60494600

CONTROL DATA CORPORATION

INTERCOM VERSION 4 REFERENCE MANUAL

CDC® OPERATING SYSTEM: NOS/BE 1

COMMAND INDEX

†EDITOR command.

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CDC® OPERATING SYSTEM: NOS/BE 1

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	are included in this description. The PAGE command has been rewritten and removed from section
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	PAGE mode, has been added. The Permissible NOS/BE 1 Control Statements section has been removed;
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Address comments concerning this manual to:

Control Data Corporation
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LIST OF EFFECTIVE PAGES

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PREFACE

The INTERCOM Version 4.7 system, operating in conjunction with NOS/BE Version 1, provides time-sharing access to a CONTROL DATA® CYBER 170 Series; CDC® CYBER 70 Models 71, 72, 73, and 74; and CDC® 6000 Series computer from a terminal at the central site or at a remote facility. The commands and directives of INTERCOM permit the terminal operator to submit a job for processing on the central computer and also to work interactively with an executing program. In addition, INTERCOM has a library of utility programs that enable the user to manipulate files and edit program texts.

The INTERCOM user should be familiar with NOS/BE and with the language of the source program. INTERCOM commands are described in this manual for use through the following terminals: Teletype, 200 User, display, 713 Teletype Compatible, and remote batch, and high-speed batch terminal support through the Local Communications Controller (LCC). Detailed terminal information is contained in appropriate reference manuals.

Sections 1 and 2 contain some hardware description which the inexperienced user may wish to ignore. Sections 3 through 6 discuss the interactive user, and sections 7 and 8 discuss the remote batch user.

RELATED PUBLICATIONS

The following manuals provide further information about NOS/BE compilers available for use with INTERCOM and operation of IMPORT on remote computer terminals, as well as publications for other Control Data terminals and the 7077 Communications Station.

Control Data Publication	Publication Number
ALGOL Version 4 Reference Manual	60496600
BASIC Version 3 Reference Manual	19983900
COBOL Version 4 Reference Manual	60496800
COBOL Version 4 to COBOL Version 5 Conversion Aid Reference Manual	19265021
COBOL Version 5 Reference Manual	60497100
Common Memory Manager Reference Manual	60499200
COMPASS Version 3 Reference Manual	60492600
CYBER 18 Controlware Reference Manual	96768910
CYBER 18 Batch Terminal Operator's Guide	96768920
EXPORT/IMPORT High-Speed Version 1 Reference Manual	60235400
FORTRAN Extended Version 4 Reference Manual	60497800
FORTRAN Version 5 Reference Manual	60481300

Control Data Publication	Publication Number
INTERCOM Interactive Procedure Guide	60495200
INTERCOM Version 4 Interactive Command Summary	60495300
INTERCOM Version 4 Interactive Guide for Users of COBOL	60495100
INTERCOM Version 4 Interactive Guide for Users of FORTRAN Extended	60495000
INTERCOM Version 4 Remote Batch Command Summary	60495400
INTERCOM Version 4 Multi-User Job Capability Reference Manual	60494700
INTERCOM Version 4 Remote Batch User's Guide	60496100
NOS/BE Manual Abstracts	84000470
NOS/BE Version 1 Diagnostic Handbook	60494400
NOS/BE Version 1 Diagnostic Index	60456490
NOS/BE Version 1 Reference Manual	60493800
QUERY UPDATE Version 3 Reference Manual	60498300
200 User Terminal Hardware Reference Manual	82128000
274 Interactive Graphics System Operator's Guide	60359800
274 Interactive Graphics System Reference Manual	60358800
711 CRT Display Terminal Hardware Programming Manual	62022700
711 CRT Display Terminal On-Site Maintenance Manual	62062300
711 CRT Display Terminal Operator's Guide	62034100
713 Conversational Display Terminal Hardware Programming Manual	62033400
713 Conversational Display Terminal On-Site Maintenance Manual	62048500
713 Conversational Display Terminal Operator's Guide	62037900
714 Remote Terminal Subsystem Operator's Guide	82184500
714 Remote Terminal Subsystem Reference Manual	82184600
731-10, 732-10 Remote Batch Terminals Operating and Programming Guide	82163500
731-12, 732-12 Remote Batch Terminals Operating and Programming Guide	82163400
733 High-Speed Batch Terminal Functional Characteristics and Programming Manual	60329500
734 Batch Terminal Operator's Guide	62971500

Control Data Publication	Publication Number
751-10 Terminal Subsystem Operator's Guide	62951400
751-10 Terminal Subsystem Reference Manual	62962800
777 Interactive Graphics System Reference Manual	17321800
777 Interactive Graphics System Remote Job Entry User Guide	76077200
777 Interactive Graphics System User's Guide	17322500
791 Communications Subsystem Functional Characteristics and Programming Manual	60325100
1700 MSOS IMPORT High-Speed Reference Manual	60305700
2550 Computer System Software Reference Manual Version 1.0	74701200
7077 Communications Station Reference Manual	60364600

DISCLAIMER

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features or parameters.

NOTATIONS USED IN THIS MANUAL

Command verbs and keyword parameters are capitalized. A verb appears at the beginning of the command before any separators or terminators. A keyword is a parameter or part of a parameter that is entered into the command exactly as shown in the command format. It is not changed by any information supplied by the user. Information supplied by the user is shown in lowercase characters. Most command parameters can appear in any order. Exceptions are noted in the command descriptions.

{ }	Braces enclose required elements of alternative entries; only one alternative can be specified.
[ ]	Brackets enclose optional elements; any one may be specified, or all may be omitted.
...	An ellipsis following an element indicates that a variable number of similar elements can be specified.
___	Underlined characters indicate allowable command and parameter abbreviations.
eqa	Represents any input or output device.
eqo	Represents output devices only.

All examples are shown as printed on a teletypewriter. Data the user enters is shown in lowercase characters.

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APPENDIXES

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FIGURES

TABLES

SYSTEM DESCRIPTION 1

INTERCOM directs the flow of information and data between the central site computer and a number of remote terminals. Remote terminal users are provided with the ability to:

Create programs by entering source statements at the terminal.

Create, store, reference, and edit files using EDITOR.

Reference and manipulate indexed sequential, direct access, and sequential files using QUERY UPDATE.

Submit jobs to a NOS/BE batch queue for processing.

Submit ALGOL, BASIC, COBOL, COMPASS, and FORTRAN programs for execution under INTERCOM control and interact with the executing programs from the terminal.

Request output from jobs run in a batch queue to be directed to either a remote terminal, central site printer, or punch.

Enter most operating system control statements for processing.

Though the user can, with the aid of INTERCOM, create and submit programs for compilation and execution, the processing of such programs is done by the various compilers either through INTERCOM or in the batch queue. If processing is requested by an INTERCOM command, the job is run through INTERCOM, and the user can interact with the executing program. If the job is placed in the input stream by the BATCH command or through a remote terminal card reader, it is run in the batch queue.

TERMINALS

In the INTERCOM system, any of the following terminals can be used.

Model 33, 35, or 38 Teletype Terminal.

Model 713-10 Teletype Compatible Display Terminal.†

Model 714 Remote Terminal Subsystem (ASCII).††

Model 214-11, 214-12, 217-11, or 217-12 Display Terminal (BCD).

Model 217-13 or 217-14 Display Terminal (ASCII).

Model 711-10 Display Terminal (ASCII).

200 User Terminal (ASCII or BCD).

Model 731-12 Remote Batch Terminal (ASCII or BCD).

†ASCII 64-character support only.
††American Standard Code for Information Interchange.

Model 732-12 Remote Batch Terminal (ASCII or BCD).

8231 or 1700 Computer (IMPORT Terminal).

Model 731-10 Remote Batch Terminal (ASCII).

Model 732-10 Remote Batch Terminal (ASCII).

Model 733-10 High Speed Batch Terminal (ASCII).

Model 734 Remote Batch Terminal (ASCII or BCD).

Model 751-10 Teletype Compatible Display Terminal (ASCII).

CDC CYBER 18 Remote Batch Terminal (ASCII).

The 200 User Terminal can be a 217-11, 217-12, 217-13, or 217-14 Display Terminal with a card reader and line printer, or it can be a 731-12, 732-12, or 734 Remote Batch Terminal. The 731/732-10 Remote Batch Terminals and the 733-10 High Speed Batch Terminal must be connected to a 791 Communication Subsystem (Local Communication Controller-11); the 713 Display Terminal and Teletypes can be connected to a 791 Communications Subsystem, a 6671 or 6676 Multiplexer, or a 2550 Host Communications Processor. The 714 Display Terminal can have attached character printers.

Any terminal with a compatible interface can be substituted for the specific models listed previously.

In this manual, the following terminology is used in discussion of remote terminals.

Teletypewriter

Any Teletype compatible model terminal including the CDC 713.

Display Terminal

Any model CRT display terminal.

Remote Batch Terminal or Batch Terminal

Any 200 User Terminal, IMPORT Terminal, 731-1x Remote Batch Terminal, 732-1x Remote Batch Terminal, 733-10 High Speed Batch Terminal, 734 Remote Batch Terminal, or 714 Display Terminal with an attached character printer.

HSBT

High Speed Batch Terminal Model 733-10.

The 217 Display Terminal, when installed without a line printer, and the 711 Display Terminal (which does not support the character printer) are treated as remote batch terminals if they are connected to the central site by dedicated line. Since no peripheral equipment is attached, only a limited number of remote batch commands can be executed. However, other remote batch characteristics such as assignment of a separate terminal id are valid. Dedicated line teletypewriter terminals are not supported.

SYSTEM RESPONSE

The INTERCOM system responds to each user entry with a message intended to aid the user in choosing the next entry. A response can be diagnostic such as FORMAT ERROR when the syntax of a command is incorrect, or the response can be informative such as CONSOLE BUSY-TRY AGAIN LATER. The most common responses are:

COMMAND- Request the next command when using INTERCOM.

.. Requests the next command when using EDITOR.

Ready.. Requests one of the following:

The next remote batch command at a remote batch terminal operating in remote batch mode (not logged in).

The first positioning command after a file has been loaded in response to a PAGE command.

Next input for interactive program in the pause state.

INTERCOM responds whenever data is transmitted to it. The key used to initiate data transmission and the INTERCOM response varies according to terminal type as indicated in table 1-1. Unless otherwise specified, all references in this manual are to teletypewriter terminal function keys.

System response time may be affected by the type of entry, the number of terminals logged in simultaneously, or the system load. The specific messages issued by INTERCOM in response to an INTERCOM command or directive are given in appendix B along with error messages returned by the system.

JOB PROCESSING

Processing user jobs is the prime function of INTERCOM. Except at an IMPORT terminal, INTERCOM offers a choice of interactive or remote batch processing. Interactive use offers the added advantage of the EDITOR utility in creating source data or constructing programs directly from the terminal as opposed to being keypunched and submitted through a card reader. Remote batch processing consists of interactively submitting previously created programs to the batch queue or at sites using remote batch terminals equipped with card readers or IMPORT terminals, entering data through a card reader as though the job were being submitted at the central site.

INTERACTIVE PROCESSING

A source program can be constructed at a teletypewriter or display terminal keyboard or read in from a remote card reader and then entered for compilation and execution under control of INTERCOM commands. When execution is interactive, the user's program can request input from, and direct output to, the terminal. Interactive commands, including those used to submit jobs to the batch queue, are described in sections 3 through 6 of this manual.

At a teletypewriter, a program file can be punched on paper tape and subsequently entered from the terminal for compilation and interactive execution. INTERCOM commands are used to read the paper tape and control compilation and execution. Paper tape processing is described in appendix F.

TABLE 1-1. TERMINAL LINE FEED/TRANSMIT FUNCTION CROSS-REFERENCE

Function							
	Line Feed				Transmit to INTERCOM		
Terminal	Line Feed	New Line	Return	↓	ETX†	Return††	Send†
Teletype	X					X	
214-1x			X				X
217-11			X				X
217-12			X				X
217-13		X					X
217-14		X					X
711		X			X		
713				X		X	
714		X					X
731-1x		X			X		
732-1x		X			X		
733-10		X					X
734		X					X
751-10				X		X	
CDC CYBER 18		X					X

†System responds by moving the entry marker to the next line.
††System responds by issuing a line feed.

BATCH PROCESSING

Jobs can be created and submitted from a terminal to the input queue for batch processing by the operating system. The job is entered in the input queue with an INTERCOM command. The output from execution can be printed or punched at the central site or directed to another terminal. Output directed to another terminal can be recovered later or examined by the original user.

At a remote batch terminal, the INTERCOM user can enter a job as a card deck through the terminal card reader for batch execution by the system. If the batch terminal is hard-wired (dedicated line), jobs can be input without logging into INTERCOM. Output resulting from execution is returned to the terminal for printing or punching unless it is directed specifically to the central site or to another terminal.

Any program submitted for batch processing as an INPUT file must contain the necessary control statements as the first logical record. These control statements can include any applicable operating system control statements.

IMPORT TERMINAL PROCESSING

CDC 1700 and 8231 IMPORT Terminal users communicate with the operating system through INTERCOM. With the possible exception of diagnostic messages issued by INTERCOM, this communications link is transparent to the user. Graphics terminal users, connected through the 1700 system, interface with INTERCOM in the same manner. 8231 IMPORT Terminal users can submit batch jobs only; interactive processing is not permitted. Users of 1700 IMPORT Terminals operating under MSOS Version 2.1 have access to all interactive capabilities of INTERCOM 4.

FILES

INTERCOM processes four types of files.

User local files	Local files are named and created by the individual user; they can be read, altered, or deleted only by the originator. They are dropped automatically when the user logs out.
Permanent files	Permanent files are mass storage files protected from unauthorized access and destruction; they are saved, even across normal system initiation, until the user releases them.
Input files	Input files are mass storage files awaiting execution by the operating system. A new file can be submitted to the input queue from a remote or central site card reader. An existing file, including one that has just been created through EDITOR, can be submitted through the BATCH command. Input files contain the control card images and input data to be executed through normal system processing. They are equivalent to system input files but should not be confused with the user's local file, INPUT.
Output files	Output files are those remaining upon completion of batch jobs; they can be printed, punched, plotted, or sent to an output device at the central site or remote terminal. They should not be confused with the user's local file, OUTPUT.

Files are organized in the same format for the system and INTERCOM.

The program text editor commands (EDITOR, section 4) can be used to create, edit, and execute files interactively. To examine files, the EDITOR LIST or the PAGE command (section 6) can be used.

Each user is allowed a maximum number of files as set by the installation. When this number is exceeded, a warning message appears after each command or statement until excess files have been dropped or otherwise removed from the local file list. Additional files can still be accessed. The RETURN control statement is used to drop local files. All local files are dropped automatically at logout. Permanent files are saved across logout and subsequent login. Permanent files can be eliminated with the DISCARD command or the PURGE control statement.

File names of the form ZZZZZxx are reserved for system use; they cannot be specified in INTERCOM commands or control statements. Systems files are not available for user display.

SECURITY AND ACCOUNTING

A terminal user can log into the INTERCOM system only when a valid password, defined in the INTERCOM password file, is entered. There are two types of passwords: restricted, in which the user is limited to one specific user name, and unrestricted, available to any user name. Unrestricted passwords are intended primarily for short term use for demonstration or classroom purposes. Users entering unrestricted passwords are denied access to some of the facilities of INTERCOM. If passwords are restricted, the user enters the user name specifically defined as valid for the password. If the password is unrestricted, the user name is entered but not tested for validity.

The password file maintained by INTERCOM prevents unauthorized access to the INTERCOM system or system files. Each logged-in user is assigned a user identification code associated with the password entry.

Each password entry is associated with a specific maximum field length and time limit. In addition, the password entry sets a limit to the number of local files permitted the user and specifies the access level, the level of commands available to the user. INTERCOM keeps account of the central processor and system time and the number of files used for each logged-in user name/password combination.

TERMINAL COMMUNICATIONS 2

All communications between INTERCOM terminals and the central site are accomplished via dedicated lines or dial-up lines. Dedicated line terminals are always connected to the central site. Dial-up terminals must be connected through a data set or an acoustic coupler over standard, voice-grade telephone lines.

The 73x Remote Batch Terminals must be autoloaded each time power is applied. On teletypewriter terminals so equipped, the LINE/OFF/LOCAL switch must be turned to LINE to be connected to the communication line. The LOCAL switch/indicator on the 713 Teletype Compatible Terminal must be off to be connected to the communications line. The ATTENDED/UNATTENDED switch on the 200 Series Display keyboard must be set to ATTENDED. The LINE/BLOCK switch on 214-11, 214-12, 217-11, and 217-12 Display Terminals must be set to LINE.

Detailed descriptions of terminal controls, autoload procedures, and operation are provided in the respective terminal reference manuals. Teletypewriter equipment operation is described in appendix F.

AUTOLOADING

Refer to the manual pertaining to your terminal for autoload procedures.

DEDICATED LINE COMMUNICATIONS

When a terminal is connected to the central site by a dedicated line, the system can be logged in for interactive use, or remote batch commands can be entered as soon as the central site responds. No dialing is required.

DIAL-UP OPERATION

When a terminal is connected to the central site through a data set or an acoustic coupler, the user must establish the telephone connection between terminal and computer.

DATA SET COMMUNICATIONS

The following procedure links a nonteletypewriter terminal to the central site using a data set (this procedure is also valid with the 713 Teletype-Compatible Terminal).

1. Lift the data set receiver from its cradle, press the TALK button, and wait for the dial tone.
2. Dial the telephone number of the line to be used; the telephone will ring. (If a normal telephone busy signal is returned, the line is already in use.)

3. If the data set at the central site is equipped with automatic answering, the phone is answered with a high-pitched tone. Pressing the DATA button on the data set and replacing the receiver connects the terminal to the computer.

4. If the data set at the central site is not equipped with automatic answering, a central site operator will answer. Request the connection, wait for the high-pitched tone, press the DATA button on the data set, and replace the receiver.

Requirements for connecting a teletypewriter with the central site differ from the model 33, model 35, and model 38 Teletype. The following instructions pertain to the most common versions of each model; users of other versions should consult a representative of the company supplying the teletypewriter for the exact procedure to follow.

For models 33 and 35:

1. Press the ORIG button to the right of the teletypewriter console.

2. Dial the number of the line to be used; the telephone will ring. (If a normal telephone busy signal is returned, the line is already in use.)

3. When a high-pitched tone is returned:

   For model 33: The terminal is connected automatically.

   For model 35: Press the K button at the bottom left of the console to connect the terminal keyboard.

For model 38:

1. Dial the number of the line to be used; the telephone will ring. (If a normal telephone busy signal is returned, the line is already in use.)

2. When a high-pitched tone is returned, press the ORIG button to the right of the teletypewriter keyboard. The button lights when the connection is completed, and transmission can begin.

ACOUSTIC COUPLER COMMUNICATIONS

The following procedure links all terminals to the central site using an acoustic coupler.

1. Dial the telephone number of the line to be used; the telephone will ring. (If a normal telephone busy signal is returned, the line is already in use.)

2. If the central site is equipped with automatic answering, the phone is answered with a high-pitched tone. Place the telephone handset in the acoustic coupler cradle. The CARRIER indicator lights when the connection is made.

3. If the central site is not equipped with automatic answering, a central site operation will answer. Request the connection, wait for the high-pitched tone, and then place the telephone handset in the acoustic coupler cradle.

LINE SPEEDS

INTERCOM supports various line speeds, communication modes, and line types (dedicated and dial-up). The following tables indicate which speeds, modes, and line types are supported by INTERCOM for each of the indicated multiplexers and communications processors.

TABLE 2-1. LINE SPEED/DEVICE CROSS-REFERENCE (LOW-SPEED, MODE 3)

Line Speed / Device	110	150	300	600	1200
6671	DU	DU	DU	NO	NO
6673/6674	NO	NO	NO	NO	NO
6676	DU	DU	DU	NO	NO
7077/791 LCC	DU	DU	DU	NO	NO
2550 NPU	DU, HW	DU, HW	DU, HW	DU, HW	DU, HW

TABLE 2-2. LINE SPEED/DEVICE CROSS-REFERENCE (HIGH-SPEED, MODES 2 AND 4)

Line Speed / Device	2000	2400	4800	9600	40.8KB/50KB
6671	Mode 4, DU	Mode 4, HW	Mode 4, HW	Mode 4, HW	NO
6673/6674	NO	NO	NO	NO	Wideband, HW
6676	NO	NO	NO	NO	NO
7077/791 LCC	Mode 4, DU	Mode 2, Mode 4, HW	Mode 2, Mode 4, HW	Mode 2, Mode 4, HW	Mode 2, HW
2550 NPU	Mode 4, DU	Mode 4, HW	Mode 4, DU, HW	Mode 4, HW	NO

DU Dial-up.

HW Dedicated (hard-wired).

NO Not supported.

AUTO BAUD RECOGNITION

Each teletypewriter line on the 2550 Host Communications Processor can be configured by installation to a fixed speed dial-up line or by using the automatic baud rate recognition feature. A line configured to use the automatic baud feature allows teletypewriter-like devices of 110, 150, and 300 baud to be dialed in to the same telephone number.

