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.

Intended Audience

Readers are assumed to have a working knowledge of C programming and a general understanding of the components of the Connection Machine system on which they will be running their programs.

Revision Information

This is a revision of the *C* Programming Guide,* Version 6.0.2. The major difference from the previous version is the inclusion of information about the CM-5 implementation of C*.

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 © 1990–1993 Thinking Machines Corporation

Part III **C* Communication Functions**

Data parallel programming lets you operate on large multi-dimensional 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 **CM-200 C* Performance Hints**

This appendix suggests ways of increasing the performance of a CM-200 C* program.

Appendix B **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 C **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 D **CM-5 C* Table Lookup Utility**

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

Appendix E **Glossary**

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

Associated Documents

If you are going to run your programs on a CM-5 system, see the *CM-5 C* User's Guide* for more information.

If you are going to run your programs on a CM-200, CM-2, or CM-2a system, see the *CM-200 C* User's Guide* for more information.

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

For information on improving the performance of your CM-5 C* program, see the *CM-5 C* Performance Guide*.

Copyright © 1990–1993 Thinking Machines Corporation

Information about related aspects of CM programming is contained in other volumes of the documentation set for your CM system.

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)

Notation Conventions

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

Convention	Meaning
`bold typewriter`	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.
`typewriter`	Code examples and code fragments.
`%` **`bold typewriter`** `typewriter`	In interactive examples, user input is shown in **`bold typewriter`** and system output is shown in regular `typewriter` font.

Copyright © 1990–1993 Thinking Machines Corporation