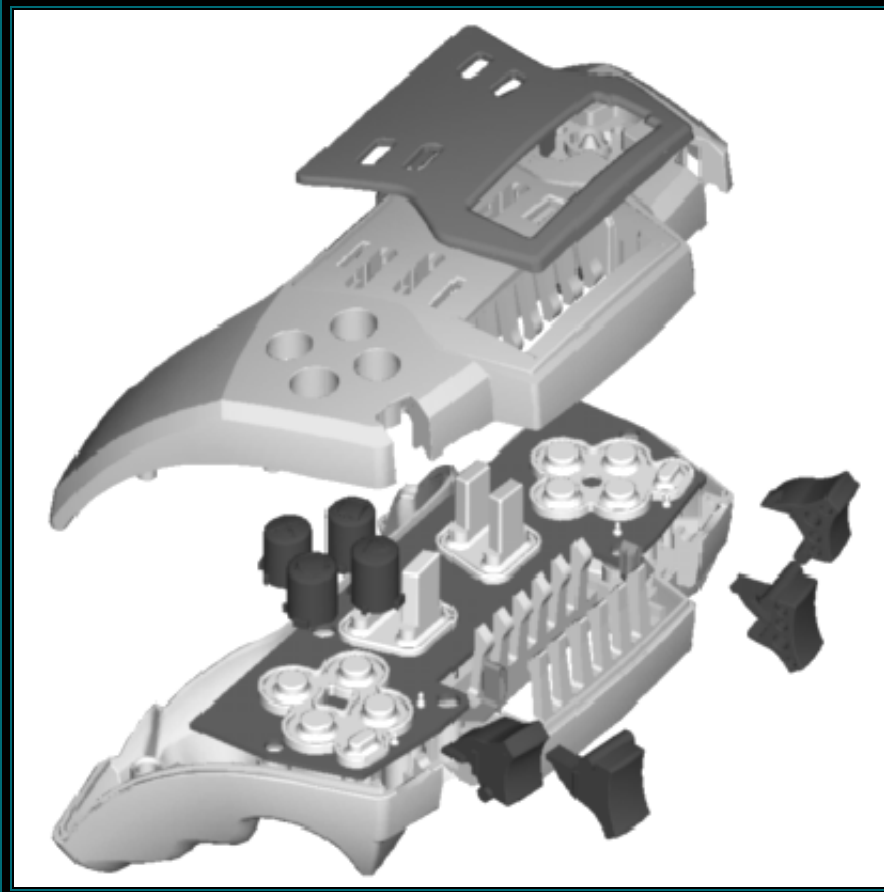# Pro|ENGINEER®
W I L D F I R E™ 5.0
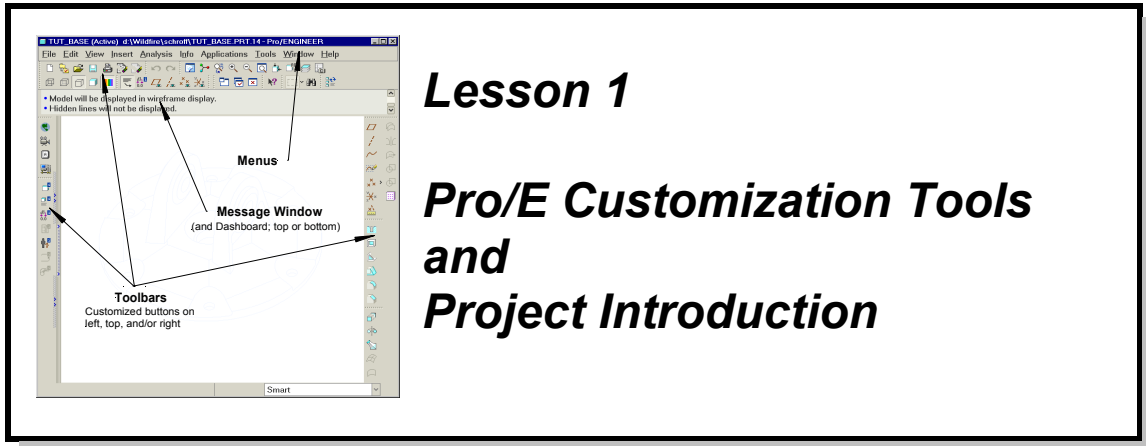# *Advanced Tutorial*

Roger Toogood, Ph.D., P. Eng.
Mechanical Engineering
University of Alberta

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Lesson 1

Pro/E Customization Tools and Project Introduction

Synopsis:

Configuration settings; customizing the screen toolbars and menus; mapkeys; part templates; introduction to the project

Overview

This lesson will introduce tools for customizing your Pro/E configuration and working environment and show you how to create some useful shortcuts for accessing Pro/E commands. The intent of these tools is to let you set up the interface so that you can work most comfortably and efficiently. The major customization tool is the use of one or more configuration files (default files *config.pro* and *config.win*). The lesson also includes managing and creating your own custom toolbars and mapkeys. We'll also see how you can create your own part templates. The major project used in this tutorial is introduced and the first four parts are presented.

Configuration Files (*config.pro*)

By now, you should be familiar with the commands for environment settings that are available in dialog windows such as

> ***Tools > Environment***
or   ***View > Display Settings > Datum Display*** (for example)

These aspects of the working environment (and much more!) can also be controlled using settings stored in configuration files (*config* files for short). Pro/E has several hundred individual configuration settings. All settings have default values that will be used if not specifically set in a *config* file, or changed during a session.

The most important *config* file is a special file called *config.pro* that is automatically read

when Pro/E starts up a new session. You can also read in (and/or change) additional configuration settings at any time during a session. For example, you may want to have one group of settings for one project you are working on, and another group for a different project that you switch to during a single session. In this tutorial, we will deal only with the use of the single configuration file, *config.pro*, loaded at start-up.

Several copies of *config.pro* might exist on your system, and they are read in the following order when Pro/E is launched:

♦   *config.sup* - this is a protected system file which is read by all users but is not available for modification by users. Your system administrator has control of this file.
♦   Pro/E loadpoint - this is read by all users and would usually contain common settings determined by the system administrator such as search paths, formats, libraries, and so on. This file cannot normally be altered by individual users.
♦   user home directory - unique for each user (Unix systems only)
♦   startup directory - the working directory when Pro/E starts up. To find where this directory is, open the Folder Navigator when you first launch Pro/E and select Working Directory in the Navigator pane[1].

Settings made in the first copy (*config.sup*) cannot be overridden by users. This is handy for making configuration settings to be applied universally across all users at a Pro/E installation (search paths for part libraries, for instance). An individual user can modify entries in the last two copies of *config.pro* to suit their own requirements. If the same entry appears more than once, the last entry encountered in the start-up sequence is the one the system will use (except for settings in *config.sup* which cannot be overridden). After start-up, additional configuration settings can be read in at any time. These might be used to create a configuration unique to a special project, or perhaps a special type of modeling. Be aware that when a new configuration file is read in (or some settings changed), some options may not take effect until Pro/E is restarted. This is discussed more a bit later.

Settings in *config.pro* are arranged in a table. Each row in the table is composed of two entries in the following form:

config_option_name   config_option_value

Option values can be composed either of text, single numbers, or series of numbers. A listing and description of many *config* options is contained in the on-line help. Select the following (starting in the pull-down menus):

Help > Help Center

Then expand the following topics in order from the top:

---

[1] In Windows, right click on the Pro/E icon on the desktop (if it exists), select **Properties > ShortCut** and examine the **Start In** text entry field.

