



Sonata Quick Start
Manual
for the Ivie

iFlex 2400
DSP Automatic Mixer

February, 2009

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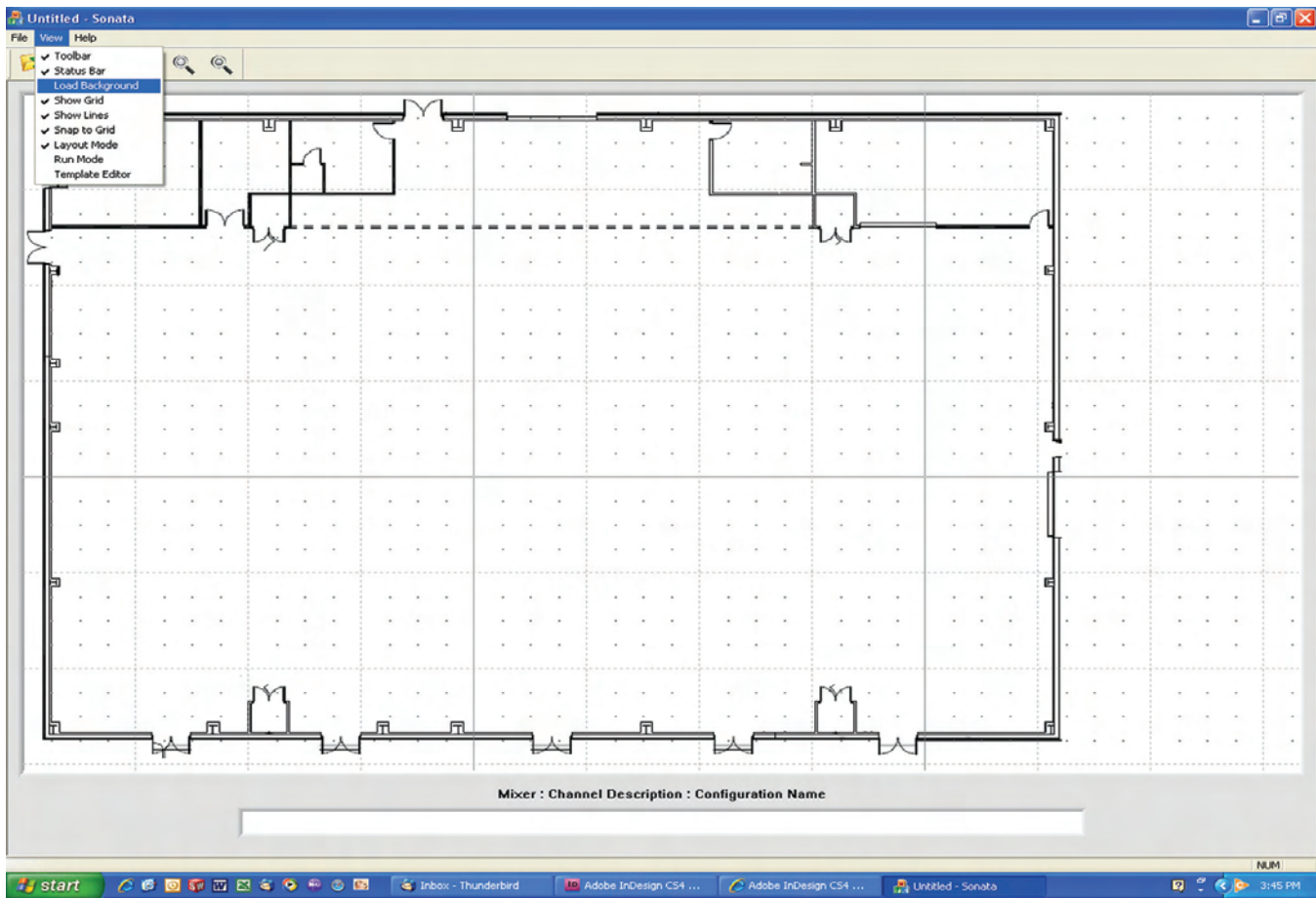


Figure 1

Layout

Designs in Sonata™ begin at the layout screen. A background is imported onto the screen, and components are placed over the background in their respective locations. The user can compare the layout screen to architectural drawings, renderings, or other background formats to verify system components and placements as a standard part of his design checklist.

Sonata™ accepts a variety of standard image file formats, such as jpeg, bmp, gif, tif, etc.. These image files will be imported with whatever size, resolution, or other limitations are associated with the image from the source. Sonata™ does not currently provide any image manipulation tools, so it is wise to adjust the image in a standard graphics package prior to importing into Sonata™.

To import a graphic into the layout background, use the 'Load Background' selection under the 'View' menu item (see figure 1). The image will be placed on the layout with left and top justification defaults. If the image requires changes, simply make the changes in a graphics manipulation package, and re-load the background.

The background in figure 1 is a simple grayscale image that was supplied in dxf format from a consultant designing a new project. It is often convenient for systems designers to use this format as it parallels common working documents.

It is also possible however, to use high resolution color images, such as satellite photos, artists renditions, etc. to provide a presentation quality user interface for sales and customer support applications (which will be discussed later in this document).

