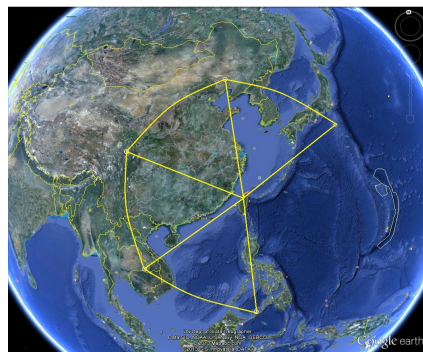


**A Dossier on the Pave Paws Radar Installation  
on Leshan, Taiwan**

**樂山**

**24.499 N, 121.072 E**

**Version of 2013-03-08**



## **Missile Defense Radar Fielded in Taiwan**

**Feb. 4, 2013**

A \$1.4 billion missile defense radar has been activated in Taiwan, Agence France-Presse reported on Sunday.

"The radar is able to provide us with more than six minutes' warning in preparation for any surprise attacks," air force Lt. Gen. Wu Wan-chiao said to the news agency.

The system, placed high on a mountain in the island state's north, can monitor incoming threats at a distance of up to 3,100 miles.

China is said to have about 1,000 ballistic missiles pointed at Taiwan. It has declared the autonomously governed island to be its territory and has pledged to take military action should Taipei seek full independence.

"The system enabled Taiwan to have comprehensive surveillance controls when North Korea launched a rocket in December and the mainland tested its antimissile system lately," an unidentified armed forces official told the Liberty Times newspaper, discussing radar practice that began near the end of 2012.

"Through the sharing with the United States of the information it collects from the radar system, Taiwan becomes a critical link in the U.S. strategic defense network in the region," according to Kevin Cheng, top editor at Taipei-based Asia-Pacific Defense Magazine.

Previous reports indicated Taiwan would not share data from the radar with the United States.

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?ID=201302030023&Type=aTOD](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?ID=201302030023&Type=aTOD)

## **Talk of the Day -- Taiwan formally commissions new radar system**

2013/02/03 22:04:38

The military held a commissioning ceremony Feb. 1 for a new advanced early warning radar system that can detect and track not only guided ballistic missiles and cruise missiles but also all types of warplanes, including stealth fighters.

The new phased array radar installation, situated on top of a mountain in Hsinchu County, northern Taiwan, is more advanced than five other similar systems established by the United States in other countries, according to media reports.

The new mountaintop radar system at Loshan can detect flying objects in a range of up to 5,000 kilometers, enabling Taiwan to have comprehensive surveillance control of aerial activities in airspace from the Korean peninsula in the north to the South China Sea in the south, the reports said.

According to military sources, the system has been in service since last December.

The sources further said that Chief of General Staff Gen. Yen Ming presided over the new radar's formal commissioning ceremony.

The long-range, early warning radar installation is expected to give Taiwan an additional few minutes of warning of any surprise Chinese missile attack, the sources added.

The following are excerpts from local media coverage of the new system and the latest developments in regional security issues:

Liberty Times:

Taiwan began to negotiate a deal with the United States on procuring an advanced surveillance radar system after China fired ballistic missiles in the Taiwan Strait ahead of the island's first-ever direct presidential election in 1996.

A deal was finally struck after 10 years of negotiations, and construction of a new facility to accommodate the new radar system got underway in 2007.

Because of the Loshan region's inclement weather and poor traffic conditions, the construction project took six years to complete, at an exorbitant cost of NT\$40.9 billion (US\$1.38 billion).

Military sources said that when North Korea launched a rocket last December, the Loshan radar system was already prepared for service.

"We decided to put the installation into service ahead of the original schedule and the system enabled us to have full surveillance control," said a military officer who spoke on condition of anonymity.

The new installation has also allowed Taiwan to detect China's recent test-firing of missile-interception weapons, the officer said.

With the new radar, Taiwan managed to detect North Korea's rocket launch a few minutes ahead of even Japan, according to a previous Defense Ministry report.

Yen said at the commissioning ceremony that the new system will greatly enhance Taiwan's ability to detect and track missiles and other aerial threats from neighboring countries.

As Loshan is located at a high altitude, military personnel had to endure hardships during the process of construction of the radar base, Defense Ministry officials said.

Daily supplies and even construction materials often had to be airlifted in by helicopter.

Many of those involved in the project, however, have become accustomed to the primitive living conditions, the officials said, adding that some officers have been posted there for over 10 years. (Feb. 3, 2013)

[http://www.channelnewsasia.com/stories/afp\\_asiapacific/view/1251961/1/.html](http://www.channelnewsasia.com/stories/afp_asiapacific/view/1251961/1/.html)

## Taiwan deploys advanced early warning radar

Posted: 03 February 2013 1608 hrs

TAIPEI: Taiwan has put into service a US-made billion-dollar early warning radar system capable of giving more than six minutes' warning of a Chinese missile attack, a senior military officer said Sunday.

The radar, located on top of a mountain in northern Hsinchu county, started providing surveillance information after a ceremony presided over by chief of the general staff air force General Yen Ming on Friday. [2013-02-01?]

"The radar is able to provide us with more than six minutes' warning in preparations for any surprise attacks," Lieutenant General Wu Wan-chiao, director of the air force command headquarters' department of political warfare, told AFP.

According to the Liberty Times, Yen said while addressing a small group of guests: "With the completion of the project, the military's airborne surveillance capability against missiles and flying objects that may threaten Taiwan has been largely upgraded."

The paper said the phased array warning system, which cost Tw\$40.9 billion (\$1.38 billion), is capable of detecting flying objects up to 5,000 kilometres (3,100 miles) away.

"The system has enabled Taiwan to have comprehensive surveillance controls when North Korea launched a rocket in December and the mainland tested its anti-missile system lately," the paper quoted an unnamed military officer as saying, speaking of the radar's trial runs since late last year.

Taiwan decided to buy the costly radar system from the United States following the 1995-1996 missile crisis, during which China carried out ballistic missile tests in waters off Taiwan in an attempt to intimidate the island ahead of its first direct presidential elections.

"This is the most advanced system of its kind in the world... it is crucial as the Chinese communists are aiming more than 1,000 ballistic missiles at Taiwan," Chao Shih-chang, then deputy defence minister told parliament in 2011, adding it was also capable of detecting cruise missiles.

<http://www.chinapost.com.tw/taiwan/national/national-news/2013/01/06/366468/Long-range-radar.htm>

## **Long-range radar budget surges by NT\$10 billion**

The China Post news staff

January 6, 2013, 12:01 am TWN

TAIPEI, Taiwan -- Taiwan's long-range early-warning radar system recently became operational at a total cost of over NT\$40 billion, up NT\$10 billion from the original budget set in 2003, according to Kuomintang lawmaker Lin Yu-fang.

Lin said the NT\$10 billion increase in the radar's budget, including a rise of NT\$4 billion for 2013, was designed to boost the system's performance, enhance the security of its software, and reinforce its civil engineering. The NT\$4 billion budget increase for 2013 was approved during an earlier secret meeting of the Legislature's National Defense Committee.

The radar system, which was purchased from the U.S., has been in construction for the last decade.

Lin made the remarks in response to questions from reporters after winding up a visit to the radar system on Loshan (2,680 meters above the sea), Hsinchu County in Northern Taiwan.

But Lin also said that the Air Force Command Headquarters has filed an application with the U.S. for arbitration over the justification of the latest budget increase of NT\$4 billion. The arbitration will take one year to complete.

Lin said the long-range early-warning radar system can conduct a 360-degree surveillance sweep, with a radius of over 2,000 kilometers. This includes inland areas of mainland China, the Diaoyutai Islands, and Taiping island of the Spratly islands.

Lin said information from the long-range radar system can be sent to the nation's missile early-warning center and Patriot Anti-Missile System, and then be sent to the Hengshan Command Center and other key weapon carrier systems.

As the radar is located on a high mountain, its surveillance scope reaches far into mainland China. This enables it to monitor any potential ballistic and cruise missiles from China as well as the activity of aircraft at various military or civil airports in the country, according to Lin.

He stressed that in terms of surveillance performance Taiwan's long-range early-warning radar is superior to the same kind of systems deployed in the U.S., Britain and Denmark.

Lin said the U.S.' decision to cooperate closely with Taiwan in deploying the radar clearly demonstrates that Taiwan's strategic position in Asia is closely related to the core interests of the U.S. The data recorded by the system can be shared by both parties, Lin added.

## **Taiwan's new early warning radar system covers as far as 3,000 nautical miles**

2013/01/05 22:44:24

Taipei, Jan. 5 (CNA) Taiwan's new early warning radar system covers nearly 360 degrees and a reconnaissance distance as far as 3,000 nautical miles that helped Taiwan detect North Korea's rocket launch even minutes earlier than Japan, a source with the Air Force has said.

The long-range early warning radar system helped the nation detected North Korea's rocket launch shortly after it blasted off Dec. 12, the source said.

The long-range early warning radar system installed at Loshan in Hsinchu County was formally inaugurated last month.

The source said that Taiwan's long-range radar can even collect information of some areas in Northeast Asia and Southeast Asia, including the disputed Diaoyutai Islands in the East China Sea and Taiping Island, the largest island in the Spratly Islands in the South Sea.

The Diaoyutai Islands, located about 100 nautical miles northeast of Taiwan, is under Japan's administrative control since 1972, but is also claimed by Taiwan and China.

The budget of the U.S.-built radar system was increased by another US\$200 million last year to more than NT\$40 billion (US\$1.38 billion), an amount the Air Force found unacceptable and has asked for an arbitration.

Statistics showed that the system is more powerful than those of the same type currently in service in the United States, according to the source.

