Interactive Processing

OS/3

Introduction

H

SYSTEM 80's INTERACTIVE PROCESSING
FACILITIES MAKE THE COMPUTER
ACCESSIBLE TO DIVERSE USERS
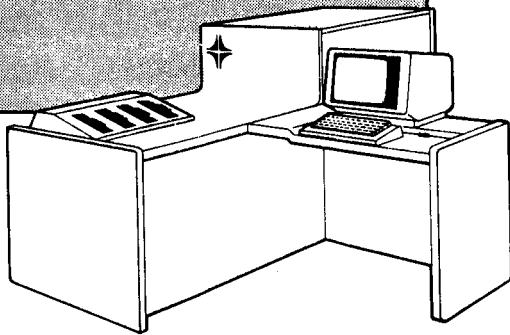
System 80 serves diverse users

At one time, data processing was the exclusive province of professional computer programmers and operators. They were the only people who knew the complex procedures then necessary to make a computer perform useful work. Now computers are much easier to use, allowing those with little or no formal computer training to make productive use of them.

The growing ease of computer use has considerably broadened the definition of *computer user*. In fact, it has created three types of computer users, each looking at the computer from a different point of view and each having different expectations of what the computer can do. The three types of users are the *information seeker, problem solver,* and *computer professional.*

SYSTEM 80 IS FOR ALL
THREE TYPES OF USERS

INFORMATION
SEEKER

COMPUTER
PROFESSIONAL

PROBLEM
SOLVER

2
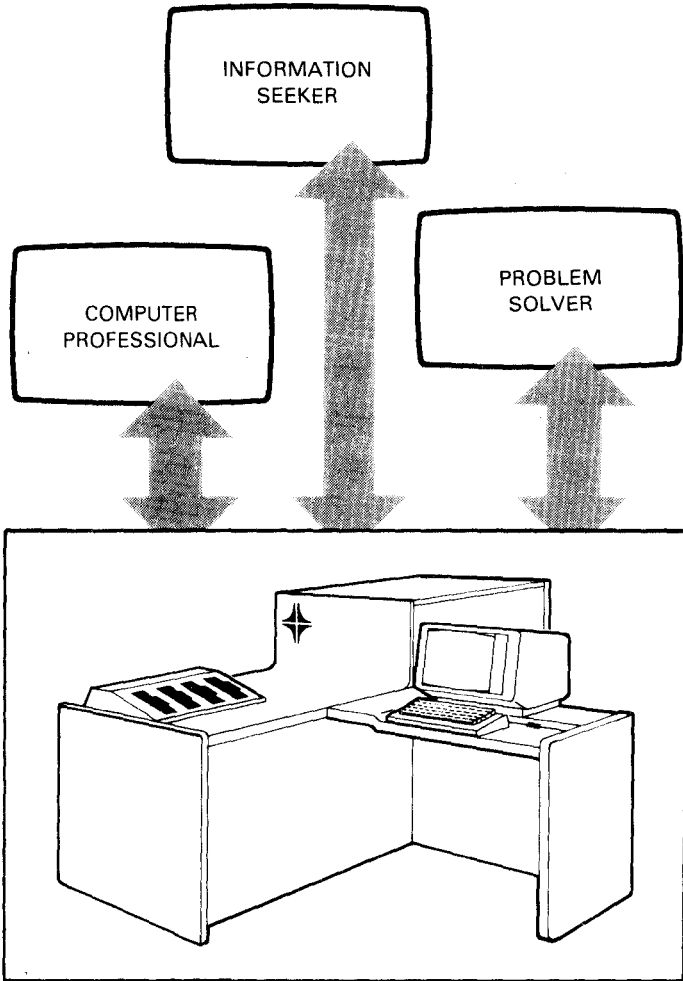
1. The Information Seeker

The information seeker can be anyone from a clerk to an executive who needs to obtain information from the computer. This information may be as simple as the number of a certain type of part available in a particular warehouse. It may be as complex as the complete accounting information for a sales office.

2. The Problem Solver

The problem solver may be an engineer or executive who wants to use the computer as a powerful tool to help solve problems. These problems could range from the computation of how much structural steel will be needed for a building, to the creation of a schedule that will use available personnel in the most efficient way.

