

Technique for creating Drawing Program using F-S Function

A Drawing Program allows a drawing to change as its model changes. The drawing program contains logic statements that control the arrangement of views and detail items in the drawing by performing drawing operations.

Drawing programs have two portions: the State and Program Text.

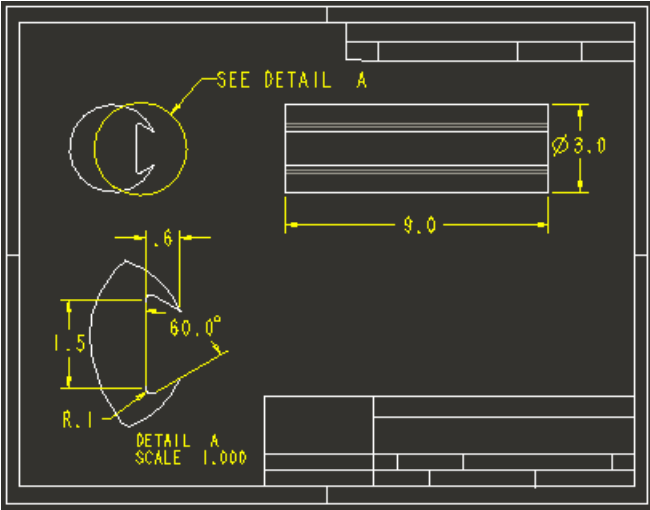
- The State is a sequence of the operations performed in the drawing. These include Move, Create, Mod Attach, Show/Erase, Switch View and Switch Sheet. These operations may be performed on Dimensions, Notes, Balloons, Symbols, Gtols, Datums, Axes, Draft Items, Tables and Views, with some restrictions. The particular operations available for performing on specific items are outlined in **Figure 3** of this document.
- The Program Text is a text file embedded inside the drawing, and it contains the logic statements to determine if the appropriate conditions exist to set the drawing state. Specific treatment of drawing program text can be found in Steps 5 and 6 of this document.

With a drawing program, changes to the drawing are made automatically when changes to the model occur. The changes in the model can be due to suppression of features, values of parameters or dimensions, instance replacement, as well as changes when the model is re-executed with new Pro/PROGRAM inputs.

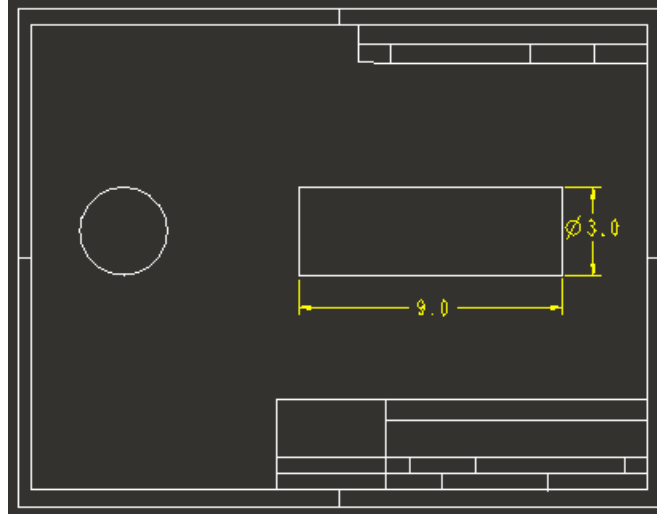
Note: Drawing programs can not modify the model in any manner. The drawing program only modifies the appearance of a drawing.

Procedure

For the example that follows, a shaft part and drawing similar to that shown in **Figure 1** have been created. An instance of the shaft part with the slot feature suppressed has also been created. The generic part name and the Feature ID of the slot will be referenced in the example program.



In this example, it is desired that the drawing display the end and side views without the detailed view when the slot is suppressed from the shaft, as shown in **Figure 2**. To turn off the highlighting of erased views, click **Tools > Environment** > uncheck the "Highlight Erased Views" option.



