



AIR POWER DEVELOPMENT CENTRE

CHIEF OF AIR FORCE ESSAY COMPETITION 2011

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## PREFACE

This is the first edition of a selection of essays from the Chief of Air Force (CAF) Essay Competition. It contains three essays from the 2011 competition including the winning submission, and it is presented to acknowledge the efforts of the authors and to demonstrate the wide range of writing styles and approaches from within the Air Force and greater Australian Defence Organisation.

The annual CAF Essay Competition was introduced in 2010 to promote the development of air power analysis, theory, and education and is open to Australian citizens and foreign military exchange officers. The objective of the competition is to encourage and inspire personnel from all areas and disciplines to research, analyse and debate contemporary air power issues. The three essays presented in this volume all demonstrated substantial merit in these areas, and it is for this reason that I have decided to publish them.

The first essay, *Air Power and Irregular Warfare*, by Flight Lieutenant Alexandra McCubbin was selected by CAF as the winner of the 2011 Wrigley Prize. In her essay, Alexandra explores the history and nature of irregular warfare, and discusses a number of considerations for air power employment in irregular conflict. A number of case studies from the Malayan Emergency to Libya are investigated in the essay, and the considerations discussed make it highly relevant as we look back at a decade of operations in the Middle East, and forward to what the future may hold for air power and its role in irregular warfare.

In contrast, Squadron Leader Rex Harrison's essay *Per ardua ad astra – the challenge of delivering space power mastery within the Royal Australian Air Force* explores a newer realm with fewer historical precedents. Harrison writes on how the RAAF may achieve professional mastery in this 'congested, contested and competitive environment' by reviewing recent developments in the space domain and investigating broad requirements and challenges. He also suggests some mitigation strategies and a roadmap to the future, which raises many interesting issues in this increasingly important subject.

The final essay returns to irregular warfare, and was written by Ms Rachel Mourad. As the title suggests, *A Critical Analysis of Air Power Objectives in Irregular Warfare: Lessons Learnt from Operation Cast Lead* examines the Israeli Defence Force operation against Hamas in 2008 and 2009. The essay explores

several aspects of the conflict including the employment of air power and the potential negative effects, both in general and during the campaign. This relatively recent operation holds a number of important lessons learnt, as well as giving some useful insight into air operations by a nation with different strategic and operational perspectives to Australia.

I hope these three well-researched and thought-provoking essays will promote further debate on these important topics, and perhaps encourage you to make a submission in future CAF essay competitions.

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August 2012

## EDITOR'S NOTE

These essays represent the views of the authors and are presented with minimal editorial change to preserve their original message. Minor adjustments have been made in line with APDC publishing standards.

Adam Braakman  
Editor  
Air Power Development Centre, Canberra.  
August 2012



AIR POWER AND IRREGULAR WARFARE

FLIGHT LIEUTENANT ALEXANDRA MCCUBBIN

## INTRODUCTION

Irregular Warfare (IW)—also known as asymmetric warfare, unconventional warfare or low intensity conflict—involves ‘military action against an adversary to which he may have no effective response and which pits strength against weakness, sometimes in a non-traditional and unconventional manner’.<sup>1</sup> The term encompasses a variety of military activities including insurgency, counterinsurgency (COIN), counterterrorism (CT), information operations, and stabilization operations.<sup>2</sup> This essay will outline the fundamental characteristics of IW and the origins of air power in this form of conflict. The second part of the essay will examine the different types of irregular operations, while the third section highlights a number of considerations for air power practitioners in the IW environment. Case studies in each section examine the application of air power in irregular wars, from Malaya in the 1950s to Afghanistan today.

## FUNDAMENTALS OF IRREGULAR WARFARE

Often defined as a ‘defender’s strategy’, IW can sometimes force conventional militaries to fight on the terms of the insurgent or terrorist.<sup>3</sup> Yet conventional forces can effectively conduct irregular operations without ceding the advantage to their opponent. The notion of asymmetry implies that we possess something that the enemy does not, and air power represents one of these asymmetric tools. Military capability in IW operations is as much about defined political-military objectives, appropriate doctrine and effective training; as modern platforms and weapons. Military force will represent only one aspect of a broader whole-of-government effort, and will operate in parallel with political, economic and social initiatives. In contemporary

conflict, achieving politically acceptable outcomes is more important than seizing territory in conventional battles.<sup>4</sup> Tactical successes on the battlefield are generally not sufficient to win an IW fight.

Most commentators acknowledge that, despite the increased focus on IW in recent years, it would be unwise to completely shift our doctrine, training and acquisition away from conventional warfare. Modern military forces must remain prepared to fight a large-scale, state-on-state conflict if required, while also being able to conduct operations across the entire spectrum of warfare. Air power operators must be aware of the fundamentals of IW and how it differs from conventional conflict, in order to understand the full range of roles and capabilities that air power can bring to the fight.

## ORIGINS OF AIR POWER IN IRREGULAR WARFARE

Air power was used extensively by colonial nations during the early 20th century as an asymmetric tool against restive tribal and militia groups. Air commanders argued successfully that using aircraft to patrol expansive colonial territories was less costly than maintaining garrisons of ground troops.<sup>5</sup> Britain was early to recognise the benefits of air power, and employed it against territorial mandates in Iraq, Aden, Palestine and the North-West Frontier Province of what is now Pakistan.<sup>6</sup> Air power operations were also conducted by the United States, France, Italy and Spain, in pursuit of their own national interests.

The colonial powers enjoyed complete air supremacy, giving them the ability to conduct aerial attacks unchallenged. As well as strafing and bombing, air power was increasingly used in a variety of roles; including reconnaissance,

1 Royal Australian Air Force, Australian Air Publication 1000—F, *The Future Air and Space Operating Concept*, Air Power Development Centre, Canberra, March 2007, p. 63.

2 US Department of Defense, *Irregular Warfare (IW) Joint Operating Concept (JOC)*, Version 1.0, Washington D.C., 11 September 2007, p. 10.

3 Rebecca Grant, ‘Air Power’s Challenges in an Age of Irregular Warfare’, *2010 RAAF Air Power Conference: The Art of Air Power*, Air Power Development Centre, Canberra, September 2011, p. 162.

4 Alan Stephens, ‘Perception, Reality and 21st Century Strategy’, *2010 RAAF Air Power Conference: The Art of Air Power*, Air Power Development Centre, Canberra, September 2011, p. 121.

5 James S. Corum and Wray R.J., *Airpower in Small Wars: Fighting Insurgents and Terrorists*, University Press of Kansas, Kansas, 2003, p. 52.

6 Chris Clark, ‘A History of Australian Air Power and Irregular Warfare’, *2010 RAAF Air Power Conference: The Art of Air Power*, Air Power Development Centre, Canberra, September 2011, p. 141.

ground support and casualty evacuation.<sup>7</sup> Following the World Wars, nations continued to use air power to suppress independence movements in their colonial territories. The success of these missions varied, as in most cases a political solution was required to satisfactorily address these popular nationalist movements.

#### CASE STUDY: THE MALAYAN EMERGENCY

The 'Malayan Emergency' refers to a period from 1948 to 1960 during which British forces, supported by a number of other nations including Australia, sought to suppress a communist insurgency on the Malayan peninsula. The Malayan Emergency in many ways typifies a COIN conflict, as it took 12 years and the involvement of 350 000 personnel to defeat a numerically small and technologically inferior enemy.<sup>8</sup> The efficacy of air power in the Malayan Emergency remains a point of contention. Aircraft were utilised in a number of roles, including air mobility, air strike, airdrop of supplies, medical evacuation (MEDEVAC) and psychological operations (PSYOPS). Air attacks were largely aimed at harassing the communist militia, who were difficult to track and rarely emerged from their jungle hideouts.<sup>9</sup>

From a purely statistical perspective, the effects of air power are underwhelming—in 1950 only 648 rebels were killed, out of an approximate strength of 7000 personnel.<sup>10</sup> Yet in a COIN conflict, the killing of individual enemy combatants is generally not a central objective of the campaign; certainly doctrine and experience demand that this not be the case. Commanders also recognised the potentially counterproductive effects of air raids on the civilian population. Thus restrictions were placed on the type of target that could be attacked, and aircrew had to personally compensate locals for damage caused

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7 Corum, *Airpower in Small Wars: Fighting Insurgents and Terrorists*, p. 1.

8 Clark, 'A History of Australian Air Power and Irregular Warfare', p. 148.

9 *ibid.*, p. 151.

10 Peter Rixon, 'Aerospace Power in the Malayan Emergency', *Air power and wars of national liberation: the proceedings of the 2002 RAAF History Conference*, Aerospace Centre, Canberra, 2003, p. 124.

by airstrikes.<sup>11</sup> The defeat of the Malayan insurgency can largely be attributed to civil and political rather than military actions, with programs such as the relocation of the civilian population to controlled 'new villages', where they could be more easily protected and isolated from insurgent influence.<sup>12</sup>

#### TYPES OF IRREGULAR WARFARE OPERATIONS

##### COIN OPERATIONS

Air power makes a significant contribution to the military component of COIN operations, defined as 'those military, paramilitary, political, economic, psychological, and civil actions taken by a government to defeat insurgency.'<sup>13</sup> The fundamental principle of COIN is that the population is the centre of gravity, and their support is vital to achieving the mission. COIN doctrine requires the application of effort across a number of lines of operation; including security, governance and development. One theory is the 'ink blot' strategy, in which counterinsurgent forces secure a number of individual villages and establish central government authority. Influence then extends outwards from each village, and these ultimately link up so that the entire country is brought under government control.

To be effective in a COIN campaign, air power must not only achieve designated military outcomes, it must do so without compromising the strategic objectives. The Australian Defence Update 2007 acknowledges that 'on the conventional military battlefield a force like the Australian Defence Force is easily superior in fire-power to non-state opponents...Yet we are

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11 *ibid.*, p. 121.

12 Ian Proudfoot, 'The Ethnic Background to the Malayan Emergency', *Air power and wars of national liberation: the proceedings of the 2002 RAAF History Conference*, Aerospace Centre, Canberra, 2003, p. 115.

13 'Counterinsurgency Operations, Field Manual—Interim No. 3-07.22', p. vi, available at <http://www.fas.org/irp/doddir/army/fmi3-07-22.pdf>, accessed 17 October 2011.

constrained in ways non-state groups are not.<sup>14</sup> One of the greatest challenges in IW is creating rules and procedures that allow for effective tactical action, without compromising the broader strategic aims. As well as complying with international law regarding *jus in bello*, conventional military forces operate under strict rules of engagement (ROE). These provide guidance on appropriate levels of force when engaging suspected enemy combatants, but are often criticised by military forces for being overly restrictive.

Air power, with its ability to deliver lethal effects at standoff ranges, is often associated with collateral damage. Former Commander of the International Security Assistance Force, General McChrystal, once stated that '*Air power contains the seeds of our own destruction if we do not use it responsibly*'.<sup>15</sup> Yet studies have shown that air power is only responsible for around five percent of civilian casualties in Afghanistan.<sup>16</sup> General McChrystal is right, however, that air power must be used in a responsible manner if it is to achieve its greatest effects. In a COIN campaign, disproportionate or indiscriminate use of force by individuals or units at the tactical level can have significant ramifications. Such actions engender resentment among the local population and can push local leaders to distance themselves from coalition forces. Where the counterinsurgents belong to a foreign nation, there is also potential for its own domestic audience to withdraw support for a campaign that is perceived to be causing more harm than good.

