

iTPS Transaction Processing Systems Terminal Application Processing System (iTAPS)

- Complete on-line transaction processing monitor
- Easy-to-use, interactive screen building utilities
- Flexible, on-line transaction development facilities
- Reduced user coding with standardized functions and processing modules
- Variable indexed sequential database structure
- Powerful interactive query language with Boolean logic capability
- Multilevel user-defined security
- Real-time report writer
- Menu-prompting

FUNCTIONAL DESCRIPTION

Intel's Terminal Application Processing System (iTAPS) is the on-line transaction processing software package customized for Intel's Transaction Processing System (iTPS). iTAPS consists of an interactive application development facility and a reliable high-performance run-time transaction processing monitor. In addition to providing ready-to-use software for building data files and maintaining data relationships and structures, iTAPS interfaces with user-specific processing modules written in COBOL or Pascal, iTAPS also supports a powerful query language that provides direct, easy and fast access to data contained in user database files.

FEATURES AND BENEFITS

Application development

As a complete transaction processing application development tool, iTAPS frees programmers from the coding complexities normally associated with development environments that include database management, telecommunications and multiprogramming-multiuser on-line systems. iTAPS enables programmers to write complex transaction processing applications with simple commands and easy-to-use interactive utilities. iTAPS is primarily intended for application programmers and requires minimal systems programmer involvement.

iTAPS furnishes an on-line facility to define screen formats, including the variables to be processed and their video characteristics. iTAPS simply requests the programmer to "paint" the screen as it should appear to the system user, and fields are then defined interactively by filling in a form on the screen.

iTAPS also provides a number of standard modules used repetitively in any transaction processing application. These modules greatly simplify the development and maintenance tasks by automating such functions as:

- Initialization
- Addition of a record to the database
- Modification of a record in the database
- Deletion of a record from the database

- Index structure update
- Data validation
- Uniqueness checking
- Dynamic specification of display format
- File writing
- Database searching
- Sorting

In addition to the standard iTAPS modules, the programmer may write user-specific COBOL or Pascal programs to address specific application processing requirements. These programs combined with the iTAPS standard modules make up an application transaction. The COBOL or Pascal program calls upon iTAPS to provide all database and terminal I/O functions. The program can also access non-iTAPS files using standard I/O programming.

All these features add up to increased system and programmer productivity. Programmers can spend more time designing and implementing their applications and less time worrying about multiuser on-line systems requirements. As a result, applications come on-line faster. Furthermore, the consistent organization of iTAPS application systems minimizes maintenance and enhancement problems.

iTAPS produces extensive application documentation. Even if the program's author has departed, very little time will be lost reconstructing or enhancing the application. This means that iTAPS reduces the cost of application software both in the development phase and in the maintenance phase.

Run-time transaction processing

At run-time, iTAPS provides a complete multiuser on-line transaction processing environment with five levels of predefined security checks: sign-on, application system selection, data add/delete, field read/write, and field index. Two menu levels to select the application system and the desired transaction are provided.

When iTAPS receives a request from a terminal to initiate execution of a particular transaction, it allocates the resources between that terminal and

the specified transaction, and manages all the disk input/output. Because Intel's Transaction Processing System has been optimized for transaction processing, the system overhead is kept at a minimum. Superior performance results as measured in terms of both throughput and response time.

iTAPS provides first level data validation. Errors are detected as they occur and before the more complex application processing takes place. Thus iTAPS significantly assists not only in validation and immediate correction of the input data, but also in realizing a more efficiently performing system by reducing unnecessary processing.

iTAPS supports a powerful query facility based on predefined commands and on the use of English words to describe each data element. Compound Boolean inquiries can be formulated using aliases, data values and logical operators. The response to an inquiry can be displayed at the terminal or printed on the system printer.

System Organization

iTAPS is composed of five modules:

- The Executive
- The Communication Manager
- The Application Manager
- The Data Manager
- The iTAPS terminal

As shown, these modules interact with the operating system, the user's software, the terminal, and the database. This segmentation enables programmers to develop each module as an independent entity and to modify it without having to alter the entire application. Each module is designed to simplify application development, implementation and execution.

