

10.0

**B 1000 System
Communications Module
(SYCOM)**

REFERENCE MANUAL

PRICED ITEM

**B 1000 System
Communications Module
(SYCOM)**

REFERENCE MANUAL

(RELATIVE TO MARK 10.0 RELEASE)

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PRICED ITEM

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SECTION 1 INTRODUCTION

GENERAL

The System Communication Module (SYCOM) program as well as the commands and procedures required to operate the SYCOM program are described in this document. The SYCOM program permits users of the B 1000 data processing system to communicate with other Burroughs computer systems, including B 1000, B 5000/B 6000/B 7000, and CMS systems. B 1000 refers to the family of B 1900, B 1800, and B 1700 data processing systems. Communication with other Burroughs computer systems occurs in the following modes of operation:

- Remote Job Entry (RJE)
- File Transfer
- Virtual Terminal
- Program-to-Program
- Program-to-SYCOM

Each mode of operation offers the user a specific form of communication which can handle the specialized needs of a distributed data processing network.

It is assumed that the reader has a working knowledge of the basic hardware and software functions of the B 1000 data processing system. A brief description of each section and appendix of this document follows.

Section 1: INTRODUCTION

Provides a brief introduction to the SYCOM program and related documents.

Section 2: SYCOM SYSTEM OVERVIEW

Contains a general description of the functions performed by the SYCOM program. This section also identifies any system requirements and restrictions of the SYCOM program, modes of operation, configurations, and message path assignments.

Section 3: SYCOM PROGRAM OPERATING INSTRUCTIONS

Describes the SYCOM program operating instructions, which include preliminary procedures, workfile naming conventions, execution of the program, termination of the program, and terminal operations.

Section 4: SYCOM PARAMETERS

Describes the SYCOM parameters.

Section 5: SYCOM OPERATOR COMMANDS

Describes the SYCOM program input commands.

Section 6: OUTPUT MESSAGES

Describes the SYCOM system output messages: SYCOM program messages, network controller messages, and Master Control Program (MCP) messages.

Appendix A: GLOSSARY OF TERMS AND ACRONYMS

Contains a glossary of terms and acronyms used in this document.

Appendix B: CHARACTER SET

Contains the character set used by the SYCOM program.

**B 1000 System Communications Module (SYCOM)
Introduction**

Appendix C: SYCOM NETWORK CONTROLLER

Describes the generation of a network controller for use with the SYCOM program and the function of the network controller in relation to the SYCOM program.

Appendix D: CONTROL MESSAGE FORMATS

Contains the communications control message formats, program-to-program message formats, and program-to-SYCOM message formats.

Appendix E: SUMMARY OF FILES

Contains a summary of all files used by the SYCOM program.

Appendix F: PARAMETERS FILE

Contains the format of the parameters file.

Appendix G: STATISTICS FILE

Contains the format of the statistics file and a sample program to list the statistics.

Appendix H: SAMPLE APPLICATION PROGRAMS

Contains two sample application programs which show how to interface with the SYCOM program in the program-to-program mode of operation.

Appendix I: RESTRICTED MCP COMMAND SUMMARY

Describes the restricted MCP commands.

Appendix J: NOTATION AND SYNTAX CONVENTIONS

Describes the notation and syntax conventions used in this manual.

Appendix K: SYCOM SYNTAX REFERENCE GUIDE

Contains a reference guide to the SYCOM syntax.

RELATED DOCUMENTS

The following manuals are referenced in this document:

B 1000 Systems System Software Operation Guide, Volume 1, form number 1108982.

B 1800/B 1700 Systems System Software Operation Guide, Volume 2, form number 1108966.

B 1000 Systems Network Definition Language (NDL) Reference Manual, form number 1073715.

B 1000 Systems Command AND Edit (CANDE) User's Manual, form number 1090586.

B 1000 Systems Supervisory Message Control System (SMCS) Reference Manual, form number 1108891.

B 1000 Systems Remote Job Entry (RJE) Reference Manual, form number 1090602.

TD 730/TD 830 System Reference Manual, form number 1093788.

MT 983/MT 993 Display Terminals Reference Manual, form number 1118361.

SECTION 2

SYCOM SYSTEM OVERVIEW

GENERAL

The Systems Communication Module (SYCOM) program enables a B 1000 user to submit jobs to run on another computer system and to transfer files between two computer systems. The SYCOM program also enables a user program to interface with the SYCOM program, a program running on one computer system to communicate with a program running on another computer system, and a remote terminal (for example, a TD 830) on one computer system to be a remote Operator Display Terminal (ODT) on another computer system.

Output from jobs run on a remote system can be returned to the local B 1000 system or directed to a peripheral device on the remote system. Interactive output data is returned to the local system directly, by way of the network controller in each system.

The SYCOM program, along with its associated network controller, is responsible for all data communications with other Burroughs systems. This includes performing the necessary functions to establish line connections, receive/transmit data, and execute the correct line termination procedures.

The SYCOM program maintains a secondary level of control (MCP has primary control) over local peripheral devices such as the card reader, card punch, line printer, and magnetic tape drives. The SYCOM program reads and transfers card, tape, and disk files, accepts input from and displays messages to the Operator Display Terminal (ODT), and receives data files/messages for printing, punching, displaying, or writing to either tape or disk files. The SYCOM program provides the mechanism by which a terminal or application program in one computer system is able to communicate with specific application programs in another computer system.

The SYCOM program retains compatibility with other Burroughs data communications line discipline and message format conventions, and maintains standard Remote Job Entry (RJE) command compatibility with existing RJE program products for Burroughs B 1000, B 5000/B 6000/B 7000, and B 2000/B 3000/B 4000 systems.

The benefits of the SYCOM program are a result of its flexibility. A SYCOM distributed data processing system can be designed and installed to satisfy the specific needs of the user. A few examples are:

- A B 1000 computer system can be installed at the same installation to increase and share resources with an existing system.

- A remote B 1000 computer system can be installed to provide extra resources to a host installation.

- A B 1000 computer system can be installed in a network of systems to provide distributed processing services.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

USER-SYSTEM/SERVER-SYSTEM RELATIONSHIP

A user-system is the computer system in a data communication network which serves as a point of data collection and data distribution. A Remote Job Entry (RJE) environment where the system sends card-image input and receives card-image and line printer output is an example of a user-system.

A server-system is generally considered to be the data processing system and is often referred to as a host system or central system. It normally receives large volumes of data to be processed or program source files to be compiled from a user-system. In the case of program compilations, the line printer file and/or program object code files can be transmitted back to the user-system for printing or possible program execution. Interactive output is returned directly to the initiating program or terminal by way of the network controller in each system.

The actual physical size of a computer is of relatively little importance when considering a system as a server-system. The B 1000 data processing system can be a user-system, server-system, or both simultaneously. *host RJE*

Figure 2-1 is a block diagram of a user-system and server-system using the B 1000 data processing system.

HARDWARE REQUIREMENTS

The following hardware elements are required to execute the B 1000 SYCOM program:

- B 1000 Central Processor
- 128K bytes main memory (minimum)
- Disk storage
- Operator Display Terminal (ODT)
- Multiline or single-line control
- Line adapters as required (leased, switched, or direct)
- Data sets and cables as required
- MT 983/TD 830/TD 820 terminals as required
- Line Printers as required (120 or 132 print positions)

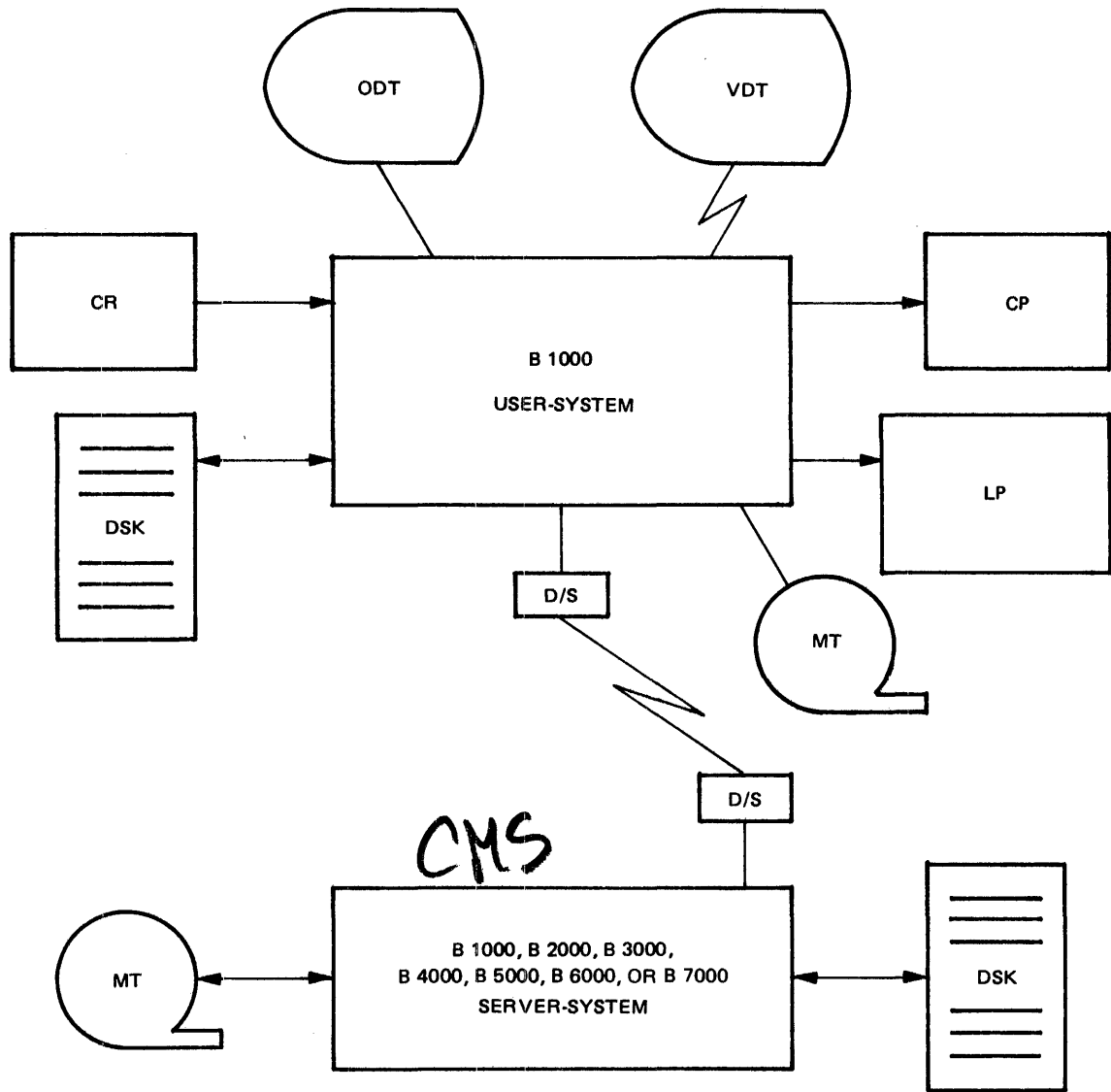
MEMORY REQUIREMENTS

A list of the memory requirements of the SYCOM system software elements follows. These requirements can be used to approximate memory requirements for an interactive B 1000 SYCOM system operating with or without a Supervisory Message Control System (SMCS):

- 66K bytes Master Control Program II (MCP) with data communication options
- 15K bytes Network controller (basic)
- 2K bytes For each additional line specified in the network controller
- 25K bytes Supervisory Message Control System (SMCS)
- 29K bytes Systems Communications Module (SYCOM)

After determining the basic memory requirements for the system, additional memory must be included for any other programs that are to be executed in conjunction with the SYCOM program.

B 1000 System Communications Module (SYCOM)
 SYCOM System Overview



LEGEND:

- CR = CARD READER
- CP = CARD PUNCH
- LP = LINE PRINTER
- MT = MAGNETIC TAPE
- DSK = DISK
- ODT = OPERATOR DISPLAY TERMINAL
- VDT = VIDEO DISPLAY TERMINAL
- D/S = DATA SET

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Figure 2-1. User-System/Server-System Schematic

SOFTWARE REQUIREMENTS

In order for the SYCOM program to become operational, certain system software programs are required. Although these programs support the operation of the SYCOM program, they are general purpose programs and support the entire system. Each program identified is individually documented for its capabilities and requirements. The required system software programs are as follows:

Master Control Program II (MCPII)
network controller
SYSTEM/MAKEUSER program (if file security is to be used)

MASTER CONTROL PROGRAM (MCPII)

The MCP is an operating system which manages the demands and resources of B 1000 computer systems. It reduces programming efforts by providing a family of commonly used functions and services. The MCP requires strict adherence to program structures and procedures in order to maintain communication between different programs, interpreters, and the MCP.

The MCP optimizes the productivity of a system by holding external intervention to a minimum and maximizing system throughput. This is achieved by incorporating into the MCP the primary tasks of input/output (I/O) control, file handling, multiprocessing, interrupts, memory allocation, and operator interfaces.

NETWORK CONTROLLER

The network controller is a program generated by the Network Definition Language (NDL) compiler. The network controller processes and supervises the flow of messages between computer systems, terminals, and programs. Properly generated, the network controller performs all data communication line discipline functions which are necessary for proper line/terminal control. This includes initiation and completion of communication I/O operations and servicing exception conditions. In order to optimally provide these functions, the user provides the configuration of the data communication network to the NDL compiler. The NDL compiler generates the network controller object program. For example, the NDL compiler requires configuration information regarding the number and type of data communication lines or the number and type of terminals. The NDL compiler also creates the Network Information File (NIF). This file contains all terminal and data communication line attributes.

The network controller program provides the SYCOM program with the capability to pass messages between terminals, application programs, and other programs running on another computer system. This is accomplished by means of MCP supported remote files and queues along with the network controller's message switching capability. Each program, including SYCOM, that is to be included in the message flow must contain a remote file for input/output message traffic. This file must also be declared in the network controller.

The following describes the normal sequence of events that involve the SYCOM program, the network controller, and the terminals of the system: In response to a poll from the network controller, a terminal transmits a message to the network controller. The network controller accepts the message and appends a header that supplies pertinent information about the message, (for example, the terminal type and logical station number). The network controller then determines which program to send this message to and writes it into a remote file designated for that program. The program reads this remote file and obtains an input message. If the message is a SYCOM program command, it is processed and a reply message is created. The SYCOM program writes the reply message to the remote file. The network controller reads the reply message and transmits it without the header to the originating terminal.

SYSTEM/MAKEUSER PROGRAM

The SYSTEM/MAKEUSER program is a utility program that creates and modifies the (SYSTEM)/USERCODE file. This file contains all valid system usercode/password combinations. The MCP uses this file to support and enforce the file security system for programs and users which access files on disk.

SOFTWARE OPTIONS

The following programs are not required but can be used in conjunction with the SYCOM program to provide particular service needs.

Supervisory Message Control System (SMCS) program
Application programs
CANDE program
DMPALL program

RD *RC* *Cande 2*

Although the Supervisory Message Control System (SMCS) program is not a required program for the operation of a SYCOM system, its use is strongly suggested for those systems which have terminals. A terminal in a SYCOM system environment is permitted to initiate file transfers or become a virtual terminal entity on a server-system. These terminals can also be utilized for other applications such as data entry and program development. The SMCS program can maintain overall control of the terminals for these varied system applications.

SUPERVISORY MESSAGE CONTROL SYSTEM (SMCS) PROGRAM

The Supervisory Message Control System (SMCS) program is a supervisor for a data communications software system which includes such programs as SYCOM, CANDE, and other on-line programs of either Burroughs or user origin.

The SMCS program provides many functions and special features to an interactive system. The highlights of some of the more pertinent functions are presented here. Relevant to the SYCOM system, the SMCS program provides some basic message switching (terminal-to-terminal, terminal-to-ODT, and ODT-to-terminal), attachment of terminals to application programs by means of a remote file, and information about the network controller.

The SMCS program also controls terminal log-on security (checking of user security codes and granting access to user files) and approves or denies all remote file open requests to terminals under its control. Moreover, the SMCS program provides a certain degree of resource allocation through security, job control, remote file control, and error handling. For example, for all terminals which are under control of the SMCS program, final control over the device as a resource is left to the SMCS program. Therefore, the SMCS program can temporarily attach terminals to the SYCOM program by means of the SMCS SIGN ON facility. For complete information concerning the SMCS program, refer to the B 1000 Systems Supervisory Message Control System (SMCS) Reference Manual, form number 1108891.

APPLICATION PROGRAMS

There are three types of application programs useful to the SYCOM program:

Interactive data entry
System-to-system
Command input to the SYCOM program

Each program type is described in the following paragraphs.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

Interactive Data Entry

A user can elect to develop an interactive application program tailored to the specific needs of an installation. These specific needs could include such functions as data entry, information retrieval, or any application desired.

System-to-System

If an application program in a user-system is required to communicate directly with another application program in a server-system, the capability is available. The communication link is directly through the network controller in each system. The SYCOM program has no role in this message traffic. However, the SYCOM program does approve a virtual terminal Logical Station Number (LSN) for identification and control purposes. This is a residual capability based on requirements for the network controller in each system by the SYCOM program.

Command Input to the SYCOM Program

An application program can provide the source for a string of SYCOM program commands to be performed on an automatic basis. Normally, this would be for off-hours operation but could also be utilized for everyday occurrences in a work flow pattern.

CANDE PROGRAM

The B 1000 CANDE program provides generalized file updating and preparation capabilities in an interactive, terminal-oriented environment. The CANDE program performs these file updating and text editing functions in program development and other such environments. The CANDE program can be utilized on the remote system by a user on the local system by means of virtual terminals.

The CANDE program has been designed to run in a self-sustaining operation or in conjunction with the SMCS program. In either case, it requires a network controller for data communication functions. The CANDE program operates with a basic usercode-password type of security that is available to the CANDE program and the SMCS program from the MCP. For complete information concerning the CANDE program, refer to the B 1000 Systems Command AND Edit (CANDE) User's Manual, form number 1090586.

DMPALL PROGRAM

The DMPALL program is a utility program which can reproduce files from one medium to another and list files from any medium with byte, digit, or combined format. The program can also start or stop reading of a file at a specified record. Specifications for these functions are entered to the DMPALL program from the system ODT, card reader, or local system terminal. For more complete information concerning the DMPALL program, refer to the B 1800/B 1700 Systems System Software Operation Guide, Volume 2, form number 1108966.

MODES OF OPERATION

The SYCOM program operates in these five modes:

1. Remote Job Entry (RJE).
2. File Transfer.
3. Virtual Terminal Communication.
4. Program-to-SYCOM Communication.
5. Program-to-Program Communication.

Each mode of operation is described in the remainder of this section.

REMOTE JOB ENTRY (RJE)

The SYCOM program, in RJE mode, reads and punches cards, prints output, accepts ODT input, displays ODT output messages, and transfers file/control messages between the user-system and a server-system.

Input can be directly from a card reader, disk, or the ODT. When using tape or disk, the MCP file attribute options must be specified. Card reader input is generally associated with RJE batch data transmissions. However, input can be from either the card reader or from disk.

SYCOM program commands can be alternately received from an application program through the Program-to-SYCOM mechanism. With this mechanism, the RJE input as well as associated output can be automatically controlled.

Output can be directed to a card punch, line printer, disk, magnetic tape, or the ODT. However, in the case of a line printer or card punch, the data received can be written to a printer backup or punch backup file on disk. If the output is written to a backup file, the appropriate MCP command must be entered to print or punch the backup file.

Example:

```
PB <printer backup file-id>
```

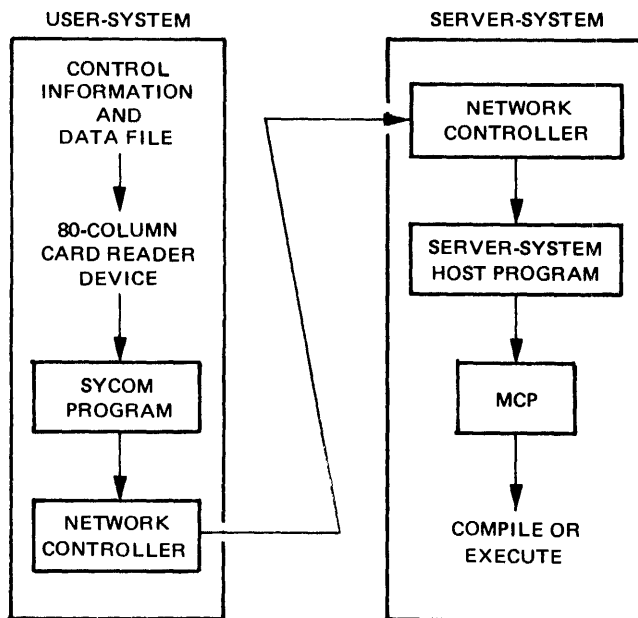
The SYCOM program can direct the network controller to establish or re-establish a connection to a server-system. If the SYCOM program on the server-system is the only data communication program using the network controller, the SYCOM program can cause the network controller on the server-system to enter an idle state while waiting for an incoming connection to be established and to terminate a connection when appropriate.

The transmission of RJE data files to or from a server-system is described in the following paragraphs.

A user of the SYCOM program on the user-system prepares a data file consisting of 80-column card images, 96-column card images, or 90-character CANDE data files for transmission to the server-system host program. The data file is read, compressed, and blocked by the SYCOM program and is written to the network controller remote file. The network controller transmits the data file to the server-system host program. After the data file has been transmitted to the server-system host program, the data file is under control of the server-system MCP. The data file is processed by the server-system MCP according to directives specified in the data file (COMPILE or EXECUTE). Figure 2-2 illustrates the path of the data file from the user-system to the server-system.

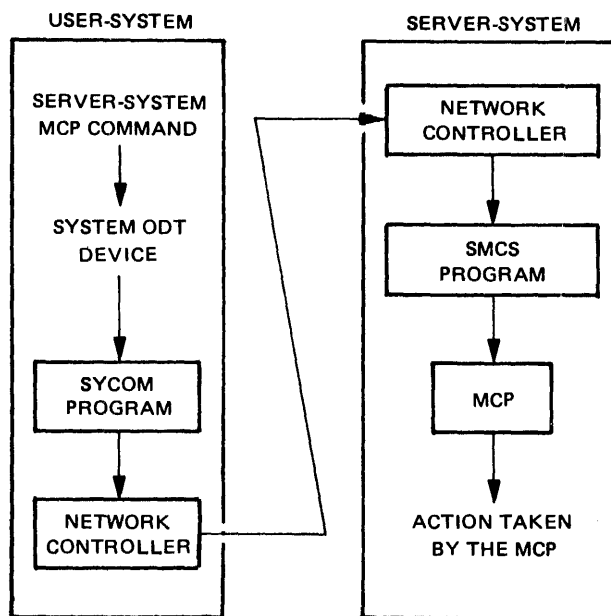
All the ODT messages that pertain to a job such as beginning of job, end of job, and special ODT messages are transmitted back to the user-system for display on the user-system ODT. A message can be entered through the user-system ODT to control jobs executing on the server-system or manipulate data files as required, providing the SMCS program is running on the server-system. The SYCOM program accepts this message and writes it to the network controller. The network controller transmits the message to the server-system network controller. The message is then given to the server-system SMCS program and then to the server-system MCP for processing. Figure 2-3 illustrates the message path. Any response to a message by the MCP is routed back to the user-system ODT.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview



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Figure 2-2. RJE Data Path

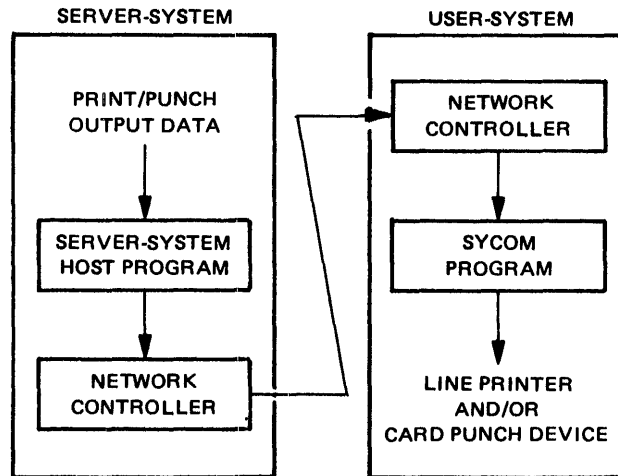


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Figure 2-3. ODT Message Path

B 1000 System Communications Module (SYCOM) SYCOM System Overview

When the job has finished, any associated line printer and card punch output created by the server-system host program can be transmitted back to the SYCOM program on the user-system. The network controller receives these incoming message blocks and forwards them to the SYCOM program. The SYCOM program then prints or punches this data on a user-system peripheral device. Figure 2-4 illustrates the path which the output takes from the server-system host program.



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Figure 2-4. Printer/Punch File Message Path

The flow of data between the user-system and a server-system in RJE mode is often referred to as a job stream. Any number of job streams can be initiated at the same time from a user-system. The number of jobs which can run on a server-system is limited only by the ability of the system to process them.

If the SYCOM program in RJE mode is to communicate with the B 1000 RJE/CONTROLLER program, the NOFS (no file separators) parameter also must be specified in the SYCOM parameters file.

FILE TRANSFER

Files can be transferred to or from disk and magnetic tape devices. Magnetic tape transfers are restricted to one data file per tape. Library file tape created by the SYSTEM/COPY program cannot be transferred by the SYCOM program. These tape files must first be loaded to disk and then transferred.

Functional Description

The user initiates a file transfer by entering the ADD, COPY, PUT, or FETCH commands to the SYCOM program. The ADD and COPY command syntax requires source and destination systems to be specified for the transfer, while the PUT and FETCH commands do not. These source and destination system identifiers must be the same as those specified for the SYSTEMID parameter in the PARAMETERS file or the MCP HOSTNAME at initialization time.

Whenever a file to be transferred is located on the user-system, the file transfer is a PUT operation. The PUT command causes a file transfer from the user-system to the server-system. When the file is on the server-system, the transfer is a FETCH operation. The FETCH command causes a file to be transferred from the server-system to the user-system.

B 1000 System Communications Module (SYCOM) SYCOM System Overview

The actual file transfer is initiated by exchange of control information between the two SYCOM programs. This process is often referred to as handshaking. All file transfers occur as PUT operations. That is, a user enters the FETCH command to the user-system SYCOM program and the program then sends a FETCH control message to the server-system SYCOM program. When a SYCOM program receives a FETCH control message, it initiates a PUT command of the same file specified in the original FETCH command. PUT and FETCH messages completely specify both source and destination file attributes. The PUT message elicits a PUT reply message signifying that data transfer can begin. The sender system then sends one or more data message blocks which are eventually followed by an end-of-file message. File transfers can take place in both directions simultaneously.

Upon completion of the file transfer, the system that received the file informs the originating system of the completion with a control message.

A file transfer can be immediately discontinued through the ABORT command. If a file transfer is aborted, the file remains unchanged on the source system and the file is not entered in the disk directory in the destination system. This means that the whole file must be transferred to the destination system in order to be entered in the disk directory.

When more than one file transfer is requested or a file transfer request is made to the SYCOM program while another is in progress, the transfer request is placed into a waiting schedule maintained by the program. When the current file transfer completes, the next file to be transferred is taken out of the waiting schedule and the file transfer process begins. File transfer requests are processed on a first-come, first-served basis. Transfers of families of files are limited by the GROUPSIZE parameter. When this limit is reached, the SYCOM program checks to see whether other users have queued file transfer requests and, if so, processes those requests. This mechanism assures an orderly processing sequence.

The NOFTS (no file transfer) parameter must not be specified in the SYCOM PARAMETERS file at initialization time. The NOFTS parameter inhibits the file transfer function of the SYCOM program.

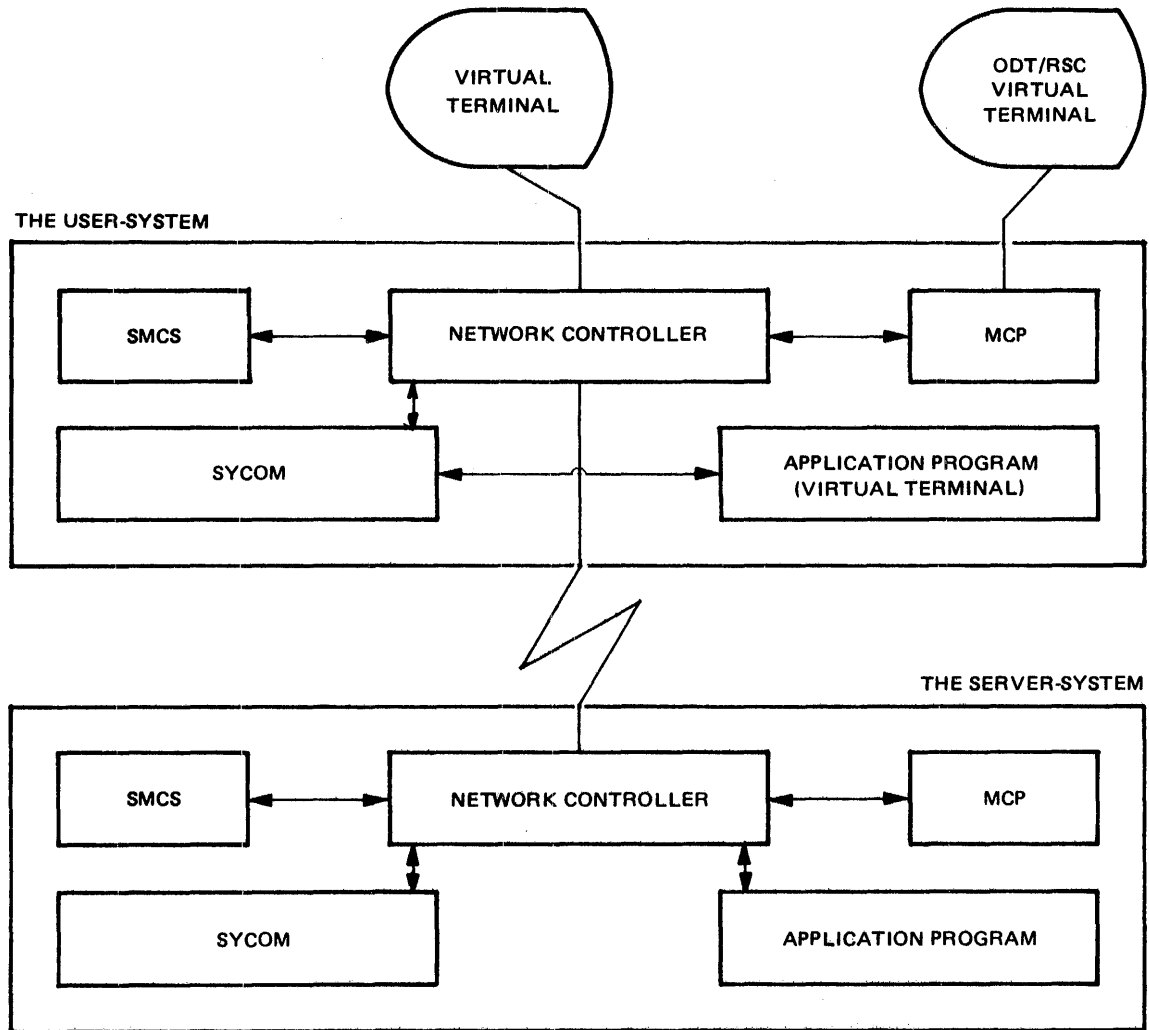
VIRTUAL TERMINALS

A virtual terminal can be either a local terminal, the system ODT, or an application program. The virtual terminal concept is a logical concept based on the actual message path established between the terminal, system ODT, or application program on the user-system and an appropriate interactive application program in a server-system. A virtual terminal can control jobs in a server-system through the capabilities of the server-system SMCS program. However, the main connections between systems are established by the SYCOM program. Figure 2-5 illustrates a user-system with virtual terminals. An application program in this environment can be any program using a remote file which does not use tallies or toggles.

A virtual terminal has access to all user-system and server-system facilities. Commands to the user-system are local and are processed by either the SYCOM program, the SMCS program, the MCP, or by an application program. Commands to the server-system are transmitted through the user-system network controller to the server-system network controller for processing and subsequent replies from the MCP, SMCS program, SYCOM program, or application program on the server-system.

The SYCOM program has the ability to mix control messages from a virtual terminal to a server-system even if file transfer is in progress. Control messages are immediately transmitted to the server-system. For example, a control message to the server-system could be a PD command to the MCP, a SIGN ON command to the SMCS program, an ABORT command to the server-system SYCOM program, or some predesignated command to an application program.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview



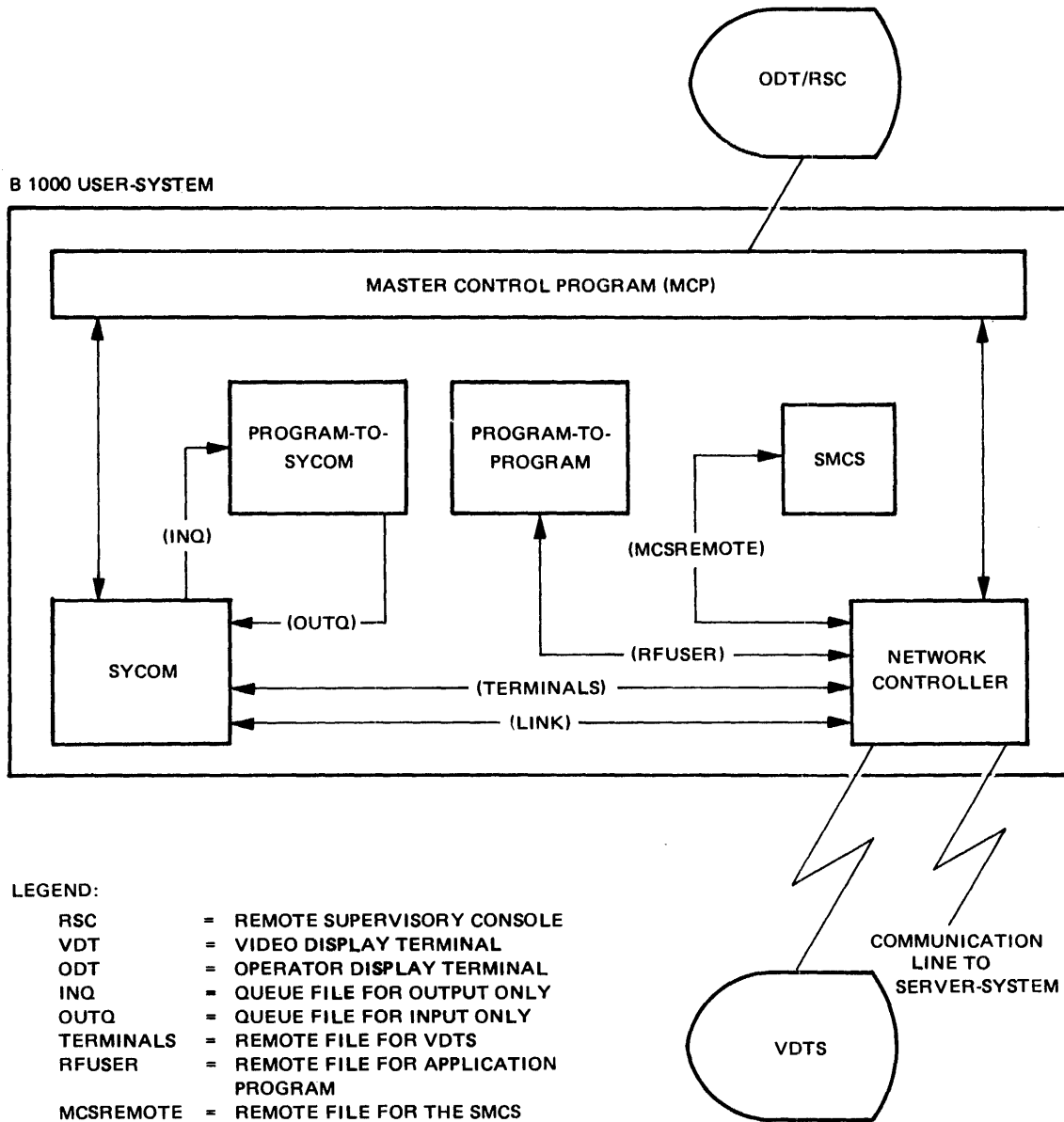
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Figure 2-5. Virtual Terminal Schematic

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

Terminal-to-Program Communications

When the SYCOM program is utilized in a larger system development or data entry environment which has terminals, then the user-system can have the configuration shown in Figure 2-6. In the hardware/software configuration illustrated, the complete spectrum of SYCOM program capabilities are available to the system user.



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Figure 2-6. User-System Schematic (SMCS with Terminals)

B 1000 System Communications Module (SYCOM) SYCOM System Overview

In the environment shown in Figure 2-6, the SYCOM program still communicates directly with the network controller for normal communications activity. However, the SMCS program maintains elementary control over the SYCOM program and control over the system terminals. Consequently the SMCS program directly causes the execution of the SYCOM program when a terminal or Remote Supervisory Console (RSC) signs on to the SYCOM program through the SMCS program. A terminal user can direct commands to the SYCOM program in the user-system or the SMCS program in either the user-system or server-system.

With the introduction of the SMCS program into a system, all of the commands, functions, and capabilities become available to the terminal user.

The communications protocol assumed by the SYCOM program supports user-system terminals connected (logically) to an interactive application program on a server-system. Using this protocol makes the terminal appear as though connected directly to the application program. The terminal is then used as if it were locally attached to that program.

Presently available interactive application programs can be used or the user can optionally elect to develop a special application program for terminal and/or other program interaction.

The method for conveying terminal data between two computer systems makes use of a device address field in the control message. The device address in the control message specifies the terminal with which the message text is associated. This device address is known as a virtual terminal address, and is a naming convention used by both the user-system and server-system network controller to reference a particular terminal. This addressing scheme is described as follows:

1. The device address or virtual terminal address is made up of two characters. One character is an upper-case alphabetic and the other is a lower-case alphabetic.
2. When a virtual terminal transmits a message on the user-system, a user transmit address with a lower-case and upper-case letter is included in the message (for example, a user transmit address of "aZ"). In order to receive a response message from the server-system the virtual terminal address letters are reversed (for example, a server transmit address of "Za").
3. When the server-system network controller receives a virtual terminal message with a device address consisting of a lower-case and an upper-case letter, the network controller remembers that the message is from a virtual terminal for any reply messages that are forthcoming. The server-system network controller passes the message to either the MCP, the SMCS program, the SYCOM program, or application program. The virtual terminal addressing scheme used by the network controllers requires the server-system to reverse these device address characters prior to transmitting back to the user-system. These transmit/receive device addresses are specified in the NDL source file when compiling the network controller for each system.
4. Assume that a user-system network controller supports a connection for six virtual terminals to a server-system. The user-system refers to these terminals by the following virtual terminal (transmit) address.

aA, bA, cA, Aa, Ab, Ac

The server-system network controller must then refer to these same terminals by a virtual terminal (receive) address as follows.

aA, bA, cA, Aa, Ab, Ac

When the user-system receives messages from the terminals on the server-system, the user-system refers to these terminals with the following virtual terminal (receive) addresses.

Aa, Ab, Ac, aA, bA, cA

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

When the server-system receives messages from the terminals on the user-system, the server-system refers to these terminals with the following virtual terminal (transmit) addresses.

Aa, Ab, Ac, aA, bA, cA

The virtual terminals are declared in the STATION section of the NDL source file. The stations could appear as follows.

User-System Virtual Terminals

STATION USER1:

DEFAULT = VIRTUALTERM.
ADDRESS = "Aa", "aA". % "receive", "transmit" addresses.

STATION USER2:

DEFAULT = VIRTUALTERM.
ADDRESS = "Ab", "bA". % "receive", "transmit" addresses.

STATION USER3:

DEFAULT = VIRTUALTERM.
ADDRESS = "Ac", "cA". % "receive", "transmit" addresses.

STATION SERVER1:

DEFAULT = VIRTUALTERM.
ADDRESS = "aA", "Aa". % "receive", "transmit" addresses.

STATION SERVER2:

DEFAULT = VIRTUALTERM.
ADDRESS = "bA", "Ab". % "receive", "transmit" addresses.

STATION SERVER3:

ADDRESS = "cA", "Ac". % "receive", "transmit" addresses.

Server-System Virtual Terminals

STATION USER1:

DEFAULT = VIRTUALTERM.
ADDRESS = "Aa", "aA". % "receive", "transmit" addresses.

STATION USER2:

DEFAULT = VIRTUALTERM.
ADDRESS = "Ab", "bA". % "receive", "transmit" addresses.

STATION USER3:

ADDRESS = "Ac", "cA". % "receive", "transmit" addresses.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

STATION SERVER1:

DEFAULT = VIRTUALTERM.
ADDRESS = "aA", "Aa". % "receive", "transmit" addresses.

STATION SERVER2:

DEFAULT = VIRTUALTERM.
ADDRESS = "bA", "Ab". % "receive", "transmit" addresses.

STATION SERVER3:

DEFAULT = VIRTUALTERM.
ADDRESS = "cA", "Ac". % "receive", "transmit" addresses.

Refer to Appendix C, SYCOM Network Controller, for more information on the generation of a network controller for use with the SYCOM program.

The following events represent the terminal-to-program procedure implemented by the SYCOM program. These events portray an interactive session between a virtual terminal on a user-system and an application program on a server-system.

USER-SYSTEM

At initialization time, the SYCOM program issues a remote file information request to obtain from the network controller the Logical Station Numbers (LSNs) for the virtual terminals assigned to the system. These numbers are placed into a table which maps the actual LSN of each virtual terminal into a virtual LSN. The SYCOM program can then reference this table to find the corresponding virtual terminal knowing the actual LSN of a virtual terminal.

To establish a connection to a server-system, a CONNECT command is entered to the user-system SYCOM program. The SYCOM program finds the next available entry in its virtual LSN table and transmits a connect message to the server-system network controller. This connect message is a control message which contains a virtual terminal address. Upon receipt of the connect reply message from the server-system network controller, the SYCOM program replies with the results.

During the time span in which a connection exists, all data messages entered from a virtual terminal are sent to the server-system for processing. Two types of commands are excluded: 1) any local SMCS commands which are prefixed with the assigned SMCS signal character, or 2) local SYCOM program commands prefixed with the pseudo-signal character. This communication is accomplished by doing a remote file write to the network controller using the virtual terminal LSN. In processing this message, the user-systems network controller maps the virtual terminal LSN into the assigned 2-character virtual terminal address. The message is then transmitted to the server-system, according to the SYCOM program protocol, with the virtual terminal address. The terminal user can then sign on to any application program that is supported in the server-system, provided the capability is inherent in the form of a Message Control System (MCS) such as the SMCS program.

Any incoming message to the user-system network controller from a SYCOM line that contains a virtual terminal address (for example, Aa, Ab, or Ac) is sent to the SYCOM program. These messages are written into the SYCOM program remote file, called LINK, by the network controller with a device address appropriate for the terminal. When the SYCOM program reads the message, it searches the virtual terminal address table for the actual system LSN for that terminal. The SYCOM program then puts the actual LSN into the reply message and writes it into the network controller station queue for distribution to the originating terminal.

B 1000 System Communications Module (SYCOM) SYCOM System Overview

When the virtual terminal is an application program, the reply message is sent to that program by way of the queue mechanism used for program-to-SYCOM communications.

When the user wishes to disconnect from the server-system, a DISCONNECT command is entered to the local SYCOM program. The local SYCOM program transmits a disconnect control message through the user-system network controller to the server-system network controller, specifying the virtual terminal address to be disconnected. The terminal user is notified of this action and is then free to establish another connection or work pattern, as desired. Virtual terminals are not automatically disconnected when the system operator enters the EOJ command to the SYCOM program.

SERVER-SYSTEM

The server-system network controller handles connect and disconnect messages, in a manner that is different from the handling of other control messages which are routed directly to the SYCOM program. On receipt of a connect message, the server-system network controller verifies that the addressed virtual terminal exists and checks to see whether it can support another connection and if some interactive application program is ready to accept input. If so, the network controller returns a connect reply message indicating successful completion. Otherwise, the network controller sends back an error response in a connect reply message.

When the connection is successful, the server-system makes this virtual terminal appear as a local terminal to that system.

If the user is logged on to the SYCOM program by way of the SMCS program, then that user is automatically logged on to the server-system SMCS program.

During the time span a connection exists, any input data received by the server-system network controller for an enabled virtual station is sent to the waiting application program through the remote file or through the SMCS program. This message transfer occurs in exactly the same manner as for local terminals. Any output data generated by the application program is transmitted back to the user-system with the virtual terminal address specified.

The server-system network controller, upon receipt of a disconnect message, takes the necessary action to detach that virtual terminal and respond to the user-system network controller with an appropriate disconnect reply message. If the user was logged-on to the server-system SMCS program, then that user is automatically logged off the virtual terminal.

Remote Supervisory Console

The SYCOM program is capable of utilizing the ODT, an application program, or a terminal in a user-system as a remote ODT to a server-system. This occurs only when the SMCS program is running in the server-system. Figure 2-7 shows the message flow. For this system, the ODT is also referred to as a Remote Supervisory Console (RSC). This term was selected to imply capabilities which exceed normal capabilities of an ODT.

Messages transmitted from the RSC to the SYCOM program are grouped into two basic types:

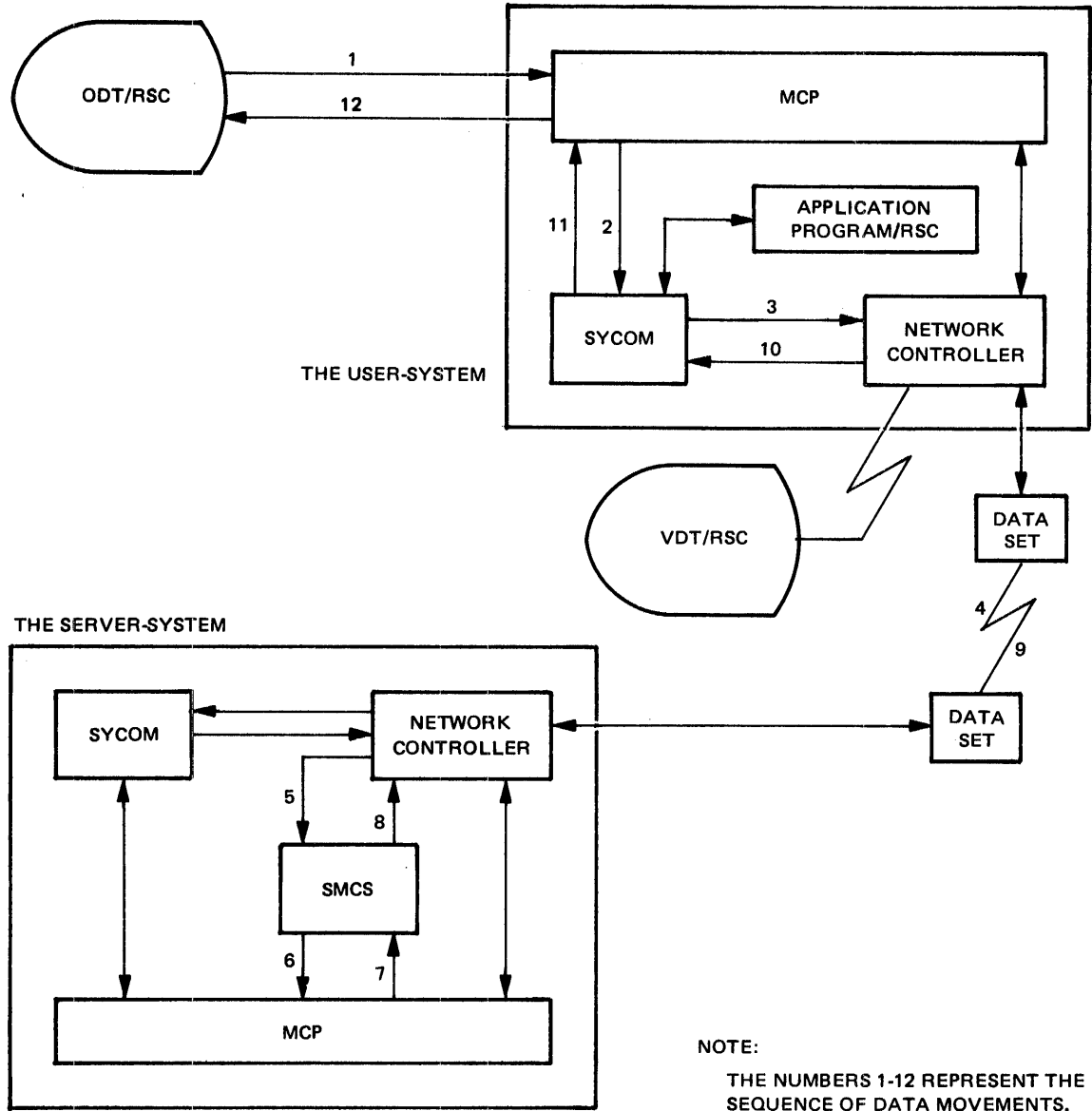
1. Local SYCOM commands.
2. Remote MCP commands.

Local SYCOM commands include commands received by the SYCOM program to initiate file transfers, request SYCOM status data, and operator responses to conditions within the domain of the SYCOM program which cannot be preprogrammed. These conditions can include card reader not ready or clear peripherals.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

Remote MCP commands received from a RSC are basically directives used to control the execution of jobs on the server-system. This is accomplished through the server-system SMCS program. Only certain MCP commands are permitted from a RSC when the RSC virtual terminal assignment is not declared as a remote ODT in the server-system network controller. For a list of the restricted MCP commands refer to Appendix I in this manual. Otherwise, only remote ODT restrictions apply.

Figure 2-7 shows the message flow from a Remote Supervisory Console (RSC) on a user-system to the MCP on a server-system. The numbers represent the message flow sequence.



