

List of Contents

Introduction	4
1 Getting Started	5
1.1 Minimum System Configuration	5
1.2 Installation	5
1.3 Starting the Program	5
2 User Interface	6
2.1 Project Window	6
2.1.1 Worksheet	7
2.1.2 Tools Palette	7
2.2 Graphical Representation of Structural and Control Elements	10
2.3 Defining Parameters of Structural and Control Elements	11
2.3.1 Input Boxes of Revolute, Prismatic, Helical, Cylindrical and Global Joints	11
2.3.2 Input Box of User Defined Joints	13
2.3.3 Input Box of Bodies	14
2.3.4 Input Box of Control Elements	16
2.3.5 Input Dialog Box of Global-Global Constraint Elements	17
2.3.6 Input Dialog Box of Eben-Global Constraint Elements	18
2.3.7 Input Dialog Box of C-R-C Global Constraint Elements	19
2.3.8 Input Dialog Box of Global-Cylindrical Constraint Elements	20
2.4 Math Editor	21
2.5 Diagram	26
2.5.1 Function of the Point Picker tool and Markers	26
2.5.2 Configuring a Diagram	26
2.6 The Menus	28
2.6.1 The <i>File</i> Menu	29
2.6.2 The <i>Edit</i> Menu	30
2.6.3 The <i>Object</i> Menu	30
2.6.4 The <i>Chain</i> Menu	31
2.6.5 The <i>Computation</i> Menu	32
2.7 Exporting Data	34

2.7.1 Naming Conventions for the Exported Data	34
2.7.2 The <i>Export Interface</i>	35
3 Theoretical Background	39
3.1 Kinematic Systems	39
3.2 Elements of Kinematic Systems	40
3.2.1 Rigid Body	40
3.2.2 Joints (Kinematic Pairs)	40
3.2.3 Constraint Elements	46
3.2.4 Control Elements	48
3.2.5 Denavit-Hartenberg Parameters (DH Parameters)	49
4 Examples	51
4.1 Single Loop Mechanisms	52
4.1.1 RPHC2R Linkage	52
4.2 3RC2R Linkage	53
4.3 Stewart Platform	54
4.4 Examples with User Defined Joints	55
4.4.1 An Example of a Manipulator of the Type PUMA.	55
4.4.2 Stewart Platform with Prescribed Motion	57
4.5 Multiple Loop Mechanisms	59
4.5.1 The Cage-Cube Mechanism	59
4.5.2 Spatial Straight- Line Linkage	60
5 Literature	62