
DF-15A IRBM (left) and ChangJian CJ-10 LACM

MIGHTY SPECTACLE

China's National Day parade featured undisclosed technologies

■ Prasun K. Sengupta

On October 1, as the People's Republic of China (PRC) celebrated the 60th anniversary of communist rule, the People's Liberation Army (PLA) showed off its conventional and non-conventional military might. The National Day parade featured previously undisclosed technologies incorporated in the 108 missiles on display, according to Yu Jixun, Deputy Commander of the People's Liberation Army's (PLA) 2nd Artillery Corps and Vice Commander-in-Chief of the joint headquarters for the military parade. The 108 missiles formed five groups that rumbled past the rostrum at Tian'anmen Square for a review. It was the 2nd Artillery Corps' third appearance in a national military parade since its debut at a National Day parade in 1984. Yu said that cadets of the 2nd Artillery Corps studying in the Wuhan-based 2nd Artillery Corps Command College, the Xi'an-based 2nd Artillery Engineering College and a Sergeant's School in Shandong Province also marched goose-step through Tian'anmen Square. A total of 46 helicopters provided by the PLA's Army Aviation Corps, Naval Aviation and PLA Air Force took part in the flypast. The PLA Navy's 10 Z-8 search-and-rescue helicopters in two arrow formations appeared for the second time this year, as they were displayed in the international fleet review held in the waters off Qingdao on April 23 to celebrate the 60th founding anniversary of the PLA Navy. The following 18 Z-11 recce gunships and another 18 Z-9G attack gunships were from the Army Aviation Corps. But a new-show this time was the ZW-10 heavy attack helicopter.

Other weapon systems showcased for the first time during the parade included the ZTZ-99 main battle tank (MBT), ZTZ-96G MBT, the army's ZTS-04 tracked

Beihang University's hand-launched mini-UAV and CH-3 UCAV

amphibious armoured infantry fighting vehicle (AIFV), tracked ZBD-97 AIFV, the PLA Marines' ZTS-04 amphibious AIFV, the army's ZBL-09/VN-1 8x8 wheeled AIFV, the PLA Air Force's (PLAAF) ZDB-03 airborne tracked AIFV, ZSL-92 anti-riot wheeled APC of the paramilitary People's Armed Police, the Army's PLZ-05 155mm/45-calibre tracked self-propelled howitzer, SH-2 122mm motorised howitzer, PLL-05 120mm self-propelled gun-mortar, PTL-02 100mm towed howitzer, PHL-03 300mm multi-barrel rocket launcher (MBRL), HJ-9 anti-armour guided-missile, PGZ-95 tracked self-propelled AAA, mobile HQ-7 SHORADS, YJ-91 and YJ-83 shipborne anti-ship cruise missiles, YJ-62 (C-602) anti-ship cruise missile, HQ-9 LR-SAM, HQ-12 (KS-1A) MR-SAM, HQ-16 E-SHORADS, ASN-207 tactical UAV, DongFeng 11 (DF-11/M-11/CSS-7) road-mobile short-range ballistic missile (SRBM), DongFeng 15 (DF-15/M-9/CSS-6) tactical ballistic missile, ChangJian CJ-10 land-attack cruise missile, DongFeng 21C MRBM, and the DF-31A ICBM.

The PLAAF's overhead flypast included the J-10A/B M-MRCA, B-6D aerial refuelling tanker, Su-30MK2s, KJ-2000 strategic AEW & C platform, and the KJ-200 twin-turboprop tactical AEW & C platform. However, the much hyped-about DongFeng-41 (DF-41/CSS-X-10 three-stage, solid-propellant, intercontinental-range ballistic missile, developed in the as a successor to the DF-5 (CSS-4) ICBM, failed to make a show. The 12,000km-range DF-41 was developed in parallel with the 8,000km-range DF-31 and consequently, like the DF-31, the DF-41 also is mounted atop a land-mobile transporter-erector-launcher. The DF-41 also features independently-targeted re-entry vehicle (MIRV) capability and penetration aids such as decoys and flares to confuse hostile ballistic missile defences. However, no test-firings of the DF-41 have taken place to date.