To use an automatic baud recognition line, follow the same dial-up procedure as described in the preceding paragraphs. When the connection is established to the terminal, press the RETURN key. The interpretation of this input by the 2550 Host Communications Processor determines the baud rate of the teletypewriter line. When the above instructions have been completed successfully, the INTERCOM banner is sent to the terminal.

AUTOMATIC TERMINAL DETECTION

The installation can specifically define a mode 4 line as mode 4A or mode 4C, or the installation can define a line for automatic terminal detection. Automatic terminal detection allows a mode 4 user to dial in to a line without knowing if the terminal is a mode 4A or mode 4C terminal. Automatic terminal detection recognizes the terminal type, and the system conditions the data for the type of terminal.

TERMINAL DISCONNECT RECOVERY

A disconnect can occur because of communication transmission failure, remote and central site hardware problems, or the inadvertent disruption of telephone connections. Entry of an input character while output is being received at a teletypewriter might cause a disconnect.

On a teletypewriter, a disconnect has occurred if pressing the RETURN key does not produce a line feed response. On a display terminal, a disconnect has occurred if the console control panel ON LINE button is not flashing.

In most situations, the user can recover to the point existing at the time of disconnect (refer to Login After Disconnect, section 3). INTERCOM allows the user time (defined by the installation) in which to reinitiate the communication link and log back into the system. At a terminal connected to a dedicated line, communication resumes automatically, and the user can simply log back in. Recovery can be attempted from the same terminal or any other available terminal, but login must be with the user name and password previously entered.

If reinitiation is successful, all of the user's local files are recovered. If the system was under control of EDITOR at the time of the disconnect, it is returned to EDITOR command mode with the edit file intact.

If communications are not reinitiated and login does not occur within the required time period, INTERCOM automatically logs out the user, and the associated local files are lost.

INTERCOM RESTART RECOVERY

An INTERCOM restart provides recovery capability for certain INTERCOM errors without any interruption of the operating system and returns users to the point existing at the time of the restart.

Communication with the operating system must be reestablished by the user. A terminal connected to a dedicated line using a 6671 or 6676 multiplexer resumes communication automatically, allowing the user to simply log back in. A terminal connected to a 2550 Network Processing Unit is disconnected, and communication is reestablished by redialing the telephone (refer to Login After Disconnect, section 3). Recovery can be attempted from the same terminal or any other available terminal, but login must be with the same user name and password previously entered.

If the user does not log in within the required time period (installation defined), INTERCOM automatically logs out the user and associated local files are lost.

If the user does log in within the required time period, all the user's local files (scratch, connected, and edit files) and user specifications (EFL, ETL, ECS, REDUCE, SCREEN, SAVEFL, and SWITCH) are recovered. If the user is in EDITOR mode at the time of the restart, the user may return to EDITOR command mode with the edit file intact.

All interactive output not yet received by the user and any input entered but not yet read by the user's job are discarded. Any interactive executing job is killed. All queue files are recovered, output files in progress at batch terminals are rewound and returned to the queue, and input files in progress at batch terminals are evicted.

RECOVERY DEADSTART

The status of the users logged in when a recovery deadstart occurs is the same as that of the users logged in when an INTERCOM restart occurs. The procedure for a recovery deadstart is the same as that for the INTERCOM restart recovery (INTERCOM Restart Recovery in this section).

TERMINAL/USER IDENTIFICATION

Two identification codes are critical in communication with INTERCOM: a user id, assigned by the login procedure, and a terminal id, assigned when communications are established with remote batch terminals. All ids are two-character alphanumerics ranging between AA and 99. As an installation option, the available ids may be apportioned between user and terminal ids.

User ids identify the logged-in user, whether at a dial-up terminal which must be logged in or at a dedicated-line, remote batch terminal which has been logged in, although it need not be. Terminal ids identify the terminal and the files associated with the terminal rather than the user. At a dial-up terminal, the terminal id and the user id are always the same since the terminal must be logged in. At a dedicated-line, remote batch terminal, the user id and the terminal id differ. Remote batch jobs originating at a dedicated-line remote batch terminal are associated with the terminal id; interactive jobs at a dedicated-line terminal are associated with the user id. All jobs originating at a dial-up terminal are always associated with user id since it is always the same as the terminal id.

User id (interactive id)	Two-character code uniquely identifying an INTERCOM user regardless of the terminal in use. Files and jobs associated with a user id are accessible at any terminal where that user is logged in.
Terminal id	Two-character code uniquely identifying a remote batch terminal. Batch jobs submitted from a remote batch terminal normally are associated with the terminal id and not the user id. Output from a batch job submitted via a remote card reader is accessible only at that terminal unless specifically diverted to another terminal id or to a user id.

OUTPUT CONTROL

Output to the terminal can be suspended or discarded by the user at any time. The procedure differs slightly depending upon the terminal in use.

At a 73x-10 Remote Batch Terminal, output can be suspended or discarded by directly entering one of the output control directives. At all other terminals, output must be suspended before the ouptut control directive is entered. At a 200 User Terminal, a 214, 217, or 711 Display Terminal, and a 714 Remote Batch Terminal, the INTER key must be pressed and held until output is suspended. At a 73x-12 Remote Batch Terminal, the F0 key must be pressed and held until output is suspended.

At a teletypewriter and the 713 Teletype Compatible Terminal, output can be interrupted by pressing any key on the keyboard; however, terminal disconnection is less likely if the ESC, ALT MODE, or CTRL and Z keys are used. If data is not being output at the terminal, the interrupt keys (ESC, ALT MODE, or CTRL and Z) must not be used; otherwise, that character (ESC) is accepted as the first character, and the abort or suspend does not occur. When output stops, any command or output control directive can be entered; if a command was entered, output continues immediately after the input has been entered, and the interrupted line is reprinted to avoid loss of data. If an empty line is entered after the interrupt (pressing the RETURN key), output resumes immediately; INTERCOM ignores the empty line. A few characters may be lost because of the interrupt.

The output control directives must be entered as a single line, consisting only of the characters indicated below, followed immediately by a RETURN, SEND, or ETX; otherwise, it is accepted as a normal input line and not used for output control.

%A User abort; terminates the job currently running. All waiting output is discarded. The message USER ABORT is sent to the terminal followed by COMMAND-. Another INTERCOM command can then be entered. If EDITOR was in control, the system is returned to EDITOR command mode, and any legal command can be entered.

%S Stops output; all output currently awaiting transmission to the terminal is discarded. If more output is generated, it is transmitted; otherwise, input can be typed immediately.

An interrupt may not be recognized when it is entered and may have to be repeated. Additionally, corrections are not allowed, the first character must be a %, and the second character must be either A or S.

INTERACTIVE COMMANDS 3

The fundamental entry in INTERCOM is the command. Once the user has logged in, and the user name and password have been validated, the system displays:

COMMAND-

Any of the INTERCOM commands described in this section can then be entered. When a command is entered, control transfers to the utility program which processes the command. When the requested operation has been performed, the utility program returns to the INTERCOM command mode, and another command can be entered. Return to command mode is signaled by the display:

COMMAND-

All commands are entered by pressing the SEND or ETX key at the display keyboard or the RETURN key at the teletypewriter board.

The examples shown in this section, as well as in section 4, result from operation of INTERCOM at a teletypewriter (TTY). The format resulting from operation at a display terminal differs in that each user response appears on a new line. User entries are shown in lowercase characters in the examples used in this manual.

COMMAND SYNTAX

INTERCOM command structure resembles that of system control statements. The command verb and its parameters can be separated by a comma, a blank, or left parenthesis, but they must be entered as one line of input. Command parameters must be separated by commas. A terminating period or right parenthesis can be used, but neither is required. Some commands and keywords can be abbreviated; the minimum required characters are underlined in the command syntax discussed in this section. Additional characters can be specified, but character sequence must be correct.

INTERCOM checks the basic command syntax. The message FORMAT ERROR is issued if:

The first character of the command is not alphabetic; leading blanks are not allowed.

The verb is longer than seven characters.

The command is longer than 80 characters.

Certain required parameters are missing or invalid.

All words printed in uppercase letters have preassigned meanings to INTERCOM; lowercase leters represent information to be supplied by the user.

SYSTEM CONTROL COMMANDS

LOGIN COMMAND

As soon as the terminal is connected to the system (Terminal Communication, section 2), the system responds:

```
CONTROL DATA INTERCOM 4.7
DATE  11/29/79
TIME  10.37.01.
```

To use commands other than those described in sections 7 and 8, a user must log in with the LOGIN command. The system requests entry of a user name and password. These entries are compared to a password list known to INTERCOM to supply a unique identifier for the logged in user. Maintenance of the password file is an installation function. Once logged in, the user is in INTERCOM command mode and can enter another command. The remote terminal user logs into the system by entering:

```
LOGIN
```

If the central site operator has locked out new INTERCOM users, the message LOGIN NOT PERMITTED AT THIS TIME is displayed at the terminal. Normally, the system responds:

```
ENTER USER NAME-
```

The user name can be up to 10 letters or digits and must not be followed by a period. If the password is restricted, the user name must be unique and must be entered exactly the same each time; a validity check is performed. If the password is unrestricted, the user name need be unique only among users logged in with the same password, and a validity check is not performed. To a user name entry, the system responds:

```
ENTER PASSWORD-
```

The password must then be entered. A password is up to 10 letters and digits which must not terminate with a period. On a teletypewriter listing, the password is overprinted on a 10-character, blocked-out line to preserve privacy. The display terminal screen is cleared on acceptance of the entered password to preserve privacy. Model 713 Teletype Compatible Terminal users must manually clear the screen in order to protect the privacy of the entered password.

When the user name and password are accepted, the user-id (a two-character user code) and the login time, followed by the equipment number (multiplexer equipment-status-table ordinal) and port number, are displayed at the terminal. The user receives the same user id at each login unless the password list is changed. INTERCOM returns the message, COMMAND-, and the user can enter any command described in this section. A remote batch terminal user can also enter any of the batch processing commands described in sections 7 and 8.

Example:

```
PLEASE LOGIN
login

ENTER USER NAME-dlfahl

■■■■■■■■■■ ENTER PASSWORD-


12/06/79   LOGGED IN AT  10.28.37.
           WITH USER-ID V4
           EQUIP/PORT 02/103
```

If the CRT screen size (format) differs from the installation's standard screen size, use the SCREEN command after completion of the login procedure to select the proper format.

Abbreviated Entry

LOGIN,username,password[,SUP]

Any of these parameters can be entered with the LOGIN command. If user name or password is omitted, it is requested by the system. Specification of the SUP parameter suppresses the information normally displayed at the end of the login procedure; all three characters must be entered. The SUP parameter can be used only with the abbreviated entry.

Login Messages

An installation can provide a login message which is displayed immediately before the COMMAND- message. The login message is displayed automatically unless the SUP parameter is specified as part of the LOGIN command. As an installation option, a login SUP message can be created which is displayed when the SUP parameter is specified.

Login After Disconnect

The same procedure as that described previously is used to log in after the terminal has been disconnected. The same user name/password combination is necessary to ensure recovery of the files which the user had prior to the disconnect. The message sent to the terminal at the conclusion of the login operation depends upon the terminal's status at the time disconnect occurred. The following messages are possible.

COMMAND-	The disconnect occurred while the user was in command mode.
..	The disconnect occurred while the user was in EDITOR mode.
WAITING FOR INPUT	The disconnect occurred while the user was executing a program that is waiting for input.

SYSBULL COMMAND

Systems personnel can communicate system status information, as well as special instructions, to terminal users through the system bulletin.

If the LOGIN command is entered without the SUP parameter, the SYSBULL/LOGIN message is displayed; if SUP is specified, the SYSBULL/SUP message is displayed. If a nonexistent system bulletin is requested either automatically through login or manually through SYSBULL, that request is ignored; an informative message is not issued.

The SYSBULL command can be entered at any time. To display an index of current SYSBULL messages, enter:

```
SYSBULL
```

Once the list has been displayed, the pertinent bulletins can be selected by entering:

```
SYSBULL[,param1,param2,...,paramn]
```

param is the name of the system bulletin. Optionally, the keyword ALL can be entered to display all bulletins, including the index.

All system bulletins requested by the SYSBULL command are written to the standard OUTPUT file. Consequently, OUTPUT should be connected prior to entering the SYSBULL command; otherwise, the OUTPUT file must be batched to a printer or examined through the PAGE command. To connect OUTPUT, enter:

```
CONNECT,OUTPUT
```

TEACH COMMAND

A brief description of the basic commands of the INTERCOM language and also a limited explanation of system control statements can be displayed by typing:

```
TEACH
```

The system returns a numbered list of topics for user selection. The user can be asked to select from a further subdivision of topics, or a brief description can be output.

TEACH outputs descriptive information and then waits for user action. The user can type a numeric selection from a list of topics, GO to continue the description, or END to return to command mode.

Example:

```
      TEACH
  IF YOU WOULD LIKE TO KNOW ABOUT THE FOLLOWING,
TYPE THE CORRESPONDING NUMBER, ELSE TYPE  END

HOW TO USE INTERCOM              TYPE   1
HOW TO USE THE TERMINAL          TYPE   2
AN INTERACTIVE COMMAND           TYPE   3
AN EDITOR COMMAND                TYPE   4
A REMOTE BATCH COMMAND           TYPE   5
        3
```

```
   INTERCOM COMMANDS--TYPE CORRESPONDING NUMBER
FOR A LIST OF ADDITIONAL COMMANDS TYPE   23
TO EXIT INTERCOM COMMAND DESCRIPTION TYPE   END
 1 = ASSETS      9 = EDITOR    16 = FILES
 2 = BATCH      10 = EFL       17 = KILL
 3 = BRESEQ     11 = END       18 = LOCK
 4 = CONNECT    12 = ERRORS    19 = LOGIN
 5 = DISCARD    13 = ETL       20 = LOGOUT
 6 = DISCONT    14 = EVICT     21 = MESSAGE
 7 = DIVERT     15 = FETCH     22 = MAP
 8 = DROP                      23 = CONTINUE
         20
    LOGOUT
TO TERMINATE AN INTERCOM SESSION ENTER
     LOGOUT
WHEN THIS COMMAND IS ENTERED THE USERS LOCAL
AND ATTACHED PERMANENT FILES ARE RETURNED.
ANY REMOTE FILES ARE RETAINED IN THE SYSTEM
AWAITING A SUBSEQUENT LOGIN.  SESSION ACCOUNT-
ING INFORMATION IS RETURNED TO THE TERMINAL
LOGOUT IS NOT ALLOWED UNDER CONTROL OF EDITOR.
AT A NON-DIAL UP REMOTE BATCH TERMINAL, THE USER
MAY CONTINUE COMMUNICATIONS WITH INTERCOM BUT HE
IS RESTRICTED TO REMOTE BATCH COMMANDS ONLY.
TO CONTINUE TYPE-- GO      TO EXIT TYPE-- END
end
```

Entering END at any time except in response to TO EXIT TYPE-END causes control to return to the initial display.

ASSETS COMMAND

The user's terminal status can be requested by entering:

ASSETS

The system replies with a header message ASSETS OF id AT hh.mm.ss, where id is the INTERCOM user id, and hh.mm.ss is the current time of day in hours, minutes, seconds. The header is followed by the equipment (multiplexer equipment-status-table ordinal) and port number, maximum number of local files allotted, number of local files in use, maximum allowed field length and time limit (octal), and total elapsed central processor time (decimal). In addition, settings of the user's sense switch, EFL, ETL, SAVEFL, REDUCE, LOCK, and MAP are given if they differ from installation default values. SITE/STATION are given if they are nonzero. Maximum and current ECS field lengths (in multiples of 1000 words) and REDUCE(ECS) flag setting are given if the user is allowed ECS access. ETL, EFL, anf field lengths are given in octal.

Example:

```
COMMAND- assets

ASSETS OF V4 AT 10.27.34
EQUIP/PORT   57/002
†SITE/STATION 00/ 01
FILE QUOTA       20
FILES IN USE      0
MAX FL        77700
†EFL          55000
TIME LIMIT      500
†ETL            100
†LOCK            ON
†SAVEFL          ON
†REDUCE         OFF
†MAP            PART
†SWITCHES ON       5
††MAX ECS FL     200
††CURR ECS FL    174
††REDUCE(ECS)    OFF
CP TIME      109.846
COMMAND-
```

If a multiplexer is deactivated, the ASSETS command specifies whether it is the multiplexer to which the user is connected.

ETL COMMAND

The ETL command specifies a time limit for execution of each succeeding command; otherwise, INTERCOM assigns a default time limit (installation defined). The specified time limit cannot exceed the total time limit assigned to this user in the password file.

Enter the time limit, t, in octal seconds.

ETL[,t]

If the time (the smaller of t or total session time remaining) is not sufficient for command execution, INTERCOM returns the message TIME LIMIT. If the message occurs because the t specification did not allow sufficient time, the user can request a larger time limit and reenter the command. However, if session time has elapsed, the user has 5 seconds of central processor time to catalog any files and log out.

Most commands entered after the ETL command are executed with the time limit specified by t until the default time limit is restored by entering the following command.

ETL,0 or ETL

†These lines are listed only if the user changes the value or setting from installation default conditions.

††These lines are listed only if the user is allowed ECS access by the password file or installation default.

Example:

The user enters a program for compilation and execution with the EDITOR RUN command, but the default time limit is insufficient. The time limit can be increased with ETL and the program reentered. The specified time limit is assigned to compilation and subsequently to execution.

```
..run,ftn
CP TIME LIMIT
   41000B   SCM STORAGE USED
       .019 CP SECONDS COMPILATION TIME
  TIME LIMIT EXCEEDED     IN TIMEL   NEAR
  LINE 3
     010500 MAXIMUM EXECUTION FL.
      7.569 CP SECONDS EXECUTION TIME.
..etl,400
..run,ftn
    .
    .
    .
..etl,0
..
```

EFL COMMAND

The EFL command specifies the field length to be allocated for the execution of each succeeding program; otherwise, INTERCOM assigns a default field length (installation defined).

Enter the field length, fl, as the number of words in octal.

EFL[,fl]

The specified field length cannot be greater than the maximum field length assigned to this user in the password file. User programs executed subsequently are assigned the field length specified with EFL until the default field length is restored by entering:

EFL,0 or EFL

Example:

A user requires a field length of 45000 to load a program. The required field length can be specified with EFL prior to the compilation and execution of the program.

```
..efl,45000
..run,ftn
    .
    .
    .
..efl
..
```

REDUCE COMMAND

On initial login, an internal system flag is set on to indicate that the user's field length is to be reduced to the minimum required for execution. Reduction occurs after a program is loaded; field length is reduced to the program's last word address rounded upward by 100 octal. Automatic field length reduction does not occur for overlay generation or absolute overlays which load higher level overlays.

For execution of ALGOL programs, the flag must be reset to off because ALGOL utilizes the field length immediately following the last word address. To change the setting of the flag to the off condition, enter:

```
REDUCE,OFF
```

Field length reduction does not occur for subsequent program execution, and system resources are used unnecessarily. Therefore, on completion of execution, the flag should be returned to the on condition by entering:

```
REDUCE,ON
```

Automatic field length reduction is again in effect.

Example:

The following commands can be entered from the program text editor (section 4) to compile and execute an ALGOL program.

```
..reduce,off
..run,algol
     .
     .
     .
(program output)
     .
     .
     .
..reduce,on
..
```

RFL AND REDUCE, ECS COMMANDS

On initial login for a user permitted ECS access by the password file or installation default, an internal flag is set on, indicating that the user's ECS field length is to be released between commands. (The user can execute programs requesting his own ECS field lengths.)

The user can turn the internal flag off and request a specific ECS field length by entering:

```
RFL,EC=fl
```

fl Octal multiple of 1000_8 ECS words.

The specified field length must not exceed the maximum ECS field length allowed to the user. The user's ECS field length is preserved between commands. Because the user's ECS must be swapped out between commands, thereby increasing response time, the normal condition should be restored as soon as possible by entering:

```
REDUCE,ECS
```

Example:

A user executes a program which expects ECS field length to have been assigned and obtains a dump of the program's ECS field length. The file ECSPROG contains the binary code produced by an assembly or compilation.

```
COMMAND- rfl,ec=20
COMMAND- ecsprog
COMMAND- dmpecs,0,20000
COMMAND- reduce,ecs
```

SAVEFL COMMAND

The SAVEFL command sets an internal flag which indicates to the system whether or not the central memory field length is to be saved after each command or control statement has been processed. The user can save the field length for subsequent printing at the central site or remote printer.

