by Carlo Kopp

The Sleeping Giant Awakens

"Political power comes out of the barrel of a gun" – Mao Tse-Tung

Perhaps the defining issue of our time in history is the emergence of India and the People's Republic of China as regional military superpowers. This is a direct by-product of large scale industrialisation, as the economies of these billion plus population base nations are able to support increasingly large and modern military force structures.

Spare cash and national pride are often a volatile mix, and the now decade long history of 'tit-for-tat' buys of advanced Russian weaponry by both nations clearly indicates a trend of competition for the dominant position in Asia. While India has been the technological trendsetter in Asia, China has compensated for this in sheer numbers and diversity in indigenous and imported weapons.

What is evident is that the relatively benign strategic environment Australia has enjoyed since the 1960s is rapidly dissolving as Asia becomes immersed in a 21st century airpower centric replay of the 1900s 'dreadnought arms race' by the then European powers.

This month's analysis will explore the developing capabilities of the PLA Air Force and PLA Navy air arms.

LEGACY AND INDIGENOUS FIGHTER TYPES

The PLA-AF and PLA-N operate a large number of legacy types, mostly cloned and evolved variants of older Soviet MiG designs. With many manufactured as recently as a decade ago, both services will be hamstrung by this large fleet of maintenance intensive visual short range combat aircraft.

By far the most numerous of the legacy types are variants of the J-6 series, essentially a cloned MiG-19 Farmer. Around 2800 are listed in current reference publications, although real numbers may be much lower as these relics are replaced with newer types.

The second most numerous Soviet clone is the J-7 series, based on the MiG-21 Fishbed. Around 700 are listed, comprising a mix of J-7-I, J-7-II/J-7C, J-7-III/J-7D, J-7E and J-7G. Later versions incorporate modern avionics, and a new and larger double delta wing planform to improve agility. The current production J-7G is claimed to have superseded the J-7E (263 built) in production as late as 2002. The Fishbed is likely to remain in service post 2020 on current trends.

China started out in the fighter business by cloning and evolving existing Russian designs, and the J-7G is by far the best Fishbed variant ever built.

The first truly local design was the Nanchang Q-5/A-5, a dedicated strike aircraft evolved from the J-6/MiG-19. A new forward fuselage with a solid nose, side inlets and numerous structural changes resulted in a supersonic equivalent to the A-4 Skyhawk, of which large numbers were exported, and around 600 remain in PLA-AF/PLA-N service. The design added an internal bomb bay for two 450kg (1000lb) weapons or more fuel, up to four external fuselage hardpoints, additional outboard wing stations and extensive avionics changes.

The nine tonne (20,000lb) empty weight class Shenyang J-8 Finback evolved to fill the air defence interception role also occupied by the Sukhoi Su-15/21 Flagon and Tornado ADV. The J-8-I Finback A grew out of MiG-21 technology, resembling a twin engine Su-9/11 Fishpot, and after an extensive 'nose job' transformed into the current J-8-II/J-8B Finback B series, equipped with a Type 208 or KLJ-1 pulse Doppler radar.

Several variants, the J-8B, J-8C, J-8D, J-8F and J-8H have been identified, with J-8B service entry around 1990. The J-8R photo-recce variant is a modified J-8A with a podded recce package. Chinese sources claim between 240 and 360 Finback aircraft in service, mostly J-8B and J-8D variants, the latter with a fixed refuelling probe.

The J-8D is best known as the Chinese fighter which collided with an EP-3C over the South China Sea, causing a major diplomatic incident. While the J-8B/D has a strike capability, it has been mostly used as a long range interceptor and remains in production.

A contemporary of the J-8 is the Xian JH-7 'Flying Leopard' maritime strike fighter, developed to replace the Harbin H-5 (Il-28) Beagle in PLA-N service. It is conceptually similar to the Panavia Tornado IDS – less the swing wing. Initiated in the late 1970s, the FH-7 now equips one PLA-N regiment. The aircraft is powered by two Rolls-

PLA-AF propaganda photo of a pair of Su-30MKK strike fighters. The Su-30MKK compares closely to the F-15E/S/K and is the spearhead of the PLA-AF's tactical strike force. Ultimate numbers in service are yet to be determined. (PLA)

Royce Spey 202 turbofans, is fitted with a Type 232H 'Eagle-Eye' pulse Doppler radar, and carries a typical weapon payload of four YJ-8K/C-801K anti-ship cruise missiles, similar to the Exocet or Kormoran.

