

FS2000'S GRAPHICAL USER INTERFACE (GUI)

The object of this tutorial is to make new users aware of the more commonly used interactive controls in the FS2000's GUI. This will be achieved using an existing model. It is not the intention to demonstrate how models are created but how they are viewed and displayed.

The techniques in this tutorial are equally applicable to all FS2000 TASKs.

Open the model and simply experiment with the controls as they are described below. Also investigate what the other menu commands do.

Remember, use the Help File and press the F1 key to get Help specific to that topic. When a menu is highlighted the Help file will go to that topic.

Section 7 in the Help File describes the main GUI tools, read it.

OPEN THE DEMONSTRATION MODEL

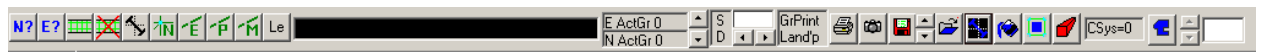
You will first open a model from Archive format. The model is called Orient.



From the **File** menu, click **Open**. Change the *File of Type* from Std Models to Archive Models. Now select orient.mod from the FS2000\Examples directory.

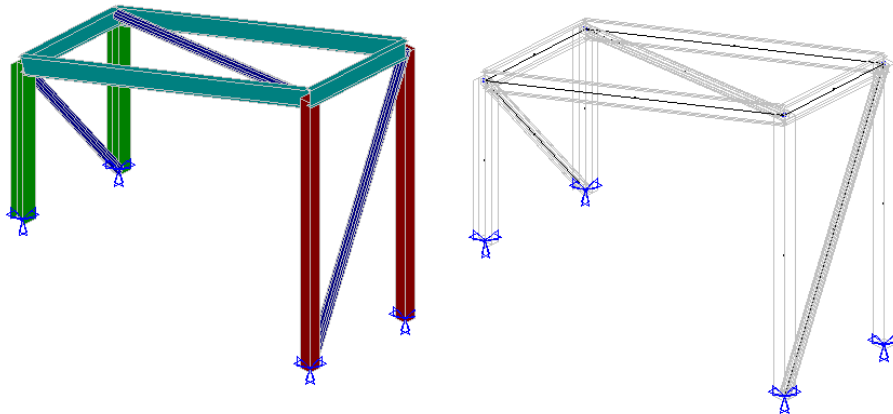
The Model Recovery form will prompt for a recipient directory. Select a directory or use the default.


Click the Recover button to open the model.

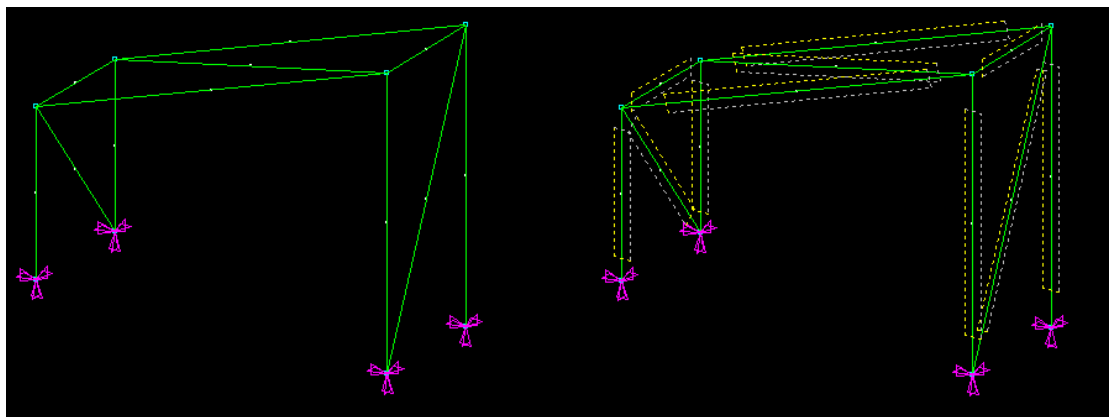
1. APPEARANCE OF BEAM ELEMENTS



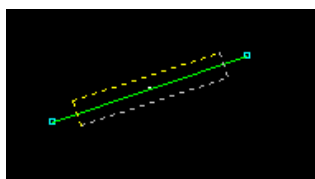
The Virtual View button  can be used to show the outline and the Solid Fill  to colour fill the elements. The use of these buttons should be apparent. The fill colour is related to the Geometric Property type.



The Local Rotation view button  is used to show the beam local orientation by superimposing a virtual plate type view aligned to the local y axis.



The dotted yellow line shows the direction of the local Y axis and also the Node1 (fore end) node of the element.