The iTAPS Executive

The Executive provides the interface with the iRMX 86 operating system and acts as the run-time transaction processing monitor. The Executive controls sign-on and menu displays, performs security-checking, and maintains a log which posts the appropriate "before" and/or "after" image of any data file change. Based on this log, the Executive provides defined recovery capabilities:

- At the network level: Following a terminal or communication line failure, the last transaction is retrieved from storage and retransmitted to the terminal upon entry of a command by the operator.
- At the file level: Following a system failure the recovery log is read to update the file and back-out the incomplete transactions. Full recovery is also provided by the recovery log in conjunction with the last back-up.

In addition, the Executive provides statistical services to evaluate system use and performance, auditing facilities

to isolate illegal transmissions, and documentation facilities to record the application and data structures.

The iTAPS Communication Manager

The Communication Manager controls the communications network. It collects data that has been transmitted from a terminal, sends messages back to the terminals, and maintains the network buffers. Supporting both block and TAPS modes, the Communication Manager is designed to optimize line transmission.

The Communication Manager is completely transparent to the application programmer as well as to the user.

The iTAPS Application Manager

The Application Manager controls the application processing sequence of each terminal within the network. Upon receipt of a request from the Communication Manager, the Application Manager determines the transaction type, schedules the

appropriate processing modules, transfers data, and generally manages the logic of the application.

The iTAPS Data Manager

The Data Manager interfaces iTAPS with the database. It performs the additions, changes, deletions and extractions requested by the Application Manager. It can be executed from a user module during the processing of a transaction or when the query language is used.

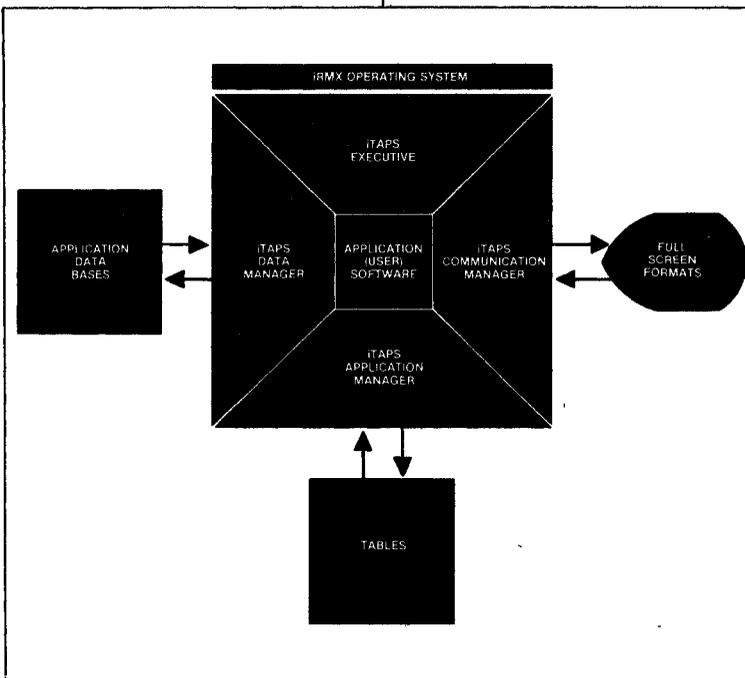
The Data Manager uses a valued, inverted structure called Variable Indexed Sequential Access Method (VISAM) to format the database. Each VISAM database is composed of a keyed access index file and a direct access primary file. The primary file contains the data records, and the index file contains all the pointers to the primary file records. Virtually all fields in the database can be accessed by keyed value. Both structured and unstructured (text) fields can be indexed.

The iTAPS terminal

When the TAPS mode feature is used in the iTAPS terminal, major iTAPS functions are handled at the terminal level. Screen-formatting, edit-checking, and data-validation are performed by the terminal. This frees the central processor from the burden of performing these tasks. iTAPS supports both block and TAPS modes in the intelligent terminals. The TAPS mode terminal feature enables the operator to correct an error while the source document is readily available.

Summary

iTAPS has been specifically designed to satisfy the requirements of transaction processing. It is a complete software system with an efficient architecture, a simplified programming style, and a wide array of features designed to optimize both applications development and on-line transaction processing. When Intel's iTPS is enhanced with iTAPS, the result is application development productivity and a complete user friendly secure run-time system.