To save central memory field length, enter:

SAVEFL,ON

The field length used by all subsequent INTERCOM commands, system control statements, or user's jobs is saved and then restored in central memory before the next command or job is executed. However, because the field length must be swapped out after each job, response times are increased. The SAVEFL,ON condition should be requested only when necessary and should be released as soon as possible by entering:

SAVEFL,OFF

Example:

After determining that a program is not functioning properly, a user obtains a dump of the program area on the file OUTPUT and prints this file, at the central site, with the following INTERCOM commands and the system control statement, DMP. The file MYPROG contains the binary code produced from an assembly or compilation.

```
COMMAND- savefl,on
COMMAND- xeq,myprog
 ARITHMETIC ERROR  MODE=1  ADDRESS=013407
COMMAND- dmp,20000
COMMAND- savefl,off
COMMAND- batch
TYPE FILE NAME-output
TYPE DISPOSITION-print
TYPE FILE ID-v4
TYPE FILE NAME-end
COMMAND-
```

SCREEN COMMAND

Some display terminals are available in models which differ in the screen format of the display. One of these formats for each communications protocol must be selected during system installation as a default format; for teletypewriters, 200 User Terminals, and 714 and 732 Remote Batch Terminals, the choice of default format is one of installation preference. This default selection can cause some terminals to default to the wrong format. The SCREEN command is used to select the format which matches the terminal.

In addition, the model 38 Teletype is capable of printing data in two different line widths. The SCREEN command can be used to select the output format desired for this terminal. In this situation, all model 38 Teletypes are capable of printing both line widths; thus, either can be selected at any time. Table 3-1 lists typical Control Data display terminal and teletypewriter formats, along with the applicable communications protocol mode. In each case, the first format is the usual installation default.

TABLE 3-1. TYPICAL DISPLAY FORMATS

Terminal	Format	Communications Protocol
200 User Terminal	50 by 20 or 80 by 13	Mode 4A†
714	80 by 16 or 80 by 8	Mode 4C
731-12/732-12	80 by 13	Mode 4A†
731-10/732-10	80 by 13	Mode 2
733-10	80 by 14 or 64 by 16	Mode 2
734	80 by 13	Mode 4A†
33 TTY/35 TTY	72	Mode 3
38 TTY	72 or 132	Mode 3
713/751-10	72	Mode 3
†Defaults to 50 by 20; SCREEN, 80,13 must be entered to select proper format.		

Care must be taken to select the proper screen format. If an incorrect screen format is entered or if the system is allowed to default to an incorrect format, both display data and print data may be lost.

To change the terminal display format, enter:

SCREEN[,width[,length]]

The width parameter specifies the number of characters spaced horizontally across the screen of a display terminal or the carriage of a teletypewriter.

The length parameter is used only for display terminals to specify the number of lines spaced vertically down the screen; the parameter is ignored if entered from a teletypewriter.

If invalid parameters are listed, INTERCOM issues an error message, and the current format setting is undisturbed.

To return the format of either a display terminal or a teletypewriter to the system installation default format, enter:

SCREEN

When the screen command is entered without parameters, the display format is returned to the default settings, and INTERCOM replies with a message informing the user of the default settings. If a display terminal is in use, the message is

CRT SCREEN SIZE

and the width and length are displayed immediately following the message.

If a teletypewriter is in use, INTERCOM replies

TTY CARRIAGE WIDTH

and lists the width.

LOGOUT COMMAND

To terminate operation at the terminal, enter the command:

LOGOUT

When the user logs out, all local files are released. Only permanent files are retained between a logout and any subsequent login. The user is disassociated from INTERCOM until a subsequent LOGIN command is entered. INTERCOM displays the date and time the user is logged out, as well as CP, system, and connect time used since login.

The LOGOUT command is not allowed when in the EDITOR subsystem.

At a dedicated-line remote batch terminal, the user can continue to communicate with INTERCOM after logout but only through remote batch commands. The user must log in again before INTERCOM can be used interactively.

Example:

```
COMMAND- logout

CPA       9.240 SEC.          9.240 ADJ.
SYS TIME                     15.674
CONNECT TIME     0 HRS.    22 MIN.
 11/29/79  LOGGED OUT AT 11.00.25.
      <
```

The order of the date (month, day, year) may be changed as an installation option. Logout time is given in hours, minutes, seconds (24-hour clock); CP and SYS time is given in seconds. System time is computed from a formula which reflects all resources used. The user should disconnect the terminal from INTERCOM by hanging up the data set receiver or telephone.

The < character displayed at the end of the logout time message is meaningless in normal INTERCOM operations. In systems using an automatic testing and performance evaluation program, this final character is interpreted by the program as the end of the terminal session.

An automatic logout occurs under certain conditions, such as: INTERCOM being dropped while users are still logged in; a user leaving a terminal without logging out and another user attempting to log in; and a terminal inadvertently disconnected and the user unable to reestablish communications and log back in. In these cases, CP,SYS, connect, and logout time are not displayed.

CRT COMMAND

The CRT command can be used at a model 714 Multibuffer Terminal Controller to reactivate a specified CRT station. A 714 controller, which is powered off or with which INTERCOM cannot communicate for an extended period, is put into an inoperative state. After 1 minute (if the station is logged out) or 30 minutes (if a user is logged in at the station) of continued communication loss, all references to the station are deleted from the system. A connection is always maintained to the CRT with station address 1. If a higher station is deleted because of an inoperative condition, communication with it can be restored by the user on station 1 by entering:

```
CRT,n
```

n is the station number in octal. On a hardwired 714 controller with multiple sites, the CRT command affects only the site from which it is entered.

Example:

A model 714 controller with stations 1, 2, and 3 has dialed into an appropriately defined port. Station 2 is powered off at the time of connection. When station 2 is powered up, the user on station 1 can enter

```
CRT,2
```

to establish normal communication between station 2 and INTERCOM.

MESSAGE CONTROL COMMANDS

Messages can be sent to other remote terminals if they are logged in and the user name is known.

SITUATE COMMAND

A list of users currently logged in, including dedicated-line remote batch terminals whether logged in or not, is obtained by entering:

```
SITUATE
```

User names and remote batch terminal types, along with their corresponding terminal ids, are displayed at the terminal. Any user names sharing the same password as the user issuing the SITUATE command are listed first, followed by other user names, if the password is restricted. Users with an unrestricted password receive only the names of users who share their password. An asterisk preceding the user id indicates the user has locked the terminal against incoming messages from other terminals.

Example:

```
COMMAND- situate

 USERS WITH SAME PASSWORD
      V4-DLFAHL
 OTHERS
      B7-STAR1        F5-TNM          FC-MJN
      CF-STAR9        CQ-CYBERBEFS    CL-STARF
      CJ-STARD        CK-STARE        DO-DML
      CN-STARH        CG-STARA        C9-SJP
      C8-PEH          CI-STARC        CM-STARG
      NJ-SCOPE        UI-DES          SU-START
      SR-STARQ        ST-STARS        VZ-GAP
      SW-STARV        SV-STARU        U3-AJZ
 BATCH TERMINALS
         AD-200UT  B8-200UT  B7-200UT
         AK-71X
COMMAND-
```

LOCK COMMAND

To prevent a terminal from receiving messages from other terminals, enter:

```
LOCK,ON
```

LOCK,ON does not prevent messages sent by the central site operator from being received at the terminal; it locks out only those messages sent by another user. A user who intends to execute a program with input and output data routed to the terminal can use the LOCK command to prevent messages from being mixed with data. To enable the terminal to receive messages again, enter:

```
LOCK,OFF
```

The terminal is unlocked automatically when the user logs out.

SEND COMMAND

To send a message, enter:

```
SEND
```

The system responds:

```
TO WHOM-
```

Enter the name of the logged in user to whom the message is to be sent. A user with a restricted password can send messages to any other logged in user by typing the user name or id-user name. To send a message to all logged in users, enter:

```
***
```

In this case, the message is sent to all logged in users not currently locked, including the sender.

A user with an unrestricted password can send messages only to other users logged in with the same unrestricted password; the *** option is not available to users with unrestricted passwords.

In case of duplicate user names (this can occur only if the sender has a restricted password), INTERCOM selects the message recipient by first searching through users logged in with restricted passwords and then through those logged in with unrestricted passwords. However, the first candidate with the same password as the sender is chosen regardless of the password restriction. To avoid this situation, enter the id along with the username in the form id-user name. The message is then sent to the user name associated with the specified id.

A user name will not be found if the selected user is not logged in or has locked the terminal with the LOCK command. In addition, if a user with an unrestricted password attempts to send a message to a user logged in with a different password, the user name will not be found. The system returns the message USERNAME username IS NOT ACCESSIBLE and returns to the command mode.

If the user name specified satisfies the previous conditions, the system responds:

```
TYPE MESSAGE OR END-
```

Enter the message, which can be up to 150 characters long. A longer message is truncated to 150 characters. The message is sent and the system repeats its request:

```
TYPE MESSAGE OR END-
```

Enter another message or enter:

```
END
```

This word is recognized as a message terminator only if the letters END are the first characters in the line followed by a carriage return (RETURN on TTY, SEND or ETX on CRT).

The message appears at the receiving terminal, preceded by

```
FROM username
```

to inform the recipient of the sender's identity (user name).

Abbreviated Entry

```
SEND,username or SEND,id-username
```

The username parameter can be specified as part of the command entry.

Examples:

1. COMMAND- send
   TO WHOM-***
   TYPE MESSAGE OR END-is anyone running a basic program?
   FROM USERA IS ANYONE RUNNING A BASIC PROGRAM?
   TYPE MESSAGE OR END-end

2. COMMAND- send
   TO WHOM-cx-userb
   TYPE MESSAGE OR END-can i run some sample programs for you?
   TYPE MESSAGE OR END-end

3. COMMAND- send
   TO WHOM-userd
   USERNAME USERD IS NOT ACCESSIBLE
   COMMAND-

4. COMMAND- send,userc
   TYPE MESSAGE OR END- can you help me with my fortran program?
   TYPE MESSAGE OR END-end

MESSAGE COMMAND

To send a message to the central site, enter:

MESSAGE,mmm...m

mmm...m is the message which can consist of any characters in the INTERCOM character set including embedded blanks. However, any character with display code greater than 57 octal is converted to a blank. A message must not exceed 58 characters. A longer message is truncated to this maximum.

If a message is sent to the central site while another message is currently being displayed there, the message that was sent is not queued at the central site, and the terminal receives the message:

CONSOLE BUSY - TRY AGAIN LATER

After a message is displayed at the central site console and entered into the system dayfile, the user can enter any legal command.

MESSAGES FROM CENTRAL SITE

Messages from the central site have priority over all other displays. They are displayed regardless of other activity at the remote terminal. After a central site message has been displayed, any activity interrupted by the message resumes. (At a 200 User Terminal, operator intervention may be required.)

A central site message is displayed at the terminal as:

```
id,mmm...m
```

id is the user id or the terminal id and mmm...m is the message. If the central site operator has sent this message to all users, the first two characters (id) are asterisks.

Examples:

A user with id v4 requests information from the central site:

```
COMMAND- m,how much more time may i have?
```

The central site operator can send a reply which appears at the user's terminal:

```
v4,you have30 minutes.
```

In addition to messages sent by the central site operator, dayfile messages are sent to the terminal each time a user's program or a system routine writes a message to the dayfile.

FILE CONTROL COMMANDS

Files are employed by the INTERCOM user to store and maintain information and programs, to contain jobs or information for processing at the central site, to hold output generated by system control statements and compilers, and to route information between remote terminals. The user can obtain a list of both local and remote files, examine and manipulate files, and specify files for terminal interaction.

Each user is allowed a specified maximum number of files. When this number is exceeded, access to file creating commands is denied until the excess files are returned to the system. The ASSETS command, described previously in this section, displays user assets including file limit information. The BATCH command, described later in this section, can be used if files are to be renamed, submitted to the central site batch queues, or recovered from the batch output queue.

USER DEVICE SETS

User device sets (also known as private device sets) can be accessed through INTERCOM using system control statements. Permanent files that reside in user device sets can be used, added, modified, or deleted from the user device set through INTERCOM; however, a user device set cannot be created using INTERCOM. (Refer to the NOS/BE Reference Manual for additional information concerning permanent files and user device sets.)

FILES COMMAND

The FILES command displays a list of the user's local files, attached permanent files, and the names of remote executing jobs and remote input, output, and punch files submitted with the user's id. To list available files, enter:

```
FILES
```

The system responds:

- - LOCAL FILES - -

(list of local file names)

This list names all local and attached permanent files belonging to the user. Attached permanent files are listed by their local file names preceded by *. Files currently connected to the terminal are preceded by $.

Terminating an INTERCOM command with an abort request may cause extraneous files to appear in the list of local files. They are scratch files that the INTERCOM routine could not release because of the abort. Scratch files created by the compilers or the COMPASS assembler may appear also. All such scratch files can be released by using the RETURN command.

- - REMOTE EXECUTING JOBS - -

(list of job names)

This list names all the user's jobs currently being executed at the central site with output to be recovered by the user.

- - REMOTE INPUT FILES - -

(list of input file names)

This list names all remote input files associated with the user; the output of these files is to be recovered by the user.

- - REMOTE OUTPUT FILES - -

(list of print file names)

This list names all remote print files associated with the user; these files are to be recovered by the user.

- - REMOTE PUNCH FILES - -

(list of punch file names)

This list names all remote punch files associated with the user; these files are to be recovered by the user.

If no files are associated with the user, the system responds:

NONE

Otherwise, only the applicable headings and associated lists of file names are displayed.

Only files associated with the specific user id are displayed in response to the FILES entry. Consequently, the output and punch files listed are not printed or punched at a dedicated-line, remote batch terminal unless the user diverts them to the terminal id.

Example:

```
COMMAND- files
--LOCAL FILES--
 $INPUT    $OUTPUT    *FILA    $FILB
  LGO       FORTX     $TEST1
--REMOTE EXECUTING JOBS--
  TEST06C
--REMOTE OUTPUT FILES--
  VICS01A   MN1234F
--REMOTE PUNCH FILES--
  DLF029J
```

STORE COMMAND

A local file can be made permanent by entering:

STORE,lfn

The filename specifies the local file to be made permanent; file name must not exceed seven letters or digits, and the first character must be a letter.

User Identification

The installation can define a default condition whereby the INTERCOM user id is assigned automatically as the permanent file user identification. Otherwise, the system responds:

ID=

The user then enters a permanent file user identification (one through nine letters and/or digits) for the file. The retention period is defined by the installation.

Abbreviated Entry

STORE,lfn[,ident]

ident is the permanent file user identification. If ident is specified, the system does not issue the request, ID=. No passwords may be specified (for example, RD=ABC).

Examples:

```
COMMAND- store,loc
ID= vss
 CT ID=      VSS PFN=LOC
 CT CY= 001 SN=SPFSET  00000128 WORDS.:
COMMAND-
```

or

```
COMMAND- store,loc,vss
 CT ID=      VSS PFN=LOC
 CT CY= 001 SN=SPFSET  00000128 WORDS.:
COMMAND-
```

After the STORE command is entered and processed, the file remains in the user's local file list as an attached permanent file with the name LOC. If the file need not be retained as a local file, the user can detach the file with the RETURN control statement. More extensive control over permanent files can be achieved through the CATALOG, ATTACH, and PURGE control statements as described in the NOS/BE Reference Manual.

The STORE and FETCH commands are intended primarily for single user access. Local files made permanent with the STORE command cannot be accessed with multiread permission by the FETCH command. However, the CATALOG control statement can be used in a form that allows access with multiread permission by the FETCH command, permitting several users simultaneous read-only access to the file. Similarly, the ATTACH control statement (with MR=1) allows a file made permanent by STORE to be accessed by multiple users.

Permanent File Queuing

Permanent file queueing occurs during heavy permanent file activity or the dumping of permanent files. When an INTERCOM job enters the queue, the user is informed that the request for the file cannot be honored immediately. The request can be terminated by entering an abort.

FETCH COMMAND

The FETCH command attaches permanent files saved without passwords. Enter:

```
FETCH,lfn
```

The file name must be that of an existing permanent file but not a local file.

User Identification

If the INTERCOM user id was assumed as the permanent file user identification when the file was stored, the named file is attached and the system returns the normal command mode response. If the above operation fails to find the file, the system responds:

```
ID=
```

Enter the user identification with which the permanent file was stored.

Abbreviated Entry

If the INTERCOM user id is assumed as the permanent file user identification, enter:

```
FETCH,lfn
```

Otherwise, enter:

```
FETCH,lfn[,ident]
```

ident must be the same as that used to save the permanent file with the STORE command.

Examples:

```
COMMAND- fetch,loc
ID=vss
COMMAND-
```

or

```
COMMAND- fetch,loc,vss
COMMAND-
```

A permanent file must be attached before it can be accessed by most INTERCOM commands or system control statements. An attached permanent file cannot be modified directly unless a rewrite-in-place operation is performed; rather, any modifications to the attached permanent file are made on a temporary or scratch file. When modifications are complete, the original permanent file can be eliminated with the DISCARD command and the temporary file saved as a permanent file with the STORE command.

Permanent File Queuing

Permanent file queueing occurs during heavy permanent file activity, the dumping of permanent files, retrieval of an archived file, or when FETCH is requested for a file attached by another job. When the FETCH is for an archived file, the user receives the following message.

```
REQUEST FOR ARCHIVED FILE - WAITING FOR CENTRAL
OPERATOR DROP OR GO
```

In response to GO, the job is put into the permanent file queue, the terminal user receives the message WAITING FOR ARCHIVED FILE, and a job is set up at another control point to retrieve the file from tape. Retrieval must be completed before the file is attached. In response to DROP, the file is not brought into the system, and the attach request is terminated.

If the user does not want the job to wait in the permanent file queue, the request can be terminated by entering an abort.

DISCARD COMMAND

The DISCARD command deletes a permanent file that was saved with the STORE command. It also can be used to delete a local file. If there is both a local and a permanent file of the same name, DISCARD returns only the local file. (Refer to the RETURN control statement described in section 5). If the file to be deleted is a local file or a permanent file which has been attached with the FETCH command, enter:

```
DISCARD,lfn
```

The file is purged from the permanent file catalog and is no longer available to the user as either a local or a permanent file.

User Identification

A permanent file can be deleted even though it has not been attached. All parameters including file name and user identification (unless the INTERCOM user id is assumed as the file user identification) must be specified in the DISCARD command. Enter the command as follows:

DISCARD,lfn[,ident]

ident is the permanent file user identification. The ident parameter is not required to discard nonattached permanent files when the system installation specifies that the INTERCOM user id be used by default. If used, ident must be the same as that used to save the file with the STORE command.

Examples:

```
COMMAND- fetch,loc,vss
COMMAND- discard,loc
COMMAND-
```

or

```
COMMAND- discard,loc,vss
COMMAND-
```

Permanent File Queuing

Permanent file queueing occurs during heavy permanent file activity, dumping of permanent files, or when DISCARD is requested for a file attached by another job.

If the user does not want the job to wait in the permanent file queue, the request can be terminated by entering an abort.

CONNECT/DISCONT COMMANDS

Specific files can be designated for terminal interaction by entering the command:

CONNECT,lfn_1[,lfn_2,...,lfn_n]

Input and output are routed to and from the terminal when the named files are read or written. CONNECT can specify INPUT and OUTPUT, as well as any other files.

A connected file contains no data; in effect, the command equates the file name to the terminal. The file can be used only to transfer data between an executing program and the terminal. If an existing file, such as a permanent file, which does contain data is connected, the effect of that CONNECT command is to make that data unavailable. Once the file is disconnected, the original data, unaltered by any terminal interaction that may have occurred, is available again.

Each time a connected input file is referenced in an executing program, the system waits for input from the terminal. Each time a connected output file is referenced, the output is printed or displayed at the terminal. It is not saved.

When input is expected, the system waits for the user to enter it from his keyboard. For BASIC programs, the INPUT statement displays a question mark at the terminal when user input is expected. For COBOL programs, the ACCEPT FROM statement displays the question mark at the terminal. It is helpful if other programs contain a signal to the user that input is expected from the terminal. For example, the PRINT statement can be used in conjunction with a FORTRAN READ statement.

The CONNECT command need not be entered when programs are executed with the EDITOR RUN command (section 4); the files INPUT and OUTPUT are connected automatically. To connect any other input/output files to the terminal, use the CONNECT command.

A file connected to the terminal with the CONNECT command can be disconnected with:

DISCONT,lfn_1[,lfn_2,...,lfn_n]

The specified files are no longer connected to the terminal; they are assigned to allocatable mass storage.

When programs are submitted for execution using system control statements, rather than the RUN command, the file OUTPUT should be disconnected to prevent the source listing from being sent to the terminal. This action is not required when the BASIC compiler is being used since BASIC does not write the source listing to OUTPUT.

BRESEQ COMMAND

The BRESEQ command resequences line numbers in a BASIC file. The manner of resequencing can be controlled by specifying the starting value and increment. The resequenced file retains its original name. To resequence a BASIC file, enter:

BRESEQ,lfn,[,start[,incr]]

lfn is the local file to be resequenced, start is the starting value, and incr is the increment. If these optional parameters are not specified, the default values (start=100,incr=10) are assumed. When only one parameter is specified, it is assumed to be the starting line number for the new file, and the default value of 10 is used for the increment.

The BASIC file must exist as a local file; it cannot be the local name of an attached permanent file. If a permanent file is to be resequenced, a copy of the file must be made and assigned a unique name either through the COPY command or by loading the file into the edit file under FORMAT, BASIC and then using the SAVE command.

