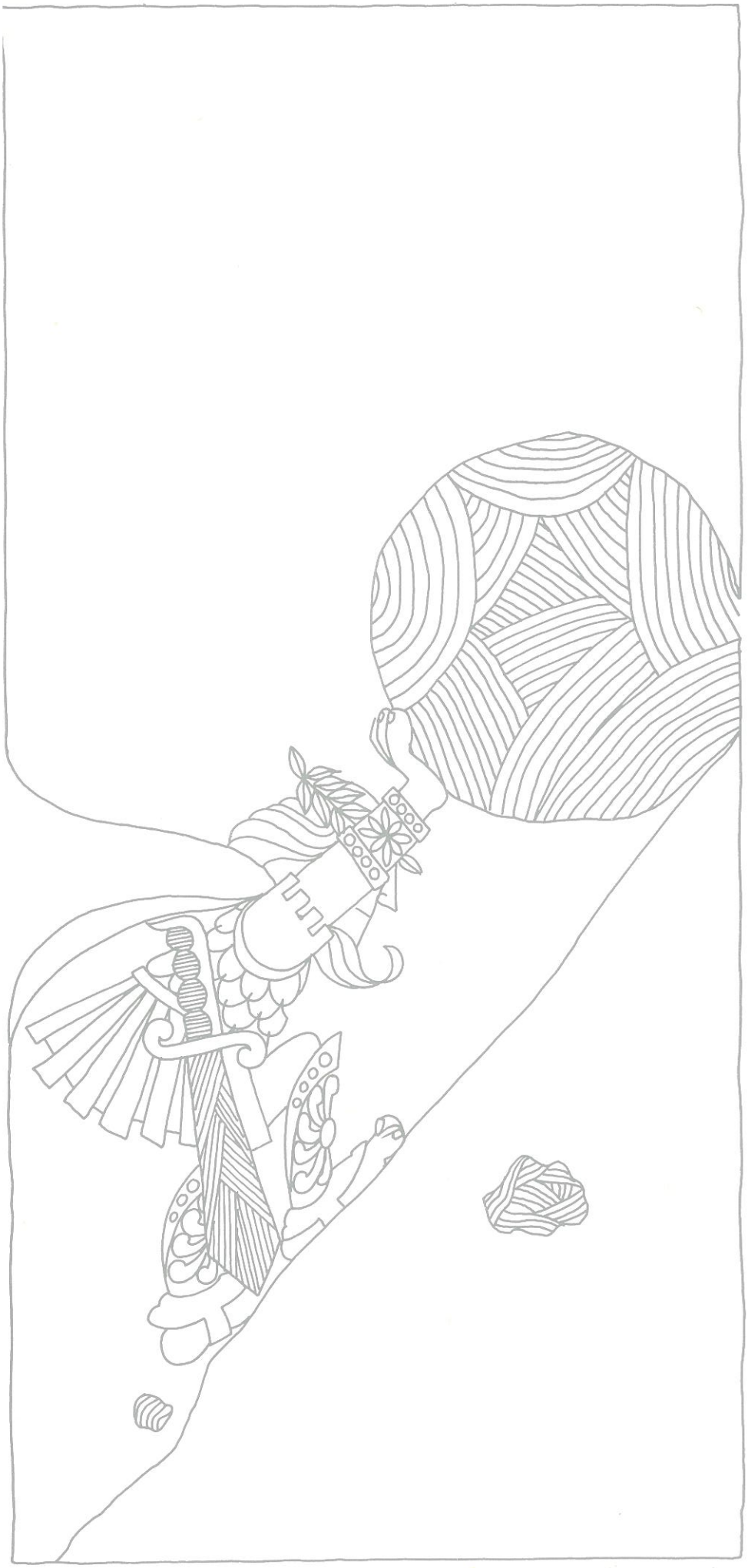
ENVIRON/1



On-line Data Communication

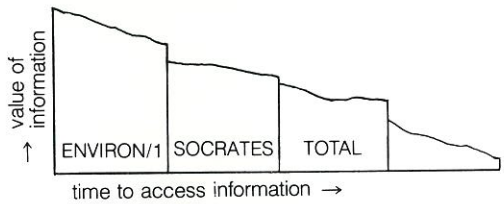
The Classical Problem:

You are a decision-maker. You realize that the speed with which you obtain information critically impacts your decision-making ability. Cincom Systems provides these software tools to assist you in solving your information accessing problems:

TOTAL, the data base management system, increases the value of your information by improving your ability to organize, relate, and access your data.

SOCRATES, the information retrieval system, further increases the value of your information by giving you the ability to quickly generate meaningful reports.

Your next step, and our next responsibility, is the development of an on-line data communications system. You want this system because you realize that immediate information is the most valuable information.



With the apparent inestimable value of on-line data communications systems, you may wonder why they have not been implemented universally. Consider the following analogy:

Companies involved in the development of on-line data communications systems have often felt like Sisyphus, the Corinthian King of Greek Mythology. Sisyphus, having fallen into disfavor with the "gods", was sentenced to an eternal punishment. He was ordered to roll a huge boulder to the top of a steep hill. But no matter how careful Sisyphus was, each time he got the boulder to the top it would roll down the other side and he would have to start all over again.

The history of on-line development for many installations shows them in a situation similar to that of Sisyphus. Conversion became a way-of-life as they attempted to meet the ever-changing demands of their users. To add to their problems, the device dependent nature of these traditional systems forced programmers into a perpetual cycle of time consuming education. This type of environment demoralizes even the best of programmers. Typically, results were below expectation while costs were above expectation. Success was always just over the next hill...