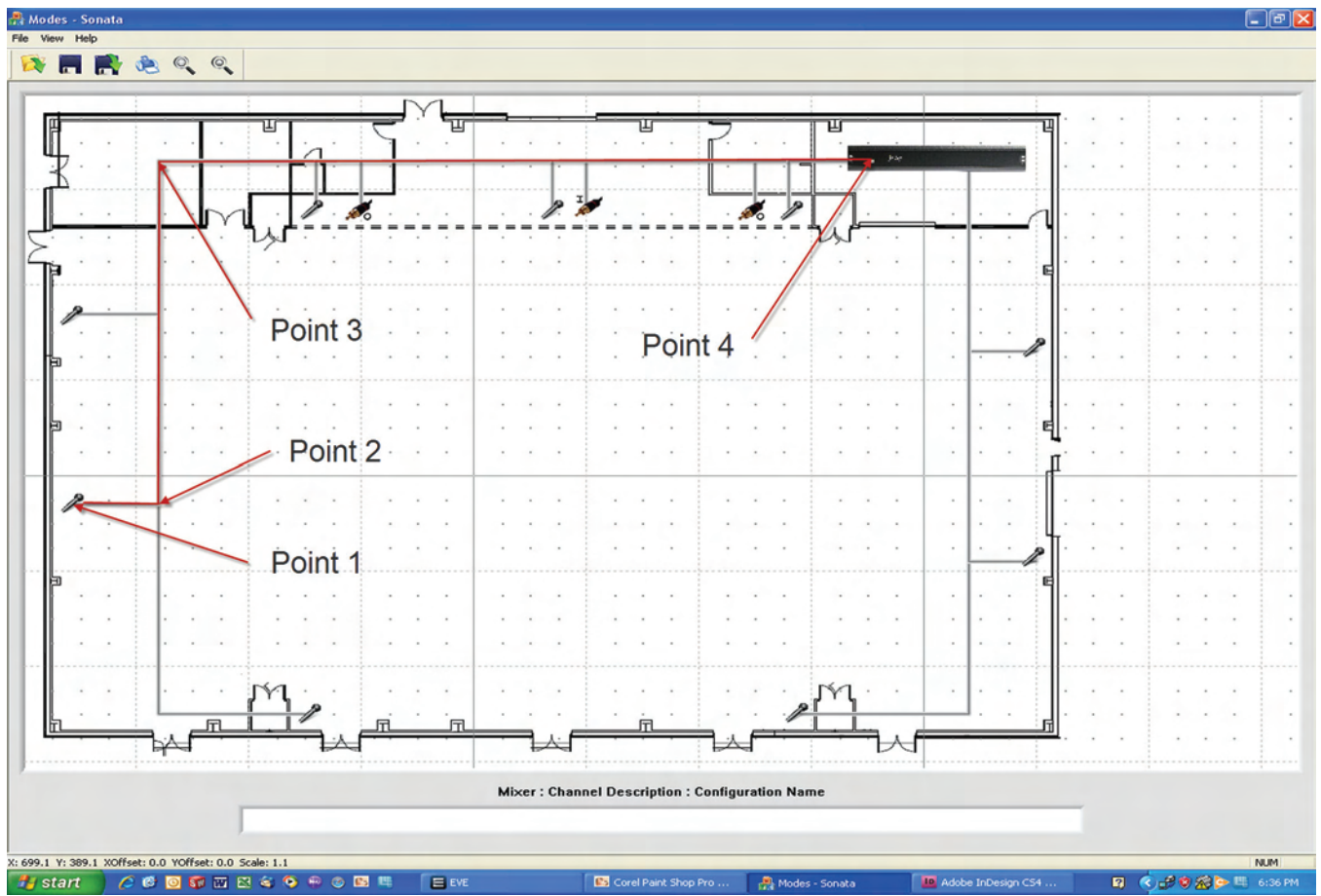


Figure 2

Input Placement

Placing inputs is a simple matter of right-clicking anywhere in the layout area and choosing the 'Create Input' option. This will place a small graphic of a microphone onto the layout wherever the mouse pointer is located. The icon can be scaled, moved and deleted using normal Windows™ conventions.

If a line input or output is desired, right-click and select the 'Create Line Input', or 'Create Line Output' options. In this case a small connector icon with the letter 'I' or 'O' will be created.

The iFlex™ mixer is placed in the same manner as the inputs above. Right-click anywhere in the layout, and select the 'Create Mixer' option. Like inputs, the mixer may be re-sized and/or moved to fit appropriately on the background.

Connections

Each input, or line output, must be connected to a mixer. In multi-box systems this is used to determine which inputs or line outputs are connected to which mixers. In a single mixer design, all are connected to the same mixer.

To connect inputs and line outputs to a mixer, simply right-click on the input or line output icon, and select 'Connect'. Connection lines are created as polylines, with the first point at the input or line output icon, any number of intermediate points, and a final point at the mixer icon (make sure your last point is inside the mixer icon area).

For simplicity in layout, it is often more visually appealing to overlay lines on top of one another (as in figure 2 above). Make sure all inputs and line outputs are connected to a mixer.

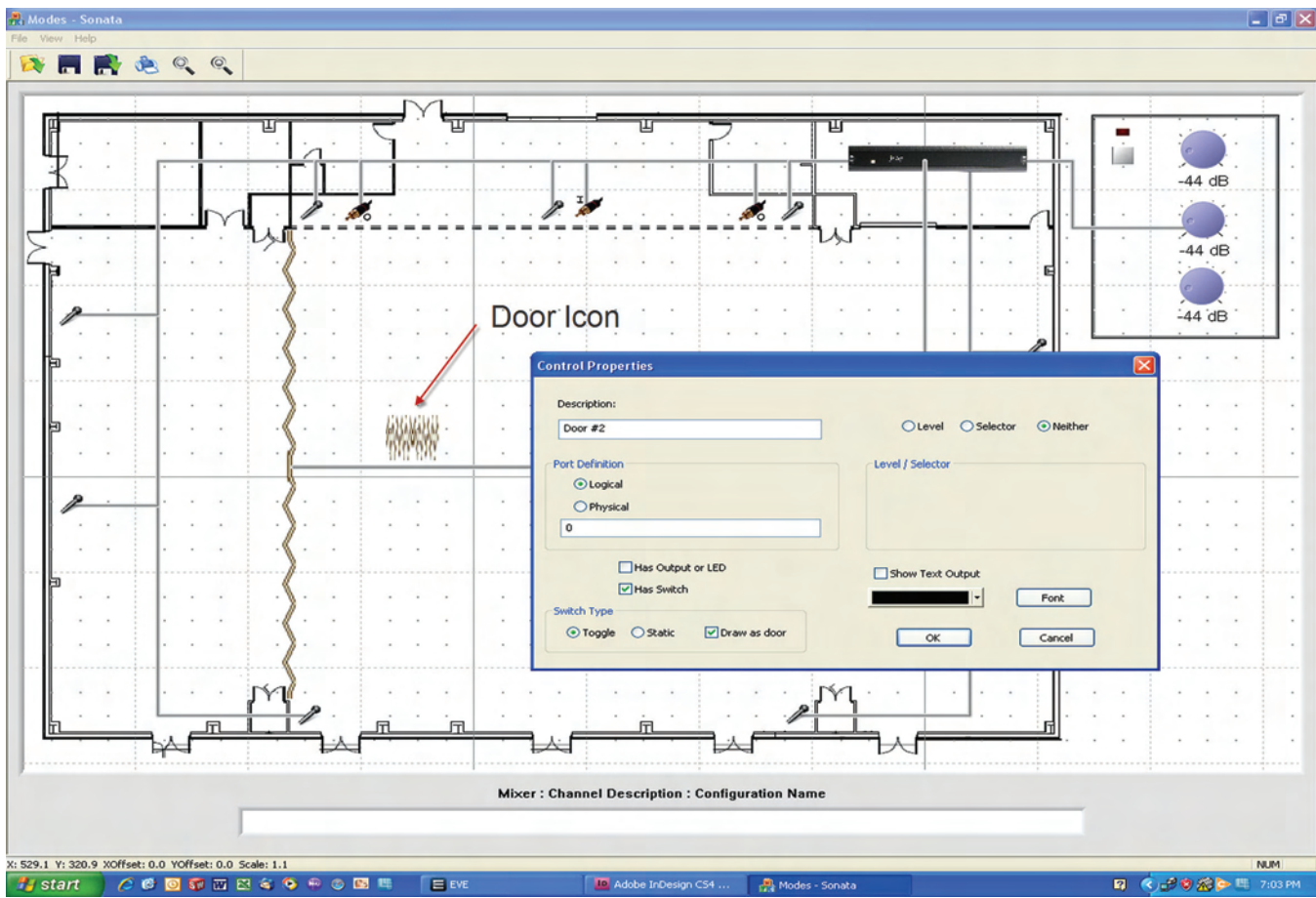


Figure 3

Controls

After placing inputs and line outputs, controls are placed. In this case, two doors are added to divide the space into three sections. Notice that doors must be connected to a mixer also (as in figure 3 above).

