**BRAINLESS BLABBER : A VIEWPOINT** PAGE 4

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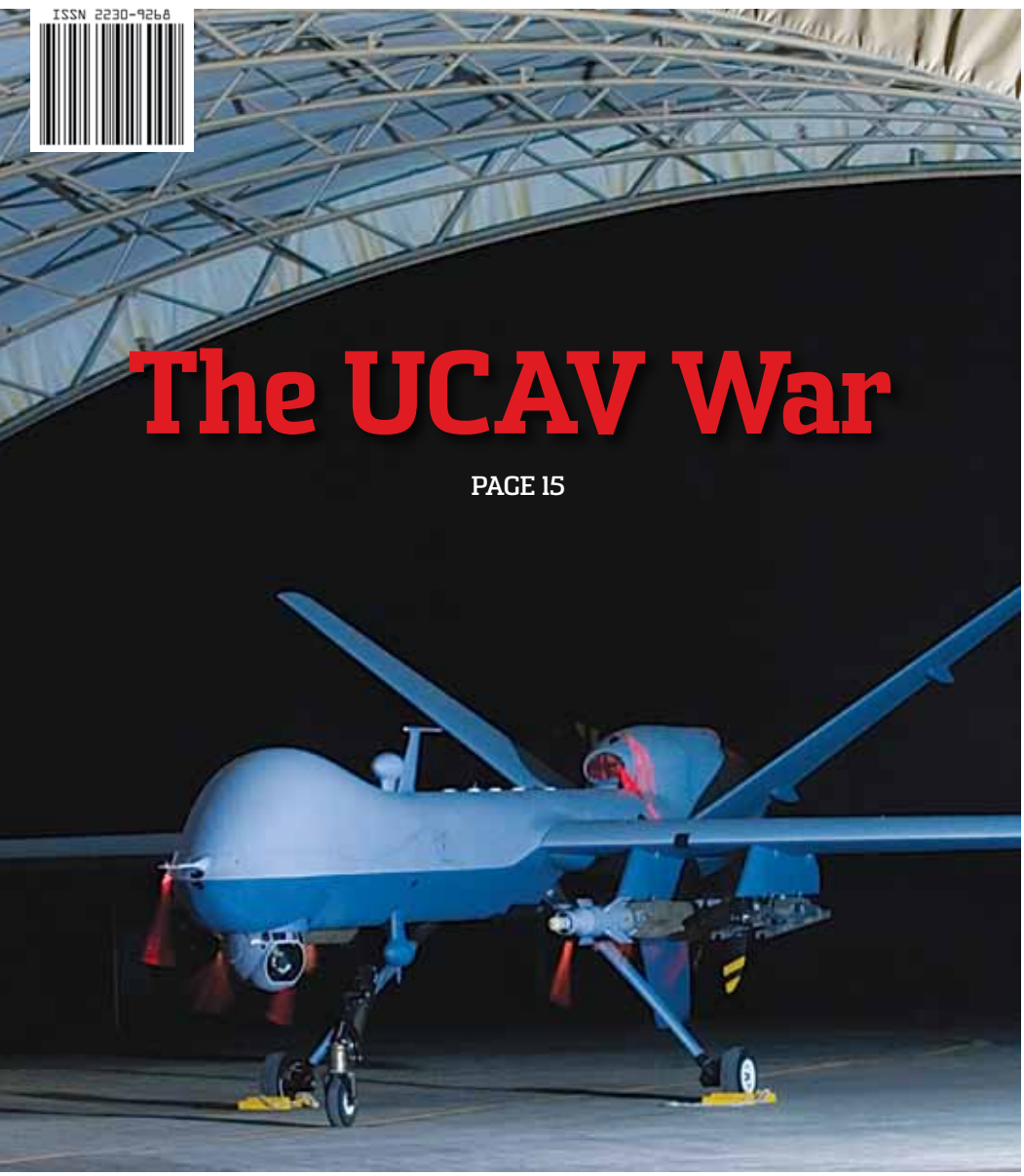

## The UCAV War

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**Indian Army's Exercise Sarvada Vijay** PAGE 10

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DELENG/2010/34651

## India's Astra BVRAAM test-fired from IAF flanker

India's first indigenously developed beyond visual range (BVR) air-to-air missile Astra was successfully test-fired by the Indian Air Force (IAF) on May 4, 2014, from a naval range in the western sector meeting all the mission objectives. The air-launch was captured by side and forward looking high speed cameras and the separation was exactly as per the simulation. Astra is India's first BVR air-to-air missile indigenously designed and developed by the Defence Research and Development Organisation (DRDO), possessing high single shot kill probability (SSKP) making it highly reliable. Astra is an all-aspect, all-weather missile with active radar terminal guidance, excellent ECCM features, smokeless propulsion and process improved effectiveness in multi-target scenario making it a highly advanced, state-of the-art missile.

The Scientific Advisor to Defence Minister, Secretary, Department of Defence R&D and Director General, DRDO, Avinash Chander congratulating the team for their high competence and tenacity to make such an event happen seamlessly said: "Astra's successful launch from the Su-30MKI combat aircraft is a major step in missile aircraft integration. Extensive flight testing that has preceded this air launch was indeed a joint effort of DRDO and IAF. This will be followed by launch against actual target shortly. Many more trials are planned and will be conducted to clear the launch envelope. Weapon integration with Tejas light combat aircraft will also be done in the near future."

PHOTOGRAPH: DRDO

Dr V.G. Sekaran, Director General (MSS), who chaired the Flight Readiness Review Committee along with S. Som, Director, DRDL, P. Venugopalan, former Director, DRDL, among others, said: "This is one of the proud moments for DRDO and the entire country." Dr K. Tamilmani, Director General (Aeronautics) who has overlooked the entire flight safety in the programme said that quality of integration and performance is of high standards and there was no doubt in the success of the launch. He further added that this is the beginning of the phase for demonstration of launch over a wide air-launch envelope. The Project Director Dr S. Venugopal said that "the air launch of Astra was perfect in all respects and is a culmination of years of effort by a very dedicated and competent team of the Missile Complex, Hyderabad, CEMILAC and IAF." SP


**Cover:**
*Currently operational UCAVs are under real-time human control, but future version may enable autonomous operation. Elimination of onboard human crew in a combat aircraft that may be shot down over enemy territory has obvious advantages.*

*Cover images: US Air Force, Defence PRO, WASS*

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# Await a better future

The outcome of the Indian general elections will be known in the next fortnight and one of the topmost agendas of the new government should be to strengthen both external and internal security, in the light of the several attacks from across the border and from within, particularly by the Maoists. Both the national political parties – the Indian National Congress and the Bharatiya Janata Party (BJP) – have spelt out how they would address the issue of internal security.

The Congress has reiterated that it would continue to pursue a policy of dealing firmly with internal security threats. The BJP is a little more specific, mentioning that it would strengthen the role of the National Investigation Agency (NIA) and put in place a system of swift and fair trial of terror-related cases. The BJP manifesto vows to "insulate intelligence agencies from political intervention and interference".

It also promises modernisation of the police force in a mission mode approach. On the issue of Naxalism, the BJP manifesto is in favour of talks with Maoists but said it should be "conditional and within the framework of the Constitution". The Congress states it would continue to address the challenge of left-wing extremism with a firm hand.

The rhetoric during the election season is high and understandable, but what is objectionable is Pakistan trying to butt its nose in India's election. The Pakistani Army Chief Raheel Sharif's claim that Kashmir is a 'jugular vein' of Pakistan is highly condemnable. Lt General (Retd) P.C. Katoch in no uncertain terms writes that Sharif has no business poking his nose into the ongoing Indian elections, especially when his army and the ISI have consigned Pakistan into jaws of radicalisation and terror in the foreseeable future.

Another viewpoint highlights the importance of unmanned combat aerial vehicles (UCAVs) in modern-day warfare and has urged India to pick up pace considering the Chinese capability in this sphere.

This issue covers the move of the Government to start semiconductor manufacturing facilities in India, although delayed. To leapfrog capacity building in this sphere, there is urgency to overhaul the system of education in engineering colleges.

Also, in this issue, we have an interview with Regional Delegate Antonio Budroni of WASS, a company which has been associated with the Indian Navy in underwater field. While outlining the company's roadmap in India, he has assured that it would further invest in Indian industry and research and development in indigenisation efforts.

We have some heartening news of seven Indian students bagging scholarships under the MBDA Programme for Excellence for two-year Master's at the Institut Superieur de l'Aeronautique et de l'Espace (ISAE), in Toulouse, France. As reported by Neetu Dhulia, the Embassy of France in India is supporting the students and according to the Ambassador of France in India, Francois Richier, these students will play their part in preparing the future of the relationship of France and India.

We look forward to a better future as the outcome of general elections in world's largest democracy will hopefully get some of the vital issues on track.

**Jayant Baranwal**
Publisher & Editor-in-Chief

LT GENERAL (RETD)
P.C. KATOCH

# Brainless blabber

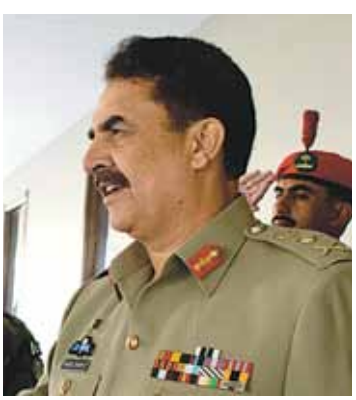
Even as India hopes that relations with Pakistan should improve, deliberate idiotic moves on part of Pakistani officials stymie such hope. And so you have the cheeky Pakistani Army Chief Raheel Sharif claim during the ongoing elections in India that Kashmir is a "jugular vein" of Pakistan despite the fact that the entire state was acceded to India by the Maharaja of Jammu and Kashmir.

