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# Regional Air Power Developments 2007

Dr Carlo Kopp

THE PAST TWELVE MONTHS HAS SEEN FURTHER INCREMENTAL GROWTH IN REGIONAL AIR power, including some important and unprecedented developments. While China's effort has been most prominent other regional nations are continuing to aggressively invest in modern air power.



Until recently, the United States, politically focused on the War on Terror, has tried its best to downplay capability growth in Asia – to the extent that former US Secretary of Defense Rumsfeld is said to have censored the 2005 DoD report to Congress on China, removing content that might have attracted media focus. This is now changing as the realities of 'strategic overstretch', constrained budgets, and growing regional capabilities begin to bite.

In a recent interview published by Aviation Week & Space Technology, General Paul Hester, Commander Pacific Air Forces (PACAF) observed about China: "They've also demonstrated that the [accuracy] of their surface-to-surface missiles is very tight. Even if they don't have a large warhead, you can inundate an airfield with hundreds of these missiles. I think we must make plans for facing the most difficult situations."

In recent interviews in the same journal, Lt Gen Loyd S. Utterback, 13th Air Force and Joint Forces Air Component Commander, and former F-4 and F-16 combat pilot, stated: "They [China's armed forces] have the means and the technical know-how. If there's anything that keeps me awake, it's intent. I don't know their intent. I won't have to fight these guys if I can present a deterrent or create enough transparency between us with tools like military hot lines, officer exchange programs, diplomacy and broad political ties."



*The MiG-35 radar, technologically comparable to the Super Hornet's APG-79 AESA, is a hot favourite in the Indian MRCA contest, and is the first Russian fighter with an active phased array (AESA) radar (top).*

**'What is abundantly clear is that China's ongoing arms shopping spree is making waves throughout the region'**

Utterback also observed: "The PLA-AF has advanced strike aircraft such as the Su-30MKK, at least two new cruise missiles as well as a new dogfight missile with Russian AA-11 and U.S. AIM-9X-like capabilities. The Sukhoi strike aircraft also has electronic attack and acquisition radar-jamming capability, effective to a range up to

100 nautical miles, mounted in two wingtip pods. These are great capabilities and they significantly challenge our legacy fighters. The Su-30MKK is a very capable airplane, and the jammers and multiple capabilities they carry are a concern. Our asymmetric advantage is the F-22. The PL-12 [PLA AMRAAM equivalent] is formidable but what kills you is what you don't see. The ALCMs [Air Landed Cruise Missiles] are also formidable and they create a defense problem we have to deal with."

On force structure priorities, General Utterback noted: "We've got the only high-end war there is [in the Pacific Rim]. If I had one thing that would enable me to conduct the high-end fight, it's tankers. Tankers are the Achilles Heel of any high-tech conflict. You have to get the force out here, and then you have to sustain it from places like Guam and Okinawa. You can't park an aircraft carrier close to submarines, 4th to 4.5 generation fighters or cruise missile threats. So tankers are going to be relied on to take the war to the enemy."

These candid observations parallel the most recent US DoD assessment of China, which is

far more detailed and incisive than in preceding years. Notable inclusions are good summaries of aircraft, weapons and warship acquisitions, and a discussion of emerging PLA debate on pre-emptive strategy displacing reactive strategy.

Japan has reacted most actively to China's growth, publicly declaring Japan's interest in acquiring the F-22A Raptor earlier this year. The US National Security Council publicly indicated a favourable view on the matter, and this sparked intense global debate, with editorials in South Korea saying 'we too would like F-22s', followed by loud condemnation by Beijing. Soon thereafter, numerous Joint Strike Fighter advocates in the US made a series of statements to the effect that Japan should buy F-35s rather than F-22s. Given that the Japanese have already sized up the F-35 and asked for the F-22 instead, the JSF camp has effectively opted to insult the intelligence of the JASDF.

