

2010+ Regional Futures

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There is ongoing speculation that the PLA-N air arm will soon acquire some variant of the Su-32MF/FN Fullback, the largest derivative to date of the Flanker family. Designed to fill a similar niche to the F-111, this aircraft carries the Leninets B004 phased array radar with similar capabilities to the APQ-164 in the US B-1B bomber (Sukhoi).



The PLA-AF is acquiring the latest Russian guided weapons for its Sukhoi fleet. These include the KAB-500/1500 precision guided bombs, the Kh-59M stand-off missile, and the supersonic Kh-31. The latter missile is available in anti-radiation, anti-shiping and anti-AWACS variants.

The scale and rate of change in strategic positioning observed across the region over the last decade has few precedents. While regional air forces are aggressively modernising, they are also restructuring, and introducing assets capable of long range power projection. This second portion of our '2010+ Futures' analysis explores the kind of region Australia will face within the next decade.

Indian Air Force and Naval Air Arm

India has become without doubt the technological trendsetter in Asia, reflecting its good quality science and engineering educational base and its ongoing growth in information technology industries. Most frequently, India has been the first to canvass purchases or acquire the latest Russian and, more recently, Israeli military technology. It is clear that India sees a key aim in becoming the technological leader in Asian military capabilities, reflected in a series of joint development programs launched with the Russians - the BrahMos/Yakhont missile, the KS-172 missile and the Su-30MKI Flanker being the leading examples.

India is now well into its planned production build of 150 or more HAL/Irkut/Sukhoi Su-30MKI Flankers, this being to date the most advanced variant seen with a BARS/N-011M phased array radar, thrust vectoring engines, glass cockpit and hybrid Russian/EU/Indian avionic suite. Indian sources claim the Israeli Elta 8222 jammer and Popeye missile, variants of upgrades being now applied to the F-111s, are to be integrated on these Sukhois. Including Russian supplied aircraft, the planned total is for 180 airframes. These aircraft are in many respects more advanced than the US Air Force fleet of around 200 F-15Es.

India retains a large legacy fleet of Russian-designed and largely licence-built fighters, cited at 250 MiG-21FL/21bis Fishbed, 100 MiG-27M and 75 MiG-23BN/MF Flogger, supplemented by about 60 MiG-29 Fulcrums, a fleet of 35 Mirage 2000H, and remaining BAC Jaguars. While the domestic LCA lightweight fighter presents a viable replacement for the MiG-21 and Jaguar, the other types are more demanding to replace. The prospects are good that further Sukhois will be acquired as replacements, funding permitting.

India recently took delivery of its first six Ilyushin Il-78MKI Midas tankers, equipped with three-point UPAZ pod refuelling systems. It is likely that further tankers will be acquired as budget becomes available. Also due for delivery later this decade will be India's first Beriev/Elta A-50I Phalcon AEW&C aircraft, based on the same L-band Elta phased array radar first bid in this region for Australia's Wedgetail requirement. The buy of the Israeli Green Pine ballistic missile defence radars illustrates Israel's growing relationship with India as a defence supplier.

The Indian Navy has been no less ambitious in its planning for the future. The legacy fleet of Soviet supplied Tupolev Tu-142M Bear F Long Range Maritime Patrol aircraft is in the process of undergoing a major avionic upgrade, although recent reports would indicate that the originally planned



India has recently signed for the A-50I, a derivative of the Beriev A-50U/E, but equipped with the Israeli Elta L-band phased array previously bid for Australia's Wedgetail program (Beriev).



India is now manufacturing the operational configuration of the Su-30MKI, in addition to the earlier Su-30K it acquired from Irkut. In the recent Cope India exercise, this aircraft outperformed the F-15C repeatedly in long range engagements (IAF, US Air Force).

Russian Leninets 'Sea Dragon/Sea Snake' package has been dropped in favour of an Israeli equivalent. The original plan was to enlarge the Bear F fleet concurrently with Russian stock, and lease interim maritime strike Tupolev Tu-22M-3 Backfire C aircraft. How this upgrade materialises now is unclear.

