

AMR UAV DIRECTORY 2011



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With Asia-Pacific's Unmanned Aerial Vehicle (UAV) ranks swelling, thanks to a combination of international acquisitions as well as an increasingly vigorous and innovative domestic production and development base, it is the right time to begin AMR's first annual Directory of UAV activity in the region. It addresses both in service systems, ongoing procurement programmes and research and development efforts. Some countries have not yet begun to deploy UAVs whereas others, notably China is sponsoring the development of a myriad of different and competing designs although few are yet to see large scale service while other still notably Singapore have plans developed over time that are being steadily and coherently implemented.

The UAV Directory has been researched using a range of resources notably AMR correspondents, industry experts and serving military personnel throughout the region as well as open sources.

AUSTRALIA

■ FIELDDED

Heron, IAI; Project Nankeen lease via MacDonald Dettwiler extended to end 2012, supporting Army and RAAF units from Kandahar which began in Jan 2010

Scan Eagle, Isitu/Boeing; Interim Tier 2 type requirement until Shadow 200 fielded.

Deployed Iraq 2006-8 and in Afghanistan since 2007 where it has logged over 25,000 operational flight hours by July 2011.

Skylark I, Elbit Systems; Eight systems ordered in Nov 2005 onwards with 20 STA Reg. deployed to E Timor and Iraq, further orders subsequently

Aerosonde III, AAI; Four Aerosondes sent to the Solomon Islands on Operation Anode with Army's 131 STA Battery

Avatar, Condarra; 18 UAVs acquired since 2001 deployed to E. Timor with ADF SF in 2003, status unknown

■ TRIALS AND DEVELOPMENT

I-View 250, IAI; Original JP129 Phase 2 A\$145m contract in 2006 awarded to Boeing Australia as prime with IAI I-View 250 UAV cancelled in Sept 2008

Maritime Ranges Sensor Delivery System, Mincham Aviation; Able to deploy sonobuoys 15nm in trials with RAN as of late 2010



Heron 1, IAI; Six week, A\$5.5m trial with Border Protection Command May-June 2008 with 80 hours flying in maritime surveillance trial equipped with ELTA 2022 multimode radar

Aqua Puma, AeroVironment; Naval trials in early 2007

RQ-7B Shadow 200, AAI; TUAV in US service selected under JP129 Phase 2 and requested from US DCSA in May 2011, with Australian decision in second half of 2011

RQ-8A Fire Scout, Northrop Grumman; Company believes it has interest

RQ-4 Global Hawk, Northrop Grumman; Flew non-stop to Australia in 2001 and took part in joint exercise Tandem Thrust. Planned to acquire the UAV as part of its participation in BAMS project but dropped out in 2009 although options remain for maritime and littoral surveillance from 2016

■ **NOTES:** TUAV requirement in JP129 Phase 4 with IOC in 2013-15. Unmanned aspect of Air 7000, known as 1B for a HALE maritime

UAV deferred and involvement in US BAMS programme cancelled in March 2009 and will receive government consideration again in 2016. In June, Northrop Grumman and Australia's DoD signed a Global Supply Chain agreement to aid Australian companies becoming supply partners.

CHINA

■ FIELDDED

BZK-005, Beijing University of Aeronautics and Astronautics; MALE UAV thought to have been in limited service since 2009

Pterodactyl 1/Yilong, AVIC; Predator-like MALE with 400km range first seen in 2008 with initial development completed in 2009 and production beginning during 2010 and can be equipped with AR-1 missiles

W-30/W-50 series, NRIST; Sometimes called PW-1 and entered service with the People's Liberation Army during 2005, radius of 100km. Later PW-2 version has longer range

ASN206/7, Xian ASN Technology; In serv-



ice with PLA

RMAX, Yamaha Motor Company; Nine systems procured in 2001 for paramilitary use
ASN-15, Xian ASN Technology; Hand launched UAV in 2000 largely used for test and proof of concept