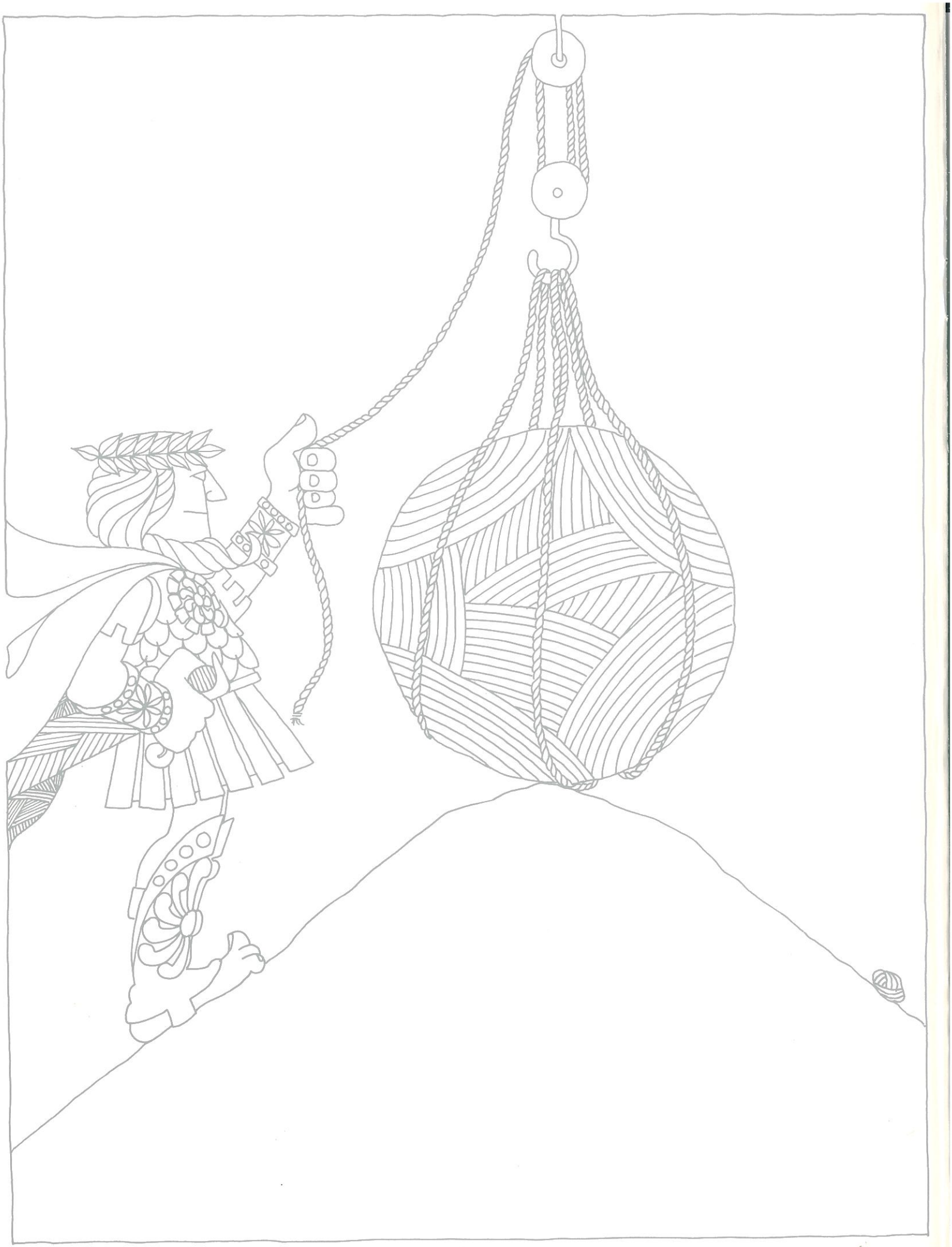
The Environ/1 Solution

ENVIRON/1 is the solution for your on-line data communications development. ENVIRON/1 provides far more than a mere terminal monitor and task manager. It is designed to conserve and efficiently utilize system resources while capitalizing on the ease and familiarity of batch programming. This concept reduces the costs of hardware and personnel normally associated with the implementation of an on-line system.

ENVIRON/1 is fully integrated with the TOTAL data base management system. Concurrent update, checkpoint, logging, and recovery are AUTOMATICALLY handled by the ENVIRON/1 control program.

ENVIRON/1 is designed for IBM hardware, but is completely independent of the IBM operating systems. One of the benefits of this independence is that your programs need not be recompiled if you convert from DOS to OS. ENVIRON/1 also offers complete terminal independence which lets you use the terminal devices that best meet your needs.

ENVIRON/1 offers ease of installation, ease of programming, and ease of operation. These capabilities, coupled with a modular and evolutionary growth path, provide an unparalleled on-line data communications system.



Environ/1 is easy to install...

ENVIRON/1 installation support is thorough and professional. A CINCOM Technical Representative comes to your location and works with you to quickly get the system operating. Education, also on-site, is provided in the areas of system configuration, application design, and programming considerations. Your existing COBOL programmers can usually code on-line programs in less than a day. Program testing can take place even before your terminals arrive. Typically, you can have an application program running the same day ENVIRON/1 is installed.

easy to program...

Traditionally, the transition from batch programming to on-line programming has been difficult, involving extensive retraining of existing personnel or the hiring of experienced individuals from outside your organization.

What is so difficult about On-Line programming?

The mode of operation is different. For example, in a batch environment, a programmer communicates through the use of a card reader with no concern for the location or type of device being used because the operating system handles that chore. However, in the on-line environment, there are multiple input devices (i.e. the terminals) and an on-line programmer is confronted with the problem of maintaining many conversations with many devices. ENVIRON/1 maintains multiple conversations AUTOMATICALLY!

In a multi-tasking environment, multiple programs are executed concurrently. Programs are overlaid as application code is requested, resulting in the loss of data unless specifically saved by a programmer in the application code. ENVIRON/1 saves data required for subsequent processing AUTOMATICALLY!

To attain optimum efficiency in a multi-tasking environment, application code must be re-entrant, a technique unfamiliar to batch programmers. ENVIRON/1's COBOL-XT compiler generates re-entrant code AUTOMATICALLY!

Requests to the data communications monitor for execution of required functions normally involve complex macros or call statements. ENVIRON/1's COBOL-XT PERFORM verb allows communication using standard ANS conventions.

What else does Environ/1 do to ease your On-line programming effort?

Input and output devices, including disk data sets, are opened and closed by ENVIRON/1.

File Descriptions (FD's) are not required and neither are SELECT statements.