The Navy plan for a land based patrol and strike capability upgrade is paralleled by the acquisition of the former Soviet CTOL/skijump carrier Gorshkov, sold by Russia for the cost of a refit as part of a package including an air wing of navalised MiG-29K Fulcrum fighters.

India has been very active in building up its domestic technology base, pursuing co-development with Russia of the 3M55/Kh-61 Yakhont/BrahMos supersonic 160 nautical mile range cruise missile, and more recently negotiating a similar deal for the Novator KS-172 long range air to air missile, marketed by the Russians as an 'anti-AWACS' weapon. These deals parallel buys of the 3M-54E/E1 Alfa, a 'Tomahawk-like' anti-ship missile with 160 nautical mile range. The land attack 3M-14E variant

recently entered production in Russia. Other buys reported include the KAB-500/1500 series EO/laser precision guided bombs.

By 2010 India will have much of this force structure upgrade in place, providing it with a capability to project air and missile power to distances between 1,000 and 4,500 nautical miles.

To date, India's force structure build up has been modelled in a large part on the types of capabilities now operated by the US, and it is reasonable to expect that India will exploit its IT industry base to develop a robust networking capability over the next decade, leveraging the established Russian technology base. Russia has actively marketed the APD-518 and TKS-2/R-098 (Tipovyi Kompleks Svyazi) digital datalinks for the Sukhoi fighters.

India will remain the benchmark in Asia for technological and operational capabilities. Earlier this year during the Cope India exercise, US Air Force F-15Cs were pitted against Indian Su-30MKs, and reports indicate that the Sukhois more than often prevailed in engagements.

People's Liberation Army - Air Force and Navy

The Chengdu J-10 is similar in concept to the Eurocanard fighters and cancelled Lavi. It is an agile multirole fighter, intended to be used in a Hi-Lo mix with the larger Su-27/30 fighters (China Defence News).

The Tupolev Backfire C is now on the PLA-AF's shopping list as a replacement for the older variants of the H-6 Badger. The last Backfires were built in 1993, and the fleet has accrued little flying time since then (RuAF).



Sukhoi's Su-32MF/FN series strike aircraft is the most radical development of the Flanker, and provides capabilities similar to the F-111, including a terrain following radar capability. The aircraft may be acquired by the PLA-N air arm for a range of maritime roles (Author).

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 largest component of the tactical fighter fleet modernisation is the licence build of 200 Sukhoi/KNAAPO Su-27SK/J-11 fighters, supplementing earlier buys of dozens of Russian built Su-27SK. The recent deliveries of several dozen Su-30MKK, a less ambitious KNAAPO equivalent to India's Su-30MKI, provide an all-weather strike capability to the Sukhoi fleet. The Russian R-77 AMRAAM analogue, indigenous PL-12, based on R-77 technology have been acquired, as have Russian Kh-59M series stand-off missiles, Kh-31 anti-radiation/anti-shipping missiles and KAB-500/1500 series precision guided bombs.

China's legacy fleet of relatively new H-6 Badgers, reverse engineered from the Soviet Tu-16 series, remain in service as strategic strike platforms, with some fraction of the fleet since converted into H-6U aerial refuelling tankers. Exact Badger numbers are unknown, but up to 150 are claimed to be in use with 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.

The most recent H-6 variant identified is designated 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 similar variant, which adds two more pylons outboard and removes the aft gunner's blisters to cut drag. 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 ongoing 'tit-for-tat' arms race between China and India has seen the PLA pursue an even more ambitious program than that of India, fed by China's robust trade surplus in manufactured goods. While China has typically opted for less ambitious choices in technology it has compensated for this in acquiring often much larger numbers.

China also operates a large legacy fleet of Soviet-era fighter designs, largely domestically built as licenced or reverse engineered and evolved copies. Cited numbers include over 2500 J-6 Farmer (MiG-19), 600 J-7 Fishbed (MiG-21) and several hundred domestic derivative Chengdu/Shenyang Q-5/J-5s, and larger J-8A/B interceptors. These aircraft are intended to be largely replaced over coming decades with a hi-lo mix of licenced and Russian-built Su-27SK/J-11, Su-30MKK and the indigenous 'Lavi/Eurocanard-like' delta canard J-10 lightweight fighters.

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 replace the J-6, Q-5 and J-7 in frontline combat regiments.