The various contingents taking part in the parade included the following:

- The army's Cadets Group Army (from Shijiazhuang Mechanised Infantry Academy)
- Naval Academic Group (from Dalian Naval Academy)
- Seamen Group (from Qingdao Naval Submarine Academy)
- Marine Corps Group (from the 1st Marine Brigade of the PLA Navy's South Sea Fleet)
- Air Force Cadets Group (from Air Force Aviation University and another 210 aviation regiments of PLA Air force)
- Airborne Troop Group (from the 15th Airborne Army)
- 2nd Artillery Corps (from the 2nd Artillery Corps' Engineering Academy)
- Armed Police Group (from the Beijing Armed Police Corps)
- Reserve Force Group (from the Beijing Garrison's Reserve AAA Division)
- Minutewoman Group (from the Chaoyang District, Beijing City)
- ZTZ-99G Heavy MBT Group (18 vehicles from the 334th Regiment of the 112nd Division of the 38th Group Army)
- ZTD-05 tracked amphibious assault vehicles (18 vehicles from the 1st Division of the 1st Group Army)
- ZBD-04 tracked infantry combat vehicle (18 vehicles from the 163rd Division of the 42nd Group Army)
- ZBD-09 8x8 wheeled infantry combat vehicles (18 vehicles from the 482nd Regiment of the 162nd Division of the 54th Group Army)
- ZBD-05 tracked amphibious infantry combat vehicle (18 vehicles from the PLA Navy's 1st Marine Corps Brigade)
- ZBD-03 tracked airborne combat vehicle (18 vehicles from the 134th Regiment of the 45th Division of the 15th Airborne Army)
- WJ-03B wheeled armed vehicle (from 'Snow Leopard' Special Forces Team of the People's Armed Police)
- PLZ-05 155mm/45-cal tracked self-propelled howitzer (from the Artillery Brigade of the 38th Group Army)
- PLZ-07 122mm tracked self-propelled howitzer (from the 338th Regiment of 113rd Division of the 38th Group Army)
- PLL-05 120mm wheeled self-propelled mortar (from the 379th Regiment and 380th Regiment of the 127nd Division of the 54th Group Army)
- PTL-02 100mm wheeled self-propelled howitzer (from the Artillery Regiment of 162nd Division under the 54th Group Army)
- PHL-03 300mm long-range MLRS (from the 9th Artillery Division of the 1st Group Army)
- AFT-9/HJ-9 anti-tank guided-missile launcher vehicle (from the Artillery Brigade of the 12th Group Army)
- PGZ-04A 25mm tracked self-propelled SPAAG (from the armoured regiment of the 127nd Division under the 54th Group Army)
- HQ-7B SHORADS (from the 86th Division and 91st Division of the 31st Group Army)
- HQ-9 and HQ-16 shipborne anti-aircraft missiles (vehicle-mounted missiles operated by soldiers from the 4th AAA Regiment of Zhoushan Naval Base, East Sea Fleet)
- YJ-83 anti-ship cruise missiles (vehicle-mounted missiles operated by soldiers from Lvshun Naval Base of the North

