

**Prepared Statement of
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Mr. Chairman, thank you for the opportunity to participate in today's hearing on an issue that is important to U.S. interests in peace and stability in the Asia-Pacific region. It is an honor to testify here today. The evolving capacity of the People's Republic of China (PRC) to leverage technical intelligence collection assets presents a number of challenges for the United States, allies, and friends in the Asia-Pacific region. In my presentation this morning, I will address PRC technical intelligence that enables or supports human intelligence (HUMINT) operations.

The People's Liberation Army (PLA) is rapidly advancing its technical intelligence, surveillance, and reconnaissance (ISR) capabilities. In doing so, the PLA advances the legitimacy of the Chinese Communist Party (CCP), and defends against perceived threats to national sovereignty and territorial integrity. PLA ISR assets support party and state interests, including military operations in the land, maritime, and space domains. For purposes of strategic, operational, and tactical awareness, the PRC is engaged in the research and development (R&D) and acquisition of space-based, airborne, and surface-based sensors that support human intelligence and clandestine influence operations. ISR assets also enable monitoring of military activities in the Western Pacific and beyond.

Ground-Based ISR. The PRC's ground-based signals intelligence (SIGINT, or technical reconnaissance in Chinese lexicon) system is significant and diverse. Before the most recent military reorganization that commenced in late 2015/early 2016, the PLA's SIGINT community

consisted of at least 28 technical reconnaissance bureaus (TRBs), each roughly equal in grade to a PLA Army division. The GSD Technical Reconnaissance Department, often referred to as 3PLA, had direct authority over 12 functional bureaus, three research institutes, and a computing center. Each bureau, along with subordinate offices, appeared to have a unique individual missions. Missions presumably include intercept of communication transmissions throughout the frequency spectrum. At least one bureau appeared to exploit satellite communications, while others likely tap in to fiber optic communications. No single 3PLA unit appeared to have a monopoly on cyber espionage, or the collection of data contained within foreign computer networks. While the ongoing military reforms likely have affected the PRC's SIGINT organization, the basic missions of individual bureaus and offices probably have remained intact.

Eight of the 12 operational bureau-level headquarters were clustered in Beijing. Two others were based in Shanghai, one in Qingdao, and one in Wuhan. For illustrative purposes, the Third Department First Bureau may have played an important role in breaking advanced encryption systems and other computer network operations. The First Bureau headquarters reportedly oversaw at least 12 offices operating in various parts of China.

As another example, the Second Bureau (Unit 61398) was one of the largest among the 12 operational bureaus that comprised 3PLA. The unit consisted of at least 12 subordinate offices and work stations garrisoned in the greater Shanghai area and other parts of China. Among these include work stations positioned near major submarine cable landing stations within Shanghai City that handle a significant volume of communications entering and leaving China. Officers assigned to the Second Bureau have allegedly engaged in cyber espionage. The bureau's network may also have included at least three high frequency direction finding (HF/DF) sites in northeast, southwest, and southern China. Through the geolocation of HF transmissions, the system may be intended to monitor, interfere, or block signals unfavorable to the CCP's goals. Potential collection targets may also include U.S. Air Force and Navy HF beyond line-of-sight communications. Civilian networks of interest may include international air traffic control managed by the International Civil Aviation Organization (ICAO), maritime safety, Radio Free Asia, and other networks.

As a final example, the Third Department 12th Bureau, headquartered in Shanghai, appeared to support space surveillance and intercept of satellite communications. Personnel from the bureau may intercept uplinked and/or downlinked electronic transmissions between satellites and transmitters on the surface. Another mission may be surveillance, identification, and tracking of satellites and other space vehicles. Passive space tracking involves the use of antenna systems on the ground that can locate with precision the source and characteristics of signal and associated transmitter. Detection of a signal may cue other space surveillance assets. Although unclear at the current time, the 12th Bureau could be resubordinated to the newly established Strategic Support Force. A separate bureau appeared to specialize in intercept of telemetry data associated with missile tests and space launch operations.

Before January 2016, each of the PLA's seven Military Regions also exercised authority over at least one technical reconnaissance bureau (TRB). The mission of a Military Region TRB, which consisted of between eight and 12 subordinate offices and work stations, likely included border and coastal defense. For example, the Guangzhou Military Region TRB probably focused on communication networks associated with maritime activity in the South China Sea. The Nanjing Military Region's First TRB, headquartered in Nanjing, presumably supports coastal defense operations in the East China Sea, while the region's Second TRB, headquartered in Fuzhou, was concentrated on communications networks on Taiwan. The Chengdu Military Region First TRB may have targeted Indian communication networks along the border with China. Chengdu's Second TRB may have concentrated efforts on communication networks along the border with Burma. Military Region TRBs likely have been resubordinated to newly established Theater Commands.

The PLA Navy (PLAN) oversees two TRBs that probably target foreign navies operating in the Western Pacific Ocean. PLAN TRBs presumably leverage ship-based technical reconnaissance collection assets. The PLA Air Force (PLAAF) leadership is supported by three TRBs that appear to target foreign air defense and surveillance communication networks in the region. In addition to operating ground-based SIGINT facilities, PLAAF TRB personnel presumably support peacetime aerial reconnaissance flights within the Asia-Pacific region.