The ENVIRON/1 COBOL-XT compiler not only generates re-entrant code, but also breaks the code into pages. The ENVIRON/1 control program utilizes a software paging technique on all programs compiled under COBOL-XT, providing virtual-machine core optimization to users of non-virtual operating systems (DOS/OS) and another level of optimization to users of virtual operating systems.

What does it all mean?

It means that ENVIRON/1 has significantly reduced the difficulty of on-line programming. No longer is it necessary for your staff to go through the trauma of massive re-education. With ENVIRON/1, your current batch programmers also become productive on-line programmers in a matter of hours.

Let Environ/1 carry the burden of On-line technology...not your programmers!

Let's look at an example of how ENVIRON/1 brings batch programming familiarity to the world of on-line...

Batch...

```
IDENTIFICATION DIVISION.
PROGRAM-ID.  EXAMPLE.
REMARKS. BATCH COBOL PROGRAM TO ACCEPT CARD INPUT
         PROCESS A DATA FILE AND WRITE TO A PRINTER.
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT CARD-FILE ASSIGN TO WR-1442R-S-INFILE
    RESERVE 3 ALTERNATE AREAS.
    SELECT PRINT-FILE ASSIGN TO WR-1403-S-PROUT
    RESERVE NO ALTERNATE AREAS.
DATA-DIVISION.
FILE SECTION.
FD  IS-FILE
    BLOCK CONTAINS 5 RECORDS
    RECORDING MODE IS F
    LABEL RECORDS ARE STANDARD
    DATA RECORD IS DISK.
01  DISK.
    03   KEY-FIELD          PIC X(6).
    03   DATA-FIELD-1       PIC 9(10).
FD  CARD-FILE
    RECORDING MODE IS F
    LABEL RECORDS ARE OMITTED
    DATA RECORD IS CARDS.
01  CARDS.
    03   INPUT-KEY          PIC X(6).
    03   INPUT-FIELD-1      PIC 9(10).
FD  PRINT-FILE
    RECORDING MODE IS F
    LABEL RECORDS ARE OMITTED
    DATA RECORD IS PRINTS.
01  PRINTS.
    03   OUTPUT-KEY         PIC X(6).
    03   FILLER             PIC XX.
    03   OUTPUT-FIELD-1     PIC ZZZZZZZZ99.
PROCEDURE DIVISION.
    OPEN INPUT CARD-FILE.
    OPEN OUTPUT PRINT-FILE.
    OPEN I-O IS-FILE.
READ-INPUT.
    READ CARD-FILE AT END GO TO END-JOB.
    MOVE INPUT-KEY TO KEY-FIELD.
    MOVE INPUT-FIELD-1 TO DATA-FIELD-1.
WRITE-RECORD.
    WRITE DISK
          INVALID KEY GO TO ERR.
    MOVE SPACES TO PRINTS.
    MOVE KEY-FIELD TO OUTPUT-KEY.
    MOVE DATA-FIELD-1 TO OUTPUT-FIELD-1.
WRITE-OUTPUT.
    WRITE PRINTS.
    GO TO READ-INPUT.
END-JOB.
    STOP RUN.
```

to On-line...

with ease

```
IDENTIFICATION DIVISION.
PROGRAM-ID.  EXAMPLE.
REMARKS. ON-LINE COBOL-XT PROGRAM TO ACCEPT TERMINAL
         INPUT (3270), PROCESS DATA FILE AND WRITE
         TO THE TERMINAL.
ENVIRONMENT DIVISION.
FILE-CONTROL.
DATA-DIVISION.
01   DISK.
     03   KEY-FIELD            PIC X(6).
     03   DATA-FIELD-1         PIC 9(10).
01   CARDS.
     03   INPUT-KEY            PIC X(6).
     03   INPUT-FIELD-1        PIC 9(10).
01   PRINTS.
     03   OUTPUT-KEY           PIC X(6).
     03   FILLER               PIC XX.
     03   OUTPUT-FIELD-1       PIC ZZZZZZZZ99.
PROCEDURE DIVISION.
READ-INPUT.
     PERFORM READ3270.
     IF AT END GO TO END-JOB.
     MOVE INPUT-KEY TO KEY-FIELD.
     MOVE INPUT-FIELD-1 TO DATA-FIELD-1.
WRITE-RECORD.
     PERFORM WRITDISK.
     IF STATUS = INVALID GO TO ERR.
     MOVE SPACES TO PRINTS.
     MOVE KEY-FIELD TO OUTPUT-KEY.
     MOVE DATA-FIELD-1 TO OUTPUT-FIELD-1.
WRITE-OUTPUT.
     PERFORM WRIT3270.
     GO TO READ-INPUT.
END-JOB.
```

