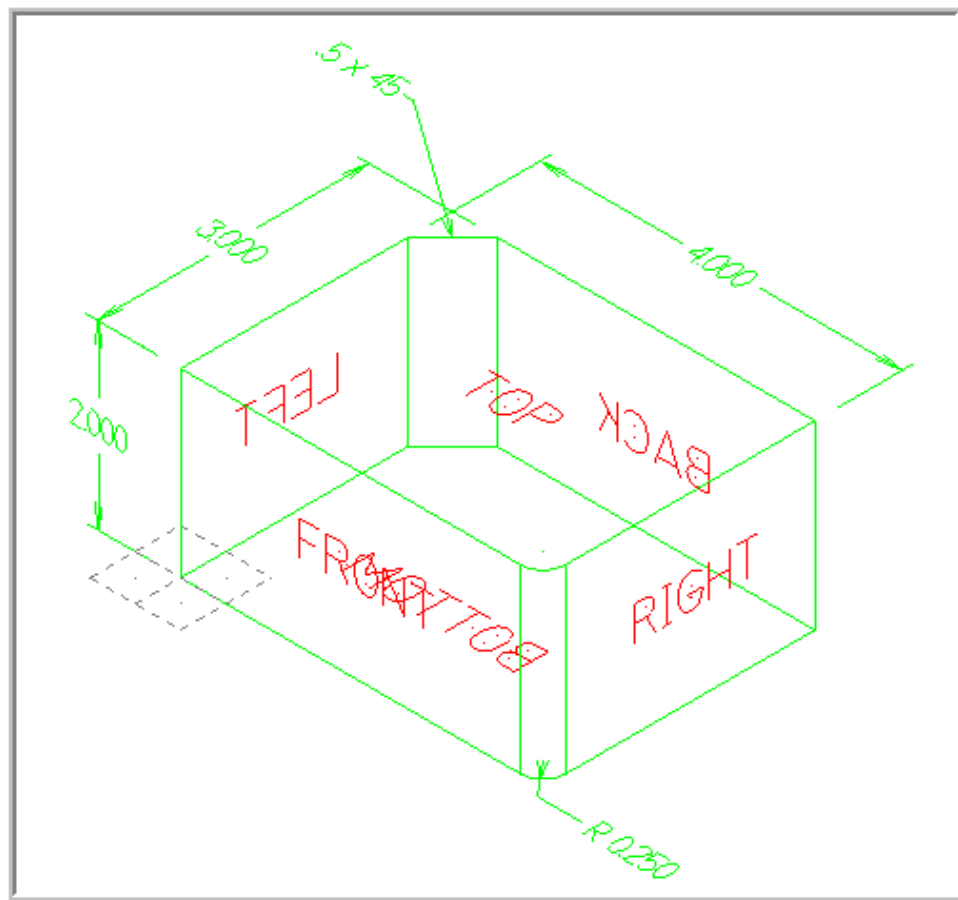


Mastercam X³

TRAINING

GUIDE



WCS-PART-1

camInstructor

Objectives

The learner will create the geometry for WCS-Part-1. This Lesson will cover the following topics:

