Preface

The DATAPLOT language was designed and developed in 1976 in response to data analysis problems encountered in the scientific/research environment at the National Institute of Standards and Technology. At that time it was evident that the three highest priority computing activities of the scientist/engineer were:

1. graphics;
2. fitting (especially non-linear);
3. function evaluation/transformation.

Prior to 1976, continuous graphics, non-linear fitting, and function operations were typically done in a subroutine-dependent, batch-oriented fashion, which was time consuming and was not conducive to the continuity of thought which is so important in scientific investigations. The need was seen for the development of a high-level, English-syntax, and interactive language which included single command capabilities for these operations. The realization of this goal occurred in early 1977 with the NIST implementation of the DATAPLOT language with its three kernel commands:

1. PLOT (for graphics);
2. FIT (for fitting);
3. LET (for function operations).

From the beginning, these three commands were the core of the DATAPLOT language and their central role as such has become a distinctive mark of the language. In addition to the above core activities, the language has extensive capabilities in

1. specialized 2d graphics formats;
2. linear fitting, smoothing, and spline fitting;
3. general data analysis;
4. mathematics.

DATAPLOT commands are high-level, English-syntax, and self-descriptive. Typical DATAPLOT commands are shown below.

```
PLOT Y X
PLOT EXP(-X**2) FOR X =  -3  .1  3
FIT Y = A+B*EXP(-ALPHA*X)
BOX PLOT Y X
ANOVA Y X1 X2 X3
LET FUNCTION F = DERIVATIVE EXP(-X**2)/(A-B*X)  WRT  X
```

Although DATAPLOT can be used in a batch environment, the language was designed for (and is most effectively used in) an interactive environment. DATAPLOT has proven to be a valuable time-saving tool from the early stages of analysis through the final presentation graphics for scientists, engineers, data analysts, and general researchers alike. No programming experience is assumed in using DATAPLOT and it can be used by both the novice programmer and by the veteran analyst.

The original manual for DATAPLOT, NBS Special Publication 667 “DATAPLOT: Introduction and Overview”, was published in 1984. Since then, DATAPLOT has continued to develop, which requires updating the documentation. The following three volume set is planned.

1. DATAPLOT Reference Manual Volume I: Commands;
2. DATAPLOT Reference Manual Volume II: LET Subcommands and Library Functions;
3. DATAPLOT User’s Guide.

The first two volumes are intended to be a complete reference guide in that each command is documented individually. They are intended for those with some prior experience with the DATAPLOT language. The third volume is intended to be a tutorial for those new to DATAPLOT. Until the DATAPLOT User’s Guide is published, the “Introduction and Overview” and the “Graphics Primer” (an unpublished document) remain the primary tutorial documentation.

The language defined in this book is consistent with the January 1995 version of DATAPLOT. Most of the commands apply to earlier versions as well. The preparation of this Reference Manual uncovered some bugs in the DATAPLOT code. These changes are included in the Reference Manual even if they were fixed after the January 1995 date. Commands added since 1987 contain an implementation date as a guide for those with older versions. Updates after January 1995 are documented in an on-line news file.

DATAPLOT is portable (written primarily in Fortran 77). Typically, only a handful of routines need to be modified when transporting DATAPLOT to a particular host and operating system. It has been implemented on machines ranging from an IBM/

386 PC to a Cray Y-MP super computer. Known implementations exist for MS-DOS (IBM/386 or higher), Unix (Sun, HP-9000, SGI, DEC Ultrix, IBM RS-6000, Cray Y-MP, Convex), VAX/VMS, and Univac. Other platforms could be utilized as long as a Fortran 77 compiler and sufficient memory are available.

This book has had the benefit of constructive and insightful comments from a number of different individuals at NIST. Particular thanks are extended to our NIST colleagues Hung-kung Liu, Raghu Kacker, Jim Lechner, Shirley Bremer, Lisa Oakley, Nien-fan Zhang, Charles Hagwood, Mark Levenson, Jolene Splett, Stefan Leigh, Mark Vangel, Dale Bentz, Ken Snyder, Mark Kedzierski, Brian Dougherty, Rob Snelick, Neil Zimmerman, Bob Zarr, Peter Verdier, Glenn Forney, Joe Conny, Santos Mayo, Gordon Lyons, Nelson Hsu, John Martin, David Dorko, and Brian Rennex. Their excellent reviewing and editing served to substantially improve earlier versions of this manual. Additionally, the comments of colleagues in the Computing and Applied Mathematics Laboratory at NIST have been extremely valuable in regard to both this manual and the DATAPLOT language. In spite of the above, however, there no doubt still remain discrepancies, errors, omissions, and other technical ambiguities in this manual. The authors welcome the opportunity to receive comments from readers, and will be glad to make corrections and clarifications. Please direct questions and comments to:

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