#### CASE STUDY: AIR SUPPORT TO THE AFGHAN GOVERNMENT

Air operations in Afghanistan support not only the efforts of coalition force troops, but also the Government of the Islamic Republic of Afghanistan. While the role of air power in the 'security' line of operation receives the majority of attention, it also supports the parallel efforts of nation-building and capacity-building. During Afghan presidential and provincial elections,

14 'Australia's Strategic Environment', A Defence Update 2007, [http://www.defence.gov.au/ans/chapter\\_1.htm](http://www.defence.gov.au/ans/chapter_1.htm).

15 D. Filkins, 'Stanley McChrystal's Long War', *New York Times*, 14 October 2009, <http://www.nytimes.com/2009/10/18/magazine/18Afghanistan-t.html>, accessed 17 November 2009.

16 Stephens, 'Perception, Reality and 21st Century Strategy', p. 118.

aircraft have assisted in distributing ballot papers and election materials to remote provinces.<sup>17</sup> With Afghanistan's forbidding terrain and poor road infrastructure, many areas could only be reached through aerial delivery. Ensuring access to remote areas played an important role in connecting rural Afghans to the central Kabul government. Similarly, rotary wing assets are used in a VIP transport role, allowing national and provincial leaders to reach out to their constituents and attend local shuras, rallies and ceremonies. With regard to development, coalition forces are assisting with construction and management of airports around Afghanistan, in order to develop a national aviation infrastructure that is safe, sustainable, and serves the needs of the Afghan people.<sup>18</sup>

#### CASE STUDY: MEDEVAC IN AFGHANISTAN

In recognition of the need to win local 'hearts and minds', coalition force troops in Afghanistan regularly provide emergency medical care to local civilians using airborne MEDEVAC assets. Whether they have been caught in the crossfire of battle, or are suffering from an unrelated medical condition, local Afghan civilians are afforded the same medical treatment as coalition troops. Certainly the need for medical assistance is greater than that which can be provided, particularly given the demand to evacuate battlefield casualties. Yet the willingness of the crews to risk their lives, as well as the resources dedicated to the effort—the fuel costs alone are around US\$3000 an hour—send a strong signal about the value placed on the welfare of the local population.<sup>19</sup>

17 Deanne Hagstrom, 'Afghan pilots deliver election material, personnel', Defence Video and Imagery Distribution System website, <http://www.dvidshub.net/news/56532/afghan-pilots-deliver-election-material-personnel>, accessed 16 November 2011.

18 M.R. Boera (Brig Gen), 'The Combined Air Power Transition Force: Building Air Power for Afghanistan', Senior Leader Perspective, *Air & Space Power Journal*, Spring 2010, <http://www.airpower.au.af.mil/airchronicles/apj/apj10/spr10/boera.html>, accessed 16 November 2011.

19 D Zucchini, 'U.S. medevac crews treat Afghan civilians, win hearts and minds', *Los Angeles Times*, 29 June 2010.

## INSURGENCY OPERATIONS

The role of military forces in COIN operations is well-documented, but conventional forces have also been involved in support to insurgencies. Where an external government deems the removal of a foreign regime to be in its interest, it may provide assets, training or assistance to local insurgent groups. This support may be direct—such as the deployment of military advisers embedded with insurgent groups—or indirect, by establishing no-fly zones or conducting coercion operations against the regime.

### CASE STUDY: OPERATION UNIFIED PROTECTOR

In early 2011, former Libyan leader Muammar Gaddafi sent his forces to violently suppress a popular uprising in the east of the country. The international community sought to protect the civilian population, but was reluctant to mount a full-scale ground intervention. The establishment of a no-fly zone over Libya, under the authority of UN Security Council Resolution 1973, prevented a potential humanitarian atrocity. International leaders emphasised that the no-fly zone was a neutral option, designed not to favour either pro or anti-Gaddafi forces, but simply to protect civilians and civilian populated areas under threat of attack.<sup>20</sup> As with most irregular enemies, pro-Gaddafi forces quickly adapted their tactics. Recognising that their tanks and armoured vehicles were easily located and targeted, regime forces began to operate civilian vehicles and use other methods of deception, complicating NATO's targeting efforts.<sup>21</sup> There is no doubt that the *Operation Unified Protector* air campaign was decisive in the overthrow of Gaddafi's regime, and demonstrated the effectiveness of air power in achieving strategic objectives.

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20 United Nations Security Council Resolution 1973, <http://www.un.org/Docs/journal/asp/ws.asp?m=S/RES/1973%20>, 2011, accessed 04 April 11.

21 James Dunningan, 'NATO Pilots Defeated in Libya', 10 May 2011, Strategy Page website, <http://www.strategypage.com/dls/articles/NATO-Pilots-Defeated-In-Libya-5-10-2011.asp>, accessed 15 November 2011.

## STABILITY AND TRANSITION OPERATIONS

Irregular Warfare campaigns tend to be of greater duration than conventional conflicts, and in most cases intervening forces—whether under the banner of the UN, a regional security organisation, a 'coalition of the willing', or even a unilateral intervention—will at some point transition responsibility for the campaign to local forces. This raises questions about what kind of air power capability will be passed on to the host nation. While training local troops in ground operations has its own challenges, in many cases partner forces already have significant fighting experience, and simply require mentoring in tactics, techniques and procedures, command and control (C2), and combat support functions. The transition of air power capabilities, however, is much more problematic.

In many cases, local partner forces have little to no experience in operating aircraft. Pilot training programs can be complicated by a lack of suitable candidates—particularly given low education and literacy rates in host nations—as well as language and cultural barriers between trainers and students. Military aircraft are generally expensive to purchase and difficult to maintain. Even if the platforms themselves are gifted to the host state, ensuring adequate through-life support and maintenance is challenging. The provision of capabilities that are not suited to the local environment, are not accepted by local forces, or rely too heavily on the expertise and oversight of mentors, will ultimately be ineffective.

### CASE STUDY: THE COMBINED AIR POWER TRANSITION FORCE

Though Afghanistan had previously had an indigenous air force, at the time *Operation Enduring Freedom* began in 2001, it was no longer functional. The task of the Combined Air Power Transition Force is to rebuild the Afghan National Army Air Corps, by introducing new platforms and training Afghan airmen.<sup>22</sup> Aircraft provided to the new air force have generally been those most critical to supporting ground forces, such as troop transport and utility helicopters. Aircrew induction programs are abbreviated, and the requirement

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22 Boera, 'The Combined Air Power Transition Force: Building Air Power for Afghanistan'.

to conduct training sorties must be balanced with the ongoing demand for aircraft and crews to perform operational missions. Building a capable local force not only allows for the transition to lead security responsibility, it can also serve as a source of pride and achievement for the local population.

## COUNTERTERRORISM OPERATIONS

As with all forms of IW, CT campaigns should not be focused solely on military solutions. Efforts to address terrorism must be integrated into a whole-of-government effort involving domestic law enforcement agencies, counter-radicalisation programs and regional intelligence sharing. The primary, and most publicised, role of air power in CT operations is kinetic strike. The ability of air assets to conduct precision, targeted attacks against high value individuals makes them the preferred weapon in the fight against terrorism. The use of remotely piloted aircraft (RPA) to conduct these strikes provide further benefits, as the aircraft can operate undetected and at long ranges. The use of unmanned aircraft also eliminates the risk of pilots being forced to eject over enemy territory and potentially being captured. Even in cases where a terrorist target is significant enough to risk a ground incursion, as with the raid to capture Osama bin Laden, helicopters are still required to provide a rapid, stealthy ingress and egress of troops.

Air power can also be used in a defensive CT role, to deter and potentially respond to attempted terrorist activity. The significance of the air domain in the domestic security environment became evident following the September 11 attacks, which demonstrated the devastating use of air power by terrorist groups. During the 2011 Commonwealth Heads of Government meeting in Perth, Royal Australian Air Force fighter jets and surveillance aircraft, as well as Army Black Hawk helicopters, were deployed as part of the wider security operation.<sup>23</sup>

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23 Australian Defence Force, 'Hornets heading to Perth in support of CHOGM', 20 October 2011, <http://news.defence.gov.au/2011/10/20/hornets-heading-to-perth-in-support-of-chogm/>, accessed 01 November 2011.

## CASE STUDY: US 'DECAPITATION' STRIKES

Air power allows a state to conduct military operations far into another nation's territory, without the deployment of troops or even a declaration of war. A US deployment of ground troops in Pakistan would meet intense resistance from the local population, Pakistani leadership and the American domestic audience. Its campaign of RPA strikes in Pakistan's border regions—while certainly controversial—allows it to pursue its strategic objective of 'decapitating' Al-Qaeda and other global jihadist groups, without a militarily and politically costly ground deployment. United States President Barack Obama has increased the rate of these attacks, with an RPA strike occurring on average once every four days.<sup>24</sup> The United States is also reported to have conducted RPA strikes in Yemen and Somalia, and this air campaign remains one of the central elements of Washington's CT strategy.

## INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE OPERATIONS

Commanders today want to 'see and understand everything on a battlefield'.<sup>25</sup> Across the entire spectrum of conflict, the ability to understand your enemy is a fundamental requirement, and in IW this is particularly challenging. The irregular adversary is dispersed among the population, has varying motivations and ideologies, and is constantly evolving. Intelligence, Surveillance & Reconnaissance (ISR) is critical to locate, track and target such an enemy. With their characteristics of reach, pervasiveness and flexibility, air platforms are ideally suited for ISR missions. Remotely piloted aircraft are used extensively for surveillance and reconnaissance missions, due to their ability to loiter over a target area or be quickly redirected to emerging threats mid-mission. Unmanned aircraft vary from large armed platforms such as the

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24 'Flight of the Drones: Why the future of air power belongs to unmanned systems', *Economist*, 08 October 2011.

25 Admiral William, A., "Owens Says Technology May Lift 'Fog of War': Breakthroughs Could Give Forces Total Command of Future Battlefield," *Inside the Navy*, 23 January 1995, p. 3, quoted in Watts, Barry D., 'Doctrine, Technology, and War', *Air & Space Doctrinal Symposium of 1996*, Alabama, available at <http://www.airpower.maxwell.af.mil/airchronicles/cc/watts.html>, accessed 13 May 2010, p. 17.

Reaper, to those small enough to be hand-launched by ground units. The United States Air Force future RPA concept envisions the use of 'nano' RPAs in IW, which can operate undetected among small groups of enemy commanders, constantly feeding information back to an intelligence cell.<sup>26</sup>

#### CASE STUDY: THE PERSISTENT THREAT DETECTION SYSTEM

One of the air surveillance systems used in IW today is remarkably similar to that used in the first recorded air reconnaissance mission. Air balloons were used in a military role as early as 1794, when French forces used the *Entreprenant* to conduct aerial reconnaissance of enemy positions.<sup>27</sup> Today, aerostats hover over many coalition bases in Afghanistan, providing constant surveillance of the surrounding terrain. Termed the 'Persistent Threat Detection System' (PTDS), the balloons provide exactly that—low cost, long endurance surveillance of the surrounding areas to provide forewarning of potential threats.<sup>28</sup> The concept of these systems is largely unchanged from that initial balloon flight, though sophisticated sensors allow the modern PTDS to operate in a greater variety of environmental conditions.

#### INFORMATION OPERATIONS

Achieving the broader political goals of a military campaign requires effective information operations, designed to influence the perceptions and behaviour of an adversary. Air power practitioners must be aware not only of air power's physical effects, but also the psychological effects it may have on both the enemy and the local population. Air assets may be employed

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26 'United States Air Force Unmanned Aircraft Systems Flight Plan 2009-2047', *Headquarters United States Air Force*, Washington DC, 18 May 2009, quoted in David Deptula (Lt Gen), 'The Information in War Revolution: ISR and RPA in the USAF', *2010 RAAF Air Power Conference: The Art of Air Power*, Air Power Development Centre, Canberra, September 2011, p. 217.