ASN-104/5B, Xian ASN Technology; In service with PLA

ASN-206/207, Xian ASN Technology; Developed from mid 1990s, range of 150km, ASN-207 first seen publicly in 2002, in limited service

ASN-209, Xian ASN Technologies; Twin-boom pusher design called Silver Eagle in PLAN service, reported to be tested by PLA as comms relay in June 2011

I-Z, Z-3, Z-2, NRIST; Rotary wing design some military and paramilitary use from early 2000s

Harpy, IAI; Sold to China in 1994, When China returned the Harpy for maintenance, US concerns over possibility of upgrade to Harop standard, saw Israel return the UAV in 2005

■ TRIALS AND DEVELOPMENT

CH-3, CASIC; MALE 12 hour endurance, canard design 108nm radius in advanced development, first seen in public in 2008, reported to be fitted with FT-5 small PGMS. Links to requirements in Brunei and Cambodia

WJ-600, CASIC; Global Hawk-like design for maritime surveillance, turbo-jet powered, options for air to surface engagement, in early development

Long Haul Eagle, AVIC; Another Global Hawk like design, status unknown

ASN-229A, Xian ASN Technology; 20hr endurance, armed UAV, in testing phase could enter service in 2011

ASN-213, Xian ASN Technology; 5Kg design with in-flight morphing design first seen in 2008

Night Eagle, AVIC; Hand launched, similar to Aerosonde

Whirlwind Scout, AVIC; Compact VTOL ducted fan design

U8E, AVIC; Lightweight VTOL design shown at Singapore Airshow 2010

SL-200, CASC; Armed HALE, described as a stealthy design

CH-802, CASIC; Hand launched similar to Pointer

V750, Qingdao Haili Helicopter Manufacturing Co; Rotary wing UAV

Tian Yi-3, LOEC; High speed HALE

Warrior Eagle, AVIC; Only sketches seen publicly and may utilise a morphing

wing design

Soarhawk, Sunward; Described as similar to piston engined ADCOM SAT-400, status unknown

DUF-2, BUAA; Hand launched SUAV

Wing Long, AVIC; Completed flight testing in Oct 2008, 20 hour endurance

Anjian/Darksword, Shenyang Aircraft Co.; UCAV in early development

■ **NOTES:** Images of Global-Hawk type design seen a runway in Google Earth pics at Chendghu Aircraft Corporation No.132 factory. Chinese Naval UAV, possibly ASN209 Silver Eagle filmed by Japanese Maritime Self-Defense Force aircraft surveilling a 11 ship strong PLAN fleet in eastern Philippine Sea while it was returning from a gunnery exercise in June 2011

INDIA

■ FIELDLED

Searcher I & II, IAI; India's Army and Navy are understood to have acquired 18 and possibly as many as 50-70 UAVs

Lakshya, DRDO/ADE & HAL; High speed reusable drone with 100 now in service. Israel pulled out of Lakshya buy in 2005

Heron I/II, IAI; IAF order in 2002 for four UAVs. Navy ordered 12 in 2005 and operates the UAVs in two mixed units alongside its Searcher UAVs. Potential requirement for 50 UAVs

Harpy, IAI; 30 in service delivered from 2005



The Nishant TUAV has been developed by the DRDO and ARDE since 1990 with 12 of the UAVs being ordered in 2005. Four have been delivered so far with two of them crashing in April 2010 © AJB



Northrop Grumman's MQ-4C BAMS UAV was reported to have been submitted in response to an Indian Navy RFI for a maritime HALE UAV issued in October 2010 © Northrop Grumman

Harop/Harpy II, IAI; 10 UAV/Loitering Munition ordered by IAF in 2009 in \$100m deal with video datalink system. Deliveries start in 2011

■ TRIALS AND DEVELOPMENT

Rustom 1, DRDO/ARDE; First successful test flight in Oct. 2010 after prototype crashed in November 2009, 12-15hour endurance, airframe built by Zephyr Aerospace. Due to begin series production in 2012-13

