INTERCOMM

SDA Products, Inc.

SDA Products INTERCOMM
TP Monitor System

■ PROFILE

Function ● multithread TP monitor for IBM systems

Computers/Operating Systems Supported ● IBM System/370 (Model 135 and up), 3000, 4300, and compatible comuters; OS/VS1, OS/VS2 (SVS and MVS), VM/370

Networks & Protocols ● SNA; SDLC and all standard IBM protocols

Language Interfaces ● COBOL, FORTRAN, PL/1, and IBM Assembler

DBMS Interfaces ● available for IMS (DL/1), Cincom TOTAL, Software AG ADABAS, Cullinane IDMS, CCA Model 204, and Intel System 2000/80

TP & File Access Methods ● BTAM, TCAM, VTAM; BDAM, BSAM, QSAM, BISAM, QISAM, and all other standard IBM access methods except BPAM

Terminals ● most standard IBM asynchronous, synchronous, and SDLC devices plus all compatible devices

Special Features ● optional Front-End interface; Generalized Front-End Interface (GFE) Special Feature; Generalized DBMS Interface (GDB); Multiregion Support Facility (MRS); CICS Compatibility Feature (unsupported); AUTOGEN feature; Dynamic File Allocation (DFA) Special Feature

Security ● station, transaction, or station/transaction sign-on/sign-off security plus user-defined file access control via system-supplied command/control subsystem

Logging/Accounting ● internal system log (INTERLOG); System Accounting and Measurement (SAM) charge-back accounting facility available

Failure Recovery ● user-defined and system-controlled data checkpoint definition; recovery analysis uses log entries and accounting routines; system quiesces to checkpoint; thread continues when log is repositioned to failure point
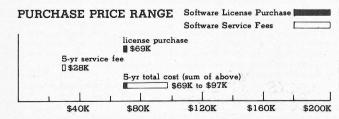
Current Version ● 8.0

Installations ● 250

Comparable Systems ● TSI International TASK/MASTER; Cincom ENVIRON/1

Vendor ● SDA Products, Inc; 475 Park Avenue South, New York, NY 10016 ● 212-481-6800

■ ANALYSIS

INTERCOMM is one of the oldest IBM-compatible communications monitors in the marketplace. It was introduced in 1968 by Programming Methods Inc (PMI) and was later acquired by Informatics. Its sister TP monitor package, MINICOMM, also became part of Informatic's repertoire of proprietary software. In 1979, both INTERCOMM and MINICOMM were sold to SDA Products, Inc, a subsidiary of Software Design Associates.

INTERCOMM is a highly technical, multifunctional telecommunications monitor with many table-driven, preprogrammed functions that minimize the amount of coding required from the applications programmer. For large OS/VS-class computer installations, only a few competitive systems can match the flexibility and richness of options available with INTERCOMM.

□ Strengths

INTERCOMM has a large repertoire of preprogrammed, automatically initiated facilities. It incorporates almost every communications operation one would expect of a sophisticated teleprocessing monitor. Users comment positively on its multithreading operations, its multiregion support capabilities, its ability to release program resources when no longer needed, and many other multiuser-support features. INTERCOMM has an exceptionally comprehensive recovery mechanism that supports recovery and restart under the most catastrophic failure conditions. INTERCOMM is unquestionably one of the best TP monitors on the market.

■ OVERVIEW

□ Terms & Support

Terms ● INTERCOMM is available on a purchase basis only; all operational facilities are included in the single, bundled price agreement; the license covers an entire facility, which may encompass multiple CPUs; multiple-copy discounts of 25% apply to additional licenses within the same company.

Support ● maintenance, installation support, and training for the first year are included in the cost of the license; maintenance for successive years costs approximately 10% of the then-current license fee; installation support can run from 3 days to 10 days if necessary; concepts and facilities and application development courses are conducted on-site after installation is completed; complete documentation is also included in the sale, and hot-line support is available for problem resolution.

□ Component Summary

INTERCOMM's facilities are configured by the user from a menu of selectable features provided by the vendor. The features are all included (bundled) under one system price to the purchaser. Significant selectable features are summarized as follows:

Message Mapping Utilities (MMU) ● transforms terminal-dependent formats to terminal-independent form and vice versa; initiated by a call from the application program.

AUTOGEN Facility ● generates MMU macros online from sample screens input from an IBM 3270 (or compatible) CRT.

