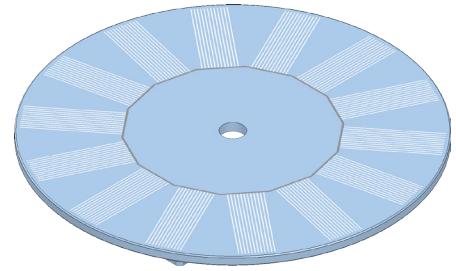


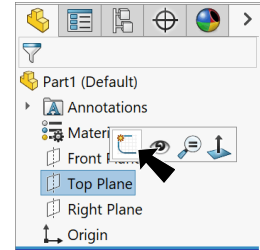
## The Watermaster Solar Panel



### A. Extrude1.

Step 1. Click File Menu > New, click **Part Metric** and OK.

Step 2. Click **Top Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 1**.



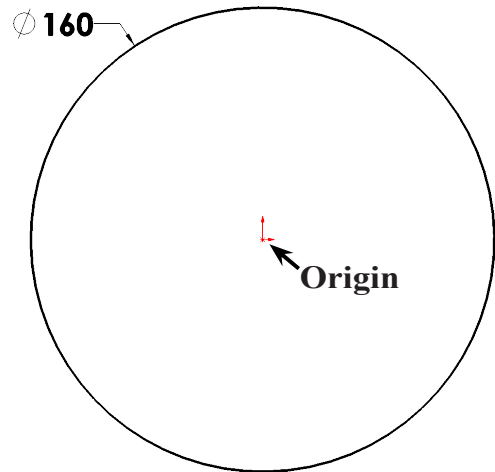
**Fig. 1**

Step 3. Click **Circle** on the Sketch toolbar.

Step 4. Sketch a circle starting at the Origin , **Fig. 2**.

Step 5. Click **Smart Dimension** (S) on the Sketch toolbar.

Step 6. Dimension circle **diameter 160**, **Fig. 2**.

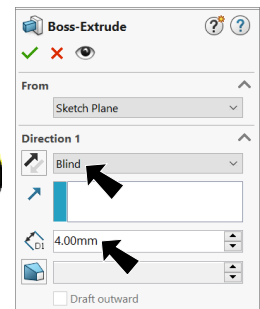


**Fig. 2**

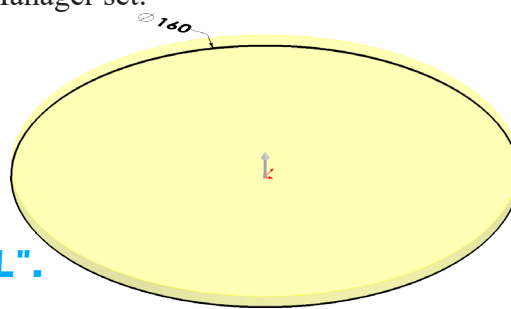
Step 7. Click **Features** on the Command Manager toolbar.

Step 8. Click **Extruded Boss/Base** on the Features toolbar.

Step 9. In the Boss-Extrude Property Manager set:  
 under Direction 1, **Fig. 3**  
 End Condition **Blind**  
**Depth** **4**  
 click OK .



**Fig. 3**



**Fig. 4**

### B. Save as "SOLAR PANEL".

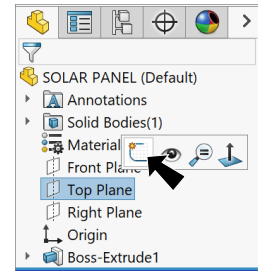
Step 1. Click File Menu > Save As.

Step 2. Key-in **SOLAR PANEL** for the filename.

**Tip:** Create a **Watermaster** folder in your My Document folder to save your Watermaster project files. At cudacountry we go a step further, and create a Tech Ed [school year] folder and in that folder we create the Watermaster folder.  
 Documents\Tech Ed 23-24\Watermaster.