Sharif had no business poking his nose into the ongoing Indian elections; a sphere he has absolutely no business to talk especially with his army and ISI having consigned his own country into the jaws of radicalisation and terror in perpetuity or shall we say at least in foreseeable future.

**Sharif had no business poking his nose into the ongoing Indian elections; a sphere he has absolutely no business to talk especially with his army and ISI having consigned his own country into the jaws of radicalisation and terror in perpetuity or shall we say at least in foreseeable future.**

PHOTOGRAPH: Wikipedia

Then you have the fledgling High Commissioner of Pakistan in New Delhi, Abdul Basit, talk of resolving Siachen, reminding one of the phrase *'Begani Shaadi Mein Abdullah* (read Abdul) *Deewana'* because on ground there is not a Pakistani soul anywhere close to the Siachen Glacier and it is Indian territory under the UN Resolution of August 1948 that conceded the legality of Kashmir's accession to India and as such no man's land, if any, to be controlled by India during the period of ceasefire and truce. This meant that the onus of proof to convince the commission of any factual position, on the date of ceasefire, in any disputed territory, rested with Pakistan.



Ceasefire apart, as mentioned above, to-date Pakistan is holding positions West of the Saltoro Range and does not have a single man or beast on Siachen Glacier, so where is the question of resolving and what? Then are the oft repeated Pakistani official's statements and calls for undertaking plebiscite in Jammu and Kashmir (J&K). The said UN Resolution was explicit in this regard too. It categorically stated that prior to any such plebiscite, Pakistani security forces will have to vacate the entire state of Jammu and Kashmir. Not only was this not done by Pakistan, she did the reverse by beefing up the area of illegally occupied Pakistan occupied Kashmir (PoK) with more and more security forces. In addition, Pakistan changed the demography of PoK by settling outsiders from the plains into these areas.

Concurrently, Pakistan sent terrorists into J&K for specific purpose of undertaking ethnic cleansing, killing scores, forcing non-Muslims to leave the State leaving behind their houses and properties. Pakistan also illegally ceded the Shaksgam Valley, which is part of J&K, to China in 1963.

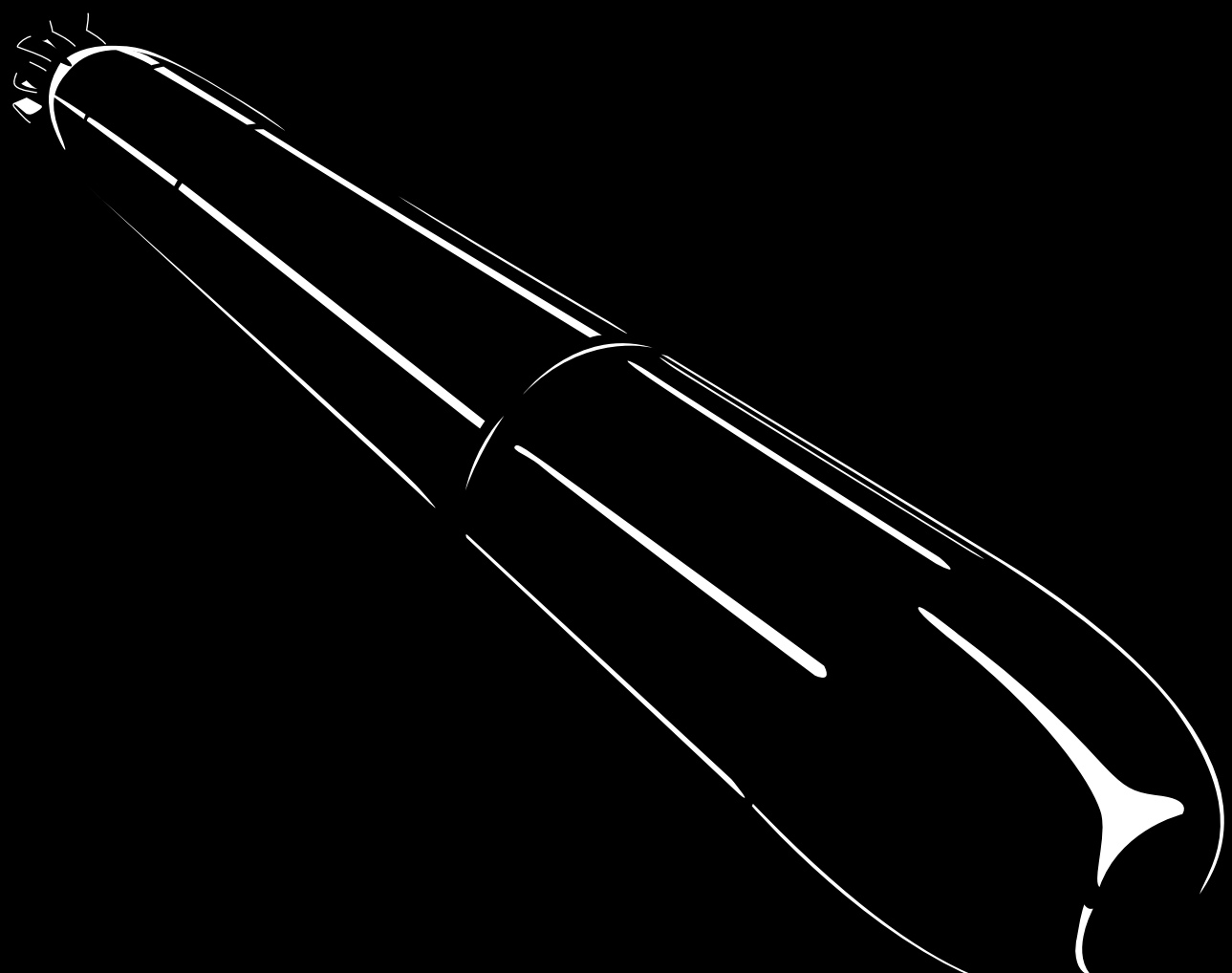
Post the ceasefire with India in 2004, Pakistan shifted major Sunni terrorist camps into Gilgit-Baltistan area of PoK to further change the demography of PoK, plus hoping to mix blood with original Shia residents reducing their numbers further. However, when the latter did not succeed, institutionalised massacres of Shia population of Gilgit-Baltistan were organised. The mounting unrest led Pakistan to bring in the Chinese People's Liberation Army (PLA) into the area in garb of civilians, and the PLA has brought along their own labour force.

As the PLA digs tunnel after tunnel in Gilgit-Baltistan for apparent deployment of missiles, the locals are not permitted to go anywhere close by despite the land in the area belonging to them. What Mian Rasheel Sharif, the Pakistani Army Chief needs to do is to get his own house in order.

It is no secret that while his army has no will to fight the Taliban, the ISI is hand in glove with the latter and Mujahid battalions trained to operate in conjunction Taliban to infiltrate and create mayhem in Afghanistan. The recent killings of some 60 Taliban close to the Pakistan border by Afghanistan National Army is indication of this. More importantly, Mian Rasheel Sharif should bother about is the genocide his military has unleashed in Baluchistan, what with discovery of mass unmarked graves and Pakistan Air Force attacking the Baluchis in blatant disregard to human rights. SP

*The views expressed herein are the personal views of the author.*

# BLACK SHARK



The stealth torpedo
Indian Navy & Wass together
from the past toward the future.

WASS

# WASS' strong ties with Indian Navy

*WASS has been operating in India since 1976 and successfully supporting the Indian Navy in underwater field. During this period it has formed a number of associations with Indian industry, especially BDL, and has established its subsidiary (WIN Blue Water Services Pvt Ltd) in India, to provide better services. WASS is committed in supporting the Indian Navy, Indian industry and research and development organisation in their endeavours for indigenisation. The first contract that WASS received was for supply a number of A244s LWTs.*

*These torpedoes have been the backbone of IN underwater operations for more than 30 years. WASS has supported the Indian Navy in its efforts to maintain and operate these optimally. In 2010, IN contracted WASS for upgradation of these torpedoes, with all the latest and modern features. In addition, since 2005 WASS has become premier and the only supplier of Torpedo Decoy Systems for the Indian Naval Submarines and has been selected for the supply of Heavy Weight Torpedo for the Scorpene submarine. Here in an interview with* ***SP's M.A.I.****, the Regional Delegate* ***Antonio Budroni*** *of WASS explains how India is as good as its second domestic market and what the company plans in terms of partnerships.*

***SP's M.A.I.*** **(SP's): Could you tell us about the journey of WASS in India since its initial steps in 1976?**

**Antonio Budroni:** In 1976, WASS was called Whitehead, the surname of the torpedo inventor Robert Whitehead and it has had relations with the Indian Navy since then. WASS has been a trusted and respected supplier to the Indian Navy and this relationship has been growing till date. It is a good reciprocal relationship.

**SP's: What were the entry challenges, if any, for WASS underwater systems, in the predominantly Soviet/Russian origin platforms in India?**

**Budroni:** About 10 years back, WASS initialised an industrial relationship with Soviet/Russian shipyards and companies and India gave WASS an opportunity to increase such relationship in the fields of submarines and ASW avionics, such as kilo class submarines, IL38 ASW airplane and K28 ASW helicopters. The HWT (heavy weight torpedoes) and LWT (light weight torpedoes) families are in the process of integration on the above mentioned platforms for both India and the worldwide market. The relationship with Russian companies has shown high growth potential that WASS products can reach not just on Soviet platforms but also those on the NATO side.

**SP's: What has been the strategy of WASS in India to make permanent inroads for its underwater systems for the Indian Navy?**

**Budroni:** WASS lays emphasis on customer care, continuous contact with the customer and new product development keeping in mind the requirements of the Indian Navy. WASS also works with Indian companies without contractual obligations such as offsets or transfer of technology.