Sea Fleet)
- YJ-62A shore-based anti-ship cruise missiles (from the 1st shore-based Anti-ship Missile Regiment of Fujian Naval Base, East Sea Fleet)
- HQ-9 LR-SAM (from the 4th Anti-Air Division and 17th Anti-Air Brigade of the PLA Air Force)
- HQ-12A/KS-1A M-SAMs (from the PLAAF's 6th Anti-Air Division)
- Mobile Radar Vehicles with JY-11B and YLC-2A radars (from PLAAF's nine radar regiments)
- SATCOM and Backscatter communication vehicles (from the PLA's General Staff Department)
- Reconnaissance UAVs (from Long-range UAV Reconnaissance Commanding Station under the General Staff Department)
- Logistics Equipment Group (from the 6th Armoured Division of the 38th Group Army)
- DF-15A conventional ballistic missiles (from the 825th Brigade of the 2nd Artillery Corps)
- DF-11A conventional ballistic missiles (from the 818th Brigade of the 2nd Artillery Corps)
- CJ-10 land attack cruise missiles (from the 821st Brigade of the 2nd Artillery Corps)
- DF-21C medium-range conventional/nuclear cruise missiles (from the 822nd Brigade of the 2nd Artillery Corps)
- DF-31A ICBM (from the 2nd Artillery Corps' 812nd Brigade)

While the October 1 parade saw the 2nd Artillery Corps publicly showcasing for the first time its 2,500-km range DF-21C road-mobile 'cannistered' medium-range ballistic missile and the road-mobile ChangJiang-10Zai (Long Sword) 2,200km-range land-attack cruise missile (LACM), what was not revealed was how exactly would these missiles be guided to their intended targets. For strategic targeting of both land-based and sea-based targets, the 2nd Artillery Corps has been, since the late Nineties, deployed a mix of overhead recce satellites equipped with both optronic sensors as well as synthetic aperture radars (SAR). Belonging to the 'Yaogan' or 'JianBing' family, the constellation presently comprises the Yaogan-1 Yaogan-3 and Yaogan-5 satellites equipped with SAR antennae (supplied off-the-shelf by Russia's NPO Mashinostroneyie), and the Yaogan-2, Yoagan-4 and Yaogan-6 satellites equipped with optronic sensors. All these satellites were designed by the China Aerospace Science and Technology Corp's (CASC) No5 Research Institute and No8 Research Institute, with final fabrication and systems integration taking place at the CASC's Shanghai Academy of Spaceflight Technology. Presently, there are three space launch bases in China, namely, the Jiuquan Satellite Launch Centre in the desert of Gansu Province in northwest China, the Taiyuan Satellite Launch Centre capital of north China's Shaanxi Province, and the Xichang Satellite Launch Centre in Liangshan Yi Autonomous Prefecture in southwest China's Sichuan Province. China began building its first rocket launch site in Jiuquan in 1958. The latest space launch centre now being built will be in Wenchang City, on the northeast coast of the tropical island province of Hainan, which is scheduled to be completed by 2013.

To date, the 2nd Artillery Corps has already implemented the launch-control protocols and ultra-secure SATCOMS-based communications networks required for employing both the land-launched and air-launched variants of the CJ-10A cruise missile against both land-based and seaborne targets. Development of the CJ-10A and its launch platforms (including the Hong H-6K bomber) was led by the Hubei-based 9th Academy of the China Aerospace Science and Industry Corp (CASIC), which is also known as the Sanjiang Aerospace Group, or 066 Base. Series-production is now underway at the Beijing-based 3rd Academy, also belonging to CASIC. The navigational and fire-control components of the CJ-10 are produced at the Shanghai-based Xinxin Factory, which was set up in the late Nineties with the help of military-technical assistance from Ukraine and Kyrgyzstan. The CJ-10's maiden test-flight took place on 10 August, 2004. It is widely believed that the CJ-10 is an exact clone of the Korshun LACM (developed in Ukraine) and weighs 1,090kg, has a wingspan of 3.1 metres and diameter of 0.514 metres, and a length of 6.3 metres, 0.26 metres longer than the Kh-55. This slight difference in length comes from placing the Korshun's R95-300 turbofan within the rear of the missile's fuselage, with an air intake underneath. The Kh-55's engine, in contrast, pops out of the rear section after launch, and hangs beneath the missile's fuselage during cruise flight. By making the

Clockwisw from left: DF-21C ASBM; DF-31A ICBM; HQ-9 LR-SAMs; JY-11B and YLC-2A radars; PTL-02 100mm tank destroyer; PHL-03 300mm MBRL





Korshun (and the CJ-10) more streamlined, like the Tomahawk cruise missile, Ukrainian designers succeeded in reducing the missile's overall radar cross-section by eliminating the unwanted right angles of the exposed engine, which reflect telltale radar energy.