## C. Extrude2.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 5**.

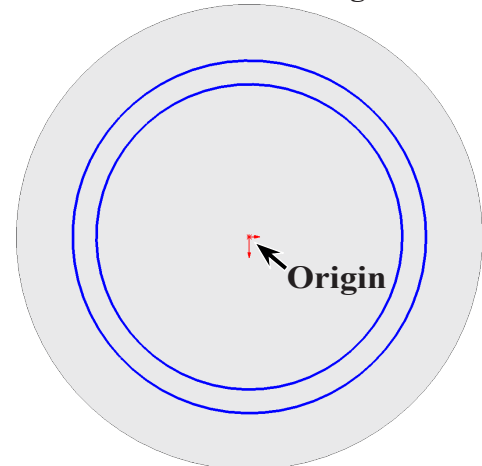


**Fig. 5**

Step 2. Click **Bottom**  on the Standard Views toolbar. (**Ctrl-6**)

Step 3. Click **Circle**  on the Sketch toolbar.

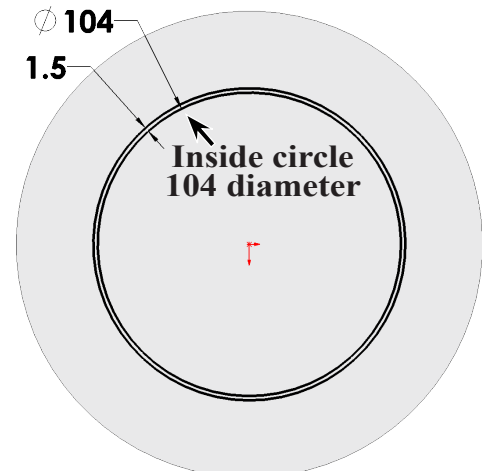
Step 4. Sketch **two circles starting at the Origin** , **Fig. 6**.





**Fig. 6**

Step 5. Click **Smart Dimension**  (**S**) on the Sketch toolbar.

Step 6. Dimension **inside circle diameter 104** and **1.5 between**, **Fig. 7**.



**Fig. 7**

Step 7. Rotate view to Reverse Isometric, **Fig. 9**. To rotate view, click **Isometric**  on the Standard Views toolbar (**Ctrl-7**), then in bottom left corner of graphics area **Shift** click the **Z axis of the Reference Triad**  **two times**.

Step 8. Click **Features**  on the Command Manager toolbar.

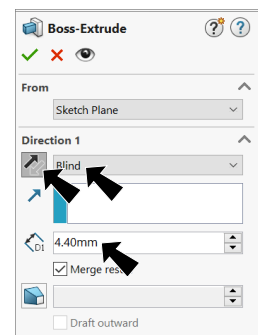
Step 9. Click **Extruded Boss/Base**  on the Features toolbar.

Step 10. In the Boss-Extrude Property Manager set:  
under **Direction 1**, **Fig. 8**  
End Condition **Blind**

**Depth**  **4.4**

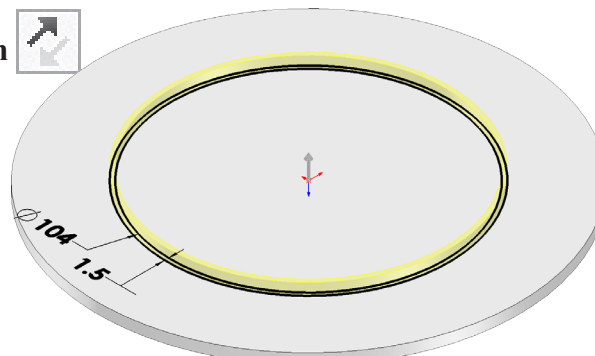
**Reverse Direction** 

click **OK** .



**Fig. 8**

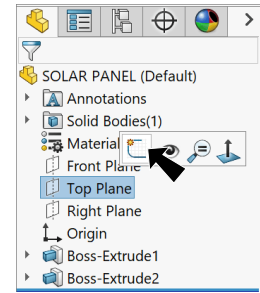
Step 11. Save  (**Ctrl-S**).



**Fig. 9**



## D. Extrude3.

Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 10**.

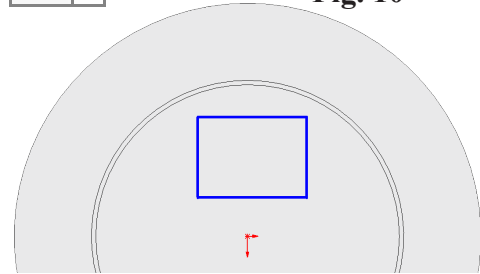


**Fig. 10**


Step 2. Click **Bottom**  on the Standard Views toolbar. (**Ctrl-6**)




Step 3. Click **Corner Rectangle**  in the **Rectangle flyout**  on the Sketch toolbar.

