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THE FUTURE OF SMALL AIR FORCES
AND COMBAT AIRCRAFT

by

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Preface

Shrinking budgets in the wake of the post Cold War “peace dividend” are causing many defense forces to find that something has to give in order to survive. If you cannot maintain multi-functionality then what do you lose? In New Zealand one solution is the proposed scrapping of the air combat forces.

Do small nations need air combat forces? If the answer is yes then what basic capabilities should they have, what is their function(s), and how do you utilize them? As a fighter pilot in a small air force this topic is close to my heart. It has come more into focus with recent events in my part of the world. New Zealand has for many years possessed a small, professional air combat force. In line with our national strategy of security through partnership it is geared towards credible coalition efforts. In 1999, the newly elected government publicly raised the issue of discarding the air combat force and freeing up money in our cash-strapped military. The government does not believe an external threat exists and instead sees the role of the defense forces in providing soldiers and support for United Nations (UN) peacekeeping operations. It struggles to see how an air combat force can contribute to these UN contingencies and Military Operations other than War (MOOTW) and instead favors a well-equipped light army. In short it does not believe air combat forces can contribute towards the emerging national strategy.

I doubt New Zealand is alone in asking these questions. For years air forces have been structured to provide a unilateral response but largely they are operating out of their

depth. They cannot hope to mount a credible response with their present equipment and inherent limitations of size. They should be redefining their roles and functions and then structuring their air force to meet the national objectives.

As an experienced pilot in the Royal New Zealand Air Force (RNZAF) with experience operating throughout NATO with the Royal Air Force (RAF), and in Australia and Southeast Asia with the RNZAF, I have witnessed firsthand air forces of both small and medium powers. The majority cannot do what they think they can—i.e. mount a credible unilateral air response. Equipment does not meet the task; inadequate logistics, multiple aircraft types, aging equipment, poor C4I, and sheer limitations of size, all serve to limit what they can actually achieve.

There has been little, if anything, written directly about this subject. I have primarily relied on exhaustive study of current articles and research of various airpower theories. The majority of the writings are either on the US perspective, which is hardly relevant, or on the problems that smaller air forces are facing with maintaining an operational tempo with reducing budgets. I reviewed materials concerning the current situation, future technology impact, doctrine, and current aircraft programs. The goal is to provide an argument for moving small nations towards logical air force structures with narrower roles and functions based on their budgets and national requirements. I am naturally biased to the Australian and New Zealand perspective—both small air forces.

I would like to take this opportunity to thank my faculty research advisor, Lieutenant Colonel David Wallace who volunteered guide me through this process. He has been instrumental in keeping me on track, providing numerous pieces of information, proving a useful sounding board for ideas and a source for the big air force perspective.

Finally I want to make it clear that this thesis only concerns itself with the “shooter,” the jet combat aircraft (fighter/strike, fighter/bomber, strike aircraft, call it what you will). This includes fighters, fighter-bombers, dedicated electronic warfare (EW) and reconnaissance platforms (EA-6B, RF-4, etc). I do not intend at any point to discredit the importance of the strategic heavy bomber (B-1, B-2 B-52, etc), airlift, maritime or air refueling (AAR) as they lie outside of the scope of this paper.

Abstract

Small nations should not be asking themselves whether they need air combat forces or not—they do. Combat aircraft are a nation's most visible, flexible, and lethal force option that can be employed, or threatened to be employed, in a range of missions. However small Western democratic national air forces suffer from lack of platforms, budgetary pressures, economics, credibility, and a visible threat. They are unable to mount a credible unilateral response, and with limited budgets they cannot pursue air force structures of multiple aircraft types and attempts to remain balanced, i.e. capable of performing a range of functions associated with the effective employment of combat air power.

Broadly speaking small nations have two choices: firstly structure for combined operations (be it alliance/coalition), or secondly equip for unilateral action if the perceived threat and/or unlikely hood of outside assistance dictates.

For combined operations it makes sense to consolidate the combat aircraft into a single fighter-bomber type, with the intention of operating in a probable American led coalition—(the United States [US] would secure, protect, and run the area of operations [AO]). This aircraft does not need to be highly sophisticated but it must be equipped to be able to function in a coalition—capable of precision engagement, self protection, and communicating with its coalition partners.

Countries choosing a unilateral option are faced with a number of difficulties. There is a limited choice in the ways of “means” as well as the not insignificant question of “ways” to effectively employ a small number of aircraft to provide a credible response. Again, economically, consolidation of effort into a single independently survivable fighter-type aircraft is desirable. The cost of pursuing an aircraft of this type would naturally lead to a small sophisticated force. Credibility would then be dependent on a defensive counterair or coercive strategy through strategic bombing—the latter still largely contentious and likely to be exceedingly difficult (in terms of effect) with limited platforms. History has shown that fighter aircraft can perform strategic attack and coercion of an opponent may be possible if only seeking limited objectives.

Chapter 1

The Need

Diplomacy is utterly useless where there is no force behind it.

Theodore Roosevelt

Combat aircraft are a nation's most visible, flexible, and lethal force option that can be employed, or threatened to be employed, in missions ranging from destruction to coercion to "air presence." The armed forces provide one instrument of power (IOP) for influencing the decision-makers of other nations. The military can be used in combination with other IOPs in campaigns of persuasion or coercion, but to be effective it must be credible.¹ The vast majority of nations in the developed world possess an air combat force as part of its armed forces. Air combat forces are a powerful, visible means of quickly bringing force to bear. Influence in military terms involves destruction—and this is what air combat forces do. Their capability is unrivalled by any other conventional force elements in both pure effect and the international awareness and speed of that effect.² Air forces provide an affect out of proportion to their size and greatly contribute to a country's influence over foreign decision-makers by providing an operational and strategic utility and flexibility. Air power may be employed with relative autonomy and it can be decisive in shaping the battlefield for the use of ground forces.³

Operational and Strategic Utility

The operational utility is simply how the air combat force is employed in the event of hostilities. It includes the capacity to shape the battlefield through counterair and counterland operations. Air support is a vital component—some would argue the vital component—which allows surface force freedom of activity. Without control of the air—if the other side has it—a nation faces high attrition and high probability of failure. Further it is essential to the effective employment of ones own surface forces and can immobilize the enemy's.⁴

The strategic utility lies in the deterrent value of air combat forces. Traditionally the notion of deterrence is more applicable when dealing with the threat of massive retaliation; therefore the deterrent value of a small fleet of conventional sophisticated aircraft is arguably negligible. However, a potential aggressor must weigh the cost of any offensive action versus its potential gain. An effective air combat force may deter an aggressor through fear of the costs and consequences of his action. This cost may be incurred through bombing or by threat to his attacking forces by air power.

