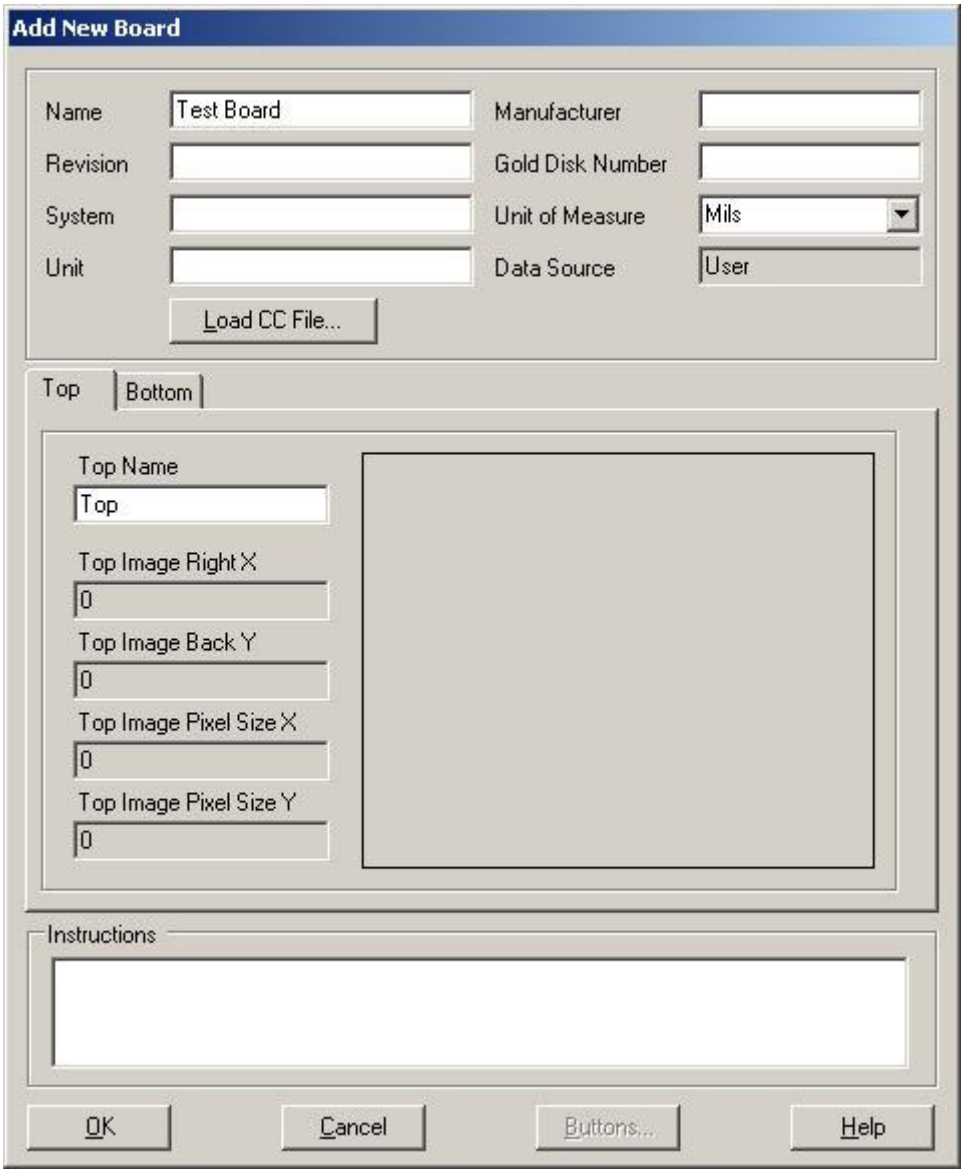
Huntron CAD Tools Tutorial

The tutorial will guide the user through the steps require to create a Huntron ASCII File (HAF) and a CAM/CAD (CC) data files. These files contain X-Y coordinates that allow the Huntron Prober to accurately probe a print circuit assembly.

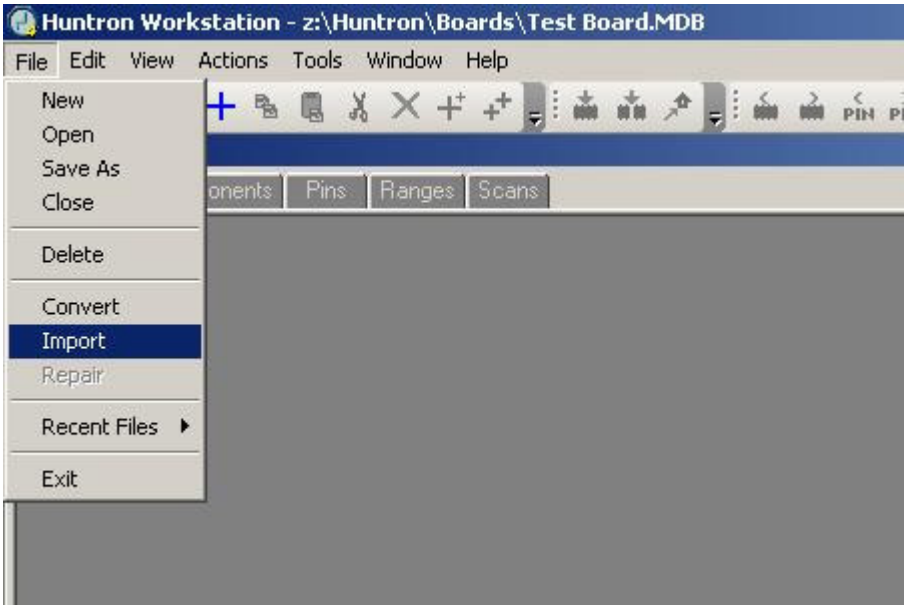
Create a Board database



After starting the Huntron software the main menu is displayed. Select **File/New** from the menu bar. The Add New Board window will be displayed. Type a name into the Name field. Adding information to the additional fields (i.e revision, system, etc…) is not necessary to create a new board. Click **OK** to save the new Board information.

File Import

After created a Board database, select **File/Import** from the menu bar.



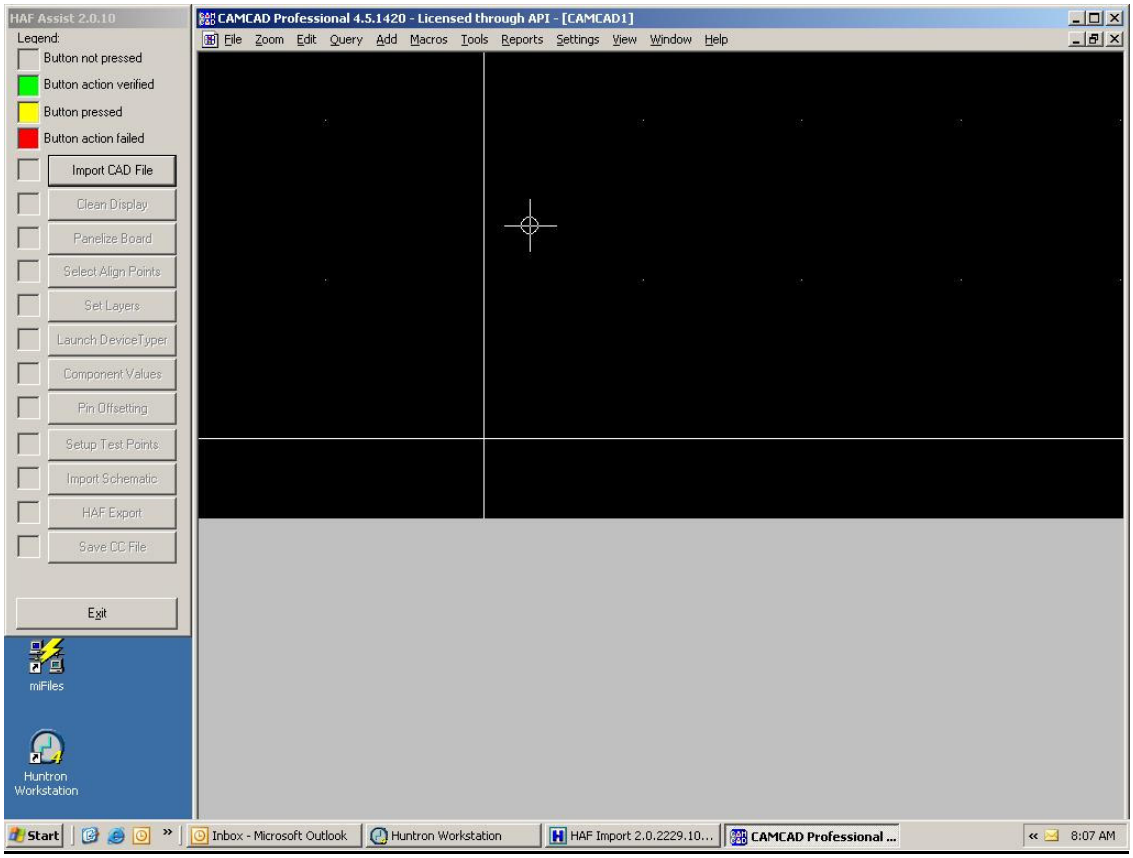
The HAF Import wizard will start and ask you whether a HAF (Huntron ASCII File) has been created. Click **No** to continue.



The HAF Assist dialog box along with the CADCAM software will start. HAF Assist is located on the left side of the screen and CAMCAD is positioned on the right. As you progress through the HAF Assist process, buttons will enable acting as a step-by-step guide. The first is to Import the CAD file.

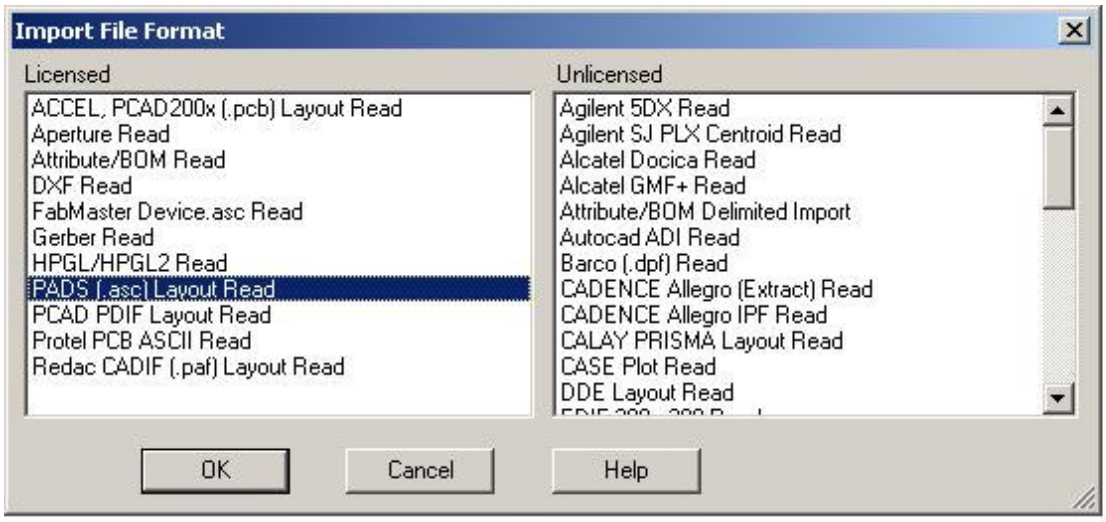
HAF Assist

HAF Assist helps automate the process of importing a PCB layout and creating the associated files. Each of the processes within the HAF Assist has help information. The five required steps within HAF Assist are Import CAD, Clean Display, Select Align Points, HAF Export and Save CC File.



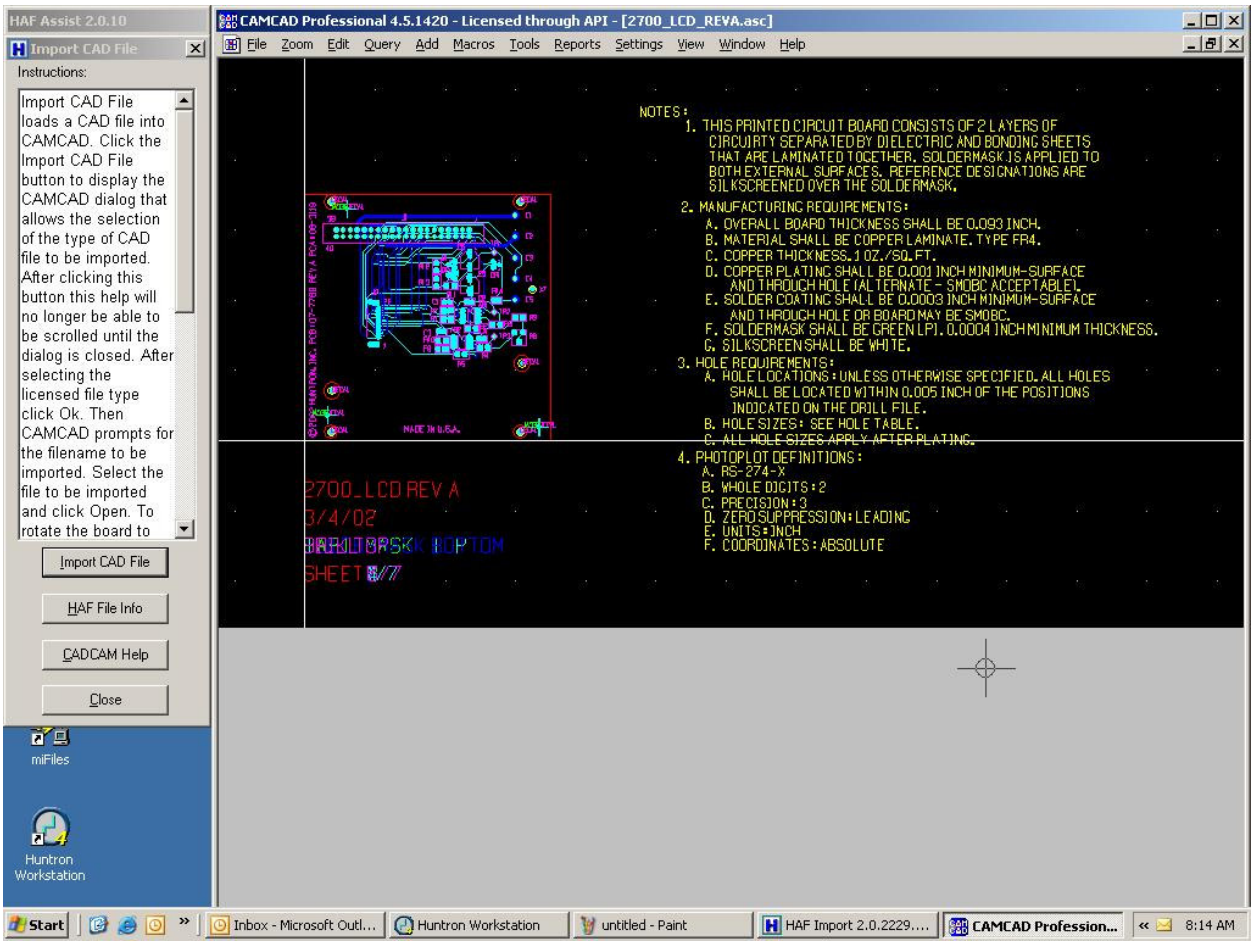
Import CAD

In HAF Assist click on the **Import CAD File** button to start the Import CAD File process. A help file and individual function buttons will be displayed. Click **Import CAD File** and the Import File Format box opens up.



