Friday Dispatch

10 January, 2020

SYLLOGE ON CHINA

Focus:Nuclear, Space, Missiles and other Security Issues

An Initiative by Indian Pugwash Society and Centre for Nuclear Issues and Arms Control (IDSA)

Prepared by:

Diya Deep Singh

INDIAN PUGWASH SOCIETY

idsa
INSTITUTE FOR DEFENCE STUDIES & ANALYSES
रक्षा अध्ययन एवं विश्लेषण संस्थान

US plans to counter Chinese influence in Asia with new Pacific missile, cyber task force
South China Morning Post, January 10, 2020

The US Army will expand efforts to counter China by deploying a specialised task force to the Pacific capable of conducting information, electronic, cyber and missile operations against Beijing. The unit, which Army Secretary Ryan McCarthy is expected to detail at an event in Washington on Friday, would also be equipped to hit land- and sea-based targets with long-range precision weapons such as hypersonic missiles, possibly clearing the way for Navy vessels in the event of conflict. The Army task force would help neutralise some capabilities China and Russia already possess and are intended to keep US carrier groups away from the Asian mainland, McCarthy said in an interview. It's not clear how quickly the unit, which would likely be based on islands east of Taiwan and the Philippines, can be deployed.

The move is designed to "neutralise all the investments China and Russia have made", McCarthy said. It would be bolstered by a new agreement with the National Reconnaissance Office that develops and manages US spy satellites, he said. Under that accord, Army tactical units will be better able to tap information gleaned from existing and future low Earth orbit satellites, he said. The pivot would help Defence Secretary Mark Esper achieve a long-sought American goal of shifting more forces from Europe, the Middle East and Africa to the Pacific, better positioning the US to take on "peer competitor" China and historic rival Russia. The extent to which the current tensions with Iran upset that plan remains to be determined but the Army is pressing ahead.

Under McCarthy's vision, the move would allow the Army to create a new paradigm in the Pacific where ground forces would "punch a hole" in enemy defences for air and naval forces. Now, the ground-based unit in those island chains can create the support "for air and sea", McCarthy said. China's military doctrine calls for a so-called "anti-access" strategy, backed by long-range anti-ship missiles and space-based surveillance capabilities, intended to keep US aircraft carrier strike groups well beyond the so-called first and second island chains. The first island chain extends from the Kuril islands down to Borneo, while the second island chain generally extends from just east of Japan to Guam and down toward New Guinea. The pivot includes greater Army participation in regional war games like the "Defender Pacific" series and deploying a "Security Force Assistance Brigade" next year for the Indo-Pacific theatre similar to ones set up and deployed to Afghanistan, he said. The Army started experimenting with the task force in 2018. The 17th Field Artillery Brigade from Joint Base Lewis-McChord in Washington State conducted nine major training exercises, plus simulations and war games to evaluate concepts.

https://www.scmp.com/news/asia/southeast-asia/article/3045527/us-plans-counter-chinese-influence-asia-new-pacific

China is developing drones that use quantum physics to send unhackable messages

Stephen Chen

South China Morning Post, January 10, 2020

Chinese scientists say they have developed the world's first fleet of drones equipped with quantum communication technology so that robots can share information securely with each other and human operators. Researchers at Nanjing University, in eastern China, built drones able to generate pairs of "entangled" particles of light that could carry information in quantum states such as charges or polarisations representing 0 or 1, according to their paper published this month in the journal National Science Review. Scientists test the alignment of the particle emitter and receiver, which need to face each other in a straight line.

By the laws of quantum physics, disturbing one entangled particle in a pair would affect the other, regardless of distance – meaning that information carried by such particles could not be intercepted without altering the message and alerting the receiver or sender. Quantum communication devices, or quantum nodes, are usually set up in a laboratory with bulky, complex equipment including laser pumps, beam-splitting crystals, mirrors and ultra-sensitive detectors. But Professor Zhu Shining and colleagues at the National Laboratory of Solid State Microstructures significantly reduced the size of the quantum node and packed it into a drone weighing 35kg (77lbs). "A third of the weight comes from the battery," said Professor Xie Zhenda, a co-author of the paper. "We have built and deployed about 10 drones." With future upgrades, these drones will be able to connect to quantum satellites or a ground-based quantum communication network and provide an "ultimate solution to secure data transfer", the researchers wrote in the paper.

