

Inquiry into Australia's Defence Relations with the United States: The Cruise Missile Defence Problem

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1 Cruise Missiles or Ballistic Missiles?

The last nine months have seen some remarkable, though previously predicted, strategic developments take place in Asia. As a result China will acquire by the end of the decade a significant capability to deliver long range cruise missiles across the Asia-Pacific region.

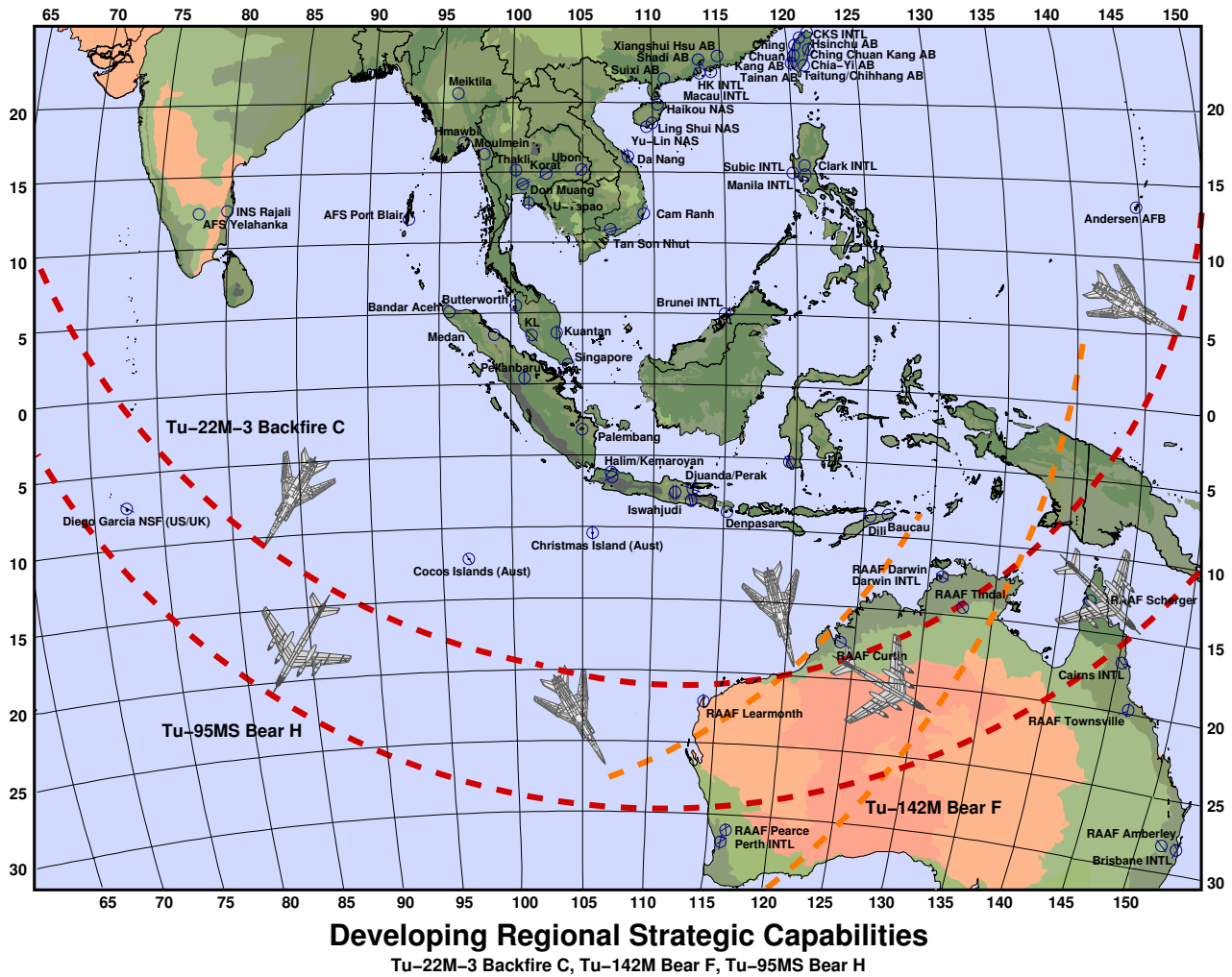


Figure 1: The now certain deployment of strategic bombers by the PLA-AF will fundamentally alter the strategic balance in the near region. This map illustrates the coverage footprint of the Tu-95MS Bear H and Tu-22M-3 Backfire C flown from southern China and Myanmar basing [Red]. The footprint of Indian deployments of like types is included for comparison [Orange] (C. Kopp).

Late June last year Hong Kong media revealed that in a resolution passed at the People’s Liberation Army Air Force’s internal 10th Congress of the Communist Party of China, the People’s Liberation Army Air Force would seek to become a ‘strategic air force’ and the acquisition of the Russian Tupolev Backfire strategic bomber was cited as a core tenet of this unprecedented policy change.

The media report (<http://www.phoenixtv.com> in Chinese) stressed that the main challenge to be

faced in building a 'strategic air force' would be the acquisition of 'long-range bombers', with the Backfire cited repeatedly. This report was replete with citations of characteristic CPC language and was remarkably detailed, covering issues of training, doctrine and force structure.

The large scale build up in PLA-AF capabilities over the last decade was clear evidence of some fundamental changes in PLA-AF strategic thinking, as a large fraction of the investment was being put into assets designed to project power over regional distances.

Subsequent Chinese media reports have reiterated the June announcement, publicly discussing the acquisition of the Tu-22M3 Backfire, Tu-95MS Hear H and even the latest Tu-160 Blackjack A strategic bombers.

Until now the acquisition of Russian strategic bombers was blocked by Russian policy on exporting such systems. This policy changed in January this year, with public statements by the Russian Chief of Air Staff General Vladimir Mikhailov. He openly canvassed the prospect of sales to China: 'We could sell some Tu-22M3 and Tu-95 bombers [to China]. We will show them to our neighbour. ... If they have the money, let them buy,'. Subsequent media reports confirm this policy shift.

Russian reports indicate that around forty Tu-22M3 Backfires were due to be mothballed, despite these aircraft being typically less than 15 years old, due to budgetary pressures. Exporting these aircraft to China would permit the Russian Air Force to recoup some of the cost of the investment.

China also restarted production late last year of the Xian H-6H, a reverse engineered Soviet Tu-16 cruise missile carrying bomber. This new variant is equipped with pylons to carry four long range cruise missiles. A prototype H-6H carrying four dummy cruise missiles, similar to the Russian Kh-65, was publicly revealed in 2002.