BASIC programs submitted for resequencing must not contain blank lines; otherwise, duplicate statements result in the resequenced file. Always use the EDITOR DELETE command to eliminate BASIC program statements.

Example:

To resequence a file named MYPROG, starting at line number 9000, in increments of 10:

```
COMMAND- breseq,myprog,9000,10
```

The following entry accomplishes the same:

```
COMMAND- breseq,myprog,9000
```

Only the initial line number is specified; default increment is 10.

Using the format

```
COMMAND- breseq,myprog
```

the resequenced file starts at line number 100 and has increments of 10.

An EDITOR file created while under FORMAT, BASIC, and subsequently saved, is correctly formatted for resequencing. A BASIC source file created under any other EDITOR format must be saved without sequence numbers (that is, lfn, NOSEQ).

The BRESEQ command affects only the specified local file and not the edit file. If further modifications are to be performed, the resequenced file must be reloaded into the EDITOR edit file using the directive:

..EDIT,lfn

BATCH CONTROL COMMANDS

A job that already exists as a local file can be submitted to a batch queue with the BATCH command. In addition, BATCH can be used to specify whether the output of a job is to be printed or punched at the central site or a remote batch terminal.

With the Q command, the user can examine contents of the batch queues and determine the state of the job.

BATCH COMMAND

The BATCH command routes a file previously created or saved by the user. Except for the LOCAL disposition, the file must be a local file or an attached permanent file accessible to the terminal user. If an attached permanent file is specified with any disposition of the BATCH command except RENAME, a copy of the file is created and processed by BATCH; the attached permanent file remains unchanged. For other local files, a copy of the file is made only if the file does not reside on the appropriate device type (such as a queue device). Except for LOCAL and RENAME dispositions, the file does not exist as a local file following execution of BATCH.

Files are processed one at a time with the BATCH command by typing:

BATCH

The system responds:

TYPE FILE NAME-

Enter the name of the file to be processed. The system responds:

TYPE DISPOSITION-

Dispositions describing how the named file is to be processed are detailed in table 3-2. Any of the following dispositions may be specified.

INPUT	PUNCH	RENAME,newlfn
INPUT,id	PUNCH,id	LOCAL
PRINT	PUNCHB	
PRINT,id	PUNCHB,id	

TABLE 3-2. BATCH COMMAND DISPOSITION

Disposition	Explanation
INPUT	File is placed in the batch input queue at the central site. The file must already contain required control statements as its first logical record. The job statement determines field length and time allotment for the job. The OUTPUT file is processed at the central site.
INPUT,id	File is placed in the input queue in the same manner as INPUT, but the output from execution of the job is directed to the remote output queue. The parameter id must be a two-character user or terminal id (or the word HERE to indicate the terminal id or the word MINE to indicate the user id). The terminal or user id is associated with the file in the output queue. The user can have the file printed on a remote line printer or can make it a local file by using the LOCAL disposition.
PRINT	File is placed in the output queue at the central site for subsequent printing on a high-speed line printer. A carriage control character is required as the first character of every line to be printed. Carriage control characters are supplied for output files produced by FORTRAN, BASIC, and COBOL compilers. For files other than standard output files, the user must supply carriage control characters (appendix D). A blank character can be inserted with the COPYSBF control statement.
PRINT,id	File is placed in the remote output queue, and subsequent action is selected by user. The specification of parameter id is as explained under INPUT,id above.
PUNCH	File is released for subsequent card punching at central site. Cards are punched in Hollerith code.
PUNCH,id	File is released for subsequent card punching at the terminal specified by id, which must be the terminal id of a remote batch terminal, the word HERE to indicate the submitting terminal id, or MINE to indicate the user id. Cards are punched in Hollerith code.
PUNCHB	File is released for subsequent card punching at the central site. Cards are punched in binary.
PUNCHB,id	File is released for subsequent card punching at the terminal specified by id, which must be the two-character terminal id of a remote batch terminal, the word HERE to indicate the submitting terminal id, or MINE to indicate user id. Cards are punched in binary.
RENAME	File is to be given a new name. The system responds TYPE NEW FILE NAME, and the user enters the name. A permanent file cannot be renamed, but the local file name associated with the permanent file while it is attached can be renamed.
LOCAL	The user's file in the output queue is made a local file. This disposition allows the user with no remote line printer to recover the output file for subsequent examination with the INTERCOM PAGE command or with EDITOR commands.

Files to be placed in the output queue require an id (banner); therefore, the system responds:

TYPE FILE ID-

Enter one through four letters or digits which are used to create a header line for identifying the output. The header line appears in the form Ixxxxss where xxxx is the file identification supplied by the user, and ss is a sequence number assigned by the operating system.

For the RENAME disposition, the system responds:

TYPE NEW FILE NAME-

Enter any legal name (one through seven characters, of which the first must be a letter) for the file.

After BATCH finishes processing the file, it requests another file with the response:

TYPE FILE NAME-

If another file is to be processed, enter the file name, and upon request, the disposition for that file. This loop can continue as long as there are files to be processed. Exit from the BATCH command at any time by typing:

END

Abbreviated Entry

The BATCH command and its parameters can be entered in one line as follows:

BATCH,lfn, { PRINT[,id] / PUNCH[,id] / PUNCHB[,id] },file-id

or

BATCH,lfn, { INPUT ,id / LOCAL / RENAME,newlfn }

The file id must be supplied for any output disposition (PRINT, PUNCH, PUNCHB). Not all parameters are necessary in the initial entry, but those specified must appear in the order indicated. Omitted parameters are requested by BATCH. When BATCH requests a parameter, it can be typed by itself or along with other remaining parameters. If one or more parameters are specified in the initial entry, BATCH terminates after processing the specified file; it does not request another file name; the system returns to command mode.

Care must be taken in using the following dispositions to differentiate between a two-character file id and a terminal or user id.

{ PRINT / PUNCH / PUNCHB },id

The parameter id is a two-character id (AA through 99) or the word HERE or MINE (refer to table 3-2 for allowed combinations). The file is directed to the remote batch output queue associated with the specified terminal or user id. When id is one, three, or four characters (but not HERE or MINE), it is accepted as a file id. If a file is batched to a terminal id, it is immediately available for output. If a file is batched to a user id, it remains in the remote output queue for that terminal until further action is taken by that user.

When entering a two-character file id, ambiguity with a two-character user or terminal id can be avoided by typing the disposition and waiting for the response:

TYPE FILE ID-

Also, care should be taken in specifying a user id. For example, a typographical error could specify some valid user id (AA through 99) that is not the intended user id and may not be any real user's id. Such an error could cause the system to hold the file for disposition indefinitely or inadvertently route the file to a wrong user or terminal.

Batch Command Termination

Entry of END or completion of the specification of one or more parameters in the initial entry of the abbreviated BATCH command returns the system to command mode.

Example:

The user punches AFILE in binary and then inserts BFILE in the input queue directing the resulting output to CX, where CX can be either a user or terminal id. CFILE is printed at the user's own terminal. Refer to Printing Output, section 7 for the method for obtaining output at specific terminals.

```
COMMAND- batch
TYPE FILE NAME-afile
TYPE DISPOSITION-punchb
TYPE FILE ID-v8
TYPE FILE NAME-bfile,input,cx
TYPE FILE NAME-cfile
TYPE DISPOSITION-print,here
TYPE FILE ID-v8
TYPE FILE NAME-end
COMMAND- go
      .
      .
      .
```

REMOTE BATCH COMMANDS

If a display terminal is equipped with a card reader and line printer, the user can transmit jobs directly to the batch input queue and receive resulting output through these input/output devices, using the remote batch commands (sections 7 and 8). The following remote batch commands are also allowed from a TTY and from within EDITOR.

DIVERT	Divert a file to central site, another user, or another terminal (DEF parameter is not allowed from a TTY).
PRIOR	Change priority of a file in remote output queue.

EVICT	Evict a file from the remote input or output queue.
DROP	Drop a remote job from execution.
KILL	Kill a remote job in execution.
REVERT	Negate the DEF parameter of the DIVERT command.

The READ,lfn command is a remote batch command that can only be used when the remote batch terminal is logged in. Files read using this command become local INTERCOM files accessible to the interactive user. The first statement is not interpreted as a job statement.

Q COMMAND

The Q command allows the user to examine the batch processing queues in a single mainframe or multimainframe environment. Enter:

```
Q [ [,x][,yyy][,OURS] ]
  [ ,ID               ]
  [ ,SYNTAX           ]
```

x can be any one of the following display options.

Omitted	Count of jobs in input, output, executing, punch, and JANUS queues.
I	List of jobs in input queue; includes job name, priority, field length, time limit, source mainframe id, and terminal id (a source mainframe is the mainframe that originated a job in a multimainframe environment).
O	List of jobs in output queue; includes job name, priority, terminal id, disposition code, and file size in PRUs.
P	List of jobs in punch queue; includes job name, priority, terminal id, disposition code, and file size in PRUs.
E	List of jobs in executing queue; includes job name, priority, status, field length, time left, source mainframe id, and terminal id.

Execution status is:

EXECUTING	Executing at a control point.
W-CPUSCM	Waiting for CPU in central memory of a CYBER 70 model 76.
W-CPULCM	Waiting for CPU in large central memory of a CYBER 70 model 76.
W-CPURMS	Waiting for CPU in rotating mass storage of a CYBER 70 model 76.
W-RECALL	Waiting for recall in a CYBER 70 model 76.
W-MEMORY	Waiting for memory.
W-EVENT	Waiting for an event.
SUSPNDED	Suspended in a CYBER 70 model 76.

W-SWAP	Waiting for a swap.
W-SCHED	Waiting for scheduler action.
W-PFILE	Waiting for permanent file.
W-DEVICE	Waiting for device.
W-OPRTR	Waiting for operation action.
W-INTRCM	Waiting for INTERCOM.
W-P PACK	Waiting for permanent pack.
W-MMFRME	Waiting for multimainframe.

A job currently being swapped in is considered to be executing.

J — List of jobs associated with JANUS; includes job name, equipment, and EST number. JANUS is available only for host mainframes (a host mainframe is the mainframe into which the user dialed when originally making contact with INTERCOM).

A — List of job names in I, O, P, E, and J queues.

Other parameters are:

yyy — Unique three-character mainframe identifier. Parameter is ignored if multimainframe environment is not running. Information from frame identified is obtained. If omitted, the host mainframe is assumed.

OURS — Allows the information in the display to be restricted to jobs originated in host mainframe. Parameter ignored if environment is other than multimainframe.

The Q command can also have the following formats.

Q,ID — Displays the mainframe identifiers for a multimainframe environment.

Q,SYNTAX — Displays the Q command syntax.

If ID or SYNTAX is entered, all other parameters are ignored. Parameters for Q are position independent.

PROGRAM EXECUTION COMMANDS

Programs can be compiled and executed directly under control of EDITOR or INTERCOM. In either case, program interaction is allowed if proper procedures are followed when the program is created (section 5). EDITOR can be used to interactively create a program and subsequently modify that (or an existing) program. When the program is complete, compilation and execution can be initiated by issuing a single RUN command. If compilation or execution errors are detected, the program can be easily modified through EDITOR and resubmitted for compilation.

An alternate method of compiling and executing a program is to use INTERCOM to enter system control statements directly from the terminal. In this situation, all control statements must be entered by the user; therefore, a working knowledge of the operating system is required. Normally, the program is compiled, and the resultant object code is placed in the system file LGO. Execution can be instituted through the XEQ command (XEQ,LGO). Alternatively, execution of the object code can be instituted in the same manner as a batch job by entering the name of the file containing the binary data (LGO).

If the file is assigned a name that is the same as that of a system command, execution must be instituted through either the EDITOR RUN command or the XEQ command. If not, the system assumes that name is a system command.

Example:

`COMMAND- files`	This command executes a system function. The INTERCOM FILES command executes.
`COMMAND- xeq,files`	This command executes the local file named FILES.

XEQ COMMAND

The XEQ command loads user files, user libraries, and system-generated binary files, and allows subsequent submittal for execution or the construction of absolute overlays. After user-specified programs are loaded, the loader attempts to satisfy remaining unsatisfied externals from the currently defined library set. Specified file names, including user libraries, must be user local file names or local file names of attached permanent files. Detailed explanations of loader directives and options are available in the Loader Reference Manual. To initiate program loading, enter:

```
XEQ
```

The system responds:

```
OPTION=
```

Enter one of the options described below. If EXECUTE, NOGO, or a file name is not entered, the system continues to request OPTION= entries.

```
OPTION=
```

To leave the XEQ command, respond to the OPTION request with END.

Option Entries

EXECUTE$\left[=\text{entrypoint}\left[,\text{param}_1\left[,\ldots\left[,\text{param}_n\right]\right]\right]\right]$

The loaded programs are executed beginning at the entry point specified by entrypoint; if entrypoint is omitted, execution begins at the last transfer address encountered by the loader. Optional execution parameters specified by param are passed to the loaded program in RA+2 through RA+63.

NOGO[=lfn[,entrypoint$_1$[,...[,entrypoint$_n$]]]]

Loading is forced to completion without execution. The filename specified becomes the file on which loaded programs are saved as an absolute overlay. The lfn parameter is applicable only to nonsegmented relocatable loads; otherwise, it is ignored. Optional entry point names to be included in the overlay header can be specified by entrypoint, but they are ignored if lfn is omitted.

lfn[param$_1$[,...[,param$_n$]]]

The named file is rewound, loaded, and executed. Execution begins at the last transfer address encountered by the loader. Optional execution parameters specified by param are passed to the loaded program.

LOAD=lfn$_1$ [{/R, /NR}][,...[,lfn$_n$[{/R, /NR}]]]

Files, whose contents are to be loaded, are specified in one of the following forms.

lfn	Installation-defined rewind parameter is assumed.
lfn/R	Rewind before loading.
lfn/NR	No rewind before loading.

LIBLOAD=libname[,entrypoint,[,... [entrypoint]]]

The loader examines the directory of the library specified by libname (a user library or system library other than NUCLEUS) and selects programs containing the entry points specified by entrypoint.

SLOAD=lfn [{/R, /NR}][,program,[,... [,program$_n$]]]

The loader searches through the specified file and loads only those programs specified by program. The file name can be entered in one of the following forms.

lfn	Installation-defined rewind parameter is assumed.
lfn/R	Rewind before loading.
lfn/NR	No rewind before loading.

SATISFY [=libname$_1$[,... [,libname$_n$]]]

The loader searches through the libraries specified by libname to fill unsatisfied external references without completing the load. Further loading can be specified following the SATISFY option. If no parameters are specified, the currently defined library set is assumed.

LDSET {=, } option$_1$[,... [,option$_n$]]

XEQ options specified through LDSET apply for the current load only. Only one LDSET statement can be used with an individual load when entered through INTERCOM; the option string must contain all entries. A loader completion statement (lfn, EXECUTE, or NOGO) terminates their effect. When an LDSET option is specified without parameters, the loader uses default values defined by the installation. If a second LDSET resets an option, the loader uses the most recently encountered setting.

The loader ignores LDSET options other than LIB, PRESET, PRESETA, ERR, REWIND, and NOREWIN when loading an absolute program.

The LDSET options are as follows:

LIB $[=libname_1[/...[/libname_n]]]$

This option defines the library names to be used as the library set for a loading sequence. Additional uses of this option add libraries to this set. If no parameters are specified, the installation-defined default library set is assumed.

MAP=[p][/lfn]

This option controls the generation of the load map. lfn is the one- through seven-character name specifying the file that is to receive the map (the default is OUTPUT). The file is not rewound, either before or after the map is written. p specifies the map contents as follows:

Omitted	Current job default, set by last MAP statement or by installation default.
N	No map is generated.
S	The map contains error messages and loader statistics only.
B	The map contains error messages, loader statistics, and a list of unsatisfied externals.
E	The map contains a list of entry points (without a cross-reference map), a block list, error messages, loader statistics, and a list of unsatisfied externals.
X	The map contains an entry point list with a complete cross-reference map (each location referencing an entry point), a block list, error messages, loader statistics, and a list of unsatisfied externals.

Any of the S, B, E, and X options can be combined by concatenation (for example, LDSET,MAP=SB).

PRESET=p and PRESETA=p

The PRESET and PRESETA options specify the value to which the loader is to set unused memory before execution of the loaded program.

p is an octal value from 1 to 20 digits, optionally prefixed by + or - and optionally suffixed by the letter B. It can also be one of the following.

p	Octal Preset Value
NONE	No presetting
ZERO	0000 0000 0000 0000 0000
ONES	7777 7777 7777 7777 7777
INDEF	1777 0000 0000 0000 0000
INF	3777 0000 0000 0000 0000
NGINDEF	6000 0000 0000 0000 0000
NGINF	4000 0000 0000 0000 0000
ALTZERO	2525 2525 2525 2525 2525
ALTONES	5252 5252 5252 5252 5252
DEBUG	6000 0000 0004 0040 0000

For PRESETA, the lower 17 bits (central memory) or lower 24 bits (ECS) of each word are set to its address. For example, if PRESETA=ONES with locations RA+1000_8 and RA+1001_8 unused, these locations are set to:

7777 7777 7777 7740 1000

and

7777 7777 7777 7740 1001

ERR=p

The ERR option specifies the type of error which causes the program to be aborted. The parameter p can specify ALL, FATAL, and NONE.

REWIND AND NOREWIN

These options alter the default option for rewinding files prior to loading. The selection of R and NR or LOAD and SLOAD statements takes precedence over this option.

USEP=$pname_1$[/...[/$pname_n$]]

The USEP option causes the specified object modules to be loaded regardless of whether or not they are needed to satisfy external references.

USE=$entrypoint_1$[/...[/$entrypoint_n$]]

The USE option forces the loading of object modules that contain specified entry points.

SUBST=$pair_1$[/...[/$pair_n$]]

The SUBST option changes external references to entry point names. This feature can be used to cause loading of object modules other than those that would normally be loaded.

OMIT=$entrypoint_1$[/...[/$entrypoint_n$]]

The OMIT option directs that the specified entry point names are to remain unsatisfied, regardless of whether or not the module containing these entry point names is loaded. The specified entry point names are processed the same as other unsatisfied names but do not result in errors. Some modules containing these entry point names may be loaded to satisfy other externals, but the specified entry points are not linked.

FILES=lfn_1[/...[/lfn_n]]

The FILES option permits CYBER Record Manager users to ensure that library programs are loaded for the processing of specified files.

Abbreviated Entry

XEQ[,$option_1$[,...[,$option_n$]]]

The options can be any described for XEQ. Entries in this form should be terminated with EXECUTE or NOGO. If not, EXECUTE without parameters is assumed. If the filename option is specified in this form, it should be the only option.

Example:

To load and execute a user binary file, enter:

XEQ,lfn

In the following example, a user wants to create and execute an absolute overlay from a previously compiled program on file LGO. The binary relocatable program on LGO must contain a loader OVERLAY statement that names the file on which the overlay is to be written. For instance, OVERLAY(FRANK,0,0) is needed for this example:

```
xeq,load=lgo,nogo
rewind,frank
xeq,frank
```

The following example loads an entry point (PROGA) from a user library (ULIB1) and causes execution:

```
xeq,libload=ulib1,proga,execute
```

ERRORS COMMAND

The ERRORS command provides listings of compiler or assembler-generated diagnostics from the file OUTPUT. The listing consists of the program or subprogram header statement for each routine containing errors, followed by the lines in error and corresponding diagnostics. If a program was created in EDITOR, the editor line number appears to the left of each listed line. In most cases, diagnostics are listed automatically when compilation is initiated with the RUN command. The ERRORS command may be useful, however, when compilation is initited with system control statement entries or if informative diagnostics are desired.

To display errors, enter:

ERRORS,language[,SUP]

language = ALGOL
COBOL
COMPASS
FTN

The ALGOL, COBOL, and FTN options also list diagnostics for any COMPASS subroutines in the program. Diagnostics generated by BASIC are sent directly to the terminal as they are encountered by the compiler.

To suppress listing of nonfatal and informative diagnostics, enter:

ERRORS,system-name,SUP

Example:

```
COMMAND- errors,f

       PROGRAM TEST       74/74
 CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

                          N=10*(M+3*(I+1)
         9  FE       (          UNMATCHED PARENTHESIS.
         9  FE      END-STMT NO MATCHING RIGHT PARENTHESIS.
```

All FORTRAN diagnostics on the file OUTPUT are listed at the terminal.

PAUSE

Some source languages, including COBOL (STOP LITERAL) and FORTRAN (PAUSE), allow a pause instruction from an executing program. Under system batch processing, this command produces a message display at the central site, and execution halts until the operator takes appropriate action. For programs executing interactively under control of INTERCOM, the message is displayed at the remote terminal. (The PAUSE control statement is not allowed from INTERCOM terminals.) Execution halts until the user takes action. Sense switch settings can be changed at such a time. The user then can enter GO to continue execution or DROP to terminate execution and return to INTERCOM command mode. While the program is pausing, only the DROP, GO, and SWITCH commands are allowed; any other entry causes a diagnostic followed by the Ready.. display.

