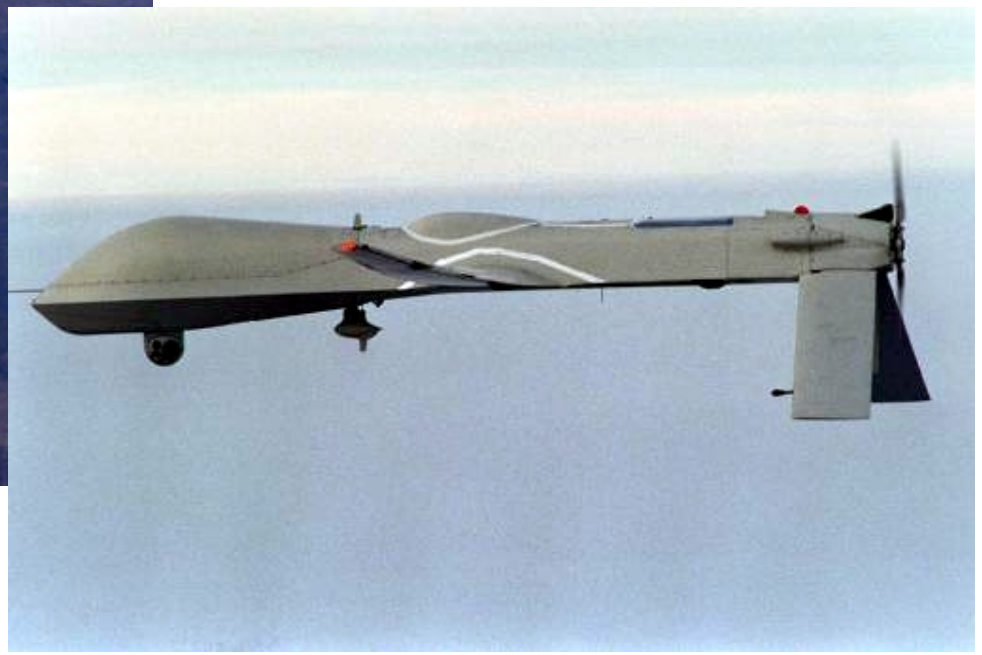
Unmanned Aerial Vehicles (UAV)
A Supplement to Battlefield Packages

June 06, 2000



Contract Number: SPO700-98-D-4002 D.O. 0003
Information Superiority and Sensors and C4/IO and ISR Analysis
IATAC TAT 98-04
June 2000
3190 Fairview Park Drive
Falls Church, VA 22042

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UNCLASSIFIED

Report Documentation Page

Report Date	Report Type	Dates Covered (from... to)
06JUN2000	N/A	-

Title and Subtitle Unmanned Aerial Vehicles (UAV) A Supplement to Battlefield Packages	**Contract Number**
	Grant Number
	Program Element Number
Author(s)	**Project Number**
	Task Number
	Work Unit Number
Performing Organization Name(s) and Address(es) IATAC Information Assurance Technology Analysis Center 3190 Fairview Park Drive Falls Church, VA 22042	**Performing Organization Report Number**
Sponsoring/Monitoring Agency Name(s) and Address(es) Defense Technical Information Center DTIC-IA 8725 John J. Kingman Rd., Suite 0944 Ft. Belvoir, VA 22060-6218	**Sponsor/Monitor's Acronym(s)**
	Sponsor/Monitor's Report Number(s)

Distribution/Availability Statement
Approved for public release, distribution unlimited

Supplementary Notes
Per conversation with Abe Usher, (IATAC), performing organization is Booz Allen & Hamilton., The original document contains color images.

Abstract

Subject Terms
IATAC COLLECTION

Report Classification unclassified	**Classification of this page** unclassified
Classification of Abstract unclassified	**Limitation of Abstract** SAR

Number of Pages
5

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 074-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	June 06, 2000	Unmanned Aerial Vehicles (UAV) – June 06,2000

4. TITLE AND SUBTITLE
Unmanned Aerial Vehicles (UAV)
A Supplement to Battlefield Packages

5. FUNDING NUMBERS

6. AUTHOR(S)

Information Assurance Technology Analysis Center

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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Information Assurance Technology Analysis Center
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8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Defense Technical Information Center
DTIC-IA
8725 John J. Kingman Rd, Suite 944
Ft. Belvoir, VA 22060

CNO/OPNAV N812
2000 Navy Pentagon
Washington, DC 20350-2000

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Distribution: Approved for public release. Distribution is unlimited.