Controls are created by right-clicking in the layout area, and selecting 'Create Control'. In this case, a door is defined by:

1. Unselecting the 'Has Output or LED' option
2. Checking the 'Has Switch' option
3. Checking the 'Draw as Door' option
4. Checking the 'Neither' option (no level associated with the door), and
5. Unchecking the 'Show Text Output' (again, because there is no level).

Door orientation (vertical or horizontal) is determined by the aspect ratio of its icon. To make a door vertical, re-size such that its vertical axis is significantly longer than its horizontal axis.

Notice that in the upper right-hand corner of figure 3, there is a custom control with an on/off switch, LED, and three pots. To place this control, right-click and select 'Create Template', then select the file 'Control 1' from the file open dialog box (be sure to connect the control to the mixer).

The template editor feature within Sonata™ makes designing custom controls very simple, and uses a similar interface to the layout screen. iFlex™ also makes every custom control a smart control with the use of the RMPC line of pc boards that attach to custom controls. For more information on custom controls, the template editor, and the RMPC line of products please refer to the Sonata™ user manual.

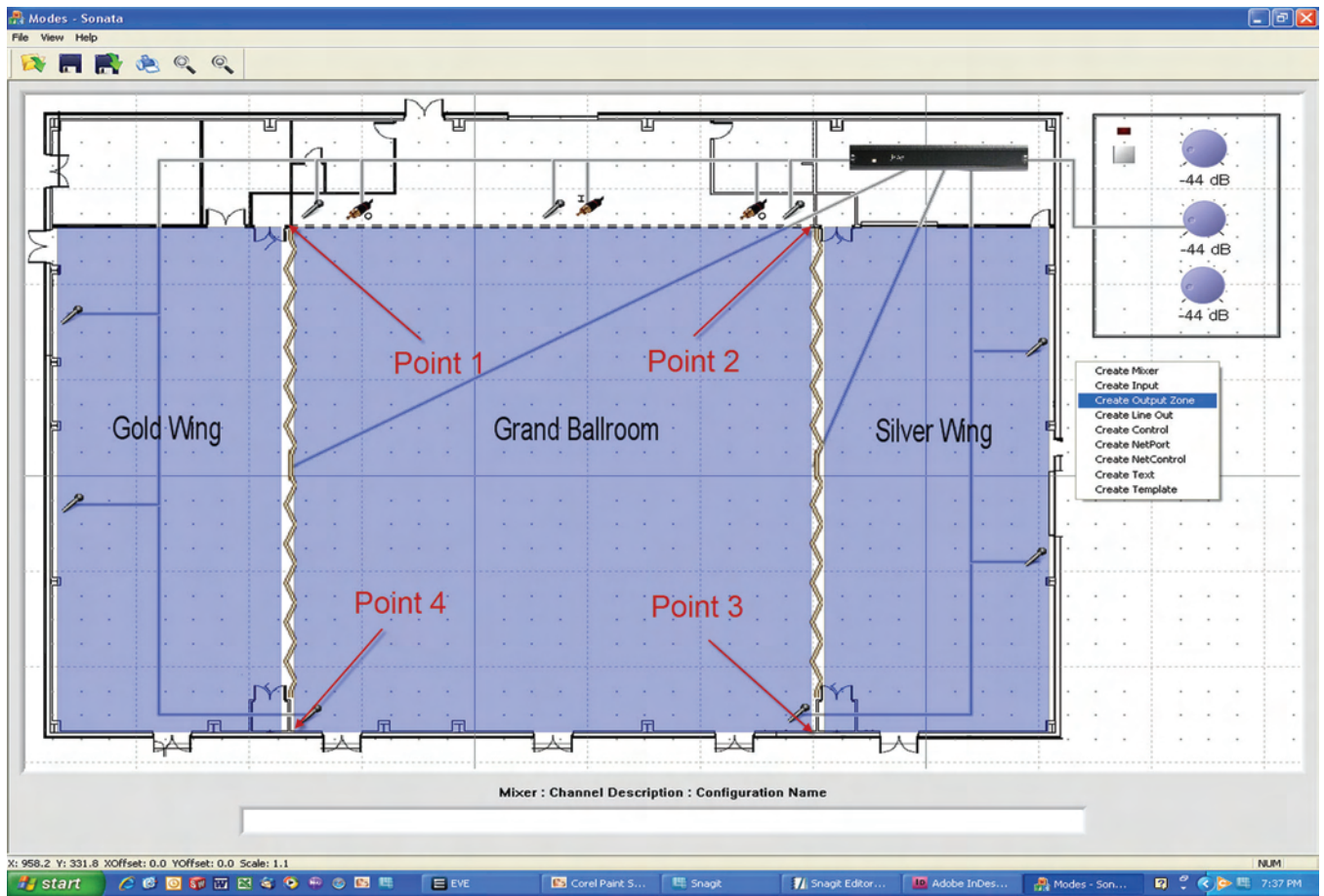


Figure 4

Output Zones

Output zones are the typical speaker zones in a design, and are an integral part of how Sonata™ helps the user visualize both the system and its logic. To create an output zone, right-click in the layout area and select 'Create Output Zone'. Much like the polylines used to connect inputs to the mixer, output zones are created by clicking at multiple points. After the final point is placed, right-click to exit zone definition.

When multiple points are selected, a shaded area will form to show the user an area affected by the zone. The shading is initially blue, but as logic is input into the system, the colors of these zones will change depending on the switch logic. This helps the designer to simulate the system changes, such as doors opening, switches being activated, etc..

In the example of figure 4, three zones are created.

One will cover the footprint of the grand ballroom, and two more will handle the side wings. The doors are placed between the wings as they show up on the design plans, and we will later use the simulation mode to show the doors opening and closing, with the changes in zone colors following the changing door states. (Make sure to connect the output zones to the mixer at this time)

Some cleanup items:

You can right-click on any of the inputs, outputs, template controls, or output zones and give them names that are more useful than their defaults. This will be very helpful in the following steps associated with inputting the system logic.

You can create and place text objects such as the labeling of the ballrooms in figure 4 above. Simply right-click, and select 'Create Text'. To change fonts, simply right-click on the text.

A Word About Modes

The heart of the programming process within Sonata™ is based on the concept of input and output “Modes”. Within Sonata™ modes provide the flexibility to create complex systems, without creating an infinite number of combinations, or requiring complex boolean logic. Modes also assist the designer in programming the system by approaching the programming in a way that is more familiar in its approach to accomplishing the task than traditional programming.

Modes can be visualized by examining inputs and outputs individually, and then determining what changes in switches can affect that input or output. Descriptive names for those changes are assigned to the modes to make the state of the input or output clear.

