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Defense Intelligence Agency

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**(U) Taiwan Air Defense Status Assessment**

*[(U) The paper responds to OSD's request for information on the status of Taiwan's Air Defenses in preparation for a response to Congress.]*

(U) Taiwan's air defense capability exists to counter a range of threats from China including ballistic and cruise missiles, third- and fourth-generation fighters, and helicopters. In recent years, the Chinese People's Liberation Army has increased the quantity and sophistication of its ballistic and cruise missiles and fighter aircraft opposite Taiwan, which has diminished Taiwan's ability to deny PRC efforts to attain air superiority in a conflict.

(U) This report provides an overview of Taiwan's air and air defense forces, including an examination of major strengths and weaknesses. This report does not provide qualitative assessments of how well Taiwan's air defenses will perform against China's ballistic missile and air threats during any cross-strait conflict.

**(U) Air and Air Defense Infrastructure Overview**

(U) Taiwan has positioned the bulk of its early warning, air, and air defense assets on the western side of the island nearest the Taiwan Strait to challenge any threat from the mainland. Although Taiwan has some domestically produced fighter aircraft and surface-to-air missile (SAM) batteries, the Taiwan authorities have purchased the majority of their air and air defense infrastructure from the United States and, to a lesser extent, other foreign suppliers.

**(U) Surface-to-Air Missiles**

(U) Taiwan uses layered SAM coverage to protect its major population centers, key national leadership installations, military facilities, and national infrastructure. The air defense network consists of 22 SAM sites utilizing a mix of long- and medium-range systems, augmented by short-range tactical SAMs to provide overlapping coverage.

(U) **Area Air Defense SAMs:** Central to Taiwan's SAM network are the area air defense systems, which include the long-range U.S.-produced Patriot PAC-2 Modified Air Defense System (MADS), the long-range Taiwan-produced Tien Kung-I (TK-I) and Tien Kung II (TK-II), and medium-range U.S.-produced Improved-Homing All-the-Way Killer (I-HAWK). In addition to providing protection for key strategic installations,

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Taiwan positions several of these systems on outer islands to provide coverage along key air avenues of approach from the mainland.

- (U) *TK-I*: Batteries are in Keelung, Kaoshiung, Penghu, Tungyin, Lungtan, and Sanchih. Taiwan has both fixed and mobile variants of the TK-I launcher. The missile has a 120 km engagement range.
- (U) *TK-II*: Batteries are at Sanchih, Tungyin, Penghu, and Lungtan. The TK-II is launched from mobile launchers, and has a 300 km engagement range. Taiwan intends to replace some I-HAWK batteries with TK-II systems beginning in 2010.
- (U) *Patriot PAC-2 MADS*: Taiwan has three Patriot PAC-2 batteries around Taipei.
- (U) *I-HAWK*: A mainstay of Taiwan's SAM network is the I-HAWK medium-range SAM, which is used to fill-in long-range SAM coverage gaps and protect several of its key military installations. Taiwan has 13 I-HAWK batteries.

**(U) Tactical SAMs:**

(U) The area air defense SAMs listed above are augmented by short-range tactical SAMs, including shoulder-fired man-portable air defense systems (MANPADS). These units are primarily subordinate to tactical combat forces to provide organic air defense support, but can be stationed at airfields and other military installations to augment longer-range systems.

- (U) *Avenger*: The Taiwan Army operates roughly 74 U.S.-produced Avenger systems. The Avenger system consists of U.S.-produced short-range Stinger missiles fired from launchers mounted on the rear of a high mobility multipurpose wheeled vehicle (HMMWV). The system has a range of 4.5km.
- (U) *Antelope*: Taiwan has developed an indigenous short-range missile system that consists of modified Tien Chien infrared air-to-air missiles mounted on the rear of a HMMWV. Taiwan has fielded one Antelope battery, with an unknown number of additional units planned. The system has a 9 km range and the missile is similar in design and performance to the U.S.-produced AIM-9 missile.
- (U) *MANPADS*: The Taiwan Army also has about 800 MANPADS for use by tactical combat units.
- (U) *Chaparral*: Taiwan has 45 land Chaparral units for tactical air defense. The Chaparral uses the MIM-72G missile system with a range of 9 km.

**(U) Fighter Aircraft**

(U) Although Taiwan has nearly 400 combat aircraft in service, far fewer of these are operationally capable. Taiwan's F-5 fighters have reached the end of their operational service life, and while the indigenously produced F-CK-1 A/B Indigenous Defense Fighter (IDF) is a large component of Taiwan's active fighter force, it lacks the capability for sustained sorties. Taiwan's Mirage 2000-5 aircraft are technologically advanced, but they require frequent, expensive maintenance that adversely affects their operational readiness rate.