27 Walter J. Boyne, *The influence of air power upon history*, Pelican Publishing Company, Louisiana USA, 2003, p. 379.

28 Lockheed Martin, 'Persistent Threat Detection System', <http://www.lockheedmartin.com/products/PTDS/index.html>, accessed 16 November 2011.

for dedicated PSYOPS missions, such as dropping leaflets or broadcasting propaganda messages. Non-kinetic actions—those that don't involve physical damage to the enemy's forces or facilities—exploit the asymmetric advantage of air power on the irregular enemy. One effective measure is a simple 'show of force' or 'show of presence'—a low-level, high speed pass by a fighter jet over insurgent positions, designed to intimidate and disperse enemy fighters.<sup>29</sup>

Just as friendly forces mount information operation campaigns, so too does the enemy. The Internet has become a powerful tool for recruitment of sympathisers and dissemination of insurgent or terrorist messages. Irregular groups often have their own spokespeople, and can release information about an incident within hours of it occurring. This information is usually fabricated or exaggerated in order to convey particular strategic messages to the local population, Allied troops, or the domestic audiences of intervening countries. Any mistakes made by Allied forces—such as accusations of civilian casualties—are broadcast by the insurgents to undermine support, and can force changes in coalition tactics and methods. As Lieutenant General David Deptula, US Deputy Chief of Staff for ISR, explains; 'Air power is one of those military instruments they cannot deny us physically, so they do it with information, creating the effects that sometimes cause us to limit its employment ourselves.'<sup>30</sup>

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29 J. Michaels, 'Airstrikes in Afghanistan drop by almost half', *USA Today*, 08 September 2009, [http://www.usatoday.com/news/military/2009-09-08-airstrikes\\_N.htm](http://www.usatoday.com/news/military/2009-09-08-airstrikes_N.htm), accessed 04 April 2010.

30 Deptula, 'The Information in War Revolution: ISR and RPA in the USAF', p. 199.

## AIR POWER CONSIDERATIONS IN IRREGULAR WARFARE

### TARGETING

The traditional doctrine on targeting was based on a 72 hour cycle of identifying targets, determining the effect required, apportioning assets and conducting battle damage assessment.<sup>31</sup> In an irregular conflict, the majority of targets will be dynamic rather than deliberate, requiring the targeting cycle to be compressed to hours or even minutes. Irregular actors rarely coalesce in large formations of fighters, don't operate from fixed bases, and move freely in populated and urban environments. There is a requirement for constant air coverage, with emerging targets being passed to crews in flight from ISR feeds or ground forces. Over 80 percent of airstrikes in *Operation Enduring Freedom* in 2001 were against 'flex' targets, whose coordinates were unknown pre-departure.<sup>32</sup>

Precision strike is vital to the IW campaign. Modern technology allows air power to strike with far greater accuracy; providing options such as using smaller yield weapons, striking from a particular angle, or 'burying' a bomb to confine the explosive effect. Precision-guided weapons are becoming the standard for air attacks, rising from 9 percent in the Gulf War to 35 percent in Kosovo, to 60 percent in the initial Afghanistan campaign.<sup>33</sup> During *Operation Unified Protector* in Libya, this figure increased to 100 percent.<sup>34</sup> Campaigners should also analyse the potential second and third order effects of each strike. Destroying any kind of dual-use facilities, which are used by the

31 'Targeting', US Air Force Doctrine Document 2-1.9, 08 June 2006, p. 25, <http://www.fas.org/irp/doddir/usaf/afdd2-1.9.pdf>, accessed 30 November 2011.

32 Grant, 'Air Power's Challenges in an Age of Irregular Warfare', p. 176.

33 Alan Stephens, 'The Afghanistan Experience', *Conflict, the State and Aerospace Power: 2002 RAAF Aerospace Conference*, Canberra, 2003, p. 193.

34 Ralph Jodice II (Lt Gen), Combined Force Air Component Commander for Operation Unified Protector, quoted in John A. Tirpak, 'Lessons from Libya', *Air Force Magazine*, available at <http://www.airforce-magazine.com/Features/airpower/Pages/box110811libya.aspx>, accessed 25 November 2011.

local population as well as enemy troops, can engender resentment towards the intervening force.

One option for targeting the enemy in irregular conflict is to conduct air interdiction, which aims to 'divert, disrupt, delay, or destroy the opponent's military potential before it can be brought to bear effectively against friendly forces'.<sup>35</sup> Interdiction involves targeting major lines of communication, which restricts the freedom of manoeuvre of enemy forces; or targeting their supply routes, which prevents them from sustaining operations. In IW, however, the enemy often lacks the logistical demands of conventional military forces. Throughout the Vietnam War, the Viet Cong needed few supplies—as little as 13 tons daily in the 1960s—and had no large production capacity.<sup>36</sup> Even where an interdiction campaign targets valuable assets and successfully prosecutes these attacks, a resourceful enemy will generally find ways to continue fighting.

### COMMAND AND CONTROL

In previous air campaigns, strategic-level military and political leaders remote from the battlespace have been criticised for trying to interfere at the tactical level—becoming what is described as a 'tactical general'.<sup>37</sup> During the Vietnam War, US President Lyndon Johnson often demanded that he be personally involved in the selection and approval of targets, which unduly restricted military courses of action.<sup>38</sup> Even when valuable targets were located, operations were delayed while waiting for permission to bomb them. More recently, US ground forces in Afghanistan in 2002 complained that intelligence

35 Royal Australian Air Force, Australian Air Publication 1000—D, *The Air Power Manual*, Air Power Development Centre, Canberra, 2007, p.148

36 Mark Clodfelter, *The Limits of air power: the American bombing of North Vietnam*, Free Press, New York, p. 245.

37 P.W. Singer, 'Tactical Generals: Leaders, Technology, and the Perils of Battlefield Micromanagement', *Australian Army Journal*, Vol. 6, No.3, (Summer 2009), p. 147.

38 'Not Postured for a Long War: Rolling Thunder', *Why Air Forces Fail: Learning from history's lessons*, Air Force Association, available at [http://www.afa.org/edop/Why\\_Air\\_Forces\\_Fail\\_2.pdf](http://www.afa.org/edop/Why_Air_Forces_Fail_2.pdf), accessed 01 November 2011.

from RPAs was relayed back to their headquarters rather than to the soldiers themselves.<sup>39</sup>

Highly centralised C2 is not appropriate for IW, where many targets are transitory or are called in by ground troops who require immediate air support. C2 must be decentralised to an extent where tactical commanders have the authority to make decisions and exploit opportunities as they arise. At the same time, where resources are limited, a central air component commander should determine the prioritisation and apportionment of assets; to ensure they are utilised most efficiently in support of operational level objectives.<sup>40</sup>

## TECHNOLOGY

The theory of 'technological determinism' maintains that superior technology can guarantee combat success.<sup>41</sup> Technological determinism operates on the assumption that it is necessary to fight technology with technology. Irregular actors who lack access to modern technologies have demonstrated numerous times throughout history that it is possible to fight a technically superior adversary—and win. In IW, 'a determined enemy may be able to use geography, climate, and ingenuity to blunt the cutting edge of technology'.<sup>42</sup>

## CASE STUDY: OPERATION IGLOO WHITE

During the Vietnam War, the Viet Cong employed a strategy that minimised and even exploited the superior technology of American forces. Operation Igloo White was the codename given to the US plan to track movement of enemy personnel and supplies along the Ho Chi Minh trail by distributing electronic sensors throughout the jungle. These sensors were

39 Stephens, 'The Afghanistan Experience', p. 197.

40 Allan G. Peck (Maj Gen), 'Airpower's crucial role in irregular warfare', Senior Leader Perspective, *Air Power Journal*, Summer 2007, <http://www.airpower.au.af.mil/airchronicles/apj/apj07/sum07/peck.html>.

41 Watts, 'Doctrine, Technology, and War', p. 6.

42 Bernard C. Nalty, 'The War Against Trucks: Aerial Interdiction in Southern Laos, 1968–1972' *Air Force Museums and History Program*, Washington DC, 2005, p. v.

developed specially for the purpose, and were designed to feed information on the size and location of enemy convoys. Considerable resources were devoted to the program, which involved 20 000 sensors, aircraft orbiting overhead, and a newly constructed Infiltration Surveillance Centre to monitor incoming feeds.<sup>43</sup> To combat this extensive technological network, North Vietnamese fighters simply placed covers over sensors they located, preventing them from transmitting. They also carried out a rudimentary deception plan by driving a single truck multiple times past the same sensor, in order to convince American intelligence analysts that a large convoy was passing through the area—provoking a bombing attack that wasted US manpower and resources.<sup>44</sup>

## AIR-GROUND INTEGRATION

Effective integration with ground forces is critical to maximising the utility of air power in the IW campaign. Even a war that appears to be ground-centric will require 'complete air overwatch' if ground troops are to operate confidently and efficiently.<sup>45</sup> Small groups of highly trained Special Forces, enabled by flexible air mobility, ISR and close air support, provide one of the most effective military contributions to IW. Too often inter-service debates about the role of air power are overly parochial and defensive—opponents of air power claim it will only ever act in a supporting role, and that ground troops have repeatedly been let down by air forces; while proponents tend to 'oversell' its capabilities, asserting that air power can win wars on its own.

Ground personnel often argue that platforms such as helicopters and RPAs should be controlled by Army members, as they are viewed as being in direct support of the ground fight. These personnel often underestimate the considerable efforts to properly process, exploit and disseminate this information, and ensure it is fused with other intelligence feeds to establish a comprehensive operating picture. Air power works most effectively when there

43 *ibid.*

44 J.T. Correll, 'Igloo White', *Air Force Magazine*, November 2004, Vol. 87, No. 11, <http://www.airforce-magazine.com/MagazineArchive/Pages/2004/November%202004/1104igloo.aspx>.

45 Grant, 'Air Power's Challenges in an Age of Irregular Warfare', p. 184.

are high levels of integration with ground forces, and each understands the capabilities, limitations and requirements of the other.

#### CASE STUDY: THE RAAF SPECIAL TACTICS SQUADRON

In 2008 the RAAF formed a new squadron to train air specialists to be embedded into Special Forces units.<sup>46</sup> Irregular Warfare operations often require small units to operate on long-range patrols, where they are unable to rely on artillery support or quick reaction forces. In these circumstances, the ability to call for the right kind of air support—whether it be strike, reconnaissance or extraction—can be crucial to success on the ground. Embedded RAAF personnel directing airstrikes in support of ground forces provide their expertise in air weapons and systems to achieve the best effect. The improved coordination and precision that air specialists offer also aims to reduce the risk of collateral damage.<sup>47</sup>

#### LOGISTICS

The logistical considerations in IW will often differ from conventional conflict; from forward basing, to resupply missions, to the type of platforms operated. Air mobility is one of the critical combat enablers in irregular warfare. Coalition forces must be able to rapidly respond to emerging situations, and air lift provides the capability to transport personnel and equipment in the most efficient manner. Air drop missions to resupply bases are vital, with troops often dispersed across remote forward operating bases and combat outposts. In environments such as Afghanistan where improvised explosive devices make road travel slow and hazardous, aerial resupply is far less risky than a ground logistics convoy.

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46 T. Allard, 'New squadron will aim to cut civilian deaths', *Sydney Morning Herald*, 17 March 2008.

47 Geoff Brown (AIRMSHL, then RAAF Director-General Capability Planning), quoted in Allard, 'New squadron will aim to cut civilian deaths'.