Another new-generation nuclear-armed missile deployed since 2007 by the 2nd Artillery Corps is the Dong Feng 21C (NATO reporting name: CSS-5 Mod-3) MBRM, which has a range of 1,700km when carrying a 2,000kg payload. The fully cannistered ballistic missile is carried on a 10x10 wheeled WS-2500 transporter-erector-launcher vehicle, which has a maximum load capacity of 28 tonnes. According to the US Defense Intelligence Agency (DIA), the DF-21C can be armed with fuel air explosive-based (FAE) and electromagnetic pulse-based (EMP) warheads, which could typically be employed against high-value strategic land-based targets, or against aircraft carrier-led battle groups. When used as part of a coordinated strike package, both the CJ-10 and DF-21C could significantly up the ante (as force multipliers with strategic reach) against any adversary, while keeping the threshold of hostilities limited to the conventional level. In India's case, the widespread deployment of these two missile systems by the PLA in either the Tibet Autonomous Region or the Chengdu Military Region could in one stroke neutralise the operational advantages of offensive airpower projection now enjoyed by the Indian Air Force (IAF) in northeastern and northern India.

Kongjing KJ-200 AEW and CS

In an annual academic conference sponsored by the 2nd Artillery Corps' Engineering College in the recent past, the proceedings clearly state that 'in order to pierce the armour of an aircraft carrier... China is developing a new boost-glide ballistic missile ...equipped with terminal guidance systems'. This startlingly direct admission reveals the level of commitment to the programme within the military branch primarily developing it. While the concept of an ASBM system is evident at high-level discussions within the PLA, the ability to operationalise what is described as 'a system of systems' involves a series of capabilities that go far beyond just the core missile components. A complete ASBM system will require the ability to detect, identify, track, target, and engage a threat and then perform damage assessment upon it – the 'kill chain'. Each of these sensor-to-shooter steps must be executed in a time-sensitive manner, since the intended target would be manoeuvrable - a US aircraft carrier-led Battle Group (comprising the aircraft carrier, its escorts, other land-attack cruise missile-carrying warships, and support and other vessels assigned to its embarked commander). A complete kill chain entails a wide range of technologies, from penetration aids on board the ballistic missile, space-based and other sensors, data processing and exchange networks, and other infrastructure to achieve a high degree of integration of both the weapons platform and its command-and-control elements.

The relevant literature stresses three technical challenges that would have to be resolved if China is to achieve an effective and reliable ASBM capability: first, ensuring that an ASBM can defeat US-developed ballistic missile defences; second, equipping a ballistic-missile to track and hit a moving target in its terminal phase; and lastly, providing accurate, real-time geolocation tracking and targeting data - particularly using space-based assets - to the missile prior to launch. Chinese academicians have gone into detail about various methods of manoeuvring during a ballistic missile's mid-course phase. Manoeuvring increases the missile's terminal target-seeking coverage so as to hit a moving target at sea. However, the impact of US missile defences - primarily the sea-based AEGIS system equipped with Standard SM-3, Terminal High-Altitude Area Defense (THAAD), and the Kinetic Energy Interceptor - on the missile's survivability has also been discussed. A number of measures have been suggested to defeat them. Altering the missile's flight path by employing a wave-like depressed ballistic trajectory rather than a traditional parabolic flight path is one method. In this scenario, the additional third stage of the DF-21C, with its hybrid liquid-solid fuel booster, is ignited several times to effect several wave patterns in the missile's mid-course flight. Other methods include weaving, spiraling, spinning, and gliding - all of which would alter the traditional parabolic flight path of the ballistic missile and boost the missile's penetration capabilities against US ballistic missile defences, which depend heavily on prediction of a missile's flight trajectory.