The radar can detect and track short- and long-range ballistic missiles and cruise missiles, the source said, adding that the radar can pinpoint the trajectory of any intruding missile and thus give Taiwan more time to prepare a response.

(By Chen Pei-hu)

<http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20121213000062&cid=1101>

## Taiwan's new radar system detects North Korean rocket launch

CNA 2012-12-13 11:43 (GMT+8)

A new early warning radar system helped Taiwan detect North Korea's rocket launch shortly after the rocket blasted off Wednesday morning, according to the country's Ministry of Defense.

In a statement issued Wednesday, the ministry said it closely monitored North Korea's rocket launch and indicated that the rocket's flight did not pose any threat to Taiwan's national security.

"Our long-range early warning radar system detected the North Korean rocket flying over waters some 200 km east of Taiwan and that the first and second stages of the rocket crashed into waters off South Korea and the Philippines, respectively," the ministry said in a statement.

It marked the first time that the ministry has mentioned the functioning of the Taiwanese military's early warning radar system. The military has revealed few technical details about its new radar installation, code-named the Anpang Project.

Ministry spokesman Luo Shou-he later confirmed that the long-range early warning radar system installed at Loshan in northwestern Taiwan's Hsinchu county was formally inaugurated Tuesday [2012-12-11?] and has since become operational.

The US-built radar, worth more than NT\$40 billion (US\$1.37 billion), is more powerful than those of the same type currently in service in the United States, according to Taiwanese military sources.

The radar can detect and track short- and long-range ballistic missiles and cruise missiles, the sources said, adding that the radar can pinpoint the trajectory of any intruding missile and thus give Taiwan more time to prepare a response.

Lieutenant General Chen Tien-sheng, chief of staff at Taiwan's Air Force Command Headquarters, once said at a legislative session that the system can detect targets as far away as 3,000 miles, including stealth warplanes.

Local media have reported, however, that the US supplier of the system repeatedly raised the price of the radar installation, and some critics have contended that Taiwan acquired the system at a price far higher than that offered to other countries.

As the US does not have access to the intelligence collected from the new system, Taiwanese lawmakers have suggested that its military should not offer intelligence collected through the radar system to the United States for free.



<http://www.govconwire.com/2012/12/raytheon-wins-287m-taiwan-radar-support-sale/>

## **Raytheon Wins \$289M Taiwan Radar Support Sale**

Posted by Ross Wilkers

Dec 10th, 2012

Raytheon (NYSE: RTN) has won a \$289,458,942 U.S. Air Force contract to provide sustainment support for an early warning radar system.

The Defense Department said this contract supports the Taiwan Surveillance Radar Program through a foreign military sale.

Work will occur in Taiwan through Nov. 8, 2017 and Hanscom Air Force Base, Mass. is the contracting activity.

According to a FedBizOpps post *[of 2004]*, the program aims to provide Taiwan two ultra high frequency phased array radars and up to four missile warning centers for missile warning, air breathing threats and maritime ship tracking missions.

The Air Force estimated the initial buy of the radar and two centers was valued at \$830 million over four years, with remaining radars and centers covered under contract options.

<http://blogs.defensenews.com/intercepts/2012/12/costs-skyrocket-for-taiwans-early-warning-radar/>

## **Costs Skyrocket for Taiwan's Early Warning Radar**

**Dec 9, 2012**

By Wendell Minnick

The price for further maintenance of Taiwan's sole early warning radar (EWR) program just went through the roof. The Pentagon announced an additional maintenance contract on December 7 worth a whopping \$290 million. Given the fact that the original price for construction of the EWR on Taiwan's west coast was only \$800 million, Taiwan legislators have already complained bitterly of extensive overruns hitting \$1.23 billion.

The Raytheon built facility is designed to warn of an initial missile and air strike from China, which is aiming 1,500 short-range ballistic missiles at Taiwan.

The construction of the radar facility was delayed by mudslides on Leshan Mountain and further unspecified delays pushed costs up. The additional increase will no doubt upset many within Taiwan's legislature and military who have been pushing for an increase in the defense budget to cover costs of paying for \$18 billion worth of arms procured from the U.S. since 2007.

The list is extensive: AH-64 Apache attack helicopters, Patriot Advanced Capability 3 (PAC-3) missiles, P-3C Orion maritime patrol aircraft, UH-60M Blackhawk utility helicopters, F-16A/B upgrade package for 145 fighters, Osprey-class mine hunting ships, AMRAAM missiles, SM-2 Block IIIA Standard air-defense missiles for Kidd-class destroyers, Harpoon anti-ship missile, etc.

See Shirley Kan's most recent report on Taiwan's arms procurement programs in her new report: Taiwan: Major U.S. Arms Sales Since 1990.

“However, Taiwan complained of mistrust, delays, and price increases for the SRP (and other programs). The U.S. Air Force unexpectedly asked Taiwan to agree to two revised Letters of Offer and Acceptance for two additional payments of about \$141 million (requested in December 2007 to cover costs in disaster response) and about \$56 million (requested in June 2009 to enhance anti-tampering). In 2011, Raytheon requested a third increase of about \$200 million. While officials in Taiwan, including in the LY and Taiwan's military, expressed frustration at the extra U.S. demands, they said they remained committed to the SRP.”

Below is the original DoD December 7th announcement:

Raytheon Co., Sudbury, Mass., (FA8730-13-C-0003) is being awarded a \$289,458,942 cost-plus-fixed-fee, firm-fixed-price, cost reimbursement contract for follow-on sustainment support of the Taiwan Surveillance Radar Program. The location of the performance is Taiwan. Work is expected to be completed by Nov. 8, 2017. The contracting activity is AFLCMC/HBNA, Hanscom Air Force Base, Mass. Contract involves foreign military sales to Taiwan.

## **Raytheon to Support Taiwan Ultra High Frequency Radar**

**December 9, 2011**

By George Seffers

Raytheon Integrated Defense Systems, Sudbury, Massachusetts, is being awarded a \$42,913,894 cost-plus-fixed-fee and firm-fixed-price contract for the Surveillance Radar Program to provide Taiwan with the elements of a missile and air defense capability. Specifically, this system includes a ultra high frequency phased array radar integrated with Taiwan-furnished Identification Friend-or-Foe beacons; two Missile Warning Centers; and communications and interface architecture and protocol to specified Taiwan mission elements via the Taiwan military communications infrastructure, consistent with U.S. government restrictions. Electronic Systems Center, Hanscom Air Force Base, Massachusetts, is the contracting activity.

## **Taiwan will not share new radar system's data with U.S.: official**

2012/11/05 17:51:53

Taipei, Nov. 5 (CNA) Taiwan will not share information gathered by its new early-warning surveillance radar system with the United States, following the completion of the system by the end of the year, a defense official said Monday.

The long-range system at a military base in Hsinchu County will be a closed network and the military "will not offer" related information to the U.S., said Lt. Gen. Liu Shi-lay, an official with the Ministry of National Defense's unit responsible for communication, electronics and information.

Liu made the remarks in response to concerns raised by ruling Kuomintang Legislator Lu Shioh-yen that Taiwan's military will provide information collected by the radar system to the U.S.

At a hearing of the Legislature's Foreign Affairs and National Defense Committee, Lu also expressed concerns that the system, which Taiwan purchased from the U.S., will be more beneficial to Washington than to Taipei.

Lu said the information collected by the radar system will be more valuable for the U.S., in the event of missile attacks by China.

However, the ministry has said that the radar system is necessary to help strengthen Taiwan's combat readiness in case of Chinese attack, given that China deploys over 1,000 missiles targeting Taiwan.

On the possibility that the U.S. may be able to intercept data collected by the system, Liu said the U.S. will be unable to access any information unless Taiwan shares it.

<http://phys.org/news/2012-10-taiwan-apple-blur-sensitive-military.html>

## **Taiwan to ask Apple to blur sensitive military images**

**October 9, 2012**

Taiwan said Tuesday it will ask US tech giant Apple to blur satellite images of sensitive military installations which are freely available to iPhone 5 users.

The defence ministry reacted after the Liberty Times newspaper printed a satellite picture, downloaded with an iPhone 5, showing a top-secret long-range radar base in the northern county of Hsinchu.

"Regarding images taken by commercial satellites, legally we can do nothing about it," the ministry's spokesman David Lo told reporters. "But we'll ask Apple to lower the resolution of satellite images of some confidential military establishments the way we've asked Google in the past," he said, referring to the Google Earth programme.

Apple has not yet received a formal request, according to Bravo, a Taiwan PR company handling its media relations. It declined to speculate how Apple would respond to a request.

The Hsinchu base houses a cutting-edge long-range radar procured from the United States in 2003. Construction of the radar is expected to be completed by the end of the year.

The ultra-high-frequency radar, supplied by US defence group Raytheon, is capable of detecting missiles launched as far away as Xinjiang in China's northwest, military officials say.

They say the radar, which cost Tw\$36 billion (\$1.23 billion), is designed to give Taiwan minutes of extra warning in case of a Chinese missile attack.

## **Nixed radar report ‘old news’: sources**

**Mon, Oct 01, 2012**

**EARLY WARNING:** A story by news agency Agence France-Presse that claimed Taiwan had dropped an early-warning defense system happened years ago, sources have said

By J. Michael Cole / Staff reporter

Defense industry sources yesterday denied a report filed last week that Taiwan had decided to drop a plan to purchase a second early-warning radar (EWR) from the US, saying the decision had been made several years ago.

Citing “military authorities,” Agence France-Presse (AFP) reported on Tuesday that the Ministry of National Defense had abandoned plans to add a second EWR to its inventory.

The story began more than a decade ago, when Taiwan launched efforts to improve its surveillance capabilities under what came to be known as the Surveillance Radar Program (SRP).