PHOTOGRAPHS: WASS

**SP's: How would you assess the existing infrastructure and growth potential available with the Defence Research and Development Organisation (DRDO), theNaval Science and Technology Laboratory (NSTL) and the indigenous production agencies such as Bharat Dynamics Limited (BDL), etc. to absorb transfer of technologies from WASS?**

**Budroni:** WASS has proposed collaboration and support to DRDO and NSTL since 2003. The collaboration with BDL since 2005 in submarine torpedo countermeasure field has strengthened. The potential for growth of these organisations are enormous, but the roadmap in India is indigenisation. In state-art-of-the art technologies, WASS believes that the right, reliable and safe way to indigenise production is to find the right partner, preferably a leader in the sector and offer it a production share as to develop technologies. WASS proposals to DRDO and NSTL were in this direction, but till date no agreement has been signed.

WASS believes that Offsets, transfer of technology, either with public sector companies or private companies, are not enough to guarantee real absorption of technologies. All these instruments are based on programmes and not on product. The way BrahMos was indigenised is the most reliable way.


**SP's: Consequent to sustained mutual interaction and cooperation in transferring key technologies from WASS, how has the growth curve evolved in enhancing the indigenous contents of underwater systems for the Indian Navy?**

**Budroni:** Transferring key technologies is a dynamic issue. Even when we are in the process of transferring a given technology, technology itself is developing. The timing in procedure, contractual constraint for transfer of technology is Slower than the change in technology in the market. Hence it is necessary to find a solution byproduct and not by programme. To clarify better the concept, we have to focus in :

- A bid in India becomes a contract in an average time of five to six years.
- The speed with technology changes in the market today is much faster than five to six years.

As a consequence of the above, the product offered in a bid, at the time of delivery, can be no more the latest technology. Enhancing the indigenous contents can be obtained only by a "real partnership" between Indian companies and WASS by product.

**SP's: What is the roadmap for transfer of technologies from WASS for manufacturing effectors and torpedo decoy systems both for submarines and surface ships of the Indian Navy?**

**Budroni:** Not just for the Indian market but also the world market, the key issue is to identify the right partner to build a joint venture for every product. In India once the foreign direct investment reaches 49 per cent, the joint venture then needs to define the work share and develop products. WASS considers India as a second domestic market.

**SP's: The WASS light weight torpedoes (LWT) have been in service with the Indian Navy for some time now. What are the future plans for upgrade of its technologies, modernisation, etc.?**

**Budroni:** WASS is running a contract for A244/S modernisation. WASS has also proposed collaboration with NSTL/DRDO, to develop the LWT for the future requirements of Indian Navy. The proposal includes joint development of the weapons and industrial work share from the beginning between Indian industries and WASS on 50 per cent share basis. Such a proposal is not limited to the Indian market, but includes the world-wide market where WASS can facilitate commercialisation.

**SP's: Despite the proven track records of LWT, not much headway has been made as far as HWT – Blackshark is concerned. What is the strategy on the anvil for inducting this potent underwater weapon system for the Indian Navy's ships and submarines?**

**Budroni:** The HWT tender for the supply of HWT for Scorpene class submarines was won by WASS. The time necessary by the Indian bureaucracy to clear the contract is affecting all the strategies in this field. Black Shark torpedo can be the weapon with 50 per cent indigenous content, for all the platforms today and also for future programmes. To stop any tender in India is very easy. It is enough that one tenderer claims irregularities and the process gets stopped. Even after all the possible verifications, the tender can be stopped again. Such approaches are against the interest of the country and it adversely affects combat readiness and modernisation of the armed forces. Additionally the ageing of the selected product in terms of technology and performances, will render null and void the modernisation foreseen, as the purchase procedure takes six years to sign the contract. Delivery after the contract is signed takes another two or three years, in all about a lapse of nine years from the time of bid.

**SP's: Lastly, how do you envision growing eminence in India of WASS?**

**Budroni:** The WASS policy for India can be summarised as:

- India is WASS's second domestic market
- Joint ventures by product for the worldwide market is a must
- Ride the technology that is growing in the country for future product development. SP

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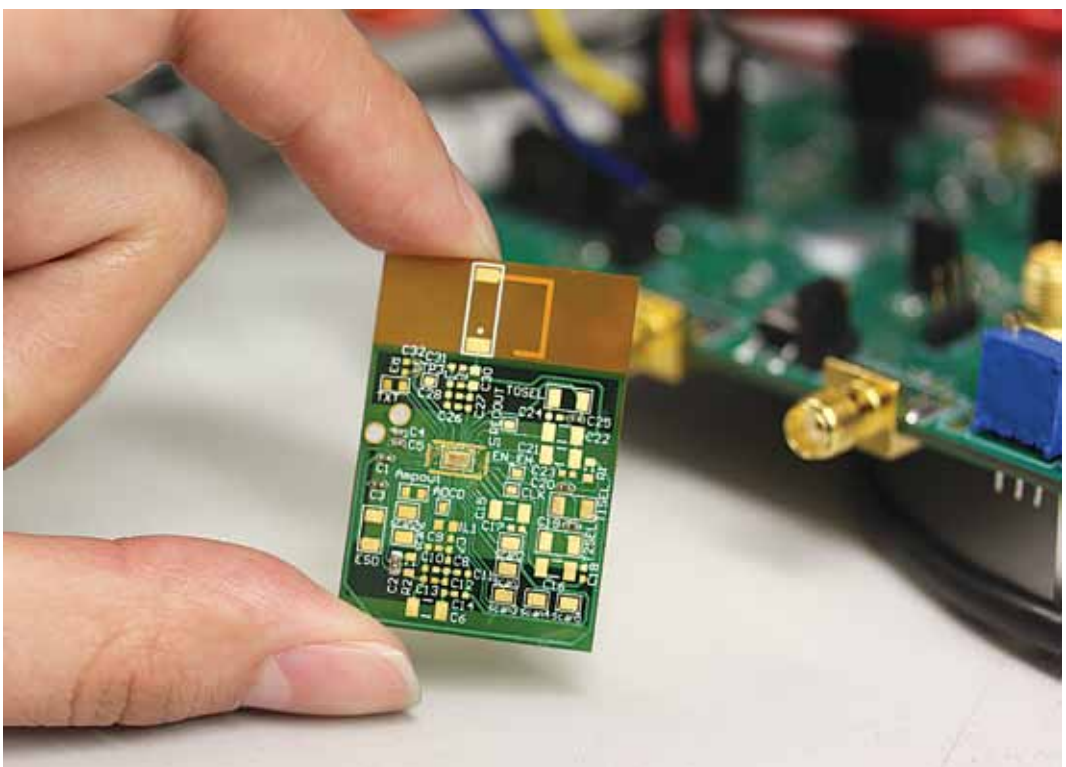
# The precious chip



PHOTOGRAPH: OSU

**Our engineering colleges need to give much more focus on practical rather than theoretical knowledge, without which our already late chip manufacturing will not get the required impetus, since we actually need to leapfrog capacity building in this sphere**

What is usually referred to as chip, IC or microchip or a semiconductor is an integrated circuit or monolithic electrical circuit of a generally solid chemical element or compound (usually Silicon) that can conduct electricity under some conditions making it a good medium for control of electric current, the conductance depending on the voltage applied to the control electrode or on the intensity of the irradiation by visible light, IR, UV or X-rays. The specific properties of a semiconductor depend on the impurities added to it.

The name 'chip' came because the set of electronic circuits on one small plate (chip) of semiconductor material. Chips can be very compact, having up to several billion 'transistors' and other electronic components in an area the size of a thumbnail, with further compression possible as technology advances – in range of tens of nanometers. The performance of chips is quite high because their small size allows short traces, which in turn allows low power logic, like CMOS, to be used at fast switching speeds. Digital memory chips and application specific integrated circuits (ASIC) are examples of the chip family that are important to the modern information society. The cost of designing and developing a complex chip is quite high but when spread across typically millions of production units the individual chip cost is minimised.

In terms of applications, the chip has become the foundation of modern electronics. They are being used in manufacturing computers, space research, medical sciences and the like. A transistor is one of the most widely used chip, available in multiple kinds which can be used in diverse fields like

for manufacturing logic gates as basis of the design of digital circuits. Transistors are also used in analog circuits as switches to respond to a constant range of inputs with a uninterrupted range of outputs since common analog circuits include amplifiers and oscillators.

Other chip applications are in the form of circuits or mixed-signal circuits, latter acting like the translator between digital circuits and analog circuits. Additionally there are 'power chips' consisting of devices which have integrated circuits. Power chips are used in those applications which require very high current or voltage requirements. Semiconductors devices application which involves combination of power semiconductor technology and Integrated Technology (IC) are called smart power devices. The main use of such devices is in the field of space research.

Finally, is the use of semiconductor devices in making high speed computer parts, calculators, telephones, medical equipment etc in addition to being extensively used in robotics. Research is ongoing to find new avenues and areas where the applications of chips can help gain better results in terms of performance and other parameters. In current research projects, integrated circuits are also developed for sensory applications in medical implants and other bio-electronic devices.

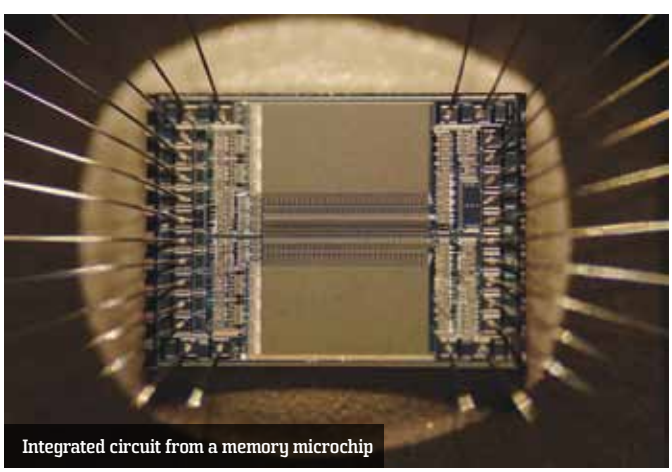
According to the report by Global Industry Analysts, Inc. released in December 2013 on Semiconductor Fabrication Material markets, global market for Semiconductor Fabrication Material is projected to reach $33.3 billion by 2018, driven by steady increase in IC fabrication activity in response to growing demand for electronic devices. Growing demand for electronic chip fabrication as a result of increasing production of mobile computing devices (notebooks, smart-phones, tablet PCs) is benefiting growth in the semiconductor fabrication material market.