Irregular Warfare has challenged traditional concepts of war as a 'linear' battlespace, with a forward line of troops and defined rear areas.<sup>48</sup> Instead, airmen and air assets will often be required to operate from bases deep within enemy or contested territory, and can expect to be targeted by irregular forces. Commanders must determine whether aircraft should be deployed within country, or operate from bases in neighbouring countries which can be more easily secured. Decisions must also be made about the most appropriate assets to be committed to an IW campaign. The United States military has been investigating the acquisition of aircraft specifically designed for IW.<sup>49</sup> Often slow, rugged propeller-driven aircraft are better suited to such missions than sophisticated high-speed jets. Modern jet fighter aircraft, while capable of performing a number of IW roles, are expensive to buy and operate, and require significant logistical footprints to keep them mission-capable.<sup>50</sup>

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48 Grant, 'Air Power's Challenges in an Age of Irregular Warfare', p. 189.

49 F. Michael, 'USAF Looks To Beef Up Capability Against Insurgents And Terrorists', *Aviation Weekly*, [http://www.aviationweek.com/aw/jsp\\_includes/articlePrint.jsp?headline=USAF%20Looks%20To%20Beef%20Up%20Capability%20Against%20Insurgents%20And%20Terrorists%20&storyID=news/USAF08146.xml](http://www.aviationweek.com/aw/jsp_includes/articlePrint.jsp?headline=USAF%20Looks%20To%20Beef%20Up%20Capability%20Against%20Insurgents%20And%20Terrorists%20&storyID=news/USAF08146.xml), accessed 01 November 11.

50 Glen Beck, (WGCDR), 'Offensive Air Power in Counter-Insurgency Operations: Putting Theory into Practice', *2008 Papers: Paper No 26*, Air Power Development Centre, Canberra, p. 33.

## CONCLUSION

In modern warfare the objectives of a campaign are often more confined than total annihilation, and require a more considered application of force. United States Senator John McCain once asserted that ‘Limited actions beget limited results’.<sup>51</sup> While some see this as a criticism of restricted military operations, it can also be concluded that a limited use of force will create the effects required in a limited war. In the IW environment, air power—along with other forms of military power—must be applied precisely, proportionately and in accordance with the strategic campaign plan. In roles such as air mobility, close air support, ISR and precision strike, air power can prove critical to the fight. By developing an understanding of the different characteristics and requirements of IW, commanders and operators can ensure that air power is employed to the full extent of its capabilities.

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51 Ellwood P. Hinman, ‘Context and theory: Lessons from Operation Allied Force’, *Air Power History*, Vol.48, No.2 (Summer 2001), pp. 26-33.

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'PER ARDUA AD ASTRA'  
THE CHALLENGE OF DELIVERING SPACE POWER  
MASTERY WITHIN THE ROYAL AUSTRALIAN AIR FORCE

SQUADRON LEADER REX HARRISON

## INTRODUCTION

During its long history, the Royal Australian Air Force (RAAF) has developed a mastery of air power through confronting and overcoming a series of challenges in the air domain, and in the process, fulfilling its motto of '*Per ardua ad astra*' ('Through Struggle to the Stars'). However, the ability of the Air Force to deliver air power will be increasingly dependent on its mastery of space. A major challenge for the RAAF will therefore be how to develop mastery of space power from within an organisation that has for 91 years been dedicated to mastering the delivery of air power.

Although the space domain has been used to significant effect by the Air Force, Defence and Australia for decades, space has been generally considered a benign operating environment. Recent events have, however, shown it to be an increasingly congested, contested and competitive environment, which is of growing concern to the Australian Defence Force's (ADF) assured access to space for critical enabling capabilities. In recognition of the increasing concerns regarding potential threats to space-based capabilities, the Air Force, on behalf of Defence, has expanded its joint responsibilities for space. To meet these responsibilities it is investing in new space capabilities and growing the expertise of RAAF personnel, in order to meet its obligations to deliver joint space effects and to advise Defence and Government on the application of space power in the defence of Australia.

While professional mastery has long been acknowledged within Air Force as a key enabler of air power, and Chief of Air Force (CAF) has stated the intent to extend this mastery into the space domain, the specific means by which this will be achieved have not been fully identified. Without a clear vision of the path ahead, particularly given the resource constrained environment Defence will continue to experience in the coming decades, Air Force risks being unable to develop the appropriate breadth and depth of space expertise necessary. Failure to do so risks both the Air Force's reputation and the ability of Defence to meet the roles required of it by Government.

This essay will firstly review recent developments within the Air Force regarding the space domain, including current space initiatives. Next, it will explore the broad requirements for the professionalisation of a space cadre in order to provide expert advice on the needs and development of

space capabilities and concepts for employing space power<sup>1</sup>, based around professional mastery of the domain. Obstacles to achieving this mastery will then be explored, concluding with a brief examination of potential mitigation strategies.

## THE ADF USE OF SPACE

As a technologically advanced Defence force, the ADF has been a user of products and services from space for decades. Defence continues to become increasingly reliant on the space-based capabilities for Satellite Communications (SATCOM), remote sensing (both for Intelligence, Surveillance and Reconnaissance (ISR) and meteorology) and Position, Navigation and Timing (PNT) services (primarily through the United States Global Positioning System (GPS)).<sup>2</sup> Locating capabilities in space ('the ultimate high ground') continues to be attractive due to the coverage, perspective, persistence and precision provided by space-based systems<sup>3</sup>, despite the substantial costs of developing, launching and operating such capabilities.

The ADF application of these products and services has been a significant force multiplier to terrestrial forces and, therefore, the focus of the development of Australian military space power has been on 'the ability to enable and enhance terrestrial effects through exploitation of the space environment'.<sup>4</sup> While appropriate in an environment where space products and services were always available when required, this view has constrained the ADF from considering other space power roles. In particular, the ability to maintain access to space—through the safe and secure deployment and operation of spacecraft and payloads—against an adversary who seeks to deny them to us has not been considered to any great extent. Due to a combination of a benign operating

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- 1 For the purposes of this essay, space power will be defined as 'the total strength of a nation's capabilities to conduct and influence activities to, in, through and from space to achieve its objectives' US DoD Joint Publication 3-14 – *Space Operations*.
  - 2 Department of Defence, *Inquiry into the current state of Australia's space science and industry*, submission to the Senate Standing Committee on economics, 2008, p. 5.
  - 3 US Air Force Doctrine Document 2-2 – *Space Operations*, 27 November 2006, p. 2.
  - 4 As defined in Royal Australian Air Force, Australian Air Publication 1000-D, *The Air Power Manual*, Air Power Development Centre, Canberra, May 2008, p. 4.

environment (through limits in technology and international custom), the limited Australian-owned spacecraft in orbit, and the 'out-sourcing' of the operation of spacecraft and payloads to alliance or commercial entities, Defence has generally not had to consider Australia's means of assuring our access to this domain.

Recent events in space have demonstrated that this is no longer a viable position to take. The space domain has become increasingly congested, contested and competitive, due in part to the rapid growth in demand for space products and services, leading to a commensurate growth in the number of satellites in orbit operated by an increasing number of countries and commercial entities.<sup>5</sup> Recent events such as the intentional destruction of satellites by both China<sup>6</sup> and the United States<sup>7</sup>, and the subsequent accidental collision<sup>8</sup> that destroyed an active Iridium communications satellite, have served to illustrate the fragility of space systems to intentional or accidental interference.<sup>9</sup> As a result, no less a space power than the United States has begun to exercise the concept of 'a day without space', to better understand the vulnerabilities and challenges confronting their abilities to respond or recover from the loss of space capabilities.<sup>10</sup>

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5 By 2010, nine states possessed space launch capabilities, with fifty states having registered ownership of satellites in orbit. *Space Security 2011*, Project Ploughshares, Waterloo, August 2011, p. 77.

6 In 2007, China conducted an ascent anti-satellite missile test of the defunct Fengyun 1C weather satellite in low-Earth orbit. M.P. Pillsbury, *An Assessment Of China's Anti-Satellite And Space Warfare Programs, Policies And Doctrines*, U.S.-China Economic and Security Review Commission, 19 January 2007, p. 3.

7 In 2008 the US Navy conducted a missile engagement of the failed USA-193 satellite which was decaying from orbit. American Forces Press Service, 'Navy Missile Hits Decaying Satellite Over Pacific Ocean', Washington, 20 February 2008.

8 In 2009 a collision between the defunct Russian COSMOS-2251 communications satellite and the operational Iridium-33 satellite in low-Earth orbit destroyed the Iridium satellite, degrading communications coverage until a back-up satellite could be activated. Malik, T. and Iannotta, B., 'U.S. Satellite Destroyed in Space Collision', 11 February 2009.

9 F.A. Rose, 'Leading With Diplomacy to Strengthen Stability in Space', *USSTRATCOM Cyber and Space Symposium*, Omaha, 17 November 2011.

10 *A Day Without Space: Economic and National Security Ramifications*, George C. Marshall Institute, Washington, 2008.

In Australia's case, it has been assessed that Defence's terrestrial capabilities are increasingly dependent on space systems, with over 50 percent of projects in the 2006-2016 Defence Capability Plan possessing a first-order space dependency<sup>11</sup>—a level of dependency that will only increase over time, with potentially critical implications to joint warfighting. Loss of access to satellite communications would limit Defence's ability to command and control forces at extended ranges, as well as denying deployed forces reach-back to strategic agencies. Loss of space-based overhead remote sensing capabilities would similarly limit the ability of the ADF to maintain situational awareness of an operating environment from a distance. Interference with GPS could potentially degrade the accuracy and performance of many modern platforms, networked communications systems, and precision-guided weapons, reducing their capabilities on the modern battlefield.

This is not to say that the ADF's terrestrial forces would be unable to continue to successfully prosecute the conduct of operations following the loss or degradation of access to the space domain—for the most part, there are terrestrial analogues for space-derived services, and redundancy has also been built into systems and operating procedures where the risk of loss has been recognised. However ADF operations would become slower, less coordinated and precise, resulting in the expenditure of greater resources while increasing the potential for casualties and collateral damage. Such a result would undermine the ADF's intent to use the concept of 'manoeuvre warfare' to offset the limitations of a small defence force, operating in a resource-constrained environment.<sup>12</sup>

This realisation has manifested itself in a series of initiatives within Defence in order to better understand the ADF's dependencies of terrestrial capabilities on space-based capabilities (and their vulnerabilities in the event of the denial or degradation of space), and to invest in capabilities that support a continued and assured access to space.<sup>13</sup> In parallel, Government has investigated and acknowledged the reliance that Australia as a whole has developed on the space

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11 Department of Defence, *Inquiry into the current state of Australia's space science and industry*, submission to the Senate Standing Committee on economics, 2008, p. 2

12 Department of Defence, *The Australian Approach to Warfare*, p. 24.

13 Department of Defence, *Defending Australia in the Asia Pacific Century: Force 2030*, 2 May 2009, p. 85.

domain, and the need to form a whole-of-government perspective on space dependencies.<sup>14</sup>

## THE RAAF AND SPACE POWER

As a result of increased importance of space power within Defence, several responsibilities, previously unassigned within Defence, have been assigned to CAF. Specifically, CAF (through the Defence Space Coordinating Office) is responsible for:

- Defence Coordinating Capability Manager for Space, as the custodian of the joint position on Defence space;
- Capability Manager for space-related warfare, space environmental awareness and space-based PNT; and
- Guiding and monitoring the development and integration of space power in support of the effective delivery of air power within Air Force.<sup>15</sup>

Additionally, in recognition for the need to assure access to space, Defence has also committed itself to developing a Space Situational Awareness capability, as a joint capability project in collaboration with allies, in order to monitor space objects and events that could compromise the security of Defence and allied operations, activities and interests.<sup>16</sup>

Given the significant change in approach to the space domain outlined above, the Air Force has acknowledged within its space policy the need to increase and formalise the space expertise held by its personnel. Observing CAF's responsibilities, it can be deduced that the RAAF requires a body of expertise in the space domain, which can support three main areas:

- Awareness of the dependency of operations in all terrestrial

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<sup>14</sup> Department of Defence, *Lost in Space? Setting a new direction for Australia's space science and industry sector*, final report of the *Inquiry into the current state of Australia's space science and industry*, submission to the Senate Standing Committee on economics, Canberra, 2008, p. 1

<sup>15</sup> DI(AF) OPS 3-9, *Air Force Space Policy*, 19 April 2010, p. 4.

