Chapter 24
Design Tools

There are several tools in HCA that can make managing your home design a bit easier.

This chapter describes these tools and includes:

- Using the Program Flag Inventory
- HCA Status dialog
- Communications Monitor
- Interface Viewer
- File Inventory

Also in this chapter are three tools for the older X10 protocol.

- Using the X10 House and Unit Code Inventory
    - Viewing X10 settings
    - Changing X10 settings
- X10 Reception
- X10 Test

Program Flag Inventory

As explained in the chapter on programs, there are objects in HCA that you create that have both a name and a value. These objects are called flags. In a traditional programming language they would be called variables.

All the flags in an HCA design can be seen and managed in a dialog accessed by pressing the *Flags* button in the *Control* ribbon category.
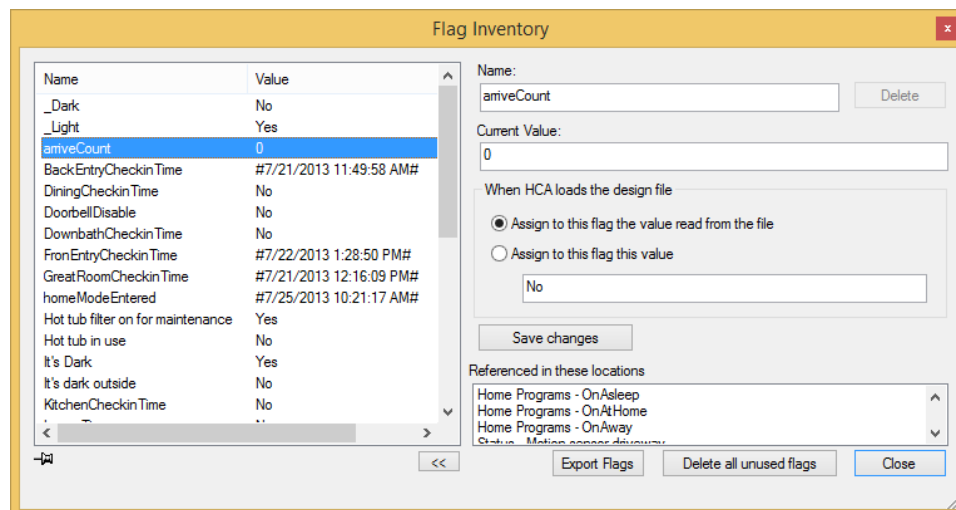
This dialog can be left open while you perform other actions with HCA and the value of each flag updates as programs that reference them are executed. If you want to temporarily stop the display from updating, click on the push-pin icon in the lower left corner of the screen. When the dialog is pinned, no updates happen to the display. Click it again to resume having the dialog update.

This dialog contains these parts:

- A list of all flags in your design with their name and current value.
- Information about the currently selected flag's value
- A list of all uses of the flag.

When the program flag inventory dialog is open you can modify the value of any flag by selecting its name in the list then changing its value in the value edit box, and pressing the *Save Changes* button. What you place in the value edit box need not be a simple thing like 100, Yes or "abc" – it can be an expression. The expression is evaluated and the result is assigned to the flag. This is an easy way to immediately see the effect of what an expression evaluates to. Enter the expression in the value edit box and press the *Save Changes* button.

When you save your design file the current values of each flag is saved. When your design file is loaded you can have HCA set the flag to that saved value or assign it a new value. This is specified in the flag inventory dialog "When HCA loads the design file" box. If you are using the restart feature of HCA, the value of the flags can come from the state file – see the chapter on Restart.

To remove a flag from your design, use the Delete button. You can't delete a flag unless it is no longer referenced any place in your design.

Hint: For more information on flags see the chapter on programs and the appendix on expressions.

Hint: When keeping the flags inventory on the screen you can use the button labeled "<<" to shrink and expand the dialog to use less screen space.