In the example of the ballroom, the output zones can be in several modes of operation, depending on the configuration of the doors. For simplicity we'll assume the designer has specified that all the inputs of a given room are mixed together into a single output for the zone. The possible modes for the ballroom would then be:

1. Grand alone
2. Gold alone
3. Silver alone
4. Grand + Gold
5. Grand + Silver
6. Grand + Gold + Silver

Let's also assume that the control template we added in the upper right-hand corner of figure 4 is a control that has a power switch to allow manual operation of the zone levels independent of door states. If we were to add this into the possible modes, we would need to add:

7. Manual Grand
8. Manual Gold
9. Manual Silver
10. Manual Grand + Gold
11. Manual Grand + Silver
12. Manual Grand + Gold + Silver

Luckily, there's a way to apply the manual mode to the inputs in the room to simplify the number of combinations. Only outputs zones have color though, and the limitation to the simplification would be that we would have no visual cues during simulation that the control was working. (If we created the extra output modes we could visually see the zones change color as the switch is activated).

This also highlights that the designer has the flexibility to add logic that is purely for show. He may wish to demonstrate the full working of the system in the graphic simulation in order to facilitate a sale with a customer. He may choose to always include the logic in output zones to more clearly help him debug his system. He may also choose to create whole sections of his layout page as a custom graphical user-interface for the end user. It's up to the designer.

There is more to learn about modes, their core-level functioning in the mix, and methods for defining systems. Please refer to the Sonata™ user manual for more detail.

For the current ballroom example we will put the manual modes onto the inputs, and live without the additional colors to the zones during simulation. However, after completing the quick start guide, the user may want to return and update the model to include this feature as a programming exercise.

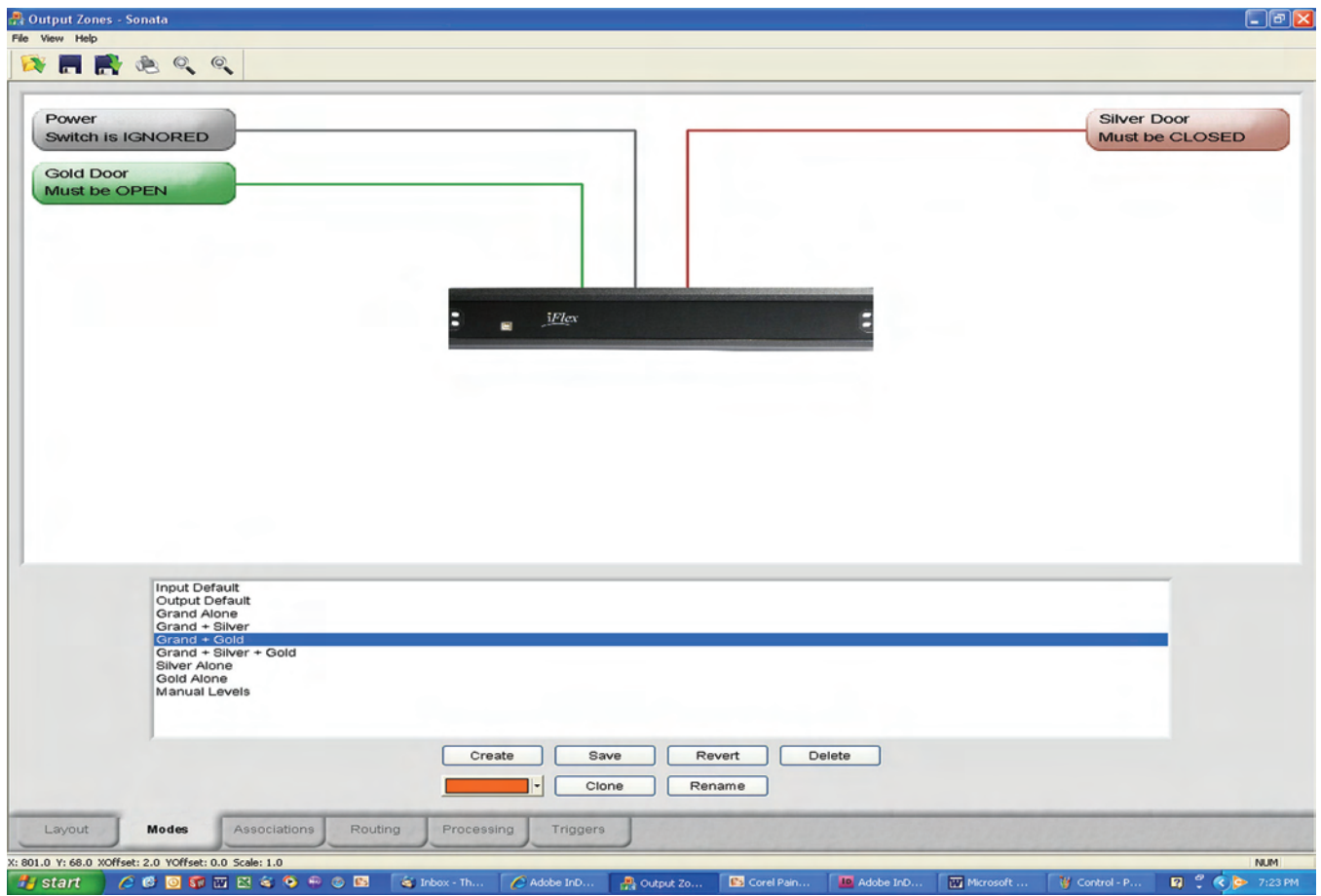


Figure 5

Modes

Double-clicking on a mixer icon in the layout page will bring the user to the modes tab. Notice that a series of tabs now appear in the lower left corner indicating a series of steps that are meant to be accomplished sequentially.

On this page the user creates the modes discussed on the previous page; naming, choosing colors, and identifying switch settings that define each mode. Switch settings are changed by left-clicking on the switch buttons above. The switch settings will cycle through all possible states as the button is selected.

There are three possible switch states:

1. On/Open
2. Off/Closed
3. Ignored

The switches are color coded to these states, with

green for on/open, red for off/closed, and gray for ignored.

It is also possible to have a selector switch, but in this model the ballroom did not use this type of control.

The user should create all the modes described on the previous page. Make sure switch settings and colors accurately describe the modes, and that all modes have been completely defined. The user may want to refer to the completed file “XXXX” to assist in the creation of modes for this example.

When all modes have been defined, pressing the ‘Associations’ tab in the lower-left corner will move the user to the next step.