What China acquires with Russian strategic bombers such as the Backfire, Bear or Black-jack, is the capability to deliver long range cruise missiles against targets across the Pacific Rim, including northern Australia. This provides China with two key strategic dividends. The first is the capability to coerce nations in Asia. The second is the capability to bypass the US National Missile Defence system, and forward deployed Theatre Missile Defence systems in Asia.

The idea of using long range cruise missiles to bypass the US National Missile Defence system is hardly new. In 2002 Russian analyst Alexander Mozgovoi canvassed this idea in some depth, writing for the Rosoboronexport house journal 'Military Parade'. He specifically argued that "Low-visibility and low-flying cruise missiles can foil the U.S. efforts to develop the NMD".

China has had a long running indigenous program to develop long range cruise missiles. Three domestically built types have been described in recent literature, the HN-1, HN-2 and HN-3. At least one photograph exists of a weapon which resembles the US Tomahawk cruise missile.

More recently reports have emerged of Chinese efforts to acquire foreign cruise missile technology. China is reported to have acquired two crashed US Tomahawks from Afghanistan prior to the US

campaign against the Taliban. More recently reports have emerged detailing the illegal acquisition of six Russian built Kh-55 long range air launched cruise missiles from the Ukraine in 2001. Complete intact samples of the Kh-55 would be sufficient to reverse engineer the missile, or key components such as the engine and guidance system.

Cruise missiles are a weapon which is well suited to China's industrial mass production aviation industry, which faces a downturn in demand for low cost legacy Soviet era fighter aircraft, which sustained the industry for decades. A program to manufacture a warstock of several thousand cruise missiles would provide ongoing activity for this strategic industry.

There can be no doubt now that by 2010 China will have an established capability to deliver large numbers of long range cruise missiles across the Asia Pacific.

This is a pivotal strategic development in the region, one which in many respects obsoletes much of the focus in US Missile Defence Policy, established almost a half decade ago. While ballistic missiles will remain an important issue globally, in the Asia-Pacific the cruise missile is the ascendant offensive capability.

2 Cruise Missile Defence and the US Alliance

Australia cannot afford to remain inactive in the area of developing cruise missile defence capabilities, nor can it afford to continue prioritising ballistic missile defence over cruise missile defence.

The US has yet to respond to the developing challenge of the cruise missile in the Asia-Pacific. The US Air Force had a well developed long term roadmap for cruise missile defence capability development, but recent events have effectively rendered achievement of the original timelines highly problematic. Should China acquire an asymmetric advantage in offensive cruise missile delivery capabilities, over US cruise missile defence capabilities in the Asia-Pacific, the US will see its strategic position strongly eroded in this region.

The US is experiencing genuine problems with strategic overstretch due to its global commitments, and especially the high cost of operations in Iraq and Afghanistan. As a result there is now significant pressure on delivery timelines and numbers of key assets the US Air Force planned to use for cruise missile defence operations. These include the F/A-22A Raptor fighter and the E-10A MC2A radar surveillance aircraft. Existing systems such as the E-3A AWACS and E-8C JSTARS are much less effective at detecting and tracking cruise missiles, and existing fighters such as the F-15C and F-16C are less effective than the F/A-22A. The Joint Strike Fighter is built to support ground forces on the battlefield and will not match even the existing capability of the F/A-22A Raptor fighter in cruise missile defence.

Australia's current defence planning does not address the issue of cruise missile defence, especially in terms of future planning for the RAAF. Current plans for six Wedgetail Airborne Early Warning

and Control aircraft fall short by at least two aircraft. Current plans for aerial refuelling tanker aircraft cover only about 25 percent of the required aerial refuelling capacity. The F/A-18A is ill suited to this role, as is the Joint Strike Fighter, due to inadequate supersonic dash performance, inadequate endurance and missile payload, and limitations in radar aperture size. Conversely, the F-111, planned for early retirement, is well suited to this role if equipped with a suitable radar and missile package. This is because of the F-111's tremendous endurance, excellent supersonic performance, its capacity to carry a large radar aperture and its existing ability to accommodate present and future weapons with Mil-Std-1760 interfaces. One of the original design aims of the F-111 was cruise missile defence.

Australia should regard the developing risks arising from regional cruise missile proliferation as an opportunity in the context of the US alliance. Australia's JORN over-the-horizon radar system is a valuable surveillance asset in cruise missile defence operations, and Australia could offer access to this technology to the US to enhance regional cruise missile defence capabilities. Other opportunities exist in surveillance systems, such as the joint development of cruise missile defence capable radar equipped variants of the P-8A MMA maritime patrol aircraft, already identified as the likely replacement for Australia's AP-3C Orion fleet. Australia could also offer test range facilities and access to Australia's world recognised and innovative Test and Evaluation professionals to support the development of systems and weapons for cruise missile defence. Given the budgetary pressures extant on the US in the F/A-22A program, were Australia to acquire this aircraft in lieu of the Joint Strike Fighter at this time, the US would be able to afford more F/A-22A aircraft from its existing budget. In essence, a return to the Defence 2000 White Paper strategy of replacing the F/A-18s before the F-111s and doing so with F/A-22As would be a strategically sound and economically prudent contribution to the US alliance.

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4 Annex B - Developing Regional Cruise Missile Capabilities

The following material was compiled from publicly available sources and reflects the best currently available unclassified intelligence.

4.1 Additional Resources

Regional Capabilities: <http://www.ausairpower.net/region.html>

Regional Strategy: <http://www.ausairpower.net/strategy.html>

Weapons Capabilities: <http://www.ausairpower.net/weps.html>

Defence Policy: <http://www.ausairpower.net/policy.html>

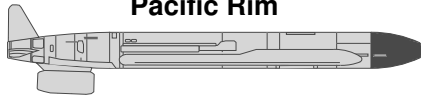
F-111: <http://www.ausairpower.net/pig.html>

F/A-18A Hornet: <http://www.ausairpower.net/bug.html>

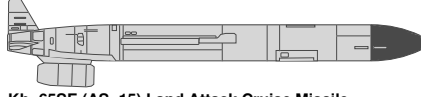
Joint Strike Fighter: <http://www.ausairpower.net/jsf.html>

F/A-22A Raptor: <http://www.ausairpower.net/raptor.html>

**Subsonic Cruise Missile Types
Pacific Rim**



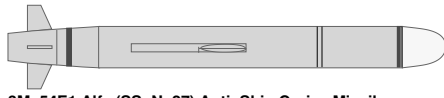
Kh-55M (AS-15) Land Attack Cruise Missile



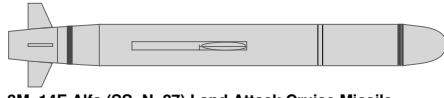
Kh-65SE (AS-15) Land Attack Cruise Missile