12b. DISTRIBUTION CODE
A

13. ABSTRACT ***(Maximum 200 Words)***

Unmanned Aerial Vehicles (UAV) are projected to have an ever-increasing role in power projection, intelligence, surveillance, and reconnaissance. Missions include data and imagery collection and transfer, over-the-horizon-targeting, and communications relay. This matrix identifies the most popular vehicles expected to enter production and provides a capability comparison for each vehicle.

14. SUBJECT TERMS
UAV DoD

15. NUMBER OF PAGES
3

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	None

	Navy UAV Programs						RQ-1A Predator[2,8]	RQ-4A Global Hawk[3,4,5]	Miniature Air Vehicle (MAV)[9,10,11]	Unmanned Combat Air Vehicles (UCAV)[12,13]	Tactical Unmanned Aerial Vehicle (TUAV)[14] (Army)
	Pioneer[1,3]	VTUAV[1,6]	Multi-role Endurance UAV (MRE UAV)[1,16]	Medium Range UAV (MR UAV)[1]	Small UAVs						
					Exdrone[1,7]	Pointer[1]					
Altitude	15,000	Threshold: 15,000 ft. Objective: 20,000 ft.	Sufficient to cover spectrum of targets	40,000 ft.	10,000 ft.	3,000 ft.	40,000 ft.	65,000+ ft.	Low altitude	Sufficient to cover spectrum of targets	15,000 ft.
Endurance	5 to 6.5 hrs.		Sufficient to cover spectrum of targets		2.5 hrs.	1 hr. NiC 2.2 hr. Li	40 hrs.	42 hrs.	12 min – 5.4 hrs.	Sufficient to cover spectrum of targets	5 hrs.
Radius of Action	Nominal: 87 nm./160 km. Max: 101 nm. /185 km.	Threshold: 110 nm. Objective: 250 nm.	Sufficient to cover spectrum of targets	Range: 700 nm.	30 nm.		500 nm.	3,000 nm./5,556 km.	LOS	Sufficient to cover spectrum of targets	50 km/31 nm.
Speed (/hr)	Max: 110 kts/176 kts Cruise: 85 kts/120 km Loiter: 65 kts/95 km Max End: 65 kts/95 km	Threshold: 200 kts. Objective: 300 kts.	Sufficient to cover spectrum of targets	Mach: 0.83	87 kts.	Cruise: 13 kts. Max: 43 kts.	Cruise: 65 kts. Dash: 120 kts.	Cruise: 345 kts./639 km.	0-100 mph	Sufficient to cover spectrum of targets	Max: 228 km/123 kts/hr Cruise: 130 km/70 kts/hr Loiter: 130 km/70 kts/hr
Propulsion	26 hp./2 stroke/2 cyl. 100 octane low lead AvGas			Teledyne CAE F408-CA-400 Turbofan	Quadra Q100s 8.5 hp. Gasoline	Astro 15 Electric NiC or Li batteries 300 w	4 cyl. Rotax engine 100 octane AvGas	Allison AE3007H Turbofan	Electric/propeller	Sufficient to cover spectrum of targets	Rotary engine/pusher propeller
Weight	Empty: 276 lbs/125 kg Fuel Cap: 65 lbs/30 kg Sensor Payload: 75 lbs/34 kg Max Takeoff: 416 lbs/189 kg	Empty: 1457 lbs. Max: 2550 lbs. Payload: 200 lbs.(T); 300 lbs. (O)		2160 lbs.	89 lbs. Payload: 24.9 lbs. Fuel Cap.: 16.1 lbs.	9.1 lbs. Payload: 2 lbs. Fuel Cap.: 2.2 lbs.	Empty: 773 lbs/351 kg Fuel Cap: 650 lbs. Max Takeoff: 2360 lbs.	Empty: 9,200 lbs. Payload: 1,960 lbs. Max Takeoff: 25,600 lbs.	65 gr. - 1457 gr./ 0.14 lbs. - 3.2 lbs.		Max: 147.6 kg/328 lbs. Payload: 27.3 kg/60 lbs. Fuel Cap: 23.1 kg/50.7 lbs.
Dimension	Wing Span: 5.2 m Wing Area: 2.8m2 Fuselage Length: 2.9m Fuselage width: .43m Wheel Base: 1.7m Propeller Diameter .74m	Rotor Disk Area: 594.5 sq. ft. Horizontal Tail Area: 3.1 sq. ft. Vertical Tail Area: 4.7 sq. ft.		Length: 18.33 ft. Wingspan: 10.5 ft. Height: 2.8 ft.	Length: 5.25 ft Wingspan: 8.2 ft.	Length: 6ft. Wingspan: 8 ft.	Length: 26.7 ft./8.1 m Width: 3.7 ft./1.1 m Wingspan: 48.7 ft./14.8m Fuselage Length: 26.7 ft./98.1m Fuselage Width: 3.7 ft./1.1m	Length: 44.4 ft. Height: 15.2 ft. Wingspan: 116.2 ft.	6 in. - 8 in.		Length: 3.4 m/11 ft. Wingspan: 3.9 m/12.8 ft.
Data Link	C-Band and UHF Tadiran – MKD-200 - MKD-400 Versatron-DS-12	UHF VHF HF Comms Relay CDL/TCDL	Comms relay. TCDL				UHF C-Band Ku-Band Data Link CDL/TCDL	Ku Band UHF X Band SATCOM CDL/TCDL 1.5-5O Mbps			TCDL VHF/UHF/SINCGARS/EPLRS Comms Relay
Sensors	Visible Light IR	EO/IR SAR SIGINT COMINT MTI Laser Desig. AEW EA/EP	ISR C4I SEAD ASW ASUW Potentially Lethal	EO/IR SAR MMW ATARS			E0 - NIIRS 7 IR - NIIRS 5 SAR MTI SIGINT	EO - NIIRS 6.5 IR - NIIRS 5.5 MASINT SIGINT SAR 1.0/0.3m Resolution MTI 20-200km/10m Range Resolution 40,000 sq.m/day 1900 Spot Tgts./day <20m CEP 200km Range	Missions: Imaging Targeting Bio-Chemical Sensing Quiet, perch and stare capability		EO IR SAR MTI
Miscellaneous	Deploy: LPDs/Landbased Launch: RATO/Runway/Pneumatic Recovery: Net/Runway/Hook Operation: Remote control or pre programmed	Contract awarded 09 February 2000	Organic sea-based UAV	NAVAIR reinstated partial program 07 July 1995 One vehicle available	Structure: Foam-board, Fiberglass Nav: GPS Guidance: Preprogrammed, Autonomous, Direct Control	Structure: Kevlar Nav: GPS Guidance: Preprogrammed, Autonomous, Direct Control	3000 X 100 ft. runway No shipboard compatibility. Requires host nation support to forward deploy. Long-dwell, single target. Not optimized for wide area reconnaissance.	Self deployable, C-141/C-17/C-5. No shipboard compatibility. Long-dwell, single target or wide area reconnaissance.	Miniaturizing sensing and comms capabilities plus withstanding military environment poses technical challenge	Contracted for an Advanced Technology Demonstration (ATD). For the post-2010 force structure.	
Dates[15,16]	FY05: Expected termination of Pioneer program	FY03: VTUAV IOC	FY10+	FY06-14: Field MR UAV	FY06-14: Field Small UAV	FY06-14: Field Small UAV	FY01: IOC/FOC	FY00-01: Production Contract Award	FY15-25: Field MAV	FY15-25: Field UCAV	FY01+: Production Contract Award
Manufacturer	Pioneer UAV, Inc.	Northrop Grumman Corp. Ryan Aeronautical Center	Four Risk Assessment Contracts announced April 10, 2000: The Boeing Company General Dynamics Info. Systems Lockheed Martin Aero. Co. Northrop Grumman Corp.	Ryan Aeronautical	BAI Aerosystems, Inc.	Aero Vironment	General Atomics Aeronautical Systems, Inc.	Teledyne Ryan Aeronautical, Inc.	Aero Vironment Sanders Lutronix Microcraft	Conducting a limited competition procurement with: Lockheed Martin Northrop Grumman Corp. Raytheon Co. The Boeing Co.	AAI Corporation

