. Army will purchase vertical takeoff and landing unmanned air vehicles, but only to meet niche missions, according to the U.S. Army's unmanned aircraft systems program office. This statement comes after the U.S. Army's cancellation of the Fire Scout VTOL UAV. Niche missions are those that require a very special capability. The U.S. Army said the vast majority of its unmanned aircraft will be fixed-wing systems.

The Fire Scout was to meet the U.S. Army's Class IV need under the former Future Combat Systems program. The U.S. Army terminated the Fire Scout saying it no longer met mission requirements. The other U.S. Army VTOL UAV is to meet the Class I need. Class I is a micro-air vehicle that can be carried in a soldier's backpack. This UAV is to provide situational awareness for small units. Now, the U.S. Army is considering the development of an enhanced Class I UAV. This enhanced UAV could take on some of the missions Fire Scout was once to perform.

The U.S. Army plans to field the Class I UAV with nine combat brigades from 2011 to 2013. Deployment to all brigade combat teams is scheduled for 2025.

The U.S. Army's Special Operations Command is voicing enthusiasm for unmanned helicopters. The Special Operations Command is using the Boeing's A160 Hummingbird in Afghanistan. Besides reconnaissance missions, the A160 is being used for duties such as performing psychological and resupply operations. (*National Defense*, 2/10)

Israel and Russia Discuss New UAV Deal – Russia is negotiating with Israel concerning a possible purchase of unmanned air vehicles. The Russian Federal Security Service (FSB) could purchase UAVs from Israeli company Aeronautics Defense Systems. The Russian Ministry of Defense is already acquiring Israeli-built UAVs. The FSB could purchase at least five lightweight Orbiter mini-UAVs to perform border patrol missions. This deal is potentially worth several million dollars. Critics say the Israeli systems are not needed because Russian-made UAVs can meet the requirements of the FSB. Founded in 2004, Zala Aero produces UAVs in Izhevsk, the capital city of

Hellstar

Russia's Udmurt Republic. The company won a tender to supply Turkmenistan's Interior Ministry with UAVs, defeating bids by British and Israeli companies. (Press TV, 1/10)

Urban Aeronautics' AirMule Completes First Phase of Flight Testing – The AirMule (formerly MULE), a single-engine, VTOL cargo and medevac UAS developed by Urban Aeronautics Ltd., has successfully completed the first phase of its flight testing. This phase consisted of autonomous hovers with the vehicle's fly-by-wire control system providing the necessary auto-stabilization in all three rotational axes of the vehicle (pitch, roll, and yaw).

Control of the vehicle is accomplished through a company-developed four-channel, redundant flight control system that relies almost entirely on inertial measurements augmented by GPS for translational position and velocity readings. Height above ground is measured by two laser altimeters. The vehicle's 460 channels of telemetry provide real-time data to the ground-based operators, enabling them to monitor the operation of the Turbomeca Arriell 730-horsepower turboshaft engine as well as its sub-systems. These include the three company-developed gearboxes, the two main lift rotors with their hydraulic pitch change mechanism, and three uplink and downlink communication channels.

Results from the tests have confirmed the company's predictions regarding power required for hover. The present hover height of approximately 60 centimeters (2 ft) is just outside of ground effect for this configuration. Based on an initial assessment of the vehicle's available control power under actual conditions, it has been demonstrated that the AirMule's vane control system used for roll and yaw control is already generating in excess of 2.0 radians/sec² of roll acceleration. This figure is expected to double in the future as additional improvements are implemented. The significance of these results is the vehicle's ability to perform hover with very high precision in gusty wind conditions (currently estimated and confirmed by the recent hover tests at 50 knots for the fully developed product).

Based on the success of these initial hover tests, the vehicle is now being readied for the next phase. This phase will include vehicle position stabilization in X, Y, and height above ground. During this phase, the safety wires that are now connected to the tarmac will be removed. (Urban Aeronautics, 1/10)

Israeli Firm to Unveil New Unmanned Helicopter – Steadicopter, an Israeli aerospace firm, has developed a new unmanned helicopter. The company will unveil its Black Eagle 50 vertical takeoff and landing unmanned air vehicle at the 3rd Israel Defense International Army and Police Exhibition in Tel Aviv. The Black Eagle 50 can observe in places inaccessible by ordinary UAVs, according to the company. Furthermore, the UAV can take off and land from most terrain. The Black Eagle 50 is operated by a two-person crew. (Israel National News, 10/09)

U.S. SOCOM to Purchase More A160T UAVs – The U.S. Special Operations Command will increase the number of A160T Hummingbird unmanned air vehicles it owns. SOCOM will procure up to 20 A160Ts, now designated YMQ-18A. Procurement will take place from FY12 to FY17. SOCOM purchased eight to 10 A160T in late 2008.

