

# SMART Rehabilitation

## Reference Manual



For SMART Software Version 1.8a

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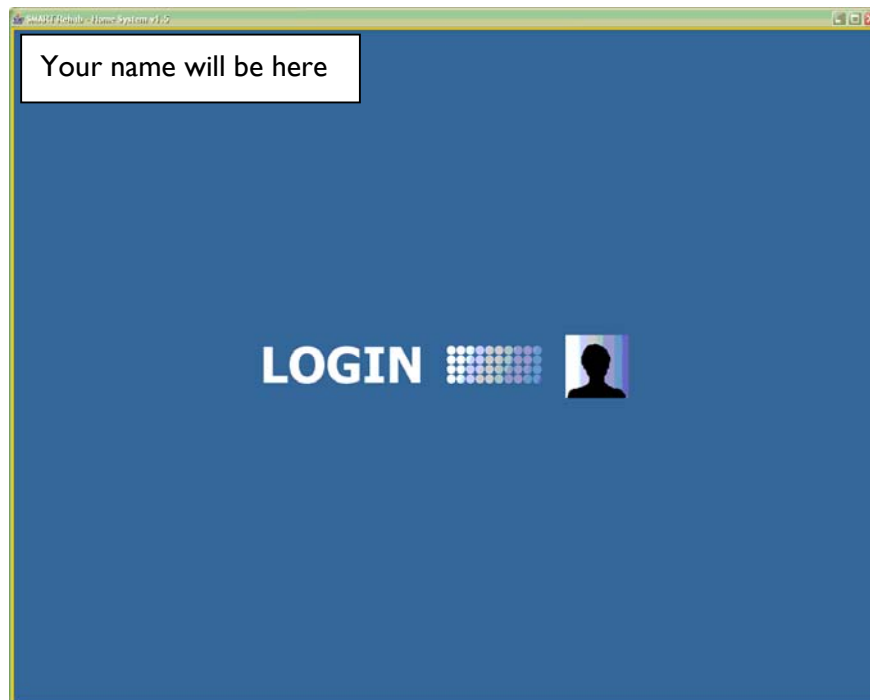
## Turning on the SMART system

### *Turning on the SMART computer and the touchscreen*

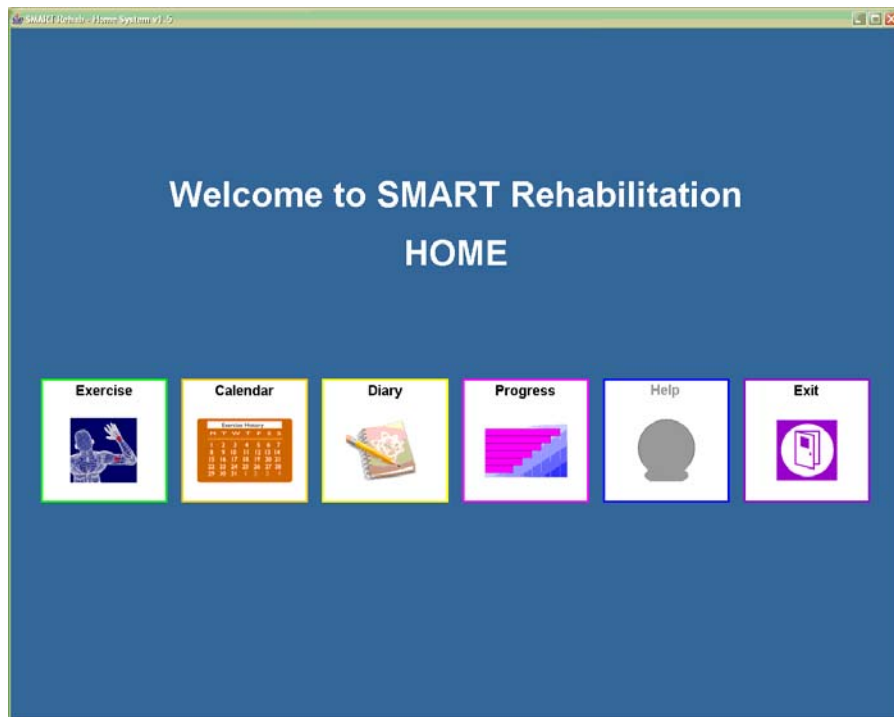
To turn on the SMART computer and touchscreen, push the button marked "ON" on the SMART computer and the "Power" button on the right side of the touchscreen. The SMART system will turn on and you should see a number of boxes appear briefly on the screen before the SMART Login screen appears.

### *Logging on to SMART*

Your name should be at the top left of the screen. To start using the SMART software, push anywhere on the Login screen. The screen may take several seconds to respond to commands.



You will see the SMART Home screen, which is shown below. You can choose from the six options: Exercise, Calendar, Diary, Progress, Help and Exit. (Help file is currently not available.)



