



Summary

The PLA Army's (PLAA) amphibious units would serve as the core of any joint force charged with invading Taiwan. As a result of the 2017 reforms, the PLAA now possesses six amphibious combined arms brigades distributed across three group armies (the 72nd, 73rd, and 74th). During a cross-strait invasion, these brigades would likely receive support from other elements of the group armies to which they belong. This could include fire support, air defense, air transport, aerial fire support, and electronic warfare/cyber-attack. Due to its large composition of two-year conscripts, the PLAA amphibious force has traditionally spent the first four months of every year developing basic individual and team skills, although a recent shift to a twice-a-year conscription cycle could allow for more complex training throughout the year. An analysis of the available reporting on 2021 training events indicates that amphibious training occurs frequently from March to October but mostly involves units at or below the battalion level. Despite efforts to bolster the PLAA's amphibious capabilities, the force currently lacks the capacity to execute a large-scale assault on Taiwan.

Introduction

One of the most important missions assigned to the People's Liberation Army (PLAA) is to provide forces equipped and trained to enhance China's military posture to deter further steps toward Taiwan independence. All four services, the PLAA, PLA Navy (PLAN), PLA Air Force (PLAAF), and PLA Rocket Force (PLARF), plus the Strategic Support Force and Joint Logistic Support Force, have a role in this effort. If deterrence fails, one military option available to the senior Chinese Communist Party (CCP) leadership is to order the PLA to conduct an extremely difficult and complex operation known as a joint island landing campaign, which would be supported by a joint firepower campaign. Although a traditional over-the-beach amphibious landing likely will not be the first military course of action to be undertaken in a campaign directed against Taiwan, the PLA is clearly preparing for this possibility should other options fail.

The core of the PLAA's contribution to the Taiwan deterrence and warfighting missions resides in six amphibious combined arms brigades (ACAB) assigned, two each, to the three group armies stationed closest to Taiwan in the Eastern and Southern Theater Commands (TC). Reforms undertaken since 2017, including increasing the capabilities and capacities of PLAA helicopter units and special operations forces (SOF), long-range multiple rocket launchers and air defense weapons, and non-kinetic electronic warfare and cyber-attack units, have greatly expanded the options available to PLAA commanders to conduct joint island landing and joint firepower campaigns.

If ordered to conduct operations against Taiwan or its offshore islands, the six amphibious combined arms brigades will work in concert with elements of their parent group armies and theater commands in an operation that likely will be reinforced by additional Army units from outside the region. Any PLAA action against Taiwan will be coordinated with units from the other services and forces and will also involve militia forces and civilian assets in support. The dispersion of forces in peacetime, however, will require days, if not weeks, to move and assemble units within striking range of Taiwan and prepare them for launching an assault.

Once these forces are ashore, Taiwan's topography is not optimal for rapid, large-scale offensive, mechanized movements. Only a few beaches along its west coast are suitable for amphibious landing and behind them the terrain soon becomes mountainous and checkered with rice paddies and urban sprawl. Given the restrictions imposed by the terrain, the PLA leadership perhaps sought to modernize PLAA capabilities, as well as capabilities in the other services, to shift the decisive phase of a joint island landing campaign from a traditional over-the-beach amphibious assault followed by a mechanized ground movement inland to a series of airborne (parachute) or airmobile (helicopter)

assault operations to seize ports of entry on the coast, airfields, and other key terrain/objectives closer to the center of gravity of Taiwan's defenses to allow for the rapid insertion of second-echelon follow-on forces by sea and air.¹ Nonetheless, a large-scale assault by multiple amphibious combined arms brigades remains a major component of China's deterrence posture and any joint landing operation.²

This report first addresses the current status of the PLAA's amphibious combined arms brigades and the support they are likely to receive from their brother Army units. It then discusses training and examines PLAA amphibious and sea-transport exercises and drills conducted in 2021 involving both amphibious and non-amphibious PLAA units. This analysis is consistent with, and supports, the U.S. Department of Defense's assessment in 2020 and 2021 that

Both PLAA and PLANMC [Marine Corps] units equipped for amphibious operations conduct regular company- to battalion-level amphibious training exercises, and the PLA continues to integrate aerial insertion training into larger exercises... The PLA rarely conducts amphibious exercises involving echelons above a battalion, although both PLAA and PLANMC units have emphasized the development of combined-arms battalion formations since 2012.³

Order of Battle

Prior to the 2017 reforms, three PLAA amphibious units were stationed on China's east coast:

- The 1st Amphibious Mechanized Infantry Division, 1st Group Army (GA), located in Hangzhou, Zhejiang, in the Nanjing Military Region
- The 14th Amphibious Armored Brigade, 31st Group Army, located in Zhangzhou, Fujian, in the Nanjing Military Region;
- The 124th Amphibious Infantry Division, 42nd Group Army, located in Buluo, Guangdong, in the Guangzhou Military Region.⁴

Like most of the other PLAA divisions, the 1st Amphibious Mechanized Infantry Division and the 124th Amphibious Infantry Division were disbanded and each transformed into two amphibious combined arms brigades. The 14th Amphibious Armored Brigade was also transformed into an amphibious combined arms brigade, and elements of the former 91st Motorized Infantry Division, also in Zhangzhou, were equipped to form a sixth amphibious combined arms brigade. Several units were transferred from their previous garrison locations to new areas, with moves that included

¹ In addition to PLAA forces, PLA AF airborne units likely will be employed to capture inland airfields and perhaps coastal ports early in a joint island landing campaign. Recent evidence of PLAA helicopter and SOF training to secure ports and airfields can be found at 陆航+特战! 强强联手展开夜间兵力投送演练 [“Army Aviation + Special Operations! Join Forces to Launch Night Force Projection Exercise”], *PLA Daily*, October 21, 2021, http://www.81.cn/syjd/2021-10/21/content_10101220.htm and “Z-20 helicopters to play more roles in China's military,” *PLA Daily*, December 19, 2020, http://english.chinamil.com.cn/view/2020-12/19/content_9955018.htm.

² The emphasis on airborne, airmobile, and SOF operations in this paragraph differs from a generic description of a brigade amphibious operation found in Headquarters, Department of the Army, *Chinese Tactics*, August 2021, ATP 7-100.3, sections 7-54 to 7-57, https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN34236-ATP_7-100.3-001-WEB-3.pdf. ATP 7-100.3 contains a wealth of information about PLAA organization, equipment, and tactics.

³ Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2021*, 120. This content is located on p. 118 in the 2020 report.

⁴ Dennis. J. Blasko, “The PLA Army/Ground Forces” in Kevin Pollpeter and Ken W. Allen, eds., *The PLA as Organization Reference Volume v2.0*, Defense Group Inc., 2015, 284-85, <https://apps.dtic.mil/sti/pdfs/AD1082742.pdf>.

crossing former Military Region boundaries. As a result, four amphibious combined arms brigades are subordinate to the Eastern Theater Command and two in the Southern Theater Command, distributed across three group armies.