HCA Status dialog

The HCA status dialog is a quick place to go to check on the state of your design. Open the status dialog by pressing the *HCA Status* button in the *Control* ribbon category.
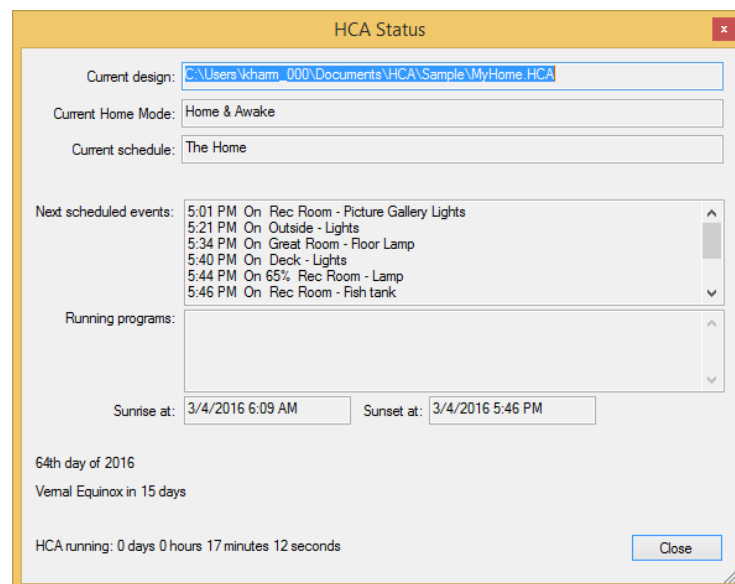
Shown in the dialog is the current schedule, the next few scheduled events and any programs currently running and what they are doing.

This dialog can be left open while you perform other tasks and HCA keeps it updated as things change.

Communications Monitor

The Communications monitor is a small window that shows when commands are sent or received from any of the interfaces connected to your computer's communications ports used by HCA to send and receive commands.

The Communications monitor is opened by pressing the *Comm Monitor* button in the ribbon *Control* category. This Window appears as:
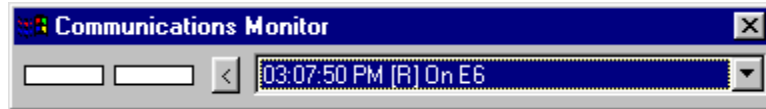
The parts of this window are:

* A rectangle that lights up when data is received from the interface
* A rectangle that lights up when data is sent to the interface
* A button that can reduce the window to just the send and receive lights or expand it to show all the information
* A drop down list that shows the last few commands with the date and time, if the command was a receive [R] or send [S], the name of the command, and the house and unit code of the command.

The communications monitor can be very useful if the interface in use doesn't have any status lights as part of its hardware.

Interface Viewer

In general, HCA takes care of all the details of interacting with the interfaces and sending, receiving, and decoding their protocols. There usually isn't a reason for you to want to see the lowest level communications between HCA and the interface but if you do, the Interface Viewer does that.

One place where you may really need to see all the data between HCA and an interface is when working with the Generic Serial and IP interfaces – detailed in the *Generic Interfaces* appendix. It can be complex working with these interfaces since all the encoding of messages you send and decoding of messages received is implemented in programs you create.

Open the *Interface Viewer* from the *Interfaces* ribbon category. This viewer shows the messages sent to and received from one or more interfaces. This gives you a window into the communications at the lowest level.
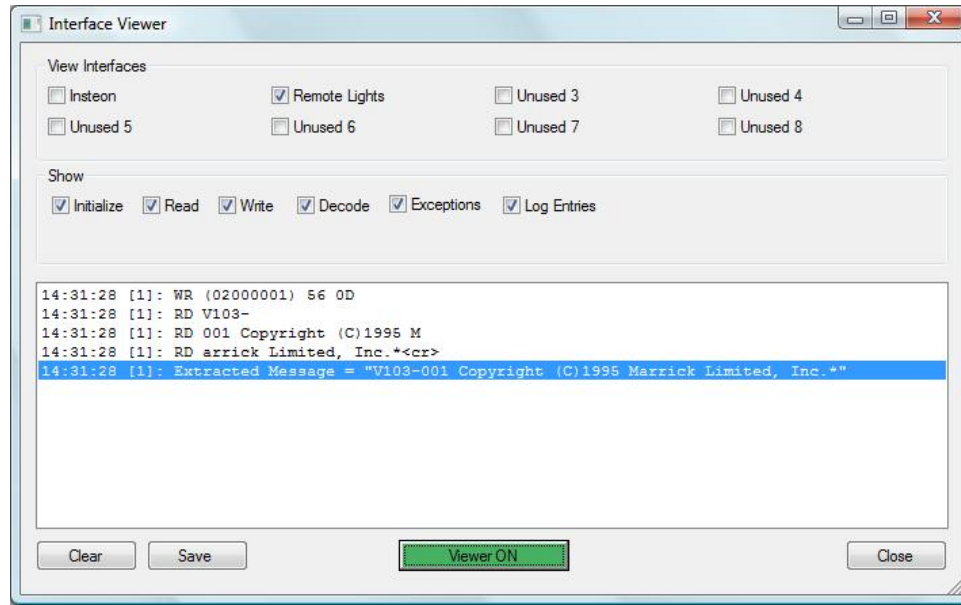
The names of the eight interfaces that can be configured are the first set of checkboxes. Tick the ones that you want to see data from. Interfaces not configured are listed as *Unused.*

