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Thwarting Communications Blackout

Protecting Taiwan's Information and Communication Networks from China's Attempts to Cut Them Off

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Executive Summary

CONTROL OVER THE PHYSICAL MEANS of transmitting information—the lifeblood of modern societies—has become a central area of contestation between Taiwan and the United States on one side and China on the other. Both Beijing and Taipei view information and communication networks as vital, perhaps decisive, aspects of a cross–Taiwan Strait contest. This report explores three areas that would be pivotal in the battle for information control across the Taiwan Strait: undersea cables, satellite communication systems, and the electromagnetic spectrum.

First, Taiwan is primarily connected to the outside world by 15 undersea cables, each roughly the width of a garden hose. As an island with a high-tech, trade-oriented economy, these cables are an essential component of its infrastructure. From 2022 to 2025, Taiwan suffered a total of 28 human-caused subsea cable incidents, three of which were suspected or confirmed to be deliberate sabotage by the People's Republic of China (PRC).

The prospect of more cable cuts looms large, and Taiwan has taken steps to address several dimensions of the problem and provide new response options. Together, these initiatives aim to harden cable infrastructure, strengthen legal frameworks, improve monitoring, and field capabilities that demonstrate Taiwan's political will to act while avoiding uncontrolled escalation.

The ultimate impact of any undersea cable attack depends on scale and location. China cannot cut off Taiwan from the global internet unless PRC forces cut through all of Taiwan's cables, although severing any of them reduces bandwidth and increases latency. Beijing might be restrained, however, from going too far by its desire to preserve some connectivity as a pathway through which to transmit cyberattacks and disinformation.

Next, Taiwan is looking to a portfolio of satellite constellations to provide backup communication options in case China cuts Taiwan's cables. But political and regulatory hurdles prevent Taiwan from relying on the dominant provider, Starlink. Commercial and indigenous alternatives are progressing, but they still have a long way to go to achieve sufficient size. A functional backup also requires access to ground stations and provider-specific terminals on the user end.

Even if a full-scale satellite communication system is in place, undersea cables will continue to outstrip satellite bandwidth by several orders of magnitude, underscoring that satellites can only supplement, not replace, Taiwan's undersea cables. In a crisis, China would likely target communication satellites in a variety of ways, but Beijing might choose restraint given the escalatory potential and its own reliance on space-based infrastructure.

THIS REPORT EXPLORES THREE AREAS THAT WOULD BE PIVOTAL IN THE BATTLE FOR INFORMATION CONTROL ACROSS THE TAIWAN STRAIT: UNDERSEA CABLES, SATELLITE COMMUNICATION SYSTEMS, AND THE ELECTROMAGNETIC SPECTRUM.

Finally, China will increasingly contest the electromagnetic spectrum using electronic warfare (EW) techniques. EW takes many forms but generally falls into three categories of support, attack, and protection. In prior eras, EW was primarily a tool for narrow tactical tasks such as defending aircraft against missile attacks. Today, EW shapes the entire battlefield and is much more intricate and dynamic. EW attacks can target navigation systems, such as GPS; radars for monitoring airspace; and communication networks, including the satellite communication systems discussed earlier.

To date, China has not yet conducted EW attack operations at a significant scale to pressure Taiwan. But Beijing has used EW in other areas, such as the South China Sea, and is gleaning new operational insights from recent conflicts, especially Russian fighting in Ukraine. In the future, China could ramp up EW pressure on Taiwan through targeted operations designed to harass and interfere with specific aircraft or places, such as critical ports or cable landing stations.

The United States, Taiwan, and other like-minded partners should take action across the following three categories to better protect Taiwan's information and communication networks and thwart any future communications blackout.

Undersea Cables

- Taiwan should consider mandating that new or repaired cable projects use physical hardening measures to make them more difficult to interfere with.
- The United States and Taiwan should deepen cooperation on maritime intelligence and monitoring.
- The United States should compile a dataset documenting cable-cutting incidents and, where intelligence supports this conclusion, formally attribute sabotage incidents.
- Taiwan should continue to enhance maritime law enforcement and response in line with its recent legal and regulatory revisions and ensuing changes to practice.

Satellite Communications

- The United States should clarify and, where needed, amend, applicable laws and regulations to ensure that companies that sell defense services to the U.S. government, and have an agreement with an ally or partner to provide such services, can be compelled by the U.S. government to continue to serve such ally or partner, under critical circumstances and in accordance with U.S. national security interests.
- Washington should support Taipei's efforts to develop a non-Starlink option for satellite communications.
- The United States and Taiwan should, as part of their occasional high-level, unofficial consultation and planning meetings, develop a plan for how to manage internet bandwidth during a situation where China (or any other actor) disrupts service from Taiwan's undersea cables.
- Washington and Taipei should continually monitor technological breakthroughs and maturation in satellite communications.

Electronic Warfare

- Taiwan should leverage its growing relationships with European countries, particularly the Nordic and Baltic states, to learn about their experiences with and responses to Russian EW activities interfering with both civilian and military operations.
- Taiwan should conduct an exercise with civilian aviation and maritime authorities to practice operating under conditions where satellite navigation services are disrupted.
- Washington and Taipei should study the viability for both civilian and military applications of creative workarounds, such as enabling key systems to use China's global navigation satellite system, BeiDou, or Russia's Global Navigation Satellite System (GLONASS).
- Both the U.S. and Taiwan militaries need to prepare for, and practice operating in, an environment where capabilities that depend on the electromagnetic spectrum to function will be severely degraded, if not outright denied.
- The United States and Taiwan should jointly develop plans to go on EW offense against Chinese forces in a contingency.

Introduction

CONTROL OVER THE PHYSICAL MEANS of transmitting information—the lifeblood of modern societies—has become a central area of contestation between Taiwan (formally, the Republic of China or ROC) and the United States on one side, and China (formally, the People's Republic of China or PRC) on the other. Whichever side gains the upper hand in this struggle will enjoy tactical and operational advantage—and could even decide strategic-level outcomes for the security environment across the Taiwan Strait.

Both Beijing and Taipei view information and communication networks as vital, perhaps decisive, aspects of a cross-Strait contest. At some point in the future, China might try to assert physical control (as opposed to cyber control) over Taiwan's information environment. Beijing could even try to create a communications blackout or information blockade of Taiwan. In doing so, China would seek to impede government and military communications about how to respond and sow confusion and fear among Taiwan's citizens.

Beijing could also try to block Taiwan's leadership from making an appeal for help to the outside world. China has watched closely how Russia's inability to cut off Ukraine's communications has allowed Kyiv to rally domestic and international support for its defense. Taiwan's civilian and military leaders understand Beijing's views and intentions. In response, Taipei has developed a plan to prevent and respond to—and thereby deter—China's attempts at imposing a communications blackout. The plan, known as Whole-of-Society Defense Resilience, lists protecting information networks as one of its five pillars.[1]

This report explores three areas that would be decisive in the battle for information control across the Taiwan Strait: undersea cables, satellite communication systems, and the electromagnetic spectrum. In each of these areas, China is on offense, while Taiwan, along with the United States and other partners, is on defense. But both Beijing and Taipei are taking the initiative, resulting in a complex game of measure and countermeasure that spans civilian and military domains.

The text proceeds in four parts. First, it explores the role of the undersea cables through which Taiwan communicates with the outside world. Then, the report considers satellite communication systems that could provide a backup to undersea cables. Third, it looks at the electromagnetic spectrum and efforts to control or deny it through electronic warfare (EW). The report concludes with recommendations for policymakers in Washington and Taipei as they work to uphold peace and stability across the Taiwan Strait and thwart Beijing's attempts to assert control over Taiwan through coercion or force.