PROGRAM TEXT EDITOR 4

The program text editor (EDITOR) is an interactive sequential file construction and modification program capable of servicing multiple remote terminals simultaneously. As with all INTERCOM features, each remote terminal using EDITOR can interact with the system independent of other users. System features protect the integrity of each user's files.

EDITOR has two modes of operation, command and text. In command mode, all input is interpreted as an EDITOR or INTERCOM command. In text mode, all input is interpreted as a line of text.

Each remote terminal using EDITOR is assigned one scratch file called the edit file. The edit file is used to create, modify, and examine single text lines, a range of text lines (up to a complete file), or character strings within text lines. This file can subsequently be submitted for compilation and execution. The edit file is the unstated object of all file-oriented EDITOR commands; that is, the LIST command lists one or more lines of the edit file, the CREATE command places data entered from the keyboard into the edit file, and the RUN command submits the contents of the edit file for compilation or assembly by the stated programming language. Normally, all data is entered into the edit file, reviewed, corrected, and submitted for compilation through EDITOR. When the file has been created, it can be allocated to mass storage, either temporary or permanent, through EDITOR, thus making the edit file available for further use. EDIT files are constructed of Z-type (zero-byte terminated) records.

Programs can be entered under the control of entry formats. The ALGOL, BASIC, COBOL, COMPASS, and FORTRAN programming language formats are predefined as an installation option. These formats can be altered or new formats can be created.

The basic unit of information in EDITOR is the line of text which can contain as many as 510 characters. Text lines and EDITOR commands are entered by pressing the teletypewriter RETURN key (or the SEND or equivalent key on display terminal keyboards).

Both INTERCOM commands and system control statements can be entered while operating under EDITOR. However, if the control statement, including the file name, has the same name as an EDITOR command, it must be terminated by a period or right parenthesis. If the INTERCOM or NOS/BE name is unique, it can be entered without the terminator, which is subsequently added by EDITOR. INTERCOM commands and system control statements entered through EDITOR cannot exceed 80 characters, including the terminator, whether added by the user or EDITOR.

EDITOR COMMAND SYNTAX

EDITOR commands consist of a command verb that may be followed by parameters. Some verbs do not require parameters; others require at least one. A command verb with associated parameters must be entered as one line.

SPECIAL CHARACTERS

Characters that have special functions in EDITOR are described in table 4-1 and are essential where shown. Most of them have special meaning only in EDITOR commands; they are recognized as valid data characters elsewhere. Others can be entered only for specific functions and cannot be used as data characters.

TABLE 4-1. EDITOR SPECIAL CHARACTERS

Character	Function
=	A separator in EDITOR commands; in text replacement, it must be specified between the text strings, and within commands, it must be specified between keywords and associated variables. When the text lines are entered singly, this sign must be specified immediately after the line number. In text mode, when a line number other than the one displayed is to be entered, an equals sign must precede, as well as follow, the new line number. As the only character entered, an equals sign terminates text mode. In most other situations, the equals sign can be used as a valid data character.
, or blank	Either blanks or commas are used as parameter separators; they are equivalent. Adjacent blanks and commas are interpreted as a single separator. Both can be used as valid data characters; however, trailing blanks are truncated on input to the edit file.
Interrupt characters ESC ALT MODE } TTY CTRLZ } suspend Abort character† %A	The INTERCOM abort characters for the remote terminals. An abort (the characters, %A) can be entered at any time during the program text editor use. Current action is terminated, and the user is returned to EDITOR command mode. The interrupt command also can be used to exit from text mode, terminate a user's interactive job submitted by the RUN command, terminate operating system control statements and INTERCOM commands, and terminate user's program calls issued while EDITOR is in use. In all cases, the user is returned to EDITOR command mode. (TTY users may have to suspend output prior to entering %; ECS ALT MODE, or CTRL Z can be used to suspend.) If an abort is issued while the editor is deleting, resequencing, or replacing text lines, the edit file is left in an unknown condition.
Text string delimiters / or any character other than blank, comma, parenthesis, equals sign, letter, or digit	Delimits text character stings on input; the symbol selected must appear as the first and last characters of the string. If the delimit character is used as a data character within a string, it must be specified twice or a different character used to delimit the string. For example, A/B as a text character string within a command can be entered as /A//B or as *A/B*.
( )	Parentheses are used to delimit column numbers in EDITOR commands. They can be used as valid data characters elsewhere.

†Refer to interactive characters and %A in section 2.

TABLE 4-1. EDITOR SPECIAL CHARACTERS (Contd)

Character	Function
*EOR,nn nn is a decimal integer, 0 through 15	This character string is entered as a line of text, beginning in column 1, each time an end-of-record of level nn (decimal) is required in a user's file. When the file is saved on mass storage, an end-of-record of level nn is written in that position. Conversely, when a file is read, each end-of-record is inserted in the edit file as *EOR,nn.
*EOR†	This character string is equivalent to *EOR,0.
*EOF†	This character string is equivalent to *EOR, 15 decimal (a level 15 end-of-record is equivalent to an end-of-file). The operating system forces an end-of-record before an end-of-file. If *EOF is inserted into the edit file without a preceding *EOR, after a SAVE/EDIT sequence, an *EOR precedes *EOF. Therefore, the file should be sequenced to allow generation of a line number for the *EOR.
†Refer to %EOR and %EOF in section 5.	

ENTERING EDITOR

EDITOR COMMAND MODE

To call the program text editor, enter:

```
EDITOR
```

EDITOR signals readiness to receive input by displaying two consecutive periods:

```
..
```

If the user previously entered EDITOR during the current terminal session and created a nonempty edit file, the following message is displayed.

```
YOU HAVE AN EXISTING EDIT FILE
```

This facility allows a user to enter and leave EDITOR to execute other programs (system control statements, local files, and others) without incurring the overhead of an EDITOR swap-in to determine that a non-EDITOR command is to be executed. If the above message is displayed, all the properties (FORMAT specifications) of the previous EDITOR session hold.

While in EDITOR command mode, EDITOR and most INTERCOM commands, as well as system control statements, can be entered. The EDITOR command mode response is displayed at the terminal after each command is processed. After the EDITOR command, line=text, however, EDITOR responds with only a line feed. In either case, another command can be entered.

Although most control statements and INTERCOM commands can be entered in EDITOR command mode, their execution is not as efficient as when they are entered in INTERCOM command mode; response time can be affected adversely. If many system control statements or INTERCOM commands are to be entered in succession, the user should exit from EDITOR.

Some remote batch processing commands and the INTERCOM commands LOGIN and LOGOUT are not allowed.

TEXT MODE

Entering a CREATE or ADD command initiates text mode. In this mode of operation, lines of text can be entered into the edit file. Line numbers are generated by EDITOR. These line numbers are displayed at the terminal unless specifically suppressed by the line number suppress parameter.

When the suppress parameter is specified, EDITOR generates line numbers but only the message ENTER LINES is displayed at the terminal. Text can then be entered line by line. A new line number is generated for each text line, but a line feed is the only visual response.

If the suppress parameter is omitted, a line number and an equal sign are displayed. Enter the line of text to be associated with that line number. EDITOR generates a new line number (the previous number incremented by a defined value) and displays the new number and an equal sign.

This process continues until text mode is terminated by the user or EDITOR. Text mode is not allowed under BASIC format specifications.

Text can be modified by using the line overwrite parameter with the ADD command. If overwrite is not specified and an attempt is made to change an existing line or to insert new text between existing lines, EDITOR terminates text mode. The user can terminate text mode by entering a single equal sign (table 4-1) or %A. The equal sign should be used whenever possible, since using %A could cause a loss of data.

EXITING EDITOR

BYE AND END COMMANDS

To leave EDITOR, enter:

BYE or END

To prevent inadvertent destruction of the edit file, upon subsequent LOGOUT, a system message

WARNING-EDIT FILE NOT SAVED

. .

is displayed if the edit file has not been saved since it was last modified.

Either save the edit file and reenter the BYE or END command, or reenter the BYE or END command to exit without saving the file. Control returns to INTERCOM command mode, and the system displays:

```
COMMAND-
```

If contents of the edit file are not to be saved, EDITOR can be immediately exited by entering:

```
BYE,BYE
```

Control is returned to INTERCOM command mode, with the edit file still available to the user. END,END is not an allowable command.

Examples:

To leave EDITOR before saving a modified edit file:

```
..b                                  Enter BYE.
WARNING- EDIT FILE NOT SAVED         System message is displayed.
..save,abc                           Enter SAVE,lfn.
..b                                  Reenter BYE.
COMMAND-                             System returns to INTERCOM command mode.
```

To leave EDITOR after saving the edit file:

```
..bye                                Enter BYE.
COMMAND-                             System returns to INTERCOM command mode.
```

To leave EDITOR without saving the edit file:

```
..b,b                                Enter BYE,BYE
COMMAND-                             System returns to INTERCOM command mode.
```

FILE CREATION AND MODIFICATION

The following text describes the EDITOR commands which can be used to manipulate files. New files can be created or existing files modified. Lines can be listed, deleted, added, searched, replaced, and saved. Text character strings can be replaced within lines. Line numbers can be generated and displayed by EDITOR or entered by the user. Line numbers within existing files can be resequenced. Program formatting can be controlled by the user.

FORMAT COMMAND

When EDITOR command mode is established, an installation-defined format specification is in effect. The tabular column positions, valid tabulating character, and maximum character count per input lines are controlled by this specification. The FORMAT command can be used to establish other formats, either system or user-defined. Specifications established with this command remain in effect for the duration of the user's session with EDITOR or until changed. This command also can be used to display format specifications currently in effect at the terminal.

Every line entered into the edit file from the terminal keyboard is affected by the format specification, which dictates the maximum character count and columnar positions for each input line. In addition, every character entered is checked against the tabulating character. When a valid tabulating character is encountered, blanks are inserted into the data line from that point to the next tabular position where the next data character is placed. The blank fill is an internal process. Spaces do not appear on the terminal display when the tabulating character is entered; however, the spaces do appear on output. If a tabulating character is entered when no tabular positions exist, the tabulating character is accepted as a valid data character.

Entering FORMAT,BASIC establishes a special state where the ADD, CREATE, RESEQ, and EDIT-with-SEQUENCE commands are not allowed. BASIC lines are entered exactly as BASIC statements. Basic statement line numbers serve as EDITOR sequence numbers. Entering a new format name or the FORMAT command without parameters causes an exit from the BASIC state. The BASIC state is further described in the line=text command description.

Text lines that exceed the specified maximum character count are truncated to the maximum line length, and an informative message is displayed at the terminal.

FORMAT Creation

The FORMAT command changes or lists the format specifications.

FORMAT [{ ,name / [,TAB=c][,tab_1[,tab_2[,...[,tab_n]]]][,CH=nnn] / ,SHOW }]

name — Establishes a compiler or assembler format for data lines entered from the terminal; the name must be one of the following:

ALGOL	ALGOL compiler.
BASIC	BASIC compiler.
COBOL	COBOL 4 compiler.
COMPASS	COMPASS assembler.
FORTRAN	FORTRAN compiler.

TAB=c — Keyword; c is any valid character on the terminal keyboard (except % on a 200 User Terminal). The character specified becomes the tab character checked on input.

tab_1,tab_2,...,tab_n — Column positions; one through three digits in the range 0 through 510. Tab column numbers must be specified in ascending sequence.

CH=nnn — Keyword; nnn is the maximum character count, one through three digits in the range 1 through 510. CH establishes the maximum character count for each input line. This count is checked also when either a SAVE or RUN command is entered. CH=999 allows variable length lines up to 510 characters.

SHOW — Keyword; the current format specification is listed at the terminal in the form:

CH=nnn TAB CHAR=c TAB COL=$t_1,t_2,...,t_n$

nnn is maximum character count, c is tab character, and t is tab column position.

All tabulation parameters, including character count, can be entered in one FORMAT command (tab column positions are interpreted by EDITOR as one parameter). Any omitted parameter remains unchanged from the current value.

If the FORMAT command is entered with no parameters, the tab column position is set to zero, maximum character count is set to accept variable length lines up to 510 characters (CH=999), and a tab character check is not made.

FORMAT Names

When a format name is entered in the FORMAT command, a format specification is established at the terminal that complies with the format of a specific language as listed below (these specifications can be changed by the installation).

ALGOL:

Character count = 72

Tab character = $

Tab columns = 7 10 13 16 19

BASIC:

Character count = 999

Tab character = ;

Tab columns = 0

; as the tab charcter is not a valid entry under BASIC and text mode is not allowed.

COBOL:

Character count = 72

Tab character = ;

Tab columns = 8 12 16 20 24

COMPASS:

Character count = 72

Tab character = ;

Tab columns = 11 18 36

FORTRAN:

Character count = 72

Tab character = ;

Tab columns = 7 10 13 16 19

Examples:

To list the format specification currently in effect at the terminal:

```
..f,s                                                    Enter FORMAT,SHOW.
CH= 72 TAB CHAR=; TAB COL=   7   10   13   16   19      System lists current specifications.
..                                                       EDITOR is ready for next command.
```

To define a user format where the colon is the tab character, maximum character count is 50, and tab columns are 10, 20, 30, and 40:

```
..f,10,20,30,40,c=50 tab=:      Enter FORMAT,tab-1,tab-2,tab-3,tab-4,CH=nn,TAB=c.
..                              EDITOR is ready for next command.
```

To change the tab character in the current format specification to an at sign:

```
..f,t=@                         Enter FORMAT,TAB=c.
..                              EDITOR is ready for next command.
```

To establish the COBOL format specification at the terminal, and show it:

```
..f,cob                         Enter FORMAT,COBOL.
..f,s                           Enter FORMAT.SHOW
CH= 72 CHAR=; TAB COL=    8   12   16   20   24
                                System displays format specifications.
..                              EDITOR is ready for next command.
```

CREATE COMMAND

The CREATE command constructs a new file.

CREATE [,line [,incr]] [,SUP]

line	The first line number to be displayed at the terminal; one through six digits from 1 to 999999. If omitted, system assumes installation-defined first line number.
incr	Line numbers are incremented by this value after each text entry; one through six digits from 1 to 999998. If omitted, system assumes installation-defined increment value.
SUP	Keyword; suppresses display of EDITOR line numbers at terminal.

On acceptance of the CREATE command, text mode is initiated; the first line number and an equal sign are displayed at the terminal. A text line of 1 through 510 characters, depending on the current format specification, can then be entered. At least one blank character (space) must be entered to produce a blank text line.

If the suppress parameter SUP is specified, only the message ENTER LINES is returned; EDITOR line numbers are generated for each text line but do not appear at the terminal.

Text mode remains in effect until terminated by the user with a single equal sign (table 4-1) or %A, returning the user to EDITOR command mode. The equal sign should be used whenever possible, since using %A could cause a loss of data.

While in text mode, the user can enter a line number other than that displayed using the following form.

```
=line=text
```

line is a number of one through six digits, and text is a text line of 1 through 510 characters, depending on the current format specification. After this line is entered, text mode resumes at the point of interrupt. If the line number entered already exists, the new text data is automatically written over the existing line. The first equal sign in the string is entered by the user immediately following the equal sign displayed by the system.

If the CREATE command is entered when the information in the edit file has not been saved as a local file since it was last modified, EDITOR ignores the command and displays the message:

```
WARNING-EDIT FILE NOT SAVED
```

The file can be saved by entering the SAVE command and then reentering the CREATE command. If the edit file need not be saved, reenter the CREATE command, which is accepted. In the latter case, contents of the edit file are destroyed.

The CREATE command cannot be entered under BASIC format.

Examples:

To create a file of two lines with a first line of 10 and an increment value of 10:

```
..create 10 10          Enter CREATE,line,incr.
    10=first line       Enter text line 1.
    20=second line      Enter text line 2.
    30==                Enter an equals sign to terminate text mode.
..                      EDITOR is ready for next command.
```

To create a file of three lines using installation-defined line and increment values, and to correct a mistake in the first line:

```
..c                             Enter CREATE.
   100=       bgin              Enter first line.
   110==100       begin         Correct first line.
   110=       a+b(i)+a          EDITOR reissues line number.
   120=       end               Enter third line.
   130==                        Enter an equals sign to terminate text mode and file creation.
..                              EDITOR is ready for next command.
```

To create a file of five lines with a first line of 100 and an increment value of 50 with line numbers suppressed:

```
..c,s,100,50            Enter CREATE,SUP,line,incr.
ENTER LINES             System responds.
line one                Enter first line.
line two                Enter second line.
line three              Enter third line.
line four               Enter fourth line.
line five               Enter fifth line.
=                       Enter an equals sign to terminate text mode.
..                      EDITOR is ready for next command.
```

line=text COMMAND

The line=text command places one line of data into the edit file.

[=] line=text

line — Line number; one through six digits from 1 through 999999. For BASIC statement input: one through five digits, 1 through 999999. In text mode, an equals sign must precede the line number.

text — Line of text; 1 through 510 characters depending on maximum established by the format specification.

This command does not affect the terminal's mode of operation. The entered line can replace an existing line or insert a new line in the edit file.

When the BASIC format has been specified for input lines, the BASIC statement number is part of the text and also serves as the EDITOR line number. A BASIC line is entered exactly as a BASIC statement with no equals sign separating the statement number and text. The equals sign can be entered under BASIC format conditions, but it is not stored as part of the statement.

EDITOR issues only a line feed in response to a valid line=text command, and then any command can be entered.

In text mode, the command can be entered in the form =line=text; the last line number displayed at the terminal is displayed again to allow the next text line to be entered in proper sequence. An overlooked text line can be entered without leaving text mode in this manner.

Examples:

To enter line 352 into the edit file with text "this is line 352;"

```
..352=this is line 352
```

Enter line in the form: line=text.
EDITOR responds with a line feed only.

To enter a BASIC program into the edit file under BASIC format, correct a line, request a listing of the edit file, and save the program as a local file named BASFIL:

```
..f,b
..200 for x = 1 to 100
400 print "x=";x
600 print "x**2=";x**2
800 next x
1000 end
200 for x = 1 to 50
list,a,sup

200 FOR X = 1 TO 50
400 PRINT "X=";X
600 PRINT "X**2=";X**2
800 NEXT X
1000 END
..save basfil
..
```

Enter FORMAT, BASIC.
Enter BASIC statements line by line.

Enter LIST,ALL,SUPPRESS.
System lists contents of edit file.

Enter SAVE,lfn.
EDITOR is ready for next command.

To correct line while in text mode:

```
..c,100,100                 Enter CREATE; text mode is initiated.
   100=;program mine        Enter program.
   200=:dimension a (100,200)
   300==100=;program mine(input,output,tape1=output)     Enter correction.
   300=;read 1000,a
   400==                    Enter an equals sign to terminate text mode.
..                          EDITOR is ready for next command.
```

ADD COMMAND

The ADD command inserts new lines between existing lines or adds lines to the end of the edit file. The ADD command cannot be used to replace or bypass existing lines unless the OVERWRITE parameter is specified.

ADD [,line [,incr]] [,SUP] [,OVERWRITE]

line	Line number; one through six digits, from 1 through 999999; first line number displayed at the terminal. If omitted, system assumes last line number in edit file plus installation-defined increment value.
incr	Increment value; one through six digits, from 1 through 999998. If omitted, system assumes installation-defined increment value.
SUP	Keyword; suppresses display of EDITOR line numbers at terminal.
OVERWRITE	Keyword; permits the user to replace or bypass existing line numbers.

Text mode is initiated; the first line number and an equals sign are displayed at the terminal. A line of text, 1 through 510 characters, depending on the current format specification, can be entered. At least one blank character (space) must be entered to produce a blank or zero length text line.

If the suppress parameter SUP is specified, only the message ENTER LINES is returned; EDITOR line numbers are generated for each text line but do not appear at the terminal. Text can be entered line by line to modify or add to the file.

Text mode remains in effect until terminated by the user with the entry of %A, entry of a single equals sign (table 4-1), or when an existing line number is encountered (unless OVERWRITE is specified); the system returns to EDITOR command mode. Use %A to terminate text mode only when no other method of termination is possible, since using %A could cause a loss of data.

While in increment mode, the following form can be used to enter any line number other than that displayed.

=line=text

line is the desired line number of one through six digits, and text is a line of text of 1 through 510 characters, depending on the current format specification.

The ADD command cannot be entered under BASIC format specifications.

