Introduction

This manual describes the Fortran 77 language specifications as implemented on the Silicon Graphics IRIS−4D series workstation. This implementation of Fortran 77 contains full American National Standard Institute (ANSI) Programming Language Fortran (X3.9−1978). It has extensions that provide full VMS Fortran compatibility to the extent possible without the VMS operating system or VAX data representation. It also contains extensions that provide partial compatibility with programs written in SVS Fortran and Fortran 66.

This manual refers to Fortran 77 as Fortran, except where specific distinctions between Fortran 77 and Fortran 66 are discussed.

The compiler can convert source programs written in VMS Fortran into machine programs executable under IRIX™.

Intended Audience

This manual is intended as a reference manual, rather than a tutorial, and assumes familiarity with an algebraic language or prior exposure to Fortran.

Corequisite Publications

This manual describes the Fortran language specifications. Refer to the *Fortran 77 Programmer's Guide* for information on

- How to compile and link edit a Fortran program
- Alignments, sizes, and variable ranges for the various data types
- The coding interface between Fortran programs and programs written in C and Pascal
- File formats, run−time error handling, and other information related to the IRIX operating system
- Operating system functions and subroutines callable by Fortran programs

Refer to the *IRIS−4D Series Compiler Guide* for information on:

- An overview of the compiler system
- Information on improving the program performance, showing how to use the profiling and optimization facilities of the compiler system
- The dump utilities, archiver, and other tools for maintaining Fortran programs

Refer to the *dbx User's Reference Manual* for a detailed description of the debugger (*dbx*).

For information on the interface to programs written in assembly language, refer to the *Assembly Language Programmer's Guide.*

Organization of Information

This manual contains the following chapters and appendix:

- Chapter 1, "Fortran Elements and Concepts," provides definitions for the various elements of a Fortran program.
- Chapter 2, "Constants and Data Structures,"discusses the various types of Fortran constants and explains a few ways data can be structured.
- Chapter 3, "Expressions," describes the formation, interpretation, and evaluation rules for each type of Fortran expression.
- Chapter 4, "Specification Statements," summarizes the Fortran specification statements.
- Chapter 5, "Assignment and Data Statements," discusses the types of assignment statements and explains how to use them. It also explains how to initialize variables and array elements using **DATA** statements.
- Chapter 6, "Control Statements," explains the various Fortran control statements.
- Chapter 7, "Input/Output Processing," discusses the programmer−related aspects of Fortran input/output processing.
- Chapter 8, "Input/Output Statements," describes the statements that control the transfer of data within internal storage and between internal storage and external storage devices. It also provides an overview of the Fortran input/output statements and lists the syntax, rules, and examples for each.
- Chapter 9, "Format Specification,"describes the **FORMAT** statement, field descriptors, edit descriptors, and list−directed formatting.
- Chapter 10, "Statement Functions and Subprograms," discusses user−written subprograms and explains the syntax and rules for defining program units.
- Chapter 11, "Compiler Options,"describes the options that affect source programs both during compilation and at run time.
- Appendix A, "Intrinsic Functions,"lists the intrinsic functions supported.

Typographical Conventions

The following conventions and symbols are used in the text to describe the form of Fortran statements:

Bold — Indicates literal command line options, filenames, keywords, function/subroutine names, pathnames, and directory names.

Italics — Represents user−defined values. Replace the item in italics with a legal value. Italics are also used for command names, manual page names, and manual titles.

`Courier` — Indicates command syntax, program listings, computer output, and error messages.

`Courier bold` — Indicates user input.

[ ] — Enclose optional command arguments.

()	Surround arguments or are empty if the function has no arguments following function/subroutine names. Surround manual page section in which the command is described following IRIX commands.
|	Ssparates two or more optional items.
...	Indicates that the preceding optional items can appear more than once in succession.
#	IRIX shell prompt for the superuser.
%	IRIX shell prompt for users other than superuser.

Here are two examples illustrating the syntax conventions.

`DIMENSION` *a*(*d*) [,*a*(*d*)] ...

indicates that the Fortran keyword **DIMENSION** must be written as shown, that the user−defined entity *a*(*d*) is required, and that one or more of *a*(*d*) can be optionally specified. Note that the pair of parentheses ( ) enclosing *d* is required.

`{STATIC | AUTOMATIC}` *v* [,*v*] ...

indicates that either the **STATIC** or **AUTOMATIC** keyword must be written as shown, that the user−defined entity *v* is required, and that one or more of *v* items can be optionally specified.