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**TARGETING AIR POWER:
THE FAILURE OF THE RCAF TO ADAPT IN THE GLOBAL WAR ON TERROR**

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TARGETING AIR POWER : THE FAILURE OF THE RCAF TO ADAPT IN THE GLOBAL WAR ON TERROR

AIM

1. This paper will examine the use of air power in the targeting process during the Global War on Terror (GWOT) – specifically the conflict against non-state actors in Afghanistan and Iraq – to show that the Royal Canadian Air Force (RCAF) has missed an opportunity to exploit air power with appropriate aircraft procurement. It will provide examples of where and how air power was employed successfully and efficiently in this role and compare these examples to RCAF equipment and examples. This will provide recommendations on areas to improve the RCAF’s contribution to the targeting cycle in current and future operations.

INTRODUCTION

2. According to doctrine, “Joint targeting provides a methodology that aids decision-making linking objectives with effects through the appropriate prosecution of prioritised targets and the assessment of any effect generated.”¹ It is effects-driven, and focuses on achieving the Joint Force Commander’s objectives efficiently and effectively.² At the tactical level, the targeting process can be broken down into a cycle of Find, Fix, Finish, Exploit, Analyze, and Disseminate (F3EAD). Though forces from all domains and components may take part in targeting, airborne platforms are particularly well suited to “F3”: Find and Fix is done by airborne Intelligence, Surveillance, and Reconnaissance (ISR) through various electronic means, while airborne strike platforms are a key method to Finish. The “EAD” portion feeds back into the cycle with the information gained and exploited.

3. With the notable exception of 2014-17 in northern Iraq, insurgencies in Afghanistan and Iraq did not often hold ground. Targets were therefore usually high value individuals rather than infrastructure or equipment (thus requiring high levels of precision), and air assets were based close to operating areas. At the same time, the Coalitions had Air Supremacy³ like they had never seen before, meaning a negligible threat to most high-flying aircraft.⁴ This provided an unmatched opportunity for air power to play a role in the targeting process in an efficient manner.

4. While allied and partner (i.e. Iraq and Afghanistan) forces took advantage of this situation, procuring and employing appropriate ISR and strike platforms, the RCAF

¹ North Atlantic Treaty Organization, “AJP 3.9 – Allied Joint Doctrine for Joint Targeting,” Ed A Version 1 (2016), 1-4.

² Ibid. 1-5.

³ “That degree of air superiority wherein the opposing air force is incapable of effective interference.” North Atlantic Treaty Organization, “AAP-6 – NATO Glossary of Terms and Definitions.” Edition 2018, 6.

⁴ Man-portable air defense systems (MANPADS), dangerous to low-flying helicopters, cannot reach fixed-wing ISR or strike aircraft at typical operating altitudes.

failed to exploit the opportunity. Its attempts were short-lived, expensive, or inefficient. This will be demonstrated through comparisons within the categories of Remotely Piloted Aircraft Systems (RPAS) ISR, manned ISR, and strike.⁵

DISCUSSION

Find and Fix: RPAS ISR

5. Allied air forces developed new, innovative, and efficient contributions to the targeting process in the past twenty years in the GWOT. Chief amongst these were RPAS for use in ISR, and no RPAS changed air power more than the MQ-1 Predator. The Predator was the “first weapon in history whose users could stalk and kill a single individual on the other side of the planet.”⁶ They were the first to provide persistent and stealthy aerial surveillance of enemy targets, allowing enough time to Find and Fix. The United States Air Force (USAF) started operating Predators in 1995, and were therefore ready to support the conflicts in both Afghanistan and Iraq since the initial invasions. They procured 268 Predators and flew over 2 million flight hours prior to retirement in 2018. Later versions were equipped with Hellfire missiles, and over 2,700 strikes were completed in its last ten years of service.⁷

6. The Predator was replaced by the MQ-9 Reaper, a larger Predator-look-alike that can provide even more persistence and carry larger payloads, including bombs. The USAF procured more than 100, and has flown more than 4 million hours on the Predator and Reaper combined.⁸ Other nations flying the Reaper include Spain, the Netherlands, and the United Kingdom.⁹

7. Canada had some success with RPAS in Afghanistan. The first equipment was the CU-161 Sperwer, acquired in 2003 for the Canadian Air Force. Though these suffered from multiple failures, crashes, and questionable service, they did announce Canada’s interest in RPAS ISR.¹⁰ The Sperwer was retired in 2009 and replaced by the CU-170 Heron. The Heron was the result of a competition for ISR required by The Manley Report, and served until completion of its lease in 2011. This capability was notable due

⁵ RPAS is now the accepted term within the RCAF and other allies, replacing Unmanned Aerial Vehicle (UAV), Unmanned Aerial System (UAS), or drone, but effectively means the same thing.