<sup>16</sup> AUSMIN 2010, *Australia-United States Space Situational Awareness Partnership*, Melbourne, November 2010.

domains on space-based capabilities.

- The development and delivery of the space power capabilities it has accepted responsibility for as Capability Manager.
- Understanding of the application of space power as an element of national power, in order to provide relevant advice and guidance to both Defence and Government.

The need for such expertise was recognised early, and a number of measures have already been implemented across Air Force to address aspects of each area. These have included the initiation of internal Defence space awareness training, the expansion of vocational training opportunities with other space powers and post-graduate education, both domestically and internationally. At the policy level, these measures have been encapsulated within the concept of 'space professional mastery', a concept previously integrated into the development of air power.

Well understood by terrestrial forces, the need for professional mastery of space power was stated in the 2009 Defence White Paper (the White Paper noted the requirement for the 'development of a career stream for space professionals'<sup>17</sup>) and has been subsequently acknowledged in RAAF space policy.<sup>18</sup> The Air Power Manual has defined professional mastery (with regards to air power) as 'knowledge and understanding, coupled with experience and confidence, which empowers a person to realise the full potential of air power in operations'.<sup>19</sup>

At its core, professional mastery is based upon technical mastery of particular roles, missions and platforms, and the individual's ability to tactically employ their capability. Once an individual has achieved technical mastery, they have the basis upon which to build professional mastery, through development of their knowledge and understanding of military power, and how the application of such power occurs within a Joint and whole-of-government perspective. Underpinning such development is an organisational design that

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<sup>17</sup> *Defending Australia in the Asia Pacific Century: Force 2030*, p. 85.

<sup>18</sup> *Air Force Space Policy*, p. 4.

<sup>19</sup> AAP 1000-D, p. 4.

provides a learning environment, supported by doctrine, which provides a basis for the design and employment of the force.<sup>20</sup>

## THE CHALLENGES OF SPACE EXPERTISE

With the increased attention and resources devoted to space by the RAAF, and the understanding Air Force has regarding the importance of professional mastery, the problem of generating and maintaining the required cadre of space expertise would appear to be a simple one. However, while the promulgation of the Air Force space policy has provided a significant statement of intent, there are a number of challenges to be overcome before the policy intent can become a reality.

As a first challenge, the RAAF must overcome the lack of current definition as to the boundaries of the space professional mastery it plans to acquire within the joint environment. While CAF has accepted a range of previously unassigned responsibilities for space power, the Air Force will not be the sole source of space power within the ADF. The majority of the ADF's space capabilities will instead continue to be acquired, maintained and operated by the other Services and other Defence groups.<sup>21</sup> The RAAF will therefore be generating expertise within a Defence environment containing significant, if dislocated and disconnected, pre-existing space expertise. Failure to manage the boundaries of the mastery desired risks, at best, the waste of resources expended duplicating pre-existing space expertise. At worst, perceptions of Air Force encroachment on the responsibilities of external stakeholders risks alienating the other space power capability managers, diminishing CAF's ability to act as the joint custodian for space.

Within Air Force, there are similarly a number of challenges that must be overcome before the link between the policy intent and the actual delivery of space expertise can be effectively made. At its core, the issue of defining who will comprise the cadre of space professionals within RAAF (who by

<sup>20</sup> *ibid*, p. 18.

<sup>21</sup> Including, for example, the Chief Information Officer Group for satellite communications and the Defence Imagery and Geospatial Organisation for overhead imagery. *Inquiry into the current state of Australia's space science and industry*, p. 1.

extension will develop Air Force's space professional mastery) has not been fully addressed. Whilst the Air Force Space Policy identifies the Air Combat Officer category as a focus for development<sup>22</sup>, it is silent as to the roles of other categories (such as Engineering and Legal specialisations) in developing space expertise. Without this resolution, Air Force risks expending scarce training resources in an ad-hoc manner that does not collectively improve the RAAF's space expertise.

Air Force 'space personnel' are currently an undefined body of people, spread across employment areas in RAAF and other Defence programs. In broad terms these personnel fall into three main groups, with respect to space power:

- Personnel posted to dedicated space positions, who perform duties that generate effects in the space domain—rather than terrestrially—as their primary result. These personnel are employed in areas such as space situational awareness and maintaining and assuring the operation of platforms within the space domain.
- A group of personnel who control and manage space-based capabilities, but whose space effects are developed in order to directly support terrestrial effects. These personnel manage SATCOM payloads, exploit remote sensing platforms for ISR and meteorology, and manage the ADF's access to and employment of the GPS signal for position, navigation and timing.
- The third group, the largest of them, comprises the bulk of the RAAF, who as air power masters will integrate space effects into the conduct of terrestrial operations.

Determining which of these groups is part of the space cadre is a matter of interpretation that will significantly impact the delivery of training and education (as well as the resultant size and diversity) of the space cadre. Limiting it to the core of dedicated space personnel would be simple, but would exclude the majority of personnel with a professional interest in space. Conversely, opening the cadre too widely risks diluting the focus on *space* professional mastery with the major business of the RAAF, the mastery of *air* power.

<sup>22</sup> *Air Force Space Policy*, p. 3.

Once a decision is made as to the nature of the space cadre, the next important issue to address is the actual nature and level of expertise required for individuals. The roles and tasks of space power are as diverse as those in air power—space professionals are therefore not be a homogeneous group. Instead the cadre will comprise managers, maintainers and operators with specialist skills in discrete mission areas. A practitioner in space situational awareness, for example, has a different background to a SATCOM payload operator; while the former may have a better appreciation of orbital mechanics, they would have had limited opportunity to develop expertise in communications links and payload management. Thus any solution for developing space professional mastery, beyond providing a core of common space knowledge across the cadre, will be required to be flexibly applied across a number of specialisations to meet their particular needs.

Following the definition of training requirements, the next issue to resolve is the mechanisms by which personnel receive necessary training, experience and professional development opportunities. It should be noted that, apart from emerging space roles (such as space situational awareness), personnel performing existing space-related duties are already managed and developed within existing training, education and career management structures, having been drawn from existing specialisations within Air Force. Given this, and the limited resources available, it is probably not feasible (nor desirable) to transition these personnel into a separate space specialisation. Hence, whether or not personnel are designated as part of the 'space cadre', the development of space professional mastery will need to be accommodated within the existing development paths of employment specialisations, and balanced against the underlying RAAF requirement for air power mastery.

Once the space cadre has been identified and trained, the final issue to be faced is that of gaining experience and confidence through the application of space power, which is another necessary step in professional mastery.<sup>23</sup> While the RAAF devotes significant resources to training and exercising, space power is currently exercised as part of single service and joint activities, with training outcomes focussed on terrestrial goals. Space power, like air power, covers activities across the full spectrum of conflict, and not all are easily exercised through routine daily operations. Additionally, there will be aspects of space

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23 AAP 1000-D, p. 25.

power (particularly the ability to deny an adversary access to space) that Australia will not possess for the foreseeable future—for both capability and policy reasons. However, were these roles to be executed by adversary or allied powers, Australia would be directly impacted. The challenge for the space cadre will therefore be to gain sufficient experience and exposure to these aspects of space power, in order to protect Defence's capabilities.

Thus, while the broad path to mastery of the space domain has been established, there are specific challenges that must be overcome in order to achieve the stated goal. Failure to do so risks Air Force being unable to develop the appropriate breadth (in terms of the coverage of the required space roles and tasks) and depth (in terms of the degree of understanding of particular roles and tasks) of expertise. Such a failure would lead to an inability to effectively deliver space power, and to advise both Defence and Government on the employment of space power in the defence of Australia. Air Force should therefore consider measures to link the policy intent with the deliver of space professionals.

#### STRUGGLING FOR THE STARS

As a first step to create this link, a clear (and detailed) articulation of Air Force's aims and end-state for space expertise must be developed in order to effectively engage with joint stakeholders. Promulgation of these aims will support the coordination and demarcation of responsibilities between stakeholders and where the RAAF intends to focus its scarce personnel resources to meet Defence's major expertise requirements. Given the historical ignorance of Defence regarding space mission assurance, I would argue that an initial focus for RAAF space expertise should be in the protection of space assets and the negation of adversary capabilities space, including space situational awareness.

Once this is established, the next step in mitigating the risk is through a more detailed investigation of the design and structure of the organisation for Air Force space personnel. The aim of this investigation would be to identify and implement the requisite support mechanisms for the development of space professionals, including the determination of the training and education requirements for individual space professionals and an examination of potential career paths that balance core specialisation requirements (supporting the

development of air power mastery) with the development of space professional mastery. This would result in a clearer definition of the nature of the space cadre within the RAAF, and ensure an appropriate balance is maintained between air and space power mastery.

In support of the resultant cadre, the RAAF should ensure that it develops and maintains appropriate space power doctrine to provide a basis for dialogue, professional development and wider understanding of space power, both internally and externally to the space cadre. Currently, space concepts are described by the RAAF in the *Air Power Manual*, and at the joint level in ADDP 3.18 - *Space Operations*. Both documents, although important steps in developing space power, are currently focused on the space power roles employed by the ADF, rather than all aspects of space power, as an element of national power exercised through the space domain. While noting the limitations and constraints of ADF participation in space, doctrine must reflect the full roles of space power, to provide a philosophical basis for the development of space professionals, in the same way as the current Air Power Manual describes air power roles 'that are common across all modern air forces, as well as aspects of air power that are tailored to meet the specific requirements of our Air Force'.<sup>24</sup>

Following this, the RAAF should explore how to maximise the participation of external contributors to the understanding and analysis of space power in defence of Australia. Given the limited personnel that Air Force will be able to devote to space power mastery, and the fact that Air Force will not be the sole space power stakeholder, the RAAF would not and should not be the sole contributor to Australia's space power expertise. Leveraging off space professionals elsewhere within Defence and Government will introduce different perspectives, while ensuring that space power is not excluded from wider Defence and whole-of-government consideration. Given the highly technical nature of many space capabilities, access to space power training, education and conceptual thinking from academia and industry will also be a crucial resource.

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24 AAP 1000-D, p. 5.

## CONCLUSION

The RAAF has a long and distinguished history of overcoming air power challenges, and in the process, living up to its motto. However, the Air Force now faces the challenge of developing its mastery of space power. Failure to manage the development of space power mastery, within an organisation dedicated to air power, will threaten the ability of the RAAF to deliver both in the air and in space, risking both the Air Force's reputation and the ability of Defence to meet the roles required of it by Government.

The RAAF has, in recognition of this challenge, commenced upon a series of initiatives to improve the space expertise of its personnel, and stated at the policy level the requirement for space professional mastery. While vital steps in the development of Air Force capability, these measures alone are no guarantee of success without a clear vision to guide development.