## Recording an Exercise

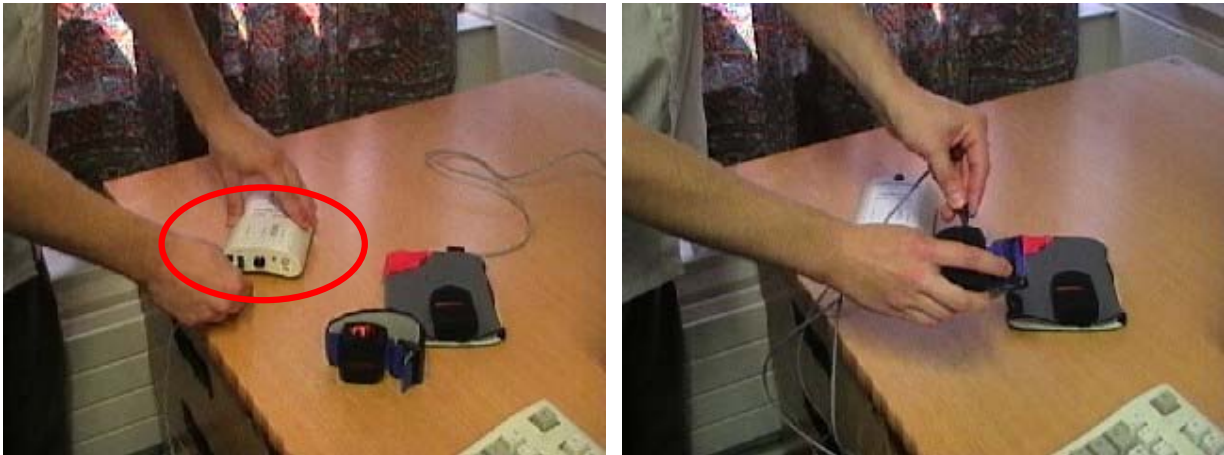
### *Preparing the SMART system for exercise*

Before you begin, the orange sensor marked “Wrist” should be inserted in the wrist-band. The sensor marked “upper arm” should be placed in the upper arm-band.

**Once you’ve inserted the sensors, you might find it easier to leave them in the wrist- and arm-bands.**



Next, connect the grey cables to the Control Box (shown below left). Now connect the cables to each of the sensors. Make sure that the cable from the control box connection marked “W” is connected to the wrist sensor.



When the sensors are secured in the attachments and the cables are connected, slide the arm-band on to the arm. The red area of the arm-band should be positioned on the inside of the elbow, as shown in the picture below. The sensor should be on the outer part of the arm.



Next, position the wrist-band and fasten the strap. Make sure the sensor is positioned on the back of the wrist, as shown in the picture below.



Next, make sure you've positioned the Xbus Control Box, using either the strap to secure the Xbus around your waist or the clips to attach it to your belt or clothing.



You must make sure that the XBus Control Box is switched on before you exercise. Turn the Control Box on by pushing the "On" button. The light on the Control Box should be blue and will be flashing on and off.

**Each time you exercise it is important that you sit in the same position.**

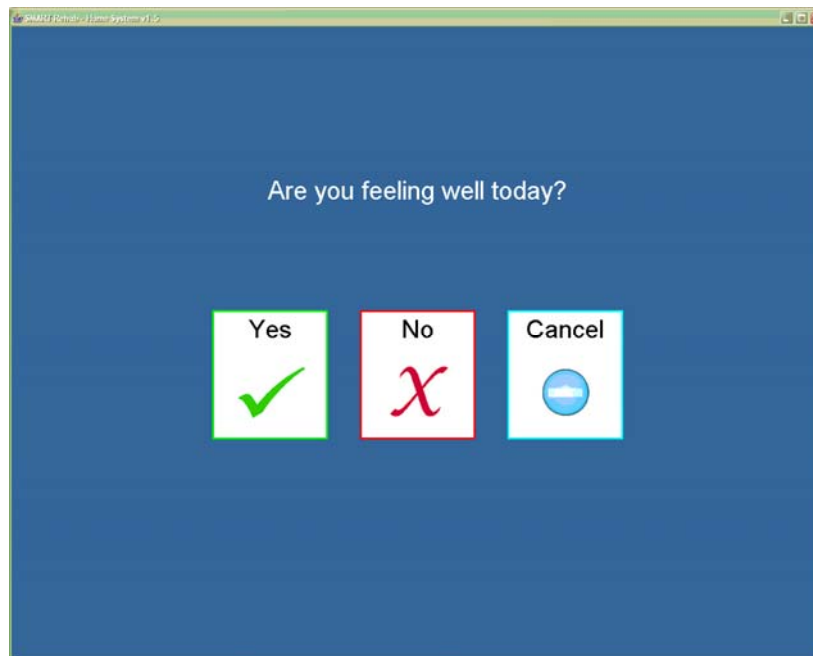


### **Selecting the “Exercise” button**

When you have prepared for your exercise, push the "Exercise" button.

### **Answering the preliminary questions**

You will be asked some questions about how you feel. Answer all the questions by pushing either the “Yes” or “No” button. You can cancel at any time by pushing the “Cancel” button.

