



Jane's

Intelligence and Insight You Can Trust

DEFENCE WEEKLY

Bell rings for ARH



**Singapore develops air
defence system – p6**
**Early entry for Javelin into
UK service – p12**

US \$7.95



32



Jane's Less-Lethal Weapons 2005 Conference

26-27 October 2005 *Breaking the Cycle of Violence – Saving Lives*
The Royal Armouries, Leeds, United Kingdom



Keynote address:

ACC Ian Arundale

ACPO Lead on Police use of Firearms, West Mercia Constabulary

Other speakers and sessions include:

Jo Guthrie, *DTI Export Control Organisation*
UK Export Controls

Graham Cooper, *Senior Fellow, DSTL*
UK Government's assessment of the medical risks of M26 and X26 Tasers

Dr Viktor E Bovbjerg, *University of Virginia School of Medicine*
Field-based evaluation of Less-Lethal Weapons:
Effects and effectiveness

For more information

Please visit www.conference.janes.com and click on the LLW 2005 logo. Alternatively e-mail: rafal.kotowicz@janes.com or call our conference hotline on + 44 (0) 20 8700 3781

**PROGRAMME
UPDATED ONLINE**

Supporting Publications

Jane's
POLICE
REVIEW

Jane's **DEFENCE**
WEEKLY

Organised by

Jane's
Intelligence and Insight You Can Trust

www.conference.janes.com



On the cover

The US Army wants the Bell Helicopter ARH to carry out missions including armed reconnaissance, light attack, troop insertion and special operations (see page 4).

Headlines

- 4 US picks Bell ARH and eyes light helicopters
- 5 US company sees gap in defences
- 6 Singapore develops Iгла air defence system
First production MH-60R flies
- 7 Turkey's MilGem project given new momentum
Rafael bids Spike-ER for Spanish Tigers

The Americas

- 8 Lockheed wins DoD contract for massive airship
Columbia, Thailand to get UH-60L helicopters
- 9 US Navy explores joint high-speed cargo ship

Europe

- 10 Bowman add-on package recast
- 11 Gavia on offer for German Army requirement
ITT Defence wins Belgian contract for radio system
- 12 Early entry for Javelin system into UK service
Turkey issues tender for acquisition of mini UAVs
- 13 Latest Kazan armed helicopter prepares for debut flight
Raytheon moves to meet UK trainer requirement

Asia Pacific

- 14 Japan report outlines growing China threat
Strait of Malacca to be given air protection
US approves transfer of F-16s to Pakistan
- 15 Report slams Australian M113 upgrade project

Middle East/Africa

- 17 Egypt requests additional M109 artillery systems
Plasan details M-PAV 2 variant for Humvee

Business

- 23 Latest acquisition pushes QinetiQ turnover above £1bn
UK signs Watchkeeper contract

Interview

34 JDW talks to General Ray Henault, Chairman of the NATO Military Committee

EMPICS: 1116412



Analysis

20 **Withdrawal from Gaza:** The Israel Defence Force is preparing for what will be a stormy disengagement from the Gaza Strip and northern West Bank. Alon Ben-David reports

Briefing



24 **Aiming for the high ground:** The lucrative air-to-air missile market remains an active one with established players and secretive developments. Robert Hewson looks at the latest trends and achievements in the world's major programmes

Air Forces Update

- 29 US DoD plans autonomous refuelling demo
- 30 India plans air force boost among major challenges
- 32 UK Sea Kings take to ground surveillance

Directory

- 33 Customer service offices; subscription form; list of advertisers

All editorial content is available online at jdww.janes.com prior to publication of the hardcopy magazine

Online this week

jdww.janes.com



Empics: 1116414

The UK Royal Navy aircraft carrier **HMS Invincible** returned on 1 August to its homeport of Portsmouth for probably the last time after an operational career spanning 25 years. A formal decommissioning ceremony followed on 3 August

- Garrison in Northern Ireland to be made deployable
- Finnish Air Force outsources basic pilot training
- US Air Force awards radar warning contract for C-130Js
- UN panel probes illegal arms sales to Côte d'Ivoire
- Italian Air Force receives first SF-260EA training aircraft

Subscribe today!

To subscribe to **JDW online** please telephone +44 (0) 20 8700 3750, or 800 824 0768 if inside the US. Or visit the website and subscribe using our secure server.

To subscribe or re-subscribe to **JANE'S DEFENCE WEEKLY** in print format, please telephone: +44 (0) 1444 475 660, or 800 824 0768 if inside the US.

We've made re-ordering easier!

Visit www.janesrenewals.com if your print subscription is about to expire.

Please note that online content is only available to online subscribers.

jdww.janes.com also regularly provides you with:

- Full access to more than 10 years of archived material;
- Full search capabilities;
- Additional weekly content not included in the magazine;
- Access to the best defence news and analysis wherever you are;
- The latest articles delivered straight to your desktop

HEADLINES

US picks Bell ARH and eyes light helicopters

MICHAEL SIRAK *JDW Staff Reporter*
Washington, DC

The US Army took two major steps at the end of July towards re-capitalising its ageing rotary-winged fleet.

On 29 July, the service selected a militarised derivative of Bell Helicopter's Model 407 commercial design to be its next-generation armed reconnaissance helicopter (ARH).

It expects to field the first units in Fiscal Year 2008 (FY08) under a programme potentially worth USD3 billion.

Three days prior to the decision, the army issued the request for proposals for its next-generation light utility helicopter (LUH). Bids are due in September and the army anticipates selecting the winning design in April 2006.

The ARH will replace the army's OH-58D Kiowa Warriors, also produced by Bell, which have been in service since 1985 and seen extensive use in Afghanistan and Iraq. Although extremely valuable, army officials have said the Kiowas suffer from performance limitations such as not being suited to hot and high conditions.

The army envisages that the new ARHs, which are expected to provide better performance in these areas, will carry out armed reconnaissance, light attack, troop insertion and special operations missions.

Bell will start delivering the first ARHs to the army in FY06. Overall, the service could buy as many as 368 units with deliveries lasting through to 2013. The programme has the potential to generate around USD2.2 billion in revenues for Bell, according to a company statement.

"This is the first competitive contract that Bell Helicopter has won

- Bell Helicopter will build up to 368 armed reconnaissance helicopters to replace the US Army's fleet of OH-58D Kiowa Warriors
- The company received a three-year, USD211 million contract on 29 July for the helicopter's system development and demonstration phase
- The army also issued a request for proposals on 26 July for its light utility helicopter

from the army in about 12 years, so from that respect this is a really big win for us," company spokeswoman Erin Dick, told *JDW* on 1 August.

US defence aerospace analysts agreed.

"They needed a win after that length of time," said Paul Nisbet of JSA Research in Newport, Rhode Island.

Jeffrey Roncka, vice president and director of Washington, DC, operations for CRA International's Aerospace & Defense consulting practice, added that the relatively high production volume should make the ARH programme a profitable endeavour for Bell.

Bell Helicopter, which is owned by Textron, beat Boeing for the rights to build the ARH.

The latter offered its AH-6 Mission Enhanced Little Bird, a derivative of the MD500-based AH-6/MH-6 Little Birds in service with Army Special Operations Command. As *JDW* went to press, an army spokesman said the service had yet to brief Boeing on the decision. It was not known if the company intended to protest against its loss.

Bell is now operating under the USD211 million contract that the



Bell will build up to 368 armed reconnaissance helicopters for the US Army, with deliveries starting in 2006

Bell Helicopter; 1116417

army awarded it on 29 July for the ARH's three-year system development and demonstration phase, during which it will build 38 low-rate initial production units.

As Bell commences work on the ARH, it is also bidding its Model 210, a modified and refurbished UH-1 Huey, to be the army's LUH.

The army expects to procure up to 322 LUHs for domestic roles such as civil search and rescue operations, damage assessment support, medical evacuation (medevac) and counternarcotics activities. The LUHs will replace existing UH-1s, UH-60A medevac platforms and older OH-58s in the Army National Guard.

As with the ARH, the army wants to field the LUH as soon as possible.

Accordingly, it has said it intends to select a platform currently in production that has been certified by the US Federal Aviation Administration.

AgustaWestland is expected to offer its A109 design, while EADS is likely to bid its EC-135 helicopter. DynCorp has said it would propose a refurbished UH-1 with a Pratt & Whitney Canada PT6C-67D engine that is lighter than Bell's 210.

Both the ARH and LUH programmes came about as a result of the army cancelling its USD39 billion RAH-66 Comanche programme in February 2004 after investing about USD6.9 billion in it. The army said the Comanche, an ARH designed in the 1980s, did not meet its revised post-Cold War requirements in areas like countering current and next-generation anti-aircraft missiles equipped with infra-red seekers.

Bell's ARH design has two crewmen and space for three passengers.

Staff

Editor Peter Felstead
Land Forces Editor Christopher F Foss
Aviation Editor Damian Kemp
Middle East and Europe Editor Robin Hughes
Naval Editor Richard Scott
Features Editor Melanie Bright
Acting Features Editor Tricia Shannon
Reporter: Tony Skinner
Washington DC Bureau:
Bureau Chief Andrew Koch
Reporters Joshua Kucera, Michael Sirak
Asia Pacific Editor Robert Karniol

Chief Sub Editor Lisa Zanardo
Senior Sub Editor Susie Kornell
Sub Editors Chris Evenden, Karen Deans
Jane's Defence Industry Editor Guy Anderson
Reporter James Murphy
Group Technical Editor Rupert Pengelley
Aerospace Consultant Nick Cook
Business Consultant James Smith
Administrative Assistant Marian Chiles
Production Controller Melanie Aris
e-Publishing Alexander Garrett, Ray Trott

Publisher Jonathan Grevatt
Group Managing Director Alfred Rolington

Correspondents

The Americas:
 Scott Gourley; José Higuera; Sharon Hobson;
 Jeremy McDermott; Pedro Paulo Rezende;
 Cesar Cruz Tantalean

Asia/Pacific:

Iqbal Athas; Rahul Bedi; Joseph Bermudez;
 Farhan Bokhari; Ian Bostock; Yihong Chang;
 Anthony Davis; Shinichi Kiyotani; Ghazi
 Mahmud Iqbal; Robert Keith-Reid; Wendell
 Minnick; Phillip Mckinnon

Europe:

Martin Bayer; John Berg; Piotr Butowski;
 Thomas Dodd; Tim Glogan; Grzegorz
 Holdanowicz; David Ing; Henry Ivanov;
 Jiri Kominek; J A C Lewis; Georg Mader;
 Nikolai Novichkov; Tim Ripley;
 Lale Sariibrahimoglu; Radu Tudor;
 Theodore Valmas; Paolo Valpolini

Middle East/Africa:

Segun Adeyemi; Alon Ben-David;
 Nicholas Blanford; Helmoed-Römer Heitman,
 Muhammad Najib

NATO and EU Affairs: Nicholas Fiorenza
UN: Thalif Deen

e-mail the editors: jdw@janes.com



It can carry a GAU-17 or GAU-19 Gatling gun, AGM-114 Hellfire air-to-surface missiles and up to 38 guided or unguided 2.75 in rockets. In its nose, it holds FLIR Systems' Brite Star II sensor turret with a laser range-finder, laser spotter, colour TV and forward-looking infra-red camera.

The ARH features Honeywell's HTS900 turboshaft engine that replaces the Rolls-Royce 250-C47B powerplant used in the basic Model 407. The standard platform configuration also includes active and passive countermeasures and a sophisticated communication suite. It has a range of 362 km and endurance of more than two hours.

Bell said two ARHs can be deployed from a C-130 Hercules medium tactical transport aircraft and be ready to fly in 15 minutes – meeting the army's requirement.

The helicopter "excels in low-hovering areas of urban street fighting", according to the company.

Bell's ARH demonstrator made its maiden flight in June.

Dick said Bell expects to add up to 350 new positions to work on the ARH programme to supplement its existing global workforce of more than 7,500 employees.

The Bell 407 airframe is manufactured in Canada in Mirabel, Quebec, as will the airframes for the ARHs. Components for the ARHs will be manufactured in Fort Worth. Dick said Bell has not yet decided where the final assembly of the helicopters will occur and the army has not yet issued the designation of the ARH.

Neither Bell's ARH programme manager nor the army's equivalent were available for comment before *JDW* went to press. ■

RELATED ARTICLES:

Light utility helicopter to be restricted to US territory (*jdw.janes.com*, 13/05/05)
US Army hones aircraft wish list (*jdw.janes.com*, 28/05/04)
Bell 407 (*jhms.janes.com*)

US company sees gap in defences

MICHAEL SIRAK *JDW Correspondent*
Washington, DC

Lockheed Martin has proposed an architecture of sensors and anti-missile interceptors to counter the emerging threat of short-range ballistic missiles and cruise missiles launched at the US homeland from ships at sea. It is a threat, the company said, that has to date been neglected in US defence planning.

"You don't need an intercontinental ballistic missile to attack the United States," said Lockheed Martin's Vice President and Managing Director for Protection Dave Kier, on 28 July.

Instead a nation or terrorist group could take a short-range Scud missile or GPS-guided cruise missile and fire it at the US from a freighter or barge sitting about 100 n miles off the US coast, he said.

In the case of the latter, he noted, the state of coastal protection is such that one could fly it "right through the front door of the [US] Capitol [building] without anyone seeing it coming".

Accordingly, the company has proposed strengthening the US' ability to detect the low-flying cruise missiles and having anti-missile batteries in place to counter both them and the Scuds. These assets would be tied to existing satellite early warning networks and command-and-control systems.

The architecture entails positioning Patriot missile batteries along the coast, augmented by Aegis ships equipped with the Standard Missile 3 interceptor, stationed in US territorial waters. Until the advent of long-loitering, overhead surveillance systems against cruise missiles, such as the company's nascent High Altitude Airship that it is developing for the US Missile Defense Agency (MDA), Lockheed Martin proposes using a novel detection system it has developed called Passive Coherent Location (PCL).

It functions by using unused FM radio bands on the US periphery to measure for electromagnetic disturbances in the air as a means of detecting low-flying objects. It could also use high-definition television signals.

- Lockheed Martin has proposed an architecture of sensors and anti-missile interceptors to protect the US coast from ship-launched ballistic and cruise missiles
- The architecture includes the company-developed Passive Coherent Location system that uses FM radio signals to detect cruise missiles and low-flying aircraft

Kier said the PCL has already been tested in an operational sense, but declined to provide specifics, citing security concerns. He said the company would like to work with the US Navy, using USD20 million that the House of Representatives has proposed adding to the Fiscal Year 2006 (FY06) defence authorisation bill, to see how far out to sea it can extend the FM signals.

The goal, he said, is to extend the signals out 200 n miles – or at least a minimum of 150 n miles – from the beach using coastal towers.

Kier told *JDW* that it would cost



Proposed architecture to counter missile threats includes positioning Patriot missile batteries along the US coast, augmented by Aegis ships equipped with the Standard Missile 3 interceptor

Missile Defense Agency; 0560680

about USD1 billion to establish the architecture for the US Northeast corridor, which runs roughly from Boston to Washington, DC.

To cover this stretch would require 12 Patriot fire units and three Aegis cruisers. To stand up this architecture in 2007 would require a government commitment, he said.

The MDA said it is examining the proposal, along with additional concepts to deal with this threat, as part of a study it is conducting and expects to complete before the end of 2005.

"There is a difference of opinion as to whether that constitutes a real threat, but that is something that I am personally concerned about," the MDA's director, US Air Force Lieutenant General Henry Obering, told reporters in Washington, DC, on 21 July.

"The thing about cruise missiles is that we have the capability to shoot them down today, as long as we can detect them. We don't have the capability over wide areas to do that with a ballistic missile."

The MDA has requested funding its spending plan for FY06-FY11 to upgrade by early next decade coastal surveillance radars in Alaska, Massachusetts and Virginia so that they could detect missiles with ranges up to 3,000 km launched at the US.

Kier said additional systems in development could be integrated into the architecture at later times like the US Army's Terminal High Altitude Area Defense and Joint Land Attack Cruise Missile Defense Elevated Netted Sensor systems, and the Surface Launched – Advanced Medium Range Air-to-Air Missile.

The army is also pursuing the Low Cost Interceptor (LCI), which is designed to counter unsophisticated cruise missiles and aircraft so that the more sophisticated and expensive Patriots can be withheld for more complex threats.

On 3 August, the service announced that it and Miltec, the prime contractor, had completed a short hot launch of the LCI. This was the first flight test of a full-size missile under the programme. ■

RELATED ARTICLES:

US releases its first homeland defence strategy (*jdw.janes.com*, 11/07/05)
US DoD seeks to bolster cruise missile defences (*jdw.janes.com*, 30/08/02)

HEADLINES



Far left: The Iгла Integrated Fire Unit

Left: Both variants of the Mechanised Iгла have two twin-mounted missile launchers. The Weapon Fire Unit is shown here

Singapore MINDEF, 1116422; 1116423;

- The locally developed Mechanised Iгла combines the Russian-made Iгла missile with the US-made M113 platform
- The system is intended to provide air defence for Singapore's combined arms divisions
- MINDEF's Defence Science and Technology Agency oversaw the project

Singapore develops Iгла air defence system

ROBERT KARNIOL *JDW Asia-Pacific Editor*
Bangkok

Singapore has unveiled a locally developed mobile air-defence system that combines the Russian-made Iгла (SA-18 'Grouse') low-altitude surface-to-air missile system with the US-made M113 armoured personnel carrier (APC).

The Iгла M113, or Mechanised Iгла, is produced in two variants: the Integrated Fire Unit (IFU) and the Weapon Fire Unit (WFU). These were developed by the Defence Science and Technology Agency

(DSTA), the Ministry of Defence's (MINDEF's) technology arm, and are intended to equip the Singapore Army's combined arms divisions (CADs).

The army has three CADs together with one rapid deployment division but it is not known how many Mechanised Iglas are required.

"The IFU comes with an integrated radar that is used to provide early warning of air threats to the WFUs. There is no difference between the IFU and WFU in

terms of engagement capability," a MINDEF source told *JDW*.

The development programme was launched in the 1990s with the aim of providing the CADs with improved air-defence capabilities. *JDW* reported that Singapore was formally briefed on several Russian missile systems in 1993 and 1996. Its purchase of several Iglas was officially confirmed in 1997, and the first live firing test was conducted at South Africa's Overberg Toetsbaan Range in 1999.

"The main challenge lay in integrating the various commercial off-the-shelf subsystems. Tests and trials were conducted to ensure the

compatibility between subsystems while maintaining system functionality in an operational environment," the MINDEF source said.