The analysis delves into the specifics of each area to explain how technical attributes shape their geopolitical contours. In doing so, it aims to inform broad policy conversations with critical context that might otherwise be confined to niche technical discussions. The report explores these central topics as they play out in the gray zone between peace and war, as well as how they might unfold during a higher-level crisis on the escalation ladder toward all-out war.[2] Using this approach avoids linking the report's analysis too closely with any one of many possible future scenarios at the expense of others.

Finally, a note about the report's scope: China's overall conception of the role of information in warfare extends beyond physical control over the means of transmitting information to include cyber warfare and so-called cognitive warfare. The latter is a catchall term for psychological warfare, disinformation, and misinformation. The authors chose not to address the latter topics in this report due to length restrictions and because they are well covered elsewhere.

Undersea Cables

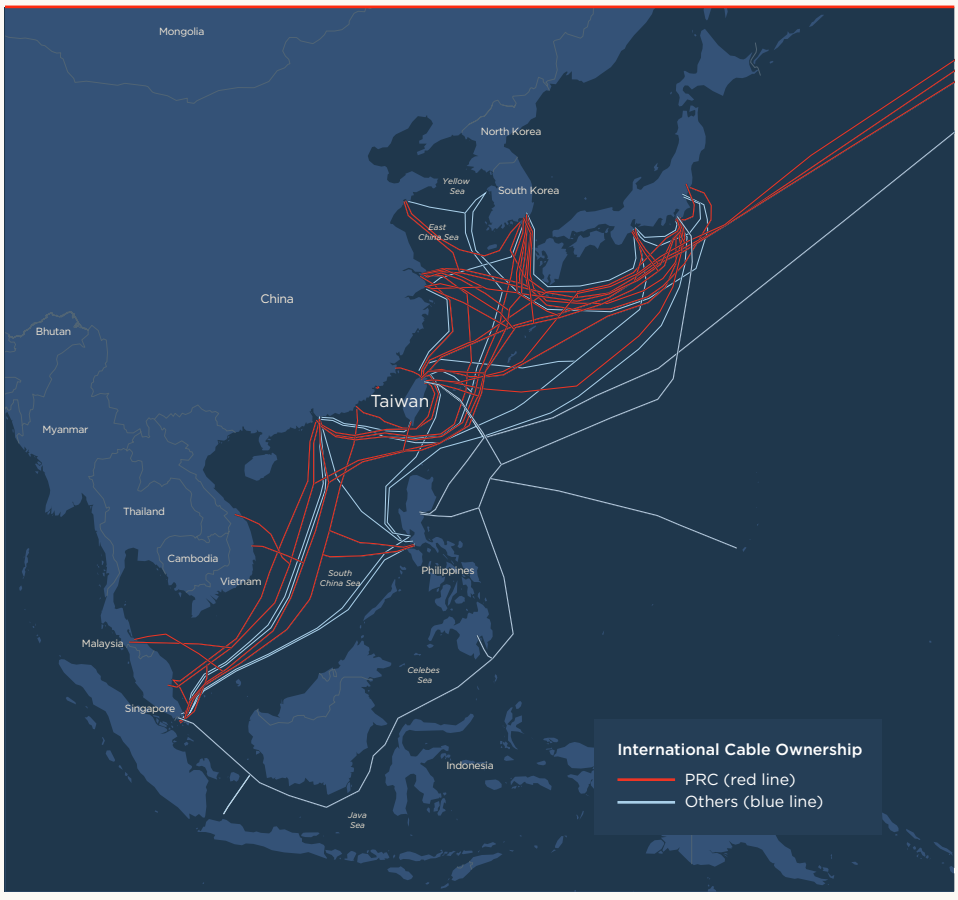
TAIWAN'S COMMUNICATIONS TRAVEL TO THE OUTSIDE WORLD primarily through undersea cables, which are the physical manifestation of the internet. Each cable consists of bundles of hair-thin strands of glass sealed in silicone, armored in steel, sheathed in copper, insulated with polyethylene, protected by more galvanized steel armor, and finally wrapped in tar-soaked nylon yarn.[3]

While the entire cable's diameter is roughly the size of a garden hose, its diminutive size masks its immense importance.[4] Globally, undersea cables carry 99 percent of internet traffic and facilitate more than $10 trillion in financial transactions every day.[5] They underpin virtually every digital interaction, from essential functions such as banking and military communications to everyday activities like streaming video and exchanging emails. As an island with a high-tech, trade-oriented economy, undersea cables play a vital role in the functioning of Taiwan's society.

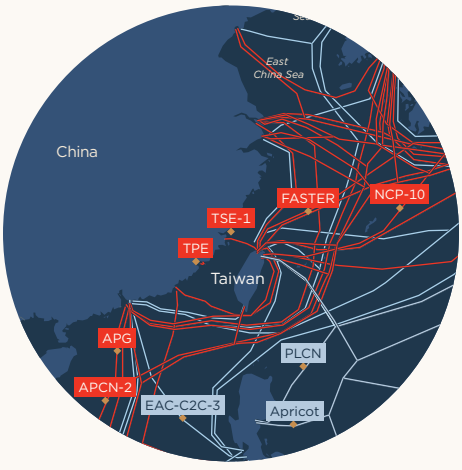
Fifteen undersea cables connect Taiwan to the rest of the global internet through links to Singapore, Japan, the Philippines, the United States, Hong Kong, and the PRC. A 16th cable is being built that will link Taiwan (and the Philippines) to the United States via Guam.[6] In addition, Taiwan has 10 domestic cables that link the main island of Formosa to outlying islands, including Kinmen, Matsu, and Penghu. All these wires require cable landing stations where they come ashore and connect to onshore network infrastructure. Taiwan operates seven international cable landing stations, and an eighth is under construction.[7]

Undersea cables are vulnerable to both accidental and intentional disruptions due to cable damage or severing. The world's more than 600 undersea cables suffer approximately 150 to 200 incidents annually.[8] Eighty percent of those are caused by accidental human activity, mostly from fishing and shipping vessels' anchors snagging wires, according to the International Cable Protection Committee.[9] The primary security concern for Taiwan, however, is deliberate action by PRC entities (or PRC-*directed* entities) to damage or cut its undersea cables. Characterizing actions as deliberate in this context includes tactics designed to either look accidental or complicate attribution and ensure plausible deniability.

Figure 1: Undersea Cables That Connect Taiwan to the Global Internet[10]



Taiwan's Ministry of Digital Affairs (MODA) lists 15 undersea cables that connect Taiwan to the rest of the global internet.[11] This map and associated appendix consolidate related MODA listings into 12 cable systems, as the Fibre-Optic Link Around the Globe (FLAG) North Asia Loop and the REACH North Asia Loop are one system, and the East Asia Crossing (EAC)-1 and EAC-2 later merged with city-to-city cable system in 2007 to form the EAC-C2C cable system.[12] Nine entries are owned or partially owned by Chinese companies. For more information, see the appendix.