While consumer electronics and appliances remain the primary driver of growth, emerging applications in automotive electronics, medical device electronics, defence and aerospace electronics, including state-of-the-art weaponry, are poised to fuel future growth in the market. The shift towards miniaturisation is also driving growth in the market by requiring specialisation of back-end fabrication. In the coming years, the persistent financial challenges and the pressure on capital will continue to mark the distinct evolution of pure-play foundries and fabless suppliers. The fabless model of microchip production will continue to gain prominence, given its unrivaled cost benefits. To say that the lack of indigenous chip manufacture in India was a strategic void would be an understatement especially with Japan being the largest chip manufacturer in the region and even China having 95 fabs way back in 1995 compared to none in India.

The Indian semiconductor sector comprises pre-fabrication, fabrication and post-fabrication verticals. Despite the current slowdown in global markets, the Indian semiconductor market has shown sustained growth over the years. In 2007, the Indian Semiconductor Association (ISA)-Frost and Sullivan estimated the Indian semiconductor market to be worth $4.56 billion, which had already risen to $7.59 billion by year 2010. Gartner had estimated India's semiconductor consumption reached $8 billion in 2012 (7.4 per cent increase from 2011) and that this consumption would reach $9.6 billion in 2013 (20 per cent increase over 2012).

After decades of wait, the Government of India has finally accorded "in principle" approval on February 14, 2014, for setting up of two Semiconductor Wafer Fabrication (FAB) manufacturing facilities in the country. These fabs would enhance the information and economic security of India, give boost to the Electronics System Design and Manufacturing (ESDM) ecosystem in the country and will provide defence offset obligations for electronic procurement through ESDM products. The two consortiums that stand approved to set up thr fab facilities are: one, Jaiprakash Associates along with IBM (USA) ans Tower Jazz (Israel) with an outlay of about ₹26,300 crore for a fab at Greater Noida producing 30,000 wafer of 300 mm size in the beginning, technology nodes approved being 90, 65 and 45 nano meter (nm) in Phase I and 28 nm in Phase II, with the option of establishing a 22 nm in Phase III; and, two, Hindustan Semiconductor Manufacturing Corporation (HSMC) along with Microelectronics (France/Italy) and Silterra (Malaysia) for a fab in Gujarat with an outlay of about ₹25,250 crore of 40,000 wafer starts per 300 mm size, technology nodes proposed being 90, 65 and 45 nm nodes in Phase I and 45, 28 and 22nm nodes in Phase II.

While on one hand India has the gigantic burden of 4.53 crore unemployed (mostly youth), on the other, we also are churning out some 9,60,000 engineer graduates every year; large number of high quality with advanced English skills that fit well with the requirements of the knowledge-intensive semiconductor industry. Growth of the Indian semiconductor design market is expected to lead to an increase in the number of engineers employed by this segment. Already job advertisements from multiple companies (there are about 150 semiconductor design companies in Bengaluru alone) are spread across the web seeking qualified persons in semiconductor VLSI design, software and embedded design, chemical and material science engineering, electrical and control systems engineering and the like. Here, the euphoria needs to be tempered with the fact that in India we have the problem of hands on experience plus exposure to the product and end application with the first two fabs just about beginning to set up.



Integrated circuit from a memory microchip

PHOTOGRAPH: Wikipedia

Product conceptualisation, management and analog design skills need to be advanced. To this end, our engineering colleges need to give much more focus on practical rather than theoretical knowledge, without which our already late chip manufacturing will not get the required impetus, since we actually need to leapfrog capacity building in this sphere. For this, our engineering colleges could tie up with industry players and co-locate labs with them to impart requisite practical training.

The government and the industry on the other hand should examine introduction of an institutionalised system of internships to provide the right engineer material in the required numbers to progress the chip industry. Even more important is the need to aim for the ultimate – totally indigenous chip design and development in place of foreign collaboration, which would be essential for our future weapon systems. This needs to be taken up on priority. SP

# Exercise Sarvada Vijay

Exercise 'Sarvada Vijay' (Always Victorious) was held at Mahajan field firing ranges on May 3-4, 2014. The overall aim of the exercise was to practise conventional cross-border thrusts into enemy territory. In the joint operation, the Indian Air Force also took part in the exercise. The exercise involved about 20,000 troops, 200 tanks, 500 infantry combat vehicles and howitzers and also involves the Headquarters of the Mathura-based Strike Corps with some support elements, as per the Army sources. The exercise was based on the concept of a divisional battle group delivering a lethal punch in a swift offensive operation across the international border. After Operation Parakram in 2002, which exposed the weaknesses in the build-up of strike forces and the slow troop mobilisation along the border, the Army reorganised its formations along the western front to ensure the capability to deliver a more effective lethal punch, if required.

Jaipur-based Headquarters South-Western Command was created in 2005 as the 1.18-million-strong Army's sixth and newest operational command. While 1 Strike Corps falls under the South-Western Command, two other such "attack" formations are 2 Corps (Ambala) under the Western Army Command at Chandimandir and 21 Corps (Bhopal) under the Southern Army Command in Pune. Earlier, Army had carried out similar exercises like 'Vijayee Bhava,' 'Sudarshan Shakti' and 'Shoorveer' on the same lines.

Experts said future wars are likely to be localised in nature and capturing of maximum high value enemy territory in swift and daring operations across the IB by relatively smaller forces with adequate firepower will give an edge to the attacker.

Lt General Arun Kumar Sahni witnessed the conduct of exercise 'Sarvada Vijay' in Rajasthan. The Army Commander was initially briefed on the training aspects and later witnessed the conduct of the exercise in the field.

The exercise was conducted as part of routine training where a designated Army formation was practised in its operational role and made to hone its war-fighting skills. Composite infantry and mechanised forces practised swift manoeuvres as part of the air-land battle. Networked radars, unmanned aerial vehicles and aerial surveillance platforms ensured continuous flow of information resulting in battlefield transparency which enabled commanders to assess and suitably modify their operational plans to meet the emerging challenges. Mobile communication systems integrated with terrestrial network provided efficient communication during manoeuvres.

The Army Commander also reviewed the command and control structures that facilitate synergy between the Army and Air Force in launching a coordinated air-land battle. He spent two days with the Strike Corps and its formations. He specifically reviewed the ability of a strike force to orchestrate battle in a network-centric environment. Due to the scale of the exercise and its closeness to the international border, Pakistan was also informed regarding the exercise. SP

***— Lt General (Retd) V.K. Kapoor***

PHOTOGRAPHS: Defence PRO

## Chief of Naval Staff visits Headquarters Eastern Naval command

Admiral R.K. Dhowan, the Chief of the Naval Staff (CNS) reviewed a ceremonial parade held in his honour at INS Circars Parade Ground April 30, 2014. He inspected a 50 men Armed Guard, and reviewed the platoons of Naval and DSC personnel drawn from various ships and establishments of the Command. Flag Officers and Commanding Officers of various ships and establishments of Eastern Naval Command were present on the occasion.

Complimenting the officers and men on a smart parade, Admiral Dhowan said that he felt privileged to be visiting the Eastern Naval Command (ENC) the premier Command of the Navy, on his first visit in the present capacity, as it was here that he had commanded the Fleet and was the Chief of Staff earlier.

During his address after the ceremonial parade the Admiral said that it is the responsibility of the men in white uniform to ensure that India's maritime interests are pursued unhindered, both in peace and war. This necessitates a multi-dimensional, combat-ready force, and the Eastern Naval Command, with operations spread across the Bay of Bengal and the Indian Ocean, is undertaking these tasks admirably, he said. Over the last two years, ENC has acquired three Shivalik class stealth frigates, P8I long range maritime patrol and anti-submarine warfare aircraft, hawk advanced jet trainers, nuclear attack submarine INS Chakra and a number of fast interceptor craft. Also, Arihant is in the final phase of its harbour trials and will shortly be put to sea; first of the four indigenous P28 class ASW Corvettes being built at the Garden Reach Shipbuilders and Engineers Ltd (GRSE), Kolkata, will be joining the Eastern Fleet in the near future. He stressed that keeping these assets in a high state of combat readiness is the responsibility of every man in uniform.

Touching upon the incidents which happened in the recent past and have dented the image of the Navy, the CNS urged that we have to work together to restore the pride and prestige of the Indian Navy and this would surely be possible through effective teamwork, diligent training and strict adherence to procedures. The Admiral stressed on the importance of the divisional system in improving quality of life and contributing towards a happy environment; he urged all men in whites to work with commitment, compassion, credibility and integrity (C3I) and work together to take the Indian Navy to greater heights and the pinnacle of professionalism.

Later, Admiral Dhowan visited the Headquarters, Eastern Naval Command and held discussions with Vice Admiral Anil Chopra, Flag Officer Commanding-in-Chief and was briefed on the activities of the Command. Thereafter, the Admiral addressed officers, men and defence civilians of the Command and visited ships, submarines and establishments.