Pro/ENGINEER allows the following changes to be made to the drawing using the drawing program:

Detail Items	Move	Edit Attachment	Erase	Show	Show View	Switch Sheet	Create
Dimensions	X	X	X	X	X		X
Ref. Dimensions	X	X	X	X	X		X
Notes	X	X	X	X	X	X	X
Balloon Notes	X	X	X	X	X	X	X
BOM Balloons	X	X	X	X	X		
Symbols	X	X	X	X	X	X	
Gtols	X	X	X	X	X	X	
Surface Finish Symbols	X	X	X	X	X	X	
Datum Targets	X		X	X			
Set Datums	X		X	X			
Axes	X		X	X			

Draft Entities	X					X	
Draft Datums	X					X	
Draft Axes	X					X	
Draft Groups	X					X	
Tables	X					X	
Views	X		X	X		X	

For example: views can be moved, erased, shown, or switched to another sheet.

1. The changes to be made in the drawing are listed in the state. For this example, create a state by clicking **Tools > Drawing Program > Define States > Create State**. Type a name for the state (for this example "detail_view"). Click **Record Cmds > Views > Erase**. Select the detailed view and type "y" at the prompt to erase all arrows and circles. Click **Move**, select the end view on the drawing and select a new location to move the end view and its projection.

Click **Done/Return** from the EDIT STATE menu, and press ENTER when prompted to put recorded commands into the state.

The state has been created for this example. The state is now available to be conditionally activated by the program.

2. The actual Drawing Program Text controls when the change to a particular state takes place in the drawing, based on expressions of certain conditions relative to the model. The expressions are limited to:
 - o Logical expressions that could be used in a part relation, such as:

```
a=b+c
if part_param==15
if description!="steel"
```

- o Part parameters for part drawings - of the form: <parameter_name>
- o Part parameters for assembly and multiple-model drawings - of the form: <parameter_name>:<model_number>
- o Drawing Parameters - of the form: <parameter_name>:d (Using an expression such as "new_param=description" will create a new drawing parameter called "new_param", where "description" is a model parameter. To extract this value in a drawing note, type "&new_param:d". This
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- equation, used in a drawing program, is one way to pass model parameter values to new drawing parameters.)
- Feature suppressed functions for parts - of the form:
feat_suppressed(<model_name>,<feature_id>)
- Feature suppressed functions for assemblies - of the form:
feat_suppressed(<assembly_name>,<component_id>)

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3. The Drawing Program Text can be entered by clicking **Edit Program** from the DRAW PROGRAM menu, and **File Edit** from the EDIT PROGRAM menu. A system editor will appear. In this example, the following drawing program text was entered:

```
IF FEAT_SUPPRESSED (SHAFT.PRT,60)
SET STATE DETAIL_VIEW
ENDIF
```

(*Note:* In this example, "shaft.prt" is the applicable model name with extension, "60" is the feature ID of the slot feature, and "detail_view" is the name of the previously defined state.)

Exit the system editor after saving the entry, and click **Done/Return** from the DRAW PROGRAM menu. The program text for the example drawing program has now been incorporated into the drawing file.

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4. With the state and program text incorporated into the drawing file, the drawing program will set the state and apply the corresponding changes to the drawing each time the prescribed condition is met in the model.

Specific to this example, when the generic drawing model (with the slot) is replaced with the instance (slot suppressed), the drawing program will update the views that have been set.

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5. To verify this, click **File > Properties > Drawing Models > Replace**, and select the instance of the part where the slot is suppressed. The drawing will update to the views depicted in **Figure 2**.

6. Drawing Program Restrictions:

- A value assigned to a parameter in the program text cannot be modified. Attempts to modify such a value will not save the changes made - the parameter will re-evaluate based on the expression controlling its value in the drawing program.
- If an item that is controlled by the drawing program is deleted, the program command controlling that item is automatically removed from the state.
- If a parameter is used on the right side of a drawing program equation and that parameter name exists as both a drawing parameter and a model parameter, the drawing parameter will always be used.
- If a view is converted to a snapshot, all commands in the drawing program that control the view and items of the view are then removed from their states.
- The drawing program can only modify the drawing - not the drawing models.
- Ordinate dimensions can not be selected when defining drawing states.