On the left hand side is a list of the licensed formats that are available with the purchased CAD tools. Select the format on the left side that is appropriate for the CAD file that will be imported. In this example the PADS (.asc) file format is chosen. Click **OK** when a format is selected. Browse to the directory where the PCB CAD data file is located. After finding the

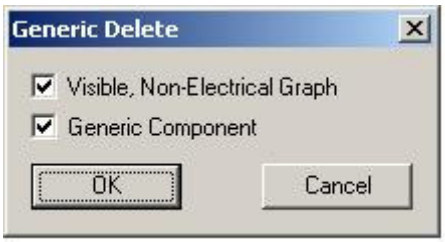
file click **Open** and the file will be imported into CAMCAD. A sample file called 2700_LCD_REVA.asc can be found in the My Documents/Huntron/CAD Files directory. The PCB drawing of your board should now be displayed in the CADCAM window.



Click the **Close** button at the bottom of the Import CAD File window to return to the HAF Assist window.

Clean Display (Optional)

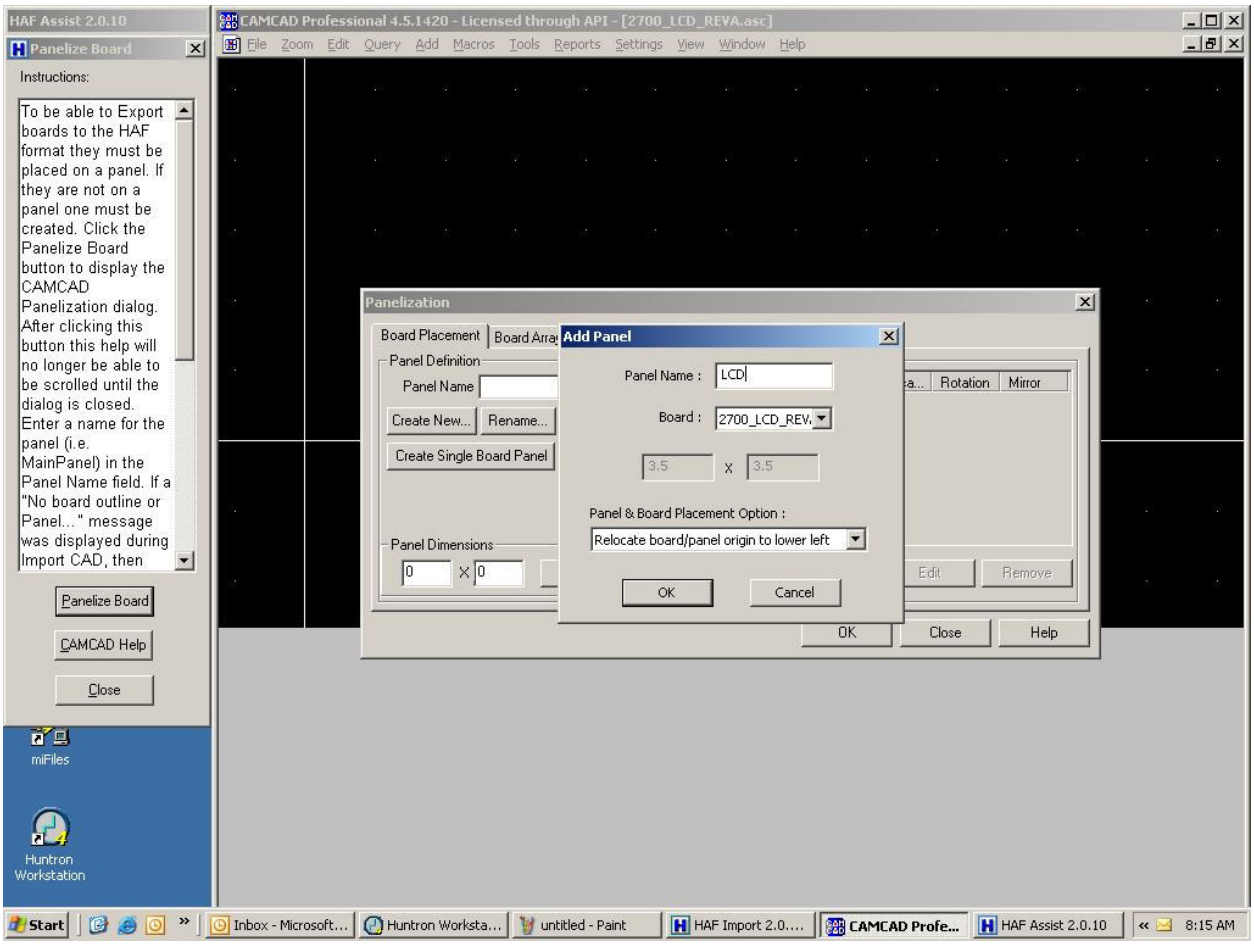
Clean Display is used to remove unwanted data such as text that is not needed when the HAF file is created. Click **Clean Display** button and the Clean Display dialog box opens with its help file. Click the **Clean Display** button and the Generic Delete box opens.



Use the default settings and click **OK**. Click **Yes** when asked if you want to proceed with the Clean Display function. The text information will be removed and only the PCB information remains. Click the **Close** button to return to HAF Assist window.

Panelize Board (Optional)

CAMCAD allows the creation of panel of boards. This step is not used for single boards or boards that are already in panels. From HAF assist, click **Panelize Board** button. This displays the Panelize Board dialog. Click **Panelize Board** to display the Panelization window. Click on **Create Single Board Panel** and the Panel Display box appears.

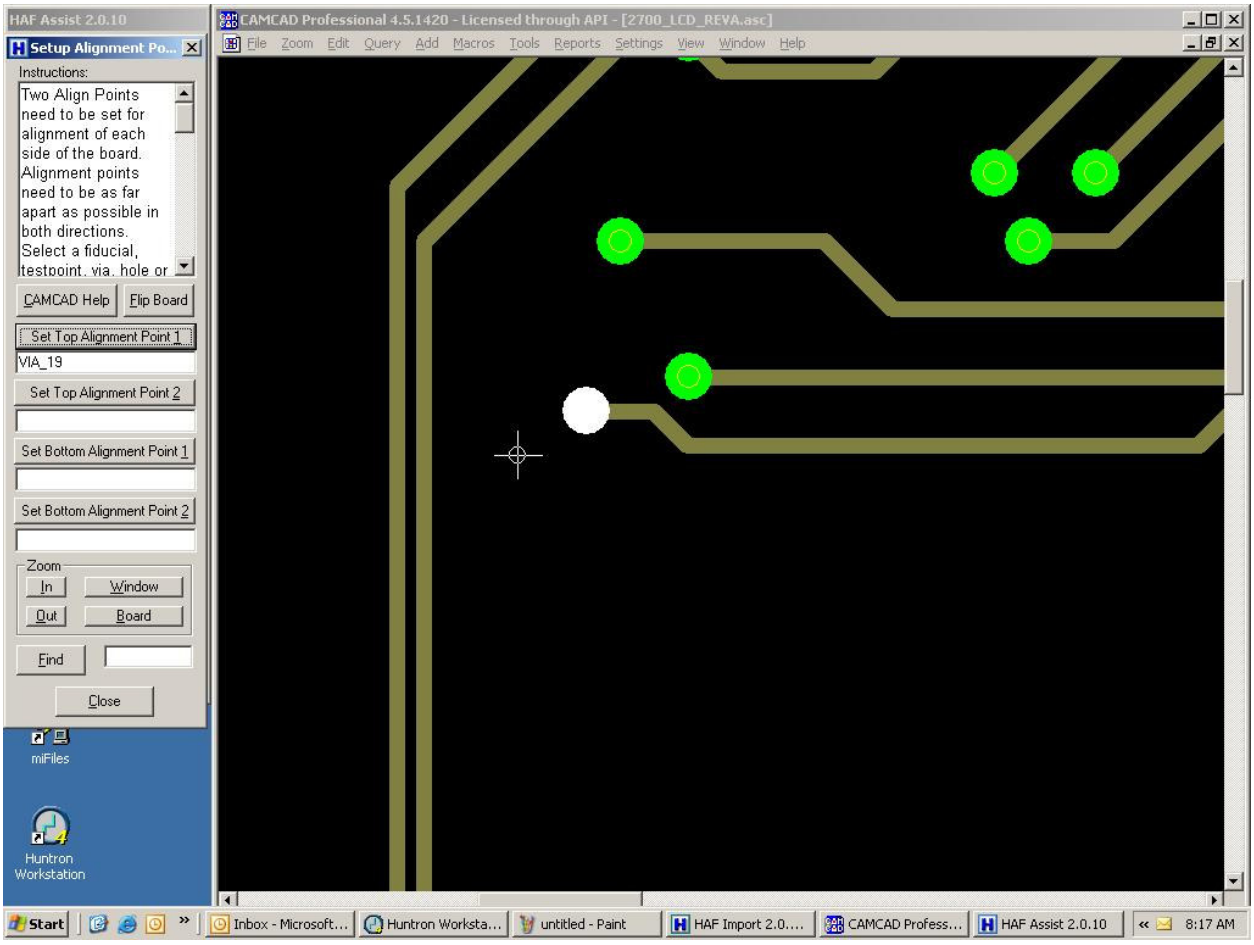


A panel name must be entered an in this example the name "LCD" is used. In the Board placement window, a board file is required. Use the drop-down arrow to select the appropriate file name. The board file is usually the same file name that was used in the import process. In this example the default file 2700_LCD_REVA.ASC is selected. Click **OK** and then click **OK** in the Panelization box. Click the **Close** button to return to the HAF Assist window.

Select Alignment Points

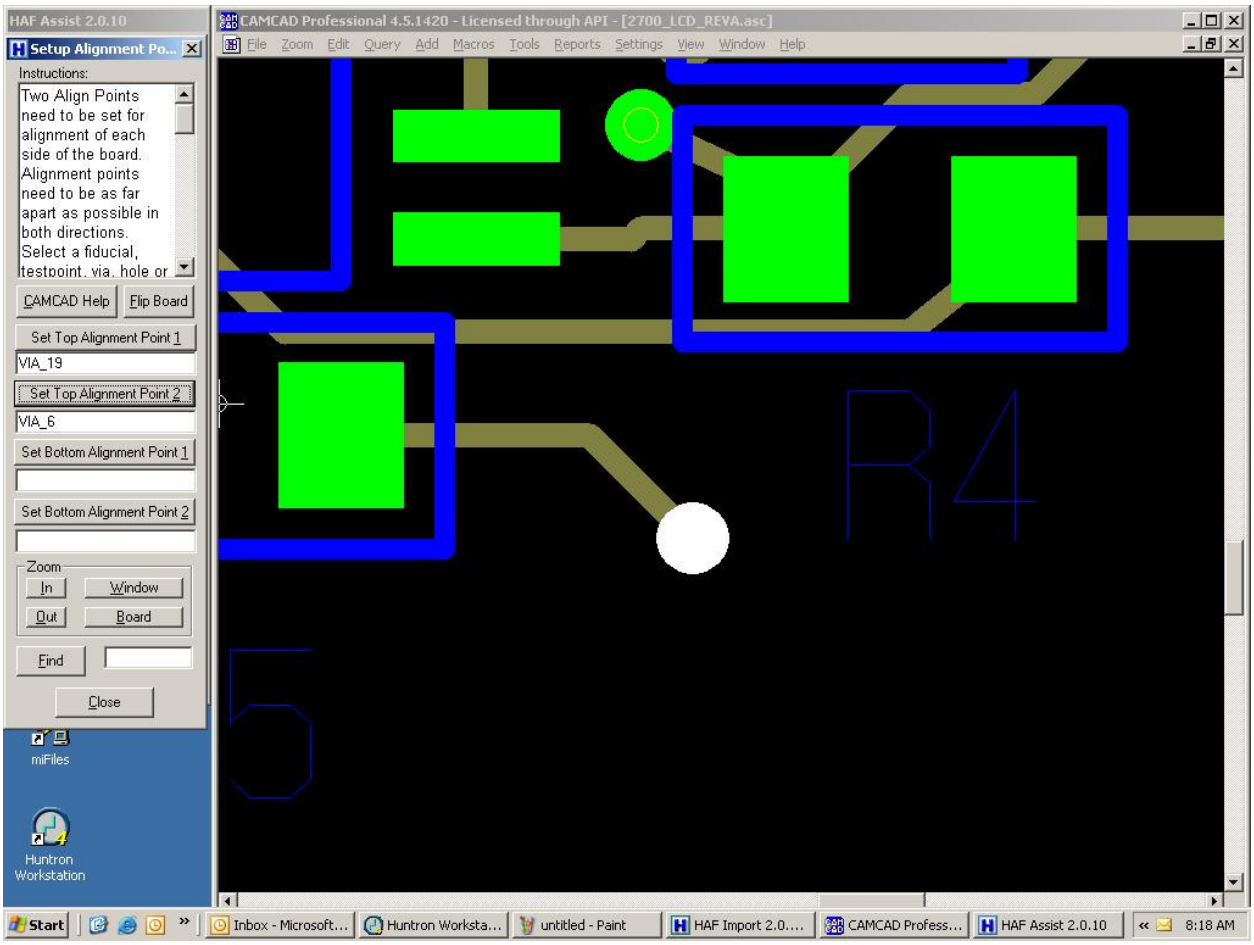
Alignments points are used as reference points to determine the relationship of the components on the PCA and the Huntron Prober. A set of alignment points are required; two on the top of the board and two on the bottom of the board. Alignment points should be located as far apart as possible for the best overall accuracy. Alignment points are physical points on the PCA that will be accessed by the camera view. The selected points should be small and have their center point easily distinguishable. Fudicials, vias or component pins can be used as alignment points. The software checks to make sure the chosen align point is valid. You may want to physically mark the points selected on an

actual PCB for future reference when using the robotic prober. Also, the points selected must be easily visible when using the robotic prober's camera.
Note the rotational board orientation for future reference. In this example, the J1 connector oriented towards the top (back).
In the HAF Assist click the **Select Align Points** button. The Select Alignment Point window appears with the help file and four boxes where the alignment values will be stored. A **Flip Board** button allows views of either the top or bottom of the board and use the **In** or **Out** buttons for zooming. The **Window** button allows you to zoom a specific area of the CAD image by drawing a box around the desired location. The **Board** button will set the Zoom level so the entire PCB is in view.

