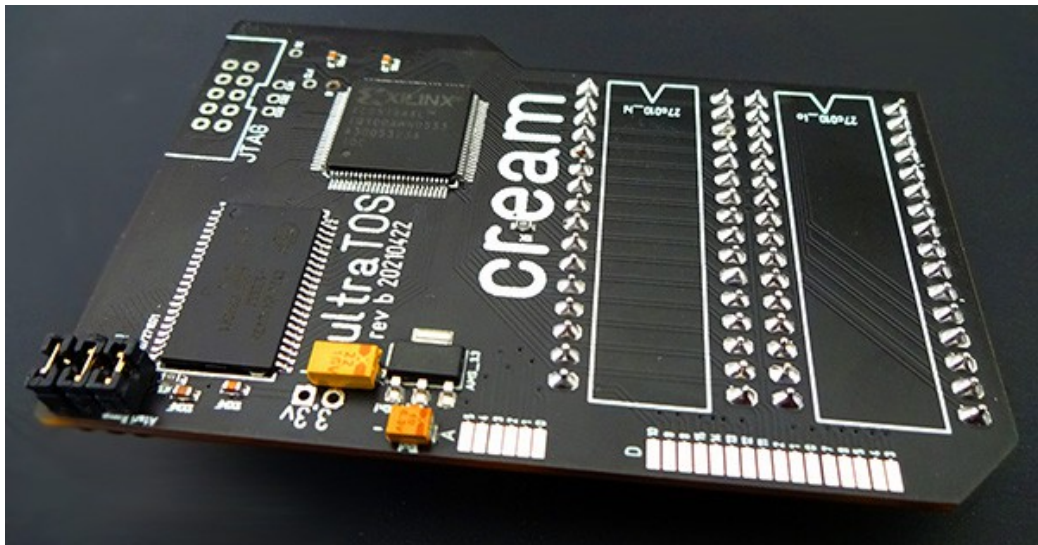# ultraTos

Tos switching made easy

User Manual

Version 0.50

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I always wanted to write that ;)

Table of Contents

1 Welcome

ultraTos is a CPLD based Tos switcher for Atari 1040STE.

How does it work?
ultraTos has 3 SPI EEProms with 512kb each. After switching on the Atari the CPLD reads the Tos from the SPI EEprom into ram. Loading into ram needs less than a second. After loading the Tos the 68k can read the Tos from the ram.

ultraDev implementation
ultraTos is recognised by ultraDev (Version >0.57) and enables some additional features in the cartridge screen. You can list the flashed Tos versions and directly select a Tos to boot from in the cartridge screen.
It is also possible to boot the Atari into a new Tos with the ultraDev command line tool (not implemented yet ;)).
This setting is not presistent after a switch off the Atari will boot again the Tos you selected with your jumper setting.

How can I flash the Tos?
The Tos Rom are flashable over the Atari by starting the flash tool on the Atari desktop. It's just a small tool with a file selector and keyboard input.

What about bad flashing?
ultraTos comes with a pre-installed Tos version at slot 1. This slot is not possible to flash to avoid a bad flashing. The pre-flashed Tos is always 2.06 (English).

How to switch the Tos?
ultraTos uses jumpers to set which Tos to boot from at startup.

This is not very handy if you just want to switch a Tos to test something.

It is possible to change the Tos during runtime without a switch off! For this you can start the Tos boot selector Prg on your Atari. After selecting the Tos to boot the Atari resets and boots into the selected Tos.

1.1 Electrostatic-sensitive device warning

ultraTos is an electrostatic-sensitive device. What does this mean? (Text from Wikipedia)

"An electrostatic-sensitive device (often abbreviated ESD) is any component (primarily electrical) which can be damaged by common static charges which build up on people, tools, and other non-conductors or semiconductors. ESD commonly also stands for electrostatic discharge.

As electronic parts like computer central processing units (CPUs) become packed more and more densely with transistors the transistors shrink and become more and more vulnerable to ESD."

ultraTos has no case if you touch the PCB you can damage the components. So it's a good idea to touch a grounded device before you touch the PCB.

But it's not that dramatic how it sounds. Often I forget to touch a grounded device before and till now never something happened. **But you have been warned :)**

1.2 Open source?

ultraTos is not open source. Maybe I will release the schematics and sources one day but currently this is not planned.

