

User Guide

Introduction

I have recently acquired an Amiga 500 and wanted to expand its capability by adding a Gotek drive but didn't want to lose the internal floppy drive. I soon came across some of the restrictions of the A500 design which basically meant that if you have the Gotek as the primary, bootable drive the internal floppy drive (df1) wouldn't work. I could have course have gone down the external floppy route but I didn't want all that stuff hanging out the back of the Amiga.

So I started this project with these objectives:

- To support two floppy drives internally to the A500
- To be able to switch which one is bootable
- For the second drive to always be available
- Not to require any irreversible change to the A500
- Not to have any connections out to the external drive port

There are a number of issues to overcome to achieve these objectives:

1. All of the needed signals need to be picked up from the motherboard
2. A motor control signal has to be generated for the second drive
3. A drive identification has to be generated for the second drive
4. Some means of switching between the drives needs to be devised

The Design

There is a readily available circuit to achieve 2. and 3. (see

http://www.primrosebank.net/computers/amiga/upgrades/amiga_upgrades_storage_fd_con.htm)

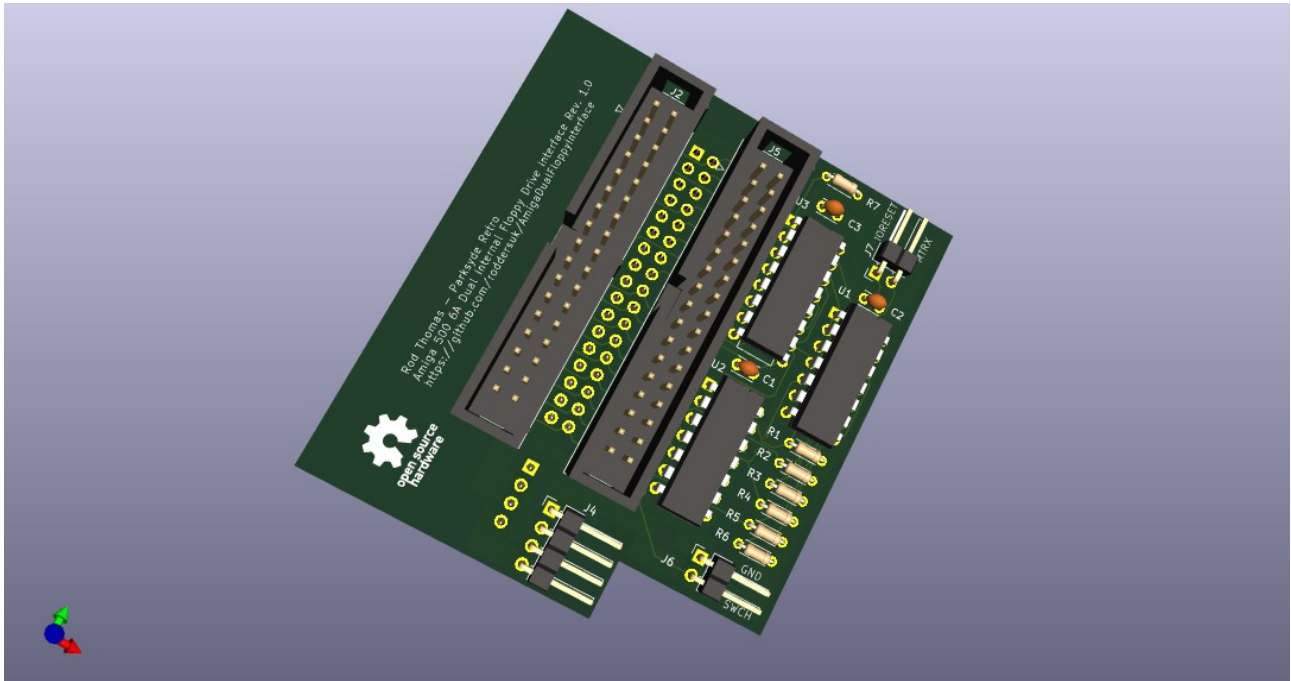
which needs the MTRX, IORESET and SEL1 signals as input and produces MTR1, RDY and INUSE as output. This design makes use of NAND gates via a 74LS38 and a D-Type Flip-Flop via a 74LS74.

A common way to achieve switching is to add some circuitry under the EVEN CIA chip, which gives access to SEL0 and SEL1 but not MTRX, RDY, INUSE or IORESET. I decided instead to use the floppy interface which provides everything I need except MTRX and IORESET which I can pick up from U36 and U37 respectively.

In order to provide switching I use a multiplexer chip (74LS157) to swap both SEL and MTR lines. Switching is effected by a single input being pulled to ground.

The INUSE signals from both drives are combined using spare gates in the 74LS38.

The design was created using KiCad, the project files are in the KiCad folder. Production ready files are provided in the KiCad/Gerber folder and PDF versions of the schematic and PCB are provided in the Docs folder.



I have only designed this board for an Issue 6A A500 board as that is all I have. It may well fit other boards but I can't guarantee that as the relative positions of components could have changed.

Fitting the Board

The board fits onto both the Floppy Drive connector and the Floppy power connector. The board is extended to the rear so that it sits on the External Drive socket for added support when inserting the ribbon cables. Two flying leads need to be connected. One from the IORESET pin to pin 8 of U37 and one from the MTRX pin to pin 3 of U36. I'm using clip on probes so that the mod is reversible. If this is not a concern a more secure connection can be made by soldering the flying leads onto the pins.

The board has separate IDC Box Connectors for the two internal drives and a power connector to which a Y-cable can be connected to provide power to the two drives. Since one of the drives is expected to be a Gotek (which does not consume much power) this should not overload the system.

A switch can be connected between the SWCH and GND pins to effect changing which is the boot drive.

Both drives should be configured as drive 0 in keeping with normal practice for Amigas.

The Gotek Controller

With the Gotek nestling inside the case there needs to be a way of controlling it. My solution to this is to connect the display, rotary controller and drive switch signals to an FFC breakout board allowing an FFC cable to be threaded through the Amiga vents to a 3D printed enclosure for the display, rotary controller and drive switch. In a similar fashion, a USB extension cable using an FFC can also be fitted in the same way so that the memory stick can be inserted into the external box.