Dependent on its imported surplus Spey engines, the JH-7 is likely to become the first victim of the PLA-N's new Su-30MK2 maritime strike fighter, which outperforms it in all cardinal parameters.

The pinnacle of indigenous Chinese fighter design is the Chengdu J-10, a single engine delta-canard agile multirole fighter which was alleged to be a clone of the IAI Lavi design, enhanced through alleged access to Pakistani F-16s. Even cursory comparison of the J-10 and Lavi indicates that 'Lavi-cloning' is not the case, even if the fighters share the same general configuration. The nose and vertical tail shape are however near enough to the F-16 to raise serious questions.

Development of the J-10 commenced in 1988, with the first prototype flying in 1996, and production planned to commence next year. The J-10 occupies the same niche as the F-16C/D/E/F and the Rafale, being smaller than the F/A-18C/D and Eurofighter. It is to form the low end of a hi-lo mix with the Flanker family and be used for air combat and strike roles, replacing the J-6, Q-5 and J-7 in frontline combat regiments.

Early models are powered by the Russian AL-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 helmet mounted sight 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 represents an important milestone for China's industry – it is a modern combat aircraft competitive in cardinal parameters with current European fighters, and is clearly a unique indigenous design despite the comments of western critics. Just like the Su-27/MiG-29 blended the best ideas in the teen series types, the J-10 blends the best ideas from the Eurofighter/Rafale/Gripen Eurocanards and the F-16 to produce a high performance low cost mass production fighter.

While the J-10 will not have the strategic impact of the long range Sukhois, it is well matched to the PLA-AF's established Soviet-like all-arms warfare doctrine, providing local air superiority over land forces and close air support/battlefield interdiction. With the likelihood of large scale production, we could see in time well over a thousand airframes built and exports made to various established China clients in the region.

In close combat the J-10 is apt to match or outperform the teen series fighters and match the Eurocanards. Its principal limitation will be in its sizing and combat radius performance – the top end roles being ceded to the Sukhois. With the J-10 China has finally joined the club of nations capable of designing a modern agile combat aircraft.

SUKHOIS AND MORE SUKHOIS

While exact numbers for the PLA's force of Su-27SK, licence built J-11 and Su-30MK Flankers disagree between sources, it is known that up to 100 Su-27SK fighters and Su-27UBK two seaters were imported since 1992. The contracted licence build will see 200 J-11s produced in China, essentially a basic Su-27SK (refer Aug/Sept 2003 AA).

The initial batch of Su-30MKKs has been put at 38 to 50 aircraft for the PLA-AF, with the PLA-N now opting for the 'maritime' Su-30MK2 with avionics changes for the role. Available photographs and press reports indicate that the Kh-59 Kazoo has been acquired, in electro optic/datalink guided and radar guided anti-ship variants, as well as the Kh-31R anti-radiation missile and the Kh-31A anti-shipping missile – the Kh-31 is likely to be licence built now. The KAB-1500 and KAB-500 guided bombs have also been supplied.

The J-7-II is equivalent to later Russian MiG-21s.

The J-7E and G variants use new avionics and a new double delta wing.

The Q-5/A-5 series are a significant evolution of the F-6/MiG-19 family, filling the A-4 Skyhawk niche.

The large twin engine Finback is used mostly as an interceptor, this is a unique design derived from MiG-21 technology but twice the size.

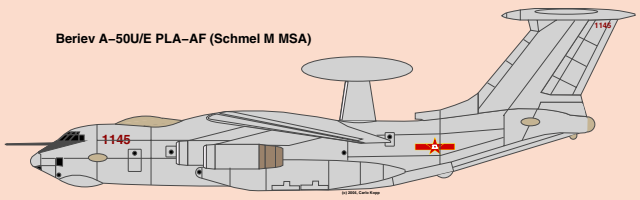
The J-8R is a tactical recce variant of the early J-8-I, with podded sensors.

