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## The RCAF Snowbirds: A Retirement Long Overdue

Major Kimberlee Wilton

**JCSP 48**

### Exercise Solo Flight

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CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES

JCSP 48 – PCEMI 48

2021 – 2022

Exercise Solo Flight – Exercice Solo Flight

**The RCAF Snowbirds: A Retirement Long Overdue**

**Major Kimberlee Wilton**

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## **RETIREMENT LONG OVERDUE: THE RCAF SNOWBIRDS**

### **INTRODUCTION**

The Snowbirds have been the Royal Canadian Air Forces (RCAF) air demonstration team since 1970, over fifty years. There were several different teams before the Snowbirds, and there will likely be other teams after the Snowbirds retire. Teams have historically been retired once the training aircraft they flew was decommissioned. The platform that the team currently flies has not been used for training since 2000. Further, the RCAF air demonstration team is not aligned with other national teams in resources or mandates. In comparing over 30 countries, Canada is the only country with a full-time team flying a nine-ship formation with an airframe that is not used for any other purpose. The RCAF currently struggles with a shortage of pilots and technicians at all units. These shortages necessarily put pressure on the RCAF to determine the appropriate staffing, funding and support for air demonstration completed by 431 Air Demonstration (AD) Squadron, the Snowbird unit.

Given the current challenges regarding personnel shortages and pressures on the RCAF to fulfill multiple new capabilities, it is time to retire the 431 AD Squadron and the Snowbird air demonstration team. While the Snowbirds have a long history, no government policy prioritizes this role. The RCAF needs to mirror peer nations by returning to using a training fleet crewed by instructors, with air demonstration being a secondary duty to instructing. This paper will examine the history of air demonstration in Canada, review how peer nations fulfill the air demonstration role, the airframe, the current flying rate, the Canadian Armed Forces (CAF) reconstitution plan, staffing, recruiting, symbolism, and government priorities. The RCAF can no longer justify

prioritizing 431 AD Squadron, given the Government and the CAF's current capabilities and priorities.

## **HISTORY**

For most Canadians, all they have ever known regarding a military air demonstration team is the Snowbirds. This reality is because the team has been flying the Tutor aircraft since 1970. However, the RCAF has a more layered history regarding air demonstration teams. Past teams have existed on several platforms, from the Golden Muskets to the Red Green Gophers to the Golden Hawks, Gimli Smokers, Skylarks, and Dragonflies.<sup>1</sup> Most teams were temporary, created for regional airshows using training aircraft; some were formed for specific anniversaries, for the country or the RCAF. Each team came and went based on interest and airframe availability. The teams were usually made up of qualified flight instructors (QFIs) and flew aircraft used for training, and it was a secondary duty to their primary role of teaching.

The Golden Hawks existed from 1959 to 1964 and were the first team dedicated solely to air demonstration in Canada.<sup>2</sup> The Golden Hawks were predecessors to the Snowbirds and were formed in anticipation of the RCAF's 35<sup>th</sup> anniversary and the 50<sup>th</sup> anniversary of powered flight in Canada.<sup>3</sup> Their initial mandate was for one year only, and they fell under the command of training.<sup>4</sup> QFIs from the Operational Training Unit flew six Sabre aircraft.<sup>5</sup> While they started as a seven ship, they flew performances as

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<sup>1</sup> Dan Dempsey and Vic Johnson, *A Tradition of Excellence: Canada's Airshow Team Heritage* (Victoria, B.C: High Flight Enterprises, 2001): 297.

<sup>2</sup> Luke Kowalski, "The Public Face of the Royal Canadian Air Force: The Importance of Air Shows and Demonstration Teams to the RCAF." *The Ascendant Historian Vol. 2 No. 1* (2013): 45.

<sup>3</sup> Dan Dempsey and Vic Johnson, *A Tradition of Excellence...*, 253.

<sup>4</sup> *Ibid.*, 263.

<sup>5</sup> *Ibid.*, 263.

four due to fatal accidents in their work-up training.<sup>6</sup> In 1960 they were stood up as a full-time component, and while their routine was popular, several factors, including military cutbacks and the retiring of the Sabre, had the team stood down in 1964.<sup>7</sup>

Following the Golden Hawks were the Golden Centennaires. This team flew the Tutors for Canada's 100<sup>th</sup> celebration. In 1967 the eight Tutor team flew 112 shows, including the opening of Expo 67 in Montreal.<sup>8</sup> The Centennaires were disbanded immediately after their last show in 1967.<sup>9</sup> This same platform was used in creating the Snowbirds in 1970, a nine ship team based in Moose Jaw, Saskatchewan (SK). Eventually, the team had a squadron dedicated to them as 431 AD Squadron was resurrected in 1977; the squadron number had lineage from WWII.<sup>10</sup> The Snowbirds have become the longest-serving air demonstration team, they have not been the only one, and history allows one to see that there will likely be future iterations of the concept going forward. Aircraft, priorities, funding, and staffing are part of an evolving RCAF and the weight it puts on air demonstration.

## **AIR DEMONSTRATION IN OTHER MILITARIES**

There are three types of military air demonstration teams around the globe based on the platforms that they fly: fighter aircraft, training aircraft, or dedicated aerobatic planes. The fighter aircraft comprises of teams like the Blue Angels and Thunderbirds in the United States or Singapore's Black Knights.<sup>11</sup> These teams fly high-performance jet

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<sup>6</sup> *Ibid.*, 274.

<sup>7</sup> *Ibid.*, 297.

