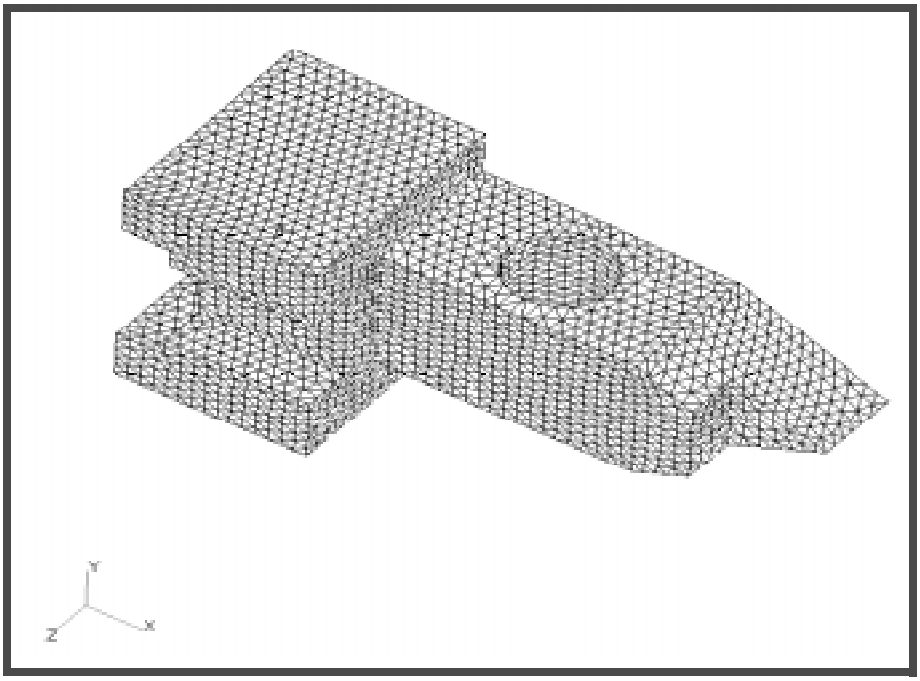
Lesson 7

Intro to Parameters and Features



Objectives:

- Demonstrate how to suppress features
- Demonstrate how to unsuppress features
- Demonstrate how to change parameters of features
- Demonstrate that changing parameters/features on a meshed part will cause an auto-update of the mesh
- Demonstrate that current state of part is retained in copy of part file

Exercise Procedure:

1. Create a new database called **test1.db**.

File/New...

New Database Name: **test1**

OK

In the ***New Model Preference*** form set the following:

Tolerance: ◆ **Default**

OK

2. Import the Unigraphics part file.

File/Import...

Object: **Model**

Source: **Unigraphics**

Unigraphics File: **key.prt**

Apply

A warning message similar to the following should appear:

> Importing Unigraphics Features will require that the Unigraphics part file be modified to reflect the changes made in PATRAN. Therefore a copy of the part is made to /tmp/hofmann/test1_ug_copy/key.prt_msc_test1 prior to import. Please do not remove or modify this copy in any way, as subsequent model updates are dependent on the undisturbed copy. This copy will not work with any other PATRAN databases.

Basically, MSC/PATRAN will make a copy of the part file located in a subdirectory titled [database_name]_ug_copy. MSC/PATRAN must be able to access this part file to modify features. If the part file is not in the same location, the user will be prompted for the new location.

Click **OK** to clear the warning.

OK

The Unigraphics Import summary should appear next. Clear this summary.