          ⊕ *Pro/ENGINEER Functional Areas*
              ⊕ *Fundamentals*

Consider adding a bookmark for this page. In the **Contents** pane, expand the topics

         ⊕ *Pro/ENGINEER Fundamentals*
           ⊕ *Configuring Pro/ENGINEER Fundamentals*

This shows quite a long list (partially shown in Figure 1) of possible options. Click on some of these to see a short description and default values (in italics). You will have a hard time remembering the meaning of all these options. Fortunately, as we will see in a minute, the dialog window for working with configuration files contains a one line description of each option and there is also a search capability for finding option names. Although this makes finding the options much easier, you are encouraged to explore the on-line help - you won't know what you are missing until you find it, and it might be just the setting you need to make your life easier! Close the **Help Center**.
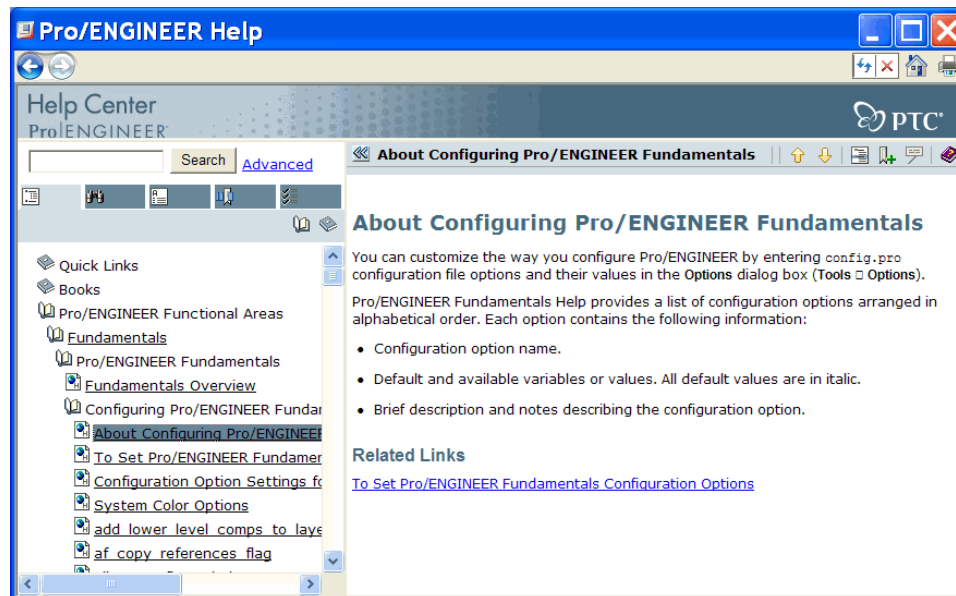

Figure 1 On-line help for configuration options

The Configuration File Editor

You can access your current configuration file using

         Tools > Options

This brings up the **Options** window shown in Figure 2. If your system has options set already, these will appear in the window. If not, the central area of the window will be blank, as in Figure 2. We'll discuss the operation of this dialog window from the top down.

The **Showing** pull-down list at the top will let you choose from a number of configuration groups (Current Session, your start-up config.pro, or elsewhere). Select *Current Session*.

Turn off the check box just below the **Showing** pull-down box. A complete list of all the Pro/E configuration options will appear. The first column shows its name; the second column shows its current value. An entry with an asterisk indicates a default value. A third column shows the status of the option (more about this later), and the fourth column shows where the option was set.
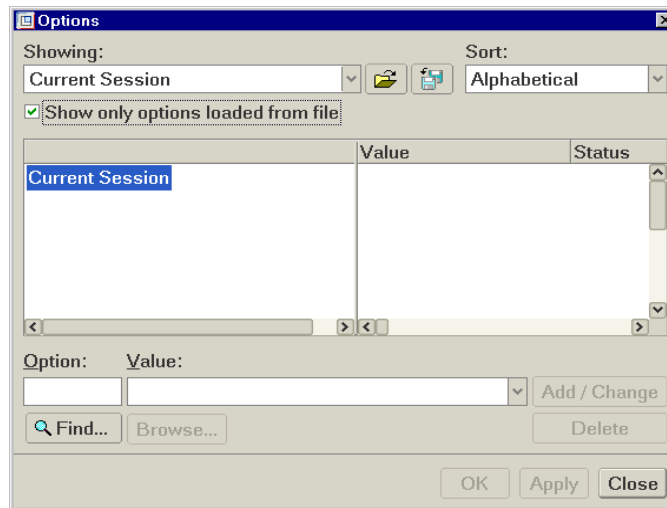
Figure 2 The **Options** window for setting and editing the configuration file

Note that you can resize the column widths by dragging on the vertical column separator bars at the top of the display area. At the far right (possibly out of the initial window view) is a final column containing a long (scrollable) one-line description of each option.

Browse down through the list. There are a lot of options here (over 750!). Note that the options are arranged alphabetically. This is because of the setting in the **Sort** pull-down menu in the top-right corner. Change this to *By Category*. This rearranges the list of options to group them by function. For example, check out the settings available in the **Environment** and **Sketcher** groups. Fortunately, there are a couple of tools to help you find the option name you're looking for. Let's see how they work.

Check the box beside "Show only options loaded from file" and select *Sort(Alphabetical)*.

Adding Settings to *config.pro*

Assuming you have a blank *config.pro*, let's create a couple of useful settings. At the bottom of the **Options** window are two text boxes for entering option names and values. If you know the name of the option, you can just type it in the first box. For new users, a useful setting is the following. In the text box below **Option**, enter the option name *prompt_on_exit*. As you type this in, notice that Pro/E anticipates the rest of the text box based on the letters you have typed in. After typing enough characters (up to the "x" in "exit"), the rest of the desired option will appear; just hit the **Enter** key. In the pull-down list under **Value**, select *Yes*. Note that the option name is not case sensitive and the default value is indicated by an asterisk in the pull-down list. Now select the *Add/Change* button on the right. The entry now appears in the data area. A bright green

star in the **Status** column indicates that the option has been defined but has not yet taken effect.

Now enter a display option. The default part display mode in the graphics window is **Shaded**. Many people prefer to work in hidden line mode - let's make it the default on start-up. Once again, we will enter the configuration option name and pick the value from a drop-down list.   The option name and value we want are

> **display**   **hiddenvis**

Now select *Add/Change* as before (or just hit the Enter key after typing the "h"). Add the following option to control how tangent edges should be displayed (HINT: try typing in the following: **tan**<enter>, backspace to remove the default, then **d**<enter>):

> **tangent_edge_display   dimmed**

Another common setting is the location of the Pro/E trail file. As you recall, the trail file contains a record of every command and mouse click during a Pro/E session. The default location for this is the start-up directory. Theoretically, trail files can be used to recover from disastrous crashes of Pro/E, but this is a tricky operation. Most people just delete them. It is handy, therefore, to collect trail files in a single directory, where they can be easily removed later. There is an option for setting the location of this directory. Suppose we don't know the configuration option's specific name. Here is where a search function will come in handy.
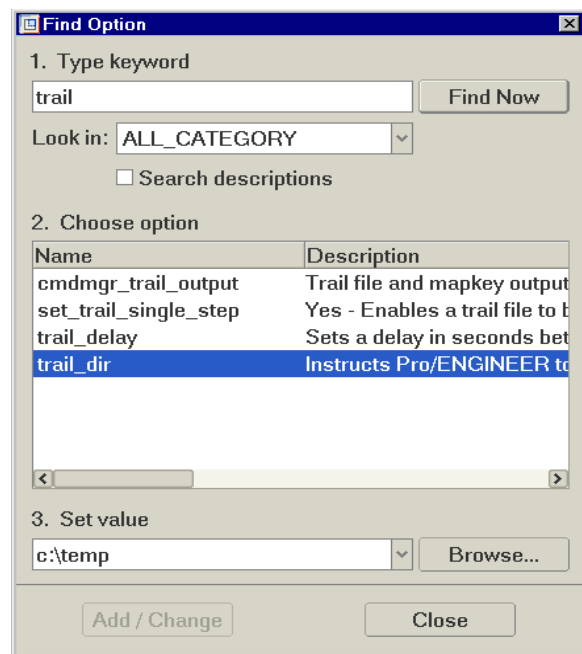

Figure 3 Finding a configuration file option

At the bottom of the **Options** window, click the *Find* button. This brings up the **Find Option** window (Figure 3). Type in the keyword *trail* and select

> ***Look in(ALL_CATEGORY) > Find Now***

Several possibilities come up. The option we want is listed as **trail_dir** - scroll the description to the right to confirm this. Select this option and then pick the *Browse* button at the bottom to identify a suitable location on your system for the value. Perhaps something like *c:\temp*. Then select *Add/Change*. The new entry appears in the **Options** window. In the **Find Option** window, select *Close*.

For some options, the value is numeric (eg setting a default tolerance, number of digits, or the color of entities on the screen). In these cases, you can enter the relevant number (or numbers separated by either spaces or commas). For example, under **Option**, enter the name **system_hidden_color**. Then under **Value**, enter the numbers **60 60 60** (separated by spaces). These give the values of red, green, and blue (out of 100). Equal values yield gray; this setting will brighten the hidden lines a bit from the default value. Select *Add/Change* (or just press Enter).