In terms of the specific requirements for air force space expertise and the nature of the space professionals who will deliver this expertise, key issues remain unresolved. The specific areas of space expertise required by the RAAF have not been defined and socialised with other space power providers within Defence. The space professionals within Air Force who would deliver this expertise are undefined and currently spread across employment fields and specialisations. These personnel possess a widely varied set of space knowledge and skills, and have been developed within an organisation focussed on the delivery of air power.

In order to meet these challenges, I believe that the RAAF must articulate a clear vision of what space expertise it will deliver, and the space roles it requires expertise in (and to what degree). From this it can investigate the mechanisms by which space professionals are identified, trained and educated, supported by an appropriate organisational structure; the means by which Air Force can leverage the contributions of other space power stakeholders, both internal and external to Defence, to the development of space expertise; and ensure that Air Force organisational design and doctrine supports these developments. By doing so the RAAF will help ensure space professional mastery and will be one step closer to the stars it has for so long aspired to reach.

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A CRITICAL ANALYSIS OF AIR POWER OBJECTIVES  
IN IRREGULAR WARFARE: LESSONS LEARNT FROM  
OPERATION CAST LEAD

RACHEL MOURAD

## INTRODUCTION

The principles of air power theory and doctrine demonstrate that the use of air power has historically been centred on high intensity inter-state conventional warfare.<sup>1</sup> The 21st century, however, has seen a rise in operations involving violent non-state actors participating in the sphere of international relations in what has come to be known as irregular warfare.<sup>2</sup> Modern armed forces, typically configured to conventional warfare, have found themselves struggling to adapt to such operations.<sup>3</sup> In particular, modern air power with its lethal offensive capabilities is well suited to conventional warfare, but there is a lack of understanding of its challenges, and how it can most effectively be applied, in irregular operations.

From 27 December 2008 to 18 January 2009, the Israeli Defence Force (IDF) found itself embroiled in a complex and violent irregular warfare operation against Hamas, known as Operation *Cast Lead*. Its stated objective was to end the rocket attacks into Israel by Hamas and other Palestinian factions.<sup>4</sup> The operation also hoped to secure the release of Corporal Gilad Shalit; an Israeli soldier who was captured by Hamas insurgents in 2006 in a cross-border raid. The application of offensive air power during Operation *Cast Lead* delivered devastating battlefield effects hitting and destroying over 400 Hamas targets in the first week.<sup>5</sup> By 18 January 2009, when Israel and Hamas both declared unilateral ceasefires, the Palestinian death toll had risen to 1400, including 300 children and hundreds of civilians.<sup>6</sup> The level of death and destruction resulting from Operation *Cast Lead* reflected decades of struggle between Israel and the Palestinians.

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1 P.S. Meiliner, 'Historiography of Airpower: Theory and Discipline', *Journal of Military History* 64, 2000, pp. 467-469.

2 Glen Beck, 'Offensive Air Power in Counterinsurgency Operations: Putting Theory into Practice' in Sanu Kainikara (ed.), *Friends in High Places: Air Power in Irregular Warfare*, 2009, p. 29.

3 *ibid.*

4 Amnesty International, *Israel/Gaza: Operation 'Cast Lead': 22 days of death and destruction*, 2009, p. 1.

5 Paul Rogers, 'The Gaza Conflict', *International Security Monthly Briefing*, 2008, p. 1.

6 *Israel/Gaza: Operation 'Cast Lead': 22 days of death and destruction*, p. 1.

While many consider Operation *Cast Lead* to have been a military success due to the successful destruction of every target identified and the minimal civilian casualties<sup>7</sup>, it failed to convert these successes into a holistic long-term victory and peaceful solution to the conflict in the region. Three years on, the rocket attacks continue and Hamas appear to have gained even more support and legitimacy in the region as the popular democratically elected party in Gaza. The primary reason for Operation *Cast Lead's* inability to achieve and secure a long-term victory was Israel's failure to adapt and implement a whole-of-government approach to the conflict, whereby basic military objectives are linked to the achievement of national security goals. A long-term solution to a conflict will only be achieved and sustained when all elements of national power work together, as irregular wars can only be won at the political level.

This paper addresses the importance of air power in irregular warfare. In doing so it considers the different capabilities that various platforms bring to the battlefield and examines the IDF's application of air power in Operation *Cast Lead*, which was largely an urban conflict. This paper then explores characteristics of irregular warfare and considers the asymmetric approaches that insurgents employ in order to achieve their objectives. It analyses the negative effects that air power can potentially wreak in irregular warfare and demonstrates how insurgents can exploit this to strengthen their own cause. Next, this paper assesses the need to balance the offensive capabilities of air power with the strategic and political objectives of an operation. It deduces that Operation *Cast Lead's* failure to obtain a long-term solution was, amongst other things, due to the IDF's lack of consideration of the hearts and minds campaign that Hamas exploited. The paper concludes by highlighting that the political objectives of a campaign are not achieved through military means alone and lastly makes recommendations for addressing post-combat issues.

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7 Matt M. Matthews, 'Hard Lessons Learned' in Scott C. Farquhar (ed.), *Back to Basics: A Study of the Second Lebanon War and Operation CAST LEAD*, 2009, pp. 5-27.

## THE IMPORTANCE OF AIR POWER IN IRREGULAR WARFARE

Air power theorists from Douhet to Warden have stressed that to command the air means victory and to be beaten in the air means defeat.<sup>8</sup> But before we explore the 'how' it is necessary to first define 'air power'. Air power is broadly defined here as 'the ability to project military force by or from a platform in the third dimension above the surface of the earth'.<sup>9</sup> At an operational level, air power is the combination of capabilities espousing air mobility, surveillance, reconnaissance, aerial supply, air-to-air refuelling, strategic bombing, close air support, air interdiction and offensive and defensive air activities.<sup>10</sup>

It must be recognised, however, that the proposition that air power is dominant does not suggest that air power is supreme. These two concepts are independent of one another. Air power is not supreme in irregular warfare as it cannot, in and of itself, achieve or secure the political end-state of which war is an extension. An overall victory in irregular warfare can only be achieved through a whole-of-government approach to security which involves both military and non-military means to achieve the political aim.<sup>11</sup> Nonetheless, air power has certainly become the dominant factor in any warfare due to its unique and lethal capabilities as well as the role it plays in creating the necessary preconditions for attaining both military and political victory.

Just how air power creates the necessary preconditions for attaining victory can be found within the Clausewitzian paradigm. If war, in Clausewitzian terms, is about 'compelling [one's] opponent to fulfil [one's] will',<sup>12</sup> then it is the unique capabilities of air power that are best placed to achieve this outcome through striking and destroying an adversary's 'centre(s) of gravity'. The

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8 Carl H. Builder, *The Masks of War: American Military Styles in Strategy and Analysis*, 1989, p. 68.

9 Richard A. Mason, 'Current Air Power Developments' in Desmond Ball (ed.), *Air Power: Global Development and Australian Perspectives*, 1988, p. 48.

10 Ronald Mason, 'Technological Trends: Capabilities and Air Power' in Philip Sabin (ed.), *The Future of UK Air Power*, 1988, p. 99.

11 Sanu Kainikara (ed.), *A Fresh Look at Air Power Doctrine*, Air Power Development Centre, Canberra, 2008, p.16.

12 Hans Rothfels, 'Clausewitz' in Edward Mead Earle (ed.), *Makers of Modern Strategy: Military Thought from Machiavelli to Hitler*, 1971, p. 102.

destruction of an adversary's centre(s) of gravity will lead to their collapse as the centre(s) of gravity is 'the hub of all power and movement on which everything depends'.<sup>13</sup>

In so far as an adversary's centre(s) of gravity incorporates physical targets, air power's ability to carry out lethal and rapid strikes, undertake mobility operations to enable rapid insertion, conduct interdiction and close air support functions, and traverse over great distances and terrains are but a few reasons as to why air power is the first choice in carrying out such operations. In irregular warfare an adversary, or insurgent's, centre(s) of gravity will typically be a complex structure that conglomerates roots that are not only physical, but also ideological, religious and/or political.<sup>14</sup> The combination of both physical and non-physical centres of gravity in irregular warfare requires military planners to thoroughly consider all strategic factors of an operation campaign before employing air power. Without careful consideration and planning, the very capabilities that make air power an invaluable asset can become vulnerabilities easily exploitable by an insurgent. The lethality of air power is but one capability that is easily exploitable by insurgents in irregular warfare.<sup>15</sup> While air power's speed of response, reach and lethality are all capabilities that make air power the dominant element in warfare, when these capabilities result in the deaths and injuries of civilians, domestic and international support for the insurgency is often increased as they are seen as the victims of the disproportionate use of force by the State.<sup>16</sup>

Yet, these challenges can be overcome through the careful consideration of air power's application. Air power today has the capability to apply lethal force with precision, proportion, discrimination and minimal collateral damage

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13 Michael Howard, *Clausewitz*, 1983, p. 39.

14 Sanu Kainikara, 'The Roles of Air Power in Irregular Warfare: An Overview of the Israeli Experience' in Sanu Kainikara (ed.), *Friends in High Places: Air Power in Irregular Warfare*, 2009, pp. 225-227.

15 Beck, 'Offensive Air Power in Counterinsurgency Operations: Putting Theory into Practice', pp. 29-38.

16 Eugene L. McFeely, 'Balancing Kinetic Effects of Airpower with Counterinsurgency Objectives in Afghanistan', *USAWC Strategy Research Project*, 2009, p. 23.

against a range of targets.<sup>17</sup> The outcome of such employment of air power has effects that go far beyond the tactical destruction of the target and have much broader strategic benefits.<sup>18</sup> The development of precision technology and the discrimination and proportion with which air power can now be applied has made the use of air power the weapon of choice in irregular warfare as it is undeniably an extremely effective means of projecting military power in an urban environment while ensuring minimal collateral damage.

The various capabilities that air power brings to the urban battlefield provide forces with an indisputable advantage over insurgents. However, the complexities of irregular warfare require air power to be applied with both military and political objectives in mind if it is to be effective.<sup>19</sup> The IDF's failure to thoroughly consider and link the basic objectives of military strategy to the achievement of national security goals and a political end state was evident in Operation Cast Lead and was one of the IDF's main criticisms in the aftermath of the operation.<sup>20</sup> While an analysis of the various armaments deployed by the IDF during Operation Cast Lead will provide an understanding of why particular weapons were used and what their tactical advantages were, it will also provide a background as to how various military decisions made by the IDF to some extent jeopardised the political objectives of the operation and provoked international condemnation of Israel.

17 Gareth B.S. Neilsen, 'Taking it to the Streets: Exploding Urban Myths About Australia Air Power' in Sanu Kainikara (ed.), *Friends in High Places: Air Power in Irregular Warfare*, 2009, pp. 117-138.

18 Kainikara, *A Fresh Look at Air Power Doctrine*, p. 58.

19 Kainikara, 'The Roles of Air Power in Irregular Warfare: An Overview of the Israeli Experience', pp. 225-233.

20 Stuart A. Cohen, 'The Futility of Operation Cast Lead', *BESA Centre Perspectives Papers* 68, 2009, p. 6.

## EMPLOYMENT OF AIR POWER IN OPERATION CAST LEAD

*I want aggressiveness – if there's someone suspicious on the upper floor of a house, we'll shell it. If we have suspicions about a house, we'll take it down... There will be no hesitation... Nobody will deliberate – let the mistakes be over their lives, not ours.*<sup>21</sup>

- An Israeli company commander in a security briefing to soldiers during Operation *Cast Lead*.

