The Army Aviation needs to play a vastly enhanced role in land operations in the coming years.
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Network-Centricity for the Indian Military
The evolution of a joint structure will necessitate specifying a doctrine and addressing specific issues of sensor architecture, weapon architectures, interoperability levels and command and control structure.
Lt General (retd) P.C. Katoch

Indian Army's Mini Air Force

Mini Air Force, or the Army Aviation Corps, is the arm of the future and will play a decisive role in any future conflict.
Lt General (retd) B.S. Pawar

Considering the lack of implementation of the Eleventh Five Year Plan, the Army's modernisation plans, both Eleventh and Twelfth Five Year Plans put together, may create a $25-$35 billion (approximately `1,25,000 to `1,75,000 crore) opportunity. It seems unlikely that over the next five years, this quantum of funds will be utilised.

Equipment Profile of Indian Army

With its experience and expertise in fighting in almost all types of terrain including the Thar Desert in the south-west, the plains of Punjab in the West, the mountains and high-altitude areas of Kashmir and Ladakh in the North and Sikkim and Arunachal Pradesh in the Northeast, and the jungle and riverine terrain opposite Myanmar and Bangladesh, in battlefields beyond its shores in Sri Lanka, and peace-keeping and stabilisation operations globally, the Indian Army ranks tall amongst armies across the world in terms of professionalism.

Currently, a substantial part of the Indian Army is involved in fighting insurgencies in Jammu and Kashmir and the North-eastern states. The Chinese infrastructural activities along the Indo-Tibetan and Bhutan borders and north Sikkim have triggered the necessity for increasing the manpower ceiling of the Army. Thus it has been reported that a total of four additional divisions have been sanctioned for the eastern theatre out of which two have already been raised. The remaining two divisions will be for a part of the Strike Corps proposed to be raised for offensive operations in the Eastern theatre.

Army's Equipment Profile

Eleventh and Twelfth Five Year Plans
Indian Army's 600 odd modernisation schemes amounting to more than `750,000 crore in the Eleventh Five Year Plan (2007-12) alone continue to be encumbered with elaborate bureaucratic procurement processes. It is in this context that we should view the letter written by General V.K. Singh, the former Chief of Army Staff (COAS), to the Prime Minister. It highlighted the lack of some types of ammunition critical for the Army and obsolescence of weapons and equipment and the stagnation in the process of military modernisation aimed at winning the conflicts of the 21st century. Moreover, the gap between the Indian Army and the People's Liberation Army (PLA) of China is apparently widening day by day in favour of the latter. Faced with a two-front challenge, India needs to accelerate considerably the pace of modernisation of the Army.
The line of control (LoC) with Pakistan has continued to draw the attention of our people since the killing of the two Indian Army soldiers in the Poonch Sector of Jammu and Kashmir on Janu-
ary 8, 2013. The tension flared up because of the brutal manner in which they were killed and their bodies mutilated. And one of them, late Sepoy Hem Raj, was beheaded. This gruesome inci-
dent led to intense media coverage and fierce discussions in the electronic media. The tension between the two countries became palpable with zealous and impassioned statements being made from both sides. What got overlooked in the bargin was the poor political leadership in the times of crises.

It was refreshing to read renowned columnist C. Raj Mohan’s piece, published in the Indian Express on January 14, 2013, appropriately titled “A Call to Leadership”. At the end of his piece, after analysing UPA’s political leadership, in the light of the stand-off between the Pakistan and In-
dian Armies on the LoC, he laminates: “Finally, the government needs to act decisively on the long overdue reform of the higher defence organisation in the country. The civilian leadership of the Ministry of Defence (MoD)—at the bureaucratic and political level—has never been as weak as it is today. The MoD’s utter inability to lead the armed forces, formulate and implement strategi-
es for national security, has been repeatedly exposed in the last few years.”

Strategic and military analysts have been say-
ing it for a long time now that our political leader-
ship has failed to create a balanced structure of the higher defence organisation in India. It is devoid of integrated planning at the apex which demands the dovetailing of political/diplomatic strategy with military strategy. This is absent in our context. We function in a firewall complex and fail to appre-
ciate and utilise each other’s strengths.

At a somewhat lower level let me illustrate the point. I recall that in November 1994 when I was a Brigadier, posted as the Deputy Director General Military Operations, I was sent on duty/dis-
pensation to the Permanent Mission of India (PMI) in New York for liaison with the Military Ad-
visor at the UN Department of Peacekeeping Op-
erations by the then Chief of Army Staff. I was told that my role was to liaise with the UN Headquar-
ters to ensure an orderly and peaceful withdrawal of our Infantry Brigade Group located in Somalia who had completed their tenure. On reaching the PMI, I was greeted with extreme hostility which I later learnt was because the Somalia mission had just con-
tinued that I would take away an important vacancy of a Deputy Permanent Representative from the IFS cadre, if I stayed put in New York. This even resulted in one of the Deputy Permanent Repre-
sentatives (there were two in New York) telling me that they could render the advice required and a military officer was not necessary. When I asked them whether they would be able to make a fight-
ning withdrawal plan from the current location of the brigade. Due to the coastline or for banking on the ships made available and whether they would be able to recommend the type of assistance required to make the entire operation safe for the Indian Brigade Group as there was an ongoing civil war in Somalia and Indian troops had already suffered a few casualties during their peacekeeping stint; there was a pregnant silence.

The trouble with us is that because of the na-
ture of bureaucracy, every bureaucrat feels that he can render all military advice and the politi-
cians unfortunately do not assert themselves when it comes to matters military. Thus currently at strategic levels, the quality of advice rendered is of a general and theoretical nature devoid of professional inputs. The situation in which de-
spite having one of the largest armed forces in the world our Service Chiefs remain outside the strategic policy-making loop within the country, is unique to our country. Our higher defence organ-
isation, a legacy of the British Empire, has been systematically whitewashed down so that the adminis-
trative and financial powers of service headquar-
ters have been taken away and the position of the Service Chiefs has been deliberately down-
graded in protocol and importance.

The Defence Procurement Procedure, de-
spite all the amendments and updates, is so con-
voluted that introduction of any new weapon sys-
tem or associated equipment has to pass through as many as 18-20 different MoD departments or agencies before acceptance and that too if ev-
eryone is on board with the decision. A procure-
ment process which takes the five to seven years period takes 8-10 years or more. A case in point is the 1997 light observation helicopter deal which has failed to fructify despite a lapse of nearly nine years from the time that the RFP was issued. Even critical fast-track procurements (FTPd) di-
rected to be cleared in 12-18 months may take two or three times longer to secure the required approval.

Indian Army is struggling to transform and modernise itself to face the future conflict set-
tings. The threats and challenges that India faces are far greater than what is faced by any other country today. Hence we would imagine dynamic planning and implementation machinery putting the new capabilities in place to have strong counters to both types of conflicts. On the other hand what we are see-
ing is vacillation in decision-making by the MoD which while being wholly responsible for the force’s continually-postponed modernisation is floundering as it does not understand the direc-
tion that has to be taken. The answer lies in truly integrating MoD with the armed forces which de-
spite the post-Kargil reforms, has not happened.