Rustom HALE, DRDO/ARDE; MALE UAV in development for tri-service customers, also precursor for UCAV development prototype in 2014-15, 12-15 hour endurance and 45kg payload

Nishant, DRDO/ARDE; Development began in 1990 trial completed in Feb. 2011. 12 Nishants ordered in 2005 with four delivered so far and two crashing in April 2010. The balance due in 2013-14

Kapothaka, DRDO/ARDE; Mini-UAV to test ISR as well as launch and recovery concepts

Pawan, DRDO/ARDE; SUAV in development

Gagan, DRDO/ARDE; TUAV in development
Global Hawk, Northrop Grumman; Listed India as a potential customer at Paris Air show 2011 in maritime and overland role

UCAV, N/A; IAF issued RFI in mid 2010
RQ-16B T-Hawk, Honeywell Aerospace; Demonstrated at the Counter Terrorism and Jungle Warfare College at Kanker in Chattisgarh in 2010

'HALE' UAV, N/A; IN HALE RFI issued October 2010. NG reported to have responded with its MQ-4C BAMS which could operate with P-8I Poseidon

■ **NOTES:** Focus expanded in past two years to explore procurement of Mini- and Small UAVS with an Army global RFI issued in early 2011 with 80-100 required. Army has a requirement for 1500-1800 UAVs of all types

from various sources. AAI reported to have recently demonstrated T-Hawk UAV to Ministry of Homeland Affairs at IGI airport. Four Searcher Mk II UAVs deployed to Tezpur and Chabua. Army Aviation bases in Assam.

INDONESIA

■ FIELDDED

IFox AT1, CAC/EADS; Four UAVs with a fixed wing design fielded with Armed Forces Strategic Intelligence Agency and Air Force in Bandung in early 2000s. Contract valued at \$10m and issues over non-delivery of rotary wing UAVs. UAVs withdrawn from service in 2006

SS-5, PT Wesco Aerospace; one or more systems reported to be deployed to Aceh in 2005

Aerosonde, AAI; Deployed with paramilitary and Police forces

■ TRIALS AND DEVELOPMENT

Sriti, Agency for the Assessment and

Application of Technology; 10km range tactical UAV using a flying wing design

ALAP, Agency for the Assessment and Application of Technology; 25kg, 50km range UAV

'TUAV', Agency for the Assessment and Application of Technology; 120kg UAV with a range of 120km. Three design shape prototypes; the BPPT-01A "Wulung" with Hi rectangular-wing, Low Boom T-tail, the BPPT-01B "Gagak" with Lo rectangular-wing, Low Boom V-Tail and the BPPT-02A "Wulung" with a Hi rectangular-wing, Hi Boom Inverted V-Tail design

■ **NOTES:** Pesawat Udara Nir-Awak or PUNA is the Bahasa Indonesia acronym for UAV. Indonesia has been carrying out a programme headed by the government's Agency for the Assessment and Application of Technology to develop indigenous UAVs since March 2007. Military announced TUAV programme last October to be acquired "from 2011" with the UAVs them-



Honeywell's RQ-16B is in service in Asia in Afghanistan with US and British forces and has been used to monitor radiation levels at Fukushima in Japan and has been demonstrated to Indian counter-terrorism units © US DoD

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selves to be manufactured locally by PT Dirgantara. Reported to be seeking UAVs from Israel but these efforts now ended in recent years.

JAPAN

■ FIELDDED

Forward Flying Observation System, Fuji Heavy Industries; Development of rotary wing design began in 1991 with three systems equipping Army artillery units from

2004. Civil version is the RPH-2

RMAX, Yamaha Motor Company; Deployed with Japan's Iraq contingent in 2005

TAYoutoK(C)Ogata Mujinki (TACOM), Fuji Heavy Industries; Trans. 'Multi-role small UAV'. Japan's Technical Research and Development Institute have been working on the concept since 1995. Evaluation flight test in 2001. In 2011 Japan released film of two turbo jet powered drones carried by an F-15J. TACOM launched while aloft and

returns to base using a retractable undercarriage. A prototype launched from a Mitsubishi/Lockheed Martin F-2 was lost at sea in 2010