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Figure 2-7. RSC Input/Output Message Flow

B 1000 System Communications Module (SYCOM) SYCOM System Overview

Output messages to the RSC can be grouped into four types:

1. Local SYCOM output messages.
2. Local MCP output messages.
3. Remote SMCS output messages.
4. Remote MCP output messages.

Local SYCOM output messages are normally responses to SYCOM commands but can also be error type messages reporting SYCOM problems.

Local MCP output includes such messages as NO PRINTER AVAILABLE and other such information messages which pertain to operations of a SYCOM system.

Remote SMCS messages are replies to SMCS commands entered for processing by the server-system SMCS program.

Remote MCP output messages include ODT type output resulting from jobs run on a server-system. These messages are routed back to the user-system SYCOM program for display.

In the case where the RSC is actually an application program, the response message is directed to that program by way of the SYCOM program-to-SYCOM queue mechanism.

Referring again to Figure 2-7, assume, for example, that a user wanted to execute a job on the server-system. Also, assume that the subject program and all data requirements reside in the server-system. The appropriate command string is entered to the user-system SYCOM program by way of the ODT/RSC. The SYCOM program accepts this message from the MCP and formats and transmits it to the server-system by way of the network controller on each system. The command string could also be entered from either a local terminal or application program. Although the message path is slightly different, the results are the same.

In the server-system, the SMCS program receives the MCP command message from the network controller and zips it to the MCP. The server-system MCP processes the request. All output messages pertaining to this job are given to the SMCS program which, in turn, gives them to the SYCOM program in the user-system. The user-system SYCOM program then displays these messages on the ODT/RSC.

Both systems can perform an identical set of functions provided both computer systems are like-systems. For example, two B 1000 computer systems are like-systems.

PROGRAM-TO-SYCOM COMMUNICATIONS

The same range of functions available with terminal-to-program communication is also available with the program-to-SYCOM facility. This feature is made possible by an adaptation of the terminal-to-program scheme.

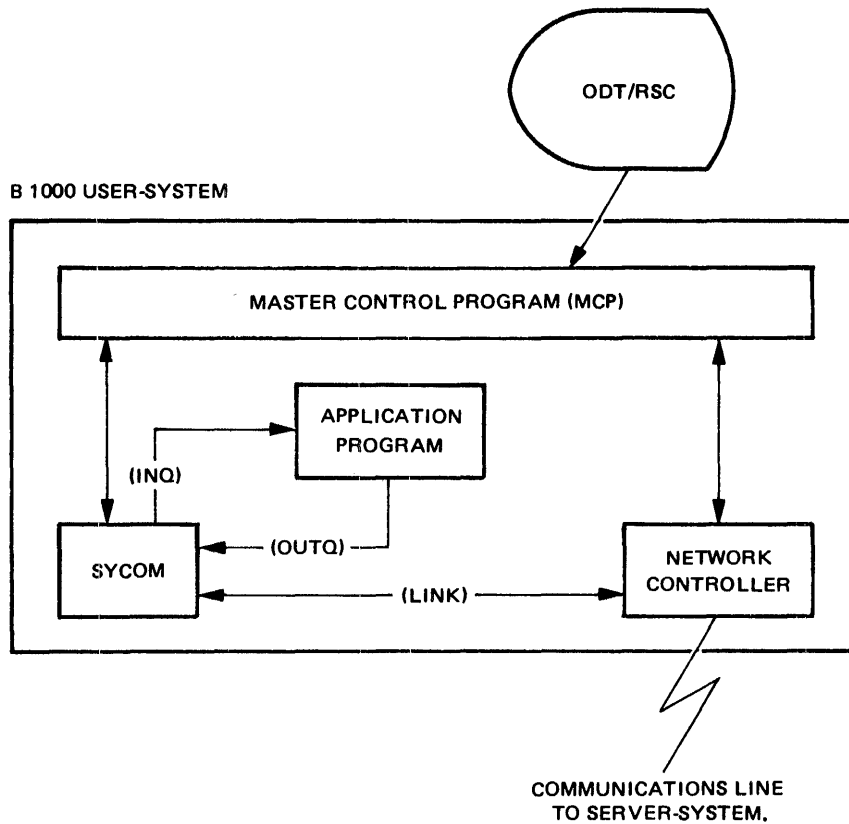
A feature is provided in the SYCOM program to allow an application program in the user-system to function as a terminal. This application program must format messages to appear as input from a terminal keyboard, and once formatted, these messages must be written to the SYCOM queue file for processing. The first 10 bytes of each message contains the program identification, message length, and message number.

Until a reply message is processed, processing for the SYCOM program is the same as for terminal-to-program commands. When the SYCOM program receives a reply message, it writes the message into the queue file. The application program then reads this queue file to obtain the message. These reply messages are formatted to terminal display specifications and contain a 2-character message key which identifies the message. Therefore, the application program can print, store, ignore, parse, or display the message text as appropriate for the program.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

The schematic in Figure 2-8 provides an overview of the mechanics for program-to-SYCOM communications. The application program gives a command to the SYCOM program by writing into the SYCOM OUTQ queue file. The application program obtains a response message by reading from the SYCOM INQ queue file.

No command restrictions are enforced for this method of communication. However, in order to invoke this feature, the SYCOM parameter PROGRAM must either be declared in the PARAMETERS file at initialization time or be enabled with the PROGRAM ON command. Refer to Appendix D in this manual for information concerning the program header and message formats for program-to-SYCOM communication.



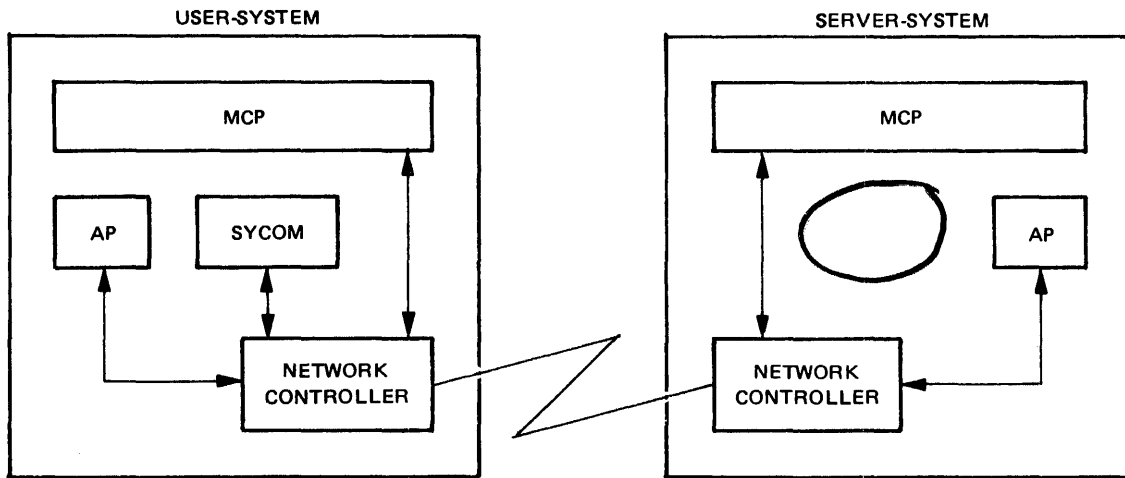
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Figure 2-8. Program-to-SYCOM Schematic

PROGRAM-TO-PROGRAM COMMUNICATIONS

The SYCOM program provides the capability for a program executing on one computer system to communicate with a program executing on another computer system. This capability is called program-to-program communication. In this mode of operation, the SYCOM program is not involved with the program-to-program message traffic and, therefore, does not provide any services to either program.

Figure 2-9 illustrates the message path for program-to-program communication. Communication occurs directly through the network controllers by way of a remote file. This remote file must be declared in each network controller, and both application programs must declare this remote file in the file declaration statements.



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Figure 2-9. Program-to-Program Communication

Each application program accepts input messages from the network controller and returns output reply messages to the same network controller for transmission to the other system or program.

Each application program must prefix each input/output message with a header. The format of this header is defined in Appendix D, Message Formats, in this manual. There are no text restrictions in these message formats except the maximum length of 1990 bytes.

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HARDWARE/SOFTWARE CONFIGURATIONS AND MESSAGE PATH ASSIGNMENTS

The System Communications Module (SYCOM) program is designed to operate in either of three levels:

1. As an individual entity without local terminals. This level is described in detail under the following heading, Level One System.
2. As an individual entity with local terminals. This level is described in detail under the following heading, Level Two System.
3. In conjunction with the Supervisory Message Control System (SMCS) program with terminals. This level is described in detail under the following heading, Level Three System.

Figures 2-10, 2-11, and 2-12 show the SYCOM system hardware configurations with supporting software elements for each of the three levels.

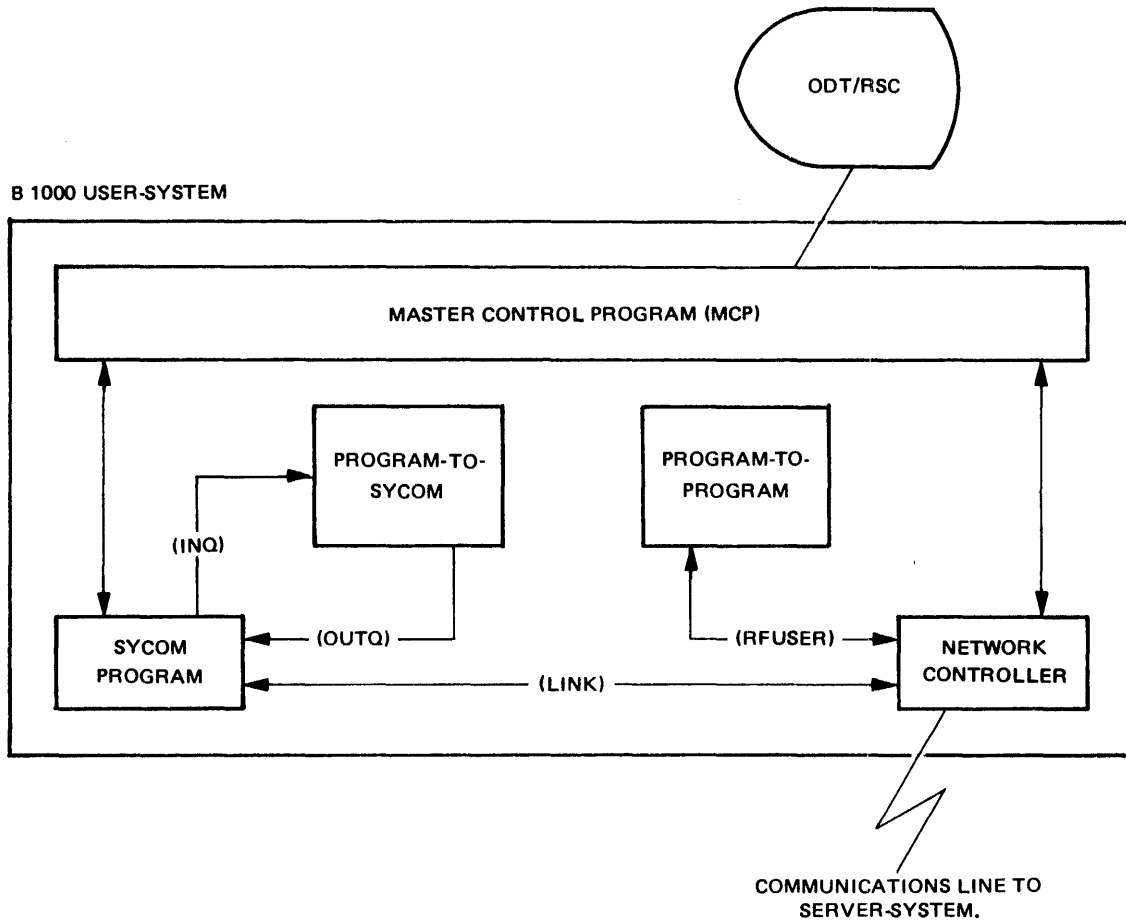
LEVEL ONE SYSTEM

This system configuration provides the SYCOM program user with the remote job entry, file transfer, and virtual terminal capabilities from the system ODT and the program-to-SYCOM and program-to-program communication capabilities. This level requires the smallest memory size commitment. Although the SYCOM program commands are generally confined to entry from the system ODT, special application programs running in the system can alternately write commands to the SYCOM program for processing.

Figure 2-10 shows the user-system schematic with the communication links between system software elements. Each of these links, queues, and remote files have specific purposes which are identified as follows:

1. INQ is a queue file used by the SYCOM program as output to an application program utilizing the program-to-SYCOM facilities.
2. OUTQ is a queue file used by the SYCOM program as input from an application program utilizing the program-to-SYCOM facilities.
3. LINK is a remote file specified in the NDL source program and is used in communication with a remote server-system. All RJE and virtual terminal input/output message traffic moves through this file. This remote file is directly related to the SYCOM communications line to a remote host.
4. RFUSER is a remote file specified in the NDL source program and is used for program-to-program I/O message traffic. This I/O message traffic moves primarily through the network controller on each system. All messages for this remote file move through the same communications line as those identified for the LINK file.

B 1000 System Communications Module (SYCOM)
 SYCOM System Overview



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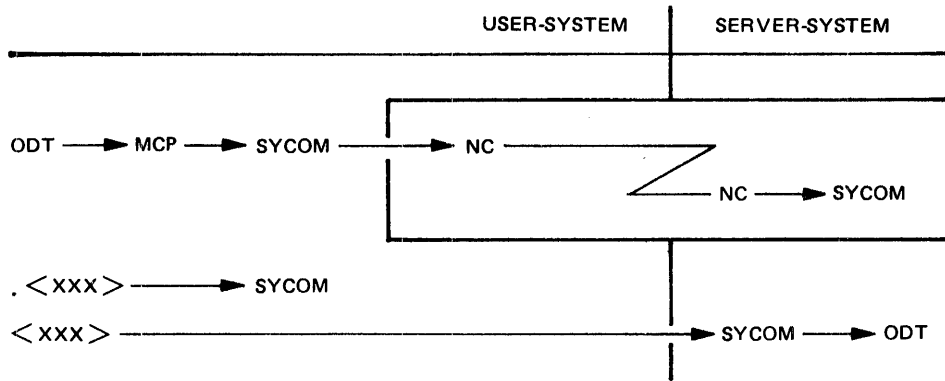
Figure 2-10. User-System Schematic

The following diagrams show the various paths a message can take in the SYCOM system. The directional flow arrows (→) indicate the path a message follows.

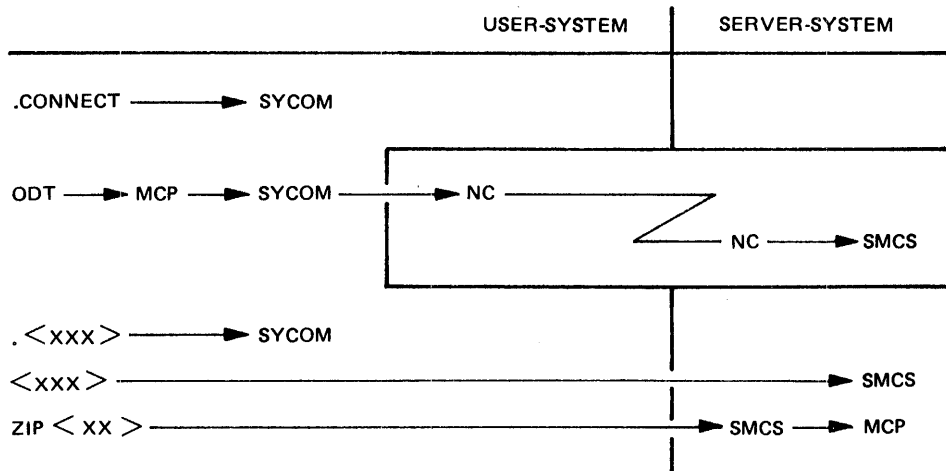
B 1000 System Communications Module (SYCOM)
SYCOM System Overview

ODT Input

There are three message paths for ODT input for the Level One System shown in Figure 2-10. The following diagrams and descriptions show each of these possibilities.



As shown in this diagram, all input command strings are given to the user-system SYCOM program by the MCP. Messages prefixed with a period (.) character are processed by the user-system SYCOM program. This period (.) character is called the pseudo-signal character and can be changed with the SIGNAL command. All other input messages are sent to the server-system SYCOM program which displays them on the server-system ODT. When the virtual terminal capability is invoked by using the CONNECT command, the following message paths are established.



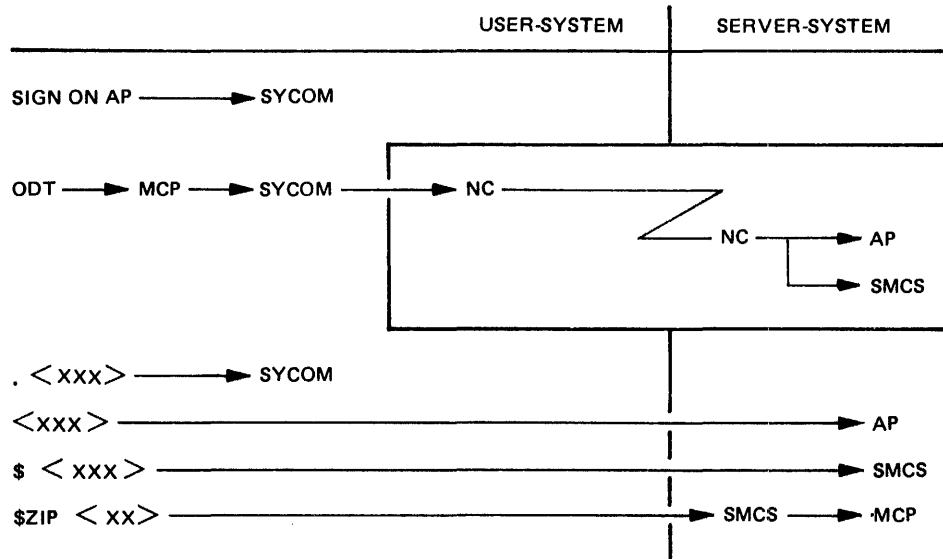
If there is no SMCS program currently running in the server-system, the following error message is returned to the requestor.

CONNECT DENIED, PROBABLY NO SERVER PROGRAM

Messages prefixed with the pseudo-signal character (default is “.”) are processed by the user-system SYCOM program. Non-prefixed messages are processed by the server-system SMCS program. Messages prefixed with ZIP are sent to the server-system MCP by way of the server-system SMCS program.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

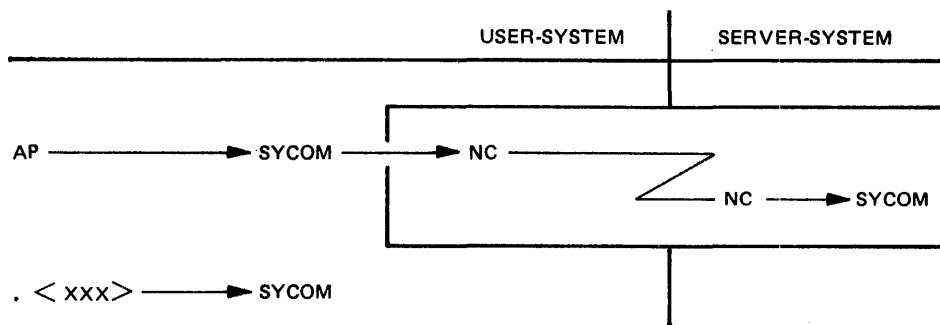
When the SMCS program is running on the server-system, the ODT operator either sign on to a program in that system or initiate Remote Supervisory Console (RSC) type commands through the SMCS program. When the virtual terminal is signed on to the specified application program, it is attached to that program. All further non-prefixed input is sent to this program for processing. In the following diagram, the dollar sign (\$) character is used as the server-system SMCS signal character.



Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Non-prefixed messages are processed by the server-system application program. Messages prefixed with a dollar sign (\$) character are sent to the server-system SMCS program. Messages prefixed with \$ZIP are sent to the server-system MCP by way of the server-system SMCS program.

Program-to-SYCOM Input

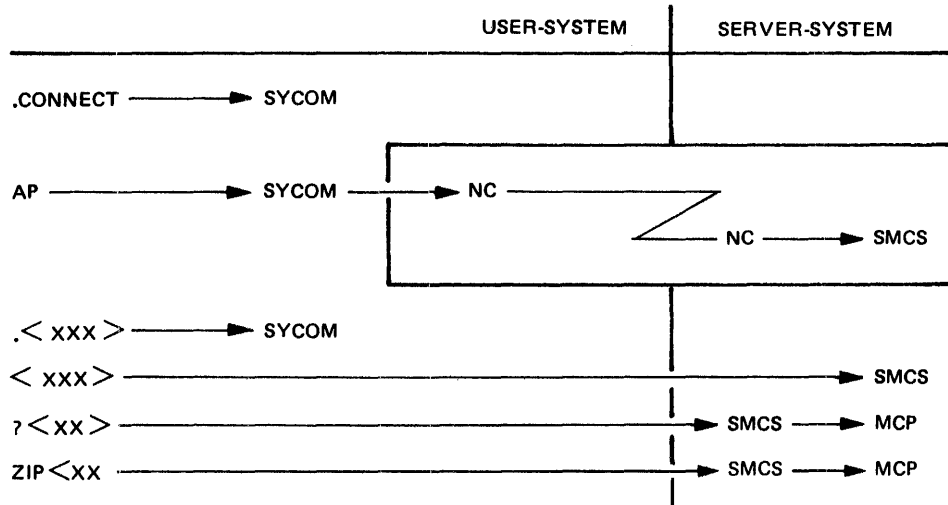
For program-to-SYCOM communications, the following message path assignments are available.



All input command strings are given to the user-system SYCOM program by the MCP through the OUTQ queue file. Messages prefixed with a pseudo-signal character that defaults to a period (.) character are processed by the user-system SYCOM program. All other input messages are sent to the server-system SYCOM program which displays them on the server-system ODT.

**B 1000 System Communications Module (SYCOM)
SYCOM System Overview**

When the virtual terminal capability is invoked by entry of a CONNECT command, the following message paths are established.

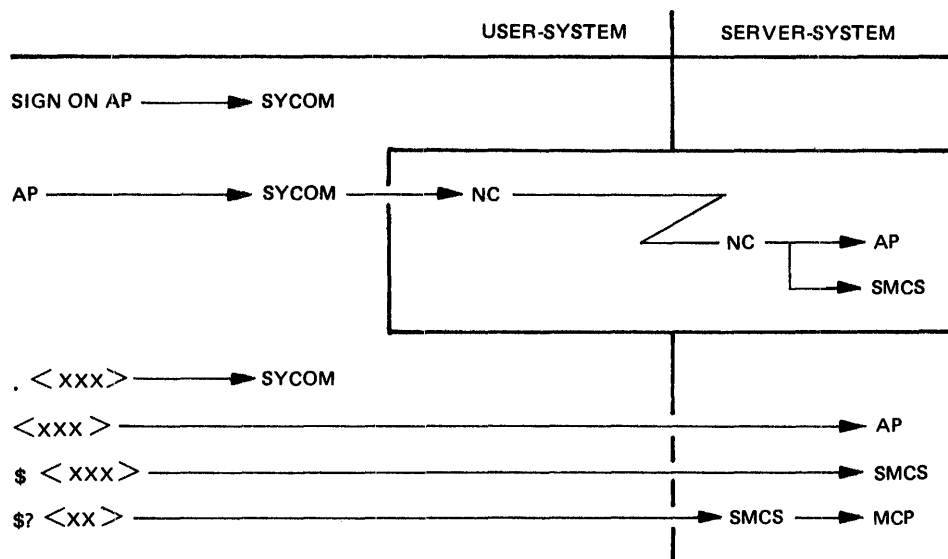


If there is no SMCS program currently running in the server-system, the following error message is returned to the requestor.

CONNECT DENIED, PROBABLY NO SERVER PROGRAM

Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Non-prefixed messages are processed by the server-system SMCS program. Messages prefixed with a question mark (?) character or the token ZIP for Remote ODT stations are sent to the server-system MCP by way of the server-system SMCS program.

When the SMCS program is running in the server-system, the application program can sign on to a program in that system or initiate RSC commands through the SMCS program. When this virtual terminal or program signs on a specific application program, the terminal is attached to the application program. All non-prefixed input is sent to that server-system program for processing. In the following diagram, the dollar sign (\$) character is used as the server-system SMCS signal character.

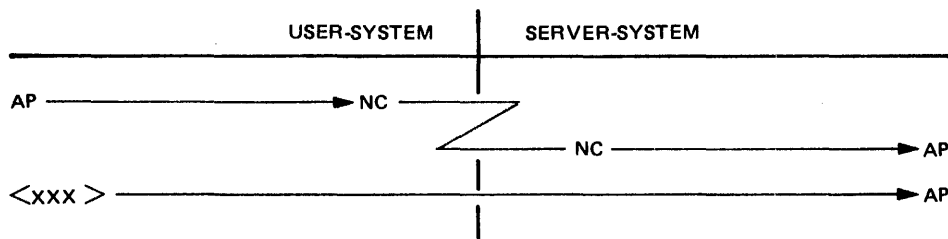


B 1000 System Communications Module (SYCOM) SYCOM System Overview

Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Non-prefixed messages are processed by the server-system SMCS program. Messages prefixed with the dollar sign (\$) character are sent to the server-system SMCS program. Messages prefixed with the dollar sign (\$) and question mark (?) characters are sent to the server-system MCP by way of the server-system SMCS program.

Program-to-program Input

The message path for program-to-program communications is limited to the predetermined path in the following diagram. Messages can be in any format and contain any text compatible with both application programs. The only prevailing restrictions are the maximum buffer size and that all messages must be prefixed with a header. Refer to Appendix D in this manual, for the message formats.



LEVEL TWO SYSTEM

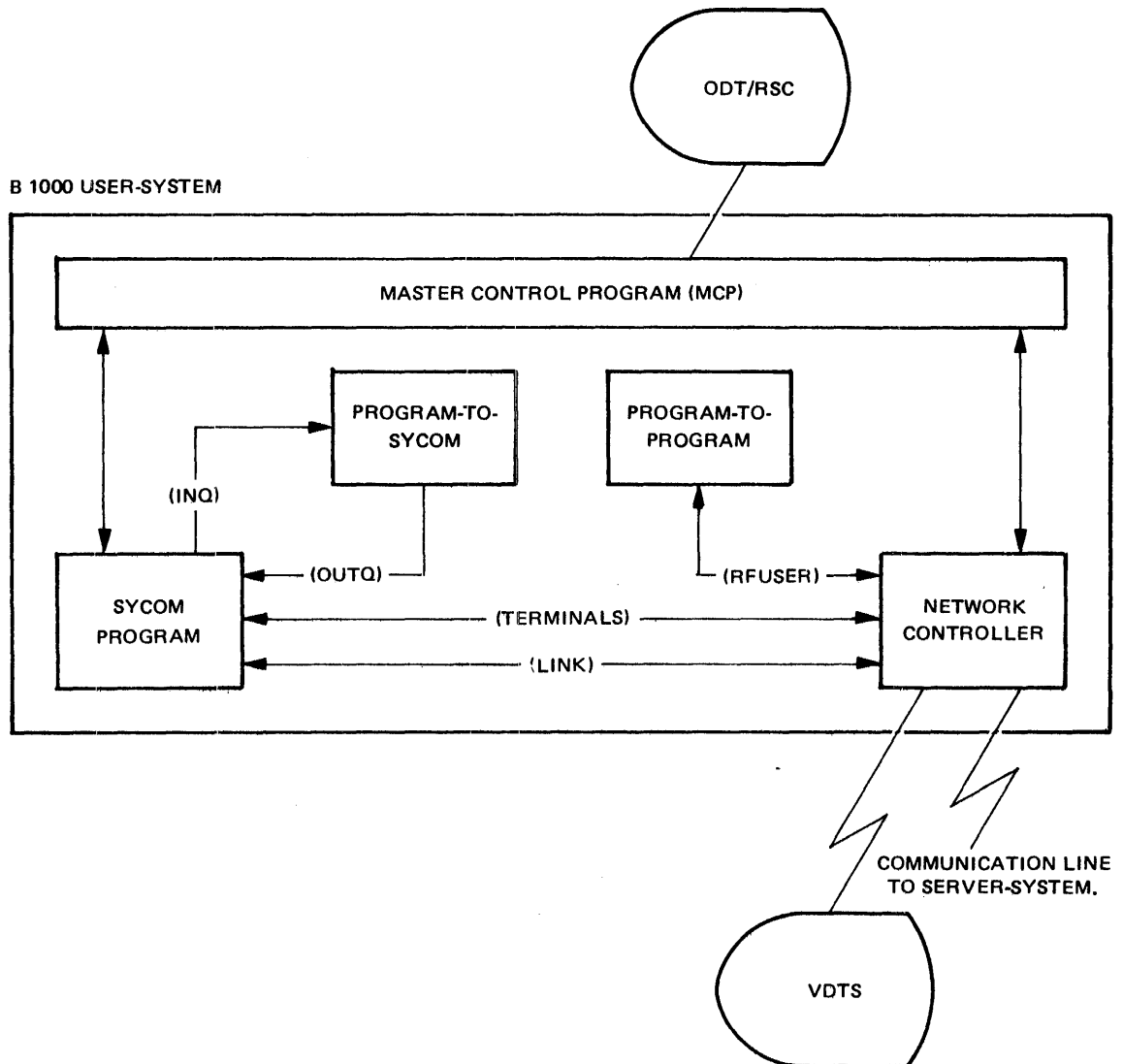
This system configuration provides all SYCOM services as outlined for the Level One System and also includes local terminals. With terminals, the SYCOM program functions can be invoked from outside the computer room and away from the system ODT. Terminals on the system increase memory usage in proportion to the number of terminals attached to the system and the number of lines for terminals. However, the memory increase is in the network controller program and not the SYCOM program.

Local terminals are exclusively owned and controlled by the SYCOM program. Although no operational SMCS program is required in a user-system, it is required in a B 1000 server-system when remote ODT type activities are required. The introduction of terminals in this system requires another remote file to be declared in the local network controller. This remote file is labeled TERMINALS and is used by the SYCOM program for local terminal input/output message traffic between the SYCOM program and the network controller.

Figure 2-11 shows the schematic of the Level Two System with terminals.

In the Level Two System configuration shown in Figure 2-11, the ODT and all terminals attached to and owned by the SYCOM program normally communicate with the local SYCOM program. When the virtual terminal capability is utilized, these devices are permitted to communicate with either the system software programs or appropriate application programs in the server-system.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

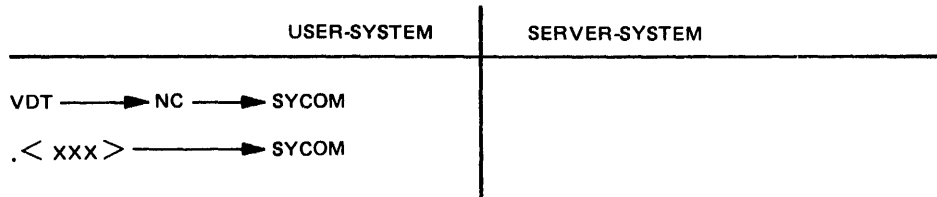


G12096

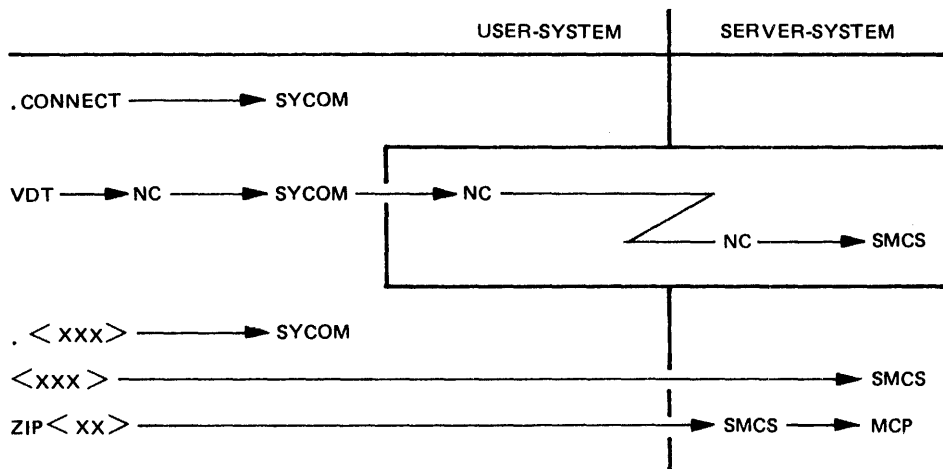
Figure 2-11. Schematic of the Level Two User-System with Terminals

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

The ODT, program-to-SYCOM, and program-to-program input message paths for this software configuration are the same as those defined for the Level One System. The message path assignments in the following diagram are for local terminals attached to this system.



The virtual terminal capability is invoked by entry of the CONNECT command to the SYCOM program. The following message paths are then established for the terminal.



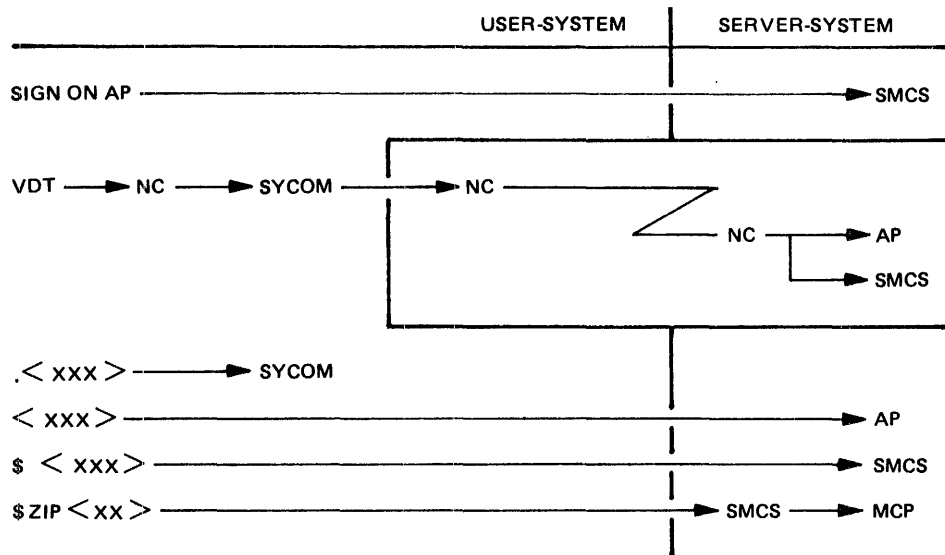
If there is no SMCS program currently running in the server-system, the following error message is returned to the requestor.

CONNECT DENIED, PROBABLY NO SERVER PROGRAM

Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Messages without the period (.) character are processed by the server-system SMCS program. Messages prefixed with ZIP are sent to the server-system MCP by way of the server-system SMCS program.

When the SMCS program is running in the server-system, the terminal user can either sign on to a program in that system or initiate RSC type commands through the SMCS program. When a virtual terminal signs on to a specified application program, the terminal is attached to that program. All further non-prefixed input is sent to that program for processing. In the following diagram, the dollar sign (\$) character is used as the server-system SMCS signal character.

B 1000 System Communications Module (SYCOM)
SYCOM System Overview



Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Non-prefixed messages are processed by the server-system SMCS program. Messages prefixed with the dollar sign (\$) character are sent to the server-system SMCS program. Messages prefixed with ZIP are sent to the server-system MCP by way of the server-system SMCS program.

LEVEL THREE SYSTEM

The Level Three System provides the same capabilities as outlined for the Level One and Level Two Systems and also provides the SYCOM terminal user with access to all of the capabilities provided by the SMCS program.

Local terminals in this system configuration are under direct control of the SMCS program. When a terminal is signed on to the SYCOM program by way of the SMCS program, the terminal is attached to the SYCOM program. When the SYCOM program attachment is no longer needed, the terminal can be detached from the SYCOM program by entering either of the following.

```
<SMCS signal character>OFF
BYE
```

In order for the SYCOM program to use the SMCS interface, an additional remote file labeled MCSREMOTE is required. MCSREMOTE is a remote file used by the SMCS program as a link to the system terminals. All terminal I/O message traffic between the SMCS program and the network controller passes through this file. During the time a terminal is signed on to the SYCOM program, certain messages are switched to the SMCS program for processing. These messages are prefixed with a SMCS signal character.

Figure 2-12 shows the schematic of the Level Three System with the SMCS program and terminals.

In the Level Three System shown in Figure 2-12, all local terminals are attached to and owned by the SMCS program; therefore, the normal message communication path is to the user-system SMCS program. When the virtual terminal capability is utilized, these terminals are permitted to communicate with either system software programs or appropriate application programs in the server-system. Additionally, these same terminals can communicate with any appropriate application program in the user-system.

B 1000 System Communications Module (SYCOM)
 SYCOM System Overview

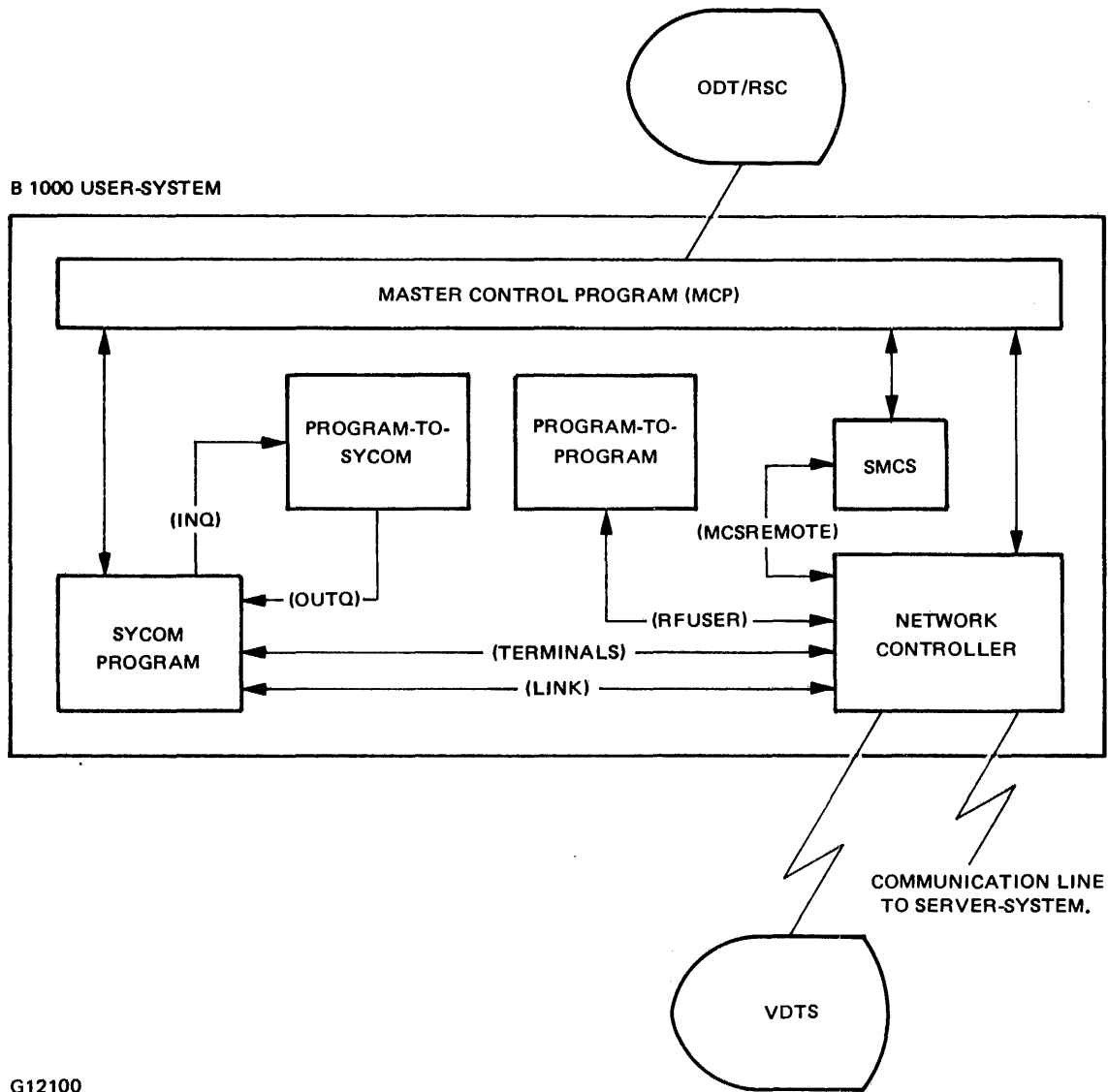
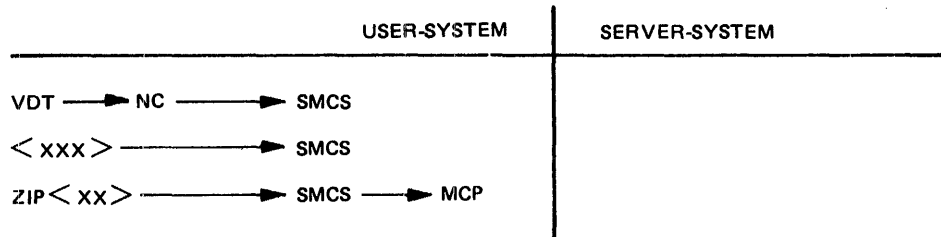


Figure 2-12. User-System Schematic (SMCS with Terminals)

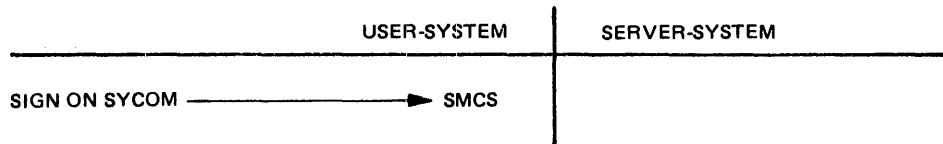
B 1000 System Communications Module (SYCOM)
SYCOM System Overview

The ODT, program-to-SYCOM, and program-to-program input message paths for this software configuration are the same as those defined for the Level One System. The following message path assignments are for all local terminals attached to the user-system SMCS program. The normal message paths for terminal input within the user-system are presented first.

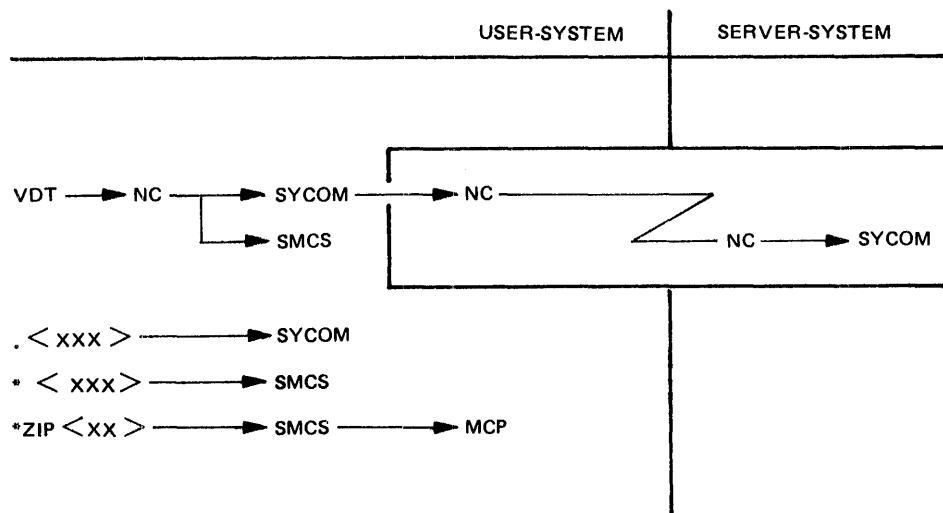


All input command strings are given to the user-system SMCS program. Messages prefixed with ZIP are sent to the user-system SMCS program and the SMCS program passes the messages to the MCP for processing.

In order for the terminal user to gain access to the user-system SYCOM program, the terminal user must enter the SIGN ON SYCOM command to the SMCS program as follows. Although this diagram shows how to sign on to the SYCOM program, it could be any appropriate application program in the user-system.



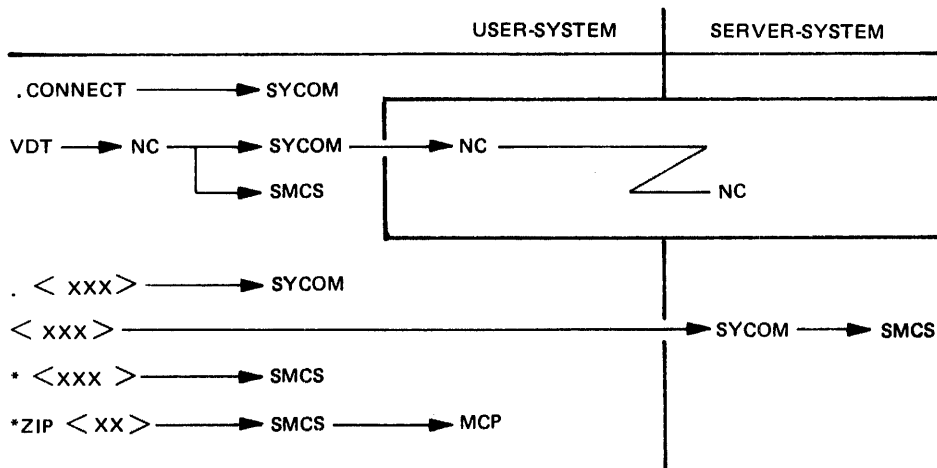
The following message path assignments are then in effect for all terminal input. The asterisk (*) character is used as the user-system SMCS signal character.



B 1000 System Communications Module (SYCOM)
SYCOM System Overview

Messages prefixed with the pseudo-signal character are processed by the user-system SYCOM program. Non-prefixed messages are sent to the server-system ODT by way of the server-system SYCOM program only from the system ODT. Non-prefixed messages from program or terminal input go to the local SYCOM program. Messages prefixed with the asterisk (*) character are sent to the user-system SMCS program. Messages prefixed with *ZIP are sent to the user-system MCP by way of the user-system SMCS program.

The virtual terminal capability is invoked when the terminal user enters the CONNECT command to the SYCOM program. The following diagram contains the message paths now established for the terminal, if the SMCS program is not currently running in the server-system.



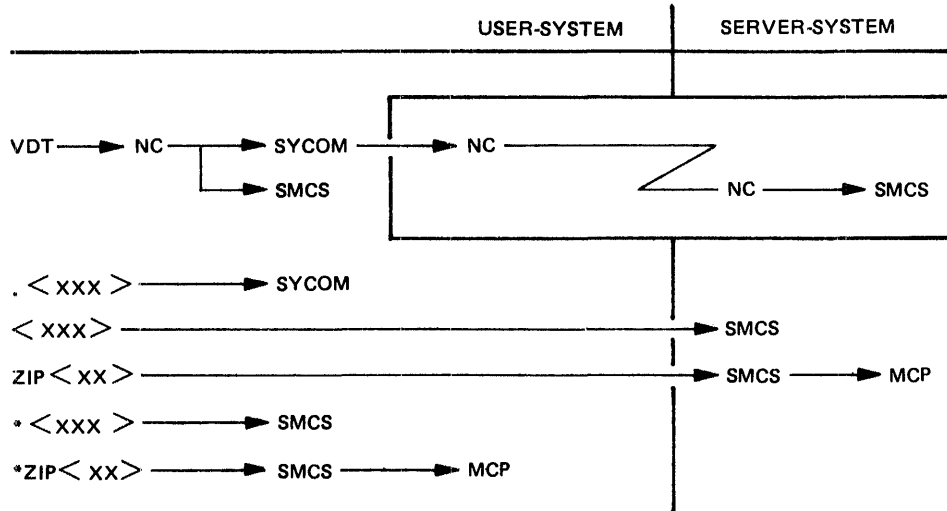
Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Non-prefixed messages are sent to the server-system SMCS program by way of the server-system network controller. Messages with the asterisk (*) character are sent to the user-system SMCS program. Messages prefixed with *ZIP are sent to the user-system MCP by way of the user-system SMCS program.

If there is no SMCS program currently running in the server-system, the following error message is returned to the requestor.

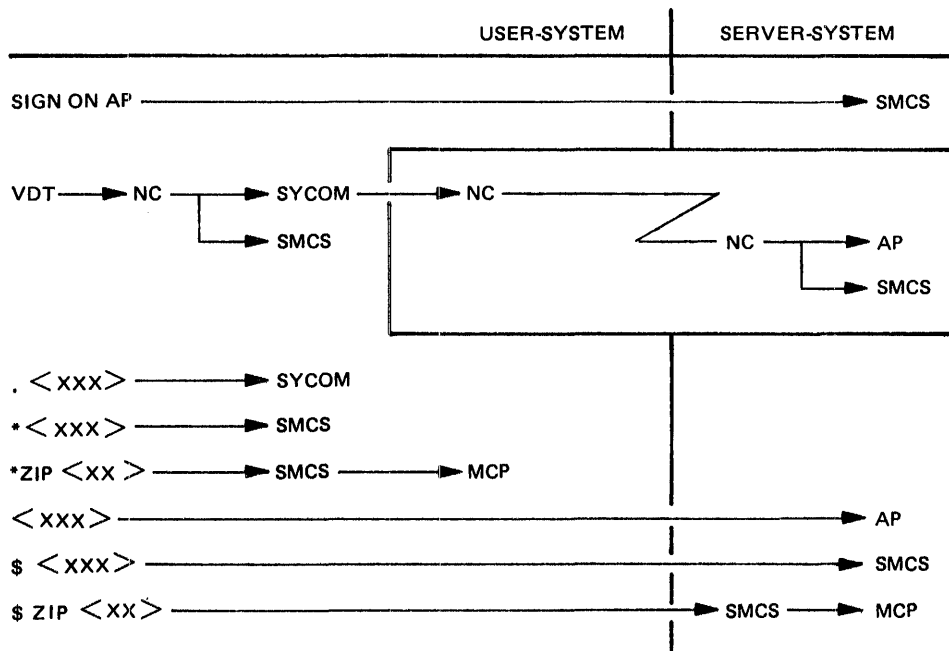
CONNECT DENIED, PROBABLY NO SERVER PROGRAM

B 1000 System Communications Module (SYCOM)
SYCOM System Overview

When the SMCS program is currently running in the server-system, the following message paths are established for the terminal.