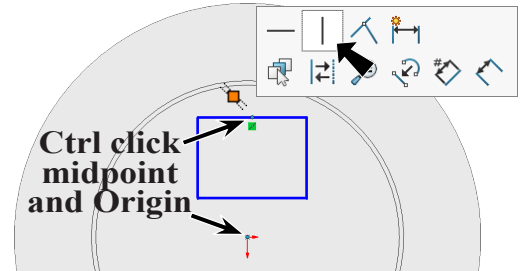
Step 4. Sketch corner rectangle inside ring, **Fig. 11**.



**Fig. 11**

Step 5. **Unselect Rectangle tool**. To unselect, **right click graphics area and click Select**  from menu.



Step 6. **Ctrl click midpoint**  of a horizontal line and **Origin**  to select both. Release Ctrl key and click **Make Vertical**  on the context toolbar, **Fig. 12**.

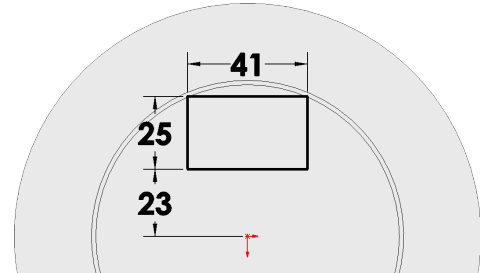


**Fig. 12**

Step 7. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 8. Add dimensions, **Fig. 13**.

Step 9. Rotate view to Reverse Isometric, **Fig. 15**. To rotate view, click **Isometric**  on the Standard Views toolbar (**Ctrl-7**) and **Shift click the Z axis of the Reference Triad**  two times.



**Fig. 13**

Step 10. Click **Features**  on the Command Manager toolbar.

Step 11. Click **Extruded Boss/Base**  on the Features toolbar.

Step 12. In the Boss-Extrude Property Manager set:

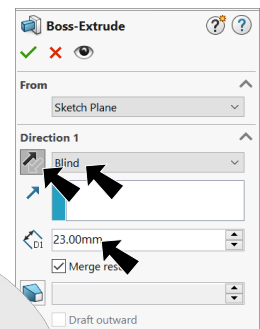
under Direction 1, **Fig. 14**

End Condition **Blind**

Depth  **23**

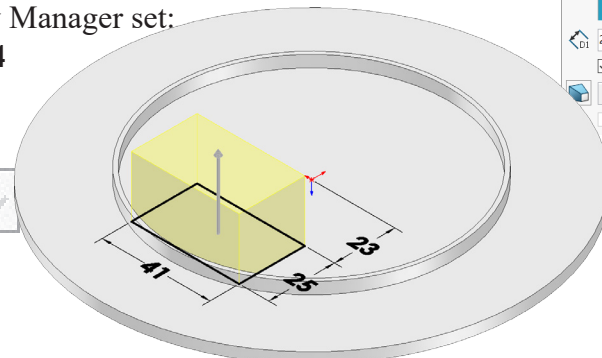
Reverse Direction 

click OK .



**Fig. 14**

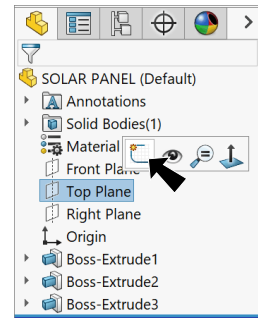
Step 13. Save  (**Ctrl-S**).



**Fig. 15**


## E. Cut Extrude 1.

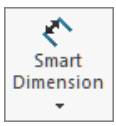
Step 1. Click **Top Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 16**.