Note that the Solid fill also applies to non-beam elements e.g. plate.


2. VIEW CONTROLS

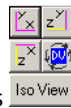


The View controls are on the Left Hand Side of the screen. Refresh is the uppermost control.


Clicking the **Iso View**  will reset the default view.


The **Full**  button removes any previous zoom selections.


To zoom, click the **Zoom** button  and then click with the LH mouse button, then move the mouse to size the window and click again with the LH mouse button. The window may be re-positioned by pressing the Shift key prior to the second click.

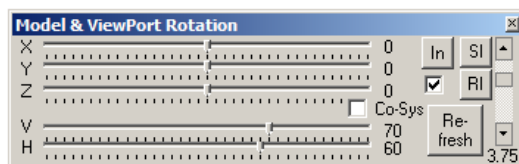


Clicking either the LH or RH buttons  will reverse the orthogonal or iso view.

Dynamic Viewing - The mouse wheel can be used to dynamically view the model. Mouse wheel rotation will enable zooming. If the wheel is pressed, mouse movement will rotate the model. If the Ctrl key is pressed the model will translate. The  button toggles between rotation and translation.

Setting the Centre of Rotation button  can be extremely useful on large models. Click the button and then select a node. Now use the mouse's Dynamic View Control to see how the model rotates about and zooms to, the selected node.

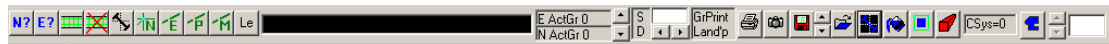
The  makes the Dynamic View Control visible. This control is used to control the view angle of the Viewport and the Visual orientation of the model. Not a commonly used feature but can be useful.



Press F1 (when form has focus) for Help

Experiment with the various controls to see how the views change.


3. CLIP PLANES




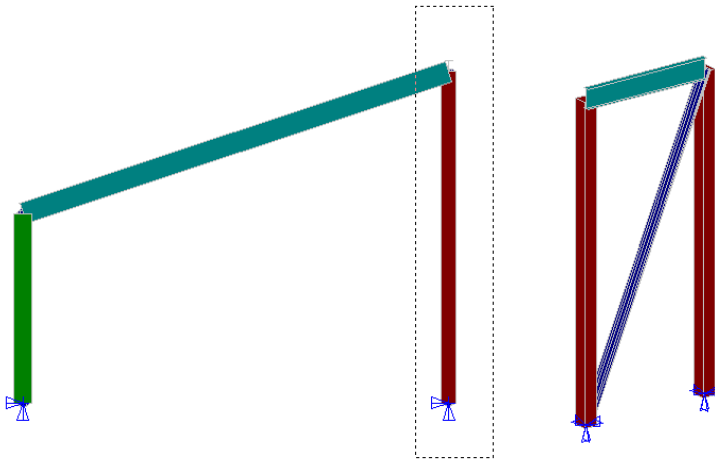
The left Clip Button selects the clip planes. The right Clip Button cancels all clip planes.


Clip planes are the most efficient method to enable only selected sections of the model to be displayed. On large models the use of clip planes is essential and on most models extremely useful.

Clip planes are used to restrict visible portions of the model to those portions that are within defined planes. The window is positioned in the same manner as that for a zoom window. Successive clip planes may be defined.

Clip planes will now be used to obtain a plot of the right hand bay of the model. To apply the clip plane to the model click the  button and obtain an orthogonal view down the x-y axis.

Now click the  button and then position the mouse to the lower LHS and click with the LH mouse button, now move the mouse to size the window and click again with the LH mouse button.



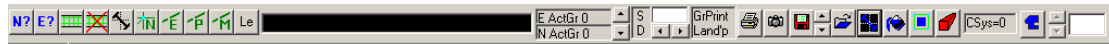
If this is done correctly then only the right-hand side of the model will be visible. Clicking the  button will remove the clip plane and the whole model will become visible.

It should be noted that:

- If the Ctrl key is pressed the clip box can be moved prior to clicking the mouse to finalise.
- Successive clip planes can be applied.
- The nodes within the box are used to select the clip planes based on principle orthogonal coordinates.
- Iso clip planes can be selected using the Iso Clip plane button.



4. LABELLING NODES AND ELEMENTS ETC



The following buttons are used to label nodes and elements




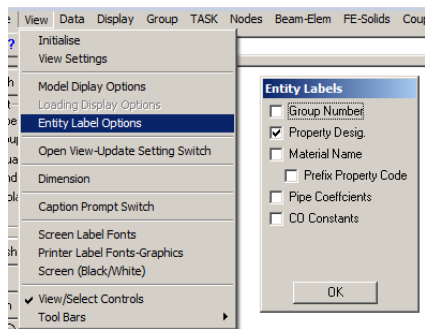
The N button labels the node.