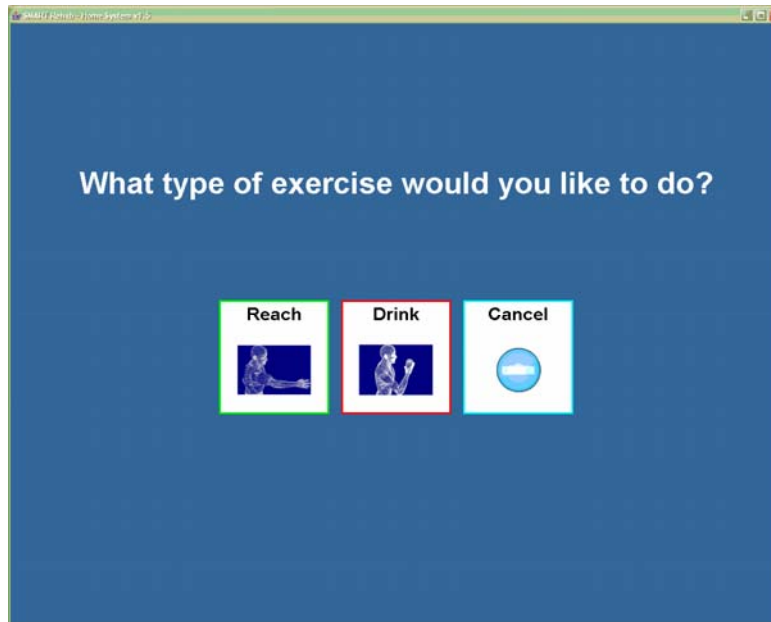


### **Selecting the type of exercise**

After you have answered the questions, you will be asked to choose the type of exercise that you want to do.

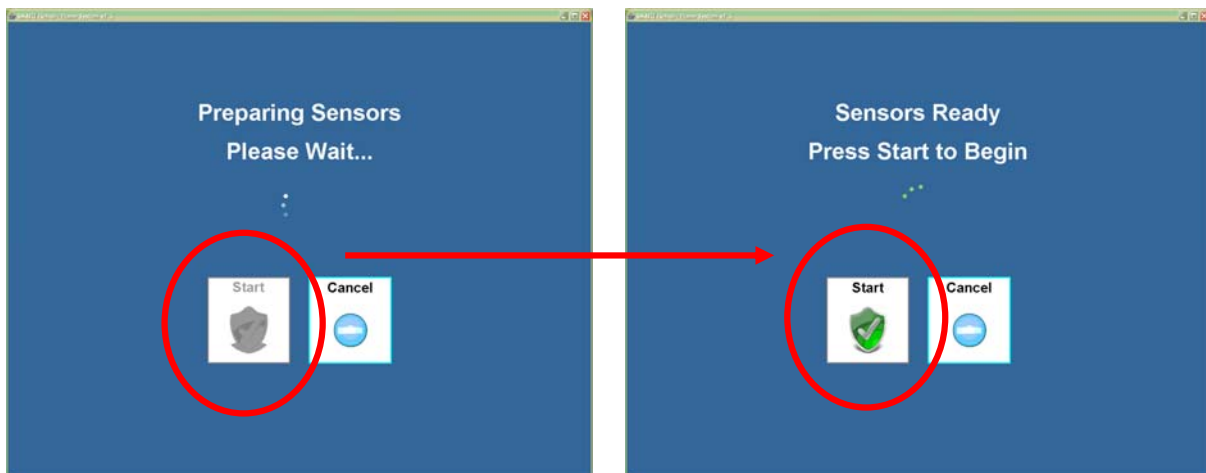
At this stage of the project, only the Reach exercise is available. Press "Reach".

Again, you can cancel at any time by pushing the “Cancel” button.



### ***Waiting for sensors to be prepared***

You may have to wait a moment while the sensors are prepared.



### ***Starting your exercise***

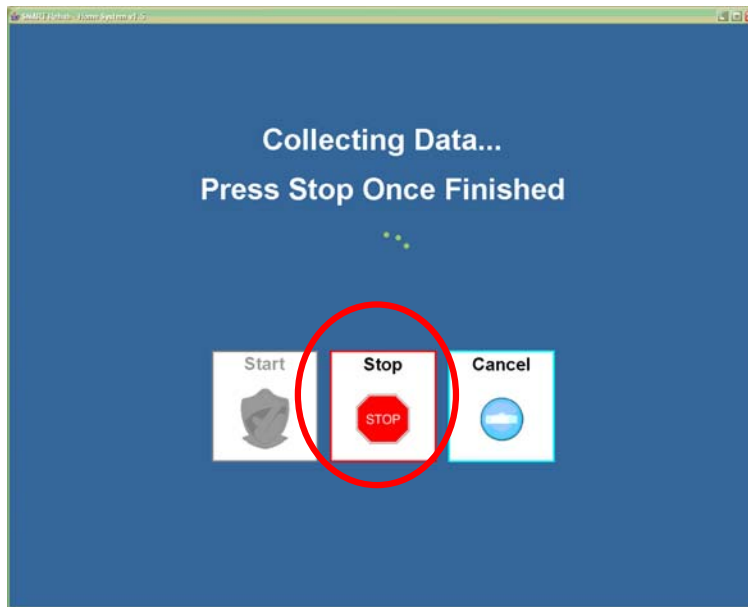
When you are ready to exercise and the "Start" button has turned green, you can push it to begin recording your exercise. (If you have forgotten to turn on the X Bus Control Box you will see a message "No data on Comport". Turn on Control Box, and wait for Home Page to reappear.)

