



U.S.-China Economic and Security Review Commission
Staff Report

February 03, 2015

**Taiwan's Improving Patrol Fleet
Could Enhance its Ability to Defend against a Chinese Invasion**

by

Michael Pilger
Research Intern, Security and Foreign Affairs

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Although Taiwan's weapons acquisition policy continues to emphasize some systems that would be highly vulnerable to a People's Liberation Army (PLA) attack, Taiwan has begun to pursue asymmetric and innovative systems designed to strike the PLA's operational centers of gravity. Most notably, the Taiwan Navy is significantly upgrading its fleet of antiship cruise missile (ASCM)-equipped small surface combatants (henceforth referred to as Taiwan's "patrol fleet"). The Taiwan Navy's more capable patrol fleet could complicate PLA operational planning and improve Taiwan's ability to damage or destroy PLA amphibious ships during a Chinese invasion.

Taiwan Rapidly Modernizing Patrol Fleet

Before 2009, the Taiwan Navy's patrol fleet consisted almost entirely of antiquated guided-missile patrol boats (PTGs) with limited firepower, range, and endurance. Since then, the Taiwan Navy has fielded 30 new advanced PTGs, improved the weaponry on an existing PTG class, and introduced a new missile corvette. Meanwhile, the Taiwan Navy has retired many of its older, less capable PTGs.

Fielding of 30 New FCG-60-Class PTGs: The FCG-60 prototype was launched in 2001 and commissioned in 2003. In contrast to most Taiwan Navy ships, which were designed or built abroad, the FCG-60 was designed and built in Taiwan.

After initially judging the prototype a success, the Taiwan Navy ordered 50 additional units in 2005. However, the program suffered a series of delays, largely due to shoddy construction and a government probe of the navy's contract with the shipbuilder.¹ The Taiwan Navy ultimately lowered its order to 30 units, and serial production did not begin until 2007. The first batch of two FCG-60s was delivered to the Taiwan Navy in 2009, and the final batch of FCG-60s was delivered in 2011.

The FCG-60 design includes features to reduce its radar signature and improve its stealth, such as radar-deflecting superstructures.² It has a range of 1,150 nautical miles (nm) at 22 knots,* a top speed of 33 knots, and a displacement of 201.7 tons.† The FCG-60 carries four HF-2 ASCMs (maximum range: 70 nm). Taiwan reportedly has begun to install the more advanced HF-3 ASCM on seven FCG-60s. The HF-3 has greater speed (up to Mach 2.0) and range (at least 80 nm) than any comparable system fielded by the U.S. Navy.³

The FCG-60 also is armed with one 20 millimeter (mm) antiaircraft gun, two 7.62 mm machine guns, and four AV-2 decoy launchers. It has an optronic director and surface search and fire control radars, and is capable of electronic support measures.

Improvements to Weaponry on JIN CHIANG-Class PTGs: The JIN CHIANG was designed to carry the HF-1 ASCM (maximum range: 19 nm), though only one of 12 total ships was originally equipped with the missile. Since 2006, at least seven JIN CHIANGs have been upgraded to carry the HF-2, and five of these seven have been further upgraded to carry the HF-3. Each of these five ships carries four HF-3s. The remaining JIN CHIANGs probably have been equipped with HF-1s or HF-2s. The Taiwan Navy ultimately plans to equip all 12 JIN CHIANGs with the HF-3.

The JIN CHIANG has a cruising range of 4,150 nm and a displacement of 761.7 tons. In addition to ASCMs, it is equipped with one 76 mm gun, one Bofors 40 mm gun, one 20 mm gun, and two 12.7 mm machine guns; it also has two rails for Mark 6 sea mines. The JIN CHIANG carries LN-66 air/surface search

* Various authors use different standards for range, including range at maximum speed, range at most efficient speed, and range at cruising speed.

† All displacement figures represent the full-load displacement, or the displacement of a vessel at maximum allowable draft.

radar, Hughes HR-76C5 fire control radar, and Racal Decca Bridgemaster navigation radar. It uses Honeywell H 930 Mod 2, Contraves, and Rafael Sea Eye FLIR weapons control systems.