⁶ Whittle, Richard, “Predator Started Drone Revolution, And Made Military Innovation Cool.” *Breaking Defense*. Last modified Mar 9, 2018. <https://breakingdefense.com/2018/03/predator-started-drone-revolution-and-made-military-innovation-cool/>

⁷ Ibid.

⁸ Bryan Everstine, “USAF MQ-1, MQ-9 Fleet Reaches Four Million Hours.” *Air Force Magazine*. Last modified Mar 12, 2019. <http://www.airforcemag.com/Features/Pages/2019/March%202019/USAF-MQ-1-MQ-9-Fleet-Reaches-Four-Million-Hours.aspx>

⁹ Martin Streetly and Beatrice Bernardi, “General Atomics – ASI Predator B/MQ-9 Reaper/MQ-9B.” *Jane’s All the World’s Aircraft: Unmanned*. (United Kingdom, 2018), 275.

¹⁰ Robert Semrau, “The Taliban Don’t Wave.” Quoted in Danny Garrett-Rempel, “Will JUSTAS Prevail? Procuring a RPAS Capability for Canada.” *Royal Canadian Air Force Journal*, Vol 4 No 1 (2015), 21.

to the massive increase in capability, and its progression from inception to operations in 14 months.¹¹ Meanwhile, the Canadian Army operated the Boeing Scan Eagle for over 30,000 hours in Afghanistan, but divested itself of the capability when the lease expired in 2015.¹²

8. The RCAF has not fielded any RPAS capability since 2011. This has meant no RCAF RPAS in Iraq. The project to provide the next RCAF RPAS, formerly entitled Joint Uninhabited Surveillance and Target Acquisition System (JUSTAS) and now known as RPAS Project, was begun in 2000, before even the Sperwer was in service.¹³ Its in-service date has consistently slipped such that it is now not expected to be fully operational until 2031.¹⁴ It has been delayed by a lack of clear and consistent operational requirements, inconsistent options analysis, and immediate operational requirements (i.e. the Heron procurement).¹⁵ In addition to conducting persistent ISR over contested areas, requirements have also included conducting maritime patrol, and dropping rescue kits in the Arctic.¹⁶ These delays will have taken the RCAF out of the RPAS business, arguably the biggest growth industry for a modern air force, for two decades.

Find and Fix: Manned ISR

9. One of the advantages of manned ISR is that the sensor operators are in the airspace. Though this increases risk in non-permissive environments, the high-altitude air threat during the GWOT was negligible. Having aircrew and specialists in the aircraft obviates the need for Beyond-Line-of-Sight communications and reduces any potential lag time; the sensor operator may be a key member of the ground fight. There may also be an improved capability over RPAS: the ability to collect, process, analyze, and disseminate within the platform.

10. If RPAS ISR in the GWOT was a revolution, then manned ISR was an evolution. The United States Army, for example, had been flying the MC-12 Liberty (an ISR derivative of the Beech King Air small twin-engine transport) since at least 1985.¹⁷ In

¹¹ Danny Garrett-Rempel, “Will JUSTAS Prevail? Procuring a RPAS Capability for Canada.” *Royal Canadian Air Force Journal*, Vol 4 No 1 (2015), 22.

¹² Ibid. 23; and Steven Fouchard, “U.S., Canada have an ‘open conversation’ on drones.” *The Maple Leaf*. Accessed Oct 11, 2019. <https://ml-fd.caf-fac.ca/en/2017/06/4878>

¹³ Canadian American Strategic Review, “Canadian Forces UAV Procurement: a DND JUSTAS Timeline.” Archived Oct 2016. <https://web.archive.org/web/20161023015215/http://casr.ca/id-justas-project-timeline.htm>

¹⁴ Department of National Defence, “Remotely Piloted Aircraft System (RPAS) Project.” Last accessed Oct 20, 2019. <http://dgpaapp.forces.gc.ca/en/defence-capabilities-blueprint/project-details.asp?id=977>

¹⁵ Chief Review Services, “Internal Audit of Joint Unmanned Surveillance and Target Acquisition System (JUSTAS) Project.” (Government of Canada, Mar 2014). Last accessed 12 Oct 2019. <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/audit-evaluation/internal-audit-joint-unmanned-surveillance-target-acquisition-system-justas-project.html>

¹⁶ Senate, “The Standing Senate Committee on National Security and Defence.” *Evidence*. Mar 25, 2013.