iTPS Transaction Processing Systems Communications

- Extensive array of remote communication connection options
- Emulation of IBM 2780/3780 RJE station
- Emulation of IBM 3270 BISYNC cluster controller
 - Intel Transaction Processing System (iTPS) looks like IBM 3271 control unit with up to 32 devices attached
 - iTPS terminals look like IBM 3277 terminals
 - iTPS printers look like IBM 3284 printers
- Emulation of IBM 3270 SDLC/SNA cluster controller
 - iTPS looks like IBM 3274 control unit with up to 16 devices attached
 - iTPS terminals look like IBM 3278 model 2 terminals
 - iTPS printers look like the IBM 3287 printer
- Communication speeds up to 19,200 bits per second (bps)
- Leased or switched communication lines

FUNCTIONAL DESCRIPTION

A variety of host communications options are available on the iTPS family of systems. Emulation of an IBM 2780 or 3780 Remote Job Entry station provides an easy and commonly recognized method of file transfer and host communication. Emulation of an IBM 3271 control unit and its attached devices using binary synchronous (BISYNC) protocol is provided for interactive communication requirements. For IBM System Network Architecture (SNA) users, emulation of IBM 3274 or 3276 control unit and its attached devices using synchronous data link control (SDLC) protocol provides interactive SNA communications. Thus, both batch and interactive communication requirements are satisfied.

FEATURES AND BENEFITS IBM 2780/3780 emulator

The IBM 2780 and 3780 data communications terminals were designed to allow the transmission and reception of large volumes of data at communications line speed. The devices consist of an 80 column card reader, a printer and an optional 80 column card

punch. The iTPS 2780 and 3780 emulators perform the same functions, using card images from disk files for transfer to the host and accepting print or punch records from the host for transfer to iTPS files or spooling to the printer.

The following IBM 2780/3780 features are supported by the emulators:

- Full data link control
- Full time-out control
- Cyclic redundancy checking
- Printer carriage control decoding
- Component selection
- Horizontal format control
- EBCDIC transparency
- Processor interrupt
- Space compression/expansion (3780 mode only)
- Multiple record transmission (2780 only)
- Leased communications lines

The emulators provide automatic or operator selectable ASCII/EBCDIC code translation. Operator selectable device modes are: 2780, 3780, 2770, 3741 or CPU. CPU mode is useful in computer-to-computer communications where record padding and truncation are not

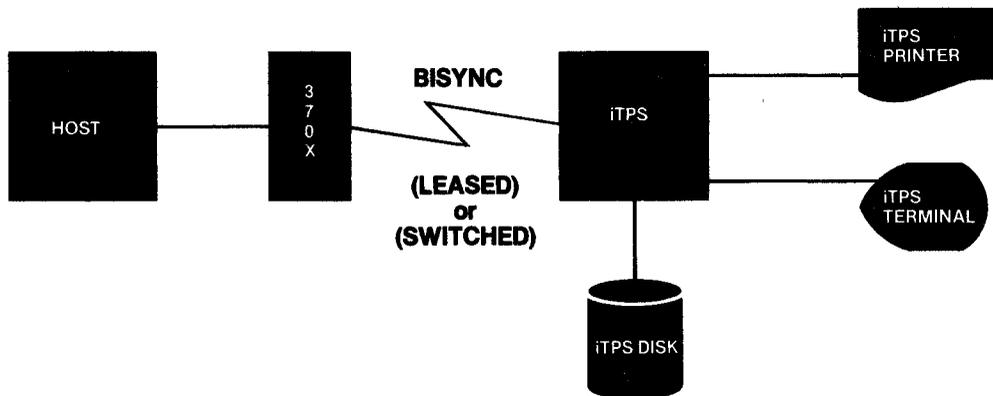
desired. The CPU mode allows one iTPS to communicate with other iTPS systems. The console operation can be optionally assigned to the disk file, minimizing operator interaction.

The emulators may be operated at data rates up to 19,200 bps using:

- Point-to-point (leased or switched) lines with synchronous modems, or
- Hard-wired connection with short-haul synchronous modems, or
- Hard-wired connections with a synchronous modem eliminator.

Interface to the modem or modem eliminator is via an 11 conductor cable equipped with DB-type connectors on both ends. The emulators communicate in half-duplex mode and require only half-duplex communications facilities.

The emulators can communicate with a host system which supports an IBM 2780 or 3780 and has a compatible modem. Typical hosts include IBM 360, IBM 370, IBM 30XX, 430X, System 34, Series 1 and Office System 6 systems.



