SOFTWARE DATA SHEET

2200 IDEAS™ RELEASE 2 (INQUIRY DATA ENTRY ACCESS SYSTEM)

IDEAS™ Release 2 (Inquiry Data Entry Access System) is a powerful application development tool that creates BASIC-2 applications for the 2200 Series product line. The IDEAS utilities establish and maintain data files, generate sophisticated screen formats, produce complex reports, and create programs to solicit and validate operator-entered data and sort data files. IDEAS Release 2 can be used to produce a complete data entry program with little or no programmer intervention. When necessary, modification to the highly modularized BASIC-2 code can be accomplished easily through the use of the system resident macros.

The IDEAS file access system is the Hashed Index Keyed Access Method (HIKAM). HIKAM offers a unique combination of hashing and indexing access techniques to handle insertions and deletions easily, optimize data storage and retrieval, minimize overflow situations, and perform well in sequential and random access environments.

IDEAS Release 2 offers many features that make it an invaluable software development tool. Hierarchical security precautions can be implemented throughout an IDEAS-developed application. IDEAS Release 2 allows for the creation of subscreens, the chaining of screen modules and program modules, and comprehensive field testing and field processing during data entry. The IDEAS utilities provide documentation for data files, screens, menus, and reports. IDEAS Release 2 screens can incorporate many of the graphic features of the Model 2236DE and 2236DW terminal.

IDEAS is a Wang-developed and supported software package offering 2200 Series users state-of-the-art software technology designed for application development.

- **Automatic Data File Creation and Maintenance**
- **Easy Screen Generation**
- **Self-Documenting**
- **Hierarchical Security Precautions**
- **Program and Screen Chaining**
- **Flexible Report Generator**
- **Generates Modularized BASIC Code**

DATA ENTRY

Data entry, inquiry, and update programs are generated through the Data Entry/Inquiry/ Update module. These data entry programs allow data manipulation on files created through the Data File utilities. The generated programs are based on the screen and data file definitions. To create a data entry program, the user need only enter the name of the program to be created and the screen format and data file to be used.
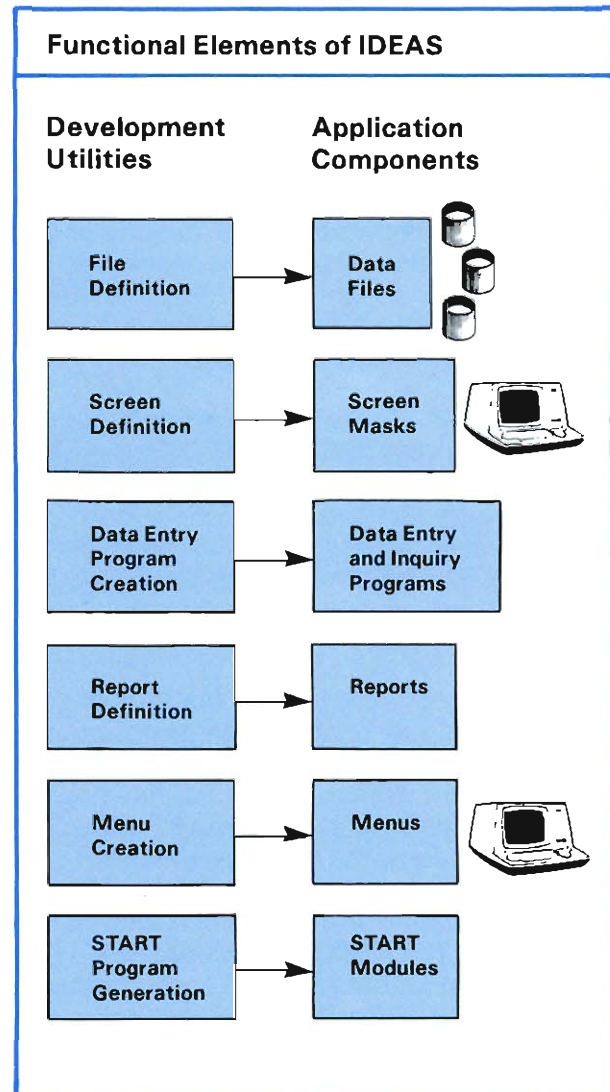
Data file definitions can be created, revised, and documented through a set of Data File utilities. The user has direct control over the position of each field within a record. Subfields for each field can be defined to any number of nesting levels. Using the IDEAS Release 2 utilities, the user can define a data entry field in a variety of ways. For example, a field can be defined to require only digits or only alphanumeric characters, or to fulfill a particular decimal format. Once a record has been established, the user is still able to add or delete fields from the record or to change the attributes defined for a field. Data records are blocked to make the most efficient use of the latest disk technology of the 2200 series.