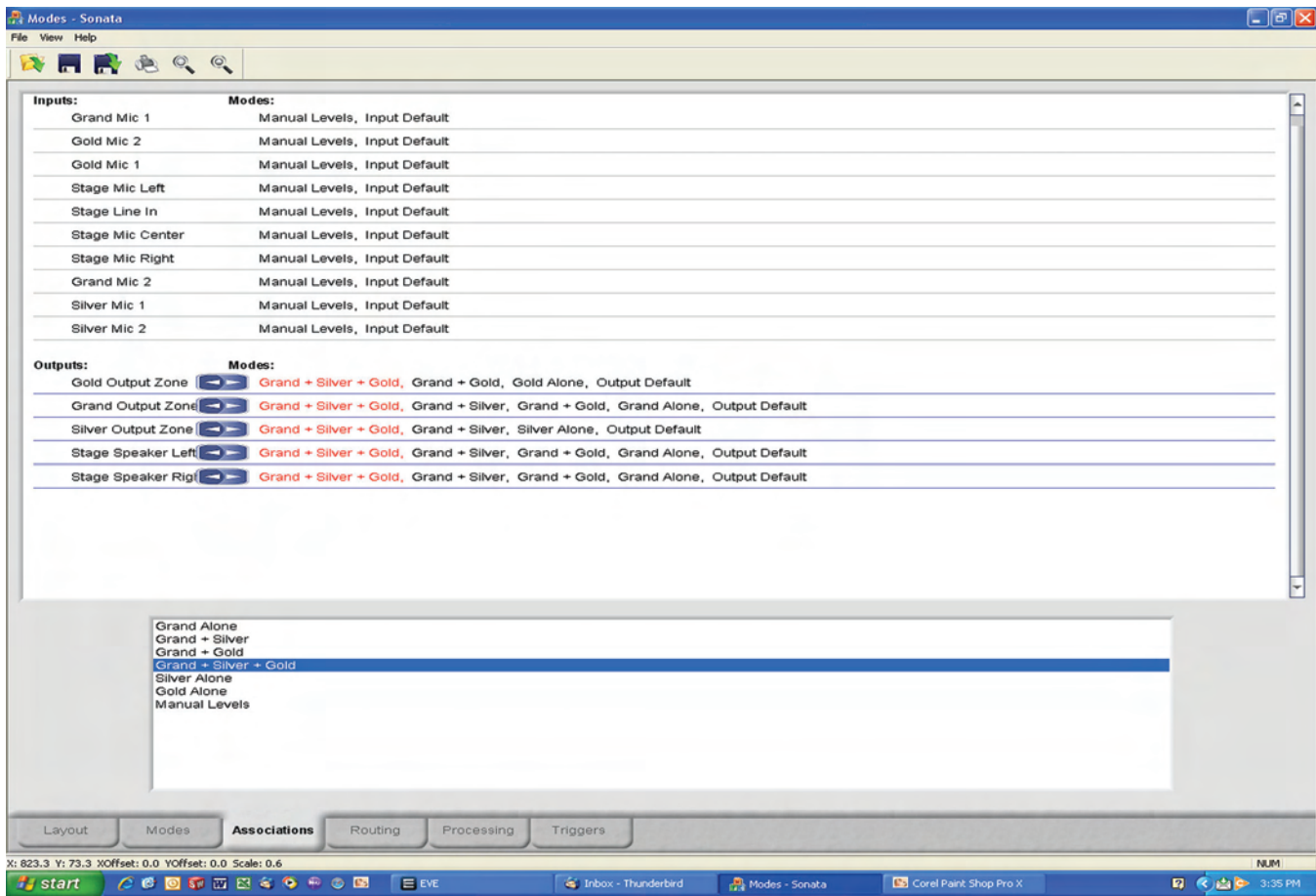


Figure 6

Associations

In the associations page, the user associates the modes to the inputs and outputs. The user identifies every mode that applies to a given input or output.

In our example, the output for the grand ballroom can be in four different modes;

1. Grand + Silver + Gold
2. Grand + Silver
3. Grand + Gold
4. Grand Alone

There is also a default mode that is assigned by the operating system for every input and output. This default can be modified, but it will apply to all inputs and outputs collectively.

To associate a mode with an input or output, select from the modes listed in the bottom-center window, and then left-click on an input or output.

The mode should show up on a list to the right of the input or output. Continue to left-click on any input or output to which that mode applies, until all associations for that particular mode have been assigned. You should see multiple instances of the mode highlighted in red.

Continue to select each mode in the bottom-center window, and make the corresponding associations until all modes and associations have been defined. The user may again want to refer to file “XXXX” to verify that all associations have been made correctly for this example.

To remove an incorrect association, select on the mode in the bottom-center window, and notice the red highlighted associations above. Place the mouse cursor over the input you want to disassociate, and right-click to remove.

Notice that when a mode is highlighted, two blue

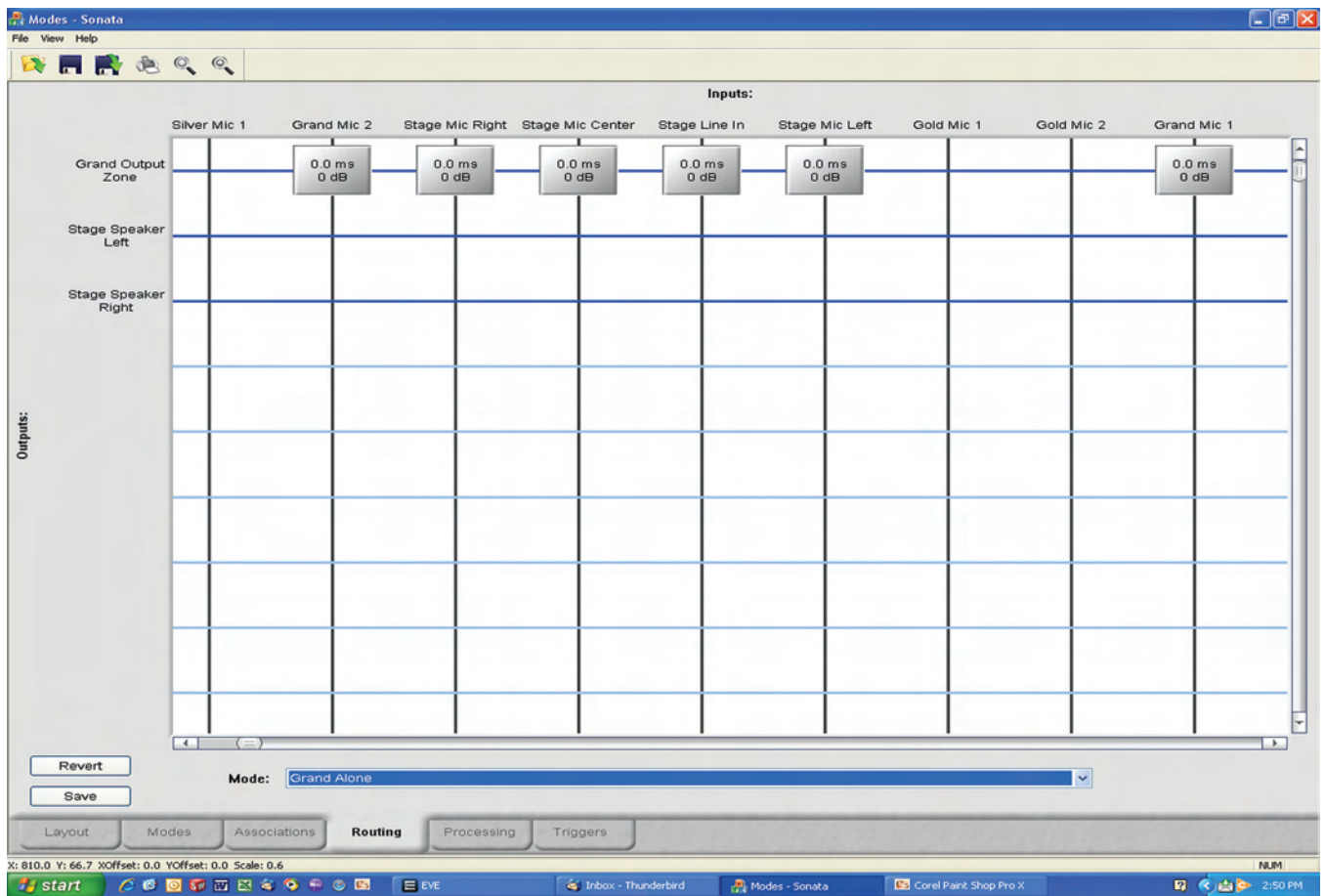


Figure 7

arrows will appear to the left of every input or output that contains an association for that mode. This allows the user to change the priority of that mode as it relates to other modes for that input or output. Higher priorities are to the left, and lower to the right. For this example, make sure to follow the priorities as shown on figure 6.

