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F-16C/D Fills Taiwan's Fighter Need

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There has been a growing undercurrent of discussion in Taiwan over whether it should proceed with its long-standing request for purchase of F-16C/Ds or seek F-35s instead.

Taiwan's official position is that it needs new fighters that are more advanced than the upgraded F-16A/Bs currently in the pipeline. The Taiwan media's focus on the F-35, however, belies political reality: The United States is highly unlikely to sell the F-35 to Taiwan in the foreseeable future. Given the Republic of China Air Force's (ROCAF) immediate requirement for a replacement aircraft for its obsolete F-5 fleet and the expanding gap between the fighters on hand and the number necessary for the most minimal deterrent, it is necessary to focus on what is doable.

Congress, especially, should not be distracted by the terms of the debate in the Taiwan media. The F-16C/D, properly configured, meets Taiwan's needs. It is more advanced than the upgraded A/B models, and available in a reasonable time frame.

F-16A/B Capabilities. The ROCAF currently fields the F-16A/B, Mirage 2000-5, Ching-kuo Indigenous Defense Fighter, and, until recently, the F-5E. The 150 F-16A/Bs are the backbone of the ROCAF. These aircraft incorporated a number of improvements at the time they were built, referred to as the Mid-Life Update. At the time they entered service into the ROCAF, they were roughly comparable to F-16s then in NATO service.

These F-16A/Bs are equipped with the AN/APG-66(V)3 radar, a mechanically scanning system (i.e., with a physically moving radar emitter) with an 83-kilometer range, which allows the aircraft to employ the AIM-120 Advanced Medium-Range Air-to-Air Missile. The aircraft is powered by a Pratt and Whitney F100-PW-220 engine capable of generating approximately 23,000 pounds of thrust.

In 2012, the Obama Administration agreed to upgrade Taiwan's F-16A/B fleet. The most important element of this upgrade is the incorporation of an active, electronically scanned array (AESA) radar system, which allows for electronic (rather than mechanical) scanning through manipulation of the radar signal. This type of radar system allows for track-while-scan engagements, simultaneous ground and air scans, and an improved capacity for engaging multiple targets. Such radars are also harder to detect due to frequency spread, improving the survivability and capability of the aircraft.

However, it cannot overcome several salient facts:

- **The F-16A/B airframes are nearly 20 years old.** The F-16 A/Bs sold to Taiwan were manufactured in the early 1990s. The upgrades will improve the electronics aboard these aircraft, but they will not rejuvenate the planes. Given the high stresses placed upon them through 20 years of air combat training, metal fatigue will eventually show, affecting their flight operations.

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- **The upgraded aircraft will still have certain limitations.** No upgrade has been authorized for the engines on the ROCAF's F-16A/B aircraft, although the fuselage could accommodate a more powerful powerplant, the F100-PW-229. The F100-PW-229 yields approximately 29,100 pounds of thrust, versus 23,000 pounds on the older engine, as well as faster acceleration (important in dog-fighting maneuvers).[1]

- **The number of aircraft available for duty will be reduced for an extended period.** The upgrading of F-16A/Bs is extremely complicated from a technical perspective and will involve unprecedented effort. As of this time, for example, no F-16A/B has had its radar and avionics as thoroughly modified as planned in this upgrade. Consequently, it is likely that this will be a protracted process. The first upgrades will not be complete for more than five years, and the retrofit of the entire fleet will probably take at least 10. During this time, it is unlikely that China will be slowing down *its* modernization.

- **Obsolete aircraft will not be replaced.** The F-16A/B upgrade will not affect the other three parts of Taiwan's air fleet: the Ching-kuo fighters, the Mirage 2000-5s, or the F-5Es. The F-16C/Ds, after all, are not intended to augment the F-16A/Bs but to replace the F-5Es, which at this point are wholly outmatched. The constant delay in acquiring the F-16C/D means that, as the F-5Es—which represent 20 percent of Taiwan's combat aircraft inventory—are withdrawn from service, the total number of ROCAF aircraft is falling. Similarly, the Obama Administration does not appear to have any interest in replacing the obsolescent Ching-kuo fighters or even improving their performance with better engines.

F-16C/D Capabilities. Seven years ago and many times since, the Taiwan government has expressed interest in the F-16C/D as a replacement for the F-5. In some quarters, however, it has been suggested that the ROCAF would be "settling" for an aircraft no more capable than what it already has.

Such a judgment would be badly mistaken. In the first place, as has already been noted, the F-16C/D is intended not as a replacement or supplement to the F-16A/B fleet but as a replacement for the F-5s. There can be no question that the F-16C/D is substantially more capable than the F-5E, which not only is physically quite old but is an older, much more basic design.