Finally there is the symbolic value of possessing a credible air combat force. It is a nation's demonstrable commitment not only to national but also to regional security. In a region that shares common security interest or defense relationships, the ability to offer credible air power in support of collective security is a highly symbolic act of a nation's seriousness in regional defense and speaks to its view of sovereignty.⁵ Indeed there are regions of the world where you are judged more on what you have over what you can do with it.

The Status Quo

After a decade of military downsizing, continual aircraft upgrades, and the end of the major arms races the majority of Western fighter aircraft are either facing obsolescence or are simply no longer economical to maintain. Further, the end of the Cold War has left many countries with equipment better suited to general war in Europe than to low level contingencies. As air forces, both big and small, make decisions about replacement aircraft, they need to reexamine the threat, national objectives, probable tasks, force structures, and size in an ever-uncertain world. For too long air forces have held to the ideals of airpower that were reinforced through a combination of dogma and institutional entrenchment by the “blue suited” élite against continued external opposition. The basic tenants of airpower and the means to employ it have led nations to try to develop the “ideal” multi-functional air force—including the ability to conduct counterair (offensive counterair [OCA] and defensive counterair [DCA]), counterland (air interdiction [AI] and close air support [CAS]), and countersea operations. Implicit in these functions is the desirability to conduct airborne reconnaissance, active electronic warfare (EW), and suppression of enemy air defenses (SEAD). Owning an air force is expensive and only a few countries have the economic and technical base to realistically hope to fully finance and train a multi-functional air force. Yet many countries persist in attempting to do the impossible. They possess a number of different aircraft types that appear on the surface to offer a solution but in reality they are incapable of providing a credible unilateral response. They become a “jack of all trades” but master of none. Even if a small air force could hope to achieve some measure of potency across a broad spectrum of

functions they are hampered by their inherent limitations of size—the ability to sustain air operations.

Sustainment of operations is the ability to mount an air campaign over an extended period with no significant loss in terms of combat effectiveness. An air force must examine its ability to logistically support a campaign and their ability to sustain attrition if no replacements are readily available. If it cannot meet these two key criteria then it is not in the business of mounting an air campaign. Both Israel in the Arab wars, the Argentina and the United Kingdom (UK) in the Falklands and Iraq and Iran in their war would argue that they mounted sustained air campaigns. However none are able to mount operations the size of ALLIED FORCE and hope to sustain the operation till reaching the desired endstate. With the exception of the Iran/Iraq war the others were of relatively short duration. Israeli airpower was decisive in 1967 but less so in 1973 where they suffered initial very high attrition. They would not have been able to mount these campaigns and overcome attrition without the generous support of the US. Without such support the ability to sustain a protracted campaign is questionable at best. In Operation BABYLON, Israel proved that occasional strategic strikes are within the capabilities of smaller, capable air forces, but how long could they survive without external support given their size?

The US and the Rest

Table one shows the number of combat jet aircraft possessed by the nations mentioned in this paper. It is merely meant to be representative of the vast difference between various nations. Strict comparison of numbers can be misleading, as it takes no account of airframe sophistication, age, or maintainability. However as a rough guideline

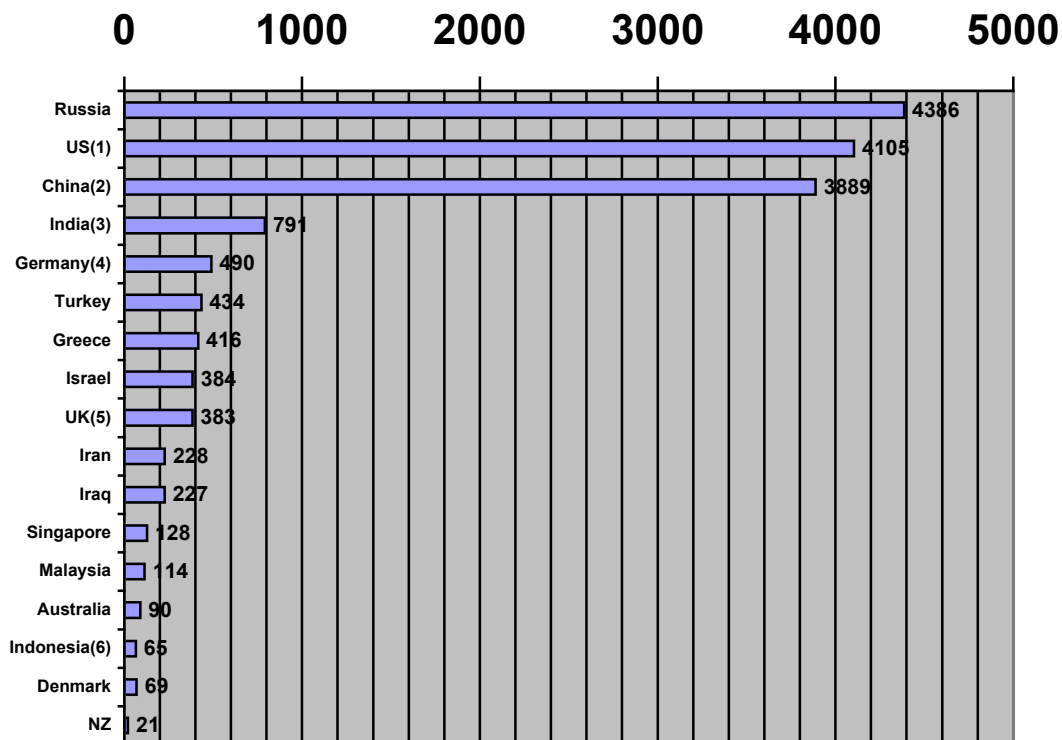
the following figures are useful: *large powers*, several thousand airframes; *medium powers*, several hundred airframes; *small powers* approximately 100 or less. It is interesting to note that of all the countries possessing some airstrike capability, 80-90 countries fall into the small air force bracket.⁶