SCREEN DISPLAYS

The Screen Mask utilities provide the user with an easy-to-use tool for developing the screens necessary for interactive application systems. An IDEAS Release 2 generated screen can automatically access up to seven different data files. Data can be retrieved from and deposited into any one file or any combination of these seven files. An unlimited number of screens may use each data file.

IDEAS Release 2 allows the user to create subscreens that can be displayed following the entry of particular fields. A subscreen can contain fields of its own or can display explanatory text only. The user can also create a help screen that consists only of text and does not allow field entry. When viewing is complete, a help screen returns control to the data entry screen from which it was accessed. IDEAS Release 2 provides the option of chaining to another screen or even to another user-written program. Chaining can be invoked at any field on the screen.

Functional Elements of IDEAS

Development Utilities	Application Components
File Definition	Data Files
Screen Definition	Screen Masks
Data Entry Program Creation	Data Entry and Inquiry Programs
Report Definition	Reports
Menu Creation	Menus
START Program Generation	START Modules

The Screen Mask utilities provide extensive field processing options for entered fields. These options allow fields to be set to defaults, to be established as nonmodifiable, to be tested for a variety of conditions, or to be processed in several ways. At the screen level, a field can be defined as a required field or as a field that cannot be modified after initial entry. Additionally, up to five actions can be specified per field. These actions include copying fields, transmitting fields, loading programs, branching to other fields, saving records, and displaying a specified range of fields.

IDEAS Release 2 supports many screen mask display options. The user can utilize the Model 2236DE and 2236DW terminal box graphics as part of the screen mask. Additionally, four field
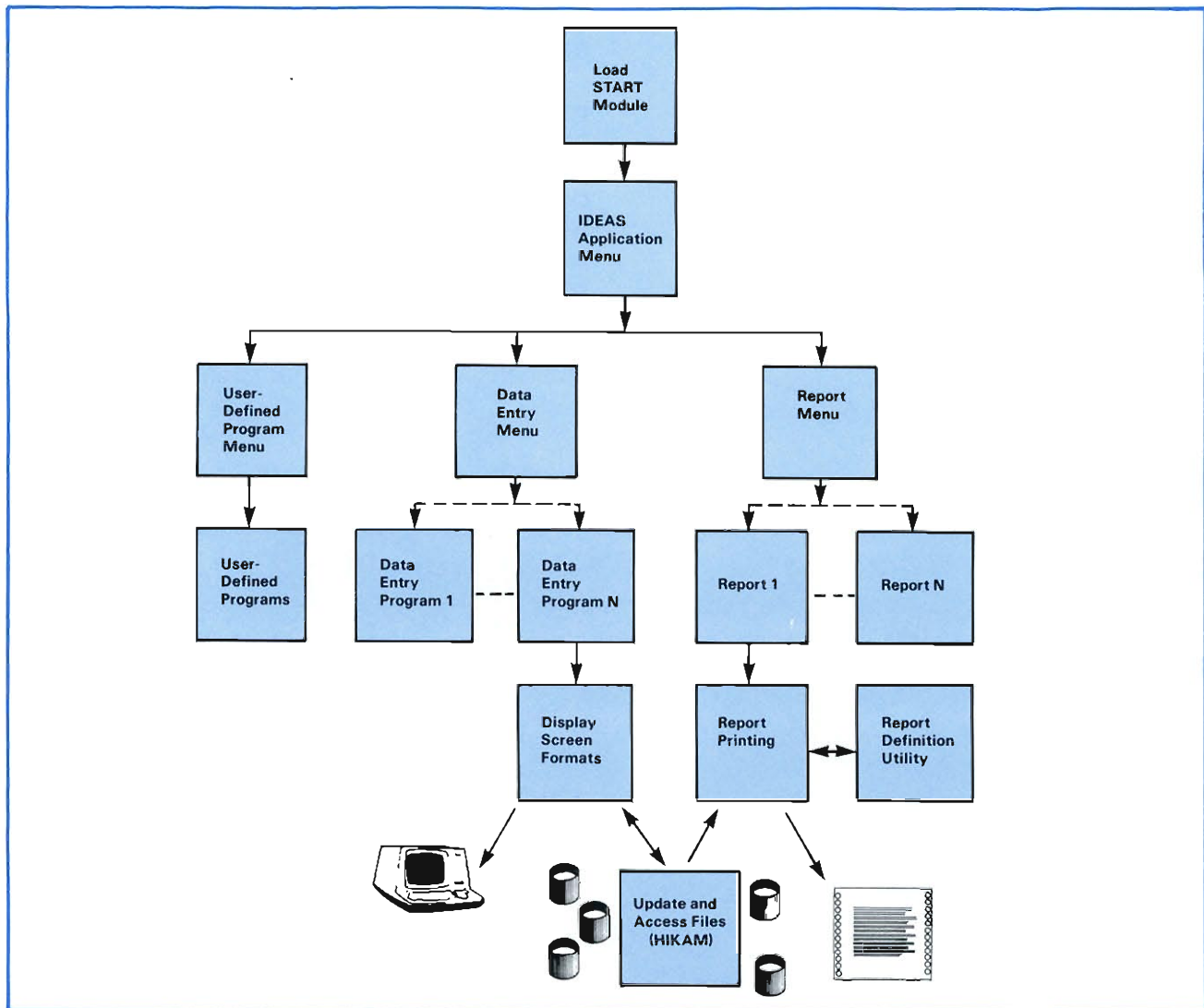
An Example of an Application Developed Using IDEAS