We have now specified five options. To have them take effect, select the *Apply* button at the bottom. The green stars change to small green circles in the Status column. The settings are automatically saved in a file *current_session.pro* in the working directory.

For practice, enter the options shown in Figure 4. The order that the configuration options are declared does not matter. Feel free to add new settings to your file (for search paths, libraries, default editors, default decimal places, import/export settings, and so on).
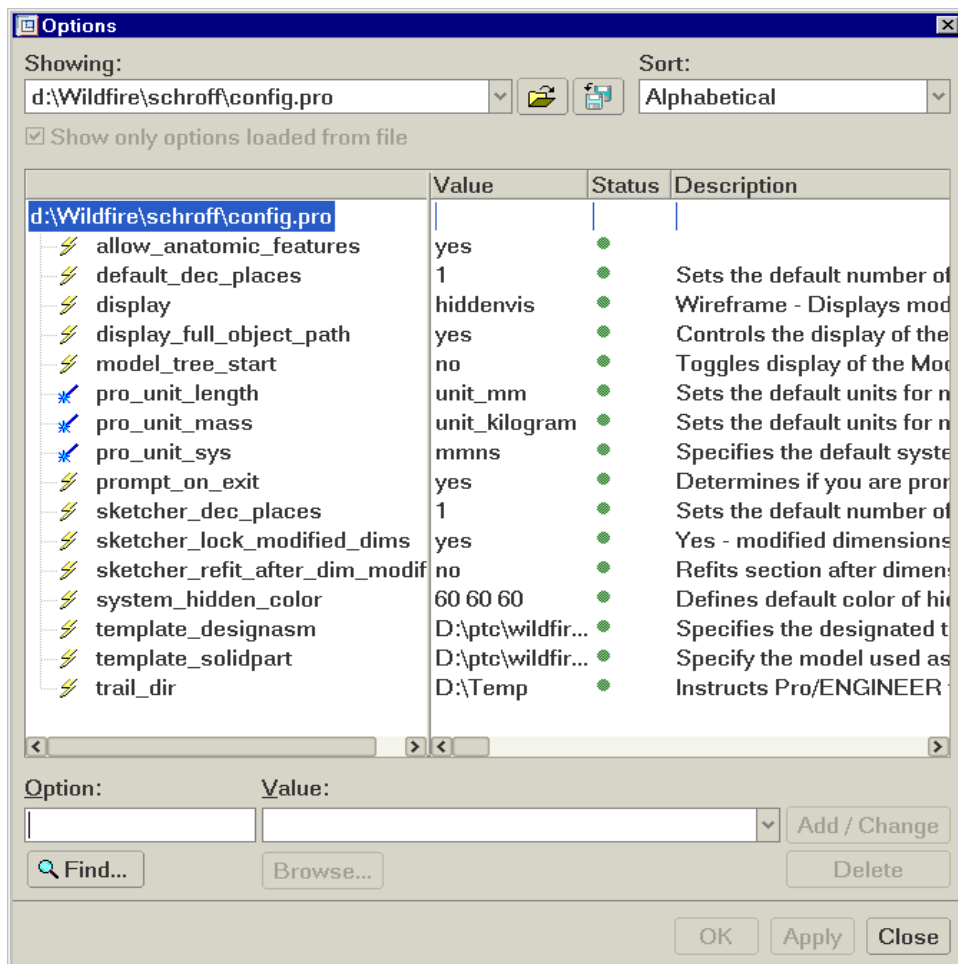

**Figure 4** Some settings in *config.pro*

Notice the icons in the first column beside the option names. These mean the following:

⚡ (lightning) - option takes effect immediately

✦ (wand) - option will take effect for the next object created

▣ (screen) - option will take effect the next time Pro/E is started

If you are using a *config* file from a previous version of Pro/E you may see a "stop sign" (actually a red circle with a line through it), which means that the option is no longer used.

Try to add an illegal option name. For example, in Release 2000i there was an option **sketcher_readme_alert**. Type that in to the **Option** field. When you try to set a value for this, it will not be accepted (the ***Add/Change*** button stays gray). Pro/E only recognizes valid option names! Thus, if you mistype or enter an invalid name, this is indicated by not being able to enter a value for it.

Saving Your *config.pro* Settings

To store the settings we have just created so that they will be loaded automatically, select the ***Save A Copy*** button 🖫 at the top of the **Options** window. At the bottom of the new window, type in the desired name for the file - in this case ***config.pro*** and select ***OK***. It should be saved in your default (start-up) working directory.

Loading a Configuration File

To confirm that the settings have saved properly, use the ***Open File*** button at the top of the **Options** window. Select the *config.pro* file you just saved, then ***Open***. Note that these settings will be read in but not activated immediately (note the green star). Select the ***Apply*** button and observe the green star changes to a circle.

Deleting Configuration Options

With the configuration file name visible in the **Showing** field at the top, highlight one of the options and select ***Delete***. Selecting ***Apply*** automatically saves the current settings.

Now select ***Close*** in the **Options** window.

Checking Your Configuration Options

Because some settings will not activate until Pro/E is restarted, many users will exit Pro/E after making changes to their *config.pro* file and then restart, just to make sure the settings are doing what they are supposed to. Do that now. This is not quite so critical since the **Options** window shows you with the lightning/wand/screen icons whether an

option is active. However be aware of where Pro/E will look for the *config.pro* file on start-up, as discussed above. If you have saved *config.pro* in another working directory than the one you normally start in, then move it before starting Pro/E. On the other hand, if you have settings that you only want active when you are in a certain directory, keep a copy of *config.pro* there and load it once Pro/E has started up and you have changed to the desired directory. To keep things simple, and until you have plenty of experience with changing the configuration settings, it is usually better to have only one copy of *config.pro* in your startup directory.

Note that it is probably easier to make some changes to the environment for a single session using *Tools > Environment*. Also, as is often the case when learning to use new computer tools, don't try anything too adventurous with *config.pro* in the middle of a part or assembly creation session - you never know when an unanticipated effect might clobber your work!

Customizing the Interface (*config.win*)

In addition to the environment settings, there are several ways of customizing the Pro/E interface: using *config.pro*, toolbars, menus, and mapkeys. An example of a customized interface is shown in the figure at the right. When you modify the interface layout, your changes will be saved in a *config.win* file in a directory of your choice (usually the current working directory). It is possible and permissible to have several different *config.win* files in different directories, each with a different customization of the screen to suit the work you may be doing on files in that directory.

Figure 5 A (somewhat cluttered) customized screen layout

In this section, we will introduce methods to customize the toolbars and menus.

Toolbars

With the cursor on the top toolbar, hold down the right mouse button. This brings up a menu similar to the one shown in Figure 6. This shows the toolbar groups currently
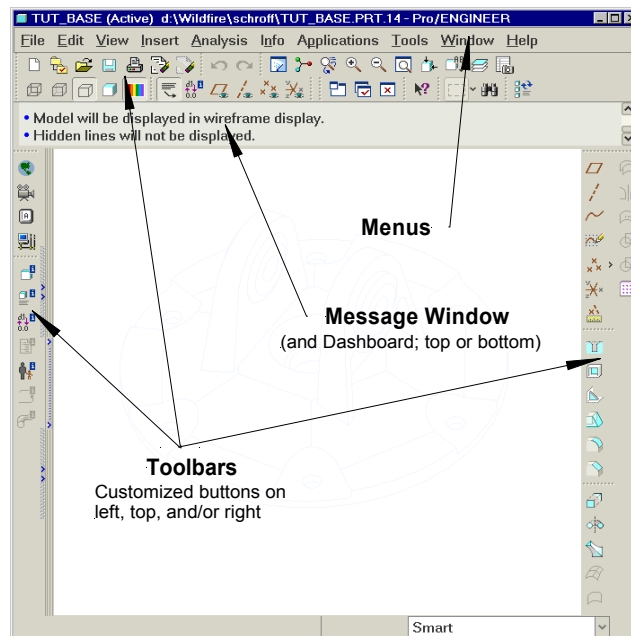
displayed (see check marks); the toolbars can be toggled to include/exclude them from the display. The contents of the menu might depend on the current program status. Each group contains a set of functionally-related shortcut buttons.