Arguably small air forces are everyone else except the USA, Russia, and China if based on sheer number of platforms. Of these three, only the US truly possesses a balanced, multi-functional capability. The Russian air force lacks the modern Command Control Communication Computers and Intelligence (C4I) and its credibility must now be seriously questioned due to a lack of funding. The Chinese air force is still very much in development and although possessing increasingly capable fighters (SU-27 Flanker) it is a long way from being “modern” and multi-functional in the accepted Western sense. Countries such as India, Israel, and the larger European nations (the medium powers) are on the next tier with respect number of platforms and credibility. However, their ability to independently mount a sustained air campaign against a medium/large foe is limited. *Sustained* is the key word. Realistically, only the US has the capability to mount sustained air campaigns. Even if the US were to stand still, it would still take a country like China more than 20 years to build an air force of sufficient quality to compete with the US on the world stage. Some European air forces, including the RAF and Luftwaffe, acknowledge they cannot go it alone. Air Chief Marshall Allison has said, “in other than exceptional circumstances (...Falklands) the UK is unlikely to go it alone. Coalition or combined operations are therefore the preferred option for sound operational and practical reasons, and I think it is fair to assume that this applies to many, if not all, European nations.”⁷ The European community is working toward the ideal of a

combined and balanced coalition air force, however they still will not be able to attain the level of dominance the US has. The huge advantage enjoyed by the US will only increase in the foreseeable future if for no other reason than its defense budget exceeds the next seven countries combined.⁸

This paper is aimed at the “small powers” although I believe the “middle powers” largely face the same problems. Further, I will talk of *modern* airforces—those not handicapped by issues skill or sophistication.⁹

Table 1. Total Number of Air Combat Aircraft



Source: *Periscope*, USNI Military Database, 10 January 2001.

Note. All figures include naval, reserve and National Guard aircraft unless otherwise stated. Does not include aircraft confirmed on order.

Note 1. Includes USAF, USN, & USMC. The USAF is the third largest air force in the world, the USN is the fourth and the USMC 10th.

Note 2. 200 SU-27K on order.

Note 3. 285 SU-30MK on order.

Note 4. 180 Eurofighter 2000 on order.

Note 5. 232 Eurofighter 2000 on order.

Note 6. Includes 30 Hawk 209/53 light attack aircraft (normally not considered a frontline fighter).

The Threat

Small nations are proportionally easier to hurt than larger ones. Direct physical attacks will have a major effect but the indirect effects of aggression, particularly on the economy, are often overlooked. The end of the Cold War has seen a breakdown of regional stability that bipolarity provided. There is now a growing importance on regional security environments as Europe has diminished in importance. A number of “rouge” states have emerged and there is now significant political instability due to the growth or release of various ideologies, religions, nationalism, irredentism, etc.¹⁰ Interstate warfare is becoming increasingly unlikely and the prospect of a democratic developed small nation going to war against another is remote. However there remains a significant threat of conflict and destabilization from “rouge” states or the chance of an intrastate conflict spilling over national boundaries dragging other countries into the conflict.

The increased lethality of today’s conventional weapons coupled with the growth in the size and quality of a belligerent government’s armed forces is a major factor in the likely escalation and lethality of any future conflict.¹¹ There are an increasing number of actors who have or are pursuing programs of Weapons of Mass Destruction (WMD) and ballistic missile technology. The ability of a rouge nation to threaten anyone within range of its missiles is real and destabilizing to any region.¹² In regions of destabilization, containing a number of actors with modern conventional weapons or

WMD then conflict between a developed democratic small nation and an emerging, rouge or failing/failed state is more likely. And what of the very real economic threat that regional destabilization brings. In the global market economy many small nations are dependent on trading partners and regional free trade agreements for their economic well being—e.g. any destabilization of the Southeast Asia (SEA) region would cripple the New Zealand economy.

Dangers to Airpower Application

No matter where the next battle is fought or what the type of conflict, the air environment is becoming increasingly dangerous. Two recent major air campaigns, DESERT STORM and ALLIED FORCE, represent operations against sophisticated, integrated air defense systems (IADS). On day one of DESERT STORM coalition aircraft managed to suppress 80% of Iraqi air defense by destroying a large amount of hardware.¹³ In contrast, during ALLIED FORCE Serbian air defense commanders refused to reveal their positions to HARM-shooters leaving the IADS largely intact and in a position to threaten friendly aircraft. However the US did manage to suppress the Serbian IADS without fully destroying the hardware on the ground. In both instances, IADS intact or not, the need for continual ongoing SEAD missions never went away.

This type of opposition would be typical of what Western air forces could reasonably expect to face from a relatively sophisticated belligerent. In SEA no such system exists except in China and to a lesser extent North Korea and Vietnam, but that does not mean that the other countries in this area are devoid of credible air defense. Some countries possess Anti-Aircraft Artillery (AAA) and Surface-to-Air Missiles (SAMs) of sufficient sophistication to force an adversary to approach an air war no differently than the US did

in Iraq or Serbia—i.e. gain and maintain air superiority and pursue active and continuous EW and SEAD with complimentary attacks on C4I to assist force protection. Therefore a small attacking air force must have the means at its disposal to carry out these tasks or face unacceptable risk to its already limited number of platforms. Further as the threat of small arms and visually laid AAA can never be entirely eliminated it is desirable to operate above 10000-15000 feet above ground level (AGL), as has been the case in Iraq, Bosnia and Kosovo. To operate at these altitudes presents its own problems, not least of which is exposure to radar guided SAMs, target identification, and need for precision weapons. But this is only looking at what is out there today. In the future, it is likely that air forces will face a wide variety of sophisticated anti-aircraft systems that will only increase the risk to conventional aircraft. Even now there is a growing proliferation of the Russian “double digit SAMs” throughout the world. These weapons represent a significant increase in performance over their predecessors. Intelligence estimates indicate that by 2005 some 22 countries will have these SAMs.¹⁴

Notes

¹ Sqn Ldr Shaun. Clarke, “The Place of the Air Combat Force in the Security Strategy of New Zealand,” (Draft paper for RNZAF response to Defense Select Committee, 1999), 2.

² Ibid., 2.

³ Gen Larry D. Welch, “Air Power in Low-and Midintensity Conflict,” in *The Future of Air Power in the Aftermath of the Gulf War*, ed. Richard H. Shultz, Jr. et al. (Maxwell AFB, Ala.: Air University Press, July 1992), 157.

