

CHIME Desktop Developer Guide

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CHIME Desktop
Developer Guide

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Definition

The CHIME Desktop is designed as an aid to children, teachers and support personnel. It can:

- ❖ For all children: Be a teaching aid to learn about shapes, colors and simple concepts.
- ❖ For non-verbal children: Provide a simple to use communication device.
- ❖ For Teachers: Provide a comprehensive lesson and quiz creation tools.

CHIME Institute

The CHIME Institute develops and implements model programs that support children to achieve their maximum potential, and that provide dynamic research and training environments to disseminate best educational practices.

More information about the CHIME Institute can be found at <http://chimeinstitute.org/>. Use of the word CHIME, and of the CHIME Institute logo is used in this document by permission of the CHIME Institute.

Architecture

The CHIME Desktop is based on the idea of a student desktop, In this desktop the user can have a book open, which can have any number of pages. Each page can have any number of areas, which can carry out actions when they have the focus, and when selected.

Structure

The following describes the structure of the CHIME Desktop.

User

A User is a person that uses the CHIME Desktop. Each user can define his/her personal [books](#).

Area

An Area is a place that the [user](#) can bring into focus (make available for selection), or select.

Page

A Pages is a set of [areas](#).

Book

A Book is a set of [pages](#).

Support Person

A Support Person is a person that defines [books](#) for a [User](#).

Location

A Location is a place where [books](#) are defined by a [Support Person](#)

Equipment

These are the hardware requirements for the equipment that the CHIME Desktop uses.

User

A User requires the following:

Computer

A laptop running Windows XP, capable of running the .NET Framework (see [current requirements](#)), DirectX9.0 or later (see [current requirements](#)), and SAPI 5.0 or later (see [current requirements](#)). The laptop should have at least two USB ports available.

Note that a touch screen laptop (also known as a Tablet PC) can be used.

USB Hard Drive

Each [user](#) requires an USB Hard Drive (also known as USB Flash Drives), which will contain the CHIME Desktop and all the [books](#) for the [user](#).

Switch Interface

In those cases where the [user](#) is unable to interface with either the standard mouse or touch pad interface in the laptop, or touch screen if available, the CHIME Desktop can make use of an external switch interface, with up to five (5) switches.

This interface is made by using the electronics from a USB mouse, and soldering standard 3.5 mm mono jacks across each switch.

Enabling the Switch Interface

The switch interface is enabled by setting the [user](#) profile [PhysicallyImpaired](#) entry to Partial.

Audio Interface

The audio interface allows the CHIME Desktop to properly route voice output to either the [user](#), or the environment. It is created by splitting the right and left channels and directing the left channel to a speaker, and the right to a headset to be worn by the [user](#).

Location

A Location requires one or more of the following:

Computer

A computer running Windows XP, capable of running the .NET Framework (see [current requirements](#)), DirectX9.0 or later (see [current requirements](#)), and SAPI 5.0 or later (see [current requirements](#)). The computer should have at least one USB port available, or two if a [Switch Interface](#) is to be used to duplicate the [user](#) environment.

Networking Multiple Computers

Multiple computers at a location can be made to share the [books](#):

Server/Client Configuration

A shared directory can be created in the server and mapped by all the stations. Each station sets the Environment Variable “CHIME” to the mapping of the directory.

Master/Client Station Configuration

One computer is set to be the master station, and should share the “CHIME Desktop” directory under the installation directory. The Client stations map the shared directory and the set the Environment Variable “CHIME” to the mapping of the directory.

Software included in the CD ROM

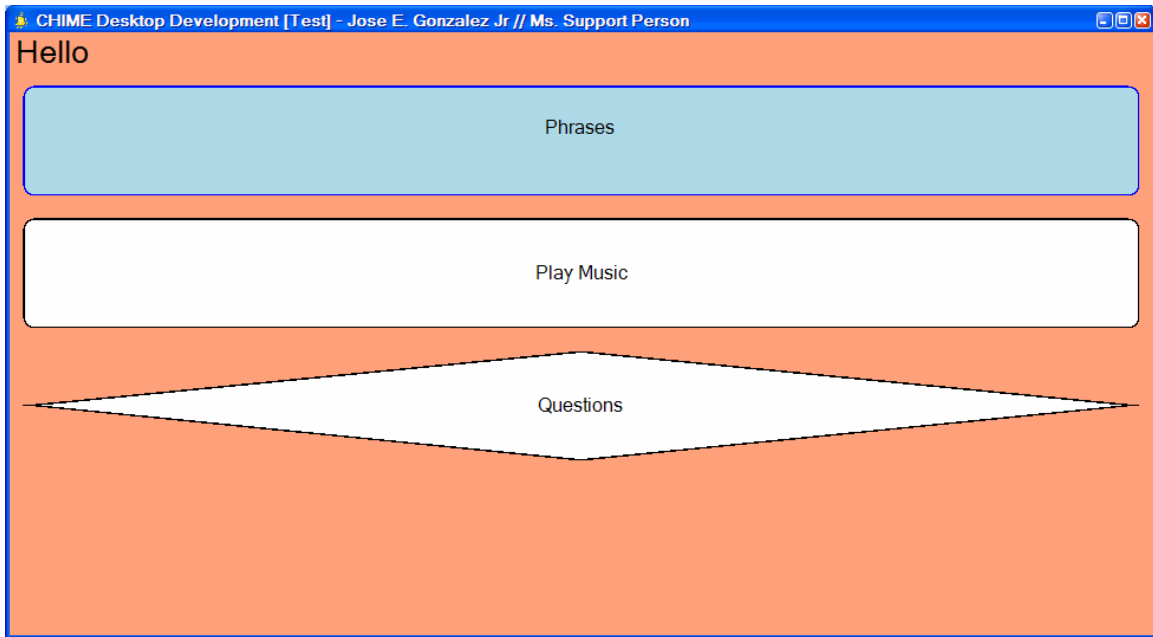
The following software is included in the CD ROM.

Directory	File	Use
	CHIMEDesktopSetup.msi	The CHIME Desktop
	CHIME Desktop.doc	This document
NETFramework	dotnetfx.exe	Microsoft .NET Framework version 1.1
DirectX	DXSETUP.exe	Microsoft DirectX version 9.0
Speech	setup.exe	Microsoft Speech Development Kit version 5.1

All of the software from Microsoft, are copyrighted products of Microsoft, Inc, and require that the installer agree to End User Licensing Agreements when installing.

Theory of Operation

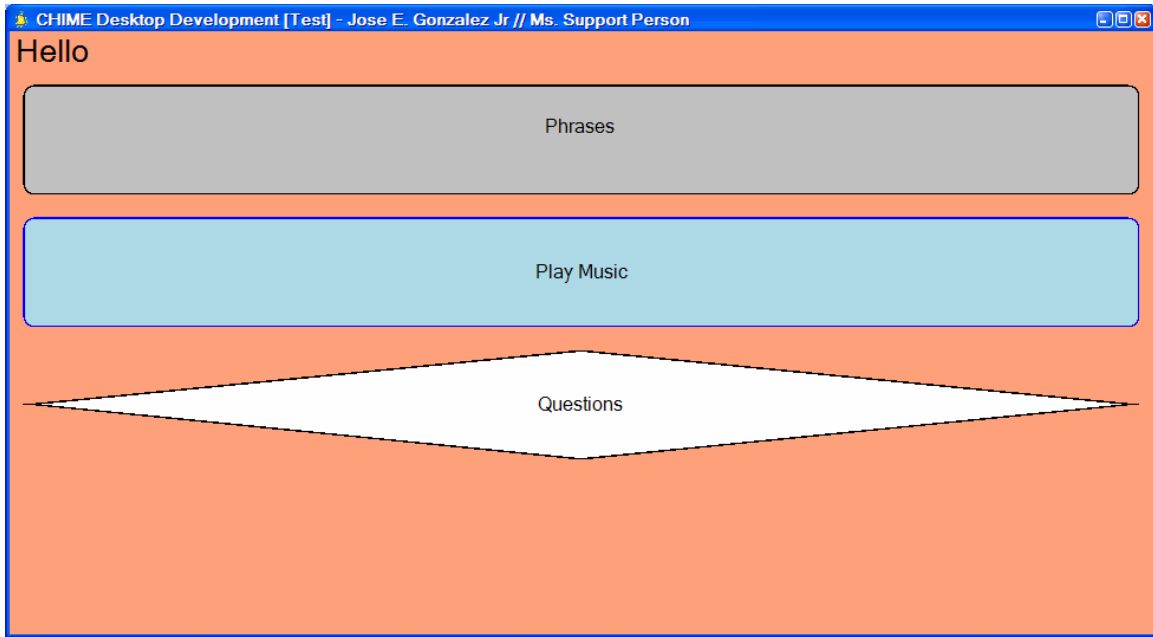
The best way to understand the CHIME Desktop is by looking at a sample page:



This page has three areas: “Phrases”, “Play Music” and “Questions”.

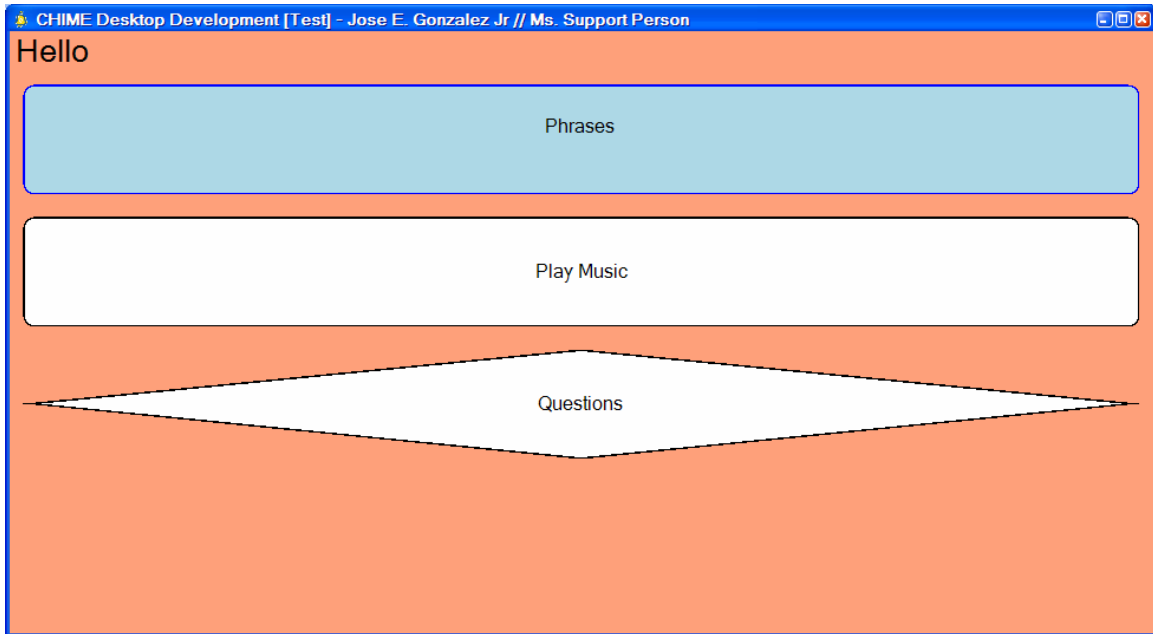
When the CHIME Desktop is running, the system starts by giving focus to the first area, and when that happens, the area can be defined to carry out some action. The action that we have defined is to turn the area background to light blue. At this point in time the user can tell the CHIME Desktop to move to the next area, which will make the page look like this:

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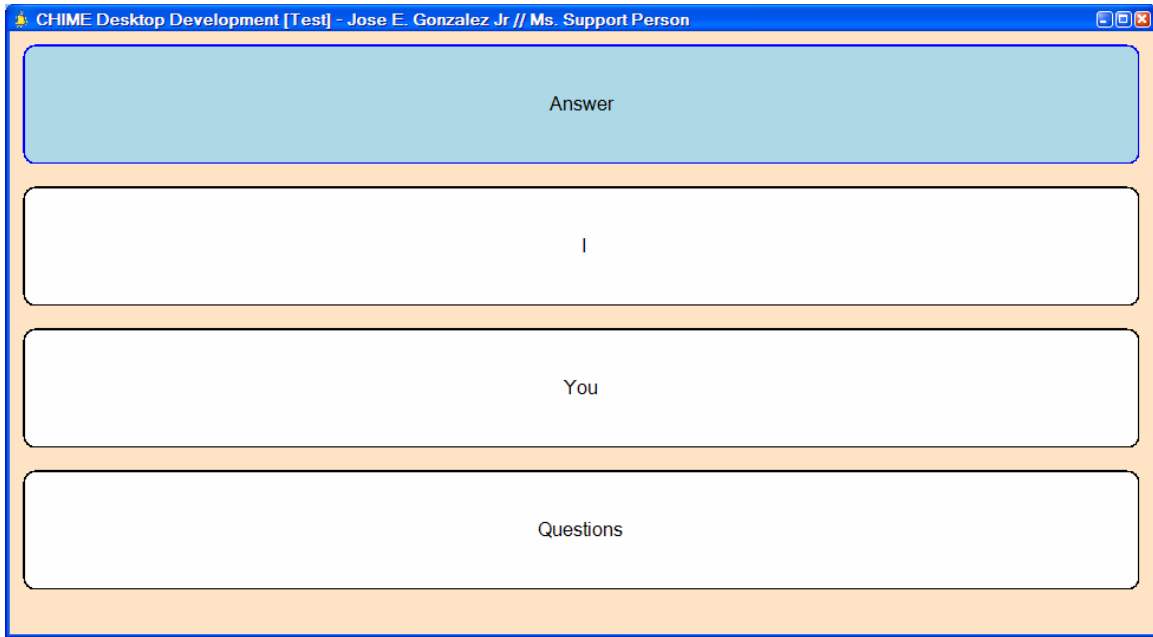
This action makes the original area (“Phrases”) go back to its normal state, and gives focus to the next area (“Play Music”).

The user can also ask the CHIME Desktop to go back, which would take the focus away from “Play Music” and return it to “Phrases”.



When an area has focus, it can be selected, which executes a second set of actions. In our case the CHIME Desktop is told to move to a different page:

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There are other actions that can be performed, for instance to play a sound.

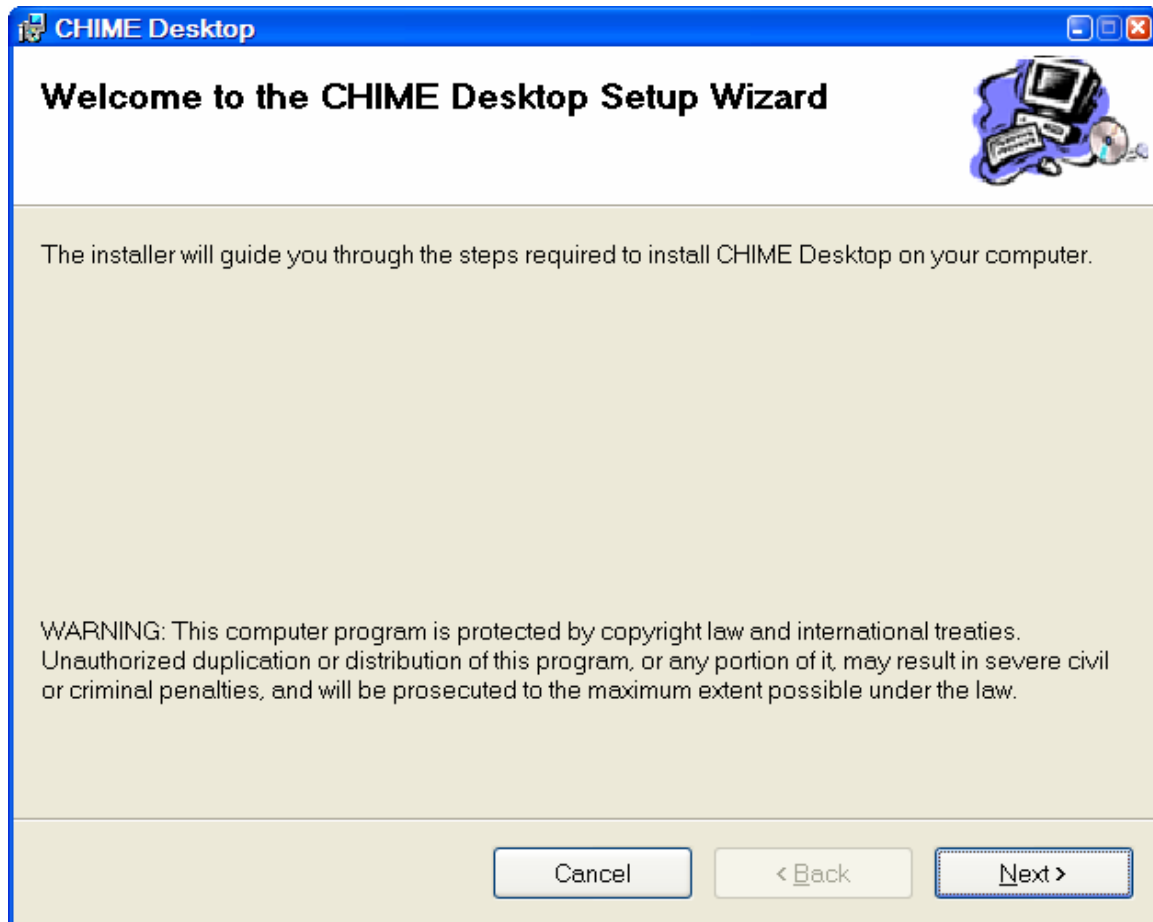
These are the basics of the CHIME Desktop. They are quite simple but allow for the creation of very powerful systems.

Setting Up a CHIME Desktop System

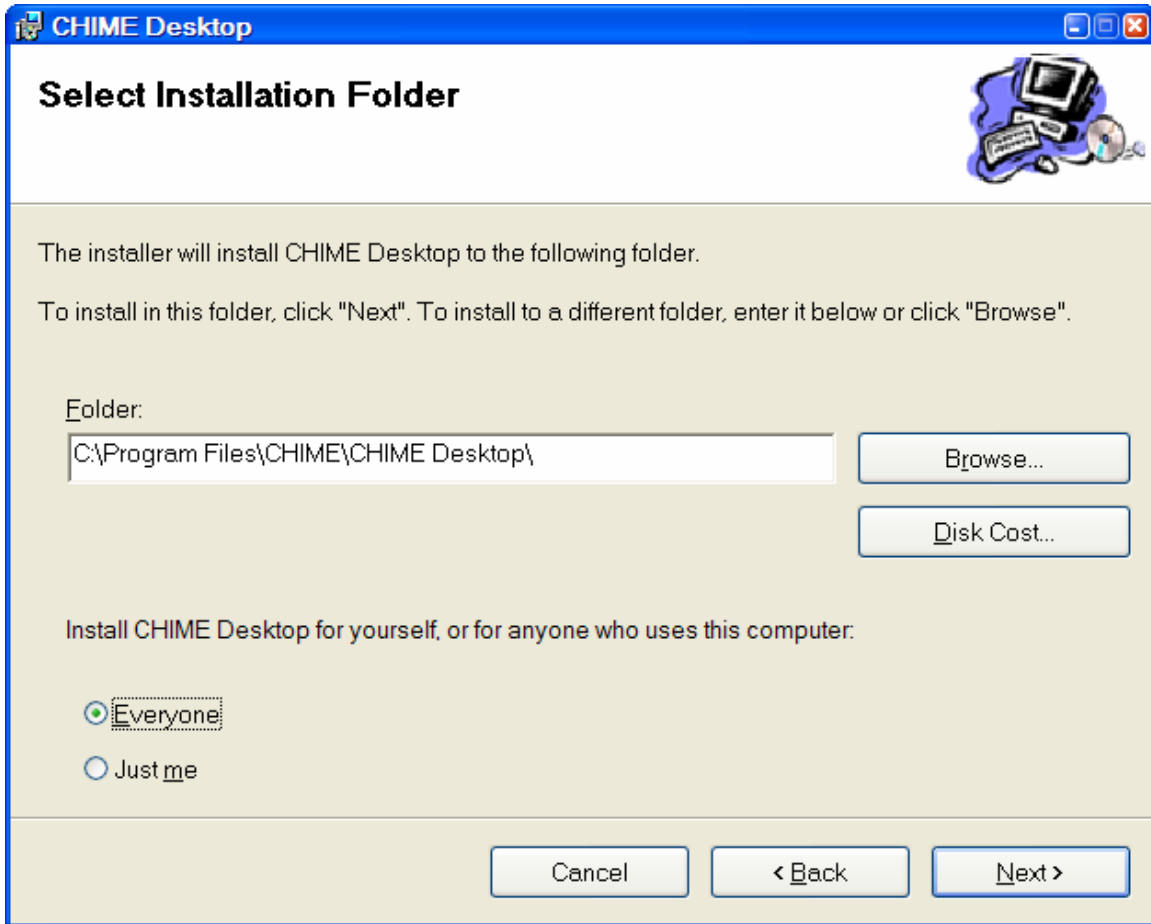
The following steps will setup a basic CHIME Desktop system.