In addition, the F-16C/D is also more capable than the A/B models it will supplement. The F-16C/D, ever since the Block 30 upgrade, has had improved air-to-ground weapons delivery capability. The F-16C/D's electronics are designed to support a variety of ordnance, including the JSOW, the JDAM, and the Wind-Corrected Munitions Dispenser, which allows for improved delivery of submunitions. This will significantly enhance the ability of the ROCAF to conduct close air support operations.

Furthermore, if the ROCAF were to acquire the F-16C/D Block 52 or better (i.e., Block 52+ or Block 60), the new aircraft would be equipped with the F100-PW-229 engine, giving it a superior performance capability. The F-16C/D Block 52+ can also be equipped with conformal fuel tanks, which extends range without sacrificing weapons carriage or performance.

The F-16C/D Block 52 and 52+ has, as standard equipment, the AN/APG-68(V)8 or (V)9 radar. This is an improvement on the original AN/APG-66 radar fitted to the F-16 A/B, but it is probably no better than the AESA radar currently planned for the F-16A/B upgrades. However, there are already AESA radars designed for the F-16C/D Block 52. South Korea has selected the Raytheon Advanced Combat Radar for its F-16C/D upgrade, while Northrop Grumman has supplied the AN/APG-80 Scalable Agile Beam Radar to a number of current F-16C/D operators. Consequently, any F-16C/D acquisition could be structured to have the improved electronic suites.

Taiwan could access an even better F-16C/D variant if it acquires the equivalent of the F-16C/D Block 60. This is a private venture funded by the United Arab Emirates and was the first to incorporate an AESA radar. It uses a different engine, the General Electric F110-GE-132, which is rated at 32,500 pounds of thrust (essentially 10 percent above the PW-F100-229 engine). It also incorporates a different electronic warfare suite and provision for the carriage of a number of additional weapons, such

1. Pratt and Whitney brochure, http://www.pratt-whitney.com/Content/Press_Kits/pdf/pw_overview_broch.pdf (accessed June 5, 2013).

as the AIM-132 Advanced Short-Range Air-to-Air Missile and the AGM-84 Standoff Land Attack Missile. To guide these weapons, the F-16C/D Block 60 has an Integrated Forward Looking Infrared and Targeting System (IFTS), freeing another hardpoint for weapons carriage and reducing drag and radar cross section.[2] Finally, the aircraft also has a larger data bus, reportedly capable of handling 1,000 times more data, allowing some 260 times more throughput than the original production F-16A/B.[3]

All of these elements combine to make the F-16C/D Block 60 a substantially more capable aircraft, a culmination of the six major block changes the aircraft has undergone since its inception in the late 1970s. In some ways, it represents an "F-35 Lite," insofar as it incorporates a variety of subsystems (AESA radar, IFTS) found on the F-35. Although this is not to suggest that, even at the Block 60 level, the F-16C/D is a direct competitor to the stealthy F-35, it *is* a "more advanced" fighter than the F-16A/B.

Finally, there is the political and physical reality that the U.S. will not sell Taiwan the F-35 until, at the earliest, it has equipped its own squadrons and those of its consortium partners, as well as previously confirmed customers. This means that Taiwan would have to wait behind not only the U.S. Air Force but also the Royal Air Force as well as the air forces of Australia, Canada, Denmark, Italy, Japan, the Netherlands, Norway, Turkey, Israel, and Singapore.

This suggests that, at the earliest, Taiwan could not hope to purchase the F-35 before 2025, with deliveries likely sometime beyond that point. By then, the F-5s will have long ago disappeared, along with Taiwan's Mirage 2000-5s and Ching-kuo.

Helping a Friend. The U.S. Administration and Congress should focus on its stated goal of closing Taiwan's fighter gap. Filling Taiwan's long-standing request for F-16C/Ds would do that. They should proceed with haste.

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2. FlightGlobal, "Flight Test: Lockheed Martin F-16E/F Block 60—Bridging the Gap," December 2, 2003, http://www.flightglobal.com/news/articles/flight-test-lockheed-martin-f-16ef-block-60-bridging-the-gap-174510/ (accessed June 5, 2013).
3. Defense Industry Daily, "The UAE's F-16 Block 60 Desert Falcon Fleet," November 30, 2011, http://www.defenseindustrydaily.com/the-uaes-f-16-block-60-desert-falcon-fleet-04538/ (accessed June 5, 2013).