IBM 2780/3780 Emulation

IBM 3270 BISYNC emulator

This offering provides emulation of an IBM 3271 model 2 BISYNC cluster controller. iTPS terminals and printers emulate IBM 3277 model 2 terminals and IBM 3284 printers, respectively. Thus, the iTPS system appears as a "real" 3271 cluster operating on a BISYNC line with up to 32 devices attached. The iTPS can offer a wide range of capabilities to end-users, like execution of transactions under CICS, software development activities under TSO, or execution of other applications developed on a host system which interacts with 3270 devices.

Functions of the 3270 such as screen-formatting, polling responses, data link control, time-out control and cyclic redundancy checking are all supported. The emulator may be configured to

define any terminal keyboard character as any 3270 keyboard character. It is possible, then, to define 3270 keys not present on the actual keyboard. An ideal use of this capability is for definition of the 3270 keys ENTER, PRINT, RESET, TAB BACK, TAB, PFn and PAn.

A hard copy of the information currently displayed on the screen may be obtained by pressing the local print key. This image will be directed to a spool file, if so desired.

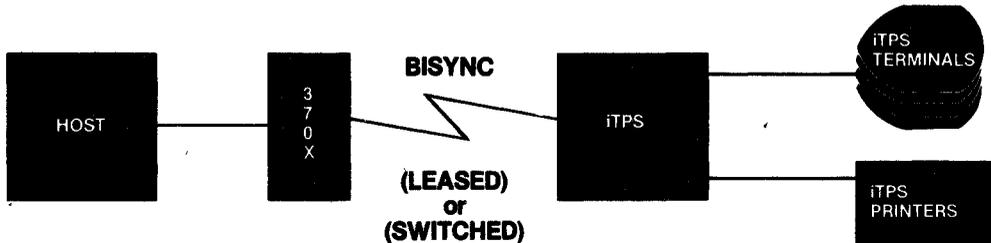
The 3270 BISYNC emulator communicates with the host in half-duplex mode on point-to-point lines. A synchronous modem is used at speeds of 1200 bps to 19,200 bps. The connection to the host may also be hard-wired using inexpensive short-haul

synchronous modems. The iTPS may be multidropped along with other 3270 clusters.

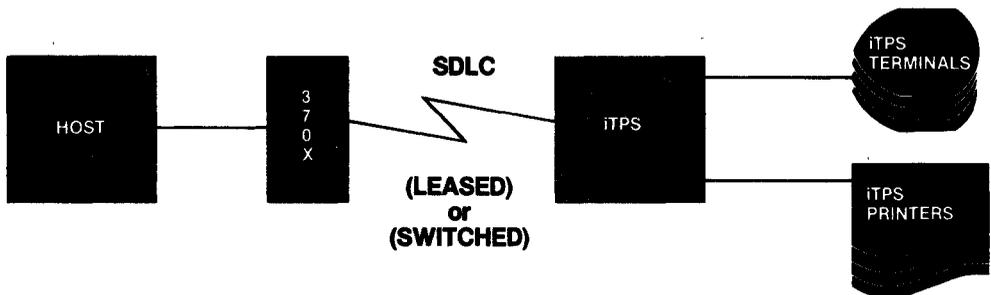
IBM 3270 SDLC/SNA emulator

Emulation of an IBM 3274 lc and 51c or SDLC/SNA cluster controller is also available. iTPS terminals emulate IBM 3278 model 2 terminals. iTPS printers emulate the IBM 3287 model 2 printer. Thus, the iTPS system appears as a "real" 3274 cluster operating on an SDLC line with up to 16 devices attached. The iTPS appears as a type 2 logical unit (LU-2) as defined in IBM's System Network Architecture for support of display devices and a type 1 and a type 3 logical unit (LU-3) for support of printer devices.