The *Show* box determines what sort of information you want to view. Tick or clear the boxes for the type of data you want to see.

You can turn the viewer on or off with the button at the bottom of the dialog. When green the viewer is enabled and when red it isn't.

In the list reads from the interface are prefixed with RD, writes with WR, and if the message is decoded – some interfaces are but as explained above the receptions from the Generic Interfaces are not – they are prefixed with DC. Enclosed in []'s is the number of the interface the list entry is for. The first interface is interface 0 and the last is 7.

This interface is at a very low level so you may see, because of the nature of network and serial reads, a single reception in multiple RD lines.

You can clear the list with the *Clear* button and save the list into a text file with the *Save* button.
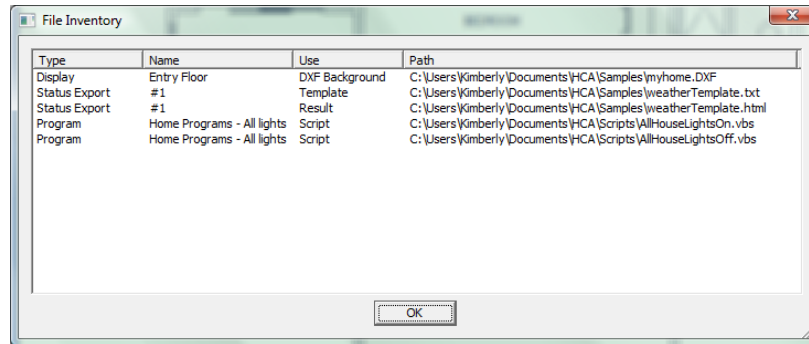
File Inventory

In addition to your design file - the .HCA file – there may be several other files that are referenced by your design. These files are:

- Display background DXF files.
- Display background image files
- HTML displays template and result files.
- IR key definition files for Global Cache IR interfaces
- Sound files referenced in "Play Sound" Visual Program elements.
- Data files referenced in "Read Data" Visual program elements.
- Files referenced in "Status Export" Visual Program elements
- Script files referenced in "Script" visual program elements

- Windows programs referenced in Visual Program "Run" elements

- The path of files used by the Weather system - import file paths, database folder paths

- Files referenced in periodic status exports

With so many files referenced from so many places in may be complex to try and keep track of them all. HCA helpfully provides one place where you can find all these files and where they are referenced.

To display this dialog, press the *File Inventory* button in the ribbon *Design Tools* category.

This dialog shows in one place all your external files that are part of your design.

Using the X10 House and Unit Code Inventory

You need to think carefully before setting the house codes and unit codes for modules in your home, because the way you assign codes can make it harder or easier to work with your design. It is smart to assign the same house code to items in the same room, or with similar functions (such as outdoor lights), and easier to control your home if you choose sequential numbers for devices that are located or used together. The logical codes and sequential listings are easier to remember, and easier to control.

Keeping track of all your devices, groups, and programs can be a daunting task. You could walk around and check each device and its codes, writing each on a master list, or you could use the device, program, and group properties dialogs to construct a list of all house and unit codes.

However, HCA makes it easy, and does this for you. The House Code and Unit Code Inventory is a fast and efficient way to check the codes that you have used in your home design. It shows you which device, group, or program you have assigned each code to. It also gives you a way to change the codes as you review them.

There are several reasons that this tool can be a helpful for you.

- You may find that after installing new devices in your home for the first time, your choices need to be changed—perhaps more than once.

- If you later add a new device to your home, it is important that you don't choose settings that conflict with another module.