Operation *Cast Lead* began at 11.30am on 27 December 2008 with a three minute, 40 second 'shock and awe' bombing campaign involving 64 fighter aircraft hitting more than 50 Hamas related targets across the Gaza Strip.<sup>22</sup> The operation consisted of two phases; the air phase and the air-land phase. The IDF had three stated objectives of the operation: to create a long term period of calm through ending the rocket attacks into Israel by Hamas and other insurgents in the Gaza Strip; to prevent Hamas from rearming itself; and to secure the release of captured Israeli soldier, Corporal Gilad Shalit.<sup>23</sup>

### THE AIR PHASE

The air phase consisted of a week-long air attack successfully hitting 526 targets.<sup>24</sup> It was a carefully planned attack with the objective of destroying Hamas' various physical centres of gravity including killing pre-identified Hamas leaders and striking command facilities, communications networks,

21 Norman G. Finkelstein, *'This Time We Went Too Far': Truth and Consequences of the Gaza Invasion*, 2010, p. 61.

22 M.K. Esposito, 'The Israeli Arsenal Deployed against Gaza during Operation Cast Lead', *Journal of Palestinian Studies* 38, 2009, pp. 175-175.

23 Giora Eiland, 'Civil-Military Processes and Results of the Campaign', *Strategic Assessment* 11(4), 2009, pp. 7-9.

24 Richard Goldstone, Christine C., Hina J., Desmond T., *Human Rights in Palestine and Other Occupied Arab Territories: Report of the United Nations Fact-Finding Mission on the Gaza Conflict*, A/HCR/12/48, 2009, p. 212.

weapons storage sites, rocket assembly plants, Hamas training camps and underground weapons smuggling tunnels; all of which were struck with extreme precision.<sup>25</sup> It was the largest assault ever carried out on Gaza.<sup>26</sup>

The IDF primarily relied on its fleet of 300 F-16s to carry out the vast majority of the air strikes.<sup>27</sup> As a multi-role tactical aircraft with the ability to travel at supersonic speeds, the F-16 was able to provide a rapid response to intelligence that was collected by ground troops as well as successfully acquire and strike 'targets ...marked by intelligence collected during the months preceding the attack' destroying hundreds of targets in a short period of time.<sup>28</sup> The F-16s were instrumental to the bombing campaign in that they successfully acquired and destroyed every target that they were assigned. The IDF made a decision to upgrade the M-82 and M-84 'dumb bombs' carried by the F-16s with precision-guided systems and to only use guided munitions in Operation *Cast Lead* due to the urban environment.<sup>29</sup> In addition to the F-16, the AH-64 Apache and AH-1F Cobra helicopters were used during Operation *Cast Lead*. As Hamas insurgents attempted to launch rockets and mortars, they were met with well-planned, precision fire from Israeli Air Force (IAF) aircraft. While rocket and mortar attacks were not stopped completely, the IAF dominance of the air had seriously maimed Hamas' rocket firing capability.<sup>30</sup> By 30 December, such was the damage inflicted on Hamas that an IDF officer went so far as to say 'the IAF began its attacks at 11:30 and could have ended them at 11:40.'<sup>31</sup> There is no doubt that Israel's air campaign had successfully achieved domination of the air.

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25 Matthews, 'Hard Lessons Learned', pp. 5-27.

26 Abe F. Marrero, 'The Tactics of Operation CAST LEAD' in Scott C. Farquhar (ed.), *Back to Basics: A Study of the Second Lebanon War and Operation CAST LEAD*, 2009, pp. 83-90.

27 Esposito, 'The Israeli Arsenal Deployed against Gaza during Operation Cast Lead', pp. 175-177.

28 Matthews, 'Hard Lessons Learned', pp. 5-27.

29 Esposito, 'The Israeli Arsenal Deployed against Gaza during Operation Cast Lead', pp. 175-177.

30 Matthews, 'Hard Lessons Learned', pp. 5-27.

31 Marrero, 'The Tactics of Operation CAST LEAD', pp. 83-90.

## THE AIR-LAND PHASE

The air-land phase began at around 8.00pm on 3 January 2009 when Israeli ground troops entered the Gaza Strip from the north sending thousands of ground troops across the border in tanks and armoured personnel carriers. One of the key objectives of this second phase was to divide the Gaza Strip along Gaza's main north-south highway to prevent weapons being supplied from the south of Gaza to insurgents in the north. Other key objectives were to secure control of areas in the north from which insurgent rockets were being fired into Israel and to conduct more precise targeting of insurgents. After dividing the strip, the IDF focused ground troops in the north and utilised air power to attack remaining targets in the south.<sup>32</sup>

Troops in the air and on the ground worked together seamlessly to carry out these objectives. Each ground brigade was assigned an IAF Forward Air Operations officer, enabling each brigade commander to have direct and practical control of air operations to assist them in carrying out operations on the ground. In addition, each brigade had 'its own attack helicopters and unmanned aerial vehicles, as well as on-call strike aircraft.'<sup>33</sup> This was a significant change in the way that the IDF conducted military operations as the IDF had ceased using fixed-wing aircraft to provide close air support to ground forces prior to the 2006 Israeli war with Lebanon.

This innovative change in military thinking proved extremely successful and was described by one IAF officer as 'groundbreaking.'<sup>34</sup> He stated that the 'concentration of air assets in a tiny territory permitted unparalleled air-land coordination. These included Unmanned Aerial Vehicles (UAVs) clearing around corners for infantry platoons, Apache helicopter gunships providing integral suppressive fire during movements by small units, jet fighters employed to remove mines and improvised explosive devices and to prepare the terrain

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32 Esposito, 'The Israeli Arsenal Deployed against Gaza during Operation Cast Lead', pp. 175-177.

33 Matthews, 'Hard Lessons Learned', pp. 5-30.

34 *ibid.*

for ground movements, as well as overwhelming firepower ahead of ground advances, servicing even the smallest unit.<sup>35</sup>

Operation *Cast Lead* also saw the IDF dominate the intelligence arena. The unprecedented amount of highly sensitive intelligence that was gathered by UAVs was not only critical in gaining an insight into Hamas operations, but also played an important role in saving many lives, both of IDF soldiers and innocent civilians.<sup>36</sup>

Yet, despite the precision targeting and clear imaging capabilities of UAVs, and the precision with which the IDF employed UAVs against insurgent targets, Human Rights Watch and the United Nations (UN) Fact Finding Mission on the Gaza Conflict found that UAVs deployed during Operation *Cast Lead* were also involved in attacks against civilians and civilian infrastructure, resulting in the death of numerous civilians and violating the Laws of Armed Conflict. These attacks included two attacks on urban streets, one on a UN run school and three on apartment rooftops in residential neighbourhoods.<sup>37</sup> The Human Rights Watch found that no insurgents were present in any of the areas where these attacks occurred.<sup>38</sup> Further, UAVs were involved in the destruction of the Namar wells that supplied water to some 25 000 people in eastern and central Jabaliyah. The UN Fact Finding Mission on the Gaza Conflict found no grounds to suggest that targeting and destroying the wells provided any military advantage to the IDF.<sup>39</sup>

Noting the amount of preparation that went into determining and designating targets as well as the high precision capability of the weapons and platforms involved in the attacks, the Human Rights Watch and the UN Fact Finding Mission on the Gaza Conflict raised the question of whether the IDF had used air power's technological capabilities to deliberately target and attack civilians, rather than to minimise collateral damage.<sup>40</sup>

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35 *ibid.*

36 Matthews, 'Hard Lessons Learned', pp. 5-26.

37 Matthews, 'Hard Lessons Learned', pp. 5-14.

38 Matthews, 'Hard Lessons Learned', pp. 5-16.

39 Goldstone et al, *Human Rights in Palestine and Other Occupied Arab Territories: Report of the United Nations Fact-Finding Mission on the Gaza Conflict*, p. 210.

40 Goldstone et al, *Human Rights in Palestine and Other Occupied Arab Territories: Report of the United Nations Fact-Finding Mission on the Gaza Conflict*, p. 209.

Indiscriminate targeting was also reported to have occurred in the first phase of Operation *Cast Lead* by both UAVs and other aircraft. According to a report by the Palestinian Centre for Human Rights, within the first phase of the operation the IDF launched 'at least 300 air and sea strikes against the Gaza Strip. These strikes ... targeted 37 houses; 67 security and training sites; 20 workshops; 25 public and private institutions; seven mosques; and three educational institutions. The public institutions that [were] bombarded [were]: the compound of ministries, the building of the Palestinian Legislative Council, the building of the cabinet in Gaza City; the buildings of the agricultural control department and the Municipality of Bani Suhaila in Khan Yunis; the buildings of Rafah Municipality and Governorate. The air strikes [also] targeted ... four money exchange shops, a clinic, three fishing harbours, the Islamic University and two schools.'<sup>41</sup>

While the IDF's application of air power in Operation *Cast Lead* was undoubtedly a military success, its indiscriminate use and resultant collateral damage lead to insurmountable problems that jeopardised the political end-state of the campaign.

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41 Goldstone et al, *Human Rights in Palestine and Other Occupied Arab Territories: Report of the United Nations Fact-Finding Mission on the Gaza Conflict*, p. 203.

## EXPLOITING THE NEGATIVE EFFECTS OF AIR POWER

*In this type of war you cannot – you must not – measure the effectiveness of the effort by the number of bridges destroyed, buildings damaged, vehicles burned, or any of the other standards that have been used for regular warfare. The task is to destroy the effectiveness of the insurgent's efforts and his ability to use the population for his own ends.<sup>42</sup>*

- General Curtis E. Lemay, Chief of Staff,  
United States Air Force

While the air strikes carried out by the IDF during Operation *Cast Lead* achieved their military aims of striking and destroying key insurgent targets, the destruction that air power inflicted upon Gaza eroded any possibility of Israel achieving a long-term solution to the conflict. The collateral damage caused by the IDF's indiscriminate application of air power was exploited by Hamas to erode the legitimacy of the Israeli government's actions and to win the support of the international and domestic population.

The United States Deputy Secretary of Defense, Gordon England, approved a working definition of irregular warfare as 'a form of warfare that has as its objective the credibility and/or legitimacy of the relevant political authority with the goal of undermining or supporting that authority. Irregular warfare favours indirect approaches, though it may employ the full range of military and other capabilities to seek asymmetric approaches, in order to erode an adversary's power, influence, and will.'<sup>43</sup> Although this definition has been criticised as not encompassing the full extent of irregular warfare,<sup>44</sup> it pinpoints one fundamental basis of irregular warfare; that insurgents do not need to employ advanced military capabilities in order to achieve their objectives,

42 U.S. Department of the Air Force, 'Irregular Warfare' *Air Force Doctrine Document 2-3*, General Curtis Lemay, Fifth Chief of Staff of the United States Air Force referring to irregular warfare, 1 August 2007, p. vi.

43 U.S. Deputy Secretary of Defense Gordon England, 'Irregular Warfare' *Department of Defense Directive 3000.07*, 1 December 2008, p. 11.

