

### **Air Dominance – Reality or Myth?**

*“The field for air superiority is not a straightforward issue like a naval battle or a land battle; it is not even a series of combats between fighters; it is frequently a highly complex operation which may involve any or all types of aircraft. It is a campaign rather than a battle, and there is no absolute finality to it so long as enemy aircraft are operating.”*

#### ***Air Chief Marshal Sir Arthur Tedder***

Control of the Air has been understood and theorised since the birth of aviation and little has changed conceptually. The Oxford English definition of dominance is: *to have a commanding influence on; or exercise control over*. ACM Tedder's comment above would suggest that the battle for control of the Air can only be considered over when all enemy aircraft are gone. Today, control of the air is a far more complex business than it was in 1940, but the principles hold true. There can be few military strategists or leaders who would wish to embark on any military operation or defensive posture unless success was achievable or even assured. There will be no serious politicians or political leaders who would embark on a military endeavour unless they could be certain that success was as painless and bloodless (possibly on both sides) as possible. It is axiomatic that military success requires a high degree of air control to deliver that success; for many, nothing less than air dominance will do. For air dominance allows a commander to hold the initiative through total freedom of manoeuvre and action. Recent conflicts have reinforced this fact and history is littered with examples where air control was the key factor in achieving victory or avoiding defeat. Moreover, where an enemy has faced an air dominant adversary, only by turning to asymmetric tactics have they staved off total defeat in the field. At the very least, any Nation state would wish to achieve air dominance in their own national airspace and over their own assets.

In recent years, global dynamics and the nature of conflicts have created circumstances where air superiority or even dominance has been achieved relatively easily, sometimes with almost no opposition. Indeed, the only realistic threat to aircraft has been the relatively unsophisticated threat of small arms or shoulder fired Surface to Air Missiles (SAMs), and these, by a combination of judicious tactics and sophisticated counter measures, have been avoided by all but the most vulnerable and unaware air vehicles. However, as the Soviets discovered in Afghanistan, this threat can ultimately negate apparent air dominance and bring a slow and painful defeat – perhaps in this case it was the Mujahedeen who might lay the greater claim for achieving air dominance. Most recent conflicts have been fought with one side enjoying overwhelming air dominance, but this has been more as a result of the limited capability or ambition of the adversary. Some would have us believe that the recent character of conflict will endure and that air dominance will be un-competed; whatever the case, air control or dominance will be a prerequisite to mission success. So, the simple answer to the question posed by this paper is that air dominance is both a reality, and highly desirable, if not

essential state, to be achieved in combat. However, the more challenging question is how can such dominance be assured and what might be needed to achieve it? I do not profess to be any more capable of predicting the future than anyone else, and for the purpose of this paper I will hedge my bets and assume that the future character of conflict will be “hybrid” in nature and, therefore, we should expect a wide range of asymmetrical and symmetrical threats to be faced – each of which will bring its own challenge to the achievement and maintenance of air dominance. This paper will discuss the ways in which we might achieve such a state, why we might need it and whether it is affordable.

## **Degrees of Air Control**

Past doctrine has concentrated on degrees of air control on the basis that much of our doctrine has necessarily focussed on conventional conflict. In such cases, such as the Cold War, but even more recently over the skies of Iraq or Serbia, air dominance could never be assured. Large numbers of enemy aircraft or, even more likely, a sophisticated and deadly, layered IADS<sup>1</sup> meant that air superiority had to be earned by systematic attack of the enemies defence system to ensure that the desired degree of control was achieved. Levels of air control have been described thus (in ascending order):

- Air Subordination
- Air Parity
- Favourable Air Situation
- Air Superiority
- Air Dominance (Supremacy)

Counter air operations seek to attain the higher levels through the destruction, degradation, or disruption of enemy forces. In a conventional conflict with sides of equal or balanced capabilities, it was generally accepted that only a Favourable Air Situation was a realistic goal and even then only achievable regionally or at a time of choosing/need by the careful sequencing of attacks (OCA<sup>2</sup>) and supporting defence (DCA<sup>3</sup>). More recently, one-sided campaigns and/or technological advancement have allowed the achievement of Air Superiority (such as over Iraq in 2003), where an enemy was struck at will with little or no response or threat, despite a relatively significant capability;

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<sup>1</sup> Integrated Air Defence System: including fighter aircraft but also a sophisticated EW system, SAM belts and ECM.