With the SMCS program running in the server-system, a terminal user can either sign on to a program in that system or initiate RSC type commands through the SMCS program. When a virtual terminal is signed on a specified application program, the terminal is attached to that program until the terminal user signs off. All non-prefixed messages are sent to that application program for processing. In the following diagram, the asterisk (*) character is used as the user-system SMCS signal character and the dollar sign (\$) character is used as the server-system SMCS signal character. The period (.) character is used as the pseudo-signal character for the local SYCOM program.



B 1000 System Communications Module (SYCOM)
SYCOM System Overview

Messages prefixed with the period (.) character are processed by the user-system SYCOM program. Non-prefixed messages are sent to the server-system application program. Messages prefixed with the asterisk (*) character are sent to the user-system SMCS program. Messages prefixed with *ZIP are sent to the user-system MCP by way of the user-system SMCS program. Messages prefixed with the dollar sign (\$) SMCS signal character are sent to the server-system SMCS program. Messages prefixed with \$ ZIP are sent to the user-system MCP by way of the server-system SMCS program.

QUEUE DEPTH CONTROL

In the SYCOM operational environment there is an MCP controlled data path which exists between the SYCOM program and the network controller. This data path is referred to as the remote file (or message queue) mechanism. Because of differences in data communication line transmission rates and peripheral input speeds, this remote file becomes a buffer. Without some kind of control on the message traffic through this file, it could grow beyond reasonable limits or become full.

To provide a control over the number of message blocks that can be queued in this file at any given time, a marker message system is employed. As the SYCOM program is writing message blocks into this file, a count is maintained by the program. When this count reaches the halfway point of the queue depth limit, a marker message is put into the file. The marker message is a specially prepared data message with a code in the message header. This special code ensures recognition by the SYCOM program when this message is echoed back to/from the network controller.

Once a marker message is placed into the file, the SYCOM program continues writing message blocks into the remote file until the predetermined queue depth limit is reached, at which time peripheral input operations are suspended. When the network controller encounters the marker message during the transmission of the queued message blocks, it acknowledges receipt of a marker message by returning a flag in the corresponding ACK message to the SYCOM program. When the SYCOM program receives this acknowledgement, it resumes peripheral input, again places a marker message into the remote file, and continues writing message blocks into the remote file until the predetermined queue depth, or end-of-file condition is reached, whichever occurs first.

The queue depth and associated offset marker can be changed or interrogated with the QS command or specified with the QUEUESIZE parameter. The default is a queue depth of ~~four~~ and with an associated offset marker of ~~three~~. The value specified in the QS command or QUEUESIZE parameter is an integer representing the queue depth. The offset marker is automatically computed by the SYCOM program based on this value. The combinations of the queue depth and its associated offset marker follow.

5

Queue Depth	Offset Marker
4	3
5	3
6	4
7	4
8	5
9	5
10	6
11	6
12	7
13	7
14	8
15	8

8

FUNCTION OF THE NETWORK CONTROLLER

The SYCOM user-system is normally considered to be a remote job entry station and must initiate the transmission of data to the server-system. In a point-to-point, non-switched network, this is accomplished automatically by enabling the line adapter and then exchanging handshaking control messages with the server-system.

In a point-to-point switched network, the user-system must call the server-system. This is accomplished by either dial-out (automatic dialing by the computer) or by manual dial-up (dialing performed by the system operator) operations. The dialing operation is performed when the adapter is enabled. When the line connection is established, the exchange of handshaking control messages with the server-system is carried out. In a point-to-point, non-switched network no dialing is done.

Once this communication link is established with a server-system, line communication is identical for the switched and non-switched networks. The user-system and the server-system must be compatible as to transmission rate and other optional hardware capabilities.

CONVERSATIONAL COMMUNICATION PROCEDURE

The basic conversational line discipline used by the SYCOM program is described in the following text. The line discipline applies to a leased or switched point-to-point data communications line.

Message Transfer

All message blocks are delineated by special characters. Messages begin with a SOH character and end with a BCC character. The message control format is as follows: SOH, ARM, TM#, STX, DA1, DA2, message text (blocked records), ETX, and BCC.

Retransmission of Messages

If the transmitting system does not receive a reply to its last transmission within a given period of time, the unacknowledged message block is retransmitted.

Parity or Block-Check Error Handling

If the receiving system receives a recognizable message that contains either a parity or block-check error, it replies with a NAK. The transmitting system must retransmit the message. This transmission and reception is repeated until the retry limit is reached (the RETRY limit is specified in the STATION section of the network controller), and if the error persists, either system can initiate error recovery.

Message Idle State

If the receiving system receives a valid message and has no message to send, it responds with an ACK. If the sending system has a message to send, it responds with that message. If the sending system has no more messages to send, it goes into the message idle state.

Normal Termination

The normal termination of a conversation occurs when one system sends an ACK, which indicates that it has no more messages to send, and also the system receiving the ACK has no more messages to send. The system receiving the ACK goes into the message idle state.

POINT-TO-POINT CONTENTION PROCEDURE

The point-to-point contention procedure is a protocol in which two systems bid for master status of a data communications line.

Master Status

If either system is in the idle state and wants to begin a message transfer, it bids for master status by sending the DLE-ENQ sequence. If the same system has just terminated a message transfer by sending a DLE-EOT sequence, then there is a delay created before this system again sends the DLE-ENQ sequence.

Begin Message Transfer State

If the system bidding for master status receives an ACK, which indicates that the system is ready to receive, the system commences the message transfer. If the response is NAK, which indicates that the system is not ready to receive, the DLE-ENQ sequence is repeated until the retry limit is reached (the retry limit is specified in the STATION section of the network controller). If no valid response is received in this time, the error recovery commences. If the system bidding for master status receives the DLE-ENQ sequence, which indicates that the other system is bidding for master status at the same time, the system abandons the bid and replies in accordance with its readiness to receive. In order to avoid any line collisions when both systems are bidding at the same time, the no-response timeout values in the line adapters must be set to different values. This is true whether the systems are like or unlike.

Termination

The DLE-EOT sequence is transmitted by the terminating system to indicate the end of the session. If a switched line is used, the modem is disconnected.

TRANSMISSION OF PACKED DATA

Data records within a message block are separated by Record Separator (RS) characters. Repeated occurrences of blank characters are removed using the ESC-integer protocol.

If the data records contain only printable characters, the first character of the record is not a DLE character. Refer to Appendix B in this manual for the list of printable characters. If the data record contains any character not in the printable character set, the first character of the record must be a DLE character and the remainder of the record contains translated data. The original data is translated so that every four bits is mapped into an 8-bit printable character. The actual data transmission occurs in the ASCII character mode.

6 if Remote is B1000

SECTION 3

SYCOM PROGRAM OPERATING INSTRUCTIONS

GENERAL

This section describes the operating procedures used to initialize, execute, and terminate the SYCOM program. Instructions on how to print the TRACE file and basic terminal operation procedures are provided.

PRELIMINARY PROCEDURES

The following steps must be performed before the SYCOM program can be executed. Steps 2 and 7 are required; the others are optional.

1. Create the (SYSTEM)/USERCODE file (optional).
2. Generate the network controller.
3. Initialize the network controller in the MCP Name Table (optional).
4. Create the SMCS/JOBS file (optional, if running with the SMCS program).
5. Assign the program priorities (optional).
6. Set the SYCOM program switches (optional).
7. Create the SYCOM Parameters file.

The preceding steps need only be done prior to the first execution of the SYCOM program.

CREATING THE (SYSTEM)/USERCODE FILE

The list of all valid usercode/password combinations is in the (SYSTEM)/USERCODE file and can be created or updated with the SYSTEM/MAKEUSER program. Refer to the B 1800/B 1700 Systems System Software Operation Guide, Volume 2, form number 1108966, for a detailed description of the (SYSTEM)/USERCODE file and the operation of the SYSTEM/MAKEUSER program.

GENERATING THE NETWORK CONTROLLER

Before executing the SYCOM program, the user must generate a network controller for the SYCOM program. The network controller is generated using the NDL compiler. Refer to the B 1000 Systems Network Definition Language (NDL) Reference Manual, form number 1073715, for more information on generating the network controller. Refer to Appendix C, SYCOM network controller, for information on generating network controllers for use with the SYCOM program.

INITIALIZING THE NETWORK CONTROLLER IN THE MCP NAME Table

In order for the network controller to be automatically executed by the MCP, the MCP must know the name of the network controller. The name of the network controller must be placed into the C slot of the MCP Name Table. To accomplish this, enter the following MCP command.

```
CM C <network controller name>
```

The MCP responds with the following message.

```
NETWORK CONTROLLER CHANGED FROM "" TO "<network controller name>"
```

B 1000 System Communications Module (SYCOM) SYCOM Program Operating Instructions

To verify that the C slot in the MCP Name Table contains the correct network controller program name, enter the following MCP command.

```
WW C
```

The MCP responds with the following message.

```
C = "<network controller name>"
```

CREATING THE SMCS/JOBS FILE

If the SYCOM program is executed in conjunction with the SMCS program, placing the SYCOM program in the SMCS/JOBS file allows the SMCS program to execute the SYCOM program 1) when the SMCS program goes to beginning of job, 2) when a SMCS user enters the PASS SYCOM <command>, or 3) when a SMCS user signs on to the SYCOM program. The SMCS/JOBS file is a file containing information about programs to be run in conjunction with the SMCS program. If the SMCS/JOBS file exists, the SMCS program checks the file at beginning of job and when a SIGN ON or PASS operation occurs for a program. For a detailed explanation of the SMCS/JOBS file and how to create it, refer to the B 1000 Systems Supervisory Message Control System (SMCS) Reference Manual, form number 1108891.

The following is an example of an entry in the SMCS/JOBS file for the SYCOM program.

```
$ SYCOM          NO-EOF LOG-ON EXCEPT NO-RR AUTO-START;  
EX SYCOM; PP 10;MP 7; PT; CG 99999;  
FILE PARAMETERS NAME USER/HUB/PARAMETERS;
```

In this example, the SYCOM workfiles are on the disk labeled "USER" and the multifile identifier of "HUB".

SETTING PROGRAM PRIORITIES

For optimum system response, run the network controller and the SYCOM program at higher priorities than batch programs in the mix. Execute the network controller at a higher priority than the SYCOM program. The following example shows how to assign priorities to the network controller and the SYCOM program.

Example:

```
?MODIFY <network controller program name> PR 15;  
?MODIFY SYCOM PR 9;
```

SETTING PROGRAM SWITCHES

Prior to or during the execution of the SYCOM program, the SYCOM program switches can be set to optimize or invoke certain features of the program.

Program Switch 0

Setting program switch 0 to 4 causes the SYCOM program to omit the display of beginning of job messages until the link to the remote system has been established. If the two low-order bits of the switch are set, the DEBUG/DISK_TRACE trace facility is initiated from BOJ until the parameters file is read by the SYCOM program. As soon as the parameters file has been read, the values contained in the parameters file control the DEBUG/DISK_TRACE trace facilities. This feature is used for debugging purposes.

B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions

omit for 11.0

Program Switch 1

If program switch 1 is set to 1, the ~~OPEN_ON_BEHALF_OF~~ file security mechanism is not used for disk files. This causes the SYCOM program to use the Mark 7.0 file security mechanisms which does not use the ~~OPEN_ON_BEHALF_OF~~ file security mechanism. This switch is only examined when processing operator input. Changing program switch 1 to any value other than 1 restores the normal mode of operation with file security.

Program Switch 2

Program switch 2 is valid only when the TRACE parameter is specified in the parameters file or the TRACE ON command is entered to the SYCOM program.

Setting program switch 2 to 0 causes the SYCOM program to trace intersystem SYCOM control messages only. Setting program switch 2 to 15 causes the SYCOM program to write all messages and data lines to the DISK_TRACE file. Setting program switch 2 to a value between 0 and 15 causes the SYCOM program to write n number of data lines to the DISK_TRACE file, where n is the value specified for program switch 2.

Program Switch 3

If program switch 3 is set to 3, the output from the SERVER stations is included in the DISK_TRACE file if the TRACE parameter is set or in the DEBUG file if the DEBUG parameter is set.

Program Switch 4

Setting program switch 4 causes the SYCOM program to suppress the file transfer messages displayed on the system ODT. The value of program switch 4 determines which message is to be suppressed. The messages that can be suppressed follow.

Message Number	File Transfer Message
1	FILE "<file name>" START SENDING
2	FILE "<file name>" START RECEPTION
3	FILE "<file name>" SENT <n> RECORDS
4	FILE "<file name>" RECEIVED <n> RECORDS

B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions

Table 3-1 shows the file transfer messages that are suppressed for each of the 16 possible values of program switch 4.

Table 3-1. Suppression of File Transfer Messages

Value of Program Switch 4 (in hex)	Message Suppressed (by message number)			
	1	2	3	4
@0@				
@1@				x
@2@			x	
@3@			x	x
@4@		x		
@5@		x		x
@6@		x	x	
@7@		x	x	x
@8@	x			
@9@	x			x
@A@	x		x	
@B@	x		x	x
@C@	x	x		
@D@	x	x		x
@E@	x	x	x	
@F@	x	x	x	x

NOTE

The "x" indicates that the message is suppressed.

If program switch 4 equals @0@, no messages are suppressed. If program switch 4 equals @F@, all the messages are suppressed.

Program switch 4 applies only to the local SYCOM program and does not affect the file transfer messages displayed by the SYCOM program on the other system.

Program Switch 5

Setting program switch 5 to 5 causes the SYCOM program to automatically print the DISK_TRACE file whenever the SYCOM program appears to out of phase, that is, whenever unexpected messages are received from the remote SYCOM program.

Setting program switch 5 to 5 causes the SYCOM program to automatically print the DISK_TRACE file when the file becomes full. The SYCOM program continues writing trace records beginning at record number 1 in the DISK_TRACE file.

B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions

Parameter for 11.0
6 = 13 for BIT 4 NC

Program Switch 6

Setting program switch 6 to 6 causes the SYCOM program to display the statistics of the SYCOM log on the system ODT whenever the DISK_TRACE file becomes full. The SYCOM program begins writing trace records to the DISK_TRACE file at record number 1.

Setting program switch 6 to 7 causes the SYCOM program to automatically write the SYCOM log to the program INQ file when the DISK_TRACE file becomes full. *Does it?*

Program Switch 7

Setting program switch 7 to 1 causes an entry in the STATISTICS file to be generated for files that have been received from a remote system.

Setting program switch 7 to 2 causes an entry in the STATISTICS file to be generated for files that have been transmitted to a remote system. *not for 11.0*

Setting program switch 7 to 3 causes an entry in the STATISTICS file to be generated for any file transfer that has occurred, that is, both sending and receiving.

WORKFILE NAMING CONVENTIONS

The family name of the SYCOM workfiles (NEWPARAMS, PUTQFILE, INQ, OUTQ, STATISTICS, RJE_Q, LINK_Q, DISK_TRACE, and OLDTRACE) are determined from the family name of the PARAMETERS file. The user disk identifier of the disk workfiles (NEWPARAMS, PUTQFILE, STATISTICS, DISK_TRACE, and OLDTRACE) is determined from the user disk identifier of the PARAMETERS file.

The family name and disk identifiers of the parameters file are determined as follows:

1. If any file equation has been made for the PARAMETERS file by the operator, the actual name and/or disk identifier specified is used.

a. Examples:

- 1) EXECUTE SYCOM FILE PARAMETERS PID USER.DISK;
- 2) EXECUTE SYCOM FILE PARAMETERS NAME USER.PARMS;
- 3) EXECUTE SYCOM FILE PARAMETERS NAME USER.PACK/HUB/PARAMS;

- b. The actual files names for the PARAMETERS file resulting from the file equations shown above are as follows:

- 1) USER.DISK/ ^{SYCOM} /PARAMETERS
- 2) USER.PARMS
- 3) USER.PACK/HUB/PARMS

2. If no file equation has been made for the PARAMETERS file by the operator, the disk identifier and the family name are taken from the actual name of the SYCOM program.

a. Examples:

- 1) EXECUTE SYCOM
- 2) EXECUTE HUB.SYCOM
- 3) EXECUTE DC/SYCOM10/SA1

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b. The actual names for the PARAMETERS file resulting from the EXECUTE statements above are as follows:

- 1) SYCOM/PARAMETERS
- 2) HUB.SYCOM/PARAMETERS
- 3) DC/SYCOM10/PARAMETERS

All workfiles are changed by the SYCOM program to have the same family name and disk identifier as the parameters file. Thus, multiple copies of the SYCOM program can be run on a single B 1000 system and the workfiles can be located on different user disks as desired.

Since the only way to force printer backup files to a user disk is by using the MCP "BD" command, the SYCOM program cannot force the DEBUG or LIST files to a user disk. The family name of these files is changed to the same family name as the other workfiles so that there is no confusion over the labeling of printer files from multiple copies of the SYCOM program.

CREATING THE SYCOM PARAMETERS FILE

When the SYCOM program is executed for the first time or if the SYCOM PARAMETERS file is not on disk, a PARAMETERS file must be created. At beginning of job, the SYCOM program first checks for the PARAMETERS file on disk. The actual label of the PARAMETERS file is determined in the manner described in the subsection on workfile naming conventions in this section. If the PARAMETERS file is present and of the correct version, the SYCOM program uses the parameters specified in the disk file. If the disk file is not present, the SYCOM program checks for a NEWPARAMS card file. The actual label of the NEWPARAMS file is determined in the manner described in the subsection on workfile naming conventions in this section. If the card file is not present, the program looks for the NEWPARAMS file on disk. If the NEWPARAMS file is present as either a card file or a disk file, the SYCOM program uses the parameters specified in the file to create the PARAMETERS disk file. Otherwise, the SYCOM program prompts the user to enter the parameters or "END" from the system ODT.

After the parameters have been entered, the SYCOM program creates a disk file labeled PARAMETERS for use the next time the program is executed. The PARAMETERS file does not need to be recreated unless the file is removed or requires permanent changes. The parameters can be changed or interrogated for the current execution of the SYCOM program by entering the parameter name and a value in an ACCEPT message. To create a new PARAMETERS file, the following steps must be followed:

1. Make the required changes to the NEWPARAMS file.
2. Remove the PARAMETERS disk file.
3. Terminate the SYCOM program.
4. Re-execute the SYCOM program.

Refer to Section 4 for a description of the SYCOM parameters.

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Preparing the NEWPARAMS Card File

The NEWPARAMS file can be a card file.

The following is an example of a NEWPARAMS card file.

Example

```
?DATA NEWPARAMS
SYSTEMID = USER1          %
BUFFER = 1100             % Allows 3 code-file records
                          1212          % per transmission
DEFAULTPSEUDOSIGNAL $    % Use "$" instead of "."
GROUPSIZE = 1             % The default is 9.
NOES                     % Required for Host RJE.
NOFTP                     %
NOPROGRAM                 %
QUEUE SIZE = 6            % The default value is 4.
WAIT                     % The default is no wait.
TIMEOUTS = 0              % The default is 11.
DEBUG                    % The default is false.
TRACE                    %
TRACEAREAS = 25           % The default value is 20.
TRACEBA = 8               % The default value is 10.
TRACERB = 5               % The default value is 4.
END                       % This is optional.
?END
```

The question mark (?) character in this example represents an invalid character for 80-column cards. The percent sign (%) character causes the SYCOM program to stop scanning the record. This allows user comments to be included in a parameter record.

This example does not show all of the available SYCOM parameters. If a parameter is not specified in the card file, the SYCOM program uses the default value for the parameter.

Preparing the NEWPARAMS Disk File

The NEWPARAMS disk file can be created by using the CANDE program. The parameters can be entered into the NEWPARAMS file in free-form format. The parameters can be entered in either upper- or lower-case letters. The percent sign (%) character can be used to denote the beginning of comments for documentation purposes. The following CANDE-created disk file shows what the NEWPARAMS file can look like. If the CANDE program is used to create the NEWPARAMS file, it can be of type DATA or SEQDATA.

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Example:

```
%  
% Sample NEWPARAMS file.  
%  
% Lower-case entries are allowed in parameters file for  
% parameters.  
%  
systemid = B1885          % Special characters are not allowed.  
                          % If this parameter is not specified,  
                          % the SYCOM program uses the MCP  
                          % HOSTNAME.  
                          %  
defaultpseudosignal &   % Controls the SYCOM pseudo-signal  
                          % character. The default is ".".  
                          %  
groupsize = 5           % Controls the number of files that  
                          % can be sent at one time when sending  
                          % an entire family of files. The  
                          % default is 9.  
                          %  
buffer = 1950        % The maximum buffersize is 1950. 2421  
                          %  
inbuffers = 5           % Number of buffers assigned to  
                          % file "IN" at BOJ. Default is 3.  
                          %  
outbuffers = 5          % Number of buffers assigned to  
                          % file "OUT" at BOJ. Default is 3 2  
                          %  
program                 % Allows program-to-SYCOM function.  
                          % The default is program.  
                          %  
% noprogram            % Inhibits program-to-SYCOM function.  
                          % The default is program.  
                          %  
% noftp                % Inhibits file transfer function.  
                          % The default is false.  
                          %  
queuesize = 8          % Controls the number of messages  
                          % that can be written in the "LINK"  
                          % file. Range is from 1 to 15.  
                          % The default is 4.  
                          %  
timeouts = 11          % If n timeouts occur, the remote  
                          % SYCOM program is considered  
                          % off line. The default is 11.  
                          %  
% wait                 % Prevents SYCOM from going to EOJ  
                          % when a disconnect message is  
                          % received. The default is no  
                          % wait.  
                          %
```

2421
Remove for 12 φ

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```
nowait                % Allows SYCOM to go to EOJ
                      % when disconnect message is
                      % received. The default is no
                      % wait.
                      %
% trace               % Allows disk tracing function.
                      % The default is trace.
                      %
notrace               % Inhibits disk tracing function.
                      % The default is trace.
                      %
tracerb = 4           % Specifies the number of records
                      % per block for the trace file.
                      % The default is 4.
                      %
traceba = 10          % Specifies the number of blocks
                      % per area for the trace file.
                      % The default is 10.
                      %
traceareas = 20       % Specifies the number of areas
                      % for the trace file. The
                      % default is 20.
                      %
% debug               % Allows printer tracing. The
                      % default is no debug.
                      %
% nofs                % File separators are allowed by
                      % default. This parameter is used
                      % in conjunction with the Host RJL
                      % program which does not allow file
                      % separators.
                      %
end                   % END is optional and signifies
                      % the end of the parameters.
                      %
```

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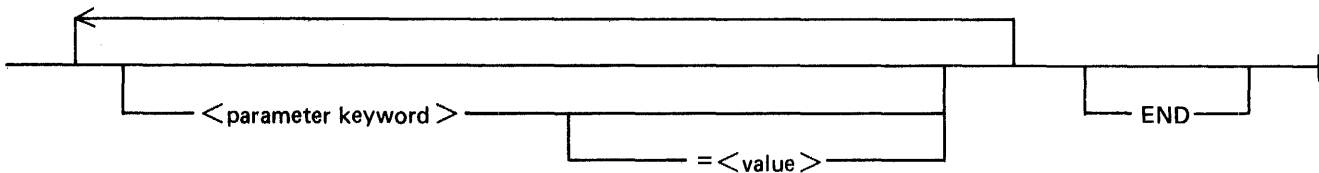
Entering the Parameters Through the ODT

If the SYCOM program does not find a disk file labeled PARAMETERS, a card file labeled NEWPARAMS, and a disk file labeled NEWPARAMS, the following message is displayed on the ODT.

```
% SYCOM = <job #> ENTER OPTIONAL SYCOM PARAMETERS OR END  
% SYCOM = <job #> ACCEPT
```

The SYCOM program is then ready to accept parameters from the ODT. The parameters are entered in free-form format and are terminated by an END parameter.

The parameters must be entered with ACCEPT entries in the following format:



Semantics

<parameter keyword>

Any valid SYCOM parameter. Refer to Section 4 for a discussion of the SYCOM parameters.

<value>

A value assigned to a SYCOM parameter. Refer to Section 4 for a discussion of the SYCOM parameters.

The parameter entries are prefixed by the SYCOM job number and the MCP AX (ACCEPT) keyword. Multiple ACCEPT entries are allowed. The sequence is terminated by the END parameter.

The SYCOM program checks each parameter for correct syntax and validity. Any incorrect entry invalidates all entries in that ACCEPT entry. Correct the error and re-enter the ACCEPT entry. If the default value for a parameter is desired, it is not necessary to include it in the ACCEPT entries.

Example:

```
1234AX INBUFFERS=10 OUTBUFFERS=10 TRACE WAIT END
```

EXECUTION OF THE SYCOM PROGRAM WITHOUT SMCS

To execute the SYCOM program when the SMCS program is not included in the system, enter the following command from the ODT.

```
EXECUTE SYCOM
```

The MCP initiates the job and displays the following message.

```
SYCOM = <job #> BOJ. PP=12, MP=12 TIME = 08:14:51.2
```

When the SYCOM program attempts to open the first remote file, the MCP automatically executes the network controller program that is specified in the C slot of the MCP Name Table.

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At initialization time, the SYCOM program looks for a disk file labeled PARAMETERS. If the user file equates the PARAMETERS to have a different family name and/or user disk identifier, that family name and/or disk identifier is assigned to all SYCOM workfiles. This file equating is necessary if multiple copies of the SYCOM program are to be running at the same time. If the disk file is present, the program uses the parameters in the file. If the disk file is not present, the SYCOM program checks the card reader for a card file labeled NEWPARAMS. If the card file is present, the SYCOM program uses the parameters specified in the card file and creates a new PARAMETERS disk file. If the card file is not present, the SYCOM program looks for a disk file labeled NEWPARAMS. If the disk file is present, the program uses the parameters specified in the disk file and creates a new PARAMETERS disk file. If the NEWPARAMS file is not present, the SYCOM program displays a message on the ODT and accepts the parameters from the ODT. Refer to SYCOM Parameters in Section 4 for a definition of each parameter.

After the parameters are entered, the SYCOM program creates the disk file labeled PARAMETERS. The PARAMETERS file does not need to be recreated unless the previous PARAMETERS file was removed or requires changes. If changing the parameters in the PARAMETERS file is required, make the required changes to the NEWPARAMS card or disk file, remove the PARAMETERS file, and re-execute the SYCOM program.

If a network controller is executing before the SYCOM program is executed, the MCP does not execute another network controller. That is, if a network controller is running, the SYCOM program opens its remote files and continues processing. If a network controller is not currently executing and the network controller program name is in the C slot of the MCP Program Name Table, the MCP automatically executes the named network controller program.

The MCP responds with the following message.

```
<network controller name> = <job #> BOJ. PP=15, MP=15  
TIME = <current system time>
```

If there is no network controller name entered in the MCP Program Name Table, then either of the following messages are displayed on the ODT.

```
REMOTE FILE "TERMINALS" NEEDS A CONTROLLER  
REMOTE FILE "LINK" NEEDS A CONTROLLER
```

The system operator must then execute the appropriate network controller by entering the following command.

```
EX <network controller name>
```

The MCP then responds with the following message.

```
<network controller name> = <job #> BOJ. PP=15, MP=15  
TIME = <current system time>
```

The MCP displays the beginning of job message and permits the remote file opens to occur. The SYCOM program is then operational, and the following message is optionally displayed on the system ODT depending on the value of program switch zero.

```
RUN DAY = <system week-day name> <date> AT <time>
```

If 1) switched data communication lines are being used, 2) an Automatic Calling Unit (ACU) is present, and 3) a telephone number is provided, the network controller initiates the dial-out.

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As soon as successful contact with the default server-system has been completed, the following messages are displayed on the user-system ODT.

```
% SYCOM =<job #> MFID_OF_WORK_FILES = B1985 on SYSTEM DISK.  
% SYCOM =<job #> RUN DAY = <date and time>  
% SYCOM =<job #> number of USER STATIONS in NC = 8, NUMBER UNUSED  
in SYCOM = 2, Total = 10  
% SYCOM =<job #> **** SYCOM <release version> (<compile date>) ****  
% SYCOM =<job #> **** SYCOM <release version> (<compile date>) ****  
NOW ONLINE TO REMOTE HOST = <server-system systemid>  
AT <time> ON <date>
```

EXECUTION OF THE SYCOM PROGRAM WITH SMCS

When the SYCOM program is executed in conjunction with the SMCS program, the SYCOM program can be executed by the SMCS program through the SMCS job spawning facility. This can occur when the first terminal user signs on or passes to the SYCOM program from a local terminal, when the AUTO-START option is specified in the SMCS/JOBS file, or when the INITIATE command is entered from the system ODT. The SYCOM program must be included in the SMCS/JOBS file. Refer to the B 1000 Systems Supervisory Message Control System (SMCS) Reference Manual, form number 1108891, for information on creating the SMCS/JOBS file.

SMCS SIGNAL CHARACTER

For a functional SYCOM network, a different SMCS signal character should be designated for each SMCS program in the SYCOM network.

An SMCS signal character can be changed while on-line. This can be accomplished by entering a signal character change command from either a local or remote source. The command syntax follows.

```
MAKE SIGNAL <character>
```

RUNNING MULTIPLE COPIES OF SYCOM

To run multiple copies of the SYCOM program at the same time, it is necessary to modify the family name and/or disk identifier of the PARAMETERS file. The SYCOM program modifies all workfiles to have the same family name and/or disk identifier

It is also necessary to modify the LINK file to the name of the file declared in the network controller.

For users not using the SMCS program, these modifications can be made at execution time or can be made permanently. If the modifications are made permanently, it is necessary to have separate copies of the SYCOM program for each remote system. If the modifications are made at execution time, the user can take advantage of the re-entrant code capabilities of the MCP. The following is an example of executing two copies of the SYCOM program at the same time:

```
US SYCOM1 EXECUTE SYCOM FILE LINK NAME LINK1;  
FILE PARAMETERS NAME (SYCOM1)/PARAMETERS;  
  
US SYCOM2 EXECUTE SYCOM FILE LINK NAME LINK2;  
FILE PARAMETERS NAME (SYCOM2)/PARAMETERS;
```

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Another method of executing the SYCOM program without usercodes is as follows:

```
COMPILE SYCOM1 WITH SYCOM FOR SYNTAX;  
FILE LINK NAME LINK1;  
FILE PARAMETERS NAME SYCOM1/PARAMETERS PID USER;
```

```
COMPILE SYCOM2 WITH SYCOM FOR SYNTAX;  
FILE LINK NAME LINK2;  
FILE PARAMETERS NAME SYCOM2/PARAMETERS PID USER;
```

In the second example, the SYCOM program appears in the mix as follows:

```
SYCOM: SYCOM1 <job #>  
SYCOM: SYCOM2 <job #>
```

This allows users who do not wish to use usercodes to readily identify separate SYCOM programs. If the SMCS program is to be used, the entries must be made in the SMCS/JOBS file. Two examples of entries in the SMCS/JOBS file are as follows:

With usercodes:

```
$ SYCOM1 NO-EOF LOG-ON EXCEPT NO-RR;  
US SYCOM1 EXECUTE SYCOM FILE LINK NAME LINK1;  
FILE PARAMETERS NAME (SYCOM1)/PARAMETERS;  
  
$ SYCOM2 NO-EOF LOG-ON EXCEPT NO-RR;  
US SYCOM2 EXECUTE SYCOM FILE LINK NAME LINK2;  
FILE PARAMETERS NAME (SYCOM2)/PARAMETERS;
```

Without usercodes:

```
$ SYCOM1 NO-EOF LOG-ON EXCEPT NO-RR;  
COMPILE SYCOM1 WITH SYCOM FOR SYNTAX;  
FILE LINK NAME LINK1;  
FILE PARAMETERS NAME SYCOM1/PARAMETERS PID USER;  
  
$ SYCOM2 NO-EOF LOG-ON EXCEPT NO-RR;  
COMPILE SYCOM2 WITH SYCOM FOR SYNTAX;  
FILE LINK NAME LINK2;  
FILE PARAMETERS NAME SYCOM2/PARAMETERS PID USER;
```

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SYCOM COMMANDS FROM THE SYSTEM ODT

Communication to the SYCOM program through the ODT is permitted using the MCP ACCEPT facility. By entering SYCOM commands, communication with application programs in a server-system is possible by means of the virtual terminal facility of the SYCOM program. A typical command session might include the following sequence of commands.

<SYCOM job #> AX.WHAT

% SYCOM =<job #> SYCOM <release version> (<compile date and time>)
ONLINE, IDLE.

% SYCOM =<job #> THIS STATION OFFLINE, LOCAL HOST = USER1
REMOTE HOST = SERVER1

<SYCOM job #> AX.PUT DHPALL

% SYCOM =<job #> FILE DMPALL START TRANSMISSION
% SYCOM =<job #> FILE DMPALL END TRANSMISSION 101 RECORDS

<SYCOM job #> AX.CONNECT

% SYCOM =<job #> ".CONNECT" INITIATED [<lsn>] <NDL receive
and transmit addresses>

<SYCOM job #> AXEX DMPALL;FI OUTP.FILE INV 2

% SYCOM =<job #> DMPALL =<job #> BOJ. PP=9, MP=9 TIME =...
% SYCOM =<job #> % DMPALL =<job #> ENTER SPECS
% SYCOM =<job #> DMPALL =<job #> ACCEPT.

<SYCOM job #> AX<DMPALL job #>AXLIST SMCS/TRACE 120 9

% SYCOM =<job #> DMPALL =<job #> "OUTPUT" = "BACKUP.PRT/11"
% SYCOM =<job #> DMPALL =<job #> "BACKUP.PRT/11" RELEASED
% SYCOM =<job #> % DMPALL =<job #> ENTER SPECS
% SYCOM =<job #> DMPALL =<job #> ACCEPT.

<SYCOM job #> AX

% SYCOM =<job #> DMPALL =<job #> EOJ. TIME = 12:35:33.6

<SYCOM job #> AX.DISCONNECT

% SYCOM =<job #> STATION DISCONNECTED

<SYCOM job #> AX.FETCH BACKUP.PRT/11

% SYCOM =<job #> FILE "BACKUP.PRT/11" START RECEPTION (optional)
% SYCOM =<job #> FILE BACKUP.PRT/11 START TRANSMISSION
% SYCOM =<job #> FILE "BACKUP.PRT/11" RECEIVED 400 RECORDS (optional)
% SYCOM =<job #> FILE BACKUP.PRT/11 END TRANSMISSION 400 RECORDS

SYSTEMATIC SHUTDOWN OF THE SYCOM PROGRAM

When the SYCOM program is running, the EOJ command can be used to bring the program to an orderly shutdown. If the EOJ command is entered, all subsequent commands are rejected. An appropriate close message is sent to the other SYCOM program after the completion of all in-process file transfers. The SYCOM program then sends a disconnect message to the network controller and goes to end of job. To initiate an orderly shutdown of the SYCOM program, enter the following command.

```
<SYCOM job #> AX.EOJ
```

The following message is displayed on the user ODT.

```
% SYCOM = <job #> EOJ INITIATED
```

No further processing requests are accepted. Any file transfer requests already queued are allowed to complete. When there is no more SYCOM activity and no users connected, the SYCOM program goes to end of job. The following standard MCP EOJ message is displayed for this occurrence.

```
SYCOM = <job #> EOJ. TIME = 16:21:55.1
```

When the SYCOM program is running in a self-sustaining environment and it is necessary to shut the system down immediately, enter the STOP command. Upon entry of the STOP command, all in-process activity is aborted. However, all scheduled events remain in the PUT_QFILE file and are resumed upon the restart of the SYCOM program. A close message is then sent to the other SYCOM program, a disconnect message is sent to the network controller, and the program goes to end of job. Enter the following command to initiate the immediate shutdown of the SYCOM program.

```
<SYCOM job #> AX.STOP
```

The following EOJ message is then displayed on the ODT.

```
SYCOM = <job #> EOJ. TIME = 16:21:55.1
```

When the SYCOM program is running in conjunction with the SMCS program, the SMCS STOP command causes the SYCOM program to be terminated automatically and the following message to be displayed on the ODT.

```
SYCOM = <job #> DEATH IN FAMILY. TIME 12:58:01.1
```

Any file transfer requests already in the PUT_QFILE file are not removed unless the SYCOM program is operating on switched or dial-out lines.

PRINTING THE TRACE FILE

If the SYCOM program is running and a list of the current DISK_TRACE file or OLDTRACE file is desired, enter the following SYCOM command.

```
<SYCOM job #> AX.LIST TRACE % Lists current trace file  
<SYCOM job #> AX.LIST OLDTRACE % Lists previous trace file
```

If SYCOM encounters a FATAL ERROR, the contents of the current DISK_TRACE file are automatically printed on the line printer provided the TRACE parameter is set. If the SYCOM program or the system halts for any reason, the previous DISK_TRACE file should be listed at the next execution of the SYCOM program.

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After a TRACE or OLDTRACE command is entered, the SYCOM program temporarily stops processing any in-process requests such as file transfers.

OPERATING PROCEDURES FOR TERMINALS

This subsection provides the basic operating procedures for terminals used in conjunction with the SYCOM program. The terminals can be owned by either the SYCOM program or the SMCS program. Because of these possibilities and the associated implications, specific operating procedures are included for both SYCOM-controlled and SMCS-controlled terminals.

TERMINAL FUNCTIONS

Terminal functions are those software features found in MT 983, TD 830, and TD 820 type Video Display Terminal (VDT) devices. These terminal features include tab stops, lower-and upper-case letters, and scrolling.

Operational procedures for local terminals are separated into two categories of terminals; terminals under the SYCOM program control and terminals under the control of the SMCS program. These procedures provide coverage of all terminal operations within the scope of the SYCOM program from the time a user signs on to the program to the time the user signs off. Actual input/output message text is used in the examples to show ease of operation and what can be expected by a user of the system.

TERMINAL OPERATIONS (SYCOM CONTROLLED)

When a local terminal is under the direct control of the SYCOM program, it is also permanently attached to it. Therefore, a terminal user has immediate access to SYCOM functions. A terminal can, however, be temporarily attached to either the SYCOM program or the SMCS program in a server-system. Through the server-system SMCS program, the terminal can also be attached to an appropriate interactive application program in the server-system. The commands that a remote user can access through the SMCS program are controlled by defining the server station in the network controller as a workstation, controller station, or remote ODT station.

Example Interactive Terminal Session

These examples show how a user can log on to a remote system and perform functions on the remote system. Terminals for these examples are attached to the user-system SYCOM program. In order to utilize the SYCOM capabilities, a terminal user need only enter the desired commands. Among these SYCOM commands are CONNECT and DISCONNECT, which are used to gain access to any appropriate interactive application program in the server-system. The examples which follow show several possible terminal connections and uses of the SYCOM program commands.

In these examples, terminal input is identified by the arrow (→). Each terminal input has a destination program indicated by the program reference in parentheses. All other lines are reply messages from the program to which the terminal is currently serving as an input device. Some basic local SYCOM commands are shown first. All SYCOM commands are entered directly as shown in the examples. All commands can contain trailing comments. The trailing comments must be preceded by the percent sign (%) character. SYCOM program commands can be in either upper-or lower-case letters. Filenames must be specified exactly as they appear in the disk directory. If a quotation mark (") character appears in a file name, the quotation mark (") character is taken to mean a quotation mark (") character and not the start of an edited string. Lower-case usercodes, passwords, and file names are considered distinct from the same tokens in upper-case letters. However, all SYCOM commands and parameters are translated from lower-case to upper-case letters.

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```
--> .WHAT % Checks the status of the user-system SYCOM program.

        SYCOM <release version> (<compile date and time>) ONLINE; IDLE.
        THIS STATION NOT CONNECTED
        LOCAL HOST = USER1, REMOTE HOST = SERVER1

--> .PUT DMPALL % Initiates a file transfer of the DMPALL file
        % from the user-system to the server-system.

        FILE DMPALL START TRANSMISSION

--> .WHAT

        SYCOM ONLINE; 0 FILES QUEUED; SENDING DMPALL(47/85);
        THIS STATION NOT CONNECTED
        LOCAL HOST = USER1, REMOTE HOST = SERVER1
        FILE DMPALL END TRANSMISSION 85 RECORDS

--> .CONNECT % Initiates a connection to the server-system
        % SMCS. Any text transmitted without a period (.)
        % character is sent directly to the server-system
        % SMCS.

        CONNECT INITIATED [virtual terminal number] <NDL sending and
        receiving address>
        CONNECT COMPLETED

--> .WHAT

        SYCOM ONLINE; IDLE
        THIS STATION CONNECTED [virtual terminal number] <NDL sending
        and receiving address>
        LOCAL HOST = USER1, REMOTE HOST = SERVER1

--> JOBS (Server SMCS)

        ACTIVE:
        SERVER/NC =<job #> PP=15, MP=15
        SMCS =<job #> PP=13, MP=14
        SERVER/SYCOM =<job #> PP=12, MP=12
        SCHEDULED:
        BOTH SCHEDULES EMPTY.
        MIX LIMIT=16
```

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It is necessary that the terminal user be aware of what signal character the server-system SMCS program is currently using. To determine this, enter the following command.

```
--> SIGNAL                                     (Server SMCS)
      CURRENT SIGNAL CHARACTER= $.
```

The terminal user can then sign on to an application program in the server-system and alternately enter commands to the server-system SMCS program. The following series of interactions exemplify this concept. In the example, the application program labeled SET/TABS sets specified tab stops in the user terminal.

```
--> SIGN ON SET/TABS                             (Server SMCS)
      SIGNED ON TO "SET/TABS", SIGNAL= $
```

```
--> $JOBS                                       (Server SMCS)
      ACTIVE:
      SERVER/NC =<job #> PP=15, MP=15
      SERVER/SYCOM =<job #> PP=12, MP=12
      SET/TABS =<job #> PP=4, MP=4
      SMCS =<job #> PP=13, MP=13
      SCHEDULED:
      BOTH SCHEDULES EMPTY.
      MIX LIMIT=16
```

```
--> 10,20,30,40,50,60,70                       (Server Application Program)
      REMOTE FILE CLOSED BY 'SET/TABS', STATION SIGNED OFF
```

```
--> EX DMPALL;FI OUTP.FILE INV 2                (Server SMCS)
      DMPALL =<job #> BOJ. PP=9, MP=9 TIME = 11:35:21.8
      % DMPALL =<job #> ENTER SPECS
      DMPALL =<job #> ACCEPT.
```

```
--> <DMPALL job #> AX COPY DSKLST SMCS/TRACE 120 9
      % DMPALL =<job #> ENTER SPECS
      DMPALL =<job #> ACCEPT.
```

```
--> <DMPALL job #> AX
      DMPALL =<job #> EOJ. TIME = 11:36:58.1
```

B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions

To terminate the session after entering the commands to the SYCOM program, the following command is entered; however, the user terminal remains attached to the SYCOM program.

```
--> .DISCONNECT % Disconnects the terminal from communication  
% to the server-system SMCS.
```

STATION DISCONNECTED

TERMINAL OPERATIONS (SMCS CONTROLLED)

When a terminal is permanently attached to and owned by the SMCS program, the terminal user must gain access to SYCOM functions through the use of explicit SMCS commands. These SMCS commands are used in examples in the following pages. By gaining access to the SYCOM program, the SMCS program temporarily attaches the requesting terminal to the program for the duration of a session. However, a terminal user is not limited to only a few SMCS commands. A user can enter any SMCS command with the exception of those restricted to input from the ODT depending on whether the virtual station is defined as a workstation, remote ODT, or controller station in the server-system's network controller.

Example Interactive Terminal Session

The following interactive terminal session begins with the terminal attached to the user-system SMCS program. In order to gain access to SYCOM capabilities, the terminal user must make use of the SMCS SIGN ON and SIGN OFF commands. The commands in the hypothetical session in the following example show the terminal user how to sign on and sign off the SYCOM program. Input from the terminal is identified by the arrow (→) and the destination of each message is enclosed in parentheses.

```
--> SIGN ON SYCOM (User SMCS)  
SIGNED ON TO "SYCOM", SIGNAL= *
```


B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions

When the "SIGNED ON" message is returned to the terminal, that terminal is then attached to the SYCOM program. Therefore, SYCOM commands are entered directly as follows.

```
--> .WHAT                                (User SYCOM)

      SYCOM <release version> (<compiler date and time>) ONLINE; IDLE.
      THIS STATION NOT CONNECTED
      LOCAL HOST = USER1, REMOTE HOST = SERVER1

--> .PUT DMPALL                          (User SYCOM)

      FILE DMPALL START TRANSMISSION

--> .WHAT                                (User SYCOM)

      SYCOM <release version> (<compile date and time>) ONLINE;
      0 FILES QUEUED; SENDING DMPALL(47/85)
      THIS STATION NOT CONNECTED
      LOCAL HOST = USER1, REMOTE HOST = SERVER1
      FILE DMPALL END TRANSMISSION 85 RECORDS

--> .CONNECT                             (User SYCOM)

      CONNECT INITIATED [virtual terminal number] <NDL sending and
      receiving address>
      CONNECT COMPLETE

--> .WHAT                                (User SYCOM)

      SYCOM <release version> (<compile date and time>) ONLINE; IDLE.
      THIS STATION CONNECTED
      LOCAL HOST = USER1, REMOTE HOST = SERVER1

--> *REPORT >                            (User SMCS)

      >D1          (ODT) : SIGNED ON TO *SYCOM*
      1 STATION REPORTED AT 11:42.6 08/22/78

--> JOBS                                 (Server SMCS)

      ACTIVE:
      SERVER/NC =<job #> PP=15, MP=15
      SMCS =<job #> PP=13, MP=14
      SERVER/SYCOM =<job #> PP=12, MP=12
      SCHEDULED:
      BOTH SCHEDULES EMPTY.
      MIX LIMIT=16
```

B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions

It is necessary that the SMCS program in a server-system have a signal character that differs from that of the SMCS program in the user-system. To ensure this, the following command is entered to query that signal character.

```
--> SIGNAL                                     (Server SMCS)

      CURRENT SIGNAL CHARACTER= $.
```

Now the terminal user can sign on to an application program in the server-system and alternately enter commands to the server-system SMCS program. A series of following interactions exemplify this concept. The application program labeled SET/TABS used in the example, sets specified tab stops in the user terminal.

```
--> SIGN ON SET/TABS                             (Server SMCS)

      SIGNED ON TO "SET/TABS", SIGNAL= $

--> $JOBS                                       (Server SMCS)

      ACTIVE:
      SERVER/NC =<job #> PP=15, MP=15
      SERVER/SYCOM =<job #> PP=12, MP=12
      SET/TABS =<job #> PP=4, MP=4
      SMCS =<job #> PP=13, MP=13
      SCHEDULED:
      BOTH SCHEDULES EMPTY.
      MIX LIMIT=16

--> *REPORT >                                  (User SMCS)

      D1          (ODT) : SIGNED ON TO 'SYCOM'
      1 STATION REPORTED AT 11:44.2  08/22/78

--> 10,20,30,40,50,60,70                      (Server Application Program)

      REMOTE FILE CLOSED BY "SET/TABS", STATION SIGNED OFF

--> .DEBUG % Resets the debug trace facility in the user-system
      % SYCOM program.

      DEBUG OFF

--> .DISCONNECT                                (User SYCOM)

      STATION DISCONNECTED
```

**B 1000 System Communications Module (SYCOM)
SYCOM Program Operating Instructions**

When a user finishes entering commands to the SYCOM program and wishes to terminate the session, the following SMCS command is entered.

--> *SIGN OFF or *OFF

(Us er SMCS)

The response from the SMCS program is as follows.

DETACHED FROM "SYCOM"

At this point, the terminal has been detached from the SYCOM program and is ready for another job session.

SECTION 4

SYCOM PARAMETERS

GENERAL

The parameter definitions listed below can be entered to the SYCOM program from a card or disk file labeled NEWPARAMS or from the ODT using the MCP ACCEPT process. Refer to Section 3 for more information on the creation of the NEWPARAMS file.

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

BUFFER

The BUFFER parameter defines the size in bytes of the buffer used in SYCOM communications with the other system. The buffer must be large enough to contain the largest possible message to be sent.

Syntax:

BUFFER _____ = _____ <integer> _____

Semantics:

<integer>

This field can be any integer number between 362 and ~~1950~~.

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The default buffer size is ~~1950~~ bytes. The maximum buffer size is ~~1950~~ bytes and the minimum allowable size is 362 bytes. The BUFFER parameter applies to the file transfer sending buffer size and not the RJE buffer size. The buffer size must be the size of the maximum record size to be transmitted multiplied by 2, plus 2.

Example:

BUFFER = 1500

B1000 [& the rest]

DEBUG

The **DEBUG** parameter sets the printer tracing mechanism to produce a record of the SYCOM program I/O message activity.

Syntax:

DEBUG _____|

The default for this parameter is no debug.

Example:

DEBUG

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

DEFAULTPSEUDOSIGNAL

The DEFAULTPSEUDOSIGNAL parameter permanently assigns a value to the SYCOM pseudo-signal character. The first nonblank character encountered after the parameter is used as the SYCOM pseudo-signal character.

Syntax:

DEFAULTPSEUDOSIGNAL <character> _____|

Semantics:

<character>

This field can be any valid EBCDIC character greater than a space (@40@).

The default pseudo-signal character is the period (.) character.