After four years of intense debate, in November 2003, a still-divided legislature agreed to set aside US\$800 million for the acquisition of one EWR from the US. In March the following year, Washington responded with a US\$1.77 billion notification to Congress, which provided an option for two ultra-high-frequency long-range EWRs.

US-based Raytheon Corp won a US\$752 million contract in June 2005 for Taiwan’s first EWR, with construction in Leshan (樂山), Hsinchu County, beginning in 2009. With its 3,000km range and ability to track as many as 1,000 ballistic and air-breathing targets simultaneously, the by-now US\$1 billion-plus EWR, which is expected to become operational by the end of this year, has been described as possibly the most powerful on the planet.

The project has not been without controversy over the years, primarily over rising construction and maintenance costs, with Raytheon requesting an additional US\$200 million last year. Chinese Nationalist Party (KMT) Legislator Lin Yu-fang (林郁方) last week called on the ministry to “stand tough in negotiating the price with the US,” adding that otherwise the radar could become “a pestering ‘money pit.’”

Despite the cost overruns, Taiwan has said it remains committed to the SRP.

According to last week’s AFP report, anger over rising costs nevertheless led to a decision to abandon plans to purchase a second radar system.

“The minister [of national defense] has said there won’t be another one,” an Air Force spokesman told AFP of the second radar, which would reportedly have been built near Greater Kaohsiung.

However, as reported in the C4ISR Journal and in an annual report by the Congressional Research Service, rather than being a recent decision taken by President Ma Ying-jeou's (馬英九) administration, which critics have often accused of being soft on defense, Taiwan abandoned plans to acquire a second

EWR in early 2007, when the Democratic Progressive Party was in power, though it had faced a KMT-dominated legislature at the time.

Part of the confusion comes from a misunderstanding of US congressional notifications on foreign arms sales, which do not oblige a client to purchase all the articles optioned in the notification, but only serve as a list of items that have been made available for purchase.

Asked to comment on the matter yesterday, a defense industry source confirmed that the decision not to procure a second EWR was made in 2007 and had nothing to do with recent developments.

"This is old news," the source told the Taipei Times.

## **Taiwan scraps plan to buy US-made long-range radar**

(AFP) – Sep 25, 2012

TAIPEI — Taiwan has decided to drop a plan to buy a second advanced early-warning radar from the US, officials said Tuesday, following criticism that the first had become a "money pit".

Taiwan purchased its first cutting-edge long-range radar from the US in 2003 and its construction is nearing completion after a delay of more than three years.

But military authorities, citing defence minister Kao Hua-chu, said they would abandon plans of adding a second one to their inventory.

"The minister has said there won't be another one," an air force spokesman told AFP of the radar that would have been installed in the south of the island.

The current ultra-high-frequency radar, supplied by US defence group Raytheon nearing completion in the island's north, is designed to give an extra six minutes' warning of any Chinese missile attack.

The radar has cost Taiwan Tw\$36 billion (\$1.23 billion) to purchase and build over the past eight years and the defence ministry has budgeted another Tw\$4 billion at the demand of the US contractor.

"A large part of the increased payment is supposed to be used in further R&D and depot-level maintenance. This is unacceptable," legislator Lin Yu-fang from the ruling Kuomintang party, who sits on parliament's defence committee, said in a statement Tuesday.

"The defence ministry must stand tough in negotiating the price with the United States, otherwise it may become a pestering 'money pit.'"



<http://fareasternpotato.blogspot.com/2012/02/taiwans-surveillance-radar-to-come.html>

## **Taiwan's surveillance radar could come online without 'space tracking'**

Posted by J. Michael Cole 寇謐將 at 12:38 AM

Saturday, February 25, 2012

The powerful SRP, which is expected to come online later this year, could be blind to the stars above

The US\$800 million early warning radar system that is being build at Leshan (樂山) in Hsinchu County, which some defense experts claim is the most powerful EWS on the face of the planet, could see a very sensitive capability — the ability to track satellites — switched off.

My exclusive for Jane's Defence Weekly continues here (subscription required).

## **Air force denies reports of more delays for radar**

By Rich Chang / Staff Reporter

The air force yesterday denied a newspaper report saying that plans to begin operating a long-range early-warning radar system at Hsinchu Air Force Base could be delayed until next year after land at a construction site subsided.

The Chinese-language United Daily News yesterday reported that construction at the early-warning radar site at Leshan (樂山), Hsinchu County, had encountered land subsidence problems and that as a consequence, plans to begin operating the radar system in November could be delayed until next year.

The report said that trucks carrying concrete and sand had arrived at the base to carry out land consolidation work.

In a press statement, the air force yesterday denied the report, saying groundwork underneath the radar site was completed last year and that there was no problem with subsidence.

The air force added that the radar was being manufactured in the US and that after the completion of software performance integration testing in November, the full system could be installed by the end of the year.

Construction of the advanced radar system faced a series of delays from September 2009 until the end of 2010 because of mudslides, among other problems. The Ministry of National Defense announced last year that the radar system would come online in November this year.

The long-range early-warning radar structure is about 10 stories high. The radar has a range of 3,000km. Taiwan purchased the equipment from the US to monitor ballistic and cruise missiles, and to act as a forward position for the US' ballistic missile defense system.

The ultra-high frequency early-warning radar system has been described by some analysts as the best in the world for its ability to look deep inside China and the advanced software that can analyze large amounts of tracking data. Aside from missiles, the system will also be able to conduct surveillance at sea as well as track satellites.

However, some military experts have raised doubts about the radar system, including its vulnerability — the site would be unlikely to survive beyond an initial missile strike — and its inability to detect cruise missiles.

Critics also say that the additional six minutes of warning time the long-range radar provides would only make a marginal difference.

Other detractors also point to its high cost — about US\$800 million — as well as environmental concerns and opposition from Aborigines living in the area.

Additional reporting by J. Michael Cole

## **Taiwan to complete long-range surveillance radar program next year**

Central News Agency

2011-11-10 04:21 PM

Taipei, Nov. 10 (CNA) Taiwan will complete a long-range surveillance radar system next year, a move to boost the nation's air defenses in the face of military threat from China, officials said Thursday. The construction of the long-range early warning Surveillance Radar Program (SRP) is set to be fully completed at a military site in Hsinchu County of northern Taiwan in November 2012, said Deputy Defense Minister Chao Shih-chang at a legislative session. Chao also downplayed concerns that the new radar system may fail to integrate with Taiwan's Patriot missile launch system and link to the Heng Shan Military Command Center, a military emergency facility also located in the north.

"The preliminary tests have showed that there are no problems with the integration between the systems," Chao said at the Legislature's Foreign Affairs and National Defense Committee.

Chao's remarks came in response to questions by legislators who expressed concern about the complete integration of the radar and the Patriot missile systems. Noting that China deploys more than 1,000 missiles targeting Taiwan, Chao said such a radar system is necessary to help strengthen the country's combat readiness in the event of Chinese attack.

The deputy minister's comments were a response to legislator Chang Hsien-yao of the ruling Kuomintang who asked why Taiwan is the only country that has purchased the radar system from the United States. The radar system was originally set to be completed by the end of this year, but the completion of the project has to be postponed due to some construction problems, according to the Ministry of National Defense. (By Elaine Hou)



## **Taiwan: Major U.S. Arms Sales Since 1990**

Shirley A. Kan

Specialist in Asian Security Affairs

February 24, 2011

Congressional Research Service

7-5700

[www.crs.gov](http://www.crs.gov)

RL30957

### Early Warning Radar

In 1999, some in Congress encouraged the Clinton Administration to approve a sale of early warning radars (see “106th Congress” below), approval that was given in 2000. The Pentagon stressed the importance of long-range early warning and tracking of ballistic and cruise missile attacks against Taiwan. Taiwan reportedly considered two options: a radar similar to AN/FPS-115 Pave Paws sold by Raytheon and the LM Digital UHF Radar proposed by Lockheed Martin.(106) Despite divided opinions among lawmakers, in November 2003, Taiwan’s legislature approved the Defense Ministry’s request for about \$800 million to fund one radar site (rather than an option for two).(107) Nonetheless, on March 30, 2004, the Defense Department notified Congress of the proposed sale of two ultra high frequency long range early warning radars, with the potential value of \$1.8 billion, that would enhance Taiwan’s ability to identify and detect ballistic missiles as well as cruise missiles, and other threats from the air, and improve the early warning capability of Taiwan’s C4ISR architecture. The notification pointed out that U.S. personnel would not be assigned to the radar(s). By early 2005, Taiwan had not contracted for the controversial program, and Lockheed Martin withdrew its bid.(108) In June 2005, Raytheon concluded a contract worth \$752 million to provide one Early Warning Surveillance Radar System to Taiwan by September 2009.(109) However, by early 2007, Taiwan decided not to procure the second radar.(110) Construction of the radar in the Surveillance Radar Program (SRP) proceeded in 2009. It would set up a missile warning center with links to Taiwan’s command authority and possibly the U.S. military.

However, Taiwan complained of delays and price increases for the SRP (and other programs). The U.S. Air Force unexpectedly asked Taiwan to agree to two revised Letters of Offer and Acceptance for two additional payments of about \$141 million (requested in December 2007 to cover costs in disaster response) and about \$56 million (requested in June 2009 to enhance antitampering). This U.S. request raised questions in Taiwan about whether there was greater U.S.- Taiwan mistrust. While officials in Taiwan, including in the LY and Taiwan’s military, expressed frustration at the extra U.S. demands, they said they remained committed to the SRP.(111)

(106) Jane's Defense Weekly, March 26, 2003, and February 11, 2004.