This is the area in which the three Chiefs should integrate their views in order to decide on the future of the Army. It is unique to our country. Our higher defence organ-
isation, a legacy of the British Empire, has been systematically whitewashed down so that the adminis-
trative and financial powers of service headquar-
ters have been taken away and the position of the Service Chiefs has been deliberately down-
graded in protocol and importance.

The T-90 is a well designed MBT which has been chosen and is designed to provide the Indian Army with an advanced MBT of world class standards. Given the deteriorating situation at the LoC, it is high time we get on with the acquisition of this MBT as soon as possible.

It is only after analysing all the above factors that we can arrive at the conclusion that the need of the hour is to induct the T-90 into the Indian Army. The time is ripe and the country is ready.
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Indian Army’s 600 odd modernisation schemes amounting to more than ₹70,000 crore in the Eleventh Plan (2007-12) alone continue to be encumbered with elaborate bureaucratic procurement processes.

It is now reliably learnt that when the Bofors 155mm howitzers were procured in 1987, transfer of technology had taken place and it has now been revealed that the Ordnance Factory Board (OFB), which had been sitting on these designs for the past 25 years, have now accepted to manufacture prototypes of 155mm/-39 calibre and 45 calibre guns for trials by the Army.

For air defence of mechanised units, it has been planned to acquire medium-range surface-to-air missile (MRSAM) and quick reaction SAM (QRSAM) systems. RFP for QRSAM is being issued and there is a joint development venture of the Defence Research and Development Organisation (DRDO) and Israel for MRSAM for all the three services. Successor to Iglas has been shortlisted and will go for trials shortly. Shortlisted systems are SABB RBS-70, MBDA, Mistral, a Russian SAM system and South Korea’s LIG Nex1.

Infantry

The Defence Acquisition Council (DAC) has approved of a new assault rifle, 5.56mm calibre and a new generation carbine. The Army awaits a complete overhaul of its basic weaponry for soldiers. Seeking to arm its infantry soldier with a lethal and sophisticated assault rifle, the Army has started the field trials for procuring more than 60,000 assault rifles in a deal worth ₹13,000 crore. The assault rifles which were under consideration as reported by the media include Beretta, IWI, SIG Sauer, Colt and Česká Zbrojovka. The Army wants its latest rifles to be equipped with detachable under-barrel grenade launchers, night-vision devices, laser designators and so on. Sources said, “The trials have begun and considering the requirements of the force, the guns will be tested in deserts, extreme cold weather, high-altitude regions and so on. The Central Paramilitary Force and
Requirements of Indian Army Aviation Corps

The Army Aviation needs to play a vastly enhanced role in land operations in the coming years. This is only possible if the arm grows both quantitatively and qualitatively. The gap between desire and reality is currently not very large and is likely to narrow down further provided the acquisitions proceed as planned.

T HE OPERATIONAL DIVERSITIES OF the Indian Army have to be viewed with the variety of terrain existing on our borders and our extensive deployment in mountains/high-altitude areas. This requires assets that are capable of operating across this environmental spectrum. The present force structure of Army Aviation Corps (AAC) inhibits it from being able to perform the roles envisaged. The arm has been unable to grow to its natural size due to numerous evolutionary factors, the constant opposition of the Indian Air Force (IAF) being one of the major reasons. The growth plan formulated for 2027 also does not fully address the requirements of an operational AAC, which would be capable of fighting and supporting the Army in future conflicts.

To make the Army Aviation a potent force it must have a mix of both helicopters and fixed-wing aircraft with the helicopters being available in larger numbers. The helicopter fleet should consist of attack and armed helicopters, heavy-, medium- and light-utility (lift) helicopters and light-observation helicopters. There also would be a need for specialised helicopters suitably modified for special operations. The aim is to make the force a capability-based organisation rather than an equipment and inventory-based structure, implying comprehensive induction of man, machine, with the organisational and infrastructural requirements. New dimensions in tactical operations at night as a direct result of sensor and avionics capabilities, with the ability to operate at low levels at night will yield great dividends. The broad requirements of the Army Aviation and what it should possess to make it a potent arm are as follows:

Reconnaissance and Observation

There is a requirement for a dedicated Reconnaissance and Observation unit for every division to cater for reconnaissance of commanders, direction of artillery fire and casualty evacuation from inaccessible areas. The present Cheetah/Cheetak fleet is vintage and needs immediate replacement. The trials for their replacement have been completed with the French Eurocopter (Femnce) and Russian Kamov (Ka-226) in fray. Both helicopters being evaluated are night-capable and modified for fitment of sensors for transmitting real-time information to ground stations during reconnaissance missions.

Utility/Lift Helicopters

The Army needs to develop capabilities for lifting up to a company at the Corps level, a battalion at the Command level and a brigade at Army level. The force commander to move within the TBA up to a company level force at the critical juncture of the battle without having to look over his shoulders. The ALH is an all-weather, night-capable, twin-engine machine with state-of-the-art avionics. The availability of this resource will give additional tactical capability to the commanders in planning and execution of their operations. The ALH has also been test evaluated for high-altitude operations with a more powerful engine ‘Shakti’, being produced by the Hindustan Aeronautics Limited (HAL) in collaboration with French Turbomeca. This will give a major boost to enhancing the load carrying capacity while operating in high-altitude areas, especially the Sachen Glacier. The medium-lift category, the Air Force continues to stonewall all attempts of the Army to acquire a suitable helicopter in the 10 to 12-tonne class. This capability is basically required for intra-theatre move of reserves and equipment including ammunition and for special operations. HAL is looking at the feasibility of a joint venture with a foreign vendor for a 10 to 12-tonne class multiple-purpose utility helicopter, but very little progress has been made in this regard so far. The Army needs to pursue this approach more vigorously to acquire this class of helicopters, which when suitably modified, will be the Army’s mainstay for special operations.

In the heavy-lift class, the resources are almost non-existent with only one unit of Russian Mi-26 helicopters currently held with the Air Force. The induction of the ultralight howitzer into the Army (trials completed—induction likely soon), for deployment in the mountains has triggered the requirement for suitable heavy-lift capability, with helicopters capable of carrying these howitzers under sling in the mountains. The process for acquisition of this class of helicopters has already commenced under the aegis of the Air Force. In fray are the American Chinook CH-47 and the Russian Mi-26. The requirement is to have four to five such units with 10 helicopters each at command level to give the capability to the Theatre Commander to move up to a battalion, as well as for transporting/lifting heavy equipment/light guns, including logistical support. The operational tasks and roles of this class of helicopters leave no doubt with regards to their ownership. Here we also need to look at the concept of the tilt-rotor technology wherein the aircraft can operate both as a fixed-wing and a helicopter. Boeing’s V-22 Osprey is a tilt-rotor which is already operating in Afghanistan in support of the US marines. This type of aircraft is ideally suited for the mountains where infrastructure in terms of landing grounds/airfields is almost non-existent—ideally suited for our eastern borders.
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There is an urgent requirement to build suitable infrastructure and have it in place to absorb the new equipment and organisations.