Example:

DEFAULTPSEUDOSIGNAL = \$

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

END

END

The END parameter indicates that no more parameters follow. If the parameters are being entered from the system ODT, the END parameter is required. Use of the END parameter is optional for card and disk files.

Syntax:

END

Example:

END

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

GROUPSIZE

The GROUPSIZE parameter controls the number of files that are sent at one time when sending a family of files. The SYCOM program transmits a number of files equal to the GROUPSIZE parameter and then checks to see if another user has files to be sent and, if so, transmits a number of files for the second user equal to the GROUPSIZE parameter.

Syntax:

GROUPSIZE = <integer> _____|

Semantics:

<integer>

This field can be any integer value between 1 and 99.

The default value of the GROUPSIZE parameter is 9.

Example:

GROUPSIZE = 69

INBUFFERS

The INBUFFERS parameter controls the number of buffers that are assigned to the IN file at beginning of job. The IN file is used for input from the remote SYCOM program when doing a file transfer. Increasing the number of buffers can increase throughput in the file transfer process.

Syntax:

INBUFFERS = <integer> _____|

Semantics:

<integer>

This field can be any integer value with a lower limit of 1. The upper limit is controlled by the user depending on the amount of memory and disk space available.

The default of the INBUFFERS parameter value is 3.

Example:

INBUFFERS = ~~10~~

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

NOFS

The NOFS parameter prevents the SYCOM program from sending card images with the FS1 or FS2 file-separator characters. ~~This parameter is used in conjunction with the RJE/CONTROLLER program which does not allow file separator characters.~~

Syntax:

NOFS _____|

File separators are sent by default.

Example:

NOFS

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

NOFTP

NOFTP

The NOFTP parameter disables the file transfer function of the SYCOM program.

Syntax:

NOFTP _____|

File transfer is allowed by default.

Example:

NOFTP

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

NOPROGRAM

The **NOPROGRAM** parameter disables the program-to-SYCOM function of the SYCOM program.

Syntax:

NOPROGRAM _____|

Program-to-SYCOM communication is allowed by default.

Example:

NOPROGRAM

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

NOTRACE

NOTRACE

The NOTRACE parameter disables tracing at beginning of job.

Syntax:

NOTRACE

Tracing is set by default.

Example:

NOTRACE

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

NOWAIT

The **NOWAIT** parameter allows the SYCOM program to go to end of job when it receives a disconnect message.

Syntax:

NOWAIT _____

The default is go to end of job when a ~~disconnect~~ message is received.

Example:

NOWAIT

OUTBUFFERS

The OUTBUFFERS parameter controls the number of buffers that are assigned to the OUT file at beginning of job. The OUT file is used for output to the remote SYCOM program when doing a file transfer. Increasing the number of buffers can increase throughput in the file transfer process.

Syntax:

OUTBUFFERS = <integer > 

Semantics:

<integer >

This field can be any integer value with a lower limit of 1. The upper limit is controlled by the user, depending on the amount of memory and disk space available.

The default of the OUTBUFFERS parameter value is 2.

Example:

OUTBUFFERS = ~~10~~

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

PROGRAM

The PROGRAM parameter enables the program-to-SYCOM function of the SYCOM program.

Syntax:

PROGRAM _____|

Program-to-SYCOM communication is allowed by default.

Example:

PROGRAM

QUEUESIZE

The QUEUESIZE parameter specifies the maximum number of messages that can be written into the SYCOM program LINK file. When this maximum number is reached, the SYCOM program goes into a waiting state until one of the messages is removed from the LINK file.

Syntax:

QUEUESIZE = <integer> _____|

Semantics:

<integer>

This field can be any integer value within the range 1 to 15, inclusive.

The default value for the QUEUESIZE parameter is 8

Example:

QUEUESIZE = 5

**B 1000 System Communications Module (SYCOM)
SYCOM Parameters**

SYSTEMID

The **SYSTEMID** parameter specifies the name of the user-system. If the **SYSTEMID** has not been entered, the **SYCOM** program uses the **MCP HOSTNAME**.

Syntax:

SYSTEMID = <system-id> _____|

Semantics:

<system-id>

This field can be any character string ranging from one to 17 characters in length and containing only alphanumeric characters. This first character of this field must begin with an upper-case letter.

Example:

SYSTEMID = AARDVARK

TIMEOUTS

The TIMEOUTS parameter specifies a number (n) that determines when the message NUMBER OF TIMEOUTS = n appears on the ODT, where n is the number specified. When the timeout count reaches the specified value the message is displayed. A value of zero inhibits the message display.

If the number of timeouts reaches the specified value, the SYCOM program assumes that the other system is off-line.

Syntax:

TIMEOUTS = <integer> _____

Semantics:

<integer>

This field can be any integer value.

The default value for the TIMEOUTS parameter is 11.

Example:

TIMEOUTS = 0

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

TRACE

The TRACE parameter causes the DISK_TRACE file to be created to trace the SYCOM program activity.

Syntax:

TRACE _____|

Tracing is set by default.

Example:

TRACE

TRACEAREAS

The TRACEAREAS parameter causes the SYCOM program to assign the specified value as the maximum number of disk areas to contain the DISK_TRACE file.

Syntax:

TRACEAREAS = <integer>

Semantics:

<integer>

This field can be any integer value that represents the maximum number of disk areas to assign to the DISK_TRACE file.

The default value for the TRACEAREAS parameter is 20.

Example:

TRACEAREAS = 10

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

TRACEBA

The TRACEBA parameter causes the SYCOM program to assign the specified value as the number of blocks per area for the DISK_TRACE file.

Syntax:

TRACEBA = <integer> _____|

Semantics:

<integer>

This field can be any integer value that represents the maximum number of blocks per area to assign to the DISK_TRACE file.

The default value for the TRACEBA parameter is 10.

Example:

TRACEBA = 7

TRACERB

The TRACERB parameter causes the SYCOM program to assign the specified value as the number of records per block for the DISK_TRACE file.

Syntax:

TRACERB = <integer> _____|

Semantics:

<integer>

This field can be any integer value that represents the value to be assigned as the RECORDS.-BLOCK attribute for the DISK_TRACE file.

The default value for the TRACERB parameter is four.

Example:

TRACERB = 2

B 1000 System Communications Module (SYCOM)
SYCOM Parameters

WAIT

The WAIT parameter prevents the SYCOM program from going to end of job when it receives a disconnect message. The SYCOM program disconnects when it receives a disconnect message and goes into an off-line/idle state.

Syntax:

WAIT _____

The default value is to go to end of job when a disconnect message is received.

Example:

WAIT

SECTION 5 SYCOM OPERATOR COMMANDS

GENERAL

The set of commands described in this section directs the System Communications Module (SYCOM) program operations from either the Operator Display Terminal (ODT), a remote operator display terminal (remote ODT), a system terminal, or an application program running in the system.

Non-SYCOM program commands are also permitted to direct user-system and server-system operations by way of the respective SMCS program.

A remote ODT station is a station that is defined in the network controller with a transmit frequency greater than 249.

A workstation is a station that is defined in the network controller with a transmit frequency less than 250.

Table 5-1 at the end of this section contains a summary of all the SYCOM commands available in the SYCOM program.

SYCOM COMMAND RESTRICTIONS

The SYCOM program commands belong to three categories.

1. Commands that can be entered from any station.
2. Commands that can only be interrogated by workstations.
3. Commands that can only be entered by remote ODT stations or the system ODT.

General Commands

The following SYCOM commands can be entered from any terminal or the system ODT.

ABORT	LIST
ADD	PUT
BYE DUMP	SIGNAL
CONNECT	USER
COPY	WHAT
DISCONNECT	RESET
FETCH	SS
HELP	

print

These commands direct file transfer and remote server-system operations. Although these commands are for terminals, they can also be entered from the ODT and special application programs used for system control. However, when these commands are entered from the ODT, the command string must be prefixed with the job number assigned to the SYCOM program, followed by an AX, the pseudo-signal character, and the command string. If the command is prefixed by the pseudo-signal character, the message is sent to the local SYCOM program for processing; otherwise, the message is sent to the operator at the remote ODT if the station is not connected.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

All SYCOM program commands can contain trailing comments which must follow a percent sign (%) character.

Example:

.BUFFER = 1500 % change the buffersize

The SYCOM program commands can be entered in either upper-case or lower-case letters by the user at the remote terminal. File names must be specified exactly as they appear in the disk directory. If a quotation mark (") character appears in a file name, the quotation mark (") character is taken to mean a quotation mark (") character and not the start of an edited string. If the terminal is connected to the remote system, the SYCOM program commands must be prefixed by the pseudo-signal character; otherwise, the program command can be entered without the pseudo-signal character.

Workstation Commands

The following commands can be used only to interrogate the value or setting of the parameter. The values of these parameters can not be changed from a workstation.

BUFFER
DEBUG
GROUPSIZE
LOG
PHONE
PROGRAM

~~OS~~
SIZE
~~SYSTEMID~~
TRACE
WAIT

REMOTE MESSAGES
CR MSG
TIMEOUTS
STATISTICS

Separate syntax diagrams are given for these commands. These syntax diagrams are designated "Workstation Syntax".

ODT and Program Commands

The following SYCOM commands are restricted to entry from either the system ODT, a remote ODT, or a special application program. This list includes commands that are in the list of workstation commands. The values or settings of these parameters can be changed by a remote ODT or by the system ODT.

BUFFER
CL
~~CP NR~~
DEBUG
EOJ
GROUPSIZE
LOG
~~PP NR~~
PHONE
PROGRAM
OFFLINE

ONLINE
QS
~~READ~~
RESTART
RY
~~SIZE~~
STOP
SV
~~SYSTEMID~~
TRACE
WAIT

REMOTE MESSAGES (RM MSG)
STATISTICS
TIMEOUTS

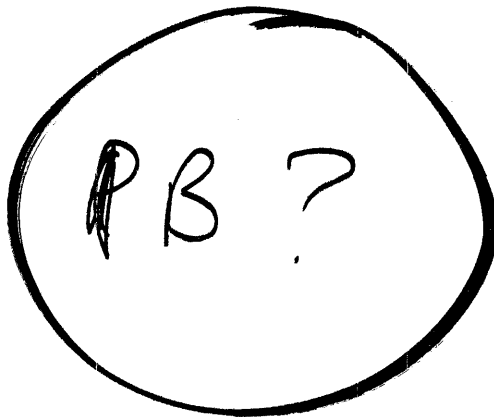
ZLP

**B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands**

These commands are used by a system operator to control functions relevant only to operation of the system. They are functions a terminal user cannot logically direct without current knowledge as to the state of the system and its peripherals.

Separate syntax diagrams are given for these commands. These syntax diagrams are designated "Remote ODT and System ODT Syntax".

Program command input does not require the command string to be prefixed with the SYCOM program job number and an AX. Command input from an application program must include a 10-byte message header preceding the same format as command input from a terminal. Refer to Appendix D for a discussion of the message header required for program command input and a guide to the messages returned by the SYCOM program.



B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

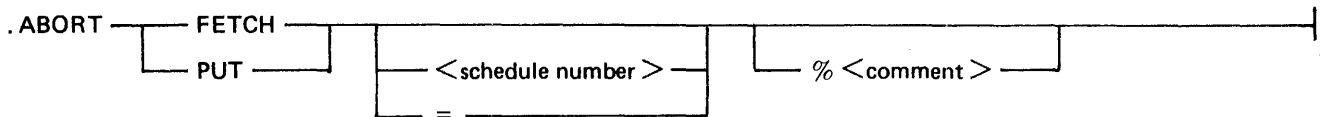
ABORT

SYCOM PROGRAM COMMANDS

ABORT

The ABORT command causes the SYCOM program to abort an in-process file transfer or a scheduled file transfer.

Syntax:



Semantics:

FETCH

The FETCH keyword causes the in-process file transfer initiated by the FETCH command to be aborted. The file being received is not saved.

PUT

The PUT keyword causes the in-process file transfer initiated by the PUT command to be aborted.

schedule number

This field identifies the file in the file transfer schedule to be aborted. If the field is left blank, the FETCH or PUT operation in process is aborted (if any).

=
The equal sign (=) character causes any in-process and scheduled file transfer operations to be aborted. The equal sign (=) character must follow PUT or FETCH. ABORT FETCH = or ABORT PUT = is only valid from a remote ODT or the system ODT.

Examples:

.ABORT FETCH

Aborts the file transfer in process which was initiated by a FETCH command.

.ABORT PUT

Aborts the file transfer in process which was initiated by a PUT command.

.ABORT FETCH 4

Aborts the file transfer, schedule number 4 in the PUT_QFILE file of the remote system, whether in process or not.

.ABORT PUT 10

Aborts the file transfer, schedule number 10 in the PUT_QFILE file of the local system, whether in process or not.

.ABORT FETCH =

Aborts all file transfers in the PUT_QFILE file of the remote system and the in process file transfer (if any) which was initiated by a FETCH command.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

ABORT

.ABORT PUT =

Aborts all file transfers in the PUT_QFILE file of the local system and the in process file transfer (if any) which was initiated by a PUT command.

The SYCOM message PUT REQUESTOR MISMATCH can occur if the user attempts to abort a PUT or FETCH operation of a file and the source file was secured with a usercode/password. The PUT or FETCH operation can be aborted by using the usercode/password that the PUT or FETCH command was initiated under or by using a privileged usercode/password.

Any one of the following conditions must exist to initiate a file transfer of a secured file.

1. The user must be logged on to the SMCS program with a usercode/password and enter the PUT or FETCH command to the SYCOM program through the PASS command to the SMCS program.

Examples:

```
PASS SYCOM PUT <file name>  
PASS SYCOM FETCH <file name>
```

2. The user must be logged-on to the SYCOM program by entering the US command to the program.

Example:

```
US = USER/JONES
```

3. The user must assign a usercode/password to the source file when a COPY, PUT, or FETCH SYCOM command is entered to the SYCOM program.

Examples:

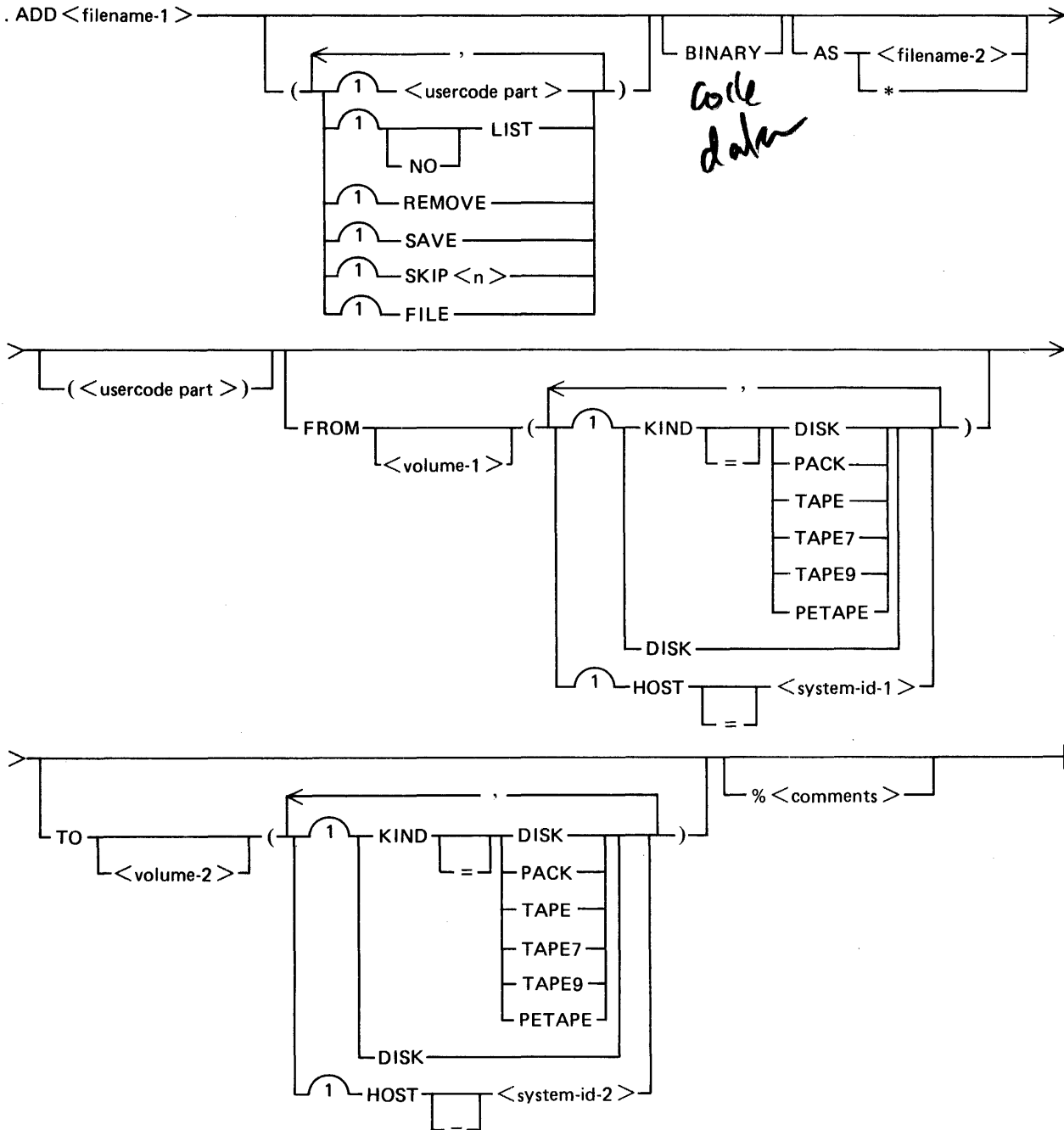
```
.PUT MASTER (US = DOE/JOHN)  
.FETCH FILEA (US = USER/PAUL)  
.COPY SOURCE (US = ODT) FROM (HOST = B1800)
```

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

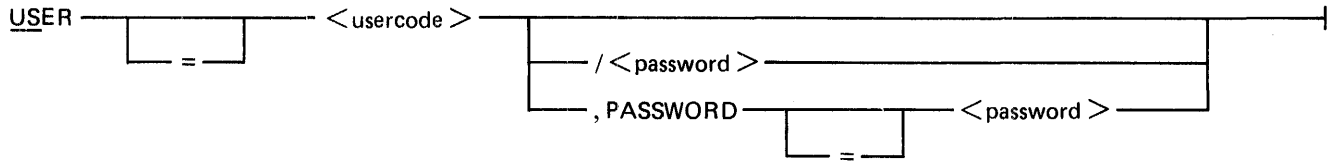
ADD

The ADD command causes the SYCOM program to initiate a file transfer. The command syntax provides for the transfer of files from the initiating system to another system and from another system to the initiating system. The files can be in either magnetic tape or disk form. The file transfer is aborted if the destination file exists at the receiving system.

Syntax:



The <usercode part> syntax is shown in the following syntax diagram.



Semantics:

AS

The keyword AS informs the server-system to create a new file with the name specified as <filename-2>. If the file is present on the server-system, the command is aborted.

BINARY

The keyword BINARY applies to data files and causes the SYCOM program to expand all the records in a file prior to transmission. Code files are always expanded. The BINARY keyword allows users to transfer files to and from an ASCII system. If the BINARY keyword is not specified for a data file transfer to a non-EBCDIC system, the SYCOM program changes nongraphic characters to question mark (?) characters. The graphic character set is the EBCDIC representation of the 95 valid ASCII characters and the null character.

If a data file is sent to a CMS system (ASCII machine) with the BINARY keyword specified, to retrieve the same file and maintain file integrity, the ADD command must include the BINARY keyword.

FILE

The keyword FILE allows the SYCOM program to read the names of the file(s) to be transmitted from the file, <filename-1>. By specifying the FILE keyword, a series of files can be transmitted by one ADD command. Each file name must be entered on separate records in the file. If the destination file name is to be different than the source file name, it is entered following the source file name and must be separated by at least one blank. Comments can follow the second file name on the record starting with a percent sign (%) character. If comments are desired and the destination file name is the same as the source file name, the destination file name can be represented by an asterisk (*) character.

filename-1

This field specifies the name of the file to be transmitted. The file name can be a single file or a family of files in the format: <multifile-id>/=.

filename-2

This field specifies the name to be given to the file at the destination system. The file name can be a single file or a family of files in the format: <multifile-id>/=.

FROM

The keyword FROM specifies the medium and/or HOSTNAME from which the file is to be transferred.

HOST

The keyword HOST specifies the HOSTNAME of the system that the file is to be transferred to or from.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

ADD

KIND

The keyword KIND specifies the peripheral device of a file. The keyword KIND is not required if the file is on disk.

LIST

The keyword LIST informs the receiving system that the printer backup file is to be printed after transmission by zipping a AUTOPRINT command to the MCP.

NO

The keyword NO overrides the default LIST option and is valid only for printer backup files.

PASSWORD

The keyword PASSWORD specifies the password part of the usercode/password pair.

REMOVE

The keyword REMOVE causes the file to be removed from the sending system after the transfer has been completed. The keyword REMOVE is the default for printer backup files.

SAVE

The keyword SAVE ensures that a printer backup file is saved after the file is transferred on the sending system. If the keyword SAVE is not specified, all non-user-named files (those backup files not created with the MCP USER.BACKUP.NAME file attribute) are removed after they have been transferred. The keyword SAVE is the default for nonprinter backup file transfer.

SKIP <n>

The keyword SKIP specifies how many files to skip if the ADD <multifile-id>/= or the indirect (FILE) option is used. The first <n> files of the family are skipped. Usage of the keyword SKIP is optional.

system-id-1

This field specifies the system identification of the system from which the file is to be transferred.

system-id-2

This field specifies the system identification of the system that is to receive the file.

TO

The keyword TO specifies the medium and/or HOSTNAME to which the file is to be transferred.

USER

The keyword USER is used to specify the usercode and, optionally, the password for the purpose of verifying access rights to the specified file name.

usercode and password

These fields identify the user for the purpose of verifying access rights to the specified file name.

volume-1

This field specifies the user disk identifier or tape identifier for the source file. This field is not required for files on the system disk, or if a user disk identifier appears in <filename-1>. The keyword DISK indicates the system disk.

volume-2

This field specifies the user disk identifier or tape identifier for the destination file. The keyword DISK indicates the system disk.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

ADD

()

The parentheses characters are key characters when using a USER, LIST, NO LIST, REMOVE, HOST, or SAVE option. The options can appear in any order within the parentheses.

*

The asterisk (*) character assigns the file name specified in <filename-1> to <filename-2>.

Examples:

.ADD XYZ (US=US/PASS) FROM (DISK, HOST=USER1) TO (DISK, HOST=SERVER1)

.ADD DMPALL AS DUMPALL FROM (HOST=HUB, KIND=TAPE)

.ADD SDL/= AS SDLNEW/= FROM (HOST=HUB)

This is an example of a transfer of a family of files.

.ADD RELEASE (FILE, NO LIST) TO (HOST=HUB)

This is an example of using a list of files to effect a file transfer.

.ADD = (US A/B, SKIP 123) TO (HOST=USER3)

This is an example of using the SKIP option.

.ADD RELEASE (FILE, SKIP 9) TO (HOST=USER5)

This is an example of using a list of files with the SKIP option.

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BUFFER

The BUFFER command causes the SYCOM program to change or interrogate the BUFFER parameter. The BUFFER parameter specifies the buffer size for sending file transfers. The buffer size is specified in bytes. The minimum buffer size is 362 bytes and the maximum is ~~1950~~ bytes. If the BUFFER parameter is not specified in the parameters file, the buffer size defaults to ~~1950~~ bytes.

The receiving buffer size is always ~~1950~~ bytes.

If the buffer size is changed with the BUFFER command, the new value is effective until another BUFFER command is entered or the SYCOM program goes to end of job. The buffer size for the next execution of the SYCOM program reverts back to the value specified by the BUFFER parameter in the SYCOM PARAMETERS file.

The value of the BUFFER parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change or interrogate the value of the BUFFER parameter.

Workstation Syntax:

.BUFFER _____

Remote ODT and System ODT Syntax:

.BUFFER [] = [] <integer> [] % <comments> []

Semantics:

integer

This field specifies the number of bytes for the buffer used in file transfers. The value must be between 362 and ~~1950~~, inclusive.

Examples:

.BUFFER

Interrogates the current transmission buffer size. The receiving buffer size can also be interrogated by entering the LIST PARAMETERS command to the SYCOM program. The command is valid from any station.

.BUFFER = 400

Changes the BUFFER parameter to 400 and is valid only from a remote ODT station or the system ODT.

.BUFFER ~~1950~~

Changes the BUFFER parameter to ~~1950~~ and is valid only from a remote ODT station or the system ODT.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

BYE

BYE

The BYE command causes the SYCOM program to log-off the current user from the SYCOM program. It is valid from all stations including the system ODT and application programs. If the user is connected to the server-system SMCS program by the CONNECT command, an automatic DISCONNECT command is initiated. If the terminal is not attached to the SYCOM program, a DETACH message is sent to the local SMCS program. Also, the pseudo-signal character is reset to the default pseudo-signal character.

Syntax:

.BYE _____
 └── % <comments > ───┘

Example:

.BYE

*Max Record size?
306a will do*

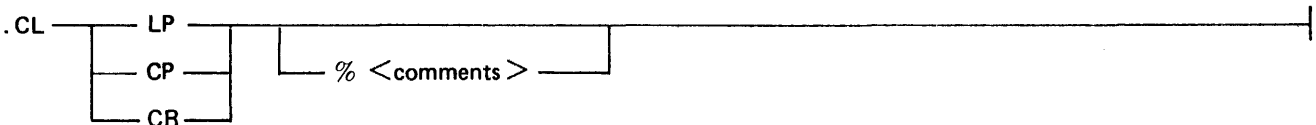
B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

CL (CLEAR DEVICE)

The CL command causes the SYCOM program to clear a peripheral device if the device becomes inoperable while receiving a data file. The buffers associated with the specified device are cleared and the receiving process is terminated.

The CL command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:



Semantics:

CP
The keysymbol CP clears the card reader.

CR
The keysymbol CR clears the card punch.

LP
The keysymbol LP clears the line printer.

Examples:

```
.CL CP  
.CL CR  
.CL LP
```

CONNECT

The CONNECT command causes the SYCOM program to log-on a terminal user to the server-system SMCS program.

The SYCOM program ensures that a MCS-type program is running in the server-system and that a virtual station slot is available before making the connection.

If a user is logged-on to the SYCOM program, that user's usercode/password is forwarded to the MCS in the other system which automatically logs the user on to that MCS.

Syntax:

.CONNECT _____
 └── % <comments > ───┘

Example:

.CONNECT

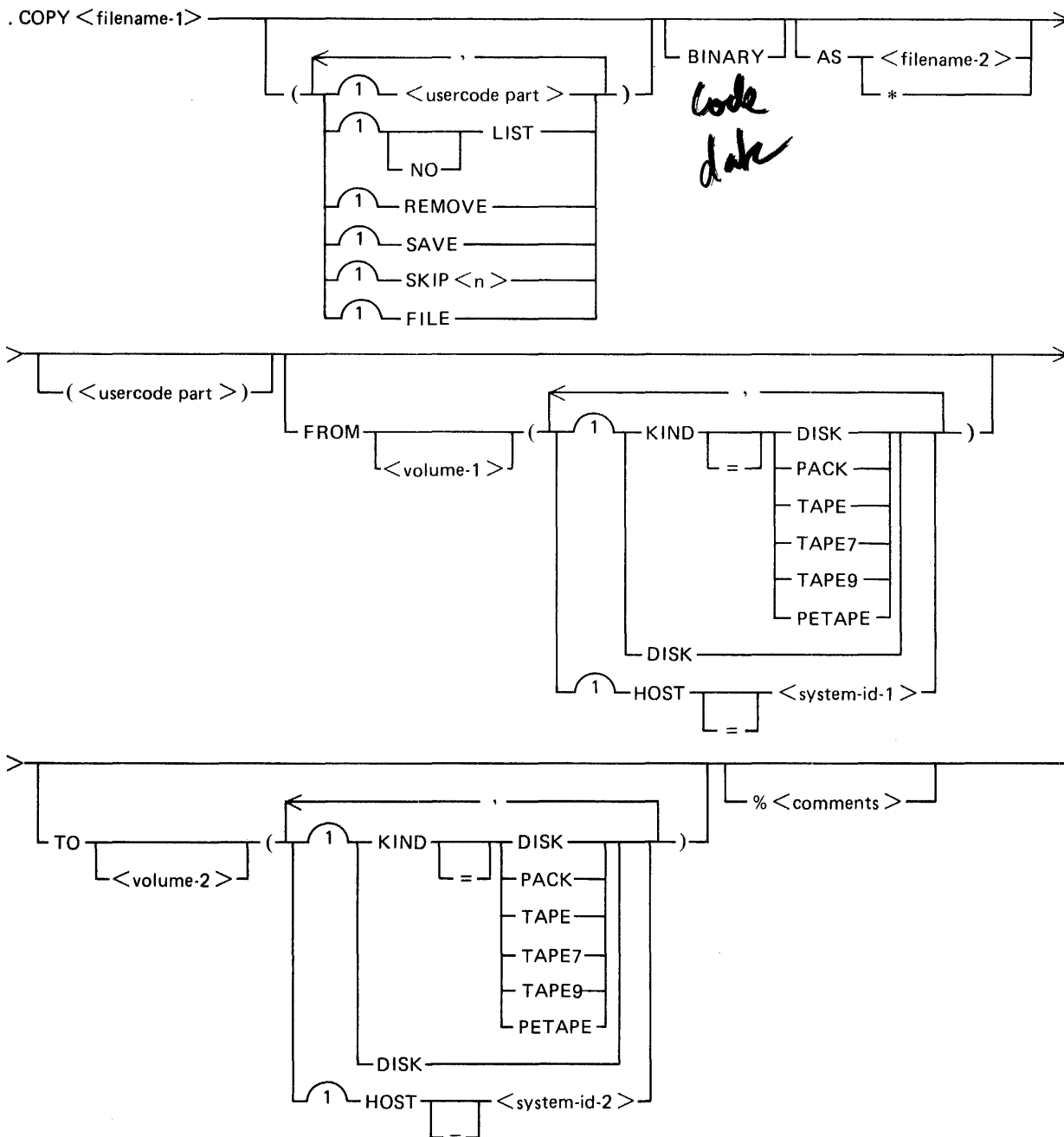
11.0 will send text

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

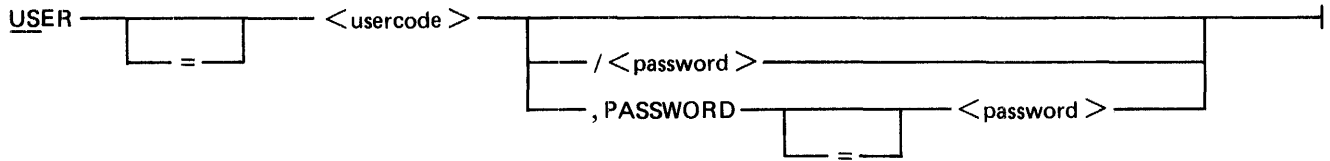
COPY

The COPY command causes the SYCOM program to initiate a file transfer. The command syntax provides for the transfer of files from the initiating system to another system and from another system to the initiating system. The files can be in either magnetic tape or disk form. If the destination file already exists at the receiving system, it is removed and replaced by the transferred file.

Syntax:



The <usercode part> syntax is shown in the following syntax diagram.



Semantics:

AS

The keyword **AS** informs the server-system to create a new file with the name specified as <filename-2>. If the file is present on the server-system, the command is aborted.

BINARY

The keyword **BINARY** applies to data files and causes the SYCOM program to expand all the records in a file prior to transmission. Code files are always expanded. The **BINARY** keyword allows users to transfer files to and from an ASCII system. If the **BINARY** keyword is not specified for a data file transfer to a non-EBCDIC system, the SYCOM program changes nongraphic characters to question mark (?) characters. The graphic character set is the EBCDIC representation of the 95 valid ASCII characters and the null character.

If a data file is sent to a CMS system (ASCII machine) with the **BINARY** keyword specified, to retrieve the same file and maintain file integrity, the **COPY** command must include the **BINARY** keyword.

FILE

The keyword **FILE** allows the SYCOM program to read the names of the file(s) to be transmitted from the file, <filename-1>. By specifying the **FILE** keyword, a series of files can be transmitted by one **COPY** command. Each file name must be entered on separate records in the file. If the destination file name is to be different than the source file name, it is entered following the source file name and must be separated by at least one blank. Comments can follow the second file name on the record starting with a percent sign (%) character. If comments are desired and the destination file name is the same as the source file name, the destination file name can be represented by an asterisk (*) character.

filename-1

This field specifies the name of the file to be transmitted. The file name can be a single file or a family of files in the format: <multifile-id>/=.

filename-2

This field specifies the name to be given to the file at the destination system. The file name can be a single file or a family of files in the format: <multifile-id>/=.

FROM

The keyword **FROM** specifies the medium and/or **HOSTNAME** from which the file is to be transferred.

HOST

The keyword **HOST** specifies the **HOSTNAME** of the system that the file is to be transferred to or from.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

COPY

KIND

The keyword **KIND** specifies the peripheral device of a file. The keyword **KIND** is not required if the file is on disk.

LIST

The keyword **LIST** informs the receiving system that the printer backup file is to be printed after transmission by zipping a **AUTOPRINT** command to the **MCP**.

NO

The keyword **NO** overrides the default **LIST** option and is valid only for printer backup files.

PASSWORD

The keyword **PASSWORD** specifies the password part of the usercode/password pair.

REMOVE

The keyword **REMOVE** causes the file to be removed from the sending system after the transfer has been completed. The keyword **REMOVE** is the default for printer backup files.

SAVE

The keyword **SAVE** ensures that a printer backup file is saved after the file is transferred on the sending system. If the keyword **SAVE** is not specified, all non-user-named files (those backup files not created with the **MCP USER.BACKUP.NAME** file attribute) are removed after they have been transferred. The keyword **SAVE** is the default for nonprinter backup file transfer.

SKIP <n>

The keyword **SKIP** specifies how many files to skip if the **COPY <multifile-id>/=** or the indirect (**FILE**) option is used. The first **<n>** files of the family are skipped. Usage of the keyword **SKIP** is optional.

system-id-1

This field specifies the system identification of the system from which the file is to be transferred.

system-id-2

This field specifies the system identification of the system that is to receive the file.

TO

The keyword **TO** specifies the medium and/or **HOSTNAME** to which the file is to be transferred.

USER

The keyword **USER** is used to specify the usercode and, optionally, the password for the purpose of verifying access rights to the specified file name.

usercode and password

These fields identify the user for the purpose of verifying access rights to the specified file name.

volume-1

This field specifies the user disk identifier or tape identifier for the source file. This field is not required for files on the system disk, or if a user disk identifier appears in **<filename-1>**. The keyword **DISK** indicates the system disk.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

COPY

volume-2

This field specifies the user disk identifier or tape identifier for the destination file. The keyword DISK indicates the system disk.

()

The parentheses characters are key characters when using a USER, LIST, NO LIST, REMOVE, HOST, or SAVE option. The options can appear in any order within the parentheses.

*

The asterisk (*) character assigns the file name specified in <filename-1> to <filename-2>.

Examples:

.COPY XYZ (US=US/PASS) FROM (DISK, HOST=USER1) TO (DISK, HOST=SERVER1)

.COPY DMPALL AS DUMPALL FROM (HOST=HUB, KIND=TAPE)

.COPY SDL/= AS SDLNEW/= FROM (HOST=HUB)

This is an example of a transfer of a family of files.

.COPY RELEASE (FILE, NO LIST) TO (HOST=HUB)

This is an example of using a list of files to effect a file transfer.

.COPY = (US A/B, SKIP 123) TO (HOST=USER3)

This is an example of using the SKIP option.

.COPY RELEASE (FILE, SKIP 9) TO (HOST=USER5)

This is an example of using a list of files with the SKIP option.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

CP NR

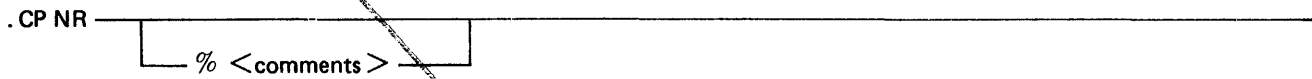
~~CP~~ NR (CARD PUNCH NOT READY)

The CP NR command causes the SYCOM program to inform the user-system that the system card punch is in a Not Ready state. The SYCOM program in turn informs the server-system of the condition of the hardware. The server-system suspends transmitting any card punch data stream messages currently in process.

It is the responsibility of the user-system operator to inform the SYCOM program when the card punch is Ready to receive output.

The CP NR command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:



Example:

.CP NR

DEBUG

The **DEBUG** command causes the SYCOM program to change or interrogate the setting of the **DEBUG** parameter. If the **DEBUG** parameter is set, the SYCOM program prints all data messages read or written by the SYCOM program.

If no option is specified, a request for the current status of the **DEBUG** parameter is displayed.

The setting of the **DEBUG** parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change the setting of the **DEBUG** parameter.

Workstation Syntax:

```
.DEBUG _____|
```

Remote ODT and System ODT Syntax:

```
.DEBUG _____|  
  |  
  |-----DUMP-----|  
  |-----OFF-----|  
  |-----ON-----|  
  |  
  |-----% <comments>-----|
```

Semantics:

DUMP

The keyword **DUMP** causes a program dump and a list trace of the SYCOM program to be initiated. Also, a similar request is sent to the remote SYCOM program.

OFF

The keyword **OFF** terminates the debugging option.

ON

The keyword **ON** initiates the debugging option.

Examples:

```
.DEBUG
```

Interrogates the status of the **DEBUG** parameter and is valid from any station.

```
.DEBUG ON
```

Turns the **DEBUG** parameter on and is valid from a remote ODT station or the system ODT.

```
.DEBUG OFF
```

Turns the **DEBUG** parameter off and is valid from a remote ODT station or the system ODT.

```
.DEBUG DUMP
```

Causes a dump and a trace listing and is valid from a remote ODT station or the system ODT.

DISCONNECT

The DISCONNECT command causes the SYCOM program to terminate a session with a host server-system. The terminal is logged-off the server-system when a DISCONNECT message is sent to the other system. The terminal reverts back to its previous state of being signed on to the SYCOM program. The terminal user is then free to enter more commands to the SYCOM program.

Syntax:

```
.DISCONNECT _____  
                |_____|  
                |  % <comments >  |
```

Example:

```
.DISCONNECT
```

The pseudo-signal character must be included in the DISCONNECT command. If it is not and the terminal is connected to the remote system, the DISCONNECT command is sent 1) directly to the remote system SMCS program and the following message is displayed or 2) it is sent to the application program that the user was signed on.

```
>> ERROR: MCP REJECTED ZIP CONTROL STRING  
INVALID MNEMONIC-DIS
```

The current pseudo-signal character is not changed by the DISCONNECT command. Only the BYE or SIGNAL SYCOM commands or the *OFF SMCS command causes the pseudo-signal character to be reset to the default pseudo-signal character.

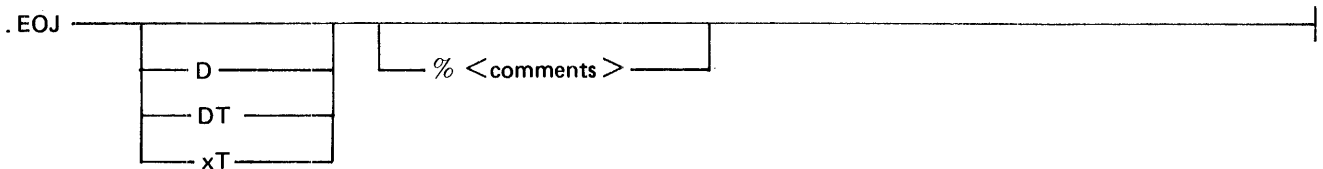
DUMP

EOJ

The EOJ command causes an orderly shutdown of the SYCOM program. No commands are processed after the EOJ command is entered. The message, "PLEASE SIGN OFF", is broadcast to all terminals currently logged-on to the SYCOM program. A close message is sent to the other system's SYCOM program after the completion of any in-process file transfer operations and when there are no longer any terminals connected to the remote system. The SYCOM program then sends a disconnect message to the network controller and goes to end of job.

The EOJ command can only be entered from a remote ODT or the system ODT.

Remote ODT or System ODT Syntax:



Semantics:

D

The letter D causes the SYCOM program to initiate a dump.

DT

The letter DT causes the SYCOM program to initiate a dump and a list trace.

xT

These letters cause the SYCOM program to initiate a list trace. The "x" character represents any nonblank character except the "D" character.

Examples:

.EOJ

.EOJ D

Causes the SYCOM program to go to EOJ and produces a dump file.

.EOJ DT

Causes the SYCOM program to go to EOJ and produces a dump file and a trace listing.

.EOJ xT

Causes the SYCOM program to go to EOJ and produces a trace listing. The "x" character represents any nonblank character except the "D" character.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

FETCH

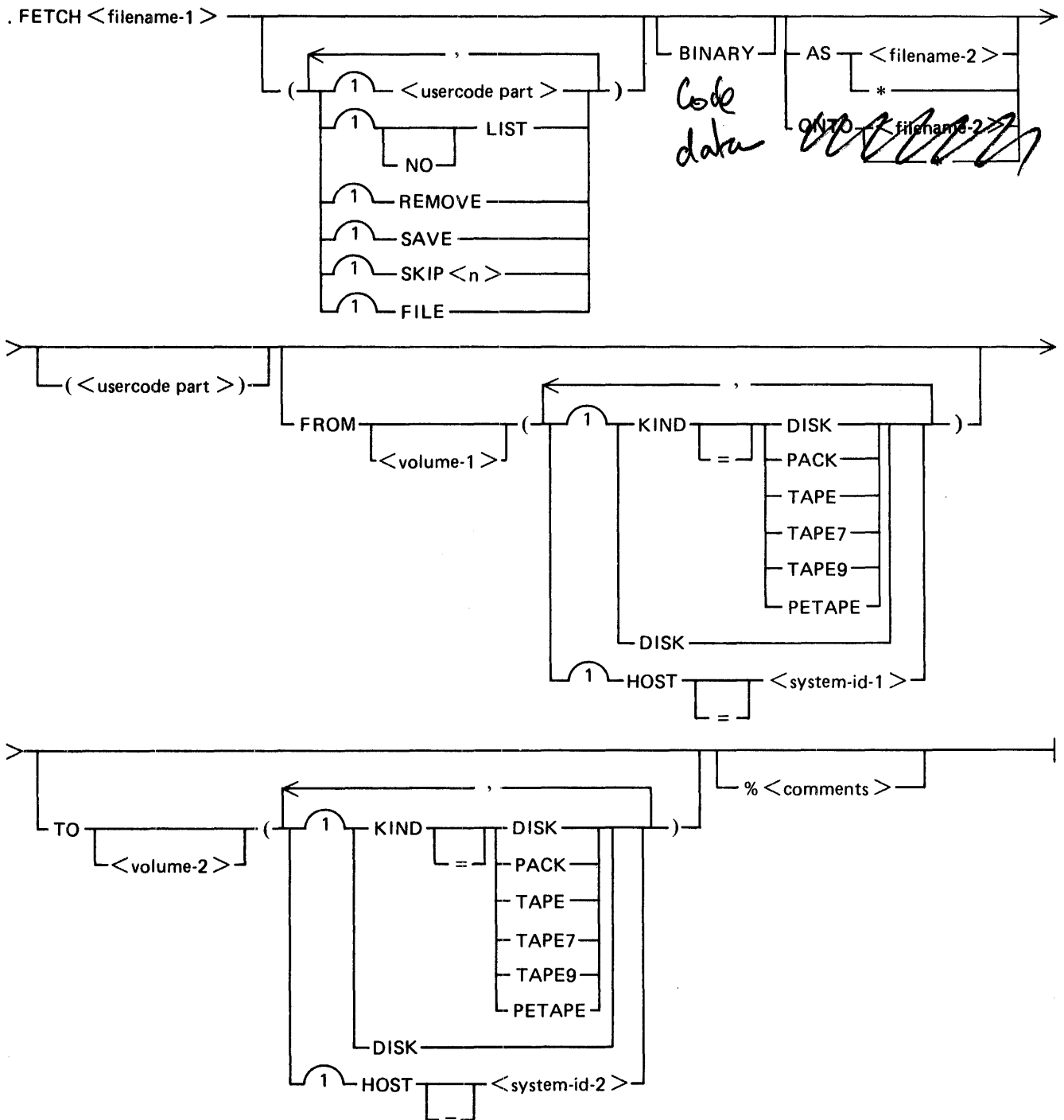
The **FETCH** command causes the SYCOM program to initiate a file transfer from the server-system to the user-system. This command is a shorthand version of the **COPY** command. The files can be on magnetic tape or disk.

In the Mark 10.0 release of SYCOM, the <destination file> is not removed unless the keyword **ONTO** is specified. The keyword **ONTO** is scheduled to be removed from the **FETCH** syntax in the Mark 11.0 release of SYCOM. In the Mark 11.0 release of SYCOM, the <destination file> is removed if it exists. If the user does not want to remove the <destination file>, the **ADD** command should be used.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

FETCH

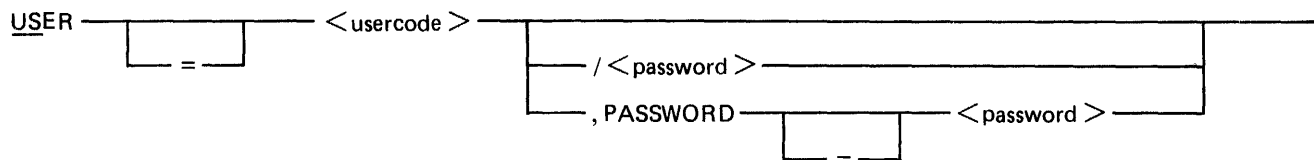
Syntax:



B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

FETCH

The <usercode part> syntax is shown in the following syntax diagram.



Semantics:

AS

The keyword AS informs the server-system to create a new file with the name specified as <filename-2>. If the file is present on the server-system, the command is aborted.

BINARY

The keyword BINARY applies to data files and causes the SYCOM program to expand all the records in a file prior to transmission. Code files are always expanded. The BINARY keyword allows users to transfer files to and from an ASCII system. If the BINARY keyword is not specified for a data file transfer to a non-EBCDIC system, the SYCOM program changes nongraphic characters to question mark (?) characters. The graphic character set is the EBCDIC representation of the 95 valid ASCII characters and the null character.

If a data file is sent to a CMS system (ASCII machine) with the BINARY option specified, to retrieve the same file and maintain file integrity, the FETCH command must include the BINARY keyword.

FILE

The keyword FILE allows the SYCOM program to read the names of the file(s) to be transmitted from the file, <filename-1>. By specifying the FILE option, a series of files can be transmitted by one FETCH command. Each file name must be entered on separate records in the file. If the destination file name is to be different than the source file name, it is entered following the source file name and must be separated by at least one blank. Comments can follow the second file name on the record starting with a percent sign (%) character. If comments are desired and the destination file name is the same as the source file name, the destination file name can be represented by an asterisk (*) character.

filename-1

This field specifies the name of the file to be transmitted. The file name can be a single file or a family of files in the format: <multifile-id>/=.

filename-2

This field specifies the name to be given to the file at the destination system. The file name can be a single file or a family of files in the format: <multifile-id>/=.

FROM

The keyword FROM specifies the medium and/or HOSTNAME from which the file is to be transferred.

HOST

The keyword HOST specifies the HOSTNAME of the system that the file is to be transferred to or from.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

FETCH

KIND

The keyword KIND specifies the peripheral device of a file. The keyword KIND is not required if the file is on disk.

LIST

The keyword LIST informs the receiving system that the printer backup file is to be printed after transmission by zipping a AUTOPRINT command to the MCP.

NO

The keyword NO overrides the default LIST attribute and is valid only for printer backup files.

ONTO

The keyword ONTO informs the server system to write over any existing file with the name specified by <filename-2>.

The keyword ONTO is scheduled to be removed from the FETCH syntax in the Mark 11.0 release of SYCOM. In the Mark 11.0 release of SYCOM, the <destination file> is removed if it exists.

PASSWORD

The keyword PASSWORD specifies the password part of the usercode/password pair.

REMOVE

The keyword REMOVE causes the file to be removed from the sending system after the transfer has been completed. ~~The keyword REMOVE is the default for printer backup files.~~

SAVE

The keyword SAVE ensures that a printer backup file is saved after the file is transferred on the sending system. If the keyword SAVE is not specified, all non-user-named files (those backup files not created with the MCP USER.BACKUP.NAME file attribute) are removed after they have been transferred. ~~The keyword SAVE is the default for nonprinter backup file transfer.~~

SKIP <n>

The keyword SKIP specifies how many files to skip if the FETCH <multifile-id>/= or the indirect (FILE) option is used. The first <n> files of the family are skipped. Usage of the keyword is optional.

system-id-1

This field specifies the system identification of the system from which the file is to be transferred from.

system-id-2

This field specifies the system identification of the system that is to receive the file.

TO

The keyword TO specifies the medium and/or HOSTNAME to which the file is to be transferred.

USER

The keyword USER is used to specify the usercode and, optionally, the password for the purpose of verifying access rights to the specified file name.

usercode and password

These fields identify the user for the purpose of verifying access rights to the specified file name.

**B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands**

FETCH

volume-1

This field specifies the user disk identifier or tape identifier for the source file. This keyword is not required for files on the system disk, or if a user disk identifier appears in <filename-1>. The keyword **DISK** indicates the system disk.

volume-2

This field specifies the user disk identifier or tape identifier for the destination file. This keyword is not required for files on the system disk, or if a user disk identifier appears in <filename-2>. The keyword **DISK** indicates the system disk.

()

The parentheses characters are key characters when using a **USER**, **KIND**, **NO LIST**, **LIST**, **HOST**, **REMOVE** or **SAVE** option. The options can appear in any order within the parentheses.