Recent Incidents of Subsea Sabotage

Taiwan has suffered 28 human-caused subsea cable incidents in total from 2022 to 2025.[13] Three of those incidents were suspected or confirmed to be deliberate sabotage. The first incident occurred in February 2023. Over the course of six days, two Chinese vessels were suspected of severing the only two cables connecting Taiwan's Matsu Islands to Formosa.[14] The incident left Matsu's 14,000 residents without internet access for six weeks, forcing them to rely on microwave radio transmission and, in some cases, Chinese subscriber identity module (SIM) cards to stay online.[15]

The second incident demonstrated how China's tactics are growing increasingly sophisticated. On January 3, 2025, the *Shunxing 39*, a Cameroonian-flagged, Hong Kong–owned cargo ship, appeared to have severed the Trans-Pacific Express (TPE) cable near Keelung, on Taiwan's northern coast. The vessel was equipped with two separate automatic identification systems (AIS) and switched off its *Shunxing 39* signal as it approached and passed directly over the TPE cable. Moments after the cable went offline, the vessel reactivated its AIS—this time identifying itself as the *Xingshun 39*—on the opposite side of the newly-severed cable. Taiwan's Coast Guard responded quickly to intercept the vessel, but inclement weather prevented authorities from boarding the ship and obtaining necessary evidence.[16] The vessel ultimately escaped detention and continued its route toward South Korea.[17]

The third incident happened barely a month later, in February 2025, when the Togo-flagged, Chinese-owned *Hong Tai 58* dropped anchor and severed the Tai-Peng No. 3 (TP3) cable connecting the Penghu Islands to Formosa. Through AIS, the ship initially identified itself as the *Hong Tai 58*—though *Hong Tai 168* was written on the hull—and the crew used the latter designation for radio communication. Meanwhile, the vessel's International Maritime Organization (IMO) number claimed a third identity as the Hong Kong–owned *Jinlong 389*. This time, Taiwan's Coast Guard responded more effectively. It swiftly intercepted the *Hong Tai 58*, detained its crew, and subsequently arrested, prosecuted, convicted, and sentenced the ship's captain to three years in prison.[18]

Two Taiwan Coast Guard personnel board the Togo-flagged, Chinese-owned Hong Tai 58*, suspected of damaging the Tai-Peng No. 3 (TP3) undersea cable connecting Formosa and Penghu Island, in waters off Penghu, Taiwan, on February 25, 2025. (Taiwan Coast Guard/Anadolu via Getty Images)*

Each of these incidents aligns with China's established playbook for maritime coercion, both around Taiwan and in other disputed areas such as the South China Sea. That playbook includes deceptive tactics to complicate monitoring, response, and attribution. Tactics include turning AIS signals on and off rather than broadcasting continuously, or outright spoofing—that is, purposefully transmitting false AIS signals.[19] Chinese commercial and fishing ships often fly flags of convenience, which are registrations to countries with loose maritime regulations or lower taxes rather than the genuine origin of a vessel or its crew. Flags of convenience are common for legitimate operations, but they have the practical effect of further complicating attribution in cases of cable sabotage. Beijing also employs all types of ships—from fishing vessels to up-armored maritime militia, uniformed coast guard, and People's Liberation Army (PLA) Navy ships—in a coordinated strategy to advance its aims below the level of armed conflict. Those forces threaten Taiwan's undersea cables, and subsea sabotage is just one of the many pillars of China's maritime pressure campaign against Taiwan.

Taiwan's Efforts to Protect Its Undersea Cables

Taiwan faces an uphill battle when it comes to protecting its undersea cables. The challenge is asymmetric, because China can sabotage cables relatively easily, conduct operations using informal forces, and strike in many disparate places at nearly any time. Taiwan has taken steps to address several dimensions of the problem and provide new response options. Together, Taiwan's initiatives aim to harden cable infrastructure, strengthen legal frameworks, improve monitoring, and field capabilities that demonstrate Taiwan's political will to act while avoiding uncontrolled escalation.

Recognizing its vulnerabilities, Taiwan's Ministry of Digital Affairs (MODA) has launched initiatives to harden and disperse cable landing infrastructure.[20] In 2024, the MODA introduced a $60.4 million (NT$190 million) subsidy to expand the number and geographic distribution of landing stations and backup facilities.[21] The initiative aims to decentralize Taiwan's heavily concentrated cable infrastructure in the north and reinforce physical and cybersecurity protections.[22]

In recent years, Taiwan has also expanded legal authorities for apprehending and punishing perpetrators trying to sabotage undersea infrastructure. Following the February 2023 Matsu incident, then-President Tsai Ing-wen's administration amended Taiwan's Telecommunications Management Act to specifically criminalize physical attacks against submarine cable landing stations, connected cables, and satellite communication centers. Violators can face up to 10 years in prison and up to $1.59 million (NT$50 million) in fines if attacks endanger national security or social stability.[23] The deterrent briefly worked: Only four disruptions were recorded in 2024, none of which appeared intentional.

> Together, Taiwan's initiatives aim to harden cable infrastructure, strengthen legal frameworks, improve monitoring, and field capabilities that demonstrate Taiwan's political will to act while avoiding uncontrolled escalation.

The seemingly intentional incidents in early 2025 prompted deeper reform and sustained enforcement.[24] In September 2025, under President Lai Ching-te, the Executive Yuan proposed amendments to a collection of relevant laws that would mandate that vessels keep AIS transponders active at all times and authorize the seizure of ships and equipment involved in tampering of cables, regardless of ownership. Penalties could include one to seven years in prison plus fines of up to $320,000 (NT$10 million) for intentional sabotage, with life imprisonment and a $3.2 million (NT$100 million) fine if perpetrators cause a disaster or serious injury.[25] The Legislative Yuan has since passed said amendments.[26]

Enhanced maritime surveillance capabilities are another key pillar of Taiwan's cable protection strategy. The Agriculture Ministry is subsidizing AIS installations on 5,000 small fishing boats to help discern which are from Taiwan and which are not.[27] Meanwhile, Taiwan's Coast Guard Administration (CGA) blacklisted 96 China-linked "shadow" vessels—ships often flying flags of convenience and frequently engaged in illicit behavior—and shares positional data with like-minded partners.[28] The CGA now conducts continuous 24-hour patrols along major cable routes. It receives notifications from the Submarine Cable Automatic Warning System, an AIS-based monitoring system that detects vessels slowing or anchoring within one kilometer of protected corridors.[29] Warnings to vessels are issued automatically; if ignored, coast guard cutters are dispatched to intercept.

Taiwan's rapid-response capabilities have become faster and more effective. The CGA's effectiveness was demonstrated in its swift response to the February 2025 *Hong Tai 58* incident, when authorities successfully intercepted, detained, and secured the conviction of the vessel's captain. And in late October 2025, within six minutes of a suspicious vessel being identified by radar and AIS, the coast guard dispatched patrols to deter potential sabotage.[30] Taiwan's navy also remains prepared to provide backup support to the coast guard during cable incidents, ready to coordinate closely and respond promptly whenever threats exceed CGA capacity.[31]

Sustaining these efforts, however, requires investment. In 2025, the Legislative Yuan appropriated $17.92 billion (NT$550 billion) for national resilience, earmarking $972 million (NT$29.6 billion) specifically for the Ocean Affairs Council and for CGA modernization.[32] CGA spending covers personnel training, upgrades to coast guard vessels, acquisition of technologies to safeguard Taiwan's maritime safety, and shipbuilding.[33]

Gauging the Impact of Cutting Undersea Cables

The scale and location of sabotage determine the impact of any attack. Severing one or even a few cables imposes the costs of making slow, complicated repairs onto Taiwan. And without its own cable repair vessel, Taiwan must rely instead on foreign repair ships based in Japan, Singapore, or the Philippines, resulting in prolonged downtime after disruptions. In wartime conditions, repair would be all but impossible if China sought to contest it. But such a small number of cuts alone does not entirely sever Taiwan's access to the internet. Data flows are instead rerouted, resulting in slower internet speeds and higher latency but not a total loss of service. Taiwan's outlying islands are an exception to this, as each is connected by only one or two cables.[34]

Going forward, China will likely continue targeting Taiwan's undersea cables as part of its pressure campaign against Taipei. Beijing might be restrained, however, from going too far by its desire to preserve some connectivity as a pathway over which to transmit cyberattacks and disinformation into Taiwan. Completely cutting off Taiwan would also cut off those avenues of attack. China could sever all cables except those that directly connect Taiwan to the PRC; Beijing could then potentially extend some or all of its information control and surveillance apparatus, including the Great Firewall, to Taiwan's domestic internet.