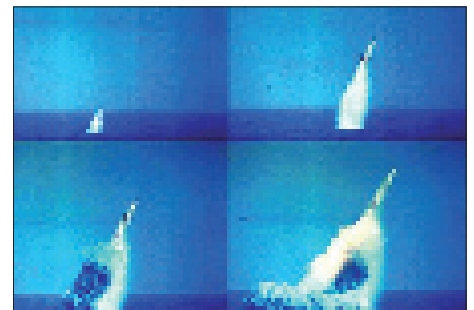
What is abundantly clear is that China's ongoing arms shopping spree is making waves throughout the region.

**air power update** →

## PLA AIR AND MISSILE CAPABILITY DEVELOPMENTS

There have been several strategically significant developments in the past year. The first of these was the leaking last December of photographs of the prototype of a new turbofan-powered variant of the Badger, tentatively labelled the H-6K; the second was an initial order for the Su-33 Flanker D shipboard fighter; the third was the announcement of initial operational capability for the J-10 Sinocanard lightweight fighter; the fourth was the demonstration of an anti-satellite weapon launched on a ballistic missile booster; and the fifth was ongoing maturation in the KJ-2000 AWACS and Il-78MCK tanker programs (refer Jan/Feb DefenceToday).

These developments have been in parallel with ongoing effort in cruise missile and ballistic missile development. In the latter category, a terminally-guided anti-shiping weapon based on the DF-21 airframe is reportedly in development, which is an implementation of a Soviet concept that was never completed at the end of the Cold War. Other major programs attracting attention include new classes of nuclear powered submarines, 20,000 tonne amphibious LPDs and a new LHD design. The new 'H-6K' Badger is the longest range derivative of the basic Tu-16/H-6 design observed



The solid fuelled two stage DF-21/JL-1 IRBM/SLBM is the basis of a terminally guided anti-ship weapon and the recently tested ASAT system.

to date. All earlier Soviet and Chinese built Badgers were powered by variants of the Mikulin RD-3M 1950s technology turbojet, comparable to the Pratt & Whitney J75 series which powered the F-105D. The RD-3M was cloned in China as the Wopen WP-8, rated in the 20,000 lb class, and provided an unrefuelled combat radius between 1,200 and 1,500 nautical miles.

The PLA funded production of the baseline H-6A Badger and improved H-6D Badger until the 1990s when production was halted. Production was restarted post-2001. The first new production Badger seen earlier this decade was the H-6H variant, armed with a pair of the cruciform tail Styx derivative KD-63 TV/datalink guided cruise missile. This weapon is a dual-use anti-ship and land attack weapon, a larger and longer ranging equivalent to the AGM-142 used by the RAAF. The H-6H was lighter than legacy Badger variants, with the cannon barbets removed, and it carries a distinctive ventral datalink radome to support the KD-63.

The H-6H was soon followed by the further evolved H-6M. This variant has four outboard wing pylons and was built to carry four YJ-83/YJ-62 class anti-ship cruise missiles and possibly land attack derivative cruise missiles. This variant is easily recognised by the four wing pylons, unique against all earlier Chinese and Soviet subtypes.

configuration of the Kh-55/DH-10/YJ-62, but the poor quality precludes a more accurate assessment. What is beyond doubt is that the H-6K is designed as a cruise missile carrier to fit the 'second island chain' strategy, with a combat radius in the class of the much larger Tu-22M Backfire B/C series.

In regional terms, a H-6K armed with a Tomahawk class Kh-55, DH-10 or YJ-62 land attack cruise missile is a strategic weapon system. These cruise missiles equipped with conventional warheads have a potential range of 500 to 700 nautical miles, providing a reach of at least 3,000 nautical miles. With nuclear warheads a range of the order of 1,500 nautical miles is more realistic, providing an effective reach of the order of 3,500 to 4,000 nautical miles.

It is likely that the reach of the H-6K has led to earlier planning for the Backfire to be deferred, likely until performance assessment of the H-6K is completed. While the H-6K lacks the performance and payload capability of the Backfire, it will be much cheaper to introduce and operate, while delivering comparable reach. With a 500 nautical mile or better range class cruise missile, intercepting the H-6K will present similar challenges to stopping cruise missile armed B-52H or Tu-95MS Bear bombers.