1. *Setting up a Location*

A Location is setup by double clicking on [CHIMEDesktopSetup.msi](#) file found in the CHIME Desktop Installation CD-ROM or via the web by double clicking on the link above. The installer will display the following screens:



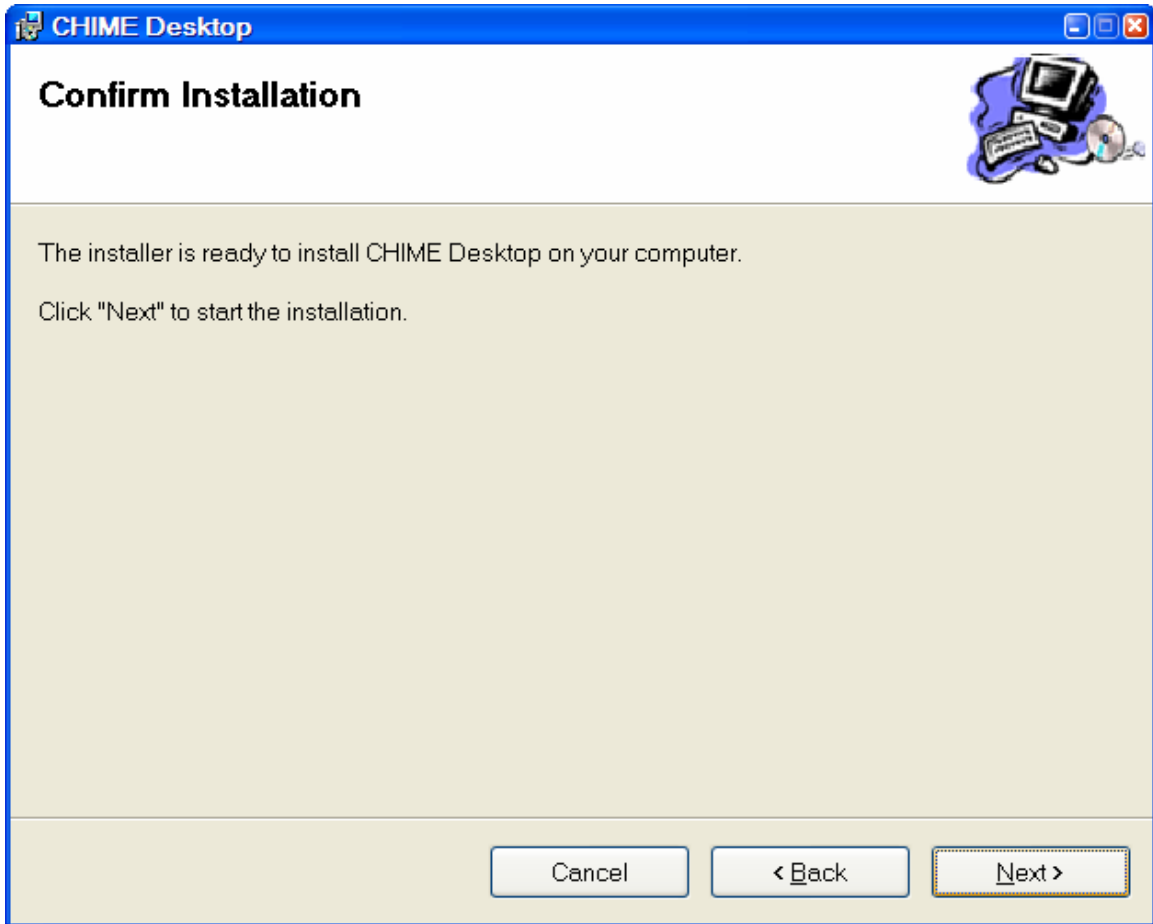
Click on the “Next” button.



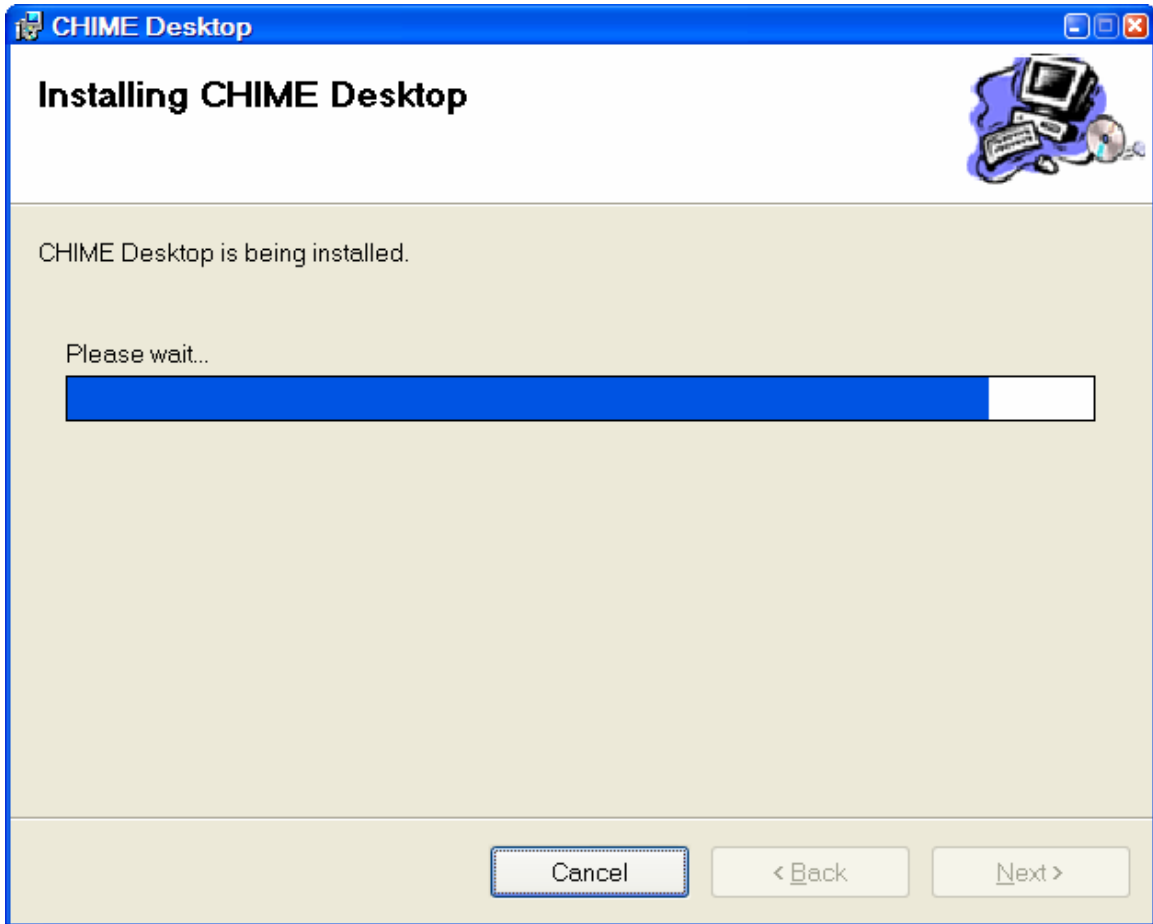
You can select the directory where the CHIME Desktop will be located. Do not use a removable device to install the CHIME Desktop.

It is recommended that “Everyone” is selected. Confirm this with your Network Administrator.

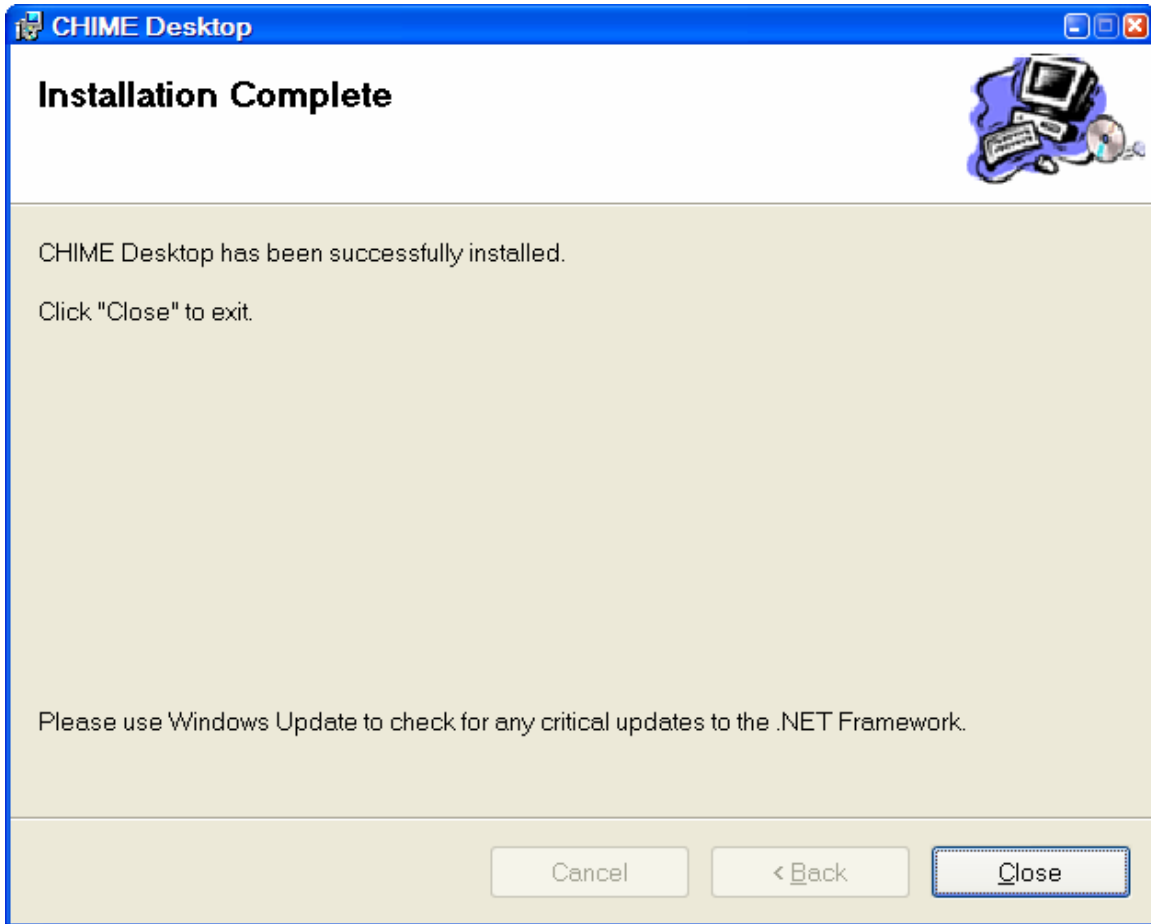
Click on the “Next” button.



Click on the “Next” button.



Click on the “Next” button.

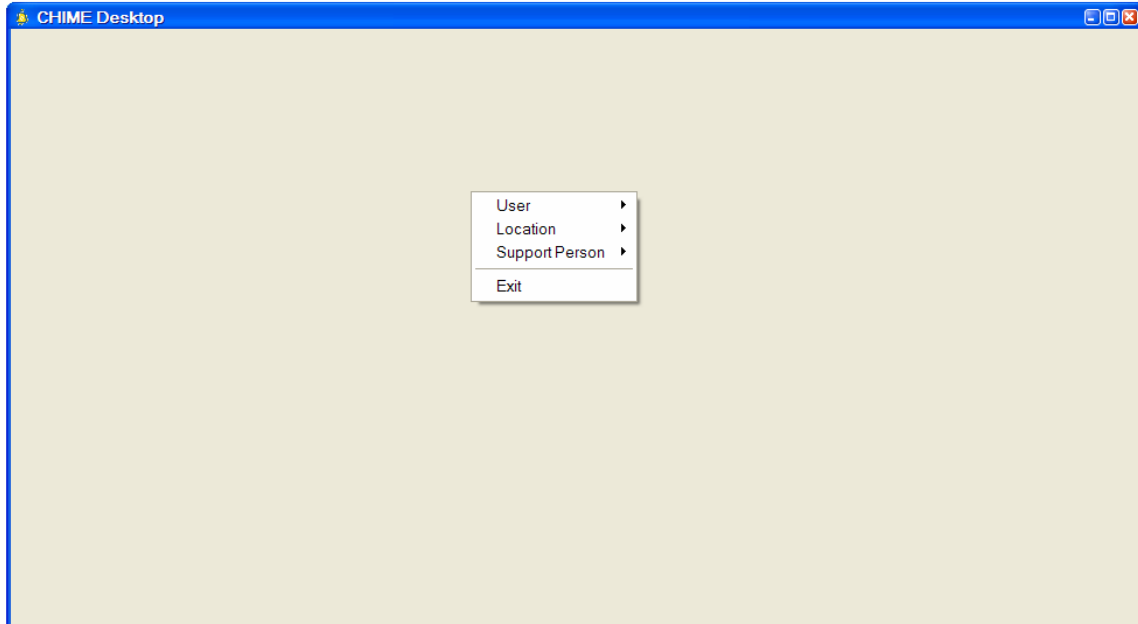


Click on the “Close” button. The CHIME Desktop is now installed. A shortcut to the CHIME Desktop is created on the desktop as:

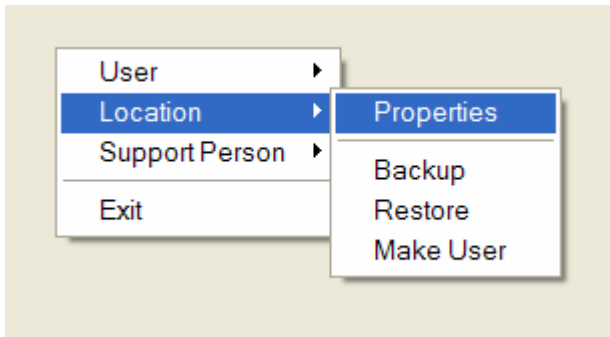


2. Running the Location's CHIME Desktop

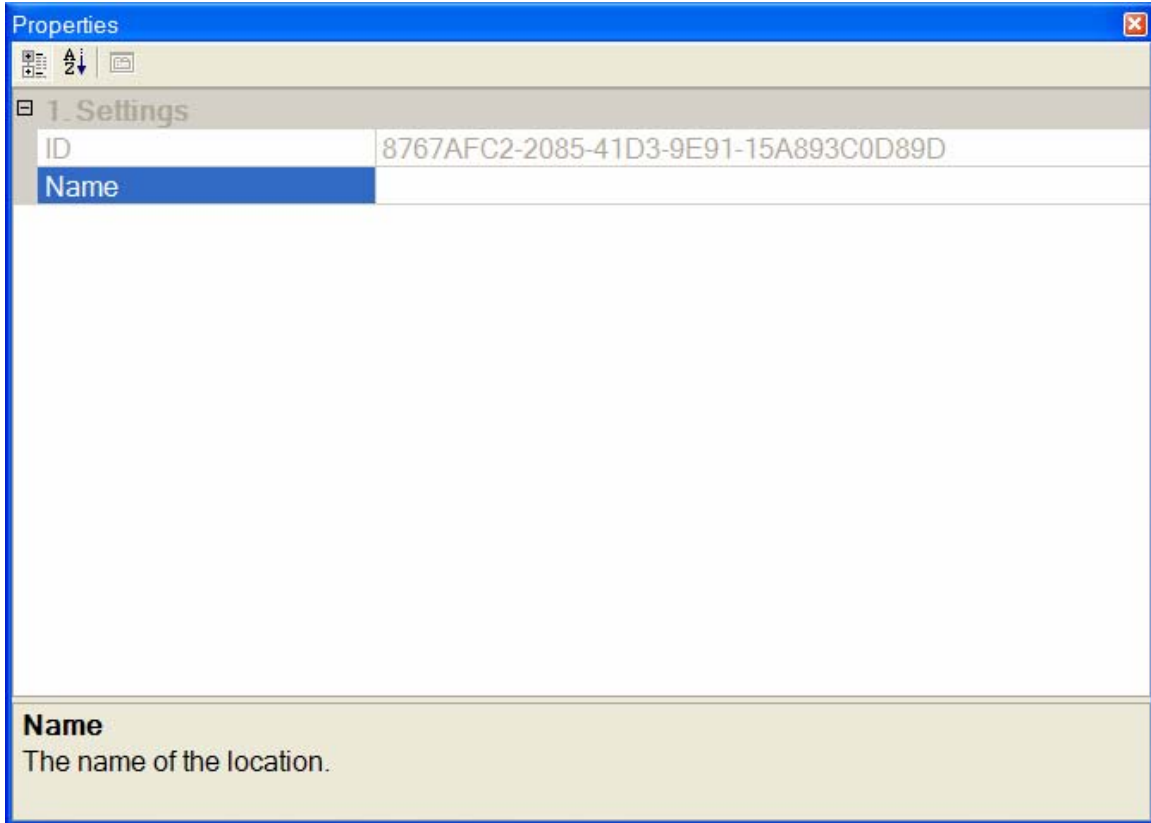
To run the CHIME Desktop, double click on the shortcut icon created on the previous step. The following screen will appear:



Select Location, and then Properties. If the menu disappears, right mouse click anywhere in the CHIME Desktop to display it again.



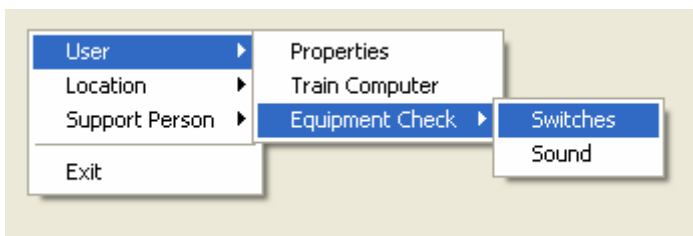
The Properties screen appears:



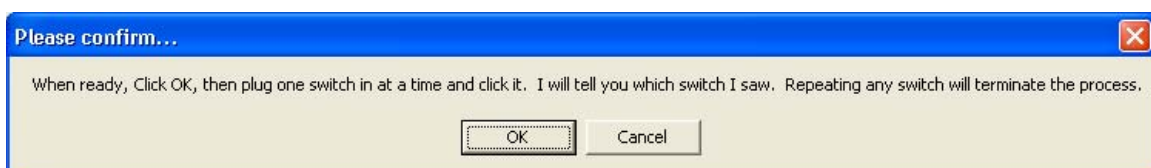
Type in the name of the location and then click on the close box on the upper right corner.

3. Testing Equipment

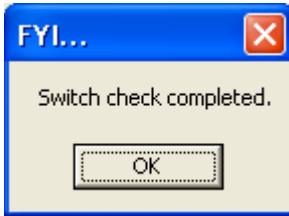
To test switches setup, right mouse click to make the menu appear, and select User, Equipment Check and then Switches:



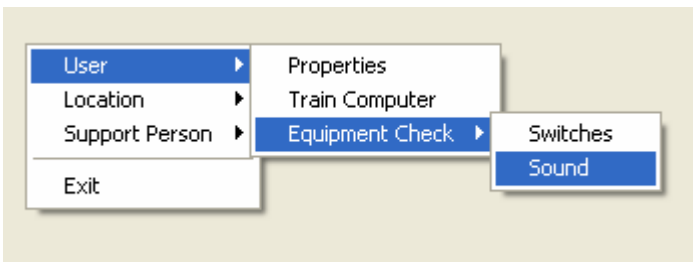
The following prompt appears:



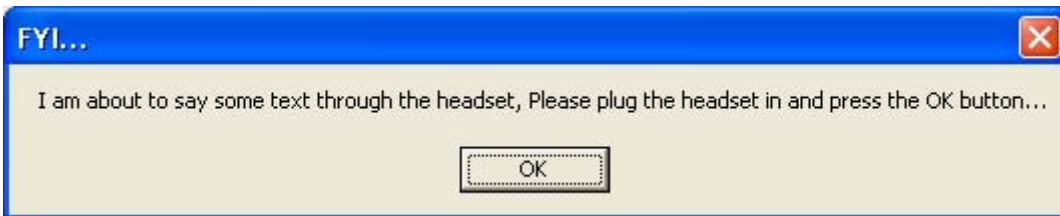
Follow the process to test each switch. When you are all done the following will appear:



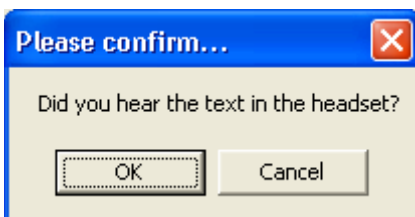
To test sound setup, right mouse click to make the menu appear, and select User, Equipment Check and then Sound:



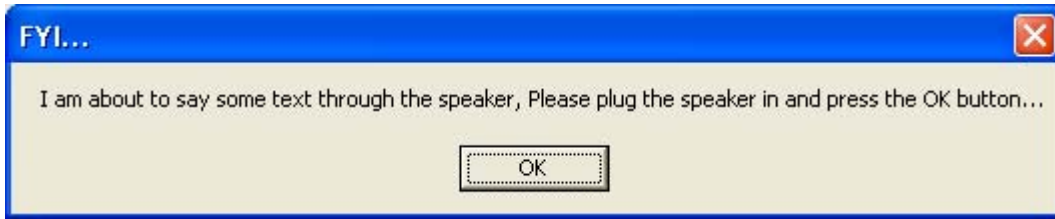
You will be prompted as follows:



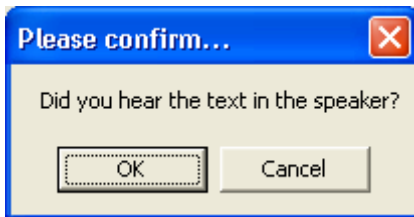
Follow the instructions, the next prompt will be shown:



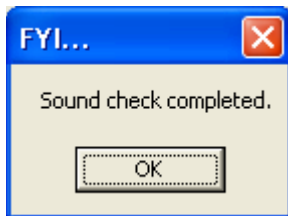
Click OK if the sound was heard correctly, Cancel otherwise. The system will keep retrying until proper operation is acknowledged. Next the following prompt will appear:



Follow the instructions, the next prompt will be shown:

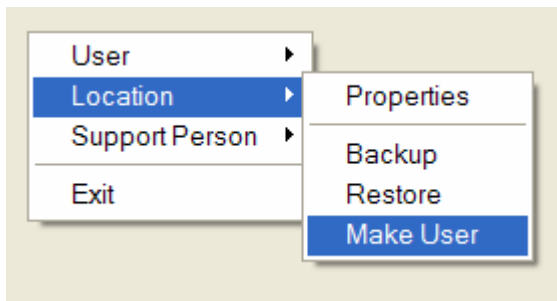


Click OK if the sound was heard correctly, Cancel otherwise. The system will keep retrying until proper operation is acknowledged. When you are all done the following will appear:

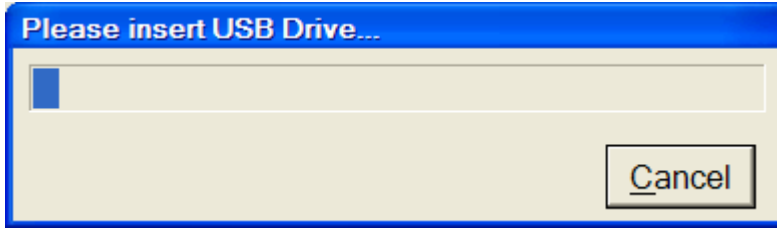


4. Creating an USB Hard Drive

To create an [USB Hard Drive](#), right mouse click to make the menu appear, and select Location and then Make User:



The following screen appears:



Insert the blank [USB Hard Drive](#) into any USB port. The CHIME Desktop will install a copy into the [USB Hard Drive](#) and tell you that it has done so. If either the “Cancel” button is clicked, or time passes without the [USB Hard Drive](#) being inserted, the process is canceled.

If this process is done on a [USB Hard Drive](#) that has the CHIME Desktop installed, it will simply update the CHIME Desktop on the [USB Hard Drive](#).