The E button labels the elements.

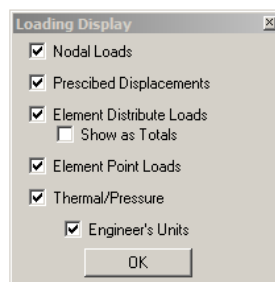
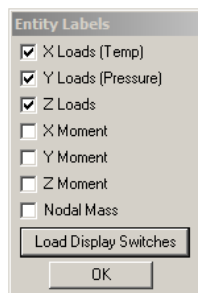
The P button labels the geometric property code assigned to the element.

The M button labels the material property code assigned to the element.

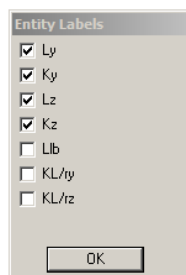
The Label Entities Button  can be used to show the property designation. What the Label Entity button displays is TASK dependent and is set using the Entity Label Options. Change from **Property Design** to Material Name and see the effect.



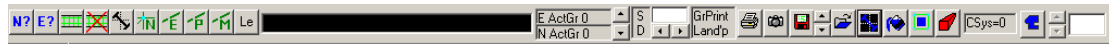
When in the Load Definition TASK the Entity Labels are also linked to the Loading Display options. Shown below are the default settings.



When in the Design Parameter TASK the Entity Label options become.



5. NODE & ELEMENT QUERY



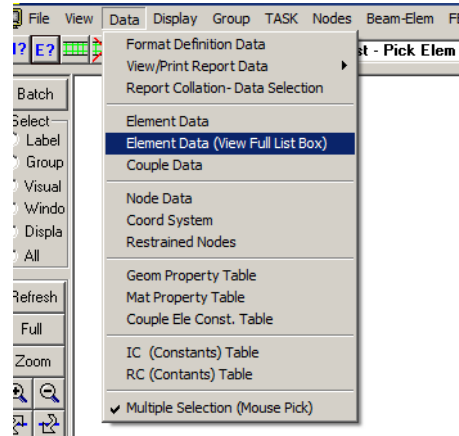
Important buttons used to interrogate the model.

Click the **N?** button on the button bar. Note the Activity Status box.

Click on the nodes of the model. As the nodes are picked they are labelled and their co-ordinates are listed in the List Box at the bottom of the screen. The distance between successively picked nodes is also given. This is very useful feature for checking the geometry of the model.

Click the **E?** button on the button bar. Click on the centre point of elements. The primary properties of the elements are listed in the List Box. Note also that Node1 (fore end) of the element is circled.

Pressing the N or E keys (Hot keys) on the keyboard will also label and list the node or element in a similar manner.

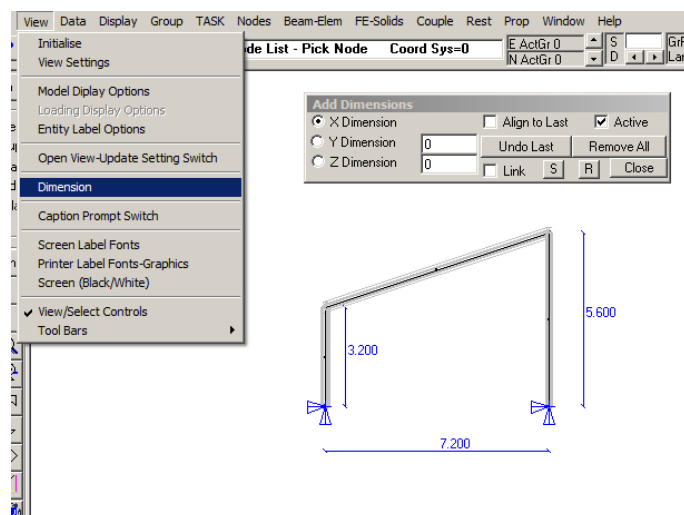


More detailed element data can be presented if the Element Data (View Full List Box) command is activated. When an element is queried the data box will be populated with data specific to that element.

When in the Load Definition TASK the data box will also list any active loading on the element.