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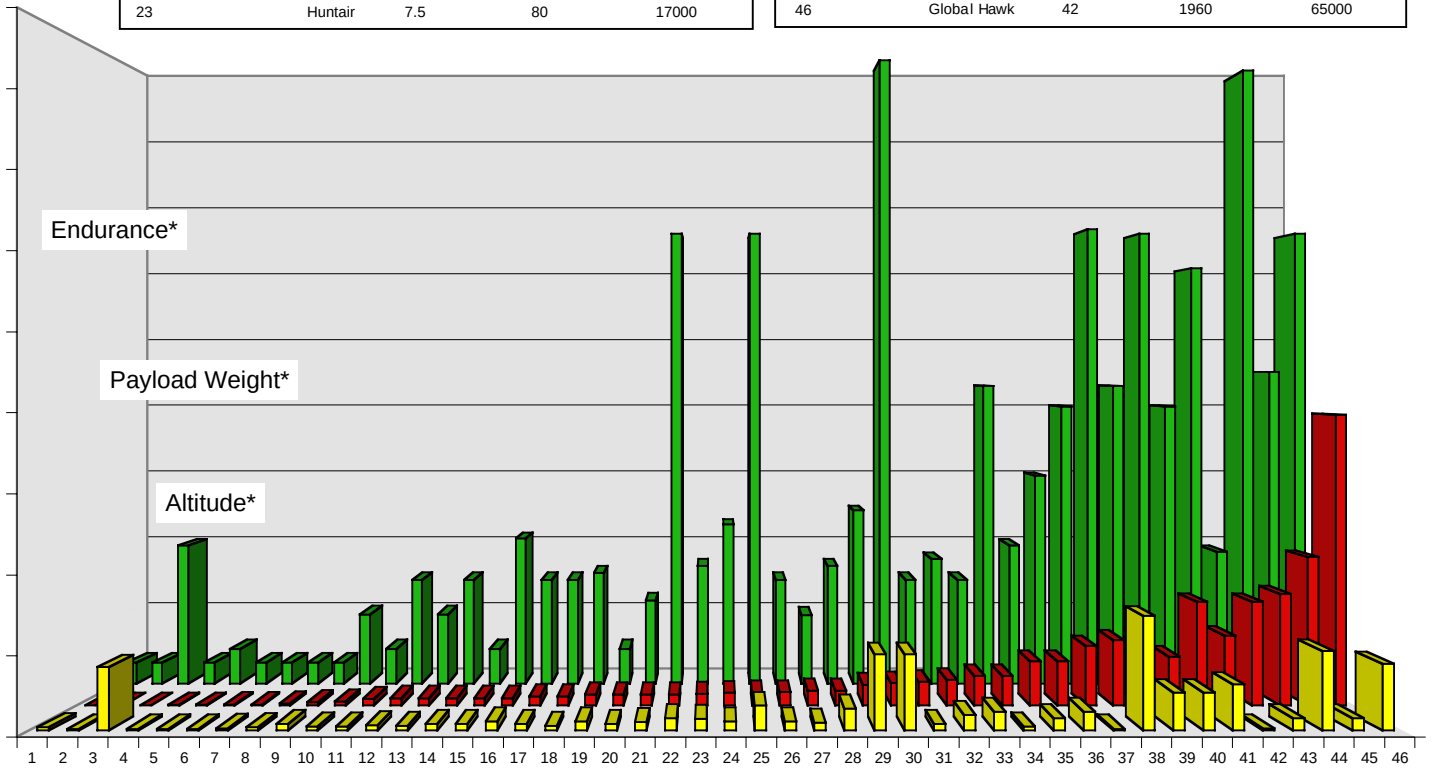
17- TUAV Overview Brief, 06 October 1999; http://www.fas.org/irp/program/collect/docs/y2tuav/sld001.htm