➤ **Create a 3-dimensional drawing by:**

Creating lines using Rectangle

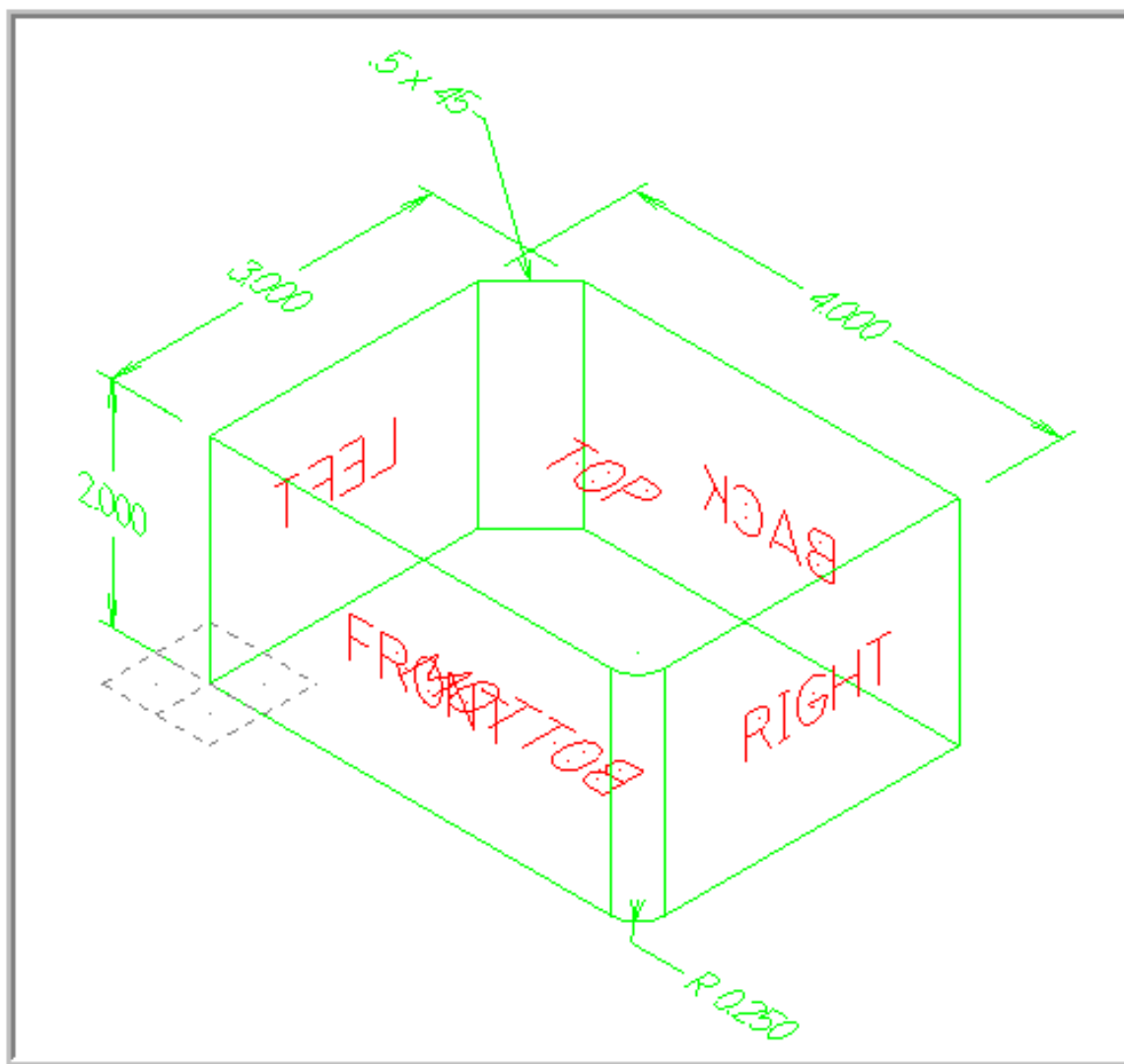
Creating Fillets

Using Xform Translate Join to copy entities

Using Views and Construction Planes

Creating Text using different construction planes and views

WCS-PART-1 DRAWING



WCS-PART-1 - THE PROCESS

- TASK 1:** Setting the environment
TASK 2: Introduction - Watch the video
TASK 3: Create a rectangle 4" x 3" – the lower left corner is at X0 Y0
TASK 4: Create the .5 x 45 degree chamfer
TASK 5: Create the .25 fillet radius
TASK 6: Translate the Geometry in the Z plane
TASK 7: Create dimensions
TASK 8: Create letters on all faces of the part geometry

Geometry Creation

TASK 1:

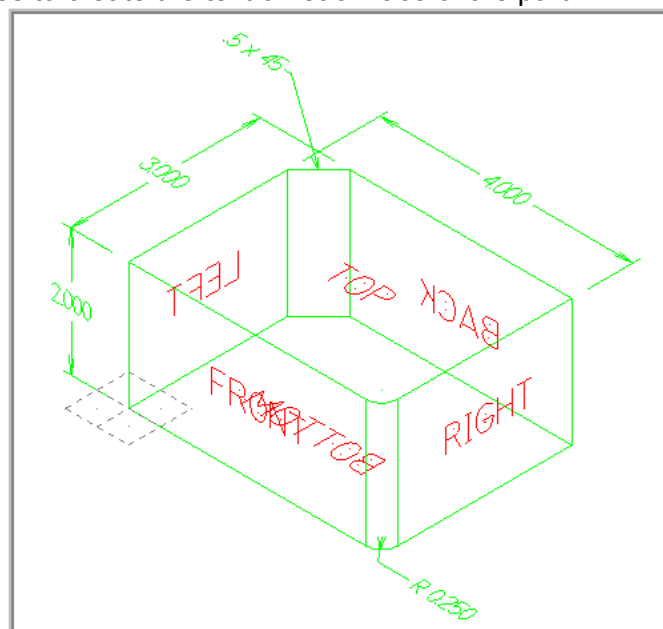
SETTING THE ENVIRONMENT

Before starting the geometry creation you should set up the grid, toolbars and machine type as outlined in the **Setting up the Environment** section at the beginning of this text:

1. Set up the Grid. This will help identify the location of the origin.
2. Customize the toolbars to machine a 2D part.
3. Set the machine type to a Haas Vertical Spindle CNC machine.

TASK 2: INTRODUCTION – WATCH THE VIDEO

1. Before you start to work on this Lesson review the video on the multimedia CD that came with this text. You will find the video in the “**Tips and Techniques**” section it is entitled **WCS - Part 1 - Construction Planes - 11 Minutes**.
- The video will demonstrate how the geometry is created, and how to use Views and Construction planes to create the text on each face of the part.

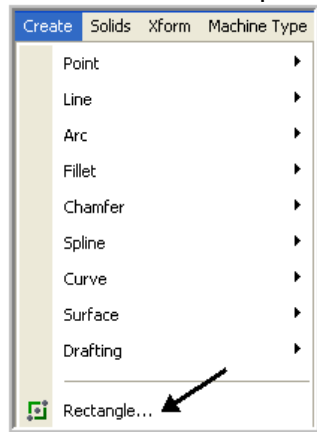


TASK 3:

CREATE A RECTANGLE 4" X 3" – LOWER LEFT CORNER IS X0 Y0.




☞ This task explains how to create the 4"x 3" rectangle. These four lines could be created in many different ways, this is just one option.

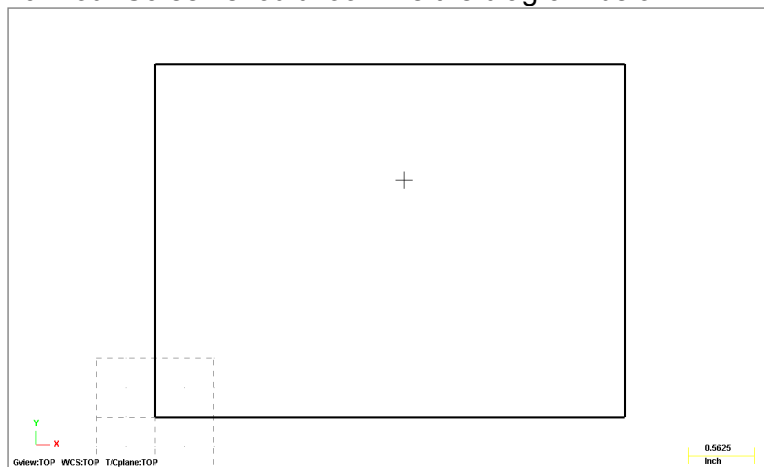
1. Select **Alt-O** to hide the Operations Manager pane.
2. Select from the pull down menu **Create>Rectangle...**