Attack/Armed Helicopter

Mechanised warfare in the plains and desert terrains requires the integration of the types of attack helicopters, with the armoured formations in terms of attack and armed helicopters. These helicopters would also be required to undertake operations in the mountains. The available Mi-25/Mi-35 is not capable of operating at those altitudes. There is a requirement for each strike corps including in the mountains to have a dedicated, state-of-the-art attack helicopter unit. The PZTV/ Holding Corps in the plains and deserts should have armed helicopters/gunships as part of their aviation assets. This will provide a formidable capability to the force commander to be applied in the TIA.

Armed ALH

The armed version called the ALH Weapons Systems Integrated (ALH WSI) is at an advanced stage of development and is likely to enter service by the end of this year. Though not a typical attack helicopter, it has an array of comparable weapons systems to include gun, rockets, air-to-air and air-to-ground missiles (ATGM). Integration of the weapons systems less the ATGM is currently going on at HAL. However, the main weapons in the arsenal of the armed/attack helicopter, the ATGM, has so far neither been developed nor acquired. The indigenous produced NAG anti-tank missile (air version ‘Helina’) which is stated to be a third-generation fire and forget missile, is not ready and not likely to be available in the near future. As an interim measure, the Army is planning to equip its initial armed ALH units with a suitable air-to-ground missile export. Trials for the same have been completed—in fray are the French PARS-3 and Israeli Spike ER. Therefore, it is expected that the ‘Helina’ would be ready for induction into the armed forces. The armed ALH units would be part of the key PZTV/Holding Corps ideal for employment in the “cold-start” strategy.

Attack Helicopters

Today this is the weakest link in the capability of the AAC. The meagre resources held—two units of attack helicopters Mi-25/Mi-35, though under the operational control of Army, are in fact manned, controlled and operated by the Air Force. These helicopters of Russian origin are vintage, though a certain amount of upgradation has been carried out to make them next generation. The trials for their replacement have been completed and the American Apache Longbow AH-64D is likely to be inducted in the IAF. Apache 64D is a state-of-the-art modern-day attack helicopter with an array of lethal weapon sub-systems to include guns, rockets, air-to-air and air-to-ground missiles as well as helmet-mounted targeting systems and advanced self-protection suite. The Apache has been extensively used in both the Iraq wars as well as Afghanistan. As per reports, the induction will commence soon.

In this context, the development of the light combat helicopter (LCH) by the HAL is a milestone achievement. The LCH aims to enter service by 2020. The LCH has been designed to be able to operate at high altitudes (16,000 feet), a distinct advantage over other attack helicopters and an asset for our mountain formations. Unlike the ALH, the LCH will have tandem seating cockpit and stealth features, but will carry the same weapons package as the ALH-WSI. The helicopter is expected to enter service by 2014. The LCH attack helicopter units will be the main punch of the land force commander and will form part of the Army Aviation Corps.

Organisations and Infrastructure

Army Aviation needs to develop organisations that enhance aviation capabilities and are suitably tailored to meet the evolving operational requirements. Each Corps should have an Aviation Brigade to provide proper command and control and ensure optimal utilisation of all diverse aviation assets located within the Corps. In fact unlike the Air Force which operates out of their bases during war, Army Aviation units will require to operate from Forward Composite Aviation Bases which would cater to the security of helicopters as well as provide essential maintenance, fuelling and arming facilities. There would also be a requirement of some forward arming and refuelling points to be established in the forward area for helicopters operating on specific missions, to cater for their replenishment in terms of fuel and ammunitions.

There is an urgent requirement to build suitable infrastructure and have it in place to absorb the new equipment and organisations. Support services like airfields, air traffic control, met equipment, maintenance equipment, etc, would also need upgradation and refurbishment. Lastly, the most important facet, the training facilities for the training of aircrew and ground crew need modernisation. The importance of simulators for this purpose cannot be overemphasised. Keeping in mind the vast expansion plans of the AAC in the coming years and induction of sophisticated state-of-the-art equipment, the simulators will be vital for future training as these are low-cost and time saving.

Conclusion

The Army Aviation needs to play a vastly enhanced role in land operations in the coming years. This is only possible if the arm grows both quantitatively and qualitatively. The gap between desire and reality is currently not very large and is likely to narrow down further provided the acquisitions proceed as planned. Most of the modernisation plans for replacement/induction of new equipment are in the final stages. The biggest advantage the AAC has is the indigenous capability of the HAL to meet the bulk of its requirement in terms of helicopters and supporting systems like the ALH, ALH-WSI, LCH, etc. For majority of the equipment to be induced ex import, the trails have been completed and decisions awaited—case in point is the light attack and heavy-lift helicopters. However, if any of these projects gets stalled, especially the replacement of vintage Cheetah/Chetak helicopters, the modernisation plans will take a nosedive with disastrous consequences.
state police undergoing modernisation programme would also be able to procure the same. According to the Indian Procurement Policy, the selected vendor will have to transfer the technology to the state-owned Ordnance Factory Board, which will then manufacture the guns under licence within the country.

New bullet proof jackets, ballistic helmets and boots anti-mine which were also to be procured, have not materialised so far. The infantry is also looking for a manPortable third-generation anti-tank guided missile under barrelled grenade launchers, 60mm mortars, enhanced-range 81mm mortars and thermal-imaging night sights for assault rifles. Incidents like 26/11 have underlined the need to equip all infantry battalions suitably for rapid reaction. This is being achieved by procuring specialised items for the Ghatak Platoons (Commando Platoons) of Infantry Battalions. Multi-mode grenades have been indented with the Ordnance Factory Board while ammunition of the Rocket Launcher Mark III is also to be procured. The infantry is also being provided with multi-purpose vehicles (MPVs), light-bullet proof vehicles (Lt BPs), light-strike vehicles (LSVs) and additional snow mobiles.

Special Forces
Equipping of Special Forces (SF) is lagging woefully. “Packaged equipping” of sub-units has not taken off and critical equipment like laser target designators is yet to be provided. The Army’s emphasis has been on expansion, ignoring the universally acknowledged four Special Forces global truths:

- Humans are more important than hardware
- Quality is better than quantity
- Special Forces cannot be mass produced
- Competent Special Forces cannot be created after emergencies arise.

It would be prudent to first consolidate the existing seven Special Forces battalions and fully equip them before adding more.

F-INSAS
The future infantry soldier as a system (F-INSAS) has been initiated to make the infantryman a weapon platform with situational awareness, increased lethality and sustainability in the digitised battlefield. F-INSAS is to be effected in three phases: Phase-I includes weapons, body armour, clothing and individual equipment; Phase-II is the target acquisition system and Phase-III comprises the computer sub-system, radio sub-system, software and software integration. F-INSAS will be a part of the battlefield management system (BMS) of the Army.