¹⁷ Global Security, “RC-12 Huron Special Electronic Mission Aircraft.” Last accessed Oct 14, 2019. <https://www.globalsecurity.org/intell/systems/rc-12-guardrail.htm>

Afghanistan, it was rapidly expanded. Task Force (TF) Odin was the Army's answer to integrated targeting – teams of one MC-12 paired with AH-64 Apache gunships. The MC-12s were fitted with a variety of visual and signals intelligence-gathering equipment that allowed them to Find and/or Fix enemy combatants and high value individuals, communicate with commanders on the ground, and vector the Apaches to conduct the strikes.¹⁸ The USAF were ordered by the Secretary of Defense to augment ISR collection in United States Central Command (which includes Afghanistan and Iraq) and so procured the MC-12 in 2008. Incredibly, this project known as Project Liberty went from funding approval to delivery in theatre in less than eight months, ultimately fielding 42 aircraft.¹⁹ If there was any doubt as to their place in the targeting process, the motto of one of the MC-12 Squadrons was “Find, Fix, and Finish.”²⁰ In Afghanistan alone, the MC-12 aided in the kill or capture of more than 8,000 terrorists.²¹

11. The Royal Air Force (RAF) also took an aggressive and evolutionary approach to manned ISR. At the beginning of the conflicts they were operating the Nimrod, an Anti-Submarine Warfare (ASW) aircraft that had been modified for overland surveillance to contribute to targeting and force protection. They were not satisfied with operating an ASW aircraft in this role. Over the course of the conflicts, they replaced the ad hoc ISR capability with the Sentinel R1, a modified Global Express business jet with a powerful wide-area radar, in 2008; the Shadow R1, a near copy of the MC-12, in 2009; and the RC-135 Rivet Joint, a strategic theatre ISR asset, in 2013.²² These have all contributed to a massive increase in intelligence collection, leading to an integrated ability in the RAF to Find, Fix, and Finish.

12. As in RPAS, Canada also dabbled in manned airborne ISR in Afghanistan. Two leased King Airs were modified to ISR aircraft in 2009, presumably to similar specifications as an MC-12 though the CAF never released any information. These flew out of Kandahar for less than two years at the end of the combat mission in support of Canadian Forces on the ground. They were disposed of at the end of their lease period in 2011.²³ No such initiative arose for the fight in Iraq.

¹⁸ Thom Shanker, “At Odds With Air Force, Army Adds Its Own Aviation Unit.” *The New York Times*. June 22, 2008. In addition to being a Norse god, ODIN was also an acronym for “Observe, Detect, Identify, and Neutralize.”

¹⁹ United States Air Force, “MC-12 Factsheet.” Last modified Jan 2016. <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104497/mc-12/>

²⁰ Defense Visual Information Distribution Service, “MC-12s find, fix and finish in Afghanistan.” Last modified Jan 2014. <https://www.dvidshub.net/image/1164629/mc-12s-find-fix-and-finish-afghanistan>

²¹ Gareth Jennings, “USAF outlines divestiture plans for MC-12W Liberty Aircraft.” *IHS Jane's Defence Weekly*, 10 November 2014.

²² Royal Air Force, “Aircraft.” Last accessed Oct 14, 2019. www.raf.mod.uk/aircraft

²³ Canadian American Strategic Review, “Canadian Manned Intelligence, Surveillance, and Reconnaissance: ISR by King Air – leased King Airs and the Manned Aerial ISR Project.” Archived Oct 2016. <https://web.archive.org/web/20160420155334/http://www.casr.ca/bg-af-manned-airborne-isr-king-air.htm>