3. The Create Rectangle ribbon bar appears and you are prompted to **Select position of base point.**

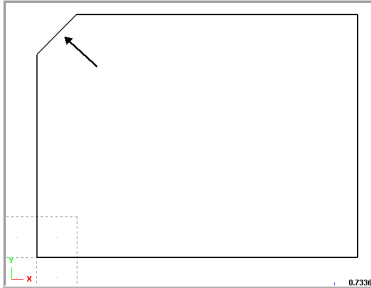


4. On the ribbon bar click in the space for **Width** and enter a value of **4.0**, hit the tab key and you will be moved over to the Height section.
5. In the **Height** section enter a value of **3.0** and then hit Enter.
6. Move the cursor to the center of the Grid and snap to the Origin for the base point.
7. Click on the **OK** icon  to complete this feature.
8. Select the **Screen Fit** icon found at the top of the screen to fit the part to the screen .
9. Next Select the **Un-Zoom .8** icon from the toolbar to shrink the display .
10. Your Screen should look like the diagram below:



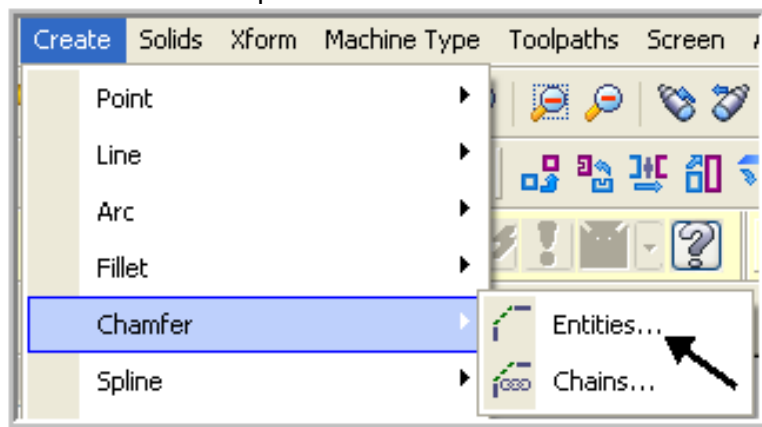
TASK 4: CREATE THE .5 X 45° CHAMFER

☞ This task explains how to create the chamfer.

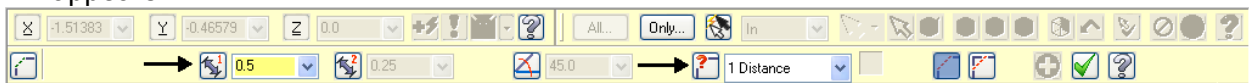


☞ Create Chamfer

1. Select from the pull down menu: **Create>Chamfer>Entities....**



2. On the graphics screen you are prompted: **Select line or arc** and the Chamfer ribbon bar appears.



3. The chamfer you are creating is .5 x 45°, click in the space for **distance 1**, left side of the ribbon bar and enter a value of **.5** and then hit the tab key.

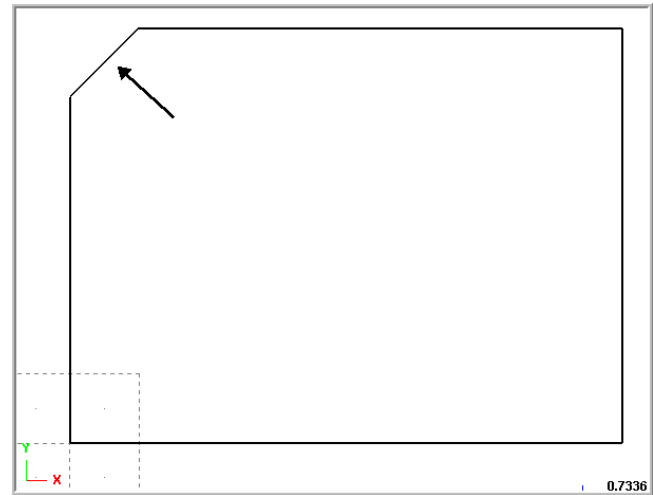
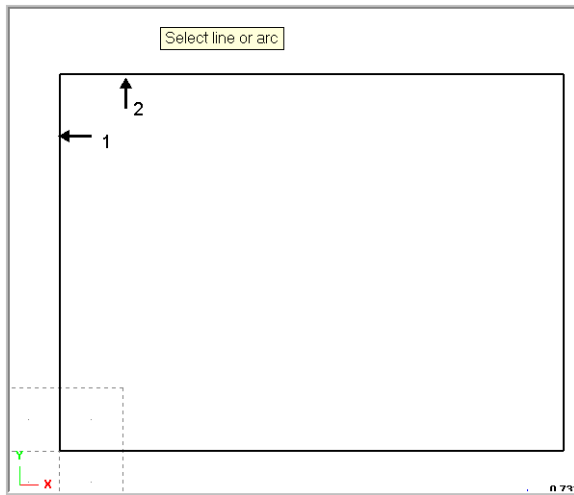
4. You are now moved over to the **Style** section, ensure the Style is set **1 Distance** before moving on.


Ensure the **Trim** function is activated, the trim button is depressed to turn the trim on.



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5. To satisfy this first prompt **Select line or arc** select **line 1** and for the next prompt **Select line or arc** select **line 2**.