iTPS 3270 SDLC provides for all field display attributes except for the



IBM 3270 BISYNC Emulation



IBM 3270 SDLC/SNA Emulation

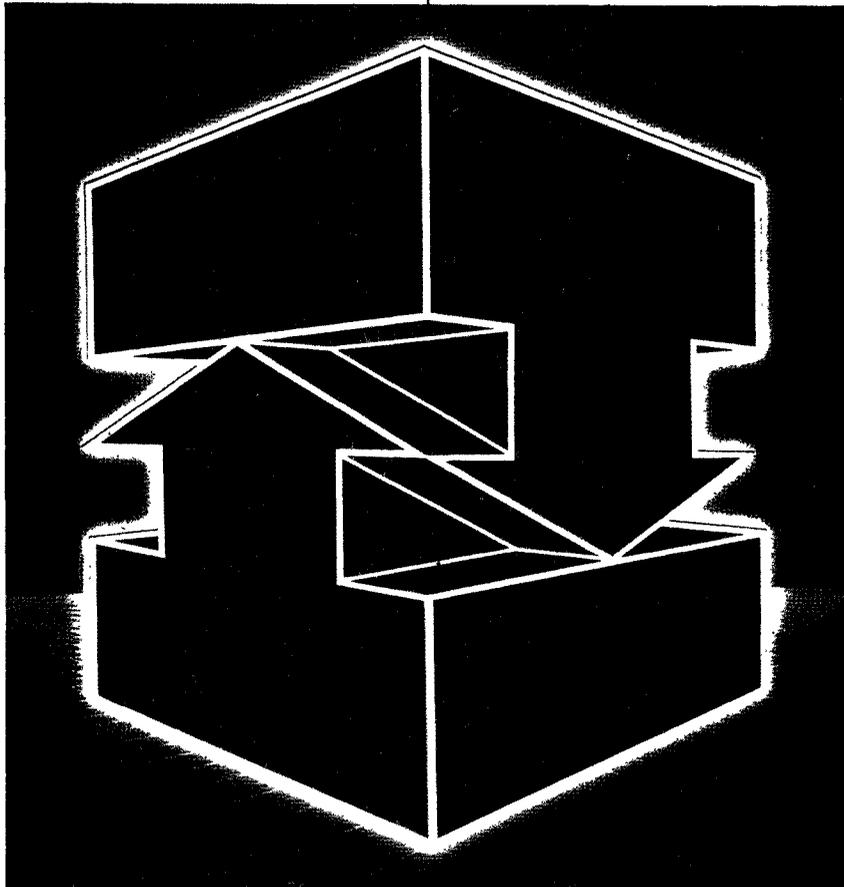
extended attributes for color, extended highlighting or programmed symbols. The 25th line on the iTPS terminals is used to display symbols for INSERT MODE, INPUT INHIBITED, SYSTEM READ, JOB ACTIVE, SYSTEM ACTIVE and CHECK. All keys supported by iTPS are supported by iTPS 3270 SDLC/SNA. In addition, attention, cursor select, delete and insert keys may be defined. The system request key, if defined, may be used to access an SSCP-LU session from a LU-LU session, as with the real 3270.

A hard copy of the information currently displayed on the screen can be obtained by pressing the local print key. The image will be directed to a spool file, if so desired.

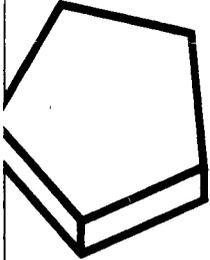
Transmission speeds from 1200 bps to 19,200 bps are supported. The iTPS can be multidropped along with other SDLC/SNA devices.

SYSTEM 2000[®]
Database
Management
System
Sperry (Univac)
1100 Series

- Fully integrated facilities
- Controlled sharing of corporate data
- Relational query
- Screens and transactions without programming
- Interactive report generator
- Application development tools
- Decision-assist microcomputer system
- Vendor service and support



SYSTEM TECHNICAL DESCRIPTION



Fully integrated facilities

IDD, the integrated Data Dictionary, controls all database-related information and processes. All access to SYSTEM 2000® is through the IDD, which acts as a control point for Data Processing. Operating at the core of Intel's SYSTEM 2000, IDD stores information on database structures and processes in a form that is compatible with the DBMS functions. Both end users and applications programmers rely on IDD functions for DBMS requests. IDD handles definition, control, and reporting functions. All updates are integrated through IDD, and user-defined procedure and other facilities operate through IDD, thus creating a central definition for all access to data. IDD security features protect the information resource from unauthorized access and usage. IDD enables Data Processing to retain greater control over the environment, provides greater systems reliability, and allows for reduced application development time.

Controlled sharing of corporate data

With SYSTEM 2000, the data administrator can maintain central control of database files. All access by end users can thus be controlled and scrutinized. System integrity and control features allow multiple levels of database recovery spanning database archiving, roll-forward, and update logs. In case of program or machine failure, data is recoverable. Concurrent access and update are allowed and protected without application support, thus saving application time.

IDD has been designed with inherent security features to protect the information resource from unauthorized access and usage. The key security feature is a password procedure which prevents unauthorized database creation or revision. The data administrator applies the password at database, record, and item levels to impose any combination of retrieval, update, or search restrictions for each item in a database. The data administrator also uses IDD to specify restart and recovery parameters for each physical database in the environment.