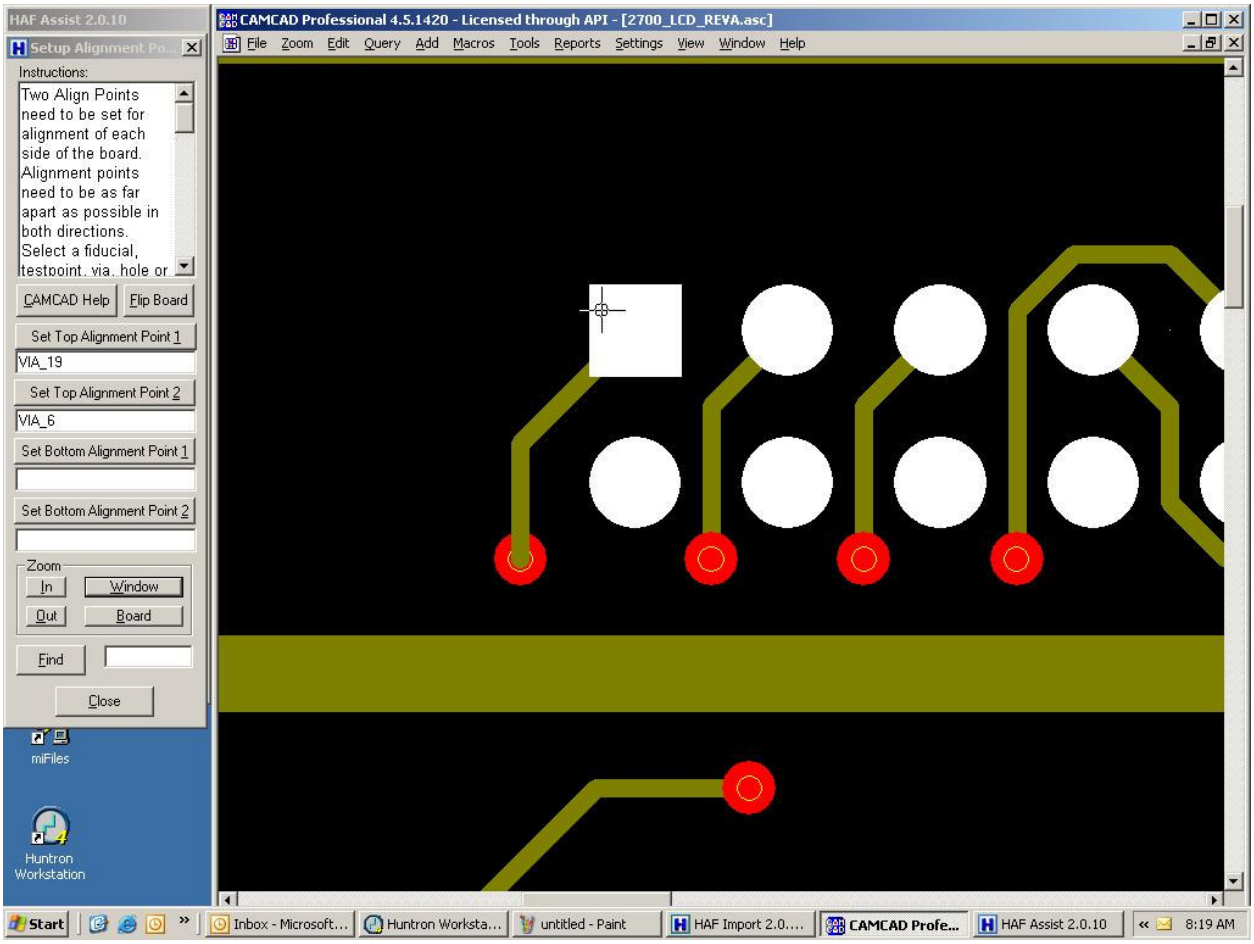


If you have a preferred alignment point on the board, you can use the **Find** field and associated button to assist in located specific points. In this example two vias on the board have been chosen for alignment points. The first alignment point is a via located in the upper left corner. Click the HAF Assist Window button. Drag the cursor to create a box around the via. This will zoom to make selection easier. Click on the via in the CAMCAD image where it will change to a white color. Click **Set Top Alignment Point 1** and the point name will be displayed as Top Alignment Point 1.

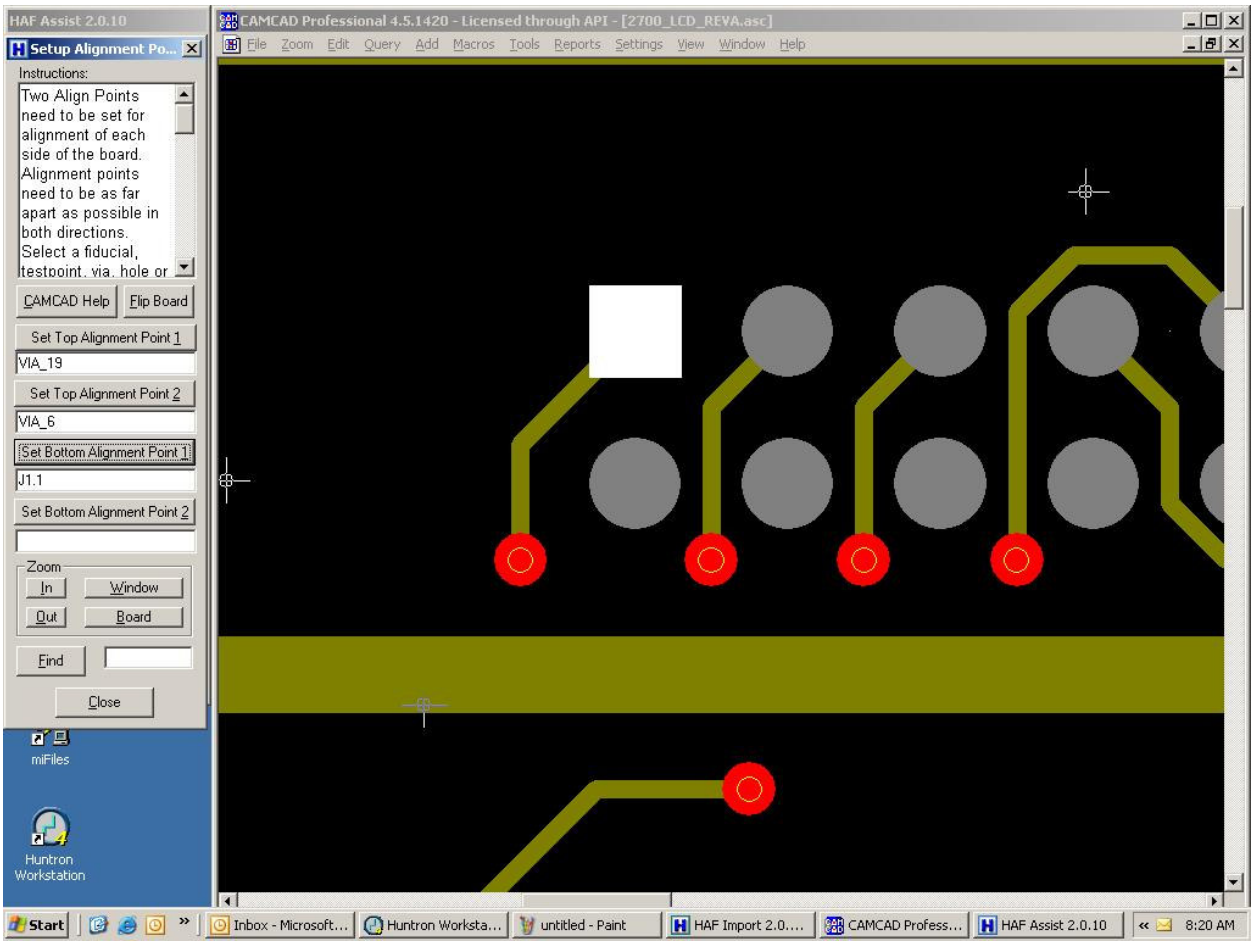
The second alignment point is a via located in lower right corner of the board. Click the HAF Assist Board button to see the whole board again. Click the Window to zoom in on the via. Click on the via so it turns white and click the **Set Top Alignment Point 2** button.



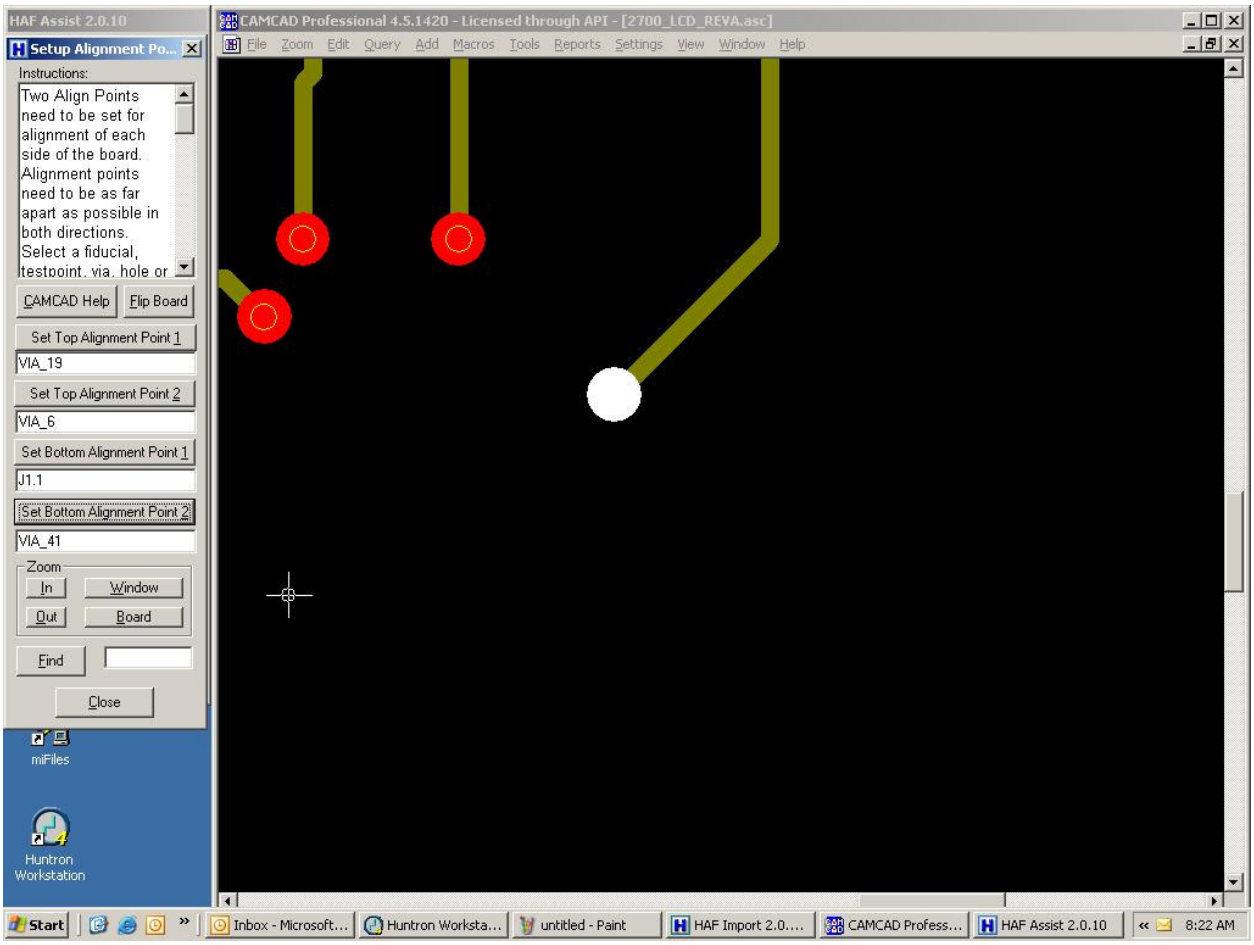
The process is repeated for the bottom side of the board. Click the **Flip Board** button to display the bottom side image. The first bottom side alignment point is pin 1 of a connector located in the upper left corner. Zoom as needed. Clicking on pin 1 in the CAMCAD image will highlight the entire component.



Press **F4** to select or "drill down" to the individual pin where it will change to a white color and the other component pins will change to grey. Click **Set Bottom Alignment Point 1** and the point name will be displayed as Bottom Alignment Point 1.



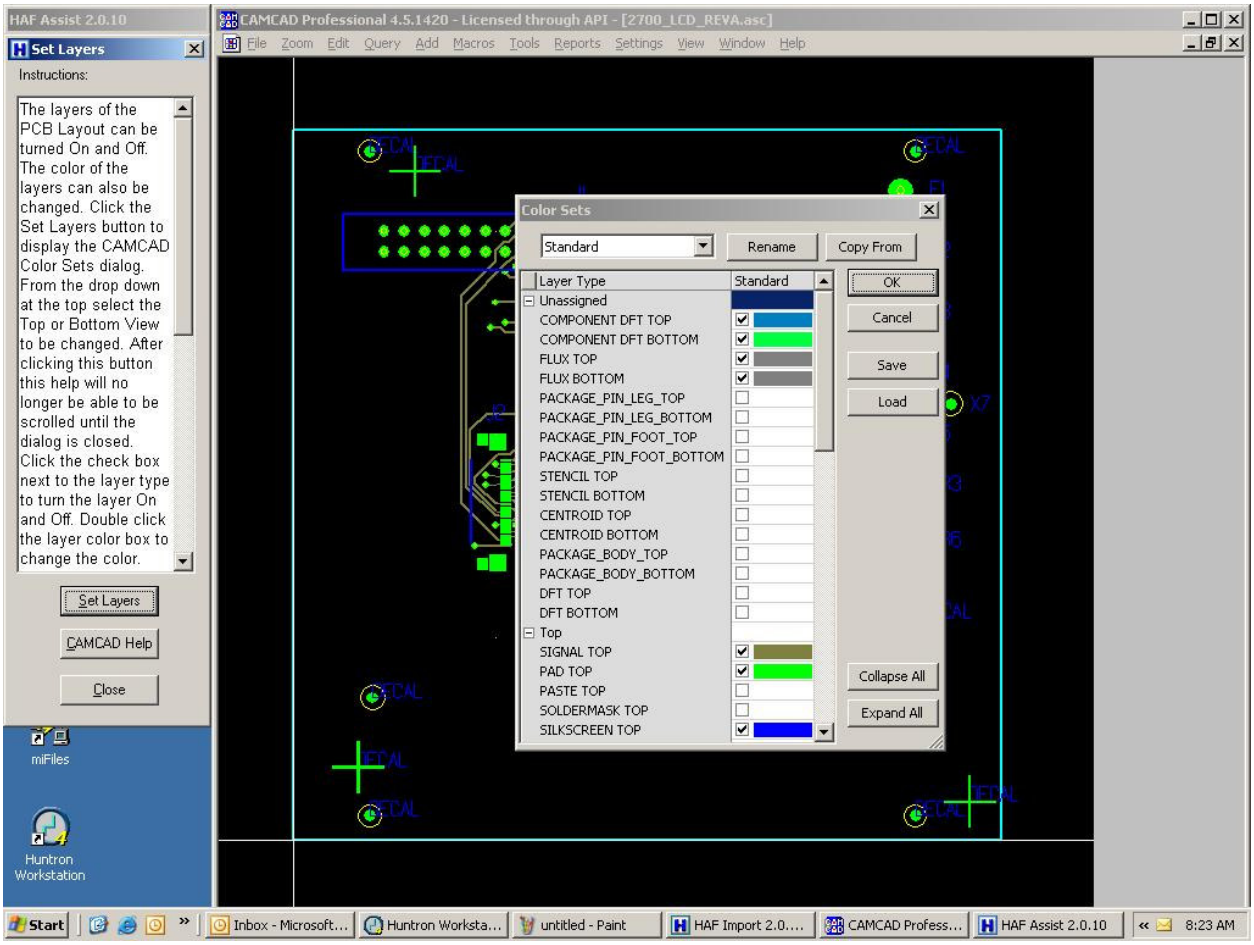
Select a second bottom side alignment point that is located in a diagonal direction from the first bottom alignment point. In this case, it would be located in lower right corner of the board. Navigate to the lower right corner of the board image and select a suitable feature as the second alignment point. Use zoom as needed. Use an actual board to help select an accessible point. Click the **Set Bottom Alignment Point 2** button once the point the point is highlighted in CAMCAD. Click the **Close** button to return to the HAF Assist window.