### ***Performing the exercise***

After you have pushed the Start button, begin the exercise that your therapist has asked you to do. Remember to face the same direction each time.

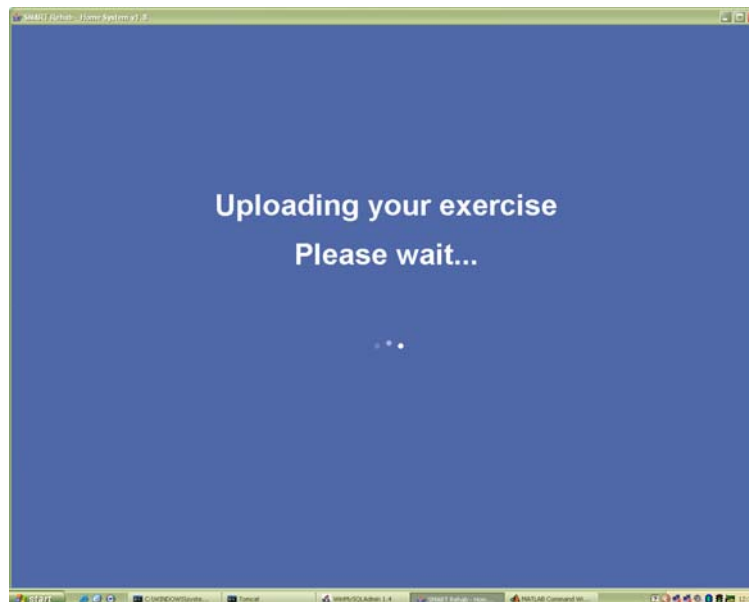
### **Stopping your exercise**

When you have completed your exercise, push the “Stop” button.

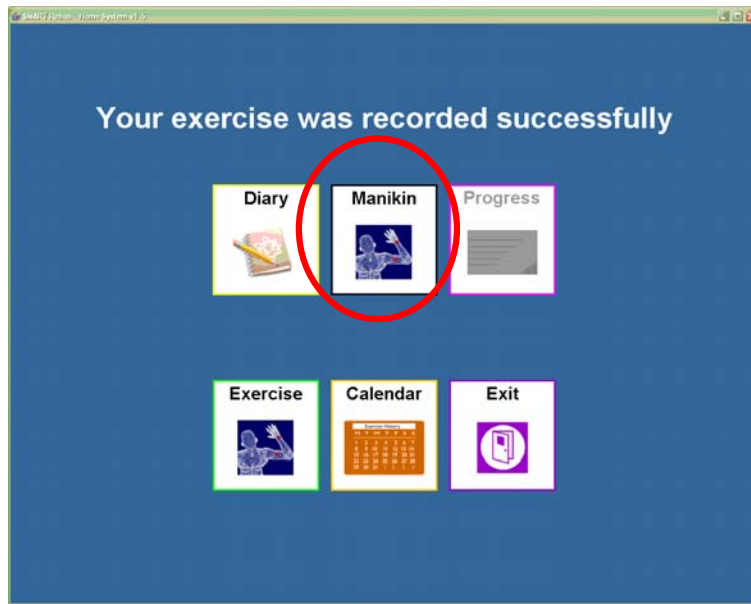


### **Saving (uploading) your exercise**

After you have recorded your exercise, it will be saved (uploaded). While it is being uploaded you will see the screen shown below. If the SMART software encounters a problem saving your exercise, you will be asked whether you wish to try again.



If your exercise has been recorded successfully, you will see the screen shown below. You will be able to choose from the six options.