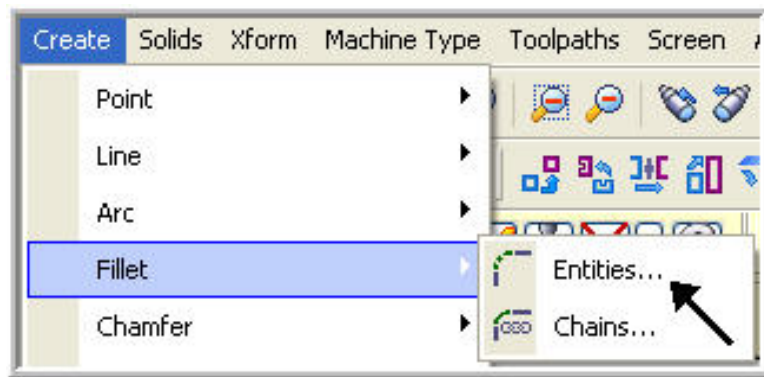


6. Click on the **OK** icon  to complete this feature.
7. Your geometry should appear like the figure above right.

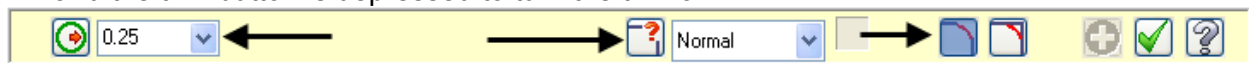
TASK 5: CREATE THE .25 FILLET RADII

☞ In this task you will create the .25 fillet radii on the lower right corner of the part.

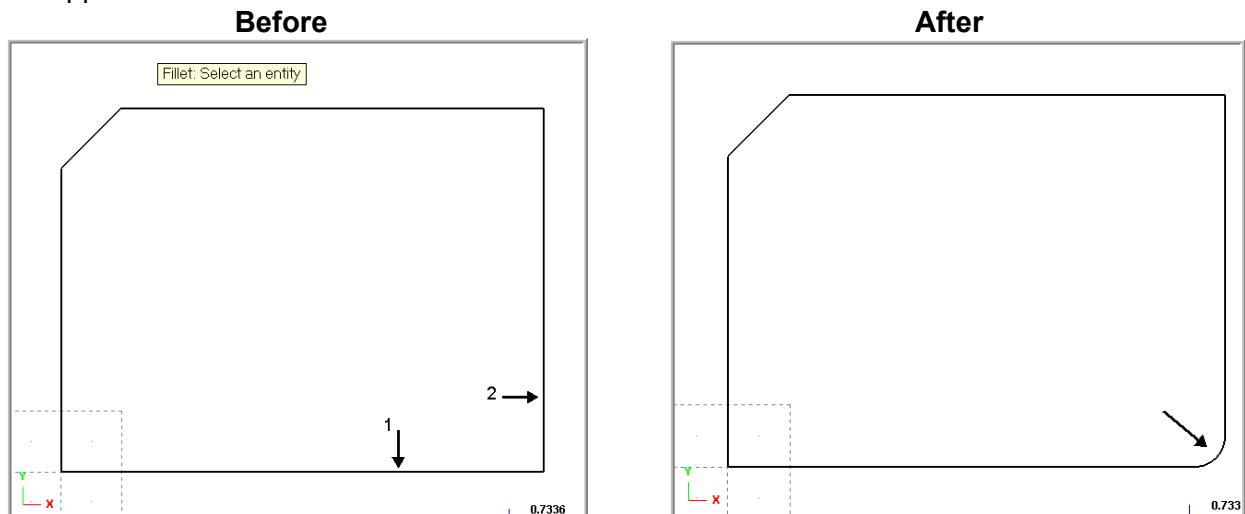
1. Select **Create>Fillet>Entities...**




2. On the **Fillet** ribbon bar enter **.25 for the radius**. Ensure the style of radius is set to normal and the trim button is depressed to turn the trim on.



3. When prompted to **Select an entity**, select **line 1 and 2** as shown below. The fillet radius appears at the corner of **line 1 and 2**.



4. Click on the **OK** icon  to complete this feature.
5. Your completed part geometry should appear like the figure on the right above.

TASK 6: TRANSLATE THE GEOMETRY IN THE Z PLANE

- ☞ Translate the geometry in the Z axis.
- ☞ All the geometry created in this part lies at Z zero. In the next sequence of instructions you will use Xform Translate Join to move the geometry up in the Z.

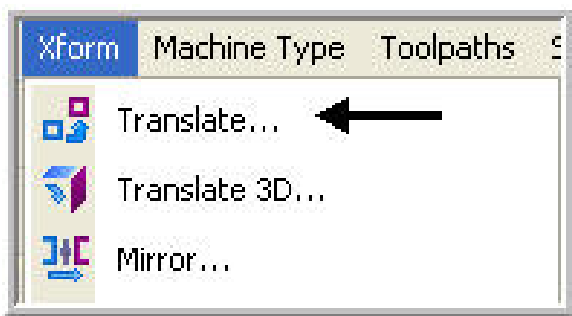
1. Change the graphics view to an **Isometric** by using the toolbar at the top of the screen.
2. For a better view of the part use the toolbar at the top of the screen to change the graphics view to **Isometric**.




3. Now select the **Fit to screen** icon .

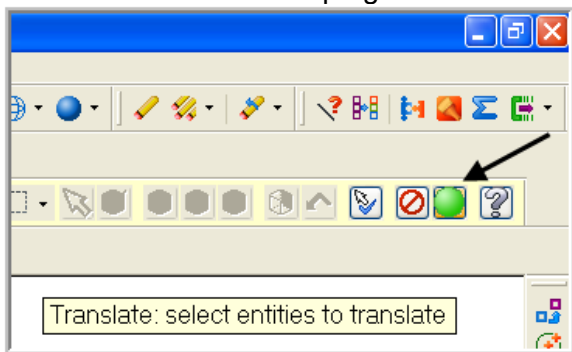
4. Next Select the **Un-Zoom .8** icon twice from the toolbar to shrink the display .

