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Faster than a speeding bullet . . .

By Dr Carlo Kopp

MELBOURNE – USAF is studying retrofitting the B-1B bomber fleet with supersonic-cruise F119 engines. The F/A-22A is the sole user of supersonic-cruise engines. The Raptor's expected evolution into the larger delta wing FB-22A strike fighter will retain the supercruise capability.

Supercruise is the capability to sustain indefinitely supersonic speeds without afterburner. With supercruise, an aircraft is freed from the high fuel consumption of afterburning supersonic dashes that can drain tanks dry in minutes.

There are two pre-requisites. The aircraft must have very low supersonic drag, achieved by wing sweep, area ruling and internal fuel and stores carriage. It also needs an engine capable of sustaining the very high turbine inlet temperatures required for high dry thrust ratings at high altitudes.

USAF identified supercruise turbofans as a key technology and heavily invested to develop the P&W F119-PW-100. The Advanced Tactical Fighter was intended to supercruise before it absorbed stealth, integrated avionics and other new-generation features.

In aircombat, a supercruising fighter has an energy advantage over any conventional opponent. Energy is life. A supercruising fighter can engage or disengage at will. No conventional fighter can run it down or match its sustained speed.

Air-to-air missile range is improved as the height/speed at launch is much higher.

In combat air patrol, the ability to intercept across an area at Mach 1.6 rather than Mach 0.85 effectively quadruples the footprint. A single supercruising fighter does the work of four conventional fighters.

In interceptor roles supercruise extends the range at which an inbound threat can be engaged through a sustained supersonic dash. In many situations ground alert interceptors can be used rather than airborne CAPs.

US analysts have also identified the value of supercruise in strike.

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Warfighting intranet proves worth

BETHPAGE – The US Navy and Northrop Grumman demonstrated in a recent exercise interconnecting sensors to locate and strike targets. The demonstration used a Navy Hawkeye AEWC to integrate and direct a precision strike mission using networked information from a Navy Fire Scout UAV, a simulated operations control centre, and an F/A-18 strike aircraft.

Northrop Grumman's information architecture used servers on platforms for data storage and sharing that enabled communication between manned and unmanned airborne systems.

"The Navy/Northrop Grumman team created a non-proprietary, open-architecture network for this demonstration using commercial-off-the-shelf equipment," said Tim Farrell, VP of Northrop Grumman's airborne early warning integrated product team. "The network was up and running in less than a week."

FORCEnet is the network of systems that the Navy envisions will integrate its Sea Power 21 operational concept.

The E-2C aircraft directed the Fire Scout UAV to search for a target within a specified area. The UAV captured and stored real-time video imagery on its AIA server. The E-2C then downloaded this imagery and sent it over a wideband network to a simulated aircraft carrier operations centre in Newport News and ground stations in Bethpage and Arlington.

Operators in both the COC and the E-2C used targeting software to determine precise target coordinates, then posted them to a Web site.

The Hawkeye crew used data from the site to direct an orbiting F/A-18 Hornet to simulate an attack.

"This concept demonstration proves that an innovative team armed with available technology can create a digital kill chain capable of reducing strike timelines from hours to a few minutes," said Captain Robert LaBelle, NAVAIR E-2/C-2 programmanager.

Don't leave the seat up

TUCSON – USAF's first woman fighter pilot – who had to sue the Pentagon over her garb – is about to become the Air Force's first female fighter squadron commander.

Lieutenant Colonel Martha McSally, 38, will take over 354th (A10) Fighter Squadron at Davis-Monthan AFB.

McSally, the first female Air Force pilot to fly combat missions, successfully sued over a policy that forced military women in Saudi Arabia to wear Muslim religious garb off base.

Maverick gets bells, whistles

TUCSON – Raytheon has been awarded a US Air Force contract to conduct a $5.3 million utility evaluation of the Lock-On-After-Launch (LOAL) variant of the AGM-65 Maverick missile.