Set Layers (Optional)

CAD files are configured in layers such as top, bottom, silkscreen component, etc. Each layer is represented by a color. To better view of a specific section of the board it may be best to turn off one or more layers.

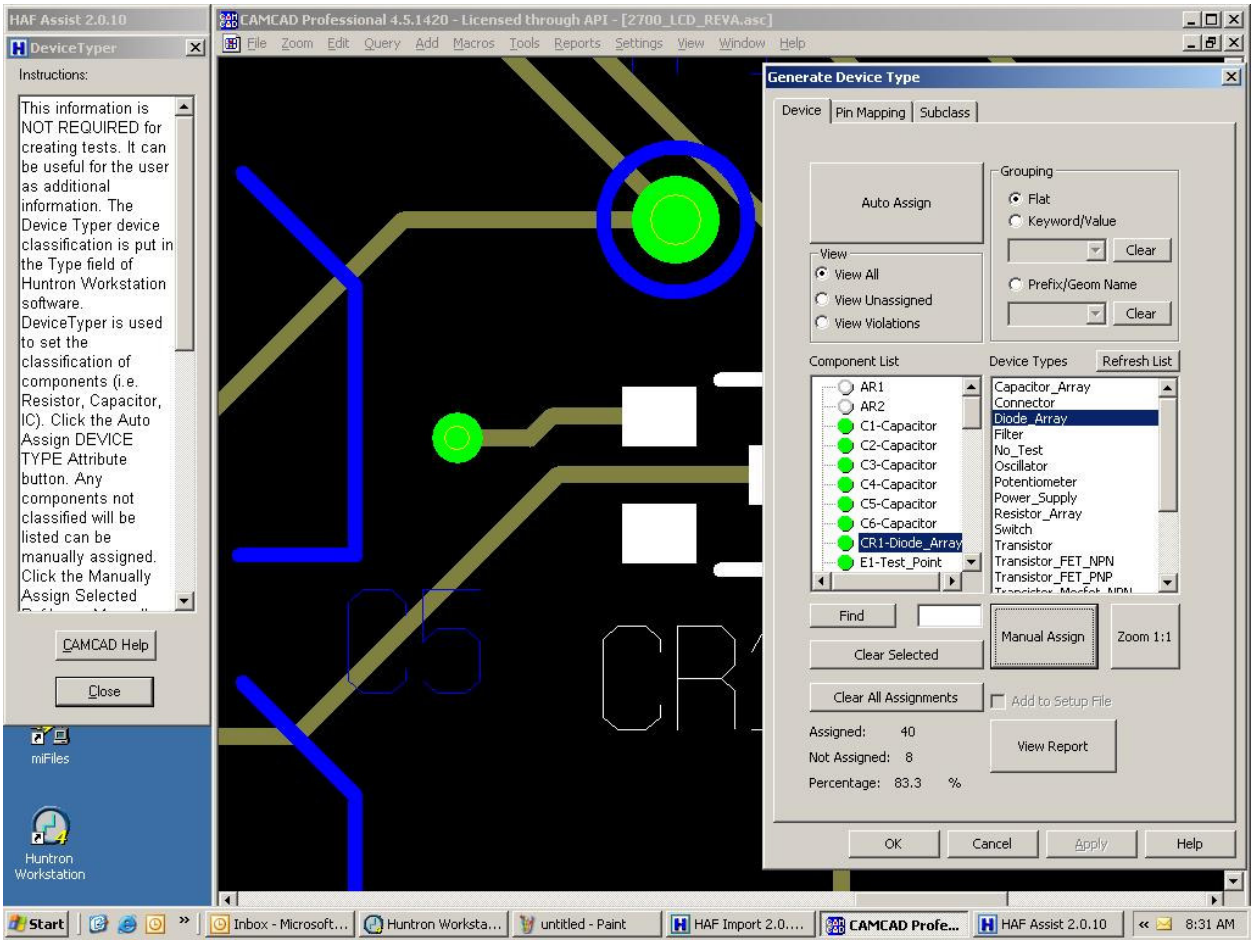
From the HAF Assist window click **Set Layers**. This will display the Set Layers dialog box that contains a Help files. Below the HELP is the **Set Layers** button which when clicked on will display the Color Sets Dialog box.



From the Layer Type list you can select which layer(s) that you want to display and assign it a color. Click on the check box which will turn white and click on the **OK** button. The selected layer will be removed from the CAMCAD image. To save a configuration, click the **Save** button. Click the Close button to return to HAF Assist.

Launch Device Typer (Optional)

Device Typer is used to classify the names of components which appear in the Type box that resides in the Component dialog box of the Huntron software. Default names within the PCB file have been predefined. For example a C represents a capacitor and R represents a resistor a Q represents a transistor, etc. The complete definition list can be found in the HAF.OUT file. On the example board is diode CR 1 a 3 pin diode array. Most diodes are 2 pin but CR1 consists of 3 pins and is considered an array. The 'Device Typer' is looking for a 2 pin component. From HAF Assist click **Launch Device Typer** and the Device Typer box with help appears on the left and Generate Device Type dialog box appears on the right.



Click **Auto Assign** and the components will turn red, yellow or green showing an attempt to classify them. If a device has a "type" violation the Device turns red. Clicking on CR1 in the component list shows CR1's PCB location. Typically diodes are two pin devices but CR1 is a three pin device, this is why CR1 has a red indicator.

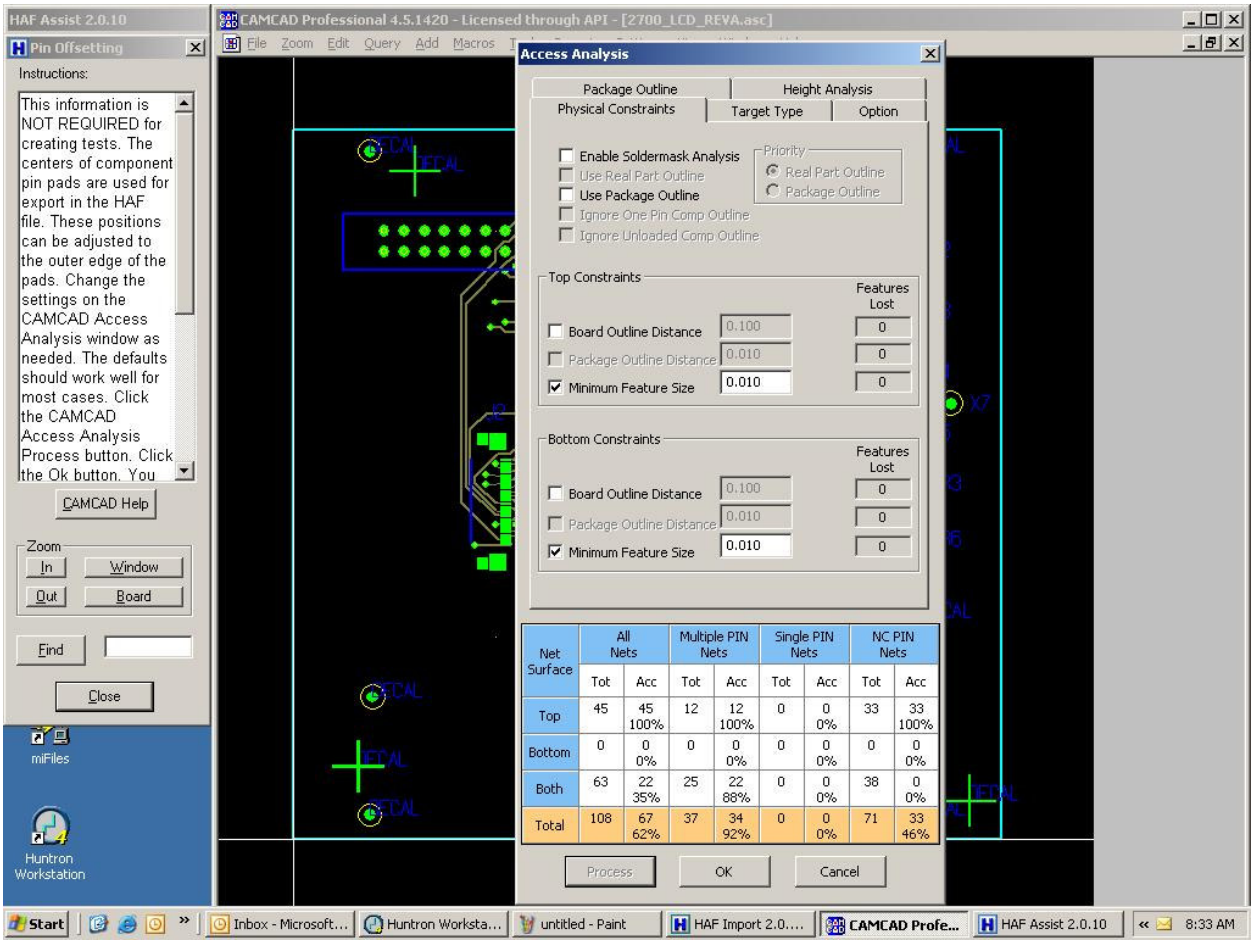
The violation can be removed by selecting 'Diode Array' from the Device Type List, then click on **Manual Assign**. CR1 now has a Green assignment. Click **OK** to close the Generate Device Type window and **Close** to return to HAF Assist.

Component Values (Optional)

The option allows component values (i.e. 100K ohms) to be specified from a attribute in the CAD data. This tutorial does not go into the steps for making these changes.

Pin Offsetting (Optional)

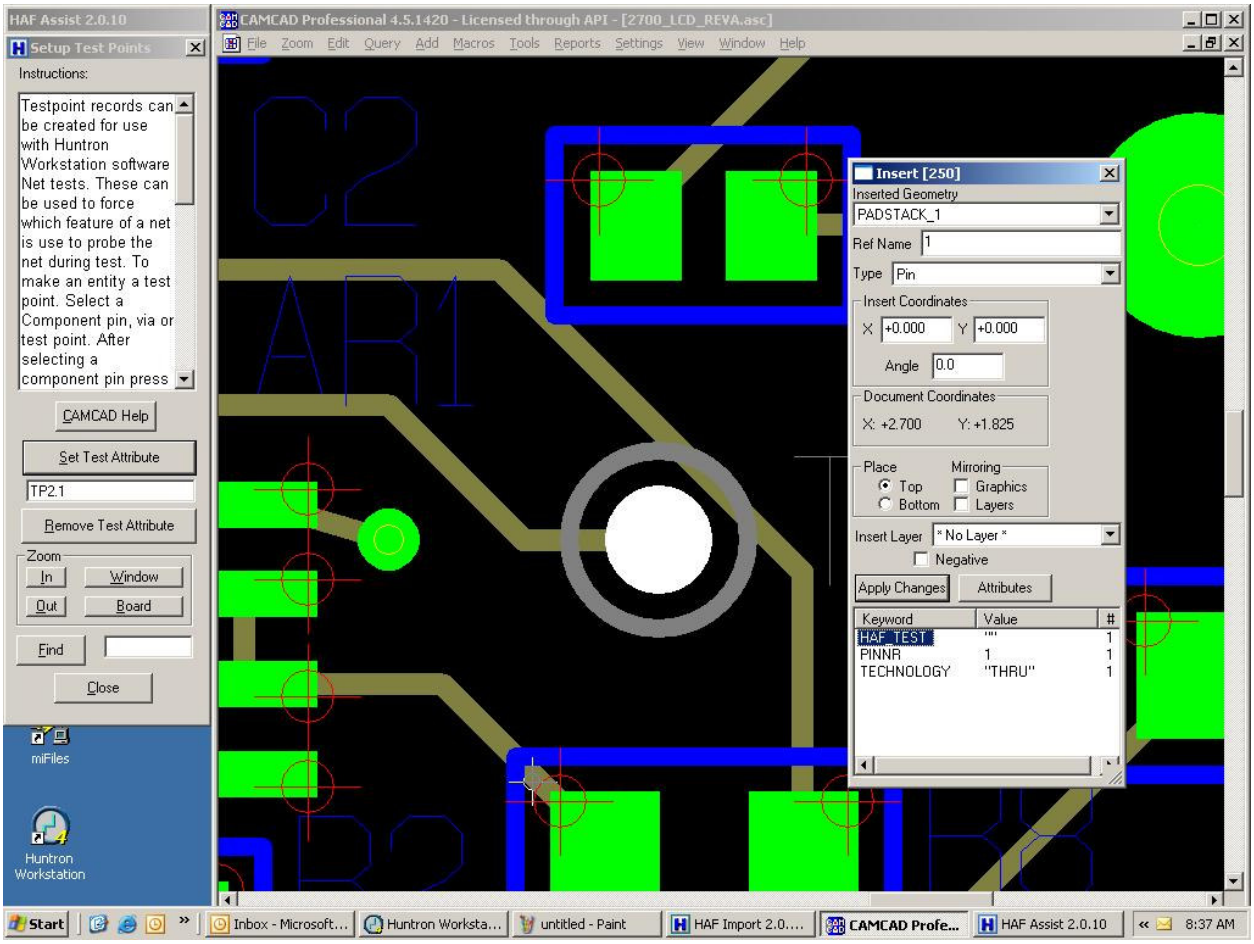
By default the center of each component pad is used as the reference point for the Huntron Prober. There maybe component package types that do not allow the Huntron Prober to connect with the center point of the pad, causing an open condition. The Pin Offsetting feature allows the selected package type to have its Top or Bottom reference point of each pad moved.
From the HAF Assist window click the **Pin Offsetting** button and the Pin Offsetting window will open where additional help resides. In the CADCAM software the Access Analysis window will open.



To change the component reference points, click the **Process** button and the pin locations will be offset to the default Access Analysis setting (0.010" from the pad corner). Use the settings in the Physical Constraints tab to modify the offset distances. Click **OK** in the Access Analysis to accept changes. Review the changes in pin offset in the CAMCAD image. You may need to zoom in to view pin placement. Click on the **Close** button in the Pin Offsetting window to return to HAF Assist.