Examples:

To add text lines between lines 10 and 20 in the edit file and correct an error in the first line entered:

```
..a,13,3                          Enter ADD,line,incr.
    13= inset one                 Enter first line.
    16==13= insert one            Correct spelling in first line.
    16= insert two                System redisplays line number.
    19= insert three
ADD WONT REPLACE OR BYPASS LINES  System displays message; next line would exceed
                                  line 20 in edit file.
..                                EDITOR is ready for next command.
```

To add a line to the end of the edit file (last existing line number is 300, and installation increment value is 10):

```
..a                               Enter ADD.
   310= return                    Enter text.
   320==                          Enter an equals sign to terminate text mode.
..                                EDITOR is ready for next command.
```

To add lines to the end of the edit file with line numbers suppressed:

```
..a,s                             Enter ADD,SUP.

ENTER LINES                       System responds.
;return b                         Enter a line.
3;return c                        Enter a line.
;end                              Enter a line.
=                                 Enter an equals sign to terminate text mode.
..                                EDITOR is ready for next command.
```

DELETE COMMAND

The DELETE command deletes lines in the edit file.

$$\underline{\text{D}}\text{ELETE,} \left\{ \begin{matrix} \underline{\text{A}}\text{LL} \\ \text{line-1} \\ \underline{\text{L}}\text{AST} \end{matrix} \right. \left[\text{,} \left\{ \begin{matrix} \text{line-2} \\ \underline{\text{L}}\text{AST} \end{matrix} \right. \right] \left. \right\} \left[\text{,/text/} \left[\text{,(col-1} \left[\text{,col-2]} \right) \right] \ \left[\text{,}\underline{\text{U}}\text{NIT]} \right] \left[\text{,}\underline{\text{V}}\text{ETO]} \right]$$

ALL	Keyword; all lines in the edit file are deleted or searched for the text search string.
line-1	Line number; one through six digits, from 1 through 999999; first or only line to be deleted or searched.
line-2	Line number; one through six digits, from 2 through 999999; last line to be deleted or searched in a range beginning at line-1.
LAST	Keyword; when LAST is the first parameter, the last line in edit file is deleted or searched; when it is the second parameter, lines beginning at line-1 through the last line in the file are deleted or searched.

/text/ Text search string; one through 20 characters delimited by slashes or an equivalent delimiter file is searched for this text string (search can be restricted to range of line and column numbers). Lines containing this string are deleted from the edit file. (Refer to Text String Delimiters, table 4-1).

col-1 Column number; one through three digits, from 1 through 510; first or only column number of text string search. Must be preceded by a left parenthesis and followed by either col-2 or a right parenthesis.

col-2 Column number, one through three digits, from 2 through 510; last column number to be searched in a range beginning at col-1. Must be greater in value than col-1 and followed by a right parenthesis. The range must be at least equal to the number of characters specified in the text search string. Column specification is significant only if a text search string is specified. Lines are deleted only if the text string occurs within the range, or if it begins in col-1, when a single column is specified.

UNIT Keyword; dictates that the text search string appear as a unit within a line; the text string must be delimited by some characters (including blank, beginning-of-line, and end-of-line), but the characters must not be letters or digits. All symbols are permissible delimiters. Delimiters need not be identical; for example, a string can be preceded by a blank and followed by a slash.

VETO Keyword; permits the user to approve deletions before they occur. The line to be deleted is displayed at the terminal. Enter:

YES to delete the line.

CONTINUE to delete the line and any subsequent lines which satisfy the requirements specified in the DELETE command.

Any characters other than the above to retain the line.

The DELETE command must include ALL, LAST, or at least one line number.

When a text search string is specified, a message reports the number of deletions performed:

n DELETIONS

n is the number of lines deleted. No more than 20 characters can be entered as a text search string; the string is truncated to the first 20 characters. An informative message is displayed at the terminal, and VETO automatically takes effect. Each line that satisfies the search conditions is displayed. Enter the VETO responses given previously.

If a LIST with no parameters is entered after a line has been deleted, the system resonds with the message

NO SUCH LINES

as the current line pointer continues to point to the deleted line.

%A can be entered to terminate execution of a DELETE command. However, the edit file may be left with only some of the specified lines deleted since termination occurs immediately whether or not all specified lines have been deleted.

Examples:

To delete line 100 in the edit file:

```
..delete 100                    Enter DELETE,line-1.
..                              EDITOR is ready for next command.
```

To delete from lines 200 through the last line, only if the character string AX appears in columns 7 through 72:

```
..d /ax/ (7,72) 200,1           Enter DELETE,/text/,(col-1,col-2),line-1,LAST.

     2 DELETIONS                System displays message.
..                              EDITOR is ready for next command.
```

To delete all lines from line 100 through line 200:

```
.. d 100 200                    Enter DELETE,line-1,line-2.
..                              EDITOR is ready for next command.
```

To delete all lines in the edit file so that a new file may be constructed:

```
..d a                           Enter DELETE,ALL.
..                              EDITOR is ready for next command.
```

To delete with veto power all lines in the edit file only if they contain the character C in column 1 as a unit:

```
..d,a,/c/,(1),u,v               Enter DELETE,ALL,/text/(col-1),UNIT,VETO.
    20=C BEGIN DO LOOP          System displays qualifying line.
n                               Elect to retain line.
    50=C END SCAN               System displays qualifying line.
n                               Elect to retain line.
     0 DELETIONS                System message; all qualifying lines display, none deleted.
..                              EDITOR is ready for next command.
```

RESEQ COMMAND

The RESEQ command resequences the line numbers in the edit file.

RESEQ [,line [,incr]]

line — First line number of new sequence; one through six digits, from 1 through 999999. If omitted, system assumes installation-defined first line number.

incr — Increment value; one through six digits, from 1 through 999998. If omitted, system assumes installation-defined increment value.

On acceptance of this command, EDITOR resequences all line numbers in the edit file. New line numbers are written over existing line numbers, and the current line number pointer is reset to the first line number in the file.

BASIC program files cannot be resequenced with this command; if the BASIC format specification is in effect, the RESEQ command is illegal. (Refer to the BRESEQ command in section 3).

The RESEQ command can be terminated by a %A; however, the result may be a partially resequenced edit file that should be resequenced before further editing.

Examples:

To resequence the edit file with first line number of 100 and increment value of 100:

```
..re 100,100                    Enter RESEQ,line,incr.
..                              EDITOR is ready for next command.
```

To resequence with installation-defined first line number and increment value:

```
..re                            Enter RESEQ.
..                              EDITOR is ready for next command.
```

TEXT REPLACEMENT COMMAND

The text replacement command replaces text strings in lines of the edit file.

/text-1/=/text-2/ [, {ALL / line-1 / LAST} [, {line-2 / LAST}]] [,(col-1 [,col-2])] [,UNIT] [,VETO]

/text-1/=/text-2/	Text strings; equals sign must be specified with no spaces on either side.
/text-1/	Text search string; 1 through 20 characters delimited by slashes or an equivalent delimiter. File is searched for this string (search can be restricted to a range of line and column numbers). Refer to Text String Delimiters in table 4-1.
/text-2/	Text replacement string; 0 through 20 characters delimited by slashes or an equivalent delimiter. Replaces text search string when conditions of the search are satisfied. Refer to Text String Delimiters in table 4-1.
ALL	Keyword; causes a search of all lines in the edit file.
line-1	Line number; one through six digits, from 1 through 999999; first or only line to be searched.
line-2	Line number; one through six digits, from 2 through 999999; last line to be searched in a range beginning at line-1.
LAST	Keyword; when LAST is the first parameter, a search is made of the last line in the file; if it is the second parameter, a search is made beginning at line-1 through the last line in the file.
col-1	Column number; one through three digits, from 1 through 510; first or only column to be searched. Must be preceded by a left parenthesis and followed by either col-2 or a right parenthesis.

col-2 — Column number; one through three digits, from 2 through 510; last column to be searched in a range beginning at col-1. Must be greater than col-1 and followed by a right parenthesis. The range must be at least equal to the number of characters in the text search string. Replacement takes place only if the text string occurs within the column range or if the text string begins in col-1, when a single column is specified.

UNIT — Keyword; dictates that the text search string appear as a unit within a line; the text string must be delimited by some characters (including blank, beginning-of-line, and end-of-line), but the characters must not be letters or digits. All symbols are permissible delimiters. Delimiters need not be identical; for example, a string can be preceded by a blank and followed by a slash.

VETO — Keyword; permits the user to approve text replacement before it occurs. The changed form of the line is displayed at the terminal. Enter:

YES to accept the change.

CONTINUE to accept the change and any subsequent changes which satisfy the requirements specified in the text replacement command.

Any characters other than the above to retain the original line.

When the text replacement command is entered with no parameters, the search is performed on the line to which the current line pointer is set.

The number of replacements performed are reported in a message:

n CHANGE(S)

n is the number of changes made. Because more than one replacement can occur in any line, the number of changes displayed can differ from the number of lines changed.

The two text strings specified need not contain the same number of characters; the line affected is expanded or contracted as necessary. If the maximum character count is exceeded, truncation occurs, and an informative message is displayed.

When a text replacement string is entered as a null string (two consecutive slashes, no embedded blanks), the text search string is deleted if all search conditions are satisfied.

No more than 20 charcters can be entered as a text search or text replacement string; the string is truncated to the first 20 characters. An informative message is displayed at the terminal, and VETO automatically takes effect. The changed form of each line that satisfies the search conditions is displayed; enter the VETO responses given previously.

The text replacement command cannot be used to edit a tabulation character (FORMAT command) into an existing line. Such an entry is accepted as a data character; no tabulation occurs.

Examples:

To replace the variable name AX with the name BZ in the current line, AX must be a unit:

```
../ax/=/bz/,u                          Enter /text-1/=/text-2/,UNIT.
         1 CHANGE(S)                   System displays message.
..                                     EDITOR is ready for next command.
```

To replace all occurrences of the character string TCS in the edit file with the string TERMINAL CONTROL SYSTEM. (Two text replacement commands must be entered since the replacement string is greater than 20 characters.) The user requests veto power:

```
../tcs/=/terminal control sy./,a,v     Enter /text-1/=/text-2/ALL,VETO.

    60=THE TERMINAL CONTROL SY. HAS THE System displays change.

y                                      Accept change.

   190=IN THE TERMINAL CONTROL SY. USERS System displays change.

yes                                    Accept change.

  2000= ***TERMINAL CONTROL SY. ABORT*** System displays change.

n                                      Retain original line.
                                       System displays message.
         2 CHANGE(S)                   Enter
../sy./=/system/,60,190,u              /text-1/=/text-2/,line-1,line-2,UNIT.
         2 CHANGE(S)                   System displays message.
..                                     EDITOR is ready for next command.
```

To replace the character C with the character * only if C appears as a unit in column 1. All lines are searched:

```
                                       Enter
../c/=/*/ a (1) u                      /text-1/=/text-2/,ALL,(col-1),UNIT.
        15 CHANGE(S)                   System displays message.
..                                     EDITOR is ready for next command.
```

To replace the character string PROGRAM in line 2310 with a null string (line currently appears as 2310=END PROGRAM); the user requests veto power:

```
../program/=//,2310,v                  Enter /text-1/=/text-2/,line-1,VETO.
  2310=END                             System displays change line.
y                                      Accept change.
         1 CHANGE(S)                   System displays message.
..                                     EDITOR is ready for next command.
```

FILE STORAGE AND DISPLAY

EDIT COMMAND

The EDIT command loads a local file into the edit file.

EDIT,lfn[,SEQUENCE]

lfn	Name of file to be edited; required immediately following the command verb.
SEQUENCE	Keyword; EDITOR line numbers are assigned to each line as they are entered into the edit file. If omitted, system assumes that EDITOR line numbers already exist in the local file.

The file name can be any coded sequential file to which the user has read access, including local and attached permanent files. The file to be loaded is called the source file; it is not modified by execution of the EDIT command. Only coded sequential files can be used in EDITOR. An attempt to edit a binary file or a file that is not in standard format (record type equals Z) generates the error message:

ERR - INVALID FILE TYPE FOR EDITOR

If the user enters the EDIT command when the edit file contains information that has not been saved as a local file since it was last modified, EDITOR ignores the command and displays the message:

WARNING-EDIT FILE NOT SAVED

The file can be saved by entering the SAVE command; if the contents of the edit file need not be retained, reenter the EDIT command. In the latter case, the contents of the edit file are destroyed.

When loading a file created outside of EDITOR, SEQUENCE must be specified to append EDITOR line numbers to the file. When SEQUENCE is specified, EDITOR line numbers beginning with the installation-defined first line number are appended to each line of the file. The source file is not affected; line numbers appear only in the edit file. Consequently, the length of each line in the edit file is increased by six characters. Because edit file lines are restricted to a maximum of 510 characters, truncation can occur; if so, an informative message is displayed.

When BASIC format specifications are in effect, the keyword SEQUENCE is not allowed since BASIC programs are by definition sequenced. The BASIC statement numbers serve as EDITOR line numbers.

Multirecord files and multifile sets can be loaded for editing. On encountering an end-of-record in the source file, the character string *EOR is assigned a sequential line number and written in the edit file to indicate an end-of-record condition. If the end-of-record is of level nn (nn zero), a character string *EOR,nn is generated. For end-of-file, the character string *EOF is generated.

Example:

To load the local file named AFIL into the edit file:

```
..e afil                                Enter EDIT,lfn.
..                                      EDITOR is ready for next command.
```

To load the local file BFIL into the edit file with line number sequencing:

```
..e,bfil,s                              Enter EDIT,lfn,SEQUENCE.
..                                      EDITOR is ready for next command.
```

SAVE COMMAND

The SAVE command loads the edit file into a local file on a permanent file device; the edit file remains unaffected.

SAVE,lfn[,NOSEQ] [,OVERWRITE] [,MERGE][,{ALL / line-1 / LAST}[,{line-2 / LAST}]]

[,/text/ [,(col-1[,col-2])] [,UNIT]] [,VETO]

lfn	Name under which edit file is saved as a local file; required immediately following the command verb.
NOSEQ	Keyword; causes EDITOR line numbers to be suppressed in local file.
OVERWRITE	Keyword; causes any local file of the same file name to be overwritten.
MERGE	Keyword; causes the entire edit file or selected portions of it to be saved and followed by an end-of-record. The named file remains positioned immediately after the end-of-record.
ALL	Keyword; all lines in the file are saved or searched for the text search string.
line-1	Line number; one through six digits, from 1 through 999999; first or only line to be saved.
line-2	Line number; one through six digits, from 2 through 999999; last line to be saved in a range beginning at line-1
LAST	Keyword; when LAST is the first parameter, the last line in the file is saved; when it is the second parameter, the file is saved beginning at line-1 through the last line in the file.
/text/	Text search string; 1 through 20 characters delimited by slashes or an equivalent delimiter; file is searched for this text string (search can be restricted to a range of line and column numbers). Lines containing the text string are saved. Refer to Text String Delimiters in table 4-1.
col-1	Column number; one through three digits, from 1 through 510; first or only column number of a text string search. Must be preceded by a left parenthesis and followed by either col-2 or a right parenthesis.

col-2 Column number; one through three digits, from 2 through 510; last column number of a text string search beginning in col-1. Must be greater in value than col-1 and followed by a right parenthesis. The range of columns must be at least equal to the number of characters in the text string.

Column specification is significant only if a text search string is specified. Lines are saved only if the text string occurs within the column range.

UNIT Keyword; dictates that the text search string appear as a unit within a line; the text string must be delimited by some characters (including blank, beginning-of-line, and end-of-line), but the characters must not be letters or digits. All symbols are permissible delimiters. Delimiters need not be identical; for example, a string can be preceded by a blank and followed by a slash.

VETO Keyword; permits the user to approve each line before it is saved on the file specified. The line to be saved is displayed at the terminal. Enter:

YES to save the line.

CONTINUE to save the line and any subsequent lines which satisfy the requirements specified in the SAVE command.

Any characters other than the above to indicate that the displayed line is not to be saved.

When the SAVE command is entered with no selective parameters, all lines are saved.

The entire file or part of it is saved as a sequential mass storage file followed by an end-of-record. SAVE does not write an end-of-file. The file is repositioned to beginning of information unless MERGE has been specified. The line length in the saved file is determined by the format specification currently in effect at the terminal. Lines are blank filled or truncated accordingly unless the variable length line specification (CH=999) is in effect or NOSEQ is specified. If truncation is necessary, a message indicates the length of the longest line encountered; if truncation is not desired, change the format character count and reenter the SAVE command. The SAVE command does not destroy the edit file.

If the keyword OVERWRITE has not been specified, and a local file exists with the same file name, the SAVE command is ignored and an error message is displayed. An attached permanent file cannot be overwritten.

If the keyword MERGE is specified, many files or parts of files can be merged under one file name. Load a local file into the edit file, and enter the SAVE command with MERGE and any other selective parameters. Specification of NOSEQ is advisable to avoid a conflict in sequence numbers. After the SAVE operation, the named file consists of lines selected from the edit file, followed by an end-of-record. The saved file remains positioned at the end-of-record.

This procedure can be repeated until the new file is complete. The end-of-record generated between merged files can be deleted later by the DELETE command if necessary. If two edit files are to be saved on a local file, both SAVE commands must be entered with a MERGE parameter.

No more than 20 characters can be entered as a text search string; the string is truncated to the first 20. An informative message is displayed at the terminal, and VETO automatically takes effect. Each line that satisfies the search conditions is displayed. Enter the VETO responses given previously.

Examples:

To save the edit file under the file name FTNPRG:

```
..s,ftnprg                    Enter SAVE,lfn.
..                            EDITOR is ready for next command.
```

To save the edit file in place of an existing local file named FTNDATA, with a line length of 400 characters and no EDITOR line numbers:

```
..f,ch=400                    Enter FORMAT,CH=nnn.
..s,ftndata,o,n               Enter SAVE,lfn,OVERWRITE,NOSEQ.
..                            EDITOR is ready for next command.
```

To save all lines between line 10 and 100 which have the character * in column 1:

```
..s,aaa,10,100,/*/,(1)        Enter SAVE,lfn,line-1,line-2/text/,col-1.
..                            EDITOR is ready for next command.
```

To merge a portion of file MAINA and all of files SUB1 and SUB2 into a single file named COMBO which contains a main program and two subroutines:

```
..ed,maina                    Enter EDIT,lfn.
..s,combo,m,100,1,n           Enter SAVE,lfn,MERGE,line-1,LAST,NOSEQ.
..e,sub1                      Enter EDIT, lfn.
..s,combo,n,m                 Enter SAVE,lfn,NOSEQ,MERGE.
..e,sub2                      Enter EDIT,lfn
..s,combo,m,n                 Enter SAVE,lfn,MERGE,NOSEQ.
..                            EDITOR is ready for next command.
```

The merged file COMBO can be loaded into the edit file with line number sequencing for examination or editing and then be saved as a local file using the OVERWRITE parameter.

```
..e,combo,s                   Enter EDIT,lfn,SEQUENCE.
     .                                .
     .                                .
     .                                .
..s,combo,o                   Enter SAVE,lfn,OVERWRITE.
..                            EDITOR is ready for next command.
```

LIST COMMAND

The LIST command displays all or selected portions of the edit file at the terminal.

$$\underline{\text{LIST}}\left[,\ \left\{\begin{matrix}\underline{\text{ALL}}\\ \text{line-1}\\ \underline{\text{LAST}}\end{matrix}\right.\left[,\ \left\{\begin{matrix}\text{line-2}\\ \underline{\text{LAST}}\end{matrix}\right\}\right]\right\}\right]\ [,\underline{\text{SUP}}]\left[,/\text{text}/\left[,(\text{col-1}[,\text{col-2}])\right]\right]\ [,\underline{\text{UNIT}}]$$

ALL	Keyword; all lines in the file are listed or searched for the text search string.
line-1	Line number; one through six digits, from 1 through 999999; first or only line to be listed or searched.
line-2	Line number; one through six digits, from 2 through 999999; last line to be listed or searched in a range beginning at line-1.

LAST — Keyword; when LAST is the first parameter, the last line in the file is displayed or searched; if it is the second parameter, the listing or search begins at line-1 and continues through the last line in the file.

SUP — Keyword; suppresses EDITOR line numbers from list displayed at terminal.

/text/ — Text search string; 1 through 20 characters delimited by slashes or an equivalent delimiter; file is searched for this text string (search can be restricted to a range of line and column numbers). Lines containing the text string are listed at the terminal. Refer to Text String Delimiters in table 4-1.

col-1 — Column number; one through three digits, from 1 through 510; first or only column number of a text string search. Must be preceded by a left parenthesis and followed by either col-2 or a right parenthesis.

col-2 — Column number; one through three digits, from 2 through 510; last column number of a text string search in a range beginning in col-1. Must be greater in value that col-1 and followed by a right parenthesis. The range of columns must be at least equal to the number of characters in the text search string.

Column specification is significant only if a text search string is specified. Lines are listed only if the text string occurs within the col-1 to col-2 range, or if it begins in col-1 when only a single column is specified.

UNIT — Keyword; dictates that the text search string appear as a unit within a line; the text string must be delimited by some characters (including blank, beginning-of-line, and end-of-line), but the characters must not be letters or digits. All symbols are permissible delimiters. Delimiters need not be identical; for example, a string can be preceded by a blank and followed by a slash.

If the LIST command is entered with no parameters, the current line is listed. The current line to which the edit file pointer is set is the last line displayed, inserted, or deleted unless a resequencing has occurred or a new file has been loaded into the edit file, in which case, the first line of the file is displayed.

No more than 20 characters can be entered as a text search string; the string is truncated to the first 20. An informative message is displayed at the terminal, followed by the lines that satisfy the search conditions.