<sup>8</sup> *Ibid.*, 253.

<sup>9</sup> *Ibid.*, 253.

<sup>10</sup> "Canadian Forces Snowbirds," *Government of Canada*, Home page last accessed 20 Mar 2022, <http://www.rcf-arc.forces.gc.ca/en/snowbirds/index.page>.

<sup>11</sup> "Blue Angels," *Blue Angels*, Home page last accessed 20 Mar 2022, <https://www.blueangels.navy.mil/>. And "Thunderbirds," *US Air Force*, Home page last accessed 20 Mar

aircraft that are used by front-line fighter units. The training aircraft category is the largest and was where the Snowbirds belonged until the Tutor was retired from training in 2000. These teams use the same aircraft used by their nation to train pilots to winged standards; examples of teams in this category range from the Australian Roulettes to the Red Arrows with the Royal Air Force.<sup>12</sup> The final category of dedicated aerobatic planes has three countries: Chile, Morocco and Jordan.<sup>13</sup> These teams fly small turbo-propeller aircraft that are not ejection seat high-performance aircraft like the Tutor is. However, this is the closest category that the Snowbirds fit though they stretch this definition given the aircraft's capabilities and the size of the team with others in this category flying five to seven aircraft. Thus the 431 AD Squadron team is the only military air demonstration team that flies an aircraft that was retired from all other roles for the Air Force.<sup>14</sup>

When the Snowbirds were stood up in 1970, they fell under the training aircraft format, with pilots coming from an instructor background and the aircraft being maintained by the school at 2 Canadian Forces Flight Training School (2 CFFTS) in Moose Jaw.<sup>15</sup> When the RCAF switched training platforms in 2000 from the Tutor to a mixed training fleet of Harvard II and Hawk aircraft, there was no mirrored team shift to

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2022, <https://www.airforce.com/thunderbirds/overview>. And “Fact Sheet: Profiles of the Republic of Singapore Air Force Black Knights Pilots,” MINDEF Singapore, 03 Aug 2015. Fact Sheet: Profiles of The Republic of Singapore Air Force Black Knights Pilots ([mindef.gov.sg](http://mindef.gov.sg))

<sup>12</sup> “Air Force Roulettes,” Air Force 100 Home page last accessed 20 Mar 2022, Air Force Roulettes | Royal Australian Air Force. And “Red Arrows,” *Wikipedia*, Home page last accessed 20 Mar 2022, Red Arrows - Wikipedia.

<sup>13</sup> “Halcones,” *Wikipedia*, Home page last accessed 20 Mar 2022, <https://en.wikipedia.org/wiki/Halcones>. And “Marche Verte,” *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Marche\\_Verte](https://en.wikipedia.org/wiki/Marche_Verte). And “Royal Jordanian Falcons,” *Royal Jordanian Falcons*, Home page last accessed 20 Mar 2022, <https://rjfalcons.com/>.

<sup>14</sup> Nigel Howarth, “Canada’s Snowbirds Team – Unique in Military Aviation,” *Aviation Week*, 25 May 2016. Canada’s Snowbirds Team - Unique In Military Aviation | Aviation Week Network

<sup>15</sup> Dan Dempsey and Vic Johnson, *A Tradition of Excellence...*, 532.

either of these fleets.<sup>16</sup> Typically when a fleet is retired from its role, the team is either retired or transitioned to a newer platform. That transition is evident when reviewing multiple teams around the globe or even Canada's history in air demonstration.<sup>17</sup>

The number of aircraft that the Snowbirds fly is also an anomaly. Only three other countries fly nine aircraft in their formation: India, Switzerland, and the United Kingdom, with Italy flying ten.<sup>18</sup> The average military team size worldwide is five to six.<sup>19</sup> The larger team has greater risks, higher maintenance costs, and personnel requirements to support and fly these extra aircraft.

Many countries do not have personnel dedicated to a team as a sole duty. It is common for team members to fulfill an instructor role and fly airshows as a secondary responsibility. Some countries that use such a model are Singapore, Australia, Denmark, Israel, Pakistan, and New Zealand.<sup>20</sup> For countries that elect this model, the team completes work-up training prior to the airshow season due to the advanced and dangerous flying. They maintain some level of instructing during the show season. Once

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<sup>16</sup> J. Clow. "RCAF Pilot Training and ASD: Assessing and Improving a Dysfunctional Paradigm for the Future," Canadian Forces College, 2015. p. 26.

<sup>17</sup>Numerous examples. "Roulettes," *Wikipedia*, Home page last accessed 20 Mar 2022, Roulettes - Wikipedia and "Red Arrows," *Wikipedia*, Home page last accessed 20 Mar 2022, Red Arrows - Wikipedia.

<sup>18</sup>"Surya Kiran," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Surya\\_Kiran](https://en.wikipedia.org/wiki/Surya_Kiran). And "Patrouille Suisse," *Wikipedia*, Home page last accessed 20 Mar 2022, Patrouille Suisse - Wikipedia. And "Red Arrows," *Wikipedia*, Home page last accessed 20 Mar 2022, Red Arrows - Wikipedia. And "Frece Tricolori," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Freccce\\_Tricolori](https://en.wikipedia.org/wiki/Freccce_Tricolori).

<sup>19</sup> Forty teams reviewed. Sample of examples. "Black Knights," *Aerobatic Teams*, Home page last accessed 20 Mar 2022, Black Knights aerobatic team (aerobaticteams.net). And "Black Falcons," *Wikipedia*, Home page last accessed 20 Mar 2022, Black Falcons - Wikipedia.