OK

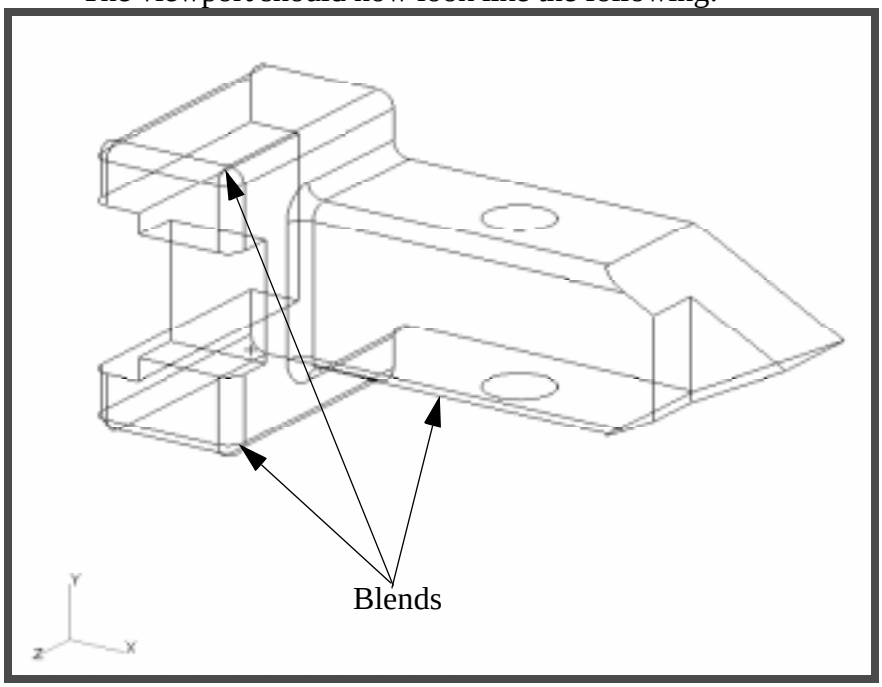
3. Obtain a good understanding of the part and which features are going to be changed.

Before making any changes, you may want to get a good look at some of the features of the part.

First, change the view to **Iso 1 View**.

Iso 1 View

The viewport should now look like the following:



Notice that there is a base to this key, blends on some of the edges, and a hole in the middle of the protrusion. These are the features which you are going to change.

4. Suppress some of the features of the part.

◆ **Geometry**

Action:	**Edit**
Object:	**Feature**
Method:	**Suppress**
Feature List:	*select* **CYLINDER(4)**

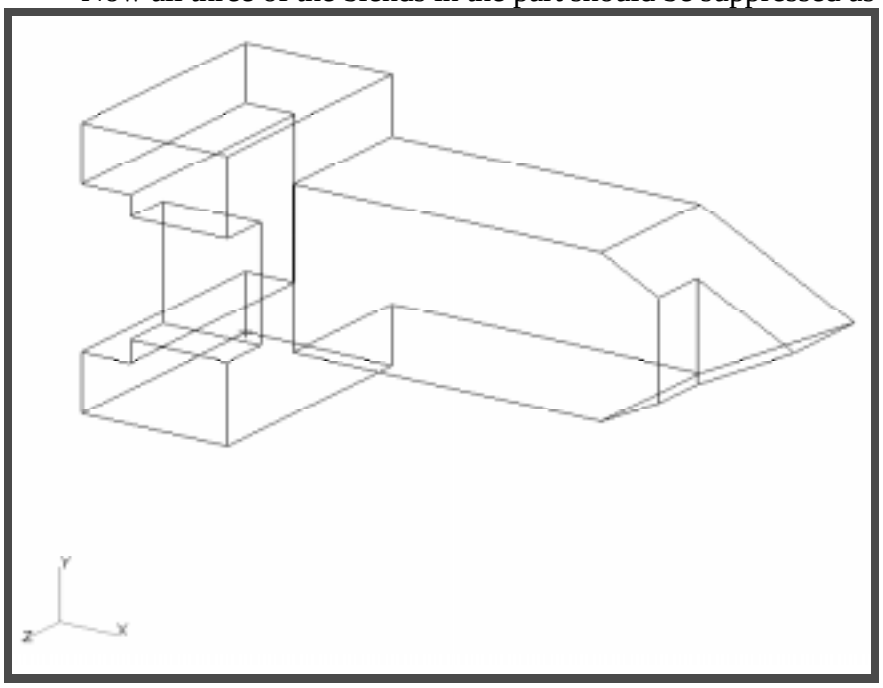
Apply

Notice that the hole disappears from the viewport. This is a concept known in Unigraphics as suppressing a feature. Notice also that when you select the feature from the list, it is highlighted in the viewport. This is one means of selecting features. You can also select features by clicking on them in the viewport (in most cases).