Alternatively, China could set aside any reservations about cutting all of Taiwan's cables if it decides to exert maximum pressure on Taiwan or attempt a cross-Strait invasion. Severing all of Taiwan's cables at once would be difficult, but it is feasible and could become easier as new technologies, such as sophisticated uncrewed underwater vehicles, emerge. In March 2025, one of China's scientific research labs unveiled a compact deep sea cable-cutting device operable by both crewed and uncrewed submersible vehicles at depths of up to 4,000 meters.[35] Underwater drones, working either alone or in conjunction with surface vessels, could enable China to attack all of Taiwan's cables at once, disrupting external communications in advance of a planned military operation.

Satellite Communications

THE VULNERABILITY OF TAIWAN'S UNDERSEA CABLES has led its government to seek options to support its strategy of "backup, backup, and backup again."[36] One backup communication system, which uses microwave radio, is already in place.[37] But microwave systems are limited by the need to have a clear line of sight.[38] In addition, Taiwan's microwave radio systems only provide enough bandwidth to fill in for Taiwan's outlying islands; they cannot supply sufficient bandwidth to fulfill the vastly larger needs of the people on Formosa.

Taipei now looks to satellite communication systems as another potential backup solution that can be expanded to fill more of the gap Taiwan would face if its subsea cables were damaged. Satellite communication systems transmit radio waves from one or more satellites to terminals where the user on the ground can connect them to their internet modem. To complete the system, ground stations on either end provide data uplink (transmitting data from the ground to the satellite) and downlink (sending data from the satellite back to the ground station or receiver).[39]

Communication satellites are usually categorized by their orbit types and come in three primary categories. The first category is satellites in geostationary orbit (GEO) around 35,790 km (22,240 mi) above Earth.[40] They rotate at a speed that allows them to stay aligned with Earth in a fixed position directly above a single ground location, hence the "stationary" in the name. The second category is medium Earth orbit (MEO) satellites, which fly at 2,000–35,800 km (1,243–22,236 mi) above Earth.[41] Not as many satellites are in MEO; those that are tend to be position, navigation, and timing (PNT) satellites, such as the U.S. Global Positioning System (GPS), which operate at roughly 20,200 km (12,552 mi).[42] The third category is low Earth orbit (LEO), which officially consists of the range between 100 km (60 mi), where most believe space to begin, and 2,000 km (1,200 mi) above Earth.[43] Taiwan is drawing from all three orbits to construct its portfolio of satellite communication capabilities. Taipei is pursuing two parallel goals: improve Taiwan's security and resiliency through a diversified and even redundant set of satellite communications options and advance the island's position in the commercial space industry.[44]

Foreign Commercial and Indigenous Constellations

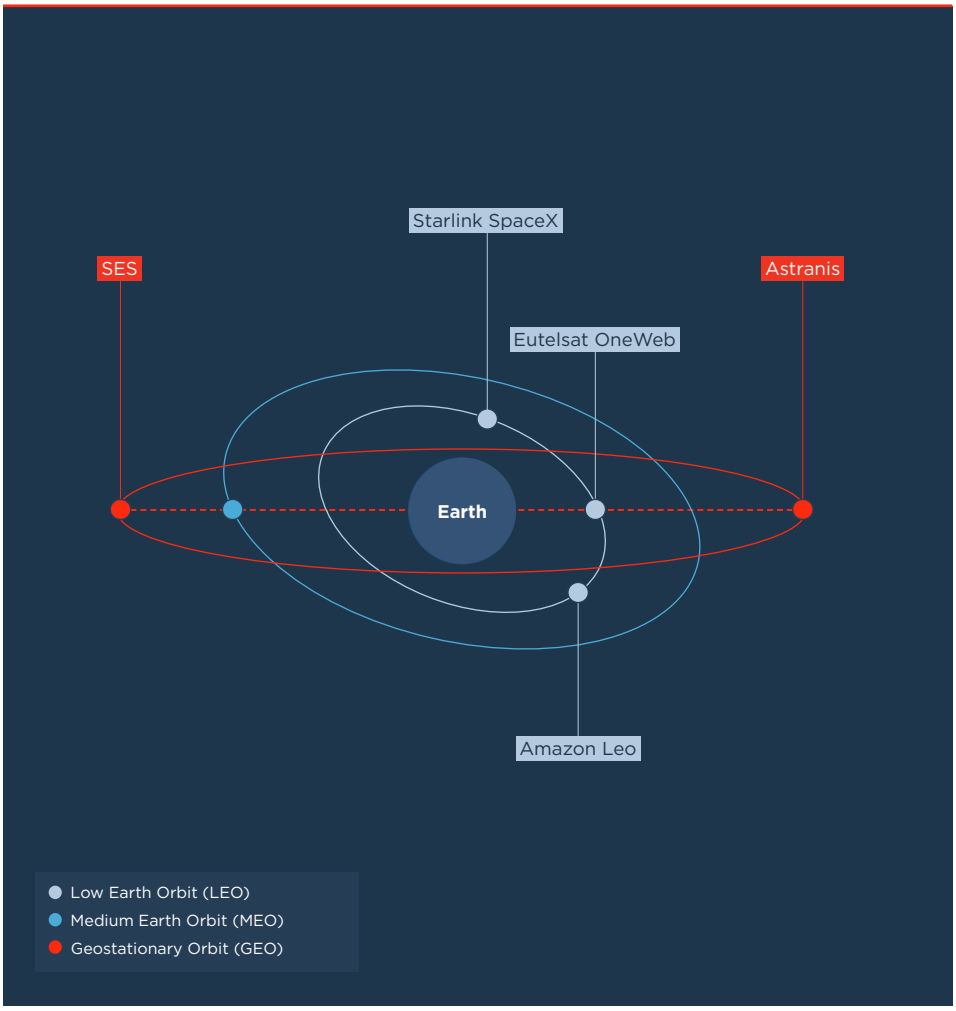
Taiwan is pursuing both foreign commercial options and indigenous options to bolster its space-based communications capability. Among the commercial options, by far the most capable system right now, defined by the number of satellites, is Starlink, a LEO constellation owned and operated by Elon Musk's SpaceX. The company also built a military-grade remote sensing constellation for the U.S. National Reconnaissance Office called Starshield that includes special hardening against various types of attacks.[45] Washington plans to acquire additional Starshield satellites, this time for communications, by 2029.[46] News reports and company statements indicate that Starshield is available to the small number of U.S. troops in Taiwan, although U.S. Congressional members have raised questions about service reliability.[47]

> Forgoing Starlink has led Taiwan to partner instead with competitors in pursuit of overlapping satellite communications provider options, despite those alternative providers' relatively small constellation sizes.