<sup>20</sup> "Black Knights," Home page last accessed 20 Mar 2022, Roulettes aerobatic display team (aerobaticteams.net). And "Baby Blue," *Aerobatic Teams*, Home page last accessed 20 Mar 2022, Baby Blue aerobatic display team (aerobaticteams.net). And "IAF Aerobatic Team," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/IAF\\_Aerobatic\\_Team](https://en.wikipedia.org/wiki/IAF_Aerobatic_Team). And "Sherdils," *Wikipedia*, Home page last accessed 20 Mar 2022, <https://en.wikipedia.org/wiki/Sherdils>. And "Black Falcons," *Wikipedia*, Home page last accessed 20 Mar 2022, Black Falcons - Wikipedia. *Aerobatic Teams*, Home page last accessed 20 Mar 2022, Black Knights aerobatic team (aerobaticteams.net) And "Roulettes," *Aerobatic Team,s*

the show season is complete, they return to full-time instructing.<sup>21</sup> This flexibility allows these Air Forces to fulfill the airshow tasking with a reduced staffing requirement. In these countries, teams are always made up of senior instructors.<sup>22</sup> This organizational structure also means that these countries do not have a dedicated squadron for the airshow team.

Other countries, like Canada, have personnel fulfill the role on a full-time basis; the United States, the United Kingdom, and Japan are some examples.<sup>23</sup> A tour on the team is two to three years, with the pool of candidates usually coming from the instructor cadre.<sup>24</sup> All countries with a dedicated team exceed Canada's in the size of their military and population overall.

Finally, several Air Forces have abandoned air demonstrations entirely: Netherlands, Germany, and Sweden are some examples.<sup>25</sup> Whereas other countries have never fielded a team, Norway is an instance of this approach.<sup>26</sup> Retiring air demonstration teams has generally been due to flight accidents or costs to maintain the capability.<sup>27</sup> It is

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<sup>21</sup> *Ibid.*

<sup>22</sup> *Ibid.*

<sup>23</sup> "Blue Angels," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Blue\\_Angels](https://en.wikipedia.org/wiki/Blue_Angels). And "Red Arrows," *Wikipedia*, Home page last accessed 20 Mar 2022, Red Arrows - Wikipedia. And "Blue Impulse," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Blue\\_Impulse](https://en.wikipedia.org/wiki/Blue_Impulse).

<sup>24</sup> *Ibid.*

<sup>25</sup> "Solo Display Team," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Solo\\_Display\\_Team](https://en.wikipedia.org/wiki/Solo_Display_Team). And "Crash of a Starfighter Formation of the German Air Force in 1962," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://second.wiki/wiki/absturz\\_einer\\_starfighter-formation\\_der\\_luftwaffe\\_der\\_bundeswehr\\_1962](https://second.wiki/wiki/absturz_einer_starfighter-formation_der_luftwaffe_der_bundeswehr_1962). And "Team 60," *Aerobatic Teams*, Home page last accessed 20 Mar 2022, Team 60 aerobatic display team ([aerobaticteams.net](http://aerobaticteams.net)).

<sup>26</sup> "Royal Norwegian Air Force," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://en.wikipedia.org/wiki/Royal\\_Norwegian\\_Air\\_Force](https://en.wikipedia.org/wiki/Royal_Norwegian_Air_Force).

<sup>27</sup> "Crash of a Starfighter Formation of the German Air Force in 1962," *Wikipedia*, Home page last accessed 20 Mar 2022, [https://second.wiki/wiki/absturz\\_einer\\_starfighter-formation\\_der\\_luftwaffe\\_der\\_bundeswehr\\_1962](https://second.wiki/wiki/absturz_einer_starfighter-formation_der_luftwaffe_der_bundeswehr_1962). And "Team 60," *Aerobatic Teams*, Home page last accessed 20 Mar 2022, Team 60 aerobatic display team ([aerobaticteams.net](http://aerobaticteams.net)).



important to note that having a demonstration team is not an indicator of a military's capability.

While Canada is not alone in having a dedicated air demonstration team, how the Snowbirds are structured is outside most of its peers. From a stand-alone aircraft to nearly double the aircraft of other teams are but a few examples of their separation from the procedures of other nations. Having military members posted to an independent unit with flying airshows as their primary duty displays how Canada puts more resources into this tasking than its peers.

## **AIRCRAFT**

DND purchased 190 Tutor aircraft in 1961 as the primary training aircraft at 2 CFFTS in Moose Jaw, SK.<sup>28</sup> It is a single-engine, turbojet-powered, low-wing aircraft with a side-by-side cockpit arrangement.<sup>29</sup> Canadair designed and manufactured the aircraft as a private venture with the RCAF.<sup>30</sup> For forty years, this aircraft would remain the primary training aircraft for the RCAF.

The RCAF changed direction with the replacement of the Tutor aircraft for its training requirements in 2000. "The abrupt end of the Cold War and decaying economic situation in the early 1990s forced defence establishments to seek a solution for rising personnel costs and shrinking capital acquisition allocations."<sup>31</sup> As Rob Kamery notes, "there were many reasons for this fiscal tumult, not the least of which was the sharp increase in fuel prices following the 1991 coalition invasion of Kuwait and Iraq during

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<sup>28</sup> J. Clow. "RCAF Pilot Training and...", 32.

<sup>29</sup> "Canadian Forces Snowbirds," *Government of Canada*, Home page last accessed 20 Mar 2022, <http://www.rcaf-arc.forces.gc.ca/en/snowbirds/index.page>.