Exhibit 1. PLAA Amphibious Combined Arms Brigades

Group Army	Brigade Name	Location
72 nd Group Army	5 th Amphibious Combined Arms Brigade	Hangzhou, Zhejiang
	124 th Amphibious Combined Arms Brigade	Hangzhou, Zhejiang
73 rd Group Army	14 th Amphibious Combined Arms Brigade	Zhangzhou, Fujian
	91 st Amphibious Combined Arms Brigade	Zhangzhou, Fujian
74 th Group Army	1 st Amphibious Combined Arms Brigade	Buluo, Guangdong
	125 th Amphibious Combined Arms Brigade	Bao'an, Guangdong

The six new amphibious combined arms brigades are structured similar to heavy combined arms brigades, but have been issued amphibious assault guns capable of swimming in the ocean instead of main battle tanks and amphibious infantry fighting vehicles (IFV)/armored personnel carriers (APC), also capable of swimming, instead of vehicles that sink.⁵ Each amphibious combined arms brigade is composed of the following:

- Four combined arms battalions, each with two amphibious assault gun companies, two amphibious mechanized infantry companies, a firepower company (mortars and man-portable air defense systems—MANPADs), and a service support company (with reconnaissance and engineer platoons)
- One reconnaissance battalion with amphibious recon vehicles, small unmanned aerial vehicles (UAV), and technical reconnaissance systems
- One artillery battalion with amphibious 122mm howitzers, tracked 122mm rocket launchers, and anti-tank guided missile systems
- One air defense battalion with tracked anti-aircraft gun systems, short-range surface-to-air missile systems, and MANPADs
- One operational support battalion with command and control vehicles, electronic warfare systems, engineering equipment, chemical defense systems, and security elements
- One service support battalion with supply, medical, and repair and maintenance units⁶

Within the four amphibious combined arms battalions, each assault gun and mechanized infantry company at full strength is equipped with 14 vehicles, while the firepower and service support

⁵ The 14th is still equipped with some older Type 63A light amphibious tanks, but they likely will be retired in the relatively near future. After reforms, Type-63A have been seen in the report “Amphibious light tanks head to shore in formation,” *PLA Daily*, August 2, 2019, http://eng.chinamil.com.cn/view/2019-08/02/content_9577563.htm and video at “PLA conducts joint multi-dimensional sea-crossing and island-landing drill,” *PLA Daily*, October 13, 2020, http://english.chinamil.com.cn/view/2020-10/13/content_9917986.htm.

⁶ Joshua Arostegui, “PLA Army and Marine Corps Amphibious Brigades in a Post-Reform Military,” paper from CAPS-RAND Conference 2020, forthcoming. See also *Chinese Tactics*, 2-9.

companies add another estimated 15-20 vehicles.⁷ A single amphibious combined arms battalion numbers about 80 total vehicles of all types and an estimated 500-600 soldiers. The other five battalions within the brigade are smaller in personnel numbers and have fewer vehicles, but not all of them can swim, adding an estimated 2,000 or more personnel and probably about another 100 vehicles or so. Thus, a full amphibious combined arms brigade amounts to an estimated 5,000 personnel and over 400 vehicles, numbers important for planning how many amphibious ships or craft are needed to transport a complete unit. In total, the six amphibious combined arms brigades command 24 amphibious combined arms battalions and six reconnaissance battalions—units dedicated to being the first wave of an over-the-beach amphibious assault.

Group Army Support for Amphibious Operations

In any amphibious operation, amphibious combined arms brigades would almost certainly be supported by other elements of the group army to which they belong. As a result of the 2017 structural reforms, group armies have a mostly standardized structure comprising a total of six combined arms brigades and six or seven supporting brigades. Combined arms brigades are categorized as “heavy” (or amphibious) with tracked armored vehicles, “medium” with wheeled armored vehicles, and “light,” which are transported by trucks or, increasingly, *Mengshi* (Warrior) wheeled armored trucks. Though each group army has six combined arms brigades, the distribution of brigade type—heavy, medium, and light—varies among the group armies (usually there are one to four of each type per group army). Non-amphibious brigades from the five group armies in the Eastern and Southern Theaters (71st through 75th) and the three group armies in the Northern Theater Command (78th through 80th) may engage in cross-beach landing training (from PLAA amphibious craft or PLAN landing ships) or sea-transport movements (using commercial civilian ships). These exercises likely replicate the second-echelon of an amphibious landing campaign, coordinated to arrive after first-echelon forces have secured landing beaches or ports.

The supporting brigades in a group army consist of an artillery brigade, air defense brigade, SOF brigade, army aviation (helicopter) or air assault (helicopters and organic infantry) brigade, engineer and chemical defense brigade (five group armies have a separate engineer brigade and chemical defense brigade), and service support brigade. Nearly all of these assets could be used to support amphibious operations.

Group army artillery brigades would play an important role providing fire support for the invasion. As a result of the 2017 reforms, all are now assigned a battalion of 300mm PHL03 long-range multiple rocket launch systems with a range of 70-160 kilometers, depending on the type of munition. When properly positioned along China’s coasts and offshore islands, these weapons can deliver fire on the Penghu Islands and the beaches from Taichung north on the west coast of Taiwan. More recently, the longer-range 370mm PCH191 system has been deployed to the three group armies opposite Taiwan with amphibious combined arms brigades, adding a second long-range multiple rocket launch battalion to their artillery brigades.⁸ This new system greatly expands the area on the mainland from which these units can bring most of Taiwan’s west coast from Tainan north under fire. Group army air defense brigades along the coast will integrate their HQ-16-series medium-range

⁷ Due to the lack of numbers from official Chinese sources, the author uses the word “estimated” to qualify the guesses he made to fill in information gaps throughout this report.

⁸ Liu Zhen, “China’s military gives glimpse of updated long-range rocket system,” *South China Morning Post*, January 9, 2021, <https://www.scmp.com/news/china/military/article/3117044/chinas-military-gives-glimpse-updated-long-range-rocket-system>.

surface-to-air missile and electronic warfare units with PLAAF and PLAN air defenses to protect PLA assembly areas and sea movements in the Taiwan Strait.

