



THE BIOPHONE, A WAY OF LISTENING TO AND RECONNECTING WITH THE WILDLIFE IN OUR ENVIRONMENT

THE CHALLENGE

Wild Connect wanted to develop an audio monitoring device for both professional and amateur conservationists to be used to study eco-acoustics and help re-engage people with their natural environment.

In a major interdisciplinary science and arts collaboration, FE educator Coleg y Cymoedd, Semiconductor Innovator Newport Wafer Fab (Nexperia Newport since 5th July 2021) and Compound Semiconductor Applications Catapult (CSA Catapult) worked with Wild Connect to create an audio monitoring device - the Biophone. Having created a concept version, the instigators sought the electronic engineering skills of GX, who are experienced in taking proven ideas to fully working and scalable production runs.

The Biophone needed to be capable of recording the full range of sounds from ultrasonic to infrasonic. It also had to be robust enough to withstand extreme weather conditions and function continuously for twenty-day field cycles in order to minimise site disturbance.

THE SOLUTION

GX designed and built a fully functioning mechanical engineering prototype, then assessed its capabilities, before outlining a final design brief, that the students would follow and build.

Throughout the course of product development the GX team kept in mind the harsh treatment each unit would encounter, the potential for water ingress on exposed Welsh hillsides, potential rough handling when in transit, extreme heat, dust storms and even the attention of curious baboons in Namibia, known for their dexterity and aggressive attacks.

“ THE BIOPHONE HAD TO BE CAPABLE OF RECORDING THE FULL RANGE OF SOUNDS, NOT JUST IN THE AUDIBLE RANGE THAT WHICH WE HEAR, BUT ALSO IN ULTRASONIC SOUNDS MADE BY INSECTS AND SMALL ANIMALS AND IN INFRASONIC SOUNDS EMITTED BY LARGER CREATURES LIKE ELEPHANTS AND WHALES!”

Richard Bebbington,
GX mechatronic engineer



PRODUCT DESIGN



VALUE ENGINEERING



CONTROL SYSTEM
DEVELOPMENT

They opted for a simple housing with waterproof membranes that would keep water and dust out but not obstruct sound from reaching the mics. To ensure success they drew up a step by step set of instructions for students to follow in order to build the fully functioning units.

THE RESULT

The resulting design allowed students to showcase their skills including electrical component preparation, soldering wires, crimping connectors and casement customisation. Engineering, Creative Arts and Media students from Coleg y Cymoedd benefitted from the project by learning valuable skills and having the opportunity to work on a real-world project. This was especially valuable to the students in a year where Covid had cancelled most industry placements.

Multiple Biophones were assembled by students at the college before being delivered to locations in Namibia and Wales where they will be deployed and managed by aspiring engineers. The Biophones will collect audio data that can be used as a means of assessing habitats and as a tool to engage communities with the sounds of the wildlife in their environment.

“This is a great example of Welsh companies working together to explore how a conceptual idea can be commercially developed. CSA Catapult aims to bridge the gap between research and industry within the compound semiconductor world, as well as inspiring the next generation of engineers through our Skills Academy and STEM programme. This project showcases the innovative ideas of aspiring engineers and how they are solving issues that will impact us all.”

Iestyn Llŷr,
Senior Embedded Software Engineer
at CSA Catapult



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PRODUCT DESIGN



VALUE ENGINEERING



CONTROL SYSTEM DEVELOPMENT



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