5. Creating a User

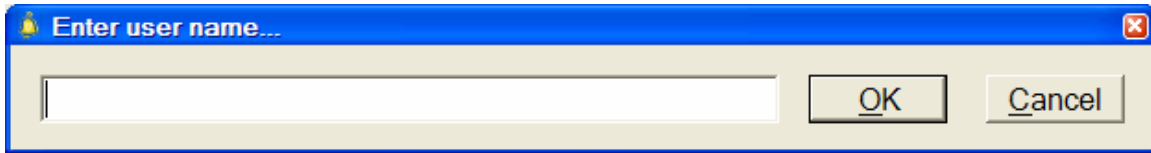
To create a [user](#), insert an [USB Hard Drive](#), created in step 3, into any USB port in the [user](#)'s laptop.

Within a few seconds, the following screen should appear:

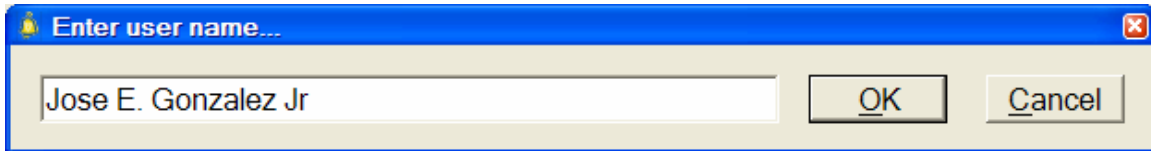


Click on the OK button to start the CHIME Desktop.

Once the CHIME Desktop starts, the system will ask you to enter the [user](#)'s name.



The name entered should be the fully qualified [user](#)'s name.



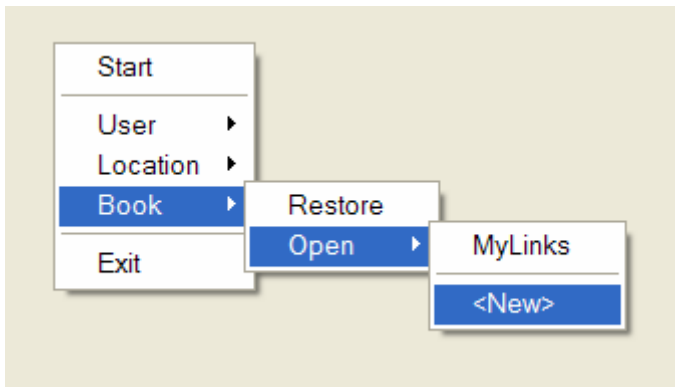
Click on the OK Button once the name is entered.

The system will then ask you to use the input switches (either the mouse or [assistive switches](#)) to determine the normal reaction speed of the [user](#). Do not worry if the assistive switches are not available, as you can [retrain](#) the system at any time.

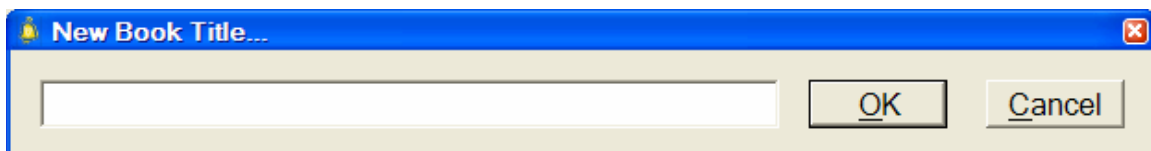
Once this step is completed the [USB Hard Drive](#) is fully activated.

6. Creating the User's MyBook

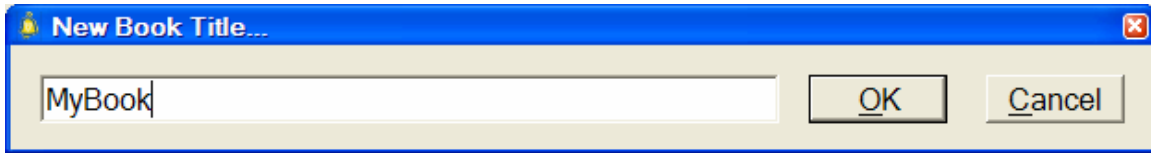
To create the default book, which is named "MyBook", right clicking on the CHIME Desktop and then select Book, next Open and then <New>:



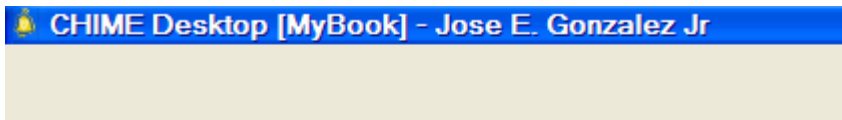
The following screen will then appear:



Enter the text "MyBook":



Click on the “OK” button to create the book. The CHIME Desktop title bar will change to reflect the open book:



7. Enrolling a User into a Location

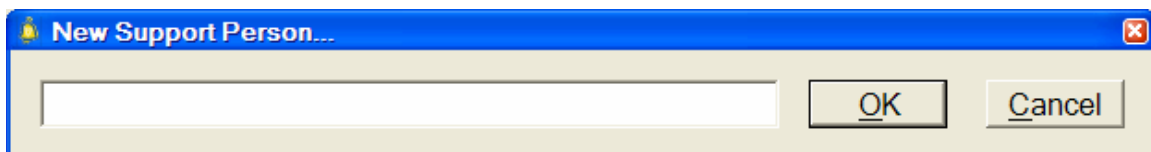
A [user](#) is enrolled into a location by inserting the [user](#)'s [USB Hard Drive](#) into any USB port in the location's computer. The system will acknowledge the enrollment of the [user](#). The [USB Hard Drive](#) can then be removed from the location's computer and returned to the [user](#)'s laptop.

8. Creating and selecting a Support Person

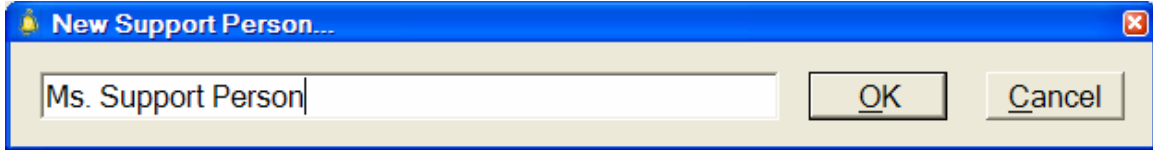
A support person can be created by right clicking on the CHIME Desktop at the location's computer and selecting Support Person, then Select, then selecting the [user](#)'s name and finally <New>:



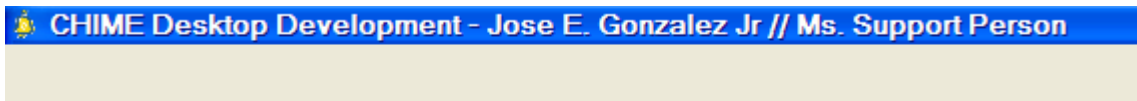
The system will then ask for the support person's name:



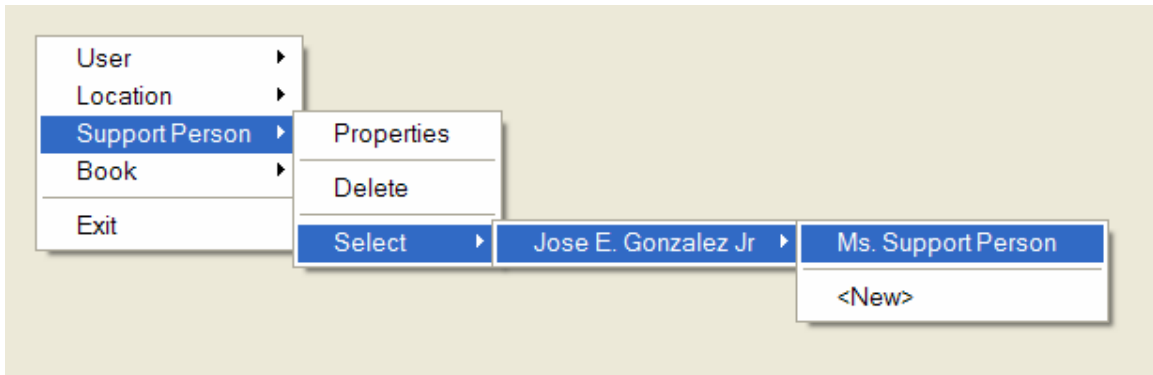
Enter a name that uniquely identifies the support person:



Click on the “OK” button to create the person. The system will display the name of the person in the CHIME Desktop title bar:

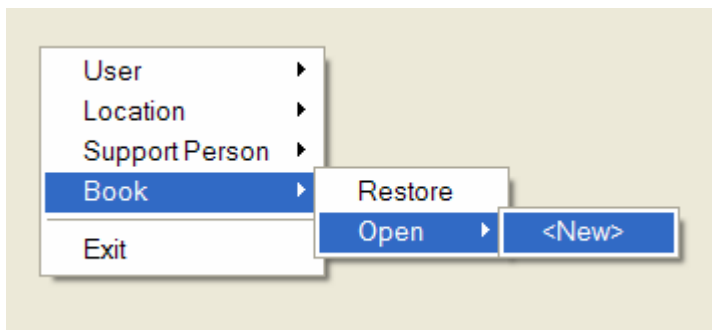


To select a support person, right click on the CHIME Desktop and select Support Person, then Select, then the user's name, and finally the support person's name:

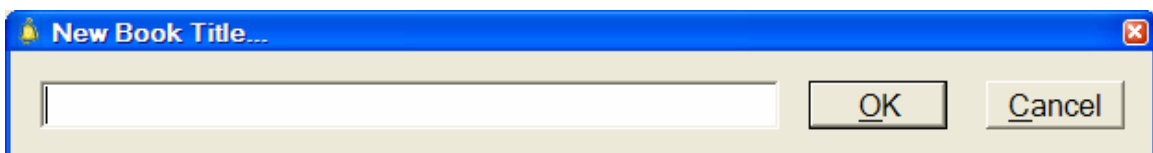


9. Creating Support Person's Books

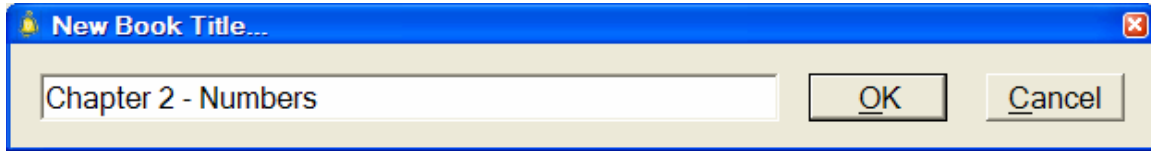
Once the support person is selected, books can be created. Right click on the CHIME Desktop and select Book, Open and finally <New>:



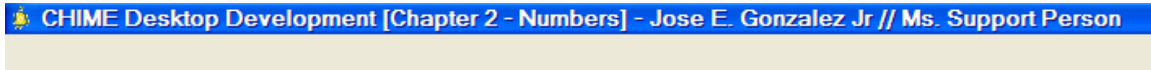
The system will then ask for the book's name:



Enter the name of the book., and click on the “OK” button.



Once the book is created the title bar of the system will reflect the status:



And the book can be defined.

10. Synchronizing User and Location Books

To synchronize changes between an [user](#) and location, remove the [USB Hard Drive](#) from the [user](#)'s laptop, The [user](#) will be warned that the [USB Hard Drive](#) has been removed.

Insert the [USB Hard Drive](#) into the location's USB Port. The following screen will be shown:



Click on the “Cancel” button.

The system will advise you that the [user](#) has been synchronized. You can then remove the [USB Hard Drive](#) from the location's computer and return it to the [user](#)'s laptop. The system will then advise the [user](#) that the system has been restored.

11. Having the User use the CHIME Desktop

The [user](#) can start the CHIME Desktop by inserting the [USB Hard Drive](#) in any USB port of his/her laptop. The following screen appears:



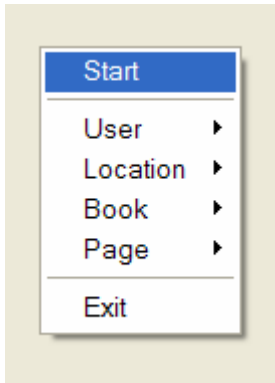
Click on the "OK" button and the system will load the MyBook and start it automatically.

CHIME Desktop

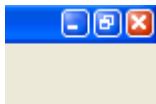
The CHIME Desktop has two modes of operation:

Running Mode

The running mode is when the CHIME Desktop is displaying a book and carrying out the commands contained therein. The CHIME Desktop automatically goes into this mode when the system is started from an [USB Hard Drive](#), or by right clicking on the CHIME Desktop and selecting the Start option:



Once in the running mode, you can switch to the development mode by clicking on the exit box, the red X box, on the upper right hand corner of the CHIME Desktop:



Special Books

The following books have a special meaning in the system.

MyBook

The MyBook book is the [book](#) that is automatically loaded and run when an [user](#) starts the CHIME Desktop from his/her [USB Hard Drive](#).

MyLinks

The MyLinks book is created by the system when new books are added and/or deleted by any support person. It is a book that creates links to all of the locations, support persons and books.

Development Mode

The development mode allows for the definition of books, locations, support persons and all other items. When the system is in the development mode, you can right click anywhere in the desktop and bring up the system menu.

We begin with the definition of the actions that can be carried out:

Defining an Action

Actions are grouped into two major categories:

- a) Options - which are settings that replace the area settings, and undone when the area loses focus. Options are grouped into logical sets, which can be activated individually.
- b) Steps – which are commands carried out by the CHIME Desktop.

The screen that defines the action is:

The screenshot shows a dialog box titled "Action" with a standard Windows interface. It contains a tree view on the left and a table of properties on the right. The tree view is expanded to "Step7_Run". The table lists various properties and their values, including font settings, background options, edge settings, and a list of steps. The "Step7_Run" step is highlighted in blue.

1. Caption	
ActivateCaptionOptions	False
Caption	
CaptionPosition	MiddleCenter
2. Background	
ActivateBackgroundOptions	False
BackColor	<input type="checkbox"/> White
BackgroundImage	<input type="checkbox"/> (none)
ImageMode	Center
3. Edges	
ActivateEdgeOptions	True
EdgeColor	<input checked="" type="checkbox"/> Red
EdgeWidth	1
4. Actions	
Step0_MemoryCommands	
Step1_SayHeadphones	
Step2_PlaySoundSpeaker	
Step3_SaySpeaker	
Step4_TimesToFlash	0
Step5_AfterDelay	0
Step6_GoTo	<none>
Book	
Page	
SupportLocation	
SupportPerson	
Step7_Run	<none>
Program	
WaitUntilEnds	True

Step7_Run
The external program to run, make sure that the location of the program is valid on the user's computer.

Caption Options

ActivateCaptionOptions

Set to true if the values that follow are to replace the area settings. If set to false, the settings are not used.

Caption

Replaces the area [caption](#).

CaptionPosition

Replaces the area [CaptionPosition](#).

Font

Replaces the area [Font](#).

ForeColor

Replaces the area [ForeColor](#).

Background Options

ActivateBackgroundOptions

Set to true if the values that follow are to replace the area settings. If set to false, the settings are not used.

BackgroundColor

Replaces the area [BackgroundColor](#).

BackgroundImage

Replaces the area [BackgroundImage](#).

ImageMode

Replaces the area [ImageMode](#).

Edge Options

ActivateEdgeOptions

Set to true if the values that follow are to replace the area settings. If set to false, the settings are not used.

EdgeColor

Replaces the area [EdgeColor](#).

EdgeWidth

Replaces the area [EdgeWidth](#).

Execution Steps

Step0_MemoryCommands

The memory commands define a set of statements to be executed by the CHIME Desktop. Each statement modifies a [variable](#), and statements are separated by semicolons:

```
Count+=1; Place=Here
```

This example has two statements:

```
Count+=1
```

And

```
Place=Here
```

Each statement has three parts:

- a) Variable name
- b) Operation
- c) Value

Variable Name

The [variable](#) name is the left most portion of the statement; it is followed by the operator and is terminated by the value.

Operations

The following operations are allowed:

=

Sets the [variable](#) to the value given.

+=

+

Increments the [variable](#) by the value.

-=

-

Decrements the [variable](#) by the value.

*=

*

The [variable](#) is multiplied by the value.

/=
/

The [variable](#) is divided by the value.

Values

Note that the value can be one of the following:

- a) A numeric value.
- b) A text string.
- c) A variable name prefixed with a up-arrow (^) sign.

Step1_SayHeadphones

The text to be spoken through the [user's headphones](#).

Step2_PlaySoundSpeaker

The sound to be played through the [speaker](#). The sound is one defined in the [Sound Editor](#).

Step3_SaySpeaker

The text to be spoken through the [speaker](#).

Step4_TimesToFlash

The number of times to flash the area. Flashing is accomplished by switching the area background color between the action [BackgroundColor](#) and the area's normal [BackgroundColor](#).

Step5_AfterDelay

The amount of time, in milliseconds, to wait until steps 5 and/or 6 are executed.

Step6_GoTo

The place that will become active.

Book

The [book](#) to switch to.

Page

The [page name](#) to go to.

SupportLocation

This entry is used to transfer control to a different location. Since multiple locations may share the same name, the value that needs to be entered here is the [location ID](#).

SupportPerson

The name of the [support person](#) to switch to.

Step7_Run

The program to run.

Program

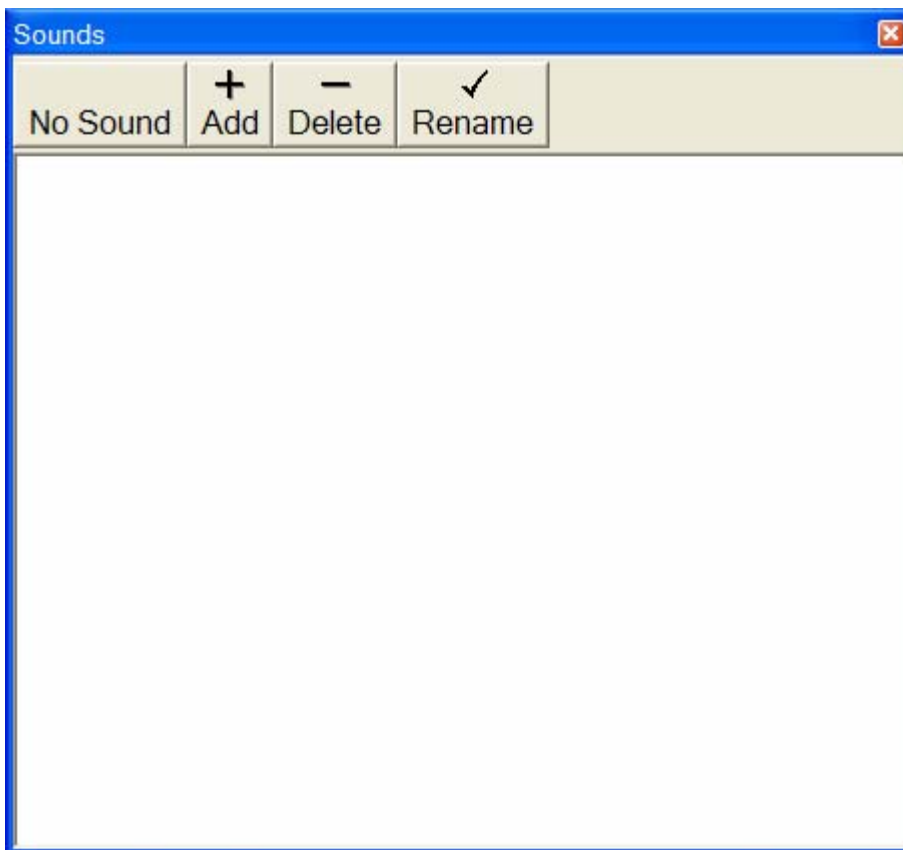
The program name. Note that the program must be installed in the given location at the [user's](#) computer.

WaitUntilEnds

If set to true, the CHIME Desktop will wait until the program ends to continue execution.

Defining a Sound

Sounds to be used in the book are defined via the Sound Editor. The editor is activated by clicking on the “...” button in the sound entry. When activated the following screen is displayed:



To use a sound, just click on the sound to be used, and then click on the close box on the upper right corner.

You can select from the following commands:

NoSound

Tells the system that no sound is to be used. This does not remove the sound from the book.

Add

Adds a sound to the book's sound table.

Delete

Removes a sound from the book's sound table.

Rename

Renames a sound in the book's sound table.

Defining a Variable

A variable is defined as part of each area action's options. A set of variables are predefined automatically by the CHIME Desktop, and another set is used in the [questionnaires](#).

Predefined Variables

These are automatically available in each [book](#).

Name

The [name of the user](#), from the User Properties.

Book

The name of the [book](#).

Questionnaire Variables

These are used in the [questionnaire](#).

Start

The date and time that the [questionnaire](#) started.

End

The date and time that the [questionnaire](#) ended.

Correct

The number of correct answers selected.

Incorrect

The number of incorrect answers selected.