Minu Dhowan, President, Navy Wives Welfare Association (NWWA), visited the Navy Children School (Kindergarten) at Dolphin Hill, Sahara facilities at Nau Sena Baugh and the NWWA Kendra, and interacted with the Executive Committee and ladies of the organisation. SP

## Chinese delegation visits India

Lieutenant General Qi Jianguo, Deputy Chief of General Staff (Operations), PLA China was on a two-day visit on April 22 and 23 in India, along with an eight member delegation. The visit is in response to an invitation extended by the Government of India.

The two sides exchanged views on various issues of mutual interest such as maintenance of peace and tranquility along line of actual control and enhancing mutual cooperation and understanding between the armies of India and China. Measures for implementation of existing bilateral agreements were also discussed.

The meeting was held in a warm and cordial atmosphere. Both sides agreed on the need to enhance bilateral military engagements. The Chinese side has confirmed its participation in the Fourth India China Joint Training Exercise scheduled to be held in November 2014 in India. The PLA delegation also called on the Chairman Chiefs of Staff Committee and the Chief of Army Staff General Bikram Singh and the Defence Secretary.

India and China attach great importance to high level military exchanges. 2014 has also been declared as "Year of Friendly Exchanges". It may be recalled that in February this year, the PLA Delegation led by Lieutenant General Wang Guanzhong, Deputy Chief of General Staff had come to India for Annual Def Dialogue and the Indian Defence Minister had visited China in July 2013. The Chinese side has also confirmed the visit of its Defence Minister General Chang Wanquan to India later this year. SP

The Deputy Chief of General Staff (Operations), PLA China, Lieutenant General Qi Jianguo meeting the Chief of Army Staff, General Bikram Singh, in New Delhi.

PHOTOGRAPHS: Indian Navy, PIB

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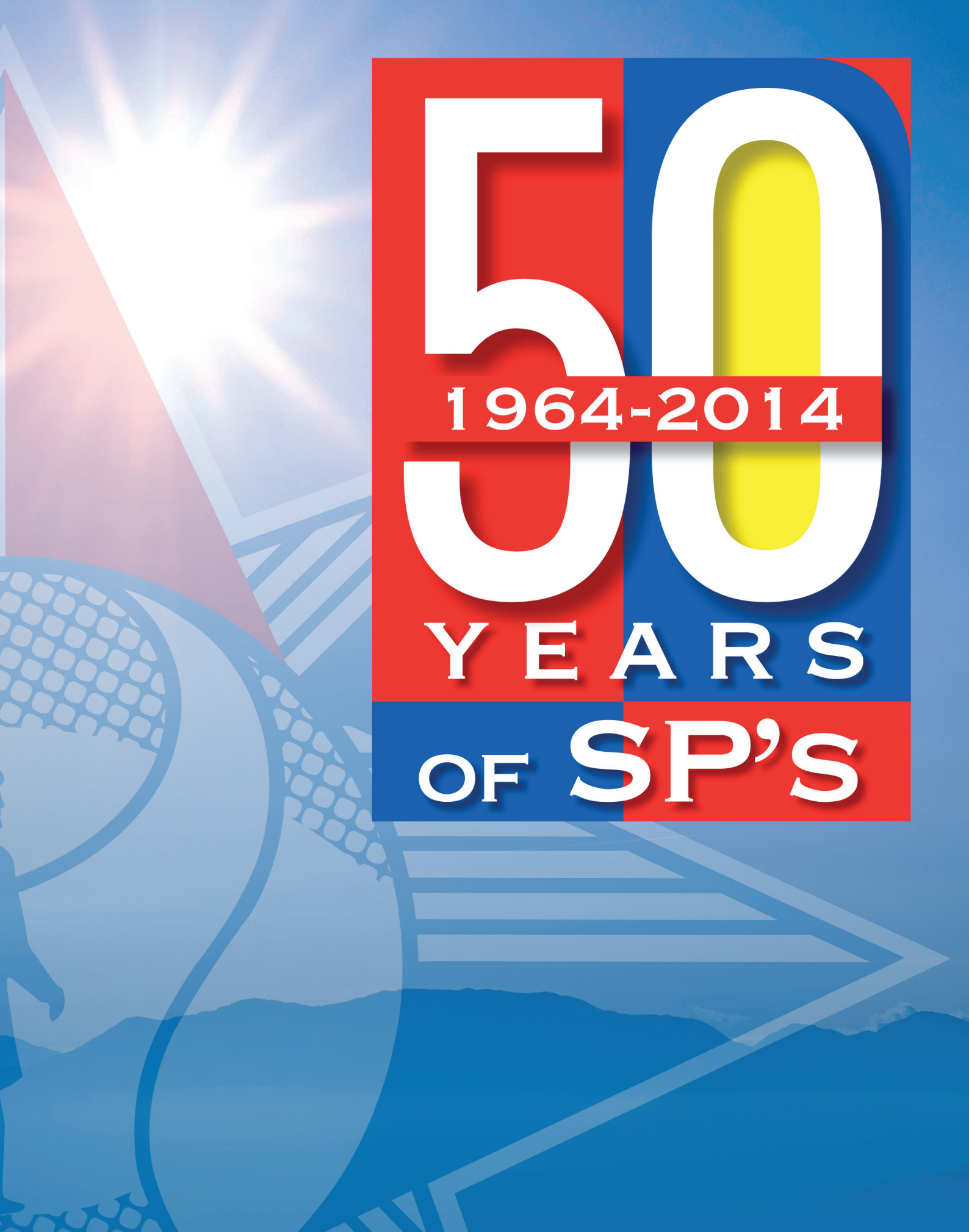
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## Air Marshal S.B.P. Sinha takes over as DCAS

Air Marshal S.B.P. Sinha takes over as the Deputy Chief of the Air Staff at Air Headquarters on April 30, 2014. An alumnus of the National Defence Academy, he was commissioned in the fighter stream on June 15, 1980. He has over 3,700 hours of flying experience having flown the Hunter, MiG-21, Mirage 2000 and Su-30MKI fighter aircraft.

A graduate of the Defence Services Staff College (DSSC), Wellington, he is a Cat 'A' Flying instructor, Instrument Rating Instructor and Examiner and has undergone operational courses in France and the United States. He has held various important Command, Instructional and Staff appointments which include Instructor at the Flying Instructors' school, Flight Commander of a Mirage 2000 squadron, Chief Flying Instructor of Basic Flying Training School, Air Force Examiner in the Aircrew Examining Board, Commanding Officer of a MiG-21 squadron, Commandant of Electronic Warfare Range, Air Officer Commanding of a premier Su-30MKI base and Team Leader of the AWACS Project Team in Israel. He has also held important Staff Appointments at the Air Headquarters which include, Deputy Director of Operations (Electronic Warfare), Principal Director of Plans, CISR and Acquisitions and Assistant Chief of Air Staff (Plans) at Air Headquarters. He is a recipient of the Ati Vishist Seva Medal and the Vayu Sena Medal.

Incidentally his brother Air Marshal B.B.P. Sinha is serving as the Director General (Works & Services) at the Air Headquarters New Delhi. SP

## Thales finalises delivery of maritime patrol aircrft to Turkey

Thales announced the delivery of the final standard for the maritime patrol aircraft to Turkey as part of the MELTEM II programme, for which Thales is the prime contractor. Till date, five of the six aircraft have been delivered to this standard, with the sixth set for delivery before the summer. This follows the three maritime surveillance aircraft which were sent to the Turkish coast guards last year.

A ceremony was held at the Topel (Turkey) naval air base to celebrate the official delivery of aircraft to the Turkish Navy in the presence of the Chief of Staff for the Turkish Navy, Bülent Bostanoglu, as well as the Secretary of State for the Turkish Defence Industry (SSM), Ismail Demir.

Pierre Eric Pommellet, Senior Vice President of Thales in charge of Defence Mission Systems, officially handed over the delivery certificate for the aircraft to the Chief of Staff of the Turkish Navy.

He highlighted the "strong relationships that have been established throughout the programme with Turkish industry partners, TAI, Havelsan, Aselsan and Milsoft. These have enabled the success of this aircraft transformation programme and pave the way for future partnerships between Thales and the Turkish industry. We're focusing on developing this close cooperation and are very proud these maritime patrol aircraft reach a technological and operational standard of excellence. The Turkish Navy can now rely on Thales's state-of-the-art AMASCOS solution to conduct their maritime patrol missions."

"We're focusing on developing this close cooperation and are very proud these maritime patrol aircraft reach a technological and operational standard of excellence. The Turkish Navy can now rely on Thales's state-of-the-art AMASCOS solution to conduct their maritime patrol missions," said Pierre Eric Pommellet, Senior Vice President of Thales in charge of Defence Mission Systems. SP

## L-3 WESCAM demo of MX-25D EO technologies on Apache

L-3 WESCAM announced that it had successful ground and flight demonstrations of its MX™-25D at the US Army's Redstone Test Center (RTC) in Alabama recently.

Through a cooperative agreement between the Apache Sensors Product Office and L-3 WESCAM, the demonstrations were conducted to investigate available electro-optical technologies. The original ground demonstration prompted the Sensors Product Office to request a side-by-side flight evaluation between the MX-25D and the current Apache M-TADS/PNVS from the US Army Aviation Flight Test Directorate (AFTD). Integration with the aircraft for this demo was funded by L-3 WESCAM.

"L-3 WESCAM is very pleased with the outcome of the demonstrations and the opportunity to show our most recent sensor advancements to the US Army," said Paul Jennison, L-3 WESCAM Vice President of Government Sales and Business Development. "We've been providing the Army with leading sensor technology for ISR missions for many years on key platforms, including EMARSS, Army National Guard UH-72, Task Force ODIN, Aerial reconnaissance low, the persistent threat detection system (PTDS), and export versions of the CH-47F and the FMS Armed 407 for the Iraqi Air Force."