The Chengdu J-10 is clearly not a Lavi, but will be competitive against the Eurocanards in capabilities. It is the 'Lo' component of a 'Hi-Lo' mix with the Su-27/30.

Russia's industry is also heavily involved in the development of China's SD-10/PL-12 'Project 129' active radar homing beyond visual range missile. Similar in appearance to the AIM-120 series but equipped with the R-77's Agat 9B-1348 seeker/datalink package, the PL-12 is claimed to outperform earlier AMRAAM variants, as well as the underperforming early model R-77s.

Russian sources claim that 500 Sukhoi sales to China by 2020 are feasible, and the current buying trend to date supports that position.

In the wake of the abortive deal to buy the Israeli Phalcon phased array AEW&C system on the Russian Il-78 airframe, reports continue to indicate an intention to field the Russian A-50E/U AEW&C system. In the meantime, China recovered the incomplete A-50I prototype which has been since photographed flying over Nanjing, home of a key test centre. Retaining the original radome designed for the three sided Phalcon array, this aircraft may be a testbed for indigenous phased array development.



CHINA'S AWACS

The July 2000 collapse of China's plan to acquire the Beriev A-50I AWACS with the Israeli Elta Phalcon phased array radar was a significant setback for the PLA-AF, who had hoped to once and for all gain the high ground in the regional Intelligence Surveillance Reconnaissance – ISR –game. The L-band Phalcon was the basis of the unsuccessful Raytheon/Elta Airbus A310 bid for the RAAF Wedgetail program and is a generation ahead of Japan's E-767 and Taiwan's E-2T.

US pressure on Israel killed the deal, upon which reports emerged that the Russian Beriev A-50U or A-50E variant, equipped with the Schmel series mechanically steered array, was to be purchased. To date no deliveries have occurred, and the status of the program is unclear – it is expected that India's order earlier this year for the same A-50I system will result in a 'tit-for-tat' commitment by the PLA-AF for A-50E to pre-empt India.

Reports have emerged claiming that a Y-8 (An-12 Cub) was observed in the Nanjing area flying with a dorsal structure resembling the Ericsson Erieye system, as well as ventral radomes. With a similar payload/volume to the C-130A, a Y-8 with an Erieye clone AEW&C system would be equivalent in performance and endurance to the C-130/Erieye proposals marketed during the late 1990s.

After the 2000 debacle the PRC government is claimed to have recovered the incomplete A-50I prototype from Israel, minus the AEW&C radar. Numerous amateur photographs of an A-50I aircraft being flown over Nanjing have emerged on the internet. These clearly show the three sided phased array dielectric radomes and wingtip ESM fairings. There is ongoing speculation that China may be attempting to clone the Phalcon system using local technology.

Given that L-band radio frequency power transistors of suitable ratings are available commercially, it is not inconceivable that such an effort is active – it would be entirely consistent with the long running PLA policy of concurrently developing indigenous products while importing foreign equivalents. An L-band Transmit-Receive module design of suitable performance and configuration could be used for both the A-50 system and the Y-8 design, sharing most of the system hardware and software.

The only uncertainty in the PLA-AF's deployment of an AEW&C/AWACS capability is in timing and numbers. The reported scale of resources committed to this area indicates that it will be a long term certainty.

CHINA'S STRATEGIC STRIKE FORCE

China's principal strategic strike aircraft is the Xian H-6/B-6 Badger, which compares closely in size and performance to the long retired RAF V-bombers. It is credited with a combat radius of 1300 to 1800nm (2400 – 3300km). China has had a long love affair with this Tupolev designed offspring of Boeing's B-29. During the 1960s Xian (Harbin) reverse engineered the Tu-16 Badger to provide a nuclear strike force, with most of the currently cited inventory of around 120 PLA-AF H-6E/I and 30 PLA-N H-6D Badgers built between 1968 and 1990. There are persistent reports that low rate production is continuing, although these may refer to factory modification programs. The Xian factory website lists the Badger as a current product with other types, and numerous photos of 'green' aircraft may well represent new build airframes.