Setup Test Points (Optional)

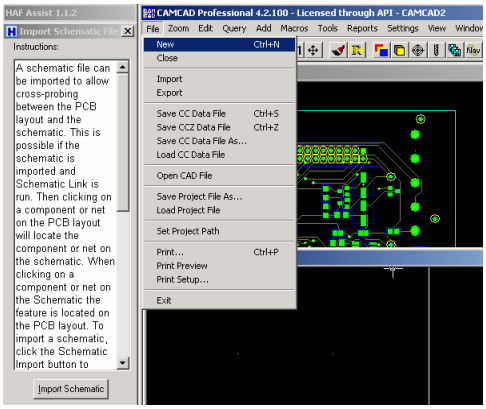
In most cases the Huntron Prober uses physical pins of a component as test points. There may be times when the prober can not make physical access with a pin and a new test point must be created
From the HAF Assist window click **Setup Test Points**. This will display the Setup Test Point window. Below are Help and two buttons, one to set a test attribute or to remove a test attribute.



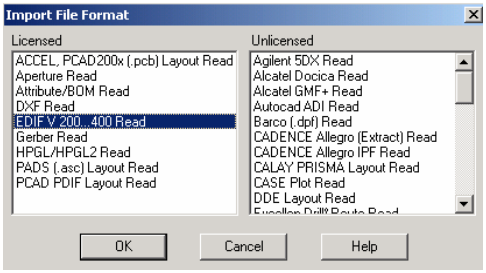
Locate the entity such as a via, component pin that you want to be a test point. The **In** and **Out** buttons will zoom in and out to help in selecting a test point. **Find** can also be used assist in locating a specific point by name. Select a test point and will it highlight. Click the **Set Test Attribute** button and a alphanumeric value will appear (object name). To verify if an entity is a test point, right click the object and select **Edit Entity** from the menu. The Insert box appears – in the Keyword box you should see the word **TEST**. This indicates the entity is a test point.
As many test points can be created as required by repeating this process.
Test points can be removed by highlighting the entity and clicking **Remove Test Attribute**.
Return to the HAF Assist window by clicking **Close**.

Import Schematic (Optional)

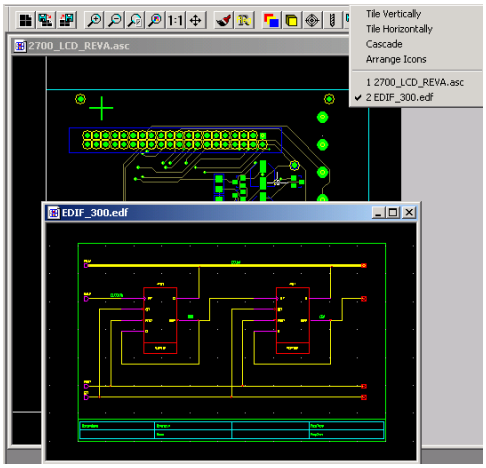
If required a EDIF schematic file can be imported into CAMCAD. This will allow you to view the PCB data and the schematic drawing at the same time. From the CAMCAD menu select FILE-> NEW. This will display a new CAMCAD work area window.



From HAF Assist click IMPORT SCHEMATIC. Select the appropriate licensed reader and click OK. Locate the schematic file in the appropriate directory and click OPEN.

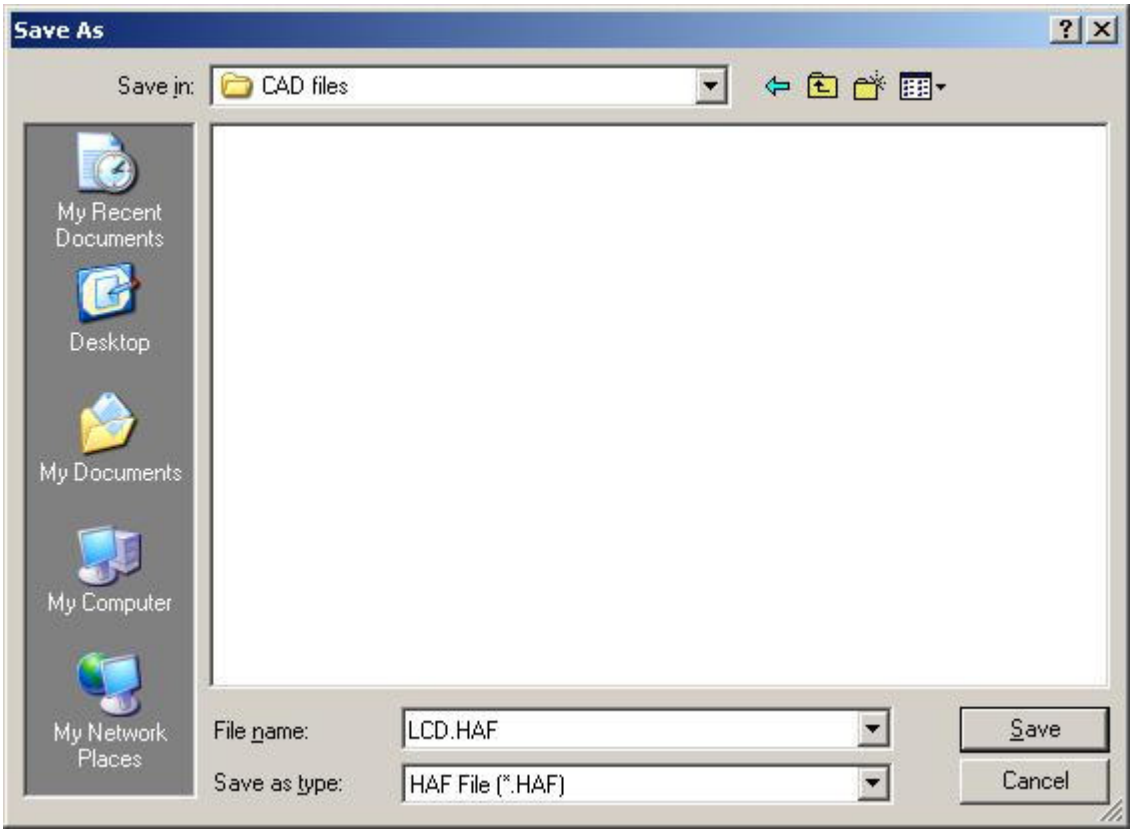


The schematic will now be displayed in the newly created work window. From the CAMCAD main menu select WINDOW; this allows the two windows to be tiled vertically or horizontally or cascaded.



HAF Export

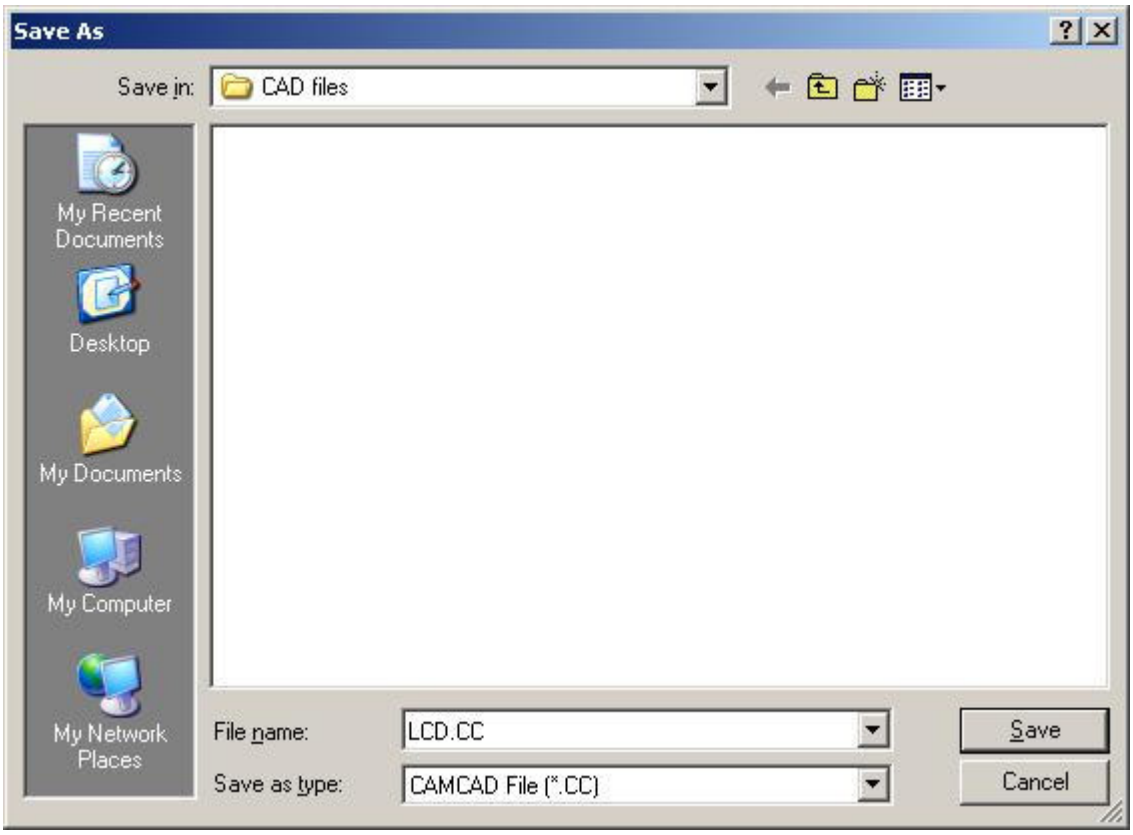
Creating the Huntron ASCII File (HAF) can be done after the Import CAD, Clean Display, and Select Alignment Points operations are performed. All values from these three mandatory operations plus the values of the optional operations will be exported to the HAF file.
From the HAF Assist window click **HAF Export**. The HAF Export dialog box will open.
Click **Export HAF File** and a standard Windows Save window will open allowing the name of the file to be entered. Browse to the directory where you wish to save the HAF file. Click **Save** to save the file.



Click the **Close** button to return to HAF Assist.

Save CC File

The CAMCAD (CC) file is created after the creation of the HAF. From the HAF Assist window click **Save CC File**. The Save CC File dialog box will open. Click **Save CC File** and a standard Windows Save window will open allowing the name of the file to be entered. Browse to the directory where you wish to save the CC file (**note:** saving the CC file to the same location as the HAF file is best). Click **Save** to save the file.



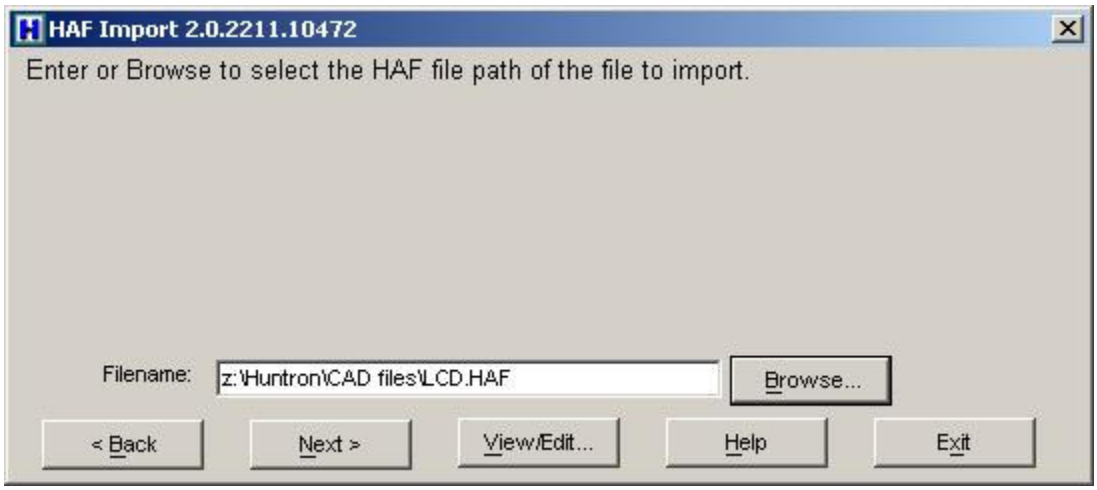
Click **Close** to return to HAF Assist.

Exit

In the HAF Assist window click on **Exit** returns the software to the HAF Import wizard.

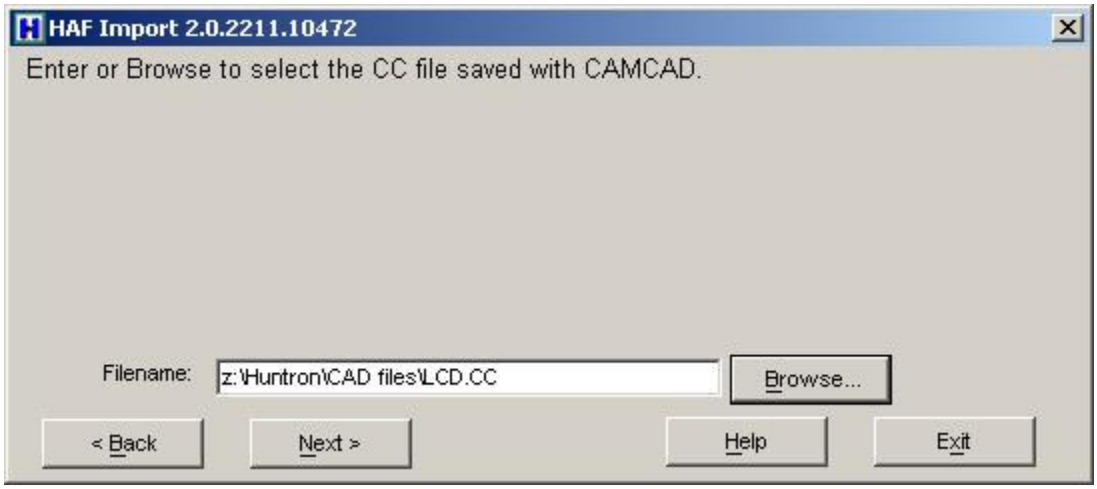
Find HAF File

Click on the **Next** button; a message appears asking for the path of the HAF file. The path can be entered or located by browsing. Browse to the location where the HAF is stored.



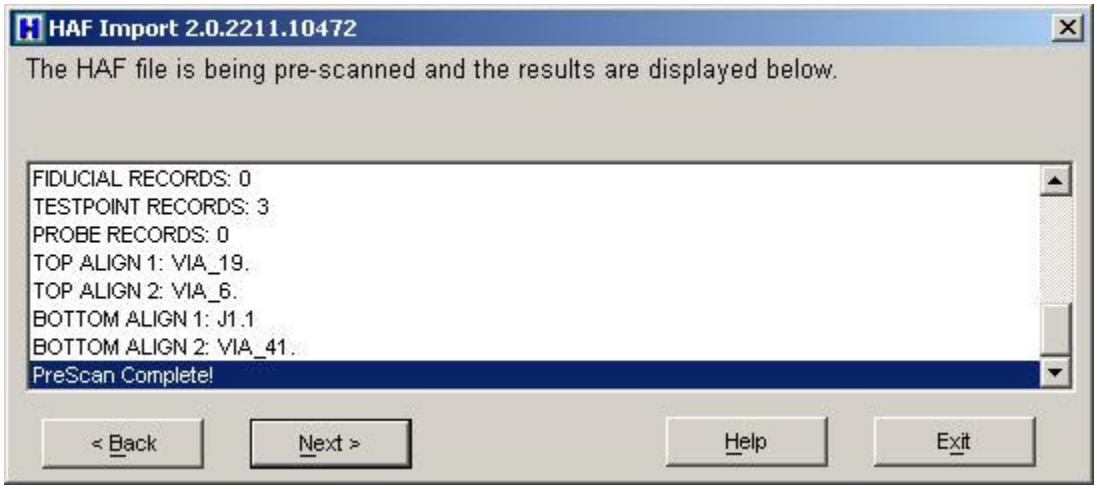
Find CC File

Click on the **Next** button a message appears asking for the location the CAMCAD (CC) file. The path can be entered or located by browsing. to the location where the CC is stored. Click **Next** to move to the next step.