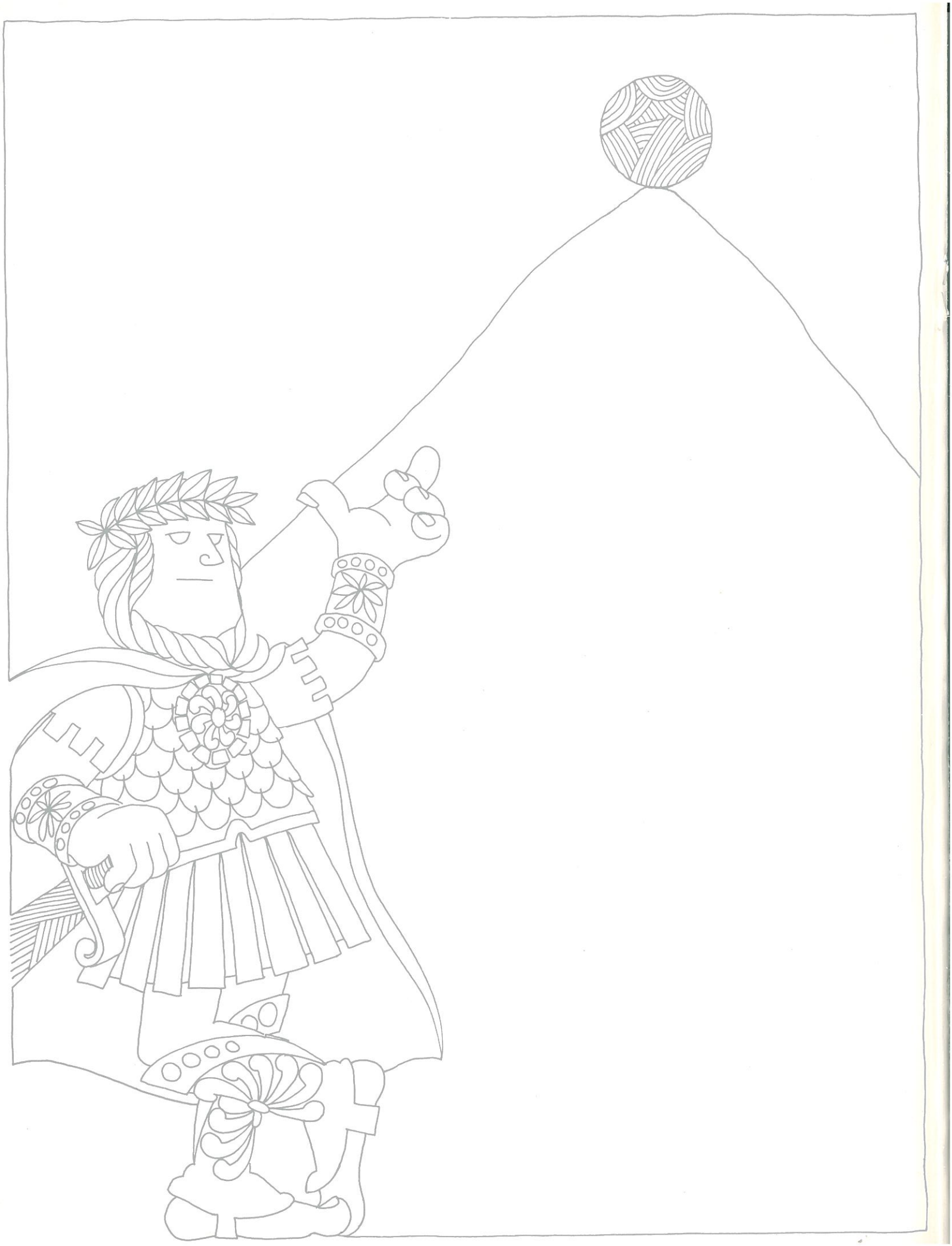
No select statements required. File names defined within ENVIRON/1 control program.

No file descriptions required. Descriptions are provided by the ENVIRON/1 control program.

Terminals and files are opened dynamically by ENVIRON/1.

No macros, no calls required. Standard ANS COBOL 'PERFORM' used for communication to input/output devices.

ENVIRON/1 maintains the conversations with the correct terminal automatically.



...and Easy To Operate and Maintain

ENVIRON/1 brings unparalleled simplicity to the operation and maintenance of what has become regarded as a complex operating environment.

The characteristics of the ENVIRON/1 control program can be modified at execution time by the use of option CONTROL cards. For instance, parameters such as the logging options and polling interval can be changed.

Application programs can be added to the ENVIRON/1 library without any modification to the control program and there are *NO* tables to be updated.

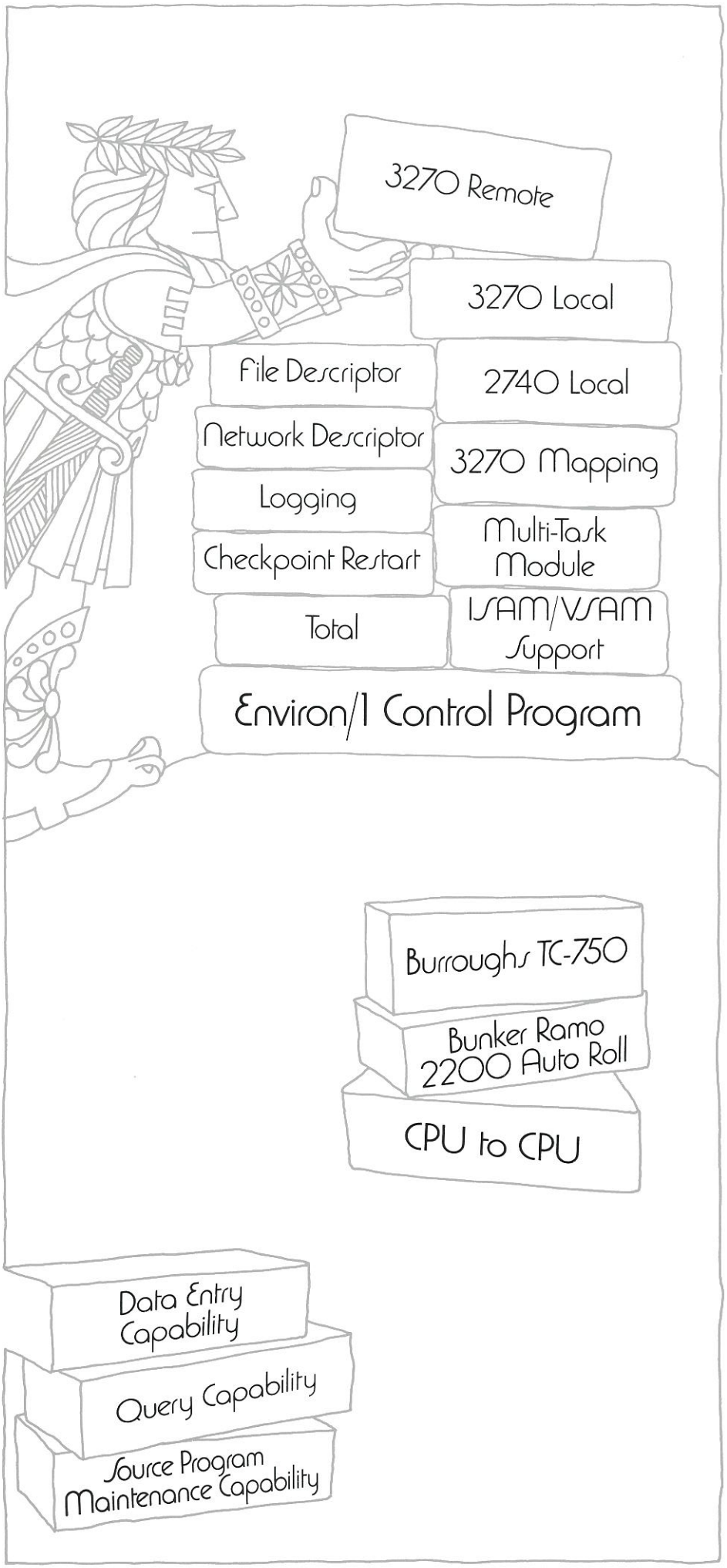
Communication to the system operator is kept to a minimum. Only information that requires operator action is transmitted. The comprehensive error recovery within ENVIRON/1 limits such intervention.