Early J-10 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

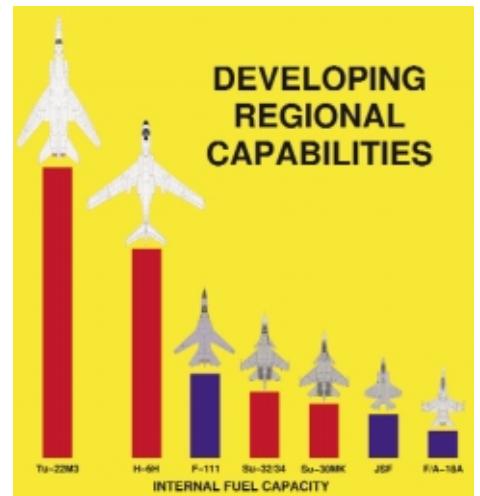
It is not surprising that the H-6 is the basis of China's first tanker – as the Badger is available cheaply and is large enough to be useful. With around 167,300lb (75,800kg) MTOW, 82,000lb (37,150kg) BEW, and an internal fuel payload of about 85,000lb (38,600kg) using a bomb bay tank to supplant a 20,000lb (9,000kg) internal bomb payload, the Badger makes for a reasonable tanker in the size class of the HP Victor K.2. With a total fuel uplift at MTOW about one half of a KC-135E/R, each Badger in practical terms can adequately support only two fighters. The H-6U Badger conversion is based on a 1980s UK FRL cooperative effort.

China has had an ongoing interest since the 1990s in acquiring four-engine Ilyushin Il-78 Midas tankers, and recent reports of negotiations with Rosoboronexport and Tashkent based TAPO to acquire six Il-78MKKs and thirty 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.

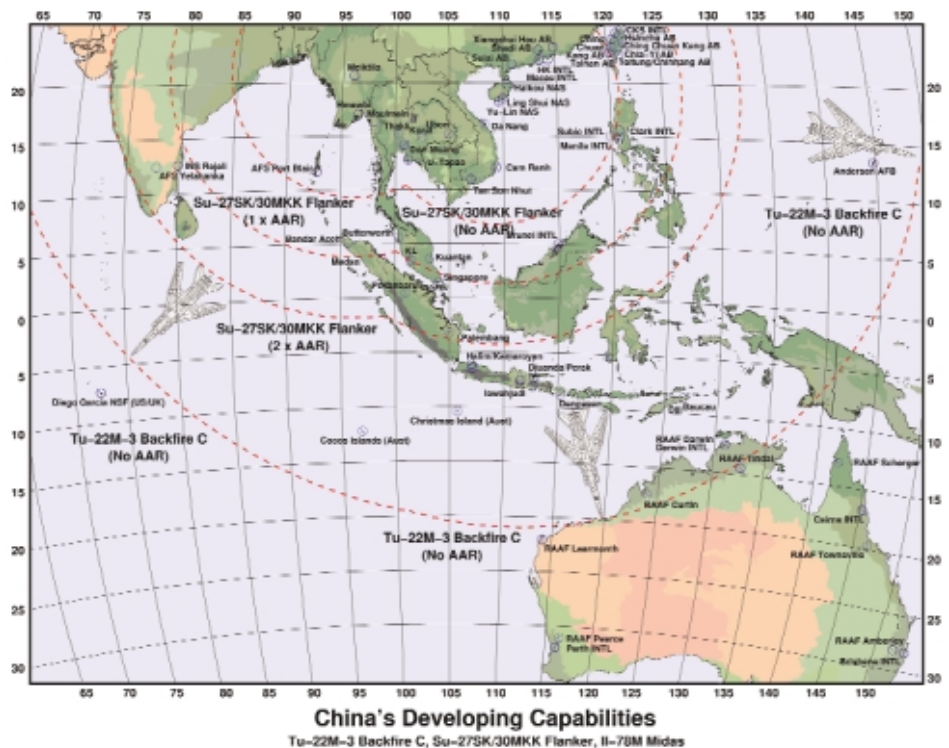
China has had an active domestic program to develop air/land/sea launched cruise missiles for some time. In terms of land attack cruise missiles five immediate options exist - the indigenous HN-1, HN-2 and HN-3 credited by Russian sources with 325NMI (600km), 800NMI (1,500km) and 1,350NMI (2,500km) range carrying 'special' payloads or less with a 900lb (400kg) class conventional payload, a cloned Tomahawk widely reported (this may be the HN-3) and a variant of the 3,300lb (1,500kg) class Raduga Kh-65SE cruise missile. The latter is based on the Kh-55/RKV-500 (AS-15 Kent) carried by Russian Bear/Blackjack 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.