5. Select **Xform>Translate...**

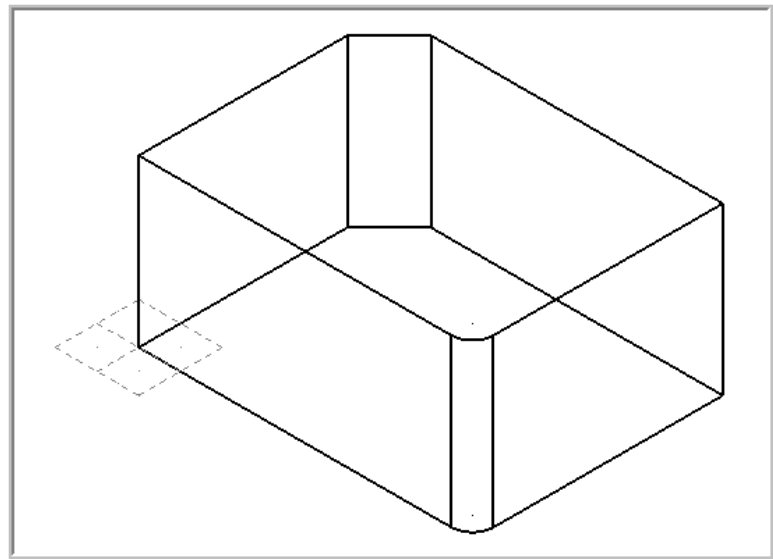
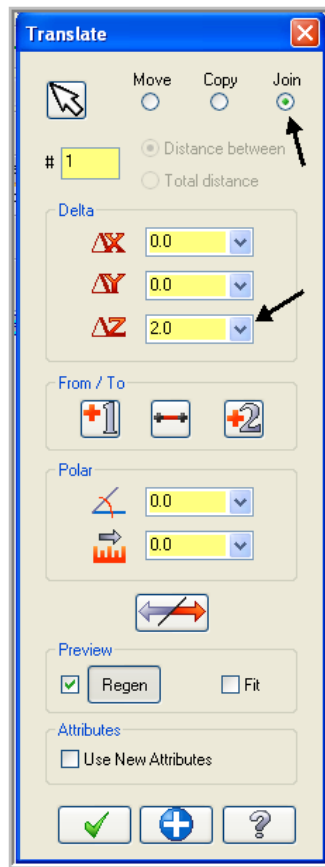



6. You are first prompted to **Translate: select entities to translate**. Draw a window around all the geometry to select the various entities.

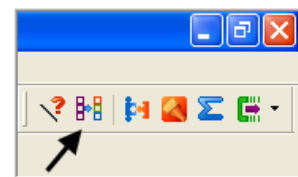
7. To move onto the next step you now need to pick the **End Selection** icon . This is located over in the top right of the screen as shown below:




8. After selecting End Selection the **Translate** window appears. Set the following values as shown below on the left. Join is activated and the **Delta Z** value is **2.0**.




9. Click on the **OK** icon  to complete this feature.



10. Click on the **Clear Colors** at the top right hand corner of the screen.

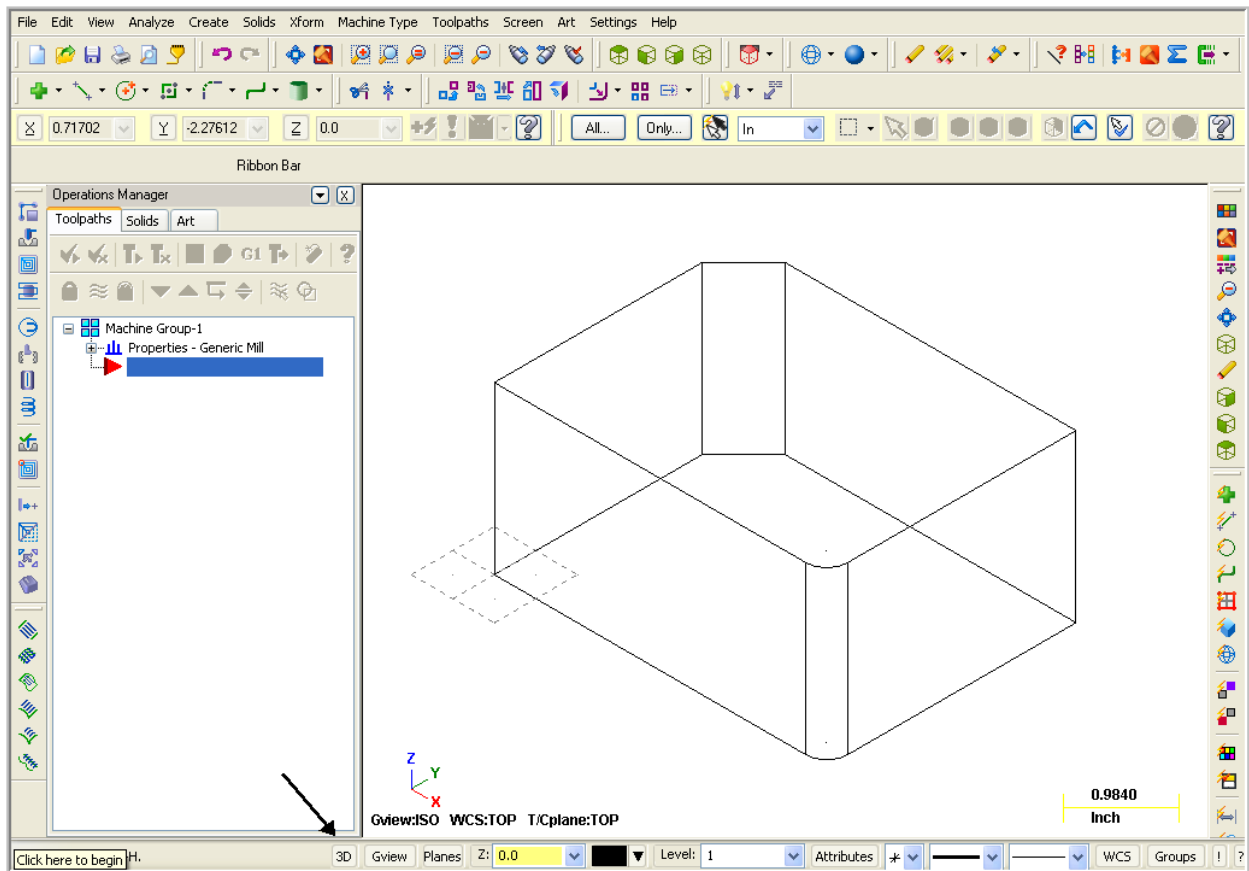
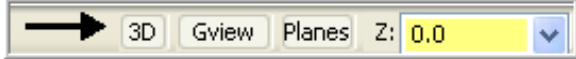
11. Select the **Screen Fit** icon found at the top of the screen to fit the part to the screen .