<sup>30</sup> *Ibid.*

<sup>31</sup> J. Clow. "RCAF Pilot Training and...", 6.

the First Gulf War.”<sup>32</sup> The net result was a twenty-three percent reduction in defence spending and a thirty percent reduction in troop levels.”<sup>33</sup> The White Paper on Defence in 1994 recommended “outsourcing of capabilities considered to be non-core activities.”<sup>34</sup> The RCAF took this recommendation to heart and decided that training was not a core activity.

The shift to outsourcing, Alternate Service Delivery (ASD), quickly gained momentum within the Department of National Defence (DND). These financial pressures and lessons learned from disastrous aircraft contracting for the Sea King replacement led the RCAF to lean into outsourcing pilot training. In addition, the RCAF could avoid acquiring actual aircraft, which DND had proved to be very poor at in the lengthy, expensive, and unsuccessful Sea King replacement attempts. These factors lined up perfectly when “in December 1994, Bombardier Incorporated delivered an unsolicited proposal to the Crown for a public-private partnership that contained a developed business case. As a result, the Crown submitted a proposal to NATO in 1995 to host a training centre.”<sup>35</sup>

The twenty-year contract awarded in 1998 at 2 CFFTS was the NATO Flying Training in Canada (NFTC), a public-private partnership.<sup>36</sup> The contractor commenced training in 2000 on 24 Harvard and 18 Hawk aircraft.<sup>37</sup> This shift to contracted training

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<sup>32</sup> Rob Kamery. “A Brief History of the Recession of 1990-1991,” *Allied Academics International Conference 2004*.

<sup>33</sup> LCol Michael Rostek, “A Framework for Fundamental Change The Management Command and Control re-engineering Initiative.” *Canadian Military Journal*, no4 Vol 5, 21 Dec 2004.

<sup>34</sup> National Defence and The Canadian Forces website, “1994 White Paper on Defence.” p. 7.

<sup>35</sup> J. Clow. “RCAF Pilot Training and...,” 22-23.

<sup>36</sup> *Ibid.*, 3.

<sup>37</sup> *Ibid.*, 25.

would have several ramifications that would impact the quantity of training, cost, and the platform options for 431 AD Squadron.

Maintaining an air demonstration team was not part of the contract, and contractor requirements regarding supporting air displays are stated in the Flight Operations Manual. It states that “the nature of the contracts necessitate careful consideration before decisions are made to use the assets for non-training activities.”<sup>38</sup> This direction ensures that the contractual obligations for training will be met and considerations for liability coverage through contractor insurance are considered.<sup>39</sup> The RCAF works in tandem with the contractor and cannot accept tasking or risk without the contractor's support. These restrictions are nearly a moot point given the significantly smaller fleet of training aircraft with NFTC of 42 compared to 190 Tutor aircraft purchased in 1961. There were also additional challenges in setting up NFTC, where the expectation was to produce 81 Harvard sorties a day on a five-wave program.<sup>40</sup> This requirement needed between 17-21 aircraft serviceable each day, thus leaving no excess capabilities for the air demonstration role.

The RCAF elected to maintain the Tutor fleet rather than retire the Snowbird air demonstration Team in 2000. However, the only units operating the Tutor from that point forward were 431 AD Squadron and Aerospace Engineering Test Establishment (AETE) in Cold Lake, Alberta. AETE initially had five Tutor aircraft but gradually decreased to zero by 2020 as the unit moved to Ottawa.<sup>41</sup> Maintaining the team on a different platform

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<sup>38</sup> Royal Canadian Air Force, *Flight Operations Manual*. 1 Canadian Air Division. Effective 21 Dec 21 to 20 Mar 22. Section 2.7.2.5.

<sup>39</sup> *Ibid.*, 2.7.2.5.

<sup>40</sup> J. Clow. “RCAF Pilot Training and...”, 41.

<sup>41</sup> Chris Thatcher. “AETE to join testing ‘centre of excellence’ in Ottawa.” Security Defence Portal. 11 Jan 2019.

was a shift from what had been done historically when a training airframe was retired from service.

Once it was decided to retain the Tutor fleet for the Snowbirds, the plan was to retire the Tutor aircraft in 2010, ten years past when the RCAF ceased using it for training.<sup>42</sup> “That date was extended another 10 years to 2020, despite an internal 2003 report that warned of escalating technical, safety and financial risks and urged the fleet be replaced immediately.”<sup>43</sup> Further, as Lee Berthiaume states, “in 2008, the Canadian Forces examined options for replacing the Tutors in either 2015 or 2020. But officials decided on the 2020 date because of concerns about the cost of purchasing new planes.”<sup>44</sup> Defence Minister Peter MacKay commented that “although extending to the CT114 to 2020 will be technically challenging, overall it can be achieved with minimal risk and at significantly lower cost when compared against a new aircraft acquisition.”<sup>45</sup> Other options, such as leasing or substituting the CF-188 Hornet fighter aircraft, were not pursued due to costs.<sup>46</sup>

The Snowbird Aircraft Replacement Project (SARP) office was created, linked to the further Tutor life extension of 2020.<sup>47</sup> This office aspired to tie the replacement to the new NFTC contract expected in 2020. This desired connection is apparent when the

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<sup>42</sup> Kathleen Harris. “Military Studies Extending life of Snowbird Aircraft 20 years past Retirement,” *CBC*, 26 Jul 2016.