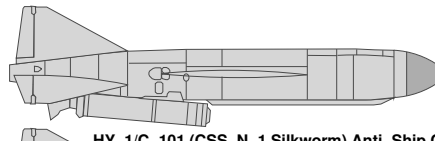
PLA-N Indigenous Land Attack Cruise Missile (TLAM-Clone)



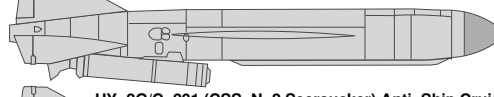
3M-54E1 Alfa (SS-N-27) Anti-Ship Cruise Missile



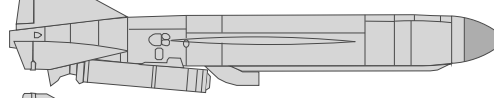
3M-14E Alfa (SS-N-27) Land Attack Cruise Missile



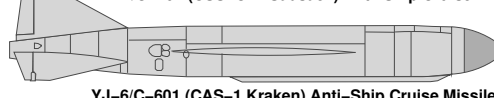
HY-1/C-101 (CSS-N-1 Silkworm) Anti-Ship Cruise Missile



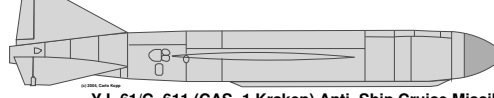
HY-2G/C-201 (CSS-N-2 Seersucker) Anti-Ship Cruise Missile



HY-4/C-401 (CSS-C-7 Sadsack) Anti-Ship Cruise Missile

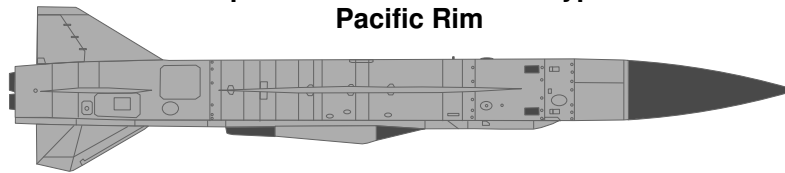


YJ-61/C-601 (CAS-1 Kraken) Anti-Ship Cruise Missile

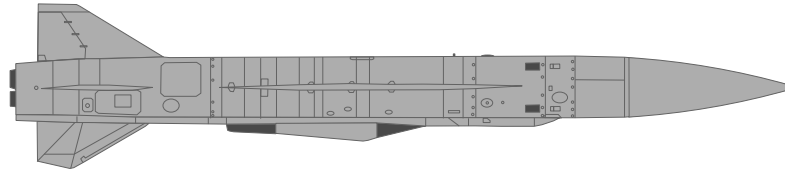


YJ-61/C-611 (CAS-1 Kraken) Anti-Ship Cruise Missile

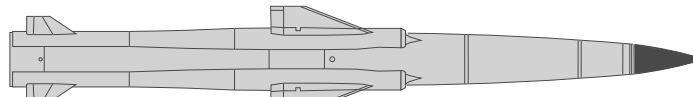
**Supersonic Cruise Missile Types
Pacific Rim**



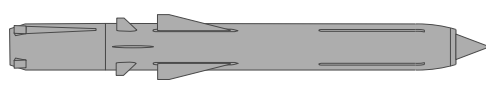
Kh-22N Burya (AS-4 Kitchen) Anti-Ship Cruise Missile (Tu-22M3)



Kh-22N Burya (AS-4 Kitchen) Land Attack Cruise Missile (Tu-22M3)



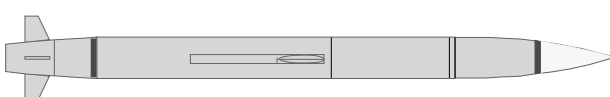
Kh-41 Moskit (SS-N-22 Sunburn) Mach 2.2 Anti-Ship Cruise Missile



3M-55 Yakhont/PJ-10 Brahmos S (SS-N-26) Mach 2.5 Anti-Shipping Cruise Missile



Kh-61 Yakhont/PJ-10 Brahmos A (SS-N-26) Mach 2.5 Anti-Shipping Cruise Missile



3M-54E Alfa/Club (SS-N-27) Mach 2.9 Anti-Ship Cruise Missile

Figure 2: Comparison of cruise missile types operated or being acquired in the Asia Pacific region. Of most concern are the long range cruise missiles, specifically copies of the US Tomahawk such as the Raduga Kh-55 (C. Kopp).



Figure 3: *Russia's latest Tu-160 Blackjack A strategic bomber, similar to the US B-1B, is being publicly canvassed as an export to the PRC. Deliveries to the PLA-AF would require restarting production in Russia (RuAF).*



Figure 4: *The Tu-95MS Bear H cruise missile carrier has been publicly offered to the PLA by Russia. These aircraft remained in production until 1993, making the Russian fleet 'young' in accrued airframe hours (US DoD/RuAF).*



Figure 5: *During the 1990s China made repeated attempts to persuade the Russians to supply the Tu-22M3 Backfire C supersonic strategic bomber, of which around 250 were built during the Cold War. The publicly stated intent to acquire this aircraft now coincides with an export drive by Russia to supply them. Russian sources claim up to forty aircraft could be available for export, in lieu of mothball storage (RuMoD).*