For Washington and Taipei, having an American company whose business relies heavily on U.S. government contracts be the dominant provider in the field should theoretically be a natural advantage. That fact should give U.S. policymakers a potent option to help improve Taiwan's resiliency in the face of pressure and fulfill the (self-imposed) U.S. legal obligation under the Taiwan Relations Act of 1979 to "make available to Taiwan such defense articles and defense *services*" (italics added) for Taiwan to protect itself.[48]

In practice, however, neither the United States nor Taiwan sees Starlink as a reliable option due to Musk's personal views.[49] Musk met with Vladimir Putin who reportedly, on behalf of Chinese Communist Party General Secretary Xi Jinping, asked Musk not to extend Starlink to Taiwan; allegedly turned off Starlink to Ukrainian forces in contested areas; and has expressed sympathy with Beijing's view of cross-Strait relations.[50] More narrowly, SpaceX has not met Taiwan's regulatory requirement to have a local partner holding a majority stake.[51]

Figure 2: Satellite Communication Systems Relevant to Taiwan



Starlink SpaceX[52] **Current: 10,153**
LEO **Projected: 15,000**
- By far the biggest and most capable constellation
- SpaceX has not met Taiwan's regulatory requirement to have a local partner holding a majority stake[53]
- SpaceX CEO Elon Musk's public comments on Taiwan and the Ukraine coverage refusal have raised concerns about unilateral service denial during crises

Eutelsat OneWeb[54] **Current: 654**
LEO
- OneWeb Eutelsat currently offers continuous global coverage
- Licensed in Taiwan through Chunghwa Telecom, with the first LEO commercial license granted in June 2025[55]

Amazon Leo[56] **Current: 210**
LEO **Projected: 3,232**
- Taiwan views Amazon Leo, formerly known as Project Kuiper, as a complement to Eutelsat OneWeb[57]
- Does not yet provide continuous global coverage, but Amazon began a late-2025 pilot service and has demonstrated link rates above one gigabit per second in tests[58]

Astranis **Projected: 1**
GEO
- A small, single GEO satellite, rather than a LEO constellation (i.e., group of satellites)
- Chunghwa-Astranis deal: Taiwan's first dedicated MicroGEO, which is a smaller satellite than those normally flown in GEO[59]
- Dedicated Taiwan beam provides sovereign, persistent backup over Taiwan[60]

SES[61] **Current: 120**
GEO **MEO** **(90 GEO, 30 MEO)**
- SES partnered with Chunghwa Telecom
- Taiwan has access to O3b mPOWER (in MEO)[62]

Forgoing Starlink has led Taiwan to partner instead with competitors in pursuit of overlapping satellite communications provider options, despite those alternative providers' relatively small constellation sizes (see Figure 2). Taiwan telecommunication company Chunghwa Telecom announced a distribution partnership in November 2023 with European company Eutelsat OneWeb, which operates the second-largest LEO constellation, and reached commercial approval in June 2025.[63] Taiwan is also in talks with Amazon Leo, formerly known as Project Kuiper, to help fill out its coverage.[64] Amazon Leo fields the third-largest LEO constellation but has ambitious plans, along with backing from its enormous parent company. In addition, Taiwan has contracted for "exclusive access" to an MEO satellite system, known by its technical designation of O3b mPOWER, operated by the Luxembourg-based communication company SES.[65]

Taiwan is also pursuing its own indigenous options. The government has an existing satellite program, the FORMOSAT series—but it is for surveillance and scientific research rather than communications. Taipei is also building, and plans to operate, its own satellite communications networks in both GEO and LEO. It has contracted with Astranis to build a small MicroGEO satellite that Taiwan will operate as its first dedicated communications satellite.[66] Taiwan also plans to launch the first of six LEO communications satellites by 2027 as part of its Beyond 5G LEO satellite program.[67]

Stratospheric Hurdles Remain

Despite these moves, Taiwan still faces several major obstacles in its pursuit of a meaningful satellite communications backup in case its subsea cables are cut. The director general of Taiwan's space agency, Wu Jong-shinn, has stated publicly that Taipei needs 150 satellites, up from its current eight satellites, to reach "basic communication resilience" and that the government's current plans might not be ambitious enough in either execution speed or size.[68] In addition, a functioning satellite internet backup requires more than the satellites flying above Earth. The system also requires ground stations to send and receive data from the satellites and connect them to the global internet via fiber-optic cables. Users in Taiwan can draw on ground stations located in Japan, Thailand, and Guam.[69] Taiwan's satellite communications access is therefore vulnerable if Beijing successfully puts pressure on those countries to cut off Taipei. Taiwan does not yet have a ground station within its own jurisdiction, but in January 2026, Chunghwa Telecom announced plans to partner with SES to build one there.[70]

Even more critically, users need terminals to receive transmissions from space and then allow users to plug in their modems. In July 2024, Taiwan's MODA announced it had tested OneWeb terminals in 773 locations in Taiwan and abroad.[71] However, terminals are currently service-specific rather than universal, which means that building backup options based on several different services risks never achieving sufficient scale in any of them. Moreover, even at maximum capacity, satellite internet could only fill some of the gap that would result if Taiwan lost its undersea cable connections. While specific measures are difficult to ascertain, Taiwan's current and near-term satellite internet capacity—at best, on the order of tens of gigabits (one billion bits) per second (Gbps)—is only a tiny fraction of the hundreds of terabits (one trillion bits) per second (Tbps) provided by its undersea cables. Even in 2026, as more satellite systems come online, submarine cables will continue to outstrip satellite bandwidth by several orders of magnitude, underscoring that satellites can only supplement, not replace, Taiwan's vital undersea digital infrastructure.

If the system and equipment were all in place, China could still try to disrupt or deny Taiwan's satellite communication links in a wide variety of ways. Beijing could use spoofing to swap out real signals with new, misleading ones. It could use directed energy to temporarily blind sensors, a technique known as dazzling. Or it could drown out a signal with a stronger signal, a technique known as jamming. Beijing is surely studying the actions Iran's government took, with mixed success, in early 2026 to disrupt Starlink connections via jamming and to restrict the flow of information to and from antiregime protestors.[72] Critically, spoofing, dazzling, and jamming are reversible; they stop when the attack stops. But China could also go further and damage or destroy satellites either through methods like burning out essential sensors or electronics or by blowing up the satellites completely.

Three factors might deter China from doing so, or at least keep attacks tailored. First, any attack would be highly escalatory, given that no country has ever deliberately physically attacked another country's satellites. Second, attacks on satellites owned by third countries, rather than Taiwan, could provoke third-party intervention in a crisis that China would prefer to keep between Beijing and Taipei. Third, China itself now relies heavily on space assets for both its civilian economy and military operations. Beijing therefore would be risking both retaliatory attacks on its own satellites and possibly sparking a dangerous chain reaction if debris from satellites that China destroyed collided with other Chinese satellites.[73]

A United Launch Alliance Atlas V rocket launches Amazon's Project Kuiper internet satellites into low Earth orbit from Cape Canaveral, Florida. Since renamed Amazon Leo, the company fields the third-largest LEO constellation and is in talks with Taiwan to increase coverage. (Gregg Newton/AFP via Getty Images)