44 Eric V. Larson, Derek E., Brian N., Thomas S.S., *Assessing Irregular Warfare: A Framework for Intelligence Analysis*, 2008, p. 10.

which are primarily ideological, religious or political. In fact, irregular warfare is the only form of warfare in which inferior forces have been able to claim victory over world 'super powers'.<sup>45</sup>

In analysing the way in which irregular warfare is both fought and contained, Sanu Kainikara identifies four important characteristics of the non-state adversary or insurgent. First, the insurgent will try to create asymmetry in the battlefield by using unconventional means, such as taking hostages and conducting terror campaigns against civilians that violate the Laws of Armed Conflict; a body of law that aims to protect non-combatants during hostilities.<sup>46</sup> Second, the insurgent will use the urban setting as its battlefield, camouflaging itself within the civilian population through not wearing uniforms, using civilian infrastructure to support their operations, and using collocated civilians, often women and children, as part of their defence strategy.<sup>47</sup> This compels conventional forces to limit their use of air power due to the high risk of extensive collateral damage that is inevitable in the urban environment, no matter how precisely air power is applied. Third, the insurgency will draw-out the conflict in the hope that a democratic State will lose its domestic population's support for the ongoing war. Maintaining popular support has been seen to be a crucial centre of gravity for States, especially where military conscription is involved, as is the case with Israel.<sup>48</sup> Fourth, a political or religious insurgency cannot be defeated by military means alone. While military force has the ability to achieve a military victory, the political and long-term objectives of irregular warfare, which include psychological and ideological aspects, can only be successfully achieved through diplomacy and other whole-of-government initiatives.<sup>49</sup> These four characteristics importantly highlight that irregular warfare is not only a tactical military battle, but is also, and perhaps more significantly, a strategic political one. As irregular warfare is largely a 'hearts and minds' campaign, winning the support of the population should be the central strategic objective of both sides.

45 Thomas X. Hammes, *The Sling and the Stone: On War in the 21<sup>st</sup> Century*, 2004, pp. 207-208.

46 *Friends in High Places: Air Power in Irregular Warfare*, pp. 225-226.

47 *ibid.*

48 *ibid.*

49 *ibid.*, pp. 225-227.

Of all the issues that arise during any conflict, civilian casualties is the one that receives the most media attention and can be easily exploited by insurgents to win the hearts and minds of the population. This is especially the case in relation to civilian casualties resulting from air strikes, which is primarily a result of the lethality that air power is capable of projecting.<sup>50</sup> With nothing to lose and no respect for the Laws of Armed Conflict, insurgents will try to exploit the negative effects of air power to gain an asymmetric advantage.<sup>51</sup> The insurgent's aim is to either diminish the State's application of air power, or to create an environment in which the lethal effects of air power can be exploited. By using the urban environment as its battlefield, insurgents force States to reduce or withhold the use of offensive air power due to the high risk of collateral damage. When offensive air power is applied in the urban environment, insurgents use the media to exploit the resultant collateral damage in an attempt to drive a wedge between the civilian population and the State.<sup>52</sup> By using the media to widely publicise the collateral damage caused by the application of air power, insurgents also hope to gather international sympathy and domestic support. The end result is that while the application of offensive air power will be an invaluable asset in gaining a short-term military advantage, it can be counter-productive in securing a long-term solution to an irregular warfare campaign if it leads to the loss of a State's domestic and international support.<sup>53</sup>

The exploitation of offensive air power was a tactic that was widely used in Operation *Cast Lead*. Hamas insurgents routinely fired rockets from within densely populated areas, using civilians as 'shields'.<sup>54</sup> When the IDF was forced to employ offensive air power to strike Hamas targets in heavily populated areas, Hamas insurgents used the media to exploit and portray the collateral damage resulting from the lethality of the IDF's force. Further, on occasions where the IDF's use of air power was indiscriminate or disproportionate,

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50 McFeely, 'Balancing Kinetic Effects of Airpower with Counterinsurgency Objectives in Afghanistan', p. 14.

51 *ibid*, p. 13.

52 *ibid*, p. 12.

53 Kainikara, *Seven Perennial Challenges to Air Forces*, p. 59.

54 Goldstone et al, *Human Rights in Palestine and Other Occupied Arab Territories: Report of the United Nations Fact-Finding Mission on the Gaza Conflict*, p. 113

Hamas was able to create a 'David and Goliath' perception through the media to gain international and domestic sympathy and support. Any negative media attention that a State receives will degrade its legitimacy and the legitimacy of its operation, jeopardising its ability to achieve its strategic political objectives.<sup>55</sup>

The images of death and destruction portrayed by the media during Operation *Cast Lead* have left a deep impression on the international community. While Israel has tried to defend its position by blaming the number of civilian casualties on Hamas' tactics of conducting its offensive operations from within highly populated areas, the photos taken of the Gaza Strip in the aftermath of Operation *Cast Lead* were nonetheless shocking. The harm that these images have caused Israel cannot be underestimated, and the loss of international support for Israel's position will not be easily recovered.

Despite the many benefits of air power, Operation *Cast Lead* demonstrated that when air power is applied indiscriminately, disproportionately and without thorough consideration of the political objectives of an operation, it does not always assist in achieving and securing a long-term victory. The destruction of infrastructure and the number of civilian casualties arising from the IDF's indiscriminate air strikes, which will not be forgotten anytime soon, was evidently counterproductive to Israel's campaign. In the short term, Hamas were only weakened. Rocket attacks from within the Gaza Strip did not cease, and captured Israeli soldier Corporal Gilad Shalit was not returned. The price that Israel paid for this short-term solution was the 'loss of international support and, to a certain extent, the credibility of the nation as a law-abiding citizen'.<sup>56</sup>

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55 McFeely, 'Balancing Kinetic Effects of Airpower with Counterinsurgency Objectives in Afghanistan', p. 23.

56 Kainikara, *Friends in High Places: Air Power in Irregular Warfare*, pp. 225-233.

## BALANCING THE OFFENSIVE CAPABILITIES OF AIR POWER

*No one starts a war-or rather, no one in his senses ought to do so-without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it.*<sup>57</sup>

- Clausewitz, *On War*.

As noted above, a political or religious insurgency cannot be defeated by military means alone. This highlights the necessity for the political aim to be kept at the forefront of military planning in irregular warfare. Military planners need to strive to keep civilian casualties at a minimum through utilising the precision capabilities, Intelligence, Surveillance and Reconnaissance (ISR) and concentrated blast radius of air power. Further, and more importantly, military forces must implement more stringent means to guide operators in discerning combatants from non-combatants in the battlefield and to ensure that combatants are adequately briefed on the Laws of Armed Conflict.

The IDF's lack of a clear political objective and failure to consider the hearts and minds element of the campaign was the primary reason for its inability to achieve a long-term solution to the conflict. A military operation that does not have as its primary consideration the support of the population is destined to fail at the grand strategic level. Galula refers to this as the first law of irregular warfare.<sup>58</sup> He expands upon this rule explaining that having the support of the population means having their active support and involvement in the fight against insurgents.<sup>59</sup> In addition to reducing collateral damage, McFeely suggests that another effective way of winning the support of the population is through investigating air strikes that have resulted in civilian casualties due to targeting errors, communicating the findings of the investigation, and compensating the families of victims.<sup>60</sup>

<sup>57</sup> Carl von Clausewitz, *On War*, trans. Michael H. and Peter P. (eds.), 1989, p. 579.

<sup>58</sup> David Galula, *Counterinsurgency Warfare: Theory and Practice*, 2<sup>nd</sup> Edition, 2006, p. 52.

<sup>59</sup> *ibid*, p. 53.

<sup>60</sup> McFeely, 'Balancing Kinetic Effects of Airpower with Counterinsurgency Objectives in Afghanistan', p. 20.

Investigating the incident requires conducting a field investigation of the urban area where the erroneous targeting occurred. Witnesses must be interviewed to ascertain a thorough understanding of the facts leading up to the air strike and to also gain a civilian perspective of the incident and the extent of damage suffered.<sup>61</sup> This needs to be conducted as soon as possible after the incident to ensure accuracy of information obtained from witnesses and to also ensure that the site has not been disturbed. Any evidence collected from the site needs to be recorded in way that ensures transparency and accountability. Photographs and video footage are ideal for ensuring this.<sup>62</sup>

Once the investigation is complete, the victims' families need to be notified of the outcome of the investigation. The State needs to explain to the families of the victims the events leading to the air strike and the decision behind the engagement.<sup>63</sup> Depending on what the initial field investigation reveals, a formal joint investigation team may need to be implemented to conduct a more thorough fact finding mission to determine whether breaches of international law have occurred and to publicly report the results of the investigation to the local population and media.<sup>64</sup> A further objective of the joint investigation must be to make a recommendation on how to avoid such events in the future. McFeely recommends that the joint investigation team is comprised of local representatives, external military representatives, a legitimate media source, the International Red Cross and Human Rights Watch.<sup>65</sup>

If the outcome of the investigation determines that civilians were killed as a result of incorrect targeting, the State needs to be proactive in adequately compensating the families of the civilian victims.<sup>66</sup> Compensation is a paramount step in the battle for the hearts and minds of the population as it essentially represents a public apology for the lives lost and property damaged during the conflict. Further, it demonstrates to the local population that the State is taking responsibility for its actions.

<sup>61</sup> *ibid*.

<sup>62</sup> *ibid*.

<sup>63</sup> *ibid*, p. 21.

<sup>64</sup> *ibid*, p. 22.

<sup>65</sup> *ibid*, p. 21.

<sup>66</sup> *ibid*.

Three years on from Operation *Cast Lead*, the Israeli government has not established an impartial and independent investigation into the instances of indiscriminate application of air power in the Gaza Strip.<sup>67</sup> The Israeli government has also refused to co-operate with independent investigations such as the United Nations Fact Finding Mission on the Gaza Conflict which was established with the mandate 'to investigate all violations of international human rights law and international humanitarian law that might have been committed at any time in the context of the military operations that were conducted in Gaza during the period from 27 December 2008 and 18 January 2009, whether before, during or after.'<sup>68</sup> The Israeli government's lack of co-operation included refusing to meet the mission and to provide access to documentation, government officials, and IDF officers. Further, the Israeli government prevented the mission from travelling to Israel and the West Bank in order to interview victims, witnesses and non-governmental organisations. As a result, the mission was unable to adequately fulfil its mandate.<sup>69</sup>

The Israeli government also dismissed the findings of a UN Board of Inquiry that investigated nine attacks on UN facilities and personnel during Operation *Cast Lead*,<sup>70</sup> and have ignored allegations made by Amnesty International and other human rights groups of war crimes and other violations of international law.<sup>71</sup> These actions have not only resulted in the widespread international condemnation of Israel and the loss of its credibility as a law abiding citizen, but have further added to the global speculation surrounding Israel's objectives of Operation *Cast Lead* and whether it was, in fact, an act of self-defence.

## CONCLUSION

Three years after the ceasefire of Operation *Cast Lead*, the situation in Gaza remains much the same. Rocket attacks have not ceased and Hamas continue to gain popularity and support. While Corporal Gilad Shalit has now been released, this has largely been the result of diplomatic efforts rather than military force.

Operation *Cast Lead's* failure to achieve a long-term peaceful solution is in no way a criticism of air power's capabilities. The IDF's application of air power was undeniably a military success; rather, it was due to a lack of understanding regarding the basic tenet that irregular warfare is won at the strategic political level which requires whole-of-government involvement. A tactical military victory is futile if it cannot be translated into a stable peaceful end-state. The failure was exacerbated by the tremendous loss of civilian lives due to various instances of indiscriminate and disproportionate use of air power and the level of international criticism that the Israeli government received.

While the 'hearts and minds' campaign is in no way novel to military doctrine, the reality is that all too often it is not being adequately considered in tactical planning. Military planners must be cognisant of this and perhaps be reminded that in very few cases throughout history has the support of the people been won over by coercion.

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67 *Israel/Gaza: Operation 'Cast Lead': 22 days of death and destruction*, p. 4.

68 Goldstone et al, *Human Rights in Palestine and Other Occupied Arab Territories: Report of the United Nations Fact-Finding Mission on the Gaza Conflict*, p. 13

69 *Israel/Gaza: Operation 'Cast Lead': 22 days of death and destruction*, p. 4.

70 *ibid*, p. 9.

71 *ibid*, p. 4.

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