In the kill-chain formulation, this would comprise detecting, identifying, tracking, targetting, and engaging the threat. Available Chinese literature on this aspect of the ASBM system is generally pessimistic that the PLA has enough of the key technologies to realise such a system. Detecting the aircraft carrier at great distances would depend on early-warning systems such as sky-wave, over-the-horizon (OTH) radar, or electronic signals intelligence that would give a general idea of the target's geographic coordinates. There is substantial evidence that China has at least one over-the-horizon backscatter (OTH-B) system up and running at Hainan Island. It could be used to identify targets at long-range, although with a tracking error of from 20km to 40km (substantially lower than the US' OTH accuracy of roughly 8km to 30km) it would be unable to perform reliable target location independently. An ASBM attack radius of roughly 20km would correlate only to the extreme, best-possible performance of China's OTH-B tracking, and even then only for a stationary aircraft carrier. Long-distance early warning could also come from electronic and signals intelligence (ELINT and SIGINT), whether air-

From top: ZTZ-99G MBTs; ZBD-03 airborne AIFV; WZ550 ZFB-05 AFT-9 with HJ-9A ATGMs

borne, shipborne, or space-based. China's ability to use airborne and shipborne electronic surveillance would be limited, however, since both would require a dangerously close approach to the aircraft carrier-based battle group.

The open-source literature is almost completely silent on China's current on-orbit ELINT/SIGINT space-based satellite assets, but indirect evidence indicates that it either does have such capabilities or is actively developing them. Once the aircraft carrier is identified, its position needs to be pinpointed. Long-range unmanned aerial vehicles (UAV) could gather such information. China is apparently committed to investing in such a programme and has several operational high- and medium-altitude long-endurance UAVs, with others planned, capable of carrying out reconnaissance far out at sea.

Presently, there are two R&D entities in China that are developing long-endurance UAVs and UCAVs. The Luoyang Opto-Electro Technology Development Center is developing the Xianglong, currently China's largest UAV, which appears to have a combat radius of 2,500km (that is, a range of 7,500km), a mission payload of 600kg, and a maximum endurance of 10 hours. It can also carry electronic jamming pods to defend against anti-radiation missiles, as well GPS jamming and anti-jamming capabilities. Guizhou Aviation Industry Group (GAIG), on the other hand, is developing the WZ-2000 (Wuren Zhencha-2000) or WuZhen-2000 heat-powered UCAV. A basic scale model of the WZ-2000 was revealed for the first time at the 2000 Zhuhai Air Show. A more accurate model of the WZ-2000 was revealed later in the 2002 Zhuhai Air Show. Powered by a single WS-11 turbofan, the WZ-2000 design shows some evident radar cross-section reductions features, making it 'stealthy' to the enemy radar. The UAV made its first flight in December 2003. The on-board remote sensing system was successfully tested in August 2004. The Xianglong, however, is believed still to lack sufficient high-altitude endurance for an anti-aircraft carrier mission. Moreover, China still lacks C4ISR infrastructure - such as information processing, bandwidth capacity, and network support - needed for wide-area surveillance at the level of the US' Broad Area Maritime System. Further, even a fully capable UAV could be vulnerable to a carrier battle group's formidable air and electronic defences - assuming the carrier(s) and accompanying warships were not operating in electronic silence in order not to announce their approach - before it could provide targetting information. Thus, the UAV alone is not a reliable option. Theoretically, if advanced enough, UAV capabilities would be adequate for targetting if combined with other terrestrial cueing systems, such as OTH-B. However, the open-source literature clearly views these capabilities as currently insufficient to deal with superior expeditionary US seapower. China has a maximum of 22 space-based imaging assets that could potentially assist in identifying, locating, and tracking an aircraft carrier battle group. Only nine of the imaging satellites in low earth orbit (LEO) are classified as military; however, given the dual-use nature of many of the civilian space assets, the possibility that other nominally non-military satellites could be tasked in times of conflict cannot be discounted.

