**Proposal for Funding: Expansion of STEM Equipment for Robotics Courses**

**To**: The Financial Subcommittee of Durham/Northumberland Wing Air Cadets

**Subject**: Request for £3420.54 to Enhance and Expand STEM Equipment for Robotics Courses

**Introduction**:

We are pleased to present a request for funding to enhance our STEM equipment stores, specifically to support and expand our highly successful Robotics courses. The initial funding provided by the committee was instrumental in launching the first course, which exceeded our expectations and received strong endorsements from HQ, Regional, and Wing levels. Building on this success, we seek to further enhance our capabilities to offer this valuable training to a larger number of cadets.

**Support:**

Our initiative to enhance and expand our STEM programs has garnered significant internal support from key stakeholders within the Royal Air Force Air Cadets (RAFAC) community. Commandant Air Cadets, North Region, and OC Durham/Northumberland Wing have demonstrated support and confidence in our robotics courses, recognizing their value in preparing cadets for the challenges of modern technology. The provision of five brand new laptops by HQ RAFAC to the Wing STEM Team is a clear indication of their commitment to facilitating the expansion of our training initiatives.

Additionally, Newcastle University's partnership adds external validation and expertise to our endeavour. Their commitment to providing facilities and manufacturing course parts not only enhances the quality of our programs but also fosters collaboration within the broader community. This combined support from internal stakeholders and external partners strengthens our programs and enables us to better serve our cadets, preparing them for success in both military and civilian contexts.

**Funding Requirements:**

The requested funds of £3420.54 has been optimised for maximum value per cadet and for scalability for more frequent courses attended by more cadets. A detailed breakdown of these funds can be found in the attached Quotation Document. Funds will be allocated across three key areas:

**Additional Equipment for Course Expansion (£1,292.41)**

* Purchase of equipment to accommodate 56 cadets, increasing from the previous maximum of 30.
* Use of high-quality equipment from renowned suppliers rather than using lowest-cost items.

**Support Costs and Storage Solutions (£685.20)**

* Acquisition of storage solutions, including a locking cabinet for laptops, to safely store equipment between courses.
* Purchase of paper and printer ink for the necessary printed resources.

**High-Quality 3D Printer & Materials (£1,442.93):**

* Procurement of a high-standard 3D printer capable of producing required parts at a much lower cost compared to external sourcing.
* The selected printer is durable and expected to last a minimum of five years, extending up to ten years with our projected use.

**Justification and Impact:**

STEM education is integral to the mission of the Royal Air Force Air Cadets, aligning with the ASTRA initiative, the course fosters essential engineering skills such as problem-solving, mechanical building, wiring, electronics, and coding. These skills are vital for potential RAF careers and are highly sought after in the modern workforce. The initial course's overwhelming success demonstrated a clear demand for this training, underscoring the importance of expanding our capabilities to accommodate more cadets. Increasing course capacity to 40 cadets will allow us to offer this valuable training to a larger number of young people, building a pool of skilled and motivated individuals.

The purchase of a high-quality 3D printer will reduce our reliance on costly external resources, ensuring we have necessary components readily available and reducing long-term costs. Support from Newcastle University and HQ Air Cadets highlights the initiative's value, with endorsements and facility access enhancing our program's impact.

Additionally, this initiative presents a valuable opportunity to up-skill our volunteer staff members within the Wing. By involving them in the setup and execution of these courses, CFAVs can gain hands-on experience with advanced STEM equipment and modern teaching methodologies. Comprehensive training on the new 3D printer and other equipment will enhance their technical skills, making them more effective instructors and mentors. This up-skilling benefits both the cadets and our overall training capacity, as well-trained staff are crucial for delivering high-quality educational experiences. The investment in storage solutions will ensure equipment longevity and readiness for future courses, setting the foundation for sustainable, long-term success. Funding this proposal will enable us to continue offering top-tier STEM education, fostering a new generation of skilled, innovative, and technically proficient cadets and volunteers.

**Added Value and Return on Investment:**

The investment in STEM equipment will yield substantial returns by:

* **Expanded Reach and Impact:** Increasing course capacity to accommodate a greater number of cadets will broaden the reach of our STEM education programs, enabling us to offer valuable training to a larger number of young people. We aim to run this course every 2 months.
* **Cost Savings and Efficiency:** Procuring a high-quality 3D printer will significantly reduce our reliance on costly external resources for parts production, ensuring cost savings in the long term and enhancing operational efficiency.
* **Community Partnerships:** Support from Newcastle University and HQ Air Cadets underscores the value of our initiative, with endorsements and facility access enhancing our program's impact and fostering stronger community partnerships.
* **Staff Up-skilling:** Involving volunteer staff members in course setup and execution provides valuable hands-on experience with advanced STEM equipment and teaching methodologies, enhancing their technical skills and effectiveness as instructors and mentors.
* **Long-term Sustainability:** Investment in storage solutions ensures equipment longevity and readiness for future courses, laying the foundation for sustainable, long-term success in delivering top-tier STEM education.

**Conclusion**:

In conclusion, the requested funding of £3420.54 represents a strategic investment in the future of our cadets and the effectiveness of our training programs. By expanding our STEM equipment and capabilities, we are poised to deliver top-tier robotics courses to a larger cohort of cadets, preparing them with essential skills for both RAF careers and the broader workforce. The cost-effective procurement of a high-quality 3D printer will not only save long-term expenses but also ensure we maintain control over the production of necessary parts, enhancing our operational efficiency.

This initiative offers tangible benefits, including expanded reach and impact, cost savings, and community partnerships. Furthermore, the up-skilling of our volunteer staff members strengthens our training capacity, ensuring the delivery of high-quality educational experiences. Your support in funding this proposal will enable us to continue offering exceptional STEM education, empowering our cadets with the skills and knowledge they need to succeed in the modern world. We are confident that with your investment, we can build a stronger, more capable generation of cadets who are prepared to meet the challenges of tomorrow.

Sincerely,

Harrison Milburn

Plt Off (RAFAC)

Wing STEM & Space Lead

Durham/Northumberland Wing Air Cadets