The MX-25 was first demonstrated in January 2013, when it was delivered to the US Army's Yuma Proving Ground in Arizona and evaluated by the PTDS Communications-Electronics Command (CECOM) team as a plug-and-play upgrade path to the MX-20 systems currently deployed on PTDS aerostats. SP

PHOTOGRAPHS: Indian Air Force, L-3 Wescam, Thales

LT GENERAL (RETD)
P.C. KATOCH

# The UCAV war

MQ-9 Reaper remotely piloted aircraft

PHOTOGRAPH: defense.gov

**The Defence Research and Development Organisation is developing the medium altitude long endurance UAV as a forerunner to the high altitude long endurance UAV.**

The unmanned aerial vehicles (UAVs) and unarmed combat air vehicles (UCAVs) are not new. The US and NATO forces have used them extensively in Afghanistan and Iraq, as also there have been numerous Predator UCAV attacks inside Pakistan. The UCAV is a UAV designed to deliver weapons (attack targets) without an onboard pilot.

Currently operational UCAVs are under real-time human control, but future version may enable autonomous operation. Elimination of onboard human crew in a combat aircraft that may be shot down over enemy territory has obvious advantages. In addition doing away of a cockpit, flight controls, ejection seat, oxygen etc results in decrease of weight, allowing greater payloads (armament, ammunition, cameras etc), plus increased range and manoeuvrability.

Interestingly, Thales is assisting Qatar armed forces in developing an optionally pilot vehicle – aircraft (OPV-A); a high performance intelligence, surveillance, target acquisition and reconnaissance (ISTAR) system with full end-to-end training solution. The OPV-A airframe seletcted by Qatar will be integrated with a mission system capability to enable the optionally piloted capability as a hybrid between a conventional aircraft and an unarmed aircraft system (UAS). It will be able to fly with or without a pilot on board the aircraft. UCAVs are being mounted with lasers and ordnance with better precision.

MBDA has successfully demonstrated its dual mode Brimstone missile on an MQ-9 Reaper remotely piloted aircraft (RPA) in January 2014, scoring nine direct hits against a range of targets including very high speed and manoeuvring vehicles in high collateral risk and urban environments. These trials are another step in the ongoing spiral development of weapon systems for UCAVs, broadening its


A model of the DRDO's Rustom UAV

application to deliver a true multi-role and multi-platform land and maritime attack capability.

Concurrent to development of drones is the ongoing research to bring down enemy drones. In December 2011, Iran captured a top of the line American Lockheed Martin Sentinel stealth UAV. Iran claimed that the UAV was brought down by her cyber-warfare unit, commandeering it in flight and safely landing it albeit western sources claimed it was shot down.

But closer home we need to take serious note of China's considerable drone capability especially since China reportedly has 24 x 7 surveillance cover along the line of actual control (LAC) through her extensive satellite network. China could possibly be having the largest drone fleets after the US. In 2012, the US was reportedly operating 6,709 drones compared to 280 by PLA but that difference in numbers could have narrowed down considering the modernisation pace of the PLA and enormous defence spending. The PLA envisions its drone swarms scouting battlefields, guiding missile strikes and overwhelming the enemy defences through sheer numbers.

China's military-industrial complex has established vide array of indigenous drones to accomplish these goals. Interestingly, China's 'Wing Loong' drone reportedly costs around $1 million, compared to the US 'Reaper' drone in the $30 million range. While technological capabilities may vary but the fact remains that one can perhaps buy 25-30 Wing Loong drones for the price of one Reaper. More significantly, the Wing Loong has the same endurance as the Reaper (20 hours), has a range of 4,000 km and packs four hard points for mounting variety of lasers, precision guided bombs.

It is also important to note that China successfully flight tested a hypersonic vehicle in January 2014 travelling at a speed five times the speed of sound, aiming eventually to attack targets at the speed of Mach 10. In our case, the Defence Research and Development Organisation (DRDO) is developing the medium altitude long endurance (MALE) UAV as a forerunner to the high altitude long endurance UAV. The MALE concept calls for aircraft which can operate virtually autonomously, programmed with route and target details to undertake the mission without help from human controllers; missions like suppression of enemy AD, electronic warfare, surveillance, precision strike and associated operations. MALE's surveillance version is expected to have an endurance of 24 hours, operational ceiling up to 35,000 feet, autonomous take-off and landing, wheeled undercarriage and a single (Rotax) piston engine.

We certainly need to pick up pace considering the Chinese capability in this sphere. The Ministry of Defence's 2010 Technology Perspective & Capability Roadmap identifies DEWs and ASAT (anti-satellite) weapons as thrust areas over next 15 years but the UAV and MAV programmes of DRDO must be accelerated.

In terms of technology, we need riposte ability to paralyse enemy C4I2 infrastructure, stand-off weapons to pre-empt enemy attack, adequate mix of DEW, PGMs, ASATs etc, ability to disrupt enemy logistics etc. Space combat, cyber space combat, radiation combat, robotic combat, nano-technology combat will add to existing forms of combat, zombie war being the latest addition. We must be prepared to win such conflict situations. Leapfrogging technology requires special emphasis. Permitting the asymmetry vis-à-vis the PLA to widen will be to our grave disadvantage. This needs to be bridged and overtaken. We have to leapfrog technology if we are to overcome our asymmetric infirmities and tilt them to in India's favour. SP

*The views expressed herein are the personal views of the author.*

PHOTOGRAPH: Anoop Kamath

## Camcopter S-100 demonstrates its maritime capability in the Netherlands

The Camcopter S-100 unmanned air system (UAS) successfully demonstrated its capability across several different maritime scenarios to Dutch Authorities in Den Helder, the Netherlands, on April 29, 2014.

Consolidating its unmatched maritime position, the S-100 demonstrated its ability to support maritime commanders and decision makers in the North Sea, west of Den Helder. The North Sea is already one of the busiest maritime areas in the world and the Coast Guard expects this to increase over the coming years.

The demonstrations were executed from a Dutch Navy vessel, using the L3 Wescam MX-10 electro-optic sensor as a payload. The demonstration programme was based around a sequence of scenarios commencing with the Camcopter S-100 introduction to the audience.

In one of those scenarios a fire onboard a ship loaded with dangerous substances resulted in the crew abandoning the vessel, two crew members are missing and no further information is available. Before the rescue mission begins it is deemed essential by the decision makers that they have "eyes" on the target to assess risks and determine the possible location of the missing crew members. The S-100 is deployed to provide this information as well as giving other useful information to help combat the fire. The Camcopter demonstrates how it can gather this time critical information quickly and efficiently.

The fight against drug smuggling formed the theme of another scenario. The S-100 is deployed to discretely follow a suspect vessel. Suddenly a rigid-hulled inflatable boat, (RHIB) appears, moving alongside the vessel. The unmanned helicopter observes and records the transfer of drugs and supplies time critical information to the allied ships to intercept and detain the RHIB.

During all scenarios the Camcopter S-100 ably demonstrated its flexibility, versatility and persistence, all of which are the key to successful operation in maritime environment.

Hans Georg Schiebel, Chairman of the Schiebel Group of companies, commented: "This series of trials once again showed how the S-100 can provide a cost-effective capability to Maritime Commanders and decision makers whether ashore or afloat."

Schiebel's Camcopter S-100 unmanned air system (UAS) is a proven capability for military and civilian applications. The vertical takeoff and landing (VTOL) UAS needs no prepared area or supporting launch or recovery equipment. It operates in day and night, under adverse weather conditions, with a beyond line-of-sight capability out to 200 km, both on land and at sea.

The S-100 navigates via preprogrammed GPS waypoints or is operated with a pilot control unit. Missions are planned and controlled via a simple point-and-click graphical user interface. High definition payload imagery is transmitted to the control station in real time. Using "fly-by-wire" technology controlled by a triple-redundant flight computer, the UAV can complete its mission automatically.

Its carbon fibre and titanium fuselage provides capacity for a wide range of payload/endurance combinations up to a service ceiling of 18,000 ft. In its standard configuration, the Camcopter S-100 carries a 75 lb/34 kg payload up to 10 hours and is powered with AVGas or heavy fuel. SP

PHOTOGRAPH: Schiebel

## Lockheed Martin demonstrates enhanced ground control system for SUAS

Lockheed Martin's Group 1 family of unmanned aircraft systems is migrating to enhanced automation capabilities using its Kestrel "Fly Light" flight control systems and industry-leading mobile ground control station (mGCS) software. The increased automation allows operators to focus on executing the mission, rather than flying various aircraft.

Earlier this year, Lockheed Martin's Desert Hawk III small unmanned aircraft system (SUAS) demonstrated these enhancements by delivering improved situational awareness to operators. The mGCS enhancements also proved to substantially reduce operator workload through an intuitive interface, user-friendly touchscreen and joystick options, as well as a sophisticated set of operator warnings, cautions and advisories.

"The mGCS is a derivative of our proven VCS-4586™ software that focuses on providing capabilities to the small unit level," said Kevin Westfall, Director of Unmanned Solutions at Lockheed Martin's Mission Systems and Training business. "mGCS is a single, portable system capable of conducting missions that would typically require multiple controllers and federated software applications in order to manage the many different types of UAS."

mGCS was developed on an open system using commercial off-the-shelf technology that is interoperable with a variety of portable computers, hand controllers, autopilots, data links and sensors. The mGCS software is compliant with NATO's Standardisation Agreement (STANAG) 4586 and also includes a full software development kit to provide other UAS manufacturers the ability to add systems and other capabilities without restriction. This significantly eases integration while reducing support and sustainment costs as well.

With more than five decades experience in unmanned and robotic systems, Lockheed Martin offers multiple solutions for air, land and sea. From the depths of the ocean to the rarified air of the stratosphere, Lockheed Martin's unmanned systems help military, civil and commercial customers accomplish their most difficult challenges. SP

## BJP says it will strengthen internal security

The BJP manifesto has stated that it would strengthen the role of National Investigation Agency (NIA) and put in place a system of swift and fair trial of terror-related cases.