Data Entry System ● provides a preprogrammed general-purpose data entry/verification capability.

Dynamic File Allocation (DFA) ● permits an application to dynamically create and retrieve sequential data sets.
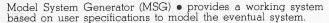
Generalized Front-End Facility (GFE) ● provides the basic structure for interfacing to nonstandard communications devices.

Dynamic Data Queuing Facility (DDQ) ● allows applications to dynamically create, retrieve, and delete logical data sets and/or queues of messages on a single BDAM data set.

Page Facility ● allows terminal operators to browse through a multiscreen output message.

PURCHASE PRICE RANGE

Software License Purchase ■
Software Service Fees ▭

license purchase
■ $69K

5-yr service fee
▯ $28K

5-yr total cost (sum of above)
▭ $69K to $97K

	$40K	$80K	$120K	$160K	$200K

SDA PRODUCTS INTERCOMM PRICING ● solid bar shows single license purchase price, which includes all package facilities; open bar shows 5-year service fee but is calculated for 4 years (48 mos) because first-year maintenance is included in license purchase price.

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Model System Generator (MSG) ● provides a working system based on user specifications to model the eventual system.

Multiregion Support Facility (MRS) ● allows groups of application subsystems to execute in separate regions while the INTERCOMM Front-End resides in a Control Region.

CICS Compatibility Feature (CF) ● an unsupported SDA product that allows application programs written for execution under standard IBM CICS/OS to execute under INTERCOMM control; no IBM-supplied CICS modules are required.

☐ Product Definition

INTERCOMM is a large-scale telecommunications monitor designed to support an IBM OS/VS environment. It competes directly with IBM's CICS/OS program product. INTERCOMM consists of four distinct facilities: subsystem control, file handling, dispatching, and a teleprocessing interface. Communications are provided for device and line control operations; full resource management, job management, and task/program management capabilities are available, as are a host of utility program and options to tailor the system to special environments.

INTERCOMM ● totally bundled system including all user-selected features:

$69,375 lcns	NA mo	$6,900 serv

■ FUNCTIONAL FACILITIES

☐ Computers/Operating Systems

INTERCOMM can be installed on any IBM System/370, 3000, 4300, or compatible computer capable of running under OS/VS1, OS/VS2(SVS), or OS/VS2(MVS). Operations are also supported under VM/370.

☐ Minimum Operating Requirements

The basic INTERCOMM system requires a minimum of 100K bytes of main storage. An additional 50K bytes (minimum) of main storage are required to support dynamic queue, control block, buffer, table, and I/O areas. SDA reports that INTERCOMM is currently supporting a system with over 2,500 terminals.

☐ Protocols & Network Interfaces

All standard IBM protocols and access methods (excluding BPAM) are supported, including SDLC. INTERCOMM also supports the networking facilities of SNA and can handle a wide variety of non-IBM asynchronous and synchronous terminals.

☐ Access Methods

The full range of IBM-supported access methods is supported under INTERCOMM. These include BTAM, TCAM, and VTAM for support of SDLC/SNA devices. INTERCOMM also provides the GFE (Generalized Front-End) hardware line control computer interface for connecting several front-end minicomputer systems.

☐ File/DBMS Interface

Although INTERCOMM can be configured to interface with general-purpose, homegrown data structures, it is used primarily with one of several popular database management systems. Standard interfaces are provided for Cincom TOTAL, IBM IMS (DL/1), Software AG ADABAS, Cullinane IDMS, Computer Corporation of America Model 204, and Intel System 2000/80. SDA Products can provide nonstandard interfaces on special order.

☐ Temporary Storage & Paging Facilities

INTERCOMM is table oriented and supports both dynamic and fixed storage buffering. The system's Resource Manager facility can allocate and assign core resources independently of the standard operating system GETMAIN/FREEMAIN facilities. The TP monitor is basically a multithread system but can be degraded to a single thread environment if necessary. All core and disk queues are managed automatically by the system, and the number of threads supported depends solely on the amount of including security functions, checkpoint/restart specifications, and logging requirements; and utility control, including MMU

resources available to the system. Thread lengths are not fixed because each portion of an application program is handled as a separate program segment. Each message is processed as completely as possible until the application subsystem voluntarily gives up control. An optional Store/Fetch facility can temporarily store data in main memory or on disk. It is identified by a user-assigned key of up to 48 characters. This capability is sometimes referred to as a "scratch pad" facility.