System checkpoints take place at user specified time intervals. In the event of system failure, recovery of the TOTAL Data Base can be invoked with a single option card (RESTART=YES).

System performance statistics are available using the ENVIRON/1 analysis utility. The effect of changes to the on-line system configuration and subsequent effect on performance can be predicted using ENVIRON/1's simulation utility, the "red line" driver.

High speed virtual access methods are provided with ENVIRON/1. Byte-string and queue/chain file modules offer the ultimate in optimized on-line file structures.

An ENVIRON/1 on-line system requires the lowest possible level of software support...

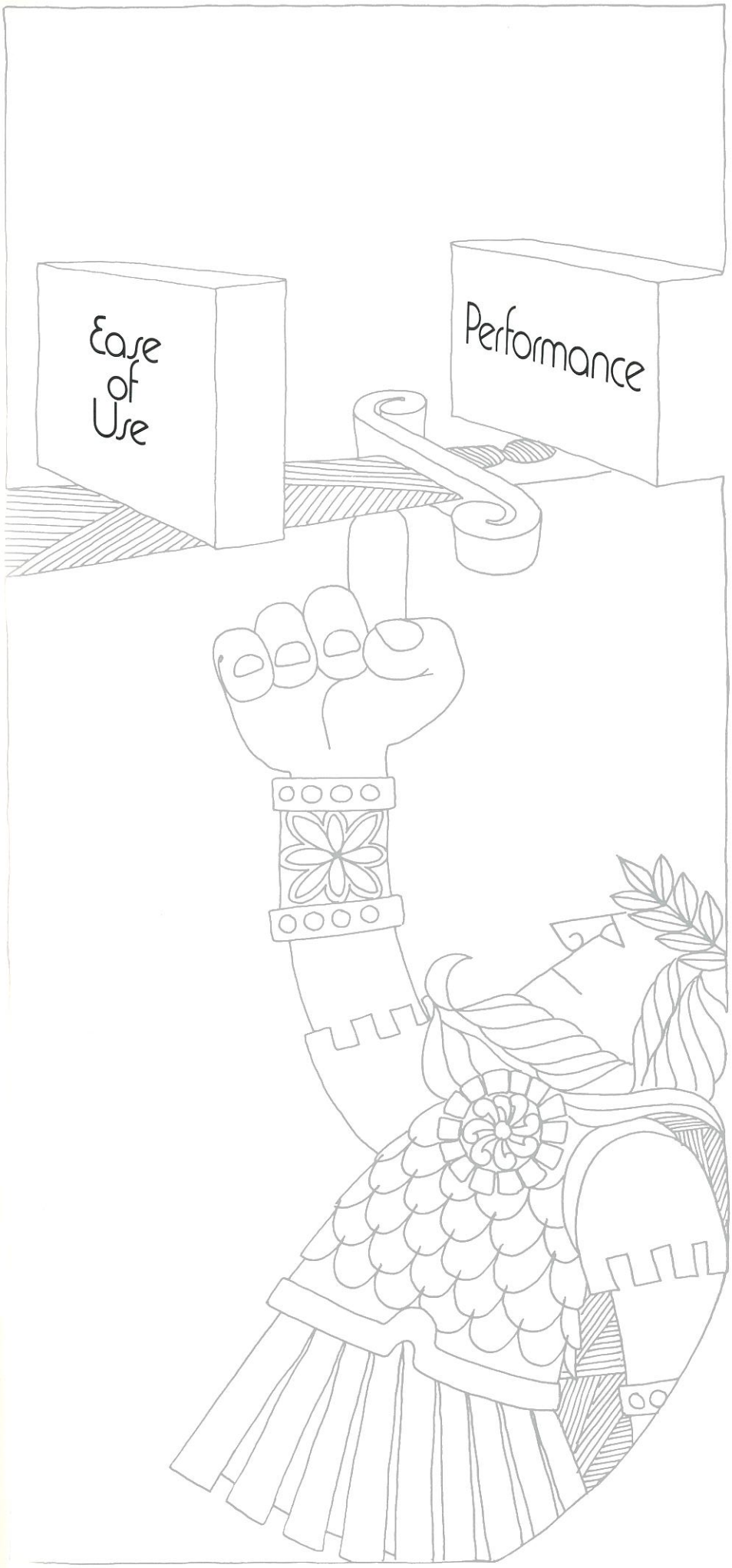


But, what about growth?

ENVIRON/1 is MODULAR in concept and design offering an evolutionary growth capability. Your on-line system can easily evolve from a simple, low volume system using a few terminals into a highly sophisticated, high volume system with scores of terminals. This evolution is controlled by you as you select the appropriate modules to fit your needs. The components of an ENVIRON/1 system can be visualized as a series of building-blocks which are put together to satisfy your specific requirements and which you can modify or extend as your requirements change.

These device support modules are but a few of the more than twenty different modules available to tailor your system. If the device you desire is not in our library of modules, we can develop it for you.

And modules like these will be available to add further capabilities to your ENVIRON/1 on-line data communications system as it grows in sophistication.



And what about performance?