⁴ Clarke, 2.

⁵ Ibid., 3.

⁶ *Periscope*, USNI Military Database, 10 January 2001, available from <http://www.periscope.ucg.com/nations>.

⁷ ACM Allison, Sir John. “Future of Air Power—A European Perspective,” lecture in Clarke, Shaun (ed), *Testing the Limits*, (RAAF Air Power Conference Proceedings, RAAF Air Power Studies Centre, Canberra, Australia, March 1998), 100.

Notes

⁸ *The Military Balance, 1999-2000* (London: The International Institute of Strategic Studies, Oxford University Press, 2000). Figures quoted for 1998 defense budgets. The US budgeted \$265.9B in FY 1998. The next seven largest defense budgets (in order): Russia (\$53.9B); France (\$39.8B); Japan (\$37.0B); China (\$36.7B); UK (\$36.6B); Germany (\$32.4B); Italy (\$22.7B). Total: \$259.1B.

⁹ Clarke, 7.

¹⁰ Daniel Goure and Christopher M. Szara, *Air and Space Power in the New Millenium* (Washington: The Center for Strategic & International Studies, 1997), 167.

¹¹ Welch, 151.

¹² Robert J. Art and Kenneth N. Waltz, eds., *The Use of Force*, (Lanham, Maryland: Rowan & Littlefield Publishers, Inc., 1999), 439.

¹³ "Gulf War, did we learn the lessons," *Airforces Monthly*, September 2000, 29.

¹⁴ Lt Col John. W. Day, "Defending the F-22." (Maxwell AFB, Ala.: Air War College, 1998), 11.

Chapter 2

Choices

Certainly no European nation (and I venture to suggest no nation on the planet other than the USA) has the requisite combinations of economic muscle and political will to field armed forces that can exploit the full range of war-fighting capabilities that technology can now offer. Thus only the USAF can speak realistically of “full spectrum dominance.” The rest of us do what we can.

Air Vice Marshal Sir John Allison¹

The vast majority of small nations have pursued the ideal of a stand-alone policy that allows for a unilateral response. Many desire to be truly multi-functional while others realize this is not possible. Most though believe they can mount a credible response, albeit limited in space and time. However the inherent limitations imposed on small air forces makes mounting any unilateral response difficult. A combination of non-stealthy aircraft, lack of SEAD, inability to gain and maintain air superiority, inadequate C4I, and by definition, a limited number of platforms and aircrew impose severe limitations on the employment of air power. Their existing structure and Orders of Battle (ORBATs) may give them ability to mount one-off strikes but the ability to sustain an air campaign would take the help of other nations.

Failure of the Status Quo

Outside of the US, the majority of air forces (especially small ones) cannot mount a credible unilateral action. Small nations, unless backed by superpowers, have been unable to decisively employ airpower due to the demands of a sustained conflict.² In the Iran-Iraq war neither side was able to sustain a credible air offensive in the face of mounting costs and attrition.³ In this case both sides chose to lower the level of technology and sophistication of their air systems in order to maintain the offensive leading directly to decreased effectiveness.⁴ Bearing in mind that these are both medium powers, this indeed may be the way that smaller air forces will have to be employed in the future if they attempt to mount a unilateral action.

The majority of air forces are limited by aircraft that are not survivable in a well defended environment unless that air force can provide EW, SEAD and air superiority—at least localized in time and space. For the present, air superiority and effective C4I is now the sole preserve of the US and the gap between the US and the “rest” is steadily growing. With the rising costs of the latest round of aircraft, the gap will only widen as the costs of keeping up fall outside the means of even the medium powers.⁵ Even countries such as France and the UK are pursuing collaborative development projects and reduced capability airframes as a way of increasing available numbers.⁶

Combined or Unilateral

Small nations are very limited as to what they can do against a larger foe, increasing the importance of regional defense security and agreements. Since WWII the majority of wars and conflicts involving the West were in coalition, and the US has dominated those. The resort to unilateral action in defense of national interests has typically been the

preserve of the US.⁷ Interstate warfare is becoming increasingly unlikely but the world has its fair share of threatening “rouge” nations and intrastate conflict is on the rise. The prospect of intrastate conflict spilling over national boundaries and infringing on neighbor’s interests is likely to provoke a response. In the age of regional security partnerships and existing treaties escalation to the point of intervention from another player is more than likely to follow. In the case of an existing alliance such as NATO then intervention should come without question.

The US has proven to be a reliable ally but can be more hesitant if its national interests are not directly threatened. Although the intervention of the US is not guaranteed, the conflicts since WWII that have involved democratic nations have seen the US become involved. If the situation is really this simple, i.e. the US will either intervene as an ally, or as a coalition partner, then nations have two choices. First, structure for integration into a (likely) US dominated coalition, or possess the means to provide a unilateral, credible, sustainable, air response if it believes US intervention is unlikely.

Intervention?

Can intervention be guaranteed from a large power, particularly the US? While it cannot be assumed the US will intervene, since WWII the US has chosen to play the role of the balancing power.⁸ US policy has been to preserve the peace as in NATO, or restore regional stability that is deemed of strategic vital importance (DESERT STORM).⁹ Increasingly the US is being drawn into non-conventional, low intensity wars and peacekeeping/making operations. Military responses from the Weinberger/Powell doctrine call for decisive use of force as a last resort but the Clinton administration

utilized the military earlier in conjunction with other IOPs. However principles of *restraint* and *perseverance* do not sit well with the military and a return to the Wineberger/Powell doctrine looks likely under the new Bush administration. Certainly many Americans would like to see the US sit out MOOTW all together. They would argue that these operations increase the likelihood of casualties. Further the status of the US as the world's sole superpower can in fact act as a lightning rod for conflict. If indeed the US reduces its commitment to these types of operations due to increased isolationism, over-extension, or casualty aversion (as a product of political expediency) then the other contributing nations will have to fill the gaps. Bearing in mind the sole ability of the US to mount sustained airpower operations then its intervention is necessary to secure/protect the AO (SEAD, C4I, etc) to allow the remaining coalition to provide the firepower. Indeed with the preponderance of US forces now in the continental US (CONUS), and further reduction of overseas forces likely, it is in the interest of the US to encourage its allies to take an increased responsibility for their own defense and address their force structures appropriately.