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 ISR game. The L-band Phalcon was the basis of the Elta 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. An A-50E/I aircraft has been photographed repeatedly.

Cruise missiles are part of a broader agenda to strengthen strategic capabilities - at this year's 10th PLA-AF internal Communist Party Congress a public announcement was made detailing changes in doctrine, a stated intention to develop a 'long range strategic air force', and an intent to acquire the Tupolev Tu-22M3 Backfire C bomber. The Backfire C with twice the payload and twice the range of Australia's F-111, with similar high speed performance, represents the single strategically most potent asset to enter the regional air power debate. Given the nature of the announcement, there is every reason to believe that the PLA-AF will acquire this aircraft, most likely refurbished Russian AF stock. Unlike new build Sukhoi Su-32MF/34 Fullback tactical strike aircraft which have been argued to be the candidate Badger replacement, the Backfire C built between 1983 and 1993 can be delivered much faster and cheaper, and requires no supporting tankers to strike across a footprint between Diego Garcia, the Gascoyne to Darwin arc, and Guam.



The current trend across the wider region is to increase the reach of strike forces, a trend which runs opposite to current thinking in Canberra. This chart compares the internal fuel loads of representative aircraft types (Author).



China's PLA-AF is pursuing the most aggressive modernisation and restructuring in its history. Recent reports indicate a doctrinal shift to a 'strategic air force' model, including an intent to acquire Russian Tu-22M3 Backfire bombers. Flown from accessible basing in Myanmar and Hainan Island, the aircraft offers the PLA-AF unprecedented regional coverage (Author/UNSW).



The latest addition to the IAF inventory are the first batch of Ilyushin Il-78MKI Midas tankers, each equipped with three UPAZ hose/drogue pods (IAF).

Acquisition of Backfires would likely see remaining late build Badgers converted into further H-6U tankers.

The PLA-AF's ambitious plans have been paralleled by aggressive modernisation of the PLA-N naval air arm. The PLA-N is now replacing its legacy H-5 Beagles and other indigenous types with several dozen KNAAPO Su-30MK2, a PLA-N specific variant of the Su-30MKK. The indigenous FH-7 maritime strike fighter, an analogue in size and role to the maritime Panavia Tornado ISD variants, equips only one regiment and is likely to remain at existing numbers. Current planning sees the Su-30MK2 armed with a unique anti-shipping variant of the Kh-59 missile, the Kh-59MK, and anti-shipping variants of the Kh-31. It is not known whether the air launched variants of the Kh-41 Moskit/Sunburn and 3M-54E will be acquired, these being carried by warships and submarines respectively. There has been some speculation that the

PLA-N may order a variant of the Sukhoi Su-32 Fullback, choices being the 'generic' multi-role Su-32MF or the specialised maritime strike and Anti-Submarine Warfare capable Su-32FN. The PLA-N's air arm is tasked with littoral sea control in the heavily contested Taiwan Straits and South China Sea, an environment where strike tasked Badgers and maritime patrol aircraft are not survivable as neither have the performance to evade modern fighters, and both must close with targets to engage. We should not be surprised if the Su-32 series is ordered as a follow-on to the Su-30MK2. China faces considerable challenges over the next decade in recruiting and training the required pool of aircrew to operate the large number of modern aircraft it is acquiring. The 10th PLA-AF internal Communist Party Congress report details the difficulties experienced over the last 12 months in shifting to a 'combat oriented' training regime, these including much

increased accident rates. It is evidently only a matter of time before the PLA-AF and PLA-N develop a modern training regime and doctrine, emulating Western practices. It is significant that the scale and pace of China's force structure rebuild is driving the regional arms race in air power and missile technology. As China increases its ability to project power across the region, smaller nations will respond by further investment in AEW&C, modern fighters, and supporting capabilities. By 2020 the Asia Pacific will have the largest collective fleet of modern and newly built fighter aircraft worldwide.