"The M113's interior and roof were modified to enable the installation of the launcher as well as to improve the overall inter-crew operation. Human factor engineers were also involved to enhance the ergonomics of the hardware and man-machine interfaces."

The MINDEF official further noted that DSTA engineers were also responsible for integrating the Iгла M113 weapon system onto the M113 APC. "DSTA also developed the command-and-control system to link up various subsystems, which include the radar and navigation system, to offer the Iгла M113 better mobility, speed and accuracy," the source.

Singapore's Mechanised Iгла was due to be formally unveiled at the National Day Parade on 9 August. It is not known when the system is due to be deployed operationally. ■

RELATED ARTICLES:

Iгла low-altitude surface-to-air missile system ([jlad.janes.com](#))

SAM sale marks Russia's debut deal in Singapore ([jdw.janes.com](#), 22/10/97)

First production MH-60R flies

The first production Sikorsky MH-60R multi-mission helicopter made its maiden flight on 28 July at the company's Stratford, Connecticut facility.

The MH-60Rs will replace the US Navy's (USN's) fleet of SH-60B/F helicopters. The USN has trialled SH-60B helicopters, which have been remanufactured in MH-60R configuration.

It was originally planned to remanufacture a large number of SH-60s but the programme was changed to the production of new-build helicopters in 2001.

The MH-60R's main roles will be submarine hunting and surface attack. The navy is expected to buy up to 254 of the multi-mission helicopters with the annual production rate ramping up to 30 aircraft.

Lockheed Martin is systems integrator on the pro-

gramme and will also provide the digital common cockpit, which is used in all MH-60s and MH-60R helicopters.

The MH-60R will be fitted with AGM-114 Hellfire anti-armour missiles, Raytheon Thales AN/AQS-22 advanced airborne low-frequency sonar and Telephonics AN/APS-147 multimode radar.

Test MH-60R helicopters have been undergoing operational evaluation since May. The aircraft will be delivered to Lockheed Martin's integration facility in Owego, New York, in August for the installation of mission systems.

The aircraft is the first of four to be built as part of a second Low Rate Initial Production (LRIP II) contract. Prior to LRIP II the helicopters were remanufactured



The first production MH-60R made its first flight in late July

Lockheed Martin; 1116430

MH-60Bs. The first MH-60B upgraded to MH-60R configuration made its first forward flight in July 2001.

Damian Kemp *JDW Aviation Editor, London*

Turkey's MilGem project given new momentum

LALE SARIIBRAHIMOGLU *JDW Correspondent*
Ankara

Turkey has given fresh impetus to its long-stalled USD1.2 billion national vessel (MilGem) project after the Defence Industries Undersecretariat (SSM) issued a request for proposal (RfP) for the local design and manufacture of a first-of-class ship.

The MilGem programme envisages the construction of a new class of patrol and anti-submarine warfare vessels at the Turkish Navy Forces Command's (TNFC's) Istanbul Shipyard. An initial eight ships are planned, with a second batch of four to follow.

The RfP was released on 15 July, with responses due back into the SSM by 26 September. Some USD200 million has been earmarked for the design, development and build of the first-of-class, which is due for delivery around 2012.

Since the programme is intended to maximise indigenous industrial capacity and content, the SSM has stipulated that design activities will be carried out by local companies.

- Turkish Defence Industries Undersecretariat RfP spurs stalled USD1.2 billion MilGem national vessel programme
- The programme envisages a new class of patrol and anti-submarine warfare vessels
- An initial eight vessels are planned, with a second batch of four to follow

However, those companies with 51 per cent or more Turkish ownership fully controlling the management will also be able to compete in the project.

Local companies Havelsan and Aselsan will jointly develop the command-and-control system destined for the MilGem ships.

Other combat system equipment to be acquired by the SSM for the first-of-class include a 3-D surveillance radar, a degaussing system, fire-control radars, hull-mounted sonar, naval guns, navigation radars, the Rolling Airframe Missile system and a tor-

pedo countermeasures system. Some Western industrialists have cast doubt as to whether Turkey has the requisite industrial capacity and design resources to undertake the indigenous development of the MilGem project.

However, outgoing TNF Commander Admiral Ozden Ornek said on 26 July that Turkey is already able to design and to develop a national command-and-control system for corvettes through the infrastructure and expertise that it has gained in the past years.

"Unjustified allegations being made both from within and outside Turkey that the Turkish Navy and Turkish industry do not have the necessary infrastructure to realise the MilGem project by itself have made us even more determined to grasp this opportunity," Adm Ornek said.

The TNFC is currently working to develop a prototype for the Turkish Navy's Vessel Integrated Warfare Management System and command, control, communications, computers and intelligence project (GENESIS) under which it plans to set up a national software

source-code system for the most advanced command-and-control systems of its surface combatants as well as submarines. The command-and-control systems to be developed under GENESIS will be applied to MilGem.

In a related development, Turkey's SSM has issued a RfP for the local production of a new class of patrol boats intended to protect naval bases and port facilities.

A total of 16 vessels are planned, to be delivered in four batches.

The RfP was released on 1 August with responses to be submitted by 30 December.

General characteristics outlined in the RfP include a maximum continuous speed of 22 kt, a maximum speed of 25 kt, and a range of 1,000 n miles.

Bidders can propose to build the ships at one or more local shipyards previously qualified to build naval ships and having already delivered vessels to the TNFC.

Maximum local content is required. In those cases where it is necessary to purchase systems from overseas, local companies are obliged to ensure appropriate technology transfer.

Additional reporting by
Lale Sariibrahimoglu,
JDW Correspondent, Ankara

RELATED ARTICLE:

Turkey gives MilGem project fresh impetus
(jdw.janes.com, 30/09/04)

Rafael bids Spike-ER for Spanish Tigers

Israel's Rafael Armament Development Authority is bidding its Spike Extended Range (Spike ER) anti-tank guided weapon (ATGW) system for the Eurocopter AS 665 Tiger multirole combat helicopter to be ordered by the Spanish Army.

Tiger has been ordered by Australia (22) France (50), Germany (80) and Spain (24) with the latter due to be delivered between 2007 and 2011.

Also competing for the Spanish Army order are MBDA/LFK with the long-delayed TRIGAT-Long Range (TRIGAT-LR) and Lockheed Martin with AGM-114 Hellfire II, which has already been selected for the Australian Tiger armed reconnaissance variant. The TRIGAT-LR ATGW, which has yet to enter quantity production, was originally intended to equip the Tiger in French and German service.

JDW sources indicate that a decision about which ATGW system to install on the Spanish Tiger helicopters is likely in the next two months.

Spike-ER is the extended long-range version of the Spike family, capable of defeating main battle tanks at a range of up to 8 km. In addition to being fitted with a tandem high-explo-

sive anti-tank (HEAT) warhead to neutralise tanks and other targets fitted with explosive reactive armour, Spike-ER can also be fitted with a penetrating blast-type warhead for use in urban operations.

According to Rafael, Spike-ER is a "fourth-generation ATGW system", where the operator has the option of either fire-and-forget/fire-observe-and-update or a man-in-the-loop mode. This is considered essential in many types of operations now being conducted as it gives much greater flexibility and reduces 'blue on blue' attacks.

The missile features a dual sensor, imaging infra-red and charge-coupled device seeker with an automatic target tracker and a fibre-optic datalink and is designed for installation on land vehicles, helicopters and naval platforms.

The Israel Air Force has tested Spike-ER on its AH-1F/S Cobra attack helicopter, and is currently considering whether to install Spike-ER on its more recent AH-64A Apache attack helicopters, which currently use the Hellfire, although this latter programme has not been funded. Spike-ER is in service with the Romanian Air Force on its upgraded IAR-330 SOCAT transport helicopters.



Israel is bidding its Spike ER ATGW system for the Spanish Tiger

Rafael: 1116421

A Spike-ER was recently displayed beside an Italian Air Force A-129 Mangusta light attack helicopter at the 2005 Paris Air Show at Le Bourget in June.

In addition to marketing Spike-ER for the Spanish Tiger attack helicopter requirement, Rafael is offering the Spike-Long Range to Spain for a ground forces' requirement.

Christopher F Foss *JDW Land Forces Editor, London.*

Additional reporting by Robin Hughes,
JDW Europe Editor, London

RELATED ARTICLES:

Spain's first helicopter factory to be in Albacete
(jdw.janes.com, 20/05/05)
Australian Tiger ARH test fires Hellfire
(jdw.janes.com, 03/06/05)

THE AMERICAS



Colombian armed forces board a UH-60L Black Hawk. The country is set to purchase additional platforms

Empics; 0096891

Colombia and Thailand line up for UH-60L helicopters

Colombia and Thailand are set to boost their Black Hawk utility helicopter fleets after the US Defense Security Co-operation Agency (DSCA) notified the US Congress in late July of the possible sale of eight and two UH-60L variants respectively to the countries.

According to the notification, the sale will occur under the US government Foreign Military Sales programme and is not believed to involve offsets.

A key use for the helicopters in both countries would be in anti-drug trafficking operations but in the case of Colombia they would be used against insurgent groups and in the case of Thailand to fill deficiencies exposed during emergency relief operations.

Both countries already operate Black Hawk helicopters.

The Colombian purchase is worth up to USD100 million, which would include spare parts and training. The DSCA said the sale would assist US national security by helping Colombia prevent illegal drug manufacture, particularly when it is tied to terrorist activities.

"These helicopters will be used to pinpoint and destroy narco-terrorists identified and operating within Colombia," the DSCA advised Congress.

Colombia has more than 14 UH-60L Black Hawks in its army fleet and about 49 UH-60A/Ls in its air force inventory.

Thailand's USD46 million possible purchase would add to the six Black Hawks already operated by the country's defence forces and would be committed to navy service. A shortfall in lift capacity was highlighted during the tsunami natural disaster, which occurred on 26 December 2004.

Damian Kemp

JDW Aviation Editor, London

Lockheed wins DoD contract for massive airship

MICHAEL SIRAK *JDW Staff Reporter*
Washington, DC

The US Department of Defense has decided to continue development of a massive, autonomous unmanned airship that could play a vital role in coming decades in protecting the US homeland from air and missile attack.

The Missile Defense Agency (MDA) announced on 26 July that it intends to award Lockheed Martin an approximately USD137 million contract in October for phase 3 of the High Altitude Airship (HAA) programme.

During this phase, which is expected to last about four years, the company will build a solar-powered airship prototype approximately 131 m long and 45.75 m at its widest point that displaces about 103,000 m³ of helium, according to Lockheed Martin and MDA officials.

The MDA wants the prototype to be capable of loitering at 18,300 m for up to one month while carrying a 227 kg payload and providing 3 kW of continuous power to the payload.

A three-flight demonstration, culminating in a one-month deployment, could begin as early as

- Lockheed Martin aims to begin flight demonstrations of the prototype airship in mid-2008
- The key challenge is to design a lightweight fabric for the airship's hull that can withstand the stresses of thermal fluctuations and exposure to radiation and ozone
- The airship will be used for long-range surveillance and as a communications relay

mid-2008, according to the officials. The exercise will yield valuable data for the larger operational variant that the MDA envisages, they said.

"What really hasn't been demonstrated before is getting a vehicle like this to altitude and going through multiple diurnal cycles and staying at that altitude," Ronald Browning, director of business development for Surveillance Systems at Lockheed Martin Maritime Systems and Sensors in Akron, Ohio, told *JDW* on 28 July.

The MDA chose Lockheed Martin in September 2003 to develop an airship that could float above the US coastline at altitudes in the stratosphere for extended periods.

There its payload of electro-optical and infra-red cameras, radar and additional sensors could observe out to hundreds of kilometres to provide



The US Missile Defense Agency wants to conduct demonstration flights of Lockheed Martin's High Altitude Airship prototype before the end of the decade

Lockheed Martin; 0562868

early warning of ballistic and cruise missiles approaching the US as well as additional air threats like low-flying aircraft.

The HAA could also be forward-deployed in-theatre to protect US troops and allies and serve additional roles. "In mountainous terrain this would be a valuable asset for communications relay," a senior MDA official said.

After a competitive first phase of concept development, Lockheed Martin concentrated during phase 2 on reducing the developmental risk to technologies like the airship's lightweight hull fabric, solar arrays, batteries and components for its four electric motors. This work led to a critical design review of its airship concept in October 2004.

After reviewing the concept, the MDA opted to continue the initiative, but under a restructured framework to allow more time to complete the project. Lockheed Martin is expected to contribute about USD43 million of its own funds to phase 3, according to MDA and Lockheed Martin officials.

Browning said Lockheed Martin is confident that it has met the principal design challenge of the prototype: developing a strong, composite lightweight fabric that can withstand the rigours of operating in the stratosphere, where it will be exposed to extreme fluctuations of temperature and radiation and ozone, and yet contain the helium.

Upon successful demonstration, programme engineers will add off-the-shelf sensors and radios to the vehicle and conduct exercises to assess the military utility of the airship.

The North American Aerospace Defense Command will lead the assessment, which will take place over US test ranges.

The MDA ultimately envisages the operational variant, which would be about twice as large as the prototype, loitering for periods approaching one year at altitudes around 70,000 ft where winds are lighter while carrying several thousand pounds of payload.

Lockheed Martin will build the prototype HAA in Akron. ■

RELATED ARTICLES:

Go to jdw.janes.com for more of this article
Ballistic Missile Defense: The end game
(jdw.janes.com, 08/09/04)
Lockheed Martin wins airship competition
(jdw.janes.com, 03/10/03)

US Navy explores joint high-speed cargo ship

ANDREW KOCH *JDW Bureau Chief*
Washington, DC

The US Navy and army are exploring the possibility of building a joint high-speed cargo ship to meet the resupply needs of army and naval forces, navy officials say.

With the army looking to move a brigade's worth of equipment directly from the continental US to austere ports around the world and the navy wanting to resupply its seabases from the US mainland, the two service's requirements appear close enough to warrant a joint programme.

Talks on a leading contender to fill the need – the Rapid Strategic Lift Ship (RSLs) – are under way, said Jonathon Kaskin, director for Strategic Mobility and Combat Logistics in the Office of the Chief of Naval Operations.

At an estimated USD1.3 billion per ship and with limited production orders expected, savings could be made by making the RSLs a joint effort. The navy anticipates needing one RSLs per Maritime Preposition Force-Future squadron, Kaskin said, noting that the service plans to have one to three of the squadrons. He added that a formal construction programme could begin in Fiscal Year 2012 (FY12) to meet the initial deployment timelines envisaged for the seabase.

The RSLs would have a notional speed of 36 kt to 39 kt, a range of 8,000 n miles, a draft of 7.3 m, and be able to carry 1,650 personnel as well as military equipment that cannot self-deploy. That equipment includes 20 CH-53 heavylift helicopters, 18 AH-1Z Super Cobra attack helicopters, nine UH-1Y Huey light utility helicopters and 10 CH-60 multipurpose helicopters.

Navy documents say the concept would cut three to four days off the time needed to conduct "force closure" and would eliminate the need for C-17 strategic transport aircraft sorties.

However, Kaskin noted, the army also wants other attributes for its resupply ship, which the navy judges to be either prohibitively expensive or not achievable with current tech-

nologies. Those include having a shallow draft of 6 m or less, a 9,000 to 10,000 n mile range and speeds of at least 45 kt. Kaskin said that, for example, with those specifications the ships would be able to carry so little cargo that it would take three such vessels per brigade (a total of 6,000 to 8,000 tonnes of cargo) rather than one, driving the overall cost of the force up substantially.

The navy is talking with the army about whether some of the more difficult requirements can be relaxed, Kaskin said, noting that reducing the ship's speed from 45 kt to 36 kt would entail only one additional day when crossing the Pacific Ocean.

The Office of Naval Research is expected to release a broad area announcement on some basic research for an RSLs type ship, including propulsion alternatives and technologies that would allow the drag that water causes on a ship's hull to be reduced by 30 per cent to 50 per cent through the use of polymers.

One such project, expected to commence in FY07, is building a 38 MW axial flow waterjet. The navy is looking at axial flow waterjet propulsion as an option to enable high-speed future vessels capable of carrying large amounts of cargo long distances, said Rear Admiral John Bowling, the Deputy Director for Expeditionary Warfare in the Office of the Chief of Naval Operations.

Water jets offer the potential advantage of saving space over traditional propulsion means and allowing that area to be used for additional cargo or fuel.

The navy is interested in building a scaleable prototype between 7.5 MW or 8 MW that could be demonstrated in a proposed T-Craft vessel or on a vessel such as the HSV-2 Swift.

Additional reporting by
Michael Sirak, *JDW Staff Reporter*,
Washington, DC

RELATED ARTICLES:

- Go to jdw.janes.com for more of this article
- US Navy shipbuilding plan takes on water**
(jdw.janes.com, 24/06/05)
- Navy considers seabase transport options**
(jdw.janes.com, 18/02/05)

Ready For The Mission

Field Test Proven
Advanced System Solution for
Low Level Air Defence



ATILGAN

Pedestal Mounted Air Defense Missile System

aselsan

www.aselsan.com.tr

Phone: (90-312) 592 10 00 Fax: (90-312) 385 19 00
e-mail: marketing@aselsan.com.tr

EUROPE

Bowman add-on package recast

TONY SKINNER *JDW Staff Reporter*
Oakdale, UK

The UK Ministry of Defence's senior procurement body, the Investment Approvals Board (IAB) is reviewing the GBP330 million software add-on to the Bowman tactical communications system.

The IAB is expected to meet in September to decide the future level of funding for the Bowman software package, consisting of the Common Battlefield Application Toolset (ComBAT), Infrastructure (I) and armoured Platform Battlefield Information System Application (P BISA) – commonly known as CIP.

Effectively three inter-related projects procured as a single entity, the

- The Bowman software package will achieve its in-service date in December 2005, 12 months after initially planned
- Problems with intercoms 'drop-outs' in armoured vehicles have been solved by a hardware/software upgrade
- Future software upgrades could be introduced on an annual basis

GBP330 million (USD581 million) CIP add-on to the Bowman programme was awarded to General Dynamics UK (GD UK) in 2002, providing the means to run a battlefield internet over the bearer system.

GD UK Bowman Vice President Andrew Browne said the CIP in-service date was originally Decem-

ber 2004 but was pushed back 12 months when field trials showed the software applications were "not reliable and robust enough".

Browne said once recast to include recently identified requirements as well as the altered delivery dates, the CIP programme will be significantly developed above and beyond the original contract.

"There will be a number of things added in – the requirements are not the same as they were four years ago. Four years downstream, we are much more knowledgeable about the technology," Browne said.

A spokesman for GD UK said the IAB will be looking to decide the level of funding for CIP Bowman going forward – whether that is the status quo or a higher level of investment.