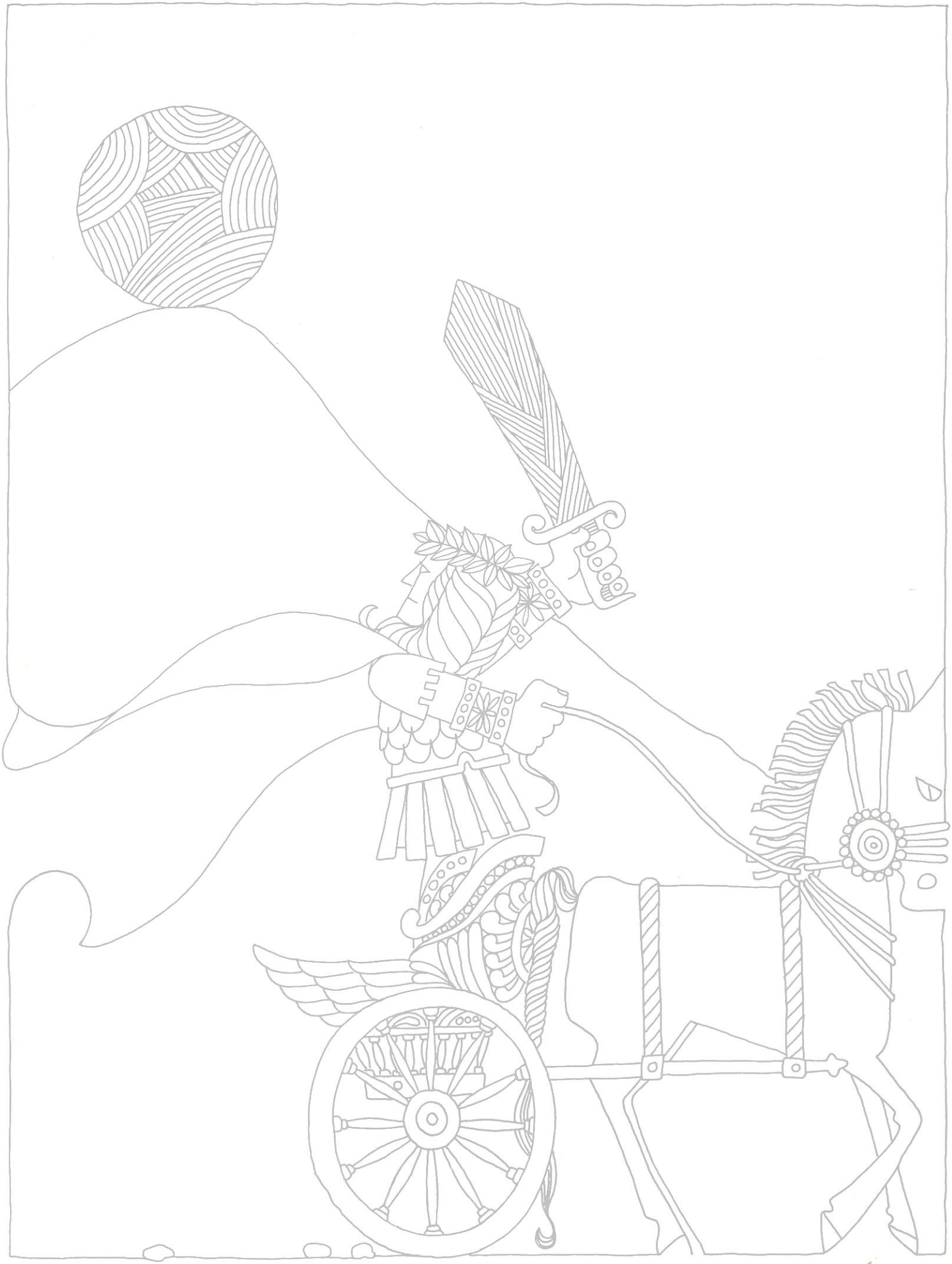
ENVIRON/1's ease of installation, definition, generation, programming, operation, and growth herald a new concept in on-line system development. All to often, the concept of "ease" is accompanied by a trade-off in performance. ENVIRON/1, however, uniquely balances ease of use with a high degree of performance. For an on-line data communications system, performance demands that programs not only reside in memory, but that they can be shared by multiple tasks. This makes efficient core residency and full re-entrancy prerequisites for optimum performance.

Residency

Mainline application code is kept core resident through ENVIRON/1's "longest-continuous-disuse" algorithm, a paging optimization method. This paging mechanism operates independent of the operating system, giving non-virtual machines virtual capability, and virtual machines further optimization.

Re-entrancy

ENVIRON/1, with its COBOL-XT compiler, AUTOMATICALLY provides re-entrant application code. An additional dimension to re-entrancy is that code can be shared across program boundaries giving your programmers the ability to write programs using tested, working routines, which already exist in other application programs. As a result, redundancy is eliminated and operating efficiency is increased.



Environ/1 review

ENVIRON/1 can be configured to meet all on-line processing needs. A modular design philosophy permits evolutionary growth. A powerful, yet low cost system can be installed initially and, as the requirements and capabilities expand, additional components can be added with minimal effect on the existing configuration.

ENVIRON/1 provides:

Optimum Performance and Efficiency
- self-optimizing core management
- fully re-entrant application code
- conversational programming
- multi-threaded operation
- priority task dispatching

Maximum Flexibility
- operating system independence
- device independence

Comprehensive Integrity and Security
- error recovery
- concurrent update protection
- logging
- dynamic task sign-on
- controlled initialization and shutdown

Programming Ease
- debugging aids
- off-line program testing
- COBOL-XT

Performance Analysis
- simulation capabilities
- statistical analysis utilities

And...ENVIRON/1 is fully integrated with TOTAL

Technical data

Technical Data:

Hardware: IBM 360/370

Operating System: DOS, OS-MFT, OS-MVT, and all IBM virtual operating systems.