Routing

By clicking the routing tab in the lower-left corner of the screen, the user is taken to the routing screen. This screen allows the user to define the mix for each existing mode.

By selecting the mode in the section box in the lower-center of the screen, the outputs of that mode are displayed on the left side of the matrix. Only outputs associated with that mode will be displayed on the left side, but all inputs of the system will be displayed above the matrix.

To place a mix node, simply click at the intersection of the input and output. A rectangular mix node will appear, with information on delay and gain for that node.

In the example above, The mode “Grand Alone” has been selected. Notice that the inputs for the stage and the two microphones have all been selected to be mixed into the output “Grand Output Zone”. If the “Grand + Silver” output were selected, the user would see all the outputs from the grand, and all the outputs from silver combined into the outputs for grand and silver.

To modify the delay or gain of a node, right-click on the node, and edit the available properties. This provides a full cross-point delay and gain for the user.

After defining each zone, the results should look like those in the file “XXX”.

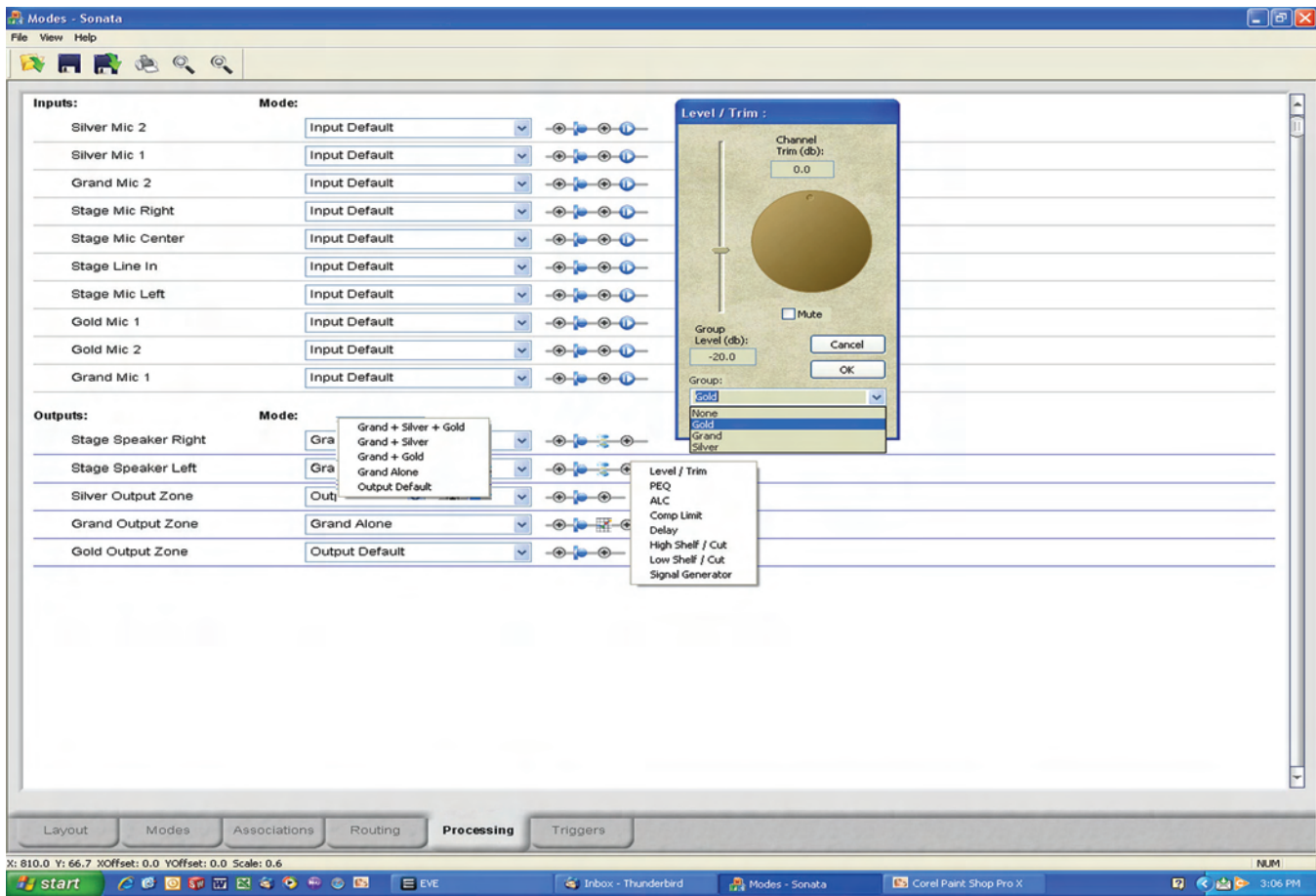


Figure 8

Processing

In the processing screen, the user can add processing elements to modes associated with inputs or outputs. The elements currently available are:

1. Level/Trim
2. PEQ
3. ALC
4. Comp Limit
5. Delay
6. High Shelf / Cut
7. Low Shelf / Cut
8. Signal Generator

To add a processing element, select a mode from the pull-down option of an input or output. All inputs or outputs associated with that mode will change to that mode so the user can make changes as a block.

Now that the mode has been selected, notice that next to the pull-down options is a line with two plus symbols, and two icons. The plus symbols will open a selection of the available processing elements, which can be placed in any order on the line.

The symbol currently between the plus symbols is a default level/trim processing element. The symbol to the right of the last plus symbol is an input gate properties element. For the purposes of our example, only the input level/trim dialog is of interest, but the user should experiment with the available processing elements to become familiar with them.