At the bottom of this pop-up menu, select *Toolbars*. This opens the **Customize** window which contains a list of all available toolbars, and their location (see Figure 7). At the bottom of this window you can specify whether or not, and where, to automatically save the current layout settings. The default is *config.win* in the current working directory. As mentioned above, you can create multiple *config.win* files, and use *File > Save Settings* and *File > Open Settings* in the **Customize** window to store and recall previous files. Note that in addition to the standard toolbar groups there are three initially empty groups (Toolbars 1 through 3), which you can populate with short-cut buttons using methods described below. The pull-down lists at the right allow you to place the selected toolbars at different places on the screen (left, right, top of graphics window).
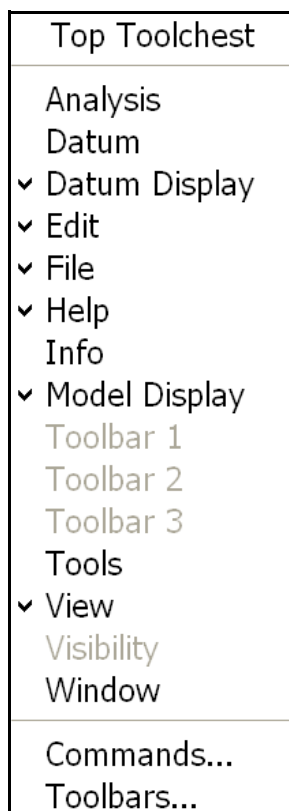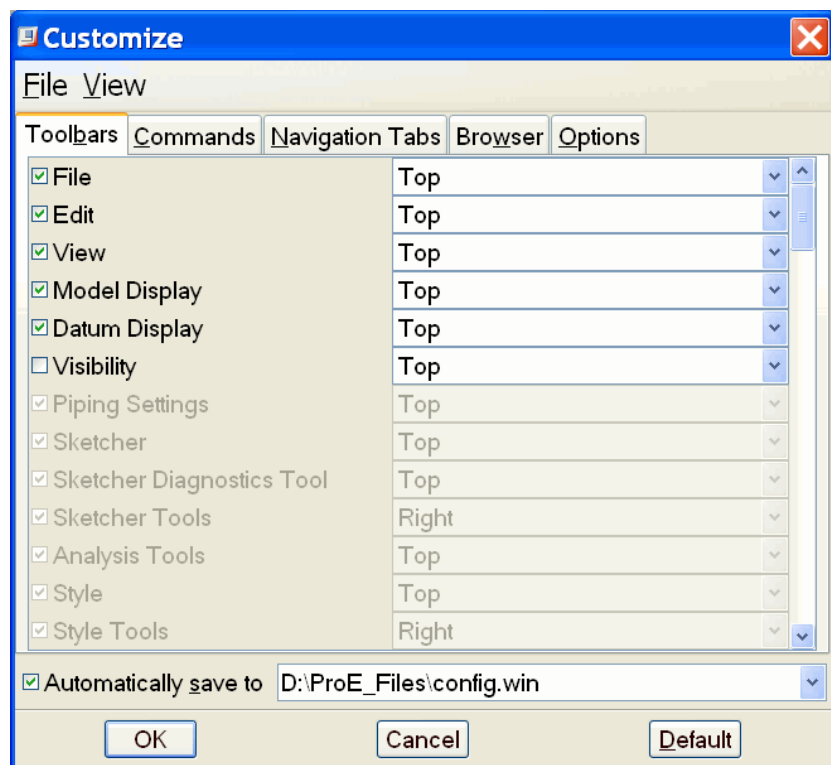

Figure 6 The
Toolbar toggle menu

Figure 7 The **Toolbars** tab in the **Customize** window

Changing Toolbar Buttons

In the **Customize** window, select the *Commands* tab. (This is also available by selecting *Commands...* in the menu shown in Figure 6 or using *Tools > Customize Screen* in the pull-down menu.) The window shown in Figure 8 will open. Groups of toolbar

commands are listed in a tree structure in the **Categories** area on the left. Click on any of the group names and the available short-cut buttons will appear in the **Commands** area on the right. It is probably best not to place too many on a toolbar unless you are sure you need them, since they will likely come up automatically when Pro/E enters particular modes.

If you really do want to add a button to a toolbar, just drag from the **Commands** area (in Figure 8) and drop it onto an existing toolbar at the top, right, or left. The button will be added wherever you drop it on the toolbar. To remove it, drag it off the toolbar and drop it somewhere else (on the graphics window, for example). Note that it is possible to mix and match the short-cut buttons: any button can be placed on any toolbar. For example, a button listed under the **File** category can also be added to the **View** toolbar. Buttons can also be present on more than one toolbar. The possibilities are endless!

At the bottom of the **Categories** list is **New Menu**. You can drag this up to the pull-down menu area at the top of the screen to create your own menus

Figure 8 Choosing short-cut buttons to add to the toolbars

of commonly used commands. There is also a **New Flyout** command which allows you to create your own flyout groupings in any toolbar.

If you turn on one of the user toolbars (select Toolbar 1, 2, or 3 under the *Toolbars* tab), an initially empty button will appear in the designated location (top, left, or right). You can use the **Commands** selector to drag any button to define your own toolbar.

Check out the *Navigation* and *Browser* tabs. One option available in the Browser area will prevent the Browser window from opening every time you start Pro/E.

When you leave the **Customize** dialog box, your new settings can be written to the file designated in the bottom text entry box. Each new or altered *config.win* file in the same directory is numbered sequentially (*config.win.2*, *config.win.3*, and so on).
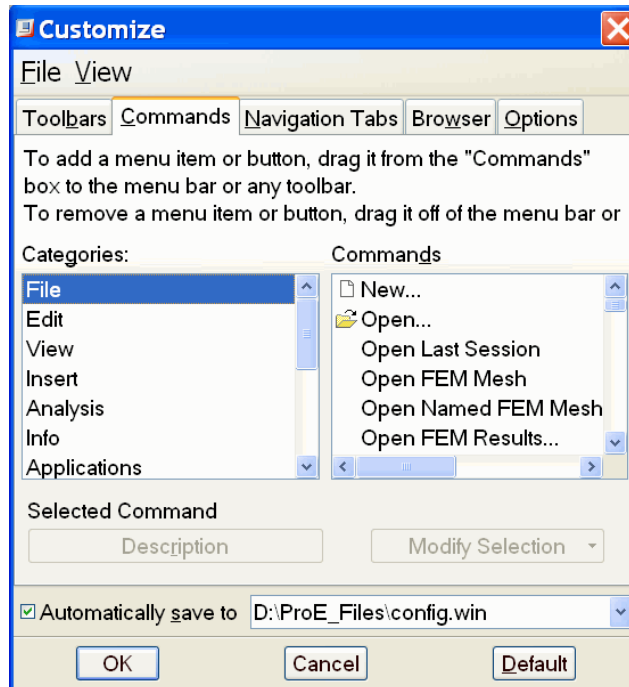
Helpful Hint
It is tempting, especially if you are blessed with a lot of screen space, to over-populate the toolbars by trying to arrange every commonly used command on the screen at once. This is reminiscent of many other Windows-based CAD programs. Before you do that, you should work with Pro/E for a while. You will find that Pro/E will generally bring up the appropriate toolbars for your current program status automatically. For example, if you are in Sketcher, the Sketcher short-cut buttons will appear. Thus, adding these buttons permanently to any toolbar is unnecessary and the buttons will be grayed out when you are not in Sketcher anyway - you are introducing screen clutter with no benefit. Furthermore, many commands are readily available in the context-sensitive, right-mouse pop-up menus. When this occurs within the graphics window, the commands are easier to get to than the toolbars.

Keyboard Shortcuts - Mapkeys

A mapkey is a short sequence of keyboard key strokes or a function key that will launch one or a series of Pro/E commands. Since many simple commands are launched using toolbar buttons, mapkeys are typically used to start extended command sequences. Mapkeys are very similar to macros that can be defined in other software packages. Mapkey definitions are contained/included in your *config.pro* file, so they are loaded at start-up. Mapkeys are meant to be used with command sequences that you use frequently.

The mapkey key stroke sequence can be as long as you want; most users restrict mapkeys to only 2, or sometimes 3, characters. This gives several hundred possible mapkey sequences - more than you can probably remember effectively. Pro/E constantly monitors the keyboard for input and will immediately execute a defined command sequence when its mapkey is detected. Single character mapkeys should be avoided due to the way that Pro/E processes keyboard input. If you have two mapkeys "v" and "vd", for example, the second mapkey would never execute since Pro/E will trap and execute the first one as soon as the "v" is pressed. For the same reason, a 3-character mapkey can never have the same two first letters as a 2-character mapkey.