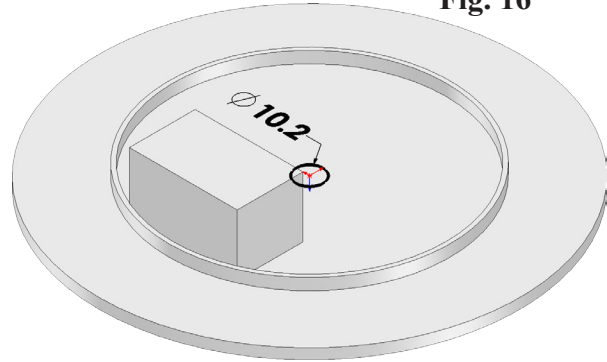
**Fig. 16**

Step 2. Click **Circle**  on the Sketch toolbar.

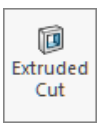
Step 3. Sketch a circle starting at the Origin  , **Fig. 17**.

Step 4. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 5. Dimension circle **diameter 10.2**, **Fig. 17**.



**Fig. 17**

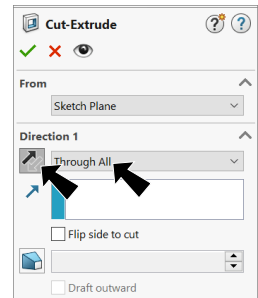
Step 6. Click **Extruded Cut**  on the Features toolbar.

Step 7. In the Cut-Extrude Property Manager set:  
under Direction 1, **Fig. 18**

End Condition **Through All**

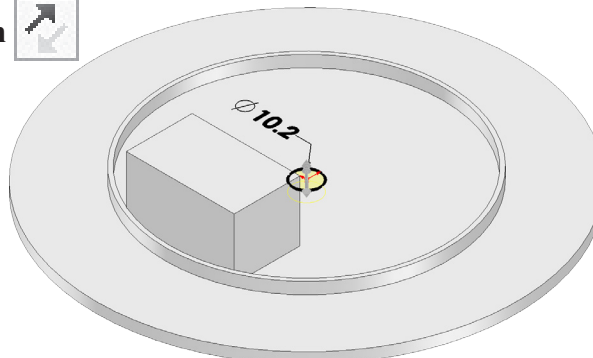
**Reverse Direction** 

click OK  .



**Fig. 18**

Step 8. Save  (Ctrl-S).



**Fig. 19**

## F. Fillet Edges.

Step 1. Click **Fillet**  on the Features toolbar.

Step 2. In the Fillet Property Manager set:  
select **FilletXpert**, **Fig. 20**

① Radius  .5

click **both outside circular edges of Extrude1**, **Fig. 21**  
click **Apply**

Radius .5

①

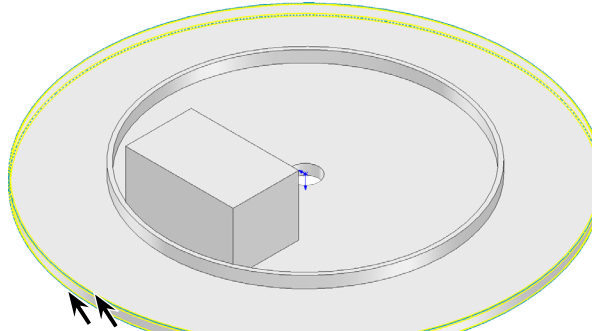




Fig. 21

② Radius  2.2

click a **vertical edge of box**, **Fig. 23**  
click **Connected to start face**  **3 Edges** on the Fillet pop-up  
click **OK** .

Radius 2.2

②

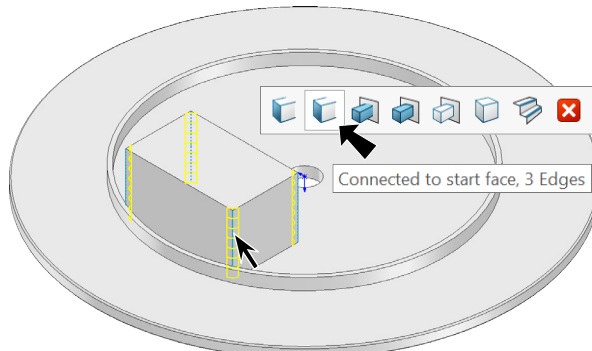


Fig. 23

Step 3. Save  (Ctrl-S).