Established in the aftermath of the 26/11 attacks, the premier counter-terror agency has been marred by lack of manpower, especially at the level of superintendent of police. Its relationship with intelligence agencies too has been rough with the latter choosing to hand over top terror operatives to state police forces rather than the federal agency.

To ensure better coordination among agencies and independence of operations related to terrorism, the BJP manifesto also vowed to "insulate intelligence agencies from political intervention and interference". The manifesto also aimed to "completely revamp the intelligence gathering system by modernising the intelligence department".

The manifesto said, "It will be accountable for real-time intelligence dissemination. Digital and cyber security will be a thrust area." To ensure such Central effort is well supported by boots on the ground, the BJP manifesto promised to provide state governments with all assistance to modernise their police forces and equip them with the latest technology. "This will be taken up on a mission mode approach," the manifesto said.

It also touched upon the important issue of police modernisation with emphasis on training of police forces, giving them new technology, strengthening of investigations, overhauling prison system and improving cyber and marine policing. The manifesto, however, was silent on certain issues of police reforms such as delinking police from political influence and having fixed tenure for officers apart from separation of law and order and investigation wings of the police. The matter has been languishing with various state governments despite a Supreme Court order.

On the issue of Naxalism, the BJP manifesto was in favour of talks with Maoists but said it should be "conditional and within the framework of the Constitution". It promised to chalk out a national plan to address Maoist challenge in consultation with state governments. SP

## Appointments

R.R. Verma, IPS, presently Director, National Crime Records Bureau (NCRB) will hold the additional charge of the post of Director General, Fire Services, Civil Defence & Home Guards (FSCD&HG), with immediate effect till an incumbent to the post of Director General FSCD&HG is appointed on regular basis, or till further orders.

Arvind Ranjan, IPS, presently DG, CISF will hold the additional charge of the post of Director General, Sashastra Seema Bal (SSB) with effect from May 1, 2014, till an incumbent to the post of Director General, SSB is appointed on regular basis, or till further orders. Arun Chaudhary, IPS, DG,SSB superannuated on April 30, 2014. SP

## Ceasefire in Nagaland

A ceasefire is in operation between the Government of India and National Socialist Council of Nagaland (Khaplang) (NSCN/K). The validity of ceasefire was further reviewed. It was decided by the Government of India to extend the ceasefire with NSCN/K for a further period of one year with effect from April 28, 2014. The agreement was signed by Shambhu Singh, Joint Secretary, MHA on behalf of Government of India and Y. Wangtin, Supervisor, Cease Fire Supervisory Board (CFSB) on behalf of NSCN/K. SP

## Detecting chemical composition of liquids

In the running for UK's premier engineering prize is a new machine which can identify the chemical composition of liquids sealed within non-metallic containers without opening them. There are quite a few contenders for the MacRobert Award.

The machine has been deployed in 65 airports across Europe and it can protect travelers by screening for liquid explosives and could spell the end of the ban on liquids in hand luggage.

Based on research undertaken at the Science and Technology Facilities Council, Oxfordshire-based Cobalt Light Systems has developed an airport security scanner, the Insight100. It should enable airports to remove the existing hand-luggage liquid ban through phased implementation over the next two years.

An STFC release reports that the Insight100's underlying technology was first developed by STFC's Professor Pavel Matousek in a true eureka moment at the Central Laser Facility. Professor Matousek said: "The technology works using the technique of Raman spectroscopy. When combined with advanced algorithms to distinguish between the container and its contents, the technology is able to identify the chemical composition in seconds, and with greater reliability than any other existing system." SP

## US Secretary of Homeland Security meets immigration stakeholders

The US Secretary of Homeland Security Jeh Johnson recently met with leaders from business, law enforcement, and faith communities to discuss a wide range of immigration issues, including the need for commonsense immigration reform. The meeting is part of the ongoing thorough and inclusive review process Secretary Johnson is undertaking to assess how the Department of Homeland Security can better enforce and administer immigration laws.

As part of the ongoing review, Secretary Johnson continues to engage with various stakeholders and members of Congress that are also working towards achieving a permanent solution by enacting commonsense immigration reform that will strengthen our security. In addition, Secretary Johnson has included and continues to seek the advice and input of his team within DHS including component leadership and frontline employees – the very people that are charged with implementing DHS policies and enforcement priorities. Since taking office, the Secretary has made clear that he shares the President's commitment of enforcing and administering our immigration laws effectively and sensibly, in line with our values as a country.

During the meeting, Secretary Johnson underscored the importance of Congressional action to pass commonsense immigration reform– which will offer a permanent solution to our broken immigration system. SP

PHOTOGRAPH: defense.gov

## A400M training centre opens

The first European expert centre for the A400M, the project's training centre, has opened its doors as part of the multinational entry into service team (MEST). Since April 1, 2014, two aviators are the first to pass their A400M type rating on Orléans air-base's new training centre.

The brand-new training centre is equipped with the latest training aids and has all the assets required to become the first pan-European A400M centre of excellence.

For the two French pilots, the training is a new challenge and a new milestone in their already rich aviation careers. Training revolves around three successive phases: first a foundation of knowledge of the aircraft and an initial familiarisation with the A400M's cockpit, followed by a detailed course on the aircraft systems as well step-by-step training on cockpit crew procedures. Finally, a series of simulator sessions rounds out the conversion training on the new aircraft. SP

## Agilent Technologies strengthens aerospace and defence portfolio

Agilent Technologies Inc., the world's premier test and measurement company, concluded the 8th annual aerospace and defence symposium in New Delhi. The Symposium is an annual property of Agilent Technologies and is India's biggest technical gathering of aerospace and defence engineers and scientists working on cutting-edge strategic electronics. This year the symposium focused on military communications, electronic warfare and radar systems, apart from detailing the challenges in test and measurement.

The symposium, organised by Agilent in partnership with IEEE (Institute of Electrical and Electronics Engineers), Association of Old Crows (AOW)-India Chapter, and IESA (Indian Electronics & Semiconductor Association), spanned across Bengaluru, Hyderabad and concluded n New Delhi. Over 600 delegates participated in various technical sessions on radar, electronic warfare, military communication, avionics, navigation systems, among others, which redefine the design and development of aerospace/defence systems.

Sudhir Tangri, Country Manager, Agilent Technologies Electronic Measurement Group said, "We see huge potential in the aerospace & defence segment, which is occupying more and more space in the country's long term strategic planning. India is an extremely important market for us globally, which is affirmed by our continued focus with the A&D symposium. We will remain focused on delivering industry defining solutions for the sector with the next phase of our evolution, Keysight Technologies."


PHOTOGRAPH: Airbus Military, Agilent Technologies

Agilent Technologies has been providing the aerospace and defence industries with products and services for more than 75 years. For Agilent, the aerospace and defence segment is a major contributor to their business in India and worldwide. The symposium was attended by key influencers from the aerospace and defence sector. The Symposium was enriched by open forums that featured discussions and demonstrations of the latest products and features from Agilent.

The new Agilent products and solutions launched during the symposium include: 1.16850 Series portable logic analysers; World's fastest, most accurate high-performance PXI VSA; MXE EMI Receiver; Microwave analog signal generators with industry-leading phase noise, power and speed; and the fastest, highest-performance PXIe controller for complex, secure applications. SP

## Saab and Pilatus sign MoU

Pilatus Aircraft Ltd. has signed a memorandum of understanding with SAAB cementing a far-reaching partnership which on the one hand addresses the offset obligations of SAAB related to the possible purchase of the Gripen for the Swiss Air Force, while at the same time forging a long term relationship between two innovative and forward looking aerospace companies.

A new generation of aircraft for a new generation of military pilots: Gripens for Switzerland – PC-21s for Sweden. The PC-21 Pilot Training System has been the subject of sales negotiations between Pilatus and Sweden for some time. A decision to proceed with the purchase of the Gripen would take Pilatus one step closer to concluding a PC-21 contract, creating a win-win situation for both countries.

Pilatus and SAAB also aim to create some 100 further new positions in the aerostructures sector. The production – for the PC-21, the Gripen and other aircraft types made by both manufacturers – will be performed at a new location in Switzerland which has yet to be defined. SP

## French Ambassador awards scholarship to the first batch of MBDA-ISAE programme

April 28th, the evening was beaming with the radiant faces of the first batch of seven proud students at the residence of the Ambassador of France to India, François Richier.

The first group of Indian students were awarded the MBDA-ISAE scholarship being part of a two-year master's programme at the French university Institut Superieur de l'Aeronautique et de l'Espace (ISAE) situated in Toulouse, France, under the MBDA Programme of Excellence.

After completing the course, the students, five young men and two young women – will be awarded MSc in aerospace, mechanics and avionics. The students mostly holding an engineering background are from different academic institutions. "The applications are out in November, I am so enthusiastic about the course and I look forward to pursuing a career in research," said Sachin, an erstwhile student of the National Institute of Engineering, Mysore. Navyakrisha from Hyderabad came to know about this programme from his senior, currently studying at ISAE. Upon receiving this scholarship award from Ambassador, Neelam chirped: "it is like a dream" and Deepali from Bangalore echoed.

During the reception Richier said: "Engineers contribute to nation's technological and industrial progress. These bright young Indian students who have been chosen by MBDA and ISAE will do even more. They will play their part in preparing the future of the relationship of France and India."

Loic Piedevache, MBDA country head India, said: "This scholarship programme, which will cover the tuition fees of the students concerned as well as contribute towards their housing, is just one of

the many initiatives that MBDA is undertaking to establish itself as a trusted, long-term partner within India's defence industry infrastructure. The French Embassy will support with free visas, medical coverage and access to student housing to the scholarship winners during their stay in France. Furthermore, the students will also be entitled, upon completion of their course, a five-year Schengen visa for themselves and their partners."