The asterisk (*) character assigns the file name specified in filename-1 to filename-2.

Examples:

.FETCH DMPALL

Uses the same source and destination names.

.FETCH DMPALL FROM USER1 TO USER2

Uses different user disk identifiers for the source and destination disks.

.FETCH USER/COBOL/= TO DISK

Takes a family of files from a user disk to the system disk.

.FETCH COBOL/= TO USER

Takes a family of files from the system disk to a user disk.

.FETCH = (US A/B, SKIP 9)

Fetches all the files under the usercode A, except the first nine files.

.FETCH RELEASE (FILE, NO LIST)

Uses a list of files.

GROUPSIZE

The GROUPSIZE command changes or interrogates the GROUPSIZE parameter used for dividing families of files into groups.

The GROUPSIZE parameter controls the number of files that are sent at one time when sending an entire family of files, for example, PUT SYSTEM/=.

This value of the GROUPSIZE parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change the value of the GROUPSIZE parameter.

Workstation Syntax:

GROUP SIZE _____|

Remote ODT and System ODT Syntax:

GROUPSIZE _____|
 └─── <integer > ───┘

Semantics:

integer

This field can be any one-digit or two-digit integer value between 1 and 99 that represents the new value of the groupsize.

Examples:

.GROUPSIZE

Interrogates the current value of the GROUPSIZE parameter and is valid from any station.

.GROUPSIZE 15

Sets the GROUPSIZE parameter to 15 and is valid only from a remote ODT station or the system ODT.

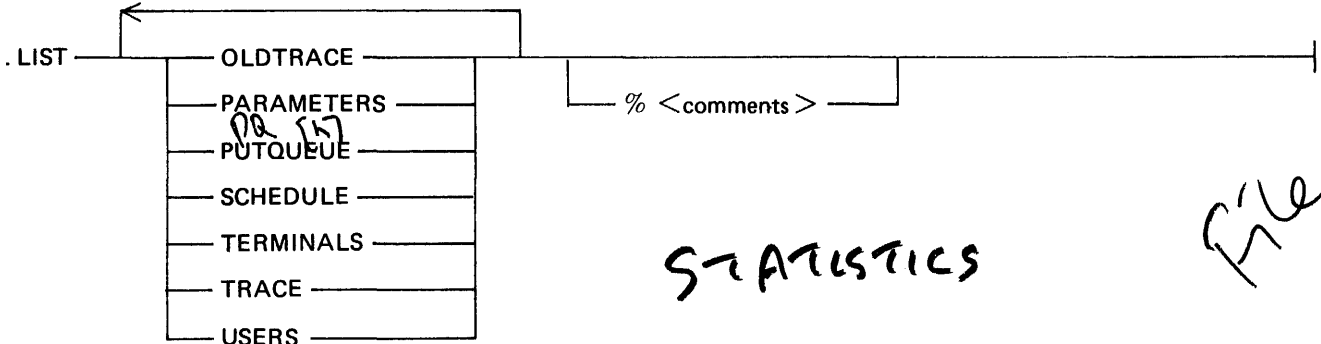
FILE

LIST

The LIST command displays information about the system and its users. Command options provide lists of those users currently signed on, terminals that are currently on-line, and file transfers that are currently scheduled to occur.

Syntax:

OLD nnnn



Semantics:

OLDTRACE

The keyword OLDTRACE prints the last trace file created by the SYCOM program.

PARAMETERS

The keyword PARAMETERS displays the values or settings of the parameters that the SYCOM program is using.

PUTQUEUE

The keyword PUTQUEUE prints the current range of file transfer requests that were initiated by a PUT request. The list provides a list of up to a maximum of 99 PUT requests.

SCHEDULE

The keyword SCHEDULE displays all file transfer operations currently in the schedule in schedule number order.

TERMINAL

The key word terminal displays all terminals that are currently on line.

TRACE

The keyword TRACE prints the current trace file being written by the SYCOM program.

USERS

The keyword USERS displays all of the users of the SYCOM program.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

LIST

Examples:

```
.LIST OLDTRACE  
.LIST PARAMETERS  
.LIST PUTQUEUE  
.LIST SCHEDULE  
.LIST TERMINALS  
.LIST TRACE  
.LIST USERS  
.LIST OLDTRACE PARAMETERS PUTQUEUE SCHEDULE TERMINALS TRACE USERS
```

*.LIST FILE SMCS/TRACER % list previous
SMCS trace*

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

LOG

The LOG command causes the SYCOM program to display the number of occurrences of specific data communication line errors and certain message transmission statistics.

A workstation can only interrogate the contents of the SYCOM log. The counters in the SYCOM log can be initialized by a remote ODT or by the system ODT if the CLEAR option is included in the command.

Workstation Syntax:

.LOG _____|

Remote ODT and System ODT Syntax:

.LOG _____|
┌ CLEAR ───┐ ┌ % <comments> ───┐

Semantics:

CLEAR

The keyword CLEAR resets the log counters and closes the STATISTICS file.

Examples:

lock ↑

.LOG

Valid from any station.

.LOG CLEAR

Valid only from a remote ODT station or the system ODT.

NR

LP NR (LINE PRINTER NOT READY)

The LP NR command informs the user-system SYCOM program that the line printer is Not Ready. The SYCOM program informs the server-system SYCOM program of this temporary condition. The server-system SYCOM program then suspends transmission of the line printer data stream messages until notified to resume by the user-system SYCOM program.

It is the responsibility of the user-system operator to inform the SYCOM program when the line printer is again Ready to receive output data.

This command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:

.LP NR _____
 └── % <comments > ───┘

Example:

.LP NR

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

OFFLINE

The OFFLINE command causes the SYCOM program to break the existing connection with the other system, go into standby mode, and wait for the other system to call back. This command can be used for either a switched or nonswitched Data Comm line connection. When a DLE ENQ character is received from the other system, the network controller re-establishes the connection with the other system and normal operations resume.

The OFFLINE command can be entered only from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:

.OFFLINE _____
 └── % <comments > ───┘

Example:

.OFFLINE

4 STOP

ONLINE

The ONLINE command causes the local network controller to attempt to re-establish the line connection to the remote system's network controller.

The error message RETRIES UP is displayed on the system ODT when the current message buffer being sent to the server-system is not being received. By entering the ONLINE command, the message buffer being sent is discarded and an attempt is made to re-establish the line connection.

The ONLINE command can be entered only from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:

.ONLINE _____
 └── % <comments > ───┘

Example:

.ONLINE

NOW

i.e. Simulates

BOJ

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

PHONE

The PHONE command changes or interrogates the PHONE parameter. The PHONE parameter provides the network controller with a telephone number for the Automatic Calling Unit (ACU) or displays the existing telephone number to a predefined server-system. The automatic dial-out using an Automatic Calling Unit (ACU) to a specific server-system requires that a telephone number be present.

This current telephone number can only be interrogated by a workstation. A remote ODT or the system ODT can change the value of the telephone number.

Workstation Syntax:

.PHONE _____|

Remote ODT and System ODT Syntax:

.PHONE _____|
=		<telephone number>		% <comments>		

Semantics:

telephone number

This field specifies the telephone number of the server-system. The maximum number of numeric characters is 20.

=

The equal sign (=) character clears the existing telephone number.

Examples:

PHONE

Interrogates the current telephone number and is valid from any station.

.PHONE 1-805-964-6881

Assigns a new telephone number and is valid from a remote ODT station or the system ODT.

.PHONE =

Clears any prior telephone number and is valid from a remote ODT station or the system ODT

PRINT

PROGRAM

PROGRAM

The PROGRAM command changes or interrogates the setting of the PROGRAM parameter. Setting the PROGRAM parameter enables program input to the SYCOM program and resetting the PROGRAM parameter disables program input to the SYCOM program.

The current setting of the PROGRAM parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change the setting of the PROGRAM parameter.

Workstation Syntax:

.PROGRAM _____|

Remote ODT and System ODT Syntax:

.PROGRAM _____|
 | OFF _____|
 | ON _____|

Semantics:

OFF
 The keyword OFF disables program input.

ON
 The keyword ON enables program input.

Examples:

.PROGRAM
 Interrogates the current status of the PROGRAM parameter and is valid from all stations.

.PROGRAM ON
 Enables program input and is valid from a remote ODT station or the system ODT.

.PROGRAM OFF
 Disables program input and is valid from a remote ODT station or the system ODT.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

PUT

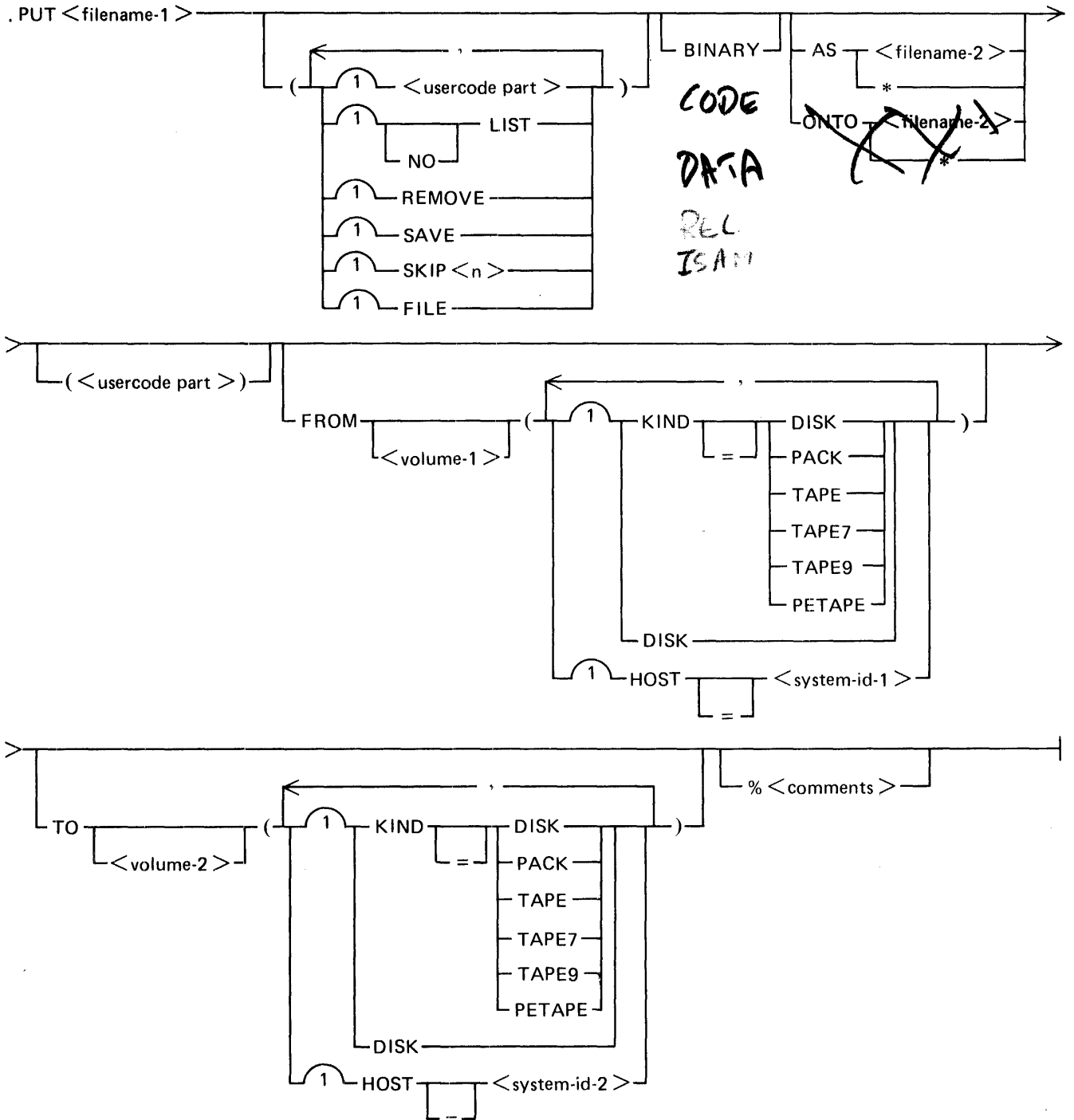
The PUT command causes the SYCOM program to initiate a file transfer from the user-system to the server-system. This command is a shorthand version of the COPY command. The files can be on magnetic tape or disk.

In the Mark 10.0 release of SYCOM, the <destination file> is not removed unless the keyword ONTO is specified. The keyword ONTO is scheduled to be removed from the PUT syntax in the Mark 11.0 release of SYCOM. In the Mark 11.0 release of SYCOM, the <destination file> is removed if it exists. If the user does not want to remove the <destination file>, the ADD command should be used.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

PUT

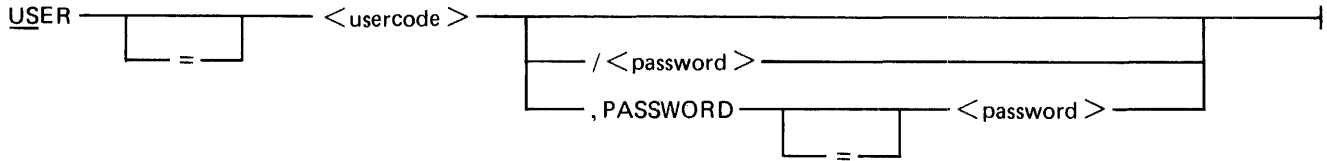
Syntax:



B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

PUT

The <usercode part> syntax is shown in the following syntax diagram.



Semantics:

AS

The keyword AS informs the server-system to create a new file with the name specified as <filename-2>. If the file is present on the server-system, the command is aborted.

BINARY

The keyword BINARY applies to data files and causes the SYCOM program to expand all the records in a file prior to transmission. Code files are always expanded. The BINARY keyword allows users to transfer files to and from an ASCII system. If the BINARY keyword is not specified for a data file transfer to a non-EBCDIC system, the SYCOM program changes nongraphic characters to question mark (?) characters. The graphic character set is the EBCDIC representation of the 95 valid ASCII characters and the null character.

If a data file is sent to a CMS system (ASCII machine) with the BINARY option specified, to retrieve the same file and maintain file integrity, the PUT command must include the BINARY keyword.

FILE

The keyword FILE allows the SYCOM program to read the names of the file(s) to be transmitted from the file, <filename-1>. By specifying the FILE option, a series of files can be transmitted by one PUT command. Each file name must be entered on separate records in the file. If the destination file name is to be different than the source file name, it is entered following the source file name and must be separated by at least one blank. Comments can follow the second file name on the record starting with a percent sign (%) character. If comments are desired and the destination file name is the same as the source file name, the destination file name can be represented by an asterisk (*) character.

filename-1

This field specifies the name of the file to be transmitted. The file name can be a single file or a family of files in the format: <multifile-id>/=.

filename-2

This field specifies the name to be given to the file at the destination system. The file name can be a single file or a family of files in the format: <multifile-id>/=.

FROM

The keyword FROM specifies the medium and/or HOSTNAME from which the file is to be transferred.

HOST

The keyword HOST specifies the HOSTNAME of the system that the file is to be transferred to or from.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

PUT

KIND

The keyword KIND specifies the peripheral device of a file. The keyword KIND is not required if the file is on disk.

LIST

The keyword LIST informs the receiving system that the printer backup file is to be printed after transmission by zipping a AUTOPRINT command to the MCP.

NO

The keyword NO overrides the default LIST attribute and is valid only for printer backup files.

ONTO

The keyword ONTO informs the server system to write over any existing file with the name specified by <filename-2>.

The keyword ONTO is scheduled to be removed from the FETCH syntax in the Mark 11.0 release of SYCOM. In the Mark 11.0 release of SYCOM, the <destination file> is removed if it exists.

PASSWORD

The keyword PASSWORD specifies the password part of the usercode/password pair.

REMOVE

The keyword REMOVE causes the file to be removed from the sending system after the transfer has been completed. ~~The keyword REMOVE is the default for printer backup files.~~

SAVE

The keyword SAVE ensures that a printer backup file is saved after the file is transferred on the sending system. If the keyword SAVE is not specified, all non-user-named files (those backup files not created with the MCP USER.BACKUP.NAME file attribute) are removed after they have been transferred. ~~The keyword SAVE is the default for nonprinter backup file transfer.~~

SKIP <n>

The keyword SKIP specifies how many files to skip if the PUT <multifile-id>/= or the indirect (FILE) option is used. The first <n> files of the family are skipped. Usage of the keyword is optional.

system-id-1

This field specifies the system identification of the system from which the file is to be transferred from.

system-id-2

This field specifies the system identification of the system that is to receive the file.

TO

The keyword TO specifies the medium and/or HOSTNAME to which the file is to be transferred.

USER

The keyword USER is used to specify the usercode and, optionally, the password for the purpose of verifying access rights to the specified file name.

usercode and password

These fields identify the user for the purpose of verifying access rights to the specified file name.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

PUT

volume-1

This field specifies the user disk identifier or tape identifier for the source file. This field is not required for files on the system disk, or if a user disk identifier appears in <filename-1>. The keyword DISK indicates the system disk.

volume-2

This field specifies the user disk identifier or tape identifier for the destination file. This field is not required for files on the system disk, or if a user disk identifier appears in <filename-2>. The keyword DISK indicates the system disk.

()

The parentheses characters are key characters when using a USER, KIND, NO LIST, LIST, HOST, REMOVE or SAVE option. The options can appear in any order within the parentheses.

*

The asterisk (*) character assigns the file name specified in filename-1 to filename-2.

Examples:

.PUT DMPALL

Uses the same source and destination names.

.PUT DMPALL FROM USER1 TO USER2

Uses different user disk identifiers for the source and destination disks.

.PUT USER/COBOL/= TO DISK

Puts a family of files from a user disk to the system disk.

.PUT COBOL/= TO USER

Transfers a family of files from the system disk to a user disk.

.PUT = (US A/B, SKIP 9)

Puts all the files under the usercode A, except the first nine files.

.PUT RELEASE (FILE, NO LIST)

Uses a list of files.

QS (QUEUE SIZE)

The QS command causes the SYCOM program to change or interrogate the QUEUESIZE parameter. If the QS command is not followed by an equal sign or number, the current value is displayed. If the QS command is followed by a number between 4 and 15, inclusive, the SYCOM program changes the QUEUESIZE parameter accordingly.

If the QUEUESIZE parameter has been changed by entering the QS command and the SYCOM program goes to end of job, the value of QUEUESIZE parameter reverts to the value specified in the parameters file.

The equal sign (=) character is optional for the QS command.

The current value of the QUEUESIZE parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change the value of the QUEUESIZE parameter.

Workstation Syntax:

.QS _____|

Remote ODT and System ODT Syntax:

.QS _____|
=		<integer>		% <comments>

Semantics:

=

The equal sign (=) character is an optional key character which can be used when changing the value of QUEUESIZE.

integer

This field can be any one-digit or two-digit integer between 4 and 15 which assigns the new queue depth limit.

Examples:

.QS

Interrogates the current value of the QUEUESIZE parameter and is valid from any station.

.QS=9

Valid from a remote ODT station or the system ODT.

.QS 12

Valid from a remote ODT station or the system ODT.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

READ

The READ command causes the SYCOM program to open a card-image file and begin transmitting the data to the host system. When end-of-file record is read, the card-image file is closed. One READ command is required to read each card-image file.

The READ command is only valid if the SYCOM program is properly logged-on to the host system. It is possible to override this feature by entering the RY CR (Ready Card Reader) command to the SYCOM program.

All nongraphic characters are replaced with the question mark (?) character.

The READ command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:

.READ _____
 ┌──────────┬──────────┬──────────┐
 |<filename>|<device type>| % <comments > |

Semantics:

filename

This field specifies the name of the file. The SYCOM program uses the file name specified to locate the file on the designated device type. The file name must not have embedded blanks. The default file name is RJE/CARDS.

device type

This field specifies the device type that the SYCOM program is to read from. Allowable entries are DISK or blank (card read device). The default is a card reader device. If a user disk identifier is included in the file name, DISK is assumed as the device type.

Examples:

.READ SOURCE

A card device is assumed.

.READ USERPACK/SOURCE/FILE

A disk device is assumed since there are two slash (/) characters.

.READ DISK/FILE DISK

A disk device is required since the DISK option was specified.

.READ

The file name defaults to RJECARDS and the device type defaults to the card reader.

RESTART

The RESTART command causes the SYCOM program to reinitialize, break the data communication connection to the other system, flush the PUT_QFILE file, and go into a standby state and wait for a connection to be initiated, by entry of either the ONLINE ~~or CONNECT~~ command to the SYCOM program.

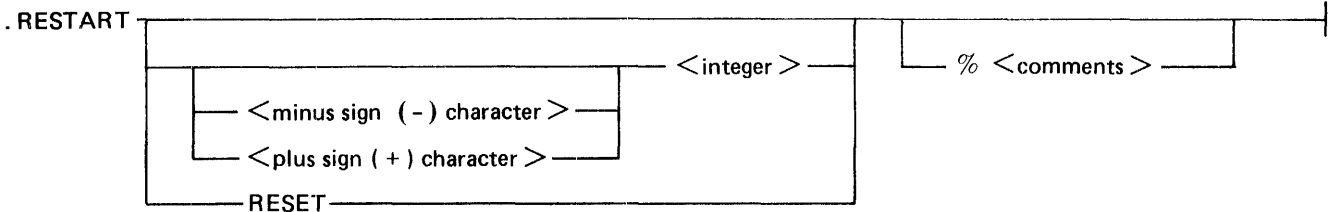
If a schedule number is supplied, the SYCOM program re-establishes the connection with the other system and restarts the file transfers beginning with the supplied schedule number. Only the last 99 PUT commands in the PUT_QFILE file can be restarted. Therefore, the schedule numbers available for restarting are between the current PUT schedule number less 99, and the current PUT schedule number.

If a minus sign (-) character appears in front of the schedule number, the SYCOM program begins transferring all of the files in the PUT_QFILE file starting with the current PUT schedule number reduced by minus the number specified in the RESTART command.

If a plus sign (+) character appears in front of the schedule number, the SYCOM program begins transferring all of the files in the PUT_QFILE file starting with the current PUT schedule number plus the number specified in the RESTART command.

The RESTART command can only be entered from a remote ODT or the system ODT.

Remote ODT or System ODT Syntax:



Semantics:

minus sign

The minus sign (-) character.

plus sign

The plus sign (+) character.

integer

This field specifies the number (located in the PUT_QFILE file and can be interrogated by entering the LIST SCHEDULE SYCOM command) from which to start the file transfers.

RESET

The keyword RESET Causes the SYCOM program to disconnect and log-off all users.

Examples:

RESTART

Flushes the PUT_QFILE and goes into the idle state.

does this work?

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

RESTART

RESTART 12

Re-establish connection and restart file transfer beginning with the schedule number 12 in the PUT_QFILE.

RESTART -5

Re-establish connection and restart file transfers beginning with the last five file transfers in the PUT_QFILE.

RESTART +3

Re-establish connection and restart file transfers beginning by skipping three file transfers in the PUT_QFILE.

RESTART RESET

Disconnects and logs-off all users.

*No op transfer
switched line.*

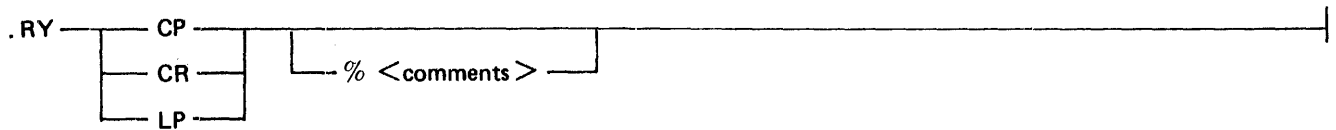
RMSG

RY (READY DEVICE)

The RY command informs the SYCOM program that the specified peripheral device is currently ready to send or receive data. The SYCOM program also notifies the server-system SYCOM program that the peripheral device is ready to send or receive data.

The RY command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:



Semantics:

CP

The keysymbol CP indicates that the card punch is ready.

CR

The keysymbol CR indicates that the card reader is ready.

LP

The keysymbol LP indicates that the line printer is ready.

Examples:

.RY LP

.RY CP

.RY CR

Must be entered if punch output is from the B 1000 RJE/CONTROLLER program.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

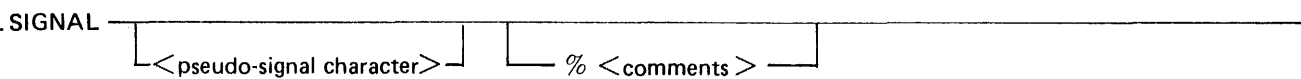
SIGNAL

The SIGNAL command causes the SYCOM program to display or change the current SYCOM pseudo-signal character. This action facilitates communication with more than one SYCOM program. If a new pseudo-signal character is not specified in the SIGNAL command, the current pseudo-signal character is displayed. If the SMCS program is executing and the SYCOM user is signed on to the SYCOM program, changing the SYCOM pseudo-signal character only applies to the one user, leaving the SYCOM pseudo-signal characters for the other users unchanged.

The default character for the SYCOM pseudo-signal character is the period (.) character or whatever character that is defined as the pseudo-signal character in the PARAMETERS file by the DEFAULTP-SEUDOSIGNAL parameter at beginning of job. The pseudo-signal character reverts back to the default pseudo-signal character after a station is signed off the SYCOM program or when the SYCOM program goes to end of job. A station can be signed off the program by entering the BYE command to the SYCOM program or the *OFF command to the SMCS program. The pseudo-signal character is not required when a terminal is not connected to a server-system.

The SYCOM pseudo-signal character is required when entering SYCOM program commands to the SYCOM program on the system ODT and the system ODT is not connected to the remote system. Otherwise, the message is sent to the remote system ODT.

Syntax:



Semantics:

pseudo-signal character

This field specifies the new pseudo-signal character for the current SYCOM user.

Examples:

```
.SIGNAL  
.SIGNAL #
```

SIZE

The SIZE command causes the SYCOM program to display or change the maximum message buffer size parameter for transmitting and receiving purposes. The SYCOM program then informs the server-system SYCOM program of this change with a special system control type message. This command applies only to the RJE function of the SYCOM program.

This value of the SIZE parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change the value of the SIZE parameter.

Workstation Syntax:

.SIZE _____

Remote ODT and System ODT Syntax:

.SIZE = <integer> % <comments> _____

Semantics:

integer

This field is a three-digit number which assigns the RJE buffer size. The value must be between 078 and ~~400~~, inclusive.

Examples:

1500

.SIZE

Interrogates the current RJE buffer size and is valid from any station.

.SIZE = 400

Equal sign (=) character is optional. Valid from a remote ODT station or the system ODT.

.SIZE 132

Valid from a remote ODT station or the system ODT.

SS

STATISTICS.

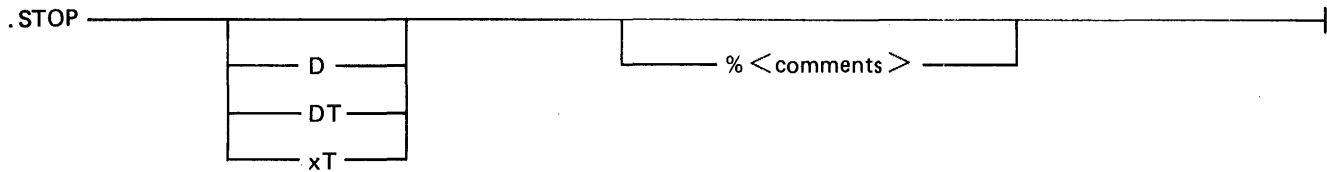
B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

STOP

The STOP command causes the SYCOM program to immediately shut the system down. No further input messages are accepted and the SYCOM program goes to end of job. Terminals are not logged-off, virtual terminals are not disconnected, nor is an intersystem connection disconnected. Also, line printer listings of the DISK_TRACE file and/or a SYCOM program dump are generated, if requested.

The STOP command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:



Semantics:

- D
The letter D causes the SYCOM program to initiate a program dump.
- DT
The letters DT cause the SYCOM program to initiate a program dump and a list trace.
- xT
These letters cause the SYCOM program to initiate a list trace. The “x” character represents any nonblank character except the “D” character.

Examples:

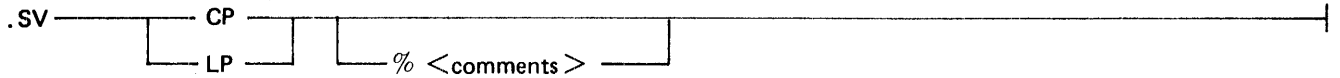
- .STOP
- .STOP D
Causes a SYCOM program dump file to be created.
- .STOP DT
Causes a SYCOM program dump file and a trace listing to be created.
- .STOP IT
Causes a trace listing to be created. The “I” character represents any nonblank character except the “D” character.

SV (SAVE DEVICE)

The SV command directs the user-system SYCOM PROGRAM to inform the server-system SYCOM program to cease transmitting the card punch or line printer data stream and to save the entire file at the server-system. The SV command permanently inhibits the transmission of any further card punch or line printer data streams until notified by the user-system SYCOM program.

The SV command can only be entered from a remote ODT or the system ODT.

Remote ODT and System ODT Syntax:



Semantics:

CP
The keysymbol CP saves the card punch.

LP
The keysymbol LP saves the line printer.

Examples:

```
.SV CP  
.SV LP
```

SYSTEMID

The SYSTEMID command displays or changes the current value of the SYSTEMID parameter. If a new SYSTEMID parameter is entered, it is sent to the remote system by means of the appropriate SYCOM control message. If the SYSTEMID parameter has not been entered, the system HOSTNAME, entered by the MCP HN command is used as the SYSTEMID parameter. This SYSTEMID parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change or interrogate the value of the SYSTEMID parameter.

Workstation Syntax:

.SYSTEMID _____|

Remote ODT and System ODT Syntax:

.SYSTEMID _____|
 ┌───────────<identifier>──────────┐

Semantics:

<identifier>

This field can be any identifier of up to 17 characters containing only alphanumeric characters used to identify the new systemid parameter. The first letter of the systemid parameter must be an upper-case letter.

Examples:

.SYSTEMID

Displays the current setting of the SYSTEMID parameter and is valid from any station.

.SYSTEMID AARDVARK

Changes current SYSTEMID parameter and is valid from a remote ODT station or the system ODT.

TIMOURS [n]

TRACE

TRACE

The TRACE command provides the facilities for tracing all SYCOM input/output messages which are maintained in a file labeled DISK_TRACE. When the TRACE command is entered without an attribute, the current status of the TRACE parameter is returned.

The disk tracing facility is used in conjunction with program switch 2. If program switch 2 is equal to 0, intersystem SYCOM program control messages are traced, and no data is traced. If program switch 2 is equal to 15, all data is traced. If program switch 2 is equal to a number between 0 and 15, then n lines of data are entered into the trace file, where n is the assigned value of program switch 2.

The size of the DISK_TRACE file can be controlled by the TRACEAREAS, TRACEBA, and TRACERB parameters. The default values for the TRACEAREAS, TRACEBA, and TRACERB are 20, 10, and 4, respectively.

The TRACE parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change or interrogate the setting of the TRACE parameter.

Workstation Syntax:

.TRACE _____

Remote ODT and System ODT Syntax:

.TRACE

ON
OFF

 % <comments>

Semantics: UST

OFF
The keyword OFF disables the trace function.

ON
The keyword ON enables the trace function.

Examples:

TRACE
Causes the SYCOM program to display the value of the TRACE parameter and is valid from all stations.

TRACE ON
Sets the TRACE parameter and is valid only from a remote ODT station or the system ODT.

TRACE OFF
Resets the TRACE parameter and is valid only from a remote ODT station or the system ODT.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

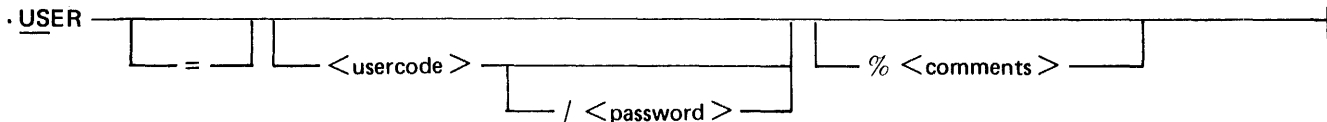
USER

The USER command assigns the specified usercode/password as the default usercode/password for file transfers when none is specified in a ADD, COPY, PUT, or FETCH command. The usercode/password is not validated when entered but is forwarded to the other system when a CONNECT command is processed.

If no usercode/password is supplied, the station is disconnected (if connected). This allows the user to be logged-off the SYCOM program without signing off. The BYE command signs the user off and detaches the station from the SYCOM program.

The usercode and password can be a maximum of 17 characters each for communication with non-B 1000 systems.

Syntax:



Semantics:

usercode

This field can be any valid character string consisting of from 1 to 17 alphanumeric characters to identify the user. The B 1000 computer system is limited to an 8-character usercode and must begin with an upper-case letter.

password

This field can be any valid character string consisting of from 1 to 17 alphanumeric characters used for identification purposes in order to meet file security requirements. The B 1000 computer system is limited to a 10-character password.

Examples:

`.USER ODT`

`.US ODT/USER`

`.US`

When this command is in effect, and a user is logged on to the SYCOM program, the user is logged off. If the station is connected, the station is automatically disconnected. The station remains attached to the SYCOM program.

WAIT

The WAIT command interrogates or changes the status of the WAIT parameter.

The setting of the WAIT parameter can only be interrogated by a workstation. A remote ODT or the system ODT can change or interrogate the setting of the WAIT parameter.

Workstation Syntax:

.WAIT _____|

Remote ODT and System ODT Syntax:

.WAIT _____|
 ┌── OFF ──┐
 └── ON ──┘ % < comments >

Semantics:

OFF

The keyword OFF turns the WAIT parameter off.

ON

The keyword ON turns the WAIT parameter on.

Examples:

.WAIT

Interrogates the status of the WAIT parameter and is valid from any station.

.WAIT ON

Sets the WAIT parameter on and is valid from a remote ODT station or the system ODT.

.WAIT OFF

Resets the WAIT parameter off and is valid from the remote ODT station or the system ODT.

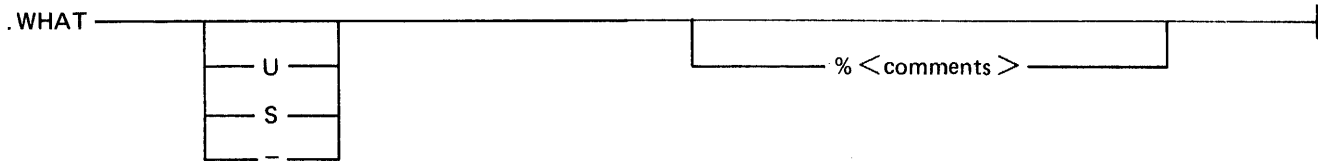
of [NO] WAIT parameters

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

WHAT

The WHAT command causes the SYCOM program to display the current status of the SYCOM program's processing activity. The reply message from the SYCOM program is variable in content and length to reflect as many conditions as possible. If a file is in the process of being transferred, the file name and the number of records transferred are displayed.

Syntax:



Semantics:

- S
The letter S appends the output of a LIST SCHEDULE command to the normal output of the WHAT command.
- U
The letter U appends the output of a LIST USERS command to the normal output of the WHAT command.
- =
The equal sign (=) character appends the output of a LIST USERS and a LIST SCHEDULE command to the normal output WHAT command.

Examples:

.WHAT
.WHAT U
.WHAT S
.WHAT =

SMCS COMMAND STRING FROM USER-SYSTEM

This command syntax allows a terminal user on the user-system to give commands to the server-system SMCS program for processing. Commands that are entered from a terminal and prefixed with an asterisk (*) signal character are intercepted by the network controller and are immediately sent to the SMCS program for processing. Consequently, the entire range of SMCS commands is available to a SYCOM user with this command syntax.

Syntax:

<signal character> <SMCS command string> _____|

Semantics:

signal character

This field specifies the signal character assigned to the SMCS program.

SMCS command string

This field specifies any SMCS command which is valid from a user-system terminal and any attributes that are required by the command.

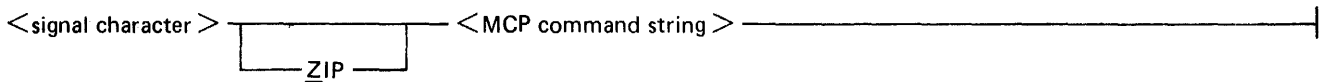
Examples:

*STATUS
*FILE DMPALL

SMCS MCP COMMAND STRING FROM USER-SYSTEM

This command syntax initiates directives to the user-system MCP for processing. By prefixing the command string with the signal character of the local SMCS program, the network controller message switches this command string to the user-system SMCS program. The user-system SMCS program then spawns the string to the MCP for processing under the following rules, assuming that the terminal is a remote ODT. If the ZIP option is included or the user is not logged-on, then the command string is spawned unsecured. Otherwise, the command string is spawned secured.

Syntax:



Semantics:

signal character

This field specifies the signal character assigned to the SMCS program.

ZIP

The keyword ZIP is used by the SMCS program to spawn a string as an unsecured control string.

MCP command string

This field specifies any MCP command string. If this string is not prefixed with the keyword ZIP and the user is logged on to the user-system SMCS, the allowable MCP commands are restricted. Refer to APPENDIX I for a list of these restricted commands.

Examples:

```
*Z PD DMPALL  
*Z EX DMPALL  
*Z EX DMPALL
```

SMCS COMMAND STRING FROM SERVER-SYSTEM

This command syntax allows a terminal user on the user-system to give commands to the server-system SMCS program for processing. Each command entered must be prefixed with the current signal character for that SMCS program, and that signal character must differ from that of the user-system SMCS program. All messages with this signal character are intercepted by the network controller and immediately sent to the SMCS program for processing. Consequently, the entire range of SMCS commands is available to a SYCOM user. This command syntax is valid only when an SMCS program is running in the server-system.

Syntax:

<signal character> <SMCS command string> _____|

Semantics:

signal character

This field specifies the signal character assigned to the server-system SMCS program.

SMCS command string

This field specifies any SMCS command which is valid from a user-system terminal and any attributes that are required by the command.

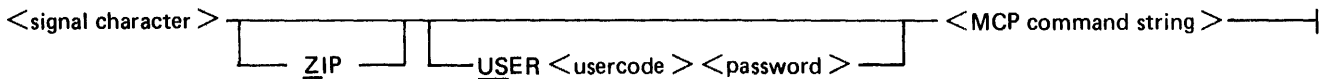
Examples:

```
$ FILE DMPALL  
$ STATUS
```

SMCS MCP COMMAND STRING FROM SERVER-SYSTEM

This command syntax allows certain MCP commands to be sent to a server-system for processing. These MCP commands can be entered from either the user-system ODT or from one of its terminals. All replies to these commands are returned to the user-system SYCOM program which causes them to be displayed on an appropriate device. Certain MCP commands require a usercode/password prefixed to the desired MCP command which is known to the server-system. This command syntax is valid only when an SMCS program is running in the server-system.

Syntax:



Semantics:

signal character

This field specifies the signal character assigned to the server-system SMCS program.

ZIP

This keyword ZIP is an SMCS command and causes the <MCP command string> to be spawned as an unsecured control string.

usercode

This field specifies an alphanumeric character string consisting of from one to eight characters and beginning with an upper-case letter that identifies the user.

password

This field specifies an alphanumeric character string used for identification purposes to meet file security requirements.

MCP command string

This field specifies any MCP command string. If this string is not prefixed with the keyword ZIP and the user is logged on to the user-system SMCS, the allowable MCP commands are restricted. Refer to Appendix I for a list of these restricted commands.

Examples:

```
$ MX  
$ WY  
$ Z US DOUG EX DMPALL; SW7 1; AX LIST SMCS/JOBS A
```

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

Table 5-1 contains a summary of the functions of the SYCOM commands. Refer to the command descriptions in this section for command syntax and option details.

Table 5-1. Summary of SYCOM Commands

Command	Station	Function
ABORT	Any	Abort a PUT or FETCH file transfer.
ADD	Any	File transfers (PUT or FETCH).
BUFFER	Any*	Interrogate or change the buffer size for file transfers.
BYE	Any	Station log-off from SYCOM.
CL	ODT	Clear peripheral device.
CONNECT	Any	Request establishment of a terminal to a server-system SMCS.
COPY	Any	File transfers (PUT or FETCH).
CP NR	ODT	Inform SYCOM of Not Ready peripheral.
DEBUG	Any*	Start or stop input/output message tracing.
DISCONNECT	Any	Request for terminal disconnect from the server-system SMCS.
<i>DUMP</i>	EOJ	Causes SYCOM to go into an orderly shutdown.
	FETCH	Any File transfers (receive a file from other system).
<i>HELP</i>	GROUPSIZE	Any* Sets groupsize for file transfers.
	LIST	Any Display selective system information.
	LOG	Any* Display a list of Data Comm error counts.
	NR	ODT Inform SYCOM that a line printer is Not Ready.
	OFFLINE	ODT Cause SYCOM to break the connection to a server-system.
	ONLINE	ODT Establish a server-system connection.
	PHONE	Any* Establish or clear phone number.
<i>PRINT</i>	PROGRAM	Any* Set or interrogate the value of program parameter.
	PUT	Any File transfers (place a file on the other system).
	QS	Any* Change network controller queue depth.
	READ	ODT Open and transmit card input file.
	RESTART	ODT Disconnect line, initialize, and standby.

B 1000 System Communications Module (SYCOM)
SYCOM Operator Commands

Table 5-1. Summary of SYCOM Commands (Cont)

Command	Station	Function
RY	ODT	Inform SYCOM of available peripheral.
SIGNAL	Any	Change the SYCOM signal character.
SS — STATISTICS SIZE	Any*	Change maximum message block size.
STOP	ODT	Cause SYCOM to shut down immediately.
SV	ODT	Stop transmitting and save file.
SYSTEMID	Any*	Interrogate or change the value of SYSTEMID.
TRACE	Any*	Start or stop SYCOM I/O disk tracing.
USER	Any	Log a user on to the SYCOM program.
WAIT	Any*	Interrogate or change the value of the WAIT parameter.
WHAT	Any	SYCOM status inquiry.

SS —
STATISTICS
TIMEOUTS

Zip

NOTES

- Any = Can be entered from any SYCOM station.
- Any* = Can be entered from any SYCOM station to interrogate the value of this parameter. Only the system ODT or a remote ODT can change the value of this parameter.
- ODT = Can be entered from the system ODT or a remote ODT.

SECTION 6 OUTPUT MESSAGES

GENERAL

The four types of messages that are displayed on the B 1000 Operator Display Terminal (ODT) follow, and are discussed in subsequent text.

1. Master Control Program (MCP) messages.
2. Server-system messages.
3. NDL network controller messages.
4. SYCOM program messages.

MASTER CONTROL PROGRAM (MCP) MESSAGES

The Master Control Program (MCP) displays messages in response to a control instruction or informs the system operator of events that have or are to take place. Refer to the B 1000 Systems System Software Operation Guide, Volume 1, form number 1108982, for further information regarding the MCP output messages.

SERVER-SYSTEM MESSAGES

The server-system displays messages in response to a system command and informs the B 1000 systems operator of events that have occurred or are to take place. Server-system messages have the following format.

% <program-name> = <job-number> <host message>

The percent sign (%) character, program-name, equal sign (=) character, and job-number are supplied by the MCP.

NDL NETWORK CONTROLLER MESSAGES

The messages displayed by the network controller start in column 2 and have the following format.

% <network controller program name> = <job-number> <message>

The ODT messages that can occur while the network controller is executing are listed in alphabetical order and are explained as follows.

#RETRIES UP ONLINE <nn>

The retry limit is exhausted for the current message without being acknowledged by the receiver, where nn is the number of times the retry limit was exhausted.

MESSAGE RECEIVED FOR INVALID ADDRESS

A message was received with an address other than 00, 01, 02, 03, or 04. The message is discarded.

MESSAGE RECEIVED FROM DISABLED STATION nn

A message was received for a station which has insufficient space to store the message. nn is the station number of the message. The message is discarded.

B 1000 System Communications Module (SYCOM)
Output Messages

SYCOM PROGRAM MESSAGES

The messages displayed by the SYCOM program start in column 2 and have the following format.

% SYCOM = <job-number> <message>

The ODT messages that can occur while executing the B 1000 SYCOM program are listed in alphabetical order and are explained as follows.

WARNING - NO "SYSTEMID"

Upon completion of the accept SYCOM parameters process, it was determined that a SYSTEMID parameter or the MCP HOSTNAME was not specified.

WARNING - REMOTE HOST NAME SAME AS SYSTEM ID

The SYSTEMID and/or the MCP HOSTNAMES for both SYCOM programs must be different if the COPY or ADD commands are to be used.

'=' EXPECTED BUT GOT <token>

The parameters which include a value must be separated by the = character.

"CONNECT FAILED": VIRTUAL TERMINAL TABLE FULL

Indicates that all allocated virtual terminal positions are currently in use. The terminal user must try again at a later time or add more virtual terminal stations to the NDL source program and recompile with the NDL compiler.

ANOTHER SYCOM WITH SAME MULTI-FILE-ID IS RUNNING

Indicates that the SYCOM program cannot gain access to the SYCOM/PUT_QFILE disk file as it is presently in use by another program.

BUFFER SIZE EXCEEDS MAXIMUM ALLOWABLE

The maximum allowable buffer size is 1950 bytes. The specified buffer size exceeded this limit.

BUFFER SIZE <value> EXCEEDS MAXIMUM ALLOWABLE 1950

RUN TIME TRANSMISSION BUFFER SIZE CHANGED TO 1950

The value specified in the BUFFER command was greater than 1950 and the SYCOM program changed the buffer size to 1950. 2421

BUG IN NETWORK CONTROLLER. VTT INDEX = <vtt>

A close message was received from the network controller for a program which contained a LSN list and is known to the SYCOM program. This list included a Virtual Terminal Table Index entry for a terminal not signed on to that program.

CAN NOT FETCH WHEN REMOTE SYCOM OFFLINE

Indicates that an intersystem line connection does not presently exist and the FETCH request cannot be accommodated.

CAN'T SCHEDULE NOW; TRY AGAIN LATER

The PUT and FETCH queue is presently full; therefore, no more PUT or FETCH commands can be accepted at this time.

CAN'T SPECIFY PASSWORD TWICE

The password is currently in use at another station.

CAN'T SPECIFY USERCODE TWICE

The usercode entered is currently in use at another station.

B 1000 System Communications Module (SYCOM)
Output Messages

CANNOT FETCH WHEN REMOTE SYCOM OFFLINE

Indicates that an intersystem line connection does not presently exist and the FETCH request cannot be accommodated.

CANNOT PUT WHEN REMOTE SYCOM OFFLINE

Indicates that an intersystem connection does not presently exist. Therefore, a PUT command cannot be processed immediately. The PUT request is saved in the PUT_QFILE file for later transmission.

CARD READER CLOSED <count?>

The card input was completed and the card file closed.

CONNECT DENIED, PROBABLY NO SERVER PROGRAM

There is no SMCS program in the remote system to which the station can be connected.

DEBUG ALREADY ON

A command was entered to turn DEBUG ON, and DEBUG was already ON.

DEBUG WAS ALREADY OFF

A command was entered to turn DEBUG OFF, and DEBUG was already OFF.

DESTINATION HOST NOT ONLINE

The destination host name specified in the COPY command string is not a local or remote system identifier.

DISK TRACE ALREADY ON

The command was entered to turn tracing ON but the SYCOM program was already in trace mode.

DISK TRACE WAS ALREADY OFF

The TRACE OFF command was entered to turn tracing OFF but the SYCOM program was not currently in trace mode.

ERROR = "ON" OR "OFF" EXPECTED

The only valid options for the TRACE command are ON and OFF.

ERROR: ".QS" OPERAND NOT NUMERIC

The QS command was entered with a nonnumeric queue size integer field and was ignored. It is necessary to re-enter the command string in the correct format.

ERROR: ".SIZE" CANNOT BE LESS THAN 78

Indicates that the integer entered is less than the minimum allowable size. The minimum size is 78 bytes.

ERROR: ".SIZE" CANNOT EXCEED 400

Indicates that the integer entered exceeds the maximum allowable size. The maximum is 400 bytes.

ERROR: ".SIZE" OPERAND NOT NUMERIC

The integer entered with the command string was comprised of at least one nondigit character.

ERROR: "QS" OPERAND MAY NOT EXCEED 15

The queue size integer entered was greater than 15. It must be re-entered with an appropriate integer value.

B 1000 System Communications Module (SYCOM)
Output Messages

ERROR: "QS" OPERAND MUST BE AT LEAST 4

The queue size integer entered was less than 4. The command must be re-entered with a legitimate integer value.

ERROR: INCOMPLETE IO ON LINK FILE

An INCOMPLETE I/O condition was detected during a read operation on the remote file LINK.

ERROR: MESSAGE TYPE = <message type>

An input message from the remote file LINK was found to be invalid. The message type code is included in the displayed error message for reference.

ERROR: MESSAGE TYPE = <type code>

This message indicates that the input message type received on the remote file LINK is incorrect.

FATAL ERROR AT <program sequence #> <text>

The display of this message on the system ODT can be caused by several reasons. The SYCOM source sequence number displayed is the only clue to the problem. The local SYCOM program initiates a memory dump, automatically prints the DISK_TRACE file, sends a request to the remote SYCOM program to initiate a memory dump and print the DISK_TRACE file, and then goes to end of job after certain disconnect functions are satisfied. Submit the memory dumps and DISK_TRACE file listings with a Field Communications Form to your Burroughs Support Organization.

FETCH REQUESTOR MISMATCH

An ABORT FETCH command was entered to abort a file transfer and the source file specified in the FETCH command was secured by a usercode/password. The user must sign on to the SYCOM program with the correct usercode/password and re-enter the ABORT FETCH command. This message can also occur if the user was logged-on to the SMCS program and signed on to the SYCOM program with a different usercode/password.