(107) Taiwan Defense Review, November 26, 2003; Jane's Defense Review, December 3, 2003.

(108) Jane's Defense Weekly, February 9, 2005.

(109) Raytheon, June 23, 2005; Department of Defense, Air Force Contract for Raytheon, June 23, 2005; Wall Street Journal, June 24, 2005; CNA, June 25, 2005.

(110) Wendell Minnick, "Taiwan's Military Grapples with a Major C4ISR Upgrade," C4ISR Journal, March 2, 2007.

(111) Author's consultations with officials in Taipei in November 2009. Also see "Taiwan Pays NT\$34 Billion on Behalf of the U.S. to Guard its Own Door," I Chou Kan, Taipei, October 22, 2009; Max Hirsch, "Taiwan 'Frustrated' with U.S. Over Key Radar and Other Arms Deals," Kyodo, November 4, 2009; and Liberty Times, February 22, 2010.

## 106th Congress

In the 106th Congress, Representative Ben Gilman, Chairman of the House International Relations Committee, wrote President Clinton on April 19, 1999, urging approval for the sale of long-range early warning radars to Taiwan. He also wrote Secretary of State Madeleine Albright on April 22, 1999, saying that if the Administration did not approve the sale, he would introduce legislation to do so. In the end, the Clinton Administration decided in principle to sell early warning radars to Taiwan. The State Department spokesperson confirmed that the United States agreed on the request in principle and acknowledged that under the TRA, "the President and Congress determined which defense articles and services Taiwan needs." (244) The Pentagon spokesperson also confirmed that the United States "agreed to work with the Taiwanese to evaluate their early warning radar needs, and that will take place over the next year or so, but there is no specific agreement on a specific type of radar, specific sale, or specific terms of sale at this time." (245)

In July 1999, after President Clinton reportedly delayed a visit to Taiwan by Pentagon officials and considered a cutoff of arms sales after President Lee Teng-hui said Taiwan and the PRC have a "special state-to-state relationship," Representative Gilman responded by threatening to suspend all U.S. arms sales. He stated that "I cannot accept undercutting Taiwan's national security and its right under the 1979 Taiwan Relations Act to receive appropriate security assistance from our nation to meet its legitimate self-defense needs. Accordingly, as a result of my concern, I plan at this point to withhold my approval for arms transfers notified to the Congress until this matter is resolved to my satisfaction." (246)

(244) Shenon, Philip, "U.S. Plans to Sell Radar to Taiwan to Monitor China," New York Times, April 30, 1999; Department of State, Daily Press Briefing, April 29, 1999.

(245) Department of Defense, News Briefing, April 30, 1999.

(246) Quoted in "Clinton Confirms Rebuke to Taiwan," Washington Times, July 22, 1999.

<http://www.military-discussion.com/forum/index.php?action=printpage;topic=2310.0>

Title: Taiwan 'frustrated' with U.S. over key radar and other arms deals

Post by: Octavian on **November 05, 2009**, 09:12:02 PM

**\*Taiwan 'frustrated' with U.S. over key radar and other arms deals\***

By Max Hirsch

TAIPEI, Nov. 4 Kyodo -

The U.S. military has required Taiwan to bear the costs of a major, unexpected security upgrade to a key U.S.-made radar on the island, a move signaling Washington's growing distrust of Taipei's ability to safeguard against security breaches as the island woos China, a local government official said.

The request came as Washington demanded what sources said are exorbitant prices on a range of arms that Taiwan seeks to purchase -- from U.S.-made missiles to helicopters -- and dithers over the island's longstanding request to kick-start the procurement process for F-16 fighter jets.

Amid the "price-gouging," the U.S. military -- without prior consultation with Taiwan -- recently asked the island to pay for the addition of costly "anti-tampering" technology in an US\$800 million early-warning radar system, the official said, speaking on condition of anonymity.

"The Taiwanese military is really frustrated with the U.S. [over radar issues]," the official told Kyodo News, adding that the price tag for the unscheduled security measures was nearly NT\$2 billion (US\$61 million).

"Implementing security measures is standard. But why has the U.S. sprung this on Taiwan some three years after the project started and as it's nearing completion?" the official said.

For Taipei, the last-minute request points to Washington's apparent concern over the security of U.S.-made military platforms on the island amid warming relations across the Taiwan Strait, the official said.

"The U.S. is worried about its Taiwan-based technology becoming compromised as cross-strait ties warm...and the island becomes more vulnerable to Chinese espionage," the official said.

Asked for comment, a media liaison officer in Taiwan's defense ministry confirmed the extra security costs, saying the ministry was "looking into the matter." The official declined further comment and requested anonymity.

In 2006, Washington hired U.S. defense contractor Raytheon to build the radar facility, reportedly on Leshan Mountain in central Taiwan. Scheduled to begin operations this year, the radar's capabilities include detecting and tracking incoming missiles from China, according to a recent report by the U.S. Congressional Research Service (CRS).

But mudslide-induced delays have abounded, according to Defense News, a U.S. newsweekly covering military affairs. Indeed, a recent job advertisement on Raytheon's website seeks an engineer to supervise "the surveillance radar program at the Taiwan field site...and work in a remote and hazardous environment."

Since construction began, Washington has "on many occasions requested more funds" from Taipei beyond the radar's sticker price, citing washouts of mountain roads and loose soil, the \*China Times\*, a local Chinese-language daily, reported last week.

But Washington's latest radar-related request fits with a more recent pattern of overcharging Taipei -- often for political or security-related reasons -- the official said, citing separate deals over U.S.-made missiles and helicopters.

*[deletia]*

<http://minnickarticles.blogspot.com/2009/10/taiwan-improves-missile-defenses.html>

Thursday, October 8, 2009

## **Taiwan Improves Missile Defenses**

Defense News

09/07/09

Taiwan Improves Missile Defenses

By Wendell Minnick

TAIPEI — Taiwan continues to improve its missile defenses by upgrading Patriot interceptors, preparing to activate an early-warning radar, and mulling a second early-warning site.

Delayed by mudslides on Leshan Mountain on the west coast in central Taiwan, the \$800 million Surveillance Radar Program (SRP) is to go online shortly. The Raytheon-built facility is designed to warn of an initial missile and air strike from China.

“It’s powerful due to size and aperture,” said a defense industry source. “But what really makes it powerful is the software that can handle a huge amount of tracks” — some 1,000 simultaneously.

Still, the system might not be around long after giving its first warning.

“It’s not realistic to assume the radar would survive past an initial missile strike,” which would likely target the facility, the source said.

Even if Taiwan had 1,000 PAC-3 fire units, the Chinese could still overwhelm the defense with waves of ballistic missiles. Still, Taiwanese and U.S. officials are talking about building a second SRP in Pingtung County in southern Taiwan.

Several industry sources said the United States wants to use the SRP to observe Chinese air power.

“It could add some in terms of covering air activity further inside China, above and beyond getting Taiwan’s current air picture,” one source said, by tracking satellites and the anti-ship ballistic missiles under development in China.

But “the benefits of getting that feed for peacetime monitoring of the air environment does not seem worth the costs,” the source said.

Among other things, the system has line-of-sight limitations.

“The further the range, the higher in altitude those aircraft would have to be. For example, to cover air activity out of Wuhu, an aircraft would need to be pretty high to pick it up due to the curvature of the Earth.”



<http://tw01.org/group/JapanNo1fightChinks/forum/topics/da-zai-mei-zhi-ju-xing-beng>

## **Leshan reconnaissance radar, Raytheon's signature product, to sell to the international missile defense**

The United Evening / reporter Gao Lingyun / Taipei 2007.06.30 03:24 pm

U.S. arms sale reconnaissance radar Shop claw with the United States long-range early warning radar is a phased-array radar, the form is slightly different from the U.S. side radar only two sides, our side is on three sides, three sides to the Chinese mainland, we will use the Raytheon to develop a single, integrated missile image SIMP, provide real-time battlefield awareness, forecast missile placement, it is recommended that the engagement function.

Taiwan reconnaissance radar is Raytheon's newly developed system, the United States also ongoing facelift, set radar system will be able to exchange information with the United States and Japan early warning system. Compared to the old early-warning radar can only monitor the ground or water launch intercontinental ballistic missiles, has stepped can monitor long-and short-range tactical ballistic missiles, cruise missiles, air flight goals, due to be deployed in the mountains, the radar can also overlooking surface ship movement.

Image of a single, integrated missile, developed by Raytheon to provide early warning radar information to another missile early warning center in Taiwan, so that early warning center operators have real-time battlefield awareness, can grasp the missile launch point and the predicted impact point, provide Patriot II missile interceptor missiles the required information, and recommendations of engagement mode. As for the other flight objectives, the plane target acquisition, to the other nodes in the WAN processing. Raytheon for the design of this type of reconnaissance radar, Raytheon to sell to the international resolve the missile defense issue has become a signature product.

## **Raytheon's Surveillance Radar Program For Taiwan Completes System Design Review**

by Staff Writers

Tewksbury MA (SPX) **May 11, 2006**

Raytheon's Surveillance Radar Program (SRP) has successfully completed its system design review (SDR). The two-day intensive technical review took place with the U.S. Air Force Electronic Systems Center, which oversees the contract on behalf of the Taiwan air force, the end-user.

Pete Franklin, vice president, Raytheon Integrated Defense Systems (IDS) Missile Defense business, said, "The SRP early warning radar system will enable the Taiwan air force to detect and track long-and short-range tactical ballistic missiles, cruise missiles and other air breathing targets."

The successful SDR is an important technical review of all contract requirements. It validates that the final design will meet performance, cost and schedule expectations and opens the way for the next major milestone, the hardware preliminary design review.