South East Asia

The most capable air force in the nearer region is that of Singapore. The RSAF has been the trendsetter in South East Asia, historically acquiring most of its hardware from the United States. Singapore was the first regional nation to field an AEW&C capability, in its fleet of four Grumman E-2C Hawkeye aircraft. More recently, the RSAF acquired four KC-135R Pacer Crag Stratotankers providing it with the best aerial refuelling fleet in Asia, albeit smaller than those of India, or China. The RSAF flies a mix of around 50 F-16A-D, mostly recent F-16C Block 52 aircraft, with a strike force comprising 50 rebuilt MDC A-4SU Skyhawks, and 18 TA-4SU trainers. Around 60 legacy Northrop F-5 variants are cited, but like the A-4SU these are increasingly irrelevant aircraft in a Sukhoi saturated region. Current planning is likely to see a decision within 12 months to acquire twenty new strike fighters to replace the A-4SU Skyhawks, with an F-15E variant - the F-15T, the Eurofighter Typhoon and Dassault Rafale being evaluated at the time of writing. The proliferation of Sukhois and



The Indian Navy recently acquired the Russian ski-jump carrier Gorshkov, and will use it to deploy an air wing of MiG-29K fighters. The navalised MiG-29K is similar to the MiG-29 flown by the IAF, and the MiG-29N flown by Malaysia (RuN).

BACKFIRE C – WEAPONS GROWTH OPTIONS

Tupolev Tu-22M-3 Backfire C PLA-AF

43020

Growth FLIR/DLIR/Laser 69 x FAB-250 External/Internal (500 lb)

STRATEGIC STRIKE

BATTLEFIELD INTERDICTION

8 x KAB-1500L/Kr/TK/S-E External (3 klb)

30 x KAB-500Kr/S-E External/Internal (1 klb)

KAB-1500L
KAB-1500Kr
KAB-1500TK
KAB-1500L-E
KAB-500L
KAB-500Kr
KAB-500S-E

W - EO Correlator Guidance
TK - EO Terrain Guidance
L - Semi-Active Laser Guidance
S-E - Semi-Active Laser Guidance

STRATEGIC STRIKE

8 x Kh-55/65 ALCM External

STRATEGIC STRIKE

MARITIME STRIKE

SEAD/DEAD

COUNTER AEW&C

1-3 x Kh-22 Supersonic ALCM External

MARITIME STRIKE

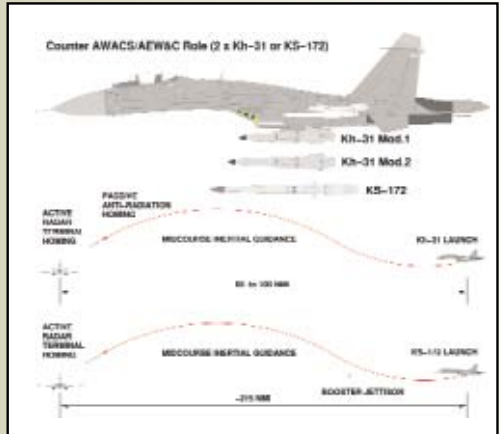
SEAD/DEAD

COUNTER AEW&C

8 x Kh-31 Supersonic ASCM External

MARITIME STRIKE

8 x Kh-35U ASCM External



Perhaps the most important addition to regional arsenals will be 'anti-AWACS' missiles, designed to kill or shut down opposing AEW&C aircraft. China is acquiring a range of Kh-31 subtypes, while India is reported to be negotiating co-development of a KS-172 variant (Author).

The Backfire C was to be upgraded to Tu-22M4 and then Tu-22M5 configuration via extensive avionics and weapons upgrades. A wide range of current Russian precision guided weapons could be carried (Author).

the strike orientation of the bid will put some pressure on Singapore to opt for an F-15 solution.