Storage Device Types: 2311, 2314, 3330, 3340, 3350

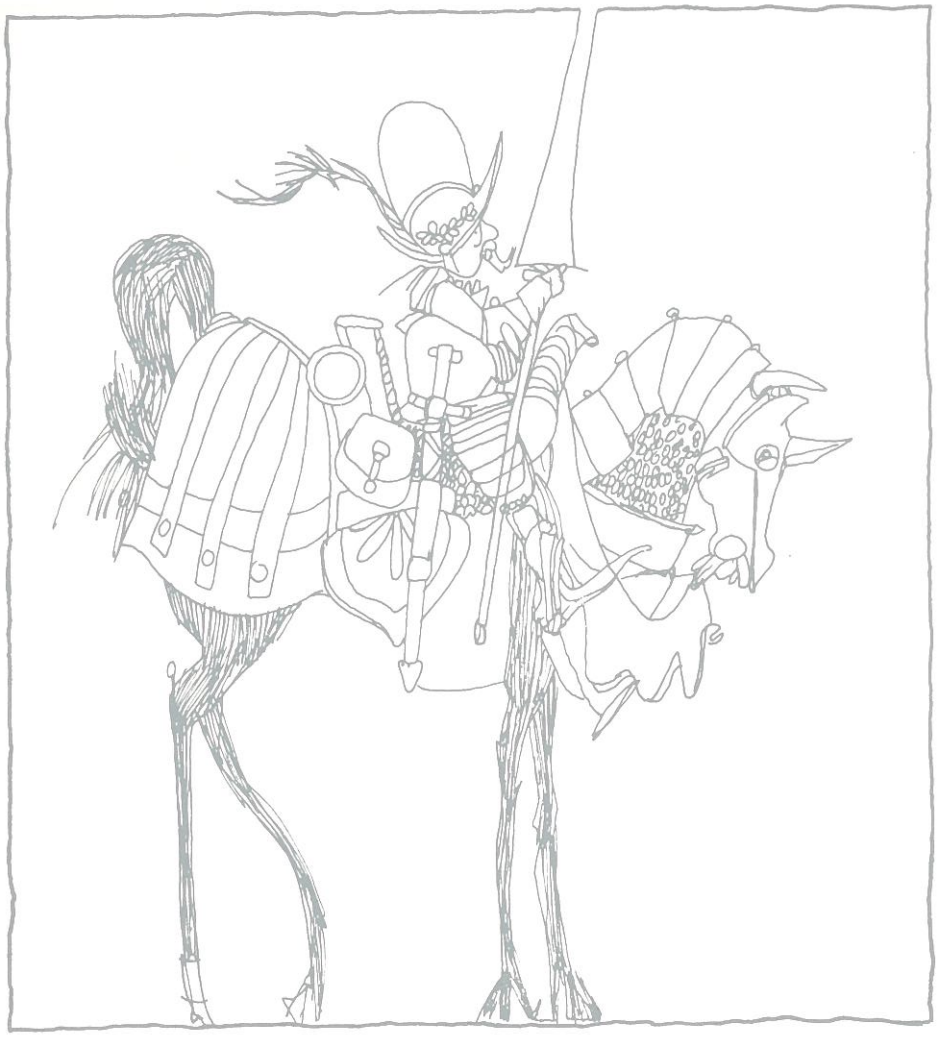
Terminal Types: All BTAM and VTAM supported devices

Access Methods: TOTAL DBMS, DAM, BDAM, ISAM, and VSAM

Core Requirements: Minimum partition size of 64K. Requirements will vary according to your system configuration, the access method you use, blocking factors, etc.

As system expansion occurs, enhanced capabilities can be incorporated:
- checkpoint/restart
- multi-tasking
- ENVIRON/1 queue/chain files

And specifically for the 3270 user:
- comprehensive mapping
- dynamic printer queuing
- message switching
- security control
- screen paging