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In pen e trat ing air defences, su-per sonic cruise per mits a bomber to fly out side the ki ne matic en ve-lope of most SAM sys tems – the com bi na tion of Mach 1.5 class speed and 50,000 ft al ti tudes de-feats all but the larg est SAMs, shrinking us able SAM range and halv ing bomber ex po sure.

Such speeds and al ti tudes in-crease the range of most free-fall mu ni tions – the JDAM or small-diameter bomb will go much further – in creas ing the dis tance from tar get and reducing bomber ex po sure to defences.

Opposing interceptors get half the warn ing time and need to fly steep after burning pro files. Once the bomber has re leased its weap-ons and turned, most in ter cep tors will be un able to sus tain pur suit. The his tory of failed in ter cepts against Foxbats is a case study.

Just as supercruise in creases pro duc tiv ity in air de fence, it also im proves pro duc tiv ity in strike. A supercruising bomber can tran sit to a tar get in half the time. RAND's MR1028 pa per en vis aged supercruising bomb ers which could sus tain sor tie rates two or more times the strik ing dis tance.

The F/A-22A Rap tor com bines supercruise and stealth to pro vide an un chal lenged ca pa bil ity in air com bat and strike. US plan ning sees all F/A-22As counted as strike assets, as the air craft is un stop pa-ble. The FB-22A, an F-111-sized stretched delta wing F/A-22A de-riv a tive, will ex ploit the same com-bi na tion of supercruise and stealth, but de liver a big ger bomb pay load over a lon ger dis tance.

The lure of supercruise is now seen in stud ies to re-engine the (F-111-like) B-1B Lancer, which has the vari able ge om e try wing and clean de sign to ex ploit the F119-PW-100 se ries en gine.

Supercruise has been of no in ter-est to Aus tra lia's De fence bu reau-cracy. Given the choice of JSF vs more sur viv able and pro duc tive F/A-22A, the lat ter was dis carded two years ago. This an a lyst's pro-pos als to trial the F119 en gine in the F-111 were ig nored.

The ef fort to kill off the F-111 shows that its po ten tial to be come a cheap supercruise plat form is re-garded as of no value, de spite pro-duc tiv ity, sur viv abil ity and supportability gains.

Jubilee of French disaster

DIEN BIEN PHU CITY – Thou-sands of vet er ans from both sides are mak ing the pil grim age to this town, about 490 km north west of the cap i-tal Ha noi and the scene of the de feat 50 years ago which drove France from what was then Indo-China..

Surrounded by rice fields and nes tled in mist-shrouded moun tains, Dien Bien Phu doesn't look like a battlefield.

General Vo Nguyen Giap's accounts of the bat tle say 16,000 en-emy troops were killed, injured or captured. The Viet Minh lost about 10,000, he says.

To day, a hill of fers a pan oramic view of fields, houses and military cemeteries and provides an indi ca-tion of the amaz ing feat by the Viet Minh in hauling 105mm artillery pieces and anti-aircraft guns through steep, densely jungled moun tains.

French vet er ans are also trick ling into the town, whose main bou le-vard is named "7 May".

Planemakers need a shed

TOULOUSE – Airbus last week com mis sioned its as sem bly build ing for the double-deck A380. The Airbus A380 as sem bly build ing, one of the big gest in the world, mea sures 490m by 250 m, 46 m high.

It is the biggest of sev eral build-ings on the site which, to gether, in cor-porate more than 32,000 tonnes of steel – the equivalent of four Eiffel tow ers – plus 250,000 cu bic metres of concrete.

Airbus A380 sections are joined to gether at a sin gle sta tion – an Airbus first – with the air craft mov ing on its own wheels into one of three sta tions in an other part of the build ing for test-ing. The facility incorporates room for expansion, with a second A380 assembly station and a further three test-stations, ini tially to be han gars.

Other build ings on the site in clude the Airbus A380 static-test facility and a general purpose hangar. The site will later also be equipped with parking for 10 A380s. The total in-vest ment is €360 mil lion.