PLAA army aviation and/or air assault brigades provide group army commanders the ability to transport troops across the strait and deliver aerial fire support to both amphibious landings and airmobile operations further inland. Army aviation units in group armies frequently train with SOF units and are likely to be employed to insert small SOF teams beyond the beach to capture important inland objectives. PLAA helicopter units train less frequently with infantry units, but army aviation brigades provide the group army commander the option of conducting airmobile operations to deliver up to an infantry battalion to seize key terrain, such as airfields, as well as supporting landing operations with reconnaissance and attack helicopters. Except for the 73rd Group Army Aviation Brigade stationed in Fujian, which could make the round-trip flight to Taiwan from their home airfields, other army aviation brigades likely would be required to pre-deploy to forward airfields and field arming and refueling points prior to the start of a major operation. Some assembly and recovery field sites are likely to be situated on offshore islands closer to Taiwan than those on the mainland. In recent years, PLAA helicopter units have practiced operations from PLAN ships and large commercial ships.⁹ In addition to the army aviation and SOF brigades in the 72nd, 73rd, and 74th Group Armies, several other out-of-area army aviation and SOF brigades are likely to reinforce the cross-strait mission.¹⁰

Other elements of the 72nd, 73rd, and 74th group armies would likely also support the amphibious invasion. Group army engineer units, for example, may facilitate the movement to assembly areas and provide construction and camouflage support for units once they have arrived at points of embarkation. Chemical defense units are capable of generating smoke to conceal key areas at critical periods of an amphibious operation. Service support brigades augment assault units with additional trucks and heavy equipment transporters necessary to move personnel, weapons, and supplies to assembly areas. Their communications, electronic warfare, and UAV units will be integrated with other non-Army assets to maintain command and control, produce non-kinetic combat effects, and gather intelligence.¹¹

No amphibious combined arms brigades are located in the immediate proximity to assembly and embarkation points and therefore will be required to make a land-movement (by road or rail) of hours or days to reach these designated areas. Despite the conventional wisdom that Taiwan is located about 100 miles from the mainland, that distance applies only roughly to the units in Fujian near the coast. Other units will have to make land, sea, or air movements much longer than 100 miles to get into position prior to the start of combat operations or to reach Taiwan. Nonetheless, units have probably practiced many of these pre-assault tasks for many years during the course of routine training.

⁹ “Army helicopters coordinate with naval landing ships in joint training,” *PLA Daily*, September 26, 2021, http://english.chinamil.com.cn/view/2021-09/26/content_10093530.htm and “Multi-type Army helicopters conduct deck-landing training on civilian semi-submersible vessel,” *PLA Daily*, August 21, 2020, http://english.chinamil.com.cn/view/2020-08/21/content_9887106.htm.

¹⁰ It is unlikely that all army aviation or SOF assets will be deployed to support a Taiwan campaign. A few units are likely to remain behind in each Theater Command in case of emergency on another front. Nonetheless, a total of 10 each army aviation and SOF brigades, or two-thirds of available units, likely would be a reasonable estimate for a phased deployment before and throughout the duration of the campaign.

¹¹ Each Theater Army also has a subordinate Electronic Countermeasures Brigade which will be integrated into the campaign as appropriate.

Annual Training Cycle and Amphibious and Sea Transport Training

Based on guidance issued at an end-of-year training conference, all units create annual training plans (or schedules) that include training objectives and dates of major events, especially large exercises and evaluations, training competitions, and training with foreign forces.¹² For most PLAA units (and ground units in the other services such as the PLANMC, PLAAF Airborne Corps, and PLARF), which comprise a high percentage of two-year conscripts (estimated to amount to about 50 percent of personnel in squads, platoons, and companies), unit manning levels and training are dependent upon the annual conscription cycle.¹³

For decades, the PLA inducted new conscripts once a year: new soldiers entered basic training in September just as conscripts who had served two years were demobilized.¹⁴ For the next three months while basic training was underway, only half of a “conscript-heavy” unit’s authorized number of conscripts were available for unit training. Shortly after new soldiers entered their permanent companies in December or January and were integrated into their billets, the annual unit training cycle would begin. However, the new soldiers were not yet fully trained to be part of teams and also had to undergo on-the-job professional training, such as driving or heavy weapons gunnery. As a result, the first four months (roughly through April) of unit training every year started with the basics of team building and improving individual skills necessary for larger, more complex training.

In 2021, the PLA changed from once-a-year conscription to a twice-a-year cycle, in the spring and fall. Depending on how well this policy is implemented, it could significantly raise the level of readiness for “conscript-heavy” units and allow them to take part in more complex training throughout the year.

In addition to developing proficiencies in the normal attack, defend, and withdraw tasks any ground combat unit must master, PLAA amphibious units also must develop an array of specialized skills unique to their amphibious mission. It appears that battalions require about a month of shore-based training to prepare them to accomplish these basic tasks, which are necessary for participation in battalion or larger amphibious exercises.¹⁵ Therefore, every year amphibious units rotate into and out of a limited number of coastal locations on beaches to develop these specialized abilities; they also deploy to inland training areas, often near their barracks, to train on the more general tasks all

¹² “Regular Press Conference of the Ministry of National Defense on January 27,” *PLA Daily*, February 7, 2022, http://eng.chinamil.com.cn/view/2022-02/07/content_10129458.htm; Chen Guoquan and Li Tang, “Chinese Navy to conduct combat drills in South China Sea,” *PLA Daily*, March 23, 2018, http://eng.chinamil.com.cn/view/2018-03/23/content_7982176.htm.

¹³ Aviation units in all services and ship units have higher percentages of officers and NCOs than most Army, Marine, and airborne units and should not be affected as greatly by conscripts coming and going. Accordingly, aviation and ship units should be able to maintain higher levels of readiness and be available for larger and more complex training exercises and real world missions throughout the year than their ground-focused comrades.

¹⁴ Marcus Clay and Dennis J. Blasko, “People Win Wars: The PLA Enlisted Force... and Other Related Matters,” *War on the Rocks*, July 31, 2020, <https://warontherocks.com/2020/07/people-win-wars-the-pla-enlisted-force-and-other-related-matters/>. In 2013, the period of recruitment and basic training was shifted to the fall; prior to that, recruits went to basic training in December and units were undermanned for three months during the winter portion of the training season.

¹⁵ 海训场上砺精兵 [“Sharpening Soldiers at a Maritime Training Field”], *Chinese Central Television (CCTV)*, June 13, 2021, <https://tv.cctv.com/2021/06/13/VIDEWJ5I0ADBZfdN8t7qQHwg210613.shtml?spm=C28340.PbtJD1QH3ct0.ET7FuMZSfFtz.6>.

combined arms battalions must be capable of conducting.¹⁶ Many aspects of amphibious training also are more dependent on weather conditions, especially sea states, than other military training, so that most amphibious and sea movement training occurs from around March to September. The limited window of good weather is a factor that may interfere with units completing all required training tasks every year. In addition to dedicated amphibious units, other PLAA units located near the coast (not equipped with amphibious vehicles) also take part in shore-landing or sea movement training.



