

Contents

Foreword	<i>page xi</i>
Preface	xiii
Overview of the book	xiv
Contributors	xv
Acknowledgments	xv
1 Introduction	1
1.1 Design rules and conventions	2
1.1.1 Orthographic conventions	3
1.1.2 Naming	3
1.1.3 Comparisons	4
1.1.4 Conversions	4
1.1.5 Characters and strings	5
1.1.6 Miscellany	5
1.2 Documentation conventions	6
1.2.1 Organization of manual pages	6
1.2.2 Terminology and notation	7
2 Library Modules	9
2.1 Required modules	9
2.2 Optional modules	10
3 Top-Level Environment	15
3.1 Modules in the top-level environment	15
3.2 Top-level type, exception, and value identifiers	15
3.3 Overloaded identifiers	17
3.4 Infix identifiers	18
3.5 The operating environment	19

4	General Usages	21
4.1	Ordering	22
4.2	Option	23
4.3	Exception handling	25
4.4	Miscellaneous functions	26
5	Text	29
5.1	Characters	29
5.2	Strings and substrings	30
5.3	Conversions to and from text	30
5.3.1	Converting to text	30
5.3.2	Converting from text	31
5.3.3	The <code>StringCvt</code> structure	31
5.3.4	The <code>Byte</code> structure	32
5.4	Taking strings apart	33
5.4.1	Tokenizing	33
5.4.2	Readers	34
6	Numerics	37
6.1	Numerical conversions	37
6.1.1	Integer to integer conversions	37
6.1.2	Word to word conversions	37
6.1.3	Word to integer conversions	38
6.1.4	Integer to word conversions	38
6.1.5	Defaults	39
6.2	Floating-point numbers	39
6.2.1	Floating-point conversions	40
6.3	Packed data	41
7	Sequential Data	45
7.1	Common patterns	45
7.1.1	Indexed iterations	49
7.2	Lists	50
7.3	Array modification	51
7.4	Subsequences and slices	51
7.5	Operating on pairs of lists	52
7.6	Two-dimensional arrays	53
8	Input/Output	55
8.1	The I/O model	55
8.1.1	Imperative I/O	56
8.1.2	Stream I/O and state	57
8.1.3	End-of-stream	58
8.1.4	Translation	59

<i>CONTENTS</i>	vii
8.2 Using the I/O subsystem	59
8.2.1 Opening files	60
8.2.2 Imperative stream input (<code>IMPERATIVE_IO</code>)	61
8.2.3 Functional stream input (<code>STREAM_IO</code>)	62
8.2.4 Stream output (<code>IMPERATIVE_IO</code> , <code>STREAM_IO</code>)	66
8.2.5 Readers and writers (<code>PRIM_IO</code>)	67
9 Systems Programming	73
9.1 Portable systems programming	73
9.1.1 File system pathnames	73
9.1.2 File system operations	74
9.1.3 Processes	77
9.1.4 I/O descriptors	77
9.1.5 Time and dates	77
9.2 Operating system-specific programming	80
9.2.1 The <code>Unix</code> structure	80
9.2.2 System flags	84
9.2.3 POSIX programming	84
9.2.4 The <code>Windows</code> structure	85
10 Sockets	89
10.1 Socket basics	89
10.2 Overview	89
10.2.1 Socket types	90
10.2.2 Sockets and addresses creation	90
10.2.3 Socket control	92
10.2.4 Socket I/O	92
10.3 Examples	92
10.3.1 Setting up stream-based sockets	92
10.3.2 Socket I/O	94
10.3.3 Polling sockets	95
11 Manual Pages	99
11.1 The <code>Array</code> structure	100
11.2 The <code>Array2</code> structure	104
11.3 The <code>ArraySlice</code> structure	109
11.4 The <code>BinIO</code> structure	114
11.5 The <code>BIT_FLAGS</code> signature	116
11.6 The <code>Bool</code> structure	118
11.7 The <code>Byte</code> structure	120
11.8 The <code>CHAR</code> signature	122
11.9 The <code>CommandLine</code> structure	129

11.10	The Date structure	130
11.11	The General structure	135
11.12	The GenericSock structure	139
11.13	The IEEEReal structure	141
11.14	The IMPERATIVE_IO signature	144
11.15	The ImperativeIO functor	150
11.16	The INetSock structure	151
11.17	The INTEGER signature	154
11.18	The IntInf structure	159
11.19	The IO structure	162
11.20	The List structure	165
11.21	The ListPair structure	170
11.22	The MATH signature	173
11.23	The MONO_ARRAY signature	177
11.24	The MONO_ARRAY2 signature	182
11.25	The MONO_ARRAY_SLICE signature	188
11.26	The MONO_VECTOR signature	194
11.27	The MONO_VECTOR_SLICE signature	198
11.28	The NetHostDB structure	203
11.29	The NetProtDB structure	206
11.30	The NetServDB structure	208
11.31	The Option structure	210
11.32	The OS structure	212
11.33	The OS.FileSys structure	214
11.34	The OS.IO structure	219
11.35	The OS.Path structure	223
11.36	The OS.Process structure	232
11.37	The PACK_REAL signature	235
11.38	The PACK_WORD signature	237
11.39	The Posix structure	239
11.40	The Posix.Error structure	241
11.41	The Posix.FileSys structure	245
11.42	The Posix.IO structure	258
11.43	The Posix.ProcEnv structure	266
11.44	The Posix.Process structure	271
11.45	The Posix.Signal structure	276
11.46	The Posix.SysDB structure	278
11.47	The Posix.TTY structure	280
11.48	The PRIM_IO signature	290
11.49	The PrimIO functor	298
11.50	The REAL signature	299

<i>CONTENTS</i>	ix
11.51 The <code>Socket</code> structure	310
11.52 The <code>STREAM_IO</code> signature	324
11.53 The <code>StreamIO</code> functor	335
11.54 The <code>STRING</code> signature	337
11.55 The <code>StringCvt</code> structure	342
11.56 The <code>SUBSTRING</code> signature	346
11.57 The <code>TEXT</code> signature	354
11.58 The <code>TEXT_IO</code> signature	355
11.59 The <code>TEXT_STREAM_IO</code> signature	359
11.60 The <code>Time</code> structure	360
11.61 The <code>Timer</code> structure	364
11.62 The <code>Unix</code> structure	366
11.63 The <code>UnixSock</code> structure	370
11.64 The <code>Vector</code> structure	373
11.65 The <code>VectorSlice</code> structure	377
11.66 The <code>Windows</code> structure	381
11.67 The <code>WORD</code> signature	391
Appendix A SML'97 Changes	397
General Index	405
SML Identifier Index	407
Raised Exception Index	429