(U) Despite the operational capability of Taiwan's fighter force, these aircraft cannot be used effectively in conflict without adequate airfield protection, especially runways. Taiwan's ability to protect its aircraft and airfields from missile attacks and rapidly repair damaged runways and taxiways are central issues to consider when examining Taiwan's air defense capability.

**(U) F-16 A/B: 146 fighters in inventory.** Taiwan currently has 146 F-16 A/B (block 20) fighters in its inventory (132 on island). Taiwan may consider seeking upgrades to some capabilities of the existing block 20 aircraft, most likely focusing on "avionics, survivability and combat effectiveness." However, the extent of the upgrades, and timing and quantity of affected aircraft is currently unknown. The F-16A/B can be armed with the AIM-120C active-radar air-to-air missile.

**(U) F-CK-1 A/B: 126 aircraft (total) in inventory.** Taiwan is also performing a modernization program for a portion of its Indigenous Defense Fighter (IDF) program. The IDF can be loaded with the indigenously developed Tien Chien II air-to-air missile (AAM). The IDF's limited combat range and payload capacity restrict its effectiveness in air-to-air combat.

**(U) Mirage 2000-5: 56 aircraft in inventory.** Taiwan currently possesses 56 Mirage 2000-5 aircraft, however the operational capability of these fighters is expected to be considerably less than that number because of a decreased operational readiness rate. High maintenance costs, the lack of required spare parts, and chronic difficulties with the aircraft's turbine fan blades have severely hampered the fighters' readiness rates. As a result, Taiwan defense leadership has considered mothballing these fighters and focusing resources on a more sustainable aircraft. The Mirage can be armed with the MICA active-radar air-to-air missile.

**(U) F-5 E/F: 60 aircraft in inventory.** Taiwan operates 60 F-5 E/F aircraft. Although open-source reporting indicates Taiwan has up to 60 F-5 aircraft, the

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number of operationally capable aircraft is likely much less, possibly in the low 30s. The Taiwan Air Force uses operational F-5 aircraft for training purposes.

**(U) Future Considerations**

**(U)** In 2008, the U.S. government authorized the sale of four PATRIOT PAC-3 missile fire units and 330 missiles to Taiwan. They will be delivered in August 2014. Taiwan is currently developing an indigenous TK-III missile system that will operate at the same ranges as the U.S.-produced PATRIOT PAC-3 system.

**(U)** Taiwan recognizes that it needs a sustainable replacement for obsolete and problematic aircraft platforms. In addition to pursuing a replacement airframe, Taiwan is also examining an upgrade to its existing F-16 A/B aircraft and its IDF aircraft.

(U) Order of Battle Tables

(U) Table 1.1

## (U) Taiwan Air Defense Infrastructure

Missile System	Batteries	Missile Type (Quantity)
<i>Conventional</i>		
Tien Kung I/II	6	(500)
PAC-2	3	Patriot (200)
I-HAWK	4	375
<i>Short Range (30 km or less)</i>		
M-48 Chaparral	37	MIM-72C (727)
Antelope	6*	Tien Chien 1 (unknown)
Avenger	74	FIM-92 'Stinger' (1,299)
Man- Portable Stingers	N/A	FIM-92 'Stinger' (728)
RBS-70	20	
<i>Future plans</i>		
Tien Kung III	IOC 2012	
PAC-3	IOC 2014	

Sources: Jane's Land-Based Air Defense, SIPRI Arms Transfer Database  
(Indicates equipment numbers procured and does not estimate for equipment destroyed or otherwise inoperable.)

\* Domestically produced system. Partially fielded (six batteries planned).

(U) Table 1.2

(U) Taiwan Air Force Aircraft and Munitions Inventory

Aircraft	Total	Fighter Munitions Type	Munitions Total
<i>Fighters</i>			
<b>F-16 A/B</b>	145	AIM-120 C-5	120
		AIM-120 C-7	218
<b>F-CK-1 (IDF)</b>	126	Tien Chien 2	250
<b>Mirage 2000-5</b>	56	MBDA Mica	960
		R-550 Magic-2*	480
<b>F-5 E/F*</b>	50		
<i>EW Surveillance</i>			
<b>E2-T</b>	6	N/A	N/A

Sources: Jane's All the World's Aircraft (2009) unless otherwise noted.  
 \* SIPRI Arms Transfer Database (2008).

(U) Table 1.3

(U) Taiwan Naval SAM Inventory

Naval Platform	Total	Missile Type
<b>Cheng Kung (Perry) Frigates</b>	97	RIM- 66B Standard IMR
<b>Keelung (Kidd) Destroyers</b>	148	RIM -66M Standard-2 block 3A

Source: SIPRI arms transfer database