Engines:
Equipped has been procured to assist in de-mining operations and to improve the engineers’ capability for disaster management. Protective equipment, to enhance the fighting capability of the Army in the nuclear, biological and chemical (NBC) scenario, has been procured. Protection against improvised explosive devices (IED) in counter-insurgency and counter-terrorist operations is being constantly enhanced through procurement of a sophisticated range of counter IED equipment. The capability is also being strengthened by replacing existing bridge systems with state-of-the-art indigenous bridges, which will enhance tactical mobility of our field formations. Procurement of new earth-moving plants and material handling cranes is also being done to reduce the fatigue factor for troops.

Signals:
The Corps of Signals has assimilated all types of technology from mobile cellular, satellite, microwave and fibre-optic communication and are today on the verge of ushering in a next-generation network, based on futuristic technology. As far as radio communications are concerned, a number of promising technologies such as software defined radio (SDR) and cognitive radio (CR) are being closely analysed for their effective military usage.

Information Systems
The objective of the Director General Information Systems is to vigorously pursue the establishment of the Command Information Decision Support System (CIDSS) for the Army to link together all other automated communication and information systems such as the battlefield surveillance system (BSS), the artillery combat command and control system (ACC&CS), the air defence control and reporting system (AD&CR) and the battle management system (BMS), in an effort to present a holistic picture to a commander and his senior staff officers to ease the decision-making process. This will also link the communication system at strategic, operational and tactical levels and enable the Army to fight “network-enabled warfare” in the future.

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The evolution of a joint structure will necessitate specifying a doctrine and addressing specific issues of sensor architecture, weapon architectures, interoperability levels and command and control structure. A phased implementation as well as war-gaming the concept would be desirable to absorb the new systems and concepts smoothly and in a graduated manner.

Integrated Network Platform

NCW Concept

Typically, in the platform-centric force, shooters do not inherently own sensors and decision-makers do not inherently own shooters; platform owns weapon sys-
tems and weapons have their organic sen-sors. A new type of relationship is required to address these head on.

NCW Model

NCW implies a change in the pace of war-
fare. This paradigm involves shrinking of
the decision-cycle which would exert additional
pressures on all other components of
the war machine, whether operational
or administrative; the buzz words being self
synchronisation, information dominance,
information superiority, shared awareness,
increased operational tempo, reduction of
the observe, orient, decide and act (OODA)
loop and the like.

With respect to command and con-
trol setup in the military (encompassing
command and control (C2) framework,
C2 process, info management, IT and tele-
communication), data bearers, informa-
tion bearers and the knowledge bearers
will require restructuring. Establishment,
maintainability and availability of the net-
work infrastructure, backbone communi-
cation network, seamless interaction and
security will be important. Establishment,
maintainability and updating of data centres
will be a critical component. Specific struc-
tures for handling issues of data integrity
and confidentiality with clear-cut account-
ability and responsibility are major chal-
lenges. Change management will be critical
with respect to knowledge bearers which is
the domain of commanders.

The experience of the corporate has
resulted in reduced levels of management,
workers empowered to take decisions and
few differences in responsibility due to the
need for speed, lesser need for communica-
tion and control function of middle manag-
ers and the impact of globalisation. However,
in the military, strategy and planning pro-
cesses are in a linear top down manner through
development and then to implementation and
a flat organisation that fundamentally
changes the present structural paradigm.
This may not be easily palatable to the tradi-
tional military. For the military, the changes
as mentioned above in the corporate sector,
translates into dynamic liaisons adaptively
forming from operational assets without the
overarching presence of higher HQ. Myriad
questions like levels of autonomy; levels,
amount of information to be fed, security
and the like will continue to be raised.

Integration of sensors in the battlefield
requires definition of the sensor architecture
as it will have a bearing on hardware pro-
curement as also the command and control
structures. The definition of the architecture
is essential to address issues of data fusion,
especially if systems of the three services
are to be integrated. Operational interoper-
ability as also procedural issues for exchange
and control of information will require addressing
in case of a collaborative archi-
tecture. There would be many such practi-
cal problems that need to be looked into.

The organisational structure to manage
the sensor grid will have to be evolved, based on
the sensor architecture that is adopted
and addressing issues of command and control
of these sensors. Similar issues will emerge
while integrating the weapon grid. A viable
option for interface between sensor and
shooter platform would have to be found
from a fast and responsive decision-support
system. Interface yet separate operational
tactical and strategic level will pose major
challenges. Inter-organisational level of
interoperability across the services and within
a service too needs to be defined.

Indian Military

Net-centricity in the Indian military has
mushroomed bottom upwards. Lack of an
NCW philosophy/doctrine has resulted in
an ambiguous NCW architecture, which
has still not been defined. Though we have
disciplines for command, control, commu-
nications, computers, information, intelli-
gence (C4I2) and information warfare (IW),
these two spheres are components of
NCW and do not constitute NCW by
themselves. NCW must also encompass policies, strat-
egy, concepts, military organisations and
adjustments. To transform the Indian mili-
tary into a NCW-capable force, we need a
NCW philosophy/doctrine as the start point.

Concepts of individual services should flow
from a joint doctrine. This will facilitate
development of coherent tri-service net-
worked architecture. Non-integration of
Headquarter (HQ) ISDS with Ministry of Defence (MoD),
limited authority/opportunistic responsibility
with HQ ISDS and void of a C3S have all con-
tributed towards this.

At present, networks of the three services
are not interoperable.iser networks nor our radio communications
are interoperable to the desired degree. Each ser-
vice develops networks on its own and starts
thinking of interoperability at a much later
stage. The defence communications network
(DCN) is coming up but little progress has
been made for achieving services handshake.

Common standards and protocols for the
three services have not been evolved. Final-
ising and adoption of standards and proto-
cols, mutually compatible database struc-
tures, development/deployment of interfaces
between systems using disparate platforms
and commonality of hardware are challenges
which need to be overcome. No single unify-
ing secrecy algorithm for the three services
has been developed. Bringer the standards
and protocols of the three services on the
same plane is a gigantic task that can only be
solved through outsourcing, given the levels
of expertise available within the services. This
process is way behind and there is absence of
knowledge management. In our context,
this collaborative working needs to be looked
at closely, not only across the services but also
within each service. The command and control
structures will have to cater to this collab-
orative working. A network-enabled environ-
ment in a conventional military would be available
down to operational level in a few years. Time,
however, is the change in mindsets and acceler-
ations that is likely to take up most of the time.

Requirement

To transform the Indian military into a
NCW-enabled force, the essential steps
would be: to evolve a network-centric
operation. The Indian NCW forces
define the level of interoperability across
the services and within the services that is
feasible/desired; define the type of archi-
tecture that is appropriate for the sensor
and weapon grids; evolve a tri-service doc-
trime for NCW defines the type of archi-
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Continued on page 13...
Indian Army’s Mini Air Force

Mini Air Force, or the Army Aviation Corps, is the arm of the future and will play a decisive role in any future conflict. It is a legitimate requirement of all professional armies the world over and the Indian Army is no exception.