<sup>2</sup> Offensive Counter Air - Operations to destroy, degrade, or disrupt enemy air and missile power as close to its source as possible; OCA is often the most effective and efficient method for achieving the appropriate degree of air superiority and in itself exploits the offensive capability of airpower. OCA operations include the suppression of enemy air defence targets, such as aircraft and surface-to-air missiles or local defence systems, and their supporting C2.

<sup>3</sup> Defensive Counter Air – includes the detection, identification, interception, and destruction of attacking enemy air and missiles and normally takes place over or close to friendly territory. DCA concentrates on defeating the enemy's offensive plan and on inflicting unacceptable losses on attacking enemy forces. DCA is synonymous with air defence and consists of active and passive operations to defend friendly airspace and protect friendly forces, materiel, and infrastructure from enemy air and missile attack.

and even Air Dominance (Afghanistan 2001) where there was a total absence of any credible threat; although, as stated earlier, even a state of Air Dominance may not make you immune to any attack, especially unconventional or asymmetric threats. However, Air Dominance is more about the ability to exercise near total control over an adversary rather than just the ability to blunt or avoid any attack and some losses may be acceptable and expected now matter how dominant you may be.

## **Owning the Skies**

So, is Air Dominance today and in the future only achievable through a lack of adversary capability such as in Afghanistan or can it be achieved against an enemy with a significant counter or defensive air capability. Clearly to overcome the latter, dominance must be fought for or acceded by the enemy.

***“If we lose the war in the air we lose the war and we lose it quickly.”***

## **General B Montgomery**

Due to recent conflicts, when air superiority has prevailed, it is almost unthinkable to contemplate military operations without it; regrettably, this cannot be assured in all cases and not all future conflicts will be so one-sided. In order to achieve air dominance, an enemy's air capability would have to be neutralised, and this would have to be done whilst preserving sufficient residual air capability to allow subsequent exploitation. It is this latter part that is key to the true meaning of air dominance; for the neutralisation of the enemy air threat or counter air capability is only the first step – this will be discussed further later in the paper.

In order to own the skies and thus achieve dominance against anything but the most rudimentary adversary will require a careful resourced and designed air plan which must systematically erode any enemy capability, whilst, at the same time, defeating any enemy attempts to do the same. The sequencing of the air control phase of the campaign is dependent on a number of factors. Recent, one-sided affairs have allowed this to be done in strict sequences so that further military operations can follow. However, it must be accepted that this will not always be possible. Time, distance, threat, necessity and a host of other factors will dictate the overall campaign tempo and sequencing, and air dominance may only be delivered during major combat operations rather than as a pre-cursor to them. The latter situation is not ideal as it will not only place forces at greater risk from enemy attack but it will also create a conflict of priorities for air assets as commanders weigh the relative benefits of employment of aircraft to defensive or offensive, supporting or supported tasks.

In order to achieve air dominance an opposing capability will have to be overmatched and then all but eliminated. There are many complex factors which have to be considered when assessing the ability to achieve air dominance; aside from mass of effort the key capabilities necessary to achieving control of the air are:

- Superior decision making (C2), based on timely information (sensors) and effective communication (network)
- Persistent presence - 24/7
- Performance (speed, height, range, endurance)
- Reach, lethality & precision of the kill chain (weapons)
- Relative invulnerability to enemy effect (countermeasures, LO)

It will be rare where one can achieve an advantage in all these capabilities; however, by achieving relative advantage through an optimised balance of capability overmatch then an appropriate level of air control can be gained. If you have overwhelming superiority in all areas then air domination is a reality, albeit, potentially an expensive one.

Some would argue that standoff weapons or ones delivered by stealth bombers will obviate the need for any fighter aircraft to deliver air dominance. In addition to having blind faith in such technology, I presume that such protagonists have also eliminated any thought of combat forces deploying in harms way or any belief in the defence of one's own airspace or national interests. However, that said, stand off weapons or stealth delivered shorter range weapons will play a key role in achieving air dominance , particularly against ground based threats or supporting elements of air breathing ones. An OCA plan will need to use all capabilities at its disposal.