SRP is a \$752 million foreign military sales contract with Air Force Materiel Command's Electronic Systems Center, Hanscom Air Force Base, Mass. It leverages Raytheon's continuing performance record of providing phased-array, early warning radars to the U.S. government.

<http://www.nti.org/gsn/article/taiwan-to-receive-missile-defense-radar/>

## **Taiwan to Receive Missile Defense Radar**

**June 24, 2005**

Raytheon Co. was awarded a \$752 million contract by the U.S. Air Force to build a missile defense radar destined for Taiwan, Reuters reported yesterday (see GSN, June 20).

The Air Force is providing Taiwan with the Early Warning Surveillance Radar by September 2009 to counter the threat from Chinese missiles. Reuters reported that China, which regards Taiwan as a renegade province, would probably be angered by the move.

The radar system is expected to allow Taiwan to track long- and short-range ballistic missiles, cruise missiles, surface ships and enemy aircraft. It includes “phased array” radar that would be integrated with missing warning centers and beacons that identify aircraft.

In the future, the system could be integrated with Patriot Advanced Capability 3 antimissile systems, which the United States has offered to sell Taiwan.

“The surveillance radar is the first step in the chain of engagement,” said Raytheon’s Dan Martin (Jim Wolf, Reuters, June 23).

## **Official denies change on radar procurement**

By Rich Chang / STAFF REPORTER

Tue, Feb 15, 2005

Democratic Progressive Party (DPP) Legislator Lee Wen-chung (李文忠) said yesterday he saw no sign of change in the government's plan to purchase early-warning radar system from the US, denying a report in the leading defense journal Jane's Defence Weekly that said Taiwan was seriously reconsidering the arms deal.

Jane's Defence Weekly published an article on Feb. 5 that said US defense giant Lockheed Martin has withdrawn its bid to supply Taiwan with an early-warning radar system, and that Taiwan's military was seriously re-evaluating the purchase of an early-warning radar system.

Lee, a military expert, said that since the legislature had approved NT\$26.8 billion for the procurement deal in 2003, and the air force has begun planning to build a base in Hsinchu County to house the early warning radar system in 2007, he saw no sign of a change in the government's plan to buy the radar system.

The Ministry of National Defense declined to comment on the report.

Lee said that the arms deal was controversial because the long-range early-warning radar system was able to detect long-range ballistic missiles, however, he said, it was more likely that China will threaten Taiwan with land attack cruise missiles, rather than ballistic missiles. In fact, he said, a middle-range radar system is considered more fit for Taiwan's defense.

In addition, a large stationary radar system would be an easy target for anti-radiation (which target radars) missiles, Lee said.

Lee added, however, that the purchase of the early-warning system has profound strategic meaning. The operational system would link Taiwan's early-warning system with that of the US, and would therefore help cement the countries' de facto military alliance.

Also, since the government has already committed to buying the early-warning radar system, it would hurt Taiwan's credibility internationally if it withdrew from the arms deal, Lee said.

On the other hand, a military officer, who declined to be identified, said that there have been some opponents in the Ministry of National Defense against the arms deal for several factors, including the system's vulnerability, its inability to detect cruise missiles, and its high price and environmental concerns.

Opponents also think the additional six minutes of warning time that a long-range radar would provide will offer few advantages, the officer said.

Lockheed Martin and Raytheon were expected to submit proposals this year to supply a radar aimed at countering the ballistic missile threat from China.

Lockheed Martin was offering a modified version of the Medium Extended Air Defense System, while Raytheon would provide a modified AN/FPS-115 Pave Paws radar.

Now that Lockheed Martin has announced it was withdrawing its bid, Taiwan could only buy Raytheon's Pave Paws radar.

However, Jane's Defence Weekly correspondent Wendell Minnick told the Taipei Times that "Lockheed Martin was basically fed up with the myriad of problems the [radar] project entailed, and had opted for subcontracting the project via Raytheon instead. There was opposition within the MND to the EWR, but the decision to move forward was a go."

The US approved the sale of the early warning radar system to Taiwan in 2000.



## 58--Surveillance Radar Program (SRP)

Solicitation Number: FA8722-04-R-0002

Agency: Department of the Air Force

Office: Air Force Materiel Command

Location: AFLCMC - Hanscom

**Solicitation Number:** FA8722-04-R-0002  
**Notice Type:** Presolicitation

### Synopsis:

Added: March 2, 2004

The purpose of this notice is to change the Solicitation No. for the Surveillance Radar Program (SRP), as published on 29 Jan 2004 in FedBizOps, From: 'R741' ... To: 'FA8722-04-R-0002' ... therefore, any further information which may be posted with regard to 'SRP' will have revised Solicitation No. FA8722-04-R-0002 associated with it.

### Original synopsis (29 Jan 2004):

The Surveillance Radar Program (SRP) is a foreign military sales (FMS) acquisition to provide an integrated early warning radar system for Taiwan. Missions include missile warning, air breathing threats, and maritime ship tracking. This system, consisting of up to two UHF phased array radars and up to 4 Missile Warning Centers (MWCs) will be installed and tested at locations in Taiwan. The SRP is estimated to cost approximately \$830 Million for an initial buy of a single radar and two MWCs. The remaining Radar and MWCs will be contract options to be exercised if funded by the FMS customer. The initial SRP procurement will be conducted over a 4-year period. ESC/NDB is the designated ESC organization responsible for the development, acquisition, fielding, testing, and sustainment of the SRP.

<http://www.east-asia-intel.com/eai/Sample/7.html>

## **Taiwan's early warning radar wars**

East-Asia-Intel, [www.eas-asia-intel.com](http://www.eas-asia-intel.com)

October 17, 2003

Taiwan is caught up in an intense internal debate over which U.S.-made, multi-million dollar early warning radar to choose.

Taiwan is considering both the Raytheon AN/FPS-115 PAVE PAWS (Precision Acquisition Vehicle Entry Phased-Array Warning System) long-range early warning radar (EWR), and the Lockheed Martin AN/TPS-59(V)3 Theatre Missile Defence (TMD) radar, according to defense sources.

The AN/TPS-59's radar has a range of only 400 nautical miles (720 km). PAVE PAWS has a range of 3,000 nautical miles (5,556 km).

If Taiwan chooses the PAVE PAWS radar, the Ministry of National Defence plans to base the radar at Leshan Mountain (Happy Mountain) in Hsinchu.

Numerous other radar and antenna complexes are positioned at the extremely secretive Leshan Mountain facility. It is also home to one of the RoC Air Force's air defense control and reporting centers (CRC).

If Taiwan chooses the AN/TPS-59 radar instead, it would base one of them on the outer islands near China and the rest on Taiwan. The trouble with this scheme, however, is that Taiwan is tentatively taking steps to demilitarize the outer islands.

<http://www.taipeitimes.com/News/taiwan/archives/2003/09/08/2003066979>

### **Radar base to be built next year**

DEFENSE Although construction of a early warning radar base in Hsinchu County is scheduled for next year, the air force must still decide which system it wants to buy

By Brian Hsu / STAFF REPORTER

The air force will start construction work on a base which will house a long-range early warning radar system next year.

The system will be bought from the US, and the air force is planning to spend around NT\$1.5 billion on the base during the first year, according to the 2004 proposed defense budget.

"The base is to be built on a mountain in northern Hsinchu County, where there are already several radar sites belonging to different armed services," said a military officer who declined to be identified. "The site was chosen because of its high altitude, which will enable the long-range radar to have an adequate view," added the officer.

The long-range early warning radar would apparently have a range of 3,000 km, but it has been reported that the US might not want Taiwan to see that far.

The air force declined to comment on the issue. It also refused to reveal whether it has decided what sort of long-range radar it wants to buy.

The Raytheon company's AN/EP-123 Pave Paws early warning radar system is generally believed to be what the air force wants.

Although the air force said it has not yet decided on the system, it is possible that a decision has been made, since it is unlikely that construction would be planned for next year without a radar system in mind.

In the 2004 proposed defense budget being reviewed by the legislature, NT\$1.5 billion has been allocated to construction of the long-range radar site.

The budget proposal does not specify what sort of radar the air force is to buy.

The NT\$1.5 billion is the first sum of money that the air force is to spend on the building of the long-range radar system.

The US approved the sale of the early warning radar system to Taiwan in 2000, but the Ministry of National Defense has been slow in deciding to buy the system, arousing some complaints from the US, according to reports by the Chinese-language Liberty Times.

The Minister of National Defense, Tang Yao-ming (湯曜明), announced recently at a press conference that the ministry has decided to buy the long-range early warning radar, which he said will be very useful in defense against China's ballistic missiles.



The long-range radar would be able to detect ballistic missiles launched from China, increasing Taiwan's early warning time by around seven minutes.

Chang Li-teh (張立德), a senior editor with the magazine Defense Technology Monthly, said the Pave Paws system has the ability to detect earth-orbiting satellites as well.

"With the Pave Paws, the military might consider developing anti-satellite weapons. Such weapons do not need to be bought from abroad. Certain domestically built weapons being used by the military have the potential to be turned into satellite killers," Chang said.

But Chang was only making a suggestion, since there is no information to show that the military considers developing anti-satellite weapons.

## ***Taiwan Communiqué No. 91, May 2000***

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### **For the defense of Taiwan**

#### ***Mr. Clinton falls short, again***

On Monday, 17 April 2000, the Clinton Administration decided it would *delay* approval of several major weapon systems requested by Taiwan. These postponed requests include the Arleigh Burke-class destroyers equipped with the Aegis battle management system, diesel submarines, and anti-submarine P-3 Orion aircraft.

Instead, the Administration decided on a "comprehensive study", as well as the sale of an older long range radar, PAVE PAWS, a medium-range AMRAAM air-to-air missile, and an upgraded version of the Maverick air-to-ground missile.