FILE <file name> ALREADY EXISTS AT DESTINATION – PUT ABORTED

When the SYCOM program is setting up to receive a disk file, the disk directory is checked. If the specified file already exists, this message is displayed and the file transfer is not started.

FILE <file name> FILE NAME WAS IDENTIFIED WITH MORE THAN 10 CHARACTERS

The name of the file to be transmitted contained an identifier that exceeded 10 characters.

FILE <file name> FILE TYPE CANNOT BE TRANSMITTED

The disk file specified for the file transfer is not one of the file types that can be transferred to a system other than a B 1000.

FILE <file name> IN USE AT DESTINATION--FETCH ABORTED

The file in question was received, but when the SYCOM program attempted to close the file, it found that the file to be replaced was currently in use. The FETCH operation is aborted and the received file is lost. The file must be requested again.

FILE <file name> IN USE AT DESTINATION--PUT ABORTED

Indicates that the SYCOM program is attempting to send a file to the other system and the specified file is currently in use on that system. The PUT operation is aborted.

FILE <file name> LOCKED

The object file for a PUT operation cannot be transferred because another program has opened the file with the LOCKOUT boolean set. Programs cannot open a file as INPUT only when the LOCKOUT boolean is set.

B 1000 System Communications Module (SYCOM)
Output Messages

FILE <file name> NOT FOUND

The object file for a PUT operation was not found in the disk directory or was not on line (tape or user disk).

FILE <file name> RECORD SIZE TOO BIG. > ~~974~~ 1800 +

The record size for the disk or tape file specified is too large for the SYCOM program to transfer with the present record size setting. The file cannot be transferred. The maximum record size is ~~974~~ bytes.

FILE <file name> SOURCE OR DESTINATION FILE NAME INVALID

The specified file name was found to contain characters other than those which are considered valid for a file identifier, or a multifile identifier was indicated but not included.

FILE <file name> SOURCE OR DESTINATION FILE NAME MISSING

Indicates that a subject file name was missing from the command string which was entered as either a COPY, PUT, or FETCH command from another system.

FILE "RJECARDS" NOT PRESENT, TRY AGAIN

The READ command was entered but the card file labeled RJE/CARDS was not present in the card reader.

FILE FAMILY NOT ALLOWED

An equal sign (=) character was found which represented either a disk identifier or a multifile identifier. This is invalid. A specific file or family of files must be named.

FILE NAME MISSING

The command syntax requires a file name to be specified that is the subject of the file transfer.

HOST ATTRIBUTE DEFINED TWICE

The HOST = attribute was specified twice.

HOST NAME HAS MORE THAN 17 CHARACTERS

A host system name with more than 17 characters (maximum allowable) was entered.

HOST SYSTEM CARD READER ABORTED

This message is used to inform the system operator that card reader input from the remote system was aborted. No action is required of the operator.

HOST SYSTEM CARD READER HALTED

Informs the system operator of a condition that presently exists on the remote system. No action is required by the operator.

HOST SYSTEM CARD READER READY

Informs the local system operator that card input from the remote system has resumed.

INQ OVERFLOW, FOLLOWING MSG DISCARDED

<60 or fewer characters of message>

An incomplete I/O error occurred during a write operation to a program-to-SYCOM application program.

INTEGER EXPECTED BUT GOT <token>

The BUFFER parameter requires an integer which specifies the BUFFER size in bytes.

B 1000 System Communications Module (SYCOM)
Output Messages

INVALID CONTROL MESSAGE RECEIVED

Indicates that the SYCOM program received a system control message from a remote system and the type code in this message is not within the 00 through 23 number range. The input message is discarded and no further processing is done.

INVALID DESTINATION HOST NAME "<token>"

The destination system name specified is the same as the local system name. The command is not processed.

INVALID FILE ATTRIBUTE DELIMITER: <token>

The COPY command syntax requires a comma (,) character between the attribute <usercode> and the keyword PASSWORD.

INVALID FILE ATTRIBUTE: <token>

The command syntax expected a keyword of US, USER, or PASSWORD. However, what was entered is displayed in the message as <token>.

INVALID HOST NAME

The host system name entered was incorrect because it contained non-alphanumeric characters.

INVALID KIND ATTRIBUTE

The attribute for the KIND keyword was not PACK, PETAPE, TAPE, TAPE7, or TAPE9.

INVALID PARAMETER: <token>

The parameters keyword entered did not match one of the acceptable keywords.

INVALID PARAMETERS FILE, BEING REMOVED

This message occurs after the parameters are read in and the maximum buffer size exceeds the system maximum of ~~1950~~ 2421 bytes or the version is incorrect. When this condition is encountered, the SYCOM/PARAMETERS file is removed and new parameters must be entered.

INVALID PASSWORD <token>

The password entered was incorrect because it contained invalid characters.

INVALID PHONE NO

This message is returned when the telephone number entered contains alphabetic characters.

INVALID SOURCE HOST NAME <token>

The system identifier specified as a source host does not match the local system name, the remote system name, or contains blanks.

INVALID SYSTEM ID

The SYSTEMID parameter entered exceeds the parameter length limit of 17 bytes.

INVALID TERMINATION OF FILE ATTRIBUTE LIST: <token>

The command syntax requires the usercode/password to be delimited by a close parenthesis (") character which is not located in the command string. The character or characters that were found is displayed in the <token>.

INVALID USERCODE "<token>"

The usercode entered was incorrect.

KIND DEFINED TWICE

The KIND keyword was previously specified in the command string.

**B 1000 System Communications Module (SYCOM)
Output Messages**

LINK QUEUE OVERFLOW, MESSAGE DISCARDED

This message indicates that the communications link between the two systems was interrupted. The SYCOM program attempts to re-establish the connection, and failing, reverts to off-line, standby mode.

LOSS OF DATA-SET-READY

This message occurs each time a loss of data-set-ready is detected. A count is maintained of these occurrences and the SYCOM program goes into the state of initialization. In-progress file transfers are aborted and lost. If a loss of data-set-ready continues to occur, the wire strappings of the adapter must be checked.

MISSING “,” BETWEEN VOLUME ATTRIBUTES

A comma (,) character is required by the command syntax to indicate the end of the attribute KIND and its associated option keyword.

NEW BUFFER SIZE IS LESS THAN 362

RUN TIME TRANSMISSION BUFFER SIZE CHANGED TO 362

The value specified in the BUFFER command was less than 362 and the SYCOM program changed the buffer size to 362.

NO VOLUME ATTRIBUTES DEFINED

Neither the KIND keyword or the HOST keyword attributes were specified in the command string.

NUMBER OF TIMEOUTS = <number>

This message is displayed automatically when read operations timeout and keep re-occurring on the intersystem line connection, where <number> is specified by the TIMEOUTS parameter in the SYCOM program parameters file.

PASSWORD MAY NOT HAVE MORE THAN 17 CHARACTERS

The length of the password entered exceeded a maximum allowable length of 17 characters.

PHONE NUMBER TOO LONG

This message is returned when the telephone number entered contains more than 20 characters.

PRINT ERROR

The line printer has either detected an error on the last line printed or has gone into a Not Ready state. In both cases, a suspend control message is sent to the server-system SYCOM program. When the line printer is Ready, enter a RY LP command to the SYCOM program.

PUNCH ERROR

The card punch has either detected an error in the last card punched or is in a Not Ready state. In either case, a suspend control message is sent to the server-system SYCOM program. When the card punch is Ready, enter a RY CP command to the SYCOM program.

PUT REQUESTOR MISMATCH

An ABORT PUT command was entered to abort a file transfer and the source file specified in the file transfer was secured by a usercode/password. The user must sign on to the SYCOM program with the correct usercode/password and re-enter the ABORT PUT command.

QC DONE

An end-of-file condition was detected while doing a read on the remote file LINK. This condition is caused by the MCP when a QC command is entered, and causes a shutdown of all programs associated with the network controller.

B 1000 System Communications Module (SYCOM)
Output Messages

“QS” COMMAND MAY NOT EXCEED 15

A value greater than 15 was specified in the QS command.

“QS” COMMAND MUST BE AT LEAST 4

A value less than 4 was specified in the QS command.

“QS” OPERAND NOT NUMERIC

An integer between 4 and 15, inclusive, was not specified in the QS command.

QUEUE RJEQ FULL, MESSAGE DISCARDED

The RJE__Q queue file is full. Therefore, no more messages can be queued and incoming messages are discarded.

READER ERROR

The card reader has either detected an error in the last card read and gone into a Not Ready state, or has detected an invalid character in a card column other than column 1. If there was a read error, the last card must be returned to the card hopper. The card reader is then Ready. The SYCOM program must be informed of this new status condition with the entry of a RY CR command.

RECORD SIZE EXCEEDS BUFFER SIZE

The integer entered for the RECORD parameter exceeds the current BUFFER size.

RECORD SIZE = <token> IS TOO BIG > 974

The maximum allowable RECORD size is 974 bytes. The buffer size entered exceeded this limit. *1800*

REMOTE SYCOM HAS GONE DOWN AND COME BACK UP

The remote SYCOM program has disconnected the data communication line and re-established communications.

REMOTE VERSION OF SYCOM IS INCOMPATIBLE

HIS VERSION = “<x>”, MINE = “02”

The two SYCOM programs are incompatible. Load and execute the correct SYCOM program.

REMOVE PUT__QFILE OR CHANGE ITS NAME IF 7.0 FILE

An end-of-file condition has been detected when reading the PUT__QFILE disk file.

REQUEST IGNORED: CARD FILE STILL OPEN

Indicates that a READ command was entered when an input card file is currently active.

REQUEST IGNORED: NOT LOGGED ON

This message indicates that the system is not logged on to the remote system as an RJE terminal.

REQUEST SCHEDULED; WILL SEND FILE <file name> LATER

The PUT or FETCH request was queued to disk and is processed as soon as previously queued or in-process file transfers are completed.

REQUEST SCHEDULED--REMOTE SYCOM OFFLINE

The PUT or FETCH operation requested has been queued to disk and is processed as soon as communications have been re-established between the user-system and the server-system SYCOM programs.

SOURCE AND HOST NAMES MAY NOT BE DEFINED IN A FETCH

Use of the shorthand version (FETCH) of the COPY command implies the source and destination systems; therefore, they cannot be specified.

B 1000 System Communications Module (SYCOM)
Output Messages

SOURCE HOST "<system-id> NOT DEFINED OR REMOTE HOST "<systemid> NOT ONLINE

Indicates one of the following conditions: (1) the system identifier specified as source host is neither the local system or the current remote system, (2) the required syntactical keyword FROM is missing, (3) the SYCOM program is not connected to the source host specified, or (4) required parentheses are missing.

SOURCE OR DESTINATION HOST NAMES MAY NOT BE DEFINED IN PUT

Use of the shorthand version (PUT) of the COPY command implies the source and destination systems; therefore, they cannot be specified in the command string.

STATION ALREADY CONNECTED

This message indicates that a CONNECT command was entered from a terminal (or ODT) that was already connected to a server-system.

STATION ALREADY DISCONNECTED

This message indicates that a DISCONNECT command was entered from a terminal that was already disconnected.

STOP OR WAIT IN PROGRESS

This message is in response to the OFFLINE command and indicates that the SYCOM program is in the process of servicing a WAIT command. The SYCOM program is currently off-line and the OFFLINE command is ignored.

SYCOM CLOSING ON REQUEST FROM REMOTE SYCOM

The remote SYCOM program was directed to go to end of job by the entry of either EOF or STOP commands from that system. When this occurs, the remote SYCOM program sends a control message to the other system.

SYCOM IS CLOSING [n]; CANNOT ACCEPT INPUT <text>

This message is returned in response to any new command entered after an EOJ command is entered but prior to the actual shutdown of the SYCOM program. Once shutdown is initiated, commands are no longer accepted. [n] represents the closing cycle number.

TAPE OR USER-CODE NOT FOUND--PUT ABORTED

This message occurs when the SYCOM program attempts to open a tape file for the file to be received and the destination magnetic tape is not on line. After the message is displayed, the transfer is aborted.

TERMINALS FILE OVERFLOW, MESSAGE DISCARDED

<60 or fewer characters of message>

The remote file used by the SYCOM program to write messages to terminals is full. All messages received are discarded until space becomes available.

THERE IS NO 'FETCH' IN PROGRESS TO ABORT

An ABORT command was entered with the FETCH option specified but no file is being received at this time.

THERE IS NO 'PUT' IN PROGRESS TO ABORT

An ABORT command was entered with PUT option specified but no file is being transmitted at this time.

UNRECOGNIZED COMMAND "<token>"

This message indicates that the last SYCOM command entered was not valid.

B 1000 System Communications Module (SYCOM)
Output Messages

UNRECOGNIZED OBJECT OF 'ABORT' "<token>"

The command was entered with an option keyword which was neither PUT or FETCH.

UNRECOGNIZED OPERAND "<token>"

This message indicates that an incorrect or misspelled option keyword was entered.

USERCODE MAY NOT HAVE MORE THAN 17 CHARACTERS

The length of the usercode entered exceeded the maximum allowable length of 17 characters.

VOLUME HAS MORE THAN 17 CHARACTERS

The volume name (or user disk identifier) entered exceeded the maximum allowable length of 17 characters. This message can relate to either <volume-1> or <volume-2> names in the ADD, COPY, FETCH, or PUT command syntax.

APPENDIX A

GLOSSARY OF TERMS AND ACRONYMS

This glossary defines SYCOM terms and acronyms used in this document.

active station

A work station (terminal) that is currently eligible for entering or accepting messages.

ACU

The acronym for automatic calling unit.

American Standard Code for Information Interchange (ASCII)

This code, established by the American Standards Association, defines codes for a set of characters to be used in the interchange between business equipment over telephone and telegraph circuits. The code consists of 128 graphic and control characters.

application program (AP)

A program that processes data and is unique to one type of application. It is sometimes referred to as a user program.

ASCII

The acronym for American Standard Code for Information Interchange.

automatic calling unit (ACU)

A device furnished by the communications common carrier which allows a user-system to automatically establish a dialed link to a server-system over a communications network.

BCC

The acronym for block check character.

beginning of job (BOJ)

The execution of a single program unit to be performed by the system.

binary card

A punched card with multiple punches in any one or more columns representing a non-ASCII character.

bit

The smallest unit of information in a binary system.

bits-per-second (BPS)

The expression bits-per-second is used to express the speed at which bits of data are transmitted over a communication channel or internally moved within a computer system.

block

A group of characters or bits transmitted as a single unit of data. See block check character.

block check character (BCC)

The block check character is a character appended to data blocks transmitted for the purpose of error detection and parity control.

blocking factor

The maximum number of characters allowed per single transmission.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

- BOJ**
The acronym for beginning of job.
- BPS**
The acronym for bits-per-second.
- broadcast**
The simultaneous dissemination of information to a number of work stations (terminals).
- buffer**
This is temporary storage that is used during the transfer of data from one device to another. It is also used to compensate for variations in bit rates or timing of events within the system.
- carriage control**
Controls the vertical paper motion for a line printer.
- channel**
A communication path used to transfer signals between two or more points. Often referred to as a link, circuit, line, or path.
- character**
A digit, letter, or special character. Letters can be upper-or lower-case.
- common carrier**
A company that provides communication service for public hire.
- common carrier exchange**
A defined area, served by a communications carrier, within which the carrier provides service.
- communication line**
Any medium, such as a wire or a telephone circuit, that connects a terminal with the computer.
- conditioned lines**
These are private and leased transmission lines that are conditioned to reduce data distortion, providing transmission of data at lower error rates.
- connection**
An established data transmission path between two or more computer systems. It is considered either a temporary or permanent connection, depending on whether it is established with or without switching facilities, respectively.
- control card**
A punched card which contains information that identifies a job or describes its requirements to the MCP. The first column must contain an invalid character in 80-column cards, a question mark (?) in 96-column cards, or a null character @00@ for remote jobs.
- control state**
The term control state refers to a program that can assume control of the system processor with privileged operands. Usually, the type of control state program suggested in this manual infers an operating system or MCP.
- conversational mode**
An operational mode in which message data (full or partial messages) is used in lieu of or in addition to, control characters as replies for message information.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

data

Data is any representation of information, such as characters, to which meaning might be assigned.

data communications

A data communications system consists of two or more computer systems that are linked by means of a communication line(s) for the purpose of data exchange.

data link

A composite of computer systems and the interconnecting network, together with control procedures, operating in a particular mode that permits information to be exchanged between these systems.

data set

A device that provides an interface between a data communications system and a data communications line. Most data communication lines use a modulated carrier for data transfer. The data set provides the logic to modify the data being received or transmitted between terminals and the system.

data set ready

A signal provided by the data set.

data transmission

Data transmission consists of transmitting data between two or more points of a data communications network.

disconnect (DEOT)

A disconnect is a communication control sequence consisting of DLE followed by EOT. It is used to signal that a disconnect of a switched circuit must be initiated.

dial-out

The use of an automatic calling unit to establish a switched connection between two computers.

dial-up

The use of a dial or touchtone data set to establish a switched connection between two computers.

disk cartridge

A secondary data storage device much the same as a disk pack but usually smaller in size. It can be moved on line or off line.

disk directory

A disk-resident table that contains the name and type of file, together with a pointer to the disk file header or subdirectory for all permanent files which reside on disk.

disk pack

A secondary data storage device that can be moved on line or off line.

disk pack identifier (dp-id) An identifier which is the name assigned to a disk pack or disk cartridge.

end of job

The termination of a single program unit to be performed by the system.

EOJ

The acronym for end of job.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

error

Any received character or sequence of characters that does not conform to those transmitted is considered to be in error.

error recovery procedures

These are data communication control procedures used to restore normal operations to a data link after an error has occurred.

Extended Binary Coded Decimal Interchange Code (EBCDIC)

A code consisting of 8 bits which is used to represent 256 unique letters, numbers, and special characters.

family name

An identifier used as a file name, or the name assigned to identify a main file with subdirectory entries.

file security

The procedures or special devices used to prevent access to or use of data or programs without authorization.

file identifier

All disk file identifiers used on the system must be unique to prevent duplicate file names. A file identifier can be comprised of any combination of the following file identifier options:

file-identifier
family-name/file-identifier
dp-id/family-name/file-identifier

half-duplex channel

This is a communication channel in which the signaling can be in either direction, but not in both directions, simultaneously.

half-duplex transmission

This is a type of data transmission where information is sent in only one direction at a time; data cannot be sent in both directions, simultaneously.

hard copy

The printed copy of material in a readable form is considered to be hard copy. This would include computer printed media such as reports, listings, and documents.

header

A sequence of characters that can precede the text of a message to provide the information necessary to route the message to any number of ultimate destinations. A message header can also contain communications relating information other than routine instructions.

headers

An option on a remote file which allows system control functions and provides a 50-byte header on all data messages moving through the remote file.

identifier

A word consisting of from 1 to 17 characters, any of which can be alphabetic, numeric, or special.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

integer

A whole number as opposed to a fraction. That is, a number that contains the unit of one, an exact number of times.

intersystem communications

A data communications network in which a terminal or program in one system can communicate with a program in another system.

intrasystem communications

A data communications network in which a terminal or program in a system can communicate with another program in the same system.

job

A single unit of work on the host system. A job is made up of one or more job steps. A job step is composed of one or more tasks, each task a single unit of processing.

job number

A unique number assigned by the system MCP to each job that is executed under its control.

job spawning

The ability to programmatically execute jobs and maintain an adequate level of control over jobs during execution.

keyboard

A device for the encoding of data by key depression, which causes the generation of the selected code element.

leased line

A transmission line reserved for use by a single customer only.

like system

A like system is a system that has the same physical characteristics as another system of the same series. In the B 1000 system, the like systems are B 1900, B 1800, or B 1700.

line

A data communications line linking two computers or a computer and its associated terminals.

line adapter

A line adapter consists of hardware and/or software logic used to interface a data set or communications line into a multiline or single-line control.

line collision

A condition that exists when the timeout delays on both systems are identical. This causes messages to "collide" on the line and become garbled.

line switching

The technique of temporarily connecting two communications lines together so that two stations can directly exchange information.

log off

The procedure by which a user ends a data exchange session either between two computers or between a computer and a terminal.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

log on

The procedure by which a user establishes a data exchange session between two computers or a computer and a terminal.

logical station number (LSN)

The identification number assigned by the network controller to a given station (terminal). The logical station number has no relationship to file names, but is determined by the order in which a station is defined in the network controller.

Master Control Program (MCP)

The Master Control Program is the operating system or supervisory program used within a B 1000 system.

message

A sequence of characters arranged in a form suitable for the purpose of conveying information. A message contains the data to be conveyed (the text). In addition, a message contains communication characters to aid in routing or processing the message.

message format

A message format defines the placement of message elements within the message text. These elements include such items as header, control characters, and text data.

message header

Every message moved between a terminal and the SMCS program, or an application program, is prefixed with a header. This header contains station attributes necessary to identify the station when returning a reply message.

message numbering

The identification of each message within a communications system by the assignment of a sequential number.

modem

See definition of data set.

multifile identifier (multi-file-id)

A generalization for a group of files with the same family name but with different file names.

multiline control (MLC)

The multiline control is an I/O control device that provides the functional control between computer hardware and the line adapters. The control is an integral part of a multiline communications subsystem.

NC

The acronym for network controller.

network

The interconnection of a number of points through which information between terminal installations is passed. Equipment implemented in this scheme operates in real time and does not introduce, store, or forward delays. A switched telephone network is the network of telephone lines normally used for dial calls. A private network is a network of communication channels reserved for the use of one customer.

network controller (NC)

The NDL-generated data communication program used by the SYCOM program to interface with the work stations (terminals) and other systems.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

Network Definition Language (NDL)

A descriptive, free-form language for defining and implementing a data communications network. The NDL compiler analyzes the input statements and generates a custom network controller.

normal state

The term normal state refers to a program which has no facilities to seize control of a system processor as opposed to control state. The SYCOM program is a normal state program.

ODT

The accepted term for the B 1000 Systems Supervisory Console (VDT or Teletype) or Operator Display Terminal.

ODT log

A disk file that contains all input/output messages sent to and received from the user ODT.

off line

There are two aspects to this term for the SYCOM system: (1) a system is off line when no communications link currently exists between it and a host system, and (2) a system terminal, ODT, or program is off line when it is not logically connected to an application program in a host system.

on line

There are two meanings for this term in a SYCOM system: (1) a system is on line when a communications link providing processing service currently exists between it and a host system, and (2) a terminal, ODT, or program in a user-system is on line when it is logically connected to an application program in a host system. The system must be on line in order for a terminal, ODT, or program to be on line.

participate

This term refers to a function in the Supervisory Message Control System (SMCS) program which allows it to participate in all input/output message traffic between the network controller and an application program. In reference to a SYCOM system, the SMCS program is not permitted to participate in the SYCOM program message traffic.

password

A unique string of characters that a program, computer operator, or user must supply to meet security requirements before gaining access to data and/or files. The password is confidential.

point-to-point communication

This is a configuration in which a network connection is established between two, and only two, computers. The connection can include a switching facility.

poll (POL)

The poll character is used to indicate "this is a poll", which precedes the ENQ character in a polling sequence.

polling

A technique for assignment of master status to a particular station on a data communications link. Polling is centrally controlled in order to maintain a strict discipline over the operation of a number of stations.

private line or private wire

This is a channel or circuit furnished to a subscriber for exclusive use.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

pseudo card reader

In a B 1000 system, a pseudo card reader is a disk file. The disk file can be created from cards, program output, or a terminal. When a program requires an input card file, the pseudo card reader can be substituted.

queue

A logical collection of messages awaiting transmission or processing.

relative station number (RSN)

The relative station number is a unique number assigned by the network controller for every remote system that is active. The RSN is calculated from the logical station number (LSN).

remote file

A file declared in a program which, in conjunction with the network controller, provides input, output, or I/O with a set of data communications devices.

remote job

Submission of control statements and data from a remote station (terminal or computer), causing the job described to be scheduled and executed at another system.

remote job entry (RJE)

Remote job entry is a method in which a remote host computer executes or compiles programs sent by other computers. These other computers are considered terminal devices.

remote ODT station

A remote ODT station is a station that is known to SMCS program as a remote ODT station and is defined in the network controller with a transmit frequency greater than 249.

remote supervisory console (RSC)

The remote supervisory console is an input/output device located on a user-system (remote to a server-system) to provide the operator with the ability to control jobs and to request information from the server-system.

RJE station

For the SYCOM system, the terms RJE station and user-system are equivalent. The term user-system is used to denote a system with many additional capabilities and potential.

RSC

The acronym for remote supervisory console.

semantics

The relationship between symbols and their meanings.

server-system

A server-system is a passive system which provides computing services to the user-system, either locally or remotely.

session

The period of time during which a user engages in dialog between a terminal and a computer or between two computers. The period between the time a user logs on and off the system.

session number

A unique number assigned by an originating system to each session.

B 1000 System Communications Module (SYCOM)
Glossary of Terms and Acronyms

single-line control (SLC)

The single-line control is an I/O control device that provides the functional control between a computer system and a line adapter. This control is an integral part of a single-line communications subsystem.

site identification

A unique 17-character identifier sent in a special message to a server-system prior to being logged-on to provide a positive means of identification, independent of any other system security.

spooling

The reading and writing of input/output data streams on secondary storage devices in a format convenient for later output operations and/or processing.

station

See the definition of terminal.

Supervisory Message Control System (SMCS)

A Burroughs program product that offers the capability of a message control system interface to the data communications network.

switched line

A communications line in which a temporary connection between a user-system and a server-system is established by dialing out.

switching

An operation involving the interconnection of circuits in order to establish a temporary communication link between two or more systems.

synchronous transmission

A data transmission process in which the sending and receiving devices are operating continuously at the same frequency and are maintained, by means of correction, in a desired phase relationship.

system disk

A disk pack or disk cartridge that is initialized as a system pack. A system disk is under control of the MCP, and one or more must be present on the system for the MCP to function. Head-per-track disk is always considered a system disk.

terminal

An input/output device designed to both receive and send source data in an environment associated with the job to be performed. It is capable of sending entries to, and obtaining output from, the system of which it is a part.

text

A sequence of characters forming information to be conveyed.

transmission block

A transmission block can contain all or part of a message block. A transmission block is independent of the message(s) from which its characters are taken.

transparent mode

An operational mode in which all coded combinations of 8-bit characters are allowed as message text characters.

APPENDIX B CHARACTER SET

The following printable characters comprise the character set acceptable to the SYCOM program for input messages from terminals. The characters are arranged by rows in internal collating sequence with blank low and 9 high.

blank	[.	<	(+	!	&]	\$	*)	;
^	-	/		,	%	_	>	?	:	#	@	'
=	"	a	b	c	d	e	f	g	h	i	j	k
l	m	n	o	p	q	r	s	t	u	v	w	x
y	z	A	B	C	D	E	F	G	H	I	J	K
L	M	N	O	P	Q	R	\	S	T	U	V	W
X	Y	Z	0	1	2	3	4	5	6	7	8	9

It is recommended that the standard signal character of asterisk (*) be retained by the SYCOM user for use in message transfers to the SMCS program. However, if this is not suitable, one of the following special characters is suggested.

[& \$ %] # @ +

The data communication control characters recognized by the SYCOM program follows.

SOH EOT DLE ENQ STX ETX RS FS

APPENDIX C SYCOM NETWORK CONTROLLER

GENERATING THE NETWORK CONTROLLER

The user must write Network Definition Language (NDL) source specifications to generate the desired network controller for the B 1000 SYCOM program. The following guidelines are intended to aid the user in generating a proper network controller. For detailed information that describes how to generate a network controller, refer to the B 1000 Systems Network Definition Language (NDL) Reference Manual, form number 1073715.

NETWORK CONTROLLER NAME

The name of the network controller program is specified by the user.

DECLARATION SECTION

The Network Information File (NIF) file name can be specified in the DECLARATION section.

Example:

```
DECLARATION :  
  NIF = "SYCOM"/"NIF".
```

NOT in 11.0
MAX MESSAGE SIZE

The NDL/LIBRARY DECLARATION, SYCOMDECL, or the audit NDL/LIBRARY DECLARATION, SYCOMAUDEC, must be declared in the DECLARATION section.

Example:

```
$ LIBRARY SYCOMDECL
```

REQUEST SECTION

A NDL/LIBRARY REQUEST procedure exists to handle the SYCOM line discipline. This NDL/LIBRARY REQUEST procedure is named SYCOMREQ, and is designed for the normal operation of the SYCOM program. If the network controller is to be audited, the NDL/LIBRARY request procedure named SYCOMAUREQ must be specified.

Example:

```
$ LIBRARY SYCOMREQ
```

If terminals are to be used in conjunction with the SYCOM program or if the SMCS program is to be used, REQUEST procedures must be declared to handle the physical terminals on the user system.

Example:

```
$ LIBRARY CANDEPOLTD  
$ LIBRARY CANDESELTD
```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

CONTROL SECTION

The NDL/LIBRARY CONTROL procedure, SYCOMCTL, must be declared to handle the line-driving for the SYCOM program. If the network controller is being audited, the NDL/LIBRARY audit CONTROL procedure, SYCOMAUCTL, must be specified.

Example:

```
$ LIBRARY SYCOMCTL
```

If terminals are to be used in conjunction with the SYCOM program or if the SMCS program is to be used, a CONTROL procedure must be declared for the line-driving for the terminals and/or the SMCS program.

Example:

```
$ LIBRARY CANDETDCTL
```

TERMINAL SECTION

There are four types of terminals that exist with the SYCOM program:

- Control terminals
- Virtual terminals
- Virtual programs
- Physical terminals

Each of these types of terminals requires a separate terminal declaration.

Control Terminals

There are five control stations that must be declared for the SYCOM program. The control stations are responsible for handling the control messages between the local SYCOM program and the remote SYCOM program. The control stations have a terminal type of 62, which indicates a B 1000 system, a transmission number size of one, an address size of 2. Control terminals use the NDL/LIBRARY REQUEST procedures, SYCOMREQ or SYCOMAUREQ, for both the receive and transmit functions of the network controller. The NDL BUFFERSIZE declared for the control stations must be twice the maximum size declared with the BUFFER parameter. Refer to Section 4, SYCOM PARAMETERS, for a discussion of the BUFFER parameter. An example of the terminal declaration for the control terminals follows:

```
TERMINAL SYCOM:
  TRANSMISSION    = 1.
  ADDRESS         = 2.
  TYPE           = 62.
  BUFFERSIZE     = 3900.
  REQUEST       = SYCOMREQ: RECEIVE, % 2 * SYCOM BUFFER
                SYCOMREQ: TRANSMIT.  parameter
```

4843

This terminal definition is mandatory.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

Virtual Terminals

A virtual terminal definition is declared to handle the virtual terminal function of the SYCOM program and need not be declared if virtual terminals are not being used. Virtual terminals have a terminal type of 61, a transmission number size of 1, an address size of 2. Virtual terminals use the NDL/LIBRARY REQUEST procedures, SYCOMREQ or SYCOMAUREQ, for both the receive and transmit functions of the network controller. The BUFFERSIZE declared for the control stations must be twice the maximum buffer size that the terminal can handle. An example of the terminal declaration for the virtual terminal is:

```
TERMINAL VIRTUALTRM:
TRANSMISSION      = 1.
ADDRESS           = 2.
TYPE              = 61.
BUFFERSIZE        = 3900.
REQUEST           = SYCOMREQ: RECEIVE,
                   SYCOMREQ: TRANSMIT.
```

Virtual Programs

A virtual program definition is declared to handle the program-to-program function of the SYCOM program and need not be declared if program-to-program communication is not being used. Virtual programs have a terminal type of ~~8~~ a transmission number size of 1, an address size of 2. Virtual programs use the NDL/LIBRARY REQUEST procedures, SYCOMREQ or SYCOMAUREQ, for both the receive and transmit functions of the network controller. The BUFFERSIZE declared for the control stations must be twice the maximum buffer size that the program can handle. An example of the terminal declaration for the virtual terminal is:

```
TERMINAL VIRTUALPRG:
TRANSMISSION      = 1.
ADDRESS           = 2.
TYPE              = 58.
BUFFERSIZE        = 3900.
REQUEST           = SYCOMREQ: RECEIVE,
                   SYCOMREQ: TRANSMIT.
```

Physical Terminals

If terminals are to be used in conjunction with the SYCOM program or if the SMCS program is to be used, physical terminals must be declared to describe the physical terminals on the local SYCOM system. The following example shows a TD 830 terminal declaration:

```
TERMINAL TD832:
TRANSMISSION      = 1.
ADDRESS           = 2.
TYPE              = 46.
BUFFERSIZE        = 2100.
REQUEST           = CANDEPOLTD: RECEIVE,
                   CANDEFSLTD: TRANSMIT.
```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

STATION SECTION

The STATION section defines the five control stations, each physical station, virtual station, and virtual program station in the system. A STATION DEFAULT declaration can be declared for each type of station. The STATION DEFAULT declaration contains the attributes common to a group of stations and is added to the attributes declared for the station.

Control Stations

Five control stations must be declared for use with the SYCOM program. The addresses of the five stations must be "00", "01", "02", "03", and "04". The MYUSE attribute should be declared as INPUT and OUTPUT. An example of the control station declarations follows:

```
STATION DEFAULT SYCOMTERM:
  RETRY           = 250.
  MYUSE           = INPUT, OUTPUT.
  TERMINAL       = SYCOM.
```

?

```
STATION SYCTL:
  DEFAULT        = SYCOMTERM.
  ADDRESS        = "00".
STATION SYSPD:
  DEFAULT        = SYCOMTERM.
  ADDRESS        = "01".
STATION SYCRD:
  DEFAULT        = SYCOMTERM.
  ADDRESS        = "02".
STATION SYPTR:
  DEFAULT        = SYCOMTERM.
  ADDRESS        = "03".
STATION SYFILE:
  DEFAULT        = SYCOMTERM.
  ADDRESS        = "04".
```

Virtual Stations

Virtual stations are declared as the user requires. However, the total number of user virtual stations declared for each copy of the SYCOM program cannot exceed ten. For example, ten user virtual terminals and ten server virtual terminals can be declared. There are two addresses assigned to a virtual station: a receive address and a transmit address. The receive address is the first address declared and the transmit address is the second. Each address consists of one upper-case letter and one lower-case letter. The transmit address is the reverse of the receive address. For example, if a receive address is "Aa", the transmit address is "aA". In addition, the receive address of a server station is identical to the transmit address of a user station and the transmit address of the server station is identical to the receive address of the user station. The addresses for the user and server stations are identical in both the local and remote network controllers. The MYUSE attribute must be set to INPUT and OUTPUT. The frequency assigned to a virtual station controls the privileges allowed that station by the SMCS program.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

Refer to the B 1000 Supervisory Message Control System (SMCS) Reference Manual, form number 1108891, for complete details. The following are examples of virtual station declarations:

```
STATION DEFAULT VIRTUALTERM:
  RETRY                = 250.
  FREQUENCY            = 250,250.
  MYUSE                = INPUT,OUTPUT.
  TERMINAL             = VIRTUALTRM.

STATION USER1:
  DEFAULT              = VIRTUALTERM.
  ADDRESS              = "Aa" , "aA".
STATION USER2:
  DEFAULT              = VIRTUALTERM.
  ADDRESS              = "Ab" , "bA".
STATION SERVER1:
  DEFAULT              = VIRTUALTERM.
  ADDRESS              = "aA" , "Aa".
STATION SERVER2:
  DEFAULT              = VIRTUALTERM.
  ADDRESS              = "bA" , "Ab".
```

Virtual Program Stations TYPE = 59

Virtual program stations are declared as the user requires. There are two addresses assigned to a virtual program station: a receive address and a transmit address. The receive address is the first address declared and the transmit address is the second. Each address consists of one upper-case letter and one lower-case letter. The transmit address is the reverse of the receive address. For example, if a receive address is "Aa", the transmit address is "aA". In addition, the receive address of a program station on the local system is identical to the transmit address of a program on the remote system and the transmit address of the local program station is identical to the receive address of the remote program station.

Local system

```
-----
STATION DEFAULT VIRTUALPRG:
  RETRY                = 250.
  MYUSE                = INPUT,OUTPUT.
  TERMINAL             = VIRTUALPRG.

STATION PROGRAM1:
  DEFAULT              = VIRTUALPRG.
  ADDRESS              = "Pa" , "aP".
STATION PROGRAM2:
  DEFAULT              = VIRTUALPRG.
  ADDRESS              = "Pb" , "bP".
```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

Remote system

```
STATION DEFAULT VIRTUALPROG:
  RETRY           = 250.
  MYUSE           = INPUT,OUTPUT.
  TERMINAL        = VIRTUALPRG.

STATION PROGRAM1:
  DEFAULT         = VIRTUALPROG.
  ADDRESS         = "aP" , "Pa".

STATION PROGRAM2:
  DEFAULT         = VIRTUALPROG.
  ADDRESS         = "bP" , "Pb".
```

Physical Stations

If terminals are to be used with the SYCOM program or if the SYCOM program is to be used with the SMCS program, physical stations must be declared as required. Refer to the B 1000 Network Definition Language (NDL) Reference Manual, form number 1073715, and the B 1000 Supervisory Message Control System (SMCS) Reference Manual, form number 1108891, for more information. The frequency assigned to a physical station controls the privileges allowed that station by the SYCOM program. For example, if a station is assigned a frequency of 230, 250, where 230 is the receive (input) and 250 is the transmit (output) frequency, the station is considered a remote ODT by the SYCOM program. All physical stations defined with the transmit frequency between 250 and 255 are considered remote ODT stations by the SYCOM program. All other stations are considered as workstations. The following are examples of declarations for physical stations.

```
STATION DEFAULT WORKSTATION:
  RETRY           = 25.
  FREQUENCY       = 0,0.
  MYUSE           = INPUT,OUTPUT.

STATION DEFAULT REMOTESPO:
  RETRY           = 25.
  FREQUENCY       = 0,250.
  MYUSE           = INPUT,OUTPUT.

STATION TD1:
  TERMINAL        = TD832.
  DEFAULT         = REMOTESPO.
  ADDRESS         = "S1".

STATION TD2:
  TERMINAL        = TD832.
  DEFAULT         = REMOTESPO.
  ADDRESS         = "S2".

STATION TD3:
  TERMINAL        = TD832.
  DEFAULT         = REMOTESPO.
  ADDRESS         = "S3".

STATION TD4:
  TERMINAL        = TD832.
  DEFAULT         = WORKSTATION.
  ADDRESS         = "DQ".
```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

LINE SECTION

All stations associated with the SYCOM program are declared in the LINE section. The address of the line is specified in the LINE section. This address can vary from system to system and can be obtained from a Burroughs field engineer. The CONTROL procedure, SYCOMCTL, is declared for the line. If the network controller is to be audited, the audit CONTROL procedure, SYCOMAUCTL, can be declared. The SYCOM control stations, virtual stations, and virtual program stations are declared on the line that connects the local SYCOM program to the remote SYCOM program. The physical terminals are declared on their actual lines. The following is an example of LINE section specifications.

```
LINE SYCOMLINE:
  ADDRESS          = 02:00:02.
  CONTROL          = SYCOMCTL.
  STATION          = SYCTL      % control stations
                    ,SYSP0
                    ,SYCRD
                    ,SYPTR
                    ,SYFILE
                    ,USER1      % user virtual stations
                    ,USER2
                    ,USER3
                    ,USER4
                    ,SERVER1    % server virtual stations
                    ,SERVER2
                    ,SERVER3
                    ,SERVER4
                    ,PROGRAM1   % program stations
                    ,PROGRAM2.

LINE TDLINE:
  ADDRESS          = 02:00:00.
  CONTROL          = CANDETCTL.
  AUTOPOLL        = 40.
  STATION          = TD1
                    ,TD2
                    ,TD3
                    ,TD4.
```


B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

FILE SECTION

There are three files that must be declared in the FILE section depending on the SYCOM functions desired. These are the SYCOM LINK file, the SMCS MCSREMOTE file, and the program file used for program-to-program communication. The SYCOM control stations and the user virtual stations must be declared in the SYCOM LINK file. The LINK must always be declared. A maximum of fifteen stations can be declared in the LINK file: the five control stations and up to ten user virtual stations. The server virtual stations must be declared in the SMCS MCSREMOTE file along with any physical terminals that are to be controlled by the SMCS program. If the SMCS program is not used, the physical terminals, if any, are declared in the SYCOM TERMINALS file. The program stations are declared in a file whose name is specified by the user. The following is an example of the FILE section:

```
FILE LINK:
  FAMILY          =  SYCTL      % control stations
                  ,SYSP0
                  ,SYCRD
                  ,SYPTR
                  ,SYFILE
                  ,USER1      % user virtual stations
                  ,USER2
                  ,USER3
                  ,USER4.

FILE MCSREMOTE:
  FAMILY          =  TD1        % physical terminals
                  ,TD2
                  ,TD3
                  ,TD4
                  ,SERVER1    % server virtual stations
                  ,SERVER2
                  ,SERVER3
                  ,SERVER4.

FILE PROGFILE1:
  FAMILY          =  PROGRAM1. % program station

FILE PROGFILE2:
  FAMILY          =  PROGRAM2. % program station
```

NETWORK CONTROLLER EXAMPLES

The network controller examples in this section illustrate the syntax required to implement the SYCOM program in the Remote Job Entry (RJE), File Transfer, Virtual Terminal, Program-to-Program and SMCS modes.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

FULL SYCOM NETWORK CONTROLLER

DECLARATION:

NIF = "B1000"/"SYCOMNIF".
MAX BUFFERS = 20.
MAX FILES = 40.
MAX MESSAGES = 20.

\$ LIBRARY SYCOMDECL
\$ LIBRARY CANDEDEC
\$ LIBRARY SYCOMREQ
\$ LIBRARY CANDEPOLTD
\$ LIBRARY CANDEFSLTD
\$ LIBRARY SYCOMCTL
\$ LIBRARY CANDETCTL

X
X T E R M I N A L S E C T I O N
X

TERMINAL TD832:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 46.
BUFFERSIZE = 2100.
REQUEST = CANDEPOLTD: RECEIVE,
 CANDEFSLTD: TRANSMIT.

TERMINAL SYCOM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 62.
BUFFERSIZE = ~~3900.~~ % 2 * SYCOM BUFFER
REQUEST = SYCOMREQ: RECEIVE,
 SYCOMREQ: TRANSMIT.

TERMINAL VIRTUALTRM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 61.
BUFFERSIZE = 3900.
REQUEST = SYCOMREQ: RECEIVE,
 SYCOMREQ: TRANSMIT.

TERMINAL VIRTUALPRG:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 59.
BUFFERSIZE = 3900.
REQUEST = SYCOMREQ: RECEIVE,
 SYCOMREQ: TRANSMIT.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

z

STATION DEFAULT WORKSTATION:
RETRY = 25.
FREQUENCY = 0,0.
MYUSE = INPUT,OUTPUT.
STATION DEFAULT REMOTEODT:
RETRY = 25.
FREQUENCY = 0,250.
MYUSE = INPUT,OUTPUT.
STATION DEFAULT SYCOMTERM:
RETRY = 250.
MYUSE = INPUT,OUTPUT.
TERMINAL = SYCOM.
STATION DEFAULT VIRTUALTERM:
RETRY = 250.
FREQUENCY = 250,250.
MYUSE = INPUT,OUTPUT.
TERMINAL = VIRTUALTRM.
STATION DEFAULT VIRTUALPROG:
RETRY = 250.
MYUSE = INPUT,OUTPUT.
TERMINAL = VIRTUALPRG.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

```

%
%           S T A T I O N   S E C T I O N
%
STATION TD1:                                % physical station
  TERMINAL                                  = TD832.                                % (optional)
  DEFALLT                                   = REMOTEODT.
  ADDRESS                                   = "S1".
STATION TD2:                                % physical station
  TERMINAL                                  = TD832.                                % (optional)
  DEFALLT                                   = REMOTEODT.
  ADDRESS                                   = "S2".
STATION TD3:                                % physical station
  TERMINAL                                  = TD832.                                % (optional)
  DEFALLT                                   = REMOTEODT.
  ADDRESS                                   = "S3".
STATION TD4:                                % physical station
  TERMINAL                                  = TD832.                                % (optional)
  DEFALLT                                   = WORKSTATION.
  ADDRESS                                   = "DQ".
STATION SYCTL:                              % SYCOM control station
  DEFALLT                                   = SYCOMTERM.                            % (required)
  ADDRESS                                   = "00".
STATION SYSPU:                              % SYCOM control station
  DEFALLT                                   = SYCOMTERM.                            % (required)
  ADDRESS                                   = "01".
STATION SYCRD:                              % SYCOM control station
  DEFALLT                                   = SYCOMTERM.                            % (required)
  ADDRESS                                   = "02".
STATION SYPTR:                              % SYCOM control station
  DEFALLT                                   = SYCOMTERM.                            % (required)
  ADDRESS                                   = "03".
STATION SYFILE:                             % SYCOM control station
  DEFALLT                                   = SYCOMTERM.                            % (required)
  ADDRESS                                   = "04".
STATION USER1:                              % user virtual station
  DEFALLT                                   = VIRTUALTERM.                            % (optional)
  ADDRESS                                   = "Aa" , "aA".
STATION USER2:                              % user virtual station
  DEFALLT                                   = VIRTUALTERM.                            % (optional)
  ADDRESS                                   = "Ab" , "bA".
STATION SERVER1:                            % server virtual station
  DEFALLT                                   = VIRTUALTERM.                            % (optional)
  ADDRESS                                   = "aA" , "Aa".
STATION SERVER2:                            % server virtual station
  DEFALLT                                   = VIRTUALTERM.                            % (optional)
  ADDRESS                                   = "bA" , "Ab".
STATION PROGRAM1:                           % program virtual station
  DEFALLT                                   = VIRTUALPROG.                            % (optional)
  ADDRESS                                   = "Pa" , "aP".
STATION PROGRAM2:                           % program virtual station
  DEFALLT                                   = VIRTUALPROG.                            % (optional)
  ADDRESS                                   = "Pb" , "bP".

```

B 1000 System Communications Module (SYCOM)
 SYCOM Network Controller

```

%
%      L I N E   S E C T I O N
%
LINE SYCOMLINE:
  ADDRESS      = 02:00:02.
  CONTROL      = SYCOMCTL.
  STATION      = SYCTL           % control stations
                ,SYSP0         %   (required)
                ,SYCRD
                ,SYPTR
                ,SYFILE
                ,USER1         % user virtual stations
                ,USER2         %   (optional)
                ,USER3
                ,USER4
                ,SERVER1       % server virtual stations
                ,SERVER2       %   (optional)
                ,SERVER3
                ,SERVER4
                ,PROGRAM1      % program virtual stations
                ,PROGRAM2.     %   (optional)
                                % optional if terminals
                                % are not used.

LINE TDLINE:
  ADDRESS      = 02:00:00.
  CONTROL      = CANDETCTL.
  AUTOPOLL     = 40.
  STATION      = TD1
                ,TD2
                ,TD3
                ,TD4.
  
```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

```
%  
%           F I L E   S E C T I O N  
%  
FILE LINK:  
  FAMILY                =  SYCTL                % control stations  
                        ,SYSPD                % (required)  
                        ,SYCRD  
                        ,SYPTR  
                        ,SYFILE  
                        ,USER1                % user virtual stations  
                        ,USER2                % (optional)  
                        ,USER3  
                        ,USER4.  
  
FILE MCSREMOTE:  
  FAMILY                =  TD1                 % physical terminals  
                        ,TD2                 % (optional)  
                        ,TD3  
                        ,TD4  
                        ,SERVER1            % server virtual stations  
                        ,SERVER2            % (optional)  
                        ,SERVER3  
                        ,SERVER4.  
  
FILE PROGFILE1:  
  FAMILY                =  PROGRAM1.           % program virtual station  
                        % (optional)  
  
FILE PROGFILE2:  
  FAMILY                =  PROGRAM2.           % program virtual station  
                        % (optional)  
  
FINI.
```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

VIRTUAL TERMINAL SYCOM NETWORK CONTROLLER

DECLARATION:

NIF = "B1000"/"SYCOMNIF".
MAX BUFFERS = 20.
MAX FILES = 40.
MAX MESSAGES = 20.

\$ LIBRARY SYCOMDECL
\$ LIBRARY CANDEDEC
\$ LIBRARY SYCOMREQ
\$ LIBRARY CANDEPOLTD
\$ LIBRARY CANDEFSLTD
\$ LIBRARY SYCOMCTL
\$ LIBRARY CANDETDCTL

%
%
%

TERMINAL SECTION

TERMINAL TD832:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 46.
BUFFERSIZE = 2100.
REQUEST = CANDEPOLTD: RECEIVE,
CANDEFSLTD: TRANSMIT.

TERMINAL SYCOM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 62.
BUFFERSIZE = ~~3900.~~ % 2 * SYCOM BUFFER
REQUEST = SYCOMREQ: RECEIVE,
SYCOMREQ: TRANSMIT.