J/AQM-1, Fuji Heavy Industries; Air force target drone, entered services 1987, indigenous design

BQM-34AJ, Fuji Heavy Industries; Navy target drone, licensed development of Firebee

■ TRIALS AND DEVELOPMENT

RQ-8A Fire Scout, Northrop Grumman; Company believes it has interest from the military

B Type Machine II, Fuji IMVAC, Used to monitor Fukushima

Ball Shaped UAV; Development of SUAV for Urban ops for Army

RQ-16B T-Hawk, Honeywell Aerospace; Used to monitor Fukushima

Global Hawk, Northrop Grumman; listed Japan as a potential customer at Paris Airshow 2011 in maritime and overland role. Thought to be as part of 2011-2015 Mid-Term Defence Programme with three of the UAVs potentially required probably working in conjunction with P-3C Orion. Japanese interests first noted in 2004. Improved Satellite surveillance the main alternative

■ **NOTES:** There are a large number of UAV companies in Japan including Fuji Heavy Industries, Yamaha Motor, Yanmar Agricultural Equipment, Kawasaki Heavy Industries, Mitsubishi Heavy Industries, Sky Remote, Hirobo, Mitsubishi Electric Corporation, Hitachi, NEC Corporation, GH Craft, Fuji Imvac and Nippi Corporation.

NORTH KOREA

■ FIELDDED

Pchela, Yakovlev OKB; Unconfirmed reports that North Korea acquired the Russian UAV in 1995

■ **NOTES:** Also reports that it operates Tupolev DR-3/M-141 jet-powered tactical reconnaissance UAVs.

SOUTH KOREA

■ FIELDDED

Harpy, IAI; 100 systems valued at \$45m fielded from 1999

Night Intruder 300, KAI; Began development in 1991 with MND funding with the Army receiving five systems 2001-2004,

Australia has deployed Elbit's Skylark since the first order in 2005, deploying to E Timor, Iraq and Afghanistan. Other users in the region include South Korea who ordered the Skylark II in late 2007 © Elbit Systems





Malaysia's Sapura continues to market its CyberEye UAV, pictured here is the latest CyberEye II UAV. The company successfully sold three systems to Thailand in 2009
© Dzirhan Mahadzir

Navy also acquired the system **Shadow 400**, AAI; One system in service with Navy for evaluation from 2006 **Skylark II**, Elbit Systems; Announced selection in Dec 2007, equipped with the Micro-CoMPASS E/O payload with first delivery in 2008

■ TRIALS AND DEVELOPMENT

Night Intruder NI-11N, KAI; Development began in 2006 with focus on maritime surveillance

Korean - Combat Unmanned Vehicle, KAI; K-CUAV shown only in sketch form

Urban Star, Kyung An Cable Company; VTOL UAV in development

Remoeye 002, Ucon Systems; In development hand launched UAV

Remoeye 006, Ucon Systems; SUAV development complete in June 2005

Remoeye 015, Ucon Systems; Development complete in June 2005, 15Kg TUAV endurance 4hrs plus

Remo H-120, Ucon Systems; In development rotary wing design endurance of two hours

RQ-8A Fire Scout, Northrop Grumman; Company believes it has interest

Global Hawk, Northrop Grumman; Listed South Korea as a potential customer at Paris Airshow 2011 in maritime and overland role with Korea allocating \$40m for partial pay-

ment in 2011 budget

Smart UAV, KARI; Tilt rotor design launched in 2002 with significant government funding, unveiled in 2005 was to begin flight testing in 2011

■ **NOTES:** South Korea's MALE requirement which could go to Israel Aerospace Industries Heron and Elbit Systems Hermes 450 UAS is being reported as dependent on whether Israel selects the T-50 jet for its training requirement.