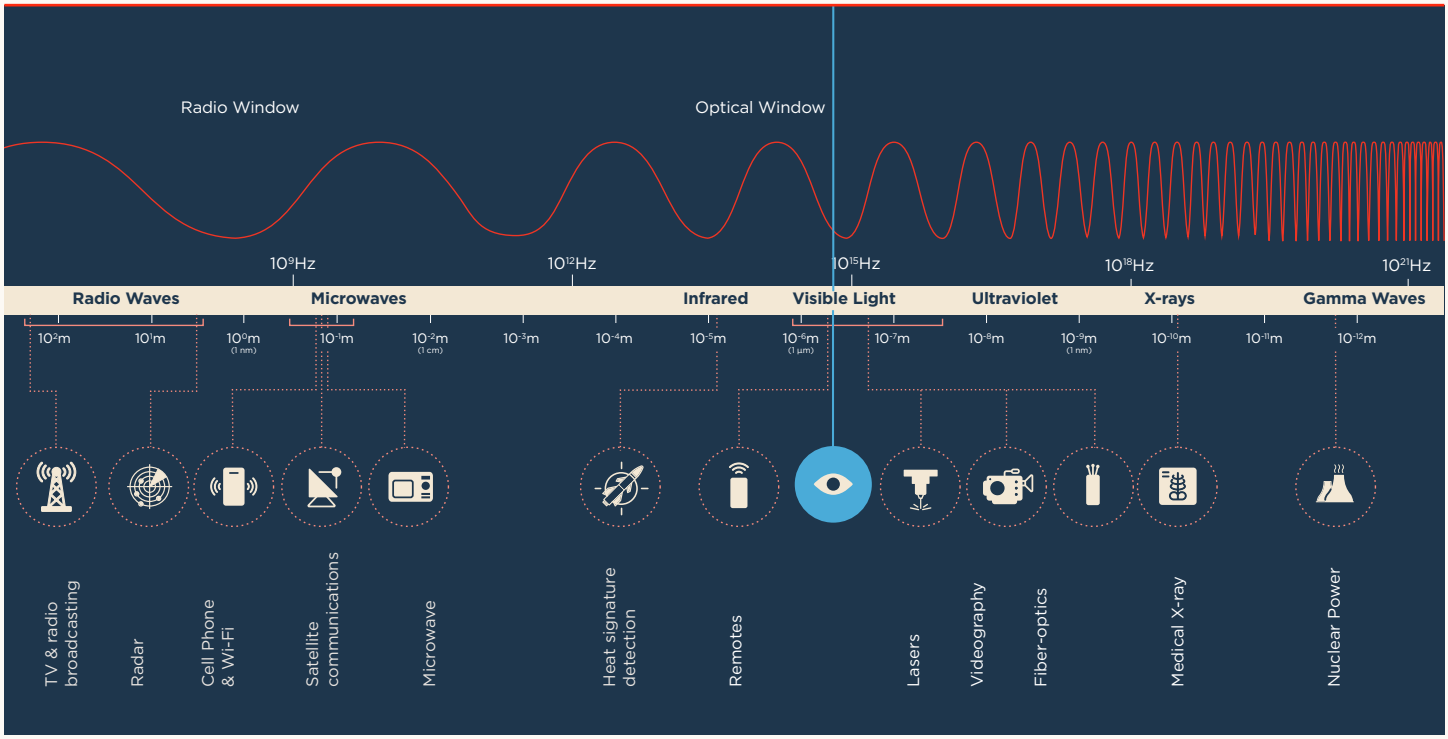
Electronic Warfare

THE ELECTROMAGNETIC SPECTRUM will also be contested through various forms of electronic warfare, a domain whose technical complexity and invisibility—its "nonkinetic" nature, in the parlance—often leaves it underexamined by policymakers.[74] The U.S. Department of Defense defines EW as "military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy."[75] It takes many forms but generally falls into three categories of support, attack, and protection.[76] EW support is also sometimes called reconnaissance, and focuses on detecting the enemy's activities—basically, intelligence gathering. EW attack, or offense, means denying the enemy's use of the electromagnetic spectrum. And EW protection, or defense, refers to protecting the ability of friendly forces to use the electromagnetic spectrum. In prior eras, EW was primarily a tool for narrow tactical tasks such as defending aircraft against missile attacks. Today, EW shapes the entire battlefield and is much more intricate and dynamic—and it crosses domains, with growing links to the cyber domain especially.[77]

At its most basic, EW entails projecting large amounts of energy using a specific wavelength, pointed in a particular direction to block or confuse communications between personnel and/or weapons. Applications include jamming and spoofing.[78] EW forces can target navigation systems like GPS; radars for monitoring airspace; and communications networks, including the satellite communication systems discussed earlier. EW operations can shape every level of warfare, from localized jamming at the tactical level to area denial at the operational level, and even complete blackout at the strategic level.

The PLA possesses extensive EW capabilities and sees EW—or what it calls "network-electromagnetic spectrum warfare"—as central to fighting and winning any future conflict.[79] The PLA has incorporated EW into military exercises, organization, and training, even as the organizational chart for the associated forces was redrawn in 2015 and 2025.[80] And China has deployed extensive EW capabilities to the artificial islands it built in the South China Sea.[81] Furthermore, China's scientific research institutions are hard at work pursuing new EW options. News reports show techniques being researched, including a technique for jamming a constellation the size of Starlink. Another technique that is still in the lab would create a large EW field that affects enemy forces but leaves a place in the center—described as an "eye of the storm"—where Chinese forces could operate without interference.[82]

Figure 3: The Electromagnetic Spectrum and Applications Relevant to Taiwan's Security[83]



Ways China Might Use EW

When it comes to using such capabilities against Taiwan, it is safe to infer that China routinely monitors EW signals during air and naval patrols around Taiwan, as well as during periodic (and growing) PLA exercises. Eliciting a reaction from Taiwan's military helps the PLA anticipate and prepare for how Taiwan's forces would act in a crisis or conflict. It is one of several rationales driving China's gray zone military pressure toward Taiwan.[84]

To date, China has not yet conducted EW attack operations at a significant scale to pressure Taiwan. But three events provide a window into China's EW capabilities. The first came when then–U.S. House Speaker Nancy Pelosi traveled to Taiwan in August 2022. News outlets reported that China targeted her airplane with EW capabilities, though U.S. EW defense measures proved effective.[85] Those news reports have not been independently verified or publicly confirmed. A second incident followed in March 2023 when an Australian commercial aircraft in the Pacific had to fly without GPS due to jamming from PLA Navy ships in their vicinity.[86] The third incident occurred when Chinese forces jammed the communications of Philippine ships as the latter worked to resupply their outpost on Second Thomas Shoal in the South China Sea.[87]

In addition to incidents in Asia, Russian actions in Europe provide a point of comparison and offer a preview of how, in the future, China could use EW to pressure Taiwan in scenarios short of war. Russia has spoofed and jammed GPS signals in ways that interfere with civilian air traffic in the Baltic states.[88] Moreover, EW has been a defining feature of Russia's war against Ukraine. China has closely observed Russia's EW operations against Ukrainian forces as well as Moscow's gray zone warfare actions targeting NATO countries. Beijing studies this case both to understand the changing character of modern warfare and so that Chinese suppliers can derive technical insights useful for supplying Russian military forces.[89]

In the future, China could ramp up EW pressure on Taiwan through targeted operations designed to harass and interfere with specific aircraft or places, such as a critical port or cable landing station. Beijing could expand those operations as part of a medium-sized pressure campaign, such as a quarantine that exerts control over traffic in and out of key locations but falls short of a complete blockade. In an all-out conflict, the PLA would likely unleash a flood of EW operations. Doing so would fit how it seems China plans to fight, as well as the pattern of recent conflicts such as Russia-Ukraine, Israel–United States–Iran, and India-Pakistan, all of which heavily featured EW.