TERMINAL VIRTUALTRM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 61.
BUFFERSIZE = 3900.
REQUEST = SYCOMREQ: RECEIVE,
SYCOMREQ: TRANSMIT.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

```
%  
%           S T A T I O N   D E F A U L T S  
%  
STATION DEFAULT WORKSTATION:  
  RETRY           = 25.  
  FREQUENCY       = 0,0.  
  MYUSE           = INPUT,OUTPUT.  
STATION DEFAULT REMOTEODT:  
  RETRY           = 25.  
  FREQUENCY       = 0,250.  
  MYUSE           = INPUT,OUTPUT.  
STATION DEFAULT SYCOMTERM:  
  RETRY           = 250.  
  MYUSE           = INPUT,OUTPUT.  
  TERMINAL        = SYCOM.  
STATION DEFAULT VIRTUALTERM:  
  RETRY           = 250.  
  FREQUENCY       = 250,250.  
  MYUSE           = INPUT,OUTPUT.  
  TERMINAL        = VIRTUALTRM.
```


B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

```

%
%           S T A T I O N   S E C T I O N
%
STATION ID1:                               % physical station
  TERMINAL                                 = TD832.                               % (optional)
  DEFAULT                                  = REMOTEODT.
  ADDRESS                                  = "S1".
STATION ID2:                               % physical station
  TERMINAL                                 = TD832.                               % (optional)
  DEFAULT                                  = REMOTEODT.
  ADDRESS                                  = "S2".
STATION ID3:                               % physical station
  TERMINAL                                 = TD832.                               % (optional)
  DEFAULT                                  = REMOTEODT.
  ADDRESS                                  = "S3".
STATION ID4:                               % physical station
  TERMINAL                                 = TD832.                               % (optional)
  DEFAULT                                  = WORKSTATION.
  ADDRESS                                  = "DQ".
STATION SYCTL:                             % SYCOM control station
  DEFAULT                                  = SYCOMTERM.                          % (required)
  ADDRESS                                  = "00".
STATION SYSPU:                             % SYCOM control station
  DEFAULT                                  = SYCOMTERM.                          % (required)
  ADDRESS                                  = "01".
STATION SYCRD:                             % SYCOM control station
  DEFAULT                                  = SYCOMTERM.                          % (required)
  ADDRESS                                  = "02".
STATION SYPTR:                             % SYCOM control station
  DEFAULT                                  = SYCOMTERM.                          % (required)
  ADDRESS                                  = "03".
STATION SYFILE:                            % SYCOM control station
  DEFAULT                                  = SYCOMTERM.                          % (required)
  ADDRESS                                  = "04".
STATION USER1:                             % user virtual station
  DEFAULT                                  = VIRTUALTERM.                          % (optional)
  ADDRESS                                  = "Aa" , "aA".
STATION USER2:                             % user virtual station
  DEFAULT                                  = VIRTUALTERM.                          % (optional)
  ADDRESS                                  = "Ab" , "bA".
STATION SERVER1:                           % server virtual station
  DEFAULT                                  = VIRTUALTERM.                          % (optional)
  ADDRESS                                  = "aA" , "Aa".
STATION SERVER2:                           % server virtual station
  DEFAULT                                  = VIRTUALTERM.                          % (optional)
  ADDRESS                                  = "bA" , "Ab".

```

B 1000 System Communications Module (SYCOM)
 SYCOM Network Controller

```

%
%      L I N E   S E C T I O N
%
LINE SYCOMLINE:
  ADDRESS          = 02:00:02.
  CONTROL         = SYCOMCTL.
  STATION         = SYCTL           % control stations
                  ,SYSPD           %   (required)
                  ,SYCRD
                  ,SYPTR
                  ,SYFILE
                  ,USER1           % user virtual stations
                  ,USER2           %   (optional)
                  ,USER3
                  ,USER4
                  ,SERVER1         % server virtual stations
                  ,SERVER2         %   (optional)
                  ,SERVER3
                  ,SERVER4.

LINE TDLINE:
  ADDRESS          = 02:00:00.           % optional if terminals
  CONTROL         = CANDETDCTL.         % are not used.
  AUTOPOLL        = 40.
  STATION         = TD1
                  ,TD2
                  ,TD3
                  ,TD4.

%
%      F I L E   S E C T I O N
%
FILE LINK:
  FAMILY          = SYCTL           % control stations
                  ,SYSPD           %   (required)
                  ,SYCRD
                  ,SYPTR
                  ,SYFILE
                  ,USER1           % user virtual stations
                  ,USER2           %   (optional)
                  ,USER3
                  ,USER4.

FILE MCSREMOTE:
  FAMILY          = TD1             % physical terminals
                  ,TD2             %   (optional)
                  ,TD3
                  ,TD4
                  ,SERVER1         % server virtual stations
                  ,SERVER2         %   (optional)
                  ,SERVER3
                  ,SERVER4.

FINI.

```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

PROGRAM-TO-PROGRAM SYCOM NETWORK CONTROLLER

DECLARATION:

NIF = "B1000"/"SYCOMNIF".
MAX BUFFERS = 20.
MAX FILES = 40.
MAX MESSAGES = 20.

\$ LIBRARY SYCOMDECL
\$ LIBRARY SYCOMREQ
\$ LIBRARY SYCOMCTL

%
% T E R M I N A L S E C T I O N
%

TERMINAL SYCOM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 62.
BUFFERSIZE = ~~3900.~~ % 2 * SYCOM BUFFER
REQUEST = SYCOMREQ: RECEIVE,
 SYCOMREQ: TRANSMIT.

TERMINAL VIRTUALPRG:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 59.
BUFFERSIZE = 3900.
REQUEST = SYCOMREQ: RECEIVE,
 SYCOMREQ: TRANSMIT.

%
% S T A T I O N D E F A U L T S
%

STATION DEFAULT SYCOMTERM:

RETRY = 250.
MYUSE = INPUT, OUTPUT.
TERMINAL = SYCOM.

STATION DEFAULT VIRTUALPRG:

RETRY = 250.
MYUSE = INPUT, OUTPUT.
TERMINAL = VIRTUALPRG.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

```
%  
%           S T A T I O N   S E C T I O N  
%  
STATION SYCTL:           % SYCOM control station  
  DEFAULT                = SYCOMTERM.           %  
  ADDRESS                 = "00".  
STATION SYSP0:          % SYCOM control station  
  DEFAULT                = SYCOMTERM.           %  
  ADDRESS                 = "01".  
STATION SYCRD:          % SYCOM control station  
  DEFAULT                = SYCOMTERM.           %  
  ADDRESS                 = "02".  
STATION SYPTR:          % SYCOM control station  
  DEFAULT                = SYCOMTERM.           %  
  ADDRESS                 = "03".  
STATION SYFILE:         % SYCOM control station  
  DEFAULT                = SYCOMTERM.           %  
  ADDRESS                 = "04".  
STATION PROGRAM1:       % program virtual station  
  DEFAULT                = VIRTUALPROG.         %  
  ADDRESS                 = "Pa" , "aP".  
STATION PROGRAM2:       % program virtual station  
  DEFAULT                = VIRTUALPROG.         %  
  ADDRESS                 = "Pb" , "bP".
```

B 1000 System Communications Module (SYCOM)
 SYCOM Network Controller

```

%
%      L I N E   S E C T I O N
%
LINE SYCOMLINE:
  ADDRESS           = 02:00:02.
  CONTROL           = SYCOMCTL.
  STATION           = SYCTL           % control stations
                    ,SYSPD           %
                    ,SYCRD
                    ,SYPTR
                    ,SYFILE
                    ,PROGRAM1       % program virtual stations
                    ,PROGRAM2.      %
%
%      F I L E   S E C T I O N
%
FILE LINK:
  FAMILY           = SYCTL           % control stations
                    ,SYSPD           %
                    ,SYCRD
                    ,SYPTR
                    ,SYFILE.
%
FILE PROGFILE1:
  FAMILY           = PROGRAM1.       % program virtual station
%
FILE PROGFILE2:
  FAMILY           = PROGRAM2.       % program virtual station
%

```

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

FILE TRANSFER SYCOM NETWORK CONTROLLER

DECLARATION:

NIF = "B1000"/"SYCOMNIF".
MAX BUFFERS = 20.
MAX FILES = 40.
MAX MESSAGES = 20.

\$ LIBRARY SYCOMDECL
\$ LIBRARY SYCOMREQ
\$ LIBRARY SYCOMCTL

%
%
%

TERMINAL SECTION

TERMINAL SYCOM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 62.
BUFFERSIZE = 3900. % 2 * SYCOM BUFFER
REQUEST = SYCOMREQ: RECEIVE,
SYCOMREQ: TRANSMIT.

%
%
%

STATION DEFAULTS

STATION DEFAULT SYCOMTERM:

RETRY = 250.
MYUSE = INPUT,OUTPUT.
TERMINAL = SYCOM.

%
%
%

STATION SECTION

STATION SYCTL:

DEFAULT = SYCOMTERM. % SYCOM control station
ADDRESS = "00". %

STATION SYSPQ:

DEFAULT = SYCOMTERM. % SYCOM control station
ADDRESS = "01". %

STATION SYCRD:

DEFAULT = SYCOMTERM. % SYCOM control station
ADDRESS = "02". %

STATION SYPTR:

DEFAULT = SYCOMTERM. % SYCOM control station
ADDRESS = "03". %

STATION SYFILE:

DEFAULT = SYCOMTERM. % SYCOM control station
ADDRESS = "04". %

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

z
LINE SYCOMLINE:
ADDRESS = 02:00:02.
CONTROL = SYCOMCTL.
STATION = SYCTL % control stations
 ▸SYSP0 % (required)
 ▸SYCRD
 ▸SYPTR
 ▸SYFILE.

z
z FILE SECTION
z

FILE LINK:
FAMILY = SYCTL % control stations
 ▸SYSP0
 ▸SYCRD
 ▸SYPTR
 ▸SYFILE.

FINI.

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

RJE MODE SYCOM NETWORK CONTROLLER

DECLARATION:

NIF = "B1000"/"SYCOMNIF".
MAX BUFFERS = 20.
MAX FILES = 40.
MAX MESSAGES = 20.

% LIBRARY SYCOMDECL
% LIBRARY SYCOMREQ
% LIBRARY SYCOMCTL

%
% T E R M I N A L S E C T I O N
%

TERMINAL SYCOM:

TRANSMISSION = 1.
ADDRESS = 2.
TYPE = 62.
BUFFERSIZE = 3900. % 2 * SYCOM BUFFER
REQUEST = SYCOMREQ: RECEIVE,
SYCOMREQ: TRANSMIT.

%
% S T A T I O N D E F A U L T S
%

STATION DEFAULT SYCOMTERM:

RETRY = 250.
MYUSE = INPUT,OUTPUT.
TERMINAL = SYCOM.

%
% S T A T I O N S E C T I O N
%

STATION SYCTL: % SYCOM control station
DEFAULT = SYCOMTERM. %
ADDRESS = "00".
STATION SYSPD: % SYCOM control station
DEFAULT = SYCOMTERM. %
ADDRESS = "01".
STATION SYCRD: % SYCOM control station
DEFAULT = SYCOMTERM. %
ADDRESS = "02".
STATION SYPTR: % SYCOM control station
DEFAULT = SYCOMTERM. %
ADDRESS = "03".
STATION SYFILE: % SYCOM control station
DEFAULT = SYCOMTERM. %
ADDRESS = "04".

B 1000 System Communications Module (SYCOM)
SYCOM Network Controller

```
%  
%      L I N E   S E C T I O N  
%  
LINE SYCOMLINE:  
  ADDRESS      = 02:00:02.  
  CONTROL      = SYCOMCTL.  
  STATION      = SYCTL          % control stations  
                  ,SYSP0      %   (required)  
                  ,SYCRD  
                  ,SYPTR  
                  ,SYFILE.  
  
%  
%      F I L E   S E C T I O N  
%  
FILE LINK:  
  FAMILY      = SYCTL          % control stations  
                  ,SYSP0  
                  ,SYCRD  
                  ,SYPTR  
                  ,SYFILE.  
  
FINI.
```

APPENDIX D CONTROL MESSAGE FORMATS

GENERAL

Several message formats are used for inter-SYCOM data communications and are described in detail in this appendix. These message formats are presented in a sequence dictated by the message type code.

MESSAGE TYPE CODES

The message type codes are derivatives of the DA1 or DA2 (Device Address) field. The message type codes apply to message transmissions that take place in either direction between systems and are compatible between system types. The device address conventions used by the SYCOM program are shown in Table D-1. All other values are considered invalid.

Table D-1. Summary of Message Type Codes

Device Address Field		Usage
DA1	DA2	
0	0	System control
0	1	ODT messages
0	2	Card reader/punch data messages
0	3	Line printer data messages
0	4	File transfer data messages
8	2	Packed card punch data messages
a - z	A - Z	User-system "transmit", server-system "receive", virtual terminal messages
A - Z	a - z	User-system "receive", server-system "transmit", virtual terminal messages

— ?

Device addresses are advisory only. The receiving system can direct a message to any appropriate peripheral device based on its own requirements.

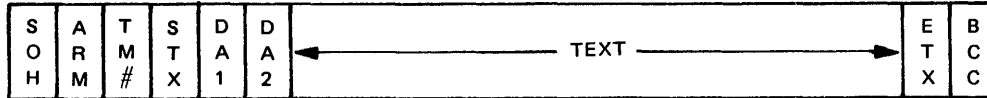
Line printer data can be sent to and received from both systems. When a system receives line printer data, it can be printed it on any available printer independently, whether the system is termed a user-system or server-system.

B 1000 System Communications Module (SYCOM)
Control Message Formats

MESSAGE FORMATS

BASIC DATA COMMUNICATION MESSAGES

Based on the line protocol, the message format described below adheres to the criteria of standard RJE message formatting.

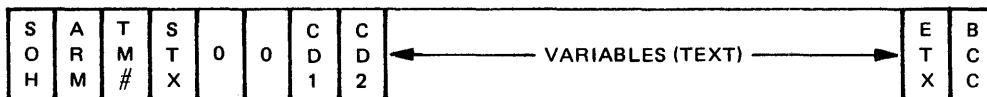


The individual characters in this message function follows.

Character	Function
SOH	The Start-of-Header ASCII character indicates the beginning of data transmission as opposed to the connection establishment communication.
ARM	The Acknowledge Received Message character is used to accept or reject the last message block received.
TM#	The Transmission Number character is used in the acknowledgement of a message. It represents one of two values (alternating characters) selected for implementation by the SYCOM program. The characters 5 and 6 are used by the user system SYCOM program. The characters F and U are used by the server system SYCOM program.
STX	A Start-of-Text character delimits the preceding header characters from the message.
DA1 or DA2	Two characters representing a Device Address value.
TEXT	The message text field usually containing data (record images or a message).
ETX	The standard End-of-Text control character.
BCC	The Block Check Character is used by the hardware to verify that the message was received correctly.

SYSTEM CONTROL MESSAGE (TYPE 00)

The type 00 system control messages are used to exchange control type data between systems. The format of this message follows.

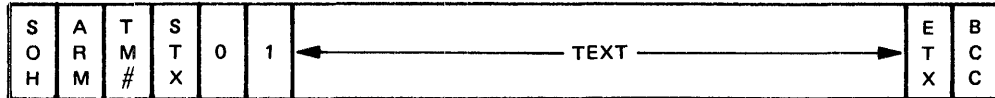


B 1000 System Communications Module (SYCOM)
Control Message Formats

The DA1 and DA2 characters are the 00 characters in this message format. The CD1 and CD2 characters are added to the basic message format and represent the SYCOM system control message code which can or cannot be followed by variable control data.

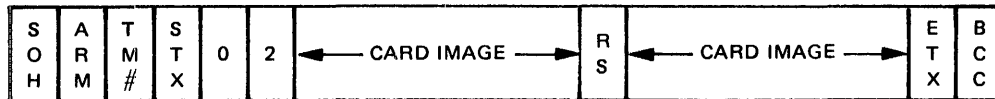
ODT MESSAGES (TYPE 01)

The type 01 ODT message format uses the basic message format without alteration. There are no provisions for blocking ODT messages. Therefore, the rule is: one ODT message per control message block. The format of the ODT message follows.



CARD READER/PUNCH MESSAGE (TYPE 02)

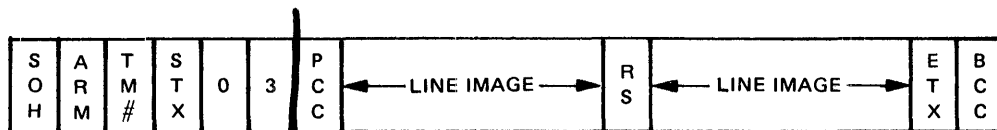
The format for card reader/punch data images follows.



The Record Separator (RS) character is used between card images to provide the means for blocking.

LINE PRINTER MESSAGE (TYPE 03)

The following format variation is used to transmit line printer data lines between systems.



should be repeated for each
line image

B 1000 System Communications Module (SYCOM)
Control Message Formats

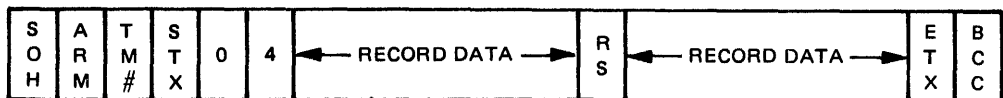
This format is the same as the card reader/punch format except that the Printer Control Character (PCC) is utilized. The contents of this field can be one of the following codes.

PCC	Function
0	Print, no spacing
1	Print, single-space
2	Print, double-space
A	Skip to channel 1 (top-of-page)
B	Skip to channel 2
C	Skip to channel 3
D	Skip to channel 4
E	Skip to channel 5
F	Skip to channel 6
G	Skip to channel 7
H	Skip to channel 8
I	Skip to channel 9
J	Skip to channel 10
K	Skip to channel 11
L	Skip to channel 12 (bottom-of-page)

Rubbish!?

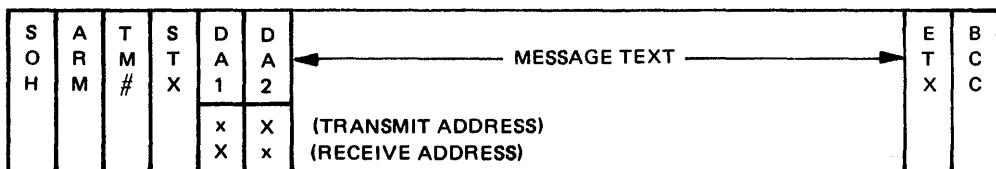
FILE TRANSFER MESSAGE (TYPE 04)

? The type 04 file transfer message format is also the same as that used to transfer card images. Although the PCC character field is included, its only function is to maintain message conformity. The file transfer message format follows.



VIRTUAL TERMINAL MESSAGE

The message format utilized for virtual terminal messages is the basic message format, with the following exception: the device address for a virtual terminal is comprised of two letters (one lower-case and one upper-case letter for the transmit address and one upper-case and one lower-case letter for the receive address) and is varied by terminal. The format of this message follows.



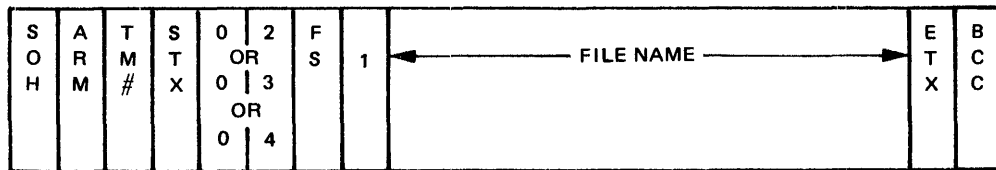
Terminal and ODT messages do not contain RS characters.

FILE SEPARATOR MESSAGES

The file separator message format is used by the SYCOM program to indicate the beginning of the file or the end of the file. This message format is used for the card reader/punch, line printer, and file transfer operations. There are three minor variations to the file transfer message format which make up the beginning file and ending file message formats. These two formats are shown in the following text.

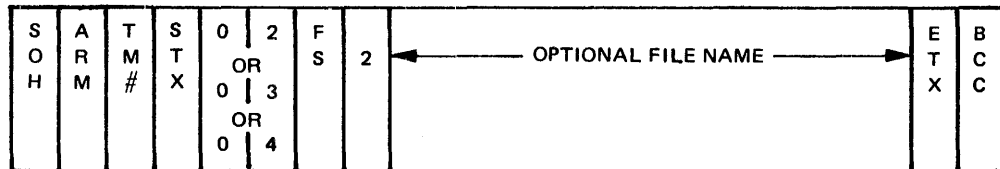
Begin File Message

The format for the begin file message follows.



End File Message

The format for the end file message follows.



PROGRAM-TO-PROGRAM MESSAGES

The following message format pertains to the program-to-program facility through the RFUSER remote file. The application program remote file must be modified to handle remote file headers.

Example:

?MODIFY <application program> FILE <remote file> HEADER;

Input/Output message formats are defined as follows.

Field Name	Length in Bytes	Function
REMOTE__KEY	10	Message "header".
RSN	3	Relative Station Number for "virtual terminal" as defined for the program-to-program remote file; usually 001.
LENGTH	4	Length of message text. The buffer size is the maximum.
TYPE	3	Message type; usually 000.
MESSAGE__TEXT	nn	Actual text message.

Q M X

PROGRAM-TO-SYCOM MESSAGES

The SYCOM program has the ability to accept command strings from an application program and respond with reply messages through the program-to-SYCOM interface facility. This facility utilizes the queue mechanism, whereby the SYCOM program reads input from the queue file <sycom>/OUTQ and writes replies into the queue file <sycom>/INQ. The application program must be written to handle queue files.

For B 1000 Report Program Generator (RPG) programs, the queue files are declared as an input demand disk file and an output disk file for the <sycom>/INQ and <sycom>/OUTQ queue files, respectively. The two queue files in the RPG program must be modified to QUEUE after the RPG program is compiled.

Example:

```
? MODIFY <program name> FILE <input file name>  
  NAME <sycom>/INQ QUEUE;  
? MODIFY <program name> FILE <output file name>  
  NAME <sycom>/OUTQ QUEUE;
```

For B 1000 COBOL programs, declare the input and output queue files with the SELECT statement.

Example:

```
SELECT <file name> ASSIGN TO QUEUE.
```

Input/output message formats are defined as follows.

Input

OUTPUT

this is broken

```
01 INPUT_MESSAGE  
  02 PROGRAM_HEADER          10 bytes  
  03 PROGRAM_ID              4 bytes % Can be any four  
                                % characters excluding  
                                % any data communications  
                                % control characters.  
  03 FILLER                   6 bytes  
02 SYCOM_COMMAND_STRING      1990 bytes (maximum)
```

Output

Input

```
01 OUTPUT_MESSAGE  
  02 PROGRAM_HEADER          10 bytes  
  03 PROGRAM_ID              4 bytes % Same ID as received and  
                                % can be a sequence number,  
                                % time, or usercode index.  
  03 TEXT_LENGTH_REPLY       4 bytes  
  03 MESSAGE_NUMBER_REPLY    2 bytes  
02 SYCOM_COMMAND_STRING      1990 bytes (maximum)
```

B 1000 System Communications Module (SYCOM)
Control Message Formats

The MESSAGE__NUMBER__REPLY field contains a key to the message that is transmitted by the SYCOM program. The key is as follows:

MESSAGE__NUMBER__REPLY	Message
00	FILE <file name> NOT FOUND <text>
01	FILE <file name> LOCKED <text>
02	FILE <file name> CAT FILE TYPE = <file type> CANNOT BE TRANSMITTED
03	<null message> % [GOOD REPLY MESSAGE]
04	PUT QUEUE FULL. <text>. TRY AGAIN LATER
05	REQUEST SCHEDULED # <schedule number> WILL FETCH/SEND FILE <file name> LATER
06	FILE <file name> START TRANSMISSION # <put schedule number> <record number> <text>
07	SOURCE OR DESTINATION FILE NAME MISSING
08	SOURCE OR DESTINATION FILE NAME <text> INVALID
09	FILE NAME HAS IDENTIFIER <text> WITH MORE THAN 10 CHARACTERS
10	FILE <file name> END TRANSMISSION # <put schedule number> <number> RECORDS @ <records>/min
12	FILE <file name> IN USE AT <destination>
14	FILE <file name> RECORD SIZE = <record size> IS TOO BIG > <max buffer size/2>
17	FILE <file name> GAINED <number> records
18	REQUEST SCHEDULED--REMOTE <remote name> OFFLINE
21	<local SYCOM name> NOW OFFLINE
22	<local SYCOM name> NOW ONLINE
23	FILE <file name> IN USE AT <local SYCOM name> or SYSTEM FILE, NOT REMOVED
24	UNABLE TO DIAL OUT
25	LOSS OF DATA-SET-READY
26	NOW DIAL HOST
29	INVALID PHONE NUMBER
30	<local SYCOM name> IS CLOSING; CANNOT ACCEPT INPUT
32	<text> % [Used for general syntax error]

B 1000 System Communications Module (SYCOM)
Control Message Formats

MESSAGE__NUMBER__REPLY	Message
33	<local SYCOM name> CLOSING ON REQUEST FROM REMOTE <remote SYCOM name>. <local SYCOM name> WILL CLOSE WHEN NEXT IDLE
36	REMOTE <remote SYCOM name> HAS GONE DOWN AND COME BACK UP
37	“THERE IS NO “PUT” IN PROGRESS TO ABORT”
38	PUT # <put schedule number> <record number> OF FILE <file name> ABORTED
39	THERE IS NO “FETCH” IN PROGRESS TO ABORT
40	“FETCH #” <record number> OF FILE <file name> ABORTED
43	<text> % [Used for any text]

APPENDIX E SUMMARY OF FILES

Table E-1 lists all the file names used by the SYCOM program, along with their internal and external names, device assignment, I/O use, and size (record size in bytes/blocking factor).

Table E-1. Summary of Files

File Number	Internal Name	External Name	Device	Records/Block
0	DEBUG	< sycom > /DEBUG	printer +	132/1
1	DISK_TRACE	< sycom > /TRACE	disk	132/1
2	FILE_NAMES	FILE_NAMES	disk	72/1 *
3	FILENAMES	FILENAMES	queue	180/1
4	IN	IN **	disk/tape	180/1 *
5	IN_OUT	< sycom > /IN_OUT	PDD	132/1
6	INQ	< sycom > /INQ	queue	2000/1
7	LINK	LINK #	remote	180/1
8	LINK_Q	< sycom > /LINK.Q	queue	180/1
9	LIST	< sycom > /LIST.TRACE	printer +	132/1
10	NEWPARAMS	< sycom > /NEWPARAMS	card/disk	80/1 *
11	OLDTRACE	< sycom > /OLDTRACE	disk	180/1 *
12	OUT	OUT **	disk/tape	180/1 *
13	OUTQ	< sycom > /OUTQ	queue	2000/1
14	PARAMETERS	< sycom > /PARAMETERS	disk	180/1 *
15	PUT_QFILE	< sycom > /PUT.QUEUE	disk	358/1
16	RJE_Q	< sycom > /RJE.Q	queue	455/1
17	RJECARDS	RJE/CARDS #	card	80/1 *
18	RJEPRINT	RJE/PRINT	printer +	132/1
19	RJEPUNCH	RJE/PUNCH	punch +	80/1
20	STATISTICS	< sycom > /STATISTICS	disk	180/1
21	TERMINALS	TERMINALS	remote	2000/1

NOTES

- * Use input blocking.
- ** These files are changed to the actual device type, record size, and file name specified in the file transfer command.
- + Backup allowed.
- # Or user specified name.

APPENDIX F PARAMETERS FILE

The PARAMETERS file is a disk file, data type, with one physical record of 180 characters formatted as follows:

Field	Length (in bits)	Default Value	Description
VERSION	4	"c"	Current version of parameters file.
Filler	96	(blank)	Reserved for identifier.
CURRENT__DATE	72		Run date; 9-byte field as dd mmm yy.
STATION__ID	136	(blank)	System identifier; 17 bytes.
MAX__BUFFER__SIZE	24	400	File transfer buffer size.
MAX__MESSAGES	24	4	The network controller message queue size.
TIMEOUT__INTERVAL	24	0	A value for message display intervals.
DEBUGGING	1	0	DEBUG ON/OFF switch. Default of 0 inhibits trace list.
DISK__TRACING	1	1	Controls disk tracing; 0 = on, 1 = off.
NOFS	1	0	When set, this parameter inhibits file separators.
NOFTP__P	1	0	When set, this parameter permits file transfer to occur.
QUE__P	1	0	When set, this parameter permits program-to-SYCOM communications.
WAIT__P	1	0	Controls shutdown when receiving a disconnect message from another SYCOM. 0 = shutdown; 1 = idle.
Filler	2	00	Reserved for future use.
N__INPUT__BUFFERS	8	1	Number of input buffers.
TRACE__R__B	16	4	DISK__TRACE RECORDS.BLOCK.
N__OUTPUT__BUFFERS	8	1	Number of output buffers.
TRACE__B__A	16	10	DISK__TRACE BLOCKS.AREA.
PSEUDO__SIGNAL__CHAR	8	"."	Pseudo signal character.
Filler	8	00	Reserved for future use.
TRACE__AREAS	8	10	DISK__TRACE AREAS.
GROUPSIZE	24	09	Groupsize for file transfers.
TERMINAL__RF__NO	24	000	Remote file number for the file TERMINALS; 3 bytes.
SYCOM__PROGRAM__NAME	240		SYCOM name; 30 bytes.

B 1000 System Communications Module (SYCOM)
Parameters File

Field	Length (in bits)	Default Value	Description
SYCOM__LOCAL__JOB__NO	32		SYCOM job number; 4 bytes.
Filler	128		Reserved for identifier.
COMPILE__DATE	72	" "	Compile date; 9 bytes as dd mmm yy.
Filler	128	" "	Reserved for identifier.
COMPILE__TIME	80	" "	Compile time; 10 bytes as hh:mm:ss.t.
Filler	88		Reserved for future use.
VERSION__OF__RELEASE	72		Release version of the local SYCOM program.
REMOTE__REL__VERSION	72		Release version of the remote SYCOM program.
Filler	16		

APPENDIX G STATISTICS FILE

GENERAL

The following is the format of the STATISTICS file. Each record occupies one disk sector or 180 bytes (1440 bits).

```
RECORD
  01 STATISTICS_RECORD          BIT (1440),
    02 text                     CHAR (116),
      03 file_lit               CHAR ( 04),
      03 FILLER                 CHAR (112),
    02 file_kind                CHAR ( 2),
    02 files_sent               CHAR ( 4),
    02 files_received           CHAR ( 4),
    02 counts                   BIT (128),
      03 receives              BIT (16),
      03 bytes_read            FIXED,
      03 writes                BIT (16),
      03 bytes_sent            FIXED,
      03 rje_files_read        BIT (16),
      03 rje_files_punched     BIT (16),
      03 rje_files_printed     BIT (16),
    02 nbr                      BIT (160),
      03 graphics              FIXED,
      03 blanks_compressed     FIXED,
      03 encoded               FIXED,
      03 blanks_expanded       FIXED,
      03 decoded               FIXED,
      03 consecutive_timeouts  BIT (16),
      03 non_expanded          FIXED,
    02 hardware_errors          BIT (128),
      03 parity                BIT (16),
      03 memory_access         BIT (16),
      03 memory_parity         BIT (16),
      03 timeouts              BIT (16),
      03 breaks                BIT (16),
      03 end_of_buffer         BIT (16),
      03 loss_of_dsr           BIT (16),
      03 loss_of_carrier       BIT (16);
```

B 1000 System Communications Module (SYCOM)
Statistics File

The following is an example of a program designed to list the STATISTICS file and is written in UPL:

```
? COMPILE STATS UPL;
? DATA CARDS
%XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX%
%
% This program reads and analyzes the <sycom>/STATISTICS file.%
%
%XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX%

$ PASS_END SIZE SUPPRESS

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

FILE
  LINE          (DEVICE = PRINTER BACKUP DISK,
                USER_NAMED_BACKUP,
                LABEL = "SYCOM"/"#STATS",
                INVALID_CHARACTERS = 3),

  STATISTICS    (DEVICE = DISK SERIAL,
                RECORDS = 180/1,
                BUFFERS = 1,
                OPEN_OPTION = INPUT,
                LABEL = "<sycom>"/"STATISTICS");

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

DEFINE
  BLANK          AS #SUBSTR(BLANK_LINE,0,1)#
  ,BLANK_LINE    AS #"                " CAT
                "                " CAT
                "                " CAT
                "                " CAT
                "                " CAT
                "                "# % 132 blanks

  ,CHAR          AS #CHARACTER#
  ,INDENT5       AS #SPACES(5)#
  ,INDENT10      AS #SPACES(10)#
  ,PROGRAM_LEVEL AS #"10.0"#
  ,PROGRAM_LEVEL_NBR AS #100#
  ,PROGRAM_NAME  AS #"SYCOM/STATS"#
  ,SW           AS #PROGRAM_SWITCHES#
  ,SPACES(n)     AS #SUBSTR(BLANK_LINE,0,n)#
%% printer spacing defines for procedure "Write_it"
  ,overprint    AS #0#
  ,single       AS #1#
  ,double       AS #2#
  ,triple       AS #3#
  ,quadruple    AS #4#
  ,page         AS #5#
;
```

B 1000 System Communications Module (SYCOM)
Statistics File

XX

RECORD

01	STATISTICS_RECORD	BIT (1440),
02	text	CHAR (116),
03	file_lit	CHAR (04),
03	FILLER	CHAR (112),
02	file_kind	CHAR (2),
02	files_sent	CHAR (4),
02	files_received	CHAR (4),
02	counts	BIT (128),
03	receives	BIT (16),
03	bytes_read	FIXED,
03	writes	BIT (16),
03	bytes_sent	FIXED,
03	rje_files_read	BIT (16),
03	rje_files_punched	BIT (16),
03	rje_files_printed	BIT (16),
02	nbr	BIT (160),
03	graphics	FIXED,
03	blanks_compressed	FIXED,
03	encoded	FIXED,
03	blanks_expanded	FIXED,
03	decoded	FIXED,
03	consecutive_timeouts	BIT (16),
03	non_expanded	FIXED,
02	hardware_errors	BIT (128),
03	parity	BIT (16),
03	memory_access	BIT (16),
03	memory_parity	BIT (16),
03	timeouts	BIT (16),
03	breaks	BIT (16),
03	end_of_buffer	BIT (16),
03	loss_of_dsr	BIT (16),
03	loss_of_carrier	BIT (16);

B 1000 System Communications Module (SYCOM)
Statistics File

RECORD

TOTAL_RECORD

files_sent	FIXED,
files_received	FIXED,
receives	BIT (48),
bytes_read	BIT (48),
writes	BIT (48),
bytes_sent	BIT (48),
rje_files_read	FIXED,
rje_files_punched	FIXED,
rje_files_printed	FIXED,
graphics	BIT (48),
blanks_compressed	BIT (48),
encoded	BIT (48),
blanks_expanded	BIT (48),
decoded	BIT (48),
consecutive_timeouts	FIXED,
non_expanded	FIXED,
parity	FIXED,
memory_access	FIXED,
memory_parity	FIXED,
timeouts	FIXED,
breaks	FIXED,
end_of_buffer	FIXED,
loss_of_dsr	FIXED,
loss_of_carrier	FIXED;

RECORD

OUTPUT_RECORD

left_part	CHAR (40),
middle_part	CHAR (18),
right_part	CHAR (40);

B 1000 System Communications Module (SYCOM)
Statistics File

XX

```
DECLARE
  line_counter          FIXED,
  n_input              FIXED,
  token                REFERENCE,
  file_name            REFERENCE,
  h_old                STATISTICS_RECORD,    % hardware
  r_old                STATISTICS_RECORD,    % received
  s_old                STATISTICS_RECORD,    % sent
  stats                STATISTICS_RECORD,
  sent                 STATISTICS_RECORD,
  total                TOTAL_RECORD,
  output (10)          OUTPUT_RECORD;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
=====
PROCEDURE                               Dec (text)   CHAR VARYING;
=====

FORMAL
  text          FIXED;
DECLARE
  temp          CHAR (8),
  number        REFERENCE;

temp := DECIMAL (text,8);
REFER number TO temp;
REDUCE number UNTIL FIRST /= "0";
      ON EOS RETURN ("0");
RETURN (number);

END Dec;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
=====
PROCEDURE                               Write_it (text, lines_to_skip);
=====

FORMAL
    text                CHARACTER VARYING,
    lines_to_skip       FIXED;

CASE lines_to_skip;

    % 0                Overprint -- must issue a single space
    DO;                afterwards
        WRITE LINE NO (text);
        WRITE LINE NO (text);
        WRITE LINE NO (text);
    END;

    % 1                Single space
    DO;
        WRITE LINE SINGLE (text);
        BUMP line_counter;
    END;

    % 2                Double space
    DO;
        WRITE LINE DOUBLE (text);
        BUMP line_counter BY 2;
    END;

    % 3                Triple space
    DO;
        WRITE LINE DOUBLE (text);
        WRITE LINE SINGLE (" ");
        BUMP line_counter BY 3;
    END;

    % 4                Quadruple space
    DO;
        WRITE LINE DOUBLE (text);
        WRITE LINE DOUBLE (" ");
        BUMP line_counter BY 4;
    END;

    % 5                Skip to next page
    DO;
        WRITE LINE PAGE (text);
        line_counter := 0;
    END;

END CASE;

END Write_it;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
=====
PROCEDURE                               Write_stats;
=====

  DECLARE
    i          FIXED;

  IF line_counter > 55
    THEN
      Write_it (" ", page);
      Write_it (" ", triple);

      Write_it (output(0), overprint);
      Write_it (" ", single);

      i := 0;
      DO FOREVER;
        IF (BUMP i) = 10
          THEN
            UNDO;
            Write_it (output(i), single);
        END;
      END;

  END Write_stats;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```

=====
PROCEDURE                               Program_header;
=====

DEFINE
    the_date AS                          # SUBSTR (date,0,2) CAT "/" CAT
                                          SUBSTR (date,2,2) CAT "/" CAT
                                          SUBSTR (date,4,2) #;
    the_time AS                           # SUBSTR (time,0,2) CAT ":" CAT
                                          SUBSTR (time,2,2) CAT ":" CAT
                                          SUBSTR (time,4,2) CAT "." CAT
                                          SUBSTR (time,6,1) #;

DECLARE
    date CHAR (8),
    time CHAR (7),
    name_of_day CHAR (9),
    the_day REFERENCE;

name_of_day := NAME_OF_DAY;
REFER the_day TO name_of_day;
REDUCE the_day UNTIL LAST /= " ";
date := DATE (MONTH,CHAR);
time := TIME (MILITARY,CHAR);
Write_it (INDENT10 CAT PROGRAM_NAME CAT " version " CAT
          PROGRAM_LEVEL CAT " on " CAT
          the_day CAT " " CAT the_date CAT " (" CAT
          the_time CAT ")", double);

READ STATISTICS (stats);
ON EOF DO;
    DISPLAY "End of file at record 0";
    STOP;
END;
REFER token TO SUBSTR(stats.text, 5);
REDUCE token UNTIL FIRST NEQ BLANK;
ON EOS DO;
    DISPLAY "Null record 0";
    STOP;
END;
REDUCE token UNTIL LAST NEQ BLANK;
Write_it (SPACES(15) CAT token, single);
READ STATISTICS (stats);
ON EOF DO;
    DISPLAY "End of file at record 1";
    STOP;
END;
REFER token TO SUBSTR(stats, 6, 35); % program switches
REDUCE token UNTIL FIRST NEQ BLANK;
ON EOS DO;
    DISPLAY "Null program switches";
    STOP;
END;
REDUCE token UNTIL LAST NEQ BLANK;
Write_it (SPACES(15) CAT token, single);

```

B 1000 System Communications Module (SYCOM)
Statistics File

```
REFER token TO SUBSTR(stats, 45); % job #, date
REDUCE token UNTIL FIRST NEQ BLANK;
  ON EOS DO;
    DISPLAY "Null job #";
    STOP;
  END;
REDUCE token UNTIL LAST NEQ BLANK;
Write_it (SPACES(15) CAT token, single);

END Program_header;

%=====
PROCEDURE                               Initialize;
%=====

  line_counter    := 0;
  n_input         := 0;
  r_old           := 0;
  s_old           := 0;
  total           := 0;

END Initialize;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
%=====
PROCEDURE                               Analyze_received;
%=====

output(0).left_part := "File: " CAT file_name CAT
                        "received";
output(1).left_part := "  ";

output(2).left_part := "Number of bytes received = " CAT
                        Dec (stats.bytes_read -
                            r_old.bytes_read);
output(3).left_part := "Number of blocks received = " CAT
                        Dec (stats.receive - r_old.receive);
output(4).left_part := "Number of records decoded = " CAT
                        Dec (stats.decoded - r_old.decoded);
output(5).left_part := "Number of blanks expanded = " CAT
                        Dec (stats.blanks_expanded -
                            r_old.blanks_expanded);
output(6).left_part := "Number of graphics received = " CAT
                        Dec (stats.graphics - r_old.graphics);
output(7).left_part := "Number of files received = " CAT
                        Dec (BINARY(stats.files_received));
output(8).left_part := "Number of RJE files printed = " CAT
                        Dec (stats.rje_files_printed -
                            r_old.rje_files_printed);
output(9).left_part := "Number of RJE files punched = " CAT
                        Dec (stats.rje_files_punched -
                            r_old.rje_files_punched);

END Analyze_received;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
X=====
PROCEDURE                               Analyze_sent;
X=====

output(0).left_part := "File: " CAT file_name CAT
                        "transmitted";
output(1).left_part := "  ";

output(2).left_part := "Number of bytes sent = " CAT
                        Dec (stats.bytes_sent -
                            s_old.bytes_sent);
output(3).left_part := "Number of blocks sent = " CAT
                        Dec (stats.writes - s_old.writes);
output(4).left_part := "Number of records encoded = " CAT
                        Dec (stats.encoded - s_old.encoded);
output(5).left_part := "Number of blanks compressed = " CAT
                        Dec (stats.blanks_compressed -
                            s_old.blanks_compressed);
output(6).left_part := "Number of graphics sent = " CAT
                        Dec (stats.graphics - s_old.graphics);
output(7).left_part := "Number of files sent = " CAT
                        Dec (BINARY (stats.files_sent));
output(8).left_part := "Number of RJE files read = " CAT
                        Dec (stats.rje_files_read -
                            s_old.rje_files_read);
output(9).left_part := "  ";

END Analyze_sent;
```


B 1000 System Communications Module (SYCOM)
Statistics File

```
X=====
PROCEDURE                                Update_received_totals;
X=====

total.bytes_read      := X_ADD(total.bytes_read,
                               stats.bytes_read);
total.receivees      := X_ADD(total.receivees,
                               stats.receivees);
total.decoded         := X_ADD(total.decoded,
                               stats.decoded);
total.blanks_expanded := X_ADD(total.blanks_expanded,
                               stats.blanks_expanded);
total.graphics       := X_ADD(total.graphics,
                               stats.graphics);
total.files_received := BINARY(stats.files_received);

END Update_received_totals;
```

```
X=====
PROCEDURE                                Update_sent_totals;
X=====

total.bytes_sent      := X_ADD(total.bytes_sent,
                               stats.bytes_sent);
total.writes          := X_ADD(total.writes,
                               stats.writes);
total.encoded         := X_ADD(total.encoded,
                               stats.encoded);
total.blanks_compressed := X_ADD(total.blanks_compressed,
                               stats.blanks_compressed);
total.graphics       := X_ADD(total.graphics,
                               stats.graphics);
total.files_sent     := BINARY (stats.files_sent);

END Update_sent_totals;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
=====
PROCEDURE                                Analyze_errors;
=====

output(0).middle_part := " ";
output(1).middle_part := " ";
output(2).middle_part := "Hardware errors: ";
output(3).middle_part := " ";
output(4).middle_part := " ";
output(5).middle_part := " ";
output(6).middle_part := " ";
output(7).middle_part := " ";
output(8).middle_part := " ";
output(9).middle_part := " ";

output(0).right_part := " ";
output(1).right_part := " ";
output(2).right_part := "Parity errors = " CAT
                        Dec (stats.parity - h_old.parity);
output(3).right_part := "Memory access errors = " CAT
                        Dec (stats.memory_access -
                            h_old.memory_access);
output(4).right_part := "Memory parity errors = " CAT
                        Dec (stats.memory_parity -
                            h_old.memory_parity);
output(5).right_part := "Timeouts = " CAT
                        Dec (stats.timeouts -
                            h_old.timeouts);
output(6).right_part := "Breaks received = " CAT
                        Dec (stats.breaks - h_old.breaks);
output(7).right_part := "End of buffer = " CAT
                        Dec (stats.end_of_buffer -
                            h_old.end_of_buffer);
output(8).right_part := "Loss of data set ready = " CAT
                        Dec (stats.loss_of_dsr -
                            h_old.loss_of_dsr);
output(9).right_part := "Loss of carrier = " CAT
                        Dec (stats.loss_of_carrier -
                            h_old.loss_of_carrier);

END Analyze_errors;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
%=====
PROCEDURE                                Update_error_totals;
%=====

total.parity        := total.parity + stats.parity;
total.memory_access := total.memory_access +
                        stats.memory;
total.memory_parity := total.memory_parity +
                        stats.memory_parity;
total.timeouts      := total.timeouts + stats.timeouts;
total.breaks        := total.breaks + stats.breaks;
total.end_of_buffer := total.end_of_buffer +
                        stats.end_of_buffer;
total.loss_of_dsr   := total.loss_of_dsr +
                        stats.loss_of_dsr;
total.loss_of_carrier := total.loss_of_carrier +
                        stats.loss_of_carrier;

END Update_error_totals;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
=====
PROCEDURE                                Analyze_stats;
=====

REFER token TO stats.text;
REDUCE token UNTIL FIRST = """;        % file names delimited
REDUCE token UNTIL FIRST NEQ """;      % by quotes
REDUCE token SETTING file_name UNTIL FIRST = """;
REDUCE token UNTIL FIRST = " ";
IF SUBSTR (token, 1, 1) = "R"
    THEN
        DO;
            Analyze_received;
            Update_received_totals;
            r_old := stats;
        END;
    ELSE
        DO;
            Analyze_sent;
            Update_sent_totals;
            s_old := stats;
        END;

    Analyze_errors;
    Update_error_totals;
    h_old := stats;

    Write_stats;

END Analyze_stats;
```

B 1000 System Communications Module (SYCOM)
Statistics File

```
=====
PROCEDURE                               Analyze_totals;
=====

Write_it (" ", page);
Write_it (" ", single);

Write_it (SPACES(45) CAT "TOTALS", overprint);
Write_it (SPACES(45) CAT "_____", overprint);
Write_it (" ", triple);

%%Z received

Write_it ("Total number of bytes received = " CAT
         Dec (total.bytes_read), single);
Write_it ("Total number of blocks received = " CAT
         Dec (total.receives), single);
Write_it ("Total number of records decoded = " CAT
         Dec (total.decoded), single);
Write_it ("Total number of blanks expanded = " CAT
         Dec (total.blanks_expanded), single);
Write_it ("Total number of graphics received = " CAT
         Dec (total.graphics), single);
Write_it ("Total number of files received = " CAT
         Dec (total.files_received), single);

%%Z sent

Write_it ("Total number of bytes sent = " CAT
         Dec (total.bytes_sent), single);
Write_it ("Total number of blocks sent = " CAT
         Dec (total.writes), single);
Write_it ("Total number of records encoded = " CAT
         Dec (total.encoded), single);
Write_it ("Total number of blanks compressed = " CAT
         Dec (total.blanks_compressed), single);
Write_it ("Total number of graphics sent = " CAT
         Dec (total.graphics), single);
Write_it ("Total number of files sent = " CAT
         Dec (total.files_sent), single);
```

B 1000 System Communications Module (SYCOM)
Statistics File

%%% hardware errors

```
Write_it ("Total parity errors = " CAT  
         Dec (total.parity), single);  
Write_it ("Total memory access errors = " CAT  
         Dec (total.memory_access), single);  
Write_it ("Total memory parity errors = " CAT  
         Dec (total.memory_parity), single);  
Write_it ("Total timeouts = " CAT  
         Dec (total.timeouts), single);  
Write_it ("Total breaks received = " CAT  
         Dec (total.breaks), single);  
Write_it ("Total end of buffer = " CAT  
         Dec (total.end_of_buffer), single);  
Write_it ("Total loss of data set ready = " CAT  
         Dec (total.loss_of_dsr), single);  
Write_it ("Total loss of carrier = " CAT  
         Dec (total.loss_of_carrier), single);
```

END Analyze_totals;

B 1000 System Communications Module (SYCOM)
Statistics File

```
%=====
PROCEDURE                               Main_loop;
%=====

DO READ_STATS FOREVER;
  READ STATISTICS (stats);
  ON EOF UNDO READ_STATS;
  BUMP n_input;
  IF stats.file_lit = "FILE"
    THEN
      Analyze_stats;
  END READ_STATS;

  Analyze_totals;

  DISPLAY "Number of input records read = " CAT Dec(n_input);

END Main_loop;

%=====
%=====
%                               outer loop

Initialize;

Program_header;

Main_loop;

STOP;
```

APPENDIX H

SAMPLE APPLICATION PROGRAMS

GENERAL

The sample programs in this appendix were designed to test the program-to-program and program-to-SYCOM communication functions of the SYCOM program. These sample programs provide the necessary mechanics for this communication process. The user can expand upon these sample programs to create programs with the capabilities desired. The first two programs are written in B 1000 User Programming Language (UPL) and show the program-to-program functions. The third program is written in the B 1000 Report Program Generator (RPG) language and shows the program-to-SYCOM functions.

PROGRAM-TO-PROGRAM APPLICATION PROGRAMS

There are two data communication type functions required for these application programs: (1) to read input messages from a remote file and (2) to write reply messages into the same remote file. The message interface architecture was established for this purpose and must be adhered to at all times.

The following program accepts an input message from the ODT using the MCP accept mechanism. This program then displays the message on the ODT of the remote system. This program is run on both systems.