Whatever the IAB's decision, the

company can expect there to be further incremental software insertions/upgrades as the programme advances and technology develops. GD UK said new BISAs were being constantly identified – around 19 at the current count – and future software upgrades could be introduced on an annual basis.

The problems of in-crew intercom 'drop-outs' in the Warrior infantry fighting vehicles, Challenger 2 main battle tanks and Combat Reconnaissance Vehicles (Tracked) – deemed a safety issue by the British Army and preventing 12th Mechanised Brigade from taking those vehicles to Iraq – has been solved by the development of a hardware/software patch. ■

Go to jdw.janes.com for more of this article

Visit Jane's at TADTE 2005

Taipei Aerospace and Defence Technology Exhibition

Taipei World Trade Centre
11 – 14 August 2005

Stand A626

For more information on our products and services, stop by the Jane's stand or contact us in advance of the show by phone, fax or email to us at asiapacific@janes.com or +65 6325 0866

Jane's

Intelligence and Insight You Can Trust

106760705



The Rheinmetall Landsysteme Gavial 4 x 4 light protected multi-purpose vehicle

RLS; 1116411

Gavial on offer for German Army requirement

CHRISTOPHER F FOSS *JDW Land Forces Editor*
Kassel, Germany

Rheinmetall Landsysteme (RLS) of Germany has teamed with France's Auverland to market a version of their A4 4 x 4 Armoured Vehicle Light (AVL) to meet the potential requirements of the German Army.

Earlier in 2005, the German Armed Forces Office for Military Technology and Procurement announced that it had a requirement for a new family of wheeled armoured vehicles – Group 1, 2, 3 and 4. These are known collectively as the Geschützte Führungs und Funktionsfahrzeuge (Armoured Command and Operations Vehicle).

The Group 1 requirement is for a 4 x 4 vehicle in the five tonne class for which RLS will bid a modified version of the French Auverland A4 AVL. This was selected by the French Army to meet its Petit Véhicule Protégé requirement following extensive trials between several vehicles.

The first French Army order is for 314 units. One of the key German requirements is that the Group 1 vehicles be fully air transportable in

- Rheinmetall Landsysteme has teamed with Auverland to market AVL for the German Army 4 x 4 requirement
- The vehicle will be designated Gavial for the German market

a Boeing CH-53 Stallion helicopter as used by the German Army. To meet this requirement the roof of the A4 will be slightly lowered.

Under the terms of the agreement between Auverland and RLS, the chassis and body for all vehicles will be supplied from France with the RLS facility at Kassel responsible for integrating the mission and weapon systems before delivering the complete vehicle to the customer.

For the German market RLS have named the vehicle the Gavial.

While RLS has the demonstrated capability to design, develop and manufacture a new wheeled armoured vehicle, its teaming with Auverland (which now owns Panther) is seen as a more cost-effective solution with almost no risk to the end user.

The Auverland A4 AVL features a chassis of tubular design to which an

armoured hull is fitted, providing the occupants with protection up to STANAG 4569 Level 2 with the floor and hull providing protection up to Level 1. Gross vehicle weight is five tonnes, with up to one tonne in payload, and up to five people can be carried.

The power pack consists of an Iveco four-cylinder turbo-charged diesel engine developing 146 hp coupled to a ZF automatic gearbox and electrically operated transfer case. An anti-skid braking system is fitted as standard, as is a rear differential lock-and-run flat tyres.

Maximum road speed is 120 km/h with an operating range of 750 km.

Optional equipment includes a nuclear, biological and chemical warfare protection system, front-mounted winch, central tyre inflation system and an RLS 609 overhead weapon station that can be armed with a 7.62 mm or 12.7 mm machine gun or a 40 mm automatic grenade launcher.

For the Group 2 requirement RLS will offer the Italian Light Multipurpose Vehicle under the name of Caracal. These vehicles will have a gross vehicle weight (GVW) of between five and 10 tonnes, a payload of one to two tonnes and incorporate a higher level of protection.

A requirement is that two of these vehicles can fit in German Air Force C.160 transport aircraft.

Group 3 vehicles will have a GVW of 10-13 tonnes, adequate protection, should fit in a C.160, have a minimum payload of two tonnes and an internal volume of 9m³. ■

RELATED ARTICLES:

Rheinmetall markets Caracal to Germany (*jdw.janes.com, 04/05/05*)
Petit Véhicule Protégé (PVP) Programme (*jaa.janes.com*)

ITT Defence wins Belgian contract for radio system

The Belgian Ministry of Defence has awarded ITT Defence, the UK arm of ITT Industries, a contract for the supply of its High Capacity Data Radio (HCDR) system.

The company hopes the initial GBP1.2 million (USD 2.11 million) order for 60 HCDRs will result in a follow-on order for a further 600 units.

ITT Defence Head of Business Development John Greenhalgh told JDW the units will undergo evaluation and trial by Belgium's Land Command Control and Communications Digitisation Programme.

The Belgian contract is the first of a number of expected export orders, Greenhalgh said.

"Everybody is delighted. Our export marketing team was only brought together [December 2005] and it is only six months later, so this is a great start for our export ambitions," he said.

The HCDR is a self-forming and self-healing, radio-based transmission control protocol/internet protocol router radio, utilising intranet routing protocols and services to provide a tactical mobile, high-capacity data distribution system, which does not require fixed-base stations and is capable of transmitting video, data and voice over IP on the move.

Utilising UHF the HCDR has a 1 Mbit/s data capacity over 10-12 km. Broadcast over a 4 MHz spread spectrum and coupled with frequency agility, the system is extremely difficult to locate or jam.

Greenhalgh said the HCDR is a key component of the company's Centaur family of radios, providing the essential mobile networking communications layer for modern field armies.

Using the HCDR would ensure tactical command-and-control interoperability with NATO coalition forces, as well as giving the Belgian armed forces a system that is capable of growing to accommodate their network-enabled communications ambitions as they are progressively deployed. Other Centaur components include cryptography management, the Communication Management System, training, installation and support services.

The HCDRs will be manufactured at ITT Defence's Basingstoke site, commissioned in 2002 to manufacture the VHF and UHF radios for the UK's Bowman digitisation programme.

Tony Skinner

JDW Staff Reporter, London

EUROPE

Early entry for Javelin system into UK service

CHRISTOPHER F FOSS *JDW Land Forces Editor*
London



The Javelin anti-tank guided weapon will soon enter UK service

Lockheed Martin; 1121330

The UK has declared the Raytheon/Lockheed Martin Javelin anti-tank guided weapon (ATGW) system operational for its armed forces four months earlier than originally anticipated.

The current Euromissile MILAN ATGW was to have been replaced in UK service by the EMDG TRIGAT Medium Range ATGW.

However, following the withdrawal of the UK from the programme, a competition was initiated for a Light Forces ATGW,

- The Javelin will replace the MILAN and Swingfire ATGW systems in service with the UK armed forces
- The new system will be in service four months earlier than anticipated
- UK industry will benefit from the 100 per cent offset agreement

contested by the Rafael Armament Development Authority Spike Medium Range and Javelin missiles. The latter system was selected in January 2003.

It was originally expected that Javelin would only replace the

MILAN in service with the British Army's 16 Air Assault Brigade and mechanised infantry brigades, and 3 Commando Brigade, Royal Marines. A decision was subsequently taken to replace all other MILAN systems in service with the British Army including armoured infantry and formation reconnaissance forces.

The latter use the 4,000 m range Swingfire ATGW, which is launched from the Striker light tracked armoured vehicle. It is expected that MILAN and Swingfire will be phased out of service with the UK by 2007.

MILAN has a maximum range of 2,000 m and is fitted with a single High Explosive Anti-Tank (HEAT) warhead that cannot neutralise armoured vehicles fitted with explosive reactive armour (ERA).

The Javelin is a fire-and-forget top-attack weapon with a maximum range of over 2,500 m and is fitted with a tandem HEAT warhead to defeat targets fitted with ERA.

The UK version has a number of modifications including an enhanced Command Launch Unit (CLU) with a wider field-of-view to recognise targets at a longer range and a tripod. The day/thermal CLU allows targets to be detected, recognised and engaged under almost all weather conditions.

The UK Javelin ATGW programme is being run by the Infantry Guided Weapons Integrated Project Team of the UK Ministry of Defence's (MoD's) Defence Procurement Agency (DPA).

According to the DPA, the early in-service date (ISD) was achieved due to the work of the UK MoD, the Javelin Joint Venture (Raytheon and Lockheed Martin) and the US Department of Defense.

Javelin is being supplied to the UK through an innovative hybrid commercial arrangement, which uses the US government's Direct Commercial Sales (DCS) and Foreign Military Sales (FMS) programmes.

Missiles and training are provided by DCS and the CLU via the FMS programme.

Javelin training courses started in late 2004 at Warminster Anti-Tank Division, Wiltshire, and in April a series of 15 successful test firings cleared the way for the acceptance of the ISD missile warstock.

From an early stage, British industry has been heavily involved in the UK's Javelin programme and, according to Raytheon/Lockheed Martin, some USD623 million of work will be brought to the UK as part of a 100 per cent offset arrangement.

UK contractors will also be allowed to bid as subcontractors for US-built Javelin ATGWs. Some 300 jobs have been created or maintained in the UK under the programme. ■

RELATED ARTICLES:

UK selects Javelin
(jdw.janes.com, 24/01/03)
Javelin ATGW (jaau.janes.com)

Turkey issues tender for acquisition of mini UAVs

Turkey's Defence Industries Undersecretariat (SSM) issued a request for proposal (RfP) on 26 July for the acquisition of 19 mini unmanned aerial vehicle (UAV) systems, each containing two to three aircraft, to meet the requirements of the Turkish Land Forces Command.

The SSM has restricted the RfP to Turkish companies that could indigenously develop the bodies and autopilots of the mini UAVs and has set 3 October as the deadline for responses. The SSM told *JDW* that several local companies have already shown an interest in the scheme.

Bidding companies will demonstrate their products, which must have an endurance of around one hour, on 17 October. The SSM also plans to issue separate tenders

for the acquisition of tactical UAVs for the army, with a minimum endurance of six hours, as well as micro UAVs, which will be deployed with units.

Meanwhile, Turkey has applied to take part in both the EADS-run medium-altitude, long-endurance (MALE) UAV and French-Swedish-led Neuron unmanned combat air vehicle programmes.

SSM Undersecretary Murat Bayar told *JDW* that he has not yet received any response to Turkey's applications.

However, Western industry sources close to the Neuron programme told *JDW* that it did not seem possible for Turkey to join the programme since the division of work-share had already been completed. The same sources

were more optimistic about the possibility of Turkey taking part in the EADS MALE project.

In parallel to Turkish attempts to join the EADS project, the SSM has authorised Turkish Aerospace Industries (TAI) to locally develop a MALE UAV under a USD65 million contract. The first local system is planned to be delivered to the Turkish armed forces in the next four to five years. If it is successful, TAI will develop another five MALE UAV systems.

Meanwhile on 18 April, under the first phase of Turkey's UAV programme, the SSM signed a USD183 million contract with the Israeli UAV partnership of IAI and Elbit for the off-the-shelf purchase of three MALE UAV systems as well as associated surveillance and ground command-and-control equipment.

Laie Sariibrahimoglu *JDW Correspondent, Ankara*

Latest Kazan armed helicopter prepares for debut flight

PIOTR BUTOWSKI *JDW Correspondent*
Moscow

Russian Kazan's Ansat-2R new lightweight armed reconnaissance helicopter was expected to fly for the first time as *JDW* went to press. The flight precedes the helicopter's expected first public appearance at the Moscow Air Show 2005 (MAKS 2005) in mid-August.

The helicopter was shown to representatives of around 12 countries, mainly from Asia and Africa, during a conference of operators of Kazan-made Mi-8 and Mi-17 helicopters on 28 July.

The Ansat-2R demonstrator was constructed around the engines, transmissions and rotors removed from the first flying Ansat prototype and it has kept aircraft number 902. The Ansat-2R pilot's cockpit is fully equipped, however the cockpit of the weapon operator, as well as the weapon systems, were mock-ups for the display.

The helicopter is fitted with the GOES 521 electro-optical turret under the front fuselage and short wings on fuselage sides with four pylons. During the presentation to



The Kazan Ansat-2R is expected to make its inaugural flight prior to its first appearance at the Moscow Air Show in mid-August

P Butowski; 1116413

operators, the pylons were loaded with two 9M39 Igla short-range infra-red air-to-air missiles, small bombs and two seven-round 80 mm rocket launchers.

A fixed Kord 12.7 mm heavy machine gun is built into the starboard. Another flexible gun is mounted in the window of a small transport compartment in the rear. UV-26 chaff/flare launchers are built into the sides of the fuselage. The Ansat-2R has a maximum take-off weight of 3,500 kg and is powered by two Pratt & Whitney Canada PW207K engines of 710 hp each.

According to the company the helicopter can reach 300 km/h and has a range of 650 km.

Kazan Helicopters funded the design and development of the Ansat-2R. A wooden mock-up of the helicopter was shown for the first time as early as August 2001, designated the Ansat-Observer and labelled as a "civilian ecological and engineering monitoring helicopter" equipped with sensors for detecting leakages of gas and oil, as well as a gamma radiation spectrometer and gas analyser.

Development of the Ansat began

- Kazan has funded design and development of the Ansat-2R lightweight armed reconnaissance helicopter
- Based on other Ansat variants it will be shown for the first time at the Moscow Air Show 2005
- According to Kazan, Ansat-2R has a maximum take-off weight of 3,500 kg, can reach 300 km/h and has a range of 650 km

in 1993 with mock-ups, substantially different to the Ansat-2R, exhibited at a number of shows, before the Ansat-2 observation helicopter, closely resembling the Ansat-2R, was shown at MAKS 2001. The first flight of the Ansat-2 took place in August 1999, but further flying was suspended because of gear problems. Flying resumed in 2000, with two Ansat prototypes accumulating 520 flights. The first three production Ansat-2 helicopters were delivered to South Korea in December 2004.

Variants of the aircraft include the Ansat-U, which was selected for the Russian Federation Air Forces light training helicopter requirement in September 2001, with the first aircraft now ready for testing. The Russian armed forces are expected to acquire up to 100 Ansat-U aircraft before 2015.

A new variant weighing 6,000 kg, designated the Ansat-3, is also being developed. ■

Raytheon moves to meet UK trainer requirement

Raytheon Aircraft Company is proposing a more capable version of its King Air 350 special mission aircraft as a solution for the rear-crew and multi-engine training requirement of the UK's Military Flying Training System (MFTS).

MFTS is expected to be worth up to GBP15 billion (USD26.7 billion) over the next 25 years, according to the UK government, and will eventually bring together the fly-



Raytheon's King Air 350ER is a modified platform now being bid for the MFTS programme

Raytheon Aircraft Company; 1116424

ing training for all three services ranging from fast jet to rotary-wing aircraft.

Three consortia are contending for MFTS – Ascent, Sterling and Vector – and they have been provided with information on a variety of platforms from aircraft manufacturers, including five from Raytheon alone.

Bids are being presented to the UK Ministry of Defence (MoD) outlining a number of possibilities. They will be submitted by 23 August with a selection expected about mid-2006 and initial service provision to begin in April 2007.

The King Air 350ER and five other aircraft were presented to the MoD's MFTS integrated project team (IPT), at the request of the IPT, and bidders from Vector and Sterling on 3 August in Oxford. The King Air 350ER, first displayed at the Paris Air Show in June, is fitted with larger fuel tanks and heavier landing gear as well as a radome, the latter particularly relevant as it reopens the synthetic-versus-live training debate. The King Air 350ER has an additional 180 US gallons (150 gallons) of fuel and

increases range from 3,317 km to 4,260 km.

Raytheon Aircraft Company Vice President Special Mission Systems John Brauneis said the aircraft was brought to the UK "to demonstrate that we could put a 360° live radar onto the aircraft. The modification to install the radome is reversible which means the aircraft can be returned to commercial service".

According to the company, the radome is capable of taking Raytheon's SeaVue, Thales Searchwater and Oceanmaster, and other maritime patrol radars of a similar size, or Raytheon's Hughes Integrated Synthetic Aperture Radar or similar radars.

Other aircraft presented to the MFTS IPT by Raytheon were King Air B200, Hawker 400 and 800XP, Beech 1900D and Beechcraft Premier 1.

Damian Kemp *JDW Aviation Editor, London*

RELATED ARTICLE:
Serco bails out of UK training contest
(jdw.janes.com, 07/05/04)

ASIA PACIFIC

Strait of Malacca to be given air protection

Indonesia, Malaysia and Singapore are set to expand their co-ordinated naval patrols in the Strait of Malacca with the introduction of air assets following an agreement announced in Kuala Lumpur on August 2. However, exact details of the plan have not been released.

The initiative is aimed to bolster security in the vital sealane.

The plan to introduce maritime patrol aircraft was announced following a two-day meeting between chiefs of defence from the three countries, which also included their Thai counterpart.

The Royal Thai Navy has been invited to participate in the co-ordinated patrols but has yet to accept.

"We want to show the international community that we are serious about securing the Malacca Strait," Indonesia's Military Chief, General Endriartono Sutarto, told reporters following the talks.

The sealane initiative was first proposed publicly by Malaysian Deputy Prime Minister and Defence Minister Dato' Seri Najib Tun Razak during a June defence conference held in Singapore and follows earlier statements by Japanese Defence Minister Yoshinori Ohno urging increased co-ordination between the three countries to better control piracy.

In his formal remarks to conference participants, Dato' Seri Najib said: "We should call upon the wider international community, and in particular those who benefit most from safe passage through the straits, to step forward and make concrete contributions to support ongoing efforts by the littoral straits." This could include the provision of maritime patrol aircraft, he added in response to a question from the floor.

Indonesia, Malaysia and Singapore launched co-ordinated naval patrols in the Strait of Malacca in mid-2004 to better deter piracy and terrorism.

The patrols are not conducted jointly and are, therefore, viewed by analysts as largely symbolic of the common interests involved. Perhaps more tangibly, Indonesia and Singapore have jointly established a tracking centre on the Indonesian island of Batam to monitor, using radar and satellite technology, vessels approaching the Singapore Strait.

Robert Karniol

JDW Correspondent, Bangkok

RELATED ARTICLE:

Multinational patrols begin in Malacca Strait (jdw.janes.com, 04/08/04)

Japan report outlines growing China threat

SHINIICHI KIYOTANI *JDW Correspondent and*

ROBERT KARNIOL *JDW Asia-Pacific Editor*

Tokyo and Bangkok

The Japanese government approved the country's 2005 Defence White Paper on 2 August, highlighting a heightened potential threat from China.