EW Pressure Considerations

For now, China's relative restraint on offensive EW toward Taiwan might be attributable to several factors. One factor is that, under certain conditions, EW actions might be considered an act of war, and Beijing is not yet ready to embark on a war with Taiwan.[90] China might also be restrained by the costs incurred when interfering with the operational safety of ships and aircraft in one of the world's busiest shipping and travel areas. A financial premium for political risk applied to Taiwan's shipping market would affect both sides of the Strait, including China.

Liaoyuan-1 high-energy laser systems are displayed during a Chinese military parade marking the 80th anniversary of the end of World War II in Beijing. While China has not yet conducted large-scale EW attack operations to pressure Taiwan, China could ramp up EW pressure through targeted operations to harass or interfere with specific aircraft or a critical port. (Greg Baker/AFP via Getty Images)

Beijing's caution toward employing EW might also stem from a desire to save its most potent options for a surprise attack during a contingency or conflict. In the course of attacking Taiwan, China would have to design its EW operations to avoid interfering with its own forces. But even if those restraints apply today, they might not prove to be as strong in the future.

China's EW activities would pose a major challenge to nearly all of Taiwan's military operations, as well as those of the United States and other partner states if any decided to intervene. EW could be particularly challenging for the uncrewed systems (drones) that both Taiwan and the United States plan to rely on for mounting a defense if China attempts to invade Taiwan.[91] As for offensive EW capabilities, if Washington chose to intervene, the U.S. military would bring formidable EW capabilities along with it. But almost all of those EW capabilities would come on ships and aircraft and could only operate in Taiwan's vicinity if they were prepared to push through Chinese forces. As for Taiwan's EW capabilities, its 2025 Quadrennial Defense Review calls for additional efforts to ensure Taiwan's forces limit their electronic emissions to avoid being targeted.[92]

Recommendations

CHINA IS ALREADY CONTESTING TAIWAN'S COMMUNICATION and information networks, and Beijing's pressure on those links is likely to intensify, whether through coercion in the gray zone or in a contingency or conflict. The United States, Taiwan, and other like-minded partners need to respond so that they can better prepare for a conflict, thereby enhancing deterrence. They should act across all three areas discussed in this report, specifically through the following recommendations:

Undersea Cables

1

Taiwan should consider mandating that new or repaired cable projects use physical hardening measures to make them more difficult to interfere with.
Those measures include adding protective layers and burying the cables.[93] Landing stations should likewise receive additional physical security and backup power generation. In addition, resilience and security should be factored into site planning for any new cables and landing stations instead of relying solely on peacetime, commercial communications criteria. Additional security requirements will increase the cost of new cables, so Taipei should take steps to offset the additional cost through low-interest financing or other subsidies.

2

The United States and Taiwan should deepen cooperation on maritime intelligence and monitoring.
Such collaboration should be grouped into two categories. The first is sharing intelligence on suspect vessels and shipping businesses. This would augment Taiwan's blacklist of ships and help predict which vessels authorities should pay more attention to should they approach the areas near Taiwan's undersea cables. The second category is real-time monitoring. In this area, the United States should offer to collaborate with Taiwan to improve its maritime monitoring mechanisms. Enhanced monitoring should span sensing technologies, such as radar and sonar systems; intelligence fusion and processing systems, such as the integration of AIS data with commercial satellite imagery; and sharing of intelligence from like-minded and willing third parties.[94]

3

The United States should compile a dataset documenting cable-cutting incidents and, where intelligence supports this conclusion, formally attribute sabotage incidents.[95]
Such attribution could ensure attacks emanating from China—or any other actor—do not benefit from deniability. This database should be run by the U.S. Department of State and draw on information from across the U.S. intelligence community. The database should include attacks on Taiwan's undersea cables, along with incidents affecting other places and countries. Where possible, the United States should offer a way for other states to endorse its findings.

4

Taiwan should continue to enhance maritime law enforcement and response in line with its recent legal and regulatory revisions and ensuing changes to practice.
As a component of that effort, Taipei should propose incorporating undersea cable enforcement into its joint coast guard exercises with Japan. For its part, Washington should state that purposeful damage to infrastructure owned by American companies—including those that connect to Taiwan—would be considered an attack on U.S. critical infrastructure and receive a commensurate response.

Satellite Communications

1

The United States should clarify and, where needed, amend, applicable laws and regulations to ensure that companies that sell defense services to the U.S. government, and have an agreement with an ally or partner to provide such services, can be compelled by the U.S. government to continue to serve such ally or partner, under critical circumstances and in accordance with U.S. national security interests.
Consideration should be given to amending the Defense Production Act in a way that provides greater assurances that critical U.S. national security policy objectives are met as they relate to private sector services that are provided to allies and partners in an emergency situation. An updated legal framework should include civil and/or criminal penalties, as appropriate. Making these changes would not prejudice whether the United States would intervene on Taiwan's behalf during a contingency. The changes would instead ensure elected officials, not private sector executives, make intervention decisions based on U.S. national interests and values, rather than narrow or conflicted commercial interests.

2

Washington should support Taipei's efforts to develop a non-Starlink option for satellite communications.
Alternatives could include Taiwan's own indigenous satellites or linking up to other services provided by companies based in the United States or allied countries. Taipei should consider loosening its local incorporation and ownership requirements

to lower the barrier to entry for satellite internet providers from fellow democracies.[96] Doing so could detract from commercial benefits but would better facilitate efforts to ensure Taiwan can access satellite communications at sufficient scale in an emergency.

3

The United States and Taiwan should, as part of their occasional high-level, unofficial consultation and planning meetings, develop a plan for how to manage internet bandwidth during a situation where China (or any other actor) disrupts service from Taiwan's undersea cables.[97]
Even if a full-scale satellite communications system is in place—which, again, is a stretch goal—Taiwan will still need a plan for how to prioritize the use of low amounts of bandwidth during a crisis. The results of that process should inform practical guidance that is subsequently added to the next edition of Taiwan's civil defense handbook for citizens and organizations outside of the government.[98]

4

Washington and Taipei should continually monitor technological breakthroughs and maturation in this field.
Technologies on the cusp of maturation and fielding at scale could soon offer new and useful options for enhancing resilience. These include intersatellite links and direct-to-device internet.[99] One separate area where a technological solution could prove critical is if a universal terminal to receive signals could be developed that eliminates the need for service-specific equipment to be in place prior to a contingency. Approaches that link up communications assets in novel ways, thereby making them more resilient, might also prove fruitful.[100]

Electronic Warfare

1

Taiwan should leverage its growing relationships with European countries, particularly the Nordic and Baltic states, to learn about their experiences with and responses to Russian EW activities interfering with both civilian and military operations.[101]
Washington could facilitate such a meeting through the Global Cooperation and Training Framework, which brings together Taiwan and third countries to discuss issues of mutual interest.[102]

2

Taiwan should conduct an exercise with civilian aviation and maritime authorities to practice operating under conditions where satellite navigation services are disrupted.
Such an exercise could help evaluate whether navigation systems that rely on quantum technologies, instead of satellites, could eventually provide a workable backup.[103]

3

Washington and Taipei should study the viability for both civilian and military applications of creative workarounds, such as enabling key systems to use China's global navigation satellite system, BeiDou, or Russia's Global Navigation Satellite System (GLONASS).
The PLA will be reluctant to block BeiDou given its importance for China's military operations, and the same is probably true for GLONASS. Naturally, studying these options requires assessing the potential risks—including intelligence vulnerabilities and embedded manipulation—as well as the benefits.