China's order for an initial pair of Su-33 Flanker D carrier-borne fighters is a precursor for an intended

48-aircraft air wing for the Type 1143.6 Kuznetsov Class aircraft carrier Varyag. The Varyag is being refurbished and outfitted at the Dalian shipyard, after spending several years in mothballs after delivery from the Ukraine. The 1143.6 class has a full load displacement in excess of 65,000 tonnes, and a ski jump for the Su-33 and dual seat Su-33UB. Russia's Kuznetsov is armed with twelve tubes for the 300 nautical mile class 3M-45/P-700 Granit ASCM, plus a range of defensive SAM and gun systems. The armament of the future PLA Varyag has yet to be disclosed, but is likely to comprise weapons already in PLA-N service such as the 3M-81/82 / SS-N-22 Sunburn.

The Su-33 and Su-33UB are tail-hook equipped, folding-wing variants of the Flanker, with foreplane canards. The most recent photos of the side-by-side seated Su-33UB show the installation of Al-31FU thrust-vectoring engines. Unlike baseline Su-27SK/UBK variants, the Su-33 and Su-33UB were built from the outset to cover the full spectrum of sea control, land attack, air superiority and air defence roles. ASCMs for the Su-33/33UB include the supersonic Kh-41 Sunburn in a centreline cradle, and the supersonic Kh-61 Yakhont on three stations. The Su-33/33UB are plumbed for a centreline Sakhalin UPAZ-1A series aerial refuelling store, emulating the US Navy practice of using the F/A-18E/F Super Hornet as a buddy tanker.

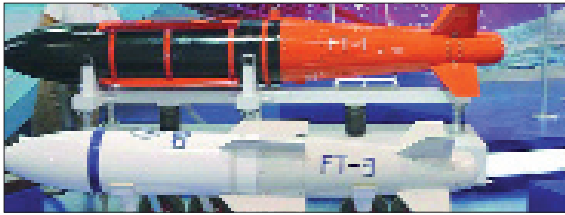
It is almost certain that the Su-33/33UB will be supplemented on the flight deck by variants of the Ka-27/28/29/31 Helix helicopter. With a 15,000 lb class empty weight and 8,800 lb class payload (cf Sea King), variants of the Helix are used for Vertrep / maritime assault / troop transport (Ka-29), SAR (Ka-27PS), ASW (Ka-27/28), over the horizon targeting for ASCMs (Ka-27/28) and AEW&C (Ka-29RLD/Ka-31). The Ka-31 Helix B is also operated by India, and it combines retractable undercarriage with a folding six-metre aperture NIIRT E-801M Oko AEW&C radar with 360 degree coverage.



The H-6M is the first of the improved Badger variants to enter operational use. The more recent H-6K with turbofan engines has the performance to reach Northern Australia with a cruise missile payload.



The primary armament of the H-6K will be Tomahawk-like air launched cruise missiles, such as the YJ-62 (left) or Kh-55SM (right).



China recently displayed the FT-1 and FT-2 electro-optically guided bombs. The LS-6 glidebomb (right) which resembles Australia's JDAM-ER, is in flight test.

Growth in the PLA's Flanker fleet continues. Two notable developments have occurred. The first was the announcement of the 'indigenous' J-11B built with Chinese components replacing a large fraction of the Russian hardware used in the design. The other notable development was the announcement that the second 100 in the contracted licence build of 200 Su-27SK/J-11A would be built in the Su-27SMK configuration. This fighter bomber variant is a single seat model which incorporates the smart munitions capabilities of the Su-30MKK series, making it an equivalent to a single seat F-15E – a configuration Boeing have yet to produce. Chinese Flankers are primarily armed with variants of the Russian Vypel R-27/AA-10 Alamo and R-77/AA-12 Adder BVR missiles, but the advent of the 'AMRAAM-like' indigenous PL-12, which uses seeker and datalink hardware from the R-77 series, expands the capabilities of the fleet.

The Su-30MKK and Su-30MK2 fleets are predominantly armed with Russian KAB-500 and KAB-1500 series electro-optical and laser-guided bombs, but it is now inevitable that the indigenous 1,000 lb class LT-2/GB-1, a KAB-500 clone, will be used. Another recent revelation was the LS-6 satellite-inertial guided glidebomb, a 1,000 lb class planar wing weapon similar in concept to the Australian Kerkanya/JDAM-ER. China has actively marketed the indigenous FT-1 and FT-2 electro-optically guided bombs, and an indigenous laser targeting pod comparable to the French ATLAS II series.