The inventory dialog provides easy access to all the codes. To open this tool, select *Unit Code Inventory* from the *X10 Tools* button menu in the *Protocols* category.
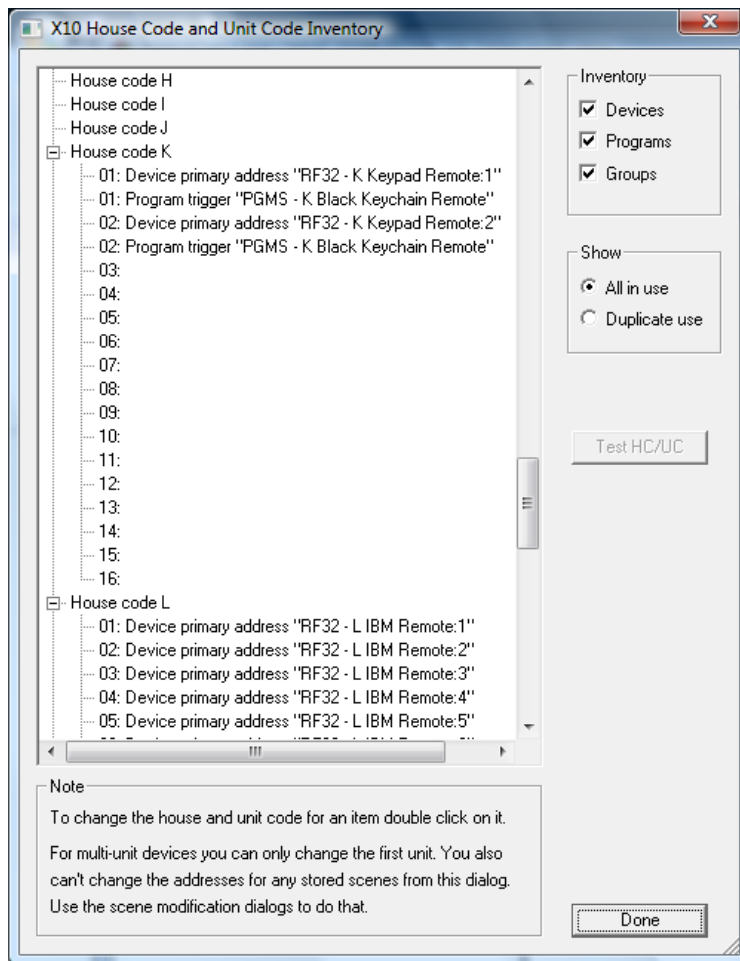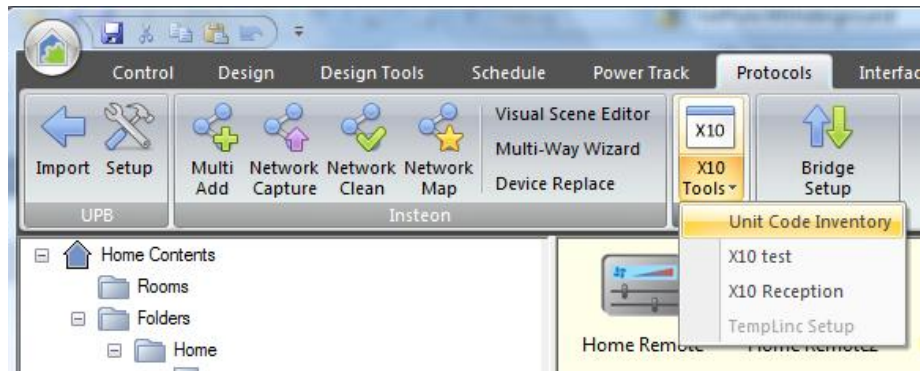
Since there are many ways that a House and Unit code can be used in your design, the Inventory displays not on the name of the item but how it is used. The possibilities are:

- Device primary address. This is what is assigned to the device on the X10 address tab.

- Device trigger. A device retransmission trigger.

- Program trigger. An X10 trigger for a program.

- Group trigger. A retransmission trigger for a group.

- Device scene. The X10 address of a scene stored in a device.

In the case of a multi-unit device, the name is suffixed with a colon and the unit number.

Viewing settings

The **display area** on the left of the dialog box lists each of the 16 house codes. Each house code that you have already used is marked with a minus sign (-) indicating that it has unit codes already assigned.