Using a variable in a caption

The value of a variable can be used in either the page caption, or area caption by including the name of the variable, prefixed with a up-arrow (^) sign, for example:

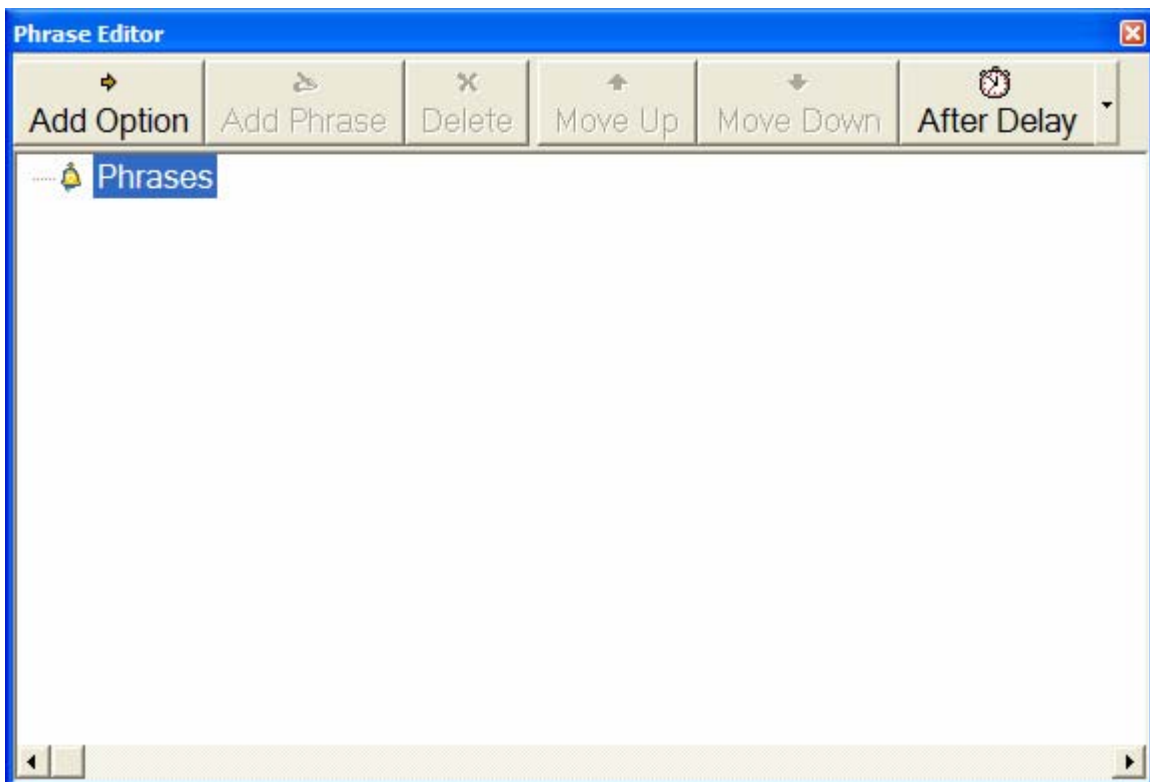
Hello ^Name

Will display the string “Hello Jose”.

Defining Phrase Table

The CHIME Desktop provides for the quick creation of pages to enable non-verbal children to create a communication method to the world. These pages allow for the creation of phrases that are selected via a word tree.

To create a phrase table, open the [Book Property](#) screen, and click on the “...” button in the “[Phrases](#)” entry. The following screen will appear:



Add Option

Adds a option that will be shown and/or spoken to the user. The default value for the option is “?”, which can be edited by clicking on the option and pressing the space bar.

Add Phrase

Adds a phrase that will be said to the world. The default value for the phrase is “?”, which can be edited by clicking on the option and pressing the space bar.

Delete

Deletes the current selected option or phrase.

Move Up

Moves the current option up the list.

Move Down

Moves the current option down the list.

After Delay

Sets the amount of time between when the phrase is said to the world and the starting option is said to the user.

See “[Appendix A- A sample phrase table](#)”, to see how the phrase table can be used.

Linking to a phrase table

The CHIME Desktop generates a set of pages for the phrase table labeled as “PhrasePage<nnnn>” where “nnn” starts at 10000, so by creating an area that goes to page PhrasePage1000, you can link to the phrase pages.

Defining Shortcuts

The CHIME Desktop allows a [user](#) to create shortcuts defined by a set of [user switches](#) sequences, that will activate particular area [OnAreaSelected](#) actions.

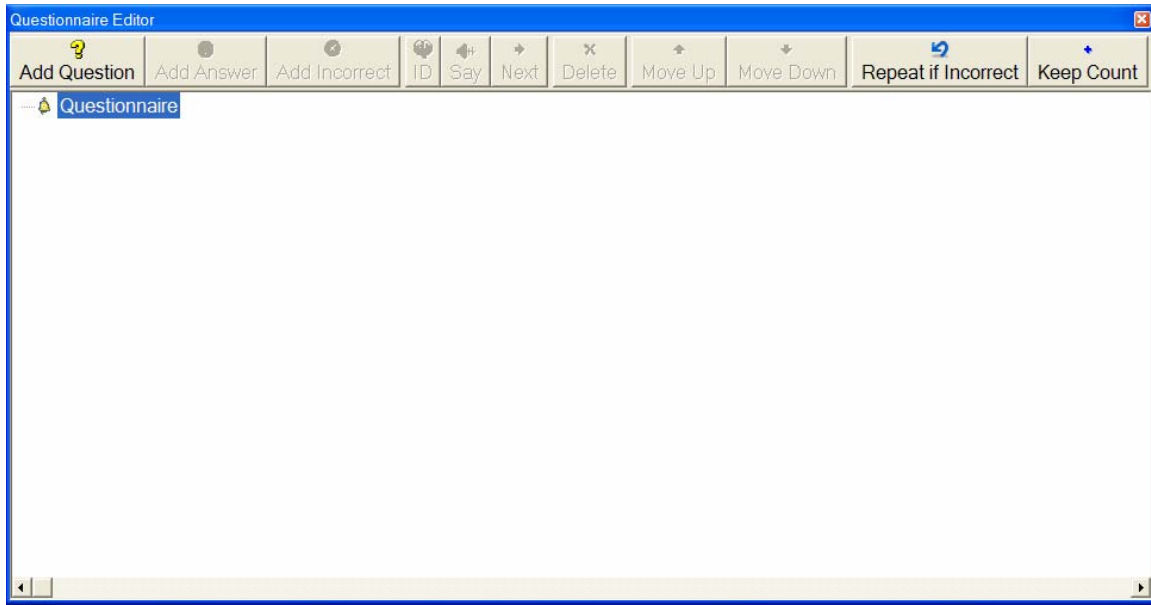
To define a shortcut, the [user](#) needs to give focus to the area, using the normal navigation options (see “[Theory of Operation](#)”). Once the area has focus, the user uses the [SwitchOptionLearn](#) command, at which time the CHIME Desktop will ask the user to activate the switches that define the shortcut.

Once the shortcut is defined, the user can activate the actions for the area at any time.

Defining Questionnaire Table

The CHIME Desktop provides for the quick creation of questionnaires to enable teachers to create a standardized set of testing tools.

To create a questionnaire, open the [Book Property](#) screen, and click on the “...” button in the “[Questionnaire](#)” entry. The following screen will appear:



Add Question

Adds a question to the questionnaire. The default value for the question is “?”, which can be edited by clicking on the option and pressing the space bar.

Add Answer

Adds a correct answer to the question selected. Only one correct answer is allowed per question. The default value for the answer is “?”, which can be edited by clicking on the option and pressing the space bar.

Add Incorrect

Adds an incorrect answer to the question selected. Any number of incorrect answer are allowed per question. The default value for the answer is “?”, which can be edited by clicking on the option and pressing the space bar.

ID

Sets an identifier for the question. This identifier is used for navigation purposes, to allow for directing the flow of the questionnaire. The default value for the id is “?”, which can be edited by clicking on the option and pressing the space bar.

Say

Sets the phrase to be said when the answer (either correct or incorrect) is selected. The default value for the phrase is “?”, which can be edited by clicking on the option and pressing the space bar.

Next

Sets the ID of the question to go to if the answer (either correct or incorrect) is selected.

Delete

Deletes the current question or answer.

Move Up

Moves the question up the list.

Move Down

Moves the question down the list.

Repeat if Incorrect

Sets the default action to repeat the question if the incorrect answer is chosen. This is overridden if a [Next](#) setting is set.

Keep Count

Tells the system to automatically keep count of correct and incorrect answers chosen.

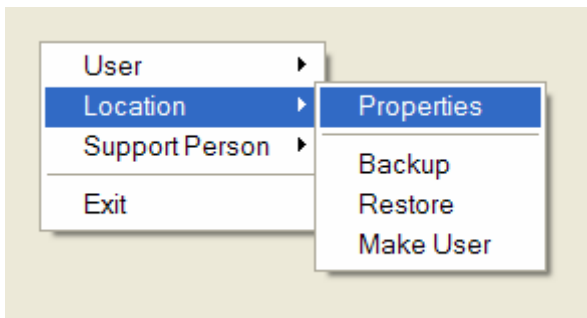
See “[Appendix B- A sample questionnaire table](#)”, to see how the questionnaire table can be used.

Linking to a questionnaire table

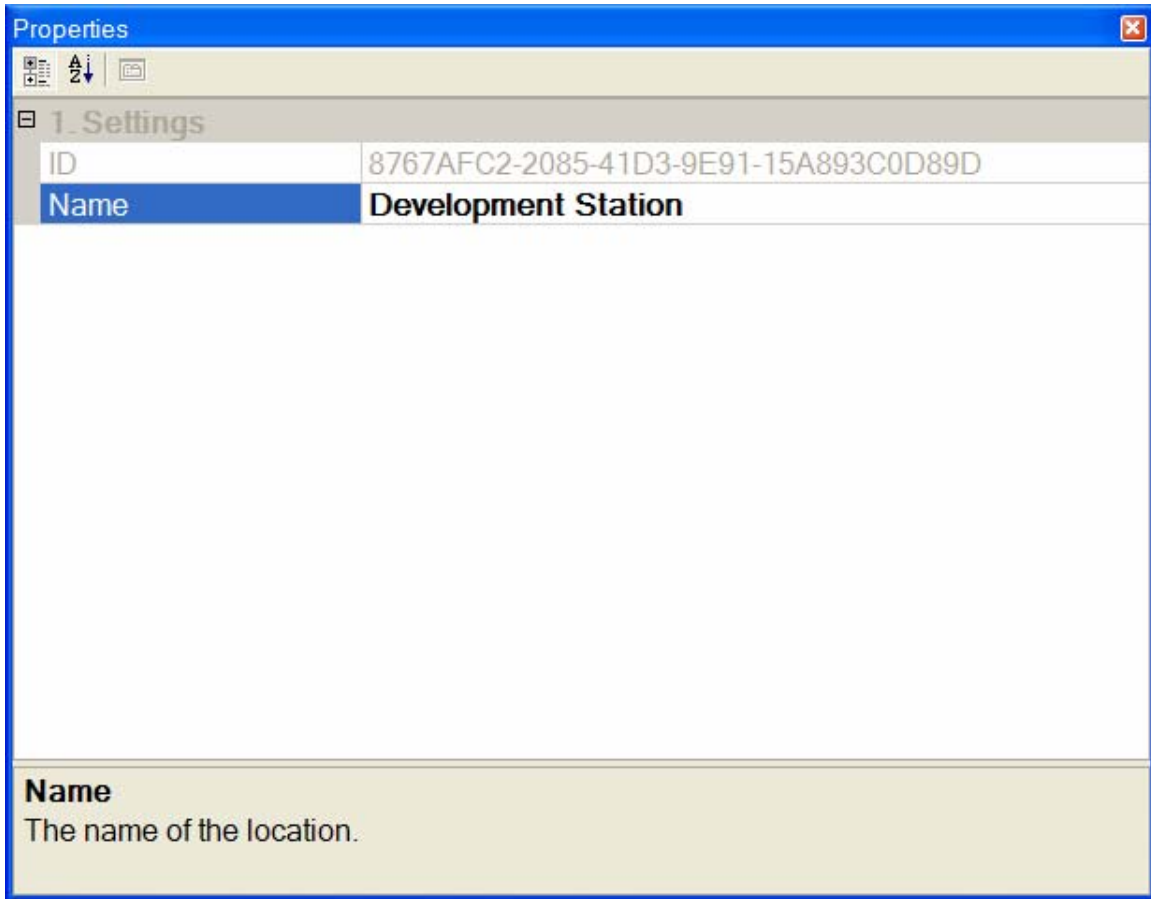
The CHIME Desktop generates a set of pages for the phrase table labeled as “QuestionnairePage<nnnn>” where “nnn” starts at 20000, so by creating an area that goes to page QuestionnairePage20000, you can link to the question pages.

Defining a Location

A location is defined by right clicking on the CHIME Desktop, and selecting Location and then Properties.



The following screen appears:



Name

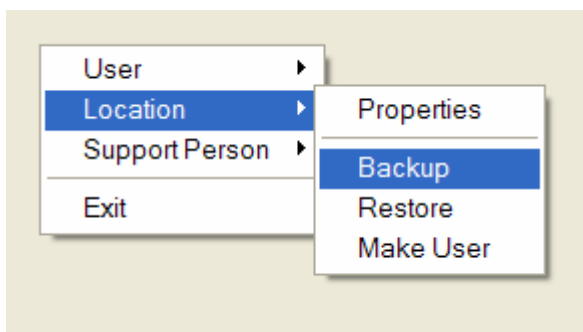
This entry defines how the location is to be known to the [user](#).

ID

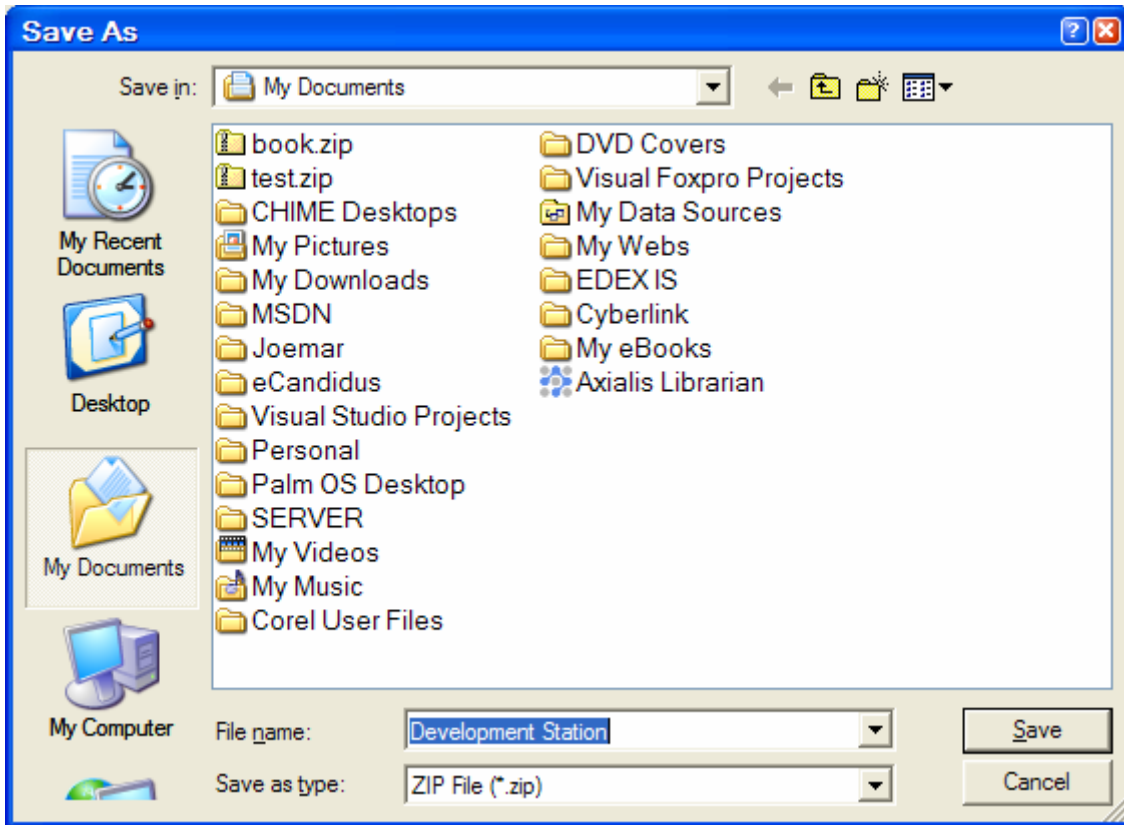
This entry uniquely identifies the location. It is created when the CHIME Desktop is first created and cannot be modified.

Backing up a Location

The entire location can be copied to a ZIP file by right clicking on the CHIME Desktop, and selecting Location and the Backup.



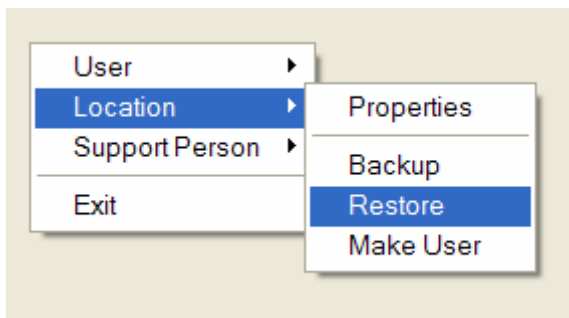
The CHIME Desktop then displays a file selection dialog box, so the ZIP file can be selected or created.



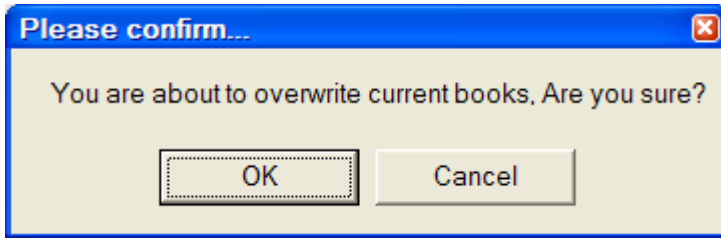
Once the file is selected, the system will copy the entire location into the file.

Restoring a Location

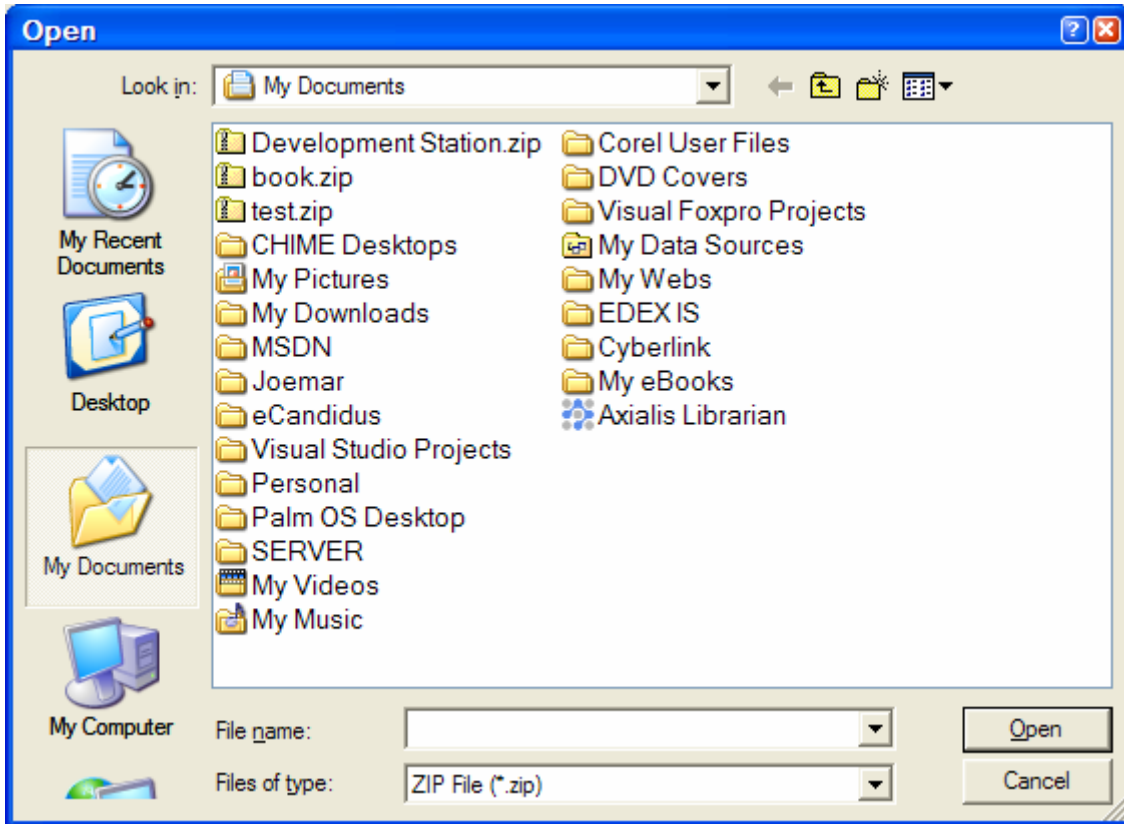
The location can be restored from a ZIP backup by right clicking on the CHIME Desktop, and then selecting Location and then Restore:



The following warning is then displayed:



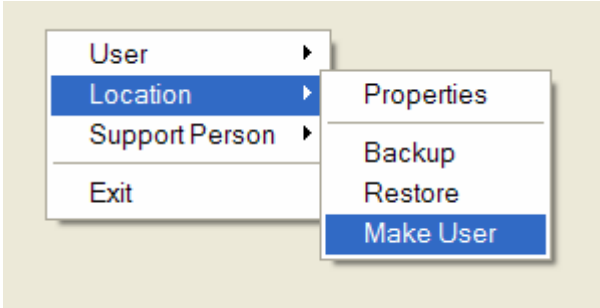
If OK is selected, the CHIME Desktop will then display a file selection dialog box:



Once the file is selected, the entire location will be replaced with the saved version.