3. The Computer Professional

Computer professionals are the people whose chief task it is to work directly with computers. They include programmers, operators, and data processing managers. They are specially trained to know your company's computer inside out and to be

3

able to make full use of all its capabilities. Also included in this category are data entry clerks, who, although not working directly with the computer, perform the important service of providing data *to* the computer.

There is necessarily some overlap between the three categories. For example, computer programmers frequently act as problem solvers, creating a program to solve a business problem. At the same time, a problem solver using one of the programming languages might become a programmer in the course of solving his problem.

The three types of users have diverse data processing needs and levels of computer training. The SPERRY UNIVAC System 80 computer can satisfy the computing needs of all three types, while providing easy operation for all users from the novice user to the most experienced programmer. The keys to this versatility and ease of operation are the extensive *interactive* facilities provided with the System 80. Interactivity means that you and the system are communicating with each other and working together to accomplish your job. Your primary tool when using an interactive data processing system is the *workstation*. The workstation is

the device through which you and the system communicate. It consists of a typewriter-like keyboard and a video screen. The screen is used to display the information you enter through the keyboard and the information sent to you by the system.

You direct System 80 to perform your job through a simple set of commands. For novice users, the system provides interactive facilities that actually engage the user in a dialog to obtain the information and instructions needed to carry out his request. Many System 80 interactive facilities provide extensive prompting and explanations of the choices offered in the dialog.

More experienced programmers can use many of the interactive facilities in a more direct manner, simply entering commands and information directly, without prompting, thus speeding their tasks.

The two purposes of the interactive facilities are:

- to extend the power and speed of the computer to more employees by making the computer easy to use; and

- to help experienced computer users by relieving them of as many of the tedious aspects of their work with the computer as possible, and to generally make their tasks easier and less time-consuming.

We'll see how System 80 accomplishes these two purposes in the following pages.

the information seeker

The information seeker has a lot of questions, and System 80 provides several methods he can use to obtain and organize the answers he needs. Before describing those methods, however, we should first define some computer terms important to the information seeker. When you ask a computer a question, such as how many of a certain part are in warehouse 3, you are performing an *inquiry*. The computer will retrieve the information you want from its files and display the information on the workstation screen. If after you determine the quantity of parts in stock an order comes in for 30, you will want to tell the computer about that new order so that it will reduce its count by 30, bringing its files up to date. This is termed an *update*.

Now, on to the methods that System 80 provides to get your answers.

HOW MANY I-BEAMS
SOLD IN MAY?

HOW MANY
EMPLOYEES IN
ENGINEERING DEPT?

HOW MANY WHEELS
IN WAREHOUSE 3?
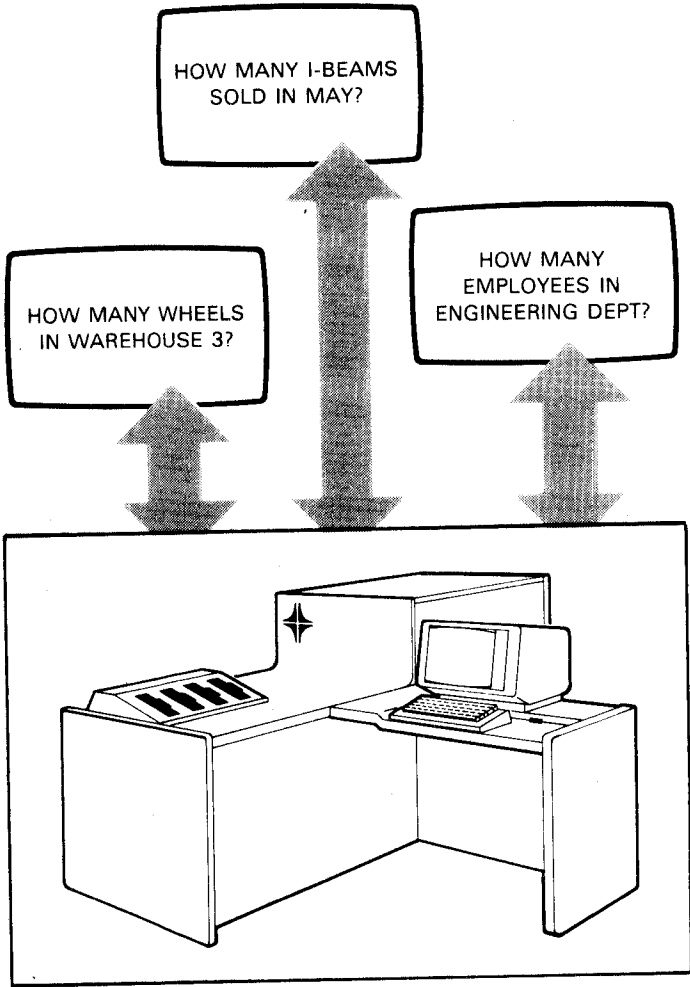
IMS UNIQUE