***Taiwan Communiqué comment:*** *While these systems are still significant, the postponement of the Arleigh-Burke/Aegis sale is the wrong signal at the wrong time:*

*It is obvious to any person willing to see, that China is increasingly threatening Taiwan, in particular by deploying hundreds of missiles along the coast facing Taiwan.*

*The time for "comprehensive studies" is over. The best response is a firm and principled stance, not the befuddled wishful thinking of the Clinton White House. Mr. Clinton needs to make it excruciatingly clear to the Chinese that ANY move against Taiwan is a move against the United States.*

*Taiwan is willing to defend itself, but if the United States is not providing it with the means to counter the Chinese threats, then the US itself will have to bear the consequences, and will have to send in more troops, ships and aircraft than it would have otherwise.*

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#### ***Aegis and PAVE PAWS***

The decision to postpone the sale of four Arleigh Burke class destroyers outfitted with Aegis, and to offer Taiwan the PAVE PAWS system instead is peculiar. The Arleigh Burke/AEGIS system is an advanced weapon system that could help Taiwan defend itself against the increasing array of short-range missiles deployed along the Chinese coast facing Taiwan.

According to the US Defense Department's own reports, these missiles now number approximately 200, and are growing at a rate of more than 50 per year, with an expected total of some 650 by the year 2005.

To defend against these missiles, the Arleigh Burke destroyers have a AN/SPY-1 multifunction radar capable of monitoring incoming missiles and aircraft. A Command Decision System (CDS) receives data from the ship's and external sensors and provides command, control and threat assessment. A

Weapon Control System directs the ship's weapons against the threats in the vicinity of the ship, while it relays information on incoming threats to other friendly ships and aircraft.

While the ships are not yet outfitted with high altitude missile defense, which are under development in the Theatre Missile Defense (TMD) program, the ships are an essential element for such a missile defense, which could be in place around 2007.

Due to their mobility and advanced defenses, the ships are much less vulnerable than PAVE PAWS (Phased Array Warning System) system, which is basically a large, static building, housing a long-range radar system developed by the United States to detect the launch of intercontinental ballistic missiles during the Cold War.

The United States originally erected four of these radar stations, at Beale Air Force Base in California, at El Dorado in Texas, at Cape Cod Air Station in Massachusetts, and at Robins Air Force Base in Georgia. Only the two stations at Cape Cod and Beale are still operational. The other two were closed down in 1995.

The problem with the PAVE PAWS system is thus that they are stationary, are based on outdated technology, and were designed for long-range detection, and not the short-range missiles that Taiwan is faced with. In addition, the system is not designed to be connected to a battle command system, and would thus be of little help in defending Taiwan against the incoming missiles from China.

## **Pictures**

<http://www.70794.com/?p=5205>



**Data Figure: Taiwan's Hsinchu Leshan base PAVE PAWS radar facilities**

Apple Map exposed to the Taiwan Air Force Base confidential 3D screen legible  
Posted on January 7, 2013 by admin

Taiwan's armed forces, the military is still highly classified, but people just hold the iPhone or iPad, use the Apple navigation map of iOS6 version of the cable will be able to be found the satellite aerial photographs of Leshan base. Software and even the 3D automatic 360-degree surround the base of each point of view, the base for all kinds of buildings, structures, trails, apron, 3 radar screen surface radar radiation body are legible. In this regard, the Taiwan Air Force is very nerve-racking, called Apple to take the moral suasion, but has received no response.

According to Taiwan's "United Evening News" reported that, in order to examine the long-range early warning radar Hsinchu Leshan base, continuously Taiwan's "Legislative Yuan" defense and foreign affairs departments "legislators" months ago scheduled visit itinerary. Before twice due to weather discomfort flight, the helicopter could not land and cancel the trip three times this week adventure overland advance, before the end of the completion of the visits. But the public was able to phone, easy to look at the hands of light military as absolutely confidential at the mountain positions.

In this regard, the Taiwan Air Force director of political warfare teach Wu Wan said, after the Air Force calls Google version of either the navigation map, Google Earth software, have Leshan base The satellite aerial photographs fuzzy, but Apple has not responded to the appeal of the Air Force. He said the Air Force will continue through enhancing the camouflage and other measures to ensure that the base security.

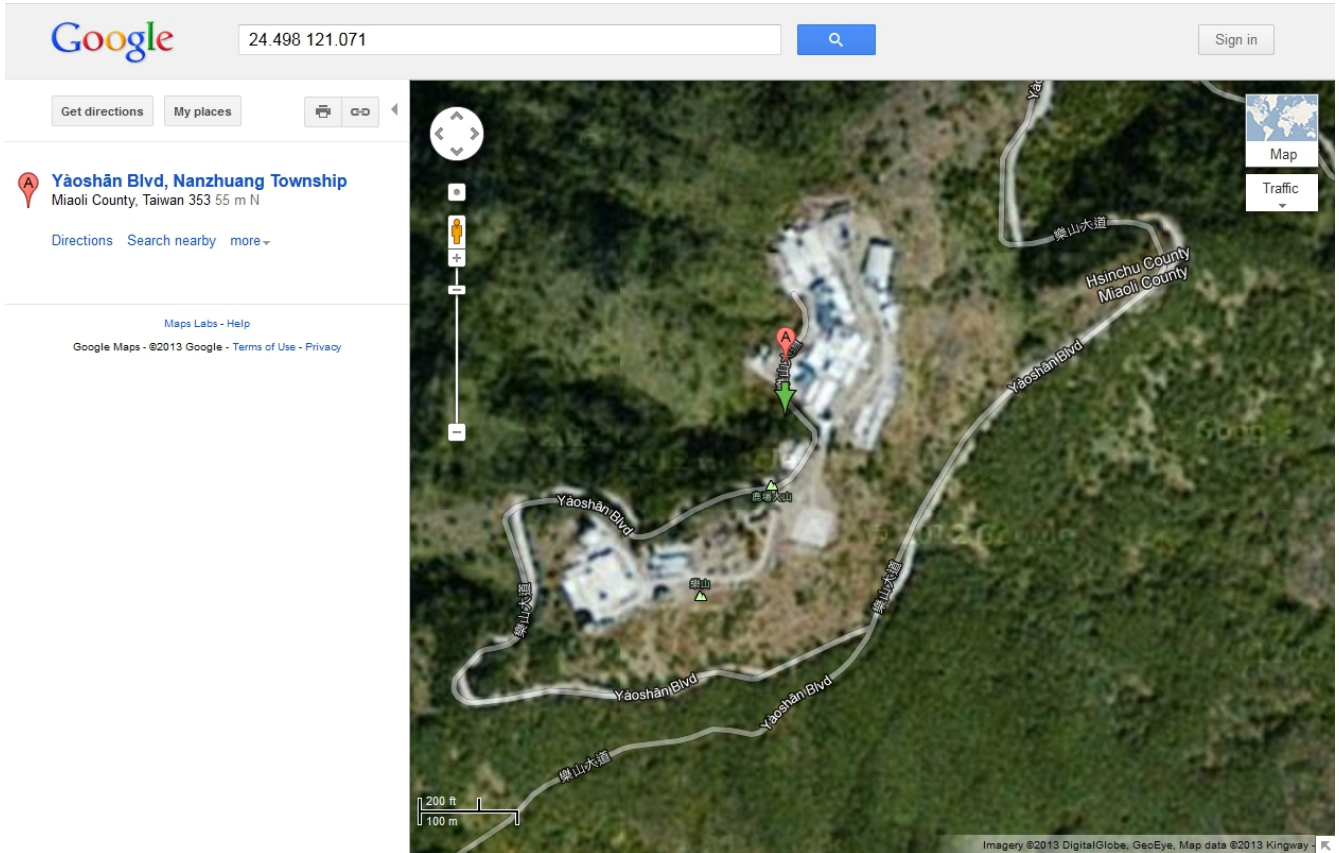
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<http://www.best-news.us/news-3607067-Image:-Apple-Map-exposed-to-the-Taiwan-Air-Force-radar-base-in-the-Department-of-Taiwan-39s-military-secrets-positions.html>