Creating an User

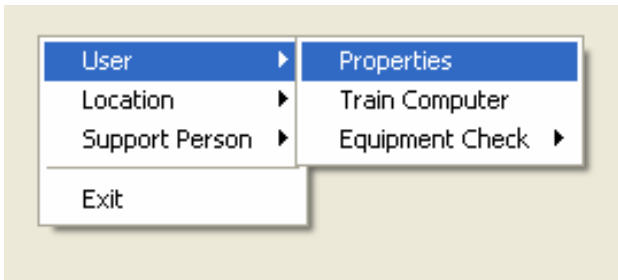
A [user](#) is created by right clicking on the CHIME Desktop and then selecting Location and then Make User:



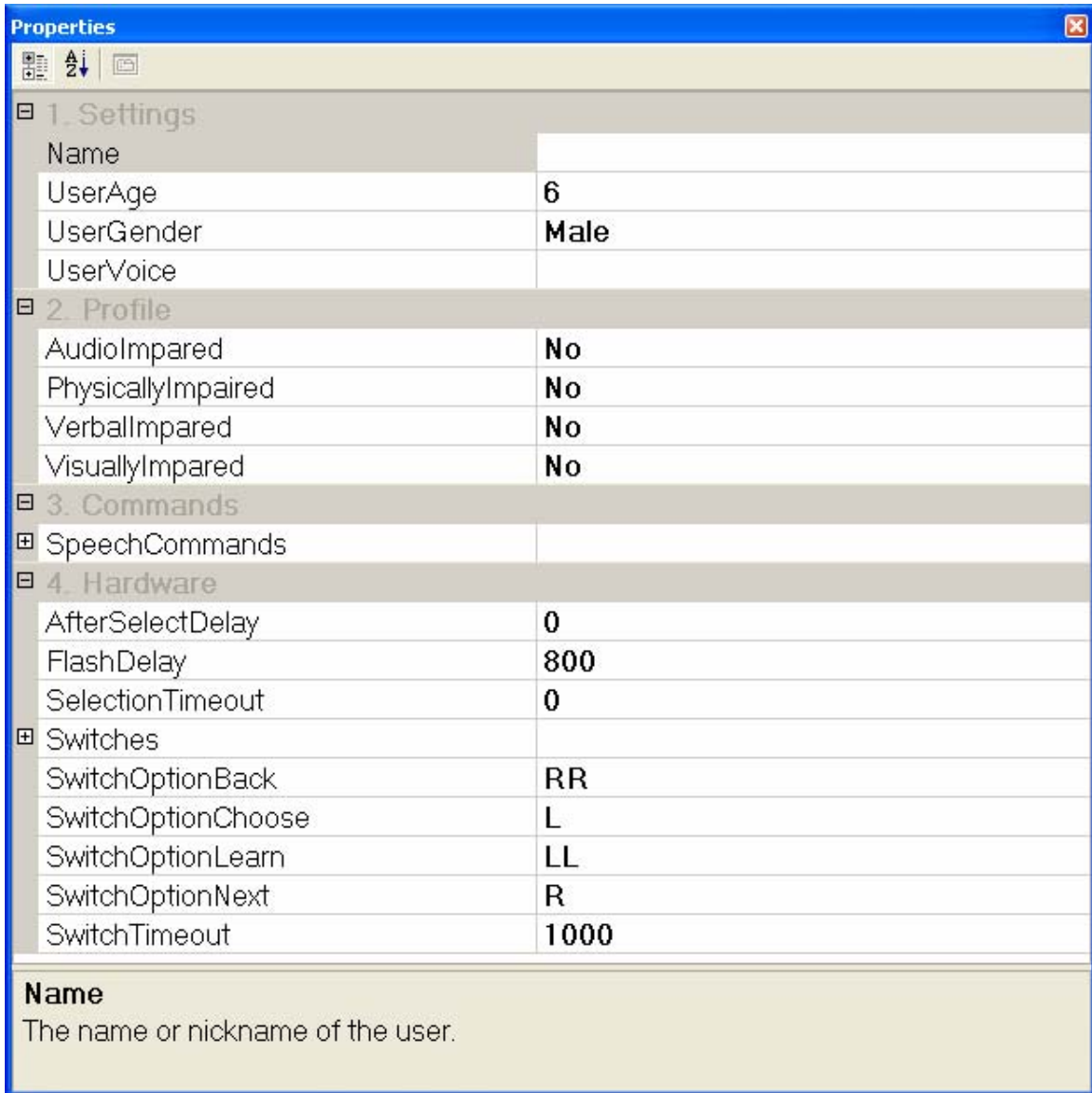
This process will copy the CHIME Desktop into an [USB Hard Drive](#). For further details see “[3. Creating an USB Hard Drive](#)” above.

Defining an User

A [user](#) is defined by right clicking on the CHIME Desktop, and selecting User and then Properties.



The following screen appears:



1. Settings	
Name	
UserAge	6
UserGender	Male
UserVoice	
2. Profile	
AudiImpaired	No
PhysicallyImpaired	No
VerballImpaired	No
VisuallyImpaired	No
3. Commands	
SpeechCommands	
4. Hardware	
AfterSelectDelay	0
FlashDelay	800
SelectionTimeout	0
Switches	
SwitchOptionBack	RR
SwitchOptionChoose	L
SwitchOptionLearn	LL
SwitchOptionNext	R
SwitchTimeout	1000

Name
The name or nickname of the user.

Name

The name that the [user](#) will have when addressed by the CHIME Desktop. Used as a variable in captions.

UserAge

The chronological age of the [user](#). Used to define the [UserVoice](#).

UserGender

The gender of the [user](#). Used to define the [UserVoice](#).

UserVoice

The preferred voice to be used, if available. Note that the choices displayed are the ones available for the current computer and may not available in other computers.

If the selection is not available, or left blank, the CHIME Desktop will use the [UserGender](#) and [UserAge](#) to select the most appropriate voice, with gender being the most important value.

AudioImpaired

The type of impairment for the [user](#).

No

The [user](#) has full use of his/her audio abilities.

Yes

The [user](#) has no audio ability. The CHIME Desktop will make all audio output into dialog boxes.

Partial

The [user](#) has partial use of his/her audio abilities. The CHIME Desktop will make all audio output into dialog boxes.

PhysicallyImpaired

The type of impairment for the [user](#).

No

The [user](#) has full use of his/her physical abilities.

Navigation

Next

User can move to the next area by pressing the TAB key.

Back

User can move to the previous area by pressing the CTRL+TAB keys, or by clicking on the back button on the lower right corner of the screen.

Select

User can select area by either clicking on it, or pressing the space bar when the area has focus.

Learn

The user can enter the learn mode by clicking on the learn button on the lower right hand of the screen.

Yes

The [user](#) has no physical ability.

Navigation

The user can navigate the system by the use of the [Speech Commands](#).

Partial

The [user](#) has partial use of his/her physical abilities.

Navigation

The CHIME Desktop will make use of the [Switch Interface](#).

VerballyImpaired

The type of impairment for the [user](#).

No

The [user](#) has full use of his/her verbal abilities.

Yes

The [user](#) has no audio ability. The CHIME Desktop will disable the [speech command](#) option.

Partial

The [user](#) has partial use of his/her verbal abilities.

VisuallyImpaired

The type of impairment for the user.

No

The [user](#) has full use of his/her visual abilities.

Yes

The [user](#) has no visual ability. The system will make both [page captions](#) and [area captions](#) into audio output.

Partial

The [user](#) has partial use of his/her visual abilities. The CHIME Desktop will enlarge both [page captions](#) and [area captions](#).

SpeechCommands

The speech commands allow for the control of the CHIME Desktop verbally. You can enter the words that are recognized for each action.

Activate

The activate command activates the speech recognition system.

Back

The back command moves the focus back to the previous area.

Deactivate

The deactivate command deactivates the speech recognition system.

Do

The do command selects the current area.

Next

The next command moves focus to the next area.

Start

The start command starts the processing of the current book.

Stop

The stop commands stops the processing of the current book.

FlashDelay

The amount of time, in milliseconds, between switching colors when an area is flashing.

AfterSelectDelay

The amount of time, in milliseconds, between a selection is made and the system returns to the base screen.

SelectionTimeout

The amount of time, in milliseconds, that the CHIME Desktop will wait until giving focus to the next area.

Switches

This entry defines which switches are to be used by the user. Since the switches are created by [mimicking a mouse](#), the standard mouse names are used. Note that changing the switch options change the default SwitchOptions defined below.

Left

Controls the left mouse switch.

Middle

Controls the middle mouse switch.

Right

Controls the right mouse switch.

Switch1

Controls the extended switch #1 in a five button mouse interface.

Switch2

Controls the extended switch #2 in a five button mouse interface.

SwitchOptionBack

The switch sequence that moves the focus to the previous area.

SwitchOptionChoose

The switch sequence that active the [OnAreaSelected](#) actions.

SwitchOptionLearn

The switch sequence that start the shortcut learning mode.

SwitchOptionNext

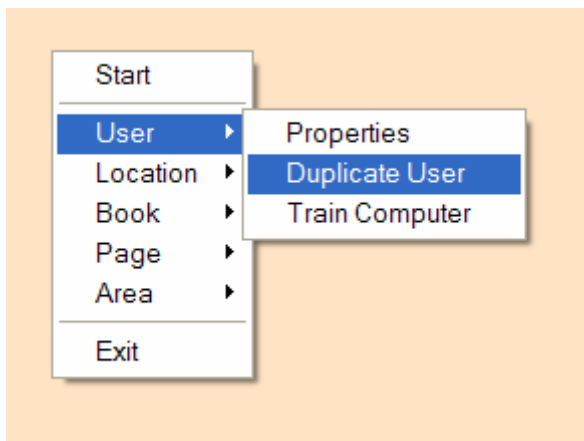
The switch sequence that moves the focus to the next area.

SwitchTimeout

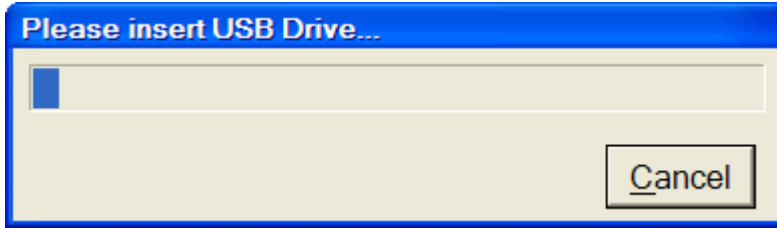
The amount of time, in milliseconds, allowed between switch activations, before a new switch sequence is started.

Duplicating an User

A user can be duplicated by right clicking on the CHIME Desktop, and selecting User and then Duplicate User:



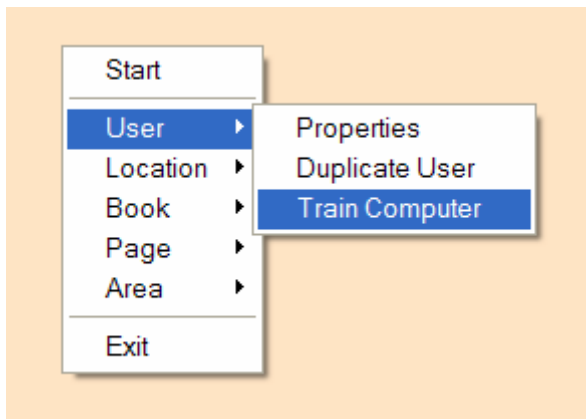
The following screen appears:



Insert a blank [USB Hard Drive](#) into any USB Port. The system will copy all of the files from the [user's USB Hard Drive](#) into the new drive.

Train Computer

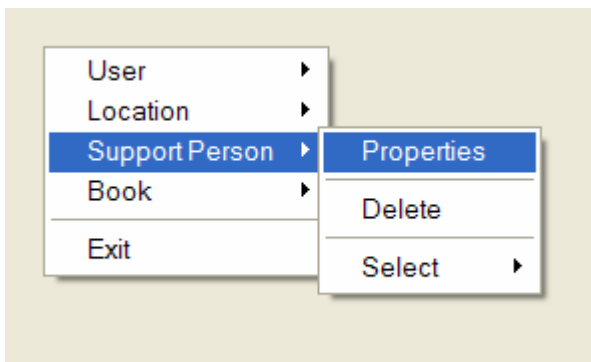
The CHIME Desktop can be trained to define the SwitchTimeout value by right clicking on the CHIME Desktop and selecting User and then Train Computer:



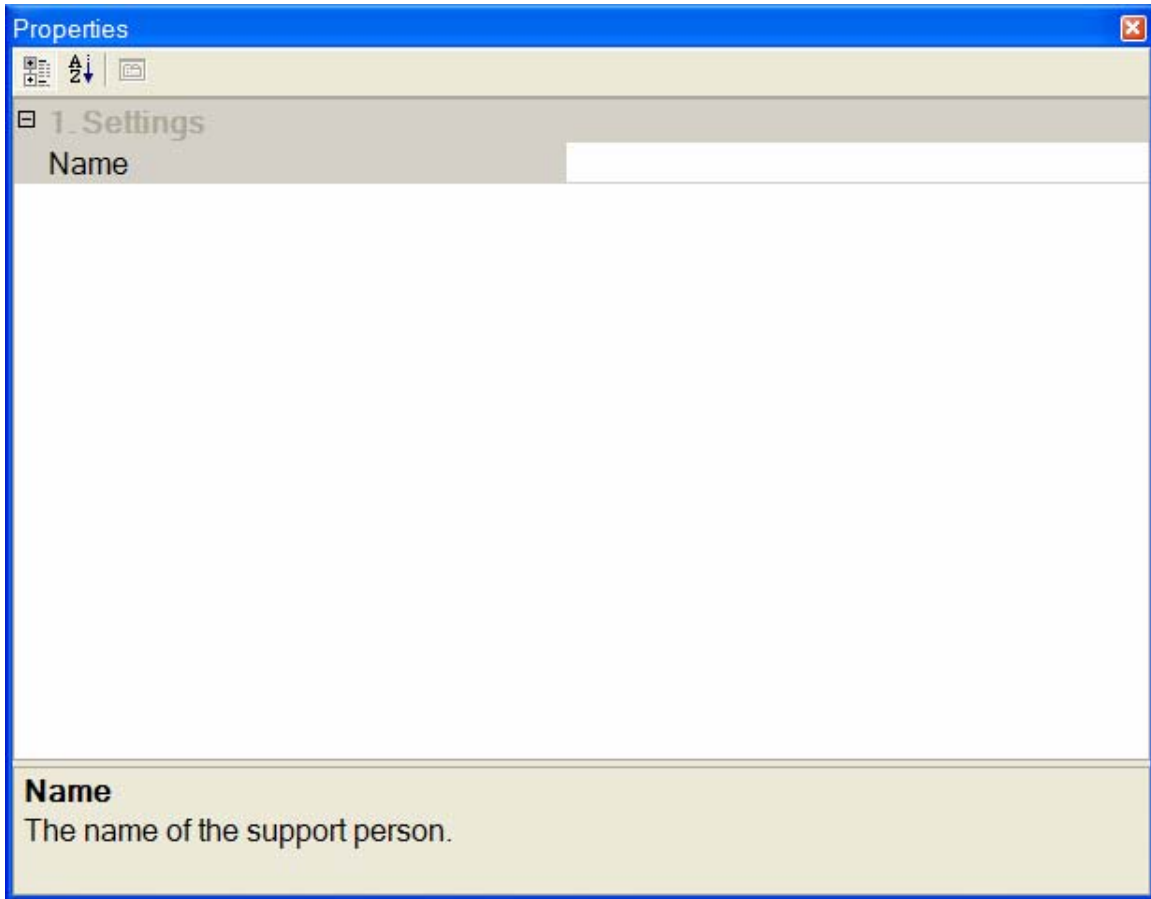
The system will then ask the user to click on the various switches, and determine the longest response time that the user requires to activate the switches.

Defining a Support Person

A user can be defined by right clicking on the CHIME Desktop, and selecting Support Persons and then Properties:



The following screen is displayed:

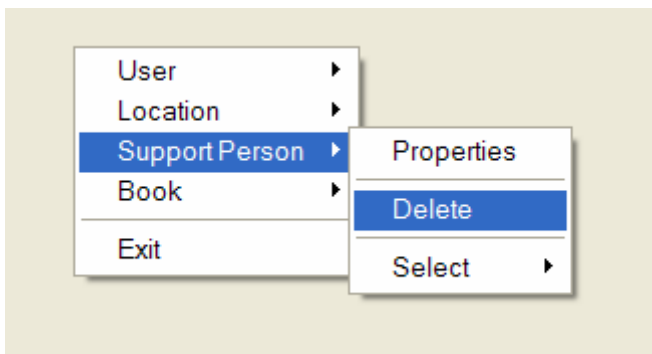


Name

The name is the name to be used when creating the [MyLinks](#) book. This allows for the user to identify the support person by nickname, or a more friendly name.

Deleting a Support Person

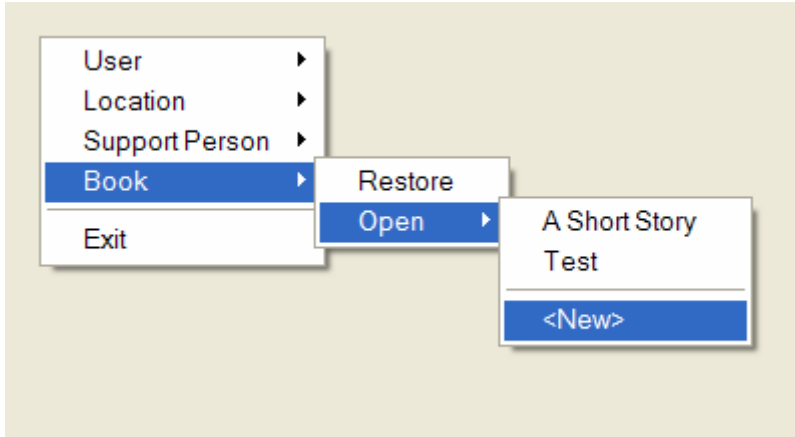
A support person can be deleted by right clicking on the CHIME Desktop and selecting Support Persons and then Delete:



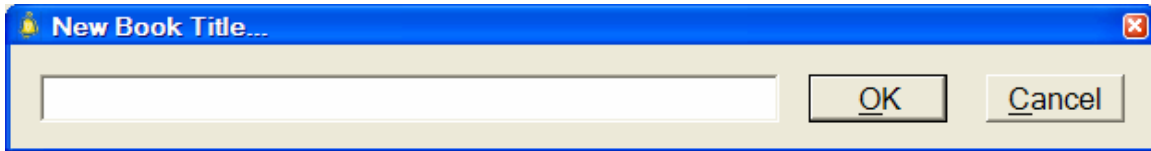
The system will confirm that you want to delete the support person and all of his/her books.

Creating a Book

A book can be created by right clicking on the CHIME Desktop and selecting Book, next Open and then <New>:



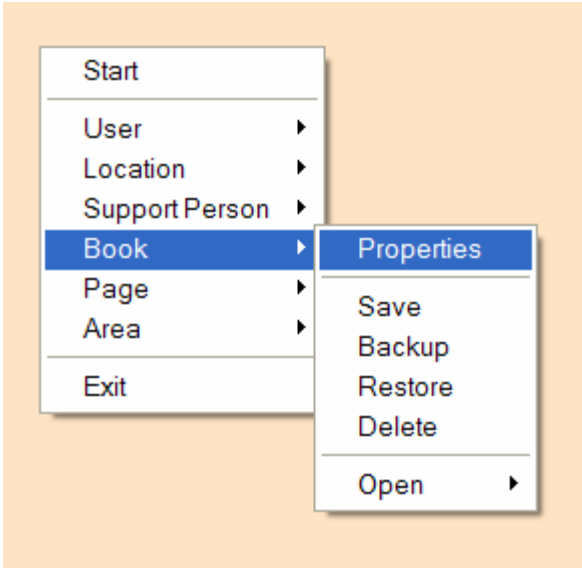
The following screen will the appear:



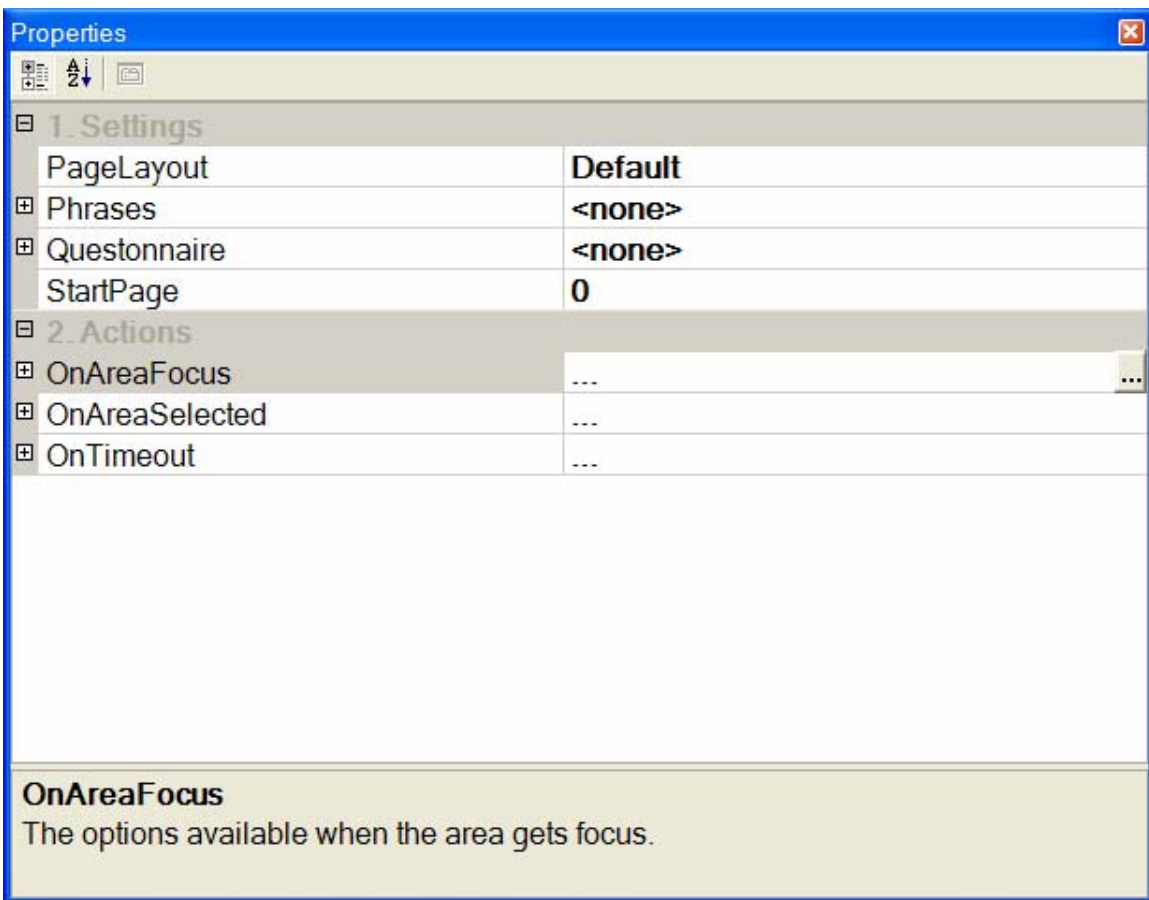
Note that a new book is not actually defined until it is [saved](#).

Defining a Book

A book is defined by right clicking on the CHIME Desktop and selecting Book and then Properties:



The following screen will appear:



PageLayout

The page layout allows for the control of how areas are drawn in the page. The setting at the book level defines the default to be used for each page. Please see the [PageLayout](#) definition at the page level for the values available.

Phrases

The Phrases entry display whether phrases are defined, by showing <phrases>, or not, by showing <none>. Phrases are defined by clicking on the “...” button and following the steps in “[Defining Phrase Table](#)” in this document.

Questionnaire

The Questionnaire entry display whether questions are defined, by showing <questions>, or not, by showing <none>. Questions are defined by clicking on the “...” button and following the steps in “[Defining Questionnaire Table](#)” in this document.

StartPage

The [page name](#), or index that will be the first page displayed when the book is loaded.

OnAreaFocus

The default [actions](#) to be carried out when an area gets the focus. This can be overridden by the page [OnAreaFocus](#), or the area [OnAreaFocus](#) settings.