PreScan

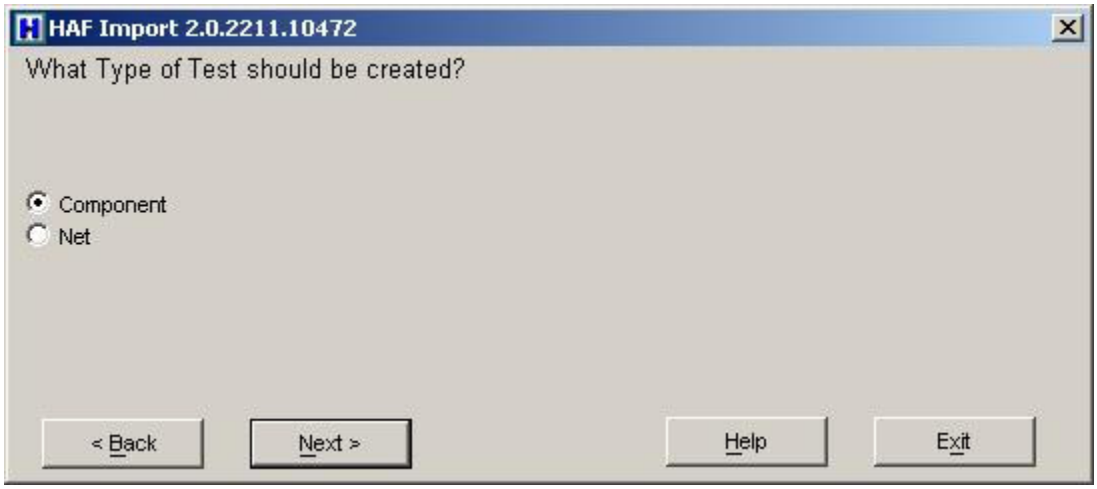
A prescan operation will be performed to verify certain features exist in the HAF file. When complete the four alignment points will be displayed along with the message "PreScan Complete".



Depending on the file size this operation could take several minutes. Click **Next** when complete.

Test Type

Two types of tests can be created; a Component test or Net test. A component test will access every component pin found in the CAD data. The component test will be slower than a net test but provides better diagnostic information. The net test will be faster because it will test only the unique net points one time. The diagnostic information will isolate problems to the net level. If required both a net test and component test can be created. The net test would be used until a problem is found. The component test could be used to isolate the problem.

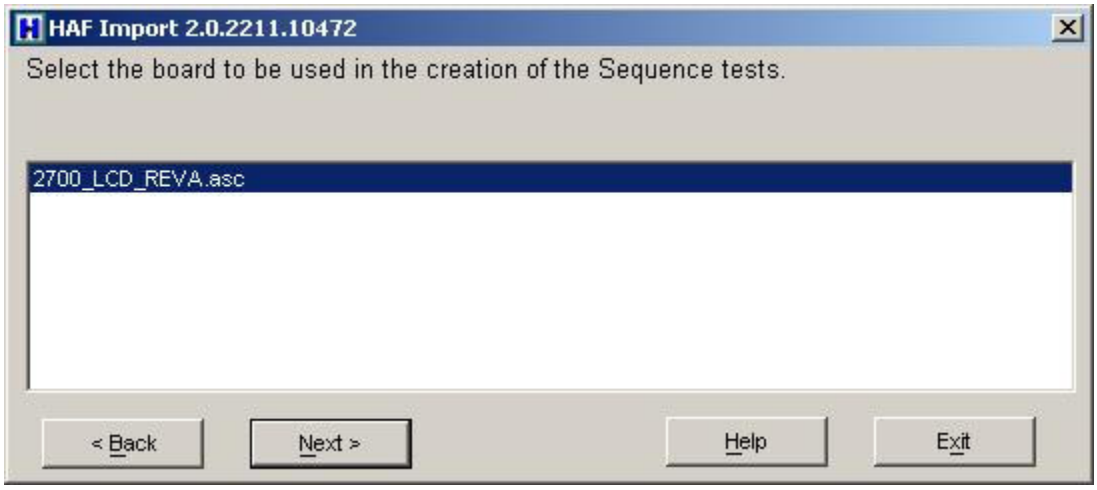


Under **Net** there are four priority groups that consist of Probe, Test Points, Pins and Vias. These groups determine the priority of which point will be used to access a point on the net. The point on the left has highest priority. For the example board select Via or Pins as

having the highest priority. Also, if Net is selected, you will be prompted to select a board side (top or bottom) to be given priority for net test point selection.
For this tutorial, **Component** is selected. Click **Next** to continue.

Select Board

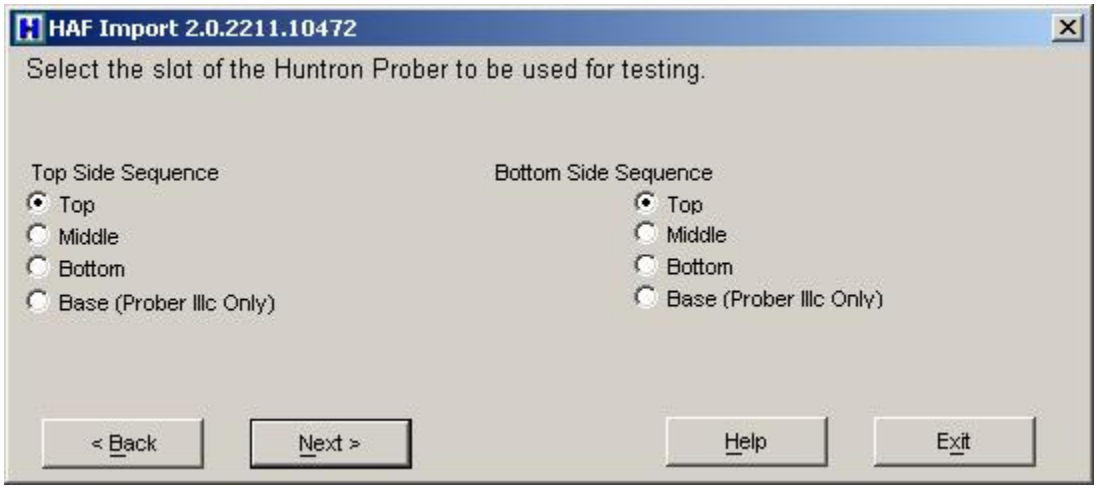
The HAF file can consist of more than one board on a panel. This name is also the name of the board being tested.



This name will appear in the Sequence section in Huntron Workstation after the Process step. If the panel consist of a single board then click **Next**.

Top Bottom Selection

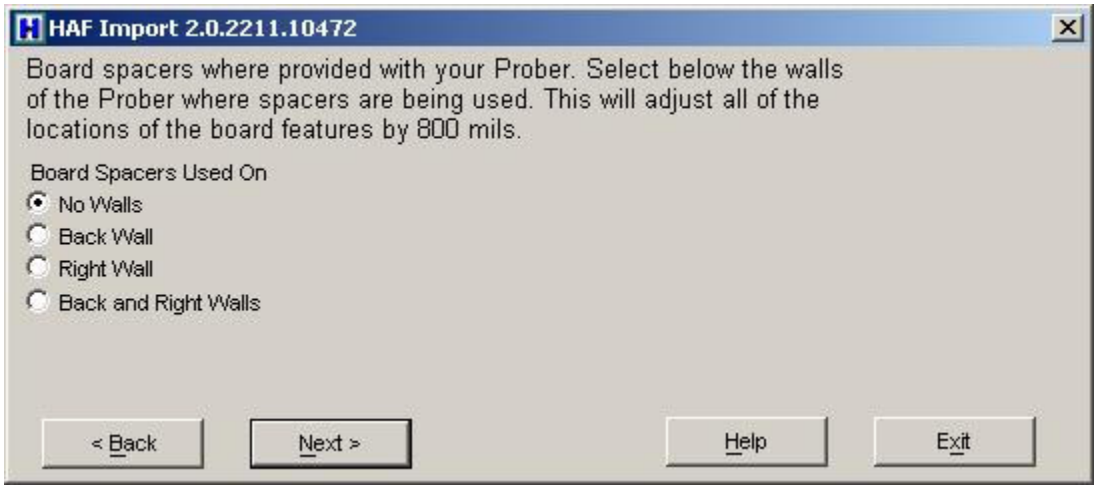
The Huntron Prober has three slot locations where a board under test will reside. Choose a selection for the Top and one for the Bottom.



This information is used to set the slot value for the Sequence in the Workstation software. Click **Next** to continue.

Board Spacers

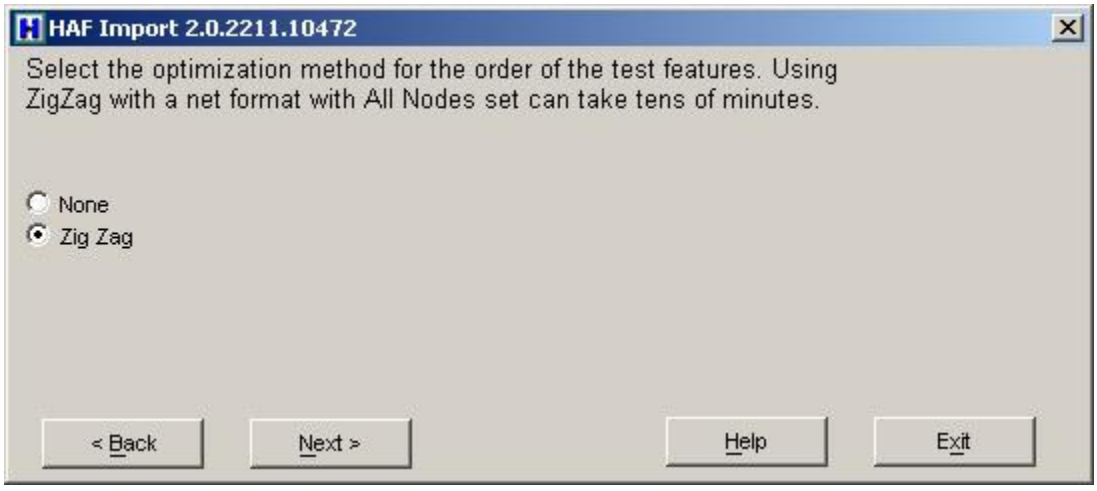
Board spacers are provided with the Huntron Prober. The spacers allow the board under test to be moved away from the walls allowing components near the edge of the board to be accessed.



Selecting Board Spacers automatically adjusts the board location by 800 mils. Click **Next** to continue.

Optimization

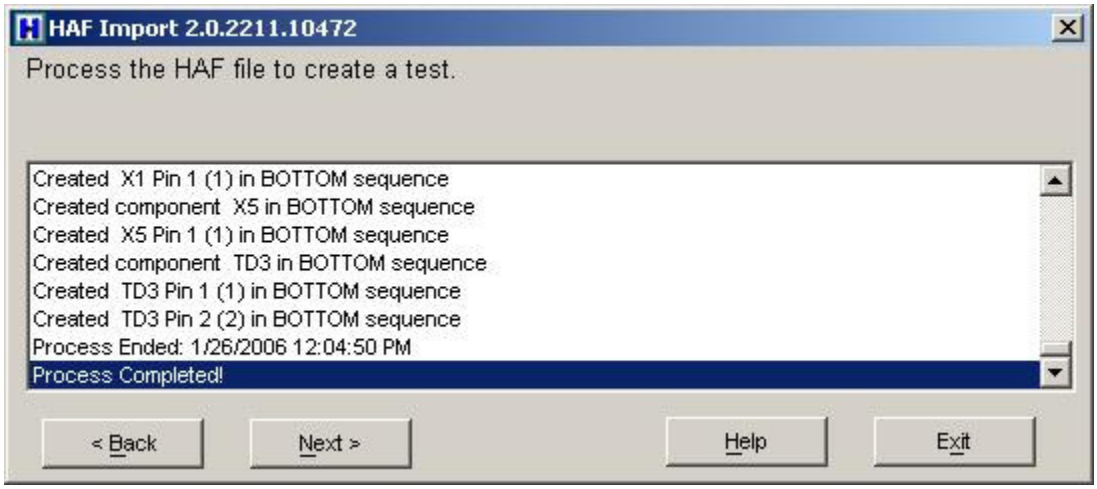
The HAF wizard allows you to select an optimization level.
Selecting None will import the components or test points based on how the components or nets are found in the CAD net list. This can cause longer test times.
Zig Zag is an optimization program that produces a back and forth pattern. The prober will start in one corner of the board and works its way across the board in a diagonal pattern. This reduces the distance that the prober travels and decreases the overall test time.



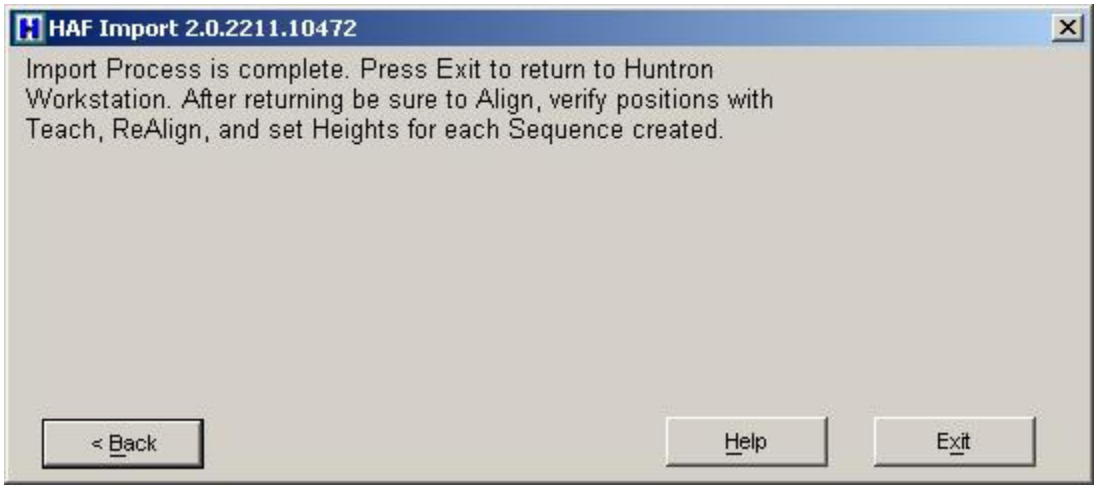
Click **Next** to continue.