13. The RCAF looked to its current aircraft for an ISR option, and found an opportunity similar to the RAF's use of the Nimrod in its ASW aircraft. CP-140 Auroras modified with the MX-20 sensor and other avionics were considered suitable for overland ISR, and cut their teeth in the task over Libya in 2011. RCAF Auroras flew 881 sorties in support of operations in Iraq between 2014 and 2017.²⁴ The CP-140 has some advantages over the MC-12: greater range, endurance, and some excellent sensors – the MX-20, for example, has a range of approximately 50% greater than the MX-15 sensor typically fitted to MC-12s.²⁵ There are also drawbacks to the platform, however: it has a minimum crew of ten (versus four), is much larger and louder (increased visual and audible signature), and is much more expensive to operate. The advantages of greater range and endurance which made it useful in Libya and over water are largely obviated in Afghanistan and Iraq, as air bases are within the country and targets are often only minutes' flying time away. For example, while CP-140s operated from Kuwait and had long transit times, American MC-12s operated from Erbil International Airport, less than 15 minutes cruising time to operations over Mosul. There were also many bases in Afghanistan close to ISR operating areas, including Kandahar Air Field. The cost of operating the aircraft is a key consideration: the forty-year-old, four-engine, ten-crew CP-140 is expensive. The economical King Air has been estimated to be between 15-25% of the CP-140's hourly cost.²⁶ Meanwhile, there is another cost associated with the CP-140: while it is doing ISR, it is not engaged in its ASW role. There is no other fixed-wing aircraft in the RCAF capable of ASW, and the shift to overland ISR has cost the Aurora fleet in terms of crew training, flying hours, and operations on ASW. Anything gained in ISR is lost in ASW.

14. If there is good news in the future of Find and Fix in Canada, it is the Manned Airborne ISR (MAISR) project for the Canadian Special Operations Forces Command (CANSOFCOM). This project will deliver three MC-12-like aircraft by 2022.²⁷ This project has not been sponsored by the RCAF but by CANSOFCOM, and its aircraft will be dedicated to CANSOFCOM operations.

²⁴ Government of Canada, "Operation IMPACT." Last accessed Oct 19, 2019. <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-impact.html>

²⁵ Canadian American Strategic Review, "Canadian Manned Intelligence..."

²⁶ Lieutenant-General Mike Rouleau, "How We Fight: Commander CJOC's Thoughts." Memo to CJOC Staff, Feb 10, 2019, 5; and Major Neil Wooden, Senior Staff Officer (SSO) SOF 1 Canadian Air Division Headquarters email to author, 23 Oct 2019; and Office of the Undersecretary of Defense, "FY 2019 DOD Fixed Wing and Helicopter Reimbursement Rates." (Washington, DC: US Government Printing Office, 2018), Tab F. LGen Rouleau puts the cost of a CP-140 at \$65,000 and a King Air at \$1,000. The \$1,000 seems unreasonably low, and might only cover fuel – the crewed cost is estimated by SSO SOF at just over \$9,000/hr. The DOD estimate, a more direct comparison, puts P-3 (comparable to CP-140) at \$9,015/hr and the C-12 at \$2,226/hr.

²⁷ Public Services and Procurement Canada, "Manned airborne intelligence, surveillance and reconnaissance." Last accessed Oct 19, 2019. <https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/air/snac-nfps/renseignement-airborne-eng.html>

Finish: Strike

15. As many modern RPAS platforms have the combined ability to Find, Fix, and Finish, they have already been mentioned: the Predator was retrofitted with Hellfire missiles, and the Reaper is fitted with a variety of Precision-Guided Munitions (PGMs). The strike capability does not need to be linked to the same platform as the Find and Fix, however, as demonstrated by TF Odin's use of Apaches.

16. The Finish may alternatively be conducted by high-performance fighter aircraft, which also have a limited ability to Find or Fix. Typical allied examples throughout the GWOT have been American F-15Es and F-18s, RAF Tornados and Typhoons, and F-16s from multiple nations. The use of these advanced platforms as strike aircraft in a targeting role tended to ignore one of the defining features of the air war: absolute air supremacy. Using these aircraft is inefficient as it is simply a waste of their advanced performance and capabilities. It is not necessary to be able to operate at 40,000 feet, fly at Mach speeds, or be capable of engaging peer air forces in air-to-air combat. Meanwhile, they take incredible amounts of support including infrastructure and air-to-air refueling to achieve any sort of persistence. The host country's air forces, with the assistance of the USAF, have adopted successful and much more cost-effective approaches.

17. The Afghan Air Force (AAF) has employed A-29 Super Tucano light attack aircraft in the strike role. These propeller-driven aircraft are similar in design and performance to the CT-156 Harvard II that RCAF pilots train in, but are fitted with advanced sensors and PGMs. The initial cost is around \$18 million. At \$1,000 per hour to operate, they are less than 10% the cost of advanced fighter aircraft but can deliver the same munitions with the same accuracy.²⁸ The AAF carried out its first combat strike with PGMs in 2018. It is now executing independent day and night strike operations with PGMs, conducting a third of all daily strikes in the country.²⁹

18. The Iraqi Air Force (IAF) has conducted strikes using L-159 and Cessna AC-208 aircraft. The L-159 is a light jet aircraft, similar to the BAE Hawk used as a jet trainer in the RCAF. The AC-208 is a small passenger transport aircraft that has been modified with sensors and Hellfire PGMs. It has been in use by the IAF since 2008, and its success had led to its possible procurement for the AAF as well.³⁰

²⁸ Fergus Kelly, "Sierra Nevada awarded 5-year Afghanistan A-29 training contract as US shifts to in-country instruction." *The Defense Post*. Last modified April 5, 2019.