The 1990s attempt by China to acquire Tu-22M3 Backfires collapsed after Russia refused to sell, allegedly due as a result of pressure by western nations, leaving the Badger as the only Chinese strategic aircraft. India's planned lease of the Tu-22M3 may result in changes in this area.

China's Badger production ramped up during the 1970s and slowed down post 1990 when the last four H-6Ds were exported to Iraq, with spares being an ongoing export to support Egypt's Soviet supplied Tu-16Ks. Initial models were essentially cloned Tu-16/16K/16KS Badger A/B, designated H-6A in PLA-AF service and armed with dumb bombs or 'special' weapons. Two B-29 style remote control barbettes and a tail gunner's station, each with paired Nudelman-Rikhter NR-23 guns were retained, including the PRS-1 Bee Hind tail gun radar.

The H-6E/I designation is usually applied to block upgrades of the H-6A – all distinguishable by the low profile nose radome for the cloned Short Horn attack radar. The subsequent navalised H-6D carried the Chinese Type 245 attack radar in a bulkier radome, and a pair of large liquid rocket powered 5400lb (24kN) C-601/YJ-6 (CAS-1 Kraken) ASCMs, based on the HY-2 Silkworm, a P-21 Styx derivative. More recently longer ranging C-611/YJ-61 have been carried and the TV guided YJ-63 reported.

The most recent variant identified is the H-6H which has all guns removed, the dorsal station faired over and the ventral station replaced with a large bulged radome, retaining two missile pylons. It has recently been joined by a similar variant which adds two more pylons outboard and removes the aft gunner's blisters to cut drag. The ventral radome is likely to house a high power jammer, a feature of some late model cruise missile armed Tu-95K Bear variants.

The latter H-6H variant has been identified as a 'cruise missile carrier' but the cruise missile type has yet to be disclosed – US sources claim 25 airframe rebuilds or new builds were planned. Footage from the 2002 Zhuhai Airshow AVIC I promotional video shows a H-6H carrying four missiles which appear to be the Kh-55/65SE – or dummy payloads of similar shape.

The JH-7 maritime strike fighter is broadly equivalent to the Tornado IDS, powered by RR Speys and armed with four YJ-8/81/82 ASCMs.

China's first operational tanker is a rebuilt Badger, comparable in offload performance to the UK V-bomber tanker variants. Equipped with what appears to be a cloned Mk.32 pod, both naval H-6DUs and air force H-6Us have been reported. Negotiations continue over the buy of much larger Russian Il-78MK Midas tankers, intended to match India's buy of the Il-78MKI. (PLA)

In terms of land attack cruise missiles five immediate possibilities exist – the indigenous HN-1, HN-2 and HN-3 credited by Russian sources with 325nm (600km), 800nm (1500km) and 1350nm (2500km) range carrying 'special' payloads or less with a 400kg (900lb) class conventional payload, a cloned Tomahawk widely reported (this may be the HN-3) and a variant of the 1500kg (3300lb) class Raduga Kh-65SE cruise missile. The latter is based on the Kh-55/RKV-500 (AS-15 Kent) carried by Russian Bears and Blackjacks and is an equivalent to the Boeing AGM-86B ALCM. There are reports claiming that a design data package, and tooling for the Kh-65SE were exported to the PRC recently. All of these missiles are claimed to use Tercom/inertial guidance like the US AGM-86 and BGM-109 series.

While the Badger is not a credible penetrator armed with free fall bombs, if armed with a modern 600nm (1110km) class conventional cruise missile, or 1300nm (2410km) class nuclear armed cruise missile, it becomes a credible strategic strike asset offering a reach of 1900 to 2600nm (3520 to 4820km). Carrying dumb bombs it replicates the close air support capability of the B-52H and B-1B. If operated in a similar fashion to these US types it could remain in service another 40 years.