<sup>43</sup> *Ibid.*

<sup>44</sup> Lee Berthiaume, “Clock Ticking as Royal Canadian Air Force Looks to Stop Hemorrhaging Experienced Pilots.” *National Post* (Online), February 10, 2019.

<sup>45</sup> *Ibid.*

<sup>46</sup> *Ibid.*

<sup>47</sup> “Archived – Snowbird Aircraft Replacement Project,” *National Defence*, Date last modified 30 May 2018, <http://www.forces.gc.ca/en/business-defence-acquisition>.

estimated Tutor replacement cost was between \$500 million and \$1.5 billion.<sup>48</sup> While the Future Aircrew Training (FAcT) program to replace NFTC discussed joining the Snowbird requirements to this contract, that was not pursued, nor was leasing aircraft for the team. The SARP office was closed, and the Tutor fleet was again extended to 2030. “Pushing the retirement planes to 2030 would make some of them roughly 67 years old at that point.”<sup>49</sup> The NFTC contract has also been extended from 2020 until 2027.<sup>50</sup>

This most recent extension of the Tutor until 2030 comes at a high cost due to upgrades that will permit it to continue flying in airspace with significantly more avionics requirements than existed in the 1970s. “Public Services and Procurement Canada awarded a \$26-million contract to L3 Harris on March 11 [2021] for the upgrade that will see the development of a new avionics suite for the aerobatic planes.”<sup>51</sup> In addition to this, “another contract will be put in place to install the avionics equipment, bringing the total project cost to \$30 million.”<sup>52</sup> This avionics upgrade is in addition to overdue upgrades to the ejection seat system. Projections for all modernization projects are between \$50 and \$99 million.<sup>53</sup>

These costs and extensions confirm that “it is increasingly challenging to keep older platforms airworthy, and that challenge becomes more expensive with age.”<sup>54</sup> It is clear why every other air force in the world flies an aircraft that is used either in training

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<sup>48</sup> Joeutey Attariwala, “To Upgrade or Replace Canada’s Snowbirds?” *Canadian Defence Review* October 20, 2020.

<sup>49</sup> Kathleen Harris, “Military Studies Extending life of Snowbird Aircraft...”

<sup>50</sup> “CAE to support NATO Flying Training in Canada Through 2027,” CAE Press Release, 2 Mar 2022.

<sup>51</sup> David Pugilese. “Government Spending \$30 Million to keep Snowbirds Aircraft flying until 2030,” *Saltwire*, 30 Mar 2021.

<sup>52</sup> *Ibid.*

<sup>53</sup> Joeutey Attariwala, “To Upgrade or Replace Canada’s Snowbirds...”

<sup>54</sup> *Ibid.*

or operationally to justify its cost and ease the burden of maintaining a completely separate platform. These developments show the RCAF reacting rather than planning realistically for a Tutor replacement. Given what peer nations do and what the RCAF has done in the past, tying the air demonstration role to the training fleet is a more affordable way forward.

### **YEARLY FLYING RATE**

The RCAF manages fleets flying rates as a means of budgeting. Each fleet is allotted a Yearly Flying Rate (YFR). The current YFR for the Tutor fleet is 3200 hours.<sup>55</sup> According to a 2016 report, the Tutor costs \$14,350 an hour.<sup>56</sup> This hourly rate at the current YFR is just under \$46 million and does not account for inflation. YFR is for items like fuel and repairs. It does not include salaries, infrastructure, travel expenses, or aircraft upgrades. In addition, inflation has been significant since this calculation. The equivalent in 2022 dollars is \$16,096, totaling \$51,507,200. With the previously noted upgrades planned to keep the fleet running until 2030 of up to \$100 million, which could be averaged out to \$10 million per year until 2030, the cost keeps increasing. It is over \$50 million a year without considering upgrades, personnel, infrastructure or travel. The costs to run the Snowbirds are significant, as would a replacement aircraft dedicated solely to the role of air demonstration, at \$1.5 billion.<sup>57</sup> The affordability of the team is questionable when one looks closely at the actual numbers.

### **RECONSTITUTION/STAFFING**

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<sup>55</sup> Canada. "2 Canadian Air Division YFR Updated End Mar 2022." Quarterly power point provided to RCAF Commander created by 2 Canadian Air Division, 31 Mar 2022.

<sup>56</sup> Kathleen Harris. "Military Studies Extending life of Snowbird..."

<sup>57</sup> David Pugilese. "Government Spending \$30 Million..."

The CAF has yet to reach the desired staffing levels directed in Strong Secure Engaged of 71,500 regular force members.<sup>58</sup> More recent reporting shows that the CAF is short 7,600 members from the more realistic target of 65,000 regular members.<sup>59</sup> Recruitment during the pandemic further exacerbated the gap, with recruiting being only at one-third of its regular rates.<sup>60</sup> The shortage is further compounded when considering attrition, where the CAF has shrunk by 2300 Regular Force members.<sup>61</sup> “Compounding this issue is the challenge of the ‘missing middle’ – nearly 10,000 vacant CAF positions, many of which are empty Sr NCO [Senior Non-Commissioned Members], junior officer, and senior leadership billets.”<sup>62</sup>

Due to these shortfalls, the Chief of Defence Staff (CDS) issued a Planning Directive for the Canadian Armed Forces Reconstitution in July 2021. The objective of this directive is to separate “out the discretionary from the essential. Focus on entry-level training. Prioritize staffing at schools to ensure personnel generation objectives are met while also reducing the requirements for incremental augmentation.”<sup>63</sup> 431 AD Squadron is neither training, Force Generation (FG) nor operational, Force Employment (FE). 1 Canadian Air Division, which controls FE for the RCAF, is whom they report to during the show season. 431 AD Squadron reports to 2 Canadian Air Division, who is responsible for FG during the offseason.<sup>64</sup> This mixed report structure is due to their

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<sup>58</sup> Canada, Department of National Defence. *Strong Secure Engaged*. Canada's Defence Policy. 2017. p. 13.