In these days of globalization and global markets, blurring of tradition borders through revolutions in information, and global media presence, it is unlikely that any conflict involving a small-developed democratic country would be allowed to go unnoticed by the world community. Some countries are geared towards defense against a "traditional" hostile neighbor, but given the premise we are talking of developed countries it is highly unlikely that any war would be allowed to occur without intervention from the United Nations (UN) or larger power. Of course, the region is an important factor in a decision for any intervention—e.g. a conflict in Europe would be

quickly contained by the European Union (EU) and the US—e.g. how long would traditional foes Greece and Turkey be allowed to resort to violence before intervention?

The Dilemma

The small size of some nations, with respect to their economy, forces them to think about what they can and cannot do. In the past air forces have chosen certain aircraft for different reasons. Some of these are not necessarily logical to outside observers and the virtual plethora of aircraft types operated by seemingly “like-minded” or aligned nations shows either that there is—or was—no one right answer to the aircraft required for credible air power. But these air forces do have one thing in common—the majority are facing decisions concerning aircraft replacement due to the advancing age of their airframes.

The cost of operating numerous aircraft types is expensive, logistically difficult, and defies economy of scale. Further, some air forces operate aircraft types of such similar capability that it is hard to fathom why—certainly part of the reason has been their desire to not rely entirely on one nation to provide aircraft.¹⁰ Having a single source of aircraft could cause the country to become politically subordinate to the supplier nation, or less likely, the supplying nation could potentially turn hostile.¹¹ However with the increasing reliance by the US and Europe (the major suppliers) on industry to self fund military research and development then it would seem logical that industry pressure for foreign military sales will increasingly overcome the desire of governments to withhold hardware. If in doubt (and you can afford it) you can develop your own aviation industry like some medium powers have done, but this is hardly realistic for the vast majority of countries.

A Single Fighter?

If a small air force chooses either the unilateral or combined path, how does it need to structure to meet national objectives? In a climate of decreasing defense budgets, air forces will have to closely examine what capabilities are required and how many aircraft it can sustain. For economy of scale a small air force would ideally operate one multi-role aircraft type that would be able to perform all required functions or circumvent the need for functions such as EW and SEAD due to its inherently independently survivable design. Further the operation of one aircraft type would significantly reduce the requirement for logistics, training and maintenance. It would be desirable that this aircraft could employ air-to-ground weapons although some countries may see its needs meet purely through DCA. Long-range is desirable (particularly in the Pacific), but for strategic interdiction aircraft size has become irrelevant when talking of range. However it is very relevant to a potential buyer when facing the cost of a fighter vs. a dedicated long-range bomber type. Further it is clear that technology had blurred the distinction between strategic and tactical air power—the Gulf War saw F-111s “tank plinking” in a CAS role with A-10s flying deep into Iraq to hunt SCUD missiles.¹² Unless seeking a specialist counterair airframe (F-15C), or counterland (F-117), then the choice of any the modern fighter aircraft available today will allow for some multi-role capability if required (F-16). Table two is shown as a broad comparison between existing and proposed types. The SU-27/34 are shown as a comparison to the western fighters.

Table 2. Aircraft Comparison

	Weight Empty	Max T/O	Internal Fuel	Combat Radius ^a
F-16 C ^b	18,238 lb.	42,300 lb.	6,846 lb.	677 nm
F-16 C (Block 60)	N/A	50,000 lb.	12,846 lb ^c	N/A
F-15 E	31,700 lb.	81,000 lb.	21,600 lb ^d	686 nm
F-18 E/F	30,567 lb.	66,000 lb.	14,460 lb.	400 nm
Rafael	20,725 lb.	44,100 lb.	9,370 lb.	486 nm
Typhoon	24,235 lb.	50,707 lb.	8,818 lb.	350 nm
SU-27 ^e	36,112 lb.	62,391 lb.	20,723 lb.	277 nm ^f
SU-34 ^g	N/A	99,428 lb.	26,676 lb.	610 nm
F-117A	N/A	52,500 lb.	N/A	600 nm
F-111A ^h	47,481 lb.	119,243 lb.	39,500 lb.	1000 nm ⁱ
F-22A	34,000 lb.	62,000 lb.	25,000 lb.	N/A

Source: *Periscope*, USNI Military Database, 10 January 2001.

^a Figures quoted are for a “typical” combat load for a interdiction mission with external fuel. Figures are hi-lo-lo-hi unless stated.

^b F100-PW-220 engine.

^c 6000 lbs. of fuel in conformal fuel tanks (CFT).

^d CFT fitted.

^e Interceptor only with limited ground attack.

^f lo-lo.

^g Two seat deep-strike version of Su-27 Flanker.

^h RAAF version (also have ex-USAF F-111G).

ⁱ Internal fuel with 24 Mk-82s.

The Right Aircraft

Coalition Aircraft

The possession of a fighter force geared towards initial survival (if required) followed by coalition would make infinitely more sense than trying to equip and train for sustained independent action. If an air force accepts that it will not operate alone, then it should equip for combined operations. A country may choose to specialize at a certain function, however rather than attempt to specialize in an area that the US is already the master of, i.e. SEAD or counterair, it would probably be better placed to offer an AI platform. Ideally the US would secure, control, suppress the AOR, and provide the C4I,

while the other coalition/allied partners provide the firepower. The more useful bombing platforms the coalition/allied partners can provide, then the less the burden on the US. The US is already suffering from the effects of over-extension with its debilitating operational tempo. A concerted effort by the US to provide suitable equipment and training to its allies and friends will aid with interoperability as well. There no argument or perception of greater or lesser contributors, or meaningful of useless contributions.

If you accept the desirability to maintain a single combat aircraft then it must be chosen based on that nation's threat, regional defense arrangements, tasks, missions and budget. If operating in coalition, then the selection of any new fourth generation fighter, advanced versions of third generation fighter (e.g. F-16 Block 60/F-18E), or existing third generation aircraft with adequate avionics for coalition integration would be the acceptable. If budgeting is a major factor, and it always is, then thought should be given to suitable upgrade options of existing types. This must be weighed-up against the cost of maintenance of aging airframes. Performance is less important than modern avionics, ease of deployability, and lifetime operating costs. This aircraft does not need to be equipped to combat a sophisticated air threat, only self-defense, as, ideally, it will operate under air superiority or at least against a heavily attrited air threat. A minimum capability includes secure communications, defensive aids, EW, and precision targeting (day and night), precision weapons, data link, and sufficient performance for both survivability and interoperability. The point is, this is a minimum and too often in the competition for budget dollars small air forces are operating aircraft that don't even meet this standard. I would suggest that their utility in a hostile environment, let alone coalition, is limited at best and suicidal at worst.