Sperry Univac provides you with a powerful and easy-to-use method for performing inquiry and update on the System 80 – Information Management System (IMS). IMS allows users of all levels to retrieve, update, and display data at the workstation. IMS facilitates the training of new users through a mode of operation that permits the exercise of update and inquiry functions without actual updating of files. This means new users may be trained online without fear of accidentally changing files.

The workhorse of IMS is the uniform inquiry update element (UNIQUE). UNIQUE is a set of application programs that, through a set of simple commands, provides a standard, easy-to-use, inquiry and update method. In addition to retrieving, updating, and displaying data, UNIQUE permits you to process specific portions of data from a file, select data based on a comparison, or perform statistical functions before displaying the data.

For example, if you had an IMS file named CITY containing information on various American cities, you could use the simple commands of UNIQUE to extract only the desired data from the file.

You would open the file by entering the OPEN command and ask UNIQUE to display information about a particular city, Alameda for example.

```
OPEN CITY
DISPLAY ALAMEDA⌐
```

The display produced by UNIQUE would look like this:

```
CITY      CITY-POP    STATE         STATE-POP      CAPITAL      CAP-POP
ALAMEDA   66,031      CALIFORNIA    19,953,134     SACRAMENTO   257,105
```

ESCORT

Perhaps the ultimate interactive facility available to the information seeker is the SPERRY UNIVAC ESCORT programming language. ESCORT is an interactive programming language that uses English statements to create a program. The ESCORT language allows you to generate reports and perform inquiry and update routines through the use of simple, sentence-like programs. Suppose you wanted to generate a report on sales of over one thousand dollars in your store. Here is the ESCORT program that would produce such a report:

```
SELECT DATA FROM SALEFILE IF PRICE IS
GREATER THAN 1000 AND PRINT
```

In this statement, SALEFILE is the file in which the records of the store's sales transactions are kept. It's just that easy to generate reports tailored to your exact needs.

You can learn the ESCORT language quickly at a System 80 workstation, using the *tutorial* mode feature. In tutorial mode, you are lead by means of a dialog through each step of program creation. Explanations of each step and the choices you must make at each step are provided.

After gaining experience from working in the tutorial mode, you can move into *program* mode to create ESCORT programs more quickly. This is accomplished via two methods.

The first is the *screen menu method*. In this method, the system displays menus on your workstation screen and you *"fill in the blanks"*, creating ESCORT programs.

The second method is the *direct method*. In this method, you simply enter ESCORT statements onto a blank screen.

If you need help while working in the program mode, you may call up one of several screen displays that provide detailed information about ESCORT statements.

MENUS

To help the information seeker gain access to interactive facilities such as IMS and ESCORT, Sperry Univac provides a series of menus. These menus, displayed on your workstation screen, give you an easy way to call up the required interactive facility, by allowing you to choose it from the menu. All you need enter on the keyboard is the number of your choice.

The menus also provide help screens, which give general information about the various interactive facilities available on your system.

System 80 benefits the information seeker as summarized below:

- The information seeker gets fast answers to questions.

- Interactive operation provides the information seeker with an important measure of self-reliance.

- System 80 is easy to use because a simplified set of commands and dialogs prompts the information seeker in the use of certain programming languages and utility programs.

