About This Manual

Objectives of This Manual

This manual is intended to help you learn how to program in the C* data parallel programming language on a CM-5 or CM-5E supercomputer.

Intended Audience

Readers are assumed to have a working knowledge of C programming and a general understanding of the components of the CM-5.

Revision Information

This is a revision of the *C* Programming Guide,* May 1993. The major difference from the previous version is the inclusion of information about the implementation of C* Version 7.2. In addition, this revision removes information about the CM-2/200 implementation of C*. CM-2/200 users should continue to refer to the May 1993 edition of the *C* Programming Guide*.

Organization of This Manual

Part I Getting Started

These two chapters introduce C* and data parallel programming on the Connection Machine system and provide a step-by-step explanation of a simple program.

Part II Programming in C*

These eight chapters describe how to write programs in C*.

Copyright © 1990–1995 Thinking Machines Corporation

Part III C* Communication Functions

Data parallel programming lets you operate on large multidimensional sets of data at the same time. These four chapters describe C* library functions that you can use to transfer values among items in the data set and to perform cumulative operations along any of the dimensions of the data set.

Appendix A Using allocate_detailed_shape for the CM-5

This appendix describes how to use the `allocate_detailed_shape` function to explicitly control how a shape is laid out on the CM-5.

Appendix B Memory Layout on the CM-5

This appendix describes the memory layout of parallel variables on the CM-5, and explains how to manipulate data via shape aliasing.

Appendix C CM-5 C* Table Lookup Utility

This appendix describes a utility available in CM-5 C*.

Appendix D Global/Local Programming

This appendix describes the global/local programming model, in which a global data parallel C* program can call local C* routines running on the nodes.

Appendix E Integer Inquiry Functions

This appendix describes functions available in CM-5 C* to perform bit-level operations on integers.

Appendix F Glossary

This is a glossary of technical terms used in the manual.

Associated Documents

See the *CM-5 C* User's Guide* for information on developing, compiling, linking, and debugging C* programs on the CM-5.

Version 7.2, May 1995
Copyright © 1990–1995 Thinking Machines Corporation

For more basic information on C*, see the manual *Getting Started in C**.

Information about related aspects of CM-5 programming is contained in other volumes of the CM-5 documentation set.

C* is based on the standard version of the C programming language proposed by the X3J11 committee of the American National Standards Institute; this version is referred to as *Standard C* in this manual. The standard is available from

X3 Secretariat
Computer and Business Equipment Manufacturers Association
311 First Street, N.W.
Suite 500
Washington, DC 20001−2178

Related books about Standard C include

- Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language*, 2nd edition (Englewood Cliffs, New Jersey: Prentice-Hall, 1988)
- Samuel P. Harbison and Guy L. Steele Jr., *C: A Reference Manual*, third edition (Englewood Cliffs, New Jersey: Prentice-Hall, 1991)

Copyright © 1990−1995 Thinking Machines Corporation

Notation Conventions

The table below displays the notation conventions used in this manual:

Convention	Meaning
`bold typewriter`	Code examples and code fragments. C* and C language elements, such as keywords, operators, and function names, when they appear embedded in text. Also UNIX and CM System Software commands, command options, and file names.
italics	Parameter names and placeholders in function and command formats.
`% bold typewriter` `typewriter`	In interactive examples, user input is shown in **`bold typewriter`** and system output is shown in regular `typewriter` font.

Version 7.2, May 1995
Copyright © 1990–1995 Thinking Machines Corporation