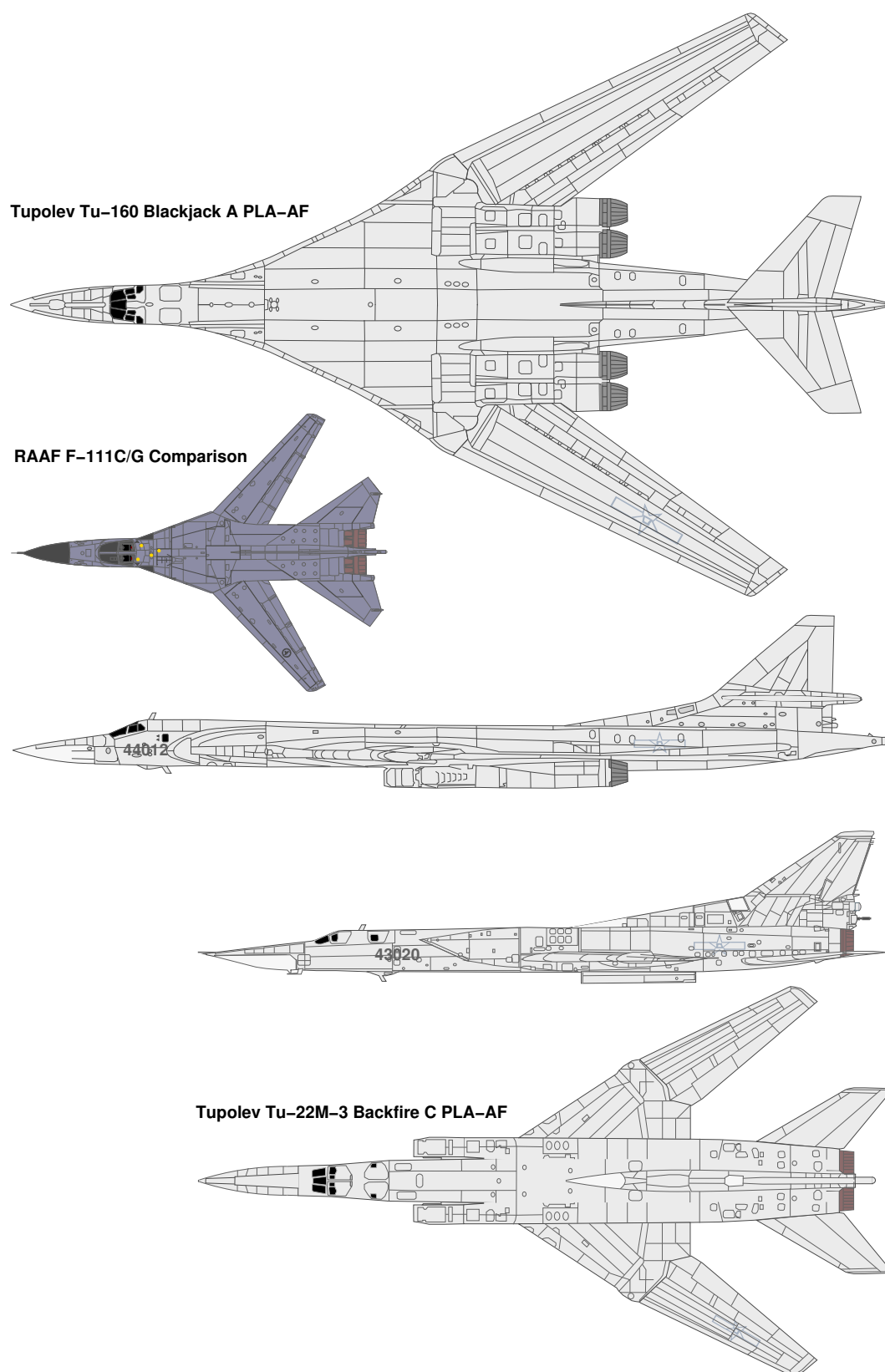
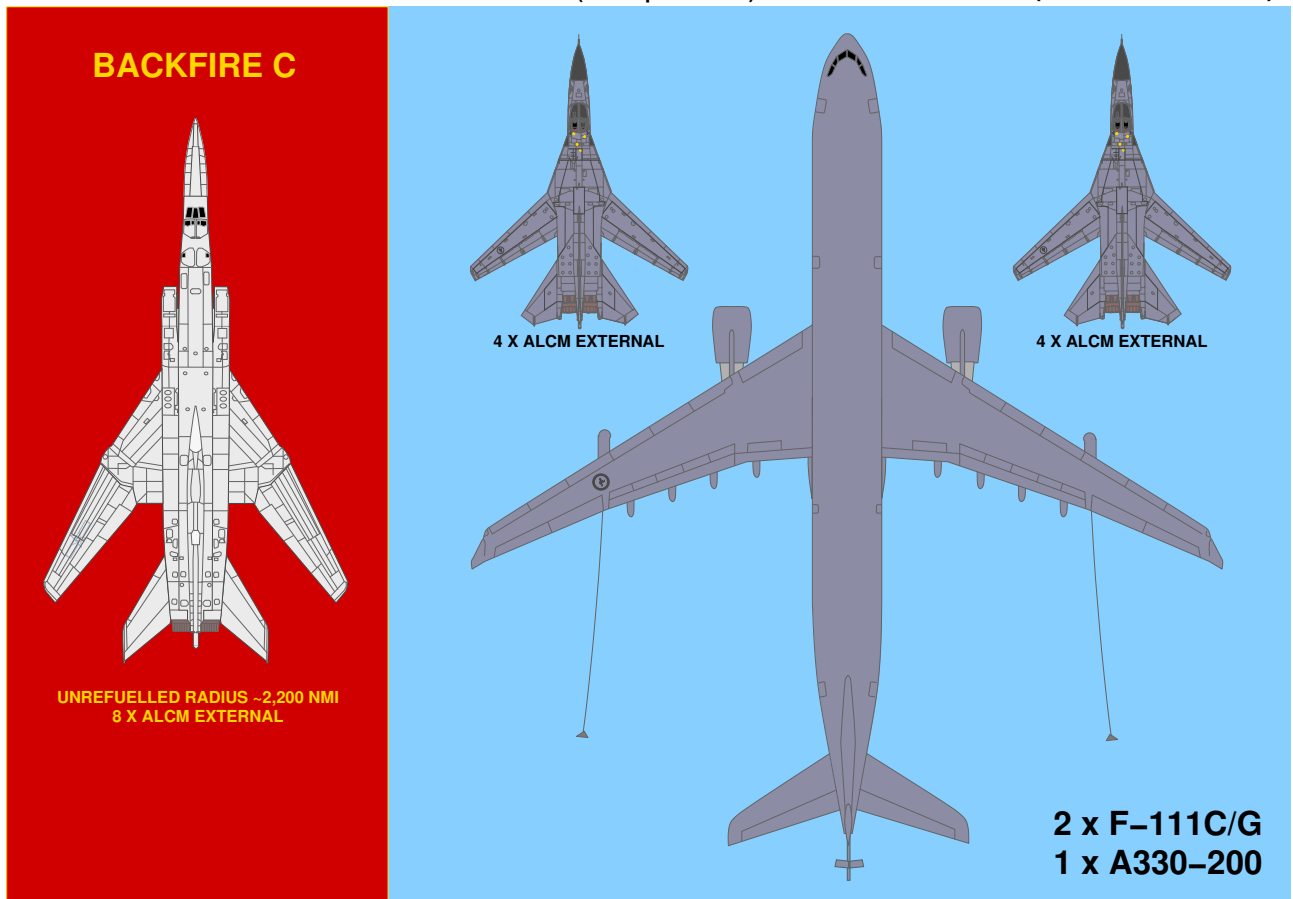
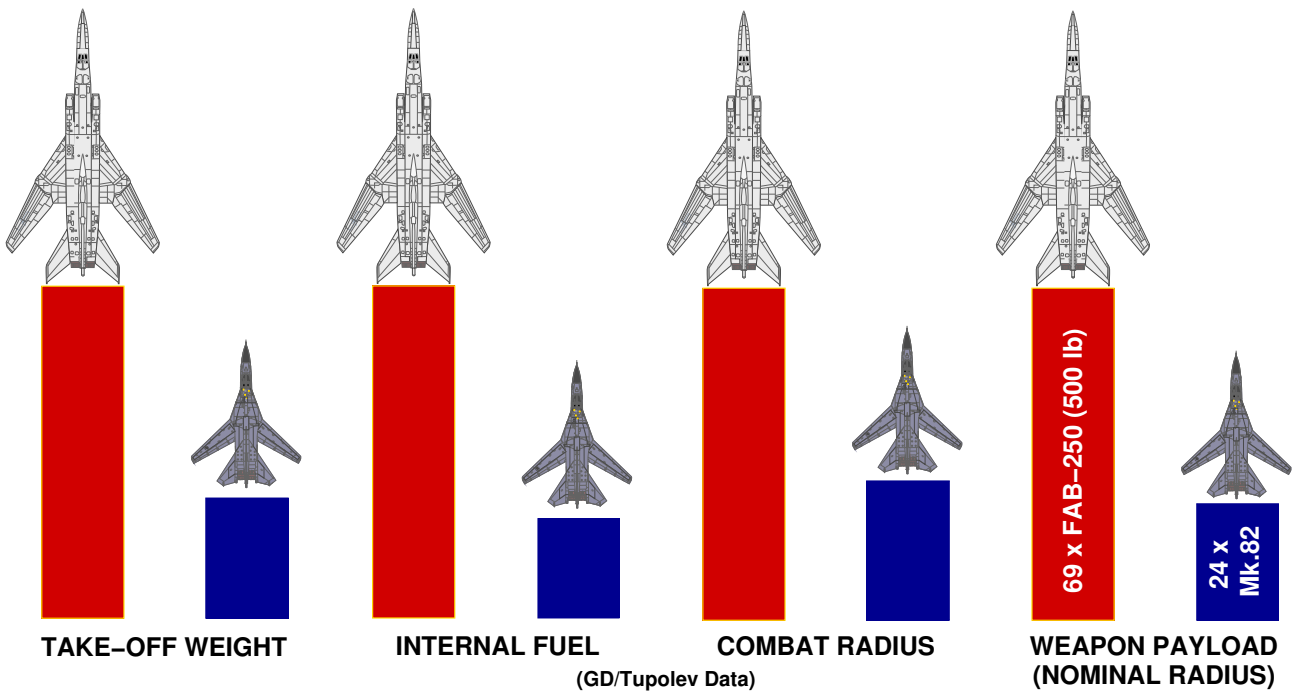