- System 80 can be used by persons of varying levels of computer knowledge.

the problem solver

System 80 offers the problem solver a powerful interactive method of solving scientific, engineering, or business problems. This is the interactive programming language BASIC. BASIC is easy to learn and simple to use. In fact, courses in BASIC programming are offered in many high schools.

You write, execute, and modify your BASIC programs at a System 80 workstation. You receive the results of your work on the workstation display screen or as hard copy from a printer.

BASIC is especially adept at handling problems requiring mathematical calculations. It uses familiar mathematical expressions and follows normal arithmetic rules. BASIC also provides you with a large, built-in library of mathematical and trigonometric statements. These statements are easy to use in a program because you write them in abbreviated form. BASIC also uses exponential notation.

15 MASONS
46 TONS OF NO.7
BRICKS SITE C
07/23/79

$A \times B + F/R = 2(X + B) - C$

CALCULATE NET
PROFIT FOR MAY
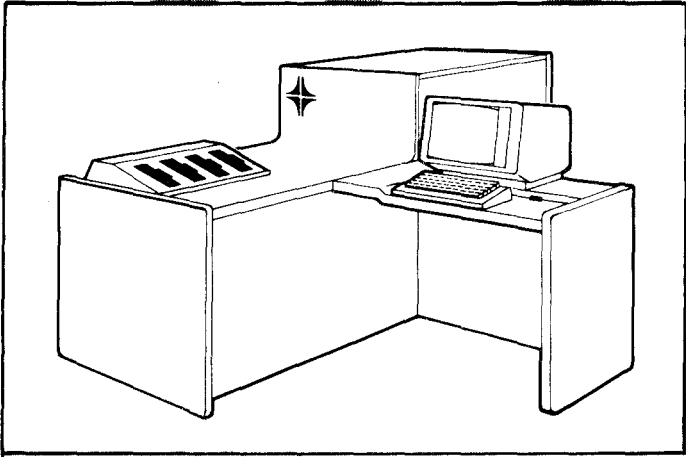
BASIC helps ensure that your program runs correctly by checking each statement as it is entered for correct syntax (grammar). If you make a mistake, the correct portion of the statement is displayed up to the point where you made the mistake. You can then correct and complete the statement.

You can easily save BASIC programs; the BASIC compiler permits you to make changes in your program, store it, and retrieve it from storage.

MENUS

To help the problem solver gain access to inter-active facilities such as BASIC, Sperry Univac provides a series of menus. These menus, which are displayed on your workstation screen, give you an easy way to call up the required interactive facility, by allowing you to choose it from the menu. All you need enter on the keyboard is the number of your choice.

The menus also provide help screens, which give general information about the various inter-active facilities available on your system.