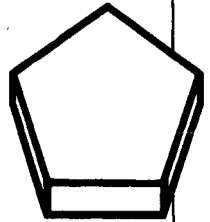
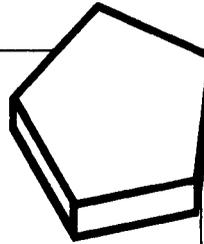
SYSTEM 2000 supports concurrent processing, including concurrent updating, in all environments. Users, databases, and resources are coordinated via the Concurrent Update facility. This coordination ensures the integrity of the database and makes the most efficient utilization of resources to support production processing.

Relational query

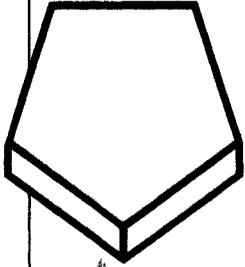
QUEST is an English-like query/update language, designed for the end user in support of ad hoc access to the database, as well as for the application developer in support of database testing and prototyping. Since this free-form, natural language is designed for ease of use and has powerful search, display and update capability, it is ideally suited for all database access needs.

For the end user, QUEST represents a powerful and user-friendly relational-like language to support on-line, ad hoc access to SYSTEM 2000. For the application programmer, QUEST is a convenient facility for trying out basic report and update procedures and as a debug tool for application program development. By giving the end user direct access to data, QUEST can ease application backlogs and substantially contribute to improving an organization's overall productivity.

QueX, Query/Update by Example, is a powerful aid for the end user environment. QueX extends the power of SYSTEM 2000 beyond QUEST, Report Writer, and PLEX by providing function-driven, screen-oriented query/update to the non-Data Processing user. QueX supports full networking and multiple database access and requires only one hour of training for non-DP end users.



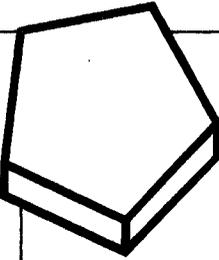
QueX provides a user with a fill-in-the-blank approach. QueX performs all concurrency control automatically and helps the user through each retrieval operation, continually displaying the current record. QueX also enables the user to perform data entry, deletion, and modification where so authorized. Once the appropriate databases have been created, QueX systems can be developed and in production in minutes. In short, QueX is the solution to immediate end user productivity.



Screens and transactions without programming

Screen Writer is an extension to QueX which allows screens to be defined and conditionally processed without any programming. Screen formats as well as the logic to process those screens are defined during an interactive session. Transaction-oriented systems can be developed in hours instead of months. Powerful security, editing, and validation features make Screen Writer an extremely effective tool for entering and updating data. Editing and validation rules can even be specified at the character level.

Both QueX and Screen Writer are available on a wide range of synchronous and asynchronous terminals.

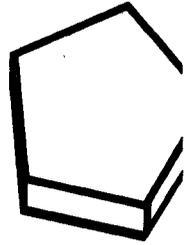


Interactive report generator

Report Writer is a facility which supplies end users and programmers with demand and batch reporting capabilities for both simple and complex requirements.

Report Writer can generate reports against all or selected portions of a database. Report Writer provides data editing, page formatting, calculations, summaries, and ordering of printed information in either demand or batch mode. By providing a quick and easy way to produce reports, Report Writer eases the burden on Data Processing, thereby reducing the application development costs.

Report Writer has a conversational option called Genius. Based on the user's response to a series of prompts, Genius generates distribution-quality reports in just minutes, without programming. Genius has the ability to store report specifications and generate the format at a later date. It not only provides the error detection and recovery capabilities needed for inexperienced users, it also makes the programmer's job easier by eliminating coding in report production. A graphics option allows the user to generate bar, pie, line and plot charts in a conversational manner.



Programmer language interfaces

SYSTEM 2000 addresses programmer needs by offering programmer productivity tools which assist in reducing application development time for applications which may require programming. These productivity tools work in concert to provide the benefits of data independence, on-line applications support, complete documentation of the environment, and reduced programmer time.

With PLEX, the Programming Language Extension to SYSTEM 2000, the application developer has powerful database search and manipulation capabilities at his disposal. Programmers can focus on specific application solutions, leaving SYSTEM 2000 to address the physical database environment. PLEX is ideally suited for production-oriented applications in demand and batch environments.