### **Designed for Success (at a cost)**

When one thinks of Air Dominance one immediately thinks of the US. The new F22 RAPTOR has been designed exclusively with Air Dominance as the aim. However, recent reductions in numbers of the delivery of these aircraft to the USAF coincide with the retirement of an increasingly ageing combat air force. By 2013, the USAF fighter inventory will not only dip below the considered minimum requirement (QDR 2006) of 2,250 but will still include significant numbers of aircraft (F16 & F15) that will be 30-40 years old (the modern equivalent of a Spitfire flying in the Falklands War). The F15 is already overmatched by the Su22 Flanker, which is also half its age. Even by 2020, only half the USAF fighter force will consist of 5<sup>th</sup> generation F35 and F22 aircraft. Whilst this has been as a result of financial pressures (new generation aircraft now command exponential costs and time to full capability when compared to earlier generations) rather than a strategic reappraisal of likely future threats, it is not difficult to imagine scenarios where the older airframes will be extremely vulnerable and would suffer significant losses (upgrades). However, recently it has been convenient to justify reduced investment in high end capabilities by hiding behind the belief that air dominance will always be assured through the new character of conflict – this would be misguided at best and catastrophic at worst.

China and Russia will field in the next 10 years two new fifth generation fighters and even less expansive countries will develop or acquire very sophisticated and lethal ground-based air defences. In many cases, such air defences would already prohibit the employment of “legacy” systems. The optimists believe that a sufficient force of fifth generation aircraft will

effectively deliver air dominance to such an extent that the more vulnerable legacy platforms will be able to operate with relative impunity once that is delivered. The balance of US investment has offset the larger number of F35s against the F22 reduction. This is hotly contested by many but the USAF have a point and the 2 aircraft cannot be compared like for like; only the RAPTOR is truly capable of delivering air dominance against all threats, which the F35 will be able to exploit. As ever a balance needs to be struck as air dominance without the ability to exploit it is meaningless. Perhaps, the limitation now is the cost benefit argument rather than ambition; however, this means accepting higher losses as a potential consequence. It is hard to imagine many nations competing favourably, with the US today, but it is very easy to see a future where such dominance would be competed. Even now, for other nations, the wrong conflict against the wrong enemy could easily result in far higher casualties than those seen in recent conflicts. Politicians and strategist need to understand the limitations of their armed forces – you get what you pay for.

There is another factor which counts against airman in the argument for resource. As well as recent successes and the relative ease by which dominance has been delivered, modern fighters are extremely capable and normally today designed for more than one role. However, whilst the capabilities of new aircraft has grown exponentially, so has that of some potential adversaries; moreover, although aircraft can fulfil two roles these can rarely be done simultaneously and certainly not in two places at once. Simple maths will not work here and numbers and relative capabilities need to be considered carefully before speculative reductions are made. On current assumptions, the F22 will replace older airframes on a 1:5 ratio: that would be a fair swap if a simple one on one capability comparison was the only factor (kill ratios better than this have been proven in recent exercises), but for a Nation with global ambition it will only go so far. Just defending US airspace from potential air attack (even if only from a rogue airliner) would tax most modern air forces in sheer sortie rates. Quantity has a quality all of its own and the tyranny of time and space will prevail even in a high tech world.

### **From Dominance in the Air to Dominance from the Air**

Most importantly, the attainment of an Air Dominant state and “ownership” of the airspace is merely a means to an end; for the defeat of the enemy’s offensive and counter air capability alone will not achieve campaign success. As the definition of *dominance* suggests, the ability to have a “*commanding influence*” implies that you must be able to exploit the achievement of Air Dominance. Again, the nature of the conflict will influence heavily in this regard; whilst an asymmetric threat will more likely cede air dominance and allow freedom of manoeuvre against it, it will then adopt tactics that seek to limit any advantage; the less conventional the threat the more challenging this becomes. “War amongst the people” brings significant challenges to airman; whilst new technologies in an air dominant force will allow air assets to operate at will and to see all that moves - these are not enough. In order to apply campaign winning effect in a counter insurgency, you need to understand what is going on rather than just observe, and discriminate

between those who confront you and those you seek to support and assist. Achieving such a state proves far more challenging than defeating sophisticated conventional threats. Therefore, true Air Dominance must include the ability to deliver precise effect on the ground – this requires similar capabilities as those to dominate in the air: a fusion of all ISR assets through a network, which allows shared understanding and the ability to deliver precise effect across the battlespace in conjunction with land and sea forces – easier to write than achieve.

