

pattern matcher that allows the IEDAS and IEOCS to analyze and understand the English-like control heuristics of the dasframe and ocsframe predicates. The IENAL parses each sentence and converts its meaning into tokens. It then substitutes variable tokens with real values from a global database. The validity of the control heuristics is then determined by pattern matching.

Apart from rule interpretation, IEDAS and IEOCS also control data acquisition and experimental control, respectively. The slots of the control frames contain structural, attributive, procedural, and heuristic information. Once the IENAL interface determines that the heuristics or firing conditions of the frames are satisfied, it calls a procedural subroutine that executes the necessary control sequences as specified in the procedural slot of the frame.

### CONCLUSION

One of the important functions of the graphics and natural language interface is to enable the user who has no knowledge

of computer programming to use the knowledge-based software effectively to configure and run experiments. The system also provides the capability for the user to query the experiment or process in real time to ascertain dynamic values of the instruments and controllers, determine trends in the form of graphical plots, and learn why a particular control action was performed.

### ACKNOWLEDGMENT

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### REFERENCES AND NOTES

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- (3) Kowalski, R. A. *Logic for Problem Solving*; North-Holland Elsevier: New York, 1979.
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## COMPUTER SOFTWARE REVIEWS

### Asystant GPIB

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The Asystant GPIB from Asyst Software Technologies, Inc., is mainly intended for users in PC environments who would like to collect, manipulate, analyze, and graphically display their scientific and engineering data. Asystant GPIB enables users to acquire data from instruments controlled through the GPIB. The GPIB and Analysis features together provide numerical and statistical analysis, input and output to files, and more sophisticated graphics capabilities.

The maximum use of Asystant GPIB can be gained from a knowledge and understanding of IEEE-488 manuals and both Asystant Tutorial and Reference manuals. This software package allows users to communicate with instruments through GPIB commands. There are two ways that the commands can be executed, either immediately (Interactive Mode) or in batch for later programmable routines (Program Mode).

Asystant GPIB comes with excellent documentation, which includes Reference and Tutorial manuals. In the Tutorial manual there are clear explanations of Asystant's features with step by step instructions, enriched with self-explanatory examples.

The user of this software package will probably get familiar with the use of Asystant very quickly as the Analysis Tutorial provides seven different demonstration sessions that show how to use various features of Asystant. These sessions look so easy that one can get the impression that working with Asystant is easier than it actually is.

When users start working on their own with Asystant GPIB, they may face problems that have not been considered. In that case there is an online help as an option in the main menu, which gives a lot of information about options and features

available on this software. In the cases where the problems are complicated and cannot be resolved simply by reading the manual or online help, Asyst Software Technologies, Inc., provides a Technical Support Hotline free of charge to new owners of Asystant GPIB for 60 days from date of purchase. After the 60-day period, customers may enroll in the Extended Support Plan that includes ongoing Hotline support and many other benefits.

Asystant GPIB also has nicely organized menus. In the main opening menu, besides the Main Menu options there are also Calculator Functions, Stack Contents, and Parameters and Variables presently used. If one is learning how to work with Asystant GPIB, I suggest selecting the Help option and reading about different Asystant options because all of the secondary menus (menus for each of the main options) and a short description for each of them will be given. Each secondary menu has a Return option that takes the user back to the Main Menu from which one can either select another option, look for online help with the Help option, or exit Asystant GPIB by selecting the Save/Exit option. If the user wants to display on the screen or plot anything, the user needs to go to the Main Menu and select the Graphics option. This option changes the screen to high resolution, which has more points per square inch and thus makes the graphs on the screen more accurate than they would be on a normal resolution screen. Before plotting, the user must set variables and parameters into Y and X values which are needed to graph the particular function. After the user has finished experimenting with the graph and the way it is presented, the graph can either be printed on the printer, plotted on the plotter, and/or dis-

played on the screen again. Then the user selects the Return option to return to the main Menu and then either exits Asystant GPIB or selects another option to continue working with Asystant.

Overall I have to say that it was a pleasure to work with such useful and easy to use software as Asystant GPIB. It helped a great deal with solving the problems and troubles I had with a project I was working on. I would recommend the

use of Asystant GPIB to any user who wishes to collect, manipulate, analyze, and graphically display scientific and engineering data.

#### REFERENCES AND NOTES

- (1) Asystant GPIB is available from Asyst Software Technologies, Inc., 100 Corporate Woods, Rochester, NY 14623 [(716) 272-0070 or (800) 348-0033]. The price is \$695.00.

## Lahey FORTRAN 77 Language System

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F77L is a FORTRAN language compiler that requires an MS-DOS or a PC-DOS operating system, version 2.00 or higher, and 256K of RAM memory and is able to make use of the INTEL family of numeric data coprocessors.

The F77L package includes a compiler for standard source files, a graphics development Toolkit binding, a P77L Profiler Demo, a NDP exception routines, and a conversion program from free to standard format and vice versa. It would have been nice if the developers had an editor included with the package.

The FORTRAN language, because of its logic and math orientation, is still very popular among engineers and scientists. Its popularity has not declined, as the experts predicted, as newer languages such as Pascal and C have been developed. As a result of FORTRAN's popularity, there are a number of FORTRAN compilers on the market.

The FORTRAN 77 language compiler from Lahey Computer Systems, Inc., is supported with very good documentation. The manual clearly shows every step of the installation of F77L, and further sections teach the user how to program in FORTRAN; there are many self-explanatory examples.

The F77L software has most of the same standard features that are available on mini and mainframe FORTRAN languages packages, but it also has some shortages like jumps in IF...THEN blocks. Personally, I also miss the DO...WHILE and DO-block loop, which are standard features on some other PC FORTRAN compilers but are missing in this compiler.

Among nice features are some nonstandard functions (like

character handling routines, random number generators, and bit handling routines), DOS interface subroutines, interfaces to other languages (C, MS-FORTRAN), toolkits like IBM graphic library, and math chip exception subroutines for handling arithmetic errors. The F77L subprogram code is re-entrant so that subprograms can be invoked recursively, which is quite a rare option even in FORTRAN compilers on mainframe computers.

The F77L compiler has a lot of different options that are very useful for efficient error analyzing and further debugging with SOLD debugger. In addition, Lahey Computer System, Inc., also provides the PLINK86 Overlay Linker, which allows efficient library management.

Lahey Computer System, Inc., provides technical support at no cost to F77L users, but there is no toll-free number. Of course this support is limited to F77L problems and does not include tutoring in how to program in FORTRAN or how to use DOS.

After evaluating all the features the F77L compiler offers, from the considerable documentation, standard and nonstandard features, and technical support, I think that the F77L compiler is well worth the money.

#### REFERENCES AND NOTES

- (1) The Lahey FORTRAN 77 Language System for personal computers, F77L, is available from Lahey Computer System, Inc., P.O. Box 6091, 917 Tahoe Blvd., Incline Village, NV 89450 [(702) 831-2500]. The price is \$477.00.

## TRC Databases for Chemistry and Engineering—Vapor Pressures

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The Thermodynamics Research center (TRC) at Texas A&M University has been in the data business for decades and has recently started to release some of its data in searchable form on disk for IBM PC compatible computers. This review is for the first of their products, a database of the

vapor pressures for 5766 compounds.<sup>1</sup> Actually, it is not a database in the usual sense in that what the system contains are not actual data values, but rather the Antoine and extended Antoine coefficients and equations that allow one to calculate the vapor pressure at the given temperature and pressure