Reports have also emerged of a Russian effort to market the Su-35BM to the PLA. This latest single seat Flanker variant includes a new large display glass cockpit, TVC engines, full multirole capabilities, and the 20 kiloWatt peak power rated Irbis-E phased array radar, second in range performance only to the F-22A's APG-77 radar. The Su-35BM is offered with the full gamut of Russian PGMs including the Kh-41 Sunburn.

The announcement of initial operational capability for the Chengdu J-10 Sinocanard fighter was a major media event in China, yielding some of the best imagery seen to date. Development of this fighter commenced in 1988, with the first prototype flying in 1996 and production launched in 2005. Claims the aircraft is based on the Israeli Lavi are impossible to support, indeed the double delta wing owes much to later build J-7 variants.

In size and role the J-10 fills the same niche as the F-16C/D/E/F and the Rafale, being smaller

than the F/A-18E/F and Eurofighter. It will form the low end of a hi-lo mix with the Su-27SK/J-11/Su-30MKK and be used for air combat and strike roles, replacing the legacy J-6, Q-5 and J-7 in frontline PLA-AF regiments.

Early J-10 models are powered by the Russian AI-31F common to the Su-27/30, with Chinese sources claiming the indigenous WS-10 fan will be introduced later. The design is claimed to use a quadruplex digital fly-by-wire control system, a glass cockpit similar in layout to the Gripen is employed, and a HMS is expected to be used. Chinese sources claim the Phazotron Zhuk series and indigenous JL-10A to be the likely candidate radars for production. The J-10 is an important milestone as China has finally joined the club of nations capable of designing a modern agile combat aircraft.

By far the biggest media coverage in the West was however reserved for China's Anti-Satellite (ASAT) weapon test. Predicted by the US DoD in 2003, it took an operational trial shot to actually attract serious debate and coverage. The weapon was based on the two-stage solid fuelled DF-21/JL-1 IRBM/SLBM airframe and is a 'direct ascent' system, which successfully destroyed a retired weather satellite in an 850 km altitude (LEO) orbit. While this capability is not yet adequate to threaten the US GPS constellation and military communications satellites, it is clearly good enough to attack reconnaissance satellites. A major concern is that this system is likely to be highly mobile, allowing rapid deployment to 'ambush' target satellites, denying them the option of adjusting orbits to avoid known launch sites.

#### INDIAN AIR AND MISSILE CAPABILITY DEVELOPMENTS

The most visible development in India has been the ongoing competition to replace legacy MiG-21 variants, which have suffered increasingly from accidents and availability problems. The Multi-Role Combat Aircraft program was initially to acquire 126 new multi-role fighters, with a significant strike and air combat capability. As India's relationship with the US has changed, the contest is unprecedented as it now sees US, Russian and EU products competing for the buy.

Boeing are offering the F/A-18E/F, Lockheed-Martin a late-build F-16 Block 70 configuration, more recently as a precursor to an Indian JSF buy, Dassault initially offered the Mirage 2000v5 but

later changed the bid to the Rafale, Eurofighter are offering the Typhoon, and Rosoboronexport the MiG-35 (formerly MiG-29OVT). India already operates legacy MiG-29 variants and recently ordered the MiG-29K and MiG-29KUB for the new air wing to equip the carrier Gorshkov. The Gorshkov' acquisition has attracted considerable adverse press over the last year.

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Recent comments by senior US officers underscore what the analytical community has said for some years now, which is that the ongoing Asian arms race is now seriously challenging the US strategic position in Asia.

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The MiG-35 is the most advanced and capable Fulcrum variant seen to date, including a modern 'glass' cockpit and a Phazotron Zhuk AE active phased array of the same technological generation as the APG-79 being introduced on the F/A-18E/F Super Hornet, and thrust-vectoring engines.