Beneath each house code, you will see its 16 unit codes. Each unit code that is used by a device, program, or group in your design, shows the name of the item it is assigned to.

You can expand or contract the house codes to hide or view the assigned unit codes.

On the right side of the dialog box are some useful controls:

- The Inventory checkboxes allow you to only show those types of items that are checked off.

- The show checkboxes allow you to show all house and unit code assignments or just ones that are assigned to more than one item. This may show you a problem in your design.

- A Test button sends an ON then and OFF command to the house and unit code selected. This may help you determine if you have the correct house and unit code selected in the module or switch. You do this by using the Test button and seeing if the light or appliance goes on.
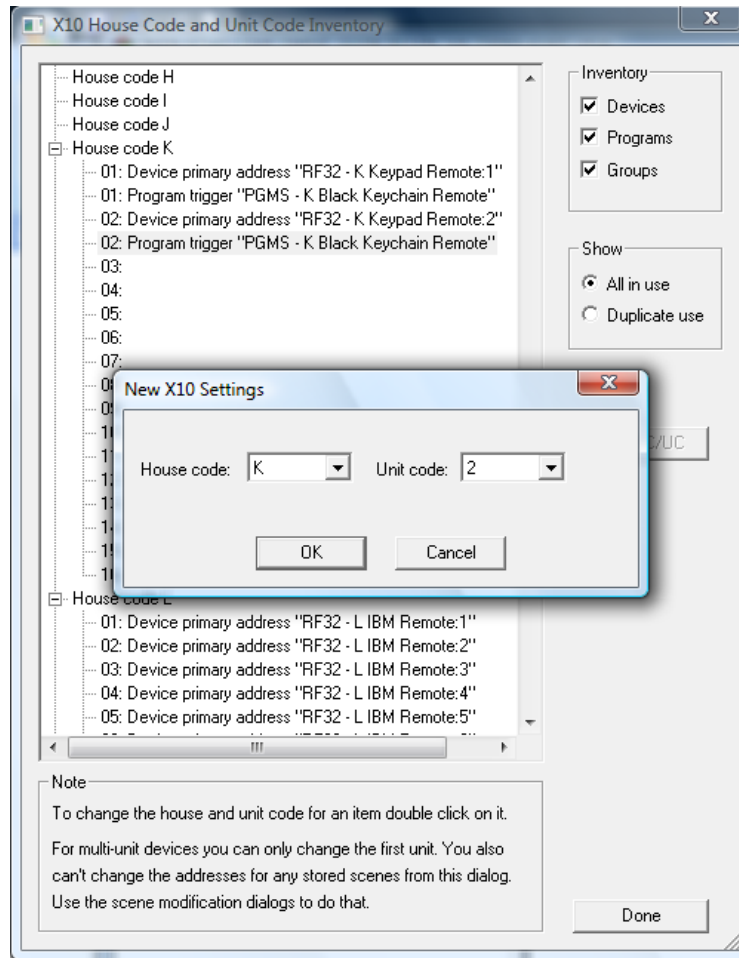
- A Done button that closes the dialog box.

Changing settings

The House Code and Unit Code Inventory dialog box not only displays X10 settings for devices, programs, and groups, but also lets you change them.

To change a setting

1. Select the object in the tree and double-click the left mouse button.

   The New X10 Settings dialog box appears.

The dialog box shows the house and unit code for the device, program, or group you selected. You can change the setting with the *House code* and *Unit code* lists.

1. Simply click the arrow, and select the new house or unit code that you want assigned to the object you have selected.

2. Click the OK button to close this dialog box.
   HCA updates the properties of the chosen device, program, or group, and the inventory dialog box reflects these changes.

Hint: Remember that changing the X10 settings for a device only changes your design as managed by HCA. You still need to make the corresponding changes on the module itself.