PLEX offers the application developer a choice of COBOL or FORTRAN programming languages to support database manipulation. PLEX commands are analyzed by a preprocessor that interacts directly with the IDD, thus ensuring system integrity.

PLEX commands are high level English-like verbs which eliminate the need to manipulate pointers or navigate data structures, improving programmer productivity and reducing program maintenance. Capabilities include:

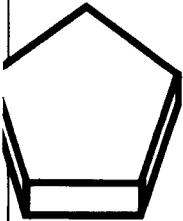
- **Dynamic Networking:** Using PLEX LINK, network relationships among data in one or more databases may be established.

- **Database Loading:** The high speed LOAD utility supports database creation and large volume additions.

- **Data Selection, Retrieval and Updating:** The WHERE clause controls data selection; LOCATE and GET verbs are for retrieval; MODIFY, REMOVE, and INSERT verbs are for updating.

- **Program Independence:** PLEX programs are independent of the physical structure of the databases which they access, a benefit which significantly improves programmer productivity over the traditional file environment.

Features such as Screen Writer, QueX, QUEST, and Genius can be used in most instances to build entire applications without any programming.



Decision-assist microcomputer system

iDIS™ 86/735 (the Intel Database Information System) is a fully integrated XENIX*-based microcomputer that allows decision-assist needs to be supported on corporate data resources. iDIS solves the problem of uncontrolled microcomputer proliferation by distributing the database where it is needed while enabling Data

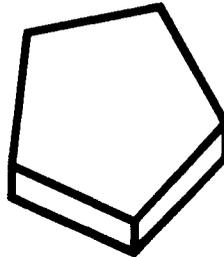
*Xenix is a Trademark of Microsoft Corporation

Processing to maintain control of the database. As a means of distributed processing, iDIS still observes centralized rules on database access, thereby preserving the investment in corporate data. SYSTEM 2000 and iDIS work in concert to extract data from SYSTEM 2000 down to the local iDIS databases, all operating under IDD control.

Many desirable features are inherent in the iDIS system:

- Local relational database operation
- Word processing and graphics capability
- User-friendly environment
- Compact desk-top integrated microsystem
- High-level language support

The hardware for iDIS is Intel's 86/735. iDIS communicates with mainframe via a configurable communications subsystem.



Complete service and support

Documentation: Intel provides comprehensive modular documentation, incorporating a user-friendly approach, to support its full line of DBMS products. At present, 25 different documentation manuals and pocket references are available for various systems audiences.

Education: To augment documentation, Intel offers nine complete, cost-effective training classes, including instructor-directed courses and workshops held publicly or at the customer's site. Video-based instruction is also available. The self-paced courses are designed to meet the varying knowledge requirements of the professional and non-technical end user.

Field Support: Whatever the level of support required, Intel responds. Intel's field offices are located throughout the U.S., Canada, and Europe. All software under a current license agreement is supported by the Intel Austin Customer Service Department and by the local sales office. Intel maintains a customer service group of highly trained, experienced information systems professionals who have the technical expertise to handle customer needs. A Customer Support Representative (CSR) is assigned to each customer to provide personalized service; the CSR can be reached via the 24-hour TOLL FREE Customer Service Hotline.

Innovation: Intel is committed to improving and enhancing its product family, thereby increasing customer productivity and extending their useful system life cycle.

Other Environments:

- IBM OS
- IBM DOS/VSE
- IBM VM/CMS
- CDC 6000, CYBER

PROGRAMMERS

**Additional
Features**

**Application
Development**

iDIS

**DEVELOPMENT
CENTER**

**Report
Writing**

**Relational
Query**

Graphics

**END
USERS**



SPECIFICATIONS

Hardware support

Sperry (Univac) 1100 Series

Operating systems

OS 1100

Communications

Demand or batch mode

Access methods

Sequential, indexed sequential

Main memory requirements

Minimum recommended-30K

Number of databases

230 maximum (concurrent access)

Size of data bank

1380 billion characters data (concurrent access)

Data model

Hierarchical

Semantic models

Relational, network, hierarchical

Number of on-line users

230 (concurrent access)

Data types

Character, text, date, integer, decimal, money

Functions

- Database definition
- Data dictionary
- Program development
- On-line query/update
- Batch query/update
- Report generator
- On-line data entry
- Multiple database access
- Item level security
- Recovery
- Reorganization utilities
- Concurrency control
- Multi-user/concurrent update
- Full Boolean logic