Unless the SUP parameter is specified, lines which satisfy the LIST command requirements are displayed in the form:

line number=text line

Examples:

To list lines 100 through 200 of the edit file and then the current line:

```
..1 100 200                    Enter LIST,line-1,line-2.

   100=THE EDIT FILE           System lists appropriate lines.
   110=CAN CONTAIN MANY
   120=KINDS OF INFORMATION
..1                            Enter LIST.

   120=KINDS OF INFORMATION    System lists current line.
..                             EDITOR is ready for next command.
```

To list all lines in the edit file containing the variable CDC as a unit:

```
..l,a /cdc/ u
```

Enter LIST,ALL,/text/UNIT.

```
   100=       PROGRAM CDC (OUTPUT)
   620=       PRINT * (CDC FILES)
..
```

System lists all lines which satisfy command requirements.
EDITOR is ready for next command.

To list each occurrence in the edit file of the character I:

```
..l,a,/i/
```

Enter LIST,ALL,/text/.
However, UNIT is not specified.

```
    10= INPUT DATA
    50= INPUT/OUTPUT DATA
   100= TIME IN
   200= TIME OUT
..
```

System lists all lines which satisfy command requirements.

EDITOR is ready for next command.

COMPILATION AND EXECUTION

RUN COMMAND

Using the RUN command, a program in either the edit file or a local file can be transferred to one of the available systems for assembly or compilation and execution.

RUN,language [,FILE=lfn] [,NOEX] [,SUP]

language — Compiler or assembler name; must be one of the following:

ALGOL	ALGOL compiler.
BASIC	BASIC compiler.
COBOL	COBOL Version 4 compiler.†
COMPASS	COMPASS assembler.
FTN4	FORTRAN Extended Version 4 compiler.† †
FTN5	FORTRAN Version 5 compiler.† † †

FILE=lfn — Name of local file to be transferred. If omitted, contents of the edit file are transferred for compilation or assembly.

NOEX — Keyword; inhibits execution. If omitted, execution is performed.

† The COBOL Version 4 compiler with the D option is called.
† † The TIME-SHARING FORTRAN option is called if it has been installed.
† † † OPT=0 is called.

SUP Keyword; suppresses nonfatal and informative diagnostics from list displayed at the terminal (ineffective on BASIC compilations). If omitted, system displays all messages.

When fatal errors are encountered during assembly or compilation, the lines containing errors (fatal and nonfatal), the EDITOR line numbers, and the diagnostics are listed at the terminal. Nonfatal diagnostics can be suppressed from the list.

If no errors are encountered, execution begins (unless explicitly inhibited). The user's field length is reduced to the minimum required for execution after the program is loaded. When running ALGOL programs, the user should prevent field length reduction by using the REDUCE command (section 3).

Interaction

During execution of ALGOL, BASIC, COBOL, COMPASS, or FORTRAN programs, the terminal user can interact with the executing program (section 5). Output can be received at the terminal and data can be input to the executing program from the keyboard. If a teletypewriter has a paper tape punch and reader, a program can call for input from paper tape with pauses (X-OFF) for output to the terminal. The INPUT and OUTPUT files are connected to the terminal, and all I/O requests for these files are directed to the terminal. These files can be disconnected and reconnected, and other files can be connected, by requests from the executing program.

The executing program pauses when input is expected. It is helpful if the program contains a signal to the terminal user that input is expected and indicates the type of input. For example, a PRINT statement can be included just prior to a READ statement in a FORTRAN program. In COBOL programs, a question mark is displayed at the terminal whenever a READ or ACCEPT statement requests input from the terminal; the BASIC INPUT statement also displays a question mark.

Dayfile messages generated by the program and execution diagnostics also can be listed at the terminal as detailed in section 5.

Two local user files are generated, or overwritten, when the RUN command is executed, OUTPUT and LGO. For the COMPASS assembler and all compilers except BASIC, the file OUTPUT contains the compilation listing for the user's program. This file can be printed at the central or remote site if a listing of the program is desired, or it can be examined at a terminal with the INTERCOM command, PAGE (section 3). Compile time output from the FORTRAN Extended compiler is suppressed when the RUN command is in use. For BASIC, file OUTPUT is connected to the terminal, and either compilation diagnostics or execution time data is written to it.

The file LGO contains the binary code generated by the assembler or compilers: this file can be executed later in the current terminal session without reassembling or recompiling the program. For BASIC compilations, LGO is not generated.

When the edit file is to be run, it is copied to a system file and transferred to the compiler or assembler. The length of the lines copied to the system file is restricted by the format specification in effect at the terminal. All lines are blank-filled or truncated to conform to the maximum character count. Regardless of the final line length, the language processor examines no more than 72 characters. If truncation occurs, a displayed message gives the length of the longest line encountered.

Examples:

To compile a BASIC program contained in the edit file (an error is encountered by the compiler):

```
..ru b                          Enter RUN,language.
ILLEGAL STRING IN 330           Compilation error message is displayed.
..                              EDITOR is ready for next command.
```

To complile and execute a FORTRAN Extended program contained in the local file XPROG; the executing program requests input data, processes data, and displays results:

```
..ru,f=xprog,ftn                Enter RUN,FILE=lfn,language.

ENTER 2 DIGIT INTEGER  13       Program request; enter data.
THE CUBE OF  13 IS  2197        Program displays result of computation.
..                              EDITOR is ready for next command.
```

To assemble and execute a COMPASS program contained in the edit file (an arithmetic error terminates the job during execution):

```
..run comp                                          Enter RUN,language.
 ARITHMETIC ERROR  MODE=1  ADDRESS=023427           System displays message.
..                                                  EDITOR is ready for next command.
```

To compile a COBOL program contained in the local file PAYROLL and then save the LGO file as a permanent file under the name PAYBIN (execution is inhibited):

```
..ru f=payroll cobol n          Enter RUN,FILE=lfn,language,NOEX.

..batch,lgo,rename,paybin       Enter INTERCOM command to rename the LGO file.

..store,paybin,abc              Enter INTERCOM command to create a permanent
                                file.
..                              EDITOR is ready for next command.
```

Stopping Execution

The execution of a program can be terminated at any time. Control returns to the EDITOR command mode.

At a teletypewriter, press the ESC key to interrupt output if necessary and then enter %A followed by RETURN. At a display terminal, press the % key followed by A and SEND.

```
%a
USER ABORT
..
```

The program currently executing terminates, and control is returned to EDITOR command mode. Contents of the edit file are not affected by a user abort.

INTERACTIVE USER PROGRAMS 5

INTERCOM allows a user to interact with an executing program. The program can be initiated by the EDITOR RUN command or by system control statements requesting execution of the program. Terminal communication can take place through ALGOL, BASIC, COBOL, COMPASS, and FORTRAN programs. This section describes the interface for these languages and is not necessary for use of the INTERCOM/EDITOR commands in sections 3 and 4.

TERMINAL INTERACTION

During normal program execution, files referenced by a user program usually reside on mass-storage devices. If a program is initiated from a terminal, any file can be connected to the terminal; the executing program then communicates with the terminal rather than with the mass-storage device. A file can be subsequently disconnected; it then reverts to mass storage. This concept of connecting and disconnecting files between mass storage and the terminal allows a program to be written which operates normally when submitted as a batch job and interactively when initiated from a terminal.

Files can be connected and subsequently disconnected by CONNECT and DISCONT commands entered at the terminal, by calling connect or disconnect routines from the user's program, or with the EDITOR RUN command.

For the inexperienced user, the EDITOR RUN command is simple and easy to use. This command connects the files INPUT and OUTPUT to the terminal. Additional files can be connected and disconnected by using the subroutines provided in the FORTRAN Extended compiler. These subroutines allow the user to change the destination of files from mass storage to the remote terminal. However, if the program is submitted as a batch job, the connect and disconnect calls are ignored and the program executes normally using mass storage files.

Once a file is connected, any input or ouput on that file is routed to or from the user's terminal until the file is disconnected. An output statement on a connected file sends the output to the terminal; an input statement on a connected file causes the program to receive data from the terminal. If no input is available, the statement normally waits until input is entered. COMPASS programs can elect to continue execution even if data is not available. Multiple entries can be buffered from the terminal for automatic input to the program. Normally, INTERCOM passes only the next line of input to the requesting program. However, a COMPASS program can select multiline input mode by setting the multiline bit in the FET. In multiline mode, the program receives all lines entered since the last read each time a read is executed. This input is limited by a line length of approximately 5600 characters, by the space available in the input buffer up to approximately 15 000 characters, or by an end-of-record or end-of-information. Because INTERCOM does not indicate to the terminal user when input is expected from the terminal, it is helpful if the user's program, written in a language other than BASIC or COBOL, sends a prompting message. An output statement containing this message can be included before each input statement in the user's program. For BASIC programs, a question mark is sent to the terminal for each INPUT statement; for COBOL programs, the question mark is sent for each ACCEPT statement or READ statement if the file to be read is a connected file.

Any local file, including attached permanent files, can be connected to the terminal. If no file of the name specified exists, one is created on execution of the connect request. Each user has an installation-defined maximum limit to the number of files that can be in use at one time, whether connected or not. Duplicate connects or disconnects have no effect on the file, and a connect-disconnect sequence does not alter the contents or positioning of the original file. Requests for nonbinary input/output should be issued on connected files; however, binary input/output requests are treated the same as coded requests.

End-of-record and end-of-file signals can be sent to executing programs by entering %EOR or %EOF, respectively. When used, the character string must be the only input on the line and must be terminated by a return.

DATA FORMATS

All interactive data transmitted to or from a user program is formatted into lines. A line is a string of characters left-justified in one or more central memory words and ending with a line terminator. The line terminator is 12 zero bits in the rightmost byte of the last central memory word of the line. On output binary, zero characters immediately preceding the line terminator are discarded. Similarly, on input, binary zero characters are used to pad the line to an integral number of central memory words.

Data is normally transmitted to and from a user program in display code with a 63- or 64-character set, depending on installation option. Programs written in COMPASS and FORTRAN can, in addition, elect to use ASCII with a 95- or 256-character set. This selection may be made on a line-by-line basis. Table 5-1 summarizes the data formats available at the various INTERCOM terminals.

TABLE 5-1. DATA FORMAT/TERMINAL SUMMARY

Mode	Terminal	Format		
		Display Code	ASCII-95	ASCII-256
Wideband	777 IGS 274 IGS	64-character display code	64-character ASCII subset	64-character ASCII subset
4A	200 UT 73x-12 734	64-character display code	64-character ASCII subset	64-character ASCII subset
4C	711 714	64-character display code	95-character ASCII subset	95-character ASCII subset
2	73x-10	64-character display code	95-character † ASCII subset	95-character † ASCII subset
3	Teletype 713 751	64-character display code	95-character † † ASCII subset	256-character † † ASCII subset

† The 733-10 CRT displays only 64 characters, although 95 can be sent from the keyboard and received by the display unit.

† † The model 38 Teletype is the only model to use the full 256-character ASCII set. Models 33 and 35 use the 64-character subset of ASCII-95 plus control codes.

Display Code

Display code is the default character set when communicating with a terminal.

For input, ten 6-bit display code characters are stored in each central memory word. INTERCOM processes control codes received from the terminal and performs character backspacing and line deletion for the user program. Control codes not meaningful to INTERCOM are not passed to the user program.

For output, ten 6-bit display code characters are taken from each central memory word. The first character of each line is used as a carriage control character. If the user program is written in COBOL or BASIC, a blank is supplied as the first character of every output line. If the line is longer than the carriage width of the terminal, a carriage return and line feed are supplied so that excess characters are output on a subsequent line.

ASCII-95

ASCII-95 is a 95-character graphics subset of ASCII-256. Processing is essentially the same as display code. ASCII-95 can be used at all terminals except interactive wideband terminals. However, ouptut to a terminal which can receive only 64 characters is folded into the 64-character uppercase subset of ASCII (refer to appendix A). Similarly, input received from a terminal which can generate only 64 characters consists of uppercase characters only.

For input, five 7-bit characters are stored in each central memory word. The upper 5 bits of each 12-bit byte are zero. Control codes are processed by INTERCOM in the same manner as display code.

For output, five 7-bit characters are taken from each central memory word. Each character is taken from the lower 7 bits of a 12-bit byte. The upper 5 bits of the 12-bit byte are not significant to INTERCOM, except in the case of line terminators where the entire 12-bit byte must be zero. The first character of each line is used for carriage control. Excess line width is processed in the same manner as display code. All control codes, except carriage control, are ignored and not output to the terminal.

ASCII-256

The ASCII-256 data format allows the user program access to the full ASCII character set including control codes and parity. It is valid only at model 38 Teletype Terminals and Teletype Compatible Terminals. On other terminals, a request for this format is interpreted as a request for ASCII-95 format.

For input, five 8-bit characters are stored in each central memory word. The upper 4 bits of each 12-bit byte are zero. Neither parity checking nor control code processing is performed by INTERCOM. Under ASCII-256 format, all characters input from the keyboard, including the CR character which delimits the logical line, are transferred to the user program. During paper tape input, all CR, LF, NUL, DEL, and DC3 (X-OFF) characters following the CR or LF are deleted by INTERCOM until the first non-CR, LF, NUL, DEL, or DC3 character is encountered (beginning of the next physical line).

For output, five 8-bit characters are taken from each central memory word. Each character is taken from the lower 8 bits of a 12-bit byte. The upper 4 bits are not significant to INTERCOM, except in the case of line terminators where the entire 12-bit byte must be zero. No parity generation, carriage control, or line overflow processing is performed by INTERCOM.

OUTPUT PAGING

Normally, output format must be selected to fit the terminal that is to receive that output. This is especially true of display terminals for, unlike teletypewriters, hardcopy is not always available. Additionally, a variety of page formats (screen sizes) is available with the various display terminals. Consequently, a program intended for use at a varicty of terminals would normally have to accommodate these variations. To relieve the user program of this task, INTERCOM performs the function of waiting at the end of each output page until the user at the terminal requests the next page. This allows a program to be written identically for teletypewriter and display terminals.

INTERCOM enters a page-wait at a display terminal if a full screen of information has been displayed since the last input from the terminal or if a CLEAR WRITE or RESET WRITE carriage control character immediately follows an output to the terminal. Once in page wait, an input from the terminal is required before the next page is displayed. This input can be an empty line; if so, it is not passed on to the user program. Since an empty line cannot be entered from an ASCII display terminal, INTERCOM ignores any single character input line from these terminals if the terminal is in page wait.

Appendix D lists carriage control characters and their effect on output paging. In addition, the characters Q and R can be used as carriage control characters as follows: Q causes INTERCOM to temporarily suspend automatic page-wait; R or the end of the program reinitiates the page-wait.

ASSIGNMENT OF PROGRAM FIELD LENGTH AND TIME LIMITS

An interactive user program is assigned a default field length and execution time specified by the installation. If a program requires additional field length or time, the INTERCOM EFL or ETL command can be entered before initiating the program. Similarly, if the program requires substantially less field length or time, an EFL or ETL command for the correct field length or time can be entered to improve system efficiency or minimize wasted system time in case of a program loop.

After execution begins, the executing program can change its field length dynamically by issuing a call to the system peripheral processor routine MEM (refer to the MEMORY macro in the NOS/BE Version 1 Reference Manual) or to CMM (refer to the Common Memory Manager Reference Manual). MEM cannot be used to request field length in ECS.

A program is never assigned more field length or more time than the maximum specified in the user's password file entry (the MAX FL or TIME LIMIT values displayed by ASSETS).

Section 3 contains information on the use of the EFL and ETL commands.

CARRIAGE CONTROL

Carriage control characters are required to control the spacing of data routed to the terminal. A carriage control character should be included as the first character of each terminal output line issued from any program (the COBOL DISPLAY verb and the BASIC PRINT statement supply them). If the character is omitted, results are unpredictable. The carriage control characters are described in appendix D.

PROGRAMMING LANGUAGE INTERACTION

The following sections describe the interactive capabilities of each programming language.

ALGOL

ALGOL 4 provides both an interactive syntax checker (ALGEDIT) for creation, modification, and syntax checking of source programs, and interactive debugging aids (AIDA) for execution time checking of compiled programs. These facilities are described in the ALGOL Version 4 Reference Manual.

ALGOL programs and the terminal communicate through connected files using input/output procedures. Within the ALGOL program itself, files are referenced by means of channel numbers. Channel numbers 60 and 61 are predefined to reference INPUT and OUTPUT, respectively (INALG and OUTALG under AIDA). Any other channels used in the program must be defined through channel statements. No channel statements are required if only the default channels are utilized. The channel must occupy a separate section on INPUT or on another file specified by the execution control statement option C. Files cannot be connected or disconnected within an ALGOL program; the commands CONNECT and DISCONT must be used. (The EDITOR RUN command connects INPUT and OUTPUT.)

The specified channel must have a formatting area; therefore, the CHANNEL definition must contain the C parameter (default). Output channels should be defined as paged (PPs parameter). Paging should not be specified for input channels, nor should it be entered as PP0. A file previously used for mass storage input should not be connected as data can be lost.

The following features of ALGOL input/output should be noted. A user logical record (line) can be built character by character over several procedure calls. On output to the terminal, a line feed is necessary to ensure termination and transmission of an output message. A partial line on channel n is not transmitted until OUTPUT (n, (/)), OUTPUT (n,"("/")") in ASCII, or equivalent is encountered. Similarly on input (particularly for free format routines such as INREAL), not every procedure call causes a wait for input on the terminal. If the last line entered for that channel has not been exhausted by the program, the new input processes the contents of that line before waiting for further input. Automatic field reduction must have been disabled prior to executing the program (refer to the REDUCE command).

BASIC

A BASIC program normally communicates with the terminal user through PRINT and INPUT statements. By default, file OUTPUT is associated with the PRINT statement, and file INPUT is associated with the INPUT statement. BASIC's J and K control statement parameters allow other file names to be associated with INPUT and PRINT statements. Files INPUT and OUTPUT are connected to the terminal when BASIC is executed via the EDITOR RUN,BASIC command. These files or the files named in the J and K parameters must be explicitly connected using the CONNECT command when BASIC is executed via the BASIC control statement or EDITOR XEQ command.

When the files are connected, a prompt character (question mark) is printed each time an INPUT statement is executed. All data in the PRINT buffer is flushed (printed at the terminal). It is good practice to PRINT a message specifying the type and number of data items expected by each INPUT statement. Error diagnostics result if too much, too little, or the wrong type of data is entered.

BASIC automatically provides a single space carriage control character on each line created by PRINT. The program cannot access or alter this character.

BASIC's file I/O statements PRINT and INPUT can also be used to communicate with the terminal user if the files referenced are explicitly connected via CONNECT commands. Unless these files are also the PRINT and INPUT statement's files (INPUT and OUTPUT or the files named by the J and K parameters), automatic prompting, buffer flushing, and carriage control do not apply.

COBOL

The Procedure Division verbs, ACCEPT and DISPLAY, provide communication between COBOL programs and the terminal user. These verbs are specified in the form:

```
ACCEPT identifier FROM mnemonic-name

DISPLAY { identifier-1 } [ { identifier-2 } ]   ... UPON mnemonic-name
        { literal-1    }   { literal-2    }
```

identifier-n is an elementary or group item, literal-n is numeric or nonnumeric, and mnemonic-name is equated with the terminal in the TERMINAL IS clause in the SPECIAL-NAMES paragraph of the Configuration Section in a COBOL program. The question mark is displayed at the terminal for each ACCEPT FROM statement encountered during execution. It is helpful if the user precedes each ACCEPT FROM statement with a DISPLAY UPON statement briefly describing the type of input required. Carriage control characters should not be specified in a DISPLAY UPON statement as they are supplied automatically.

Files must be connected before program execution; subroutines have not been provided for connecting and disconnecting files from COBOL programs. Once the input and output files named in the COBOL SELECT clauses have been connected, the READ and WRITE statements access the terminal rather than the input or output peripheral device. At this point, READ and WRITE function in the same manner as ACCEPT and DISPLAY.

The print file must be declared as OUTPUT in the SELECT clause and OUTPUT must be connected if execution diagnostics are to be displayed at the terminal.

COMPASS

Requests for terminal input and output from a COMPASS program are made through calls to CIO (circular buffer input/output) directly or through either the CPC subroutine or CYBER Record Manager. Prior to making a CIO call, a file environment table (FET) for the input/output file must have been created. The file should be connected to the terminal so that the device type in the system file table specifies a remote terminal.

To connect or disconnect a file, issue CONNECT or DISCONT commands or call the peripheral processor routine CON from the program. All requests from the user to the system are made through relative location 1 of the user's program (absolute location RA+1); the call to CON follows.

In RA+1:

Bit	Description
59-42	CON in display code.
40	1 indicates auto recall.
35-24	Zero indicates connect, and nonzero indicates disconnect.
17-0	Address of parameter word X.

In RA+X:

Bit	Description
59-18	File name in display code (left-justified, with zero fill).
1	Set if CON detects an error, such as an illegal file name.
0	Set on completion.

Requests for READ and WRITE on connected files can be issued directly or through system macros. Input and output requests should be in coded mode. Bit 1 of the code-and-status field in the FET must be set to zero when the input/output request is made. The mode of the file is specified by bit 1. A binary operation is treated the same as a coded request.