EVER SINCE THE DECISION of the Ministry of Defence (MoD) to hand over the Army aviation to the Army, there have been a spate of articles in the media focusing on their misplaced perception of the Army getting its own “Mini Air Force”. The recent decision of the Army on the creation of a permanent cadre for the Army Aviation Corps seems to have further fuelled this perception. The latest article on this subject appeared in a leading daily on December 3, 2012, with a sensational title, “Now Army to Get Own Mini Air Force”. The protagonists of these views obviously do not understand the constitution of the term Mini Air Force or they would not use it in the context of actions being taken by the Army/MoD towards the planned modernisation and transformation of the Army Aviation.

They fail to understand that the world over army aviation has a separate philosophy/concept of employment and roles/tasks vis-a-vis the air forces. This fact has been amply demonstrated by the employment of such forces in the two Iraq wars and their present employment in Afghanistan.

The Indian Army today has the larg-est fleet of helicopters in its inventory (270 to be precise) consisting mainly of the light observation (Cheetah and Chetak) and light/tactical battle support helicopters. These assets are nowhere near what had been envisaged in 1963 by the then Chief of Army Staff (COAS) General J.N. Chaudhuri, to have a fully-fledged arm of the Army which would include all classes of helicopters including attack and light fixed-wing air-craft of the Jhoria class. It is worth noting that it took nearly 23 years for the Army to finally break away from the Air Force and form its own aviation corps in 1986. It has taken another 27 years for the Government to take the decision on the issue of the organ-isation of such resources, and hence the concept of corps aviation Brigades, the first of which was inducted in 1999 with the Indian Army’s fleet of Cheetah/chetak helicopters.

With regard to a permanent cadre for Army Aviation, there are three distinct categories in its cadre—the aviators (pilots), technicians (E&ME personnel) and the support staff. The aviators are officers selected from all arms and currently have strength of approximately 280 officers. In this number, almost 30 per cent are already permanently seconded to the aviation corps and form part of the permanent cadre. The first batch of officers was inducted into the permanent cadre in 1999 and thereafter a continuous process of induction of a certain number of officers based on a selection system takes place every year. Recently the direct induc- tion of officers into Army Aviation Corps has also commenced both from the Indian Military Academy, Dehradun, and Officers Training Academy, Chennai. It is ultimately planned to have a permanent to support cadre ratio of 40:60 with regards to the aviators, keeping in mind the organisational and career progression aspects. The techni-cians are already permanently affiliated to the Army Aviation Corps. Their induction is done directly into Army Aviation through the corps of EME with separate career and promotional prospects and they retire on their superannuation from the corps itself. The support cadre on the other hand consists mostly of personnel required for administra-tion, logistics, security and flying operations. These involve trades like clerks, drivers, radio operators, air traffic controllers, metro- logical staff, fire-fighting personnel, etc.

The Army Aviation due to its inherent characteristics is a game changer and a force multiplier that can tilt the balance in any conflict.

The Army Aviation due to its inherent characteristics is a game changer and a force multiplier that can tilt the balance in any conflict.
The India-Pakistan Corundum

Pakistan was carved out of India on the specious ground that Muslims are a separate nation and that they will not get equal status. This is a specious ground that has already proved both assumptions wrong. Soon after its formation, Pakistan adopted a policy of appeasement to immediate India; heavy reliance on non-state actors to act as the vanguards to their Army and wanting concessions from India ad infinitum. Pakistan latched on to Kashmir within two months of its partition of India by sending so-called raiders led by Pakistani Army personnel and since then it evokes alarm as the cause bell between the two countries. Its second gambit was to create a strong army by telling its people that India was the villain who was out to grab Pakistan! The result was that the Army soon became the biggest and at times only power-centre in the country, using resources at the cost of the people. Despite this, the Pakistani Army has yet to deliver in any fight against the Indian Army, but this is hidden from the people of Pakistan by the spin doctors telling outright lies.

The third important aspect is that while the Indian Army has remained apolitical and professional, the Pakistani Army soon started toppling elected governments and became the ultimate power-centre of the country. In the process it lost its military qualities and professionalism. It is that this gets reflected so glaringly in this incident of beheading an Indian soldier and mutilating the body of the other.

Dynamics of the LoC

The present LoC is the second avatar of the erstwhile Cease Fire Line (CFL), which had come into being on January 1, 1949. After the 1971 war with Pakistan, a fresh line was demarcated, which is the present LoC. A fact not well known is that when the LoC came into being, the role of UN Observers in Jammu and Kashmir (J&K) became redundant and India told the UN that they could withdraw. However, in its efforts to internationalise the Kashmir issue, Pakistan asked the UN Observers to continue. Pakistan again attempted to drag in the UN as this event unfolded, but was informed in no uncertain terms that India would not rise to the bait.

Despite the formal demarcation, the Pakistani Army did not honour the sanctity of the CFL from the very beginning. These constant encroachments and nibbling on our side of the CFL, hoping to either gain tacit or actual recognition of its validity and incorporate additional real estate. This was naturally resisted by our troops. Thereafter, eyeball to eyeball deployment, exchange of fire, raids across the lines and similar activities became the norm. The result was that the CFL became an active and live border, except when a ceasefire was in effect. This state of affairs continued even after the CFL became the LoC.

Whenever a new infantry battalion is inducted on their portion of the LoC, the enemy unit opposite them assesses by initial action. Units that respond with guts and vigour then dominate and assume moral ascendancy on the unit opposite. Subsequent actions on either side thereafter conform to this relationship. One example should suffice. On the first night after a Maratha Light Infantry battalion assumed control of their area, the Pakistani unit subjected their forward posts to heavy shelling. The next morning, the officer at the Maratha post climbed a tree with a rocket launcher and blasted two bunkers of the enemy post. Thereafter, not one bullet was fired by the Pakistanis on the Marathas during their entire tenure!

The present ceasefire has been in force since 2003, the longest among many. Even though an active LoC favours our troops, we had agreed to the ceasefire, so that Pakistan could withdraw troops for conducting operations against the Taliban and other insur- gents. However, Pakistan chose not to do so and instead continued to nurture those terrorists. It also continued pushing infiltrators across the LoC.

The troops deployed on the LoC have an onerous task as they have to constantly strike a balance between stopping infiltration and observing ceasefire norms. The government keeps insisting that the troops must refrain from retaliating without realising that to carry out their twin tasks of maintaining the sanctity of the LoC and not permitting infiltration, some force has to be used. The commanding officers know how to maintain a correct balance between keeping motivational and morale levels of troops high and also implementing the effects of political decisions as they pertain to their levels. They must be given a free hand.

Security Strategies

The dire need for a security strategy that defines the parameters of our relationship with it with our allies, as well as with other nations is an obvious lacuna in our country. Successive governments have talked about formulating security strategies that would cover anticipated security issues but have always baulked at issuing formal written policies or even guidelines. The result is that we seem to be caught literally with our pants down when an event with security connotations occurs. Our policy-makers and security experts must first formulate a comprehensive security strategy and thereafter the diplomats and others should work out an entirely fresh negotiating plan.