Exhibit 2. Elements of a PLAA amphibious combined arms brigade conduct landing drills with PLAN forces (late 2021).¹⁷

The three largest permanent Army amphibious training areas are at Dongshan Island in southern Fujian province, Dacheng Bay near the Fujian/Guangdong provincial border, and near Shanwei, Guangdong province, with several other smaller training areas located along the coast. The Dacheng Bay training area can accommodate an entire amphibious combined arms brigade, while the others appear more suitable for an amphibious combined arms battalion.¹⁸ Basic tasks practiced at shore

¹⁶ Due to the limited number of specialized training areas, the number of units, and the time it takes to prepare a battalion for all tasks necessary to conduct an amphibious assault, it is not clear from open sources whether all 24 amphibious combined arms battalions undergo a full cycle of amphibious training at shore locations every year.

¹⁷ 徐明章, 谢权鑫, 储文祥, 林佳裕 [Xu Mingzhang, Xie Quanxin, Chu Wenxiang, Lin Jiayu], 乘风破浪, 登陆突击——陆军某两栖合成旅与海军某部联合开展渡海登陆作战演练掠影 [“Riding the Wind and Breaking the Waves, Landing Assault—An Army Amphibious Combined Arms Brigade and a PLAN Unit Jointly Conduct a Landing Operation Drill”], 解放军画报 [PLA Pictorial], December 2021, http://www.plapic.com.cn/pub/2022-01/04/content_10120601.htm

¹⁸ For example, an amphibious combined arms brigade can be seen deployed to Dacheng Bay on Google Earth imagery of July 18, 2020 at 23 37 36N 117 13 09E; an amphibious combined arms battalion can be seen on Google Earth imagery of

training areas include personal survival swimming; armored amphibious vehicle (AAV) driving, maintenance, and rescue/recovery; loading and unloading AAVs on PLAA landing craft on shore and/or on PLAN amphibious ships anchored offshore; AAVs entering the sea from shore for landing formation practice or gunnery against shore-based targets; assault landing by AAVs swimming to shore from PLAN amphibious ships; shore landing by troops in small squad-size motor boats; offshore and onshore obstacle clearance; and movement inland to destroy enemy forces. Progressive training for these tasks begins with squad and platoon drills moving up to company and battalion formations. Every training season, new conscript vehicle drivers, gunners, and infantrymen must undergo this training to prepare themselves and the unit for larger battalion evaluation exercises.

In 2020, *PLA Daily* produced a short video of a typical sequence of events in a battalion joint landing exercise supported by brigade, group army, and PLAN assets:

- Day and night loading of PLAN amphibious ships anchored offshore or in port
- Initial reconnaissance of landing beaches by small teams in rubber boats assisted by small UAVs
- Artillery bombardment of landing beaches (in this case, 122mm howitzers and 122mm multiple rocket launchers from the brigade artillery battalion provided fire support¹⁹)
- Unmanned surface vessels clearing obstacles in water on approaches to landing beaches
- Attack helicopters (from the group army aviation brigade) fire on targets near the beach and/or transport helicopters insert troops to objectives beyond the shoreline
- Reconnaissance and engineer troops land in small motor boats to clear beach obstacles
- Amphibious fighting vehicles and assault guns disembark from PLAN amphibious ships to assault the shore and consolidate the beachhead
- Additional SOF troops are inserted by helicopter beyond the beach
- Armored amphibious units move inland to seize key terrain and assigned objectives
- Small unmanned reconnaissance robots advance inland²⁰

Though this demonstration is intended for external audiences, the individual clips and sequence of events conform to PLA amphibious landing doctrine. Similar exercises probably are conducted by many, if not all, amphibious combined arms battalions as a culmination and evaluation of their time spent training at the coast.

Battalions are the building blocks of larger operations, so preparing battalions to perform the technical intricacies of amphibious landings is fundamental to a large-scale joint island landing campaign. Execution of each phase of amphibious operations on their own is extremely difficult, but

Dongshan on August 14, 2019 at 23 40 26N 117 28 10E; and as an example of a smaller training area, an amphibious combined arms battalion can be seen northeast of Shanwei on Google Earth imagery of April 9, 2021 at 22 49 20N, 115 33 44E.

¹⁹ In a real world situation, longer-range artillery/multiple rocket launchers and/or PLAAF, PLAN, and conventional PLARF units would provide fire support for more distant objectives augmented by cyber and electronic warfare operations.

²⁰ “PLA conducts joint multi-dimensional sea-crossing and island-landing drill.” This video did not depict second-wave landings which would deliver artillery and other units and supplies to the beach to support the advance inland.

they must be carefully planned, sequenced, and controlled by staffs at brigade and higher levels to ensure that all assets and capabilities are properly employed and do not interfere with actions taken by brother units. A large-scale joint island landing does not need to be practiced all at the same time and in the same area; furthermore, some aspects, like PLARF strikes, could be computer simulated for staff planning purposes.

Annual amphibious training thus includes a lot of small unit practice before larger exercises can be conducted. Given the total number of amphibious combined arms battalions to be trained and the handful of training areas, at least one unit, usually more, will be conducting some phase of amphibious training throughout the spring and summer, weather permitting. The Chinese military media routinely publicizes much of this training for deterrence and propaganda effects. However, not all exercises are reported in the media, and what is reported often does not identify the units involved, the exercise location, or the length of exercise. Most of the time, not all elements of the exercises are included in media reports—thus, what is seen/reported may not represent the totality of the exercise—and some exercises are reported multiple times by multiple media outlets. File footage from other exercises may be used to fill gaps in current reports and reporting may contain errors in details.

Analysis of PLAA Amphibious and Sea-movement Training in 2021²¹

Openly-reported training events in 2021 illustrate an annual cycle of PLA amphibious and sea-movement training. What follows is an analysis of roughly 32 Army amphibious training events and six sea movement exercises employing civilian roll-on/roll-off (RO-RO) ships reported in the Chinese media (including two entries observed on Google Earth imagery) from March through October 2021.²² This analysis covers both amphibious and non-amphibious units across the PLA, including from other TCs and group armies beyond the 72nd, 73rd, and 74th group armies. The report appendix provides brief descriptions and sourcing data for these events. The events analyzed here certainly do not include all PLAA amphibious and sea movement training (because many events are not covered by the Chinese media), but they represent a significant portion of what occurred during 2021.

At least 10 of the 38 events were covered by multiple Chinese media reports. Of the total, 29 were conducted by units from the Eastern TC, 7 by the Southern TC, and two by the Northern TC. Only nine events revealed training with Navy sealift assets and only three included movement by Army landing craft (two of the PLAA units were not amphibious units).

Six exercises utilized civilian RO-RO ships (four in the Eastern TC and two in the Northern TC, from mid-July to mid-August). Four of the brigades involved in the six movements by civilian RO-RO ships were not amphibious units. The number of sea movement exercises probably was the most significant aspect of the 2021 training season, as they represent the second echelon of an amphibious assault to be landed after first wave forces (including airmobile or airborne troops) capture ports where these ships could unload. These sea movements could have been coordinated with other real troop exercises or during computer simulations to give higher level staffs training in coordinating multiple units in a single larger notional exercise.

