

Promoting Electronics to A-Level Physics Students

Context

The UK has the sixth-largest Electronics industry in the world, with an annual turnover of £98 billion and over 1,000,000 related jobs. It contributes 6% of the UK's GDP, making the sector strategically important to the economic success of the UK. Electronics is essential to enable future technologies, including the Internet of Things, autonomous vehicles, augmented reality, wearables and renewables. Over 90% of smartphones contain electronics designed in the UK, yet the number of students studying Physics at school and Electronics at university is not increasing.

Whilst the overall number of UK students starting Engineering degrees has increased by 64% since 2007 to over 24,000 in 2016, the number starting Electrical & Electronic Engineering degrees is only 3,510. Consequently, 61% of employers in the sector have open vacancies for engineering and technology staff, with 69% stating a lack of suitable available candidates is affecting recruitment.

Project

This project will show young people how relevant Electronics can be, and the exciting career opportunities that are available within the sector.

Why Physics? Around 35,000 pupils study A-level Physics each year. Although electronics is part of the curriculum, the content can be somewhat 'dry'.

The approach taken by the UKESF for this project is to provide a practical, hands-on tool (pictured, right) for teachers to deliver the fundamental electronics parts of the A-level¹ Physics curriculum. It is centred around a 'Music Mixer' circuit, which enables students to mix music from two sources (e.g. smartphones) using an op-amp circuit, controlled by potential dividers and electronic sensors.



The bare PCB exposes all components, creating a link between electronics and applications in many consumer products, and showing students that electronics is not a mystery black box. Importantly, the project also provides CPD for teachers to increase their knowledge about electronics and so inspire more young people to take up a career in electronics.

"The board is a great teaching tool." Joint Head of Physics, Graveney School, London.

The project, a collaboration with the University of Southampton, has been successfully demonstrated through a pilot phase. By July 2017, 40 teachers will have been trained, with classroom sets provided to their schools. A conservative estimate is that this will reach around 2,400 pupils per year.

¹ and Advanced Highers in Scotland.

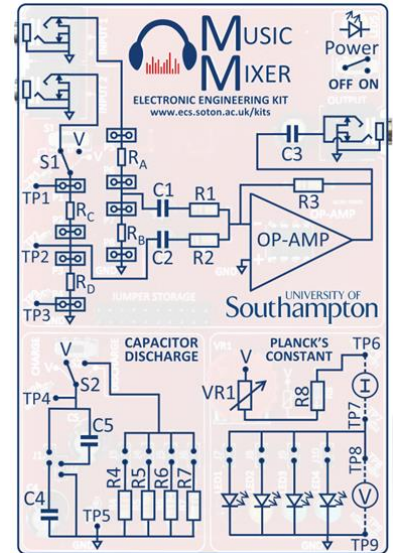
Proposal

In the academic year 2017/2018, the UKESF, working with the University of Southampton, propose to scale-up the project. With the support of corporate donors, we want to reach many more A-level students and to provide resources for as many schools as practical.

Project Deliverables

Each school supported by this project will:

- Receive a classroom set consisting of 16 circuit board kits. These resources will be fully packaged and re-usable;
- Have a Physics teacher attend a comprehensive, face-to-face, CPD training session, to familiarise themselves with all aspects of the teaching resource;
- Gain access to on-line teaching resources, guides and additional information;
- Be covered by a comprehensive support package including a replacement/repair service.



Impact

This will be a low-cost but high-impact project, as it is focused on enabling teachers to deliver the A-level curriculum in an engaging way by providing a hands-on classroom learning experience for their pupils.



Benefits

The company benefits derived from this project would be as follows:

1. Inspire students taking A-level Physics to consider studying Electronics afterwards, and to take up careers in the sector.
2. By supporting a local school, enhance community links and raise the company profile.
3. Boost the sponsoring companies' Corporate Social Responsibility agendas.
4. Maximise potential PR and marketing opportunities for the supporter companies within local schools.
5. Enable the supporter companies to offset charitable giving against corporation tax.

Donation Requested

For each **£1,000** donated, the UK Electronics Skills Foundation will arrange for **two** secondary schools/colleges to be supported. Each school will be provided with a classroom set of the circuit board kits, access to supporting resources, and one teacher from the schools will receive the CPD training session.

A company can nominate one specific school/college, often local, that they would like to support through their donation. The second one supported by the donation will be chosen by the UKESF and the University of Southampton (these will be state-sector schools, in our target 'harder to reach' areas).

About the UKESF and the University of Southampton

The UKESF. The UKESF is an educational charity, launched in 2010. It operates collaboratively with major companies, leading universities and other organisations to tackle the skills shortage in the Electronics sector. The UKESF's mission is to encourage more young people to study Electronics. As well as working with schools, the UKESF helps undergraduates and prepares them for the workplace.

Registered charity number: SC043940

www.ukesf.org | info@ukesf.org | [@theUKESF](https://twitter.com/theUKESF)

The University of Southampton. The University of Southampton is a global centre for excellence in research and education, and a founding member of the prestigious Russell Group. Southampton has been a UKESF partner since its creation; their graduates are highly regarded by leading employers. The university works closely with industrial partners, both in teaching and research.

- Ranked number one in the UK for Electrical and Electronic Engineering (Guardian University Guide 2017).
- Offering a range of degrees in Electronic and Electrical Engineering, including Mechatronic, Aerospace and Biomedical Electronics.
- A research led degree including advanced theory underpinned by practical experiments in our £4M teaching labs.

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