A focus on Beijing's military build-up echoes a similar theme articulated by the US, where the Bush administration has expressed concerns over the pace of China's force modernisation, which is viewed as increasing the threat to Taiwan and, more broadly, to US national security interests.

China's Foreign Ministry was quick to respond to the Japanese report, dismissing Tokyo's concerns as "groundless" and "irresponsible".

Chinese Foreign Ministry spokesman Kong Quan, quoted by the Xinhua news agency, said the White Paper harms efforts to establish mutual trust on security.

Reflecting directions laid out in

- Japan's new defence White Paper stresses the growing potential threat from China
- The report also points to destabilising developments in North Korea
- Force development plans outlined in a new policy paper released in 2004 are also reiterated

a defence policy paper released in late 2004, Japan's new White Paper stresses the efforts to improve capabilities of the Self-Defence Force (SDF) to respond to crises, including ballistic missile attacks, threats from terrorists or special forces as well as large-scale natural disasters.

On the issue of missile defence, which is being pursued jointly with the US, the White Paper calls for speedier research and development activity as well as operational studies.

It is also noted that the SDF is

due to introduce a joint command structure from March 2006 through a transformation of its Joint Staff Committee.

Regarding China, the White Paper stated that Beijing has yet to make public its true spending on defence-related activities. Japan is also calling for greater transparency regarding China's People's Liberation Army (PLA), including organisation, equipment and detailing of expenditure. There are also concerns over the PLA's growing air and naval power capabilities.

North Korea is also highlighted as a concern for Tokyo, reiterating a long-standing worry over Pyongyang's efforts to develop its nuclear and ballistic missile forces and its extensive special operations capabilities.

These are a seriously destabilising factor for the region, the White Paper stated. ■

RELATED ARTICLES:

Japanese Defence Reform: shifting gear (jdw.janes.com, 17/03/05)

China more open to using force, says US report (jdw.janes.com, 03/06/04)

US approves initial transfer of two F-16s to Pakistan

The US has approved the initial transfer of two refurbished F-16 multirole fighters to Pakistan, ending a moratorium on such sales introduced over 15 years ago.

A further shipment involving at least 10 additional refurbished aircraft could be delivered in mid-2006, according to a Western diplomat based in Islamabad.

The sales will boost Pakistan's F-16 fleet of 32 operational aircraft to at least 40. However, Pakistan Air Force sources said that Islamabad could seek up to 75 new F-16s worth over USD3 billion, which would represent the country's largest defence purchase.

The deal for the two F-16 fighters comes just a fortnight after the US agreed to provide civilian nuclear power reactors to India, which caused dismay in Pakistani political circles.

"This would intensify the nuclear rivalry between India and Pakistan and harm any future US-backed confidence-building measures," a foreign ministry official told *JDW*.

Western diplomats are divided over Pakistan's chance of receiving clearance for the 75 new F-16 fighters.



The lifting of a 15-year moratorium by the US may see Pakistan increase its F-16 fleet to over 40 fighters

Pakistan MoD: 0013282

Although Lockheed Martin and Boeing are bidding for a major fighter aircraft contract in India, offering the F-16 Block 50/52 and dual-engine F/A-18 Super Hornet respectively, New Delhi has warned the US that the resumption of F-16 sales to Pakistan could have negative consequences for India's security interests.

Farhan Bokhari, *JDW correspondent, Islamabad, Pakistan*

Report slams Australian M113 upgrade programme

IAN BOSTOCK *JDW Correspondent*
Sydney

A report compiled by the Australian National Audit Office (ANAO) has revealed a litany of contractual and management inadequacies in the troubled programme to upgrade the Australian Army's fleet of M113A1 tracked armoured vehicles

Tasked with providing an independent analysis of the Defence Materiel Organisation's (DMO's) management of the M113 upgrade, the report – entitled 'Management of the M113 Armoured Personnel Carrier Upgrade Project' – found that the AUD552 million (USD428 million) programme has undergone extensive scope changes and chronic schedule delays since its inception in the early 1990s.

The latest upgrade iteration, which requires prime contractor Tenix Defence to upgrade 350 vehicles to the AS3 and AS4 standards, suffered a three-year delay between project approval in June 1999 and contract signature in July 2002. The ANAO found that this period of excessive inactivity was "characterised by an inability of [the Department of] Defence to successfully manage changes in requirements".

Managed within the Tracked Manoeuvre Systems Program Office, the DMO accepted an unsolicited proposal from Tenix in January 1998 to combine the two phases of the original M113 Minimum Upgrade into one project sole-sourced through the company.

According to the report, Tenix indicated that vehicles could be delivered two to three years earlier than planned and an AUD30 million saving be realised by adopting this acquisition strategy.

The 2000 Defence White Paper stated that the upgraded vehicles acquired through this proposal were to enter service beginning in 2005. That milestone has since slipped to November 2006, when Tenix is required to deliver 14 initial production vehicles (IPVs) to the army for test and evaluation.

- **The M113 APC upgrade programme has undergone extensive scope changes and chronic schedule delays since its inception in the early 1990s**
- **November 2006 introduction into service goal is unlikely to be achievable, says ANAO**

Part of the problem in Tenix meeting the contracted schedule is due to performance issues concerning excessive engine heat from the new 260 kW MTU 6V 199 TE diesel engines installed in the two demonstration vehicles.

This delay has hindered Tenix in progressing to Stage 2, which involves production and delivery of the 14 IPVs. The DMO has nonetheless allowed Tenix to progress to Stage 2, confident that a technical remedy would be implemented by the company in a timely manner. The issue, however, has not yet been resolved, the report cited.

Tenix has informed *JDW* that solutions to the engine heating problem have been identified and are being installed in the two demonstration vehicles.

The solutions, according to a company spokesman, include replacement of selected engine components, increasing fan speed and a new air intake screen that improves air flow to the engine. The new system will undergo company engineering and field testing throughout the rest of 2005.

The November 2006 introduction into service goal is unlikely to be achievable, however, according to the ANAO, which stated that the production of some of the IPV variants would "slip by up to six months". This is likely to result in delivery of the IPVs around May 2007. Final deliveries, therefore, would not take place until 2011. Tenix has also failed to supply the DMO with the requisite integrated logistics support data, the report found. To hasten transition to full-rate production (FRP), Tenix devised a process of fast-tracking production whereby it commences

production of the vehicles before they have passed Department of Defence (DoD) formal testing.

This circumvents the DoD's own plan to put the 14 IPVs through a series of rigorous functional and physical configuration audits, reliability and maintainability demonstrations and qualifications. From these tests, the DoD would give Tenix approval or otherwise to proceed to FRP under Stage 3.

However, Tenix will conduct its own reliability qualification tests and proceed directly to FRP based on the results. "This revised programme shows that not only is the schedule some 11 months later than originally planned, [but] production will occur before the necessary Department of Defence sign-off," the ANAO concluded. This, it said, was still a high-risk option for delivery of army capability even if most of the commercial risk resides with Tenix. As of 30 June, Tenix had received AUD187 million from the DoD for the M113 upgrade. The ANAO determined that the original AUD30 million in savings for the DoD predicted by Tenix will not occur due to increases in project cost and changes to the acquisition strategy. ■

RELATED ARTICLES:

Australian Defence Industry: hard drive
(*jdw.janes.com, 05/03/05*)

Australian Army falls short of capability goals
(*jdw.janes.com, 04/02/05*)

One of the two demonstration vehicles produced by Tenix Defence for the Australian Army's **M113** Upgrade project

DMO: 1116419



In Brief

China, Russia to hold joint exercises

China and Russia will hold their first joint military exercise over the period 18-25 August with more than 100,000 troops expected to participate, according to China's official Xinhua news agency. 'Peace Mission 2005' will involve forces from ground, naval, air, marine corps, airborne and logistic units. It will be held in Vladivostok in the Russian far east and in the coastal Chinese province of Shandong and adjacent waters.

ST Engg acquires US vehicle business

Singapore Technologies Engineering (STEngg) has acquired the US-based company Specialised Vehicles Corp through its local subsidiary, Vision Technologies Land Systems, at a cost of some USD52.5 million. "The acquisition is in line with STEngg's strategy to grow the commercial automotive business of its land systems sector and to become a global specialty vehicle player," the Singapore company said in a statement announcing the deal.

Indonesian firm wins C-295 contract

Dirgantara Indonesia has been awarded a USD45 million contract to produce parts for C-295 and CN-235-300 aircraft to be produced by CASA in Spain. The seven-year contract involves component packages for the nose, centre and rear fuselage.

Australian companies win JSF contract

Canberra-based Kellogg Brown & Root together with Catalyst Interactive, in collaboration with Adacel Technologies from Melbourne, have been selected for software development on the US-led Joint Strike Fighter (JSF) project. At undisclosed cost they will help development of training courseware products for pilots and maintenance personnel.



The Gulf Defence Conference 2005

The cauldron of Iraq – its implications for security and defence

Gulf Defence Conference CD-ROM now available!

All the presentations from the largest Gulf Defence Conference to date are now available on an interactive CD-ROM. The CD includes full speaker presentations, biographies, IDEX exhibitor information and other useful resources relating to the conference.

Presentations comprise:

4th Generation Warfare and US/Coalition Maritime Operations in the Middle East

Rear Admiral Mike Tracy, Commander, USS HARRY S. TRUMAN Strike Group

The Cauldron of Iraq – Its Wider Implications for Defence Equipment Acquisition

Tony Edwards, formerly Head of DESO, UK, currently visiting professor, RMCS, Shrivenham

Terrorism – The Contagious Threat

Dr. Andrew Stewart, King's College, University of London

The Maritime Security Challenge

Commodore Allan Du Toit, Director General, Navy Capability, Performance and Plans, Australian Navy

Two Years On – Military and Security Lessons to be Learned from Iraq

General Sir Jack Deverell, Deputy Chairman, SOE

Future Warfare – The Blueprint for the Future

Admiral Sir Ian Forbes, recently Supreme Allied Commander, Atlantic (SACLANT)

The Changing Role of the Military

Major General Marc Dumais, Assistant Chief of the Air Staff, Canadian Armed Forces

Maritime Border Management & Control

Commander Ian McLaren, Marketing Consultant, BlueFinger Ltd

All these presentations and many other useful resources for only UK£150 (inc p&p)

To order your copy of the Gulf Defence Conference 2005 CD-ROM please call + 44 (0) 20 8700 3781 or e-mail: rafal.kotowicz@janes.com quoting GDC CD-ROM



Jane's

Intelligence and Insight You Can Trust

MIDDLE EAST/AFRICA

Egypt requests additional M109 artillery system

ROBIN HUGHES *JDW Middle East Editor*
London

The Egyptian Army is seeking to augment its inventory of M109 series 155 mm self-propelled howitzers with the acquisition of additional systems under the US government's Foreign Military Sales (FMS) programme.

Cairo has requested the possible purchase of 200 M109A5 155 mm self-propelled howitzers plus associated logistics and training packages with a potential notification contract value of USD181 million, the US Defense Security Co-operation Agency (DSCA) announced on 29 July.

The systems requested are former US Army M109A5s that will be refurbished by prime contractor BAE Systems Land and Armaments' Ground Systems Division (formerly United Defense Industries). BAE Systems acquired United Defense on 24 June for

- Egypt requests 200 refurbished M109 A5s self-propelled howitzers
- Potential order will augment existing Egyptian Army M109 series systems

USD4.19 billion. The company has now merged its existing land systems activities in South Africa, Sweden and the UK with United Defense to form a new BAE Systems Land and Armaments operating group, headquartered in the US.

"Egypt will use the M109A5 howitzers primarily in support of its armed forces, but may also use them in joint exercises with the US government," a DSCA statement said.

In December 2004, Cairo took delivery of its first batch of a total of some 201 surplus US Army M109A2/M109A3 self-propelled

howitzers to be refurbished for the Egyptian Army under a USD43.7 million FMS contract awarded to the then United Defense Industries by the US Army Tank-Automotive and Armaments Command.

The howitzers are being refurbished to a fully functional condition at the now BAE Systems Land and Armaments' Ground Systems Division facilities at York and Fayette County in Pennsylvania and at Anniston Army Depot, Alabama. The remainder of the order is expected to be delivered by November.

This latter order will be used alongside the 164 new-build M109A2 self-propelled howitzers currently in service with the Egyptian Army. These are supported by 51 United Defense M992 Field Artillery Ammunition Support Vehicles and 72 Fire Direction Centre vehicles.

The refurbished self-propelled howitzers will probably replace older Russian-supplied 122 mm and 152 mm towed systems to complement the Egyptian Army's M1A1 Abrams and M60A3 main battle tank (MBT)-equipped divisions.

Defence sources have told JDW that Egypt has also test-fired a 155 mm/52 calibre weapon mounted on a modified T-55 MBT chassis. However, to date, this has not entered into service with the Egyptian armed forces. ■

RELATED ARTICLE:
Egypt receives refurbished M109 howitzers (*jdw.janes.com*, 15/12/04)

In Brief

Booz Allen Hamilton wins Saudi contract

Booz Allen Hamilton of the US has been awarded a USD16.4 million contract for training, education, engineering, technical and management support services for the Royal Saudi Naval Forces under the US government's Foreign Military Sales programme. The contract includes a base year and four one-year options which, if exercised, would bring the total estimated value of the contract to USD99.99 million. Work will be performed in Saudi Arabia (65 per cent); McLean, Virginia. (34 per cent); and other locations (1 per cent) and is expected to be completed by July 2006.

Oryx life extension

The South African Department of Defence's acquisition agency, Armscor, has issued a request for proposals for airframe and engine life-extension work on the South African Air Force's fleet of Oryx medium transport helicopters. The Oryx, essentially a Puma with a Super Puma power train and tail boom, is expected to remain in service up to 2015. It had been intended to receive a new avionics suite developed from that of the Rooivalk, but funding will probably only permit a partial avionics upgrade.

A-Darter technology demonstrator

Denel Aerospace Systems has been awarded a contract to develop an A-Darter air-to-air missile technology demonstrator. The South African Air Force has provisionally selected the A-Darter as the 'dogfight' missile for its future Gripen fleet.

Plasan details M-PAV2 variant for Humvee

Israeli ballistic protection systems developer Plasan Sasa has detailed the latest in its Multi-Purpose Armoured Vehicle (M-PAV) family of up-armoured AM General Humvees – the M-PAV 2.

Building on earlier solutions developed for the Israel Defence Force Humvees, and for the Hellenic Armed Forces M-PAV 1 variant, the M-PAV 2 retains the same four-wheel mine protection and NATO STANAG Level II armour packages, while extending the armour suite to a new passenger-accessible rear load area volume of over 2.2 m³. According to Plasan, this does not encroach on the front crew compartment.

With a height of 1.1 m and minimum width of 1.3 m, the company said the M-PAV 2 rear load area can "easily accommodate a 1 m³ payload through its rear double doors.

Plasan Chief Executive Officer Dan Ziv told *JDW* that, "while the M-PAV 2 features a more comprehensive level of protection for vehicle-mounted equipment and systems, our



Plasan Sasa has received an order for an unspecified number of M-PAV kits for a NATO user Plasan; 1116429

composite armour solutions still give unprecedented payload capacities of 900 kg [and 1300 kg for M-PAV1]."

Approved by Humvee manufacturer AM General and compliant with requirements for retaining the vehicle's chassis flexibility, the M-PAV 2 is also configurable with a third row of seats and extra windows, which, Ziv noted, "for the first time offers a fully-armoured six-seater Humvee variant".

The vehicle also has an optional rear roof hatch that can be fitted with an extendable electro-optic/radar system that can retract into the protected rear area.

Ziv said that Plasan designers have upgraded both ergonomics and maintainability for the M-PAV 2.

"With a raised roof-line extending the front screen to create a more spacious cabin [M-PAV 2 is 20 cm higher than M-PAV 1 or other standard Humvees]. Plasan's new M-PAV 2 helps ensure that troops can remain combat-ready even on extended duty aboard the vehicle," he said.

The M-PAVs sandwich-structure composite armoured body provides insulation from temperature and noise and features single-piece panoramic ballistic windshields and sweeping side ballistic windows for uninterrupted field of vision.

Plasan has been awarded a contract to supply the M-PAV 2 package to an unspecified NATO user, with the vehicle now approved for production. The company will provide the armour suite in kit form, which will be assembled locally by the customer.

Robin Hughes
Middle East Editor, London

Jane's Defence Weekly Digital

A new innovation – try it today for **FREE!**

Designed to complement our online service, *Jane's Defence Weekly* Digital is an exact replica of your magazine delivered straight to your computer.

This new and improved version downloads really quickly and has greater functionality, and what's more, we've arranged for you to try it out for free!

SAMPLE IT NOW

You don't need to download anything to view your free sample issue. Simply go to www.janes.com/digital to experience *Jane's Defence Weekly* Digital immediately!

Sample it **FREE** at www.jan

ery of Jane's Defence Weekly

LATEST
VERSION!

Striking back

This year marks a watershed for the UK Royal Navy's RN's three-ship Invincible-class aircraft carrier (CVS) force as the service seeks to optimise its carrier strike capability in the run-up to the introduction of the Future Aircraft Carrier (FAC).

On the one hand it is the beginning of the end of an era in UK carrier operations, with HMS *Invincible* entering a state of 'extended readiness' in September, that will, barring a major contingency, bring to an end the vessel's ongoing career with the RN.

On the other, it signals the beginning of a new epoch. When the recently refitted HMS *Illustrious* assumes the mantle of fleet flagship in mid-2005, it will be optimised to operate primarily as a strike carrier and general readiness offensive air power against targets ashore. Since ship HMS *Ark Royal* will be a similarly reconfigured by the time it returns to service in early 2007.

In parallel, Joint Force Harrier (JFH) - which brings together Royal Air Force (RAF) Harrier GR.9 and RN Sea Harrier FA.2 squadrons under a single command - is progressing a migration strategy that will see the retirement of the Sea Harrier and introduction of the upgraded Harrier GR.9.

The early demise of the Sea Harrier has a broad tactical rationale and the RN acknowledges that the aircraft's withdrawal will result in a significant

diminution of fleet air defence capability. However, with an increasing focus on power projection from the sea, the service accepts that proposed upgrades to the FA.2 should be sacrificed in favour of investment in the far more potent offensive air capability offered by the Harrier GR.9.

Taken together, the re-orientation of *Illustrious* and *Ark Royal* and the introduction of the Harrier GR.9 to the JFH will provide the UK with the foundations on which to develop and hone the organisation and posture required for carrier strike. It is the intention that this latest chapter in the career of the CVS force should become the 'prequel' to the new era of carrier aviation promised by the introductions of the CVF and the Joint Combat Aircraft (JCA) - in the guise of the F-35B Joint Strike Fighter - into the early part of the next decade.