If China deploys a successful ASBM in the near future, rapid progress in its development will be traced in part to the 1995-1996 Taiwan Strait crisis, which further underscored Chinese feelings of helplessness against US seapower. The deployment of the USS Nimitz (CVN 68) and Independence (CV 62) aircraft carrier-based battle groups in response to the 2nd Artillery Corps' ballistic missile tests and military exercises in the Taiwan Strait was a move that China could not counter. We cannot know at this time how the events of 1995-1996 affected the precise calculations of Chinese leaders, but they seem to have given a major boost to homegrown military prowess in general, and PLA Navy's development in particular. Moreover, there is specific evidence that a new impetus was given to ASBM-related research and development at this time. One such document describes five ways to use ASBMs against aircraft carrier-based battle groups, a centerpiece of 'military intervention by a powerful enemy' and thus the proper 'focal point for attacks'. Such tactics as firing intimidation salvos, destroying shipborne aircraft with sub-munitions, or disabling with electromagnetic pulses the sensor systems of AEGIS-equipped warships are designed to make the aircraft carrier-based battle groups retreat or render them inoperable. More specifically, this passage of the 2nd Artillery Corps' warfighting doctrine describes

- 'Firepower harassment (strikes)', which involve hitting 'aircraft carrier battle groups'.
- 'Frontal firepower deterrence', which involves firing intimidation salvos in front of an aircraft carrier-based battle group's advance 'to serve as a warning'.
- 'Flank firepower expulsion', which combines interception of an aircraft carrier-based battle group by PLA Navy forces with intimidation salvos 'launched toward the enemy carrier battle group opposite our relatively threatened flank' to force it away from the vulnerable area.
- 'Concentrated fire assault', which entails targeting the aircraft carrier as a centre of flight operations: 'When many aircraft carrier-borne aircraft are used in continuous air strikes against our coast, in order to halt the powerful air raids, the enemy's core aircraft carrier should be struck as with a 'heavy hammer'. The conventional ballistic and cruise missile forces should be a select group carrying sensitive penetrating sub-munitions and, using the 'concentrated firepower assault' method, a wide-coverage strike against the enemy's core aircraft carrier should be executed, striving to destroy the enemy's carrier-borne aircraft, the control tower [island] and other easily damaged and vital positions'.
- 'Information assault', which entails attacking the aircraft carrier-based battle group's command-and-control system electromagnetically to disable it:

ZBL-09/VN-1 8 x 8 AIFV

'Directed against the enemy's command-and-control system or weak links in the AEGIS system, conventional missiles carrying anti-radiation sub-munitions or electromagnetic pulse (EMP) sub-munitions can be used when enemy radar is being used and their command systems are working, with anti-radiation sub-munitions striking radar stations and EMP sub-munitions paralysing the enemy's command-and-control system'.

News of China's State Oceanic Administration scientists using synthetic-aperture radar to detect surface warships suggest that the PLA has developed substantial expertise in the use of such hardware. A recent paper by researchers at Dalian Naval Academy offers a regimen of tests and data fusion to 'achieve our goals of monitoring and identifying warships in large-scale sea areas by using space-borne optical sensors'. A study by researchers at the Beijing Institute of Technology simulates terminal targetting of a moving aircraft carrier using adjoint equations and non-dimensional analysis, but states that guidance precision-enhancing technologies still need to be developed. A mathematical study by researchers at the 3nd Artillery Corps' Engineering College appears designed to demonstrate conceptual feasibility. Researchers at the College and 2nd Artillery Base 55, Unit 96311, Huaihua (Jingzhou), have offered a theoretical exploration of the ability of TBMs with terminal-phase guidance and manoeuvring capabilities to attack aircraft carriers. Some other researchers from the College and the National Defence Science and Technology University have offered a mathematical model of a type of terminal guidance, based on a prediction model of an aircraft carrier's movement. Modelling suggests that this method can allow warhead precision to achieve a CEP of about 12 metres under the most ideal conditions. Defeating US ballistic missile defences is also seen by many PLA researchers as essential to attacking an aircraft carrier-based battle group successfully, and it has attracted considerable study. Some researchers have offered a theoretical model of re-entry-vehicle manoeuvring using 'moving mass centre' control methods. This involves changing the centre of gravity of a warhead by adjusting movable masses within the warhead, thereby modifying its atmospheric flight path. The aerodynamic profile of the warhead would remain unchanged, and the method can be used in conjunction with fins and other conventional control surfaces.