OnAreaSelected

The default [actions](#) to be carried out when an area is selected. This can be overridden by the page [OnAreaSelected](#), or the area [OnAreaSelected](#) settings.

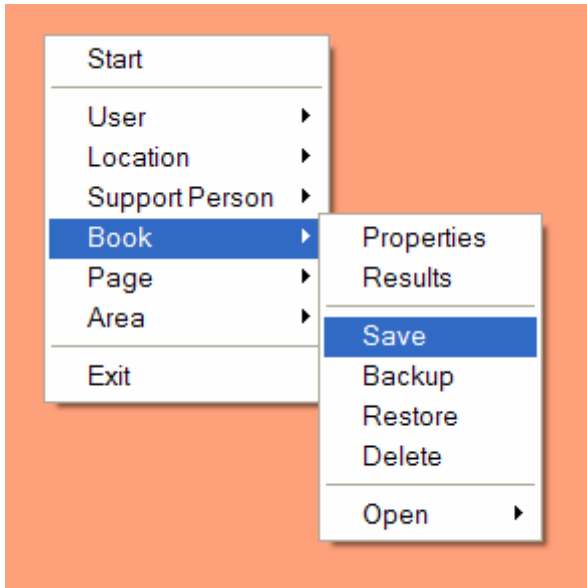
OnTimeout

Not implemented at this time.

The default [actions](#) to be carried out when a [PageTimeout](#) elapsed without an area being selected. This can be overridden by the page [OnTimeout](#) settings.

Saving a Book

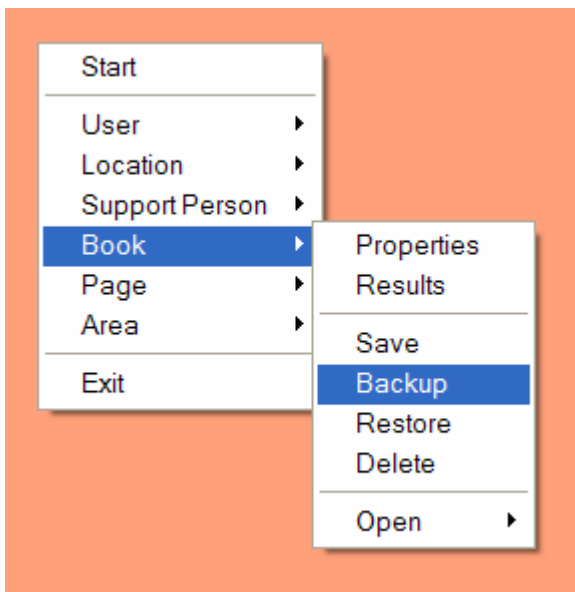
A book can be saved by right clicking on the CHIME Desktop, and selecting Book and then Save:



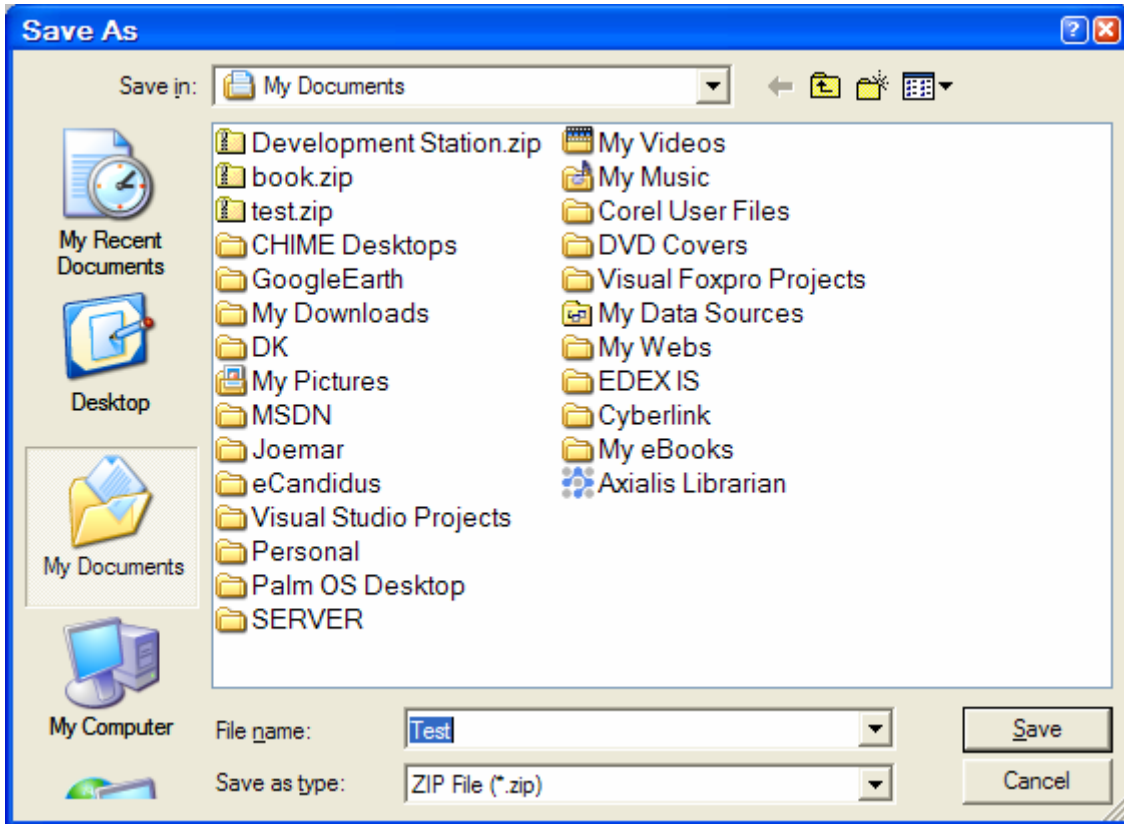
Note that any operation that threatens to lose any changes to the active book forces the user to be warned, and allowed to save the changes.

Backing up a Book

The current book can be backed up by right clicking on the CHIME Desktop and selecting Book and then Backup:



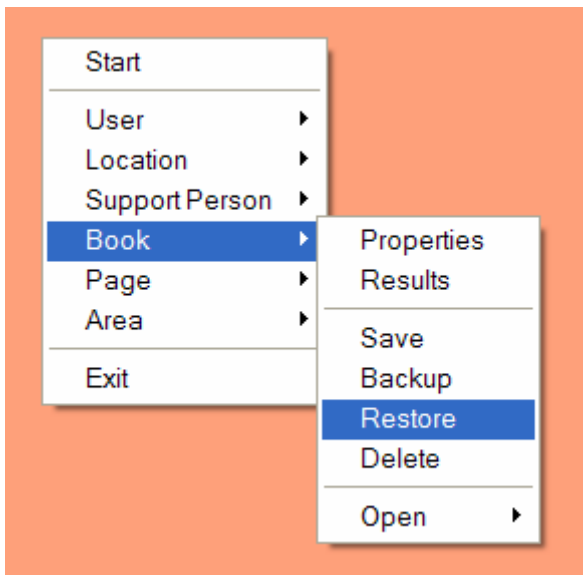
The following screen appears:



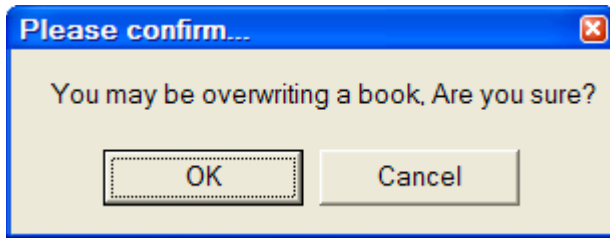
Once a name and location is selected, and the “Save” button is clicked, the system will ZIP the entire book, and place it in the file selected.

Restoring a Book

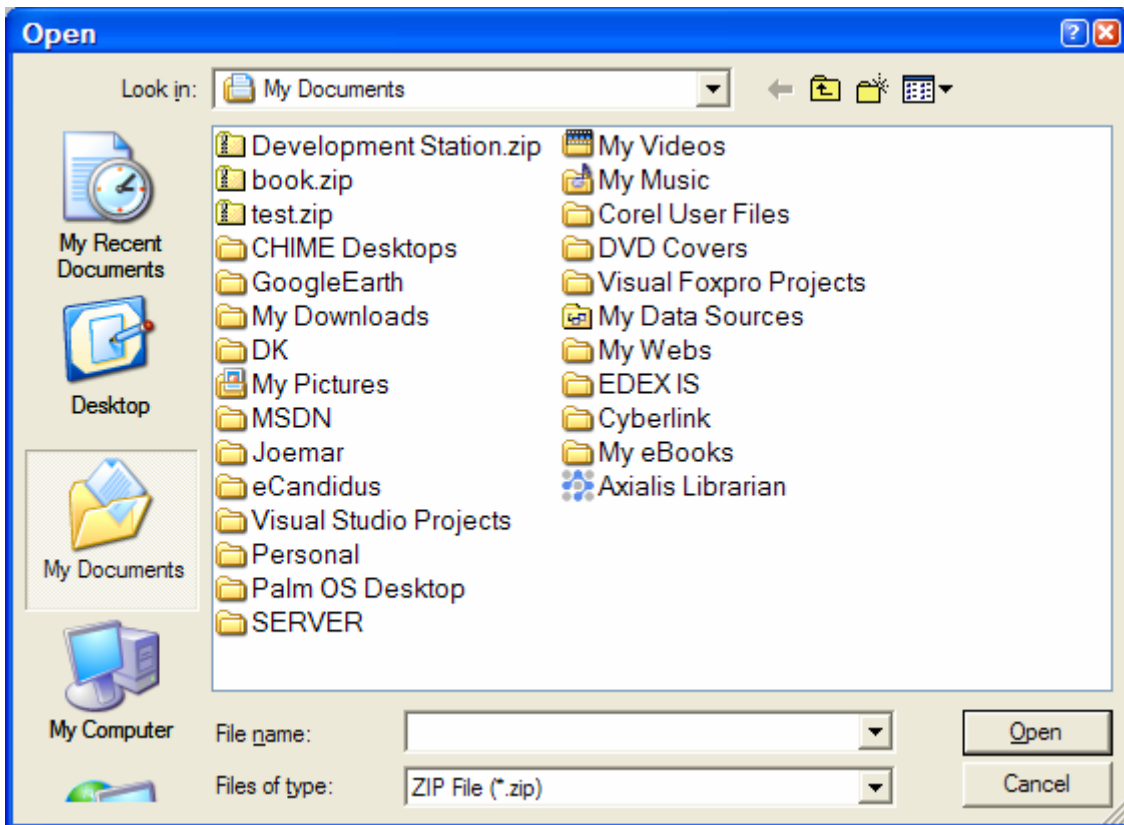
A book can be restored from a ZIP file by right clicking on the CHIME Desktop, and selecting Book and then Restore:



The following screen will appear:



If “OK” is selected, the following screen appears:

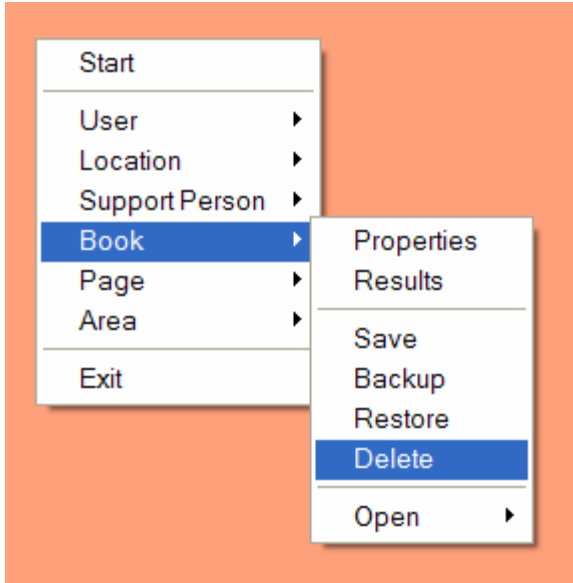


Once the file is selected, and the “Open” button is clicked, the system will restore the book.

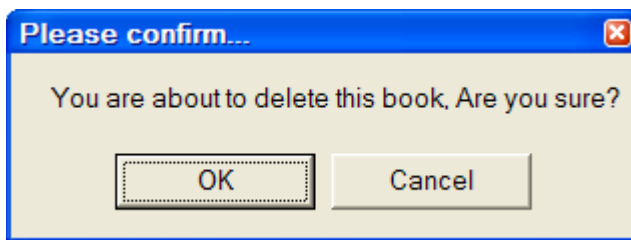
Note that a book can be restored to a different user/support person combination, allowing for the copying of books between users.

Deleting a Book

A book can be deleted by right clicking on the CHIME Desktop, and selecting Book and then Delete:



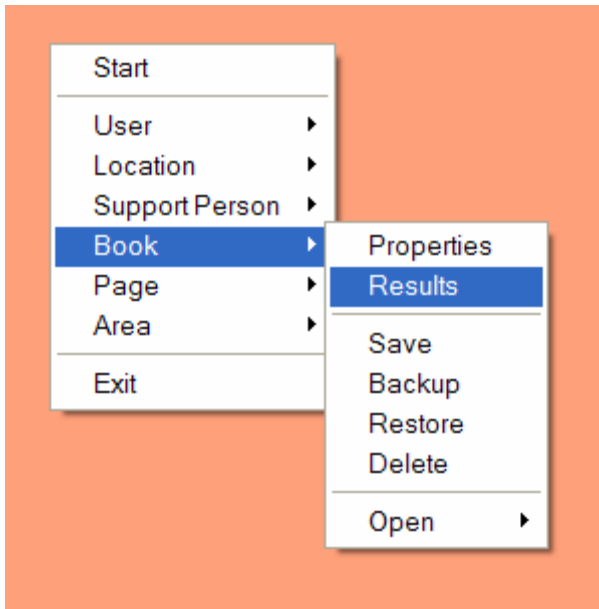
The following screen will be displayed:



The book will be deleted if the “OK” button is clicked.

Obtaining the results of Questionnaires

To obtain the results from a questionnaire, right click on the CHIME Desktop and select Book and the Results:



Note that the entry is available only if there are results. When selected the following screen appears:

A screenshot of a window titled 'Results'. The window contains a table with the following data:

	Start	End	Mins. Elapsed	Correct	Incorrect	Pct
▶	9/11/2005 12:26:56 PM	9/11/2005 12:27:22 PM	0	3	0	100
	9/11/2005 12:27:30 PM	9/11/2005 12:28:05 PM	1	3	2	60

Note that the contents will be different that those shown.

Start

The date and time that the questionnaire was started.

End

The date and time the the questionnaire ended.

Mins. Elapsed

The number of minutes that the user took to answer all of the questions correctly.

Correct

The number of correct answers given.

Incorrect

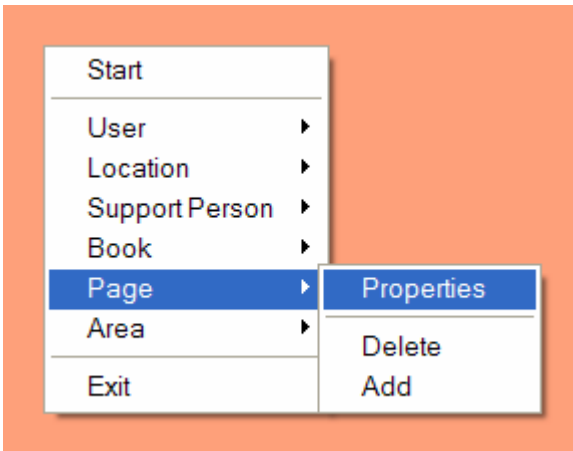
The number of incorrect answers given.

Pct

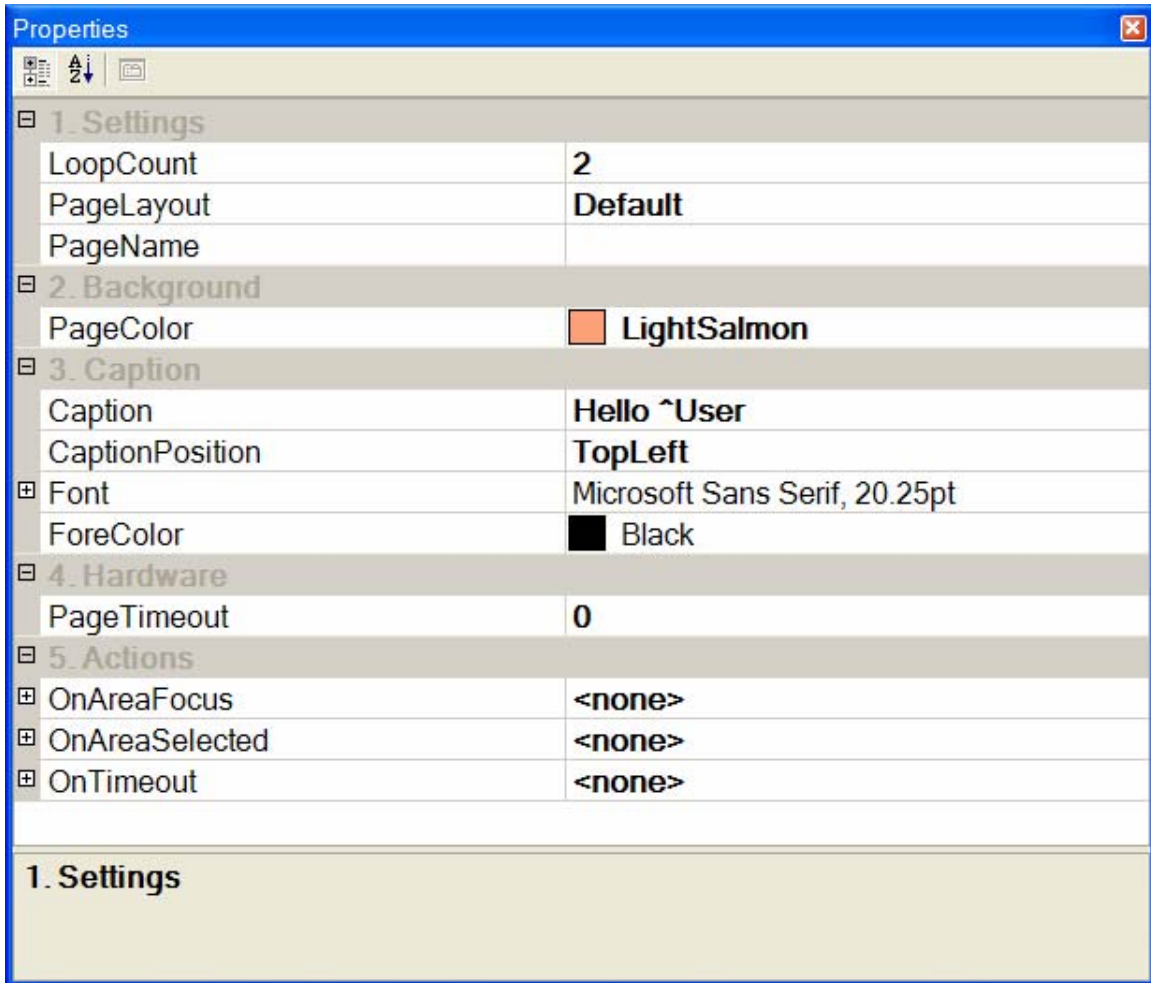
The percent of correct answers to the total number of answers.

Defining a Page

A page is defined by right clicking on the CHIME Desktop, and selecting Page and the Properties:



The following screen is displayed:



LoopCount

The number of times that the user is allowed to go through all of the areas in the page before the previous page is displayed. Setting this to zero (0) disables the effect.

PageLayout

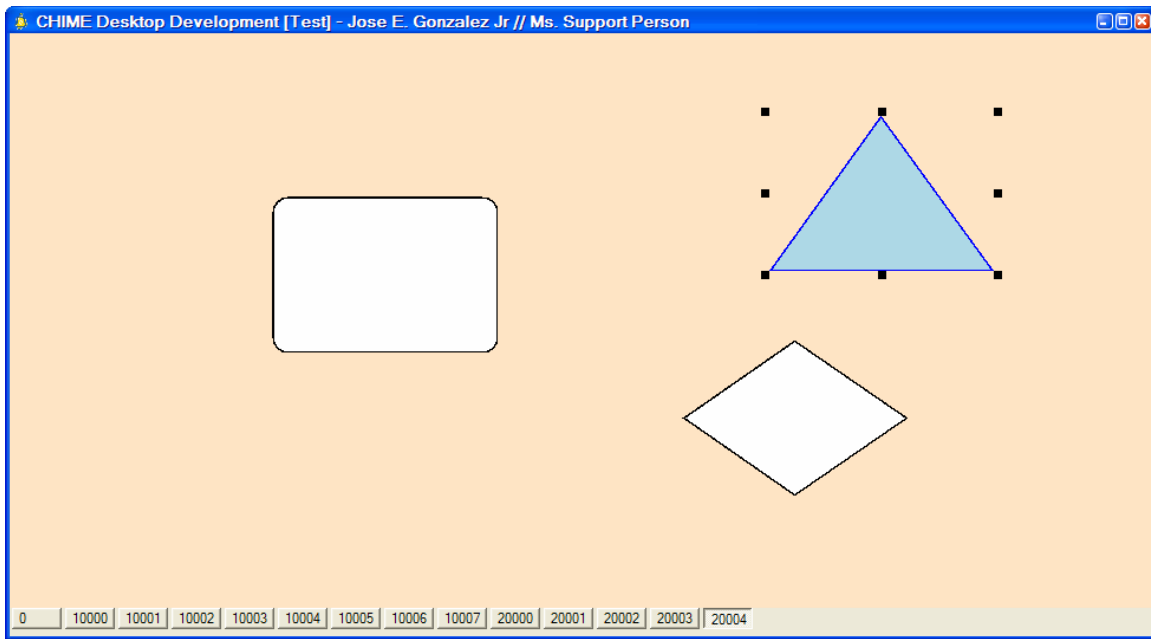
The page layout allows for the control of how areas are drawn in the page. The following options are available:

Default

Use the definition from the book level [PageLayout](#).