MARSTRIKE deployment

HMS *Invincible* left Portsmouth on 17 January to lead a group of RN ships - constituting the MARSTRIKE 05 deployment - to undertake a series of planned exercises in the Mediterranean and the Gulf over a three-month period. Designed to demonstrate the UK's ability to deploy, operate and sustain a maritime strike force with significant global reach, the major focus of the deployment was Exercise 'Magic Carpet', which

involved French, Danish, UK and US aircraft operating over a range in southern Oman.

"MARSTRIKE 05 is being used to exercise *Invincible* and its Tailored Air Group (TAG) in the maritime strike role," Rear Admiral Charles Syke, Commander UK Maritime Forces, told JFH on board *Invincible* in late February. "We want to develop our capability to achieve effect on the ground by utilising the flexibility of air power deployed from the sea and improve our ability to put together responsive strike packages able to deliver best effect from our ships. 'Magic Carpet' provides us with an ideal proving ground to exercise this capability."

During 'Magic Carpet' the ship embarked a force of 15 JFH air jets, comprising seven Sea Harrier FA.2s from 801 Naval Air Squadron and eight Harrier GR.9s from No. 146 Squadron, RAF. Three Sea King AS.33 aircraft from 849 NAS B Flight operated in concert to provide organic surveillance and air control to support composite air operations. A single Sea King HAS.6 from 771 NAS B Flight was also

Two Harrier GR.9s from No. 146 Squadron RAF are launched from the deck of HMS *Invincible*.



With Joint Force Harrier transitioning to the upgraded Harrier GR.9, the UK Royal Navy is developing the potential of its Invincible-class



ANALYSIS

IDF braces itself for withdrawal from Gaza

The Israel Defence Force is preparing for what will be a stormy disengagement from the Gaza Strip and northern West Bank. Alon Ben-David reports

While Israel is already experiencing the turmoil of the forthcoming withdrawal from the Gaza Strip and northern West Bank, its strategists and planners remain concerned over the potential ‘morning-after’ scenario following the implementation of Ariel Sharon’s ‘Disengagement Plan’.

On 14 August more than 50,000 Israel Defence Force (IDF) troops and Israel Police officers will be deployed in and around the Gaza Strip. The following morning they will knock on the door of each of the 8,000 Israelis living in 20 settlements in the Gaza Strip, notifying them that in accordance with the law, they are requested to leave peacefully within 48 hours.

“Following that notice, I believe that more than 50 per cent of the settlers will obey and leave peacefully,” said Major General Dan Harel, General Officer Commanding Southern Command, who will lead this operation. Others claim this is wishful thinking and the majority of settlers will refuse to leave willingly. Moreover, the opposition movement’s efforts to breach the isolation imposed on the Gaza Strip in July have already succeeded in smuggling an additional 2,000 Israelis to reinforce the Gaza settlements.

Whatever the number of settlers might be, on 17 August unprecedented deployments of troops and police will begin a systematic forceful eviction of all settlements. “We cannot afford to fail,” said IDF Chief of General Staff Lieutenant General Dan Halutz. “Failure to implement a legitimate decision of the Israeli government and parliament would be the end of Israeli democracy as we know it.”

A ‘likely severe’ scenario

IDF planners have sketched several scenarios on the level of resistance the evacuating forces will meet from the settlers. Gen Halutz selected the “likely severe” scenario, in which the majority of settlers resist evacuation non-violently, the minority resist, using physical force, and there is likelihood that some elements will resort to the

use of weapons to avoid eviction. Under those conditions, the IDF’s specially created evacuation units were ordered to prepare to end the evacuation of all Gaza settlements within three to four weeks.

Subsequent to the Gaza withdrawal, the IDF will evacuate four additional settlements in the northern West Bank, where the struggle is expected to be even harsher. While the fence-

Jerusalem],” said the source. As a result, the ISA has placed an unprecedented level of protection on Sharon and Israel Police have substantially reinforced security around the Muslim holy sites in Jerusalem. While Sharon and Temple Mount will be hard to damage, the ISA is mostly disturbed by what is called the ‘lone gunman’ scenario – an attack by a lone assailant on a sensitive Palestinian target, such as a mosque or a school. “This requires no preparation and no organisation, just a single armed and determined person, and therefore is very hard to prevent,” said the ISA source.

On 4 August, an IDF defector randomly shot and killed four Israeli Arabs in northern Israel. Similar attacks with graver results could ignite a wave of violence among the Palestinians, which could jeopardise or stall the disengagement, the ISA fears.

“The radicals believe only a spectacular act could derail the Disengagement Plan”

encircled Gaza Strip is relatively easy to isolate, the four settlements in Samaria are accessible from various directions, and therefore expected to draw masses of demonstrators who would join the settlers in resisting the withdrawal. “It already appears that the major showdown of the Disengagement [Plan] will be in the settlement of Sa-Nur,” a senior IDF source told *JDW*. Sa-Nur, located north of Nablus, which was until recently a small moderate settlement hosting 10 families, now holds more than 500 settlers, many of whom are from the neighbouring extremely radical settlements of Samaria. “This will most likely be the grounds for the final ‘Disengagement’ battle,” said the source.

The ‘lone gunman’

“There will be evacuation, period,” says Gen Harel. “No question about it.” Yet, the Israeli Security Agency (ISA, aka Shabak), which is monitoring the radical right movements opposing the Disengagement Plan, fear that extremists are seeking ways that will stop the process from taking place. “The radicals believe that only a spectacular act could derail the disengagement,” said a senior ISA source. “The two most common scenarios mentioned by extremists are an attempt on the Prime Minister’s life or an attack on the Mosques of Temple Mount [in

‘Iron Fists’

The Palestinians are also preparing to decrease friction during the disengagement: some 5,000 Palestinian troops will be deployed in the



areas surrounding the Gaza settlements to prevent violence from insurgent groups. Although the other Palestinian insurgent organisations, such as Hamas and Islamic Jihad, have declared that they would refrain from attacks during the Israeli withdrawal, the IDF remains sceptical. “The Palestinians won’t be able to resist the temptation of appearing as chasing Israel out of Gaza,” a senior IDF source said.

Under the assumption that Palestinian attacks will increase before or during the withdrawal, the IDF has readied three armoured brigade combat groups, dubbed ‘Iron Fists’ to take over Palestinian territory and prevent firing on the settlers and the evacuation forces. “There will not be evacuation under fire,” said Gen Halutz. “If there is Palestinian fire we will first suppress it and only then resume evacuation.”

Although attempts have been made to coordinate the withdrawal with the Palestinian Authority (PA), the IDF doubts the PA’s capability to actually control events. “The PA’s capability to enforce law and order is virtually nil,” Yuval Diskin, the head of ISA, recently told a Knesset Committee. “Hamas, which has become a real alternative to the PA in Gaza, would like to take credit for the Israeli withdrawal,” added the IDF source. “Eventually, they will open fire and we will be forced to move into the Palestinian areas.”

Following the evacuation of settlements from Gaza, by early October, the IDF will withdraw all its bases and forces from the Gaza Strip and will redeploy on the Israeli-Egyptian 1949 Armistice Demarcation Line. The IDF is already expanding its defences, both on the ground and along the Mediterranean coastline, to prevent Palestinian infringements after the disengagement.

Egypt is scheduled to deploy 750 additional troops along its border with the Gaza Strip in early September. Israel, Egypt and the Palestinians are still negotiating the passage procedures that will exist between Gaza and Egypt after the withdrawal, but it appears that Palestinians will be able to enter Gaza from Egypt for the first time

Israeli Border Police train for the disengagement in a mock-up settlement built in the Negev

Moshe Almaliah, Israeli Police:
1116428



without Israeli monitoring. This, combined with Israeli consent to allow free maritime passage to Gaza, worries both the IDF and the ISA. “With an open sea port and an open border with Egypt, weapons and foreign terrorists could be easily imported into Gaza, and turn it to a massive base of terrorism,” said a defence source. The ISA is extremely concerned that Al-Qaeda-affiliated organisations, which apparently are active in Egypt, will be able to enter the Gaza Strip.

Hamastan

Israel is also concerned about the strengthening of the Islamic Resistance Movement Hamas in the Gaza Strip, which recently began participating in Palestinian elections and gaining increasing support. “With Hamas running several municipalities, and with its 5,000-strong ‘popular army’ [Jeish A-Sha’abi], Gaza is slowly, but surely, turning into ‘Hamastan’,” a senior IDF source said. “Hamas is imitating the transformation of Lebanese Hizbullah – becoming a political party with an army of its own,” the source added. IDF assessments say there is a “fair chance” that Hamas will take over the Gaza Strip following the Israeli withdrawal.

Yet, not all Israelis see it as a threat. “Even radical movements are forced into moderation once they take power,” said an IDF source. “Israel has been dealing with the Palestinian Fatah movement for more than a decade, but they proved to be corrupted and have consistently failed to deliver. If Hamas could establish a vital, non-corrupted, government – albeit extreme – they will eventually have to negotiate with us.”

However, very little optimism can be found in Israel for the day after the disengagement. What started as a unilateral act and turned into a coordinated one, is still perceived by most Israelis

not as a step towards peace or reconciliation with the Palestinians, but as an internal Israeli decision aimed at ending its presence in the Gaza Strip. Recent surveys show a solid 60 per cent consensus among the Israeli public in support of the withdrawal, but at the same time doubting that it will improve Israel’s security situation.

The ISA’s Diskin foresees an immediate wave of violence in the West Bank following the disengagement: “Hamas will have an interest to demonstrate control over Gaza immediately after the withdrawal,” he told the Knesset. “I believe that in the weeks following the disengagement, the focus of Palestinian struggle will move to the West Bank.” Former IDF chief of staff, retired General Moshe Ya’alon, has a more apocalyptic vision. “If Israel does not commit to a further withdrawal [from the West Bank], we will face a violent eruption that begins in the West Bank and spreads to Gaza,” he said recently.

Sharon, who has lost support among the Israeli right, and will by then begin preparing for his reelection, would probably respond aggressively to Palestinian violence, in an attempt to rehabilitate his reputation as a hawk.

Both IDF and ISA sources believe that violence will continue to come out of Gaza after the Disengagement and that will eventually require the IDF to continue operating there. With the IDF improving its efficiency in sealing the border between Gaza and Israel, the main concern is a development of Palestinian rocket capabilities, which will threaten the highly populated areas in southern Israel. “The morning after the withdrawal we will be ready to lead armoured columns back into Gaza,” Colonel Eyal Eisenberg, commander of IDF Givati infantry brigade told *JDW*. “We just hope we won’t have to.”

Alon Ben-David

JDW Correspondent, Tel Aviv

Opponents of the disengagement plan try to convince IDF soldiers to disobey orders. Opposition movements have already succeeded in smuggling around 2,000 Israelis to reinforce the Gaza settlements

Empics; 1116431

RELATED ARTICLES:

IDF gears up for Gaza disengagement

(*jdw.janes.com*, 29/07/05)

PA recruits more troops

(*jdw.janes.com*, 16/06/05)





'Libraries - A voyage of discovery'

14-17 August 2005 - Oslo, Norway

Visit Jane's at WLIC 2005

Jane's are pleased to be exhibiting at the 71st World Library and Information Congress (WLIC) promoted by IFLA (International Federation of Library Associations and Institutions). WLIC is the largest international event for professionals within the library and information sector.

Contact Sue Keyse at sue.keyse@janes.com for your personal invitation and visit us on stand 204 in the Oslo Spektrum where your details will be entered into our exclusive prize draw.

For further information about the conference and exhibition visit www.congrex.nl/ifla2005exhibition

BUSINESS

Latest acquisition pushes QinetiQ turnover above £1 bn

GUY ANDERSON *Editor, Jane's Defence Industry*
London

UK science and technology group QinetiQ has completed its largest-ever acquisition in the US, the third transatlantic deal in 12 months, which will take its turnover beyond GBP1 billion (USD1.8 billion).

QinetiQ – which is 31 per cent owned by the US private equity house Carlyle Group and is gearing up for a listing on the London Stock Exchange (LSE) – announced on 3 August that it had acquired information technology provider Apogen Technologies in a GBP162.7 million deal.

Chief executive Sir John Chisholm described the US as “central to our overall growth strategy”.

QinetiQ began its push for growth through acquisitions in the US with the purchase of defence companies Westar Aerospace & Defense Group for GBP72.2 million and Foster-Miller for GBP91.8 million in September 2004.

The first two acquisitions provided a bridgehead into the US Department of Defense for the UK technology provider, and increased its US sales from GBP300,000 to GBP70.1 million in Fiscal Year 2005 (FY05).

“Stronger access to the world’s

● UK science group QinetiQ has acquired US defence technology group Apogen Technologies in a USD288 million deal, its third US deal in 12 months.

● The acquisition will push QinetiQ's turnover beyond GBP1 billion for the first time, and comes as it prepares to be listed on the London Stock Exchange

largest defence and security market provides us with a powerful pull-through for our UK-based business, allowing our capabilities to reach a bigger overall market,” Chisholm said. “Our strategy in the US is to penetrate the defence and security markets by creating three operating businesses that reflect our three main routes to market – through the provision of ground-breaking technology, systems engineering and customer support, and information technology.”

Virginia-based Apogen – a national security and federal technology specialist with a 900-strong staff – posted revenues of USD205.1 million in FY04. The increase of 12 per cent on the previous year was largely driven by growth in demand for its homeland security expertise.

Chisholm said: “Our objective

now is to develop the synergies between these three operating businesses, which together delivered some USD600 million in revenue in 2004.

“Our US development from now on will be carried out principally through these companies, both by organic growth and through possible acquisition.”

The company saw sales increase from GBP795.4 million to GBP872.4 million during FY05 – largely on the back of the first two US acquisitions. Adding Apogen to the QinetiQ North America portfolio will increase the group turnover to around GBP1.12 billion.

QinetiQ, which was partly privatised two years ago when Carlyle acquired a 31 per cent stake for GBP150 million from the UK government, is expected to take its first steps towards an initial public offering on the LSE in September this year.

Investment markets have been poised for the flotation since the UK Ministry of Defence announced in July that it would permit QinetiQ to appoint financial advisers. The market consensus is that the flotation will value QinetiQ at around GBP1 billion.

RELATED ARTICLES:

September IPO on the cards for QinetiQ (*jdw.janes.com, 03/08/05*)

Another US acquisition for QinetiQ (*jdw.janes.com, 17/09/04*)

General Dynamics to acquire Itronix

General Dynamics (GD) has acquired Itronix Corporation, a provider of wireless, rugged mobile computing technology, in a move the company sees as a significant increase in its computing solutions capability.

GD announced on 3 August that it had entered into a definitive agreement with Itronix Holdings and Golden Gate Capital for the acquisition. The company is now awaiting a regulatory review by the US Department of Justice to finalise the sale, expected before the end of September.

A GD spokesman said the terms of the acquisition were not being disclosed.

Itronix, which will become part of the General Dynamics C4 Systems business unit, supplies a range of hand-held equipment, laptops and tablet PCs, and wireless integration and support services.

General Dynamics C4 Systems President Mark Fried said, with much of the company's business already in the rugged computing solutions market, the acquisition would help broaden its product range.

“The acquisition of Itronix will allow General Dynamics C4 Systems to bring even higher value to our core Department of Defense and Department of Homeland Security customers, and expand further into select commercial and international markets, which increasingly are calling for rugged computing solutions to meet their mission requirements.”

Tony Skinner

JDW Staff Reporter, London

Go to jdw.janes.com for more of this article

UK signs Watchkeeper contract

The UK Ministry of Defence (MoD) has signed a GBP700 million (USD1.24 billion) contract with Thales UK for the Watchkeeper unmanned aerial vehicle (UAV) system but details remain sketchy on how many aircraft will be manufactured or what the initial capability will be when it is declared.

The contract signature on 4 August was pre-empted by Secretary of State for Defence John Reid on 20 July, one day

before the UK parliament went into recess, when he announced the programme had been given the “green light”.

The Watchkeeper contract was originally predicted to be worth GBP800 million but the move from two platforms to one and clarification of the requirement is believed to have reduced the price. However, the contract is the largest to date for Thales UK.

The MoD plans to “introduce [the] capability in 2010”, according to a spokesman, but what this involves in terms of number of platforms or ground stations is unknown and a date when all platforms will be delivered has not been announced.

Watchkeeper involves the purchase of Israel's Elbit Systems' Hermes 450 UAVs (designated WK450 for the programme, pictured left), ground stations and sensors to

provide 24 hour, seven-day-a-week surveillance when required.

Thales and Elbit Systems are finalising details of a joint venture (JV), which will be established in Leicester, central England, and signatures for the creation of the JV are expected to be placed later in 2005.

Elbit Systems, in a statement released on the day of the contract signature, said it expected to receive about GBP300 million of the contract. Other team members include Logica CMG, Marshall SV, Cobham, Cubic Corporation, Boeing and Vega.

Thales UK Chief Executive Officer Alex Dorrian said the company “expects to secure export sales of at least GBP400 million over the next 10 years”. Thales UK was selected as preferred contractor in July 2004 and was awarded a GBP6 million development contract six months later.

Damian Kemp, *JDW Aviation Editor, London*



P.Allen/janes.com, 10/07/05



Aiming for the high ground

In the global market (excluding Russia and China) the US dominates the industrial and operational landscape in two ways. With the largest deployed air force it obviously has the largest weapons requirement. US manufacturers will always be supported by this single, fiercely protected market that guarantees sales. For example, the US Air Force (USAF) plans to replace its AIM-9M Sidewinder stocks (about 4,400 missiles) on an almost one-for-one basis with the AIM-9X (4,000 missiles) by 2012. No other customer has this kind of buying power.

At the same time, it is interesting to note that projected AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) export sales are running at a roughly 2:1 ratio to current domestic buys. AMRAAM production Lot 20 for (Fiscal Year 2006, FY06) contains 267 missiles for the USAF and US Navy (USN), but 565 for Foreign Military Sales (FMS) customers. In FY07 the number is 365 US versus 585 FMS.

This illustrates the second dominant US position: platform access. US air-to-air weapons are

KEY POINTS

- The US has the largest AAM requirement and enjoys the market 'high ground'
- European developers have produced advanced weapons while struggling with delays and high costs
- Israel continues to be a major source of innovation and new technology
- China draws heavily on Russian technology for key systems

probably integrated and available for a wider range of aircraft than those of all the rest of the world's missile makers put together. This market 'high ground' ensures a continuing stream of follow-on sales, quite apart from any new customers. And there are new customers.