X10 Reception

The X10 reception tool provides an alternative view of information that appears in the log. To open this tool, select *X10 Reception* from the *X10 Tools* button menu in the *Protocols* category.
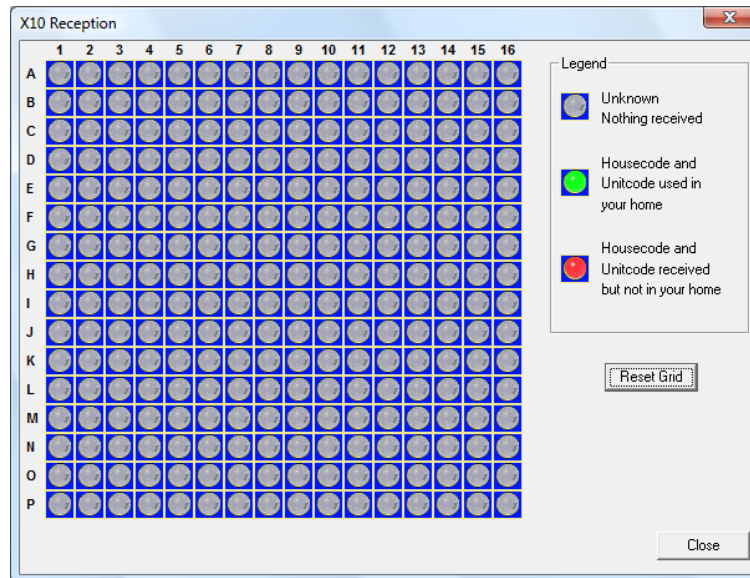
The large grid that appears in this tab shows, for each housecode and unitcode, if any X10 commands have been received by HCA and when. This could have been an ON, OFF, DIM or Status command.

The color coding tells you at a glance if the code has been received or not. If no command has been received for a housecode-unitcode, then the corresponding cell is gray. However, if a command for a housecode-unitcode has been received, the corresponding cell is green if that device is in your home design or red if it is not in your design.

To see the time when the last command was received, move the mouse over any of the 256 cells in the grid and a popup window shows the date and time of that reception. If you right click on a cell, a popup menu allows you to send an On, Off, or Status Request command to the house and unit code for that cell.

Why is this important?

This can be a useful tool to make sure that some controller in your home is not sending signals that you have not planned for. If X10 commands are being received by HCA and they don't correspond to a device, program, or group in your design, they have no effect. This may not be what you intended.

To reset the grid and have all cells show as Unknown (gray), press the *Reset Grid* button.

NOTE: This grid only shows receptions and not transmissions from HCA.

X10 Test

The X10 test dialog is lets you send continuous X10 commands on to the power line for test purposes. To open this tool, select *X10 Test* from the *X10 Tools* button menu in the *Protocols* category.
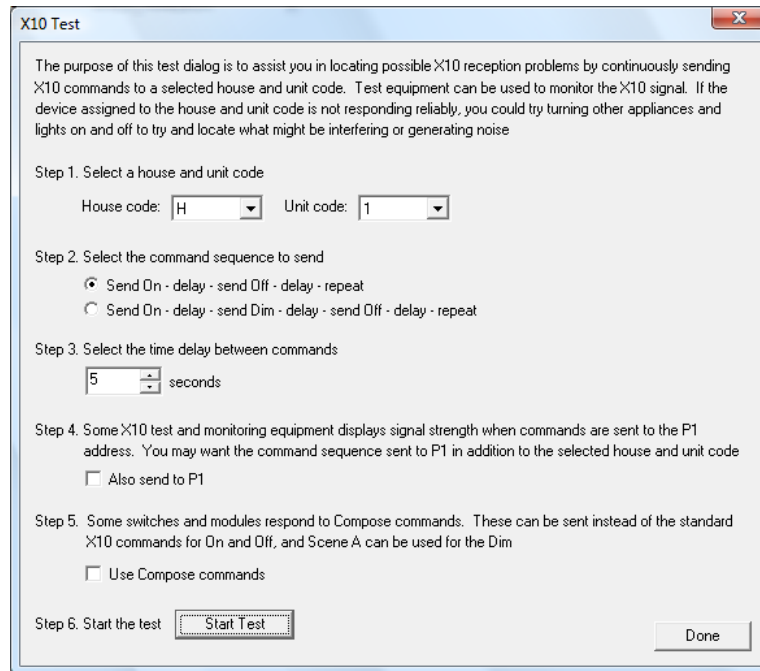
As it says in the dialog, the purpose of this dialog is to send X10 commands using your X10 interface in an effort to assess how X10 communications are working in your home.

This tool can be particularly useful if you are attempting to diagnose x10 signal strength throughout your home with an X10 signal meter. The x10 test pattern will continue to operate until you click the *Done* button.