The Peace Process

India has been making overtures for peace for decades, yet all we have received is the return from Pakistan is violence of many types, including wars and terrorism; hedging and and not with understanding and Pakistan's subterfuges. It is unfortunate that our political leaders have taken a somewhat rigid approach and think that the process should continue, come what may. This has apparently been done at the instance of a few peace activists and vociferous leaders who have their own agendas, as well as international (read USA) pressure. Unfortunately, our leaders have failed to consult those organisations and individuals who are at the receiving end and understand Pakistan's intransigence fully and are clear about how far one must go in trying to achieve this country that is constantly drumming up antagonism against our nation and loses no opportunity to take recourse to violence to achieve its ends.

Our apparent inability to even discern who really is in power in Pakistan is baffling. It is not possible that a nation which is at loggerheads with Pakistan at a flag meeting, could withdraw troops for conducting operations against the Taliban and other insurgents. We then resort to taking 'fire-fighting' actions in an ad hoc manner. All stakeholders need to be on the same page and must be clear as to what exactly is our policy or strategy and what we want to achieve. This will result in coordinated responses and not what we normally do, with individuals and even agencies/institutions speaking out of turn and at variance with each other. This aspect clearly stood out in the present case when all kinds of statements were issued by different individuals, ranging from absolute vacuous policy on the one hand to military response on the other. Consequently, it is imperative to spell out our policy and determine if it has any relevance and action to be taken if the other side crosses one or more intentionally or by default.

Conclusion

It is nobody's case that we should not live peacefully with our neighbours and resolve all problems and disputes by discussion, but this needs give and take on both sides. So far, it has been a one-sided affair and there are no indicators that the future would be any different. The least what we can do is to apply a brake on the peace process, jettison the "composite dialogue" and wait for a more conducive environment. Our policy-makers and security experts must first formulate a comprehensive security strategy and thereafter the diplomats and others should work out an entirely fresh negotiating plan.
**Antey-2500 Long-Range Air Defense Missile System**

**Antey-2500** is undoubtedly a world leader. The current expert version of Antey-2500 has been upgraded extensively from the 1990s version to meet the present and future air threat. It includes modern element base and digital technologies that significantly enhance the performance of the system. The most significant innovation in the new missile is to increase its firing range up to 350 km with which it can effectively engage and destroy airborne warning and control systems (AWACS) aircraft. Earlier such hostile targets were engaged by fighter aircraft. Antey-2500 has a combination of pre-programmed guidance of surface-to-air missile (SAM) with the radar correction and semi-active guidance at the final stage of flight, which provides it a high anti-jamming and accurate firing capability. The effective destruction of the target is provided with the use of heavy warhead weighing 150 kg. Its destructive effect multiplies because of the Russian “know-how” – which is guided blasting of the warhead charge providing fragments spread within the spatial angle of 60º.

**When firing missiles which have active radar seekers on the group of targets, they may target the most powerful emitting target, which is almost impossible for “Antey-2500” SAM. It is capable of destroying all types of aerodynamic targets, including cruise missiles, as well as the ballistic missiles launched at the ranges of more than 2,500 km.** Antey-2500 can easily be integrated into the customers overall AD system but it can effectively operate in autonomous mode, using its own highly effective detection radars.

One of the major advantages of ADMS Antey-2500 is its capability to use its sensors to considerably increase the effectiveness of other air defense means including medium-long-range and anti-ballistic missile defence (ABMD) systems. Combat batteries or even separate launchers with missiles of “Antey-2500” ADMS might be easily integrated into these systems. Each launcher by itself computes the optimal launch moment for its missiles and its built-in radar provides for missiles guidance to the target (radio correction of flight program and target designation for several seconds before its destruction). For this purpose, it is necessary to provide constant transmission of the target coordinates to the launcher from the radar of AD System with which “Antey-2500” launcher has been integrated. Such integration of “Antey-2500” ADMS elements into perspective non-strategic missile air defence systems will provide effective protection against a wide spectrum of ballistic missiles at a stage of atmospheric interception as well as the protection of objectives and ABMD means themselves against all types of air assault means.

**“Antey-2500”** ADMS is characterised by very high combat survivability: the deployment/down time does not exceed 5-6 minutes and the tracked chassis allow to change positions even in cross country and adverse conditions. On the customer’s demand, the ADMS may be supplied on the wheeled chassis.

The command and control over ADMS (ADMC/battalion) is executed from command and control post (CCP). It receives the information from two subordinate radars and/or external sources (higher level CCP, external radars). One of radars executes circular search of space at a distance of 500 km. The second radar (having electronic controlled beam in two planes) operates in the prescribed sector. Its main missions are: the timely detection of ballistic missiles warheads as well as targets detection in conditions of heavy jamming. The automated analyses of the airspace situation is executed at the CCP, after that it distributes the chosen targets among subordinate missile batteries (ADMBat), there are up to four batteries under one CCP.

The multi-channel missile guidance radar (MGr) is the main element of the battery; the radar may detect enemy’s targets independently in the prescribed sector, or operate depending on the target designation from CCP. Each MGr tracks up to 12 targets and controls up to six launchers by transmitting the coordinates of one target to each launcher. Depending on the data received from MGr, the launcher provides for the firing on the determined target, guiding radio correction and designation radar antenna on the target. The firing is executed with the use of one or several SAMS, launched from the launcher or loader/launcher attached to it. Every battery may contain up to six launchers and loader/launchers.

There are two type of missiles: the “light” missiles of maximum range up to 130 km are launched by the launcher (up to four missiles on each launcher) and three types of “heavy” missiles, range of up to 350 km, are launched by the launcher/launcher (two missiles of one type per loader/launcher).

**“Antey-2500”** ADMS is available in serial production for the Russian Armed Forces and for export as well. The system continuously undergoes development and has vast upgradation potential.

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**Antey-2500 ADMS-Performance**

**Killing zone:**

- **Against aerodynamic targets:**
  - Range, km: up to 380
  - Altitude, km: up to 30

- **Against ballistic targets:**
  - Range, km: up to 40
  - Altitude, km: up to 25

- Radar cross-section of targets engaged, m^2: ±0.02

- Max. start range of ballistic missiles engaged, km: 2,500+

- Number of targets engaged simultaneously: up to 24

- Number of missiles:
  - 9A34MBLV: 4
  - 9A34MBLV: 2

- Launching rate, s:
  - From different launchers, sec: 0
  - From one launcher, sec: 1.5

- Reaction time, s: 10

- In/out deployment time, min: not more than 6

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**Marketing Features**

- The mobile long-range air defense missile system (ADMS) Antey-2500 is a very effective air defence (AD) which could become the mainstay of AD of any nation.
- When the characteristics are compared to other systems in the world, Antey-2500 has been integrated with. Such integration of "Antey-2500" ADMs into perspective non-strategic missile air defence systems will provide effective protection against a wide spectrum of ballistic missiles at a stage of atmospheric interception as well as the protection of objectives and ABMD means themselves against all types of air assault means.
Army Air Defence (AAD) is holding systems of varying vintage ranging from 49-year-old (L/70 gun) to the youngest being 17-year-old (Tangushka). However, majority of the remaining guns and missiles are more than two decades old. Considering the vintage, the current AAD picture is rather dismal when reviewed system by system.

