

# meshO – a success story

TATE NEEDHAM

The team applied for a Moira Whiteside Bequest grant in February 2024 to develop a new generation of radio controls for orienteering. The Australian Mountain Bike Orienteering Championships held in Canberra from 17 October to 20 October 2024 was the target to use the technology for the first time at a large competition, and it did not disappoint. With the addition of many radio punches streaming in in real time, the commentator Árpád Kocsik was able to track the competitors throughout their courses to provide timely and exciting updates!

Competitors watched the live results on the TVs using technology developed by the team that presented radio punches and real-time results in a clean and uncluttered interface. The feedback from competitors and event organisers was overwhelmingly positive, demonstrating meshO's potential to enhance event management and improve the athlete and spectator experience. Marina Iskhakova, the Australian MTBO 2024 Carnival director, said: 'Having meshO technology at the carnival allowed to provide higher level of safety, the top level of informativeness for the audience, and created a spirit of true and large carnival! We were thrilled to work with fast-moving and super-innovative meshO team!'

With five different maps, and some very unique challenges, it was a great proving ground for the technology. We had torrential rain at one event, very large distances to cover at another, and the full gamut of terrain from open and clear to dense and hilly. We learnt a lot about how the devices work in a competition setting, and will use these lessons to improve the product.

While the project ventured into unexpected territories—such as designing and 3D-printing custom base plates and designing the printed circuit boards (PCBs) in-house, the overall outcome has been successful, but there is plenty more to come.

Despite its success, the project faced a few challenges, particularly with the durability of the 3D-printed base plates and the limits of radio signal range at the Stringybark map. Several base plates broke during the event, but a new, stronger design is already in development to address the weak points. Additionally, lessons learned about optimal radio placement will be incorporated into future documentation, ensuring better reliability and coverage at future events.

## Budget breakdown: How the funding was spent

The project's budget covered several key areas, starting with core components like enclosures, antennas, radio modules, and USB connectors. The antennas turned out to be more expensive than expected, and bulk purchases of other items, such as enclosures and magnetic USB connectors were made to save costs in the long run. Trial and error with various components during prototyping added to the expense, but the experience has provided invaluable insights for future iterations and projects. Initially, we expected to outsource PCB and firmware development, but bringing these skills in-house allowed us to pivot quickly during key moments of development, resulting in substantial cost savings and more control over the final product. There were also unexpected expenses, such as antenna masts, USB chargers, and the development of 3D-printed parts to attach the radios to control stands. However, the savings from other areas allowed the team to try out more components during the research phase and include other parts to form a complete kit, such as the magnetic on/off switch, transport and charging case, and masts.



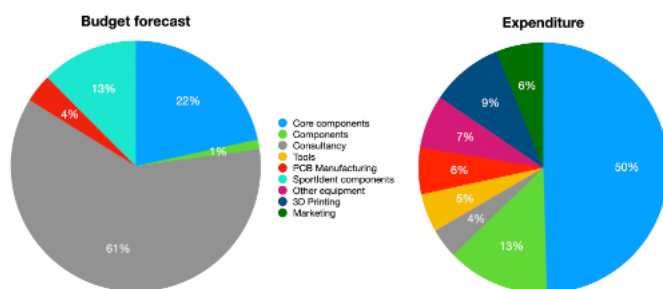
## What's next for meshO?

While meshO is not yet commercially available, several critical tasks remain before it is ready for wider release. Extensive testing is still underway to ensure the product is as robust and bug-free as possible, with plans to use it at multiple events in Canberra over the coming months. Integration with SI Timing software is also a priority, as many other clubs rely on this system for event timing. Plus, we will soon be collaborating with several other clubs to test meshO in real-world conditions, allowing us to identify and fix any remaining issues. Lastly, we are exploring alternative antennas to reduce costs and streamline the manufacturing process for larger-scale production.

Overall, meshO's journey has been one of innovation, learning, and success. With continued development, testing, and community collaboration, we are confident that meshO will become a must-have tool for orienteering events across Australia and beyond.

We thank the Moira Whiteside Bequest committee for supporting this project, and we really appreciated the flexibility to experiment and pivot during the development process.

<https://mesho.live>



meshO budget forecast and expenditure



meshO control at the Australian Mountain Bike Orienteering Championships 2024. Photo by Mike Radajewski.

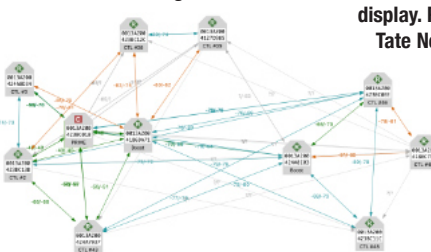


meshO in action at the Australian. Photo by Tate Needham



meshO kit. Photo by Tate Needham

## meshO network diagnostics.



## meshO visual display. Photo by Tate Needham.