Each of the drones could generate 2.4 million pairs of entangled particles of light each second, they said. 'Game-changer' methanol battery keeps drone in the air for 12 hours

Existing military drone communication is protected by mathematical encryption. Google announced last year a prototype quantum computer that could complete in 200 seconds a computational task that would take the fastest supercomputers about 10,000 years. The machine could not yet be used to decode information, but it is believed that the technology would eventually produce a code breaker that could work out a password protected by number-based algorithm in seconds. Drones could thus be hijacked and turned against their home base – and the best known way to protect them is using quantum communication.

But quantum communication involves many challenges. For instance, the sender – or rather the particle-emitting device that uses a crystal to split a beam of laser light in two, entangling the particles – must be positioned in a straight line of sight from the receiver. Commercial applications for quantum computing still far off, Tencent says. Compared with satellites and ground-based stations, drones are not stable platforms and are vulnerable to unpredictable conditions. A gust of wind could make the Nanjing team's drones sway by an arm's length, they found. To keep the

airborne drone's entangled particle emitter and the receiver on the ground pointing at each other, Zhu and colleagues used pairs of beacon light beams to coordinate their positions. They reduced the margin of error to about 1.3 microns, smaller than a 50th of the width of a human hair. A medium-sized camera at the drone's belly can also act as a receiver to pick up the entangled light particles, or photons, from the ground station or other drones and pass messages to others in the network.

The range of effective communication in the experiment was limited to about 200 metres (656 feet) during their experiment, but the researchers team said they could use a larger drone camera to extend the range to 2km (1.2 miles). The military-grade cameras on high-altitude drones such as China's Rainbow and the United States' Predator series – two of the world's most widely used war drones – had a range of up to 200km, according to their paper. Another challenge during the experiment came from the drone's eight pairs of rotary blades, which generated vibrations that could affect the precision of the quantum devices. The researchers used specially designed rubber absorbers to eliminate the vibrations. Quantum communications system was used at Party Congress in Beijing. Future improvements would be required before the technology could be deployed in battle or other real-life applications. One problem was the low efficiency of photon reception. Although the drone could generate large numbers of entangled photons, only 10 particles per second could be received at the other end, limiting the amount of information that could be carried.

China is the global leader in quantum communication technology. It has sent the world's only quantum satellite into orbit. A land-based quantum communication network between Beijing and Shanghai is the longest and most sophisticated on the planet. Chinese researchers recently reduced a building-sized quantum satellite ground station to an 80kg unit that could fit into a family car.

https://www.scmp.com/news/china/science/article/3045229/china-developing-drones-use-quantum-physics-send-unhackable

China-Pakistan joint naval exercise concludes first phase activities
Chen Guoquan and Li Guanmei
China Military Online, January 10, 2020

The port-training phase of the PN-PLAN Sea Guardians-2020 Bilateral Exercise wrapped up on Thursday. The Chinese-Pakistani composite fleet set sail from the Karachi Port to the scheduled exercise area in northern Arabian Sea for the second phase of live fire fleet drill on Friday morning. During the first phase of port training from 6th to 9th of January, the two navies conducted joint marine training. Marines from both sides trained on subjects of beach landing, and live-fire shooting of light weapons.

On the destroyer Shah Jahan of Pakistani Navy (PN), Chinese service members watched the visit, board, search and seizure (VBSS) drill given by the Pakistani side, deeply impressed by their skillful cooperation and the simple-but-capable movements. On the frigate Yuncheng of the PLA Navy (PLAN), Chinese seamen demonstrated the whole process of damage control drill including fire fighting, war injury rescue for their Pakistani peers. At the Pakistan Naval Tactical School, the two sides held a seminar on the over-the-horizon target strike procedure and maritime interception operation. In the meantime, the joint headquarters staff of both sides conducted command post exercise, discussing maritime training subjects and rules for the second phase.

http://english.chinamil.com.cn/view/2020-01/10/content_9714421.htm

China has powerful military drones but won't use them like the US, analysts say
Liu Zhen
South China Morning Post, January 9, 2020