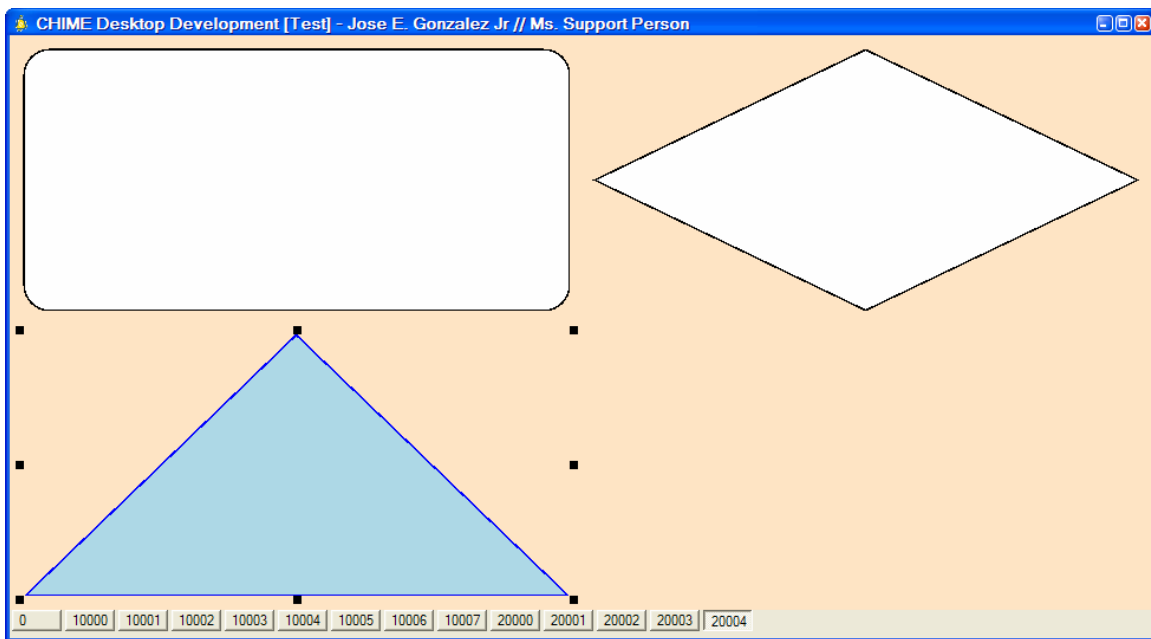
Manual

The areas will be drawn as they are defined when created. This is an example of a manual layout page.



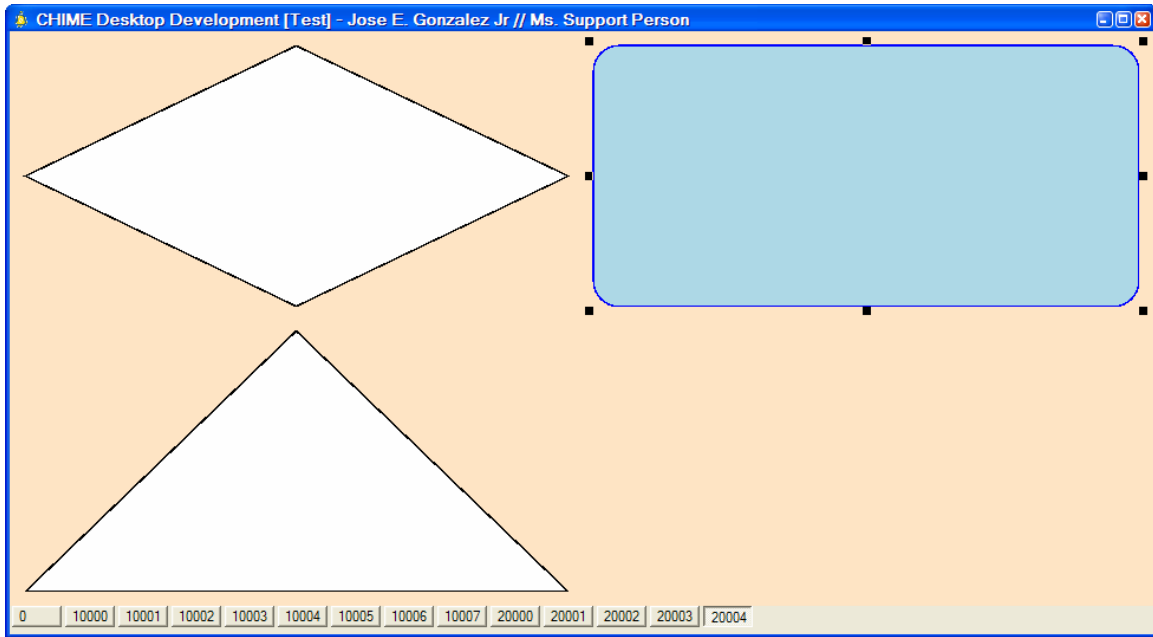
Auto

The areas will be position and resized according to the number of areas in the page. The order is defined by the [AreaIndex](#) property:



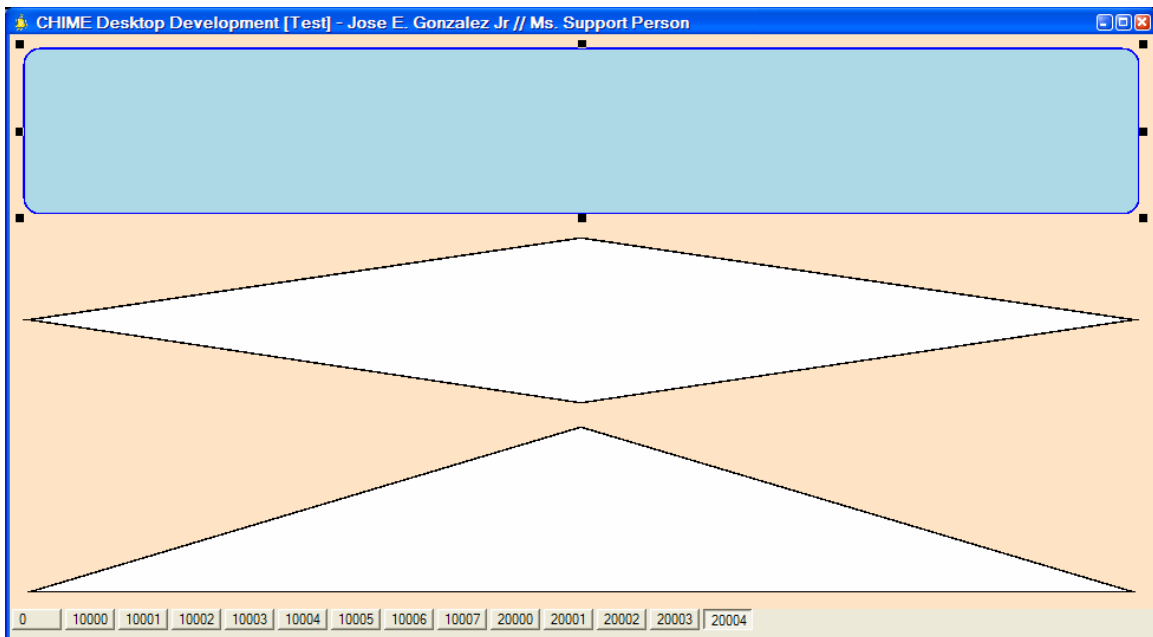
Shuffle

The areas will be drawn similar to the Auto setting, except that their position will vary in a random manner.



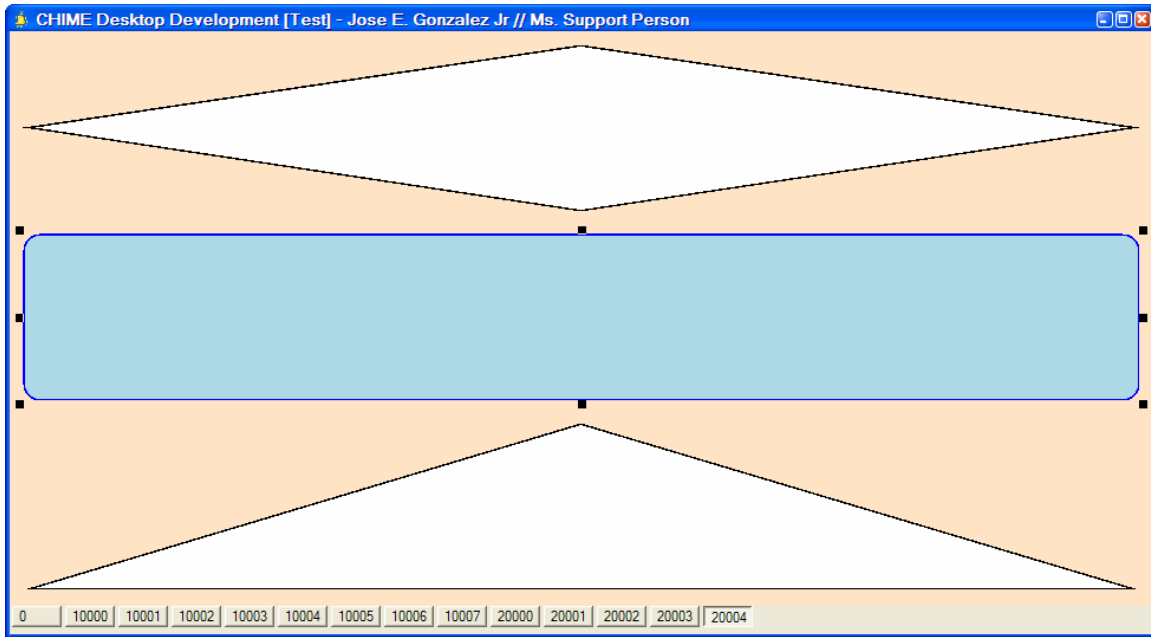
Questionnaire

The areas will be placed and positioned down the page:



ShuffleQuestionnaire

The areas will be placed like defined in the Questionnaire setting, except that their order will vary in a random manner.



PageName

The name of the page. Used as part of the [GoTo](#) actions.

PageColor

The color of the page.

Caption

The caption to be used for the page.

Caption Position

The position where the caption is to be displayed in the page. You can select the position from a graphics display shown when the down triangle button is clicked.

Font

The font to be used for the caption of the page.

ForeColor

The color of the caption of the page.

PageTimeout

Not implemented at this time.

The amount of time, in milliseconds, until the [OnTimeout actions](#) are executed, if no area is selected.

OnAreaFocus

The default [actions](#) to be carried out when an area gets the focus. This can be overridden by the area [OnAreaFocus](#) settings.

OnAreaSelected

The default [actions](#) to be carried out when an area is selected. This can be overridden by the area [OnAreaSelected](#) settings.

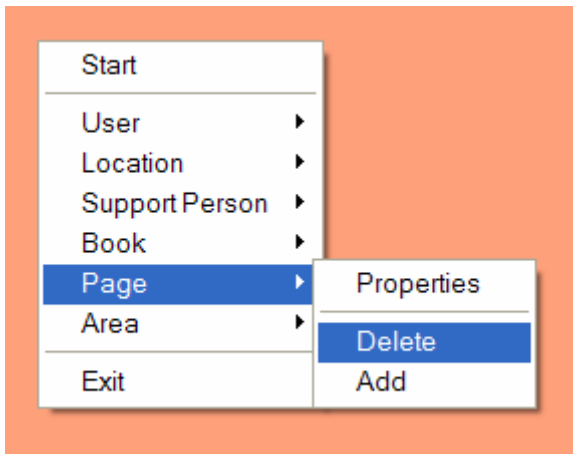
OnTimeout

Not implemented at this time.

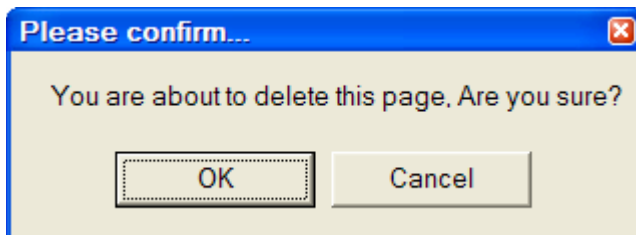
The default [actions](#) to be carried out when a [PageTimeout](#) elapsed without an area being selected.

Deleting a Page

The current page can be deleted by right clicking on the CHIME Desktop, and selecting Page and then Delete:



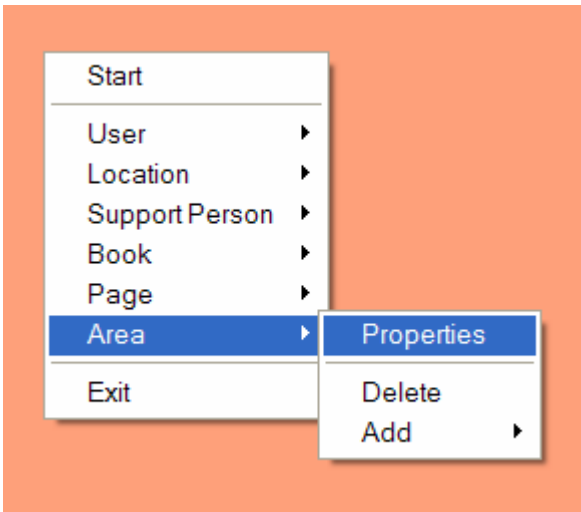
The system will then display the following screen:



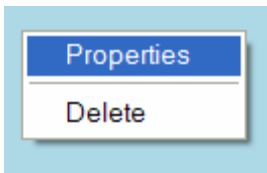
The page will be deleted if the “OK” button is clicked.

Defining an Area

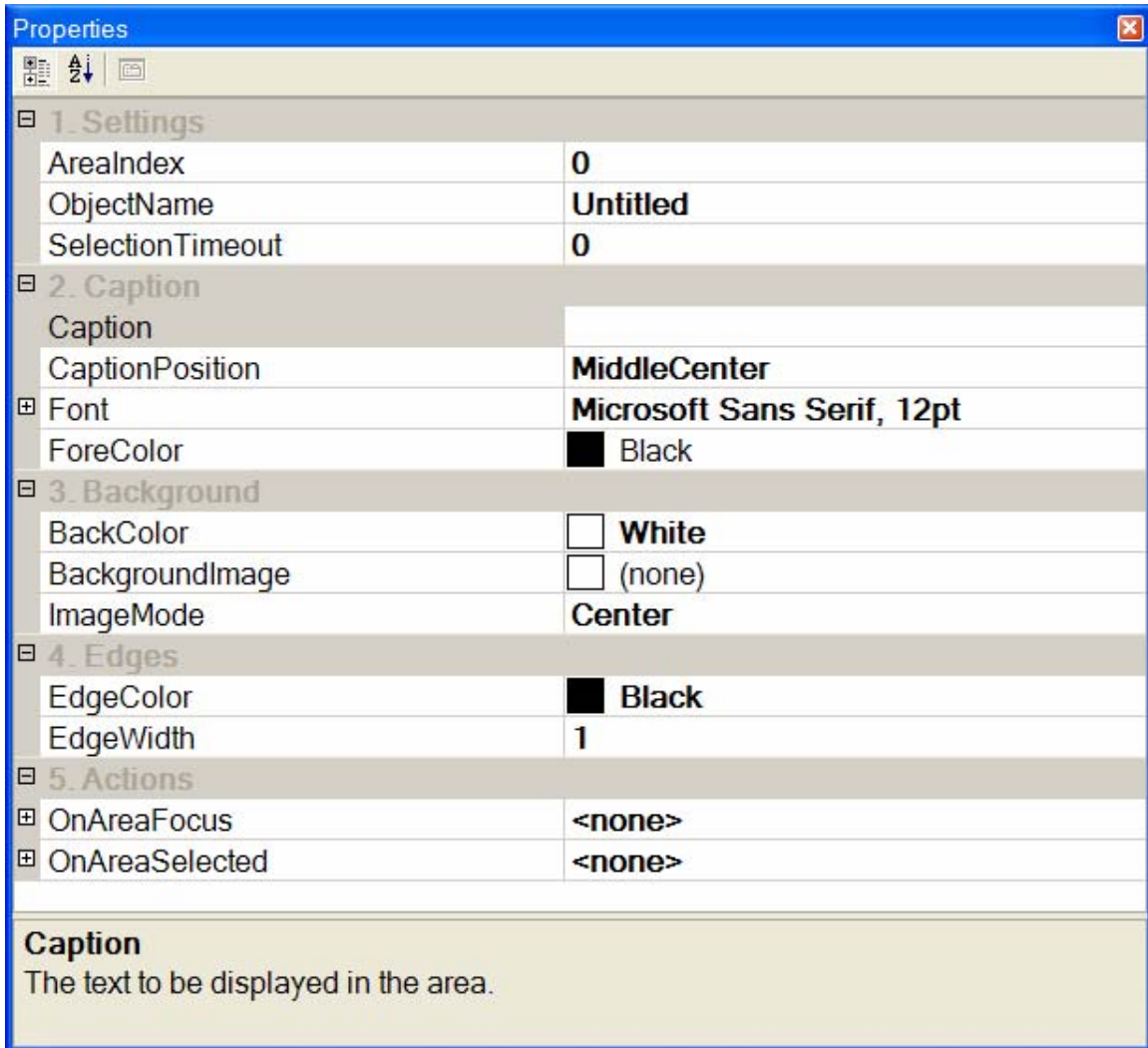
An area can be defined by right clicking on the CHIME Desktop and selecting Area and then Properties:



You can also define the area by right clicking on the area itself and selecting Properties:



The following screen will be displayed:



AreaIndex

The logical position of the area in the focus list. The first area is numbered zero (0), and areas are automatically renumbered when any area index changes in the page.

ObjectName

The name of the area. Used for reference purposes only.

SelectionTimeout

The amount of time, in milliseconds, before focus is given to the next area. Setting the value to zero (0) disables the automatic focus change.

Caption

The caption to be used for the area.

CaptionPosition

The position where the caption is to be displayed in the area. You can select the position from a graphics display shown when the down triangle button is clicked.

Font

The font to be used for the caption of the area.

ForeColor

The color of the caption of the area.

BackgroundColor

The background color of the area in its normal mode.

BackgroundImage

The image to be displayed in the area's background.

ImageMode

The mode that the background image will be displayed. The options are:

Center

The image will be centered in the area.

Stretch

The image will be stretched/reduced to fill the area.

EdgeColor

The color of the area's edge in normal mode.

EdgeWidth

The width of the area's edge in pixels.

OnAreaFocus

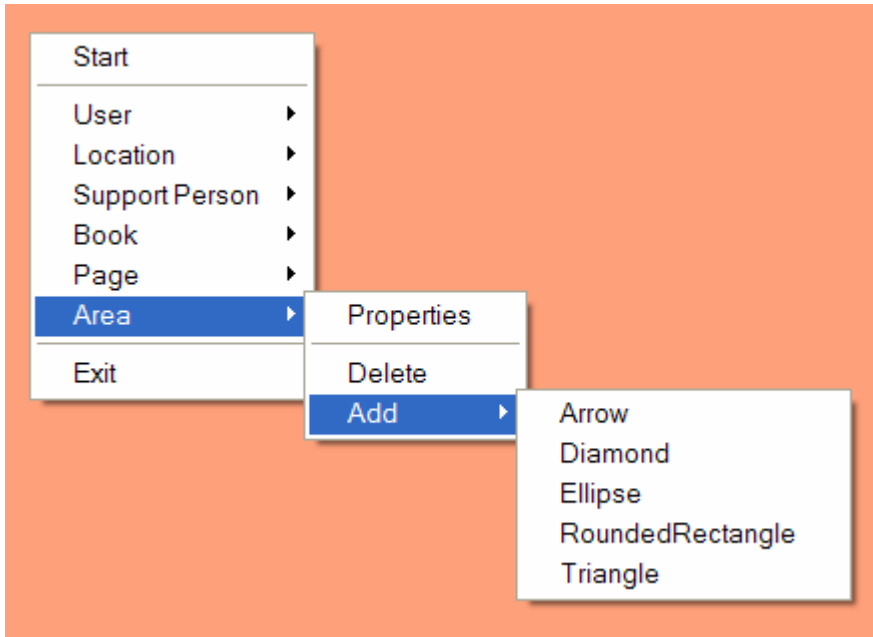
The [actions](#) to be taken when the area gets the focus.

OnAreaSelected

The [actions](#) to be taken when the area is selected.

Adding an Area

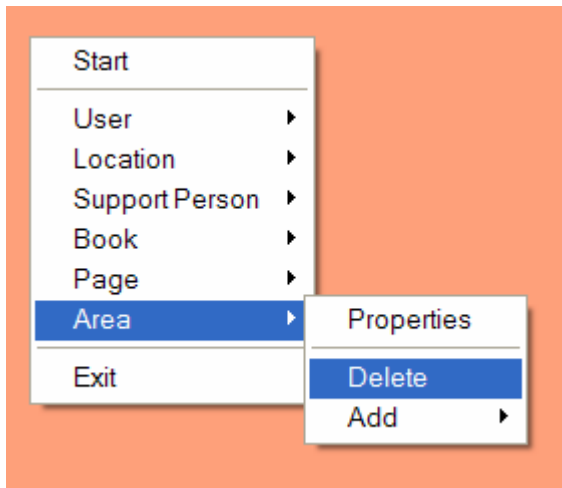
An area is added by right clicking on the CHIME Desktop and selecting Area, the following is displayed:



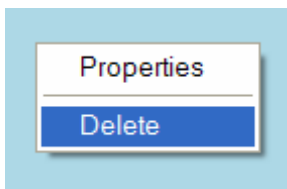
The area is created when the shape is selected.

