



# **SMART Wheelchair**



## **User Manual**

### **Version 5**

© CALL Centre, 2000

**Don't panic !**

**Phone 01635 37550**

**Play and Exploration are the cornerstones of learning.** A person with poor co-ordination and control, communication problems, or one who cannot walk, has less chance to explore and play and is less effective when they do so.

For a person with all these problems, learning is difficult. It's a vicious circle - lack of physical control means no mobility - no mobility restricts the ability to explore the surroundings thus leading to an inability to learn *how* to learn. Communicating with others involves new learning - tasks like tracking, scanning or coding. Even if learning is successful, the results don't transfer because the skills needed for another task, say mobility, are rarely the same.

The Smart Wheelchair was designed to help, by providing:

- a common learning environment for communication, mobility, and some structured play and exploration, in which skills transfer from task to task.
- some relief from the responsibility for mundane mobility tasks, whilst new skills are acquired.

This Manual should be read in conjunction with the Wheelchair Playbook, which sketches out things to do with the Smart Wheelchair, as well as outlining some of the background to its development.

### **How to Use this Manual**

The Smart Wheelchair design has been evolving since 1991, and this process continues. As we discover new uses for the wheelchair and add new features, we will be issuing new versions of the Manual. This can be quite confusing, especially if you try to use an old version of the Manual or if you have to look through the new version to find out what is changed.

As we introduce new information, these will be given out as amendment sheets that can be inserted into the appropriate place and the old sheet removed if required.

Any comments or suggestions that you would like to see incorporated into the Manual will be gratefully received by Smile Rehab and CALL.

# **Have fun!**

# CONTENTS

<b>1</b>	<b>The Smart Wheelchair: An Introduction</b>	
	What is the Smart Wheelchair?	1.1
	What the wheelchair does	1.2
	Who's running this thing anyway?	1.3
<b>2</b>	<b>The Smart Wheelchair: A Description</b>	
	The Smart Wheelchair	2.1
	The Smart Controller, Power Module and Controls	2.2
	The Drive Wheels	2.3
	Seating	2.3
	Battery Charging	2.4
<b>3</b>	<b>Smart Wheelchair Controller</b>	
	Smart Wheelchair Controller box	3.1
	Switching on and off	3.1
	The chair switches itself off	3.1
	'OK so what do I do now?'	3.2
<b>4</b>	<b>Driving the chair with switches</b>	
	Types of switches	4.1
	Connecting switches	4.1
	Choosing switches	4.2
	Switch connectors	4.2
<b>5</b>	<b>Smart Wheelchair ToolBox</b>	
	Adjusting Speed	5.1
	Adjusting Distance	5.1
	Adjusting Response	5.2
	Using the Programme switch on the ToolBox	5.2
	Programming speeds	5.3
	Programming veer	5.3
	Programming distance for 'Timed' motion	5.4
	Programming chair response	5.4
	Programming switch response	5.4
	Resetting default values	5.5
	Muting Tool speech feedback	5.5
	Software version	5.5
<b>6</b>	<b>Smart Wheelchair Motion Tools</b>	
	Motion Tools	6.1

	Characteristics and functions of Motion Tools	6.1
	Selecting separate go and turn Motion Tools	6.2
<b>7</b>	<b>Integrating a computer or communication device to the chair</b>	
	Using the Switch Output sockets	7.1
	Driving the chair with a computer or communication aid	7.2
	Sending commands to the chair	7.2
<b>8</b>	<b>Driving with the Scanner</b>	
	The Scanner box	8.1
	Function of the Scanner and Scan Leds	8.2
	Scan Leds	8.2
	Visual Feedback using the Scanner and Scan Leds	8.3
	Scanner Tools	8.4
	One switch scan	8.4
	Two switch scan	8.4
	4/8 direction scan	8.5
	Smart scan	8.5
	Auditory Scanning	8.5
	Setting scan speed	8.5
	Setting number of scan cycles	8.5
	Three switch scan	8.5
	Three switch smart scan	8.6
<b>9</b>	<b>Smart Wheelchair Bump Tools</b>	
	Bump Tools	9.1
	No bump	9.2
	Bump and Stop	9.2
	Bump and Backoff	9.2
	Bump and Turn	9.2
	Bump and Choose Turn	9.2
	Bump and Avoid	9.3
	User/chair Bump Control	9.3
	Programming the Bump parameters	9.3
	Bumper fault finding and adjusting sensitivity	9.4
<b>10</b>	<b>Smart Wheelchair Line Follower Tools</b>	
	Line Follower Tools	10.1
	Line Following On	10.1
	Line Following with Junctions	10.1
	junction Scanning	10.1
	Safety Fence	10.2
	User/chair Line Control	10.2
	Line Follower accuracy	10.2

Line Follower box and tape	10.3
Who might use a Line Follower?	10.3
Finding the line	10.5
Following the line	10.5
Leaving the line	10.6
Line Junctions	10.6
Laying out a line	10.6
Line Follower tape	10.6
Corners	10.6
Line Follower ‘circuits’	10.7
Line Junctions	10.7
Who might use a Doorway Funne?	10.9
Using a Doorway Funnel	10.10
Laying tape for a Doorway Funnel	10.11
<b>11 Smart Wheelchair Observer Speech Tool</b>	<b>11.1</b>
<b>12 Maintenance and safety</b>	
Maintenance	12.1
General	12.1
Electronic components	12.1
Safety warnings	12.2
Supervision	12.2
The wheelchair must not be operated...	12.2
In case of fire	12.2
General use	12.3
Emergency stop	12.3
Weight and lifting	12.3
Transporting the chair	12.3
Electronics and controls	12.4
Trouble-shooting	12.5
The chair will not switch on	12.5
The green light on the Smart Controller flashes when you switch on	12.5
The chair stops and the red light on the Smart Controller comes on	12.5
The chair drives in different directions when I press the forward switch	12.5
The chair chats away as though it’s stuck in a loop and behaves strangely when I switch on	12.5
The green light on the joystick flashes when you switch on	12.6
The chair does not move when I press the switch	12.7
The chair does not follow the line properly	12.8
Suppliers	12.9
	.