Ideally, you would like to have mapkey sequences that are very easy to remember, like "vd" (view default), or "rg" (regenerate). Furthermore, mapkeys are usually launched with your opposite hand from the mouse. Because it is common to only use two characters, it will take some planning to decide how you want to set up your definitions to use only a couple of easy-to-remember key strokes! The mapkey should be mnemonic, but can't collide with other definitions. You don't want to have to remember that "qy" means "repaint the screen."

A practical limit on usable mapkeys is perhaps in the range of 20 to 30, although some "power users" can use over a hundred. With the development of the Pro/E interface (where some commands used to be several menus deep into the program, requiring numerous mouse clicks), the need for dozens of mapkeys is diminishing - you can probably get by with just a few (or even none!).

Listing Current Mapkeys

To see a list of your current mapkeys (some may be defined in your *config.pro* file) select

Tools > Mapkeys

This dialog window (Figure 9) allows you to define and record, modify, delete, run, and save mapkeys. Note that each mapkey has a short **Name** and **Description**. The **Name** will be used on any short-cut button (described below), and the **Description** will appear in the message area above the main graphics window. Mapkeys that start with a "$" are function keys.

Figure 9 Defining mapkeys

Note that mapkeys created using a previous release of Pro/E may differ in command syntax and it is likely that some mapkey definitions from previous releases will not function properly. However, mapkeys are easy enough to record.

In the following, it is assumed that you have no mapkeys defined as yet. If any of these tutorial mapkeys collide with existing mapkeys shown in the mapkeys list (Figure 9), you can modify the keyboard sequence (for example, use "dv" instead of "vd") for the new mapkey.

Creating Mapkeys

New mapkeys are created as follows. We will create a mapkey sequence "vd" that will reorient the view to the default orientation. To set this up, you will have to bring in one of your previously created parts. Do that now. We will not be modifying the part.

Select the *New* button in the Mapkeys menu. The **Record Mapkey** dialog box shown in Figure 10 will open. Enter the data shown in the figure: key sequence, name, description. Now we record the command sequence:

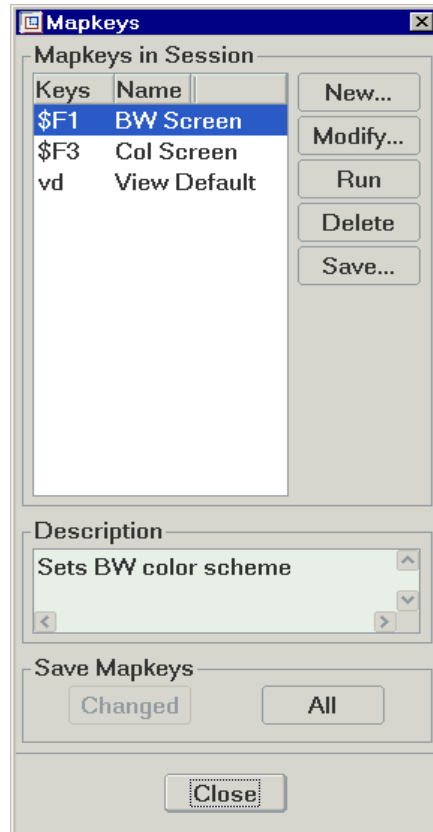### *Record*

>*View > Orientation > Standard Orientation* (in the top pull-down menus)
>*Stop > OK*

Every command and keystroke between ***Record*** and ***Stop*** is added to the mapkey. It's that easy! Spin the model with the middle mouse button. In the Mapkeys window, highlight the new mapkey "vd" and select the ***Run*** button. It's a good idea to check your mapkey definitions now when it is easy to modify them.

As mentioned above, mapkey definitions are saved in a configuration file (as in *config.pro*). New mapkey definitions are appended to the end of the file. If you redefine a mapkey (or use a duplicate keystroke sequence), the definition closest to the bottom of the *config* file is the one that will be used. When saving a mapkey you can choose either *config.pro* or *current_session.pro*. There are three ways to save the mapkeys using the buttons in the **Mapkeys** window:

>***Save*** - saves only the highlighted mapkey
>***Changed*** - saves any mapkeys changed this session
>***All*** - saves all mapkeys defined for session

Figure 10 Creating a mapkey

Remember that if you save the mapkey in the *current_session.pro* or elsewhere, it will not be loaded automatically the next time you start Pro/E. To do that, you must explicitly save the mapkey definitions into the *config.pro* file. Select one of the three options and save our "vd" mapkey.

Also, be aware that if you save all mapkeys defined in the session, they are appended to the end of the *config.pro* file. If you do this excessively, the file can become quite large (and slow to load). You should occasionally edit the file with a text editor to remove the early duplicates.

Close the **Mapkeys** window. Minimize Pro/E and open *config.pro* using your system text editor. Scroll down to the bottom of the file to see the new lines that describe the mapkey. It is possible to move the mapkey definitions elsewhere in the file but for each definition these lines should never be separated since they are a continuation of the same sequence. It is possible, but probably not advisable, to try to edit the mapkey definitions manually - leave that to the power users! Exit your text editor and restore the Pro/E window.

Some final points about mapkeys: it is possible to set up the mapkey so that execution will pause to allow user input during the command sequence, either by picking on the screen or through the keyboard. Mapkeys can also call other mapkeys. You might like to experiment with these ideas on your own. The possibilities for customization are
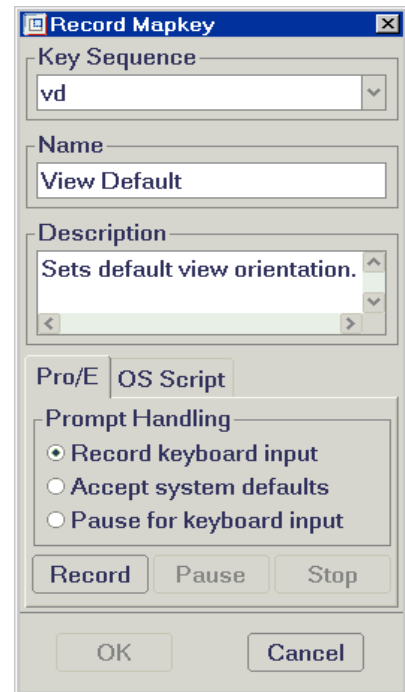
almost limitless! Some commonly used mapkeys are listed in Table 1-1 on the previous page. As mentioned earlier, with the "flattening" of the user interface in Wildfire, the need for mapkeys is diminishing. They are primarily used as shortcuts for a few, very common command sequences. We will return to mapkeys after the next section.

Table 1-1 Some commonly used mapkeys

General Mapkeys		Feature Creation Mapkeys	
wc	Window Close	ct	Create Cut
wa	Window Activate	cp	Create Protrusion
rg	Regenerate	ch	Create Hole
dd	Done	cr	Create Round
qq	Quit	cc	Create datum Curve
View Mapkeys		cd	Create Datum plane
rr	Repaint	Utility Mapkeys	
sd	Shade	fr	Feature Redefine
vd	View Default	fs	Feature Suppress
vr	View Refit	fd	Feature Delete
vf	View Front	fe	Feature Resume
vb	View Back	fm	Feature Modify
vt	View Top	fi	Feature Information
vl	View Left		
vg	View Right		

Creating a Customized Part Template

Most part files that you create contain many common elements such as datums, defined views, coordinate systems, parameters, and so on. Creating these from scratch for every new part that you start is tedious and inefficient. Prior to Release 2000i^2 a very handy model creation tool used the notion of a "start part" which contained these common elements. Users would then create a mapkey that would bring the part into session and then rename it. This made the creation of new parts very quick and efficient, with the

added bonus that standard part setups could be employed.

This "start part" functionality has been built into the program using part templates. Several part templates are included with a standard Pro/E installation for solid and sheet metal parts in different systems of units. You may have a reason at some point to create your own template, which we will do here. We'll also define a mapkey to quickly bring it in session and allow you to change its name. Then you can immediately get on with the job of creating features. We will create the part template from scratch, although you could use any of the existing templates as a basis for this.