display options are offered: bright, blinking, normal, and not displayed. When creating or modifying a screen mask, the user can move entire lines of text, with or without the fields within them, up or down on the screen mask.

FILE MANAGEMENT

HIKAM, the IDEAS file management system, combines hashing and indexing techniques to provide excellent performance in random and sequential storage and retrieval environments. HIKAM files are formatted under software control in a way that optimizes search and access time, provides efficient disk management, and eliminates the need for periodic file reorganization. Compression of numeric and alphabetic data is available for more efficient use of disk space.

The maximum file size on an IDEAS-developed system is virtually unlimited since multiple volume files, as well as single volume files, are supported. A logical file can span up to eight disk platters on line; thus, the maximum file size is limited only by available memory and disk space, and, in extreme cases, key size.

Each data file must have one primary key; up to sixteen alternate keys can be associated with each primary data file. Duplicate primary and alternate keys are allowed. A reference file containing only primary keys can be created. All key file maintenance, regardless of file type, is automatically performed by the system.

Primary or alternate keys can be composed of up to five different fields that do not have to

be contiguous in the record. Any combination of five fields can form the key. The sort order for each field in the key can be specified as ascending or descending.

Several supplementary utilities are available that increase the power of IDEAS-developed software systems. The File Recovery utility reconstructs damaged data files from information saved on disk. A utility to convert IDEAS files to standard telecommunications format allows the use of any standard Wang telecommunications (TC) utilities and batch emulators; TC files can be converted to IDEAS format using this utility. Applications developed using IDEAS Release 2 support telecommunications with host computers using interactive protocols such as 3270 protocol. IDEAS Release 2 also provides utilities to check file status, to protect all records in a file, and to release all records in a file.

SECURITY FEATURES

IDEAS Release 2 offers an extensive security network. Each user of the IDEAS utilities and of the IDEAS-generated programs is assigned a User ID and one of 16 hierarchical user classes. Access to programs, screens, and data files can be restricted by User ID or user class. Programs, screens, and data files can also be protected with password security. Programs not available to a user of a particular class are not displayed for that user on IDEAS-generated program menus.

MENU DISPLAYS

Menu displays are quickly created by the Application Menu Program utilities. Up to 17 programs or submenus can be called by each menu. Application Initialization programs can be chained together, allowing one application menu to contain several other applications.

The user can move directly from an application menu to the IDEAS Release 2 Development Utilities menu. This facility allows for modifica-

tion during runtime. For example, if the user wants to change the format of the report while running an application, the Report Generation utility can be used to modify the report.