Geometric Entity List:	*shift-pick the 3 blends from the viewport*

Apply

Now all three of the blends in the part should be suppressed as well.



5. Unsuppress the hole in the key.

We were a little reckless in our suppression of features a little bit ago. While the blends were intentionally removed, the hole however plays a significant part in the model. Let's put the hole back in the model.

Action:	**Edit**
Object:	**Feature**
Method:	**Unsuppress**
Feature List:	*select* **CYLINDER(4)**

Apply

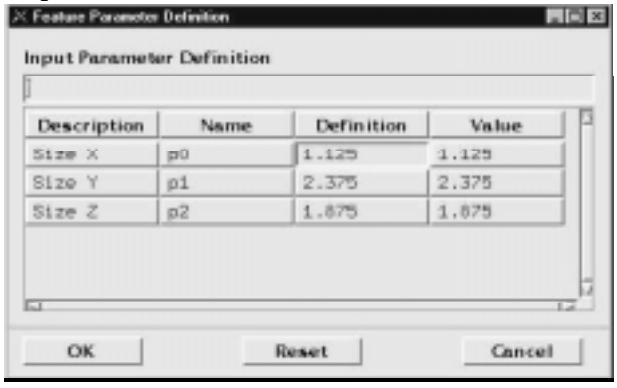
The hole is back in the model, as it should be. See how easy it is to remove and retrieve features for this part.

6. Change the base of the model.

When the Unigraphics model has been set up parametrically (assigned values for dimensions and positions), MSC/PATRAN now has the capability to modify these parameters. Let's make the base of the key a little thicker.

Action:	**Edit**
Object:	**Feature**
Method:	**Parameters**
Feature List:	*select* **BLOCK(0)**

The Feature Parameters form should now pop up on the screen, listing some parameters of the selected feature.



Click in the cell corresponding to **Side X / Definition.**

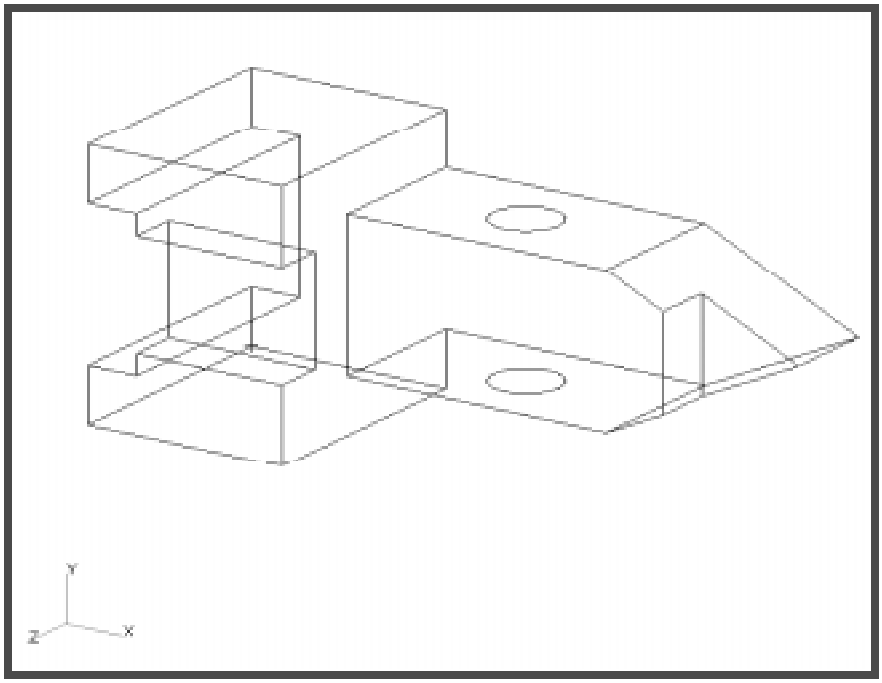
Input Parameter Definition: **1.5** *be sure to hit* **Enter**

When you hit **Enter**, notice that the value in the form updated from 1.125 to 1.5. This is critical to remember. Otherwise, none of your updates will be committed to the model.

OK

Apply

Notice that the base of the model is now thicker.