SOCOM will deploy three of its eight existing A160Ts in 2010 to an "undisclosed location" overseas. The UAVs will carry the FORESTER foliage-penetrating radar and other surveillance packages. In addition, some of the A160Ts will be armed. The A160T is a vertical takeoff and landing UAV that uses variable-speed rotor technology.

A160T program officials expect this UAV to compete with the Northrop Grumman Fire Scout. The A160T is also a candidate to meet a new U.S. Marine Corps requirement, the officials said. The Marines want to deploy a cargo-hauling unmanned aircraft to Iraq or Afghanistan in 2010. (Flight International, 5/09)

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Funding

No specific Hellstar funding allocations have been released by the Israeli Ministry of Defense.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1980s	Land-based VTOL program under way in Israel
Aug	1989	Hellstar program announced
	1990-92(a)	Flight testing under way
	1993	Israeli Navy decides against Hellstar purchase Hellstar program placed on hold
	2004	IAI announces it is working on new VTOL UAV
	2006	Israeli forces invade Lebanon
	2009	Israel and India research VTOL UAV
	2010	U.S. conducts demonstrations of cargo hauling UAV
	2010(a)	Cargo hauling UAV deploys to Afghanistan with U.S. troops
	2012-2013(a)	Israel deploys new maritime unmanned aircraft

(a) Estimate

Worldwide Distribution/Inventories

User Countries. No initial operators have been identified.

Forecast Rationale

The United States and Israel operate the largest unmanned aircraft fleets in the world. Each nation is involved in combat against irregular forces, including terrorist groups, in both urban and non-urban settings. This fighting fuels demand for a range of unmanned air vehicles, primarily to perform reconnaissance missions. However, the duties assigned to these unmanned aircraft are steadily expanding.

Israel has long been at the forefront of the development and employment of UAVs. These systems were heavily used in the Second Lebanon War (2006), as well as during Operation Cast Lead (the 2009 incursion into the Gaza Strip). Even after major combat operations cease, unmanned air vehicles remain in action, keeping a close eye on Palestinian territory and sections of southern Lebanon.

Israel operates few vertical takeoff and landing unmanned air vehicles. A previous effort to acquire a VTOL UAV was canceled before production started. Still, Israel never lost interest in this type of system. Battlefield experience is said to be pushing up Israeli interest in VUAVs. Various Israeli defense firms are working on new designs.

Eventually, Israel will deploy a new unmanned air vehicle on its major naval surface combatants. Unmanned aircraft are playing an ever increasing role in

Israeli military operations. Extending the surveillance horizon of its surface combatants remains a goal of the Israeli Navy, but the service's budget is tight. The small size of the Israeli Navy has made its equipment very expensive. This could make the development of any VUAV prohibitively expensive if it is not undertaken with a partner. A joint effort with Israel's ground forces may be the only way to move forward with this program. When Israel will procure a VUAV is uncertain. No firm plans for a specific procurement effort have been announced.

Another application of interest to Israel and the United States is resupply and medical evacuation. U.S. troops operating in Afghanistan will receive a resupply UAV in 2010. Demonstrations in Afghanistan will determine if a production contract will follow. Overall number of resupply UAVs the U.S. procures will probably be low. Israel could be first to deploy a medevac unmanned helicopter.

The U.S. Special Operations Command is already operating its own small fleet of unmanned helicopters. Among these UAVs is the A160T Hummingbird. This UAV performs reconnaissance missions but also carries a large air-to-surface arsenal. Further purchases are planned. This version is different from the one Boeing is offering to the Pentagon to meet its cargo-hauling requirement.

Hellstar

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Boeing Defense, Space & Security												
A160T <> Hummingbird <> United States												
	8	0	0	3	3	4	3	4	3	0	0	20
Hummingbird GCS <> United States												
	5	0	0	2	2	2	2	2	2	0	0	12
Hummingbird Payload <> United States												
	8	0	0	3	3	4	3	4	3	0	0	20
Subtotal	21	0	0	8	8	10	8	10	8	0	0	52
MFR Not Selected												
Cargo UAV <> United States												
	0	0	5	5	0	0	0	5	5	5	5	30
Cargo UAV GCS <> United States												
	0	0	5	5	0	0	0	5	5	5	5	30
Israel Naval GCS <> Israel												
	0	0	0	1	1	2	2	1	1	0	0	8
Israel Naval Payload <> Israel												
	0	0	0	3	5	7	7	7	7	3	0	39
Israeli Naval VUAV <> Israel												
	0	0	0	3	4	5	7	7	7	7	4	44
Subtotal	0	0	10	17	10	14	16	25	25	20	14	151
Total	21	0	10	25	18	24	24	35	33	20	14	203

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