Deleting an Area

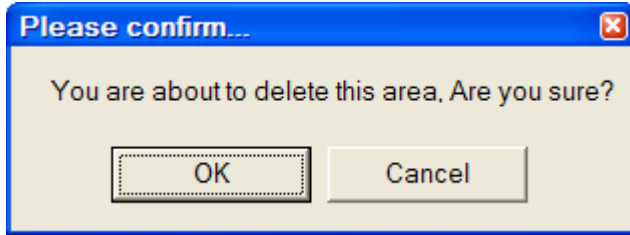
The current area can be deleted by right clicking on the CHIME Desktop, and selecting Area and then Delete:



You can also delete the area by right clicking on the area itself, and selecting Delete:



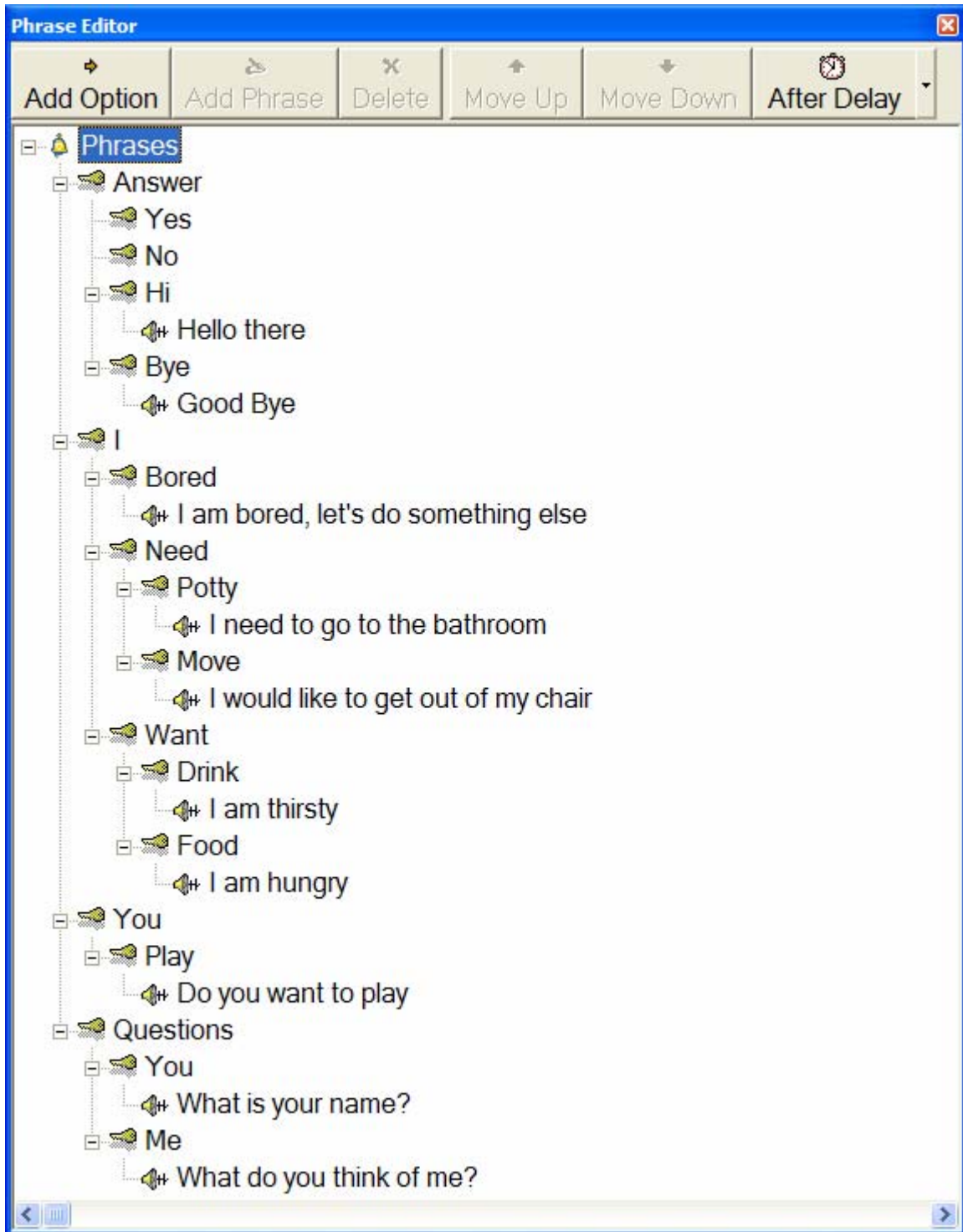
The following screen is displayed



The area is deleted if the “OK” button is clicked.

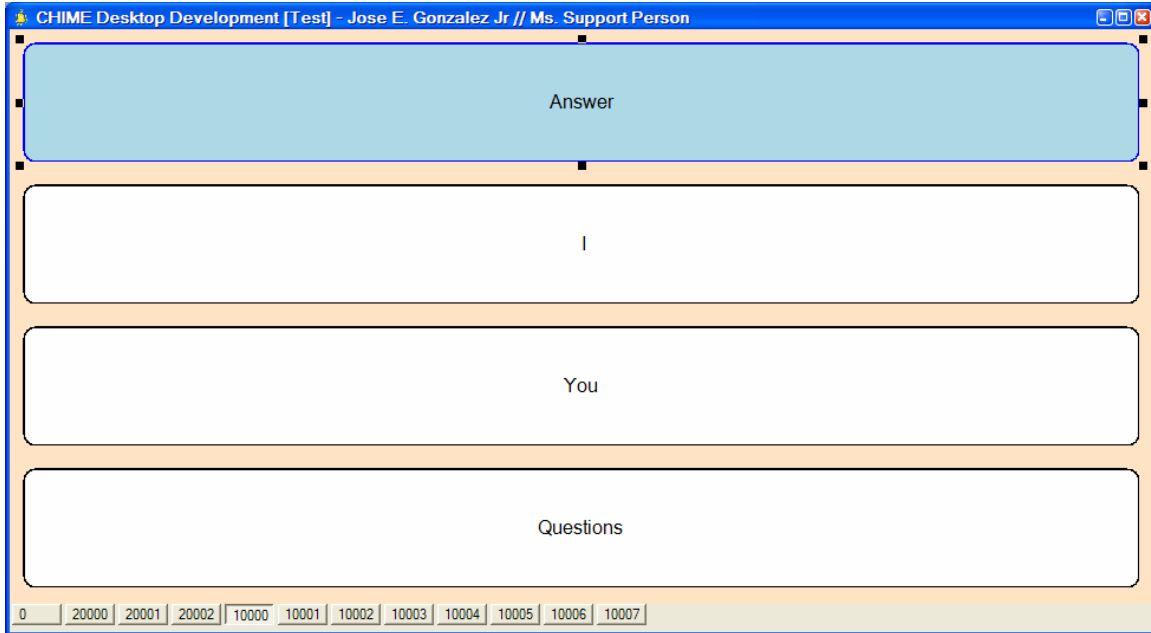
Appendix A – A sample phrase table

The following is a sample phrase table:

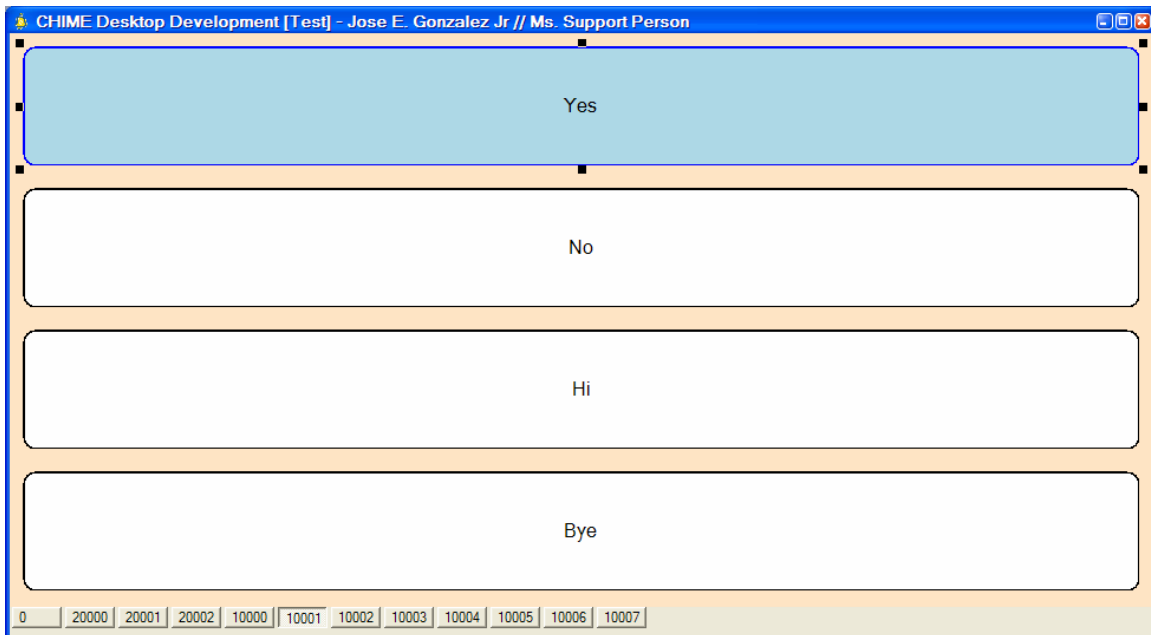


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This phrase table generates the following as the first selection page:



Notice that the page is built by the first level of choices in the phrase table. Let's assume that the answer choice is selected, the CHIME Desktop would then display the following:



This is the list of selections found under the “Answer” entry in the phrase table. Any number of levels can be defined this way. In this case there are two levels of selection. Lets assume that “Hi” is selected, the CHIME Desktop would then say the phrase “Hello, my name is John”.

Note that the “Yes” option has no phrase under it, which tells the CHIME Desktop to say the option itself.

Shortcuts and Phrases

One of the powerful combinations of the CHIME Desktop is the use of [shortcuts](#) with the [phrase table](#) defined in the [MyBook](#) book.

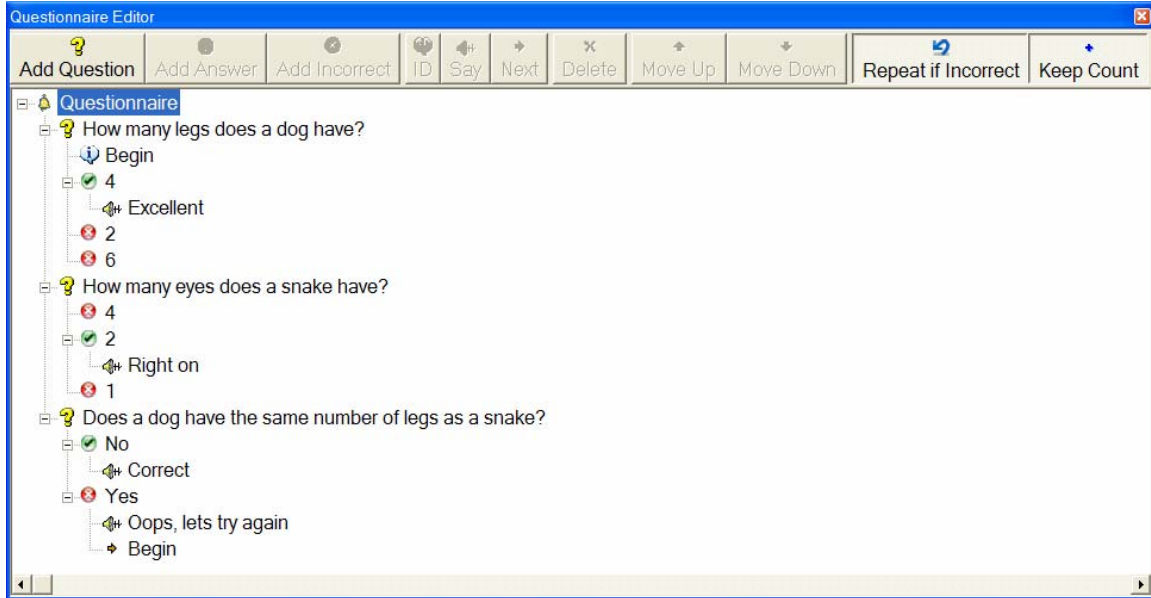
Using the phrase table defined above, a user that can use two switches, right and left, can create the following shortcut table:

Shortcut	Says phrase
LR	Yes
RL	No
LLL	I am bored, lets do something else
LLR	I would like to get out of my chair
LRL	I need to go to the bathroom
LRR	I am thirsty
RLL	I am hungry
RLR	Do you want to play?
RRL	Hello there
RRR	Good bye

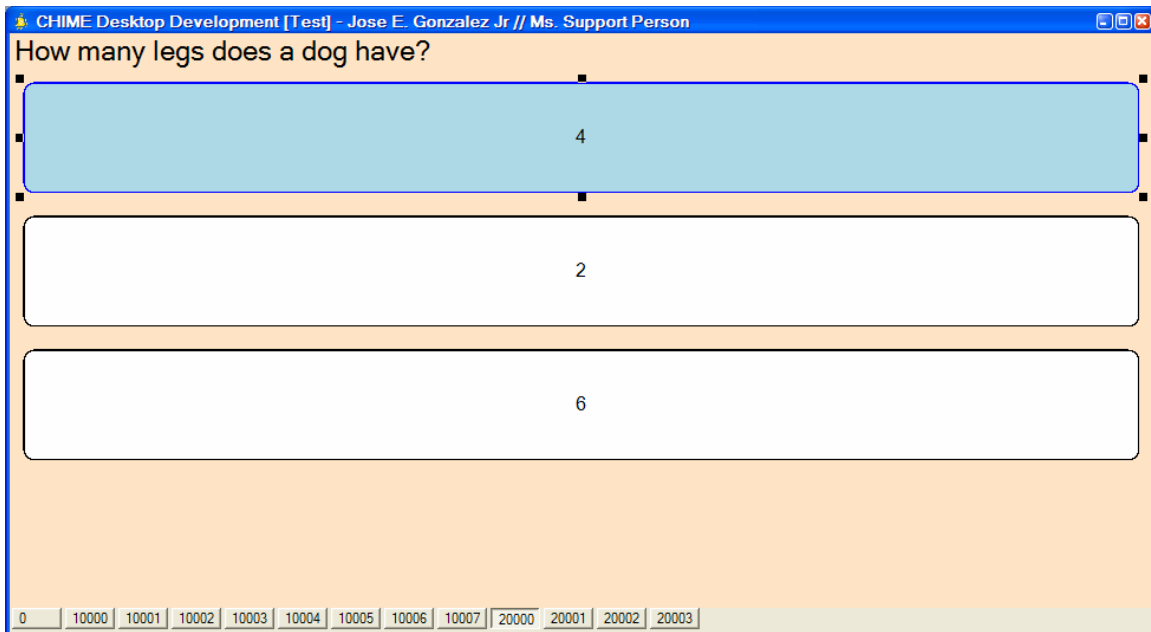
As you can see a simple set of phrases that allows the user to communicate needs, and answer yes/no questions can be accessed with three switch activations. With a [SwitchTimeout](#) setting of 1.5 seconds, the User can generate responses within two seconds, creating a sense of normal response.

Appendix B – A sample questionnaire table

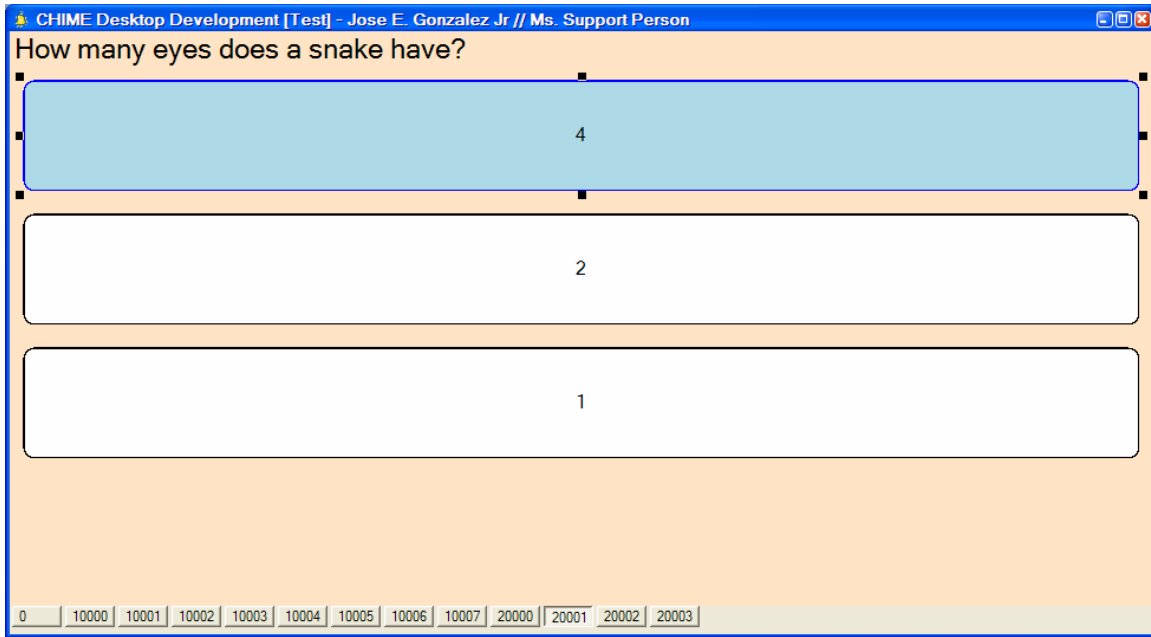
The following is a sample questionnaire table:



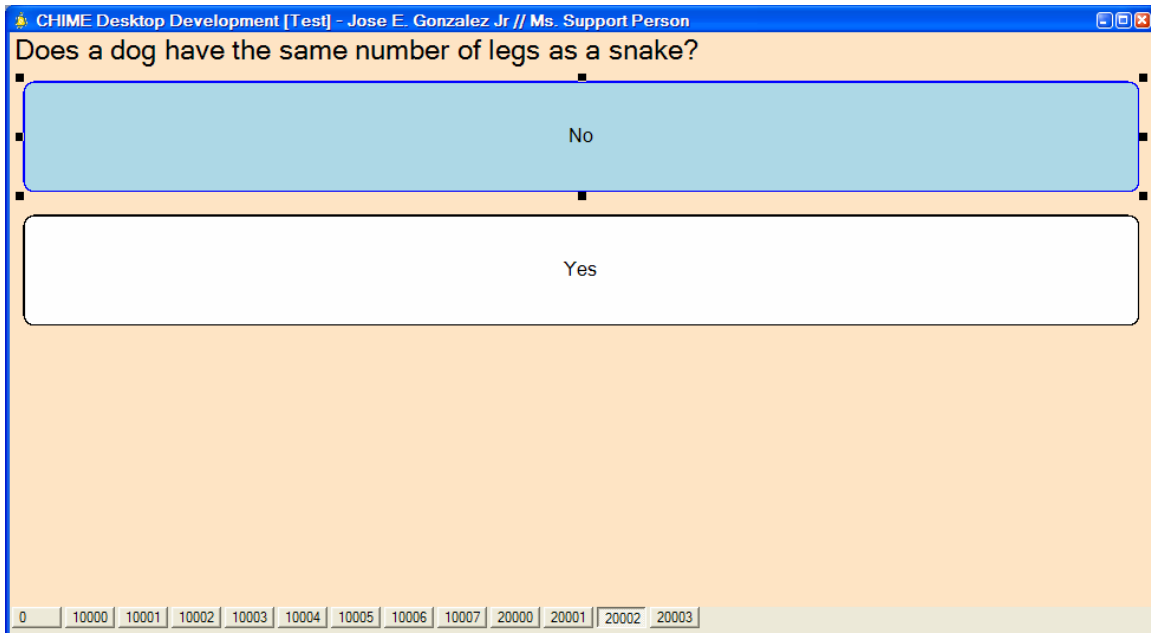
This questionnaire table generates the following as the first question page:



If the answer of “4” is selected, the phrase “Excellent” is told to the user and the following page will be shown:

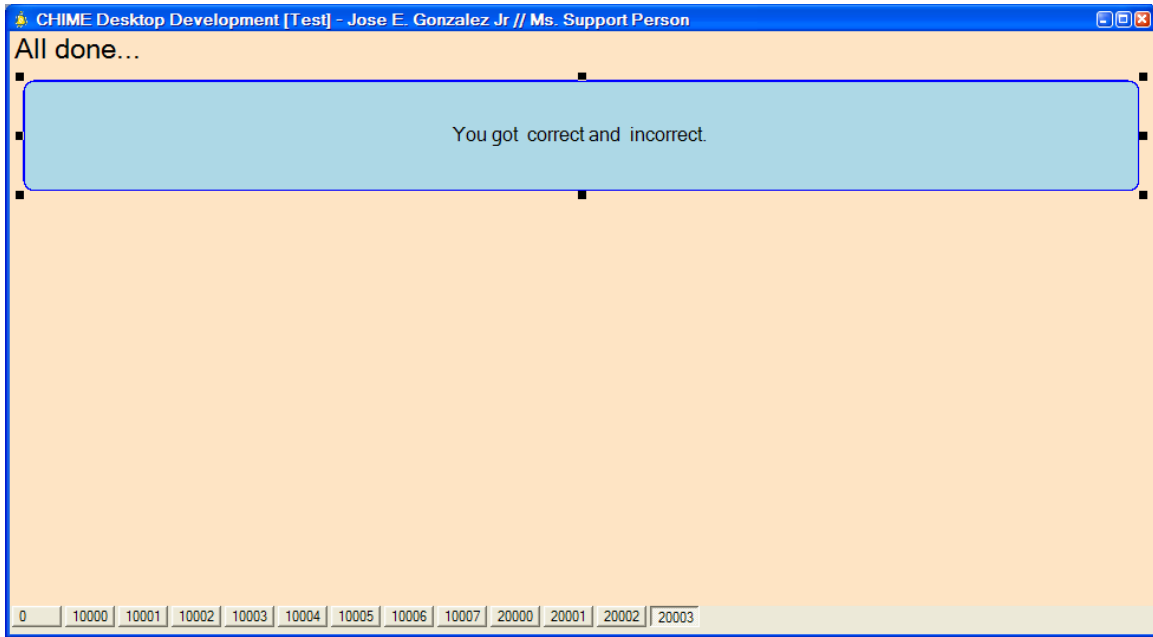


If any answer but “2” is selected, the question will be asked again, since the “[Repeat if incorrect](#)” option is selected. If “2” is selected, the phrase “Right on” is said to the user and the following is shown:



If “Yes” is selected, the phrase “Oops, lets try again” is said to the user, and the first question is asked again. Selecting “No” will say “Correct” to the user, and since the “[Keep Count](#)” option is selected, the following page is shown:

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Note that the number of correct and incorrect answers would be shown, as the caption created is “You got ^Correct correct and ^Incorrect incorrect.”

Acknowledgments

This project is being carried out for the benefit of all of the children that are lucky enough to be part of the CHIME Elementary and Middle School projects of the CHIME Institute.

My family has been fortunate enough to be part of the project, as my youngest son Evanne Gonzalez has been part of the schools since their inception. He is currently on the seventh grade, and was diagnosed with Autism/Asperger's Syndrome at three years of age. He has benefited from CHIME's unique method of inclusion, truly incredible staff and never ending attention to the needs of all.

I wish to thank Ms. Amy Meck, who is leading the development process, Ms. Renee Harvey and Ms. Julie Fabrocinni for leading the Middle and Elementary schools respectively, and to the Evans family for allowing me and my son Joemar, to try to help in their infinite struggle. I hope that our goals, to allow Donovan to be able to interact with his environment, are successful.