MALAYSIA

■ FIELDDED

Eagle 150B, CTRM; Conversion of CTRM's Eagle 150 trainer aircraft into an aircraft which could function either as manned aircraft or a UAV, three aircraft and a GCS entered service in 2002 and withdrawn in Feb 2006

Aludra Mk1, CTRM; Trials from October 2008 to late 2010, Mk2 version in development

■ TRIALS AND DEVELOPMENT

'TUAV', N/A; Requirement for six UAVs announced at DSA 2010, expected to go to Aludra MK2 with improved payload and greater endurance

Cyber Eye, Sapura; demonstrated to

Malaysian Military

Cyber Shark, Sapura; demonstrated to Malaysian Military

■ **NOTES:** Malaysia still has limited interest in UAVs.

NEW ZEALAND

■ TRIALS AND DEVELOPMENT

Kahu/Hawk, SKYCAM UAV NZ; New Zealand is exploring SUAV concepts

■ **NOTES:** New Zealand troops benefiting from UAV coverage in Afghanistan.

PAKISTAN

■ FIELDDED

Uqab-II, ACES; First squadron inducted into Pakistan Navy in July 2011 and tasked with Maritime Interdiction Operation. The timing coincided with the crash of an Uqab-II Navy UAV near an oil refinery. Developed from Eagle Eye system

Uqab, Integrated Dynamics; Flight tests completed in March 2008, developed with Turkish help similar to the US Army RQ-7B Shadow 200

Burraq, Pakistan Aeronautical Complex; Based on Falco-Selex Galileo technology and is believed to be intended as Pakistan's main equivalent to the American Predator

to be equipped with NESCom designed laser designator and laser-guided missiles.

Falco, Selex Galileo; Pakistan bought 4-5 unarmed reconnaissance drones from Italy. First Italian produced aircraft operational in early 2009 after delivery 2006-8. Some produced locally by Pakistan Aeronautical Complex with local production beginning in August 2009

Bravo+/Jasoos II, AWC; In use of the Pakistan Air Force since 2004 and supports Operations and Training Programme

CH-3, CASC; 20 UAVs reported to be on order from China for delivery in 2011 and equipped with FT-5 PGM

Luna, EMT; Acquired for Pakistani Army in 2006

■ TRIALS AND DEVELOPMENT

S-100C, Scheibel; VTOL UAV tested on PN Type 21 frigate in March 2008 in a four

hour mission

RQ-7 Shadow 200, AAI; 12 UAVs in three systems requested, confirmed in Jan 2010 by Sec Def. Gates. Now in limbo with an estimated cost of \$150m from the Pakistan Counterinsurgency Capability Fund budget

'UQAB III', ACES; presumed designation for HALE/'Strategic' version with radius of operation of over 300km

K1, AWC; Trial by Army in 1997

■ **NOTES:** Pakistan aviation firms involved in UAV development include Integrated Dynamics Surveillance & Target Unmanned Aircraft, East West Infiniti, Air Weapons Complex National Development Complex (NDC) and Pakistan Aeronautical Complex. Tusas Aerospace Industries signed an MoU in May 2007 with local firm Air Weapons Complex working on a MALE solution.

The Falco is in service with Pakistani forces operating platforms manufactured in Italy and produced domestically by The Pakistan Aeronautical Complex © Selex Galileo



PHILIPPINES

■ FIELDDED

Predator A, General Atomics; Two of the UAVs were reported to be registered with the Office of the National Security Advisor

Hunter RQ-5, Northrop Grumman/IAI; Reported to be from the US Army and operated by the Philippines Air Force.

■ TRIALS AND DEVELOPMENT

Blue Horizon, UVision Air; Reportedly obtained for trials and operational testing in 2001

■ **NOTES:** Some domestic work on TUAVs but considerable access to US UAV ISR data. The \$934m five year modernisation and security plan did not include UAVs.