12. Next Select the **Un-Zoom .8** icon from the toolbar to shrink the display .

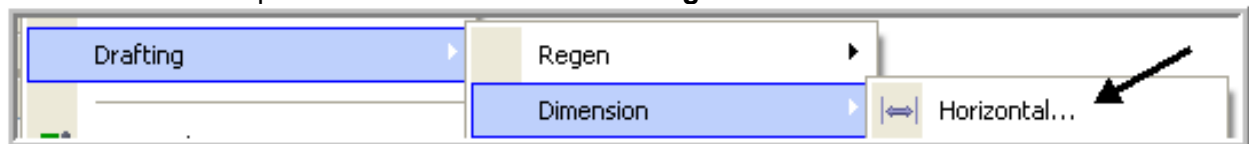
TASK 7: CREATE DIMENSIONS

➤ Create three dimensions to keep track of the changing Z depths.

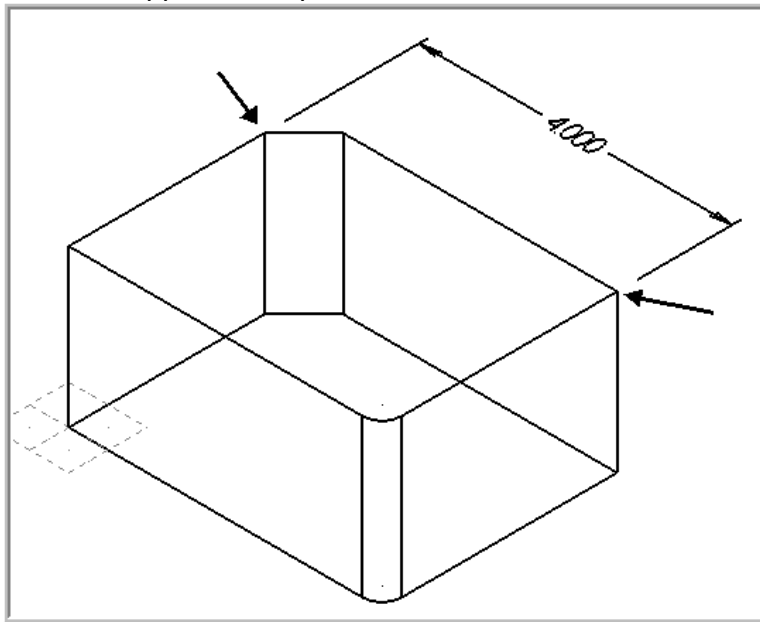
1. On the Status bar toggle to 3D by clicking on the **2D (3D) window** as shown below:




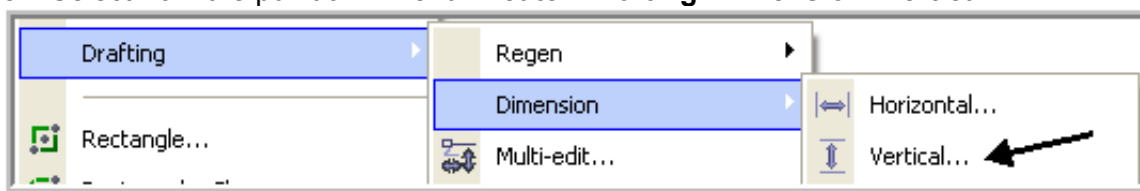
2. Select from the pull down menu **Create> Drafting>Dimension>Horizontal**



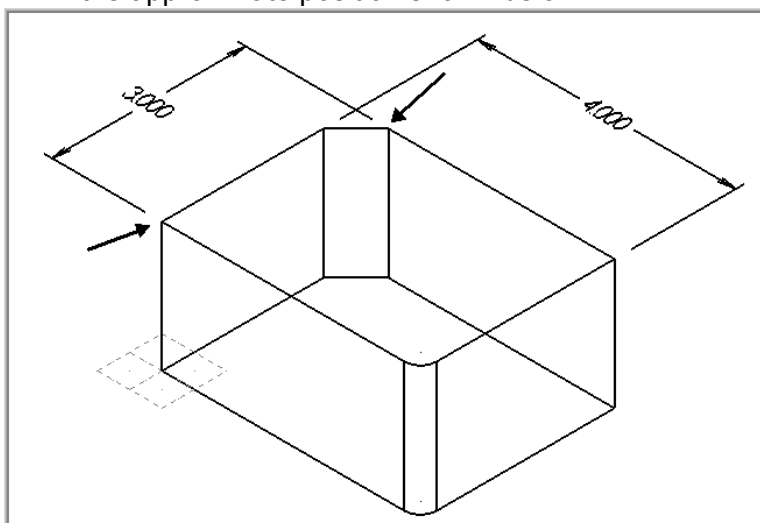
- When prompted pick the **two endpoints** shown below and then place the **4.000** dimension in the approximate position shown below.