**Current AD Scenario**

AAD is holding systems of varying vintage ranging from 49-year-old (L/70 gun) to the youngest being 17-year-old (Tangushka). However, majority of the remaining guns and missiles are more than two decades old. The technology, especially in the field of ammunition, missiles, sensors and active seekers has advanced very rapidly. Thus it is necessary to upgrade and replace the existing AD weapon systems at least every 15-20 years, so that they remain current. Apart from the aspect of obsolescence, there is a factor of shelf life of ammunition and missiles which effects their lethality, accuracy and safety. Considering the vintage, the current AAD picture is rather dismal when reviewed system by system.

**L/70 Gun system:** L/70 is the mainstay of AAD and has been the warhorse of AAD since 1964. It was to be replaced but there is no progress. The Defence Research and Development Organisation’s (DRDO) development effort also kept its replacement at a limb for about two decades. Not many gun systems are currently available but a possible choice was Skyshield of Rheinmetall AD. DrdO has signed a MoU with a company which has been blacklisted by India. Thus there is no hope even in the distant future for a successor system. Even if a gun is shortlisted, it may take at least five years for the delivery to start. Notionaly, if 10 regiments have to be provided with the new guns then at the rate of one regiment per year, it will take 10 years to equip all the 10 regiments provided there is no spill over. That takes it to 2028 and if the gun remains current for even three decades, the time frame will be 2058.

**Schilka System:** It is a highly mobile system for supporting armour formations and is in service since the early 1970s.

**Medium Range SAM (MRSAM) system:** Kvadrat is the current system which is more than 35 years old and has the technology of early 1960s. Thus a RFP has been issued. Hopefully, the current RFP will be taken to its logical conclusion.

**Shoulder-fired surface-to-air (SAM) systems:** The current system is Osa-AK which is a highly mobile system for the air defence of armour formations. This system is more than 20 years old and needs to be replaced. DRDO’s effort to develop Trishul system did not succeed and a RFP has been issued twice. Hopefully, the current RFP will be taken to its logical conclusion.

**Quick Reaction SAM (QRSAM) system:** The current system is OSA-ak which is a highly mobile system for the air defence of armour formations. This system is more than 30 years old and needs to be replaced. DRDO’s effort to develop Trishul system did not succeed and a RFP has been issued twice. Hopefully, the current RFP will be taken to its logical conclusion.

**Patriot Advance Capability-3 (PAC-3) missile:** This is an air defense system which is more than three decades old. The upgrade of firing is very good (2,000 rounds per minute). It is suitable for mobile role and employment in the mountains. It is being upgraded with a power lay and electro-optical sighting system which will enhance its capability manifold and also provide it with night firing capability. The upgrade should be implemented at the earliest.

Apart from the aspect of obsolescence, there is a factor of shelf life of ammunition and missiles which effects their lethality, accuracy and safety.

**Schilka System:** It is a highly mobile system for supporting armour formations and is in service since the early 1970s. It has been blacklisted by India. Thus there is nothing new to show—a telling comment on the modernisation of AAD.

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Network-Centricity... Continued from page 8

force based on above with appropriate level of jointness with other services; create a network-centric environment for the above force and wargame concepts; redefine doctrinal, organisation, and command and control structures based on experiences gained; and restructure other formations/organisations once the concept is proved.

What we must acknowledge is that a leaner and flatter organisational structure is required in a network-centric environment. This can only be achieved by breaking down existing hierarchy, reducing manpower content and enhancing the knowledge base. The revised structure must take into account varied conflict scenarios to include short duration conventional wars under proactive strategy, counter-insurgency, nuclear/asymmetric operations as well as operations undertaken as part of out-of-area contingency.

To ensure effective transformation from the platform-centric capabilities to network-centric, a phased shift in the existing technology at the level of all the three services and horizontal fusion in our armed forces at laid down hierarchical structure is necessary. A thorough cultural change is warranted through an aptitude-based selection procedure which should influence the values, attitudes and beliefs of our future military leaders. We need to pursue development of human resources (HR) vigorously. Requisite emphasis needs to be laid on educating the man behind the weapon, aware of the state of future warfare and how to fight it. All commanders and the men they command will be the focus of transformation and the man behind the machine will continue to be the nerve centre. NCW requires technology; but ultimately reliance is essentially on people and organisations. NCW environment would demand a whole new set of skills and competencies from the information age warriors. These warriors must have a thorough understanding of all the system capabilities present in the battlespace and the ability, initiative and innovativeness to employ the capabilities for best effects. They must have the ability to interpret and make decisions on incomplete data, or when flooded with data (info overload), ability to operate in flatter organisational hierarchies. In addition, the capability to deal with lethality and accuracy of new technologies and adaptability and flexibility to cope with change is a major challenge which involves both the technological as well as psychological aspects of change. There is an inescapable need for standardisation and commonality of equipment and protocols so as to achieve integration of the individual modules and systems for an integrated and resilient-networked architecture.

HQ IDS must be empowered to accelerate synergy and seamless interoperability in the services including formulating a suitable joint NCW Doctrine providing an evolving strategic vision of ‘full spectrum dominance’. Effective management of the transformation and increasing the technical threshold of the users is essential. Cyber warfare technology needs to be nurtured to develop the asymmetry against the adversary by denting his networks and downgrading his fighting ability. Our inherent strengths lie in the dominance of our operations. The last decade has seen significant improvements in sensors, high speed digital data transfer using worldwide space, optical and mobile telephony links, and the ruggedisation of hardware, coupled with greater affordability. Cutting-edge sensor technology has ensured that the results remain unaffected by bad weather and light conditions. The important thing is that precise data and/or imagery for quick and accurate decision-making is available on call, creating battlefield transparency and situational clarity even under the most trying circumstances. We must make the most of this age of networking, with individual systems plugging into larger systems, thus leading to the ultimate goal of a system of systems.