Element Properties											
		Print	Copy	<input type="checkbox"/> Show Nodal Coordinates		<input type="checkbox"/> Show Loads Only					
Node-1	Node-2	Node-3	Rot	Codes	Code	Z	Y				
2	3	0	0.000	7.5895	3	0	1	0	0	0	0
GEOMETRIC PROPERTIES											
Code	Designation	Iz	Iy	J	Diam	Wall					
Type	Area	Sx	Sy	Sx	Tot.Mass	Tot.Length					
3	UB 35612739	1.010E-04	3.570E-06	1.490E-07							
4	4.940E-03	6.540E-04	8.870E-05	0.000E+00	2.947E+02	7.589					
GEOMETRIC STRESS POINTS											
Code	Iz	Iy	Iz	Iy	Az	Zt					
No	Iz	Iy	Iz	Iy	Az	Zt					
3	6.300E-02	6.300E-02	-6.300E-02	-6.300E-02	2.696E-03	2.292E-05					
	1.764E-01	-1.764E-01	-1.764E-01	1.764E-01	2.293E-03						
MATERIAL PROPERTIES											
Code	Name	E	G	Dens	Pois	Co.Exp	Yield Stress	Ultimate			

The Node Query can be used to add dimensions to a model plot. The Add Dimension box is activated using the Dimension command from the View menu (make Add Dimension form active and press F1 key for Help on this topic).

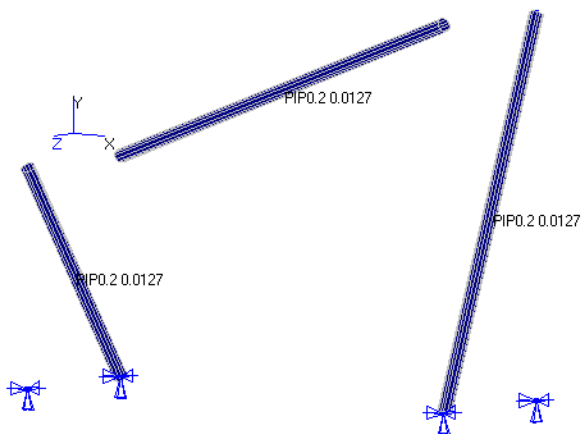


6. SELECTIVE ELEMENT DISPLAYS - GEOMETRIC & MATERIAL

The most common use of selective model plot is when the user requires knowing which geometric property types and which material property types are assigned to the various elements of a model.

To initiate viewing selective geometric type, press the keyboard '**p**' key (or click the RH mouse button and select **Show Geom P**) then enter the Geometric Property code number, in this case one. The model display will now show only elements whose property code is assigned to P1.

If the  button and the  button are clicked the display should look like the one below.




By repeating the process any property code property can be plotted.

Selected plots based on material property ('**m**' key) or group attribute ('**g**' key) can also be undertaken.



Selective Plot SCROLLING

When a selective plot is displayed, e.g. P1 as above, the activity status will show the property description.




If the RH scroll button is clicked  the display will show elements assigned to property code 2.



The SD panel is actually a button  if this is clicked it will change to AD . These represent two modes of operation. When SD is active only one property code will be visible in the display. When AD is active and the scroll button is clicked the next property code will be appended to the display.

By selective switching it is possible to display any group of property codes. This is an extremely useful feature when working with element groups.

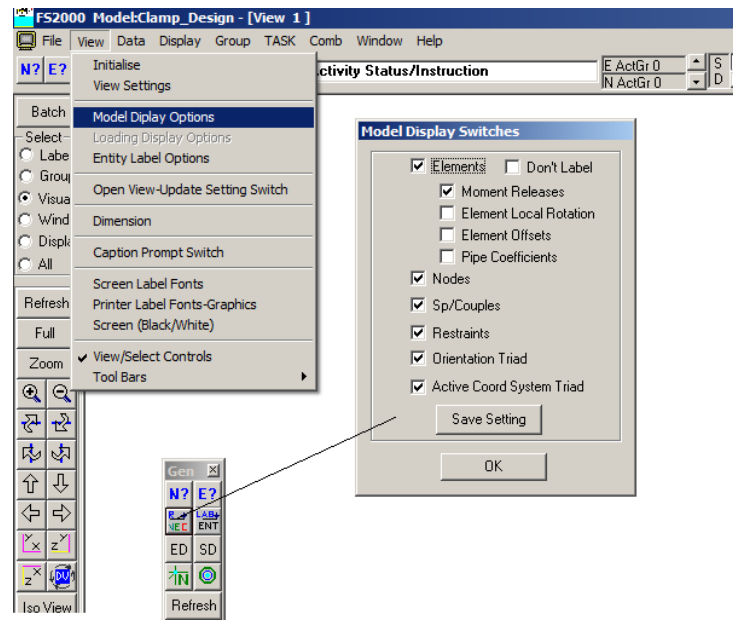
When undertaking selective element plots the nodes of the model will always be displayed. If the Nodes –

Only by Element Assoc  button is pressed, only those elements attached to the displayed elements will be visible, this makes for a cleaner display.