²¹ PLAN Marines conducted additional amphibious training not assessed here.

²² A 39th event was reported on November 26, 2021, but other than showing two AAVs in the water, it provided no details and is not included in the analysis to follow.



Exhibit 3. An armored vehicle operated by an Eastern TC amphibious combined arms brigade enters the water from a PLAN landing ship during training (summer 2021).²³

In roughly 20 exercises, no landing ships were observed or mentioned, and amphibious vehicles were observed only swimming to/from shore, sometimes firing at targets on shore. It is possible that sealift was involved in some of these events, but the majority of reported amphibious training portrayed platoons and companies practicing the basics of amphibious movement to shore. These platoons and companies, no doubt, were deployed to amphibious training areas as part of the battalions to which they belong.

Only 11 events were estimated to involve enough forces to be battalion-level exercises, including all six RO-RO sea transport exercises (one of which appeared to involve multiple battalions of an air defense brigade). Thus, as mentioned earlier, this analysis of training activity supports the Department of Defense's conclusion that PLAA amphibious units "conduct regular company- to battalion-level amphibious training exercises," with increasing amounts of helicopter or heavy-lift insertion of personnel to support operations on the beach, but operations rarely involve echelons above battalion.

Without examining the level of amphibious and sea transport training in previous years at the same level of detail, it is not possible to determine if the tempo and content of three dozen exercises

²³ 杨智超, 谢文剑, 徐明章 [Yang Zhichao, Xie Wenjian, Xu Mingzhang], 水际滩头 铁甲冲锋——东部战区陆军某两栖合成旅组织海上训练 [Beachhead and Armored Charge—An Army Amphibious Combined Arms Brigade of the Eastern Theater Command Organizes At-Sea Training], 中国军网 [China Military Online], August 24, 2021, http://www.81.cn/bg/2021-08/03/content_10070944.htm.

conducted in 2021 indicate an increase or decrease over normal training patterns. It also is not possible using only open sources to determine how many of the PLAA's 24 amphibious combined arms battalions achieved their targets for operational readiness. This analysis does demonstrate that amphibious training routinely is undertaken somewhere along China's coast, weather permitting, nearly every week from March until October.



Exhibit 4. Elements of a heavy combined arms brigade of the 72nd Group Army conduct embarkation and sea movement exercises on mixed shipping at a site near Tiegang Harbor, Zhejiang province.²⁴

Conclusion

The modernization of PLAA amphibious and support units demonstrates the *capability* to conduct amphibious operations. Regular amphibious and combined arms training activities cover most of the specialized and general skills required to carry out a landing against Taiwan, despite the constraints of the conscription system. Moreover, group armies could render significant combined arms support to their subordinate amphibious units, especially fire support—which has been enhanced by the recent delivery of advanced multiple rocket launch systems. Furthermore, the number of sea-movement training events identified in 2021 also indicates effort to prepare second echelon forces for delivery to Taiwan.

However, PLAA amphibious capabilities do not necessary translate into the *capacity* to effectively launch a large-scale amphibious assault on Taiwan. The number of units dedicated to the specialized task of amphibious assault is a small fraction (about seven percent) of the number of combined arms brigades in the entire force (six out of 83 total combined arms brigades). Currently, there is no open-source indication of the intention to further increase the number of these forces. Moreover, the PLA

²⁴ Terminal location at the following coordinates (29.483116, 121.483318). 东南沿海，陆军登陆演练! [“The Army's Landing Exercise on the Southeastern Coast!”], 央视军事 [CCTV Military], August 26, 2021, <https://china.huanqiu.com/article/44Vb0jX2UjP>.

lacks the amphibious lift capacity for the approximately 30,000 personnel and more than 2,400 vehicles of the six amphibious combined arms brigades.²⁵

The PLAA may be capable of more modest aims. As the U.S. Department of Defense assessed in its 2021 report:

The PLA is capable of attempting various amphibious operations short of a full-scale invasion of Taiwan. With few overt military preparations beyond routine training, the PRC could launch an invasion of small Taiwan-occupied islands in the South China Sea such as Pratas or Itu Aba. A PLA invasion of a medium-sized, better-defended island such as Matsu or Jinmen is within the PLA's capabilities.²⁶

Some PLAA amphibious units could swim to islands in the Matsu or Jinmen groups, be supported by their own organic artillery, and not require PLAN amphibious lift support. Such a scenario would not require the difficult task of delivering large-volumes of follow-on forces for the push inland. Such an operation on its own, however, likely would not be decisive to force capitulation by Taiwan.

The PLAA's amphibious capacity has been augmented significantly by other capabilities. Since 2017 reforms, new army aviation/airmobile and SOF brigades have strengthened options to support a joint island landing campaign beyond the traditional over-the-beach assault. The number of units capable of long-range rocket, missile, and aerial bombardment in all services also has increased over the past five years. New technologies, like UAVs and robots, are being acquired that may further expand capabilities and complicate Taiwan's defense planning. These capabilities add new dimensions to previous PLA courses of action directed at Taiwan.

²⁵ Quick Look—CMSI's 4–6 May 2021 Conference: "Large-Scale Amphibious Warfare in Chinese Military Strategy," June 14, 2021, <https://www.andrewerickson.com/2021/06/quick-look-cmsi-4-6-may-2021-conference-large-scale-amphibious-warfare-in-chinese-military-strategy-taiwan-strait-campaign-focus/>

²⁶ Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2021*, 117.

Appendix: PLA Army Amphibious Landing and Sea Transport Training in 2021

#	Date	Army Unit	Activity/Estimated Size
1	3/16 (early spring)	72 nd GA	PLAN Type 071 anchored, 4 AAVs in water to rear, M-17 and Z-10 attack helicopter over ship; platoon/company training ²⁷
2	3/29	73 rd GA	9 AAVs (in three photos) swimming to shore in a “maritime driving drill”; company training ²⁸
3	4/06	14 th ACAB 73 rd GA	Type-63A, AAVs, small boats in landing training and inland movement and rail movement; battalion training ²⁹
4	4/9	STC/ Probably 74 th GA	Amphibious battalion in parking area behind beach, no beach activity; battalion training ³⁰
5	4/12	74 th GA	5 AAVs swimming; platoon/company training ³¹
6	4/20	72 nd GA	Trucks and armored vehicles loading/unloading on PLAN LST #917 in port; probably company training ³²
7	Late April	72 nd GA	3 AAVs swim from shore (Dongshan); company training ³³
8	4/29	STC/ Probably 74 th GA	3 AAVs swimming ashore, ~7 on beach, possibly up to 15 in barracks motor pool (Shanwei); amphibious battalion in parking area behind beach; company training ³⁴
9	5/02	74 th GA	14 AAVs swim from shore, fire while swimming, and land on shore; company training ³⁵

²⁷ Photo from 中国军网 [China Military Online], March 16, 2021, http://www.81.cn/jfjbmap/content/2021-03/16/content_284858.htm;

²⁸ “Amphibious Armored Vehicles Move Forward at Sea,” *China Military Online*, April 14, 2021, http://english.chinamil.com.cn/view/2021-04/14/content_10021898_3.htm.