Open sources identify the 8th (merged with the 48th), 10th, 36th Bomber Divisions as the principal units flying the H-6A/E/H/U Badgers, and the 2nd Bomber Division flying the H-6D/DU.

CHINA'S AERIAL REFUELLING PROGRAM

The sole operational tanker type in PLA service is the locally built Badger. It is not surprising that the H-6 is the basis of China's first tanker as the Badger is available cheaply, and is large enough to be useful. With around 75 tonne max takeoff weight, 37 tonne basic empty weight, and an internal fuel payload of about 38 tonnes using a bomb bay tank to supplant a nine tonne internal bomb payload, the Badger makes for a reasonable tanker in the size class of the Handley Page Victor K.2. With a total fuel uplift at max takeoff weight about one half of a KC-135E/R, each Badger in practical terms can adequately support only two fighters.

Exact details on the number of H-6 Badgers converted to tankers are sketchy, as is technical detail on the configuration of the tanker. The aircraft is claimed to have dual INS and dual TACAN beacons. At least two variants have been reported, the PLA-AF H-6U and PLA-N H-6DU. Both appear to be conversions of existing variants, using a pair of wing mounted hose/drogue pods. The pod design has a more than passing resemblance to the UK FRL Mk.32 series pod – UK sources claim FRL was engaged during the 1980s to engineer the conversion.

Photographs indicate configurations with and without the ventral search radar radome, and some indicate the glazed

navigator's station in the nose has been painted over or reskinned with sheetmetal, and a weather radar fitted. The remote control gun barbettes and tail turret are deleted to save weight.

What fraction of the Badger fleet will end up as tankers remains to be seen. The current age of the fleet varies roughly between 12 and 30 years, and the design is a very sturdy Russian derivative of 1940s Boeing technology. Publicly available data suggests that Badger crews often average less than 100 hours annual flying time, which if true indicates that the fatigue life in the Badgers could last for decades yet, corrosion permitting. The bigger issue for the Badger are the 1950s technology Xian WP-8 (Mikulin AM-3M-500) 21,000lb (93kN) class turbojet powerplants which are thirsty and maintenance intensive by current standards, and the antiquated avionics. Earlier attempts to re-engine the Badgers were abandoned. A newer technology increased thrust turbofan would have a major impact on the achievable fuel offload performance and the operationing economics of the H-6U/DU Badger fleet.

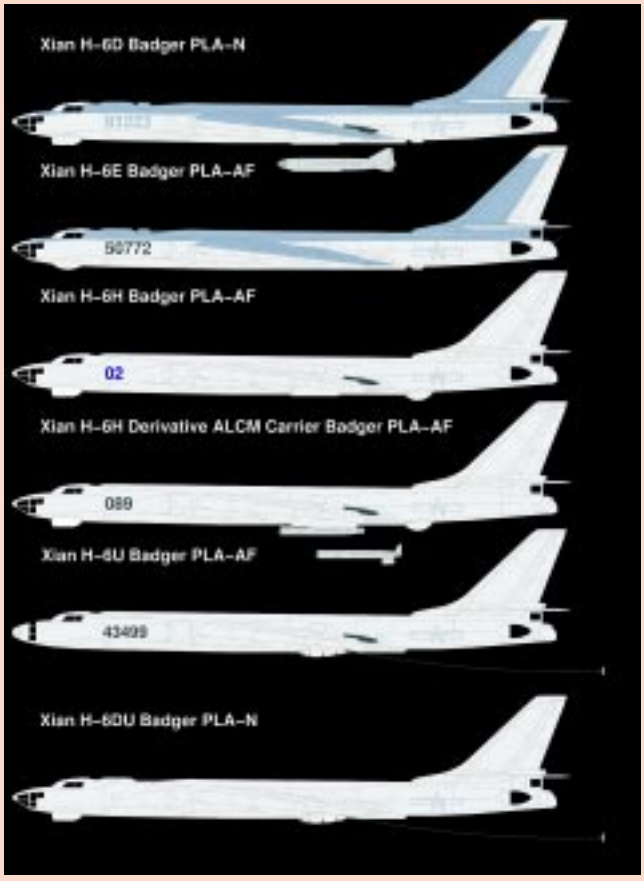
Conversion of 50% or more of the existing Badger inventory would provide a formidable aerial refuelling fleet by regional standards. Much will depend on perceived need vs demand for strategic strike tasking. The current inventory of around a dozen aircraft are claimed to be flown by the PLA-AF's 9th Air Division.