The Indian Air Force also ordered an additional 40 new-build Su-30MKI Flanker H fighters as replacements for early delivery Su-30K airframes, which were recently sold off to a former Soviet republic. Overseas sources claim India may be expanding its initially planned fleet of 180 SU-30MKIs to beyond 200 aircraft. India also attracted considerable press this April with the first successful test shot of the Agni-III IRBM, which has a cited range of 3,500 km.

#### NORTH ASIAN AIR CAPABILITY DEVELOPMENTS

The most notable development by far has been Japan's overt and very public pursuit of the F-22A Raptor. Japan has an obsolescent fleet of 120 F/RF-4E/EJ Phantoms, and a 20-year-old fleet of F-15CJ/DJ Eagles. Japanese sources claim that up to 100 F-22As would be sought.

In a minor embarrassment for Boeing, Japan's first KC-767-200 tanker delivery was put on hold this May, allegedly due to certification issues. A June report in the Wall Street Journal claims the delivery will be delayed one year for technical reasons. South Korea's Korea Aerospace Industries Ltd on

the other hand signed this June to modify three of the four Boeing 737 AEW&C aircraft, variants of the Wedgetail AEW&C ordered for the RoKAF. South Korea ordered 40 F-15Ks and is expected to order an additional 20 aircraft. North Korea backed down earlier this year over the nuclear issue, largely due to pressure from China and the US. In strategic terms the principal issue over the coming decade will be strategic competition between China, Japan and South Korea in North Asia.

### SOUTH EAST ASIAN AIR CAPABILITY DEVELOPMENTS

The most notable air power development in the near region was the delivery in May of the first two Irkut Su-30MKM Flanker H fighters of the 18 ordered by Malaysia to 11 Squadron to be based at Gong Kedak. The Su-30MKM is the most advanced subtype delivered to the region to date, and is an incrementally improved Su-30MKI with TVC engines, glass cockpit and N-011M BARS multimode phased array radar. Israeli-sourced avionics in the Indian variant are replaced with Russian hardware. Malaysia thus becomes the first nation in the near region to deploy a phased array equipped fighter. Russian sources indicate

that intensive marketing is underway to sell additional aircraft, with earlier reports indicating that a planned buy of a further 18 Flankers would be postponed for budgetary reasons. Malaysia operates legacy MiG-29N and F/A-18D variants, which are likely to be targeted by Rosoboronexpert for replacement with the Su-30MKM or Su-35BM, in competition against the F/A-18E/F.

Indonesia has ordered an additional six Flankers, supplementing the four aircraft in service. India is now competing against Russia for the supply of Flanker maintenance, and reports have emerged of a dispute between Indian and Russian contractors over the marketing of the PJ-10 Brahmos and Kh-61 Yakhont in Indonesia.

The recent report that Iran will be purchasing 250 Flankers (plus 20 Il-78MK Midas tankers) is significant, as the Iranian variant of 'Islamic Flanker' is almost identical to the Malaysian Su-30MKM model. The size of the Iranian buy will drive down the cost of follow-on buys and block upgrades to other export clients, and expand the technology and services base for advanced phased array equipped Flankers.

Singapore, which recently ordered 20 phased array equipped F-15SG multirole fighters, recently

announced the acquisition of four Gulfstream G550 AEW&C aircraft to replace its ageing Grumman E-2C Hawkeyes. The G550s will be equipped with an Israeli mission package based on the L-band Elta Phalcon system, an unsuccessful bidder for the Wedgetail contract.

### CONCLUSIONS

Recent comments by senior US officers underscore what the analytical community has said for some years now, which is that the ongoing Asian arms race is now seriously challenging the US strategic position in Asia. On current trends, the US Navy will soon lose its ability to operate without overwhelming US Air Force support in this region.

Australia's current planning for the RAAF does not reflect the strategic realities Australia now faces in the region – and repeatedly downplaying the strategic impact of regional growth, especially that of China, amounts to denial of what is really happening in Australia's area of interest. What is clear is that Australia is now firmly set on a path that could lose the capability to contest and win air superiority in a regional conflict, beyond the 2010 to 2012 timeframe.

air power update →



The single seat Su-33 and dual seat Su-33UB are being procured to equip the Varyag carrier air wing. Latest Su-33UB images show the retrofit of thrust vectoring engines.