Select *File > New*. Make sure the **Part** and **Solid** radio buttons are selected. Deselect the **Use Default Template** box, and enter a name *mytemplate*. Select *OK* and in the next window, select the **Empty** template and *OK*.

Create the default datum planes and use *Edit > Set Up > Name* (or select the features in the model tree and use the RMB pop-up menu) to rename the datums *RIGHT* (DTM1), *TOP* (DTM2), and *FRONT* (DTM3). Now set up some named views.

> ### *View > Orientation > Reorient*

and create the following three named views:

View Name	Reference 1		Reference 2	
	Direction	**Pick Datum**	**Direction**	**Pick Datum**
FRONT	Front	FRONT	Top	TOP
TOP	Front	TOP	Right	RIGHT
RIGHT	Front	RIGHT	Top	TOP

The completed list of saved views should appear as shown in Figure 11. Feel free to add additional standard views (Left, Back, Bottom, Iso_Right, ...). Select *OK* to leave the **Orientation** dialog.

Check out our previously defined mapkey for setting the default view ("vd").

Set the part units using

> **File > Properties**

and use **Change** to pick (or confirm) "millimeter-Newton-Second" are the units, then

> **Close**

We are finished with creating the start part, so save it in your default working directory with the name **mytemplate.prt**. If you have write access, move the part file to the Pro/E installation directory, something like

> **\ptc\wildfire5\templates**

This is the default directory where Pro/E will look for part templates. If you do not have write access to this directory, leave the part file in your working directory. You can rename the file to remove the version number if you want, so that it appears as **mytemplate.prt** rather than **mytemplate.prt.1**.
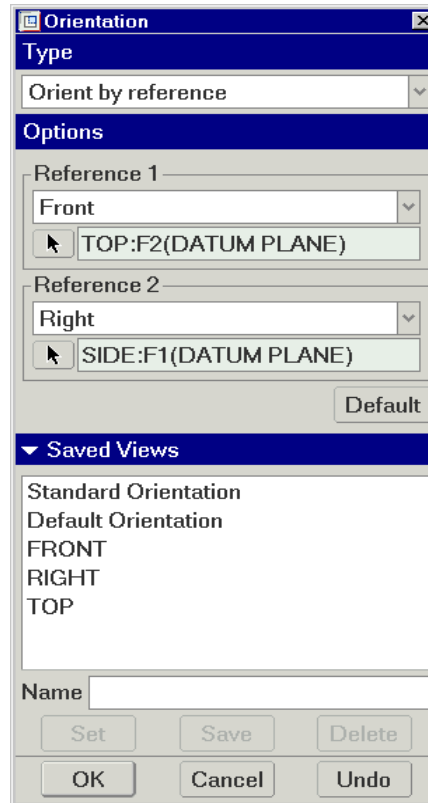
Figure 11 Creating named views

Creating More Mapkeys

Before we leave this new part template, let's create some more mapkeys to go directly to the named views. Select

> **Tools > Mapkeys > New**

Use the key sequence "vt" and enter a short name like "View Top" and description "Orientation Top View". Now record the mapkey using

> **Record**
> **Named View List** (a toolbar button) **> TOP**
> **Stop > OK**

Spin the datum planes, and select **Run** to try out the mapkey. Similarly, create and test two more mapkeys to go to the front view ("vf") and the right side view ("vg")[2]. Don't forget to save all the changed/new mapkeys in your *config.pro* file. Open up your *config.pro* to confirm that they are there.

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[2] The mapkey "vr", which is more logical for the right view, is usually used for "View Refit"

Using the New Part Template

Erase the current part from the session. Select

> *File > New*

Deselect the **Use Default Template** box, enter a name (like *test*), and select **OK**.
Depending on what you did before, your template is either in your working directory or
in the default templates directory (or possibly both!). In the **New File Options** window,
highlight the template **mytemplate**. This is the copy in the default templates directory.
Alternatively, if you weren't able to put your file there, use the *Browse* button to find it
in the working directory. Once the template is located, select **OK**. A copy of the
template is now brought into session and given the name you specified.

Setting the Default Part Template

We can tell Pro/E to use our new template as the default by setting an option in
config.pro. Select

> *Tools > Options*

and enter the Option **template_solidpart**. Set the value for the option by browsing to the
template directory (or use the current working directory, wherever you have saved the
template file) and selecting the part file **mytemplate.prt** we created above. Select
Add/Change and then *Apply* the new setting (remember that this automatically saves the
config file).

Creating a Mapkey to Start a New Part

Erase the current part from the session. Select

> *Tools > Mapkeys > New*

Enter the key sequence "cp" ("create part"), name "Create Part", and description "Create
a New Part and Rename". Now select

> *Record*
> *File > New*

Choose *Part | Solid | OK*. Leave the default part name as **prt0001**, and the check beside
Use Default Template. Now select

> *File > Rename*

This is where we want the mapkey to stop, so select *STOP > OK* in the **Record Mapkey**
dialog. In the **Rename** window, enter a new name for the part, like **test2**, then select **OK**

twice. We have a new mapkey called "cp", so highlight this in the **Mapkeys** dialog and save it. Close the **Mapkeys** dialog window. Open the *config.pro* file to see the listing added for this new mapkey.

To try out the mapkey, erase the new file with *File > Erase > Current*. Type "cp". Several windows will quickly open and close, and you will be left with the dialog box for renaming the part. You can now enter the desired name for a new part, which will contain the default datums, units, and named views set up above to work with the view mapkeys we created earlier. Pretty slick!

We have created a very simple part template here. You can make this as elaborate as you like with parameters, units, materials, layers, datum features and so on - even solid features. For example, if you often create parts whose base feature is a cylindrical solid, consider including this in a special template, perhaps called *cylinder.prt*. You can include as many features as you want in a template and, of course, use any of the provided part templates as a starting point for any new ones.

Adding Mapkeys to Menus and Toolbars

Mapkeys can be added to any of the existing toolbars and pull-down menus. You might like to do this for mapkeys that you do not use frequently, and are likely to forget.

To see how this is done, select the *Commands* tab in the **Customize** window (see Figure 12). At the bottom of the **Categories** list, you will find an entry called **Mapkeys**. Select this to see your currently defined mapkeys on the right. In the Mapkeys pane, select the mapkey **Create Part**. The two buttons *Description* and *Modify Selection* are now active. Selecting the former shows you the description you entered when defining the mapkey. Selecting the

Figure 12 Adding mapkeys to menus and toolbars

latter allows you to modify the mapkey button image and display. You might like to get rid of the default, since many mapkeys use this same icon by default. You can select from a large collection of Pro/E icons, or design your own.
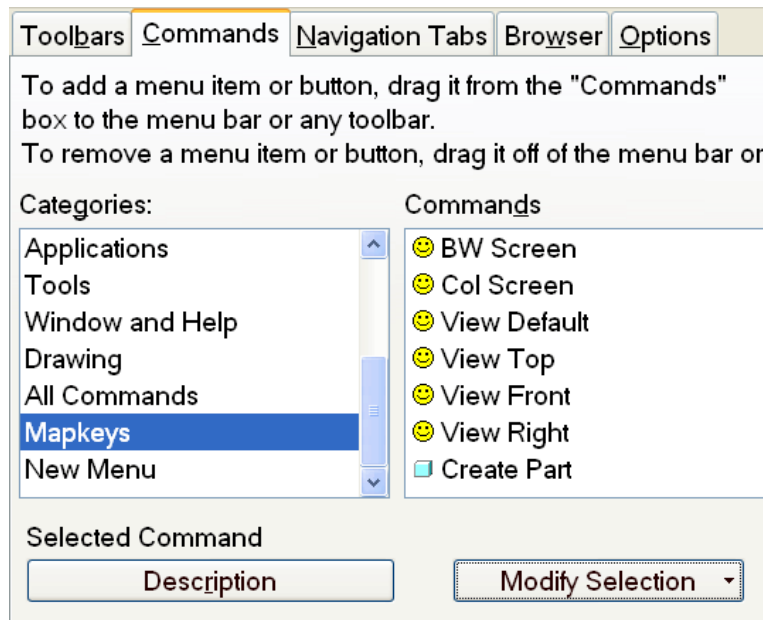
Drag the **Create Part** mapkey in the right pane up to the **File** pull-down menu and drop it in a convenient location, as in Figure 13 (notice the changed button icon). Selecting this will launch the mapkey.