Regional SIGINT assets are likely augmented by ground-based electronic and air surveillance radar networks. MRs (Theater Commands) likely oversee organic electronic intelligence systems that support border and coastal defense, among other missions. For example, a Guangzhou MR radar reconnaissance unit has been noted tracking U.S. Navy radar activity in the South China Sea. The PLA Navy's South Sea Fleet's Observation and Communications Brigade manages more than 20 electronic surveillance sites across three provinces in southern China, including one on Subi Reef.

In addition to SIGINT collection assets, the PLA has made significant advances in its joint air surveillance system. In the past, the PLAAF and PLAN appeared to divide air defense responsibilities, with the Navy responsible for defense of major naval bases (eg., East and South Sea Fleet homeports). Since at least 2006, authoritative media outlets have indicated that the PLAAF has been granted responsibility for developing and fielding a new automated joint air surveillance system. The system relies on a network of sensors that provides data to centralized air command and control centers. The PLA also operates over the horizon (OTH) radar systems capable of tracking air and surface targets at extended ranges. OTH systems, which have both military and civilian applications, support China's scientific community, including atmospheric and oceanic studies.

Space-Based ISR. Increasingly greater spatial resolution and an ability to monitor U.S. activity in the Asia-Pacific region (including the locations of US aircraft carrier battle groups) in all weather conditions are likely to enhance China's capacity for power projection. Over the years, the PLA and civilian defense industry have fielded electro-optical (EO), synthetic aperture radar (SAR), electronic intelligence (ELINT), and other space-based sensor platforms that can transmit images of the earth's surface and emitter data to ground stations in near-real time.

Since at least 2006, the PLA and China's defense R&D community have been developing and fielding a dedicated military EO satellite system with increasingly high resolution. China is expected to have multiple types of space-based SAR systems on orbit over the coming years that cater to various users. SAR satellites use a microwave transmission to create an image of maritime and ground based targets. They can operate night or day and in all weather conditions, and are

therefore well suited for detection of ships over a wide area. Processed SAR imagery may depict a ship in various ways, depending on weather conditions, ship orientation and construction, and beam focus. A SAR satellite is also able to image ship wakes from which information on ship speed and heading can be deduced.

Chinese military analysts view space-based electronic reconnaissance as necessary to accurately track and target U.S. carrier strike groups in near real time from lower earth orbit as part of China's long-range precision strike capability, including its anti-ship ballistic missile (ASBM) system. Major surface vessels, such as aircraft carriers, have prominent electromagnetic, acoustic, and infrared signatures and large radar cross section. Although controlling emissions from carriers is feasible for limited periods of time, air operations depend on electromagnetic radiation.

The newly created PLA Strategic Support Force most likely drives requirements and leverages the data produced by space-based sensors. Space assets enable the monitoring of naval activities in surrounding waters and the tracking of air force deployments into the region. A constellation of small SAR and ELINT satellites could provide commanders with geolocation data on mobile targets. In a crisis situation, China may have the option of augmenting existing space-based assets with microsatellites launched on solid-fueled launch vehicles. Increasingly sophisticated satellite communications also offer a survivable means of linking sensors to strike systems, and will become particularly relevant as PLA interests expand further from Chinese shores. Existing and future data relay satellites could transmit targeting data to and from command centers.

Airborne ISR. Airborne ISR assets include manned ISR platforms and an increasingly advanced and diverse range of unmanned aerial vehicles (UAVs). Operated by the Central Military Commission (CMC) Joint Staff Department, PLAN, PLAAF, and other PLA organs, conventional high altitude, long endurance UAVs are said to employ EO, SAR, and electronic reconnaissance sensor packages. The PLA also appears to be investing in the R&D of "near space" flight vehicles, operating at altitudes between 20 and 100 kilometers, and equipped with a range of sensors.

Support to National Leaders and HUMINT Community. The PRC's ability to coordinate military and civilian intelligence disciplines is unknown. At the national level, technical

intelligence and HUMINT communities likely suffer a similar type of stovepiping that exists in other countries. The PRC's policymaking, technical intelligence, and HUMINT communities probably have a symbiotic relationship. In particular, the PLA's SIGINT community presumably provides direct support to senior policymakers and HUMINT community, including the Ministry of State Security (MSS), CMC Joint Staff Department Intelligence Bureau, and the CMC Political Work Department Liaison Bureau. The structure and process for intelligence tasking is also unclear. However, intelligence collection priorities of the Politburo Standing Committee are likely coordinated by the CCP Secretariat and Central General Office, CMC General Office, and State Council General Office. At the national level, priorities may range from perceived challenges to sovereignty and territorial integrity, to political and economic negotiations.

At the local level, technical and HUMINT communities may have formal or informal mutual support arrangements. For example, PLA technical reconnaissance assets in Shanghai could provide communications intelligence support to local MSS and PLA HUMINT operations. The capacity to intercept email exchanges, computer files, cell phone calls, and text messages of targets of interest in the U.S., Taiwan, and elsewhere may facilitate assessment of individuals—both military and civilian—with access and influence for political purposes. At the operational level, however, the PLA has invested heavily in R&D and deployment of a system, the Integrated Command Platform, which appears capable of correlating or fusing sensor data within intelligence information centers at the national and regional levels.

The effectiveness of China's technical reconnaissance, including cyber espionage, is unknown. However, the organization and engineers responsible for R&D and acquisition of technical intelligence systems appear sophisticated and capable of meeting future requirements. Exploiting vulnerabilities in international communications systems and computer networks, the PRC's creation of a global digital electronic fishbowl would have significant implications for U.S. national security interests and warrants further study.