the computer professional

So far, we've only discussed the ways in which System 80 interactive facilities can help users with no computer training. However, the interactive facilities also aid professional computer users. Your company's programmers, operators, and other data processing professionals all benefit from the increased efficiency and productivity offered by System 80 interactive facilities. In this section, we'll discuss what System 80 offers each type of computer professional.
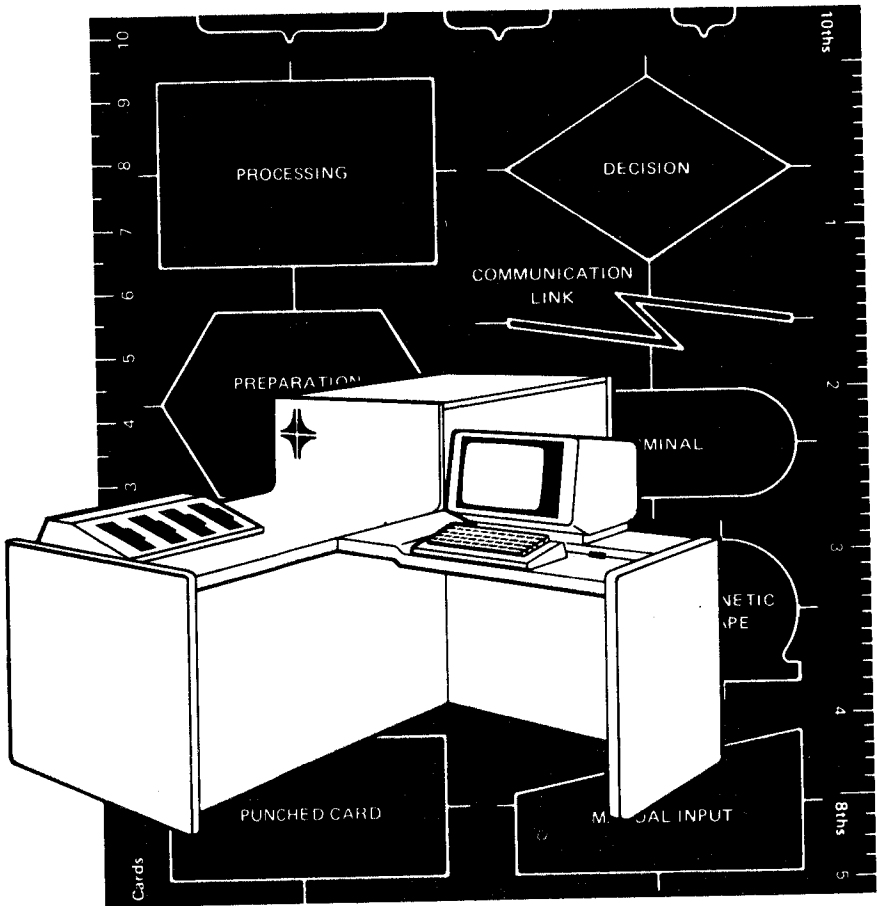
PROGRAMMERS

- **Extensive Workstation Command Set**

The extensive set of commands available through the workstation gives programmers the ability to perform many functions previously available only to the system operator, such as running jobs and controlling the processing environment of these jobs. A programmer who has created a new program may run it from the workstation, monitor its progress as it runs, and even terminate it before it has completed. The programmer (or anyone using the workstation) has at his disposal commands that execute utility routines. These routines perform such functions as making printed or punched card copies of files, recovering library file elements that have been deleted, and obtaining information about the files on a given disk volume. The workstation commands lessen the programmer's dependence on the system operator, and give him greater freedom to test new programs he creates.

■ General Editor

The general editor gives programmers the ability
to create, update, correct, and combine files of
data and programs interactively from the work-
station. The general editor provides these ser-
vices through an easy-to-understand set of com-
mands. Very little training is required to use the
general editor. The general editor also provides
the ability to build procedure files (strings of
editor commands) to perform specific functions.
When these procedure files are needed, either
by a user at a workstation or by a program.
executing on the system, they may be called in
by entering a single command.

The general editor also allows programmers to
write source programs at a System 80 worksta-
tion in either the FORTRAN or COBOL pro-
gramming language. Programmers can also
modify the COBOL or FORTRAN programs at the
workstation.

For programmers using the RPG II language, the
general editor offers a subsystem that enables
RPG II programs to be created interactively. The
RPG II programmer may choose one of three
methods. (One method helps novices. The other
two are more suited to experienced program-
mers.) Novice programmers can use a formatted

display method that allows them to fill in the blanks on forms showing the specifications necessary to create an RPG II program. Experienced programmers may choose a positional format, giving them a template with a column number scale on which to write their statements. Or, they can choose a free-form screen display, allowing them to enter RPG II statements in the manner they wish. Whatever method is chosen, the statements will be automatically checked for proper RPG II grammar before the programmer continues programming.

■   Job Control Dialog

System 80 provides a programmer with the means to interactively create the statements necessary to execute his program. These statements are called *job control statements*. A collection of these statements that executes a program is known as a *job control stream* or *job stream*. Through what is called the *"job control dialog"*, programmers can build job control streams from the workstation. This dialog leads them through the process of creating a job stream by providing prompting screens. The control stream, which is built at the workstation, is automatically stored at the end of the dialog session and can then be run from the workstation.