Perversely, recent successes and the obvious benefits of a dominant air capability have caused the expectation for success to be overblown – layman and politicians alike have been seduced, even airman have been complicit in perpetuating the apparent invincibility of air power in order to secure resources. By overplaying the “air can do it all” card, rational arguments have been lost in a misdirected tit for tat debate, which has pitted military capabilities against each other – a situation that gets worse the tighter defence budgets get. As conventional air dominance requires ever more sophisticated capabilities, such as the B2, F22 and F35 aircraft, the greater the pressure on resources and the greater the cost delta between conventional and irregular warfare. The argument that such high end capabilities are just as relevant to asymmetric warfare is negated by the disproportionate cost and the far cheaper low tech solutions that could be employed. If this wasn’t challenge enough, information campaigns waged against air power have a powerful if rather distorted impact on the employment of air power. Although statistics show air strikes cause an increasingly small proportion of civilian casualties (~17% in Afghanistan) through ever precise attacks and tighter ROE, they are usually created from a small number of spectaculars, thus raising the profile – a situation any enemy who fears air power is quick to exploit – airman should be flattered by the speed at which an enemy attempts to discredit them.

However, democratically elected governments and morally guided alliances will not be able to sustain long drawn out wars of attrition when embarking on wars of discretion. So, the moral and practical imperative is for quick and effective neutralisation of an enemy with minimal, acceptable losses (possibly on both sides) and certainly with the very minimum of civilian casualties. Dominant air power can deliver the former; it has to get better at delivering the latter.

### **New paradigm?**

The spectrum of warfare has never been more colourful – from the highly effective suicide bomber to low observable, hypersonic weapons systems. Covering such a spectrum does not come easily or cheaply. Modern SAMs (S300) will deny access to all but the most sophisticated of capabilities; low tech air solutions (such as the Tamil Tiger aircraft) and terror attacks (such as 9/11) question our very perception of air power. Irregular adversaries will continue to seek low cost solutions and tactics that negate any advantage that overwhelming air power can bring to bear. Moreover, an increasing moral voice makes the employment of overwhelming force more of a challenge.

However, that has not stopped the development of ever sophisticated air platforms, and increased investment and capability generation by China and Russia amongst others has begun an air dominance arms race between conventional state competitors. But, in addition to making the domination of airspace an ever increasing challenge, space and cyberspace has become a new battleground - one that must be conquered if air dominance is to be maintained.

So, the air dominance debate does not end with the relative superiority of aircraft such as the F22. A superior kill ratio between aircraft or the ability to penetrate defences at will do not air dominance make. Returning to Tedder's quote at the beginning of this essay, I would change nothing other than to add to the final sentence the following clause: *"...or overwhelming effect can be delivered from the air at will in support of the Joint Campaign"*. Air power theorists and supporters instead of arguing (wrongly) that air power can dominate to the extent it can win wars alone, need to argue that a dominant air capability is essential for military success in any conflict, but perhaps more significantly stop conflicts from starting. The deterrent and coercive effect of overwhelming air power is perhaps its greatest strength. Whilst the best form of defence is attack, the best form of attack is to deter all adversaries through overwhelming threat.

The question should not be can air dominance be achieved, but can you live without it? Short sighted, cost driven decisions on force structures and resource priorities cannot be made only looking to a near horizon or a convenient low tech scenario. Those who would argue that conflicts such as the current one in Afghanistan portend the future character of all those that follow, conveniently forget that without dominant air power we would not even be there and we would certainly be taking far higher casualties today. Selecting the wrong strategy today will have long term implications, for air dominance is achieved through a balanced and forward thinking research and procurement strategy; disinvesting from the development and maintenance of such a capability and trusting to luck that the threat never comes is a one-way, high risk path. However, there will always be pressures on defence budgets, therefore, the attainment of "enough" dominance and the maximum utility of multi/swing-role assets will be key to defence budgets watching their costs. Airpower, as any other form of military power in the future, will need to be both relevant and affordable in equal measure, but a dominant air capability is a military force's asymmetric advantage; to let it wane is foolish for it is surely an insurance policy worth the price.

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*This essay is the personal viewpoint of the author and does not in any way represent the official view of the UK government or the RAF.*