7. SELECTIVE ELEMENT DISPLAYS – SHOWING MODEL ATTRIBUTES

Certain model attributes can be switched on or off to suit the requirement of the model display.

The Model Display Switches form is accessed from the **Model Display Options:View** menu command or from the Gen Toolbar:Model Display Switches button.

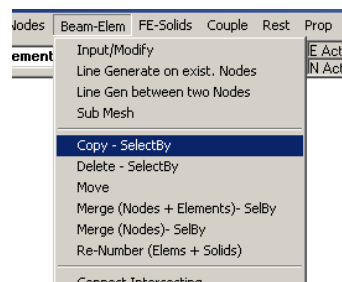


8. SELECTING ENTITIES

Selecting entities e.g. nodes, elements etc. is a common requirement when using the GUI.

If the data input form has a **Select** button or a menu command has a **SelectBy** suffix then direct user action is required to select specific entities.

Shown below is the form used to define nodal loads. When the **Select** button is clicked selected nodes will have a load 5.5kN assigned to them.

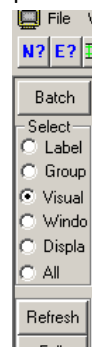


This example shows the **Copy** elements command.

When such action is required the Activity Status box will state what action is required.



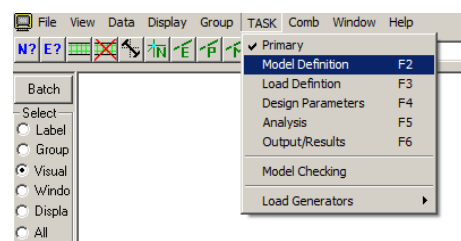
Entities can be selected by various methods and the method to be used has to be chosen before the selection process is activated. The choice is defined using the **Select** options displayed in the **Select** panel



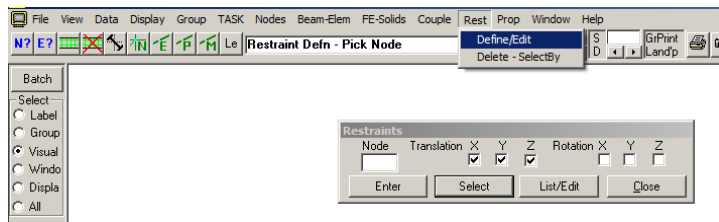
- Label** Select by label range. A dialogue box will appear.
- Group** Select by Group attribute. A dialogue box will appear.
- Visual** Select by individual mouse pick.
- Windo** Select by mouse Window. For best results use when viewing parallel to one of the principal planes. For critical selections first use the window to select entities to be displayed. Re-draw the display and if the display is correct, select by that display. This approach gives the most reliable visible feedback that the selection is correct.
- Displa** Select by current display entities. This is not restricted to those entities that are visible on the screen but those that are in the display settings i.e. zooming does not change the Display. Use the **Full View** button to ensure that the full display is visible. Use this option with CAUTION
- All** Select all entities in the model. Use this option with CAUTION

Many operations where multiple selections are being used will require confirmation.

As an exercise, practice applying and deleting restraints on this model. To do this, select **Model Definition** for the **TASK** menu.



From the Rest menu select the **Define/Edit** command and the **Restraints** definition form will become visible.



There should be restraints currently applied to the four lower nodes.

Click the **Select** button and use the mouse to pick one of the other nodes and this will apply restraints to that node.

The **Delete-SelectBy** command can be used to delete restraints.

Experiment by using the different select by methods. Apply different restraint freedoms to different nodes.

You will notice that some select options are not active e.g. it is possible to delete restraints from **ALL** nodes but not possible to apply restraints to **All** nodes.

On the Restraints form there is an **Enter** button. This is typical for a few of such input forms. If a node label is entered in the **Node** box and then the **Enter** button is clicked the restraints will be applied to that node. The **Enter** button is never used when the **Select** button has been used to activate the selection process.

Click the **List/Edit** button and pick a node with a restraint already applied. The node label will appear in the **Node** box and the current restraint directions will be indicated in the form. If the **Enter** button is clicked the node will be re-assigned using the current restraint directions. If the **Select** button is clicked the current restraints may be applied to any picked node.

NOTE: To terminate a selection process, use the **Esc** key or the **RH** mouse button.