<sup>59</sup> Ashley Burke. “Canadian Military reports sagging Recruitment as NATO ramps up Deployment in Eastern Europe.” Canadian Broadcast Corporation (Online), 23 Mar 2022.

<sup>60</sup> *Ibid.*

<sup>61</sup> Canada. Chief of Defence Staff. “CDS Planning Directive for Canadian Armed Forces Reconstitution.” National Defence Headquarters, Ottawa. 9 July, 2021. p. 5.

<sup>62</sup> *Ibid.*, 4.

<sup>63</sup> *Ibid.*, 27.

<sup>64</sup> Royal Canadian Air Force, *Flight Operations Manual*. 1 Canadian Air Division. Effective 21 Dec 21 to 20 Mar 22. p. 547.

blurred existence. Thus, when the CDS prioritizes school staffing, 431 AD Squadron is not a training establishment and, therefore, not a main effort for the Reconstitution plan. However, the staffing levels at 431 AD Squadron are robust, with 89 of 91 positions filled.<sup>65</sup>

The Occupational Health of the pilot trade is currently at 90%, with 1396 trained pilots.<sup>66</sup> The forecasted occupational health in 2025 is 84% and 80% in 2029.<sup>67</sup> The trade forecasting is currently down due to the reduced numbers of students graduating. The factors for the low production are multiple, but the primary reason is the shortage of QFIs at the training establishments. In addition, the RCAF cannot train enough pilots to make up for those released from the institution. The typical attrition rate for the pilot trade is 6% which equates to approximately 84 personnel per year.<sup>68</sup> 2 CFFTS is expected to produce 115 Phase II graduates each year.<sup>69</sup> The current forecast is at 60, with the shortage of QFIs being one of the most significant factors for the reduced production.<sup>70</sup> This gap of 24 between pilots being created and pilots being released is causing occupational health to have the forecasted downward trend.

2 CFFTS provides most applicants to Snowbird tryouts each year. It is also 2 CFFTS whose staffing levels are even below the RCAF average. Of the 76 Captain pilot

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<sup>65</sup> Canada. 2 Canadian Air Division Headquarters. "431 Air Demonstration Squadron Training Standardization Visit Report." 1775-1 (D/SSO AOT) 30 Oct 2018. p. 7.

<sup>66</sup> Canada. National Defence. "Pilot (00183) 2021/2022 AMOR Presentation." Director Research Workforce Analytics, GBMPRA. 02 Dec 2021. Slide. 8.

<sup>67</sup> Canada. "Aircrew Production Update Fall 2021." Bi-annual power point provided to RCAF Commander created by 2 Canadian Air Division, 25 Oct 21. Slide 8.

<sup>68</sup> Canada. National Defence. "Pilot (00183) 2021/2022 AMOR Presentation." Director Research Workforce Analytics, GBMPRA. 02 Dec 2021. Slide. 15.

<sup>69</sup> Canada. "Aircrew Production Update Fall 2021." Bi-annual power point provided to RCAF Commander created by 2 Canadian Air Division, 25 Oct 21. Slide. 5.

<sup>70</sup> *Ibid.* Slide 4.



positions, only 53 are filled, equating to 70%.<sup>71</sup> Of those, only 32 are fully trained QFIs, equalling 42%.<sup>72</sup> The remainder has not completed the Flight Instructor Course, are medically grounded, or are on parental leave.<sup>73</sup> Several factors have led the school to unhealthy staffing levels that significantly reduced pilot graduates to half of the RCAF expected amount. In addition, 2 CFFT's QFIs who have experience on the Tutor aircraft have assisted 431 AD Squadron during tryouts, further exacerbating a shortage at the school.<sup>74</sup>

The aircraft maintainer trades are also in dire health. The occupational health of aircraft maintenance trades in February 2022 was considered red at 90% and is on a downward trend due to the reductions in enrolment during the pandemic.<sup>75</sup> In addition, the actual trade health is 80% when considering who is fully qualified to do the job.<sup>76</sup> Since 431 AD Squadron has a small maintenance footprint, it is not considered a Training Establishment; it does not receive apprentice technicians to fill vacancies, but rather qualified journeymen from other fleets, mainly the CF188. Air Maintenance Technical health is forecasted to be on a downward trend until 2025.<sup>77</sup> This reduction is primarily because training during the pandemic did not keep pace with attrition and is exacerbated by the addition of two new fleets for the RCAF of Manned Airborne Intelligence

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<sup>71</sup> Canada, 2 Canadian Air Division Headquarters. "2 Canadian Forces Flying Training School Flying Training Evaluation Report." 1775-1 (SO NFTC) 1 Dec 21. p. 10.

<sup>72</sup> *Ibid.*, 10.

<sup>73</sup> *Ibid.*, 10.

<sup>74</sup> Canada, 2 Canadian Air Division Headquarters. "431 Air Demonstration Squadron Training Standardization Visit Report." 1775-1 (D/SSO AOT) 30 Oct 2018. p. 7.

