How to use the Universal Chassis System

1

Take measurements of your hilt. The two you need are:

HiltLength - total length of the hilt from pommel to emitter

ButtonDepth - distance from emitter to top of button hole (assuming 18mm button)

In my case, HiltLength was 11.15in and ButtonDepth was 2.37in

You'll be typing these into Fusion 360 later, so write them down somewhere.

2

Take measurements of Battery length and Board width and length. These measurements can often be found wherever you bought your components. Examples on right:

Do not measure batteries using calipers to span the contacts. It can cause serious damage and may result in fire or explosion. Please read how to safely handle lithium ion batteries.

Also decide how deep you want your blade to sit in your hilt. This will be the BladeWell Dimension

Featurs of the Verso include:

- Dimensions: 18.9×29.9×4.5mm (+2.4mm longer with micro SD card)

Specifications:
- **Battery Size:** 21700
- **Battery Chemistry:** Li-ion IMR
- **Nominal Voltage:** 3.7V
- **Nominal Capacity:** 5100 mAh
- **Estimated Charge Cycles:** 500 cycles
- **Max Discharge Current:** 20A
- **Operating Temperature Range:** -22°F to 176°F (-30°C to 80°C)
- **Dimensions:**
  - *Length* - 2.945" (74.8 mm)
  - *Diameter* - 0.827" (21.3 mm)

Listing includes 1 x Proffieboard v2.2 and 1 x 16GB Micro SD Card. The latest manual can be found here.

More board information and diagrams can be found here.

These boards have been improved since the v1.5 and now has:

- Breadboard compatible, no more tiny soldering pads
- Same size as before (1.3 x 0.7 inches)

3

Make sure to have Fusion 360 installed. It is necessary to edit dimensions of the chassis.

Download the Fusion 360 file from the Github or Google Drive

https://github.com/tbenenSabers/OSCS

4

Open the file in Fusion by using the Upload button. This will add a few component files as well as the main chassis file.
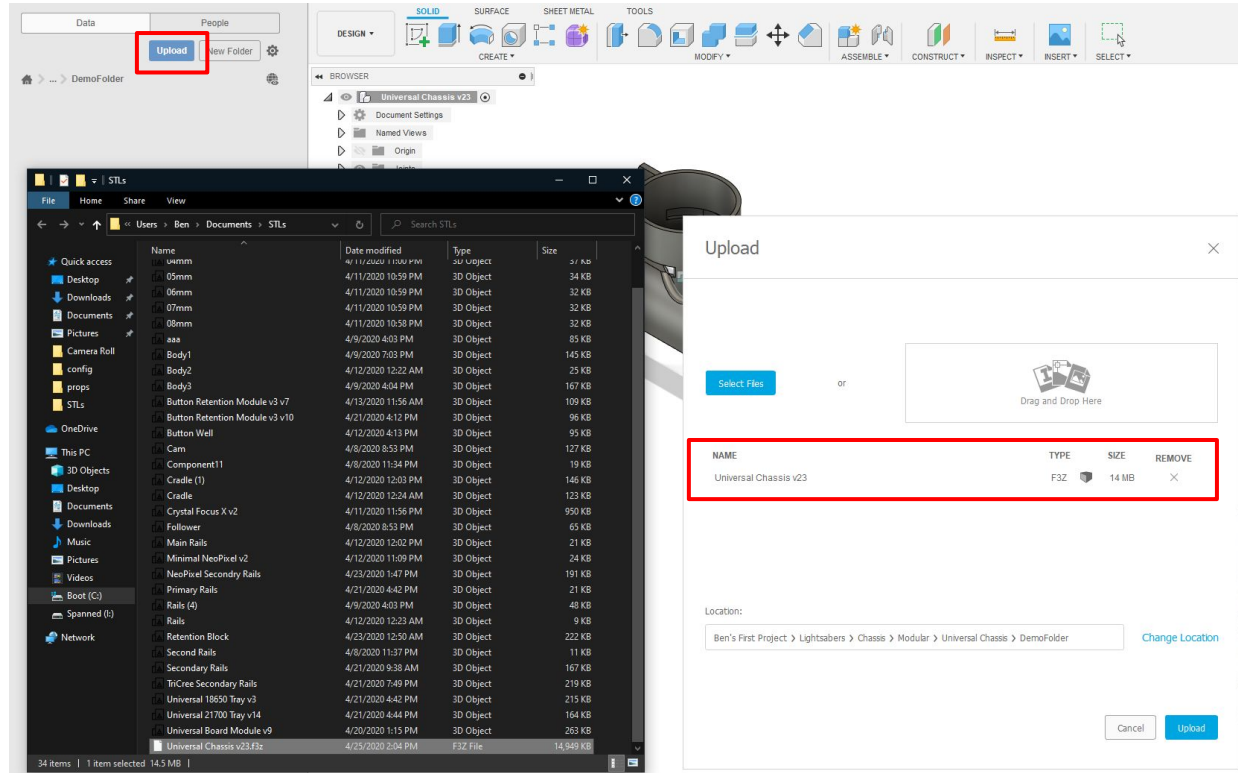
It will look like this:

Open the Universal Chassis File

5

Under the modify tab, go to Change Parameters. This is where all the aspects of your saber are plugged in. The next slide has an explanation of all parameters.
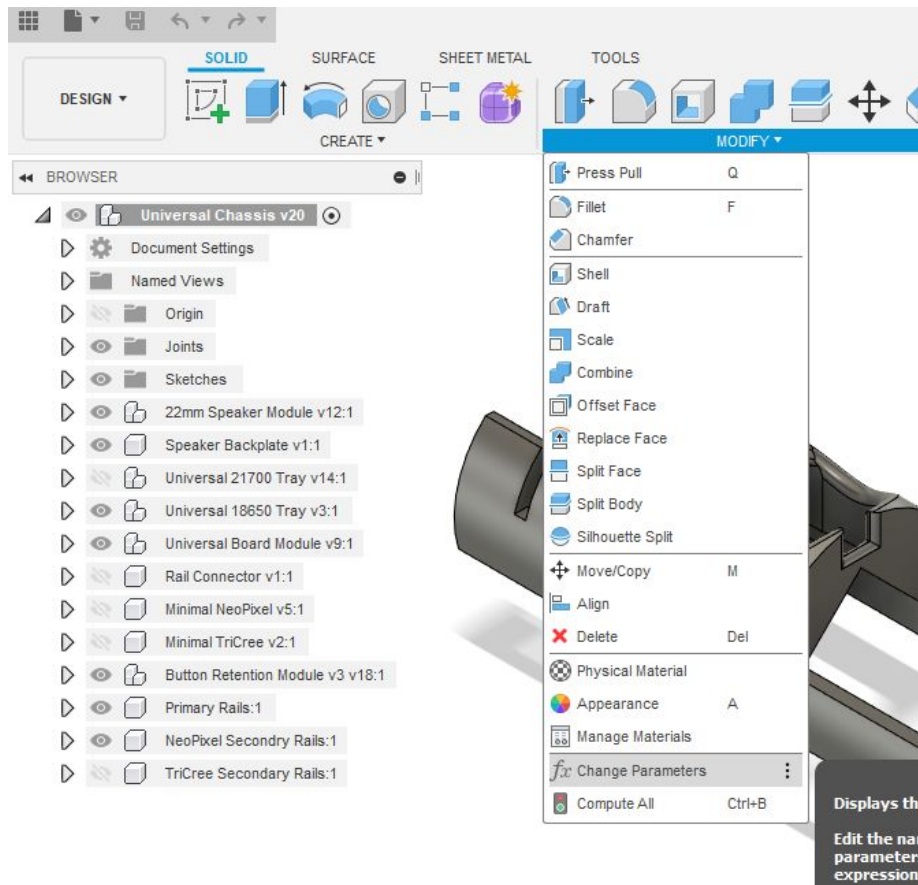
HiltLength - total length of hilt