7. Mesh the model.

◆ **Finite Elements**

Action:	**Create**
Object:	**Mesh**
Type:	**Solid**
Global Edge Length:	**0.1**
Mesher:	◆ **TetMesh**
Input List:	**Solid 1**

Apply

8. Clean up the display a little.

First, remove the geometry from the screen.

Display / Plot/Erase...

Geometry: **Erase**

OK

Next, clean up the wireframe by only displaying the free faces.

Display/Finite Elements...

Show Only Free: ◆ **Faces (in Wireframe)**

Apply

Cancel

Next, change the viewing angle to better see the elements around the hole.

Viewing/Angles...

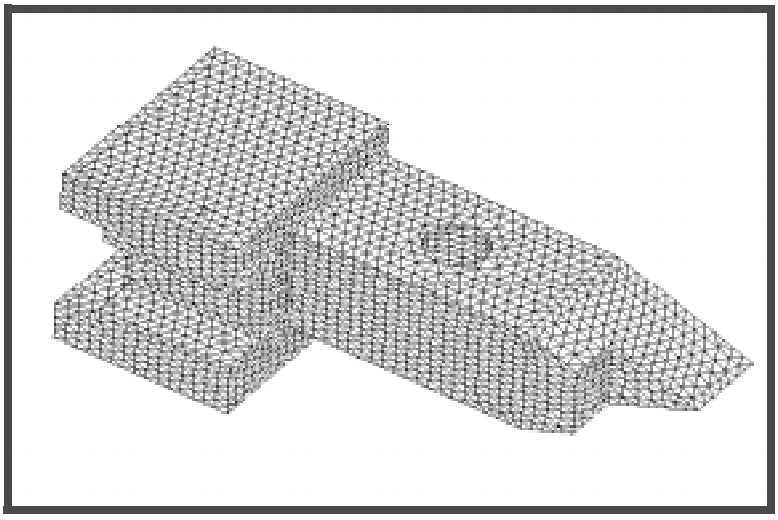
Angles: **49.81 -35.05 -1.93**

Apply

Cancel

Finally, change the render style to **Smooth Shaded** using the toolbar icon:

 **Smooth Shaded**



9. Change the diameter of the hole, allowing the mesh to auto-update.

◆ **Geometry**

Action:	**Edit**
Object:	**Feature**
Method:	**Parameters**
Feature List:	*select* **CYLINDER(4)**

The Feature Parameters form should now pop up on the screen, listing some parameters of the selected feature.

Click in the cell corresponding to **Diameter / Definition.**

Input Parameter Definition: **0.8** *be sure to hit* **Enter**

OK

Apply

You should now get the following warning from MSC/PATRAN:

> A change has been detected in the geometry and topology. This will cause PATRAN to eliminate or modify meshes or loads on the highlighted entities. Do you want to continue?

Yes

Notice now that the hole is significantly bigger, and that the part has been remeshed. You may want to clean up the graphics a bit.

Display / Plot/Erase...

Geometry: **Erase**

OK

Refresh the graphics if needed.

Refresh Graphics

10. Verify that the copy of the part file has been updated according to all changes made.

First, quit out of PATRAN.

File/Quit

Next, in your UNIX shell, look in the current directory (where the database was created). There should be a subdirectory called test1_ug_copy. Located in this subdirectory is the copy of the UG file which you have been currently working on. Copy the file out of the directory using the following command:

cp test1_ug_copy/key.prt_msc_test1 copy.prt

This copies the current state of the part back a directory and renames it **copy.prt**.

Start up PATRAN again.

Create a new database called **test1b.db**.

File/New...

New Database Name: **test1b**

OK

In the ***New Model Preference*** form set the following:

Tolerance: ◆ **Default**

OK

Import the Unigraphics part file.

File/Import...

Object: **Model**

Source: **Unigraphics**

Unigraphics File: **copy.prt**

Apply

A warning message should appear:

Click OK to clear the warning.

OK

The Unigraphics Import summary should appear next. Clear this summary.

OK

Notice that the part file imported retains the same feature and parameter states as the model you were just looking at.

If you import this database into another one, the current solid geometry of the part will also be imported, but you will be unable to access the features.

Quit MSC/PATRAN when you have completed this exercise.