



# Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

89/16

## PAKISTAN'S CHINESE AWACS ZDK-03 KARAKORAM EAGLE

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Image 1: Pakistan Air Force Shaanxi ZDK-03 (Y-8) inflight over Manora, near Karachi.

Source: Wiki Commons, [https://commons.wikimedia.org/wiki/File:Pakistan\\_Air\\_Force\\_Shaanxi\\_ZDK-03\\_\(Y-8\)\\_inflight.jpg](https://commons.wikimedia.org/wiki/File:Pakistan_Air_Force_Shaanxi_ZDK-03_(Y-8)_inflight.jpg), accessed on August 30, 2016.

In the last ten years Pakistan Air Force (PAF) has made a quantum jump in enhancing its early warning network with the induction of Chinese ZDK-03 Karakoram Eagle AWACS (Air borne Warning and Control System) aircraft and the Swedish Saab-2000 AEW&C (Airborne Early Warning and Control) aircraft. With AWACS

having been inducted in the IAF (Indian Air Force) also, any future India-Pakistan conflict will involve an AWACS versus AWACS scenario. This article briefly discusses the induction of ZDK-03 AWACS in PAF inventory and its implications for India.

Pakistan has shown interest in AWACS since the 1980s when the Soviets invaded Afghanistan and Soviet aircraft frequently intruded into neighbouring Pakistan's air space. To strengthen its radar network, Pakistan submitted a request to USA for the Boeing E-3A AWACS aircraft. At that time the E-3A was the most advanced AWACS aircraft in the world and was in service only with the USAF and NATO. USA was understandably hesitant to supply such a costly and advanced aircraft to Pakistan and offered the smaller Grumman E-2C Hawkeye airborne early warning (AEW) aircraft. However, this proposal did not materialise since PAF was not satisfied with the E-2C performance over mountainous terrain. With the withdrawal of Soviet troops from Afghanistan in 1988-1989, Pakistan's usefulness for the Americans diminished. Despite this development the Pakistanis again bid for the E-3A Sentry in 1988 but their efforts fell on deaf ears due to the Pressler Amendment in the US Congress. The Pressler Amendment of 1990 prohibited sale of US arms to countries having nuclear weapons and by 1987 it was known that Pakistan had built a nuclear bomb with Chinese assistance<sup>1</sup>. Pakistan's interest in AWACS resurfaced in the last ten years, perhaps due to IAF plans to procure Phalcon AWACS radar from Israel.

In 2008 the Pakistan Air Force signed a \$278 million<sup>2</sup> contract with China for four ZDK-03 AWACS systems to be built as per specifications and requirements of the PAF. The

ZDK-03 Karakoram Eagle is based on a Y-8F600 (Y-8 is a copy of Soviet era An-12 transport aircraft) airframe and is built by Shaanxi Aircraft Corporation of China. The aeroplane is similar to the American C-130J Hercules. The radar and on board systems were developed by China Electronics Technology Corporation (CETC). The first aircraft was rolled out for testing in November 2010 and delivery of the first aircraft was done in October 2011<sup>3</sup>. Y-8F600 is a four engine turbo prop aircraft with a maximum level speed of 660 kmph and a cruising speed of 550 kmph. The ZDK-03 radar has an electronically steered antenna, which scans the airspace 360 degrees in azimuth. The radar antenna is installed in a dorsal mounted radome. PAF's number 4 Squadron based at Masroor in Karachi, has been equipped with the ZDK-03.

PAF's AWACS inventory consists of four Chinese ZDK-03s, based at Karachi, and four Swedish Saab-2000 Erieye aircraft based at Kamra. ZDK-03 is a four engine turboprop aircraft, whereas the Erieye is a smaller twin engine turboprop. The ZDK-03 radar is also bigger and covers full 360 degrees in azimuth but it is not confirmed whether it is an AESA (Active Electronically Scanned Array) radar.<sup>4</sup> On the other hand the Erieye radar has a smaller dual side fixed planar array antenna which can only cover maximum of 120 degrees in azimuth on each side. It has an advanced AESA radar with pulse Doppler multi mode capability. It seems the reason for basing the Erieye in Kamra was

because of its powerful signal processing and capability for radar pickup over land being better than the Chinese AWACS which has been based in a coastal area at Masroor airbase in Karachi. In technical terms, the radar clutter signal reflected from land is stronger than clutter signals over the sea. Therefore, the AWACS radar should have powerful signal processing and clutter handling capabilities to pick up targets over land while the relatively weaker sea clutter can be handled by less powerful radar. Apparently, the Swedish Saab 2000 Erieye radar has better pick up over land than the Chinese ZDK-03 AWACS and for this reason has been based in Kamra for use over the Pakistan- India land frontier.