The paging constraints of INTERCOMM are governed directly by the paging characteristics of the operating system. The Virtual Execution Group storage scheduling technique utilizes the operating system paging algorithm to manage program residency. It strives to optimize page loading to achieve the highest level of page utilization with the least number of page faults. The Look-Ahead-Page-Load facility checks each critical page boundary movement to ensure that needed pages are resident in real memory. Thus, when a potential page fault is detected, the system can pre-load the necessary page(s) overlapped with processing for other message traffic.

INTERCOMM supports three page fixing methods: the user can provide a list of system or user modules to be fixed at system initialization time; the INTERCOMM control terminal operator, through the use of terminal commands, can dynamically fix or unfix individual modules in main storage; or the INTERCOMM Time-Zone utility can be used with the VS system control to alter page-fix characteristics during selected time periods.

☐ Message Switching Facilities

The Subsystem Controller and Dispatcher routines handle all message switching functions. The path of each message is controlled by one or both of these routines. Control includes acquiring the message from the queue, formatting it, obtaining required data from online files, executing the application program, formatting the response, and directing the output to the proper terminal. Message switching is supported between application programs, terminals, and/or system programs either through a direct interface to the INTERCOMM queuing routine (via a two-parameter CALL) or by an INTERCOMM-supplied subsystem. Through a series of priority structures, a message can be analyzed and sent on to a lower priority subsystem for processing.

If a receiving terminal is unable to receive a message, INTERCOMM reroutes the message to an alternate device, if one was specified, or queues the message until the receiving terminal comes up again, at which time all accumulated messages for that terminal are transmitted. All operating system task management and message transfer control are bypassed by INTERCOMM, and the operating system regains control only when no messages or when all messages are awaiting completion of I/O operations. Messages on queues waiting for transmission are preserved across system failures by a Message Restart facility. The highly-parameterized Message Mapping Utilities (MMU) subsystem provides an interface between the application subsystem and any terminal-dependent message processing logic for both input and output messages. All tasks within queues are dispatched on a first-in/first-out basis within priority levels.

■ USER INTERFACES

☐ Languages Supported

INTERCOMM interfaces with application programs written in COBOL, FORTRAN, PL/1, and IBM assembler language.

☐ Host Operating System Interface

INTERCOMM interfaces with the host operating system through macro-generated tables. Tables exist for such system functions as: line control, including network configuration and transaction identification; message processing control; system control,

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requirements, edit utility requirements, output utility formatting specifications, and display/change utility file descriptions. Other system-oriented tables are: a Verb Table, which lists all the valid transaction codes required for processing; Station Table and Device Table, which describe terminal device-dependent characteristics; System Parameter Table, which describes system-wide operating characteristics; a Data Set Control Table, which is generated automatically by the File Handler function to describe online data sets; and the Subsystem Control Table, which lists the characteristics (reentrancy, language, entry point, etc), queue specifications (core and/or disk queues), and scheduling specifications (resident or loadable, concurrent message processing limits, etc) for each subsystem.

In addition, INTERCOMM provides the user with station, transaction, and station/transaction sign-on/sign-off security. A full range of operator commands is available, and INTERCOMM allows user programs to place application log entries on the system log data set to clarify the status of message processing in the case of system failure.

☐ Batch Processing

Although INTERCOMM is designed to operate primarily in an online mode, batch operations can be handled easily through basically the same facilities used in the online environment. If both an online application and a batch task need to update a file concurrently, the File Handler is placed in the operating system's Link Pack Area so that the batch program can perform its I/O against the files via calls to the File Handler. This procedure avoids update problems and maintains file integrity.

☐ Transaction Processing

All transaction processing is handled by the INTERCOMM Teleprocessing Interface, which controls the communications processing between the host computer and the connected terminals. User programs do not interface directly with terminals; they utilize a queuing mechanism that operates independently of the operating environment. All Interface operations are transparent to the application program and include all message polling, addressing, and transmission functions. The File Handler performs all of the file accessing for the application programs. The File Handler notifies the Dispatcher of all I/O activities to provide internal task overlap management. The File Handler also controls files in a way that precludes updating conflicts. Multiple programs can access files in parallel.