<sup>75</sup> Aircraft maintainers are including AVN, AVS, and ACS for this paper as these are the technicians required by 431 Squadron. Canada. Director General Military Personnel Research and Analysis (DGMPPRA). "Establishment and Strength Report." Feb 2022.

<sup>76</sup> Canada. "Maintenance Occupational Health Brief to Commander RCAF." Bi-annual power point provided to RCAF Commander created by 2 Canadian Air Division, 22 Jan 2022. Slide 6.

<sup>77</sup> *Ibid.* Slide 6.

Surveillance and Reconnaissance (MAISR) and Remotely Piloted Aircraft System (RPAS).

Due to this shortage of maintainers, the RCAF has analyzed this situation and, as a result, believes the continued decrease in authorization health of the maintenance technicians will lead to an inability to support up to 25% of the anticipated future YFR until health can be reconstituted.<sup>78</sup> The analysis has determined that operational YFR support issues are likely to impact 431 AD Squadron YFR allocations.<sup>79</sup> It can be expected that 431 AD Squadron will lose some of its maintainers to keep higher prioritized units staffed. This reduction would mean that the unit will need to reduce the number of airshows it performs, typically 60, as it may not have the YFR allocated to fulfill such a schedule.<sup>80</sup>

Historically RCAF has elected to make 431 AD Squadron a Category A posting slot, meaning the unit must be kept at 95-100% effective strength.<sup>81</sup> This ranking has just shifted in 2022, with the unit becoming a category C which means 90% or less effective strength.<sup>82</sup> This recent shift from a high-priority posting to a third-tier unit indicates the hard truth about the current RCAF staffing levels and capabilities. The shift also aligns with the CDS direction on reconstitution.

Attracting qualified candidates has become a significant challenge since the RCAF stopped using the Tutor as its training aircraft in 2000. Candidates no longer have

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<sup>78</sup> *Ibid.* Slide 8.

<sup>79</sup> Canada. "Distribution of Pre-Apprentice Aircraft Technicians for Fiscal Year 2022/23." 1 Canadian Air Division A4, (4975-1), 24 Mar 2022.

<sup>80</sup> "Canadian Forces Snowbirds," *Government of Canada*, Home page last accessed 20 Mar 2022.

<sup>81</sup> Canada. Commander Royal Canadian Air Force. "2021 RCAF Unit Staffing Priority Direction." National Defence Headquarters, Ottawa. 30 Jan, 2021. And Canada. Commander Royal Canadian Air Force. "2022 RCAF Unit Staffing Priority Direction." National Defence Headquarters, Ottawa. 15 Feb, 2022.

<sup>82</sup> *Ibid.*

experience flying the Tutor as all pilots have trained on the Harvard in the past 22 years. Historically the expectation for applicants was 1300 military jet time.<sup>83</sup> The most recent solicitation message states, “1000 hours flying time and 2 years of operational flying. Preference will be given to those candidates with a tour on the ejection seat aircraft.”<sup>84</sup> To address the shortfall of candidates, the unit “will now seek applications direct from the multi-engine and rotary-wing communities. Pilots applying from those communities should expect to spend 1 year with 431 AD Squadron in training, prior to being placed in a numbered show team position.”<sup>85</sup> Thus the number of pilots posted to 431 AD Squadron will increase above what would typically be posted as they try to allow candidates time to build Tutor experience prior to trying out for the team.

A further example of the lack of desirability of the unit can also be seen in the most recent solicitation message. It states, “Those successful candidates who complete their tour obligations with 431 AD Squadron will be given their choice of follow-on postings to the Capability Advisory Group (CAG) or geographical location of their choice.”<sup>86</sup> Such promises of postings are not offered to any others in the CAF. A further sign of the difficulty of garnering applicants is the recent addition to the solicitation message “Unit COs [Commanding Officers] are expected to be actively involved in searching for skilled and professional candidates for this tremendous opportunity.”<sup>87</sup> This direction stresses the low interest and the pressures put on all communities to fulfill this remit even though all communities feel the current shortage of personnel.

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<sup>83</sup> Mike Sroka, *Snowbirds: Behind the Scenes with Canada's Air Demonstration Team*. (Calgary: Fifth House, 2006): 29.

<sup>84</sup> CANAIRGEN 06/21. “CAF Snowbirds call for Show Team Pilots Coordinator and PAO Applicants.” National Defence Headquarters: Chief of the Air Force Ottawa, 11 Aug 2021.

<sup>85</sup> *Ibid.*

<sup>86</sup> *Ibid.*

<sup>87</sup> *Ibid.*

Tryouts are held each autumn and allow up to eight personnel to audition for up to four positions. In recent years 431 AD Squadron has had as few as six try out for the four positions.<sup>88</sup> The unit has extended tours of successful applicants to four to five years from three to ensure the team remains fully staffed.<sup>89</sup> Filling the 431 AD Squadron billets is happening at a high cost to other RCAF units.

### **RECRUITING TOOL/SYMBOLISM**

The Snowbirds state that they are “serving as ambassadors of the CAF” who “inspire the pursuit of excellence wherever they go in North America.”<sup>90</sup> There is no doubt that over their 52-year history, they have become a Canadian symbol. However, no data support any link between Snowbird performances and increased CAF recruitment. Nor does their mandate include foreign relations, yet 20-35% of their annual shows are done in the United States.<sup>91</sup> This high number of air shows outside Canada also means that the costs spent on this capability are only in support of 40 to 48 Canadian events per year.

