## Preface

Fortran has been the premier language for scientific computing since its introduction in 1957. Fortran originally was designed to allow programmers to evaluate formulas—FORmula TRANslation—easily on large computers. Fortran compilers are now available on all sizes of machines, from small desktop computers to huge multi-processors.

The *Fortran 2003 Handbook* is a definitive and comprehensive guide to Fortran 2003. Fortran 2003, the latest standard version of Fortran, has many modern features that will assist the programmer in writing efficient, portable, and maintainable programs that are useful for everything from "hard science" to text processing.

The *Fortran 2003 Handbook* is an informal description of Fortran 2003, developed to provide not only a readable explanation of features, but also some rationale for the inclusion of features and their use. In addition, "models" give the reader better insight as to why the language is the way it is.

## Target Audience

This handbook is intended for anyone who wants a comprehensive survey of Fortran 2003, including those familiar with programming language concepts but unfamiliar with Fortran. Experienced Fortran 95 programmers will be able to use this volume to assimilate quickly those features in Fortran 2003 that are not in Fortran 95 (Fortran 2003 contains all of the features of Fortran 95).

Although the handbook is written for use in conjunction with the standard, it is also designed as a practical stand-alone description of Fortran 2003. The syntax rules have been recast into more readable form. On the other hand, in places where the standard is not completely clear, a reasonable interpretation is often given, together with ways to implement and program that will avoid potential problems. Of course, if information is being sought to understand a fine point of compiler implementation, settle a bet, resolve a court case, or determine the answer to a Fortran trivia question, the standard itself should be considered the final authority.

## Organization

Chapters 1–16 correspond to Sections 1–16 in the standard. (The standard is the complete official description of the language, but it is written in a legally airtight, formal style without tutorial material and can be difficult to understand in places.) The handbook and the standard can be read in parallel for insights into the Fortran language. This makes it feasible to use this handbook to "decipher" the standard, and this is an ideal use of this book.

Specific information can be found in the following places:

- A brief list of references can be found at the end of Chapter 1.

- Each chapter begins with a summary of the main terms and concepts described in the chapter.

- Each of the standard intrinsic procedures is described in detail in Appendix A; a general discussion of the intrinsic functions is in Chapter 13.

- The IEEE module procedures are described in detail in Appendix B and Chapter 14.

- Appendix C contains a listing of the new, obsolescent, and deleted features.

- The index is unusually comprehensive.

## Style of the Programming Examples

In order to illustrate many features of the language and as many uses of these features as possible, no single particular style has been used when writing the examples. In many cases, the style illustrated is not necessarily one that the authors recommend.

## Jeanne Adams

It is with deep regret that we acknowledge the passing in 2007 April of Jeanne Adams—our coauthor and longtime colleague and friend. Among her many contributions to computing and Fortran standardization, she is best known for her chairmanship of the committee that developed Fortran 90.

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