SINGAPORE

■ FIELDDED

Searcher I, IAI; Fielded with No. 119 and No. 128 Sqns RSAF operates at least ten systems

Hermes H-450, Elbit Systems; No. 116 Sqn operates the UAV with 12 platforms fielded since 2007

Skyblade III, ST Aerospace; Planned to be fielded late 2011, equipping size units at battalion and brigade level developed by Singapore Armed Forces (SAF), the DSO National Laboratories, ST Aerospace and the Defence Science and Technology Agency

Skyblade II, ST Aerospace; delivered to SAF in mid 2005, 5kg range of 8km

Skylark, Elbit Systems; Fielded by RSAF from 2006

■ TRIALS AND DEVELOPMENT

Blue Horizon, Singapore Technologies Dynamics, MALE ordered in 1998 acquired in 1999

Scan Eagle, Boeing/Insitu; Republic of Singapore Navy successfully trialed the Scan Eagle in March 2009, the trials involving the successful operation of the Scan Eagle from a RSN frigate and LST

ST Skyblade IV, ST Aerospace, 54nm range

Schiebel Camcopter's S-100 rotary wing design has been widely tested in the region for naval applications including by Pakistan on a Type 21 frigate in March 2008 in a four hour mission. It is shown here equipped with two Thales Lightweight Multi-role Missiles © AJB



ST Aero's Skyblade III is planned to be fielded late 2011, equipping units at the battalion and brigade level © AJB

UAV unveiled 2006

Global Hawk; Northrop Grumman; Listed Singapore as a potential customer at Paris Airshow 2011, possibly to meet Singapore's requirements dating from early 2000s

FanTail, ST Aerospace; VTOL SUAV

MAV-1, ST Aerospace; Low-observable developmental UAV

RQ-8A Fire Scout, Northrop Grumman; Company believes it has interest from the military

■ **NOTES:** In May 2007, responsibility for UAV development, training and operations were placed under the RSAF's UAV Command. Local company Stratech Systems & Aeronautics formed UAV focused Stratech Aeronautics at Singapore Airshow in 2010.

SRI LANKA

■ FIELDDED

Searcher, IAI; Mks II and III variants equip No 111 Air Surveillance Squadron based at Anuradhapura with one or two systems in service

■ **NOTES:** No public plans for new UAVs.

TAIWAN

■ FIELDDED

Chung Shyang II, CSIST; Initiated programme in 2002 unveiled in 2005

"Zhongxiang III UAV", CSIST; Prototype crashed and found by fishermen in June 2010, reported counter-radar role

■ TRIALS AND DEVELOPMENT

AI Rider, Gang Yu Corp; Indigenous six-rotor 1.5Kg design launched at Secutech, in Taipei in April used by Taiwan's military and academic institutions for surveillance and geographic surveying

Kestrel II, CSIST; Early development non-operational

Cardinal, CSIST; Hand launched Mini-UAV, 1.5 hour endurance military interest reported

Blue Magpie, CSIST; Hand launched Mini-UAV, no military interest reported

AL-4, Aeroland UAV Inc; Hand launched UAV ordered by non-Military customer in Taiwan

'Gray-faced Buzzard', National Cheng Kung University; Fuel-cell/lithium battery powered 22kg UAV first flew in 2010

Spoonbill, National Cheng Kung University;

Flew 92km in 52 minutes over water in 2009

■ **NOTES:** Air Force reported to be interested in a HALE UAV but not Global Hawk in 2010.

THAILAND

■ FIELDDED

Cyber Eye, Sapura; Three systems acquired from Malaysia in 2009

Aerostar; Aeronautics Defence Systems design; One system, ordered in early 2011

Raven, AeroVironment; Successive contracts since 2008

Searcher I&II, IAI; One system comprising four UAVs, GCS and RVT, since retired

■ TRIALS AND DEVELOPMENT

Firescout RQ-8, Northrop Grumman; Company believes there is interest

■ **NOTES:** Thai Air Force is leading efforts on UAV strategy with plans outlined in 2009 to equip a squadron and calling for a three systems with 15km, 30km and 100km ranges aimed at acquiring capability and building a domestic research and production base. Burma denounced unidentified UAV flights on Thai-Burma border in January 2011. **AMR**