The MBDA and the ISAE have signed a sponsorship agreement, setting up an Indian scholarship programme in France. Between 2014 and 2017, this programme will contribute towards the financing of 24 students and young aeronautical professionals from India, enabling them to undertake masters at ISAE. SP

***— Neetu Dhulia***

## eInfochips receives Rockwell Collins 2014 supplier of the year award

EInfochips, a leading product design company, earned the 2014 Supplier of the Year award for Development and Engineering Services from Rockwell Collins, a global leader in avionics with more than $4 billion in annual revenues. Rockwell Collins' Supplier of the Year Award acknowledges significant contributions made during the year by suppliers. eInfochips was selected in the Development and Engineering category based upon performance in five core supply chain values: quality, delivery, total cost of ownership, lead time and customer service.

"Rockwell Collins' development and engineering suppliers are all highly qualified," said Bruce King, Senior Vice President, Operations, Rockwell Collins. "Congratulations to the eInfochips team for being recognised as the top performer in their category."

According to Sribash Dey, Executive Vice President, North America, eInfochips, "Being recognised as Supplier of the Year is always gratifying. We truly appreciate being recognised by a global leader like Rockwell Collins."

eInfochips and Rockwell Collins have collaborated for more than seven years on several aspects of product design, re-engineering and sustenance with expertise on DO-254, DO-178B and DO-160 requirements. Both companies will continue working together with a focus on applying engineering best practices established and implemented by global companies to continuously innovate. SP

## Nexter Systems signs acquisition agreements

Nexter Systems signed acquisition agreements with Chemring Group for all the shares of the companies Mecar (Belgium) and Simmel Difesa (Italy). These two transactions will enable Nexter Group to strengthen its ammunition division and establish its position among the European leaders in this area.

Based on its solid past performance and on its strong balance sheet, Nexter has developed a growth strategy and intends, when opportunities arise, to actively participate in industry consolidation. The two acquisitions constitute a unique growth opportunity for Nexter group, which will enrich its range of ammunition products in three domains – land, air and sea ammunition – and extend its commercial footprint on key export markets.

The ammunition division will be comprised of complementary companies, focused on their core business, relying on the skills of their employees, and benefiting from synergies generated by their being part of the Nexter Group.

This strengthening of the ammunition division will enable accelerated development of new products and expansion of the customer base; ammunition design and production facilities will also be strengthened.

"This important step opens new perspectives and confirms the key role of the group in the momentum of European consolidation," declared Philippe Burtin, Chairman and CEO of Nexter Systems. SP

# Electric E-Fan aircraft demonstrates airborne E-mobility

The successful first public flight of the electric E-Fan experimental aircraft was the highlight of Airbus Group's E-Aircraft Day in Bordeaux, France. The flight demonstration was attended by Arnaud Montebourg, French Minister for Economy, Industrial Renewal and Digital Economy, Alain Rousset, President of the Aquitaine Region, Josy Reiffers, who represented Alain Juppé, President of the Communauté Urbaine de Bordeaux and Alain Anziani, Senator and Mayor of Mérignac.

The electric E-Fan training aircraft is a highly innovative technology experimental demonstrator based on an all-composite construction. Airbus Group and its partners are aiming to perform research and development to construct a series version of the E-Fan and propose an industrial plan for a production facility close to Bordeaux Airport. Airbus Group's research efforts support the environmental protection goals of the European Commission, as outlined in its "Flightpath 2050" programme. SP


PHOTOGRAPH: Airbus

## DARPA breakthroughs in prosthetics and neural interfaces

To understand the meaning of "proprioception," try a simple experiment. Close your eyes and lift your right arm above your head. Then, move it down so that it's parallel to the ground. Make a fist and release it. Move it forward, and then swing it around behind you like you're stretching. Finally, freeze in place, open your eyes, and look. Is your arm positioned where you thought it would be?

For most people, the answer will be, "Yes." That's because your brain and nervous system worked together to move your body according to your intent and processed the sensory feedback to know where your arm was in space despite not being able to visually track it.

For many upper-limb amputees using prosthetic devices, the answer would be, "No." They wouldn't have confidence that their device would be where they think it is because current prostheses lack provisions for providing complex tactile and proprioceptive feedback to the user. Without this feedback, even the most advanced prosthetic limbs will remain numb to the user and manipulation functions will be impaired.

The Defense Advanced Research Projects Agency's (DARPA) new hand proprioception and touch interfaces (HAPTIX) programme seeks to deliver those kinds of naturalistic sensations to amputees, and in the process, enable intuitive, dexterous control of advanced prosthetic devices that substitute for amputated limbs, provide the psychological benefit of improving prosthesis "embodiment," and reduce phantom limb pain. The programme builds on neural-interface technologies advanced during DARPA's Revolutionising Prosthetics and Reliable Neural-Interface Technology (RE-NET) programmes that made major steps forward in providing a direct and powerful link between user intent and prosthesis control.

HAPTIX aims to achieve its goals by developing interface systems that measure and decode motor signals recorded in peripheral nerves and/or muscles. The programme will adapt one of the advanced prosthetic limb systems developed under Revolutionising Prosthetics to incorporate sensors that provide tactile and proprioceptive feedback to the user, delivered through patterned stimulation of sensory pathways in the peripheral nerve. One of the key challenges will be to identify stimulation patterning strategies that elicit naturalistic sensations of touch and movement. The ultimate goal is to create a fully-implantable device that is safe, reliable, effective, and approved for human use.

"Peripheral nerves are information-rich and readily accessible targets for interfacing with the human nervous system. Research performed under DARPA's RE-NET programme and elsewhere showed that these nerves maintain motor and sensory fibres that previously innervated the amputated limb, and that these fibres remain functional for decades after limb loss," said Doug Weber, the DARPA Program Manager. "HAPTIX will try to tap in to these biological communication pathways so that users can control and sense the prosthesis via the same neural signaling pathways used for intact hands and arms." SP


## Pakistani singer detained for travelling on expired passport

The Pakistani Consulate of Dubai has confirmed that Pakistani pop singer and President of Youth Wing of Pakistan Tehreek-e-Insaf, Abrar-Ul-Haq, has been detained at the Dubai International Airport for travelling on an expired passport, even as organisers denied the claims.

Abdul Waheed, press counsellor, Pakistan Consulate of Dubai spoke said: "Abrar-Ul-Haq is currently detained at Dubai Airport, because he was travelling on an expired passport. He has not been arrested. "He forgot his valid passport in Pakistan and travelled to Dubai on an expired one."

Waheed continued: "Other members of his entourage will be arriving on the next flight and are bringing his valid passport with them. He should be allowed to leave then. "We are liaising with the Dubai authorities to ensure the matter is resolved soon." SP

## Boards wrong flight

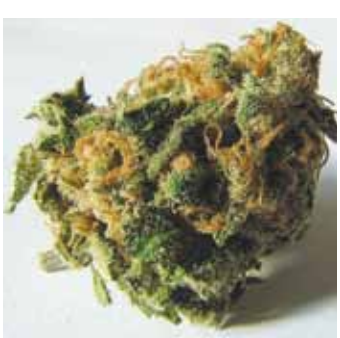
A 37-year-old man who did not have an airline boarding pass managed to clear three security checkpoints and fly from Mumbai to Rajkot on a Jet Airways flight recently. The man was supposed to take a flight to Nagpur, but boarded the one to Rajkot. After he reached Rajkot he realised he had flown to the wrong destination and informed Jet officials.

The incident brings into question the security arrangements at Mumbai airport made by both by the airline and the Central Industrial Security Force (CISF). The incident occurred on April 25 after Liju Verghese landed in Mumbai airport from an international flight. He was booked for an onward journey to Nagpur and was supposed to board the 4.11 p.m. Jet Airways flight 9W 2165. Verghese, who was reportedly in an inebriated state, cleared the CISF security check at domestic terminal 1B of the Mumbai airport. With the security-stamped boarding pass and a handbag, he then proceeded to the security hold area to wait for the boarding announcement. Meanwhile, a boarding call was made for the JetKonnect Mumbai-Rajkot flight 9W 4079 scheduled for a 3.25 p.m. departure from gate number A2 of domestic terminal 1C. The passengers were to board the Rajkot flight using an aerobridge.

"The man left behind his handbag, which also contained his boarding pass and for some reason proceeded to board the flight to Rajkot," said a source. First, he managed to walk past Jet's customer service staff entrusted with what's called "passenger reconciliation". It is a mandatory security procedure done to ascertain whether the number of passengers who check in for a given flight is equal to the number of passengers who have boarded the aircraft. The airline staffers manually check the seat numbers on each boarding pass and tally it with the data they gather from their check-in desks.

Verghese managed to get past the CISF security personnel who check whether the boarding pass and the tags on the hand baggage of passengers have the CISF's security-cleared stamp. Then, prior to entering the aircraft, Jet's security personnel man the doors to verify whether all passengers are carrying the boarding passes for the right destination, whether their boarding passes and baggage tags carry the CISF security stamp. Verghese crossed that barrier as well. SP

## Cannabis smuggled into Queensland everyday



An organised crime syndicate exploited serious security failures at major domestic airports to fly more than two tonnes of cannabis on domestic flights bound for Brisbane. Police allege that since November, a cashed-up crime gang packed about 22 kg of cannabis into everyday baggage before boarding about 40 flights from Victoria to Brisbane.

The shocking breach was eventually detected by the Queensland Police Service's anti-bikie squad, which smashed the dope ring with the National Anti-Gang Squad.

It comes eight years after whistleblower Allan Kessing revealed shocking details about drug smuggling at Sydney airport – prompting the then Howard government to spend $200 million in beefing up the police and customs presence at airports. Kessing was later charged for leaking information. SP

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