In figure 3 we introduced the control template, but never provided a way to link the controls within the template to the levels of the outputs. We also created manual modes for the inputs that were never used for anything. In this screen we pull the

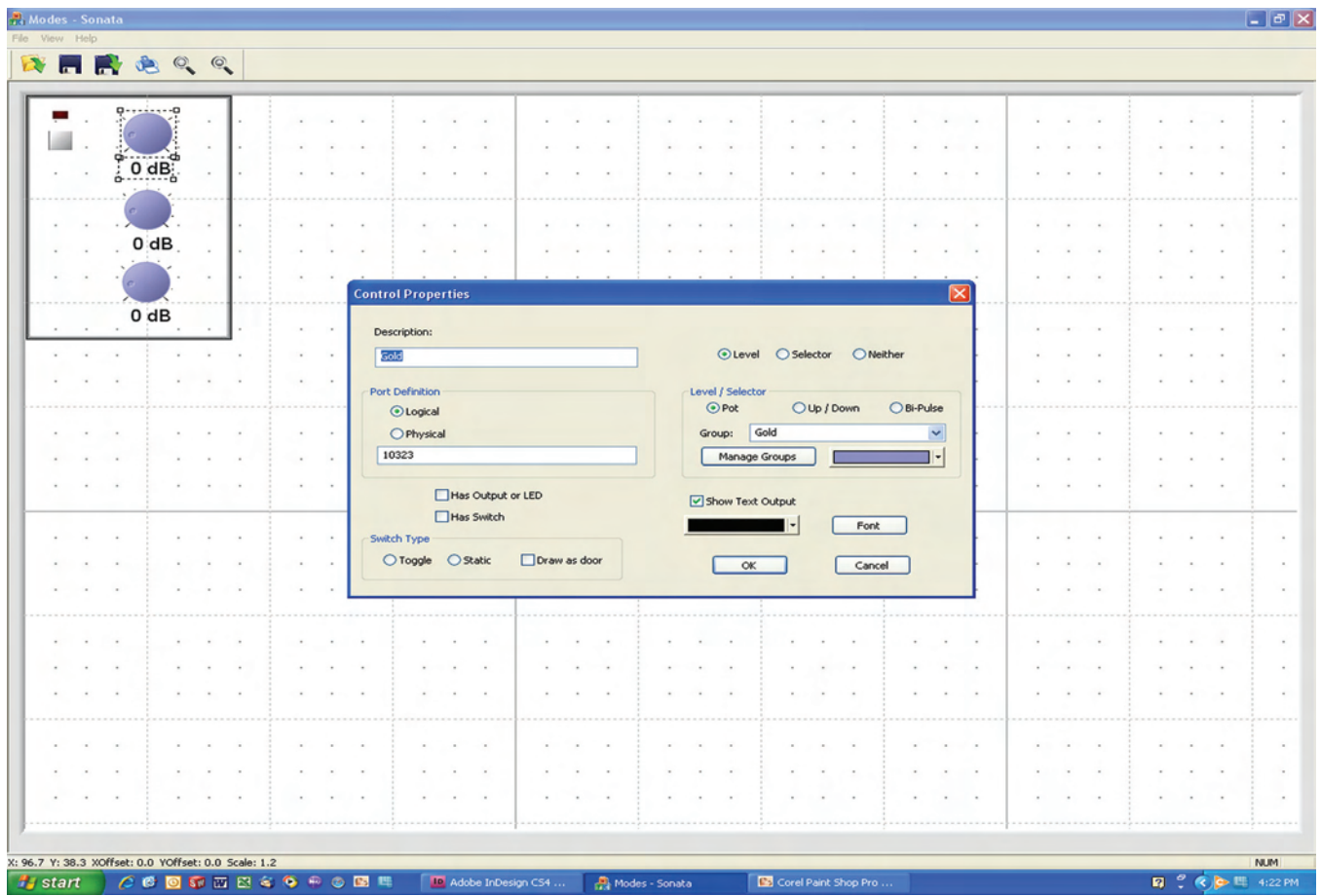


Figure 9

final elements of the control definition together to provide for the correct functioning of the manual control.

We now need to return for a moment to the layout page, and make some changes to the control template. Select the layout tab in the lower-left corner of the screen, and then right-click on the control template in the upper-right corner of the layout. Select “Properties”, and the user will be taken to the template editor screen (see figure 9).

Right-click on the top level control knob, and select “Properties”. The properties dialog box will appear. Edit the description of the knob to be “Gold”, then click the “Manage Groups” button. Create a group named “Gold”, and the select it through the pull-down option above the manage group button. Repeat this process until the three knobs are labeled “Gold, Grand, and Silver” respectively, and are assigned to those names

respectively as well.

Return to the layout page by selecting the ‘View, Layout Mode’ menu options on the menu bar above. Now double-click the mixer again, and select the processing tab. You are back where you started, but now you’re ready to finalize the control connections.

In the default level trims (between the two plus icons), there is a way of matching the groups created a moment ago, with the individual inputs. First, select the ‘Manual’ mode from the pull-down options next to any of the inputs. all the input modes will automatically change to ‘Manual’. Now select the ‘Gold Mic 1’ input level trim element between the two plus icons (you should see the dialog illustrated in figure 8).

In the ‘Groups’ pull-down menu of this dialog, you should be able to select the ‘Gold’ group. This