BladeWell - how far the saber seats into the hilt

BatteryLength21700 - length of the 21700 battery you're using

BatteryLength18650 - length of the 18650 battery you're using

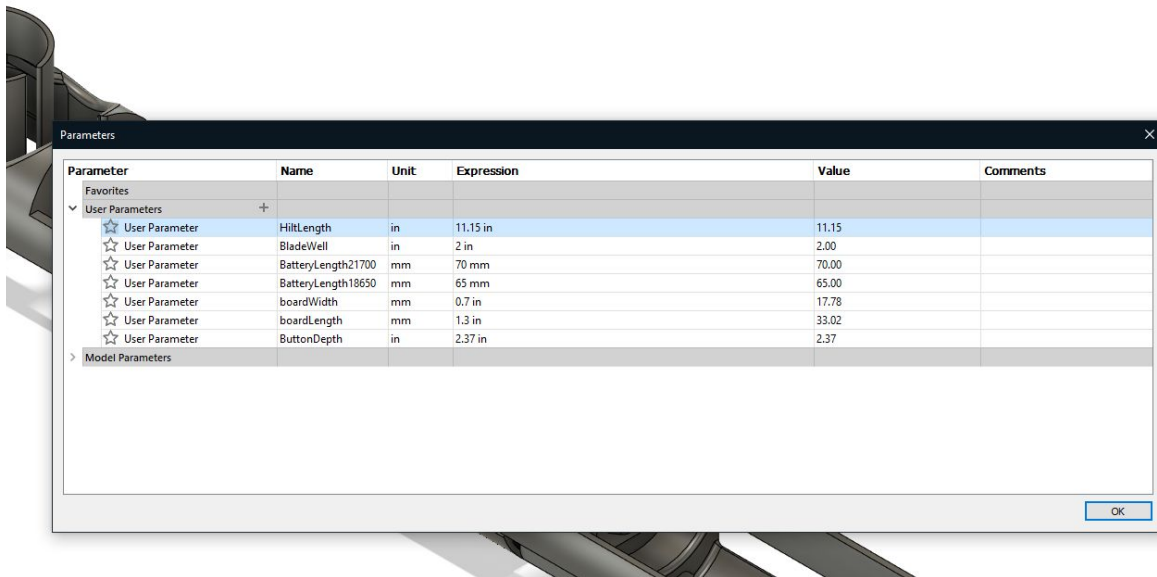// Ignore the battery length that you are not using. Max length is 75mm

boardWidth - width of board

boardLength - length of board

ButtonDepth - distance from emitter to top of button hole (assuming 18mm button)

Parameter		Name	Unit	Expression	Value	Comments
Favorites						
⌄ User Parameters	+					
☆ User Parameter		HiltLength	in	11.15 in	11.15	
☆ User Parameter		BladeWell	in	2 in	2.00	
☆ User Parameter		BatteryLength21700	mm	70 mm	70.00	
☆ User Parameter		BatteryLength18650	mm	65 mm	65.00	
☆ User Parameter		boardWidth	mm	0.7 in	17.78	
☆ User Parameter		boardLength	mm	1.3 in	33.02	
☆ User Parameter		ButtonDepth	in	2.37 in	2.37	
> Model Parameters						

I'm using a 70mm 21700 liion battery with a Proffieboard. We measured HiltLength and ButtonDepth in step 1 and decided BladeWell in step 2.

Typing in these dimensions will automatically change dimensions of the chassis to custom fit your saber.

NOTE: You can see the default units next to the parameter. If you want to override these (like what I have above for board length and width), type in the unit prefix (in or mm) after the value.
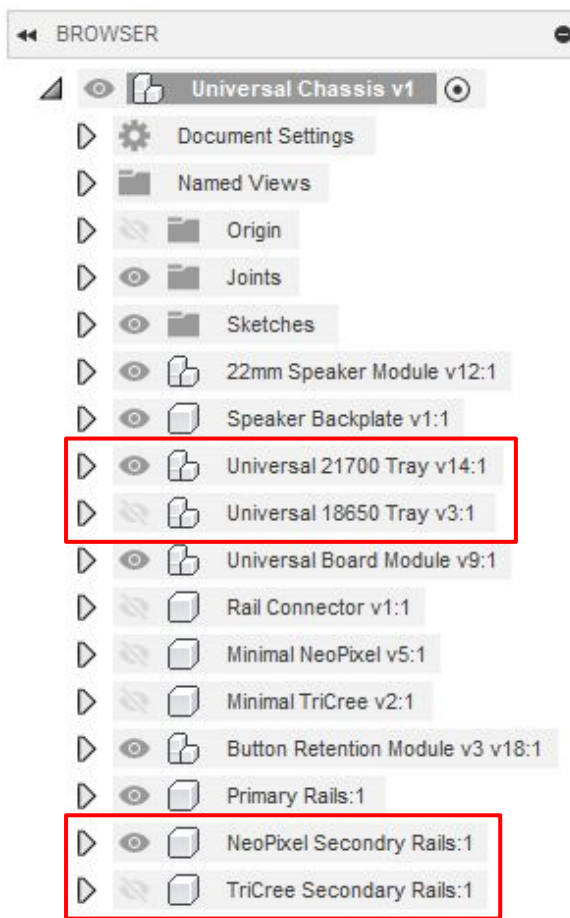
6

Once all dimensions are in, close the window.