Theatre-Level Expeditionary Warfare

To further fine-tune the deployment of its REMCFs at the theatre-level, the PLA has for the past three years been conducting the 'Vanguard' and 'Stride' series of field exercises, which are tri-services-level events under the operational control of a single unified theatre command. The Vanguard military exercises serves as the PLA's test-lab for fine-turning its warfighting doctrine and reforms at the operational-level. Last year's exercises experimented with offensive and defensive tactics of the PLA's new battalion-sized battle-groups and featured 2,200 troops that centered on a battle-group augmented by mechanised infantry, field artillery, combat engineering, communications, electronic warfare and army aviation elements. The core of the battle-group was drawn by the 1st Tank Battalion of the 58th Mechanised Infantry Brigade of the 20th Group Army (GA), based in the Jinan Military Region (MR). The exercises were divided into four parts - strategy-planning, mobilisation, long-distance manoeuvres, and ended with a live-fire joint operation against the 'Blue Army' from the Beijing MR at the Jinan MR's Combined Arms Tactical Training Base (CATTB) in Queshan. The exercise was also thrown open to 179 foreign military students representing 67 countries from the PLA's National Defence University and the Nanjing Army Command College.

This year's Vanguard 2009 exercises (closed to foreign observers) were much larger in scale (including 1,000 officers and 10,000 soldiers of other ranks) and focussed on the 'joint theatre of military operations' and included the entire 58th Mechanised Infantry Brigade, plus elements from 11 separate service arms. The 300 AFVs, 11 helicopters, airborne troops, tactical ballistic missiles and air cover were placed under a single joint operational commander. And for the first time, the PLA's airborne parachute forces drawn from the Guangzhou Military Area Command conducted their first 'vertical landing' at 'enemy bases' behind simulated 'enemy' lines. Kicking off in central Henan Province, Vanguard 2009 saw a Brigade

from Jinan Military Area Command being in charge of ground attacks. This Brigade is said to be among the best of the PLA's land forces. The exercises aimed to achieve innovative breakthroughs in eight areas, including: the formation of a joint operations command structure in accordance with the general staff requirements; formation of centralised, hierarchical simple, streamlined and efficient ground-air joint command structure; the joint ISTAR network; joint intelligence and information security; and joint operations command decision-making. During the joint exercises, six major combat groups, including the information combat group, air combat group, army aviation combat group, special operations group, field artillery group and the air defence artillery group cooperated closely with each other and focused on four key result areas: information warfare, joint fire strikes, joint attack and joint area dominance. The exercises were concluded by October 13.

Prior to Vanguard 2009, the PLA had conducted another path-breaking exercise, codenamed Stride 2009, which got underway on August 11 (following three months of preparations) and involved the deployment of about 50,000 heavily-armoured troops over thousands of miles to test the PLA's long-distance mobility and operational logistics, plus the ability to switch mechanised infantry formations between various theatres.