2 Included parts

Delivery of ultraTos includes:

- The ultraTos PCB
- an additional jumper (just because they get lost easily;))
- some replacement pins for the ultraTos connectors.

Why replacement pins? The ultraTos connectors can easily break off if you aren't be careful. This is why i decided to add some.

3 Support and Bugs

If you have problems, questions or you found bugs you can reach me at: ultrafex1@gmx.de

I'm also quite often on irc (ircnet) channel #atariscne.

4 ultraTos Software

Releases can be found at: http://ultradev.ultrafex.de/utreleases/

FYI: The firmware for the ultraTos CPLD is fixed and there will not be updates in future but if needed the Atari software will be updated.

5 Setup & Install

Download the ultraTos software from the link above and copy it to your Atari.

6 Hardware install

6.1 Opening the Atari

First of all switch your Atari off and remove the 230v power cable. Open up your Atari there are surely some videos on YouTube how to do this. You need to remove the shield and even the floppy to install ultraTos.

Keep in mind open up the can be dangerous especially do not touch the power supply of your Atari.

Before touching something on the PCB you should touch a grounded device to avoid electrostatic loads.

## 6.2 Setup of ultraTos for different Tos Roms configurations

This is an important step you need to do. Read it otherwise ultraTos may not work!

If your Atari is fully opened and you removed the shield and floppy you can find the Tos Roms on the right side under the floppy.

The Atari is able to use different Rom ics. The Rom ics have different pin counts and the pins assignments.

Which Rom type your Atari is using is set by the Rom config on the Atari PCB. The Rom config is on the right of the Rom sockets (see W102, W103, W104 printed on the Atari PCB).

In order to work correctly ultraTos needs to know which Rom config is set in your Atari. To set the Rom config ultraTos has one jumper (lower jumper) on the upper left of the ultraTos PCB which looks like this:
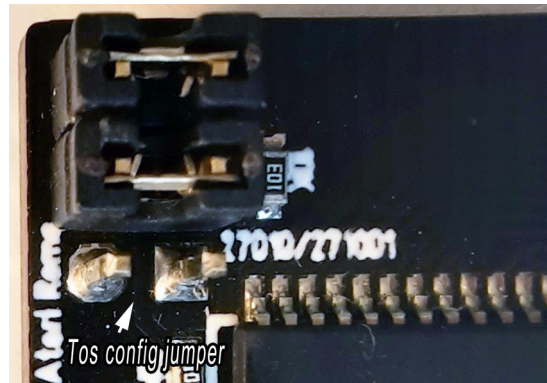

The lower jumper is to set which Rom config your Atari is using (Closed jumper for Original Atari Roms. Open jumper for 27010, 27C1001 and 57100).

If your Atari uses a different Rom config you need to set the one of the two Rom configs on your Atari PCB.

6.2.1   Booting with a wrong jumper setting

No Worries if you switch on the Atari with a wrong Rom configuration it will not get broken the Atari will just not boot. Or better it will not boot correctly.

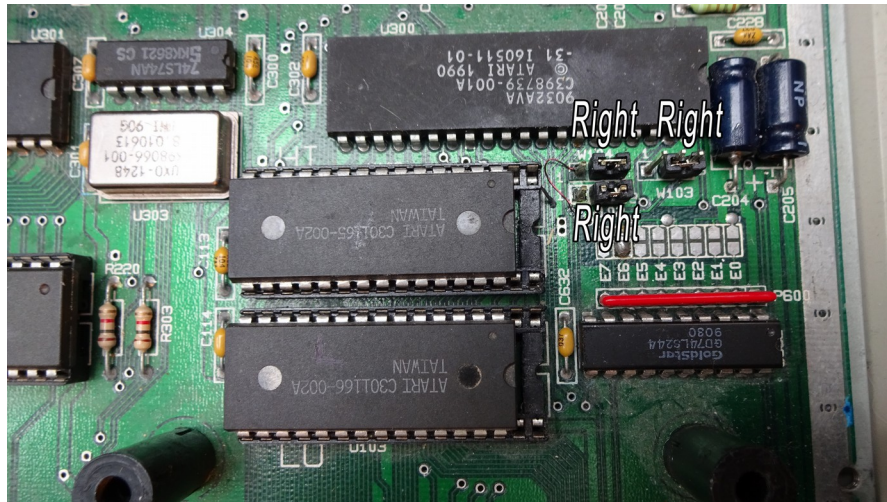A wrong jumper setting on the ultraTos PCB will look like this:
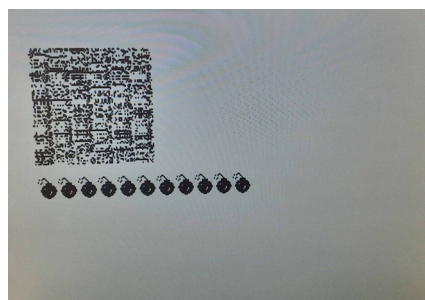
This will show up after switch on and the Atari will do an endless reset.