Scope of NCW

NCW as a concept is still evolving but the potential is immense. The challenge to the Indian military is to match what technology can offer with what is desirable on the battlefield. Technology misapplied within an organisation only guarantees failure. Big changes in military capabilities have taken place when new weapons came into use along with equally pronounced shifts in tactics, doctrine and military organisations. The evolution of a joint structure will necessitate specifying a doctrine and addressing specific issues of sensor architecture, weapon architectures, interoperability levels and command and control structure. A phased implementation as well as war-gaming the concept would be desirable to absorb the new systems and concepts smoothly and in a graduated manner.
MISSION MEN HONOURED BY GOI

In an affirmation for the country’s missile and drone programme, three top missile scientists were honoured this year by the Government with prestigious awards. Chief Dr Vijay Kumar Saraswat, Scientific Adviser to Defence Minister and a scientist best known for his association with the successful Akash SAM programme, has been honoured with a Padma Bhushan. “It is DRDO that has got the award and it is a recognition of the DRDO contribution towards our UN building,” said Dr Saraswat. Dr Sivathanu Pillai, ISS & CCR&D and CEO BrahMos and Avinash Chander, Chief Control Research & Development (Missiles & Strategic Systems), are the other two eminent scientists of DRDO who have been honoured with Padma Bhushan and Padma Shri respect- ively. The country’s missile programme has enjoyed an upswing since 2008, with sev- eral programmes coming to fruition and new technologies proving themselves.

INDIAN ARMY FOR UAV MISSILE SIMULATOR

The Indian Army is in the market for a mission simulator to train UAV crews in operating LAI Heron and Souther MI-8 multipurpose helicopters have formally been handed over to the country’s Special Forces Command, currently headed by Vice Admiral S.P. Cheema. As far as the Agni-V is concerned, future technolo- gies will include multiple independent re- entry vehicles (MBIRs) and an improved navigation system.

—SP’S Special Correspondent
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The Army proposes to use the simulator for simulation of single, air data relay (ADR) mission scenario, maritime mission scenario, with or without satellite communication (SATCOM) for single or multiple payloads, simulation of all phases of UAV mission as well as its pay- loads and to play prerecorded missions with Annotations for analysis, training of interna- tional pilot, external pilot, mission commander and observer in stand-alone mode and as coordinated crew of a mission on all types of UAV emergencies and to carry out student assessments.

INDIA’S LONGEST RANGE MISSILE DEBUTS AT REPUBLIC DAY PARADE

This Republic Day the Indian Government showcased the Agni-V, the country’s long- est range nuclear ballistic missile, capable of hitting pretty much any target in China. With a range of nearly 6,000 km and the capacity to deliver a 1.5-tonne nuclear warhead, the Agni-V made its inaugural flight this year’s ceremonial parade on Rajpath. Footage of the missile trundling down the VIP avenue was flashed on Chinese state television stations, sparking almost as much interest as the missile did during its debut—and so far only—test-firing in April 2012. While the precise range of the missile remains classified, there has been speculation—including by Chinese think- tanks, that the Agni-V’s range could be in excess of 8,000 km. The Agni-V is likely to be tested once again this year before being officially handed over to the army’s strategic nuclear forces. The US Army has validated the tactical net- working capabilities of BAE Systems-built rotorcraft to support intelligence, surveillance and reconnaissance, and other operations.

SEELAS’ GABBIANO T-20 RADAR TESTED ON HERMES 450 UAS

Selex Galileo’s Gabbiano-T-20 radar has suc- cessfully demonstrated ground-mapping and target detection capabilities onboard an Elbit Systems Hermes 450 unmanned aircraft system (UAS). Conducted at an undisclosed location, the testing was designed to validate the radar’s high-resolution ground mapping, with both strip and spot synthetic aperture radar (SAR) modes, as well as ground moving target indicator (GMTI) capabilities. Ground- based moving targets were successfully detected by the radar at up to 40 m, while delivering high quality digital images of the terrain below, during the testing.

BAE PHOENIX NETWORKING RADIOS VALIDATED BY US ARMY

The US Army has validated the tactical net- working capabilities of BAE Systems-built Phoenix 2 networking radios during exer- cises recently concluded at Fort Huachuca in Arizona, US. The radios were successful in testing the Army’s requirement by facilitating communication between soldiers over a 20-km range dur- ing exercises, which was conducted earlier this month.
Izhevsk Electromechanical Plant KUPOL, JSC, being part of the ALMAZ-ANTEY Air Defense Concern, unveils its new surface-to-air missile system Tor-M2KM, which differs from the widely known SAM systems Tor-M2K and Tor-M2E in a modular design of the combat and support vehicles.

SRSAM system Tor-M2KM with its modular combat and support vehicles is designed for air defence of vital public facilities. It is very reliable and effective against high maneuvering targets, guided and gliding area bombs, anti-radar and cruise missiles, UAVs, aircraft and helicopters within the SRSAM engagement area day and night under adverse weather and countermeasures environment.

Independent combat module (ICM) of the SRSAM system is an autonomous missile launcher which incorporates radar and optical facilities, special equipment, surface-to-air missiles, primary and backup power supply sources and crew. A shelter with unified mount adapters has been specially designed for the ICM, allowing its arrangement on truck, semi-trailer, trailer or other platforms of appropriate load-carrying capacity.

Due to modular design, the ICM can be slungloaded beneath a helicopter Mi-26T or its analogs. Helicopter-transported ICM can be deployed in very hard-to-reach places, for example, in mountains and roofs of buildings.

Tor-M2KM is the first system to fully meet air defence needs of the big cities (megapolises).

The system is fitted with up-to-date computers and radars, making it possible to destroy four aerial targets simultaneously.

Combat operation of the SRSAM system Tor-M2KM is fully automated, operator only needs to select a target to hit from the list given by computer and then press Start button. Surface-to-air missile is guided to the selected target automatically, and SAM warhead blows up in a target impact point. The missile carries irregular shape fragmentations made of special tungsten-nickel-iron alloy, providing high non-ricocheting penetrating efficiency of fragmentations. Radio fuse adaptation to the air target type along with special missile munitions make the system very effective against all types of targets.

Independent combat module provides transportation, storage and launch of four surface-to-air missiles. Transporter/loader module can be mounted on the automobile chassis similar to the ICM chassis. ICM is fitted with power supply source ensuring its autonomous operation in any weather conditions irrespective of the platform the ICM is placed on. The ICM has also a backup power source allowing ICM (if deployed without platform) to operate from commercial network or any mobile power plant generating voltage of 220V 50Hz and power of not less than 80 kW.

Maintenance tools and spare parts for the SRSAM system are placed in the unified shelters which can be mounted on any trucks, semi-trailers and trailers. The maximum weight of the loaded ICM does not exceed 15 tons.

The combat crew is 2 men.

SRSAM system Tor-M2KM can successfully accomplish AD missions both independently and as part of various AD units, and be integrated with Russian and foreign AD systems. Over 50 years Izhevsk Electromechanical Plant KUPOLO, JSC has been manufacturing high quality surface-to-air missile systems. High technologies, skilled personnel and many years’ experience in production and modernization of the military equipment make the company successful in the foreign and domestic markets.

Through creation of air defense missile systems for today’s and tomorrow’s army KUPOLO company upholds its reputation as a Russian high-grade weapon manufacturer.

ICMs mounted on various platforms can significantly expand application range and scope of missions carried out by the SRSAM system, besides modular design results in substantial reduction of operational costs.

Being deployed on various platforms SRSAM system Tor-M2KM is capable of accomplishing AD missions of Land Forces, Air Forces and Navy, protecting vital strategic military and civilian facilities against air attack.

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