Figure 6: Relative size comparison of the Tu-160 Blackjack A and Tu-22M-3 Backfire C strategic bombers against the RAAF's F-111. The Tu-160 carries up to twelve long range cruise missiles, the Tu-22M3 has the capacity to carry eight such weapons. The F-111 could carry four, the Joint Strike Fighter only two (C. Kopp).



THROW WEIGHT EQUIVALENCE – 8 x CRUISE MISSILES

Figure 7: The strategic weight of the Tu-22M3 can be easily appreciated by parametric comparison against the RAAF’s F-111s. A single cruise missile armed Backfire delivers the punch of a pair of F-111s supported by an A330-200 tanker, or four JSFs supported by multiple A330-200 tankers (C. Kopp).
Australia’s Defence Relations with the United States

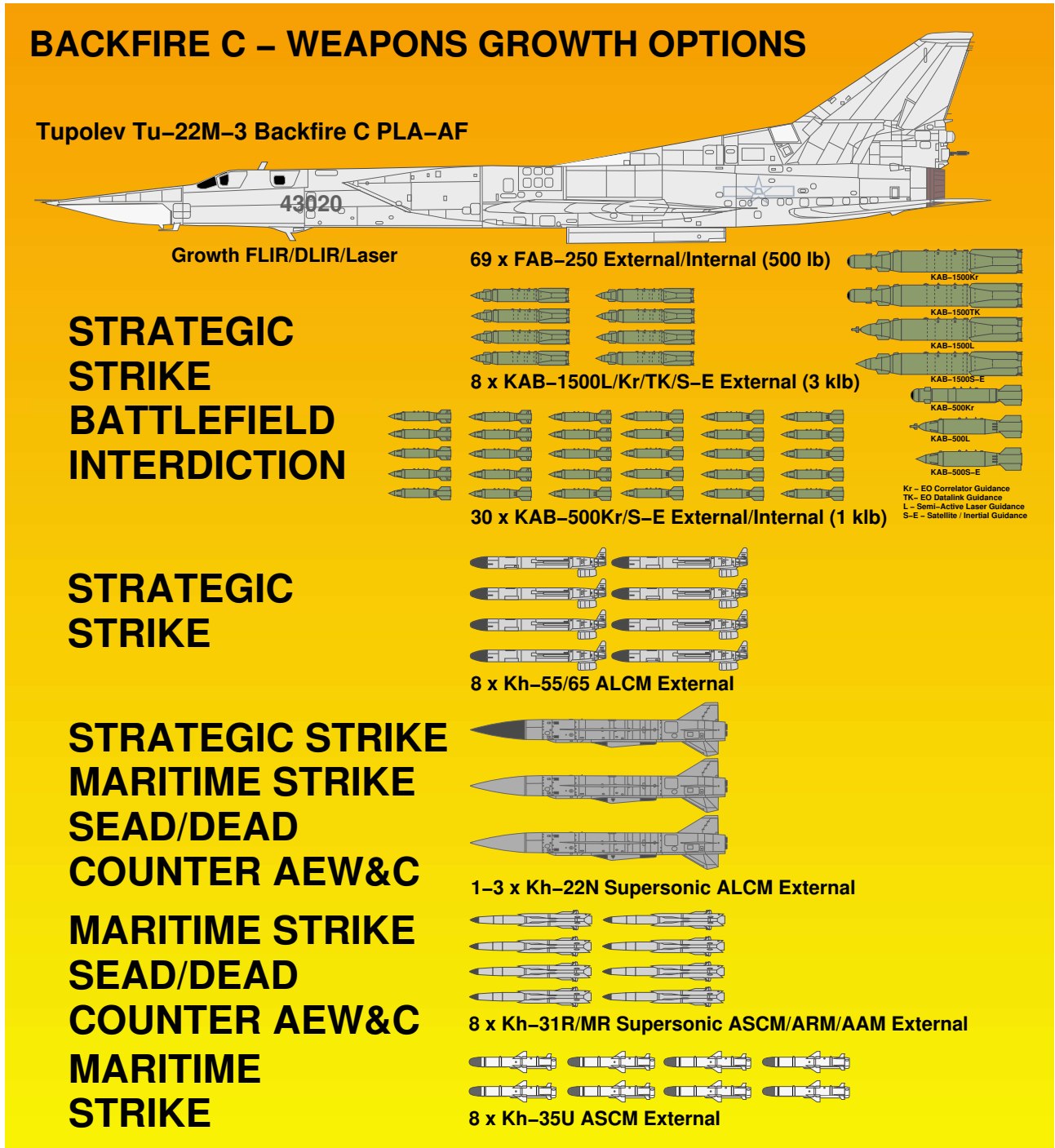


Figure 8: A wide range of weapons options exist for upgrades of the Tu-22M3 Backfire C (PLA).