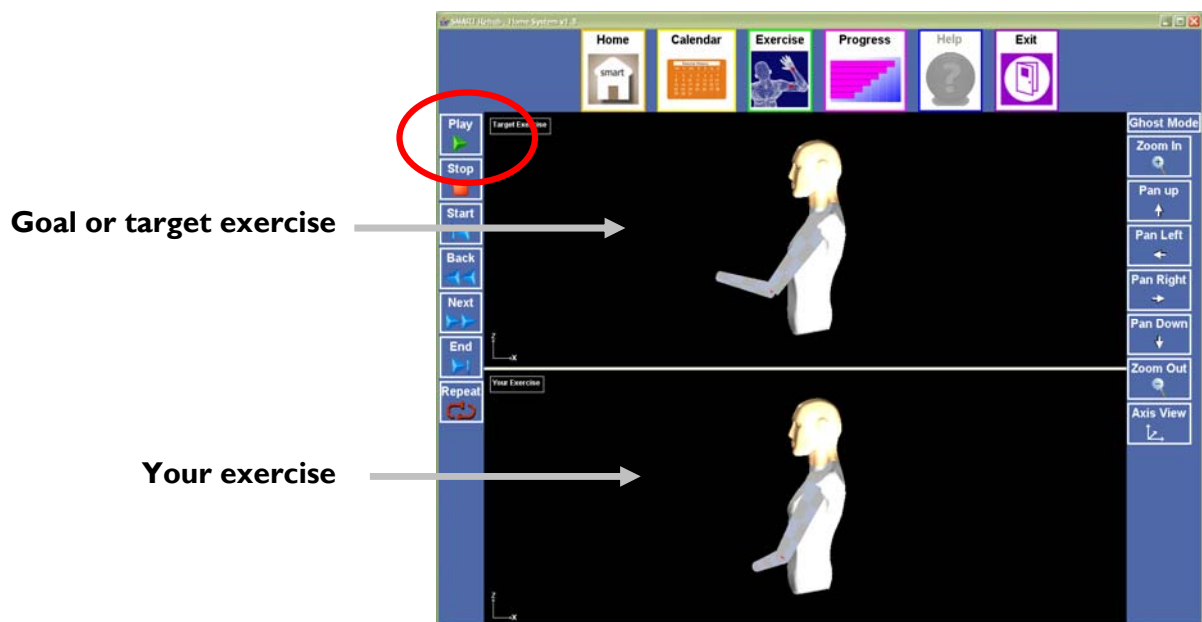


## Viewing your exercise with the manikin

To view the exercise that you have just recorded, simply push the “Manikin” button, which is circled in the picture above.

### Observing the movement of the manikin

You will be able to view your exercise and compare it with the goal (or target) exercise. The target exercise appears in the upper pane, and your exercise appears in the lower pane.



### ***Playing the Exercise and Target Movement***

Push the “Play” button twice to make the target movement and your exercise “play”. The “Play” button is located at the top left of the screen and is circled in the previous picture on page 10. All of the buttons are also shown here to the right.

### ***Stopping the Exercise and Target Movement***

Push the “Stop” button to stop the movement.

### ***Using the other buttons***

Push the “Start” button to take the movement back to the start.

Push the “Back” button to take the movement back a step - like rewinding a video one frame at a time.

Push the “Next” button to take the movement forward a step - like advancing a videotape, frame by frame.

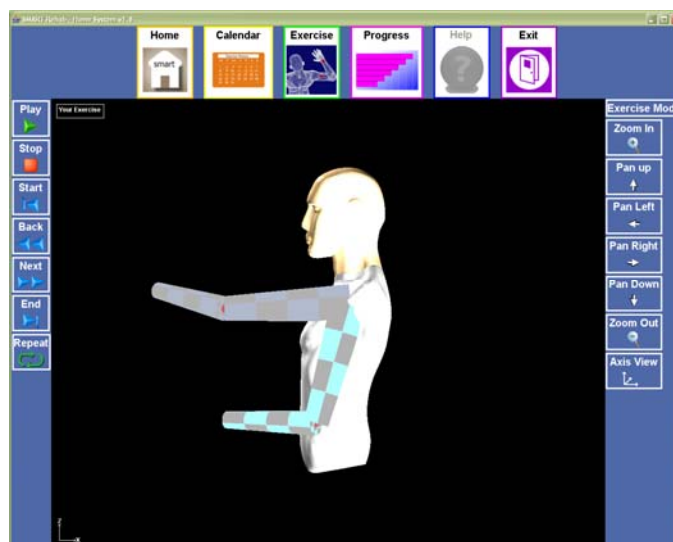
Push the “End” button to take the movement to the end.

### ***Making the exercise play continuously***

If you want to look at your exercise over and over again, push the “Repeat” button. You will see that the arrows turn green when the "Repeat" option is playing and red when you have stopped the "Repeat" option. (The movement may still play for a few seconds after the "Repeat" button changes to red.)

### ***Changing the manikin presentation***

When you first open the manikin you will see both the target movement and your exercise. You can also make the movements appear in “Ghost mode”, as shown below. The light blue arm is the target exercise. The other arm shows your exercise.



### Changing angle of observation

If your right side is affected, the manikin screen will open to show the manikin's right side; if your left side is affected, the manikin's left side will be shown. If you would like to look at your exercise or the goal exercise from a different angle, use the "Axis" button, which is the lowest button on the right of the screen.



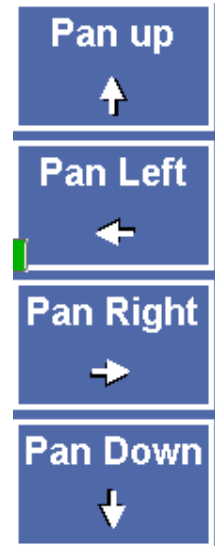
### Zooming in and out

If you would like to zoom in or out, use the Zoom buttons, which are also found on the right of the screen.