But let's see which config your Atari is using.

6.3 Original Atari Roms

If your Atari uses original Atari Roms the jumpers W102, W103 and W104 should look like this:

As you can see my Atari has jumpers for the Rom configuration. In most cases these are be resistors. Sometimes the W103 jumper is short cutted directly on the PCB.

Anyway if your config looks like this you need to close the Tos config jumper on the ultraTos PCB.

6.3.1   27010, 27C1001 and 57100 Roms

If your Atari uses 27010, 27C1001 or 57100 Roms the jumpers W102, W103 and W104 should look like this:

As you can see my Atari has jumpers for the Rom config. In most cases these are be resistors. Sometimes the W103 jumper is short cutted directly on the PCB.

Anyway if your config looks like this you need to open the Tos config jumper on the ultraTos PCB.

6.3.2   My Atari Rom config does not match one of the two

In this case you need to set the Atari Rom config on the PCB to one of the upper configs.

One tip. Do not try to remove the resistors on the Atari PCB and replace it by jumps if you do not have a good desoldering tool.

I did it and fucked up a trace on the Atari PCB ;)

6.4 Removing the old Roms from the Atari

Before you remove the old Roms of your Atari you should add a small sticker to the ic which was on the upper (hi) and lower (lo) position just in case you want to put the old Roms back then you know on which position the IC was.

To remove the Rom ic use a screwdriver and slowly lift up the IC. Do that on the left and on the right for both ICs. Be careful not to bend the IC pins.

6.5 Plugging in the ultraTos PCB

But be careful the pins of the ultraTos PCB trend to bend off if the placement is not correct. This can also happen if to remove the ultraTos PCB wrongly!

This is no joke! These pins of the ultraTos connectors are bending every easy and break off. I searched for a long time for better connectors but there aren't better which fit into all IC sockets.

Best is if you check the correct placement when you watch at the lower end of the ultraTos PCB.
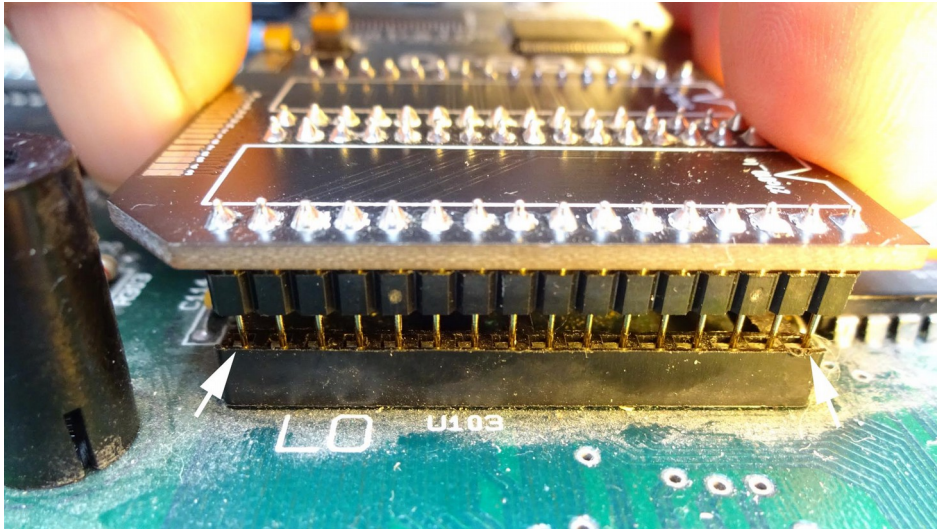
Ops a bit dusty ;) anyway

You should also check the placement of the right ride where the Rom config is.

When you are sure the placement of the PCB is correct just press it down.