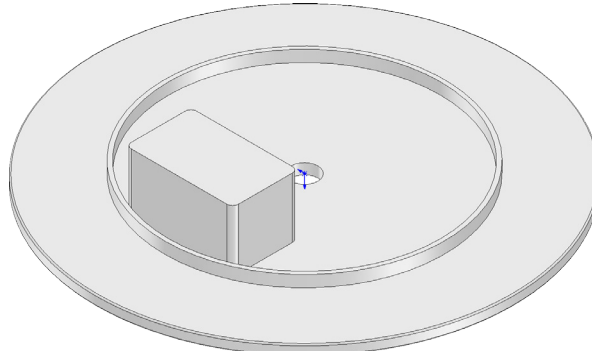


Fig. 24

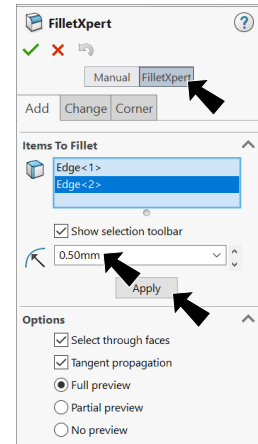


Fig. 20

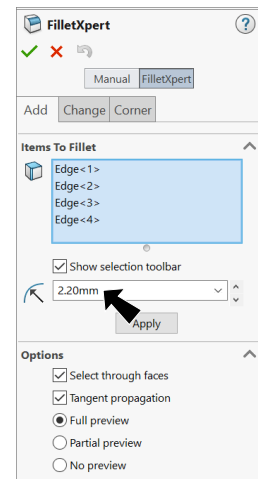


Fig. 22

## G. Appearance: Blue.

Step 1. Click part, click **Appearance Callout** on the context toolbar and click **SOLAR PANEL**, Fig. 25.

Click part →

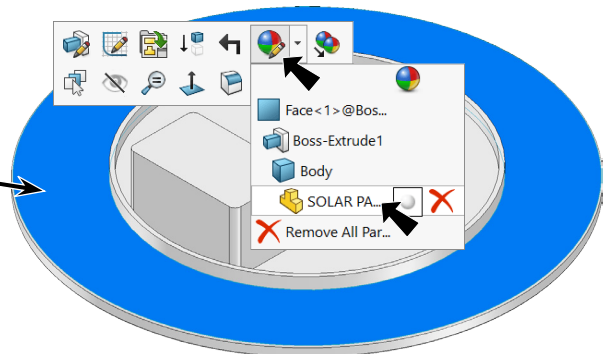


Fig. 25

Step 2. In Appearances Property Manager:  
under Color, Fig. 26

set **RGB values** to:

**R 174**

**G 204**

**B 235**

click OK ✓.

Step 3. Save (Ctrl-S).

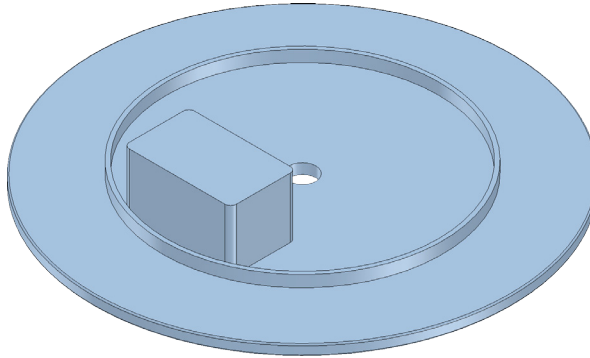


Fig. 27

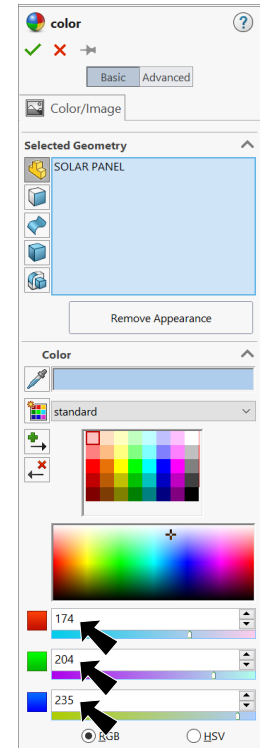


Fig. 26

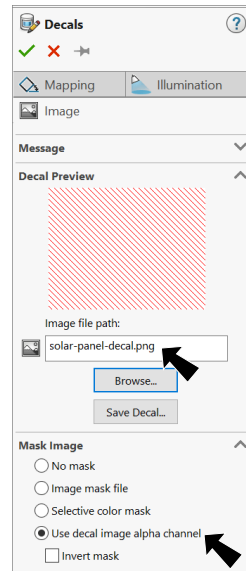
## H. Decal.