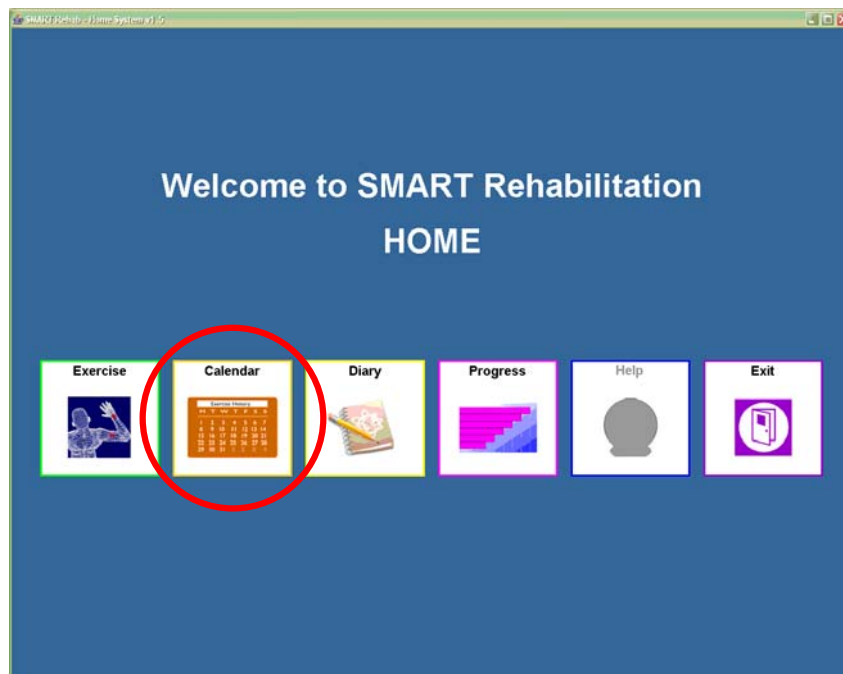
### Moving the manikin

The manikins automatically appear in the middle of the screen. However, you can move them by using the "Pan" buttons (shown here to the right), which are also found on the right side of the Manikin screen.

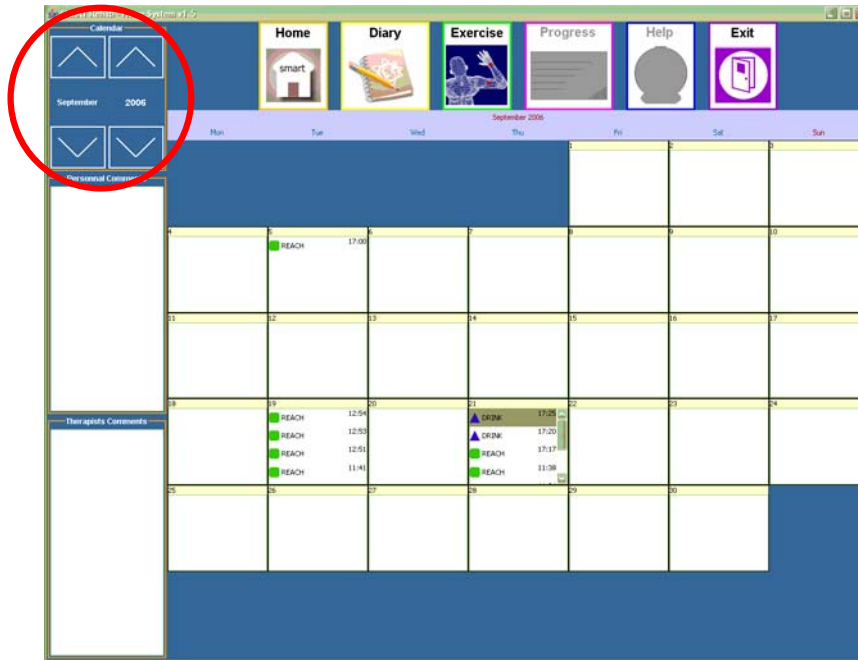


### Viewing an old exercise from the Calendar

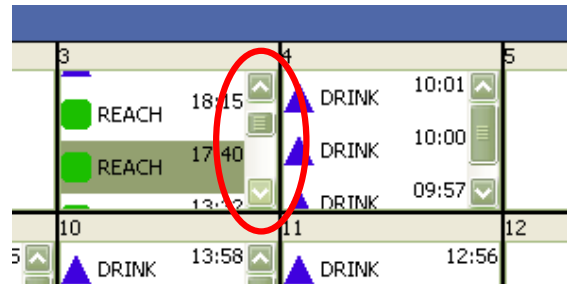
You can use the Calendar to find and view your old exercises. First, push the "Calendar" button to open the Calendar.



The Calendar is shown below.



Use the arrows to find the month in which you recorded the exercise. The arrows (circled above) can be found at the top-left of the Calendar screen. When you've found the correct day you may see several "Reach" and/or "Drink" exercise files, as shown here to the right. Each exercise file shows the time it was recorded. Choose the one you want to look at, and open it by tapping on it twice.



If you have many exercise files you may need to use the scroll bar (circled in the picture) to find the exercise you want to view.