The enhanced detection capability of AWACS/AEW has enabled PAF to change its air defence philosophy. The earlier philosophy of having a standing CAP (Combat Air Patrol) in all the CRCs (Control and Reporting Centres) is no more required. With 8 AWACS/AEW aircraft PAF can now have one in north/central Pakistan and one in south on patrol 24 hours. This has given Pakistan, for the first time, trans-frontier radar cover from low level to high level. AWACS/AEW has enabled PAF to change its strategy of having standing CAPs for air defence to having air defence fighters on ground alert and to be scrambled on early warning from AWACS aircraft. Thus, PAF can now have more aircraft available for counter air strikes.

The IAF has three Israeli Phalcon AWACS and two more are in the pipeline. The Phalcon radar is mounted on Russian IL-78 airframe which is powered by four turbofan engines. IL-78 is bigger than PAF's ZDK-03 and Erieye aircraft. The Phalcon AESA radar in the IAF AWACS is also more powerful than the PAF AWACS/AEW radar. IL-78 being a jet aircraft can fly faster than the turboprop powered ZDK-03 and Erieye. This is a critical factor when it comes to survivability under enemy fire. India is also developing indigenous AEW radar which will be mounted on Embraer-145 airframe. This project is already behind schedule, the original induction date was in 2011<sup>5</sup> but testing work is still going on. In addition IAF has two aerostat radars and plans to procure eight more aerostats<sup>6</sup>. The combination of AWACS, AEW and Aerostat radars will provide IAF a strong network of low level and high level radar cover well inside Pakistani airspace. In addition to the airborne radar network, India plans to strengthen its air defences with induction of five batteries of Russian long range surface to air missile (LR-SAM), S-400, which has a range of 400 km<sup>7</sup>. Procurement of the S-400 is high on India's priority list and it is planned for induction in the IAF from 2017-2022. There are also reports that India has tied up an arrangement with Russia to develop and license produce the R-172 400 km long range air to air missile (LR-AAM)<sup>8</sup>. The induction of R-172 missiles on SU-30MKI aircraft will enhance IAF capabilities against PAF.

To counter PAF AWACS, IAF will have to achieve air superiority in the initial stages and keep PAF AWACS at bay. The deployment of lethal S-400 missiles along the India-Pakistan border will force PAF AWACS to operate from deeper inside and negate their radar cover in Indian airspace. In addition the R-172 LR-AAM will be a potent weapon against PAF. This missile has been designed to be an AWACS “killer” and when carried on the SU-30 MKI will pose a serious threat to PAF AWACS.

***(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])***

#### Notes

<sup>1</sup> Bhumitra Chakma, *Pakistan's Nuclear Weapons*, (UK: Routledge, 2009, p. 30).

<sup>2</sup> IHS Jane's *All the World's Aircraft: Development & Production 2013-2014*.

<sup>3</sup> Sinodefence, <http://sinodefence.com/aew-awacs-aircraft/>, accessed on 28 Apr 2016.

<sup>4</sup> Usman Ansari, “Pakistan Re-equips Squadron with AEW&C Planes,” in *Defense News*, February 28, 2015, <http://www.defensenews.com/story/defense/air-space/air-force/2015/02/28/pakistan-re-equips-squadron-with-new-aewc-aircraft/24140709/>, accessed on August 2, 2016.

<sup>5</sup> Press Information Bureau, Government of India, [pib.nic.in/newsite/erelease.aspx?relid=93863](http://pib.nic.in/newsite/erelease.aspx?relid=93863), March 18, 2013, accessed on August 26, 2016.

<sup>6</sup> Vijay Mohan, Tribune News Service Chandigarh, “IAF to procure 8 aerostat radars,” in *The Tribune*, February 2, 2016, <http://www.tribuneindia.com/news/nation/iaf-to-procure-8-aerostat-radars/191264.html>, accessed on August 26, 2016.

<sup>7</sup> Nilova Roy Chaudhury, RIR, “India will finalise S-400 ‘Triumf’ purchase soon,” May 11, 2016, <http://in.rbth.com/economics/defence/2016/05/11/india>

-will-finalise-s-400-triumf-purchase-soon\_591961 , accessed on August 26, 2016.

<sup>8</sup> Dr Carlo Kopp, “The Russian Philosophy of Beyond Visual Range Air Combat,” *Air Power Australia*, March 25, 2008, <http://www.usairpower.net/APA-Rus-BVR-AAM.html#mozTocId350052>, accessed on August 26, 2016.