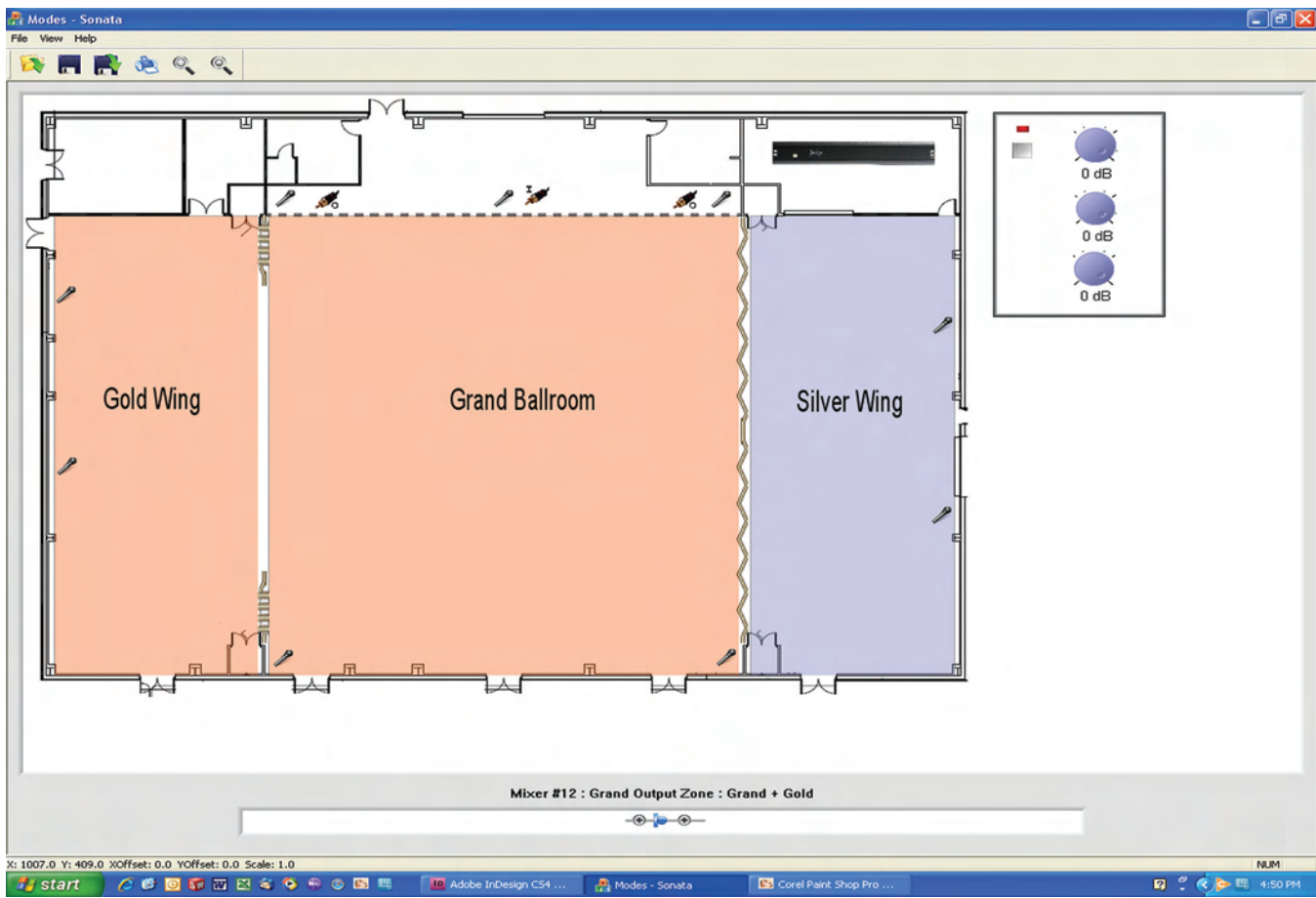


Figure 10

will set the mixer to control the 'Manual' mode level with the level control that has the same group name. Set all the gold inputs in manual mode to this same group designation, and they will all follow the level control defined in our template.

You will want to complete the programming of the other inputs, using the 'Grand' and 'Silver' group names where appropriate.

Simulation

You have now completed the programming of the iFlex mixer for the ballroom example. You may at this point want to again compare the model to the file "XXX". You should now be ready to use the simulation/debugging features in Sontata™.

Return to the layout screen by selecting the layout tab in the lower-left corner of the screen. Now select the 'View, Run Mode' option of the menu

bar in the upper-left corner of the screen. You should now see something similar to figure 10 above.

If you see lines or grid points when you didn't want them, you can go back to the layout view ('View, Layout Mode' from the menu bar), and turn them off ('View, Show Lines/Grid'). When you return to the run mode ('View, Run Mode'), they should be gone.

Play around with the folding door switches to watch your logic displayed. You can turn the manual switch on, but remember that since the 'Manual' mode was placed on the input side of the mix, no colored output zones will change.

You can also select any output zone, in any mode, and look at the processing elements associated with that zone in that mode. The processing elements for the selected zone are displayed in the

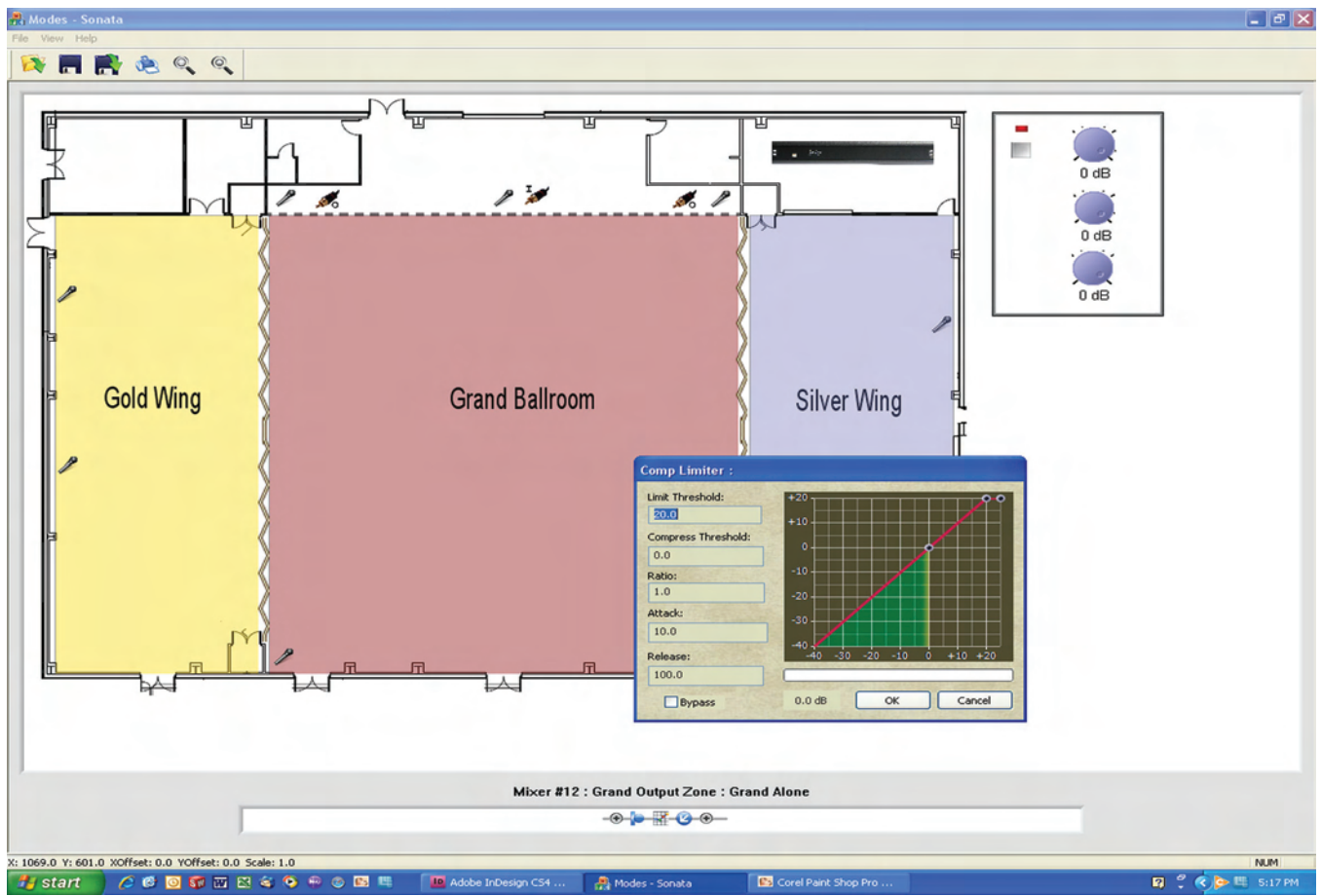


Figure 11

bottom-center of the screen, and will update whenever you select a new output zone, or a mode changes for the selected zone. You may also add, modify, or delete processing blocks for the selected zone and mode displayed in this window.

As an example, the designer can watch the ALC parameters change as input levels change, modify PEQ filters in real-time, and hear the changes, or see the modes change as doors are opened from across the building.

The simulation feature in Sonata™ is a powerful debugging tool. The ability to display logic visually helps the designer to identify faulty logic before the install, see the effect of priority changes in modes in real-time, and verify/modify processing elements as the system operates in its different modes.

Beyond the run mode, Sonata™ also connects to any iFlex mixers in a system to provide a real-time window of the system as it operates. Smart sensors communicate through the iFlex mixer to Sonata™ to show doors opening and closing, switches and levels changing, and processing elements as they operate.