**Note: The scroll bars are very difficult to use without a mouse.**

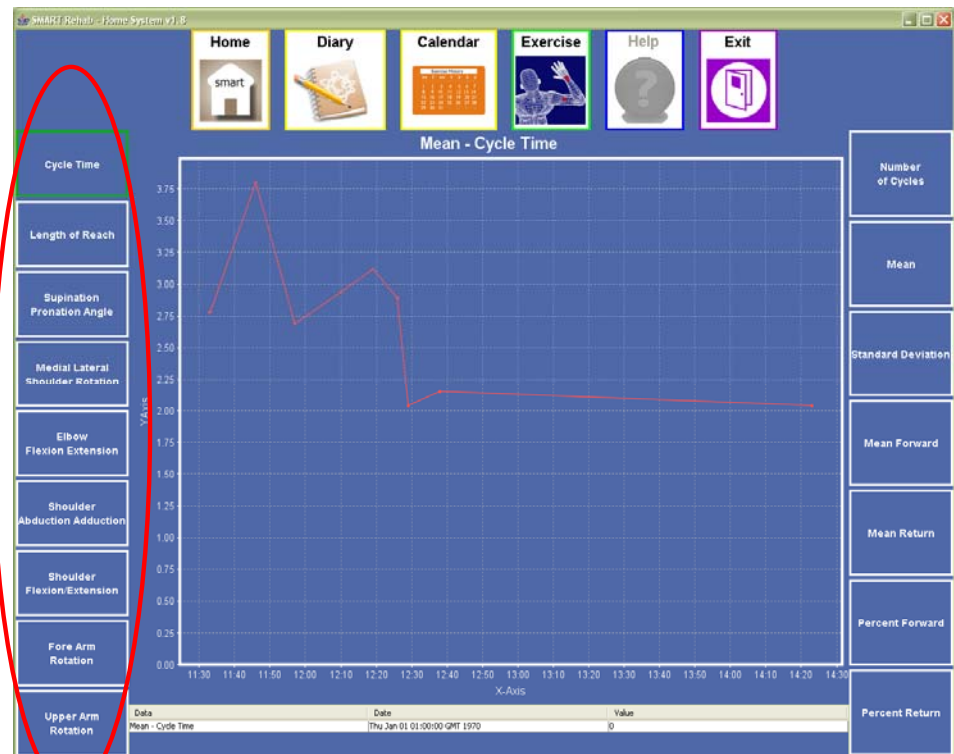
## Viewing your Progress

You can review your progress by pushing the "Progress" button from the Home screen, the Calendar, the Manikin screen or after you have recorded an exercise. The "Progress" button is shown here.



- Cycle Time
- Length of Reach
- Supination  
Pronation Angle
- Medial Lateral  
Shoulder Rotation
- Elbow  
Flexion Extension
- Shoulder  
Abduction Adduction
- Shoulder  
Flexion/Extension
- Fore Arm  
Rotation
- Upper Arm  
Rotation

When you push the “Progress” button you will see the screen shown below. The “Progress” screen allows you to look at the progress you have made in particular aspects of your movement, such as how long it took you to perform the movement (cycle time), how far you were able to reach (length of reach) and how much movement you had in your arm. The buttons circled below are also shown on the left. They illustrate the aspects of your movement that you can view from the “Progress” screen.



### Viewing Cycle Time

When the “Progress” screen opens the “Cycle Time” graph is shown automatically. A high cycle time means that the exercise was performed slowly. A low cycle time means the exercise was performed quickly.

### Viewing Length of Reach

If you want to see how your “Length of Reach” has progressed, push the “Length of Reach” button. A graph will appear showing all the reaching exercises you have performed and how far you reached during each one.

### Viewing Supination and Pronation angle

Supination and pronation mean how much did you forearm rotate or twist when you were doing your exercises. It might be helpful to think of pronation as “palm down” and supination as “palm up”.

### **Viewing Medial and Lateral Shoulder Rotation**

Choose this option to see how much twisting movement occurred in your shoulder. Medial rotation of your shoulder (or upper arm rotation) is the same as twisting your shoulder inwards; *lateral rotation* means twisting your shoulder outwards.

### **Viewing Elbow Flexion and Extension**

Push on this button to view how much bend you had in your elbow when you did your exercises. Having your elbow straight means having it extended. Lots of bend at your elbow means lots of elbow flexion.

### **Viewing Shoulder Abduction and Adduction**

If you move your arm straight out to the side, that is shoulder abduction. Moving it back again is shoulder adduction.

### **Viewing Shoulder Flexion and Extension**

If you move your arm straight out in front of you, that is shoulder flexion. Moving it back again is shoulder extension.

### **Viewing Forearm Rotation**

This means the same as forearm pronation and supination. The graphs are the same.

### **Viewing Shoulder Abduction and Adduction**

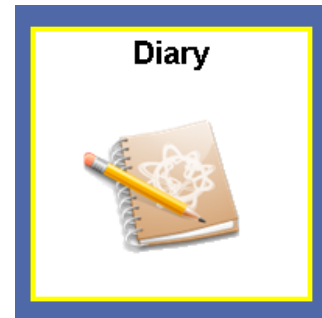
If you move your arm straight out to the side, that is shoulder abduction. Moving it back again is shoulder adduction.