4

Both the U.S. and Taiwan militaries need to prepare for, and practice operating in, an environment where capabilities that require the electromagnetic spectrum to function will be severely degraded, if not outright denied.
This will require building proficiency across a range of techniques, including old technologies, such as sextants for navigation; emerging technologies, such as munitions and drones that use artificial intelligence for terminal guidance; and other methods in between, such as fiber-based internal military communications and preplanned fires.

5

The United States and Taiwan should jointly develop plans to go on EW offense against Chinese forces in a contingency.
The modern PLA relies on communication and information links as much as any other modern military. Like all of Taiwan's military procurement decisions, though, decisions about which EW systems to acquire should be made in line with an overall asymmetric defense strategy rather than trying to match the PLA on a one-for-one, symmetrical basis.

Conclusion

Ensuring Taiwan can access information and communication systems—or continue to function effectively without them—will be critical in preparing for additional Chinese gray zone pressure, or a larger crisis or conflict. Preparations also bolster deterrence by making it harder for a Chinese blockade or invasion to succeed in coercing Taiwan or forcing it to capitulate. Taiwan's fate might ultimately be decided by whether it can indeed thwart or fight through a communications blackout. U.S.-Taiwan collaboration can help ensure Taipei stays connected.

Appendix

International Undersea Cables Connected to Taiwan[104]

International Cable	All Landing Points	Landing Points in China	Landing Points in Taiwan
Asia-Pacific Cable Network 2 (APCN-2)	Chongming and Shantou, China; Lantau Island, Hong Kong; Chikura and Kitaibaraki, Japan; Kuantan, Malaysia; Batangas, Philippines; Katong, Singapore; Busan, South Korea; and Tanshui, Taiwan	Chongming, Lantau Island, and Shantou	Tanshui
FLAG North Asia Loop/ REACH North Asia Loop	Tong Fuk, Hong Kong; Wada, Japan; Busan, South Korea; and Toucheng, Taiwan	Tong Fuk	Toucheng
East Asia Crossing and City-to-City (EAC-C2C)	Nanhui and Qingdao, China; Chung Hom Kok and Tseung Kwan O, Hong Kong; Ajigaura, Chikura, and Shima, Japan; Batangas and Cavite, Philippines; Changi North and Changi South, Singapore; Busan and Shindu-Ri, South Korea; and Fangshan, Pa Li, and Tanshui, Taiwan	Chung Hom Kok, Nanhui, Qingdao, and Tseung Kwan O	Fangshan, Pa Li, and Tanshui
Trans-Pacific Express (TPE) Cable System	Chongming and Qingdao, China; Maruyama, Japan; Geoje, South Korea; Tanshui, Taiwan; and Nedonna Beach (Oregon), United States	Chongming and Qingdao	Tanshui
Cross-Straits Cable Network (CSCN)	Dadeng Island and Guanyin Mountain, China; and Guningtou and Lake Ci, Taiwan	Dadeng Island and Guan-yin Mountain	Guningtou and Lake Ci
Taiwan Strait Express-1 (TSE-1)	Fuzhou, China, and Tanshui, Taiwan	Fuzhou	Tanshui
FASTER	Chikura and Shima, Japan; Tanshui, Taiwan; and Bandon (Oregon), United States	N/A	Tanshui
Asia Pacific Gateway (APG)	Chongming and Nanhui, China; Tseung Kwan O, Hong Kong; Maruyama and Shima, Japan; Cherating, Malaysia; Changi South, Singapore; Busan, South Korea; Toucheng, Taiwan; Songkhla, Thailand; and Danang, Vietnam	Chongming and Nanhui	Toucheng
New Cross Pacific (NCP) Cable System	Chongming, Lingang, and Nanhui, China; Maruyama, Japan; Busan, South Korea; Toucheng, Taiwan; and Pacific City (Oregon), United States	Congming, Lingang, and Nanhui	Toucheng
Pacific Light Cable Network (PLCN)	Baler, Philippines; Toucheng, Taiwan; and El Segundo (California), United States	N/A	Toucheng
Southeast Asia–Japan Cable 2 (SJC2)	Lingang, China; Chung Hom Kok, Hong Kong; Chikura and Shima, Japan; Changi South, Singapore; Busan, South Korea; Fangshan and Tanshui, Taiwan; Songkhla, Thailand; and Quy Nhon, Vietnam	Chung Hom Hok and Lingang	Fangshan and Tanshui
Apricot	Agat, Guam; Batam and Tanjung Pakis, Indonesia (planned); Minamiboso, Japan; Baler and Davao, Philippines (planned); Tuas, Singapore (planned); and Toucheng, Taiwan	N/A	Toucheng

International Cable	Owners	PRC Ownership	Date Ready for Service	Cable Length
Asia-Pacific Cable Network 2 (APCN-2)	AT&T, BT, China Telecom, China Unicom, Chunghwa Telecom, Hong Kong Broadband Network (HKBN), KDDI, KT Corporation, LG Uplus, Nippon Telegraph and Telephone (NTT), Orange, PCCW, PLDT, Singtel, Singtel Optus, Softbank, Starhub, Tata Communications, Telekom Malaysia, Telstra, Verizon, and Vodafone	Yes	December 2001	19,000 km
FLAG North Asia Loop/ REACH North Asia Loop	Fibre-optic Link Around the Globe (FLAG), PCCW, and Telstra	Yes	June 2001	9,504 km
East Asia Crossing and City-to-City (EAC-C2C)	Telstra	No	November 2002	36,500 km
Trans-Pacific Express (TPE) Cable System	AT&T, China Telecom, China Unicom, Chunghwa Telecom, KT, NTT, and Verizon	Yes	August 2008	17,968 km
Cross-Straits Cable Network (CSCN)	China Mobile, China Telecom, China Unicom, and Chunghwa Telecom	Yes	August 2012	21 km
Taiwan Strait Express-1 (TSE-1)	China Mobile, China Unicom, Chunghwa Telecom, Far EasTone Telecommunications, Taiwan International Gateway Corporation, and Taiwan Mobile	Yes	January 2013	260 km
FASTER	China Mobile, China Telecom, Google, KDDI, Singtel, and TIME dotCom	Yes	June 2016	11,629 km
Asia Pacific Gateway (APG)	China Mobile, China Telecom, China Unicom, Chunghwa Telecom, KT, LG Uplus, Meta, NTT, National Telecom, Starhub, TIME dotCom, VNPT International, and Viettel Corporation	Yes	November 2016	10,400 km
New Cross Pacific (NCP) Cable System	China Mobile, China Telecom, China Unicom, Chunghwa Telecom, KT, Microsoft, and Softbank	Yes	May 2018	13,618 km
Pacific Light Cable Network (PLCN)	Google and Meta	No	January 2022	11,806 km
Southeast Asia–Japan Cable 2 (SJC2)	China Mobile, Chunghwa Telecom, DongHwa Telecom, KDDI, Meta, SK Broadband, Singtel, Telin, True Corporation, and VNPT International	Yes	July 2025	10,500 km
Apricot	Chunghwa Telecom, Google, Meta, NTT, and PLDT	No	October 2025	11,972 km

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11. Ministry of Digital Affairs, "Latest Submarine Cable Status."

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13. Taiwan has suffered 28 human-caused subsea cable incidents in total from 2022 to 2025. Source: *114*年度臺灣海底通訊電纜損害原因分析及策進報告 *[2025 Taiwan Submarine Communication Cable Damage Analysis and Countermeasures Report]* (Ministry of Digital Affairs, April 7, 2026), 11, https://www-api.moda.gov.tw/File/Get/moda/zh-tw/kj9vSvBw5wUeqla.

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