All the former Warsaw Pact states that have re-equipped their new NATO air forces – the Czech Republic, Hungary and Poland – have each signed for US air-to-air weapons regardless of whether they have purchased US aircraft. That trend is set to continue, both in Europe and elsewhere.

Europe's missile industry watches the air-to-

air weapons market with increasing frustration. The easy availability of integrated and affordable US missiles continues to eat up market share. Europe's air-to-air missile (AAM) developers hold impeccable high-tech credentials and have produced advanced and effective weapons. However, they have failed to develop sufficient critical mass while always struggling with delays and high costs. France has had a reliable market for its missiles but these weapons have been tied to French-built platforms. That route is now a dead end for future volume sales. The UK is arguably in a worse position, with no national aircraft industry to fall back on and exports to the US or Europe unlikely. Other projects, like the German-led IRIS-T, survive at the margins but the European missile industry is failing to effectively compete by not having a unified product line, or even a unified process.

A 'must have' package

One of the few instances where this is not true – and the only example in the AAM field – is MBDA Missile Systems' Meteor Beyond-

BRIEFING

AIR-TO-AIR WEAPONS

A active radar-guided MICA EM is launched by a Dassault Rafale. The passive infra-red-homing MICA IR variant entered operational testing this year

MBDA Missile Systems; 1116395



The lucrative air-to-air missile market remains an active one with established players and secretive developments. Robert Hewson looks at the latest trends and achievements in the world's major air-to-air missile programmes

Royal Air Force (RAF) and, since September 2004, the Royal Australian Air Force, arming the Tornado F.3 and upgraded F/A-18 Hornet respectively.

In May 2005 RAF Eurofighter Typhoons undertook the first operational ASRAAM trials, shooting down two targets over the Hebrides sea range, off Scotland.

ASRAAM remains an intriguing weapon. High speed and highly agile, it is a within-visual-range (WVR) missile that can engage targets at beyond-visual ranges (BVRs). It is also the only current AAM capable of conducting lock-on-before-launch engagements from inside the JSF's internal weapons bay.

Conversely, MBDA's MICA is a larger BVR weapon that (like the US AMRAAM) offers an effective WVR capability. The MICA is available in two variants, the active radar-guided MICA EM and passive infra-red (IR)-homing MICA IR.

The MICA EM has been in service on the Mirage 2000-5 with several operators for several years. It was declared operational on the Rafale in 2002. In June the French Air Force conducted the first live fire trial of the MICA IR variant from a Mirage 2000, as part of its clearance for service testing.

Germany, together with Greece, Italy, Norway, Spain and Sweden, is developing the IRIS-T short-range dogfight missile for the air forces of those six countries. IRIS-T production was launched by a German order for 1,250 missiles in 2003 and operational testing continues. The first launch from a Eurofighter was conducted in April 2004.

Raytheon monopoly

In the US, Raytheon looks unlikely to relinquish its monopoly position as developer, supplier and supporter of all in-service and future air-to-air weapons for the US armed forces. Today's Raytheon product portfolio includes the AIM-9X Sidewinder and AIM-120 AMRAAM for the USAF, USN and US Marine Corps (USMC) – and the FIM-92 Stinger that arms US Army OH-58D Kiowa Warriors and other helicopters.

The AIM-9X Sidewinder has now been deployed by the USAF (F-15), USN and USMC (F/A-18C/D) units. The full introduction of the Joint Helmet-Mounted Cueing System (JHMCS), first used operationally by USN Super Hornets in 2003, will further increase the efficacy of the AIM-9X. In March, Raytheon delivered its 1,000th missile and export orders have been received from Denmark, Poland, South Korea and Switzerland, while the missile has also been selected by Finland and Turkey.

The current AMRAAM production variant for the US and international customers is the AIM-120C-5. This version features a longer rocket motor section, an improved warhead and a repackaged guidance system. The C-5 development is Phase II of the AMRAAM pre-planned product improvement (P3I) programme, which began with the baseline AIM-120C of 1994.

Beginning in 2000 the AM-120C-5 became available to the US government's FMS cus-

Visual-Range Air-to-Air Missile (BVRAAM) programme. The Meteor should be a benchmark future weapon, one that pulls together all of Europe's skills into a 'must have' package. The threat to this rosy future is two-fold. Meteor may yet arrive into a 'no need' world, where there is no effective air threat to warrant such a high-performance (and highly priced) missile.

The second, greater, danger is a 'no room' scenario where Meteor is quietly but effectively shut out from any US platform – specifically the F-35 Joint Strike Fighter (JSF) – and thereby excluded from what could be the lion's share of the post-2020 combat aircraft market.

Missiles are nothing without the aircraft to carry them on and there are already rising concerns that the US will not exert itself to assist a Meteor integration, while producing its own next-generation AAM in the 2015 timeframe.

The first Meteor live firing trial is scheduled to take place in Sweden before the end of 2005.

Along with Meteor, MBDA is responsible for the UK-developed Advanced Short-Range Air-to-Air Missile (ASRAAM) and French MICA combat and air intercept missiles.

ASRAAM is now operational with the UK

BRIEFING

tomers. The UK has ordered 170 AIM-120C-5s to arm RAF Tornado F.3s and as an interim weapon for the Typhoon F.2.

Significant leap

The US is now moving forward with the AIM-120C-7 (P3I Phase III), launched in the Lot 16 production order. The C-7 introduces what Raytheon describes as a “significant leap in radar architecture” using guidance systems originally intended for Raytheon’s Extended-Range Air-to-Air Missile (ERAAM) challenger to the European Meteor missile. The C-5 will also have improved electronic protection, or resistance to jamming and countermeasures. The missile has now completed operational tests and should be in service by October.

Following the C-7 is a new and shadowy AMRAAM variant – the AIM-120D. Work on this weapon began quietly in 2004 under P3I Phase IV. It is being developed primarily for the USN’s F/A-18E/F Super Hornet force to provide long-range air defence, but will go on to equip the F-15, F-16 and F/A-22. The AIM-120D incorporates a two-way datalink for improved accuracy over distance, augmented by GPS navigation. The missile also delivers greater kinematics and an improved high off-boresight capability. Some sources credit it with a 50 per cent increase in range over existing variants and it is due to enter service in late 2007.

Beyond AMRAAM and AIM-9X the US is evaluating an entirely new AAM programme, the Joint Dual Role Air Dominance Missile (JDRADM). This would be a combined air-to-air and air-to-ground weapon, intended for the F-22, F-35, future unmanned combat aerial vehicles and some existing types. A USAF briefing document describes JDRADM succinctly as “the future” – but that future is still some distance off.

With a notional deployment date of 2018, seed funding for the JDRADM has been requested for FY11, but in US budgetary terms this effectively means the programme does not exist. In addition, the USAF continues to fund development work of the Aerojet (formerly Atlantic Research) Variable Flow Ducted Rocket ramjet system as a future propulsion option for an extended range AAM.

Beyond Europe and the US there are many areas of interest – some well documented, others less so. Israel continues to be a major source of innovation and new technology. The Rafael Armament Development Authority is the national AAM house and is currently marketing its Python 5 highly agile AAM and the active-radar BVR Derby.

As far as is known, neither missile has yet been sold to a foreign user and the first operational export application of both the Python 5 and Derby is likely to be in Rafael’s Spyder ground-based air-defence system. Israel has sold the earlier Python 4 to Chile, Thailand and others, and all existing Python 3 and 4 customers

Right: the efficiency of the AIM-9X Sidewinder will be further increased in US service by the full introduction of the Joint Helmet-Mounted Cueing System

Raytheon Missile Systems; 1116393



Upgraded RAF Tornado F.3s armed with the **ASRAAM missile** on the dual launchers under the wing. AMRAAMs can be seen on the centreline stations

MBDA Missile Systems; 0577895



The Astra is India's new BVR missile, now under development and scheduled to enter service at the end of the decade

R Hewson; 0547205

are being offered the improved Python 5. Both Python 5 and Derby will equip Chile’s new Block 50 F-16s, the first of which made its debut flight in June.

South Africa and partners

Israel and South Africa co-operated closely on the joint BVR missile programme that delivered the Derby, and the essentially identical R-Darter (also known as V4) to South Africa. Kentron (now part of Denel Aerospace Systems) headed R-Darter development and the missile is operational on South African Air Force (SAAF) Cheetah C fighters.

The missile will also arm the SAAF’s new Gripen, to be operational in 2008. The R-Darter

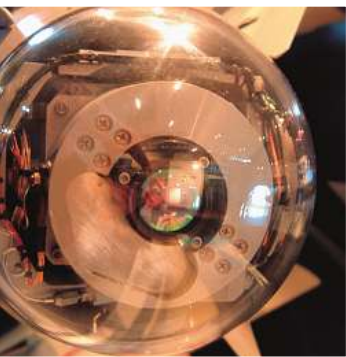
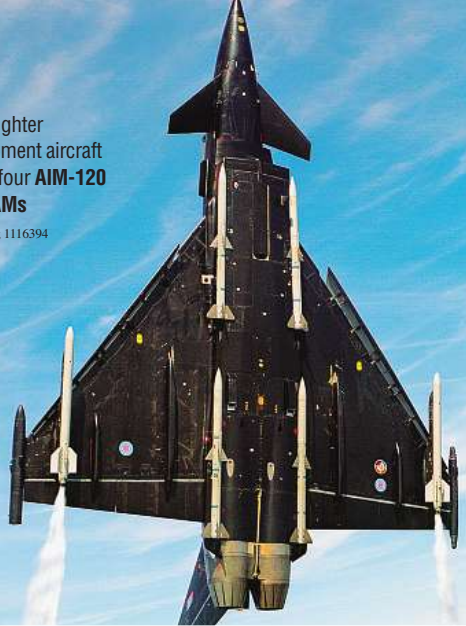
has been earmarked for Brazil’s F-5BR aircraft, now being upgraded by Embraer and Elbit. In April Kentron announced it had completed F-5BR integration trials for the R-Darter, but no order has yet been placed.

Brazil has its own short-range AAM programme in the shape of the Mectron MAA-1 Piranha. After a development process that began in the mid-1970s the Piranha was finally declared operational in June 2003. It currently arms Brazilian Air Force (FAB) F-5Es and will be integrated on several other FAB aircraft. Mectron has high hopes of export sales as part of the weapons package for the Embraer ALX (Super Tucano).

South Africa has developed and fielded a line of combat-proven short-range missiles, the lat-

A Eurofighter development aircraft carried four AIM-120 AMRAAMs

Eurofighter; 1116394



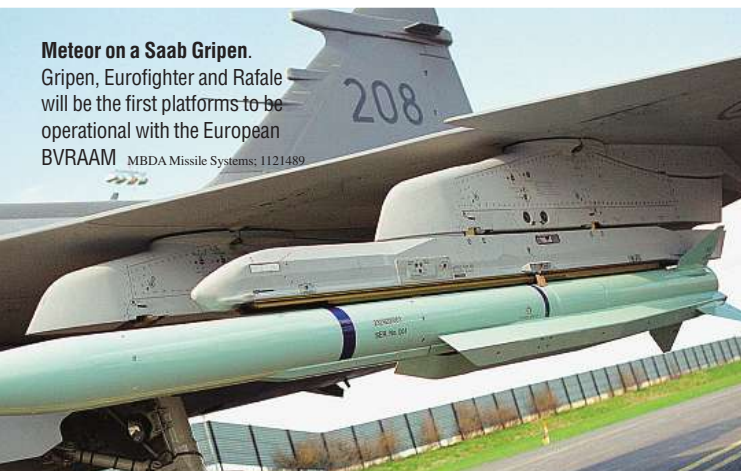
Israel's Python 5 is the cutting edge of agile dogfight missile technology. The new dual-band imaging infra-red seeker is shown here

R Hewson; 0552859

Meteor on a Saab Gripen.

Gripen, Eurofighter and Rafale will be the first platforms to be operational with the European BVRAAM

MBDA Missile Systems; 1121489



est of which was supposed to be the advanced A-Darter (Agile-Darter), or V3E. Work on this weapon has been under way since the 1990s but it has been crippled by a lack of funding and a SAAF requirement that has not always been clear. The A-Darter will still notionally equip SAAF Gripens, but a long-awaited series of initial flight tests have yet to occur and the future of the programme is in doubt.

There are persistent reports that Pakistan and South Africa have co-operated on several missile programmes, including new AAMs. Sources within Pakistan have alluded to an AAM that incorporates elements of the advanced BVR Darter designs that were once part of South Africa's previously well-funded development plans. There is still no hard evidence for this

AAM programme – although a South African-derived stand-off air-to-surface weapon is thought to have been tested and deployed.

Long denied a BVR AAM for its air force, the development of such a missile has been an obvious priority for Pakistan. It remains to be seen how its revived relationship with the US will affect any such national programme.

India develops Astra

The same is also true for India, now entering an entirely new phase in its military dealings with the US – and also developing its own BVRAAM known as Astra. The Astra should be ready for service by 2010-11, potentially to arm the Tejas light combat aircraft (LCA) and other Indian Air Force fighters. To date, two ground test campaigns have been conducted, in 2003 and again in January. The first airborne trials were predicted for 2004, but this has slipped. The Astra remains an intriguing project with several unanswered questions surrounding it, not the least of which is where India has gained access to the sensitive active radar seeker technology that the missile requires. This is a closely guarded technology that few nations possess and one that is immensely difficult to master for any country seeking to build an advanced BVRAAM from scratch, as India is.

Two nations that do appear to have developed their own active radar BVR missiles are Taiwan and Japan, although both have probably benefited from US input. Taiwan's Chung-Shan Institute of Science and Technology (CSIST) has successfully developed the Tien Chien II (Sky Sword II) – operational on the F-CK-1 Ching Kuos of the Republic of China Air Force (ROCAF) since 1996. More recently the existence of an anti-radiation variant of the missile, the Tien Chien IIA has been revealed. Japan's AAM-4 (Type 99) missile is thought to have entered service on the F-15J Eagle around the beginning of this decade and an upgrade programme for the missile is now under way.

Both Taiwan and Japan have also produced

their own indigenous short-range missiles. In Taiwan's case it is the CSIST's AIM-9 look-alike Tien Chien I. This missile was developed during the 1980s and entered service in 1993. It currently equips the F-5Es and F-CK-1s of the ROCAF and the CSIST hopes to integrate it on Taiwan's F-16s and Mirage 2000-5s.

In Japan the Technical Research and Development Institute of the Japan Defence Agency has teamed with Mitsubishi to develop the AAM-5 agile dogfight missile. This is an advanced weapon that on first glance shares many similarities with the IRIS-T. Captive carriage tests and ground-launched firings have been conducted, but the operational status of the AAM-5 is unclear. The missile is not thought to be in Japanese Air Self-Defence Force service and has not yet been issued a Type designation like the AAM-4/Type 99. Japan is intensely secretive about all of its military technology and virtually no public data has been released on the AAM-4 or AAM-5.

China making strides

Elsewhere in Asia, China's military industries are making major strides in the aerospace sector, with particular attention being paid to missile and AAM development. During the 1980s – before sanctions were imposed following the Tiananmen Square clashes between students and military – Chinese endeavours were boosted by an influx of technology and expertise from Europe and the US.

In the post-Tiananmen era and into the 1990s Israel supplied weapons and expertise, epitomised by the PL-8/Python 3 programme that made a major contribution to current AAMs such as the PL-9. During the 1990s China renewed its links with Russia and has become the main customer for advanced Russian hardware, including entire missile families.

To support sales of Sukhoi Su-27 and Su-30 multirole fighter aircraft to the People's Liberation Army Air Force (and Navy), Russia has supplied China with extensive stocks of Vypel's R-27 (AA-10 'Alamo'), R-73 (AA-11 'Archer') and, crucially, RVV-AE/R-77 (AA-12 'Adder') AAMs. The R-77, more correctly known under its export designation RVV-AE (Raketa Vozdukh-Vokdukh Aktivnaya Export – air-to-air missile, active, for export) gives China's expanding force of Russian fighters a significant air-to-air combat capability.

China has also taken delivery of extended-range R-27E (Energitisheskaya) 'Long Alamo' missiles, which are equally formidable. These substantial sales have given China access to Russian technology, particularly radar seeker technology, which has been exploited to the full.

China is now preparing to field its own active radar BVR missile, the PL-12 (SD-10), which draws heavily on Russian technology for its all-important seeker and other key systems. China took components bought off-the-shelf from Russian suppliers – including AGAT (seeker), Vypel (actuation systems) and NIIP (inertial

BRIEFING

navigation system) – and delivered them to its own engineering teams for further development. The PL-12 project has been under way for well over a decade, and a comprehensive series of ground-launched trials have been completed. Airborne firings were due to have commenced in 2004, but recently there has been a clamp-down on new information from Chinese sources.

However, in May, representatives of the Chengdu Aircraft Company told *JDW* that the PL-12 had already been “fully tested” on the J-10 fighter. China is now working on its next generation of agile dogfight missiles, incorporating advanced IR seekers and thrust vectoring controls. It has also successfully deployed the helicopter-launched TY-90 system.

Russian missiles and seekers

China and India are now the two main customers – effectively the only customers – for Russia’s missile manufacturers. The Vypel Design Bureau is almost the only air-to-air weapon developer left in Russia. Its sole companion is Novator, which may have restarted development of its KS-172 ultra-long-range AAM in partnership with India.

A handful of specialist component suppliers in the Ukraine are tied in with Vypel. Ukraine’s Arsenal enterprise supplied the electro-optical seekers for missiles like the R-60 (AA-8 ‘Aphid’) and R-73 (AA-11 ‘Archer’). In 2002 it was reported that Vypel was studying a new two-colour IR seeker, possibly known as ‘Impulse’, for an upgrade to the R-73 (R-73RDM3). The status of this missile is still unknown.

The other key link in Russia’s AAM chain is the AGAT Moscow Research Institute. AGAT supplies radar seekers for a host of Russian missile systems.

These include the 9B-1348 seeker for the R-77 and the improved 9B-1103M, which AGAT has offered to RVV-AE export customers. The 9B-1103 was originally developed for a proposed ‘active Alamo’ variant of the R-27, the R-27AE.

Another specialist version of the R-27 is the passive radar homing R-27P (Pasnivnaya) variant, fitted with the AGAT 9B-1032 seeker. This classified anti-radiation AAM has been in Russian service for many years but in 2004 the authorities there cleared it for export for the first time.

This missile’s passive RF homing capability, combined with the range of the R-27E airframe is a unique and lethal capability for any air force that fields it.

