

cartographic techniques

SOFTWARE REVIEW

Software reviews will normally be solicited by the editors, but unsolicited reviews are invited for consideration. If you are using a piece of software useful in working with map information, and are interested in contributing a review, please communicate this interest to the editors.

SYSTAT version 4.1, SYSTAT, Inc., 1800 Sherman Ave., Evanston, IL 60201, (312) 864-5670, \$595.00.

reviewed by Mark Leitzell,
Donnelley Cartography
and Alan M. MacEachren,
Penn State University

SYSTAT is one of a small number of serious statistical analysis packages to be developed specifically for use on microcomputers. It is a comprehensive package that should answer most cartographer/geographer's needs. Most parametric statistics found in well known mainframe packages are included, as are a wide range of non-parametric capabilities. The package is divided into seventeen modules, two for data input and processing, one to develop macros, and fourteen sets of analytical procedures. The latter cover: cluster analysis, correlations, factor analysis, simple graphics, multidimensional scaling, multivariate analysis (including regression, ANOVA, etc.), nonlinear estimation, nonparametric statistics, series, statistics (i.e., means, standard deviations, t-tests, Tukey HSD, etc.), and tabulations. All of the analytic modules seem to operate as expected.

Like most mainframe statistics packages, upon which it appears to be modeled, SYSTAT is a command driven package with no menus or mouse support. In the editing module, it does at least support the arrow, PgUp, PgDn, Del, Ins, Home, and End keys, but no function keys. Although the command structure is easy to

grasp, it is reminiscent of the early 70s computing environment. Variable names, for example are case sensitive and failure to remember this results in the obscure message "no non-missing values to tabulate." We were also initially rather intimidated by the 822 page manual and lack of interactive tutorials. The manual does contain examples of data and command sequences for virtually all possible operations and is reasonably well indexed. Following the examples exactly, however, will occasionally produce a different result than that shown, or no result at all! Once you get to know the package, there is an abbreviated 89 page command reference manual that includes both SYSTAT and SYGRAPH (the accompanying statistical graphics package) commands.

Installation is a fairly painless process (if you know how to edit your CONFIG.SYS and AUTOEXEC.BAT files), but our version generated an error message when installation was complete when there was actually no error. Although it is possible to install the package on floppy disks, you would need fifteen! A critical issue that becomes only partly apparent at first is disk space. The package includes nine 360Kb disks in packed form. If you add SYGRAPH, approximately 5Mb of space is swallowed up by the software alone. This is actually not bad if you consider that the microcomputer version of SAS requires about 21Mb for its statistics and graphics modules.

When the package is put to work on any substantial data set, disk space becomes even more of a problem. We found, for example, that a 5391 byte ASCII data file turned into a 42117 byte SYSTAT file — almost an eight-fold increase! By default, files are stored in double precision, and file size can be cut in half if your data do not require it. There is, however,

no software toggle that can be set to effect this change on even a semipermanent basis. Every time you create a file you must add "single precision" to the save command.

If you want to process just one part of a data set or need to group data by one of the variables stored in the file, a variety of procedures are available to do so. A problem is that any of these operations requires that you produce another SYSTAT file containing the subset of data or the data sorted by group. To make matters worse, it is impossible to replace a file with an edited version of that file. You can only save to a different file than the one you are working on. You can not, for example, sort by a grouping variable and replace the original file with the sorted version. Files seem to multiply like rabbits!

If you make the mistake of running a procedure that creates a new file on the same disk drive that SYSTAT is on and there is not enough room for the resulting file to be created, SYSTAT generated a hidden file containing results as far as it got, thus reducing disk space even further.

Another space problem is the standard one in the DOS world — the 640Kb memory limit. More than once we received the message "The problem is too large for this version of SYSTAT." This message is more optimistic than the reality that generated it. *No version of SYSTAT for the IBM can access extended or expanded memory and the minimum memory requirement to run the program is 640Kb.* We hit the limit with data sets containing 21 variables of 4200 cases each. Analysis of about 25 variables at a time by county for the U.S. should be possible, as should the package's upper limit of 256 variables for counties in any individual state.

Data input is quite easy if you do not have too much of it. The

editing module is spreadsheet-like and has some handy transformation procedures included. Input of data from an external ASCII file is equally easy — if data are in nice neat columns with no missing values. On the output end, you can print results (but not to an Apple LaserWriter), direct print files to disk, and export SYSTAT data files as ASCII files for use in other packages.

Once information is in SYSTAT form, a powerful DATA module is available to manipulate it. There is even a built in BASIC module that can be used to design custom data transformations. A sophisticated macro editor is also included that allows you to build multistep procedures. The macro files are in ASCII, therefore they can be generated externally in a program editor. The macro facility can be used with most of the statistical modules so that running the same procedure on several different files does not require continued entry of commands. Another positive feature of the DATA module is its capability to merge multiple files, both vertically (appending rows) and horizontally (appending columns).

The authors of the manual assume a considerable level of statistical sophistication. Procedures and parameters generated in the output are not explained. Some of the terminology is rather obscure, at least for a pair of geographers. To the author's credit, advice about misuse of statistical procedures is sprinkled throughout the manual, and should inhibit users from making some common mistakes. The authors also have a sense of humor; a pleasant change from most computer manuals!

Support for the package is fairly good. Calls to technical support staff were seldom handled immediately, but they do return their calls and would generally stick with a question until it was

answered, even when that took two or three return calls on their part.

Overall, in spite of some flaws, we give SYSTAT a high rating. It is a powerful package and the learning curve is relatively gentle for the power you get. Most of the problems are in the user interface, or related to space limitations that are a problem for most IBM-based systems. If you want an integrated statistical/graphic analysis package with an intuitive user interface that allows real time interaction between statistics and graphics, SYSTAT/SYGRAPH is not for you. If, on the other hand, you are willing to deal with a command driven package, need a comprehensive set of statistical analysis procedures, and can put up with switching from one package to another between graphics and statistics, we recommend the SYSTAT/SYGRAPH tandem.

Editors' note: a comprehensive review of SYGRAPH will be included in CP Number 5, Spring 1990.

DESKTOP MAPPING SOFTWARE VENDORS MERGE

The December, 1989 issue of *The GIS Forum* reports that "Less than two months after renaming his company, Strategic Mapping, Inc. [purveyors of Atlas*Graphics™, the best known desktop mapping software for MS-DOS platforms], Steve Poizner has announced its merger with Select Micro Systems, Inc., the developer of MapMaker™, the leading Macintosh based desktop mapping system . . . The combined firm will operate under the SMI banner from its current location in San Jose."

The merger is something less than a surprise, given that "SMI has been a MapMaker dealer since 1987 and Select Micro Systems' exclusive source of data and boundary files." *The GIS Forum*

lauds Poizner for acknowledging that "the Macintosh has become the clear choice for desktop publishing," and concludes that the merger "suggests that desktop mapping has finally gained corporate acceptance and should lead to the introduction of even better and more innovative products."

For a review of MapMaker 3.0, see CP Number 1, March 1989.

SERVICE BUREAU DIRECTORY

The trade publication *Electronic Publishing and Printing* has announced publication of its *Second Annual Service Bureau Directory*, a list of more than 650 outlets offering PostScript output services including color separations, typesetting, and presentation graphic output. In addition to addresses and phone numbers, the operating systems, output devices, software, and special services available at each service bureau are listed. The directory is organized alphabetically within five rough geographical regions (east, central, west, south, Canadian). The directory is available for \$7.50 from Ms. Jean Miller, Electronic Publishing and Printing, Dept. SBD, 29 Wacker Dr., Chicago, IL 60606.

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