The assassination of Iranian military commander Qassem Soleimani in Iraq last week shows the ever increasing role of drones in modern warfare. But while China has its own fleet of powerful unmanned aerial vehicles, it is unlikely to use them for such an audacious mission, analysts say.
During last Friday's operation, a US MQ-9 Reaper, controlled from afar, identified and locked in on Soleimani's convoy near Baghdad airport. It fired at least two missiles at the two vehicles, killing everyone inside. Introduced to the US military in 2007, the long-endurance stealth drone is capable of carrying up to four AGM-114 Hellfire missiles and other bombs, and can fly for up to 14 hours at a cruising speed of more than 300km/h (186mph). It is piloted by two operators from a ground station up to 1,850km (1,150 miles) away.

While the Soleimani assassination is probably the drone's highest profile mission to date, it was also used in the air strike in Raqqa, Syria in 2015 that killed Islamic State terrorist Mohammed Emwazi, or "Jihadi John" as he was dubbed by the press. Not all of the United States' drone missions have been so successful, however. In June last year, an RQ-4A Global Hawk surveillance craft was shot down over the Strait of Hormuz by an Iranian air defence missile, while several MQ-9 Reapers have been shot down in recent years by the Iran-backed Houthi military group in Yemen. The US is also not alone in its development of military grade UAVs. The People's Liberation Army (PLA) has equally powerful machines at its disposal, though has yet to use them in such a high-profile or deadly mission. "Future warfare will involve more technology and fewer humans," he said. "Air superiority is the key to victory, so UAVs will have a very important role to play." Beijing-based military commentator Zhou Chenming agreed. "Drones are quiet, fly at low altitude and are hard to detect. So to prevent a drone attack is difficult and costly," he said. But while China had UAVs capable of carrying out missions similar to the one that killed

Soleimani, Zhou said Beijing was unlikely to risk breaking international law by using one to assassinate a foreign leader.

“I don’t see China using this method,” he said. “The PLA tends to be more cautious and discreet.” During China’s National Day parade in October, the PLA showed off several UAVs, including the DR-8 supersonic spy drone, the GJ-11 stealth combat drone with its flying wing design, and the GJ-2 reconnaissance and strike drone. Several new Chinese UAVs are currently under development, while others are in service in foreign militaries. As of early 2017, CH-4 and CH-5 fixed-wing reconnaissance and strike drones, for example, had been sold to more than 10 countries across central Asia and the Middle East, with more than 200 units being shipped abroad each year. And in 2018, China finalised its biggest ever drone sale when Pakistan agreed to buy 48 GJ-2 drones, under their export name, Wing Loong II.

https://www.scmp.com/news/china/military/article/3045440/china-has-powerful-military-drones-wont-use-them-us-analysts

Chinese peacekeepers to S. Sudan finishes first patrol & escort mission in 2020
Liu Jinqing and Yu Donghai
China Military Online, January 9, 2020

The 6th Chinese peacekeeping infantry battalion to South Sudan finished its first short-distance patrol and escort mission in 2020 and safely returned to their barracks on January 8, local time. Chinese peacekeepers were highly praised in the Juba Theater and by the escorted personnel and contingents. This short-distance mission was jointly assigned by the UN Mission in South Sudan (UNMISS) and the Juba Theater. In order to carry out the mission with a high standard, Chinese battalion , before setting out, conducted comprehensive information collection and analysis on the patrol areas and their military, social and natural conditions, and made as detailed primary judgment as possible. Such thorough preparations laid a solid foundation for them to effectively deal with emergencies such as surprise inspection by local armed forces, vehicle breakdown and traffic obstruction.

Before the Chinese peacekeeping infantry battalion set out, it was assigned an additional task - to provide armed escort for the military observers and the Bangladesh detachments. The battalion adjusted its plan in a timely manner to combine the two tasks, increased escorting strength and worked in close coordination with their foreign counterparts. During the 170km patrol and escort route, the Chinese peacekeepers passed 16 sensitive locations including local inspection points and about-100-kilometer bad road featuring dangerous bridges, hurdles and bumps.

http://english.chinamil.com.cn/view/2020-01/10/content_9714277.htm