- Dialog Processor

Dialogs are often mentioned throughout this book in the context of prompting users through the creation of ESCORT programs and job control streams. And, with System 80, programmers can write their own dialogs for special needs and applications. For example, a dialog could be created to allow hospital admitting personnel to enter patient information directly into the computer system. The dialog could solicit such information as name, insurance carrier, address, closest relative, any known allergies to medicines, etc.

Dialogs are created by using a special language, the dialog specification language, and are managed by the dialog processor.

- Screen Format Services

We've seen that formatted screen displays are used with the RPG II general editor facility. The System 80 also allows programmers to create their own formatted screen displays and use them to pass information to and from programs. These screen formats are created interactively, using the workstation keyboard to lay out the format and inform the system as to what kind of information to expect from use of the format.

Screen format services, that is, the software that handles the creation and use of screen formats, automatically takes care of the screen management details. All the programmer needs to do is specify in his job stream that he wants to use screen formats and specify in his program the formats he wants to use.

In addition to the facilities we've discussed so far in this section, all programmers have access to BASIC, ESCORT, and IMS for report generation, quick inquiries, or any other purpose.

OPERATORS

The System 80 console is a dual-mode device that functions as a system console and a workstation.

In console mode, the system console allows the operator to monitor and control all aspects of the system operation. The operator is given an easy-to-use set of commands, which include all the commands available to the workstation user, as well as specialized commands for system control.

In workstation mode, the system console offers the operator the facilities of a workstation, including the ESCORT programming language, the general editor, screen format services, and other interactive facilities.

THE SYSTEM ADMINISTRATOR

The system administrator oversees the operation of System 80. System administration can be the job of a senior programmer or operator, or the job of the data processing department manager.

The system administrator's function is to control who uses the system and what files and pro-grams are available to each user. He also controls configuration of the system.

He controls users and their access through an interactive dialog that only he may use at a workstation. Through this dialog, he assigns passwords to users and user identification num-bers that control access to the system.

Controlling system configuration is also an im-portant duty of the system administrator. When we speak of the *configuration* of a particular system, we mean the hardware and software *resources* available to that system to perform

jobs. The system is made aware of the available resources through a process called system generation (SYSGEN). System 80 makes the process of system generation easier through a dialog that helps the system administrator supply the necessary input for SYSGEN. This dialog allows the system administrator to change the configuration of the system to reflect new peripheral devices or additional software. Thus, the system administrator can easily increase the system's capabilities, power, and performance.

DATA ENTRY CLERKS

The ease with which the System 80 workstation may be used and the interactive facilities, such as the dialog specification language and screen formatting, combine to make the job of the data entry clerk both easier and more productive. Now the data entry clerk can enter data directly into the computer, eliminating the need for key-to-disk facilities, thus making their work easier. This direct entry also enhances their productivity by permitting them to enter data directly to programs running on the system.

The benefits of System 80 to the computer professional can be summarized as follows:

■ Increased productivity

System 80 interactive facilities allow programmers to spend less time on routine housekeeping and maintenance programming and more time on developing application programs.

■ Skill level adaptability

System 80 offers a selection of interactive languages and varying levels of prompting in facilities such as the RPG II editing function.

■ Job satisfaction

System 80 is easy to use and, with the workstation, allows the programmer to not only create a program, but run it and receive the results quickly.

■   Language flexibility

System 80 offers six programming langu-
ages: COBOL, FORTRAN, RPG II, BASIC,
basic assembly language (BAL), and
ESCORT. Programmers can pick the langu-
age that best suits their application.

summary

Users of every level can productively use the SPERRY UNIVAC System 80 computer. The *capabilities of System 80 match the capabilities of the user*. An experienced computer programmer may command a wider variety of interactive services and be able to do more with the System 80 than a novice, but both benefit from the simplicity, power, and speed of System 80.

System 80 can improve two aspects of your company's data processing productivity.

First, System 80 increases the productivity of your employees by allowing them to perform their duties more efficiently and in some instances more accurately. Some of the facilities of System 80 provide tutorial assistance – making the system easy to use.

Second, System 80 helps you to make better use of your computer resources. In data processing, computer time that is wasted results in money wasted. System 80 manages resources and jobs competing for those resources to its best advantage so that computer time isn't wasted.