### **Viewing Upper Arm Rotation**

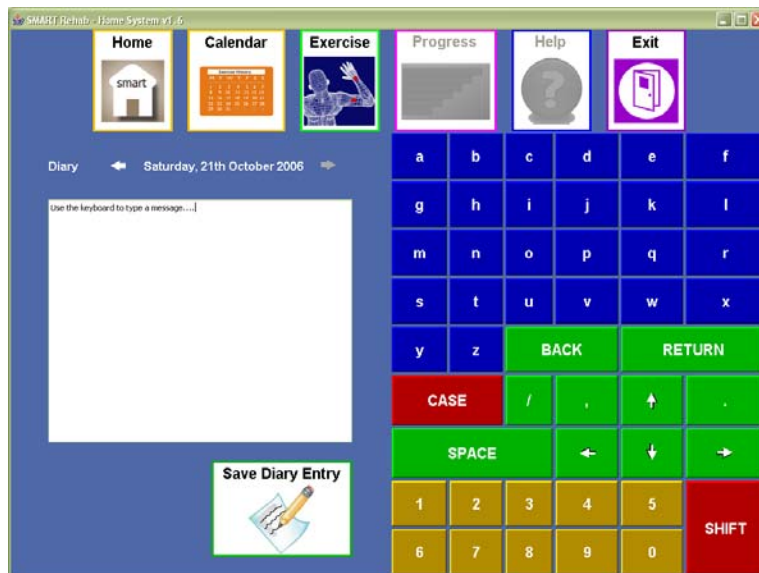
This means the same as Medial and Lateral Rotation. The graphs are the same.

## Adding a entry to your Diary

You can access the SMART diary from the SMART Home screen, the Calendar or after you have recorded a new exercise. Push the "Diary" button, shown here.

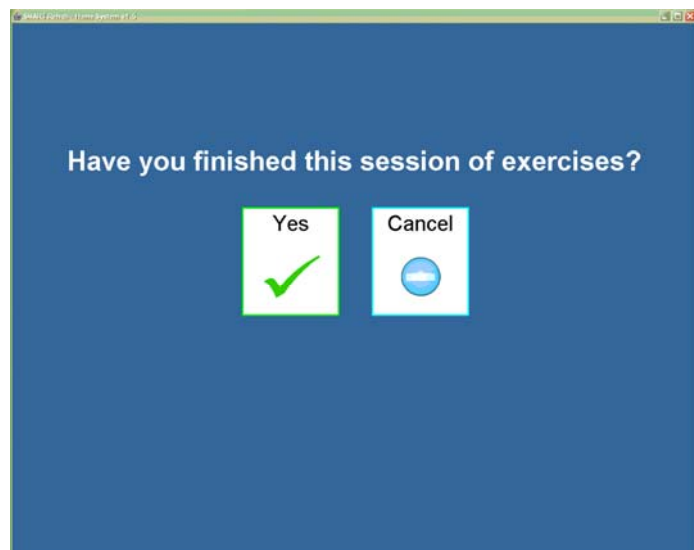


You can use the keyboard in the "Diary" screen to write notes to your therapist about your exercises, about how you are feeling, how you are getting on with your programme of exercises or you can mention any particular problems you may have with the SMART system. When you have completed your diary entry, push the "Save Diary Entry" button.



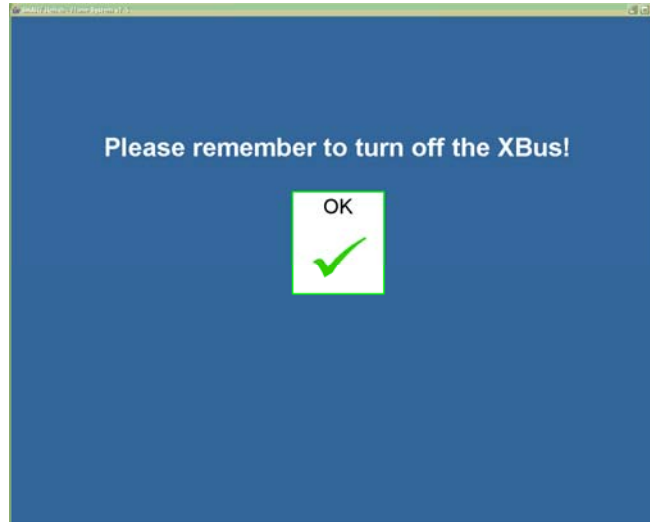
## Turning off the SMART system

If you want to exit the SMART system, simply push the "Exit" button, shown below. You will see the screen shown on the right.



Push the "Yes" button if you want to exit, or Cancel if you want to return to the SMART programme.

You will be reminded to turn off the Xbus Control Box. If you haven't already done so, turn off the Xbus (by pushing the On/Off button quickly three times) then push the "OK" button, shown below.



## Using the SMART Help File

The online Help file does not yet work. If the screen freezes for more than a minute while you are using the system, turn the computer and X Bus Control Box off, leave for a few seconds and then start again. If you have continuing difficulties with the system please contact the researchers on the following numbers: