

STEM HIGH FLIERS

Report and Accounts for the year ended 31 July 2023

CHARITY NO 1178285

ANNUAL REPORT

Address 12 Church Road
 Codsall
 WV81EA

Trustees

The following trustees served during the year:

Christopher Ian Hughes BSc CEng FRAeS	(Chairman)
Michael Oldham Roach	(Secretary)
Anthony Charles Cotton BSc FCA	(Treasurer)
Graham Frederick Elvis AUMIST	
Graham Paul Wiley	

Structure

The charity is a Charitable Incorporated Organisation, registered with the Charity Commission 1178285. It was constituted on 11 January 2018 and received registration on 8 May 2018. It is managed by the Trustees in accordance with the Constitution. The trustees may appoint additional trustees, who will be chosen on the basis of their ability to contribute to the objectives of the charity. One third of trustees stand down and may offer themselves for reappointment at the Annual General Meeting.

Activities and Objectives

Introduction

Our prime objective is to inspire young people towards Science, Technology, Engineering & Maths (STEM), by having them build a light aircraft and then fly in it.

We comprise an experienced group of volunteers who have already managed two such programmes with schools. We felt that our two projects had such great impact that we have launched this project, registered as a charity, and independent of RAeS but with its support.

Background

There are few experiences for a young teenager that can be more inspirational and motivational than being actively involved in constructing and flying a real aircraft.

The Birmingham, Wolverhampton and Cosford branch of the Royal Aeronautical Society ("BWC") has been directly responsible for the management of two such projects, including the display (both flying and static) of the completed aircraft at major international events such as the Farnborough Air Show and RIAT. These were sponsored by Boeing who after several years of support have ended their programme. We directly observed the life-changing effects that engagement in such a project has by significantly improving a student's prospects in further education or first employment. This has been both through promotion of STEM, and in the personal development of the participants, encouraging confidence, determination, resilience and ambition. A number

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of students who applied for apprenticeships stated that the Build-a-Plane project was a “game changer” at interview.

Objective

The objective of STEM High Fliers is to provide a challenging and enjoyable educational opportunity in STEM (Science, Technology, Engineering and Maths) for school pupils and youth group members in our geographic area. We know from our two successful projects that, as well as the direct engineering, design and scientific experience, there are valuable lessons in teamwork, persistence, resilience and an increase in self-confidence. When exhibiting our aircraft at displays, shows and conventions, many thousands of young people have experienced the project and been inspired towards STEM activities. Our experience has confirmed that the programme is equally successful irrespective of gender and has a positive effect on social mobility.

A Proven Engineering Project

We have selected the UK manufactured Sherwood Ranger biplane which is considered to be well engineered and provides experience in metal, wood and composite construction. Its “vintage” appearance in a modern design attracts attention and helps motivate both participants and supporters. It has been successfully built by other school and youth-based projects.

The aircraft will be assembled largely by the young participants, under the close guidance of our volunteers who have many years’ experience in senior roles within the aerospace and engineering industries and/or the military services. They have already successfully completed two such projects, training and guiding almost 100 students in the process. Our volunteers are registered STEM ambassadors, with DBS clearances, and are well-versed in operating in safety with appropriate risk assessment.

Construction is in accordance with the LAA’s rules for amateur built aircraft, will be independently inspected at regular intervals by local LAA inspectors, and monitored overall by the LAA, which is responsible for issuing the aircraft’s permit to fly. We are not considering a high-performance sports aircraft, nor one in which the construction technology is so advanced that there is little to be gained by the pupils. The major benefit for them is derived from the build process itself and the disciplines that must be learned as part of it. The construction therefore must be within the capabilities of inexperienced teenagers, given suitable instruction. The Sherwood Ranger has a successful track record in other similar projects.

Schools and youth organisations have been invited to participate, on the basis of a long-term commitment to see the programme through to completion. The anticipated timescale would be between two and three years for the build, up to first flight and certification. A further six months to a year will be dedicated to giving all pupils that were involved the opportunity for a flight experience. Several of our volunteers are highly experienced pilots.

Finance and Organisation

The Sherwood Ranger kit may be bought for a total of approximately £50,000 including VAT and engine. Since the kit is available in modular form, the project may proceed even without full funding being initially in place and in this regard the kit suppliers have been highly supportive. The staging of fundings is especially the case with regard to the engine and fitting kit, and indeed the engine type can be determined at a very late stage. Beyond the capital cost of the aircraft kit, the costs of consumable materials, fuel, insurances and other associated costs will have to be met, until the point where the completed aircraft can be sold.

Finance is by funding from individuals, companies and charitable foundations with any shortfall covered by loans from supporters. Whilst donations will enable the project to self-perpetuate by the proceeds of the first aircraft being used to finance a second, we recognise that a more realistic approach may be loan finance for

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the kit, and donations for tools, consumables and running costs. Since the finished aircraft will be an attractive design constructed to the highest standards it is expected to have a ready market. The option then exists for the CIO to repay members' and sponsors' original loans or to continue with a further project, depending on the wishes of the lenders.

Participating Schools

The ideal age for participants' involvement in this project is from 13 to 15 years, or school years 9 and 10. This is early enough for the project to have some influence on their subject choices and it will also benefit them in acquiring life-skills, such as determination and persistence, needed in their later studies, but without directly impinging on their time in Y11 which should be focussed towards GCSEs. Most projects have found that the involvement of Y12 pupils helps in strengthening the management and organisation of the work, and in the passing on of acquired skills and experience.

We expect at least 40 young people to be involved in the project, but we expect that it will be seen by and inspire several hundred children in a year.

The success of a school's participation depends heavily upon committed members of staff to support the pupils over the two to three years anticipated duration of the project. Involvement in an aircraft building project offers a school a huge range of opportunities to build into the established curriculum. In order to be considered for inclusion, we would expect schools to demonstrate the widest possible impact of the project on their pupils' education.

Achievements and Performance

We have been introduced by Millenium Point Trust to Dudley Academies Trust, a group of 4 secondary and 2 primary academies within the Borough of Dudley. Each of the secondary schools has nominated pupils to build the Sherwood Ranger. The construction site has been kindly provided by Black Country & Marches Institute of Technology. This is a superb facility which is able to provide outstanding engineering support where needed. The environment gives a positive interpretation of the study of engineering and the potential for careers within its sectors.

We began working with the academies in September 2022. They are:

Beacon Hill Academy
St James Academy
Pegasus Academy
The Link Academy

Each school participates once every 2 weeks, which allows a larger number of participants.

The year 9 learners are split into an engineering team and a support team. The engineering team have been trained to safely and effectively operate hand and light machine tools. Safety is our priority at all times. The mix of materials in the Sherwood Ranger has so far given experience in working with wood and aluminium. During the course of the year, our learners have cut, drilled, sanded and machined the parts of the aircraft and the jigs to make them, and have produced 4 sets of wing ribs, ready for assembly of the wings. As part of this process, test pieces were made which were subject to destructive testing to demonstrate the strength of a properly made adhesive bond.

We have been delighted by the diligence of the young engineers and their willingness to learn new skills and processes, and to learn to work to the level of precision necessary for the safe construction of the airframe. Each learner has prepared a record of their achievements, and have learnt the necessity of supporting engineering skills with appropriate documentation.

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The support team have recorded the progress of the project for social media and have learnt aspects of aviation technology.

In March 2023, some of the learners who are taking part in the project gave a presentation on it to an audience at RAF Cosford, where they were able to develop their confidence, public speaking skills and teamwork.

Shortly after the year end, the charity ordered a fuselage and empennage kit to enable the next stage of assembly to continue.

The trustees would like to place on record their thanks to the Institute, the Academies and Millenium Point Trust, and to the ongoing support of the kit supplier, TLAC.

A number of our volunteers have also continued mentoring pupils of a local Engineering Academy in the completion of a Slingshot aircraft kit provided by the Air League.

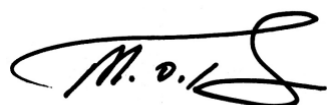
Financial Review

We have continued to receive financial support from local business, from the Royal Aeronautical Society, and from individuals. Of particular significance was the conversion of a £5,000 loan to a donation which resulted in a reduction of the charity's liabilities and a Gift Aid claim, received after the year end.

The trustees remain confident that the project will proceed successfully and that funds will become available to enable a successful conclusion.

The trustees declare that they have approved the trustees' report above.

Signed on behalf of the charity's trustees.

A handwritten signature in black ink, appearing to read 'M. O. Roach', with a stylized flourish at the end.

