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優勝作品專輯

國家：New Zealand

編號：100020

作品名稱

iPod Super Dock

得獎獎項

Engineering First Award

作者姓名

Ben Mulholland

iPod Super Dock

Abstract

This project originated when I was considering buying an iPod dock. After doing some research to buy an iPod dock I discovered that there was a limited range available, they were expensive, and did not offer all of the features that I desired. Most of the docks available had integrated speakers, which I did not want, as I already had a good 2.1 speaker system and therefore the integrated speakers were unnecessary and bulky. The Apple™ dock was better, with an easy option to connect the iPod USB cable and plug in external speakers, but it did not offer remote control, and was (in my opinion) overpriced for what it offered. This made me think – could I make a better one myself?

When I was making this project I broke it down into four main steps:

- Circuit design
- Writing the microcontroller code
- Creating the enclosure
- Making the remote control.

These steps were interdependent and worked on simultaneously, rather than in a sequential order, as changes to any one aspect affected others.

I began by making a rough sketch of possible circuit ideas on paper. Next I began to trial the ideas on a breadboard to see if they would work. After this I began to design the actual circuit in EAGLE CAD. Once I had completed an initial design I attempted to create the circuit on a breadboard, adjusting the schematic as necessary. I now had a working design, I tested it (with the microcontrollers in place) and set about transferring

it to a vero board that I customized as necessary.

Writing the microcontroller code was one of my biggest challenges, especially for the iPod communication aspect, as Apple have not officially released information about the iPod accessory protocol. I developed the majority of the code on an AVR microcontroller, then ported the code to PICAXE as I did not have the necessary equipment to program the equivalent AVRs.

The enclosure was one of the last things that I completed. I made rough designs out of thin MDF and cardboard, then made the final version out of white and translucent black acrylic, shaped with a heat-gun around a wooden mould.

The remote was designed using a similar process to the main circuit board, but was made out of a painted 'kiwi patch' board instead of a vero board.

The project took around 7 to 8 months to complete, working when I had spare time. This is only a first prototype, and I may develop this project in the future, making improvements and changes in response to feedback from others and my own reflections. These improvements may include changes such as: reducing components and hence costs, improving the appearance of the remote, adding additional features such as integrated rechargeable battery.

I really enjoyed making this project, and learnt a huge amount along the way. I think that if I further develop it I would have a potentially commercial product.

評語

本作品以當前最風行的產品為平台，進行個性化的科技產品優化。在研究過程中，能以合宜的電子、資訊技術進行整合，整體作品的發展潛能高。