Choose which components you are using by clicking on the eye icon. The only components you are choosing between are:

Universal 21700/18650 Tray

NeoPixel/TriCree Secondary Rails

It is important to deselect the components you are not using.

Ignore everything else for now.

I'm using a 21700, so I have the Universal 21700 Tray selected and the other one unselected.
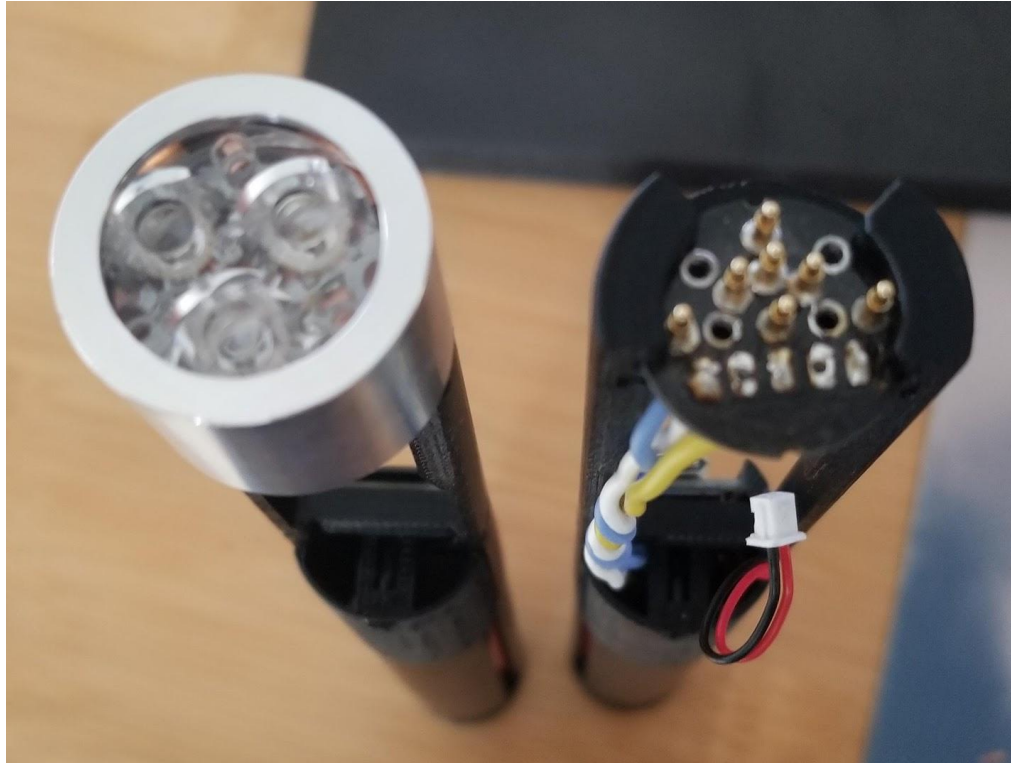
I am also using NeoPixels, so the NeoPixel Secondary Rails are selected instead of the TriCree.

Things to note:

The NeoPixel Secondary Rails are designed around the TCSS NeoPixel PCB.

The TriCree Secondary Rails are designed around the TCSS 1 in TriCree Heatsink.

The default speaker holder is designed around the 22mm speaker sold on TCSS.

By now you'll be able to see if there are any errors in the model. For example, if your button depth is not in between the light mount and the board mount, it will not print properly.

