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Project Wireless

Connecting a keyboard and mouse directly to the EPIA motherboard

WARNING:

I believe that the information in this document is correct, but I take no responsibility for any errors or misunderstandings, or for any damage arising from the use of this information. You use this information entirely at your own risk.

Background

I have my EPIA motherboard in a neat black Cubid Procace 2677. The one thing that detracts from this is the untidy tangle of cables emerging from the rear. This tangle is a standard feature of PCs in general, but seems out of place on such a small and otherwise neat machine. One possible solution is to make use of a wireless keyboard and mouse, but these generally have quite large receiver boxes that take up yet more desk space and again contribute to the spaghetti behind the machine.

But what if the receivers don't have to be outside the machine?

Parts used

For this project I have used a Chic black wireless keyboard, and a Chic black-and-silver wireless mouse. Both were obtained from [eBuyer](#) at under a tenner each.

(Click the image to the right to see a larger version of the photograph)



The Plan

Since the Cubid Procace, like many PC cases, has a metal chassis, and a largely hollow plastic front bezel, my initial plan was to hide both the keyboard and mouse receivers in this front bezel. There are a number of obstacles in the way of doing this, though - the most important being that the receiver circuit boards are too big!

Execution

The receiver circuit board for the keyboard is obviously designed to accept components to make either a keyboard receiver, a mouse receiver or a combo receiver. Only the keyboard side of mine was populated, so I trimmed off some of the redundant mouse circuitry with a hacksaw! The truncated board is now a wedge fit in the front bezel of my case.



There is a long track running around the perimeter of the circuit board, which acts as an antenna. Because I'd trimmed the board, this was now broken. To replace



- [AIRLink driver](#)
- [Amiga C Source Repository](#)
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- [Mini-ITX Motherboard](#)
- [EPIA CIR/PS2 Header](#)
- [Project Wireless](#)
- [EPIA TVOut](#)
- [EPIA TVTool](#)
- [VIDIX Driver](#)
- [AWBMTTools \(bootlogos\)](#)



- [Reducing fan speeds](#)
- [Fan voltage drop calculator](#)



this, I soldered on a length of wire which is now clipped to the inside of the plastic bezel, in the crack between the top and the CD drive slot.

The mouse receiver's circuit board was fully populated, but there was plenty of empty space around the antenna to trim the board, so again I attacked the board with a hacksaw and replaced the now missing antenna with a length of wire.

Unfortunately, having both receivers in the front bezel didn't work particularly well; the bezel is not huge, and the boards won't both fit without touching each other.

With both boards in the front of the case, the range of both the mouse and keyboard was dramatically reduced, so I started looking at other options.

The Cubid Procase, as I mentioned in my review of the system, contains a pair of fans obviously intended to draw air over the hard-drive. Since my drive runs nice and cool, I'd left these fans disconnected, and with the machine running quite happily for over three months with no fans at all, I'd more or less forgotten about them.

However, the fans are easy to remove, and leave a pair of threaded support pillars available at the back of the case, with a fair amount of clear space around them.



The mouse circuit board is now attached to one of these support pillars, and I have the antenna trailing out of the back. This is not the neatest of solutions, but with the case stood on end on its weird "feet", the antenna tucks unobtrusively under the machine and works nicely.

Loose Ends

The receivers originally came in odd-shaped plastic boxes, each with an LED, and each with a microswitch for establishing a connection. The LEDs are easily dealt with - I found them distracting, so I just bent them flat against their boards, to be incarcerated out of my sight. It would be fairly easy to desolder them, and put them on extension wires if one really wanted them to be visible. A knottier problem was the microswitches; these are needed every time you change the batteries on the keyboard or mouse, so these do need to be accessible. I have yet to decide exactly what to do about these switches, but it should be easy enough to desolder them, and site them elsewhere.

Finally, all that remains is to connect the keyboard and mouse to the motherboard. The obvious solution of having the cables trail out of the case, only to be plugged into the existing keyboard and mouse socket is inelegant to say the least.

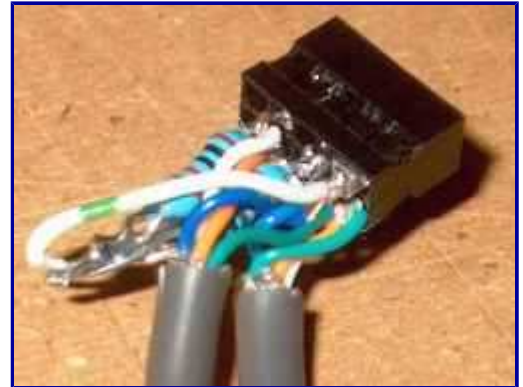
The EPIA's CIR header is a perfect place to attach these peripherals, so that's what I did. Details of this header's pinouts can be found [on this page](#).

The easiest way of deciphering the colour code used in the keyboard and mouse cables is simply to cut them in half, bare the wires of both the receiver end and the end with the plug, plug in the latter, and use a multimeter to find out which wires connect to which pins on the CIR header.

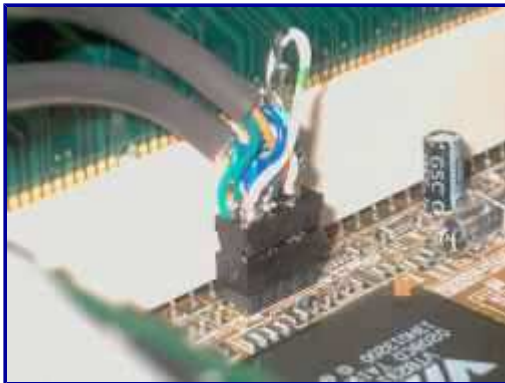
The header's pins are in pairs; each signal has an internal and external pin allocated, and the multimeter trick will match wires to **external** pins. What is needed is to wire the receivers directly to the corresponding **internal** pins; if a wire from the plug matches pin 9, for instance, its corresponding wire from the receiver will need to be connected to pin 7.

Take particular care when identifying the +5v and Gnd wires; these are most easily identified by just switching the machine on with the cable connected, and measuring with a multimeter.

One other pitfall is that pullup resistors are needed between +5v and all four signal pins; there are built-in pull-ups between the ext pins and the sockets on the backplane, but this hack bypasses them, so replacements are needed. I'm not sure what the value is supposed to be, but 10KOhm works nicely here.



Wiring the header itself can be an extremely fiddly operation; be very careful not to short anything out. When it's done it should look something like the hideous creation pictured to the right - but with any luck, a bit neater!



Finally - the great moment of truth - the newly created internal Keyboard/Mouse header can be connected!