Unilateral Aircraft

For a unilateral response the choice is limited. For purely DCA, the F-22 is the ultimate prize, although it is still far from reaching operational status. Further it is very expensive and technologically sensitive therefore budgetary constraints and export controls are likely to force a more conservative approach. The Typhoon is likely to be the best of the rest, but an existing type would prove adequate given an investment in an IADS and sophisticated long-range air-to-air missiles (AAMs). If facing a threat operating the latest Russian designs overriding importance should be placed on combat persistence and adequate missiles.

To pursue an option of a unilateral strategic bombing response is infinitely more difficult. Realistically there is no suitable, independently survivable interdiction fighter aircraft available. The exceptions are the F-117 and the F-22—the former now out of production and both suffering from cost and limited weapons carriage. As shown with the loss of the F-117 in ALLIED FORCE, this aircraft is starting to lose some of its advantage through improvements in defenses. Early first generation stealth can no longer rely on penetrating enemy defenses unchallenged. To a lesser extent than conventional aircraft, they must now also have SEAD support.¹³ The cost of providing SEAD needs to be balanced against the cost of stealth.

Notes

¹ ACM Allison, Sir John. “Future of Air Power—A European Perspective,” lecture in Clarke, Shaun (ed), *Testing the Limits*, (RAAF Air Power Conference Proceedings, RAAF Air Power Studies Centre, Canberra, Australia, March 1998), 99.

² John Buckley, *Air Power in the Total Age of War* (Bloomington, Indiana: Indiana University Press, 1999), 203.

³ *Ibid.*, 203.

Notes

⁴ Ibid., 203.

⁵ Norm Augustine of The Air Force Research Lab made a statement that airplanes are priced per pound and based on historical trends he projected out that in approximately 2020 the US DoD budget will cover the cost of one new aircraft.

⁶ Buckley, “Air Power,” 203.

⁷ Recent examples include Grenada, Panama and Somalia—a notable exception is the Falklands war fought in 1982 between the UK and Argentina.

⁸ Dr Robert L. Pfalzgraff, “The United States as an Aerospace Power in the Emerging Security Environment,” in *The Future of Air Power in the Aftermath of the Gulf War*, ed. Richard H. Shultz, Jr et al. (Maxwell AFB, Ala.: Air University Press, July 1992), 41.

⁹ Ibid., 42.

¹⁰ Singapore and Greece provide two good examples. Singapore operates an updated A-4SU, F-5E/S, and F-16A/B and C/D. Greece has the A-7E/H, F-4E, F-16A & C/D, F-5A, Mirage 2000, and as just ordered the Typhoon.

¹¹ Brian Walters, “Europe’s Fighter Market,” *Air International* 59, no. 2 (August 2000): 85.

¹² “Gulf War, did we learn the lessons,” *Airforces Monthly*, September 2000, 28.

¹³ Rene J. Francillion, “The Aircraft Needs of the USAF,” *Air International* 59, no. 5 (November 2000): 297.

Chapter 3

Credible Response

A second-best Air Force is like having a second-best poker hand—adequate for bluffing, but no good at the call.

Wing Commander Andrew Brookes¹

Credibility

Any nation's military response would be viewed by another country under three criteria: capability, credibility, and intent.² Capability is the air combat force's ability to react (response time), and ability to destroy targets. How survivable are the tactics and aircraft (EW/ECM), and can they prosecute attacks with relative impunity? What range of targets can they attack and how many can they prosecute on a given time-scale?³ The size and proficiency of the force also contributes to deterrence. This includes the number of platforms, weapons stocks, level of technology, logistic support, morale, C4I, and training levels of personnel.

Credibility is simply about the aggressor's perception of a nation's commitment to use the force it possesses.⁴ How has the country historically reacted to crisis and to what level does it have public support? Does it possess the means to back up its policies and rhetoric? One can also look at the country's involvement in regional exercises and gauge its resolve, level of commitment and capability.⁵

Credibility and Unilateral Response

Is possessing a small force of fighters logical? How does a nation with a small number of platforms hope to provide a credible unilateral response? Does a strategic interdiction air campaign require the resources beyond those of small nations? The answers lie in the country's objectives. Obviously, a strategic air campaign on the scale of the Gulf War is not possible but strategic interdiction to achieve limited objectives is.⁶ What approach can a small nation take that might maximize the impact on the battlefield? It is simply a matter of scale. A country such as Australia could not hope to inflict the damage of the air campaign in operation DESERT STORM but could carry out a raid such as that OPERATION BABYLON or EL DORADO CANYON.⁷ Some small nations might well see their response lying purely in DCA in the hope of exacting a sufficient cost on the enemy to force them to stop attacking.

Strategic Air Campaigns

According to Pape, coercion, "at least in conventional wars, succeeds when force is used to exploit the opponent's military vulnerabilities, thereby making it infeasible for the opponent to achieve his political goals by continued military efforts".⁸ Coercion seeks to influence another state's decision making—specifically by forcing them into performing a cost/benefit analysis.⁹ Coercion seeks to force the opponent to alter his behavior—hence they can be linked in practice.¹⁰ If a small nation is to have a coercive affect on an opponent then targeting to achieve the desired level of coercion becomes all-important. This does not focus on the application of airpower against specific targets, but the use of interdiction to generate *strategic effect*—in particular, the direct influence of critical decision makers.¹¹

This is all very well in theory but there are some basic limitations inherent in small nations and the theories of strategic bombing itself. Strategic bombing, long the cornerstone of USAF doctrine, has yet to be proven independently decisive. Many strategic bombing advocates argue that it has been proven in WWII against Japan and the ROLLING THUNDER, DESERT STORM and ALLIED FORCE air campaigns. However closer examination of these campaigns leaves many questions. Airpower champions tend to ignore other factors in these campaigns—e.g. the Russian invasion of China in WWII and its influence on Japan to surrender, the ground invasion in Iraq, and the loss of Russian support for Serbia in Kosovo. There is no doubt that airpower played a major part in these campaigns but it is better viewed as one means in a combined arms operation. Decisive yes, but from the point of view of ensuring the eventual outcome by enabling other forces or IOPs to be brought to bear.