The Subsystem Controller searches the control table for the next program/task. Once it receives a message from the process queue, it activates the appropriate program to start message processing. The Edit routine is one of the real-time utilities available with INTERCOMM. It is used to prepare messages from the terminals for processing by the applications programs. The Edit utility strips off the control characters and superimposes a predefined format onto the message. An Output utility determines the format of the output message/data, obtains the data to make up the output, and produces the actual message for the designated terminal. After the communications control characters are appended to the message, the message is passed back to the Telecommunications Interface for actual transmission.

☐ Program Development

In the INTERCOMM environment, an application program is a subsystem that executes under the control of the Subsystem Controller. Many of the programming services offered by this subsystem are invoked automatically. These include a monitor service via a standard call, conversation processing with a terminal, support for both nonreusable and/or nonreentrant programs, single-thread operations if required, a variety of mapping utilities, automatic conversational facility, multiscreen CRT output browsing, facility for subtasking applications with embedded WAITs, and automatic release of program resources in a failure situation. Application programs can be written in COBOL (ANS or IBM F), PL/1 (IBM F or Optimized), FORTRAN G or H, or the IBM assembler language. The application logic analyzes the input message, but the file is actually accessed by either INTERCOMM or a DBMS interface service routine. The application program can create one or more response messages to be sent to the originating terminal and/or other terminals.

☐ Security

INTERCOMM offers an extensive set of security facilities. The standard system-supplied options include sign-on/sign-off security at the station, transaction, or station/transaction level. The user can also specify what operator is allowed to enter what type of transaction from which terminal. A system-supplied set of Extended Security System facilities supports more comprehensive control to system resources in a multiregion or single region INTERCOMM system and allows the security environment to be defined dynamically via a command language available to the user. Finally, many user exits are supplied to implement custom security routines and procedures.

☐ Monitoring & Evaluation

INTERCOMM maintains the INTERLOG system log, which contains a historical record of all traffic within the monitor. It provides for system control and maintains complete performance documentation. It is a variable-length sequential data set that can reside optionally on disk or tape. System log entries are automatically posted at key processing points. Each message is logged at the time of entry on a subsystem queue. Aside from INTERCOMM system log entries on INTERLOG, the user can gather information from various user log entries. These entries can be instrumental in gathering statistics about specific operating conditions. In addition, application programs can place information on the system log data set. A charge-back accounting facility called SAM (System Accounting and Measurement) interacts with information gathered in INTERLOG. Some of the statistics gathered for performance analysis include: terminal status, which can be requested at any time for any duration of time; file statistics, for assessing file organization and I/O frequency; subsystem statistics, which show the number of messages processed by each subsystem; off-line statistics, which can be generated per terminal, per transaction, or per application program, and which can be used to produce traffic histograms and/or response time reports; storage utilization statistics, which constitute global and/or detail core-use information; and system tuning statistics, which is an optional facility that allows INTERCOMM to gather information relating to its own performance characteristics. In all cases, the user specifies the testing period for gathering the statistics.

☐ Failure Recovery Methods

The checkpoint/restart capability available with INTERCOMM is based on the system log. Checkpoint data is written to the log at checkpoint time. At restart time, the data is restored exactly as it was when the last checkpoint was taken. An option permits user data to be included in the checkpoint. The Message Restart facility restarts messages from the point of system failure and restores the status of all messages that had completed input transmission. Recovery consists of reading the log in reverse sequence and replacing uncompleted messages into the application program or into terminal queues. Message classification and selectivity priorities can be established during restart. Both the restart and normal modes of INTERCOMM operate concurrently within a single execution. New messages are accepted from a live terminal network as soon as the log is repositioned to the failure point. The restart facility is transparent to the user, but the user is responsible for the table entries made at the system level. The entire restart system is coordinated with the recovery of the operating system files and/or DBMS file data. Data recovery is aided through the use of the File Recovery Special Feature, which is used to restore online disk files in the event of system failure. INTERCOMM also employs before-image and after-image processing to restore records.

A Backout-on-the-Fly (BOF) restart facility is executed following a program check, a program time-out, or a special request by a subsystem. BOF follows the same methodology as file recovery and requires the Dynamic Data Queuing (DDQ) Special Feature. BOF places the thread's before and after images on a DDQ. If the thread completes successfully, then the DDQ is deleted. If the thread fails, it is backed out, and standard recovery action is invoked.

• END