At the 2005 Paris Air Show AGAT displayed another new seeker system that may be applied in a revolutionary way. AGAT’s designers have



Above: Vypel’s R-77 has been exported in large quantities to China and India

R Hewson; 11163396



Right: AGAT’s new miniaturised 9B-1103M-150 active radar seeker could herald a revolution for short-range missiles

R Hewson; 11163397



China’s PL-12 (SD-10 for export) active radar BVR missile. According to the Chengdu Aircraft Company the PL-12 has been fully tested on the J-10 fighter

CATIC; 0563303

taken the 9B-1103M active radar seeker and condensed it to fit within a missile body of 150 mm diameter – hence the designation 9B-1103M-150.

The seeker now weighs just 8 kg and has been designed to replace the IR seeker on a conventional short-range AAM. AGAT claims that it is effective at ranges of up to 13 km against a target with a 5 m² radar cross-section.

In the past, Vypel suggested that the R-73 could be fitted with such a seeker to allow 360° engagements with particular emphasis on the rear sector, which is blind to conventional missiles.

The 150 mm sizing of the 9B-1103M-150 does not precisely line up with the 170 mm

diameter R-73, but it is close enough to be considered a candidate.

Alternatively, AGAT may have designed the seeker for a completely new application, and given the company’s efforts to sell seeker technology in China, the possibility of another such link cannot be ruled out.

Rob Hewson is Editor of *Jane’s Air-Launched Weapons* and is based in London

RELATED ARTICLES:

Raytheon Missile Systems wins partnering contract (*jdw.janes.com*, 21/06/05)

US Army works to expand air defence (*jdw.janes.com*, 21/01/05)

Air-to-air missiles: command of the air (*jdw.janes.com*, 22/05/03)

AIR FORCES

US DoD plans autonomous refuelling demo

MICHAEL SIRAK *JDW Staff Reporter*
Washington, DC

The US Department of Defense has tasked Boeing to demonstrate around 2010 the ability of the X-45C strike unmanned aerial vehicle to refuel autonomously in flight.

The company is building three X-45C air vehicles for the Defense Advanced Research Projects Agency (DARPA), US Air Force and US Navy under the Joint Unmanned Combat Air Systems (J-UCAS) programme.

Under a USD175 million contract modification that DARPA announced on 11 July, the company will conduct "a full fuel transfer" between a KC-135 Stratotanker and an X-45C equipped with a boom receptacle, said Tom Goldman of Boeing's J-UCAS X-45 business development office. This contract builds upon the USD767 million that Boeing received from DARPA for J-UCAS work in October 2004.

The air force and navy envisage using operational variants of vehicles like the X-45C to penetrate hostile airspace to jam enemy communications and radar signals, strike air defence sites, communications nodes and fleeting targets, and gather intelligence as part of a battlefield network of sensors.

The ability to refuel these vehicles in flight will further extend their ability to loiter in hostile airspace and hold enemy forces at risk, US defence officials said.

At the same time, it presents challenges such as ensuring that the unmanned aircraft can gauge their position relative to the tankers to avoid colliding with the manned platforms.

The air force does not plan to operate tankers dedicated to refuelling unmanned aircraft, so it is seeking

- Boeing will demonstrate the full fuel transfer between an X-45C unmanned strike aircraft and a KC-135 tanker around 2010
- The demonstration builds upon Boeing's continuing J-UCAS activities

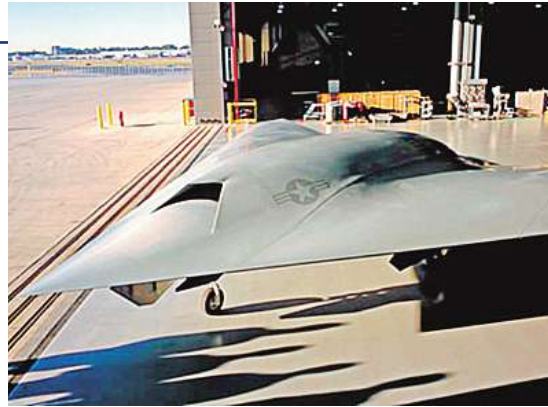
options for supporting them that do not require extensive modifications to its tanker fleet yet will ensure the safety of the tanker aircrews, air force officials have said.

Accordingly, Boeing and the air force intend to demonstrate a precision GPS system that allows the unmanned aircraft to approach the tankers safely and remain in their proximity during the tanking process, while adjusting their relative positions as necessary, and having the ability to abort rendezvous.

The Air Force Research Laboratory (AFRL) is laying the foundation for this type of refuelling through the activities it has under way with its Automated Aerial Refuelling (AAR) advanced technology demonstration. This project will culminate in 2007 with a flight test of a Calspan Lear jet, acting as an unmanned aircraft surrogate and equipped with the precision GPS software, rendezvousing with a KC-135 tanker autonomously, manoeuvring itself into position behind the tanker and remaining there for an extended period to simulate a tanking period.

It will also demonstrate break-off manoeuvres, according to Jacob Hinchman, who heads the AAR project for the AFRL.

Goldman said Boeing will take the AFRL's GPS software and install it, initially, on the manned T-33 test aircraft that the company has been using



Boeing will demonstrate the ability of the X-45C strike unmanned aerial vehicle to refuel autonomously in flight

Boeing; 0590084

to support the J-UCAS programme. Flight tests will be conducted to verify it.

The software suite will then be transferred to the first C-model air vehicle, designated X-45C1. Flight tests will incrementally add complexity, leading up to the final demonstration that will be conducted using the third air vehicle, which is designated X-45C3.

"It is a building block approach," Goldman told *JDW*. "At every stage we will go from a rendezvous to a pre-contact position to a contact position and then eventually to a contact and then to a fuel transfer."

Boeing's refuelling exercise will build upon the J-UCAS activities that it has under way to demonstrate the technical feasibility, military utility and operational value of using the sleek, stealthy X-45Cs in combat. The air force has said it would likely opt for larger, operational derivatives. The C-model design is a 16,326 kg gross weight vehicle. X-45C1 is in production and scheduled for completion in 2006. Flight testing of it will commence in 2007.

As part of the J-UCAS programme, Northrop Grumman is building several X-47B prototypes. DARPA is currently transitioning control of the J-UCAS programme to the air force.

As Boeing prepares for the refuelling demonstration, work under the AFRL's AAR project continues. Hinchman said the programme conducted a flight test in September 2004 that proves that the GPS system is "a viable solution" for the autonomous refuelling.

The next flight mission, expected around September, will position the Lear jet and a KC-135 aircraft in proximity to one another using real-time GPS updates via the Tactical Targeting Network Technology (TTNT) system, Hinchman said. DARPA developed TTNT as a robust, high-data-rate transfer and easily scalable system to give tactical

users access to real-time information.

In the following flight in May 2006, which will be the mission prior to the project's final flight demonstration, the Lear jet will maintain its position behind the tanker for an extended period.

Upon completion of the flights, the AFRL will carry out ground simulations to demonstrate how a group of four unmanned strike aircraft would carry out a refuelling. Concepts of operation will also be refined before the project concludes in 2007, said Hinchman.

The AFRL is also examining the merits of installing electro-optical/infra-red or millimetre wave sensors on board the tankers and unmanned aircraft to allow them to operate in proximity and carry out the fuel transfers, said Hinchman.

Unlike the GPS system, they would not be as susceptible to disruption, but likely would take longer to develop and require more modifications to the tanker aircraft.

Boeing is in the final stages of flying two, smaller X-45A air vehicles under a J-UCAS programme. It has conducted more than 55 flights since May 2002, including missions during which the two aircraft co-ordinated their activities and also operated with manned aircraft.

As *JDW* went to press, Boeing and the air force were preparing to demonstrate at Edwards Air Force Base, California, the ability of the two X-45As to attack enemy air defences in a simulated preplanned strike mission. During the mission, the two aircraft will determine autonomously the best route of flight to attack mock radar and missile sites before they can fire on friendly aircraft. ■

RELATED ARTICLES:

Special Report: Soaring ambitions - Future offensive air systems (*jdw.janes.com*, 15/06/05)

Northrop Grumman proposes J-UCAS revision (*idr.janes.com*, 12/05/05)

AIR FORCES

India plans air force boost among major challenges

RAHUL BEDI *JDW Correspondent*
New Delhi

The Indian Air Force (IAF) faces a crisis of depleting assets over the next decade, threatening its expanding operational challenges that include conventional and nuclear warfare, regional power projection and energy security and domestic counter-insurgency operations.

By the end of the 12th Finance Plan in 2017, the IAF's existing 29 combat squadrons will drop to 26. At the same time, its obsolete integrated command-and-control systems for better air space management, air defence (AD) detection radar and overall missile capability will also be substantially degraded, requiring either replacement or augmentation.

Senior officers concede that the IAF, which operates 26 different types of aircraft, will for the "foreseeable future" continue to buy an air force, AD assets and force multipliers rather than build them locally. This is despite the ambitious claims of the state-owned Defence Research and Development Organisation (DRDO) and the fledgling involvement of private industry in

- India plans new airborne early warning system, fighter, transport, refuelling and light combat aircraft over the next decade as well as new weapons for aircraft
- The Indian Air Force's improved capability is considered necessary to make a networked defence force and match its neighbours China and Pakistan
- Doubts remain that the ambitious programme can be achieved

the military sector. "There are numerous difficulties, [in particular] budgetary support has not been made available at the desired level," a senior IAF officer said. The DRDO, he added, has proven "inadequate" in numerous air force programmes plagued by time, cost and technological over-reach.

The officer pointed to the fly-by-wire Tejas light combat aircraft (LCA) powered by the General Electric F404-GE-F2J3 engine, which is more than a decade behind schedule, as one such project.

The LCA, having logged more than 380 sorties since its 2001 maiden flight, is projected to join IAF squadron service around 2010

to replace the MiG-21 variants that form the backbone of the IAF and face retirement by 2015-20.

However, the IAF, under political pressure to acquire the import-dependent LCA, remains privately sceptical about its capabilities and has yet to order 20 aircraft for INR20 billion (USD444.4 million) as announced in February by IAF Chief of Staff Air Chief Marshal Shashindra Pal Tyagi at Aero India 2005 in Bangalore. He had said a follow-on order for 20 additional LCA's in full operational configuration would also be forthcoming. Doubts also persist over the local development of the Kaveri engine for the LCA to replace the US engine.

The DRDO has also stymied efforts to replace the IAF's obsolete air space management command and reporting centres that have limited real-time linking and multi-sensor tracking capability with the wider integrated air command-and-control systems (IACCS) encompassing a spectrum of assets, including airborne early warning (AEW) systems, radar, fighter aircraft and battlefield air defence systems.



After the 1999 border conflict with Pakistan in the northern disputed Kashmir state, the government cleared the import of five IACCS for deployment from Kashmir to the western port city of Mumbai. Additional systems were also to be deployed later in central, eastern and southern India.

Testing of six IACCS systems, including those from Thales of France, Elta Electronics of Israel and from Italy, was completed in 2002 and tie-ups with local companies finalised when former air chief marshal Srinivasapuram Krishnaswamy recommended the project be handed over to the DRDO, leading to its "quiet demise".

Meanwhile, despite financial constraints and increasing bureaucratic vacillation in the Ministry of Defence (MoD), triggered by allegations of large-scale corruption in military purchases, the IAF claims to be "firmly embarked" on a programme to emerge "lean and mean" by 2025. This is despite Defence Minister Pranab Mukherjee ordering an investigation in April into 37 military contracts worth over USD324 million awarded to overseas vendors by the previous Hindu nationalist-led administration.

To transform itself from a tactical, status-quo force into a strategic one, to meet extended challenges, the IAF plans by 2025 to operate 35 combat and some nine support squadrons, including one comprising six Ilyushin Il-78 air-to-air refuellers bought in 2001 for INR8 billion to provide its fighters



India's Tejas light combat aircraft is delayed and further problems are being experienced with the locally developed engine

Indian MoD: 1116410



Ilyushin Il-76 aircraft are already in service with the IAF as transports but the platform will also be used for AEW systems

Indian MoD: 1116409



ACM Tyagi: "Enhanced technological capability can never adequately make up for numbers"

Indian MoD: 1116408

with enhanced endurance.

Senior officers said the IAF's platform capability will be further augmented by net-centric warfare, secure communication, electronic warfare and an aerospace command to implement the air force's evolving joint warfighting doctrine. This includes offensive counter-air operations to suppress enemy air defences, offensive air defence and counter surface forces campaign, planned jointly with land combat forces and launched in tandem with them.

Largely with Israeli help, the IAF plans to exploit the proposed Aerospace Command to develop a mobile ground-based imagery receiving and processing terminal for use by the army and the navy.

Through a complex web of locally developed satellites and launch vehicles and with sensors provided by Israel Aircraft Industries and Israel's Elta Electronics, the IAF also aims to use the Aerospace Command to accurately target a varied range of indigenously designed, nuclear capable ballistic missiles.

"The IAF aims to achieve lethality through a combination of importing fighters and by selectively upgrading existing platforms and rendering them all capable of delivering beyond-visual-range missiles and precision-guided munitions (PGMs)," ACM Tyagi told *JDW*. The air chief also insists that maintaining numerical superiority in fighters is a priority for the IAF since "enhanced technological capability can never adequately make up for numbers".

Consequently, the IAF is in the market to acquire 126 multirole combat aircraft through a combination of outright purchase and licensed manufacture. It is examining proposals and presentations from the US's Lockheed Martin for F-16s and Boeing for F/A-18s, France's Dassault for Mirage 2000-5s, Russia for the MiG-29M2 and the JAS-39 Gripen from Sweden.

Official sources said Indian

defence planners are "favourably" viewing the two American fighter offers following closer bilateral strategic and nuclear ties forged during Prime Minister Manmohan Singh's US visit in mid-June.

The IAF will also conduct its third round of exercises with the US Air Force later in 2005 in which the F-16s and F-18s are expected to participate. The IAF also participated in 'Garuda-II', the second joint fighter exercise with the French Air Force in France in June in which Mirage 2000-5 and Sukhoi Su-30K fighters took part.

The IAF's projected assets in 2020-25 will include a combination of imported and locally built 180-190 Su-30 MKIs, around 50 Mirage 2000-Hs, 125 upgraded MiG-21bis ground attack aircraft and around 40 upgraded dual and single-seat Jaguar fighters, all capable of delivering PGMs.

The IAF's efforts at acquiring PGMs, however, have encountered problems after the Rafael Armament Development Authority/Lockheed Martin medium-range, conventional stand-off AGM-142 Popeye missile proved unsuccessful in its second validation test firing in April in India's western Rajasthan desert. The missile's first validation firing, which also proved unsuccessful, was held in December 2004.

In December 2001, the IAF had signed a deal for 30 AGM-142 missiles for around INR2.7 billion subject to two "corroborative" tests in India. Official sources, however, dismissed the problem as "minor [and] easily rectified".

The IAF's planned force levels would be further amplified by around 40 upgraded MiG-27M fighters with improved avionics and weapons delivery systems.

It will also be boosted by the phased induction from 2007 onwards of three Israel Aircraft Industries Phalcon AEW systems mounted on Russian Il-76TD transport aircraft, significantly altering the regional power balance with nuclear rivals Pakistan and China.

Neither country has AEW capability, though Pakistan is negotiating with Sweden to procure such systems.

With the Phalcon's induction, the IAF will begin executing its air defence and airborne battle management operations, leading to a

gradual winding up of the six ground-based Air Defence Direction Control Centres located along India's northern, western and eastern frontiers.

Additionally, India's Cabinet Committee on Security has cleared the development of an indigenous AEW system by 2011 for INR18 billion, reviving the DRDO's six-year project that was abandoned after the locally designed airborne surveillance platform crashed in 1999, killing eight people involved with the programme.

The DRDO has signed a memorandum of understanding with Brazil's Embraer to purchase three EMB-145 aircraft as platforms, with the option of acquiring a similar number, for the IAF to be fitted with active phased-array radar antennae which will also double as an inverse synthetic aperture radar designed by the Electronics and Radar Development Establishment and the Centre for Airborne Systems in Bangalore.

Operating in tandem with the Phalcons, these integrated surveillance and reconnaissance systems will eventually mean the end of extended surface-to-air missile networks and gun-based artillery assets.

The emphasis, instead, will shift to the selective deployment of low-level quick-reaction missile (LLQRM) systems for which the IAF is currently evaluating France's MBDA VL MICA and Israel's Rafael-IAI's Spyder-SR.

The IAF wants 12 LLQRM batteries, three of them in completed form, and the remainder to be built locally; they will be specially configured to local deployment patterns, terrain and weather conditions in a deal estimated at around INR15 billion.

The IAF's rotary wing and strategic medium transport lift capability also needs refurbishment as the service strives doctrinally and in its overall equipment profile to execute "extended challenges" domestically, in its neighbourhood and beyond, ACM Tyagi declared. ■

RELATED ARTICLES:

Indian Su-30K fighters display new capabilities (*jdw.janes.com*, 08/07/05)

Indian Defence Industry: Two-way stretch (*jdw.janes.com*, 27/01/05)

Aero India 2003: Air force on course to become 'lean and mean'

(*jdw.janes.com*, 07/07/03)

AIR FORCES

UK Sea Kings take to ground surveillance

TIM RIPLEY *JDW Special Correspondent*
 RNAS Merryfield, UK

British Army commanders deployed Royal Navy Westland Sea King Airborne Surveillance and Control Mk 7 (ASaC.7) helicopters in a ground surveillance role for the first time in a major field exercise in late May to expand the network enabled capability of 16 Air Assault Brigade.

The use of the airborne early warning (AEW) helicopters to identify hostile armoured vehicles for AgustaWestland Apache AH.1 attack helicopters (AH) builds on the employment of 849 Naval Air Squadron in an airborne ground surveillance or 'mini Joint STARS' role during the invasion of Iraq in 2003.

During the warfighting phase of the UK's Operation 'Telic', the Sea King ASaC.7 Thales pulse Doppler Searchwater 2000 radar provided effective overland moving target indicator (MTI) coverage of Iraq troop movements, allowing air and artillery strikes to be directed against targets.

An 849 Squadron pilot told *JDW* that since the war the squadron had been increasingly "dragged across the beach" as army and marine commanders became aware of the ASaC.7's ability to contribute to land operations.

As part of these efforts, three of B Flight 849 Squadron's helicopters were used to support deep-strike operations by AgustaWestland Apache AH.1 attack helicopters of 9 Regiment Army Air Corps during Exercise 'Eagles Strike' in south-west England in May.