²⁹ This reporting could possibly be file footage from different events. 奋进“十四五”开启新征程 训战一体 锻造两栖作战劲旅 [“Forge Ahead in the ‘14th Five Year Plan’ and Open a New Journey. Integrate Training and Warfighting and Forge an Elite Amphibious Force”], 央视网 – 军事报道 [CCTV – Military Report], April 6, 2021, <https://tv.cctv.com/2021/04/06/VIDEoRVvtwVQmtydt4HL8WYQ210406.shtml>.

³⁰ Google Earth, image 4/9/21, at 22 49 20N, 115 33 44E.

³¹ Image from 中国军网 [China Military Online], April 17, 2021, http://www.81.cn/jfjbmap/content/2021-04/17/content_287333.htm.

³² 直击演训场 多兵种联合 跨海装载航渡演练 [“Witnessing Multi-Arm Joint Training Exercises in Cross-Sea Loading and Transit Drills”], 央视网-军事报道 [CCTV – Military Report], April 20, 2021, <https://tv.cctv.com/2021/04/20/VIDEPAv46kKuqhHi79euLnBy210420.shtml?spm=C53074552346.PlgREq4pd4yq.Ezufm7A0dzE0.63>.

³³ Photo from 中国军网 [China Military Online], May 6, 2021, http://www.81.cn/jfjbmap/content/2021-05/06/content_288597.htm.

³⁴ Google Earth, image 4/29/21, at 22 41 24N 115 25 06E and 22 49 20N, 115 33 44E.

³⁵ 节日我们在战位上 粤东某海域 两栖装甲部队泛海强渡 [“We are at Our Combat Posts During the Festival, Amphibious Armor Units Crossing the Sea in an Area of Eastern Guangdong”], 央视网-军事报道 [CCTV-Military Report], May 2, 2021, <https://tv.cctv.com/2021/05/02/VIDEjZDy2eiO0Y2iUJAUjg5w210502.shtml?spm=C52346.PPajx7cbYDEB.S60782.6>; 直击演训一线:第74集团军某旅 两栖装甲海上协同 精准高效 [“Directly to the Front Line of Exercises, Amphibious Armor of the 74th Group Army Coordinate at Sea Accurately and Efficiently”], 正午国防军事 [Mid-Day National

10	5/11	74 th GA	AAV swimming from PLAN LST (possibly a continuation of #9); platoon or higher training ³⁶
11	5/12	73 rd GA	4 AAVs swimming (no shore, no ships visible); platoon training ³⁷
12	5/17	14 th ACAB 73 rd GA	6-7 Type-63A and AAVs swimming and landing training and movement inland; company training ³⁸
13	5/21	5 th ACAB 72 nd GA	“Amphibious training exercise focused on subjects of basic driving, landing craft ferrying and assault wave formation”; company training ³⁹
14	5/18-21	73 rd GA	<i>Mengshi</i> loads/unloads from Army LCM LD174, as well as a truck from LD173; company training ⁴⁰
15	Mid-May	74 th GA	2 AAVs circle LST “steer on and off a landing ship during the several-week-long realistic combat training”; platoon training ⁴¹
16	5/23	72 nd GA	4 AAVs swimming; platoon training ⁴²
17	5/26	73 rd GA	Multiple AAV swim on/off PLAN LST (similar to training seen at #15); platoon training ⁴³
18	6/07	85 th CAB 72 nd GA	Armored vehicles, trucks and dismounted troops load/unload PLAN LST #982 (Yuting II), #981 (Yuting II), #939 (Yuting I) at port; battalion training ⁴⁴

Defense]. May 3, 2021,

<https://tv.cctv.com/2021/05/03/VIDECeyR4VoKDqMrIFLBW28F210503.shtml?spm=C28340.PbtJD1QH3ct0.ET7FuMZSfFtz.1>.

³⁶ Photo from 中国军网 [*China Military Online*], May 19, 2021, http://www.81.cn/jfjbmap/content/2021-05/19/content_289689.htm;

³⁷ 泛水编波 [“Surface Crossing Wave Formation”], 中国军网 [*China Military Online*], May 14, 2021, http://www.81.cn/jfjbmap/content/2021-05/14/content_289286.htm.

³⁸ 百年铸辉煌 第73集团军某旅一连：铁心向党当先锋 [“A Hundred Years of Glory, First Company of a 73rd Group Army Brigade: Serving as a Vanguard for the Party with Iron Hearts”], 央视网-军事报道 [*CCTV-Military Report*], May 17, 2021, <https://tv.cctv.com/2021/05/17/VIDEWNVi2Rios0GwfepgcjqK210517.shtml?spm=C52346.PPajx7cbYDEB.S60782.2>.

³⁹ “IFVs Conduct Amphibious Training,” *China Military Online*, June 11, 2021, http://english.chinamil.com.cn/view/2021-06/11/content_10047785_2.htm.

⁴⁰ “Military Vehicles Pull Out of RO-RO Vessel,” *China Military Online*, May 27, 2021, http://english.chinamil.com.cn/view/2021-05/27/content_10040485.htm;

⁴¹ AAV loading/disembarking on two PLAN LSTs anchored off Dongshan can be seen on Google Earth image dated 8/19/2019 at 23 41 15N 117 28 55E. This could also possibly be a continuation of training from event #9; “IFVs and Landing Ship Conduct Coordination Training,” *China Military Online*, June 5, 2021, http://english.chinamil.com.cn/view/2021-06/05/content_10044245_2.htm.

⁴² Image from 中国军网 [*China Military Online*], May 27, 2021, http://www.81.cn/jfjbmap/content/2021-05/27/content_290304.htm.

⁴³ “IFVs and Landing Ship in Coordination Training,” *China Military Online*, June 8, 2021, http://english.chinamil.com.cn/view/2021-06/08/content_10045871.htm;

⁴⁴ 直击演训场 装载航渡 锤炼部队两栖作战保障能力 [“Directly to the Training Grounds, Loading and Ferrying Tempers the Troops’ Amphibious Combat Support Capabilities”], 央视网 – 军事报道 [*CCTV-Military Report*], June 7, 2021, <https://tv.cctv.com/2021/06/07/VIDEG2rR4bpkta6540tugXRi210607.shtml>; 东部战区两栖演练 强化跨海作战能力 [“Eastern Theater Command Amphibious Exercises Strengthen Cross-Sea Combat Capabilities”], 央视网 [*CCTV*], June 10, 2021, <https://v.cctv.com/2021/06/10/VIDEelyDFheIbd2pv3F8wwOb210610.shtml>.