Another way to utilize mapkeys is to create shortcut buttons on the toolbars. Again select the **Create Part** mapkey in the right pane and drag it to a toolbar. If the mapkey name is showing, use the RMB pop-op and select **Image Only**.

We now have three different ways to launch the Create Part mapkey:

♦ from the keyboard, with "cp"
♦ from the pull-down **File** menu
♦ from the toolbar

Experiment with these to find out which one is most suitable for you. Again, remember the cautionary note about cluttering up your screen.
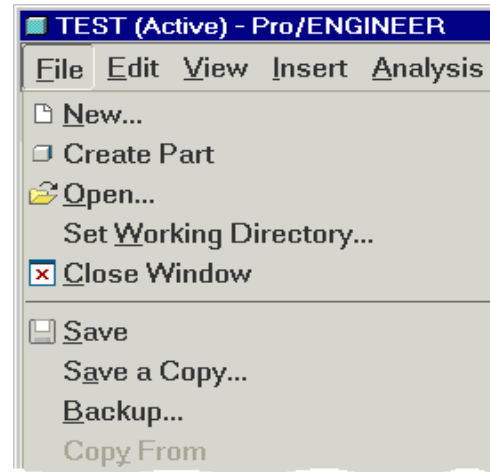
Figure 13 *Create Part* mapkey added to a pull-down menu

Introduction to the Project

The assembly project to be completed in this tutorial involves the modeling and assembly of the three-wheeled utility cart shown in Figure 14. The cart contains 26 or so parts, many of which are repeated in the assembly. The total assembly has about 75 parts (mostly bolts!). We will use the techniques introduced in the lessons to model various parts of the cart as exercises at the end of each lesson. We will average about 4 parts per lesson, so you should get lots of practice! In the final lesson, we will assemble the cart, using a number of advanced functions for dealing with assemblies. Try not to "jump the gun" on this assembly task, since the functions to be covered in the last lesson can really speed up your job of putting the cart together.

For your modeling exercises, the parts shown at the end of each lesson[3] will illustrate the critical dimensions. A figure will also be provided to show where the parts fit into the overall assembly. **Not all dimensions are shown on each part - you can use your judgement and creativity to determine the remaining dimensions.** In this regard, please take note of the following:

♦ ALL UNITS ARE IN MILLIMETERS! You might set up your default part template with this setting.

___

[3] A complete list of project parts is included on page ix in the preface (right after the Table of Contents) to this book.

♦   Dimensions are usually multiples of 5mm. For instance, all the plate material and the wall of the cargo box are 5mm thick. The tubing is 25mm square.
♦   All holes and cylinders, unless otherwise dimensioned, are $\varphi 10$. This applies to bolt holes, pins, rods, and so on.
♦   All holes, unless otherwise dimensioned, are coaxial with cylindrical surfaces or located on symmetry planes.
♦   For some of the trickier parts, in addition to the figures showing the dimensions, there will be some discussion and hints to help you get going.
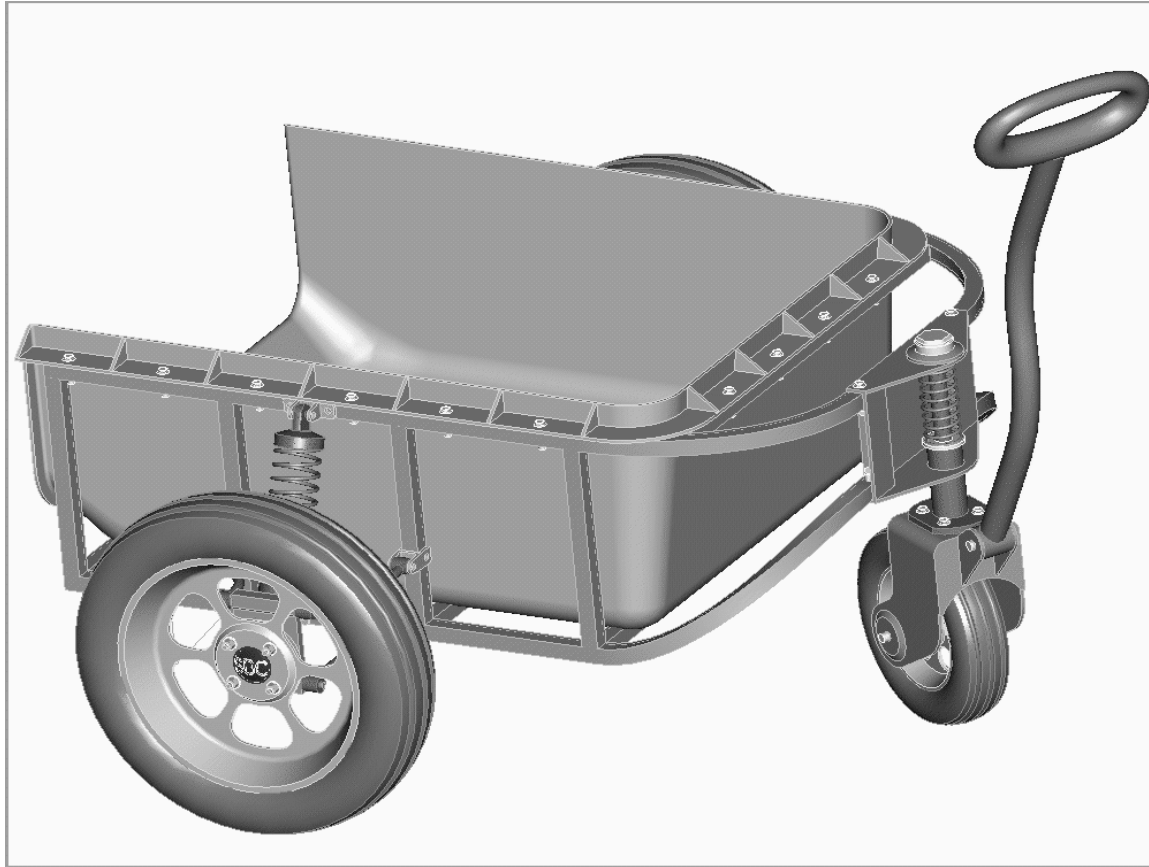
Figure 14 The assembly project - a three-wheeled utility cart

When we get to the final assembly in Lesson 8, remember that it is an easy matter to modify dimensions of the various parts so that the assembly fits together. Don't be too concerned when you are modeling the parts if you have to guess at one or two dimensions. These can be modified later if the need arises.

When you are creating the parts, try to be aware of the design intent for the part and how it might eventually be placed in the assembly[4]. For example, if the part has one or more planes of symmetry, it is common practice to use the default datum planes for these. In

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[4] You might like to look ahead to the last lesson to see what assembly constraints are used for each part.

the assembly, the ***Align*** constraint using these datum planes is an easy way to position the part (usually with another symmetric part).

Although a suggested part name is given, feel free to make up your own part names (although this might cause confusion in Lesson 8!). Remember that Pro/E is fussy about files that get renamed in isolation, or moved to another directory. If a part has been used in an assembly (or sub-assembly) or drawing, make sure the assembly or drawing is in session if you rename or move the part so that the related files can also be updated.

For the entire project, you will require about 10 Megabytes of disk space to store all the parts and assemblies. This does not include parts we will make during the lessons themselves, just the cart project parts. If you are not particularly careful about disk housekeeping (like deleting older version of the part files), you will require more space.

Summary

This lesson should have given you enough ideas and ammunition to allow you to customize the interface so that it will be most efficient for the type of work that you do. There are a surprising number of users who are unaware of the many options available in *config.pro*. Check them out!

In the next lesson we will look at functions directly involved in model creation. These are for the creation of sweeps.

Questions for Review

1.   What is the name of the file containing your configuration settings?
2.   What is the name of the file containing your screen layout settings?
3.   When, and from where, are your configuration settings loaded? Why is there more than one location?
4.   What happens if your configuration file contains multiple entries for the same option, each with different values?
5.   How can you find out where your start-up directory is?
6.   How can you create/edit/delete configuration settings?
7.   When do configuration settings become active?
8.   Is it possible to have more than one customized screen layout?
9.   How do you place toolbars on the top/left/right edge of the graphics window?
10.   How do you add/delete shortcut buttons on the toolbars?
11.   How many empty toolbars are there?
12.   Where are the toolbar definitions saved?
13.   What is a mapkey?