Unmanned Aerial Vehicle Endurance, Payload Weight, and Altitude Capability

#	Unmanned Aerial Vehicle (Name)	Endurance (Hours)	Payload Weight (Pounds)	Altitude Capability (Feet)
1	AV Pointer Micro Blimp	2	1.5	3000
2	AV Pointer	1	2	3000
3	Aerosonde	40	2.2	20000
4	H-7B	1	3	3000
5	XAP	1	4	5000
6	H-7H	1	5	3000
7	Javelin	1.5	6	3000
8	H-7F	2	12	3000
9	Tern	4	22	3000
10	Exdrone	2.5	25	10000
11	Cypher	2.5	45	5000
12	Freewing	3.5	50	15000
13	Seabat	3	50	10000
14	Shadow 200	4	50	15000
15	Truck	4	50	5000
16	Prowler	6	50	21000
17	MK-105 Flash	4	60	15000
18	MK-106C HIT	3	60	15000
19	STM-5B	6	75	16000
20	Porter	4	75	5000
21	Pioneer	5.5	75	12000
22	Raptor	8	75	65000
23	Huntair	7.5	80	17000

#	Unmanned Aerial Vehicle (Name)	Endurance (Hours)	Payload Weight (Pounds)	Altitude Capability (Feet)
24	Spectre II	6	85	23000
25	Pathfinder	16	88	65000
26	A24-2	6	90	15000
27	SASS Lite Blimp	5	100	9850
28	Shadow 600	14	100	17000
29	Gnat 750	48	140	25000
30	Helios	48	150	90000
31	Outrider	4	160	15000
32	Skyeye	10	175	18000
33	Hunter	12	200	15000
34	Model 324	2.5	200	43000
35	Eagle Eye	8	300	20000
36	Mode 410	12	300	30000
37	Model 350	1	400	40000
38	Perseus B	72	441	65620
39	Altus I	24	330	43000
40	Altus II	24	330	65000
41	Predator	29	700	40000
42	BQM-34	1.25	470	60000
43	Chiron	8	700	19000
44	Theseus	50	750	88500
45	DarkStar	8	1000	45000
46	Global Hawk	42	1960	65000



*Within Categories to Scale
Across Categories Not-to-Scale

5/27/99