19	6/13	14 th ACAB 73 rd GA	12 AAVs landing, 2 nd Battalion month-long amphib training (no landing ships observed); battalion training ⁴⁵
20	6/15	73 rd GA	10 AAVs swimming ashore in line and abreast; company training ⁴⁶
21	7/10	73 rd GA	12 AAVs swimming ashore; company training ⁴⁷
22	7/19	35 th CAB 71 st GA	35 th CAB loading civilian RO-RO <i>Bohai Zhuang Zhu</i> , including Type 96 tanks and Type 86 IFVs. Event included personnel swim training; battalion training ⁴⁸
23	7/23	NTC	Heavy CAB (may be 69 th CAB from Weifang) railroad movement to load RO-RO <i>Bohai Zuan Zhu</i> (Yantai-Dalian); at least battalion training ⁴⁹
24	Late July	91 st ACAB 73 rd GA	“In late July, elements of the 73 rd GA 91 st CAB embarked onto [RO-RO] <i>Bohai Zhen Zhu</i> and <i>SCSC Fortune</i> at Xiamen port for a 4-day training event”; probably at least battalion training ⁵⁰
25	July 27	14 th ACAB 73 rd GA	Battalion Command Post, small boat recon, 40-50 small UAVs, formation of AAVs (three 4-vehicle platoons) (Blue Force on shore), landing included clearing obstacles, no landing ships observe (Dongshan); battalion training ⁵¹

⁴⁵ 海训场上砺精兵 [“Sharpening Soldiers During Sea Training”], 央视网-军营的味道 [CCTV-A Taste of the Military], June 13, 2021, <https://tv.cctv.com/2021/06/13/VIDEWJ5I0ADBZfdN8t7qQHwg210613.shtml?spm=C28340.PbtJD1QH3ct0.ET7FuMZSfFtz.6>.

⁴⁶ “Amphibious Armored Vehicles Make Ways to Beach-Head,” *China Military Online*, July 18, 2021, http://english.chinamil.com.cn/view/2021-07/18/content_10062990_3.htm;

⁴⁷ Image from 中国军网 [China Military Online], July 13, 2021, http://www.81.cn/jfbmap/content/2021-07/13/content_294015.htm.

⁴⁸ 奋斗百年路 启航新征程 牢记初心使命 争取更大光荣 第71集团军某合成旅：传承英雄精神 锻造精兵劲旅 [“Struggle for a Hundred Years, Set Sail for a New Journey, Remember the Original Mission, and Strive for Greater Glory. A Combined Arms Brigade of the 71st Group Army: Inheriting the Heroic Spirit and Forging Elite Forces”], 央视网-军事报道 [CCTV-Military Report], July 19, 2021, <https://tv.cctv.com/2021/07/19/VIDEPnwe0SMxNGTw5Y20sKvm210719.shtml?spm=C53074552346.PLgREq4pd4yq.0.0>.

⁴⁹ 刘海鹏, 胡兴, 李游 [Liu Haipeng, Hu Xing, Li You], 铁水联运 探索陆海投送保障“新模式” [“Combined Rail and Waterway Transport Explores a ‘New Model’ of Land and Sea Delivery Support”], 中国军网八一电视 [China Military Online Bayi TV], July 23, 2021, http://tv.81.cn/jq360/2021-07/23/content_10066178.htm.

⁵⁰ 赵亚雄, 范道恒, 徐定海 [Zhao Yaxiong, Fan Daoheng, Xu Dinghai], 军地协同 提升两栖部队跨海投送能力 [“Military-Civilian Coordination to Enhance the Ability of Amphibious Forces to Cross the Sea”], 中国军视网 [js7tv.cn], August 16, 2021, http://www.js7tv.cn/video/202108_255176.html.

⁵¹ This same exercise was reported again on 8/31/21, and noted “recent beach raid training exercise... amphibious landing drills on subjects of landing craft ferrying, assault wave formation, beach-landing, obstacle breaking and so on.” 第73集团军某两栖重型合成旅 全记录：东南沿海联合演练 渡海登陆 119高地 [“Full Record of a Amphibious Heavy Combined Arms Brigade of the 73rd Group Army: Joint Drills Along the Southeast Coast, Crossing the Sea and Landing on Hill 119”], 央视网-正午国防军事 [Mid-Day National Defense], July 27, 2021, <https://tv.cctv.com/2021/07/27/VIDEamwPfiwayHIDbs2qbIE210727.shtml>; 解放军东南沿海越海夺岛登陆演练 台媒：剑指台湾 [“The People’s Liberation Army Crosses the Sea and Seizes an Island in a Landing Exercise, Taiwanese Media: They are Targeting Taiwan”], 环球网 [Global Times], July 28, 2021, http://www.xinhuanet.com/mil/2021-07/28/c_1211262923.htm; “Amphibious Armored Vehicles Make Ways to Beach-Head,” *China Military Online*, August 31, 2021, http://english.chinamil.com.cn/view/2021-08/31/content_10083283.htm.

26	8/04	2 nd CAB 71 st GA	Night railroad movement, tanks/armored vehicles, trucks daytime load/unload RO-RO <i>Bohai Zuan Zhu</i> , movement from ETC to NTC; at least battalion training ⁵²
27	8/4	73 rd GA	14-15 small boats in shore assault and obstacle demolition; company training and evaluation ⁵³
28	Early August	34 th CAB 72 nd GA	5 days/nights, <i>Mengshi</i> , armored vehicles, port loading, 3 Army LCM LDX65; battalion training ⁵⁴
29	8/9	73 rd GA	5 AAVs disembark/embark on PLAN landing ship and launch at sea to circle ship and re-load; company training ⁵⁵
30	8/11	NTC, Air Defense Brigade 79 th GA	Troops, at least two battalions towed anti-air artillery, HQ-16, formation on dock, load/unload COSCO <i>Yong Xing Dao</i> RO-RO in Dalian; brigade training ⁵⁶
31	(Mid-summer) 8/12	73 rd GA	7 AAVs swim ashore abreast, 12 AAVs swim ashore in line; (likely a continuation of #29); company training ⁵⁷
32	8/17	5 th ACAB 72 nd GA	17 AAVs swimming, amphib truck swims ashore, no landing ships observed; company training ⁵⁸

⁵² 北部战区 直击演训场 军地联动 探索陆海投送无缝衔接新模式 [“Directly to the Training Ground in the Northern Theater Command, Joint Military-Civilian Movement Explores a New Mode of Seamlessly Connecting Land and Sea Delivery”], 央视网-军事报道 [CCTV-Military Report], August 4, 2021, <https://tv.cctv.com/2021/08/04/VIDERiyXyN3x702QuMbb6EP2210804.shtml?spm=C28340.PbtJD1QH3ct0.ET7FuMZSfFtz.9>.