Figure 9: The Xian H-6 is a reverse engineered Russian Tu-16 Badger, broadly equivalent to the 1960s RAF V-bombers. Production was resumed last year, involving a new H-6H cruise missile carrier variant. Around 150 Badgers are in service, mostly built between 1972 and 1992 (Xian).

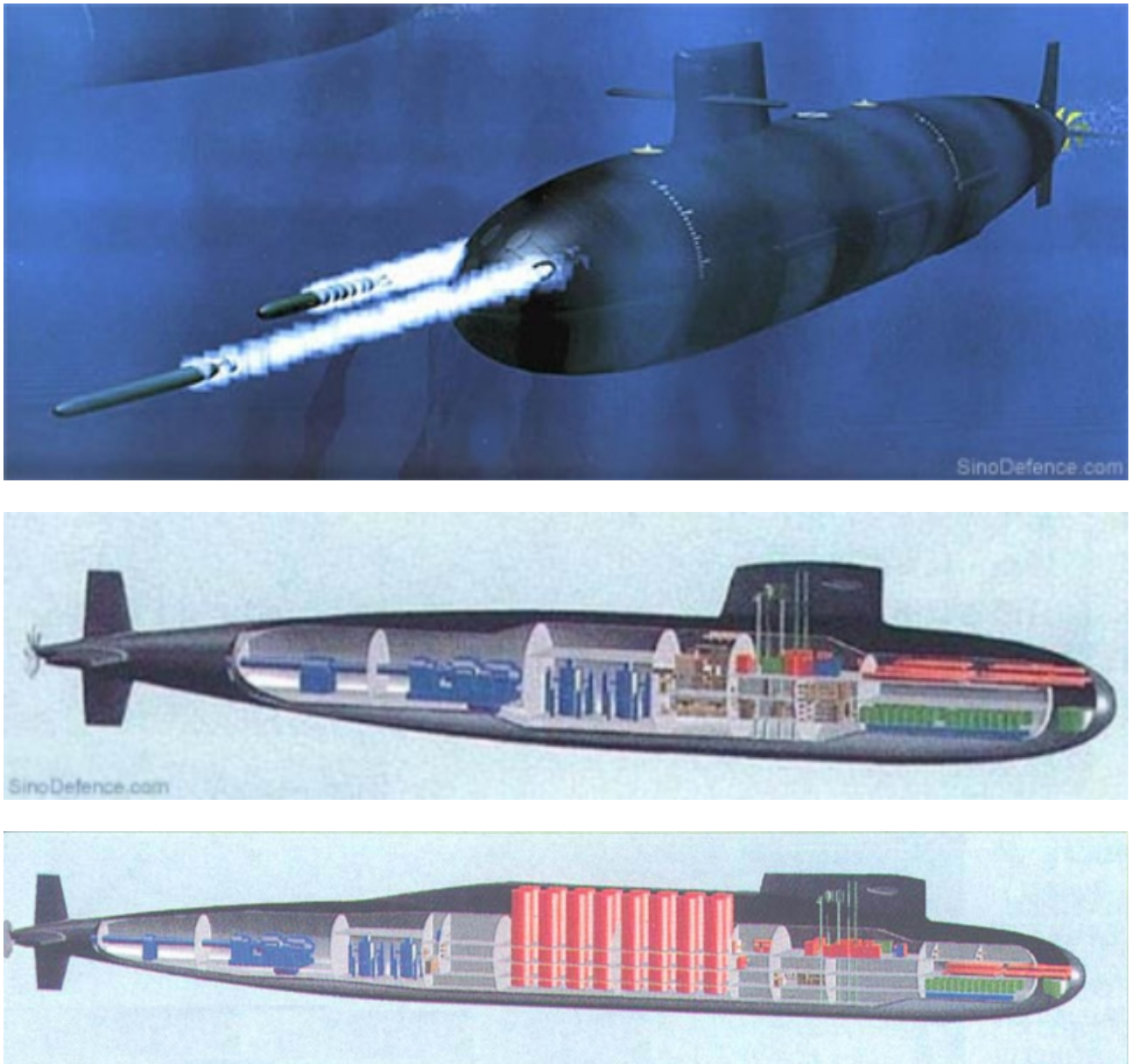


Figure 10: *The PLA-N is deploying a new generation of indigenous nuclear powered submarines. The Type 093 is an attack submarine, the Type 094 a ballistic missile submarine, to be armed with sixteen JL-2 SLBMs (CSS-NX-4) with MIRV delivery systems (via Internet).*



Figure 11: *The PLA acquired a pair of Project 877EKM Kilo diesel-electric submarines, followed by a pair of enlarged Project 636 Kilo boats, armed with the 3M-54 series cruise missile. More recently another eight Project 636 Kilo boats were ordered. These low signature boats are considered difficult to defeat (Rosvooruzheniye).*



Figure 12: *The Raduga Kh-55/55SM Granat or 'Tomahawk-ski' (AS-15 Kent) cruise missile was developed as an equivalent to the US AGM-86 carried by the B-52H and the US RGM-109 Tomahawk carried by submarines, and arms the Tu-95MS and Tu-160 strategic bombers. Numerous reports claim the PLA illegally acquired Kh-55 rounds from the Ukraine, and legally purchased tooling for the non-nuclear Kh-65 variant of this missile (RuMoD).*



Figure 13: The PLA has had a long running program aimed at developing indigenous long range cruise missiles for submarine and air launched applications. The upper image depicts a submarine launched cruise missile very similar to the US RGM-109 Tomahawk, the lower image a H-6H Badger prototype carrying four missile shapes resembling the Kh-55/65 series (PLA).



Figure 14: Novator 3M-54 Alfa/Club. This family of subsonic and supersonic sea skimming anti-ship cruise missiles has been exported to the PLA. The Club suite includes the subsonic 3M-54E1 anti-ship and 3M-14E land attack missiles which resemble a shortened Tomahawk, and the supersonic 3M-54E anti-ship missile. The Club is available in ship-launch, submarine-launch and air-launch variants, the submarine-launch variant is now in service. There is no direct Western equivalent to the 3M-54E (Rosvooruzheniye/NIC).