The TriCree heatsink is much larger than the NeoPixel PCB, so play around with your BladeDepth if things aren't lining up well.
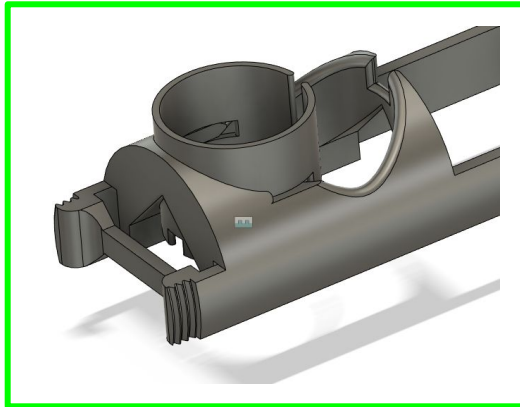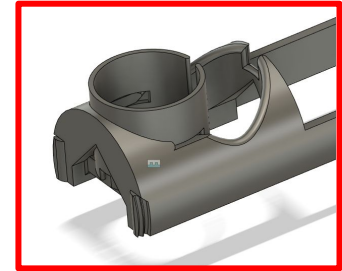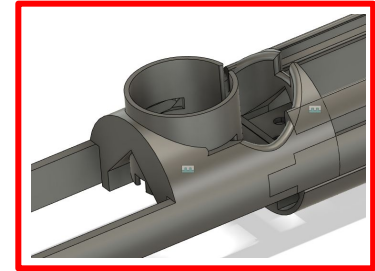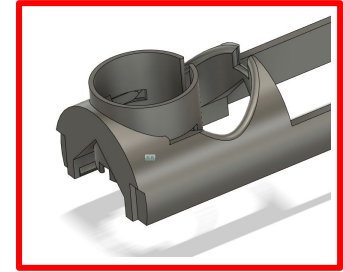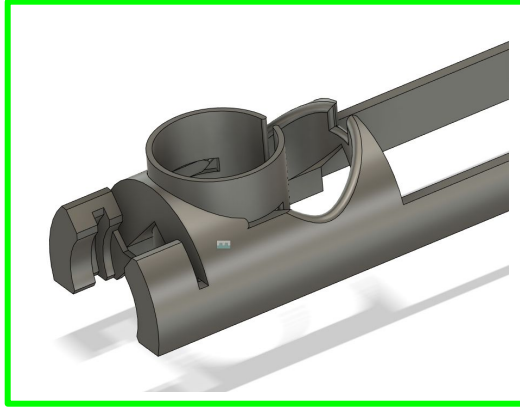
If you're using the CFX, it has elements on the board that intersect with the board holder. To fix this, there are mods that need to be implemented.

After typing in the board dimension, go to the timeline at the bottom and find the CFX Mods by hovering over the icons.

Right click that Icon and click on Unsuppress Features.
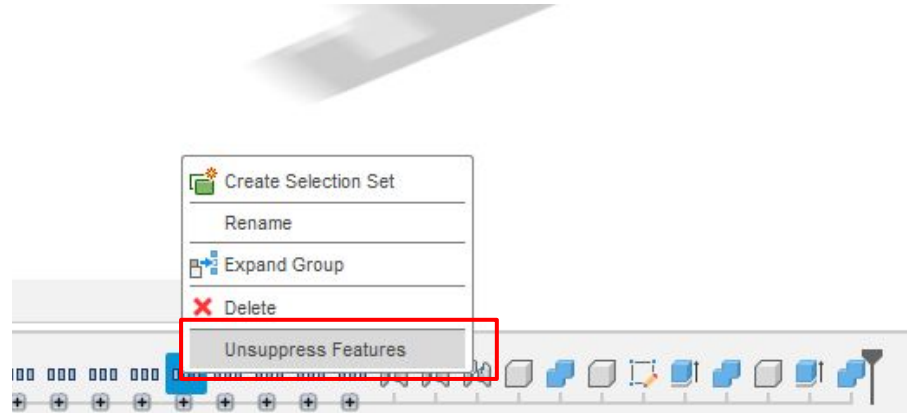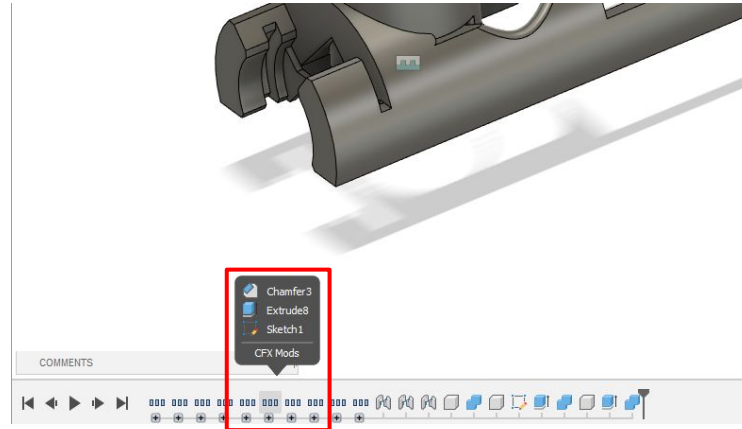
7

After confirming the button module is in the right spot, you're all set and ready to export!

Right click on each selected component and click Save As STL. Press OK without changing anything. You'll end up with 7 parts that can be printed and assembled into a full chassis.

Parts can be printed with little to no support material.

Happy saber building!