- Click on the **OK** icon  to complete this feature.
- Select from the pull down menu **Create> Drafting>Dimension>Vertical**



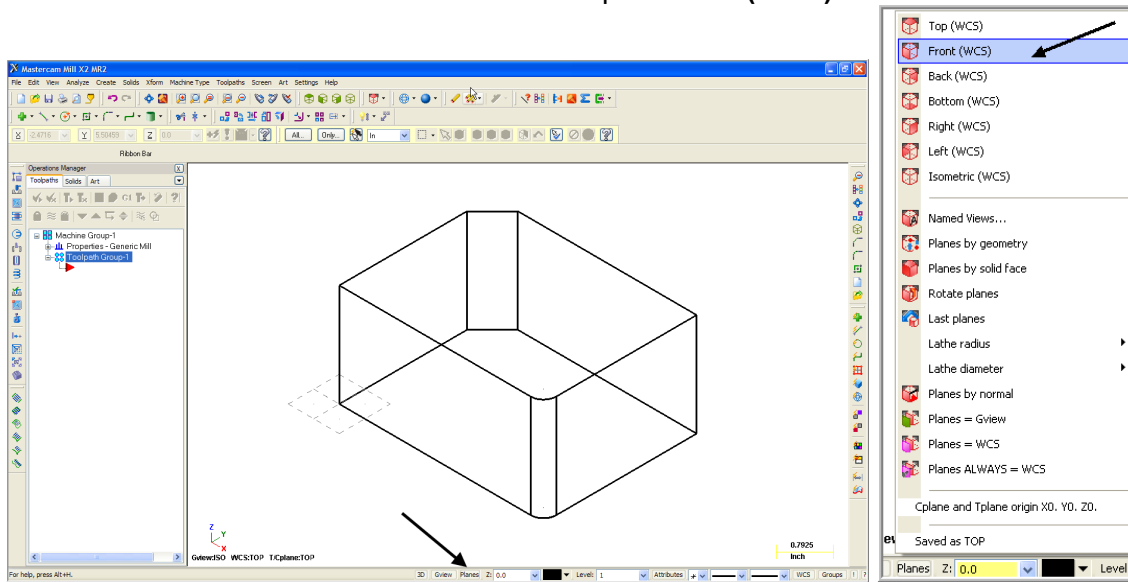
- When prompted pick the **two endpoints** shown below and then place the **3.000** dimension in the approximate position shown below.



- Click on the **OK** icon  to complete this feature.

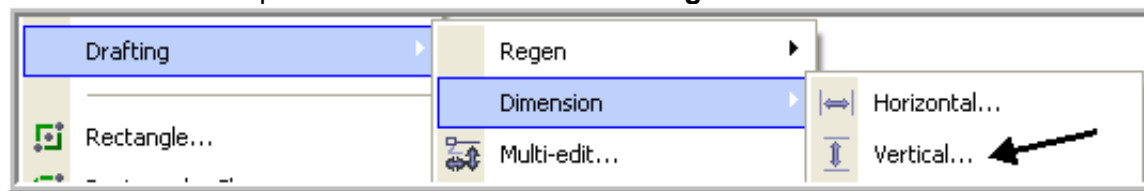
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8. On the Status bar select **Planes** and then pick **Front (WCS)**.

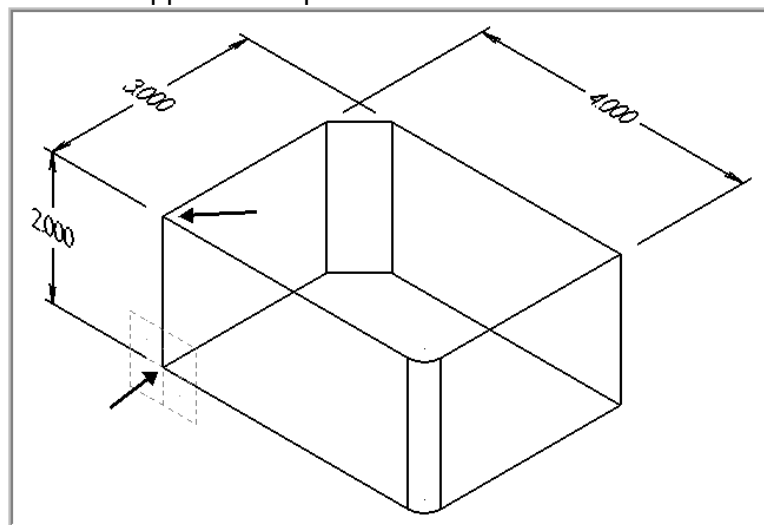


9. Notice the **Grid** change position and **CPlane** at the bottom of the screen changes to **Front**.

10. Select from the pull down menu **Create> Drafting>Dimension>Vertical**



11. When prompted pick the **two endpoints** shown below and then place the **2.000** dimension in the approximate position shown below.



12. Click on the **OK** icon  to complete this feature.



13. Select the **Isometric** view from the view toolbar. Take note of the WCS and Construction Plane status now - **WCS: Top T/CPlane: Top**.