Figure 15: Raduga Kh-41/3M-80/3M-82 Moskit (Upper). This supersonic sea skimming anti-ship cruise missile has been exported to the PLA in its ship-launched variant. The missile is on offer as the air launched Kh-41 for the Su-30MK fighter. There is no Western equivalent to the Moskit (Rosvooruzheniye). OKB-52 3K-55/3M-55 Yakhont (Lower). This supersonic sea skimming anti-ship cruise missile has been licenced to India for domestic manufacture. It has been reported as the armament for latter 956E series destroyers to be supplied to the PLA-N. There is no Western equivalent to the Yakhont/Brahmos (Rosvooruzheniye/NIC).

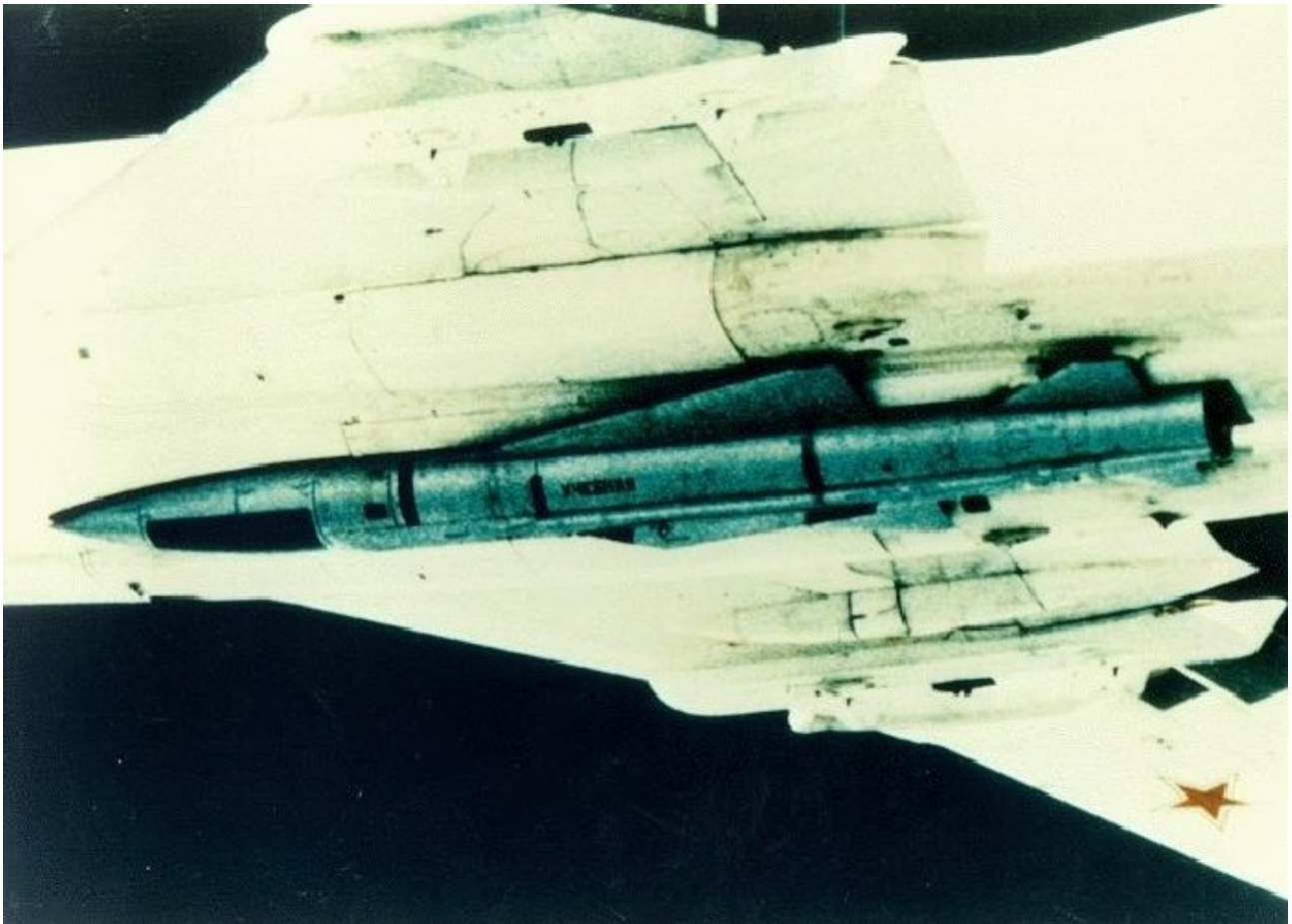


Figure 16: *Kh-22M Burya*. The *Kh-22* series of supersonic cruise missiles was developed during the 1960s and is equivalent to the RAF's former *Blue Steel* missile carried by the V-bomber fleet. This Mach 3 missile is the primary weapon of the *Tu-22M-3 Backfire C* bomber, available in anti-ship and land attack variants. Reports claim a mid life upgrade has been designed (US DoD, RuMoD).

