Chapter 1

Introduction

This document contains a summary of the syntax and semantics of the C programming language as implemented on the IRIS−4D™ Series workstations. It documents previous releases of the Silicon Graphics® C compilers as well as the ANSI C compiler.

The Silicon Graphics compiler system supports two modes of compilation: a 32−bit mode and a 64−bit mode. For information on compilation modes and general compiler options, see the *Compiling and Performance Tuning Guide.*

The term "traditional C" refers to the dialect of C described in the first edition of The C Programming Language, by Kernighan and Ritchie.

What This Manual Contains

This manual also includes information formerly in the *ANSI C Transition Guide*. That material is now in the following chapters:

- Chapter 2, "An Overview of ANSI C," discusses some effective strategies in porting your traditional C code to ANSI C.
- Chapter 3, "C Language Changes," presents an overview of changes that the ANSI standard introduced to the language.

Chapters 4 through 10 of this manual describe the syntax and semantics of C, and specify ANSI C differences.

- Chapter 4, "Lexical Conventions," lists and defines the six classes of C tokens.
- Chapter 5, "Meaning of Identifiers," describes objects, *lvalues*, identifiers, and disambiguation.
- Chapter 6, "Operator Conversions," discusses object type conversions and result types.
- Chapter 7, "Expressions and Operators," defines the various types of expressions and operators and gives their order of precedence.
- Chapter 8, "Declarations," discusses type specifiers, structures, unions, declarators of various kinds, and initialization.
- Chapter 9, "Statements," describes expression, compound, selection, iteration, and jump statements.
- Chapter 10, "External Definitions," explains the syntax for external definitions.
- Appendix A, "Implementation−Defined Behavior,"describes various implementation−specific aspects of the Silicon Graphics C compiler, keyed to paragraphs from the ANSI standard.

Suggestions for Further Reading

This *C Language Reference Manual* is part of the IRIS Developer Option (IDO), which provides the software and documentation that you can use to write applications for Silicon Graphics platforms. A few

IDO online and printed manuals that may be of interest to you are listed below.

- *Programming on Silicon Graphics Systems:An Overview* provides information about the IRIX programming environment and tools available for application programming. Topics covered include IRIX operating system, compilers, user interface and developer tools, and application libraries.
- *Compiling and Performance Tuning Guide* describes the compiler system, Dynamic Shared Objects (DSOs), programming tools and interfaces, and explains ways to improve program performance.
- *dbxUser's Guide* explains how to use the source level debugger, *dbx*.
- *Topics in IRIX Programming* presents information about internationalizing an application, working with fonts, file and record locking, and inter−process communication.

You can order a printed manual from Silicon Graphics by calling SGI Direct at 1−800−800−SGI1 (800−7441). Outside the U.S. and Canada, contact your local sales office or distributor.

Silicon Graphics also provides manuals online. To read an online manual after installing it, type **`insight`** or double−click the InSight icon. It's easy to print sections and chapters of the online manuals from InSight.

In addition, you may want to consult the ANSI C language specification, which is available from the American National Standards Institute (ANSI) at 1430 Broadway, New York, NY 10018, (212) 642−4900. Specify ANSI X3.159−1989 or ANSI/ISO 9899−1990. This *C Language Reference Manual* is not intended as a substitute for the specification.

Conventions Used in This Manual

This manual uses some typographical and notational conventions explained below.

The expression [fF] stands for "f or F."

Filenames are italicized. For example, *<stddef.h>* is the file */usr/include/stddef.h*.

Syntactic categories are indicated by italic type, and literal words and characters by bold type. Alternative categories are listed on separate lines. An optional entry is indicated by the subscript "opt" to indicate an optional expression enclosed in braces. For example:

{ $\text{expression}_{\text{opt}}$ }

This notation is the standard BNF notation.