Strategic targeting is still largely consistent with what came out of Air Corps Tactical School (ACTS) in the 1930's, and Warden has built on this with "system" theory. Both maintain that any system can be paralyzed and fatally weakened by bombing. These theories make some bold assumptions. First they assume vital centers of gravity (COGs), and second, you are dealing with a rational actor that will capitulate when the situation appears hopeless. ACTS industrial web theory was based on the US and assumed an opponent is an industrially developed country. The futility of this has been seen in early LINEBACKER operations against an enemy with no industrial base and therefore no vital COGs. Further the interdiction of supply lines had little affect against the Vietcong, who did not rely on them.

The industrial web theory of the ACTS and Warden's "five-ring model" are based more on principled belief than on analysis.¹² There is no proof that airpower has affected a guerilla or "people's war," or indeed can. Moreover, even against developed countries vital organs can be replaced, historically bombing has increased the people's will to resist, and there is no proof that decapitation is effective, and if achieved it may well hinder conflict termination. Strategic bombing advocates tend to make unqualified calculated predictions on bombing effectiveness and tend to confuse target destruction with strategic objectives.

The implications for a small nation relying on a strategic bombing response to aggression are obvious. It places reliance on what is arguably an unproven theory. Even if one argues that strategic bombing has proven decisive in the past, no small nation has ever attempted it. A limited number of airframes are a major limiting factor, however precision targeting and weapons—one bomb, one target—have served to redefine concentration and mass. Parallel bombing campaigns are outside of the realm of a small air force but a campaign of limited scope for limited objectives could be sought, but it is a gamble.

One-off strikes are within the reach of small air forces but the deterrent value is lessened if the enemy is prepared for the next strike and believes it can attrite the attacker. Strategic campaigns are fraught with the risk of conducting strikes with limited intelligence (presuming no large power assistance), with limited platforms in an attempt to decapitate, punish, coerce, or deny the enemy. Strategic campaigns are best left to the US to plan and execute. One-off strikes are an available option but will they achieve the objective, and then what if they don't?

Defensive Counterair

A small nation may well see the role of its air combat forces as purely DCA. As a unilateral option is it more sound than a strategic bombing response but still difficult. To build an effective integrated air defense system is expensive. Medium powers such as Iraq and the North Vietnam (with considerable Soviet assistance) have done it but it is probably prohibitive to the small nation without a significant capital outlay. It requires excellent C2 and ideally airborne early warning (AEW) to be effective. The possession of AEW means another aircraft and added expense. However even a small force of highly skilled pilots in modern fighters armed with the latest AAMs has a deterrent value. Obviously the relative size of the attacker vs. the defender will be a major factor in the outcome. However an attacker, unless having a significant number of aircraft (simply overwhelming the opponent), will keenly feel the loss of any aircraft. He must gain air superiority and then prosecute an uncertain bombing campaign. Passive and active air defense measures will make this difficult and may be the best unilateral option for small nations. An air combat arm entirely geared towards defense of the homeland does not preclude its ability to deploy and integrate into a combined operation if the opportunity presents itself.

Pitfalls of Unilateral Response

There are a number of potential pitfalls with operating a small fleet of sophisticated fighters geared to unilateral response; the risks involved are five-fold: counters to stealth, effectiveness of strategic interdiction, cost, C4I support, and attrition.

First, there is no guarantee that sometime in the future technology will not be readily available that will counter stealth aircraft. There is already indication that countries such

as China are experimenting with low-frequency radar and other technologies to detect stealth aircraft. These measures are meeting some success, albeit limited, but will likely improve. However it is quite another matter to engage an aircraft like the F-22 even when you have found one. If technology now is only at the point that stealth can be *detected*, that does not automatically imply that they can be *tracked*. Even then SAM guidance must be developed against a fast moving, stealth platform that will be using advanced ECM.

The incorporation of stealth into an aircraft design can be regarded as a “one-shot” deal. If stealth does turn out to be easily countered in the near future then one is stuck with a 30-year, very expensive fighter that now has to rely on other factors for an advantage. The other major factor against stealth is that daylight is a great leveler. Are countries willing to risk an expensive stealth aircraft on a mission that involves the risk of visual acquisition?

Second, the employment and utility of strategic bombing is still contentious and beyond the capability of small air forces in anything other than one-off strikes.

Third, the cost of acquiring platforms capable of operating alone will be high. There are the benefits of operating a single type but there will be a significant initial capital outlay. The number of aircraft required (plus attrition airframes) will need to be carefully considered.

Fourth, the possession of effective C4I is outside of the means of all but the major powers. To operate outside of a coalition without a major power is to have an incomplete picture of the environment. Operation in increased “fog and friction” is to place valuable assets at risk.

Attrition and the ability of a small air force to take it are already limited. To place your faith in a few sophisticated airframes may be a one shot deal. There is no factoring unforeseen disaster such as a precautionary grounding due to safety concerns that may result in the loss of the air combat capability of the nation. Bearing in mind that a small nation will only be able to afford the minimum number of these sophisticated aircraft then the loss of just one will be felt.

Airpower and MOOTW

With MOOTW becoming the predominant operations it is worth examining the utility of airpower, especially as some governments struggle to see any contribution outside of ground forces. Fighter forces bring speed, lethality, and precision, and they have proven effective means of coercion in peace operations. In support of UN peace operations airpower has been tasked to deny the enemy use of the air, punish non-compliance, and provide a show of force to demonstrate resolve.¹³ The resort to airpower to achieve “bloodless” victories is becoming the dictum of today’s political environment. DELIBERATE FORCE forced concessions from the Bosnian Serb Army, and Kosovo saw the exclusive use of airpower to coerce Serbia. But political restrained airpower is often not fully employed leading to its greatly reduced effectiveness, however politicians demand minimum violence and precision engagement, and the aircraft is the tool of choice.¹⁴ Collateral damage and casualty avoidance is paramount and only precision engagement from the air (for the time being) will achieve this.