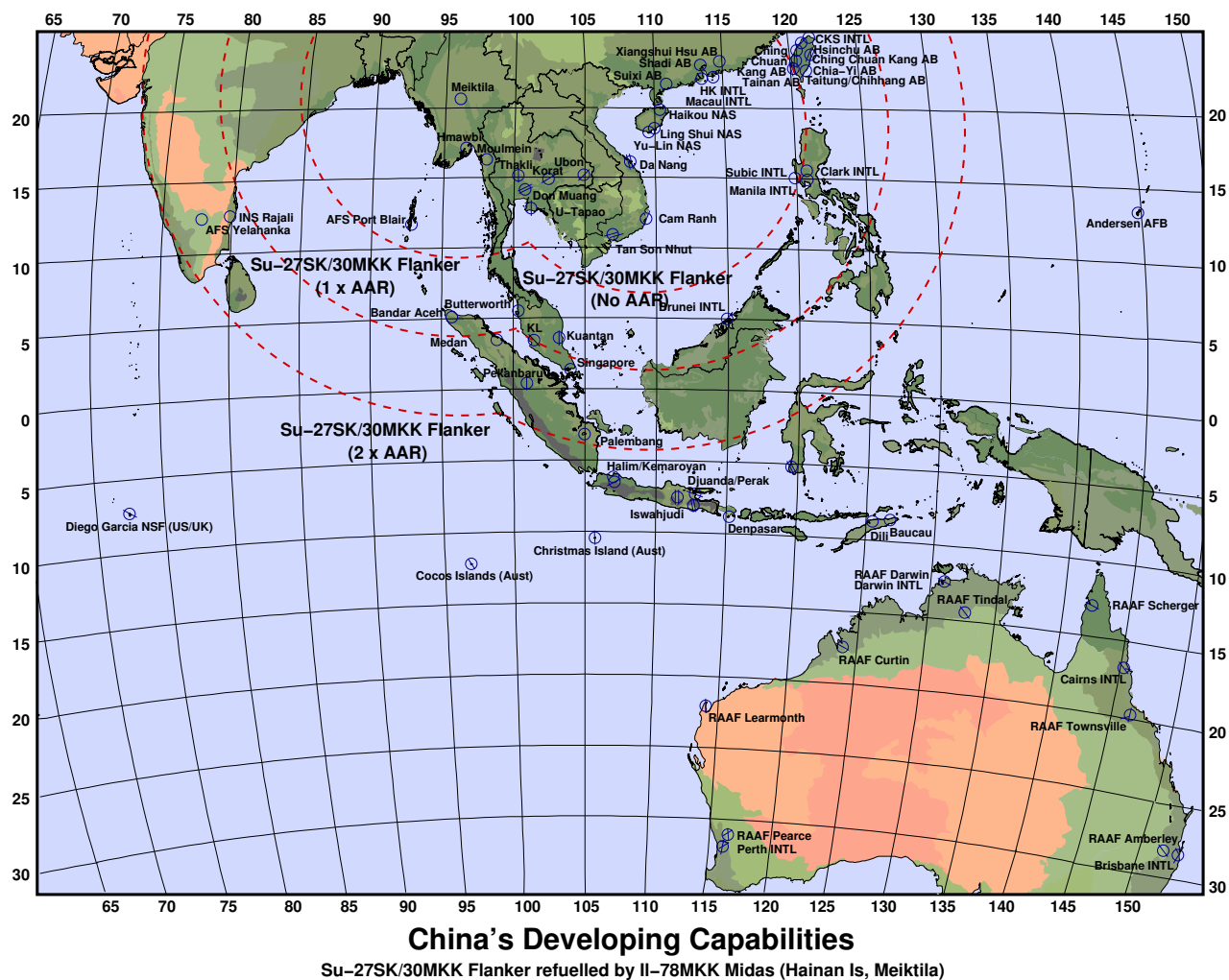
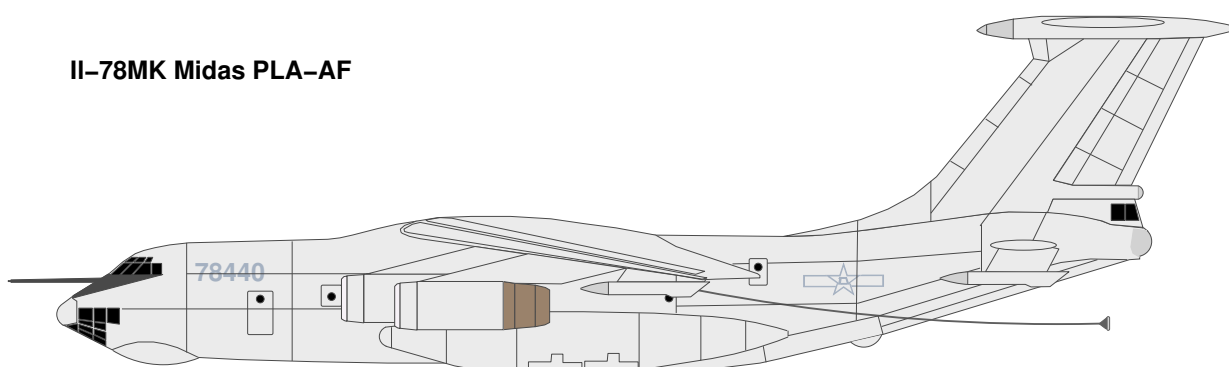


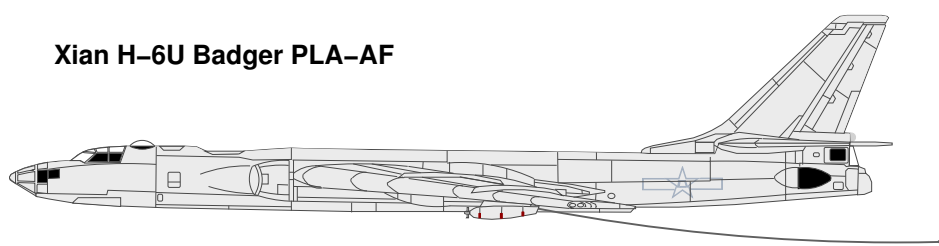
Figure 17: The acquisition of long range Su-27/30 fighters and supporting Il-78MCK aerial refuelling tankers provides the PLA-AF with unprecedented reach across the near region (C. Kopp).



Il-78MK Midas PLA-AF



Xian H-6U Badger PLA-AF



Xian H-6DU Badger PLA-N

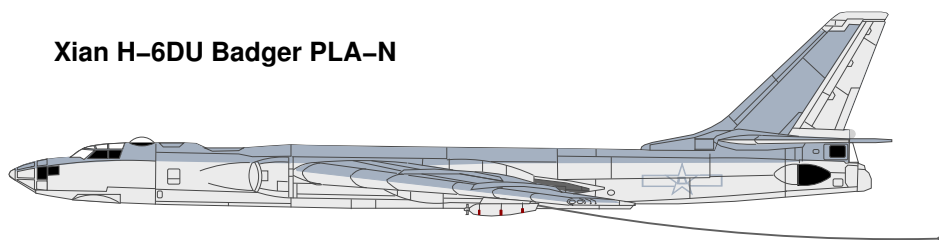


Figure 18: The PLA is reported to be negotiating the buy of an initial batch of six Russian Il-78MK Midas tankers, based on the Il-76 Candid airlifter already flown by the PLA-AF. This aircraft compares closely in offload performance to the US KC-135 Stratotanker (RuMoD/C. Kopp).



Figure 19: The Il-78MK Midas tanker uses a variant of the UPAZ-1A Sakhalin aerial refuelling pod, which has also been cleared for buddy refuelling on some variants of the Su-27 fighter (RuMOD).



Figure 20: *The Xian H-6 is the basis of China's indigenous aerial refuelling tanker program. Development was reported to be initially a collaboration with Flight Refuelling Limited in the UK during the 1980s. With the questionable usefulness of the Badger as a strike aircraft, it is likely many more will be converted to tankers, especially given the low age of much of the Badger fleet. As a tanker the Badger compares closely to the now retired RAF Victor K.2 (PLA).*

End of Submission



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