Yitian VSHORADS

According to the PLA's General Staff Headquarters, one Army Division from each of the military commands of Shenyang, Lanzhou, Jinan and Guangzhou, participated in a series of live-fire drills lasting for two months. Unlike previous annual tactical exercises, the Army Divisions and their supporting Army Aviation units were deployed in unfamiliar areas far from their garrison training bases by civilian rail and air transportation assets. The Mechanised Infantry Division from the Shenyang Military Command in the northeast was transported northwest to the Lanzhou Military Command. Troops from the Jinan Military Command to the east and the Guangzhou Military Command to the south were exchanged. In the unprecedented exercises, one of the PLA's major objectives this time was to improve its capacity for long-range force projection. All heavy weapon systems, such as MBTs and AFVs, were carried by rail, and lightly armored troops deployed to the Jinan Military Command by China Railway High-speed (CRH) trains travelling at up to 350kph. It subsequently emerged that though the PLA's battlefield logistics capacities have been greatly improved, they still require greater coordination and efforts to conduct joint operations and long-range force projection. The live-fire drills of Stride 2009 were conducted at four tactical training bases respectively in the four military commands. The PLA this time introduced a newly developed laser-beam combat simulation system through which the troops in each base were divided into 'Red' and 'Blue' rivals to carry out simulated battles. The troops involved in the exercises also adopted China's Beidou or COMPASS-G2 satellite communications and positioning system for encrypted communications between the PLA's headquarters and the Divisions to reduce the dependence on foreign space-based communications systems.

When the Mechanised Infantry Division from the Lanzhou Military Command headed for the Taonan Tactical Training Base in Jilin Province of the Shenyang Military Command, more than 700 vehicles advanced across the Yellow River trough a 250-metre long pontoon bridge built by the Lanzhou Division's engineering regiment at a ferry place in northwest Ningxia Hui Autonomous Region. The Division's forward command post elements took off from a northeastern air base on two civilian B.737-800 airliners. Another group of heavy equipment carried on two chartered trains also departed from railway stations in Yinchuan and Qingtongxia. This was followed up by the rest of the 13,000 troops of the Lanzhou Division being transported through five provinces and regions, day and night, to reach the Taonan Tactical Training Base. The Lanzhou Military Command also deployed combat aircraft and attack helicopters to provide air cover for the long-distance manoeuvres, and also participated in the live-fire drills at the tactical training base of the Shenyang Military Command.

On September 1, about 10,000 soldiers and 1,000 vehicles of a Division under the Shenyang Military Command were deployed at the foot of the Helan Mountain in Northwest China. The last participating components of Stride 2009 debuted on September 9, this being a Motorised Infantry Division of the Guangzhou MC that crossed the Xiangjiang River in a forced-march and pressed on toward Central China. In the following four days, the soldiers traversed four provinces and autonomous regions spanning 2,000km.

Another prominent exercise to be carried out by the PLA was the 20-day 'Airborne Manoeuvres 2009', the largest such exercise to be carried out to date by the PLA's 15th Airborne Army. Kicking off on October 18, it has been described as being a 'trans-theatre comprehensive campaign manoeuvre exercise' involving 13,000 officers and men, 1,500-plus vehicles and 7,000-odd units of equipment. During the exercises, the participating troops manoeuvred more than 2,000km between Hubei, Henan, Anhui and Jiangsu provinces with multiple means and routes. Besides, they also assembled at the designated places twice to carry out live-shell, multi-terrain and multi-subject exercises under close-to-actual-war conditions. The 15th Airborne Army is the PLA's Strategic Rapid Reaction Unit and reports directly to the Central Military Commission. Its principal mission is to intervene rapidly into China's internal trouble spots as was done during the 1988 Tibetan riots when 10,000 airborne troops were airlifted in less than 48 hours. During the Sichuan earthquake in May 2008, 4000 airborne troops arrived within 36 hours for spearheading the disaster relief operations. The principal components of the 15th Airborne Army include the 43rd Parachute Division, 127th Parachute Regiment, 128th Parachute Regiment, 129th Parachute Regiment, 44th Parachute Division, 130th Parachute Regiment, 131st Parachute Regiment, 132nd Parachute Regiment, 45th Parachute Division, 133rd Parachute Regiment, 134th Parachute Regiment, 135th Parachute Regiment, and three Light Artillery Regiments. ●