In MOOTW, the use of violence is limited and airpower can only be expected to achieve limited aims. Airpower has never singularly achieved victory in any war and thus far has failed to achieve the desired end-state in either Iraq or the Balkans.¹⁵

“People’s” wars and guerilla wars have demonstrated the limitations of airpower. MOOTW in third world countries, unconventional wars or people’s wars are always difficult, and the employment of fighter aircraft in environments of restrictive ROE and minimum collateral damage needs to be carefully approached. However there is a vital role for fighter forces to play in MOOTW. Civilian ideals of minimum violence should not be confused with minimum force. Precise and devastating airpower can be used to apply maximum force to an objective with minimum risk of domestic political fallout and collateral damage.¹⁶ Airpower can be employed with apparent autonomy and it can be decisive in that it could assure the eventual outcome.¹⁷ Small nations can benefit in many ways by offering fighter forces for coalition peace operations.

A good example would be the decision by a small nation as to what force contribution it will provide to a coalition. As part of the coalition operations in Bosnia under the UN, New Zealand (NZ) deployed approximately 500 soldiers into Bosnia-Herzegovina. These soldiers were in harm’s way 24 hours a day and NZ was faced with the problem of deploying and supporting 500 men in theatre. As an alternative, if we had deployed an A-4 Skyhawk squadron to Italy it would involve 10 aircraft (possibly 6), approximately 130 personnel living out of harms way, and only a few pilots placed at risk over the AO. Fewer people to support in theatre, hugely reduced risk of casualties, and a highly visible contribution to the coalition (fighters are obvious, 500 men in green among 10,000 others dressed in green is less so). I do not mean to sound facetious or belittle the equally important contribution made by ground forces to MOOTW, however the air option is too often overlooked by some countries in favor of risky commitment of ground troops.

Notes

- ¹ “Gulf War, did we learn the lessons,” *Airforces Monthly*, September 2000, 28.
- ² Sqn Ldr S. Clarke, “The Place of the Air Combat Force in the Security Strategy of New Zealand,” 1999, 5. (Draft)
- ³ Ibid., 5.
- ⁴ Ibid., 6.
- ⁵ Ibid., 6.
- ⁶ Sqn Ldr Shaun Clarke, *Strategy, Air Strike and Small Nations* (RAAF Base Fairbairn, ACT.: Air Power Studies Centre, 1999), 78.
- ⁷ Ibid., 78.
- ⁸ Robert A. Pape, *Bombing to Win—Air Power and Coercion in War* (Ithaca, N.Y.: Cornell University Press, 1996), 1.
- ⁹ Ibid., 4.
- ¹⁰ Ibid., 4.
- ¹¹ Clarke, *Strategy*, 29.
- ¹² Dr. Lewis Ware, “Ware on Warden: Some Observations of the Enemy as a System,” *Airpower Journal* 9, no. 4 (Winter 1995), 92.
- ¹³ William W. Francis II, “Coercive Air Strategy in Post-Cold War Peace Operations,” (Maxwell AFB, Ala.: School of Advanced Airpower Studies, 1999), 46.
- ¹⁴ John Buckley, *Air Power in the Total Age of War* (Bloomington, Indiana: Indiana University Press, 1999), 203.
- ¹⁵ Francis, 49.
- ¹⁶ Welch, 154.
- ¹⁷ Ibid., 157.

Chapter 4

Conclusions

We drop bombs. We kill people and break their stuff.

—General Ron Fogelman

The times of two nations armed forces lining up against each other as seen in Iraq may be past, but the world is still an uncertain place due to the presence of rouge nations and intrastate conflict. The small nation must be ready to meet the challenges of the future and possess meaningful, credible defense forces for either unilateral self-defense or participation in combined operations. Air combat forces provide the most precise, flexible, rapid, and lethal response for military contingencies. The move toward low intensity conflict and MOOTW provide challenges for air combat power but fighter forces have a place. They are often seen as an efficient solution to achieve national or coalition objectives. They are perceived, rightly or wrongly, to provide precision (minimum collateral damage), and lower risk of casualties. They have been used to coerce, destroy and deny the enemy, and will continue to do so as long as the manned fighter is with us.

The size of small nations imposes severe limitations on what they can and cannot do. One-off strikes are possible but the ability to mount a sustained air campaign and to gain and maintain control of the AO is beyond the means of a small or even medium power. The small nation must choose what it wants its defense forces to do—structure for

combined or unilateral action. Combined operations are the easiest to structure for. The choice of a fighter equipped for precision targeting and engagement, secure communications and self-defense is the aim. For unilateral response the choice is very limited if looking for a survivable penetrating interdiction platform and less so if seeking a credible DCA response. Regardless of the decision the choice one a single aircraft type is desirable for economy of scale, logistics and budgeting.

There are pitfalls for any of these decisions. The least risky is to hope that you won't have to fight alone. The vast majority of air forces cannot do so now (at least not for long) and would be better suited in consolidating their efforts and force structures. Strategic type bombing campaigns are going to have a very limited affect but single retaliatory strikes are possible, but to what end. DCA is attractive but again difficult with limited platforms and the requirement for further investment in an IADS.

Small air forces cannot stay on the path they are on. Hard decisions will need to be made if they are to remain credible in the future. Abandoning them altogether is not the answer. It does not make sense to rid yourself of one of you most flexible, lethal, visible force options. It does make sense to have available a small, well-equipped force able to meet the national objectives.

Glossary

AAA	anti-aircraft artillery
AAM	air-to-air missile
AAR	air-to-air refueling
ACM	advanced cruise missile
AEW	airborne early warning
AI	air interdiction
AMRAAM	advanced medium-range air-to-air missile
AO	area of operations
AWACS	airborne warning and control system
CAS	close air support
CONUS	continental United States
CFT	conformal fuel tanks
C4I	Command, Control, Communications, Computers, and Intelligence
DCA	defensive counterair
ECM	electronic countermeasures
EW	electronic warfare
IADS	integrated air-defense system
IRBM	intermediate-range ballistic missile
JSF	Joint Strike Fighter
JSTARS	Joint Surveillance Target Attack Radar System
NATO	North Atlantic Treaty Organization
OCA	offensive counterair
RAF	Royal Air Force
RAAF	Royal Australian Air Force
RMAF	Royal Malaysian Air Force
RNZAF	Royal New Zealand Air Force
RSAF	Republic Singapore Air Force
SAM	surface-to-air missile

SEA	Southeast Asia
SEAD	suppression of enemy air defenses
UCAV	unmanned combat aerial vehicle
UK	United Kingdom
UN	United Nations
US	United States
USA	United States of America
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
VSTOL	vertical/short take-off and landing
WMD	weapon(s) of mass destruction
WWII	World War Two

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