MO Roach
Secretary
12 September 2023

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Statement of Financial Activities for the year ended 31 July 2023

	Notes	Unrestricted funds £	Total 2023	2022 £
Incoming resources				
Voluntary income	3	7,417	7,417	19,930
Incoming resources from charitable activities		7,417	7,417	19,930
Total incoming resources		7,417	7,417	19,930
Resources expended				
Charitable activities		1,760	1,760	496
Governance costs	4	-	-	-
Total resources expended		1,760	1,760	496
Net incoming resources		5,657	5,657	19,434
Total funds brought forward		17,169	17,169	(2,265)
Total funds carried forward		22,826	22,826	17,169

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Balance Sheet at 31 July 2023

		2023 £	2022 £
Current assets	Note		
Cash at bank and in hand		22,076	22,669
Debtors and prepayments	6	1,250	-
Total current assets		<u>23,326</u>	<u>22,669</u>
Net current assets		<u>23,326</u>	<u>22,669</u>
Total assets less current liabilities		<u>23,326</u>	<u>22,669</u>
Creditors: amounts falling due after one year	6	500	5,500
Provisions for liabilities and charges		-	-
Net assets		<u>22,826</u>	<u>17,169</u>
Funds of the Charity			
Unrestricted funds		22,826	17,169
Total funds		<u>22,826</u>	<u>17,169</u>

Approved by the Trustees and signed on behalf of all the trustees



AC Cotton
Treasurer
12 September 2023

Notes to the Accounts

1 Basis of preparation

1.1 Basis of accounting

These accounts have been prepared on the basis of historic cost in accordance with Accounting and Reporting by Charities – Statement of Recommended Practice (SORP 2005) and with Financial Reporting Standards for Smaller Enterprises (FRSSE) and with the Charities Act.

2 Accounting policies

INCOMING RESOURCES

Recognition of incoming resources

These are included in the Statement of Financial Activities (SoFA) when:

- the charity becomes entitled to the resources;
- the trustees are virtually certain they will receive the resources; and
- the monetary value can be measured with sufficient reliability.

Incoming resources with related expenditure

Where incoming resources have related expenditure (as with fundraising or contract income) the incoming resources and related expenditure are reported gross in the SoFA.

Grants and donations

Grants and donations are only included in the SoFA when the charity has unconditional entitlement to the resources.

Tax reclaims on donations and gifts

Incoming resources from tax reclaims are included in the SoFA at the same time as the gift to which they relate.

Contractual income and performance related grants

This is only included in the SoFA once the related goods or services have been delivered.

Gifts in kind

Gifts in kind are accounted for at a reasonable estimate of their value to the charity or the amount actually realised.

Gifts in kind for sale or distribution are included in the accounts as gifts only when sold or distributed by the charity.

Gifts in kind for use by the charity are included in the SoFA as incoming resources when receivable.

Donated services and facilities

These are only included in incoming resources (with an equivalent amount in resources expended) where the benefit to the charity is reasonably quantifiable, measurable and material. The value placed on these resources is the estimated value to the charity of the service or facility received.

Volunteer help

The value of any voluntary help received is not included in the accounts but is described in the trustees' annual report.

Investment income

This is included in the accounts when receivable.

EXPENDITURE AND LIABILITIES

Liability recognition

Liabilities are recognised as soon as there is a legal or constructive obligation committing the charity to pay out resources.

Governance costs

Include costs of the preparation and examination of statutory accounts, the costs of trustee meetings and cost of any legal advice to trustees on governance or constitutional matters.

Grants with performance conditions

Where the charity gives a grant with conditions for its payment being a specific level of service or output to be provided, such grants are only recognised in the SoFA once the recipient of the grant has provided the specified service or output.

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Grants payable without performance conditions

These are only recognised in the accounts when a commitment has been made and there are no conditions to be met relating to the grant which remain in the control of the charity.

Support Costs

Support costs include central functions and have been allocated to activity cost categories on a basis consistent with the use of resources, eg allocating property costs by floor areas, or per capita, staff costs by the time spent and other costs by their usage.

ASSETS

Tangible fixed assets for use by charity

These are capitalised if they can be used for more than one year, and cost at least £1,000. They are valued at cost or a reasonable value on receipt.

Investments

Investments quoted on a recognised stock exchange are valued at market value at the year end. Other investment assets are included at trustees' best estimate of market value.

Stocks and work in progress

These are valued at the lower of cost or market value.

3 Incoming Resources

	2023	2022
	£	£
Donations	6,167	19,930
Gift Aid	1,250	-
Total	<u>7,417</u>	<u>19,930</u>

4 Trustee expenses

No expenses or remuneration were paid in 2023 or 2022.

5 Debtors and Prepayments

	2023	2022
	£	£
Gift Aid Recoverable	1,250	-
Total	<u>1,250</u>	<u>-</u>

6 Creditors and accruals

	2023	2022
	£	£
Amounts falling due after 1 year		
Loans and overdrafts	500	5,500
Total	<u>500</u>	<u>5,500</u>

Loans are repayable on completion of the project, or earlier at the discretion of the trustees.