By 2010 the RSAF will have fielded the A-4SU replacement, and possibly follow on aircraft to replace the increasingly ineffective F-5s. It is reasonable to expect that Singapore will by then have applied a mid-life upgrade to its E-2C fleet, most likely bringing them up to the Hawkeye 2000 configuration now being introduced by the US Navy. Strategic pressure is also likely to see further tankers acquired downstream. Singapore's well developed training system and good technology base will see it become an early adopter in the region of networking capabilities for its AEW&C and newer fighter aircraft. The extent to which the RSAF is prepared to invest in strike oriented ISR capabilities remains to be seen.

Malaysia has also been rapidly modernising its fleet, progressively retiring older types. The best aircraft in the current RMAF/TUDM fleet are the 18 MiG-29N Fulcrums, and eight Boeing F/A-18Ds, flown concurrently with 16 legacy Northrop F-5E/F Tigers. The latest acquisition for the Malaysians are 18 Irkut-built Su-30MKM Flankers, based upon the Indian Su-30MKI, although the full configuration of the RMAF/TUDM subtype has yet to be disclosed. While public statements indicate a strong interest in a follow on order of additional Irkut Su-30s, current indications are that this buy will be deferred to fund the acquisition of four AEW&C aircraft, likely to be ordered well before the end of the decade.

In the period following 2010, we can expect to see Malaysia maturing its AEW&C capability, applying midlife upgrades to the F/A-18D and MiG-29N, and introducing its follow on Su-30MKMs, likely replacing remaining F-5s.

Malaysia's small geographical footprint and the considerable endurance of the Su-30 at shorter distances to station may see the RMAF/TUDM not opt for aerial refuelling capabilities, although the UPAZ hose/drogue pod would provide a useful capability to support air defence patrols. The extent to which the RMAF/TUDM is

prepared to invest in networking remains to be seen, and much will depend on the type of AEW&C aircraft acquired.

Indonesia remains in economic difficulty as a result of political instability, Islamist subversion, fallout from the late 1990s collapse, and ongoing separatist and religious disagreements. The TNI-AU's principal capability until recently resided in a legacy fleet from the Suharto era, comprising less than a dozen F-16A/B Block 15 OCU fighters, 16 A-4E/H/J Skyhawks and less than a dozen F-5E/Fs, supportability remaining an issue due to US Congressional pressure over East Timor.

The TNI-AU has ambitious plans for the future, and its leadership have publicly stated an intent to acquire around 50 Sukhoi fighters, statements widely repeated by Russian sources at the time. Prior to the economic collapse the TNI-AU ordered twelve KNAAPO Su-30KIs, similar to the Russian Su-27SMK upgrade configuration. This order was believed to be dead until last year's announcement of a lead in buy of four Su-27/30 of unspecified configuration. Russian sources have also claimed that the TNI would like to acquire S-300PMU-2 long range SAM systems.

How many Sukhois Indonesia ultimately acquires remains an open question, as is the ability of the TNI-AU to find adequate talent to crew the fleet. Nevertheless, the

Su-27/30 is the most credible aircraft Indonesia has ever operated and if used cleverly in any dispute with Australia, could cause considerable mayhem given the geographical exposure of gas/oil industry assets in the North, and other targets like airfields.

In summary, the region Australia will face after 2010 will be unlike anything seen since the 1940s, in relative terms. The technology, the doctrine, the numbers and types of assets will present a strategic challenge that cannot be ignored.



India is to locally manufacture the BrahMos 'Supersonic Cruise Missile', an improved variant of the Russian Kh-61 Yakhont (NIC, RuN).



China continues to manufacture the legacy J-7, a reversed engineered and evolved Fishbed. The latest J-7E and J-7G variants employ a new double delta wing (PLA).



The latest photo from the Xian factory shows a H-6 cruise missile carrier, fresh from a rebuild and sporting the new low visibility grey camouflage, but full colour insignia. The upgrade includes removal of all gun turrets and the aft gunner's blisters, to save weight and reduce drag. Four pylons for 3,000 lb weight class cruise missiles replace the paired 6,000 lb rated pylons used for the YJ-6/61/62 Kraken ASMs. It is unclear whether the bomb bay fuel tank devised for the H-6U is used to further improve combat radius over gains produced by drag/weight reduction (via RD Fisher).