In the end the installation should look like this (of course the lower jumper will maybe look different depending on your Atari Rom configuration):


6.6 Removing the ultraTos PCB

If you want to remove ultraTos best is to pull up a little on the top and then on the

6.7 Default Tos to boot

With ultraTos you are able to flash up to 6 different Tos-Version. The first 4 Tos version you can select to boot after a switch on of the Atari. The last two Tos versions are only available over the UTBoot.Prg tool on Atari.

ultraTos has two jumpers to select the Tos to boot at power up. The jumper encodes the Tos to boot in binary.
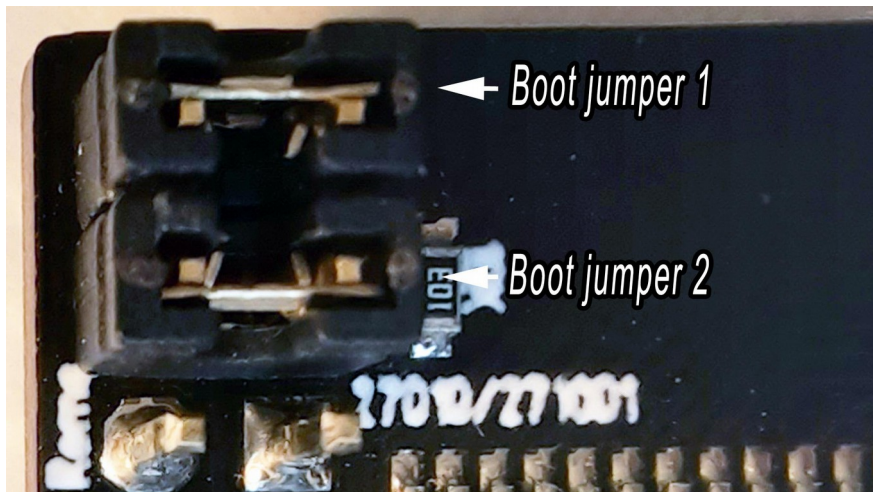
In this configuration ultraTos will boot the Tos 1 which is the pre-installed Tos version. The pre-installed Tos version is always available since it is not flashable. The Tos is always Tos 2.06 english.

Jumper setup:

	Boot Tos 1	Boot Tos 2	Boot Tos 3	Boot Tos 4
Boot jumper 1	Closed	Open	Closed	Open
Boot jumper 2	Closed	Closed	Open	Open

If you select a configuration and there is no Tos installed at this slot the Atari will of course not boot (screen will stay white or black). Don't panic if something is wrong. Just go back to the Boot Tos 1 configuration this is always installed!.

7 Flashing new Tos version

Flashing new Tos versions is done via the Atari desktop. For this download the a ultraTos release and start UTFlash.prg.

The flash tool shows the already flashed Tos version. You can select the Tos slots by pressing 2-6. Slot 1 is it fixed and can't be flashed. This is to avoid bad flashing. Without a Tos you aren't able to boot your Atari also this turns ultraTos into a brick.

After selecting the Tos slot the tool shows the selected Tos slot with - > infront of Tos slot and now you can decide between E for erase or F for flash.

E will erase the slot.

F opens up a file selector and you need to browse to the Tos image you want to flash.

The size of the flash must be 256kb or 192kb (for Tos 1.x Roms).

When selecting a Tos 1.x Rom the flash tool relocates the Rom to the correct address space.

ultraTos uses RamTos to relocate 1.x Tos versions. Means not all Tos languages are supported only these which are working with RamTos.

RamTos was developed by P. Putnik thanks for allowing me to use it ;) Check the RamTos here: http://atari.8bitchip.info/astopensw.php#seltos

The flashing process is shown by color changes. Flashing needs about 9 seconds.

You can leave the flash tool by pressing q.

8 Booting into a different Tos

You can use UTBoot.prg to boot into a different tos. Follow the instructions on screen. After selecting the Tos the Atari boots into the previous selected Tos.

Of course it's not possible to boot into an unflashed Tos slot.

9 Showing the current running Tos

You can use UTTosInf.prg to show the current Tos. This is just a small tool I did to check if the Tos is correctly.

10   ultraDev implementation

If you own an ultraDev cartridge it recognises an ultraTos installation and shows on the cartridge screen "ultraTos detected". (This works only with ultraDev Version 0.57 which is not released yet)

In the cartridge screen you can press l to list the flash Tos versions. By pressing 1-6 you can boot into a new Tos.

Of couse it's not possible to boot into an unflashed Tos slot.