# Google Maps

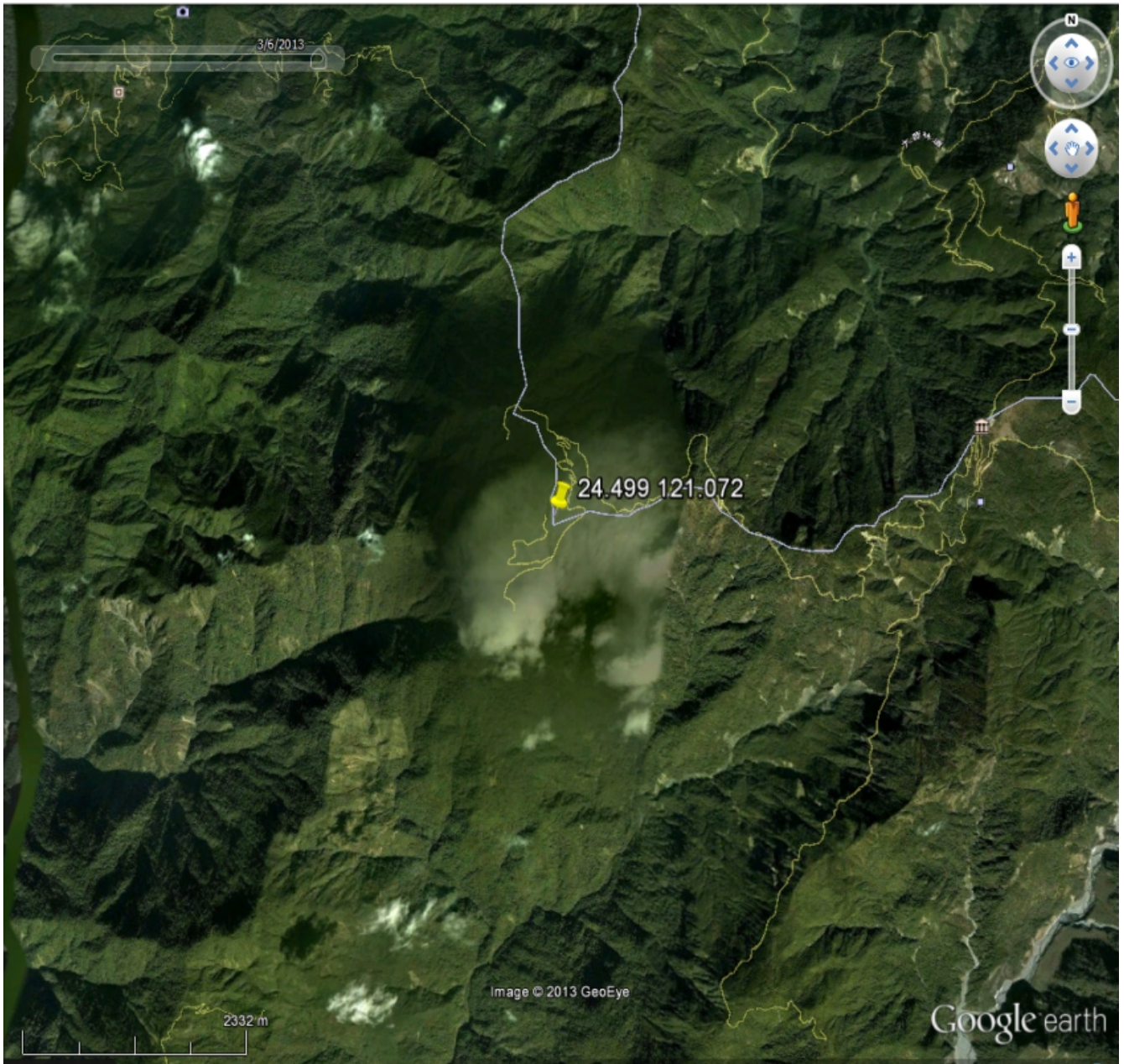




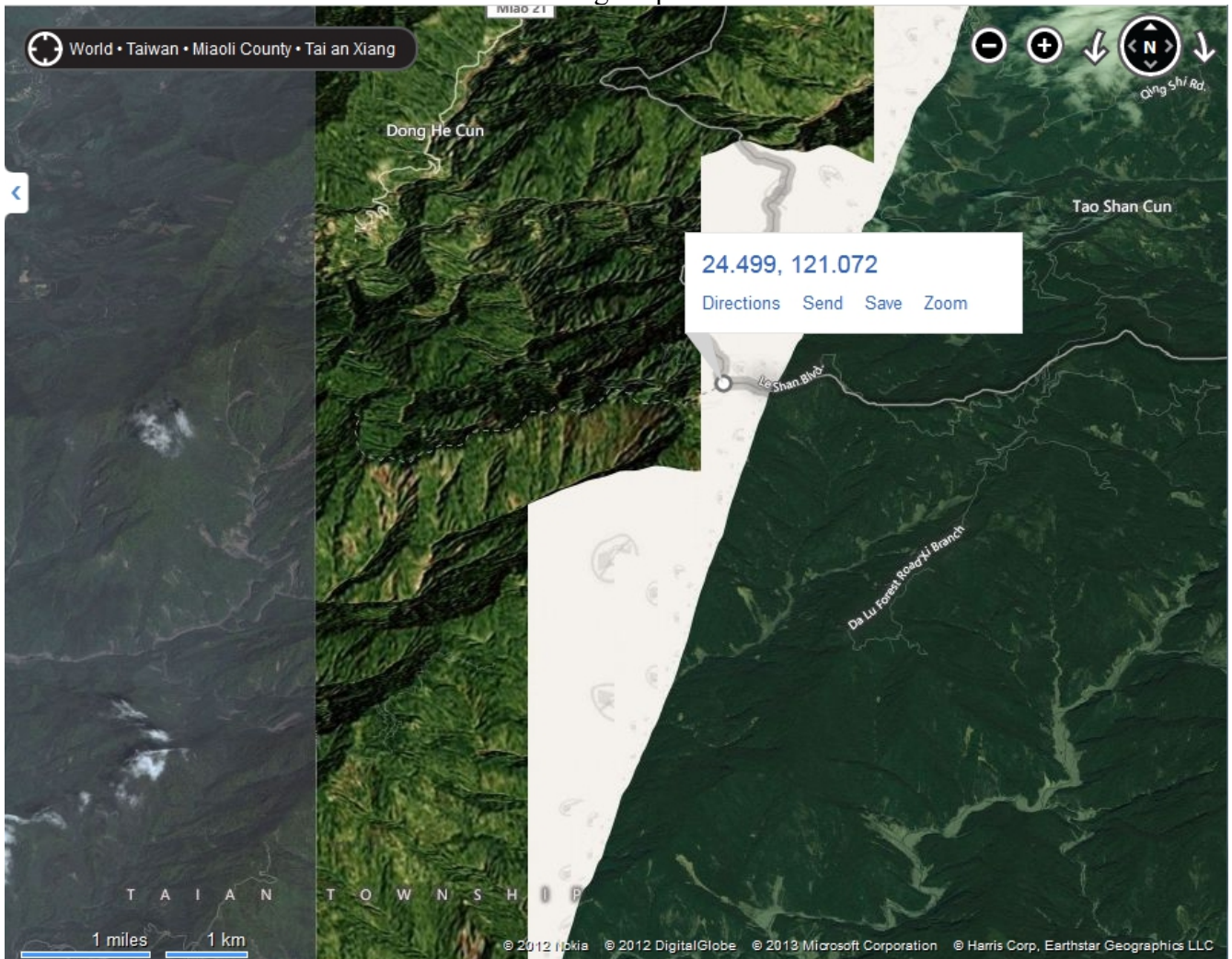


# Google Earth

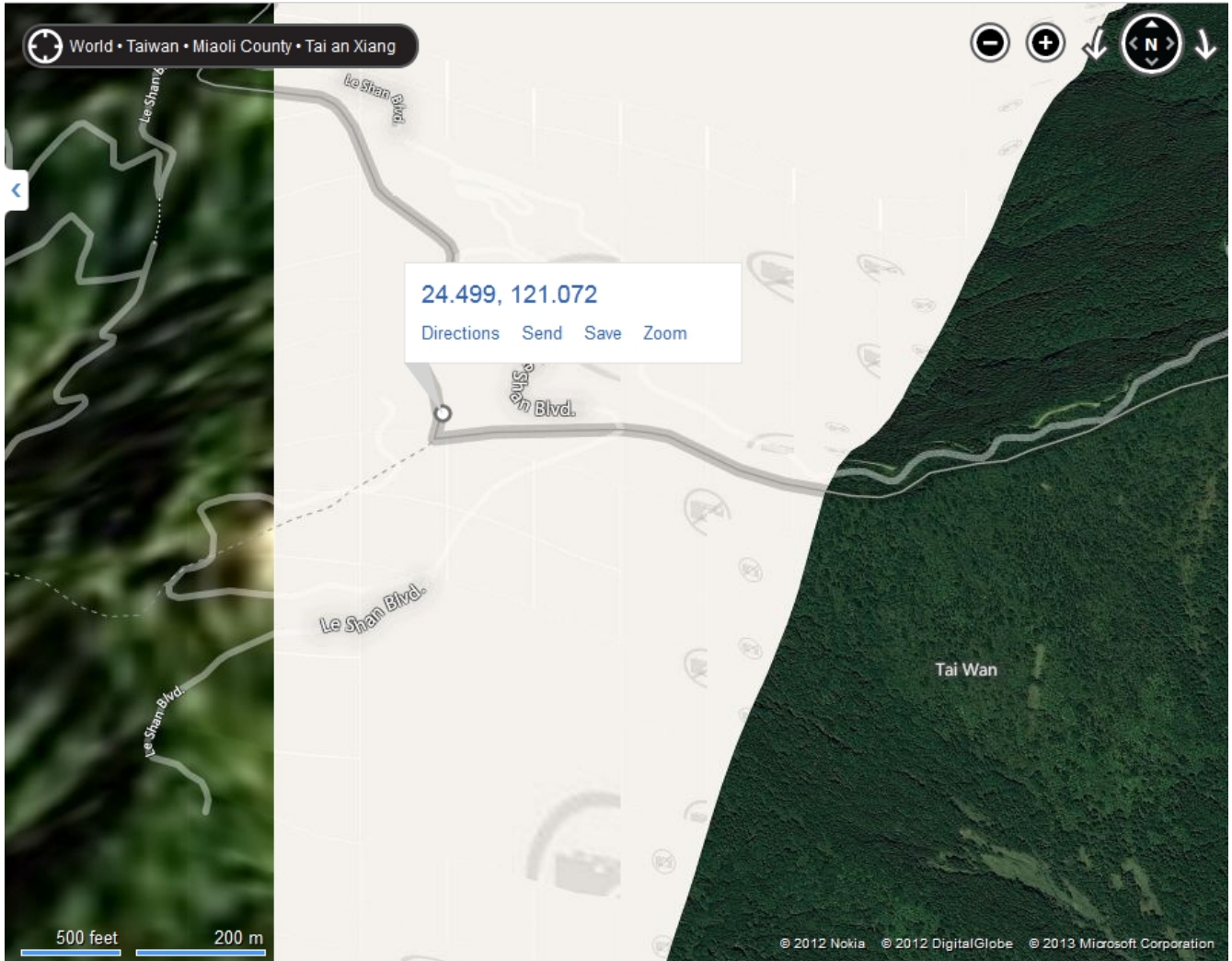




# Bing Maps



# Bing Maps





**DigitalGlobe WorldView I Browse Image**  
**2011-04-19**

**A series of photos of a ceremony, possibly on 2011-11-11**

<http://www.militaryphotos.net/forums/attachment.php?attachmentid=164601&d=1320986985>