If there is nothing to validate that the team impacts recruiting, they have no foreign relations mandate, and one-third of their shows are not in Canada, what military role are they fulfilling for the CAF? While they are a symbolic entity that the Government has leaned on, most recently during OPERATION INSPIRATION during

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<sup>88</sup> Canada. 2 Canadian Air Division Headquarters. “431 Air Demonstration Squadron Training Standardization Visit Report.” 1775-1 (D/SSO AOT) 30 Oct 2018. p. 8.

<sup>89</sup> CANAIRGEN 06/21. “CAF Snowbirds call for Show Team Pilots Coordinator and PAO Applicants.” National Defence Headquarters: Chief of the Air Force Ottawa, 11 Aug 2021.

<sup>90</sup> “Canadian Forces Snowbirds,” *Government of Canada*, Home page last accessed 20 Mar 2022.

<sup>91</sup> *Ibid.*

the pandemic, the prioritizing of the Snowbirds by both the RCAF and the Government is worth questioning.<sup>92</sup>

## **GOVERNMENT PRIORITIES**

The Government released Strong Secure Engaged (SSE) in 2017 to provide a long-term vision of Canada's defence policy.<sup>93</sup> This 113-page document goes into detail regarding the priorities for the CAF and the planned procurement projects for the institution. Recruiting and retention are mentioned, but there is no reference to the Snowbirds, their role, or an upgrade to the fleet. This absence speaks volumes regarding the Government's prioritization of the team.

The Future Aircrew Training (FAcT) program is in the process of being contracted by the RCAF. "The program will include delivery of pilot training, as well as aircrew training for air combat systems officers and airborne electronic sensor operators."<sup>94</sup> The Request for Proposal (RFP) has been provided to qualified suppliers. This contract is significant as it will combine contracts for training done in Moose Jaw, Southport, and Winnipeg for three trades. The awarding of the contract is planned for 2023.<sup>95</sup> FAcT will replace the Harvard and Hawk fleets in Moose Jaw. There is no requirement in the RFP to support an air demonstration capability.

Fighter Lead in Training (FLIT) is the flying program that fills the gap between pilots who obtain their wings on the training fleets in Moose Jaw and are streamed to fly jets, currently the CF-188 Hornet. The FLIT program is presently under the NFTC

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<sup>92</sup> "Canadian Forces Snowbirds launch cross-Canada tour," *Government of Canada*, Date last accessed 11 Apr 2022.

<sup>93</sup> Canada, Department of National Defence. Strong Secure Engaged. Canada's Defence Policy. 2017.

<sup>94</sup> Government of Canada. National Defence. "Future Aircrew Training. Defence Capabilities Blueprint." Last accessed 13 Apr 2022.

<sup>95</sup> *Ibid.*

program that expires with the current contract and is not included in the FAcT program. Industry Engagement began for the FFLIT (Future FLIT) replacement contract in June 2021, and the project is currently in the Options Analysis Phase with a planned definition summer of 2024.<sup>96</sup> The Strategic Context Document does not include air demonstration as a requirement.<sup>97</sup> The RCAF has moved towards a contracted solution for pilot training and has not defined air demonstration as a requirement or priority in either program now being finalized.

An added complication is that 431 AD Squadron is on the 15 Wing Base in Moose Jaw, where portions of the FAcT and FFLIT contracts will be implemented. These contracts also include infrastructure for the school but not for 431 AD Squadron. With no concrete plan other than the current airframe being used until 2030, the requirement for updated facilities will also need to be considered if this is a continued role that the RCAF feels warrants the investment.

## **CLOSING**

Given the current challenges regarding personnel shortages and pressures on the RCAF to fulfill multiple new capabilities, it is time to retire 431 AD Squadron and the Snowbird air demonstration team. Canada has had several different air demonstration teams over the years. When the Tutor was retired from training, it should have been retired from air demonstration, but the RCAF elected to do otherwise. The expectation is that if the current team were to be retired, opportunities would arise again for air

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<sup>96</sup>Government of Canada. "Future Fighter Lead-in Training Industry Engagement." National Defence. 1 June 2021.

<sup>97</sup>*Ibid.*

demonstration. No other peer nation flies a nine-ship team full time on an aircraft with no other role in their Air Force.

The RCAF needs to prioritize FG and FE over entertainment. The Snowbirds were a luxury from another era, flying an aircraft that ceased being used for training in 2000, with team members having no other role but to perform. The extravagance of having a unit of 100 personnel dedicated to air demonstration is long past. The staffing levels of the RCAF overall show this, and the difficulties that 431 Squadron has at recruiting potential candidates reflect this.

Perhaps the airframes selected for FAcT or FFLIT may be appropriate for a smaller team of up to five who perform at Canadian shows as the flying schools can support. Once those contracts are awarded, feasibly, an amendment could include additional aircraft and services to support this role. With the RCAF increasing airframes and capabilities, the institution needs to realize it cannot do it all.

The Snowbirds celebrated their 50<sup>th</sup> anniversary in 2021; that would have been an ideal time to retire the team and commence efforts to look forward to what comes next for the country regarding air demonstration. The RCAF will be celebrating their 100<sup>th</sup> anniversary in 2024. At that point, the Tutor will have been flying for 64 years. This anniversary seems like another ideal opportunity to disband the team. Disbandment does not mean that Canada is quitting air demonstration, nor is it an indicator of how the team has conducted themselves. There have been many teams before the Snowbirds; there is no reason to believe that there will not be again. It is time for the RCAF to make the hard decisions that staffing and priorities demand.

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