TASK 8: CREATE LETTERS ON ALL FACES OF THE PART GEOMETRY

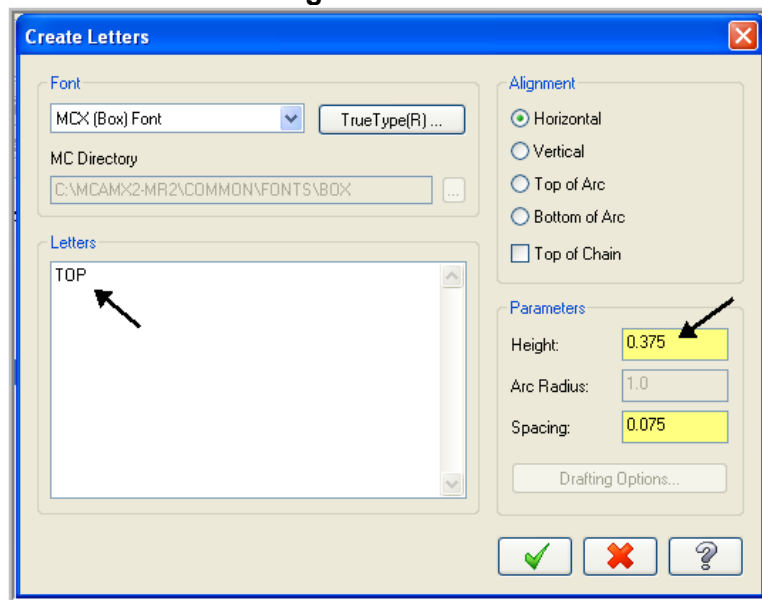
- Setup and create the letters on each face of the part geometry using different construction planes and views.
- 1. On the status bar double click on the **Color window** and change the system color to **Red, color 12**.




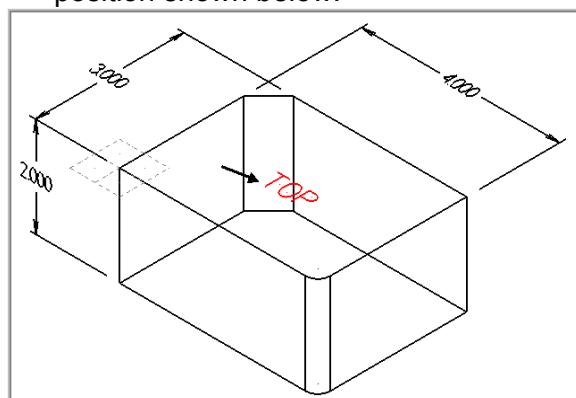
- 2. On the status bar double click on the **Z: window** and change the Z depth to **2.0**.



- 3. Select from the pull down menu **Create>Letters...**
- 4. The **Create Letters** dialog box appears. Enter **TOP** in the **Letters** section of the dialog box and set the **height to 0.375**:



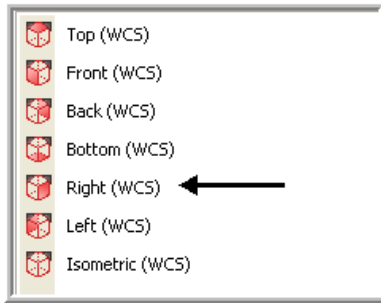
- 5. Click on the **OK** icon  to complete this feature.
- 6. To satisfy the prompt **Enter starting location of letters** pick a point in the approximate position shown below.



- 7. Hit the **escape** button when complete.

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8. On the Status bar select **Planes** and then pick **Right** (WCS).

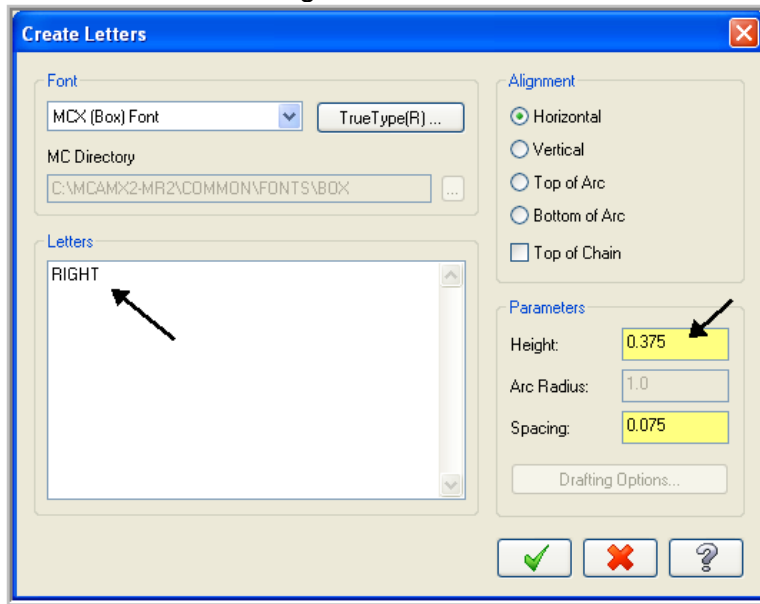


9. On the status bar change the **Z** depth to **4.0**.



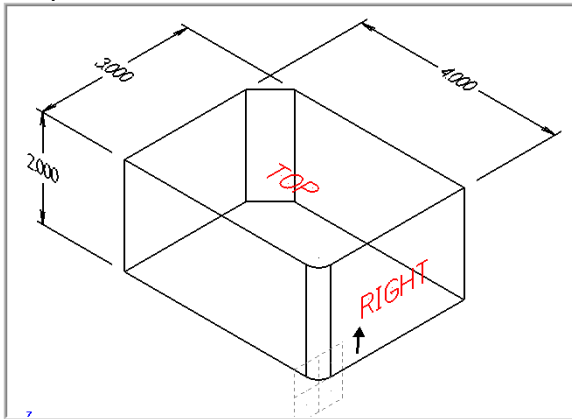
10. Select from the pull down menu **Create>Letters...**

11. The **Create Letters** dialog box appears. Enter **RIGHT** in the **Letters** section of the dialog box and set the height to **0.375**:



12. Click on the **OK** icon  to complete this feature.

13. To satisfy the prompt **Enter starting location of letters** pick a point in the approximate position shown below.



14. Hit the **escape** button when complete.
15. Using the techniques used above complete the remaining text on the other faces of the part.
- Please Note:** if you get stuck check out the video on multimedia CD that came with this text. You will find the video in the “**Tips and Techniques**” section it is entitled **WCS - Part 1 - Construction Planes - 11 Minutes**.