<https://thedefensepost.com/2019/04/05/afghanistan-a-29-training-sierra-nevada/>

²⁹ Ibid.

³⁰ Defense Security Cooperation Agency, "Republic of Iraq –AC-208 Aircraft, Transmittal No. 16-42." Oct 7, 2016; and Flightglobal.com, "USAF plans to buy seven armed AC-208s for Afghan military." Last modified December 28, 2017. <https://www.flightglobal.com/news/articles/usaf-plans-to-buy-seven-armed-ac-208s-for-afghan-mil-444507/>

19. Canada's contribution in airborne strike in the GWOT was through CF-18 Hornets. Though absent from Afghanistan,³¹ they conducted nearly 1,400 sorties over 16 months in Iraq striking 399 targets.³² The issue with using CF-18s in this role is the same as noted in paragraph 16 above: that is, inefficiency. As important as the Finish in a targeting cycle may be, it can be done just as effectively by aircraft that are much less capable overall, and thus less expensive to procure, operate, and support. The Department of Defense estimates the hourly operating cost of an F-18 at over \$17,000. As these typically operate in pairs, this is 17 times more expensive than a pair of A-29s and nearly 50 times more expensive than operating a lone Reaper.³³ While being employed using only a fraction of their capability in the GWOT, CF-18s have a published capability gap in achieving their primary role in North American and alliance defence.³⁴

CONCLUSION

20. The GWOT has presented an unprecedented opportunity to exploit air power in targeting due to air supremacy and the ability to base air power in-country. Several allied nations have taken advantage of this through procurement and use of new RPAS for ISR, armed RPAS, dedicated manned ISR platforms including small and inexpensive options, and accurate and efficient strike options. This opportunity has not been exploited by the RCAF. Nearly twenty years after Canadian combat operations in the GWOT began, the RCAF has no RPAS at all; only a modified and inefficient manned ISR platform; and the same platform for light strike that it uses for continental air defence. Though short-term successes were found with Heron and King Air in Afghanistan, the effect was not long-lasting. The two long-term approaches have been to adapt current platforms in an inefficient manner, and to initiate massive procurement projects that, in trying to fulfil every capability, arrive too late for the war.

RECOMMENDATION

21. The RCAF should be fully adaptable to opportunities in the air domain, and targeting in the GWOT has provided many. Project requirements for today's needs must be focussed on the problem of today, not on solving a wide range of potential future problems. Rather than focusing on massive projects with many capabilities to fill multiple roles (eg. RPAS Project), agility encourages focusing on efficient procurement

³¹ For an excellent summary of reasons why, see Lieutenant-Colonel D.E. Molstad, "CF-18s in combat from Iraq to Libya," (Master of Defence Studies Course Paper, Canadian Forces College, 2011), 48-67.

³² Government of Canada, "Operation IMPACT – Airstrike history (archived)." Last accessed Oct 19, 2019. <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-impact/airstrike-history.html>

³³ Office of the Undersecretary of Defense, "FY 2019 DOD Fixed Wing and Helicopter Reimbursement Rates." (Washington, DC: US Government Printing Office, 2018), Tab F. While this may not be the actual rate, it does allow direct comparison with other US aircraft. Reapers are listed at \$714/hr.

³⁴ Government of Canada, "Supplementing the CF-18 fleet." Last accessed Oct 20, 2019. <https://www.canada.ca/en/department-national-defence/services/procurement/fighter-jets/supplementing-cf-18-fleet.html>

and operation where overmatch occurs in rapid turnaround and improved intelligence processing. Meanwhile, any capability crossover (eg. ASW to overland ISR; CF-18 strike) must be measured against the loss of capacity in primary roles. The RCAF should have looked for more efficient precision options in the GWOT, whether from RPAS, armed helicopters, or light attack aircraft. It is only through a full and continuous analysis of these non-traditional RCAF platforms and roles that that RCAF will regain agility and relevance in the next war.

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