*Station must be
TYPE = 58
for complete independence
from SYCOM stations*

B 1000 System Communications Module (SYCOM)
Sample Application Programs

```
?COMPILE SYCOM/TEST UPL LIBRARY;  
?DATA CARDS
```

```
%      This application program shows the program-to-program  
%      communication using SYCOM.
```

```
$ SIZE PASS_END
```

```
FILE      RMTE (DEVICE = REMOTE, NUMBER_OF_STATIONS = 1,  
              RECURDS = 80/1, BUFFERS = 2);
```

```
DEFINE    CHAR                AS #CHARACTER#;
```

```
DECLARE   text                CHAR (80);
```

```
OPEN RMTE WITH INPUT, OUTPUT;
```

```
DO IT FOREVER;
```

```
  DISPLAY "Enter message to be transmitted to remote system";
```

```
  CASE WAIT (SPD_INPUT_PRESENT, READ_OK(RMTE));
```

```
    DO SPOIN;
```

```
      ACCEPT text;
```

```
      IF SUBSTR (text, 0, 5) = ".STOP"
```

```
        THEN STOP;
```

```
      WRITE RMTE (text);
```

```
    END SPOIN;
```

```
    DO READ_IT;
```

```
      READ RMTE (reply);
```

```
      ON EOF STOP;
```

```
      DISPLAY reply;
```

```
    END READ_IT;
```

```
  END CASE;
```

```
END IT;
```

```
? END
```

B 1000 System Communications Module (SYCOM)
Sample Application Programs

PROGRAM-TO-SYCOM APPLICATION PROGRAM

The data communication type functions required for this type of application program are: (1) to read input messages from the SYCOM program INQ queue file and (2) to write messages to the SYCOM program OUTQ queue file. The syntax for each of the SYCOM program commands is the same as specified in Section 5 of this manual. The message formats for the program-to-SYCOM are described in Appendix D.

```
?COMPILE PROGRAM/SYCOM RPG LI  
?OBJ FILE INQ NAME <sycom>/INQ QUEUE;  
?OBJ FILE OUTQ NAME <sycom>/OUTQ QUEUE;  
?OBJ FILE DUMMY NAME <dummy disk file name>;  
?DATA CARDS
```

00100H

00200FDUMMY	IPE F 180 180	DISK
00300FINQ	ID F20002000	DISK
00400FOUTQ	0 F20002000	DISK
00500FLINE	0 F 132 132	PRINTER
00600IDUMMY	NS 01	
00700I		1 1 DUM
00800IINQ	NS 02	
00900I		1 10 HEADER
01000I		1 4 ID
01100I		5 8 LENGTH
01200I		9 10 MESNUM
01300I		11 110 RESPON

No COBOL ?
SDC2 ??

B 1000 System Communications Module (SYCOM)
Sample Application Programs

```

01400C* The BEGIN subroutine builds a PUT command and writes
01500C* it to the OUTQ file.
01600C*
01700C  N99                EXSR BEGIN
01800C*
01900C* The following loop reads the INQ queue file for any
02000C* SYCOM program messages.  If the file is successfully
02100C* transferred, this program sets on the LR indicator
02200C* and goes to end of job.
02300C*
02400C          AGAIN      TAG
02500C  01          READ INQ                80
02600C  01N80      EXCPT
02700C  01N80      MOVELRESPON  MESSAGE 20
02800C  01N80      ENDMES  COMP MESSAGE    20
02900C  01N20      GOTO AGAIN
03000C          SETON                LR

03100CSR          BEGIN      BEGSR
03200CSR          MOVE 'TEST'  PROGID  4
03300CSR          MOVEL'PUT DMPA'PUTMES 16
03400CSR          MOVE 'LL AS D 'PUTMES
03500CSR          EXCPT
03600CSR          SETON                99
03700CSR          MOVEL'FILE DMP'ENDMES 16
03800CSR          MOVE 'ALL END 'ENDMES
03900CSR          ENDSR

040000OUTQ      E          01N99
041000          PROGID      4
042000          PUTMES      26
043000LINE      E          01 99N80
044000          ID          4
045000          LENGTH     10
046000          MESNUM     14
047000          RESPON     130
048000          E          01N99
049000          5 '*****'
050000          PUTMES     21

?END

```

APPENDIX I

RESTRICTED MCP COMMAND SUMMARY

All input commands that are prefixed with a question mark (?) character are sent directly to the MCP exactly as entered. The MCP then generates appropriate responses which are sent to the terminal by way of the Network Controller. Security restrictions impose certain constraints on MCP commands from remote terminals. In addition, certain commands such as those which alter system options, purge, or clear system peripherals, have been disallowed for a remote terminal. The following list represents the MCP command subset permitted from user-system terminals and the user ODT.

The following command subset is listed in the same order as described in the B 1000 Systems System Software Operation Guide, Volume 1, form number 1108982. Any command in the following list which is followed by (US) must be entered with a valid usercode/password combination.

Library Maintenance Instructions

- CH Change (US)
- ADD (US)
- COPY (US)
- RE Remove (US)

Program Control Instructions

- CO Compile (US)
- DY Dynamic
- EX Execute (US)
- MH Modify Header (US)
- MO Modify (US)

Program Control Instruction Attributes

- AF After
- AN After.Number
- CA Conditional
- CG Charge (certain restrictions apply)
- DS Dynamic.Spaces
- FI File
- FR Freeze
- HO Hold
- IN Interpreter
- IT Intrinsic.Name
- ID Intrinsic.Directory
- ME Memory
- OV Override
- PR Priority
- SC Schedule.Priority
- SW Switch
- TH Then
- UC Unconditional
- UF Unfreeze
- UV Unoverride
- VI Virtual.Disk

B 1000 System Communications Module (SYCOM)
Restricted MCP Command Summary

System Control Instructions

AX Response to ACCEPT
BF Display BACKUP files (US)
CP Compute
CU Core usage
DF Date of file (US)
DM Dump memory and continue
DP Dump memory and discontinue
DS Discontinue program
FN Display internal file name
FR Final reel of unlabeled tape file
FS Force from schedule
GO Resume stopped program
HS Hold in waiting schedule
HW Hold in waiting schedule until job EOJ
MR Close output file with purge
MX Display MIX
OF Optional file response
OK Continue processing
OL Display peripheral status
PD Display directory
PM Print memory dump
PR Change priority
PS Prod schedule
QF Query file (US)
QP Query program
RB Remove backup files (US)
RM Remove duplicate disk file
RS Remove jobs from schedule
SP Change schedule priority
ST Suspend processing
SW Set switch
TD Time and date
TI Time interrogation
TS Test switches
UL Assign unlabeled file
WD Display MCP date
WM Display current MCP and interpreter
WS Display schedule
WT Display MCP time
WY Program status interrogation

Job Spawning Control Attributes

QU Queue command
US Usercode command
ZQ Zip queue command

Mix-related MCP commands can refer only to jobs initiated by the same remote terminal from which the initial command was entered. All MCP commands must be entered in upper-case characters.

APPENDIX J

NOTATION AND SYNTAX CONVENTIONS

NOTATION CONVENTIONS

LEFT AND RIGHT BROKEN BRACKETS (< >)

Left and right broken brackets are used to enclose letters and digits which are supplied by the user. The letters and digits can represent a variable, a number, a file name, or a command.

Example:

<job #>AX<command>

AT SIGN (@)

The at sign (@) is used to enclose hexadecimal information.

Example:

@F3@ is the hexadecimal representation of the EBCDIC character 3.

The at sign (@) is also used to enclose binary information when the initial at sign (@) is followed by a (1).

Example:

@(1)11110011@ is the binary representation of the EBCDIC character 3.

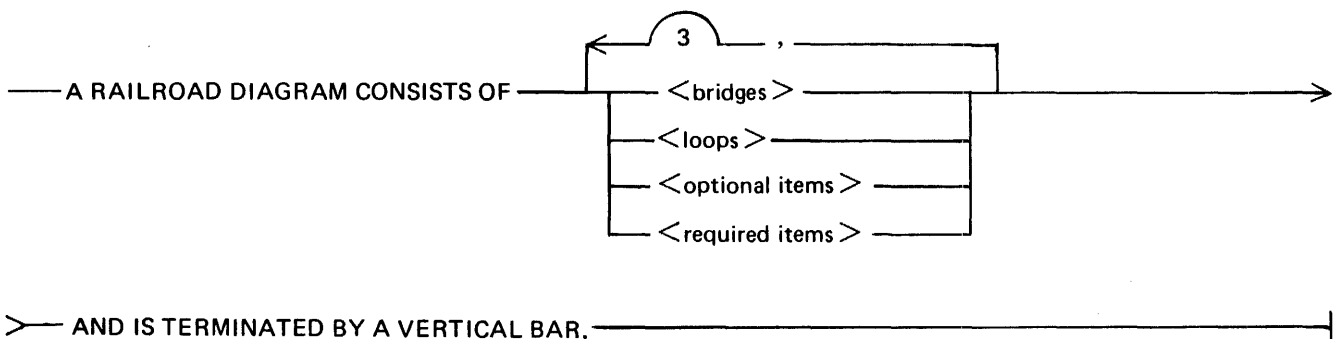
SYNTAX CONVENTIONS (RAILROAD DIAGRAMS)

Railroad diagrams show how syntactically valid statements can be constructed.

Traversing a railroad diagram from left to right, or in the direction of the arrow heads, and adhering to the limits illustrated by bridges produces a syntactically valid statement. Continuation from one line of a diagram to another is represented by a right arrow (→) appearing at the end of the current line and beginning of the next line. The complete syntax diagram is terminated by a vertical bar (|).

Items contained in broken brackets (< >) are syntactic variables which are further defined for which the user is required to supply the requested information.

Upper-case items must appear literally. Minimum abbreviations of upper-case items are underlined.



G50051

The following syntactically valid statements can be constructed from the preceding diagram:

A RAILROAD DIAGRAM CONSISTS OF <bridges> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <optional items> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <bridges>, <loops> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <optional items>, <required items>, <bridges>, <loops> AND IS TERMINATED BY A VERTICAL BAR.

REQUIRED ITEMS

No alternate path through the railroad diagram exists for required items or required punctuation.

Example:

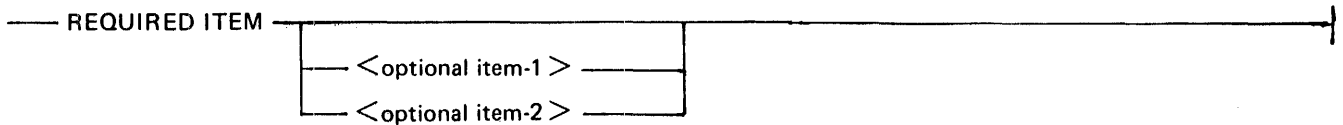


G50052

OPTIONAL ITEMS

Items shown as a vertical list indicate that the user must make a choice of the items specified. An empty path through the list allows the optional item to be absent.

Example:



G50053

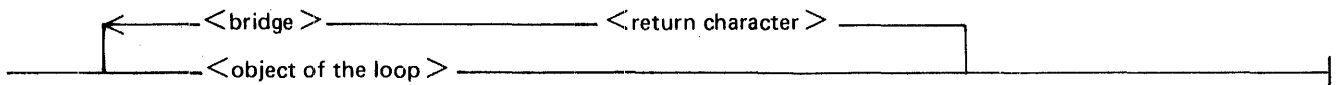
The following valid statements can be constructed from the above diagram:

```

REQUIRED ITEM
REQUIRED ITEM <optional item-1>
REQUIRED ITEM <optional item-2>
    
```

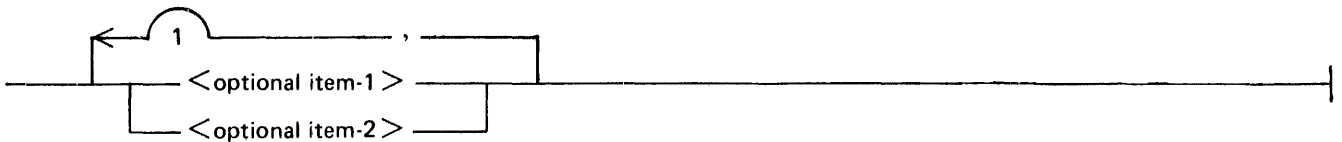
LOOPS

A loop is a recurrent path through a railroad diagram and has the following general format.



G50054

Example:



G50055

The following statements can be constructed from the railroad diagram in the example.

```


<optional item-1>
<optional item-1>,<optional item-1>
<optional item-2>,<optional item-1>
    
```


A <loop> must be traversed in the direction of the arrow heads, and the limits specified by bridges cannot be exceeded.

BRIDGES

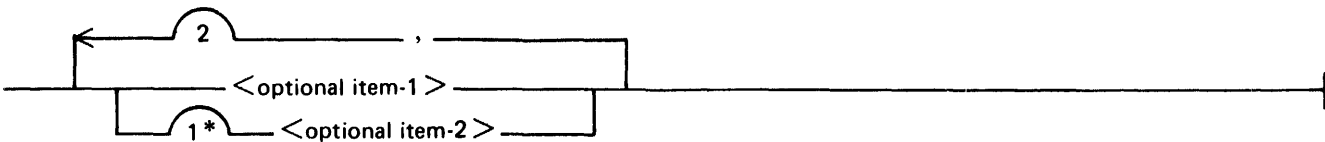
A bridge illustrates the minimum or maximum number of times a path can be traversed in a railroad diagram.

There are two forms of <bridges>.

 n is an integer which specifies the maximum number of times the path can be traversed.

 n is an integer which specifies the minimum number of times the path must be traversed.

Example:



G50057

The loop can be traversed a maximum of two times; however, the path for <optional item-2> must be traversed at least one time.

The following statements can be constructed from the railroad diagram in the example.

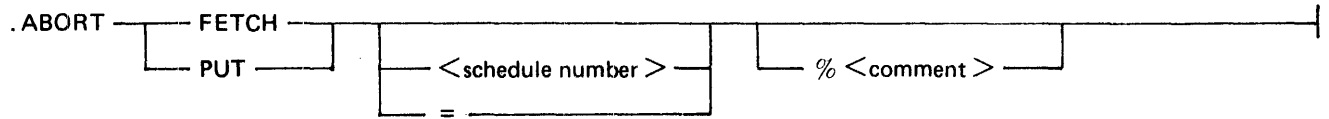
<optional item-1>, <optional item-2>
<optional item-2>, <optional item-2>, <optional item-1>
<optional item-2>

APPENDIX K SYCOM SYNTAX REFERENCE GUIDE

SYCOM PROGRAM COMMANDS

ABORT

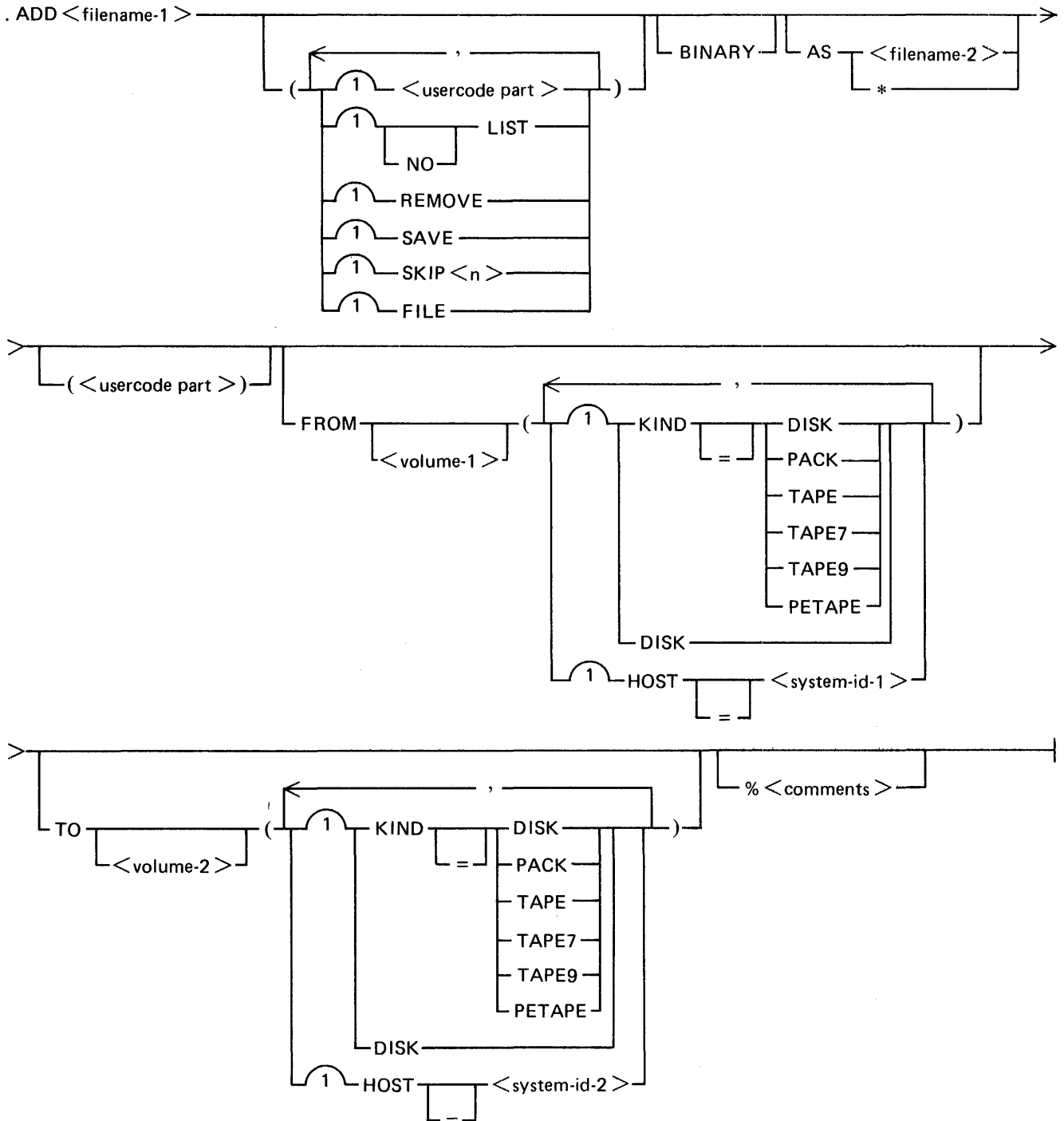
Syntax:



B 1000 System Communications Module (SYCOM)
SYCOM Syntax Reference Guide

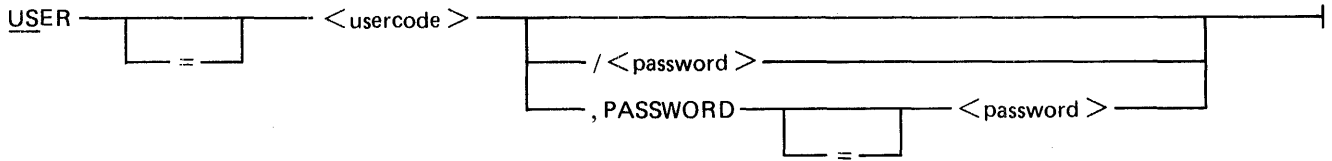
ADD

Syntax:



B 1000 System Communications Module (SYCOM)
SYCOM Syntax Reference Guide

The <usercode part> syntax is shown in the following syntax diagram.

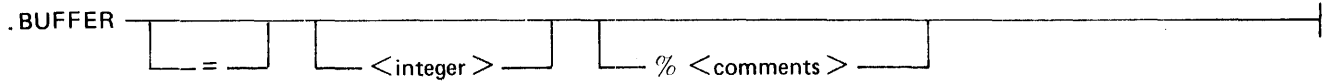


BUFFER

Workstation Syntax:



Remote ODT and System ODT Syntax:



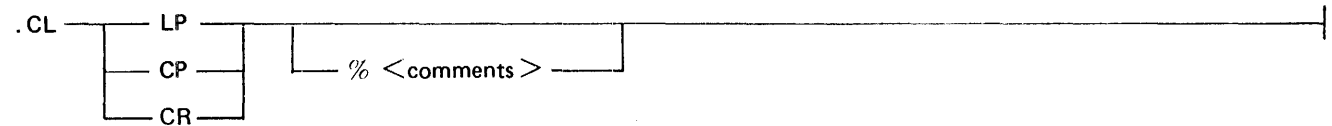
BYE

Syntax:



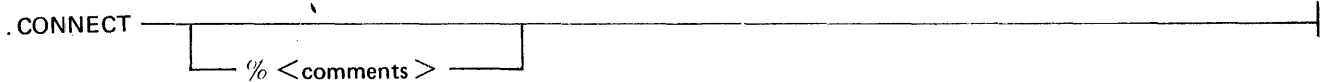
CL (CLEAR DEVICE)

Remote ODT and System ODT Syntax:



CONNECT

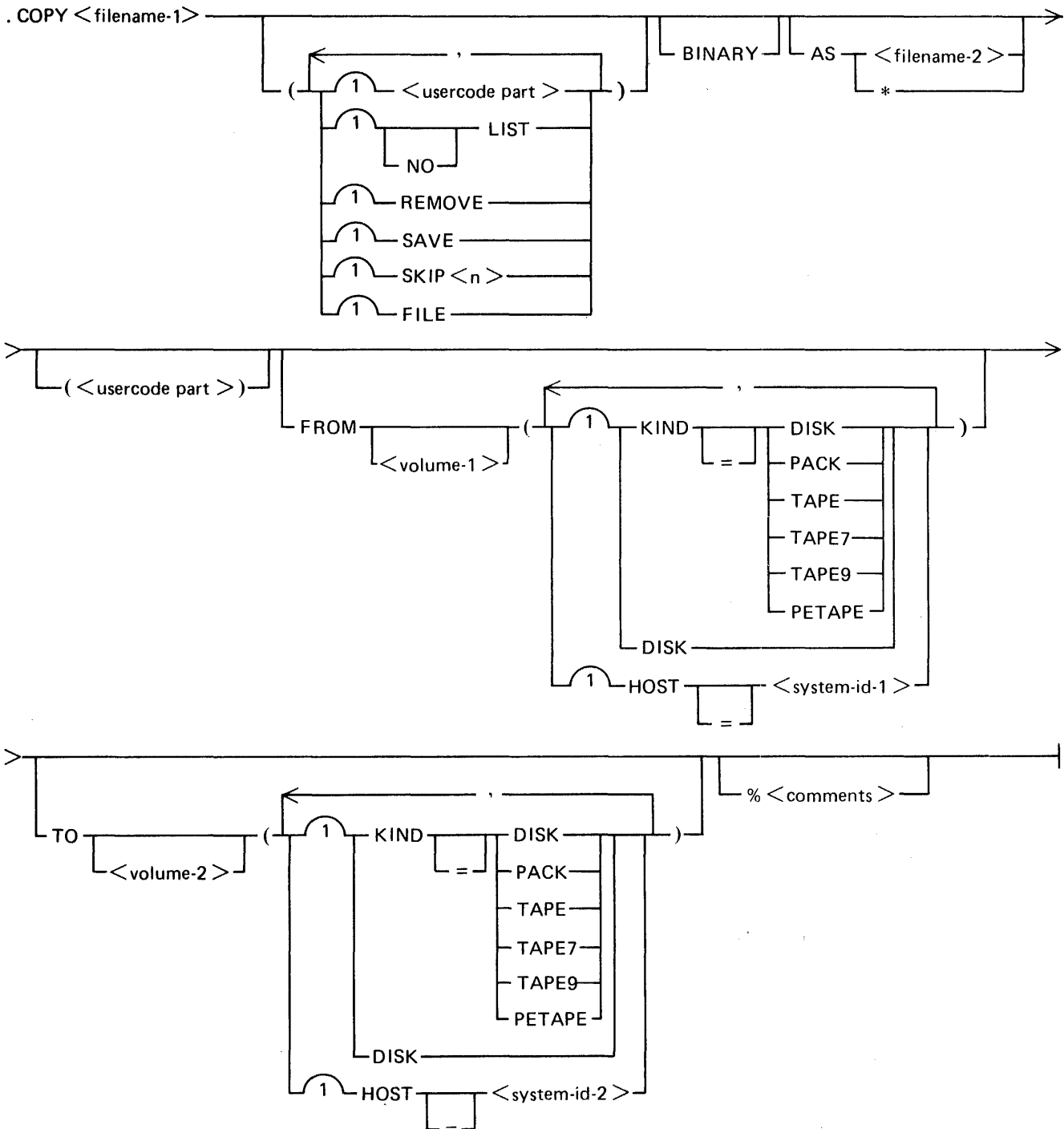
Syntax:



B 1000 System Communications Module (SYCOM)
 SYCOM Syntax Reference Guide

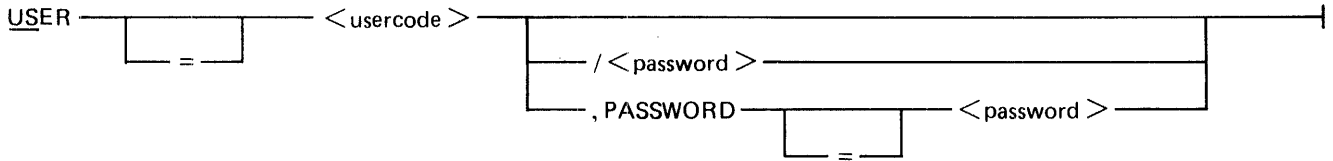
COPY

Syntax:



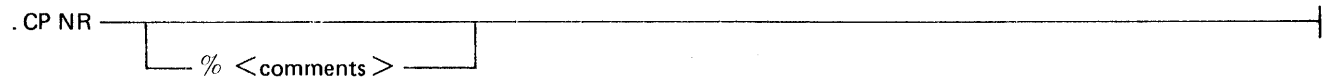
**B 1000 System Communications Module (SYCOM)
SYCOM Syntax Reference Guide**

The <usercode part> syntax is shown in the following syntax diagram.



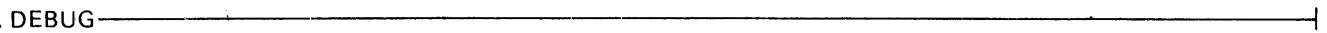
CP NR (CARD PUNCH NOT READY)

Remote ODT and System ODT Syntax:

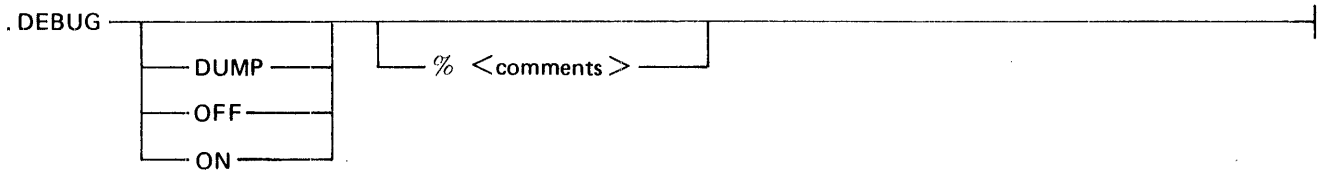


DEBUG

Workstation Syntax:



Remote ODT and System ODT Syntax:



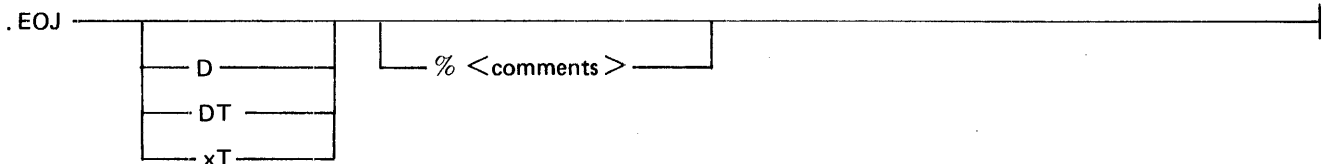
DISCONNECT

Syntax:



EOJ

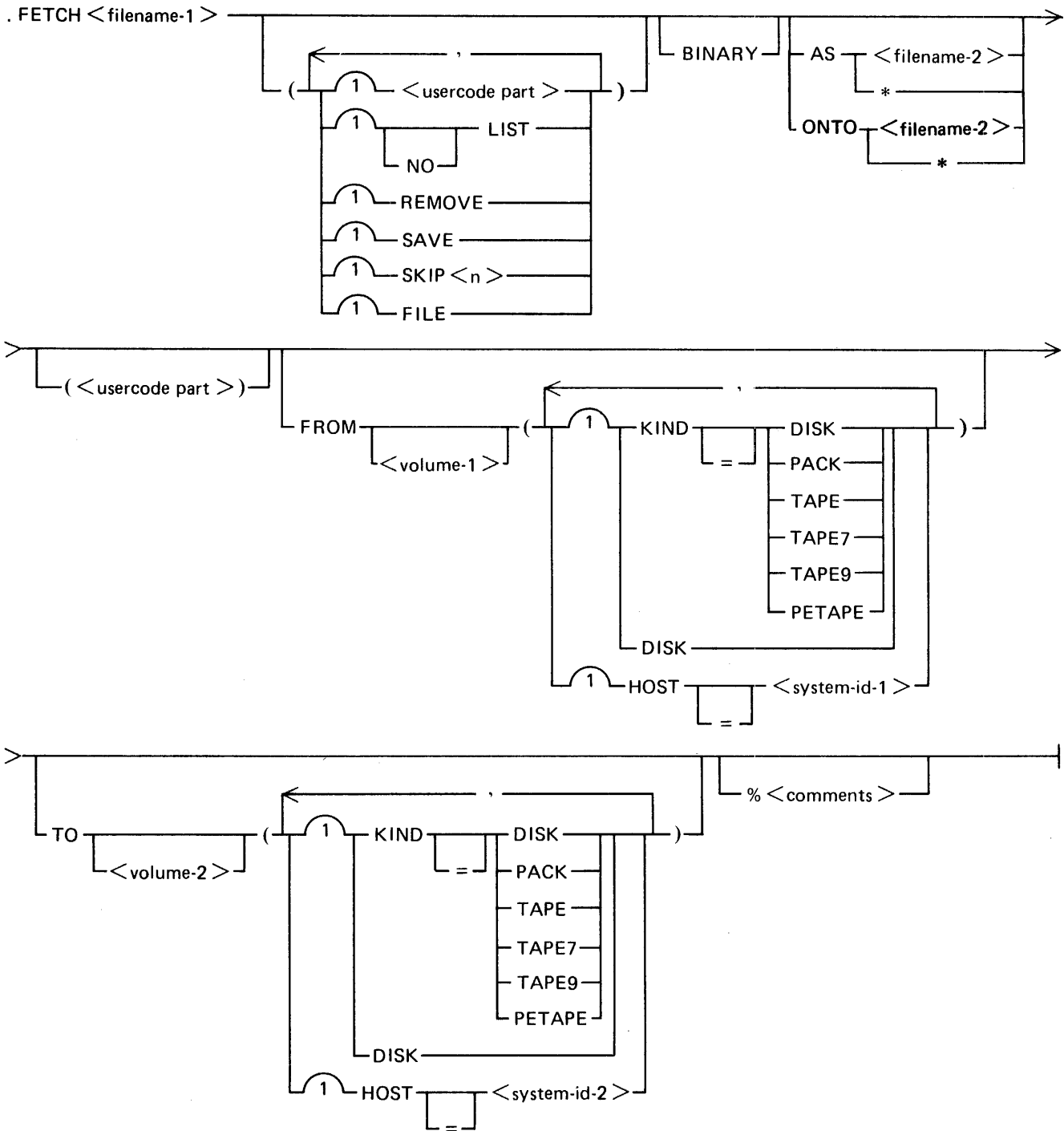
Remote ODT or System ODT Syntax:



B 1000 System Communications Module (SYCOM)
 SYCOM Syntax Reference Guide

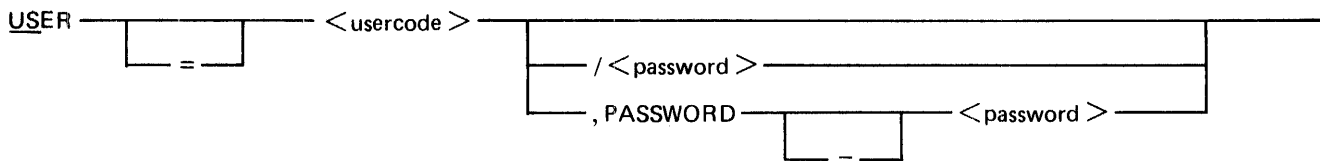
FETCH

Syntax:



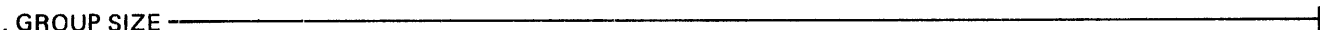
B 1000 System Communications Module (SYCOM)
SYCOM Syntax Reference Guide

The <usercode part> syntax is shown in the following syntax diagram.

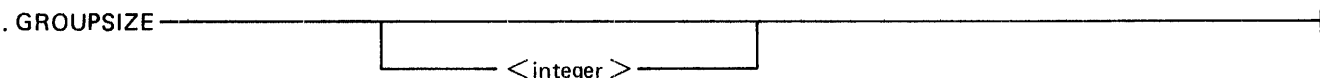


GROUPSIZE

Workstation Syntax:

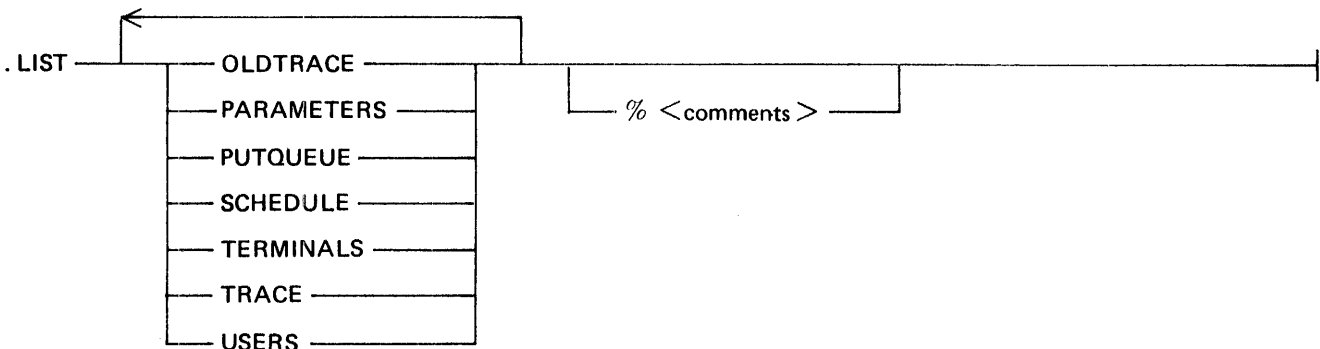


Remote ODT and System ODT Syntax:



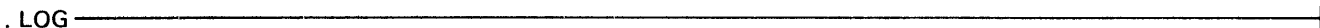
LIST

Syntax:

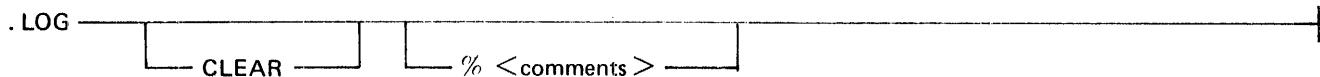


LOG

Workstation Syntax:



Remote ODT and System ODT Syntax:



LOCK

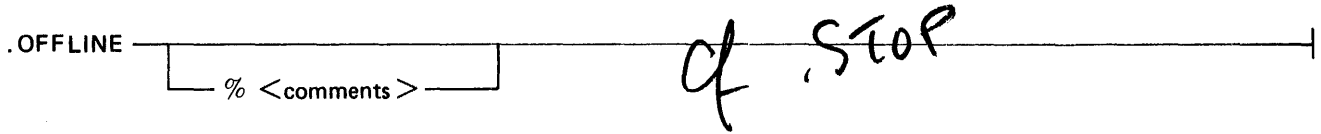
LP NR (LINE PRINTER NOT READY)

Remote ODT and System ODT Syntax:



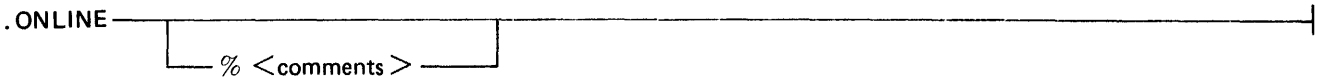
OFFLINE

Remote ODT and System ODT Syntax:



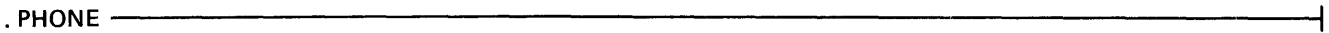
ONLINE

Remote ODT and System ODT Syntax:

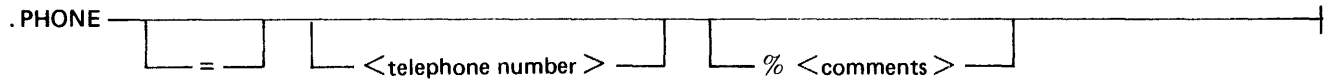


PHONE

Workstation Syntax:

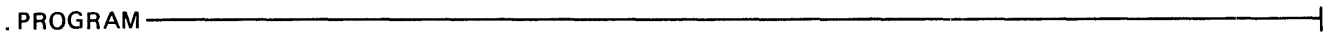


Remote ODT and System ODT Syntax:

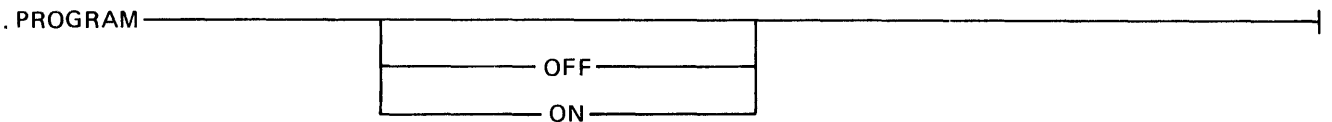


PROGRAM

Workstation Syntax:



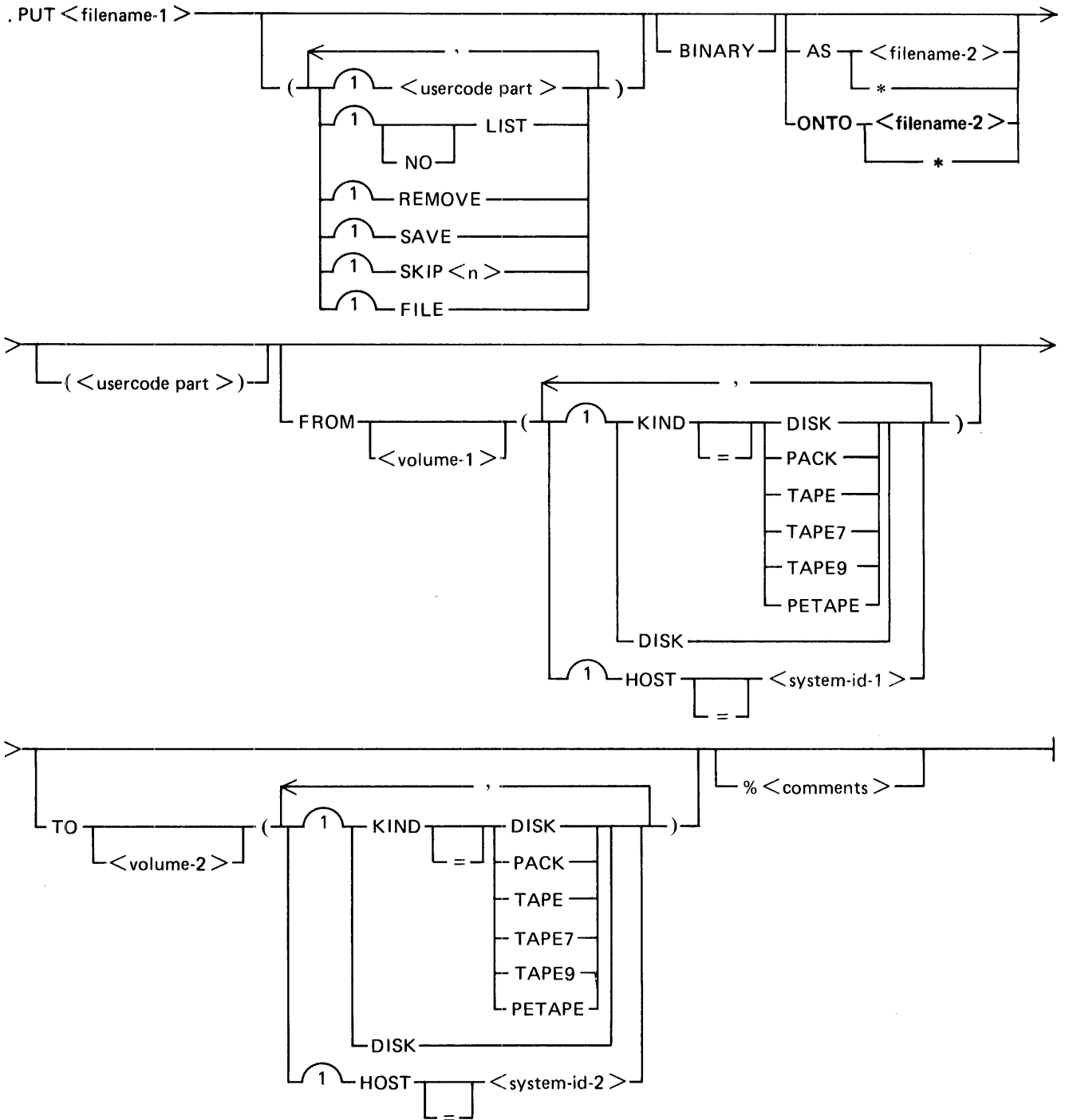
Remote ODT and System ODT Syntax:



B 1000 System Communications Module (SYCOM)
SYCOM Syntax Reference Guide

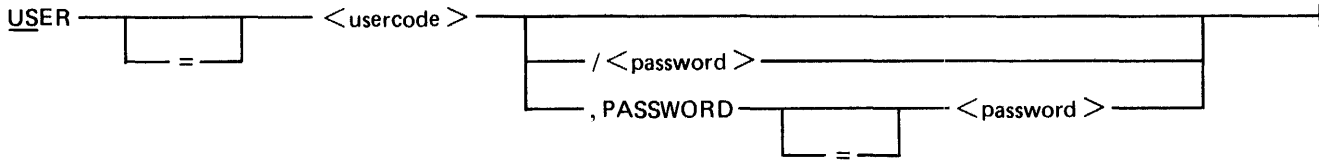
PUT

Syntax:



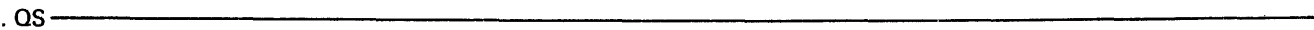
**B 1000 System Communications Module (SYCOM)
SYCOM Syntax Reference Guide**

The <usercode part> syntax is shown in the following syntax diagram.

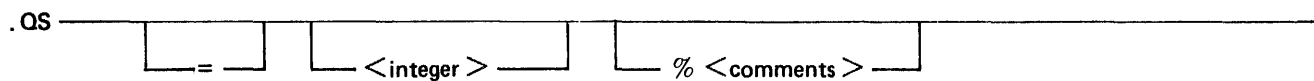


QS (QUEUE SIZE)

Workstation Syntax:

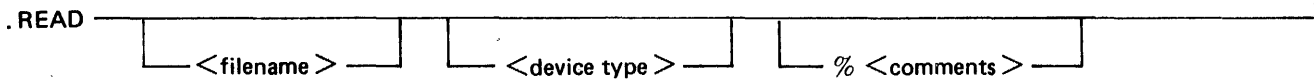


Remote ODT and System ODT Syntax:



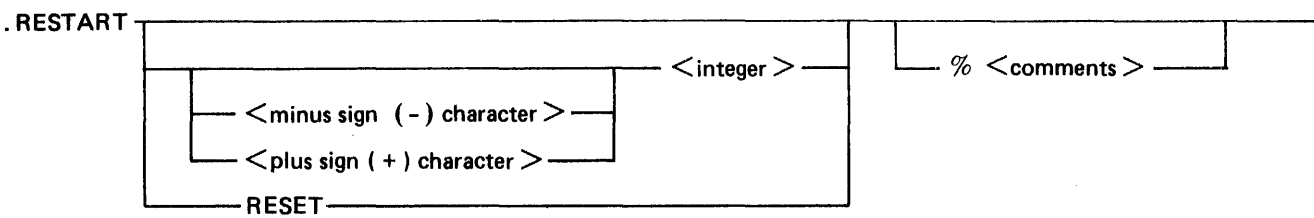
READ

Remote ODT and System ODT Syntax:



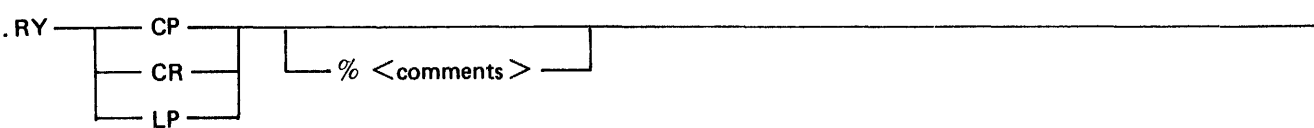
RESTART

Remote ODT or System ODT Syntax:



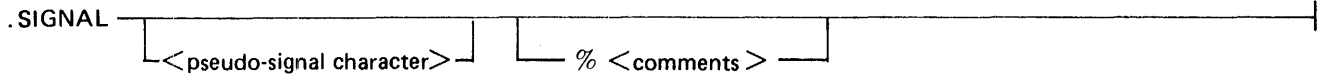
RY (READY DEVICE)

Remote ODT and System ODT Syntax:



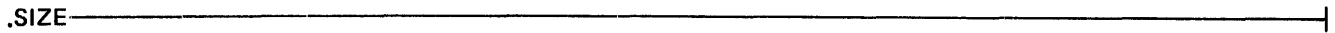
SIGNAL

Syntax:

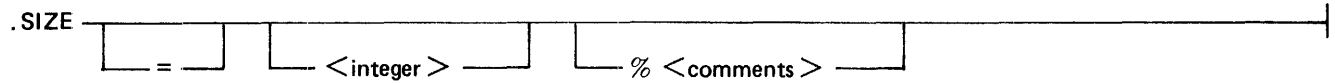


SIZE

Workstation Syntax:

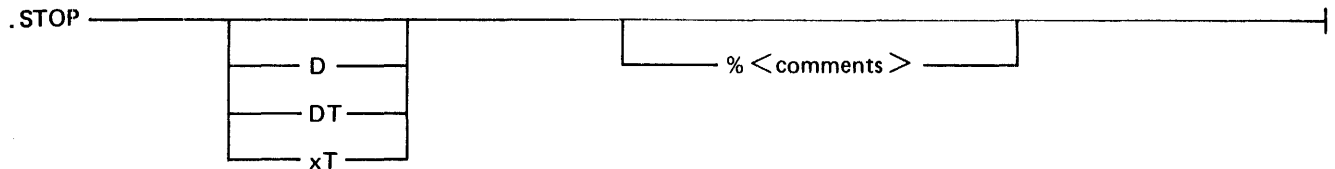


Remote ODT and System ODT Syntax:



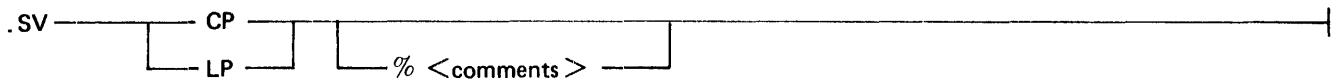
STOP

Remote ODT and System ODT Syntax:



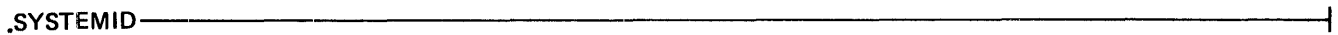
SV (SAVE DEVICE)

Remote ODT and System ODT Syntax:

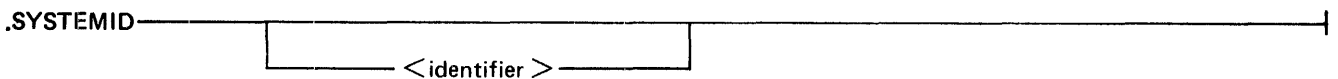


SYSTEMID

Workstation Syntax:



Remote ODT and System ODT Syntax:



TRACE

Workstation Syntax:

.TRACE _____|

Remote ODT and System ODT Syntax:

.TRACE _____|
 ┌── ON ──┐
 └── OFF ─┘
 % <comments >

USER

Syntax:

.USER _____|
 ┌── = ──┐
 └── <usercode > ─┘
 ┌── / ──┐
 └── <password > ─┘
 % <comments >

WAIT

Workstation Syntax:

.WAIT _____|

Remote ODT and System ODT Syntax:

.WAIT _____|
 ┌── OFF ──┐
 └── ON ───┘
 % <comments >

WHAT

Syntax:

.WHAT _____|
 ┌── U ──┐
 └── S ──┘
 ┌── = ──┐
 % <comments >

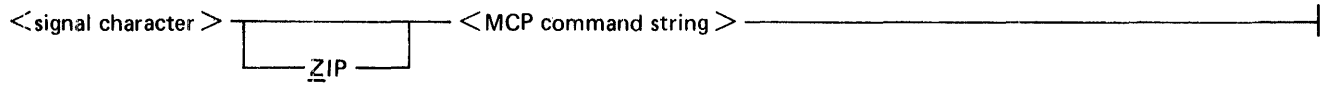
SMCS COMMAND STRING FROM USER-SYSTEM

Syntax:

<signal character > <SMCS command string > _____|

SMCS MCP COMMAND STRING FROM USER-SYSTEM

Syntax:



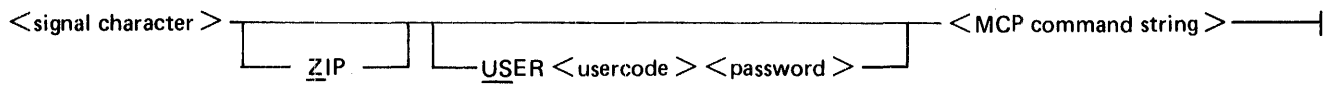
SMCS COMMAND STRING FROM SERVER-SYSTEM

Syntax:



SMCS MCP COMMAND STRING FROM SERVER-SYSTEM

Syntax:



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