Retirement of Legacy PTGs: From the early 1980s to the late 2000s, the Taiwan Navy's patrol fleet consisted almost entirely of 50 HAI OU-class PTGs. Taiwan began retiring these PTGs after FACG-60 serial production began in 2007. As of July 2012, all HAI OU PTGs had been decommissioned.

Introduction of New Missile Corvette: On December 23, 2014, the Taiwan Navy received the first ship in the TUO JIANG-class of catamaran-style missile corvettes from Taiwan's Lung Teh Shipbuilding Company.⁴ Taiwan may build as many as 11 more of these ships.⁵ The new corvette has better range, endurance, and sea-keeping ability than Taiwan's current patrol ships, and will have more firepower than Taiwan's larger surface combatants. The Taiwan Navy already has begun to integrate the TUO JIANG into its training, and plans to operationally deploy the corvette in the first half of 2015.

The TUO JIANG has a top speed of 38 knots and a displacement of 551.2 tons. It carries eight HF-2s and eight HF-3s, and features an Otobreda 76 mm primary gun, four 12.7 mm machine guns, and a Mark 15 Phalanx antimissile system. Detailed information about TUO JIANG's specifications, including sensor equipment, is not yet available in open sources.

Implications for Taiwan's Security

The Taiwan Navy's more capable patrol fleet could improve its ability to damage or destroy PLA amphibious ships during a Chinese invasion. In such a scenario, Taiwan likely would use its upgraded patrol fleet—in conjunction with Taiwan's larger surface combatants, land-based ASCMs, fighter aircraft, and mines—to conduct a multi-axis attack against PLA amphibious ships as they cross the Taiwan Strait.

- Taiwan strategists regard an amphibious invasion as the chief threat China poses to Taiwan. They assess the PLA will attempt to land troops on the main island of Taiwan via a mix of dedicated amphibious sealift and civilian merchant and fishing ships.⁶
- Nevertheless, despite significant improvement to the Taiwan Navy's patrol fleet, its wartime effectiveness could be limited by overreliance on vulnerable land-based radars for command and control and over-the-horizon targeting,⁷ and difficulties rearming, refueling, and resupplying in a high-threat environment.

The Taiwan Navy also could use its new PTGs and missile corvettes for patrol and surveillance in the South China Sea, harbor defense, and search and rescue, thus freeing the Taiwan Navy's larger, more capable surface combatants to focus on preparing for wartime missions and conducting more complex peacetime missions.

Appendix 1: FCG-60 PTG



Source: J. Michael Cole, "China Pans Navy's New Attack Boat," *Taipei Times*, January 12, 2012.

Appendix 2: TUO JIANG Missile Corvette



Source: Japan Times, "Taiwan Navy Gets First Homemade 'Carrier Killer,'" December 24, 2014.

¹ *Taipei Times*, “Task Force to Probe Navy's Plan to Buy Missile Boats,” December 20, 2005; James Holmes, *Taiwan's Navy: Able to Deny Command of the Sea?* (The Jamestown Foundation, April 16, 2010).

² All information on ship characteristics and performances comes from *IHS Jane's Defense & Security Intelligence & Analysis* database.

³ Ian Easton, *Able Archers: Taiwan Defense Strategy in an Age of Precision Strike* (2049 Institute, September 2014), p. 64.

⁴ U.S.-China Economic and Security Review Commission, *2014 Annual Report to Congress*, November 2014, p. 489.

⁵ U.S.-China Economic and Security Review Commission, *2014 Annual Report to Congress*, November 2014, p. 489.

⁶ Piers M. Wood and Charles D. Ferguson, “How China Might Invade Taiwan,” *Naval War College Review* 54:4 (Autumn 2001): 61-62.

⁷ James Holmes, *Taiwan's Navy: Able to Deny Command of the Sea?* (The Jamestown Foundation, April 16, 2010).