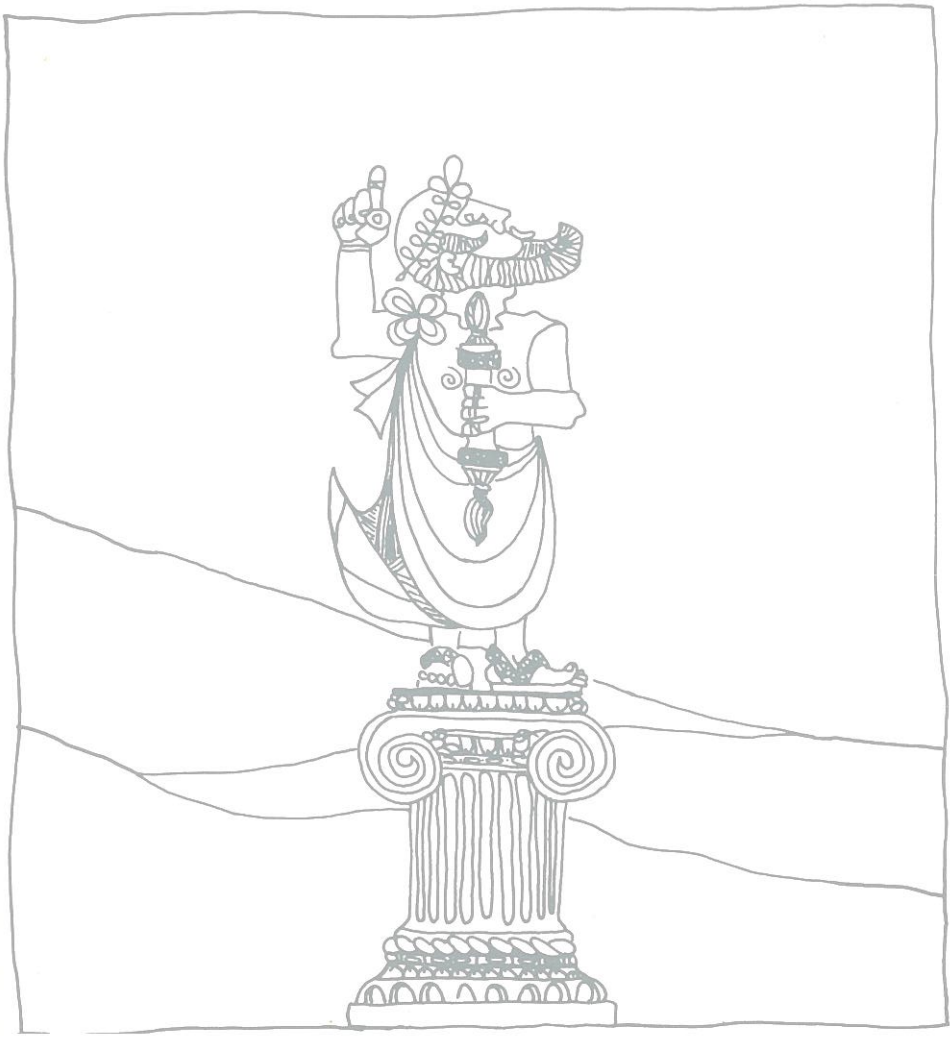


Other members in the Cincom Family of Products

Total

Don Quixote... the "impossible dreamer" is Cincom's symbolic figure for the TOTAL data base management system. He was chosen because our clients have been so successful in realizing their previously impossible dreams of successful information systems.

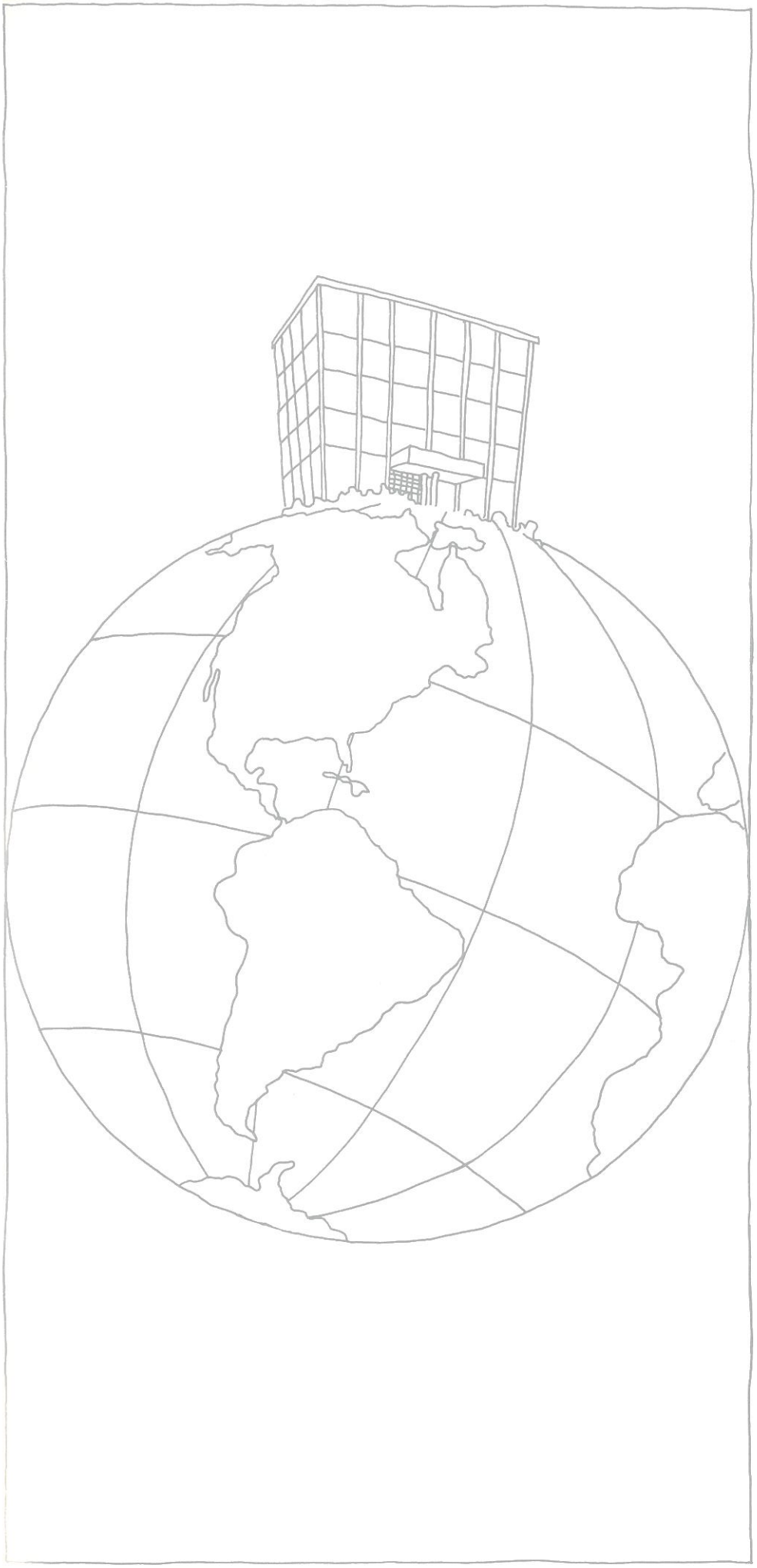
TOTAL is the most widely used data base management system in the world. In fact, there are more TOTAL users than all other data base users combined.



Socrates

SOCRATES... the Greek philosopher, is the symbolic figure and name of Cincom's information retrieval system. He was chosen because of his philosophy of asking questions to gain information.

No mere report writer can compare with the power and capability of SOCRATES in a data base environment. It is remarkably easy to use yet sophisticated in scope and flexibility. SOCRATES brings the same leverage to your information extraction and reporting that TOTAL gives to the management of your data.



Cincom Systems We create efficiency around the world

CINCOM SYSTEMS, Inc. is a company dedicated to your success in data base/data communications. CINCOM is international in scope, presently serving five of the seven continents... and we are expanding throughout the world.

We have offices in most of the major cities in the United States and Canada. In Europe, our offices are located in the United Kingdom, Belgium, France, Germany, Italy, Switzerland, and Scandanavia. Cincom serves South America and Central America and there are also offices in Japan and Australia.

Our clientel is made up of organizations involved in almost every type of business endeavor. Leaders in manufacturing, insurance, banking, aerospace, education, data processing, automotives, services, government... In fact, leaders in every field are successfully using CINCOM products and services.

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