<http://www.militaryphotos.net/forums/attachment.php?attachmentid=164602&d=1320986986>



<http://www.militaryphotos.net/forums/attachment.php?attachmentid=164603&d=1320986986>



<http://www.militaryphotos.net/forums/attachment.php?attachmentid=164605&d=1320986988>

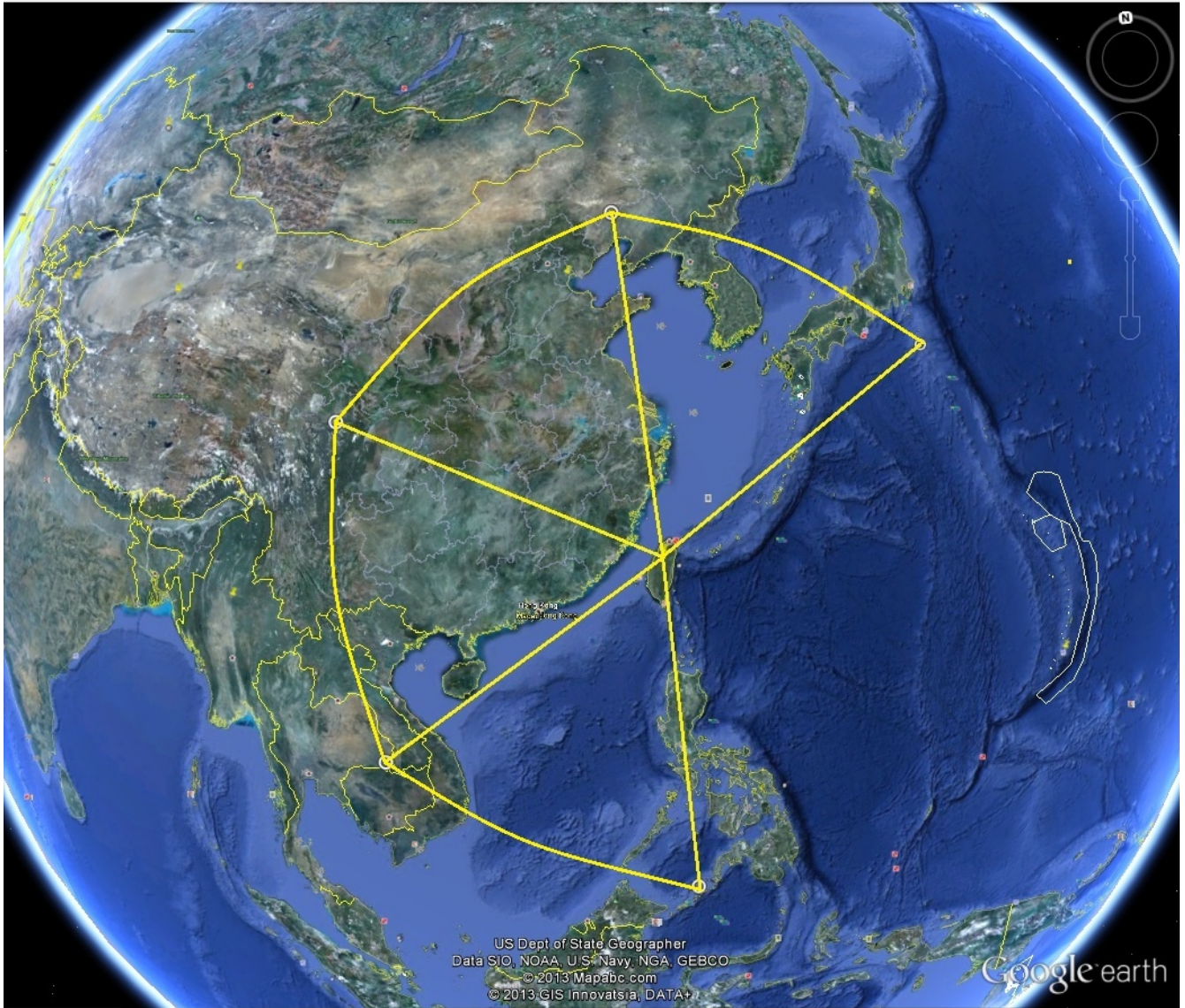




<http://www.militaryphotos.net/forums/attachment.php?attachmentid=164606&d=1320986988>



## **Related Material**



**2000 km coverage sectors assuming two antenna faces boresighted at 0 and 240 degrees and 60 degree beam steering**

## **Other Pave Paws Installations**



**Overhead view of two-antenna Pave Paws installation at Clear AFB, Alaska**



**Ground-level view of two-antenna Pave Paws installation at Clear AFB, Alaska**



**Overhead view of three-antenna Pave Paws installation, RAF Fylingdales**

## **Air Force moving forward with potential upgrades to PAVE PAWS, BMEWS, and PARCS missile-defense radar**

By John Keller

Posted by John Keller

THE MIL & AERO BLOG, 7 Feb. 2013.

U.S. Air Force planners are wrapping up the first phase of what may become a long-term project to modernize and upgrade three ageing ground-based ballistic missile warning radar systems known as PAVE PAWS, BMEWS, and PARCS.

This initiative, which results from a request for information (solicitation number: 01262012) last year may lead to a project to upgrade radar front-end equipment on PAVE PAWS, BMEWS, and PARCS such as radar receivers, exciters, and beam steering units.

The size of the strategic radar systems upgrade -- if it actually comes to pass -- would depend on how much money the Air Force has to spend on it, which likely won't be much, experts say. PAVE PAWS is short for Phased Array Warning System; BMEWS is the Ballistic Missile Early Warning System; and PARCS is the Perimeter Acquisition Radar Attack Characterization System.

The latest step in upgrading the missile-warning radar systems, called an early engineering effort, involves an attempt by the Air Force Electronic Systems Center (ESC) at Hanscom Air Force Base, Mass., to identify defense companies that could oversee or contribute to systems upgrades and technology insertion on these radar systems.

ESC officials are scheduled soon to submit a report to Air Force Space Command at Peterson Air Force Base, Colo., to present a status report on the condition of the radar systems, as well as to put forth options on potential upgrades and technology insertion.

If a formal industry solicitation results from this early engineering effort to upgrade PAVE PAWS, BMEWS, and PARCS, it mostly likely would not be issued for perhaps more than a year, experts say. A solicitation most likely would come from Air Force Materiel Command at Hanscom.

Should the Air Force move ahead with a major upgrade initiative for the strategic radar systems, it would involve technology refresh for the front-end and remoting capabilities.

The PARCS upgrade project may require technology insertion for the back-end processing capabilities that will support front-end modernization. PAVE PAWS and BMEWS will have received significant upgrades to their data- and signal-processing subsystems by 2016 in separate efforts.

One contractor familiar with the systems says component failures are happening in the old radar systems "left, right, and center." The central issue with the radars, however, involves component obsolescence rather than component and subsystem failures.



One expert familiar with the systems says PAVE PAWS, BMEWS, and PARCS sites "are still in really shape [*sic*]. They are built like tanks." To date, the ITT Exelis Electronic Systems segment in Clifton, N.J., is the prime sustainment and modernization contractor for these radar systems.

PAVE PAWS is a ground-based radar system that provides U.S. Strategic Command (USSTRATCOM) at Offutt Air Force Base near Omaha, Neb., with warning and attack-assessment information on all intercontinental ballistic missiles (ICBMs) launched throughout the world that might be headed for U.S. territory.

BMEWS, meanwhile, is a ground-based radar system that helps warn USSTRATCOM and NATO authorities of submarine- and sea-launched ballistic missile (SLBM) attacks and provides data to help evaluate the severity of ballistic missile attacks.

PARCS is a large radar installation in North Dakota that provides ballistic missile warning and attack assessment, as well as space surveillance data to the North American Aerospace Defense Command (NORAD) Peterson Air Force Base, Colo., as well as to USSTRATCOM and regional combatant commanders. PARCS monitors and tracks more than half of all Earth-orbiting objects with its AN/FPQ-16 phased-array radar system pointed northward over Hudson Bay, and analyzes more than 20,000 tracks per day, from giant satellites to space debris.

PARCS was built in the early 1970s, and its signal processing has received only superficial fixes since the site went online in 1975. PARCS uses 1960s-era technology, which is not widely used, and few sources are available for depot-level repair on failed components, Air Force officials say.

The PAVE PAWS and BMEWS beam steering unit (BSU), receiver exciter (REX), receiver beam former (RBF), array group driver (AGD), radio frequency monitor (RFM), frequency time standard (FTS), and the corporate feed (CFD) were built for these five radars in the late 1970s and were upgraded in the 1980s, Air Force officials say. The REX and FTS already have been redesigned and upgraded at the Beale Air Force Base, Calif., Fylingdales, England, and Thule, Greenland sites as part of the Upgraded Early Warning Radar (UEWR) programs. They will be upgraded at the Clear, Alaska, and Cape Cod, Mass., sites by 2016 or 2017., officials say.

Still, the PAVE PAWS and BMEWS have not upgraded the array front end of these radar systems, and this equipment has been in service without being replaced for More than 20 years and is rapidly nearing obsolescence, which requires a substantial technology-refresh effort.