There is no evidence to date of strike tasked Badgers being fitted with refuelling probes. The natural candidate is the Tu-95/142 Bear probe, fitted either to the H-6 lower starboard gun port, or above the nose. With a single refuelling an ALCM armed Badger could reach northern Australia from the Chinese mainland.

China has had an ongoing interest since the 1990s in acquiring four engine Ilyushin Il-78 Midas tankers, a recent reports of negotiations with Rosoboronexport and Tashkent based TAPO to acquire six Il-78MKKs and 30 Il-76MDs should be taken seriously. With India's recent delivery of Il-78MKI tankers, we can expect to observe a repeat pattern of tit-for-tat orders as seen in the fighter and missiles game.

With contemporary indigenous designs and later build Sukhois fitted with aerial refuelling probes there can be no doubt that the PLA-AF and PLA-N have plans for growth in their tanker fleets. However, until there are further public disclosures the composition and size of that fleet will remain unknown. What is clear is that every additional tanker deployed further increases China's capability to project airpower.

The venerable H-6 Badger remains a key element in the PLA force structure, with a range of early and much newer variants in service. The latest H-6H series are cruise missile carriers, with electronic warfare equipment replacing guns. An as yet unnamed H-6H variant has been flown with four wing pylons loaded with what appear to be Russian Kh-55/65 cruise missiles. The Xian website continues to list the Badger in its current production lineup (Author).



CONCLUSIONS

By 2015 the PLA will have numerically the most formidable fleet of modern third generation combat aircraft in Asia, comprising around 350 Su-27SK/J-11s, Su-30MKK/MK2s and several hundred J-10s. These fighters will supplement a fleet of around 150 or more H-6 Badgers by then mostly retasked as cruise missile carriers and tankers. The PLA is likely to be operating a regiment with one or more variants of the Beriev A-50 Mainstay AWACS, and may also operate one or more regiments of the Il-78MK Midas tanker.

To place this in context, the US Air Force flies around 400 F-15C and 200 F-15E fighters as its primary air superiority and strike fighter component. The PLA-AF will likely have around 60% of the paper strength of the current Air Combat Command F-15 fleet in just over a decade.

Historically the PLA-AF and PLA-N was a force ill equipped for power projection, with the 1500nm (2780km) radius class Badger unable to survive against modern air defences. By 2015 we can expect to see a respectable inventory of long range cruise missiles providing additional reach and survivability for the Badger fleet, giving it a new lease on life as a strategic strike platform. Moreover, with Badger and likely Midas tankers, the Su-30MKK/MK2 will be capable of prosecuting strikes well beyond the basic 700nm (1300km) class radius of this type, as well as providing escort for the Badger fleet. The scale of this power projection capability will be limited only by the number of tankers.

In regional strategic terms, the capability of the PLA to directly project firepower into South East Asia from mainland bases will put significant pressure on smaller regional nations to politically align with the PRC, or to acquiesce to any future PRC demands. In turn this will put considerable pressure on the US and Australia to match or exceed the PLA's capability to do so.

The massive expense of the ongoing War on Terror has impacted US budgetary planning and exacerbated existing 'global overstretch' problems. The US Air Force will face genuine problems in funding the replacement of the tired teen series fighter fleets, and portions of the KC-135/KC-10 tanker fleets over the coming two decades. Without stripping assets from the continental US and Central Command, the US will be hard pressed to balance China's growing inventory of high technology weapons.

In Australia the Department of Defence shows little outward interest in the ongoing Asian arms race and pressures on the US force structure, indeed the current Defence Capability Plan sees a progressive and aggressive downsizing of the RAAF's basic force structure over the next decade.

Australia cannot afford to ignore the long term strategic reality.