14. Why do you usually want to keep mapkey names short?
15. How is the mapkey name different from the mapkey sequence?
16. How do you create a new mapkey?
17. Are new mapkeys stored automatically? Where?
18. What is the purpose of a part template? Where are they stored and how do you access them?
19. How can you prevent the Browser pane from opening automatically when you launch Pro/E?


Exercises

1. Create an assembly template. This should have named datums and named views to match your view selection mapkeys and default units to match your default part template. Make this the default template for assemblies.

2. Set up a mapkey *Create Assembly* to create a new assembly using the default assembly template.

3. Put the *Create Assembly* mapkey on the pull-down *File* menu.
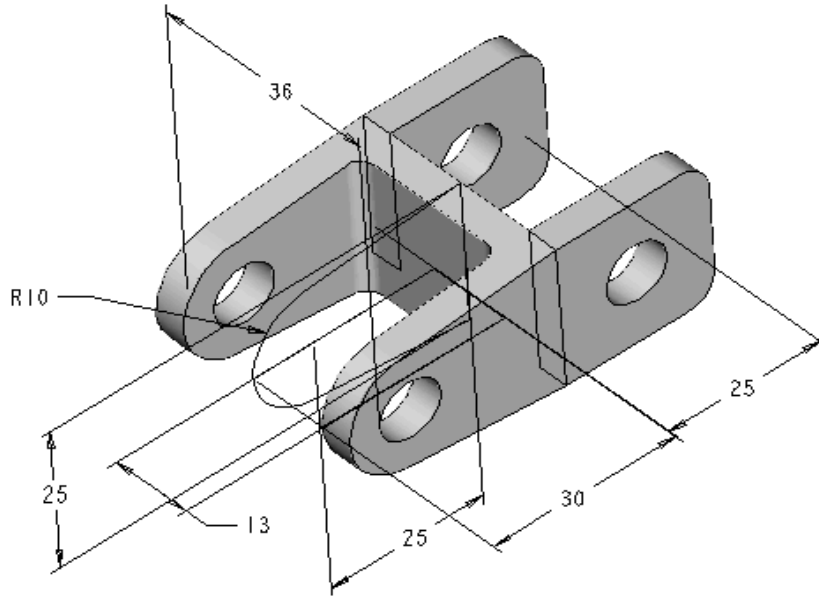
Project Exercises

We're going to start off with some of the easier parts in the cart. These should give you some time to experiment with your configuration file, mapkeys, and part template. The project parts are shown in the figures below. Their location in the cart is also shown here for reference.
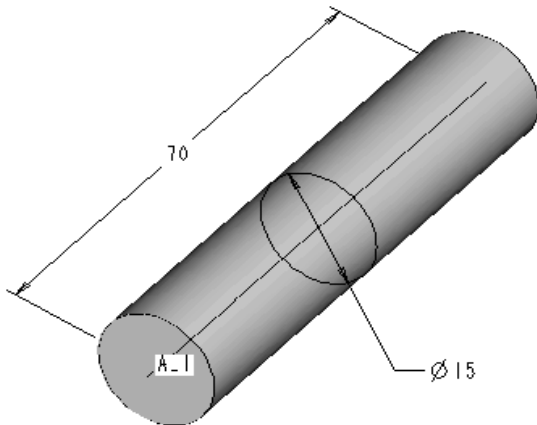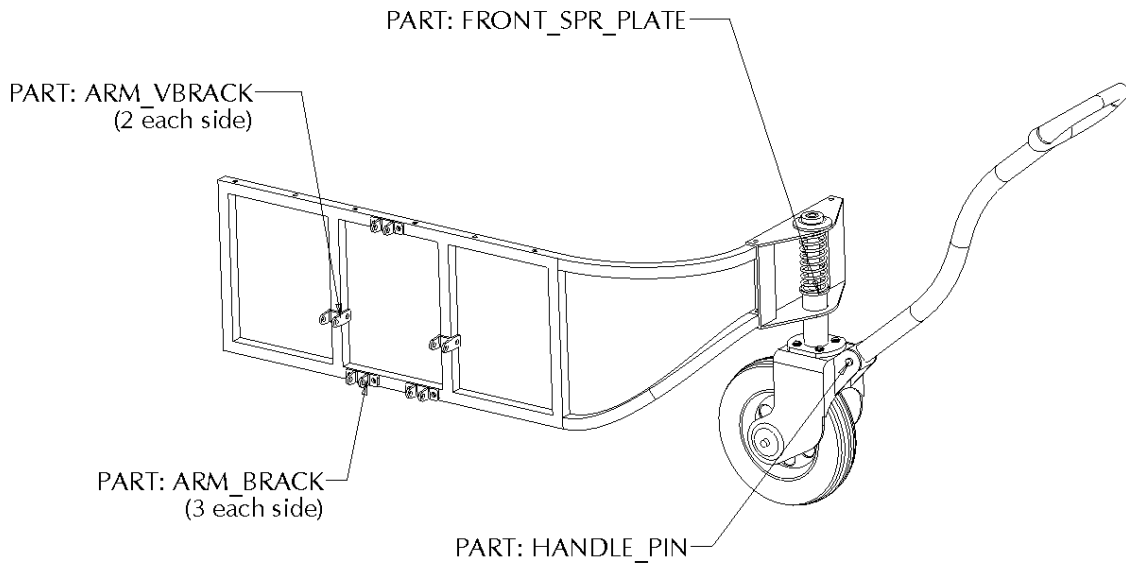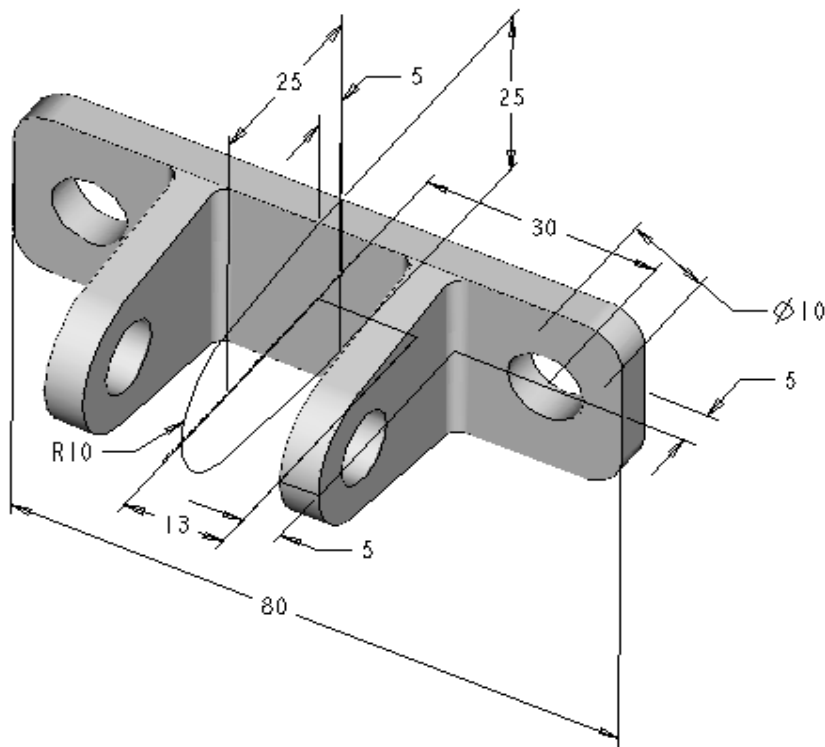

Part: *handle_pin*
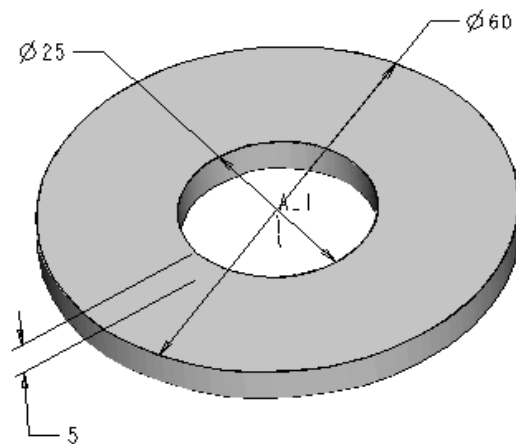
Part: *front_spr_plate*

Part: *arm_vbrack*

Part: *arm_brack*