Step 1. Click **Top**  on the Standard Views toolbar. (**Ctrl-5**)

Step 2. Click PhotoView 360 Menu > Edit Decal.

Step 3. In the Decals Property Manager Image tab:  
 under Decal Preview  
 click **Browse** and **My Documents** buttons  
 open **solar-panel-decal.png** **Fig. 28**  
 Download decal [here](#).

under Mask Image  
 select **Use decal image alpha channel**



**Fig. 28**

Step 4. Click **Mapping** tab  at the top of the Decals Manager, **Fig. 29**  
 under Selected Geometry

**unselect all except Select Faces** 

click **top face**, **Fig. 30**

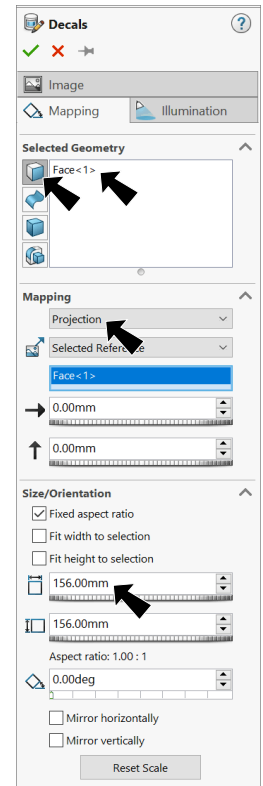
under Mapping  
 Mapping type **Projection**

**Projection direction**  **Selected Reference**

under Size/Orientation

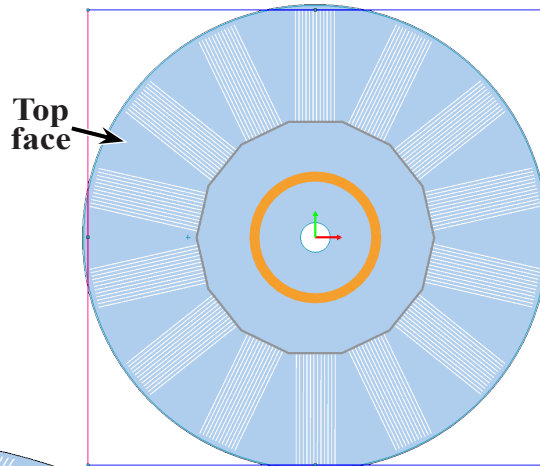
**Width**  **156**

click **OK** .

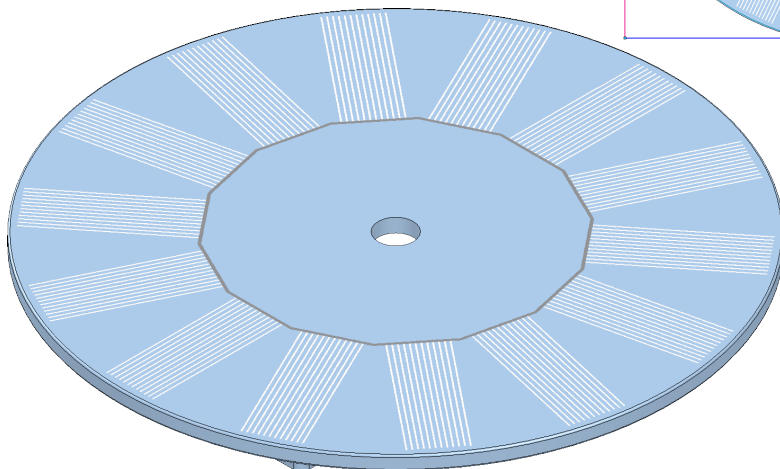


**Fig. 29**

Step 5. Save  (**Ctrl-S**).



**Fig. 30**



**Fig. 31**