Process

The HAF file will be read to create the Huntron Workstation Sequence test. The file will be displayed in the Board section of the Huntron Workstation window.
Click PROCESS to start (note: if the file is large this Process can take minutes to complete)**.**



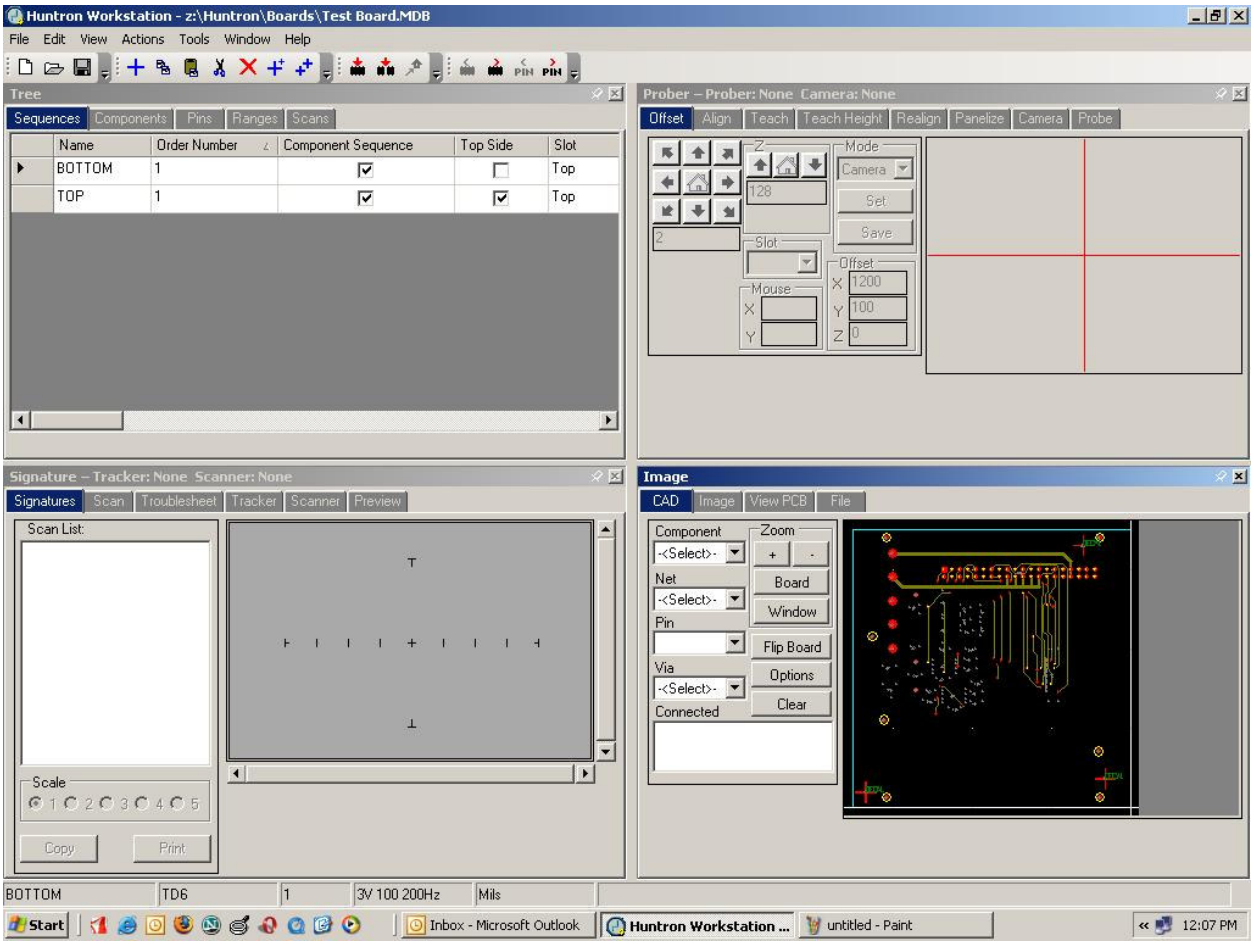
Information will scroll up during the Process. When the Process is complete the words "Process complete" will appear.
Click **Next** to continue.



Click **Exit** to return to the Huntron Workstation software.

Board Set Up

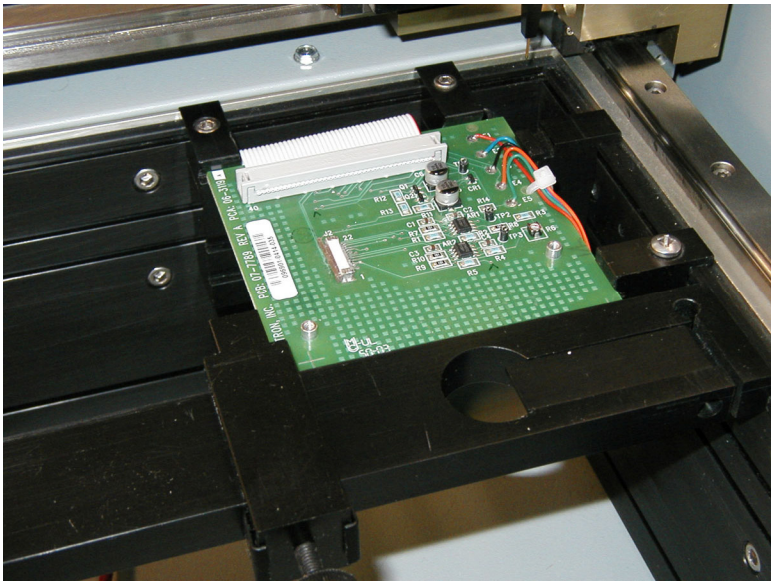
Once the HAF Import wizard is closed, you are returned to the Huntron Workstation software. Notice that two Sequences have been created in the Sequences tab of the Tree pane. There should be a sequence for the Bottom side and the Top side of the board. The CAD data obtained from the CC file will be displayed in the CAD tab of the Images pane.



Align and Realign

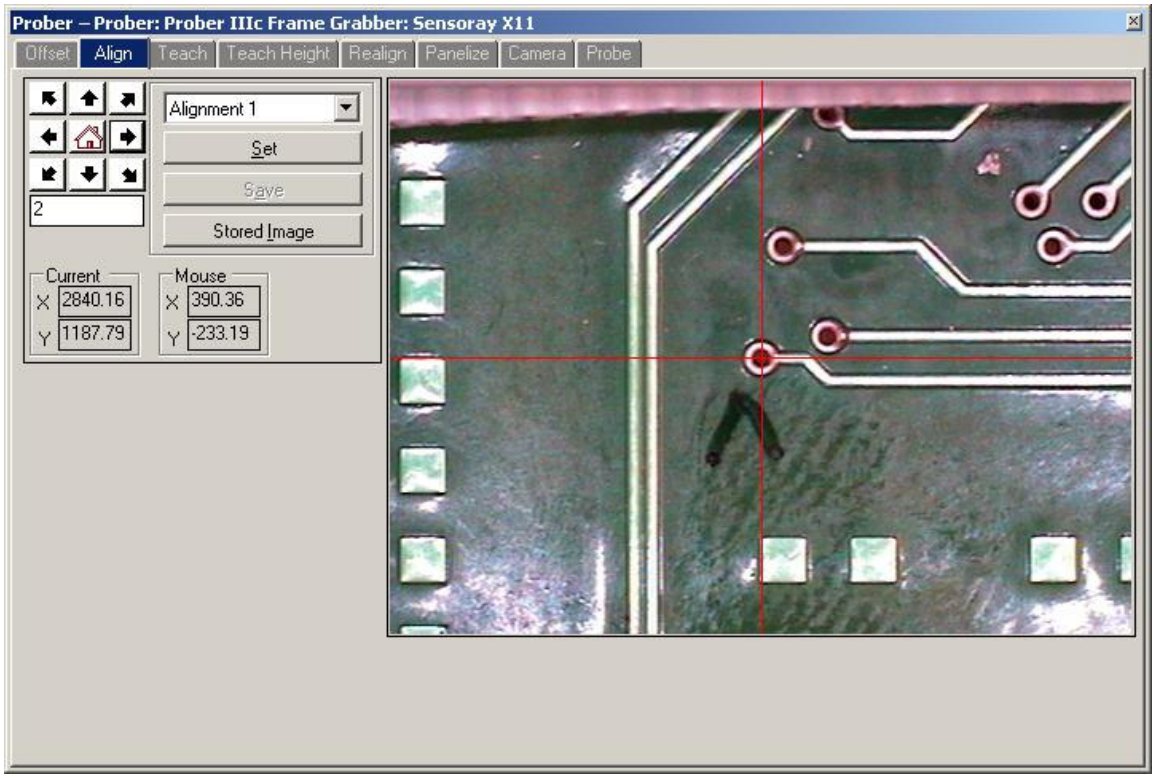
Select the Sequence you wish to scan in the **Sequence** tab. In the following example, the Top sequence is selected.
Select the **Align** tab in the Prober pane and you will be prompted to mount the board.



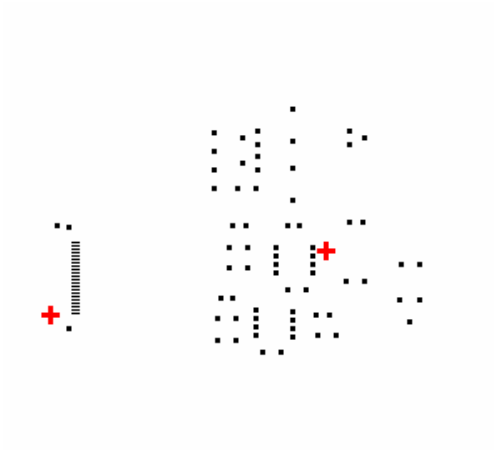


Mount the board to test in the Prober making sure the rotational orientation is correct and board spacers (if selected during the Import process) are in place. Click **OK** to continue.

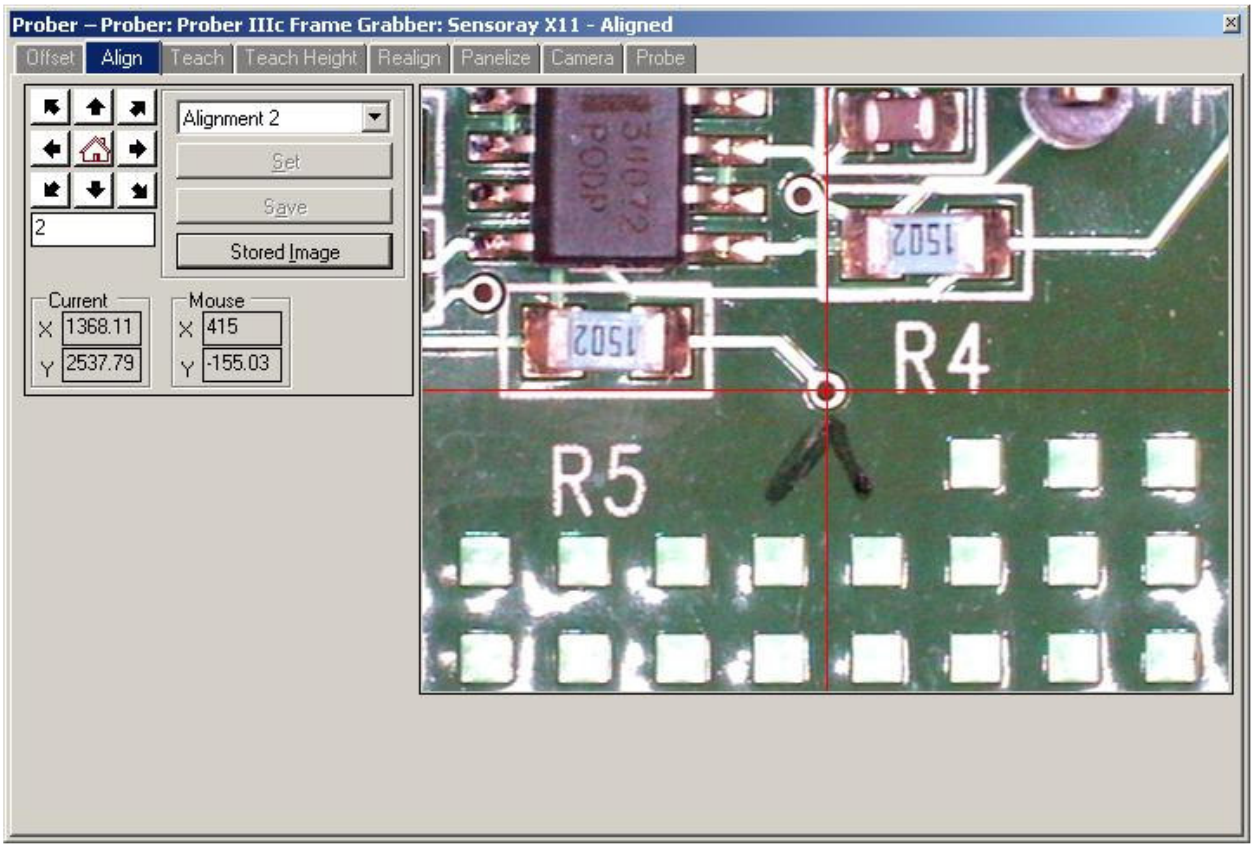
Select **Alignment 1** from the drop menu. The prober will move to the imported XY location for the alignment point. In many cases, you will need to navigate to point visually using the camera. You can you the **Arrow** buttons to move the camera or you can click directly in the camera image and the camera will move to that point. Place the red crosshairs on the center of alignment point as precisely as possible. Once positioned, click the **Set** button.



If you are uncertain of where the alignment points should are located, click on **View PCB** tab in the Image pane to display the board outline and the two alignment points.



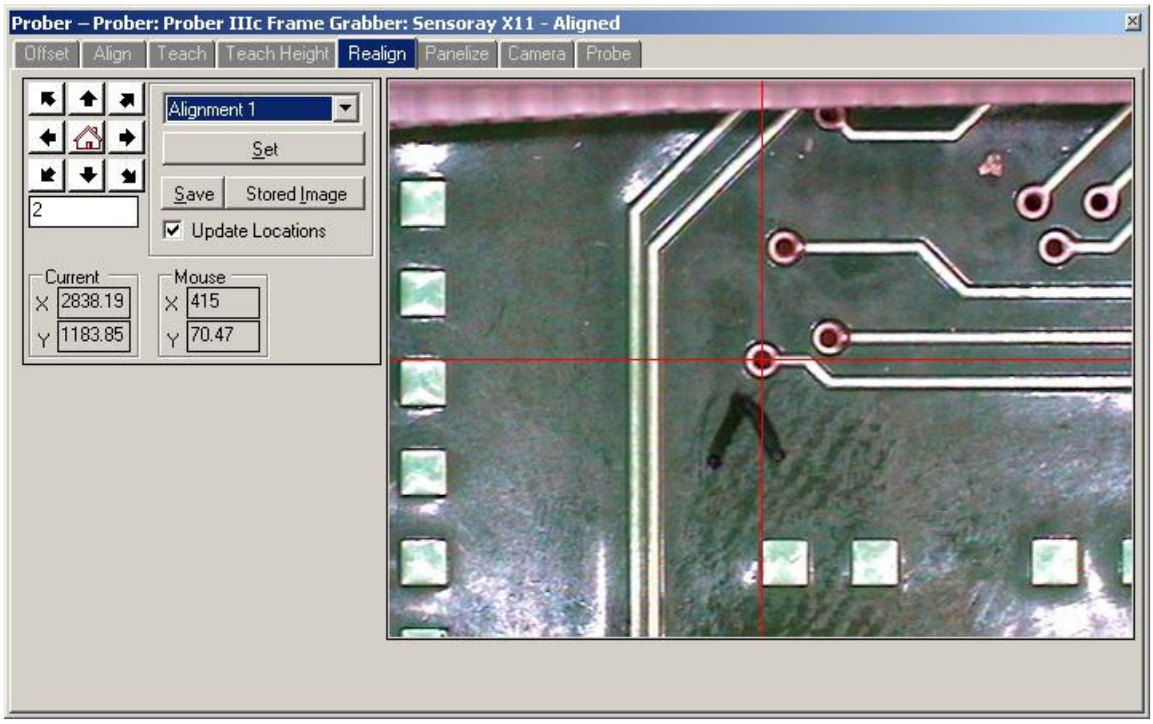
Select **Alignment 2** from the drop field and the prober will move to the imported XY location for the alignment point. In many cases, you will need to navigate to point visually using the camera. Place the red crosshairs precisely on the center of the second alignment point. Click **Set** to save the point.