REPORTS/FORM PRINTING

The Report Generation utility, provided by IDEAS, combines versatility, power, and ease of use. Complex reports can be designed and implemented quickly, with a minimum of effort. The report definition files created by the Report/Form Printing utilities define the content and format of the report to be printed. Each report can automatically access data from up to seven data files, and specific fields can be accessed from any data file.

Reports can contain three levels of totaling in addition to page totals and page numbers. Up to 10 math constants and 32 math functions can be used for each report. Text is entered for the report mask directly onto the screen. The screen scrolls to the side to accommodate the maximum width of 158 columns for each report (in 12-pitch), and the screen scrolls vertically to allow the maximum page length of 66 lines.

APPLICATION INITIALIZATION

START modules for IDEAS-developed applications are created from user inputs in the Application Initialization Program Generation module. The created START module initializes system addresses and operating parameters, and opens user-specified files. The user can selectively inform a START program to open some data files and not others. The START program loads a user-specified program . Typically, this program loads a main menu from which the different components of the application can be selected.

SYSTEM RESIDENT MACROS

All application programs generated by IDEAS use the system-resident macros, a set of powerful subroutine calls that form the basis of all phases of IDEAS-developed applications.

For example, all file access, key file maintenance, data packing and unpacking, and actual disk operations are performed automatically through the use of the system resident macros. The same set of macros is used for the development utilities, as well as for the generated applications, allowing easy movement between the development stage of an application and the running of an application. Several commonly used system resident macros are summarized as follows.

- A macro GETs and unpacks a record from a specified file.
- A macro packs a record and PUTs it into a specified file.
- A macro displays all fields starting at the current field.
- A macro finds the first physical key in a specified file.
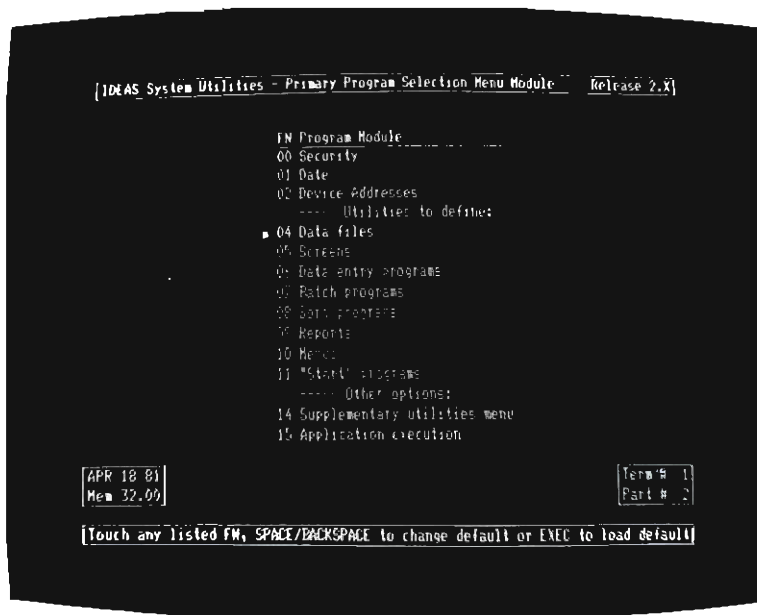
EASE OF MODIFICATION AND MAINTENANCE

Generally, IDEAS-generated code does not need to be modified. However, when modification is required, it is greatly simplified when the system resident macros are used. The BASIC code generated by IDEAS is designed to facilitate the use of the macros through a high degree of modularity. This modularity makes it easy to modify IDEAS-generated code; for example, because the generated code is modularized, it is easy to provide specialized field editing logic or processing logic beyond that already supported by IDEAS Release 2. Maintenance is also easy as a result of the modularized code.

SORT UTILITY

IDEAS Release 2 contains a Sort utility that can be used to create an interactive sort program with parameters that can be modified by the operator at run time, or it can be used to create a nonmodifiable sort with predefined record selection parameters. The developed sort program is able to sort multiple files, and can produce a key file or a pointer file. The sort key can be defined with multiple fields, and an ascending or descending sort order specification can be established for each field.