This culminated in a night-time air assault operation launched from RNAS Merryfield in Somerset to seize the Imber urban warfare training site, some 100 km away on Salisbury Plain in Wiltshire, which

- UK Sea Kings flew 109 sorties as part of ground surveillance during warfighting during Operation 'Telic'
- They were also used to check for Iraqi mining operations before the invasion in March 2003
- The ground surveillance role has been incorporated into exercises and is likely to now be a common role for the helicopters as required

was being defended by a simulated hostile armoured force.

"The Sea Kings gave me an Airborne Command Element, a UHF strike primary radio net and an air mission command radio net," Lieutenant Colonel Richard Felton, commanding officer of 9 Regiment, told *JDW*.

"I used two Sea King's [radar in] MTI [mode] to track moving vehicles and then to cue my attack helicopters to destroy the enemy armour. The Sea King's radar has a far wider coverage than the Longbow radars on our Apache."

Senior commanders in 16 Brigade's headquarters were able to watch an air picture of the operation showing the position of all helicopters linked in real-time from the seekings by the Link 16 Joint Tactical Information Distribution System throughout the assault on Imber.

Individual attack mission had to be cued verbally over radio nets by operators on the Sea Kings because the Apaches do not have Link 16 fitted to allow their aircrews to monitor the radar tracks from the early warning helicopters.

"Our AHs don't have Link 16 but we do have the Improved Data Model that allows us to track the position of all the other AHs," said Col Felton.



Sea King ASaC.7s at RNAS Merryfield during Exercise 'Eagles Strike' P Allen/Jane's; 1143420

During the fielding of the Bowman digital communications system, beginning later in 2005, to 16 Brigade in 2006, a network of gateways or rebroadcast systems will be procured by the British Army to allow improved data-communications traffic to be routed to and from airborne Apache and ground headquarters.

According to Commander Brian Meakin, officer commanding 849 Squadron, the ASaC.7s were called in to support the amphibious assault by 3 Commando Brigade Royal Marines on to the Al Faw peninsula on the opening day of the Iraq war because US Air Force Northrop Grumman E-8 Joint STARS were heavily committed to supporting the US Army's drive on Baghdad.

The lack of Joint STARS coverage was constraining ground manoeuvre planning so an ad hoc surveillance of the Al Faw peninsula was launched by 849 Squadron, Comm Meakin told the recent Defence IQ Airborne Early Warning and Battle Management Conference in London. A week before the invasion in late March 2003 the squadron began using its radar in MTI mode to establish traffic patterns in southern Iraq to check if roads were being mined.

Constant surveillance of the peninsula was mounted once 3 Commando Brigade began its assault and radar tracks were downloaded into the brigade's headquarters by Link 16, said Comm Meakin. On the second day of the conflict, Royal Marine officers were

flown in the helicopters to act as an airborne ground command element.

As 3 Commando Brigade began expanding its bridgehead on the Al Faw peninsula, the Sea Kings began to be used to cue targets for attack. The rules of engagement required positive visual identification of targets so it took time for BAE Systems' Phoenix unmanned aerial vehicles of the British Army Royal Artillery to positively identify targets for artillery and air strikes.

This process was complex and could take up to two hours, according to UK officers involved in the operation, because of a lack of secure data networks, meaning that much of the co-ordination had to be undertaken over voice radio links.

By 10 April when UK forces moved from warfighting to peace-keeping mode, 849 Squadron had flown 109 sorties, including 154 hours by day and 102 at night. According to Comm Meakin, confirmed tracks from the squadron's helicopters resulted in the destruction of 26 Iraqi main battle tanks, 15 armoured personnel carriers and artillery pieces. 849 Squadron lost two of its four helicopters in a non-combat crash during the conflict, with the loss of seven personnel. ■

RELATED ARTICLES:

First Apaches fully operational
 (jdw.janes.com, 27/05/05)

Sea King AEW.7 and Apache AH.1
 (jwaf.janes.com)

Thales outlines Sea King versatility
 (jdw.janes.com, 19/11/03)

JDW DIRECTORY

Customer Service Offices

Europe and Africa	Jane's Information Group, Sentinel House, 163 Brighton Rd, Coulsdon, Surrey, CR5 2YH, UK	Tel: +44 (0)1444 475660	Fax: +44 (0)20 8700 3700	e-mail: customerservices.uk@janes.com
Middle East	Jane's Information Group, PO Box 502138, Dubai, United Arab Emirates	Tel: (+971 4) 390 2336	Fax: (+971 4) 390 8848	e-mail: mideast@janes.com
Nth/Ctl/Sth America	Jane's Information Group, 110 N. Royal Street, Suite 200, Alexandria, Virginia 22314, USA	Tel: (+1 703) 683 3700	Fax: (+1 703) 836 0029	e-mail: customerservices.us@janes.com
Asia	Jane's Information Group, 78 Shenton Way, #10-02, Singapore 079120	Tel: (+1 800) 824 0768	Fax: (+1 800) 836 0297	e-mail: asiapacific@janes.com
Japan	Jane's Info. Group, Palaceside Building, 5F, 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100-0003, Japan	Tel: +81 (0) 3 5218 7682	Fax: +81 (0) 3 5222 1280	e-mail: japan@janes.com
India	78 Shenton Way, #10-02, Singapore 079120	Tel: +91 (0) 11 2651 6105	Fax: +91 (0) 11 2651 6105	e-mail: india@janes.com
Australia/N Zealand	Jane's Information Group, PO Box 3502, Rozelle Delivery Centre, NSW 2039, Australia	Tel: +61 (0) 2 8587 7900	Fax: +61 (0) 2 8587 7901	e-mail: oceania@janes.com

Advertising offices

AUSTRALIA: Richard West, see UK
BENELUX: Nicky Eakins, see UK
BRAZIL: Katie Taplett, see USA and Canada
CANADA: see USA and Canada
FRANCE (Key accounts): Patrice Février; 35 Avenue MacMahon, 75824 Paris Cedex 17, France; Tel: +33 (0) 145 72 33 11; Fax: +33 (0) 145 72 17 95; e-mail: patrice.fevrier@wanadoo.fr
FRANCE: Nicky Eakins, see UK
GERMANY, AUSTRIA, EASTERN EUROPE (EXCLUDING POLAND): Dr. Uwe H. Wehrstedt, MCW Media & Consulting Wehrstedt, Hagenbreite 9, 06463 ERMSLEBEN, GERMANY; Tel: +49 34 743 62 090; Fax: +49 34 743 62 091; e-mail: info@Wehrstedt.org
GREECE: Nicky Eakins, see UK
HONG KONG: James Austin, see UK
INDIA: James Austin, see UK
IRAN: Ali Jahangard; Tel: +98 21 873 5923; e-mail: eideh@mavara.com
ISRAEL: Oreet International Media, 15 Kinneret Street, Bene Berak, 51201 Israel; Tel: +972 (3) 570 6527; Fax: +972 (3) 570 6526; e-mail: admin@oreet-marcom.com
Defence contact: Liat Heiblam; e-mail: liat_h@oreet-marcom.com
ITALY AND SWITZERLAND: Ediconsult Internazionale Srl, Piazza Fontane Marose 3, 16123 Genova, Italy; Tel: +39 010 583684; Fax: +39 010 566578; e-mail: genova@ediconsult.com
JAPAN: James Austin, see UK
MIDDLE EAST: James Austin, see UK
PAKISTAN: James Austin, see UK

POLAND: Nicky Eakins, see UK
RUSSIA: URALS & EAST: Vladimir N. Usov, P.O.Box 98, Nizhny Tagil, Sverdlovsk Region, 622018 Russia; Tel/Fax: +007 (3435) 329-623 e-mail: uvn125@uraltelecom.ru
RUSSIA: MOSCOW & WEST: Nicky Eakins, see UK
SCANDINAVIA: Gillian Thompson, The Falsten Partnership, P O Box 27, Portslade, East Sussex, BN41 2XA; Tel: +44 (0) 1273 771020; Fax: +44 (0) 1273 770070; e-mail: sales@falsten.com
SINGAPORE: Richard West, see UK
EXCLUDING POLAND: Richard West, see UK
SOUTH KOREA: Mr Jongseog Lee, Infonet Group, Inc.; Sambu Renaissance Tower 902, 456, Gongdukdong, Mapogu, Seoul, South Korea; Tel: 0082 2 716 9922; Fax: 0082 2 716 9531; e-mail: jslee@infonetgroup.co.kr
SPAIN: Julio de Andres, VIA Exclusivas S.L., C/Albasanz, 14 Bis 3º I, 28037, Madrid, Spain; Tel: +34 (91) 448 7622; Fax: +34 (91) 446 0214 e-mail: jdeandres@viaexclusivas.com
TURKEY: Richard West, see UK
UNITED KINGDOM (HEAD OFFICE): Jane's Information Group, Sentinel House, 163 Brighton Road, Coulsdon, Surrey CR5 2YH, UK.; Tel: +44 (0)20 8700 3700; Fax: +44 (0)20 8700 3744/3859; e-mail: defadsales@janes.com.uk. Janine Boxall, Head of Advertising, Tel: +44 (0) 8700 3852; Fax: +44 (0) 8700 3963; email: janine.boxall@janes.com. Richard West, Senior Key Accounts Manager; Tel: +44 1892 725580; Fax: +44 1892 725581; e-mail: richard.west@janes.com. James Austin, Advertising Sales Executive; Tel: +44 (0) 208 8700 3963; Fax: +44 (0) 20 8700 3744; e-mail: james.austin@janes.com. Nicky Eakins, Senior

Advertising Sales Executive; Tel: +44 (0) 20 8700 3853; Fax: +44 (0) 20 8700 3744; e-mail: nicky.eakins@janes.com
USA/CANADA: Jane's Information Group, 110 N. Royal Street, Suite 200, Alexandria, VA 22314, USA; Tel: +1 (703) 683-3700; Fax: +1 (703) 836-5537; e-mail: defadsales@janes.com
USA AND CANADA: Katie Taplett, US Advertising Sales Director; Tel: +1 (703) 683-3700; Fax: +1 (703) 836-5537; e-mail: katie.taplett@janes.com. Sean Fitzgerald, Account Executive; Tel: +1 (703) 236 2446; Fax: +1 (703) 836 5537; e-mail: sean.fitzgerald@janes.com
NORTHEASTERN USA AND EAST CANADA: Linda Hewish, Northeast Region Advertising Sales Manager, see USA and Canada; Tel: +1 (703) 236 2413; Fax: +1 (703) 836 5537; e-mail: linda.hewish@janes.com
WESTERN USA AND WEST CANADA: Richard L. Ayer, 127 Avenida del Mar, Suite 2A, San Clemente, California 92672, USA; Tel: +1 (949) 366-8455; Fax: +1 (949) 366-9289; e-mail: ayercomm@earthlink.net
SOUTHEASTERN USA: Kristin D Schulze, Southeast Region Advertising Sales Manager, PO Box 270190, Tampa, FL 33688-0190, USA; Tel: +1 (813) 961-8132; Fax: +1 (813) 961-9642; e-mail: kristin.schulze@janes.com
ADVERTISING COPY:
USA AND CANADA ONLY: Lia Johns, see USA and Canada addresses; Tel: +1 (703) 236-2438; Fax: +1 (703) 836-5637; e-mail: lia.johns@janes.com
REST OF WORLD: Delwyn Salter, Ad Sales Admin Manager, (see UK (Head Office) address); Tel: +44 (0)20 8700 3850; Fax: +44 (0)20 8700 3859; e-mail: delwyn.salter@janes.com

List of advertisers

Aselsan
www.aselsan.com.tr

9

Online sponsors

CEV
Harris RF
Israel Aircraft Industries
Schiebel
Tadiran Communications
TEAC Aerospace
Whitehead Alenia
William Cook

SUBSCRIBE TODAY

YES, I would like to subscribe to JANE'S DEFENCE WEEKLY

Your delivery details

Name
Job title
Company name
Address
Postcode/Zip
Country
Telephone
Fax
E-mail

Annual price (please tick)	Print	Online
UK	£235	£700
†Europe	£255	£700
*USA	\$375	\$1,120
†Australia	A\$967**	A\$1,800**
†Rest of World	£387	£700

* (US prices applicable to residents of North/Central/South America only)
 † Includes delivery by airmail **Price includes GST at 10%

To order print please call +44 (0) 1444 475 660
To order online please call +44 (0) 20 8700 3750
For America call (+ 1 703) 683 3700
For Asia call +65 6325 0866

To order print please fax +44 (0) 8456 759 102
To order online please fax +44 (0) 20 8700 3751
For America fax (+1 703) 836 0297
For Asia fax +65 6226 1185

@ e-mail us at: janes.subs@qss-uk.com

Three easy ways to pay

- I enclose a cheque made payable to: Jane's Information Group
- Please charge my credit/debit card
 Mastercard Visa Amex Switch
 Expiry date: -
 Start date: -
 Issue number: (Switch only)
- Please invoice me

Signature: _____ Date: _____

EU customers (including UK): When ordering online subscriptions, please add VAT at 17.5% or quote your European VAT No. below.

VAT Reg. No. _____
 (VAT/TVA/BTW/MOMS/MWST/IVA/PPA)

Please tick here if you do not wish to receive information of interest to you from other companies approved by Jane's.

Post print orders to: Jane's Information Group, Rockwood House, 9-17 Perrymount Road, Haywards Heath, West Sussex RH16 3DH, UK
 Post online orders to: Sales Department, Jane's Information Group, Sentinel House, 163 Brighton Road, Coulsdon, Surrey CR5 2YH, UK

Code: AJ10

INTERVIEW

GENERAL RAY HENAULT
CHAIRMAN OF THE NATO MILITARY COMMITTEE

Newly appointed Chairman of the NATO Military Committee, General Ray Henault is the first Canadian Forces officer to occupy the post in 25 years. This, he says, is important for Canada from the international perspective and a great mark of confidence in its role in the alliance.

While Canada no longer has troops permanently stationed in Europe, it plays an important role in NATO peacekeeping operations. It is currently setting up a provincial reconstruction team (PRT) in Kandahar, Afghanistan, initially under the US-led Operation 'Enduring Freedom', but this will switch to NATO's International Security Assistance Force (ISAF) as part of its stage three expansion to the south of the country.

"By [early] next year, the February-March timeframe, we will be able to formally transition to stage three of our plan for Afghanistan," Gen Henault said. "Stage one is now complete [north of Kabul], stage two in the west is almost complete," he says, adding that national commitments made at the force generation conference on stage three expansion were "very, very positive".

"Everything leads to our confidence that we will be able to transition to stage three in the timelines that we have set for ourselves. The indications are that nations are committed to providing enablers, the rotary wing, tactical airlift capabilities," he said.

Gen Henault observed that "each PRT has a different threat assessment attached to it. Each region has capabilities which are slightly different than the other. The commitment of assets, whether that's rotary wing, fast air or whatever it happens to be, is all based on the threat assessment in that particular region. So the assets required to go into stage three are now being assessed based on the stage three capability requirement, especially on the threat assessment itself and, by and large, we have seen the commitment by nations to satisfy that requirement."

Gen Henault is also positive about the NATO Response Force (NRF), which he describes as "the transformational engine" of NATO.

"The NRF has come a long way since it started. Each subsequent NRF component, whether air, land or naval, has been better each time that we've done it. The NRF did achieve its initial operational capability in October 2004. We're still working, though, towards a full operational capability declaration in October 2006," he said.

"The June or July [2006 to be held in Cape Verde] LIVEX [first full scale NRF deployment exercise] is an important component of that ability to declare a full operational capability. That LIVEX will demonstrate clearly our ability to both put the force together [and] deploy the force to a relatively austere location, a location which will demand deployment and operation from a non-fixed base of operations. It will demonstrate the interoperability of the force and the strategic deployment capability, the command-and-control and surveillance. The full package of what's required to deploy the force



ENAPCS: 1116412

“[NATO] Nations are committed to providing enablers”

will be validated at Cape Verde in terms of our LIVEX.”

However, he noted, "there is more than just the exercise itself that will validate the NRF, it will be our ability to deploy, the ability to have the command-and-control and communications in place, the sustainability aspect of it, not just the LIVEX itself but the force itself; and then the ability not only to declare full op-capability [operational capability] in October of this coming year but full op-capability of the next six-month tranche. We have to sustain that capability once we achieve it and that's not a simple matter for nations. We are all paying very close attention to achieving this full op-capability. It is considered to be a key element of not only our credibility but also our capability in the longer term."

The NRF is meant to start deploying within five days of a decision by the North Atlantic Council, the Alliance's highest decision-making body which meets weekly at the ambassadorial level. Gen Henault said he is considering "how we can streamline the decision-making process and how we can provide more timely advice to the North

Atlantic Council. Many of the things that we now do are relatively quick-paced and that really means you do need to adapt the decision making process at NATO to this new security environment, which demands much quicker deployability, interoperability, sustainability". The fundamental review of the International Military Staff launched by Gen Henault's predecessor, General Harald Kujat of Germany, "will seek to realign the staff and seek efficiencies in that respect not only for decision making but also the staffing process and what's needed to actually support decision making for the Military Committee and North Atlantic Council".

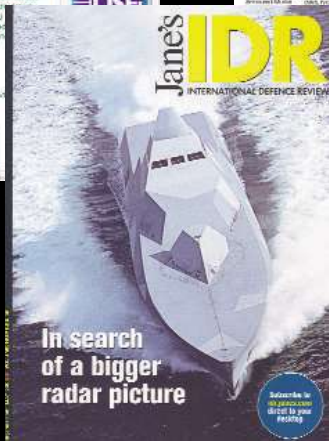
Gen Henault was still the Canadian Chief of Defence Staff when NATO defence ministers, meeting during the alliance's Istanbul summit in June 2004, agreed to usability goals for NATO land forces of 40 per cent deployability and 8 per cent sustainability. "It's important from a NATO perspective that we seek to achieve those goals. That's all part of transformation," he said.

However, he added: "There's a certain asymmetry in terms of the ability of nations to actually achieve that. Some have already achieved it. Nations will move towards them, they'll achieve them, they may slip down below them every now and then: that happens over certain periods as nations go through their own adjustments or their own transformational processes. My own country has been through an operational pause based on the intensity, the tempo of operations and personnel deployments over a period of time and a restructuring and transformation process that was going on internally. That also happens in other nations as they shift from conscript armies to all professional armies."

Nicholas Fiorenza

JDW NATO and EU Affairs Correspondent, Brussels

Exclusively Jane's at DSEi



The Official Publications at DSEi
No other publication will have greater visibility

UK Tel: +44 (0)20 8700 3738
US Tel: +1 (703) 236 2410
e-mail: defadsales@janes.com
Or contact your local sales representative

Jane's
Intelligence and Insight You Can Trust