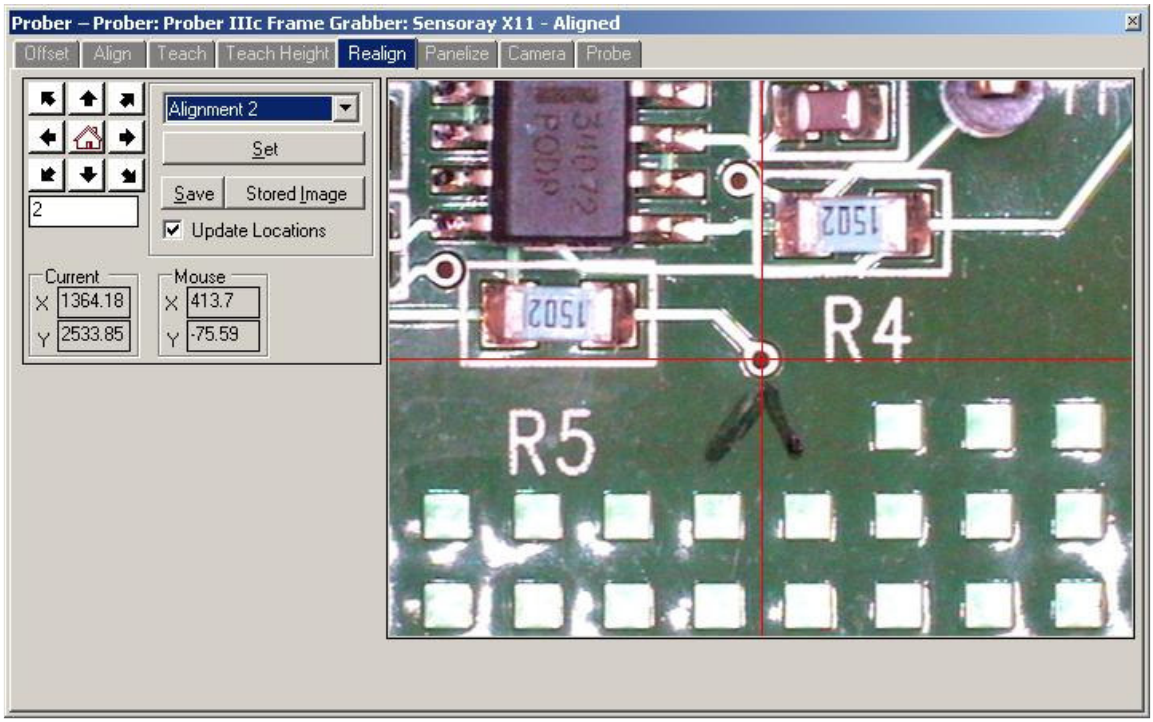
Currently, the alignment point position is only stored temporarily. To make these positions, permanent, select the **Realign** tab in the Prober pane. Before proceeding with the Realign, it is **very important** that you align the board precisely in the **Align** tab first. Failure to do so can cause the XY location data to be modified improperly. Since Realign permanently modifies the XY data, you may also want to select **Save As...** from the File menu and save

the current database under a new name. This will allow you to work on a copy and be able to go back to the original file if problems during Realign are encountered.

Select **Alignment 1** from the drop menu. The camera will move to the first alignment point. Click **Set** to save the position.



Select **Alignment 2** from the drop menu. The camera will move to Alignment 2. Click the **Set** button to save the position. Click the Save button to make these alignment points permanent.



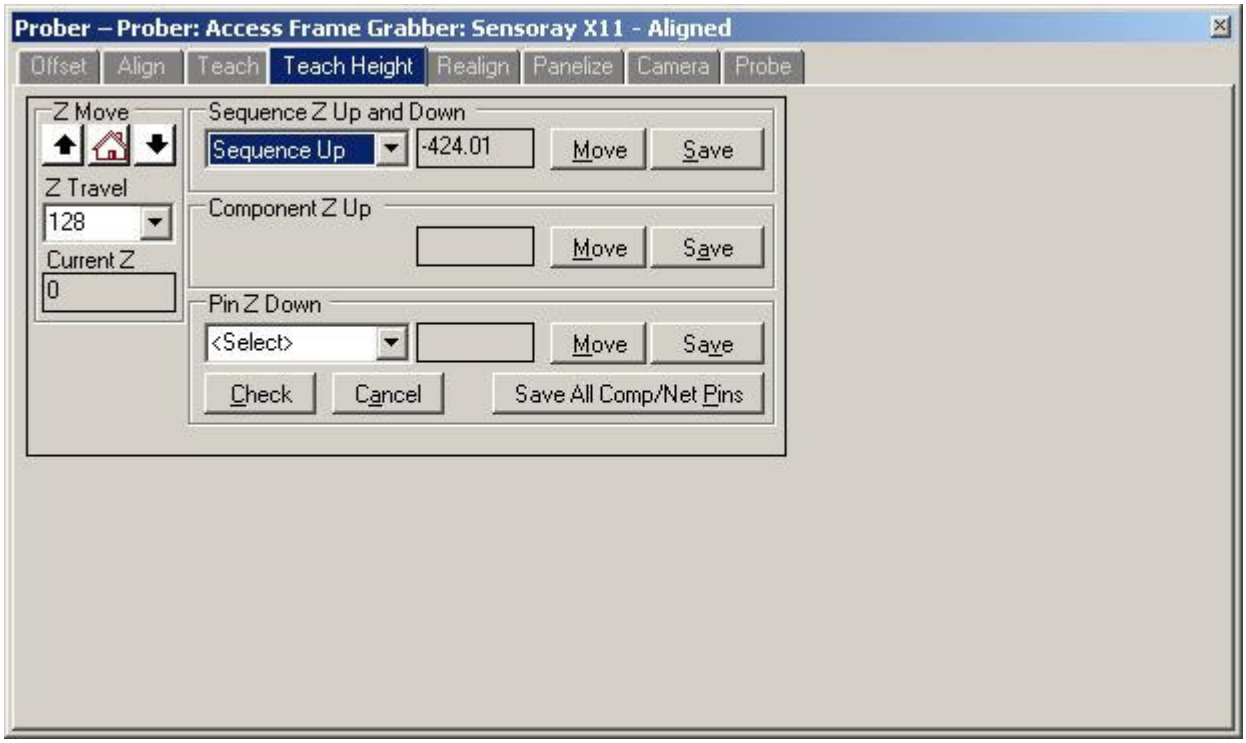
You will be prompted to make these changes. Click **OK** to continue.



Once the Realign is complete, the Z axis positions need to be set.

Teach Height

To set the up and down probe movement positions for the prober, click the **Teach Height** tab in the Prober pane. Select **Sequence Up** from the drop field in the Sequence Z Up and Down section.

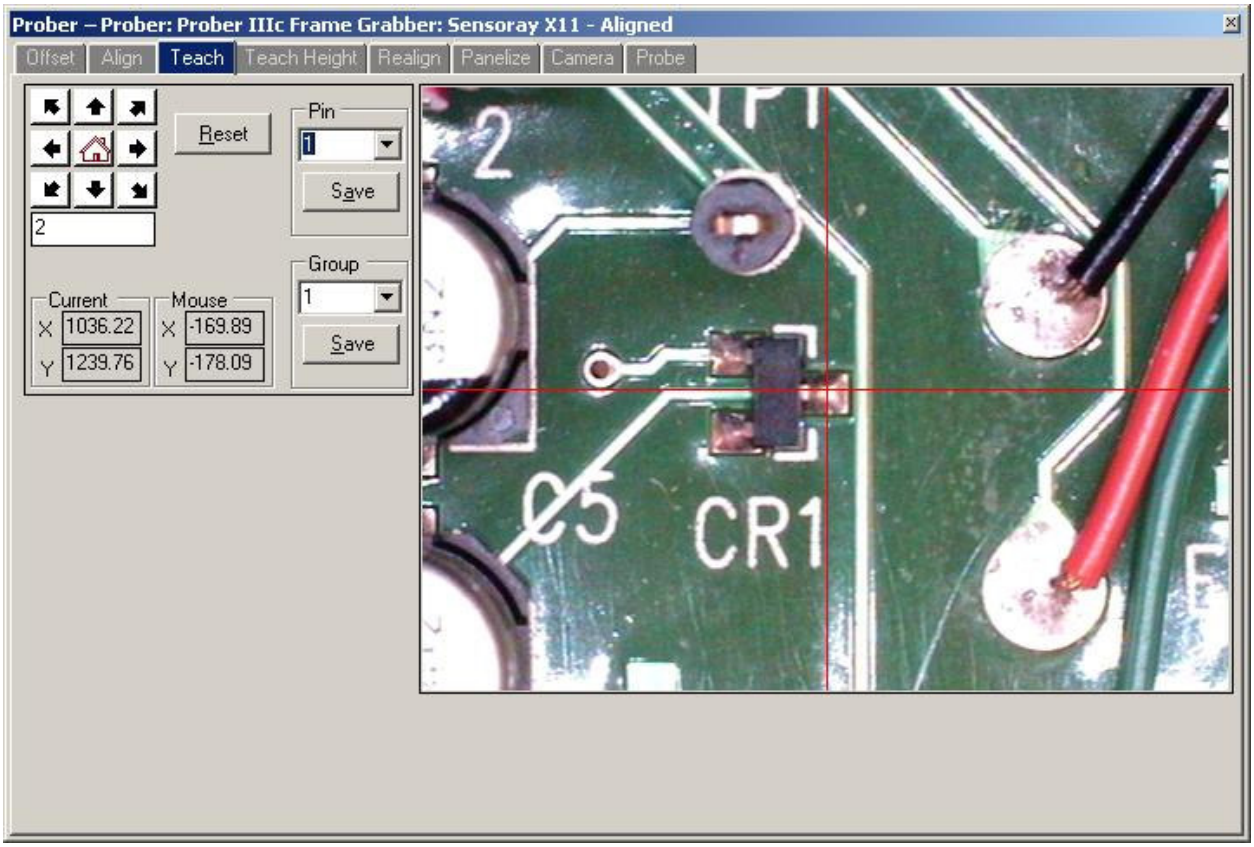


Use the **Z Move** buttons to lower the probe tip to a position above the board where it will clear any tall components or objects on the board. Use the Z Travel field to control the distance the probes with each click. Click the **Save** button to store this Z position. Select Sequence Down from the drop field in the Sequence Z Up and Down section.
Use the **Z Move** buttons to lower the probe tip until it makes contact with the board. Make sure the probe tip is down far enough to ensure good contact to the test points. Click **Save** to store the down position. You will be prompted to confirm saving the down position for all components or nets. Click **Yes** to continue.



Verify Component Position

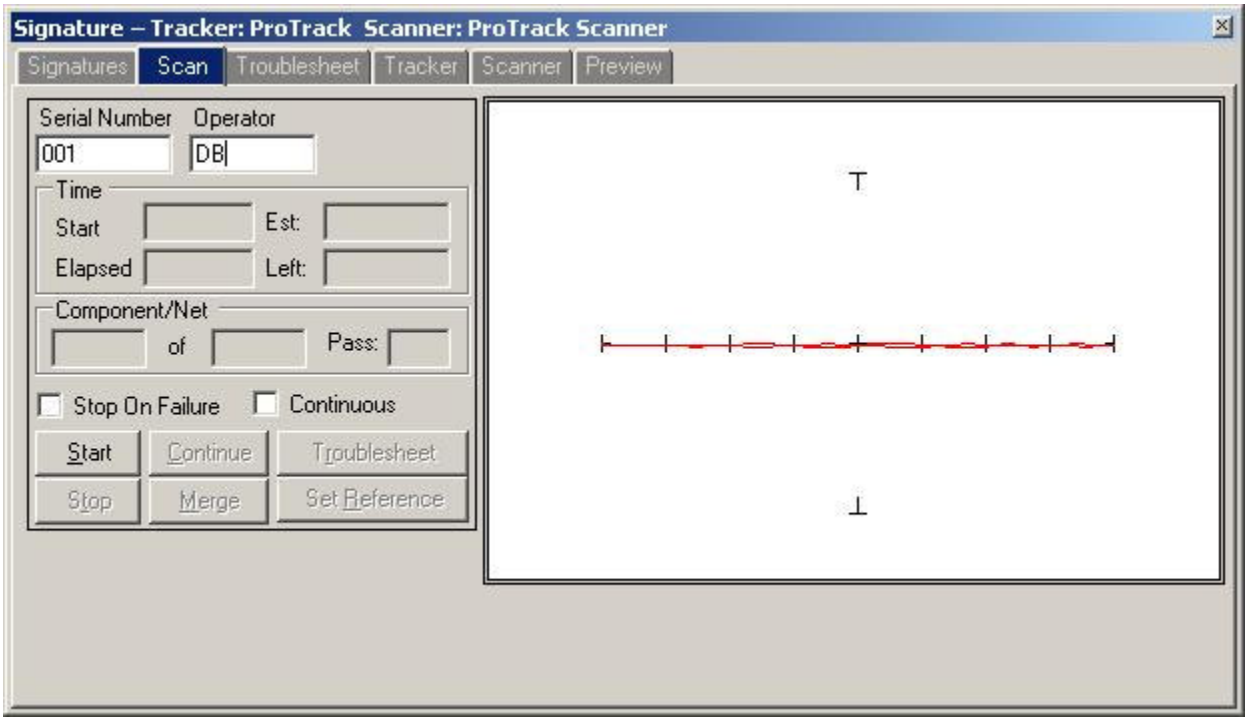
To check that all changes have worked properly up to this point, select the Teach tab in the Prober pane.



Select **Pin 1** from the Pin drop field and the camera will move to pin 1 of the selected component. Look in the status bar at the bottom of the main window or select the Component tab in the Tree pane to see which component is selected.

Scanning a Component

To execute a scan, select the **Scan** tab in the Signature pane.



Connect a Common reference lead to the board under test (typically to board ground). Type a serial number into the **Serial Number** field. The serial number is simply a name assigned to the scan and subsequently stored signatures. Click the **Start** button to execute the scanning of the selected component. Signatures will be displayed as the prober scans.

This concludes this tutorial. For more information, see the Help in the Huntron Workstation software or view the Huntron Workstation Tutorial.