⁵³ Image from 中国军网 [China Military Online], August 8, 2021, http://www.81.cn/jfjbmap/content/2021-08/08/content_295982.htm. The same footage of the August 4, 2021 event was included in reports on 25 August and 11 October. 燃! 抢滩登陆演练现场画面 [“Burn! The Scene of a Beach Landing Exercise”], 央视网新闻 [CCTV News], August 25, 2021, <http://m.news.cctv.com/2021/08/25/ARTIXd5ZnaxisrgW1c9sNCHk210825.shtml>; 赵亚雄, 方翰毅, 卞建行, 姚健, 宋凯琦 [Zhao Yaxiong, Fang Hanyi, Bian Jianxing, Yao Jian, Song Kaiqi], 闽南海域, 抢滩登陆演练正在展! [“In Southern Fujian Waters, a Beach Landing Exercise is Underway!”], 中国军网八一电视 [China Military Online Bayi TV], October 11, 2021, http://tv.81.cn/jq360/2021-10/11/content_10097575.htm.

⁵⁴ 直击演训一线:第 72 集团军某合成旅 5 天 5 夜远程航渡 锤炼海上作战保障能力 [“Directly to the Front Line of Training, a Combined Arms Brigade of the 72nd Group Army Conducts a Five-Day and Five-Night Long-Distance Voyage to Temper Maritime Combat Support Capabilities”], 央视网-正午国防军事 [Mid-Day National Defense], August 5, 2021, <https://tv.cctv.com/2021/08/05/VIDEPpuHPreiW8HYi7UBIFFq210805.shtml?spm=C28340.PbtJD1QH3ct0.ET7FuMZSfFtz.3> and 东南沿海, 陆军登陆演练! [“The Army’s Landing Exercise on the Southeastern Coast!”], 央视军事 [CCTV Military], August 26, 2021, <https://china.huanqiu.com/article/44Vb0jX2UjP>.

⁵⁵ “Amphibious IFVs Practice Maritime Driving Skills,” *China Military Online*, August 27, 2021, http://english.chinamil.com.cn/view/2021-08/27/content_10081994.htm.

⁵⁶ 吴旭升, 杨兴博, 闫锡友, 王峰 [Wu Xusheng, Yang Xingbo, Yan Xiyu, Wang Feng], 准备登船! 集群跨海投送演练开始! [“Ready to Embark! Grouped Cross-Sea Delivery Exercise Begins!”], 中国军网八一电视 [China Military Online Bayi TV], August 11, 2021, http://tv.81.cn/svtj-tupian/2021-08/11/content_10074519.htm.

⁵⁷ Image from 中国军网 [China Military Online], August 12, 2021, http://www.81.cn/jfjbmap/content/2021-08/12/content_296304.htm; Image from 中国军网 [China Military Online], August 16, 2021, http://www.81.cn/jfjbmap/content/2021-08/16/content_296598.htm.

⁵⁸ 谢权鑫, 樊俊鹏, 巩沛文, 储文祥, 王恒 [Xie Quanxin, Fan Junpeng, Gong Peiwen, Chu Wenxiang, Wang Heng], 超燃! 水陆两栖卡车海上装备抢救演练! [“On Fire! Amphibious Truck in At Sea Recovery Drill!”], 中国军网八一电视 [China Military Online Bayi TV], August 17, 2021, http://tv.81.cn/jq360/2021-08/17/content_10076962.htm.

33	8/17	74 th GA	May be light CAB, 5 Army LCMs land on beach, 10 small boats; battalion training ⁵⁹
34	8/17	ACAB 73 rd GA	122mm self-propelled arty, loading/landing RO-RO <i>Bohai Zhen Zhu</i> at ports; battalion training ⁶⁰
35	8/22	ETC	PLAN LCAC w/elements of unidentified Army brigade ⁶¹
36	9/4	72 nd GA	“military helicopters and amphibious assault vehicles attached to a brigade of the army under the PLA Eastern Theater Command conduct coordination in a maritime training exercise on September 4, 2021” with three PLAN LSTs; battalion training ⁶²
37	9/9	ETC	6 AAVs swimming in line; company training ⁶³
38	9/14	73 rd GA	New soldier training 3 AAVs swimming firing drill, 8 AAVs swimming (Dongshan); company training ⁶⁴
39	11/26	Unidentified army brigade	2 AAVs swimming, no details provided; platoon training ⁶⁵

⁵⁹ 直击演训场 渡海登陆 检验两栖作战能力 [“Directly to the Training Ground to Cross the Sea and Land, Testing Amphibious Combat Capabilities”], 央视网-军事报道 [CCTV-Military Report], August 17, 2021, <https://tv.cctv.com/2021/08/17/VIDEAOvJHQvZya1fyG5XjqCR210817.shtml?spm=C52346.PiumOrlYLNUM.E0VXtwLj8YU7.12>.

⁶⁰ 直击演训场 军地协同 提升跨海投送能力 [“Directly to the Training Ground, Military-Civilian Coordination to Improve Cross-Sea Delivery Capabilities”], 央视网-军事报道 [CCTV-Military Report], August 17, 2021, <https://tv.cctv.com/2021/08/17/VIDEEpnow4vveqIcoXVYIB4P210817.shtml?spm=C52346.PiumOrlYLNUM.E0VXtwLj8YU7.13>.

⁶¹ Image from 中国军网 [China Military Online], August 25, 2021, http://www.81.cn/jfjbmap/content/2021-08/25/content_297467.htm.

⁶² “Amphibious Assault Vehicles in Maritime Training Exercise,” *China Military Online*, September 12, 2021, http://english.chinamil.com.cn/view/2021-09/12/content_10088509.htm;

⁶³ 泛水编波 [“Assault Wave Formation”], 中国军网 [China Military Online], September 12, 2021, http://www.81.cn/jfjbmap/content/2021-09/12/content_298856.htm.

⁶⁴ 赵亚雄, 范道恒, 刘鹏, 赖坤, 王孝尊, 骆龙飞 [Zhao Yaxiong, Fan Daoheng, Liu Peng, Lai Kun, Wang Xiaozun, Luo Longfei], 新兵来了! 海上实弹射击初体验 [“New Recruits are Here! First Experience of Live-Fire at Sea”], 中国军网八一电视 [China Military Online Bayi TV], September 23, 2021, http://tv.81.cn/jq360/2021-09/23/content_10092493.htm; Image from 中国军网 [China Military Online], September 23, 2021, http://www.81.cn/jfjbmap/content/2021-09/23/content_299601.htm;

⁶⁵ Image from 中国军网 [China Military Online], November 26, 2021, http://www.81.cn/jfjbmap/content/2021-11/26/content_303946.htm.

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