The circular buffer provided for terminal input must be at least as large as the longest input line expected. For a display terminal, the input line can be up to 105 words (one screenful). For a teletypewriter, the line length is not limited; the user must estimate the longest expected line length. On input, if a line is larger than circular buffer limits, an error code is returned in the code-and-status field of the FET, and data is transferred until the circular buffer is full; remaining data is discarded.

If a READSKP function is specified, results are similar, but no error code is returned.

The following CIO codes may be used.

READ	10_8 or 12_8	Read complete lines into the circular buffer.
WRITE	14_8 or 16_8	Write complete lines from the circular buffer.
READSKP	20_8 or 22_8	Read complete lines into the circular buffer or read a partial single line and skip to the end of the line if the line does not fit into the circular buffer.
WRITER	24_8 or 26_8	Write complete lines from the circular buffer until it is empty. A line terminator is supplied if necessary.
WRITEF	34_8 or 36_8	Same as WRITER.

When coding in COMPASS, the program should have only one input/output request pending for the terminal; otherwise, data may be lost or input/output operations may never be completed. This restriction applies only to input/output requests, not to the number of files connected simultaneously.

Data received from a terminal is formatted in display code character representation, left-justified and zero filled as required to take up an integer number of central memory words, including the 12-bit zero byte end-of-line indicator.

Data sent to a terminal must be formatted in display code character representation. The first character position of each line is the carriage control character. The end of a line is indicated by a 12-bit zero byte in bits 0 through 11 of a central memory word.

Input/output to a terminal can use a normal FET with no special consideration. However, if the FET is larger than the minimum five words, the following additional facilities are available.

Word	Bit	Description
2	59-54	Device type equals 61_8 for a terminal returned after the first operation on a connected file.
	42	1 indicates word 6 is to be used.
	23-18	0 indicates word 6 is to be used.
6	59-48	User ID for multiuser job input/output only.
	23	1 indicates ASCII-256 mode is to be used.
	22	1 indicates ASCII-95 mode is to be used.
	19	Indicates 1 for multiline reads. Normally only one input line is transferred into the circular buffer. If this bit is set, multiple lines are transferred if available and if there is room in the buffer.
	17-0	User table address for multiuser job input/output only.

The FET code and status field is used by INTERCOM for connected files to return error codes and end-of-record and end-of-file indications. Error codes are returned if the CIO circular buffer is too small for an input line or if an ilegal input/output request is attempted. The end-of-record or end-of-file status bits are set if the user enters %EOR or %EOF at the terminal.

A COMPASS program can also derive more information about its environment by calling the peripheral processor program RWE. The format of RA+1 is as follows:

RA+1

Bit	Description
59-42	RWE in display code.
40	1 indicates auto recall.
17-0	Address of parameter word X.

RWE returns the following information in RA+X.

RA+X

Bit		Description
47	0	Line operative.
	1	Line inoperative.
46	0	Dial-up terminal.
	1	Hardwired terminal.

45-43 Line speed; baud rate indicated by line speed is protocol dependent.

Line Speed	Mode 2	Mode 3	Mode 4	Wideband
0	-	110	-	-
1	-	134.5†	-	-
2	-	150	-	-
3	-	300	-	-
4	2000/2400	600† †	2000/2400	-
5	4800	1200† †	4800	-
6	9600	-	9600	-
7	19200†	† † †	-	19200†

42-41 Code conversion.

- 0 ASCII.
- 1 External BCD.
- 2 Display code.

40-39 Subprotocol.

If mode 4 terminal:

- 1 Mode 4A.
- 2 Mode 4C.

If wideband terminal

- 1 Batch.
- 2 Interactive.

† 134.5 bits per second not supported.
† † 600 and 1200 bits per second allowed for 255x front end only.
† † † Indicates auto baud recognition (allowed for 255x front end only).

Bits	Description
38-36	Protocol field. 0 Empty. 1 Mode 3. 2 Mode 4 3 Mode 2. 4 Wideband.
35-24	Line width.
23-12	Screen size.
0	Set on completion.

FORTRAN

FORTRAN Extended programs can issue formatted or NAMELIST input/output statements on connected files. If the files INPUT and OUTPUT have been connected, READ, WRITE, and PRINT statements are used for terminal communication. If the EDITOR RUN command is used, the INPUT and OUTPUT files are connected. These files must be specified in the PROGRAM statement.

Files can be connected and disconnected from the program with calls to the CONNEC and DISCON subroutines:

CALL CONNEC (lfn, mode) CALL DISCON (lfn)

The parameter, lfn, is the file name. Parameter lfn can be a Hollerith constant of the form nLfilename, an integer constant with a value from 1 through 99 corresponding to a logical unit number, or an integer variable containing either of these. The optional parameter, mode, is the mode of input/output. Mode can be an integer constant or variable with value 0 for display code, 1 for ASCII-95, or 2 for ASCII-256; if it is omitted, display code is assumed. Files can be connected or disconnected at any time to switch a file between mass storage and the terminal, or to change the mode of input/output. An input file, however, should be connected to the terminal at end of record in order to avoid losing data.

Other FORTRAN input/output requests, such as BUFFER statements, can be used for terminal communications; the mode of transmission must be coded.

All files connected or referenced by READ and WRITE requests must be declared in the PROGRAM statement. If execution diagnostics are to be sent to the terminal, the file OUTPUT must be declared in the PROGRAM statement and connected to the terminal.

Calls to CONNEC and DISCON are ignored when programs are not executed interactively; consequently, a FORTRAN program can be coded such that it can be executed either as a batch job or an interactive job without recompilation. An attempt to connect or disconnect an unidentified file results in a fatal execution time error.

Substituting an asterisk for a format reference number in any input/output statement calls the list directed input/output feature. This feature allows data input to be in free form, separated by either spaces, commas, carriage returns, or a combination of the three.

Minro variations in data values can be accommodated through the use of slashes as an input terminator if the variable data occurs at the beginning of the list. For example,

```
1,2,3,4,5
4,5,3,4,5
```

can be input as:

```
1,2,3,4,5
4,5/
```

Any value in the input data stream can be repeated by entering the data in the format of repeat constant, asterisk, and value. For example, the value of PI can be entered five times by entering 5*3.14 instead of 3.14 3.14 3.14 3.14 3.14.

Real and double precision values can be entered as integers without the decimal point; the decimal point is assumed to be to the right of the last digit.

All of these features can be used when operating in batch mode. Refer to the FORTRAN Extended Version 4 Reference Manual or FORTRAN Version 5 Reference Manual for more detailed information.

OPERATING SYSTEM INTERACTION

The operating system provides the user with a number of capabilities that augment the INTERCOM command set. Most control statements can be entered at the terminal during command mode. Certain operating system control statements are not permitted; however, most of these functions can be performed by INTERCOM commands.

In addition to describing the alternate means of performing the functions of prohibited control statements, this section contains a description of the most commonly used system utilities. For more detailed information, refer to the NOS/BE Reference Manual.

PROHIBITED SYSTEM CONTROL STATEMENTS

The following control statements cannot be entered in INTERCOM command mode. In addition, user-called LOADER requests CMLOAD, ECLOAD, and REQUEST for tapes are not permitted. Tape processing by interactive users is not permitted. Any of these control statements can be used by placing them in a local file (created through EDITOR) and using the bATCH command to submit that file to the input queue.

ADDSET	LABEL	LISTMF	PFLOG
CKP	LABELMS	LOAD	RECOVER
DUMPF	LDSET	LOADPF	RESTART
EXECUTE	LIBLOAD	NOGO	SLOAD
GENLDPF	LISTCID	PAUSE	VSN

The EXECUTE, LDSET, LIBLOAD, LOAD, NOGO, and SLOAD command functions are all available through the INTERCOM XEQ command. LIBRARY can be used to define a global library only. The XEQ, LIBLOAD command can be used to define and load either a global or local library.

The PAUSE control statement suspends execution and displays a message to the central site operator. This capability, though not available to the interactive user, can be executed through FORTRAN or COBOL. Here, the message is displayed at the remote terminal rather than the central site.

PAGE MODE 6

The PAGE mode enables the user to examine a local file page-by-page. Various options include:

- Processing the previous line of commands.
- Exiting and then reentering PAGE without losing the position of the pointer to the file, the tabulation parameters, or the mode of print.
- Entering tabulation parameters which reformat the display lines. This is used when the lines of the local file exceed the terminal line length and would be truncated.
- Displaying a page beginning at a specified header line, subheader line, or line of text.
- Searching for the occurrence or omission of a specified character string within a header line, subheader line, or within a line of text and displaying the first page satisfying the search requirements.
- Transferring any number of lines of text to a print file, along with user comments, for printing at either the central site or remote site.
- Converting a paged file or the print file to either display (6-bit) code or ASCII (12-bit) code.

An example illustrating some of these options is at the end of this section.

A file can be of any length. A page of a file consists of 11 lines, each line containing no more than 150 characters. A longer line is split into lines of 150 characters or less. The PAGE mode requires files with Z-type records only. Other record types produce unpredictable output. The character line format of a page on a terminal depends upon the terminal screen format. If a terminal's format differs from the installation-defined format, the SCREEN command must be used to alter that format (refer to SCREEN command in section 3).

ENTERING PAGE MODE

To enter PAGE mode, type:

PAGE [, [lfn$_1$] [,lfn$_2$]]

The first parameter is the name of the file to be paged; if omitted, OUTPUT is assumed, but OUTPUT does not have to be connected. The second parameter is the name of the print file; if omitted, PRINT is assumed. If lfn$_1$ has been connected, PAGE disconnects the file before displaying occurs, and the file is left in the disconnected state.

PAGE responds to the preceding command as follows:

Ready..

The file to be paged is now positioned at the beginning of information.

PAGE commands can be entered after the Ready.. message or once output has begun, on the line following the last line of output. Blanks in the command line are ignored, except those within search or print character strings. Any number of PAGE commands can be entered on one line, separated by commas, but the command line cannot exceed 150 characters. Positioning, tabbing, and searching can be specified in one entry with this feature. Commands are processed consecutively; if more than one display command is entered on one line, only the resultant display command is processed. Commands entered on the last line on the screen of a BCD display console (214-11, 214-12, 217-11, and 217-12) must not extend beyond the last character position of that line, since the hardware does not transmit lines which wrap around to the top of the screen on these terminals.

The last line of each displayed page has the following form.

LINE nnnnnn

nnnnnn is the PAGE line number of the first line of the displayed page. Line numbers are generated by PAGE and are not related to line numbers the user might supply as in a program statement number.

A single command or sequence of commands on the same line is scanned and processed left to right. If an error at any point makes it impossible for PAGE to recognize the remainder of the command line, scanning terminates, the current line is displayed, and the last displayed line contains the following notation.

U/xxx...

xxx... indicates the unexecuted portion of the command line.

The user has the option of aborting PAGE by typing any character followed by %A. If this happens, the following message appears.

USER ABORT

The user abort terminates a search or print command; control remains in PAGE.

If the PAGE time limit expires, the message is as follows:

TIME LIMIT

COMMAND DIRECTORY

The command directory is a list of the categories of commands which are allowed while the user is in PAGE mode. The categories are as follows:

- General control commands
- Display format commands

- Line location and page searching commands
- String searching commands
- Copying to a print file

To obtain a display of the command directory, enter HELP.

GENERAL CONTROL COMMANDS

To obtain a list of the general control commands, enter HELP 1.

Command	Explanation
R	Process the previous command line again.
E or Q	Exit from PAGE mode.
ES or QS	Exit from PAGE mode and save the current parameters (page file name, print file name, and the display format).
PAGE(*)	Reenter PAGE mode at the point of interruption. Used after ES or QS is entered.

DISPLAY FORMAT COMMANDS

To obtain a list of the display format commands, enter HELP 2.

A page can be displayed in partial lines (S command) or full lines (F command); the default is partial. When partial lines are being displayed, one source line is shown per display line. When full lines are being displayed, each nonblank line is displayed in its entirety, using several display lines if necessary and prefixing each line with a line number. The line format remains until user changes it or exits from PAGE via the E or Q command.

Paged files can be in either uppercase (display code) or uppercase/lowercase (ASCII) mode; the default is uppercase. To select the mode, enter U for uppercase or L for uppercase/lowercase. The mode remains in effect until the user changes it or exits from PAGE via the E or Q command.

The T command, used with the S command for setting the tabs, has several forms. Possible forms are as follows:

Command	Explanation
T or +T	Tab right from the current tab position to the next tab stop. For a CRT 50-by-20 screen, the tab stops are character positions 1, 51, and 101; the teletypewriter tab stops are 1, 73, and 145. If this command is used three or more consecutive times in one PAGE session, the 150th character of each line is displayed as a page of information.
-T	Tab left from the current tab position to the next tab stop. If already at the leftmost position, this command has no tabulation effect.

Command	Explanation
Tnnn	Move the tab position to character position nnn. Displays a page of information, each line being left-justified at character position nnn. If nnn is larger than the character length of each line, one page of blank lines will be displayed.
T(a-b,c-d,...)	Reformat the line for display. a-b,c-d,... are character ranges of the line which is displayed. Up to 15 ranges can be specified. If the second value is not specified, it is presumed to be the same as the first value. If the second value is less than the first value, it is as though only the first value was specified. The ranges of characters do not have to be in ascending order; here, the effect is to transpose the ranges in the order entered. If the last range specification is missing, it is assumed to extend to column 150.
TF	Reformat for FORTRAN Extended. Equivalent to T (21 through n, 92 through 106). n is the largest column number that allows the entire reformat to fit on one display line.
TC	Reformat for COMPASS. Equivalent to T (2, 9 through 15, 41 through n, 112 through 126). n is the largest column number that allows the entire reformat to fit on one display line.

After any T command, the current page is displayed in the format chosen. When multicolumn range reformatting is in use (such as TF or TC), UPDATE, assembler, compiler header lines (lines with a 1 in column 1 and data extending past column 125), and subhead lines are reformatted as T (9 through n, 116 through 126). n is the largest column number that allows the entire reformat to fit on one display line.

LINE LOCATION AND PAGE SEARCHING COMMANDS

To obtain a list of the line location and page searching commands, enter HELP 3.

These commands enable the user to display different portions of the file. All of the commands except the * command cause a display of the first page satisfying the command. The user can display the previous page, the next page, or any page beginning at a specified line number.

Pages with header lines produced by UPDATE or the compilers and assemblers available through INTERCOM can be examined. A header line contains the carriage control character 1 in column 1. When any of the Hnn commands are entered, the entire header line is searched for the page number. If the word page occurs more than once in the header line, the last occurrence is used.

The commands which are used to produce these results are as follows:

Command	Explanation
nn	Go to line nn and display the page beginning at that line. If nn is larger than the length of the file, an end-of-information message is displayed. †

† nn is numeric

Command	Explanation
+nn	Go forward nn lines and display the page beginning nn lines from the current line. If +nn causes PAGE to search for a line number greater than the largest line number in the file, an end-of-information message is displayed.†
-nn	Go backward nn lines and display the page beginning nn lines from the current line. If -nn causes PAGE to search for a line number less than the smallest line number in the file, the first page of information is displayed.†
Hnn or +Hnn	Go forward to a header line page nn and display that page. If page nn does not exist or if nn is too large, an end-of-information message is displayed.†
-Hnn	Go backward to a header line page nn and display that page. If page nn does not exist or if nn is too large, a beginning-of-information message is displayed.†
H or +H	Go forward one header line and display the page beginning at that header line.
-H	Go backward one header line and display the page beginning at that header line.
+	Go forward one screen page and display that page.
-	Go backward one screen page and display that page.
*	Go forward to end-of-file. No display.

STRING SEARCHING COMMANDS

To obtain a list of the string searching commands, enter HELP 4.

A file can be searched forward or backward for the occurrence or omission of a specified character string. The search can be restricted to a header line, subheader line, or column range within a line of text. A subheader line is any line that immediately follows a header line. The first line encountered that satisfies the search condition is displayed as the first line of a page of information. If search conditions are not satisfied, a message indicates that the beginning or end of the file has been reached.

The general form of a string search command is as follows:

direction type range condition string

The fields can have the following values.

direction

+ or missing	Search forward.
-	Search backward.

† nn is numeric.

type

missing	Search every line of text.
H	Search header lines only; search subhead lines if condition is * or /.

range

missing	String can start anywhere in the line of text.
(i)	String must start at character position i.
(i-j)	String must start somewhere between character positions i and j, inclusive.

condition

=	String must be in a line of text.
≠	String must not be in a line of text; that is, the first line of text that does not contain string is displayed as the first line of a page of information.†
/	String must be in a subhead line (allowed with type H only).
*	String must not be in a subhead line; that is, the first subhead line that does not contain string is displayed as the first line of a page of information (allowed with type H only).

string

dxxx...d	The search string is xxx..., and d is the delimiter. The delimiter d is any character not in xxx... The first delimiter must immediately follow the condition.

When an ASCII file is searched, uppercase characters are considered equal to their lowercase counterparts.

COPYING TO A PRINT FILE

To obtain a list of the print file copying commands, enter HELP 5.

Lines of a file are transferred to the print file exactly as found on the source file unless either of the carriage control options (PC and PC=d) is used. End-of-record (EOR) and end-of-file (EOF) marks are never copied to the print file. The PAGE line number is not included on the print file. At the end of a PAGE session that has print output, the print file remains positioned after all print lines but before the end-of-file. No positioning occurs before a print file is written; the user must properly position any declared print file that was not a print file previously. The processing of a print command does not change the logical position (line to be displayed) of the source file.

† On a teletypewriter, a quotation mark (") is typed instead of a not equal sign (≠).

Print file options are as follows:

Command	Explanation
Pnn	Copy line nn to the print file.
Pnn-mm	Copy lines nn-mm (inclusive) to the print file. If mm is *, lines are copied from nn through the next EOF.
P=dxxx...d	Print the string xxx... delimited by the character d. No carriage control character is inserted, so the first character in the string is not printed unless a prefixing command is used before this entry.†
PC	Prefix each copied line with a blank carriage control character.†
-PC	Do not prefix each copied line with a carriage control character.† This is the default.
PC=d	Change the carriage control character to d.†
PU	Force the print file uppercase. This is the default.
PL	Force the print file uppercase/lowercase.

The prefixing commands, PC, -PC, and PC=d, remain in effect until changed by a subsequent prefixing command. PC should be specified to ensure single-spacing of output.

USING THE PAGE COMMAND

A common use of the PAGE command is to examine a remote output file. This example shows the creation of the remote output file and the following PAGE capabilities.

- Locating the dayfile and a portion of the output with string search commands.
- Reformatting the output with display formatting commands.
- Copying the dayfile to a print file.

Although the example includes a FORTRAN program, a symbolic reference map, program statistics, and a dayfile, the user need not be familiar with these subjects to understand the workings of the PAGE commands.

CREATING THE REMOTE OUTPUT FILE

The user creates a FORTRAN job complete with control statements using EDITOR, saves it, and enters the BATCH command to transfer it to the input queue. After the user submits the job, he must wait for processing to be completed. Then the system transfers the OUTPUT file for the job to the remote output queue where it remains until the user recovers it. The remote output file for this job is shown in figure 6-1. No banner pages are listed; they are printed if the file were to be printed at the central site. After he has created and saved the file, the user enters the following commands.

† The carriage control characters for the prefixing commands are located in appendix D.

```
COMMAND- batch,example,input,here
                                    Name of the file created in EDITOR

COMMAND- files

--REMOTE EXECUTING JOBS--
  IROBE3I
COMMAND- files

--REMOTE OUTPUT FILES--
  IROBE3I                                    Job id
COMMAND- batch,irobe3i,local

COMMAND- page,irobe3i

Ready..
```

The FILES command gives the status and the id for each job submitted with the user's id. Local and attached permanent files are also listed, but in this example there are no attached permanent files and the only local file (created in EDITOR) was dropped after it was transferred to the input queue. The job id is associated with the file and consists of seven characters, the first five coming from the job statement card, followed by two system-generated sequence characters.

After the Ready... message, the user can examine the file, but he must remember that the file is local and is lost after he logs out.

LOCATING THE DAYFILE AND THE OUTPUT

The user wishes to find out whether his FORTRAN program successfully compiled and executed. The dayfile contains this information. To locate the dayfile, which is at the end of the OUTPUT file, the user enters the following string search command.

```
f,*,-=/irobe3i/
```

The F directs the system to print full lines of the dayfile, the asterisk (*) sets the pointer to the end of the file, and the remainder of the command line initiates a reverse search for the job id IROBE3I. The portion of the dayfile listed in response to this command is as follows:

```
   102= 13.45.35.IROBE3I  FROM     /1U
   103= 13.45.35.IP  00000192 WORDS - FILE INPUT   , DC04
   104= 13.45.35.IROBERT. (user accounting information entered here)
   105= 13.45.35.                              000100
   106= 13.45.39.ATTACH,PPAGE,ID=ROGER.
   107= 13.45.39.                              000110
   108= 13.45.39.PFN IS
   109= 13.45.39.PPAGE
   110= 13.45.39.PF CYCLE NO. = 001
   111= 13.45.39.MAP,OFF.
   112= 13.45.39.                              000120
Line   102
```

The user can enter plus signs, one at a time, to continue paging through the dayfile.

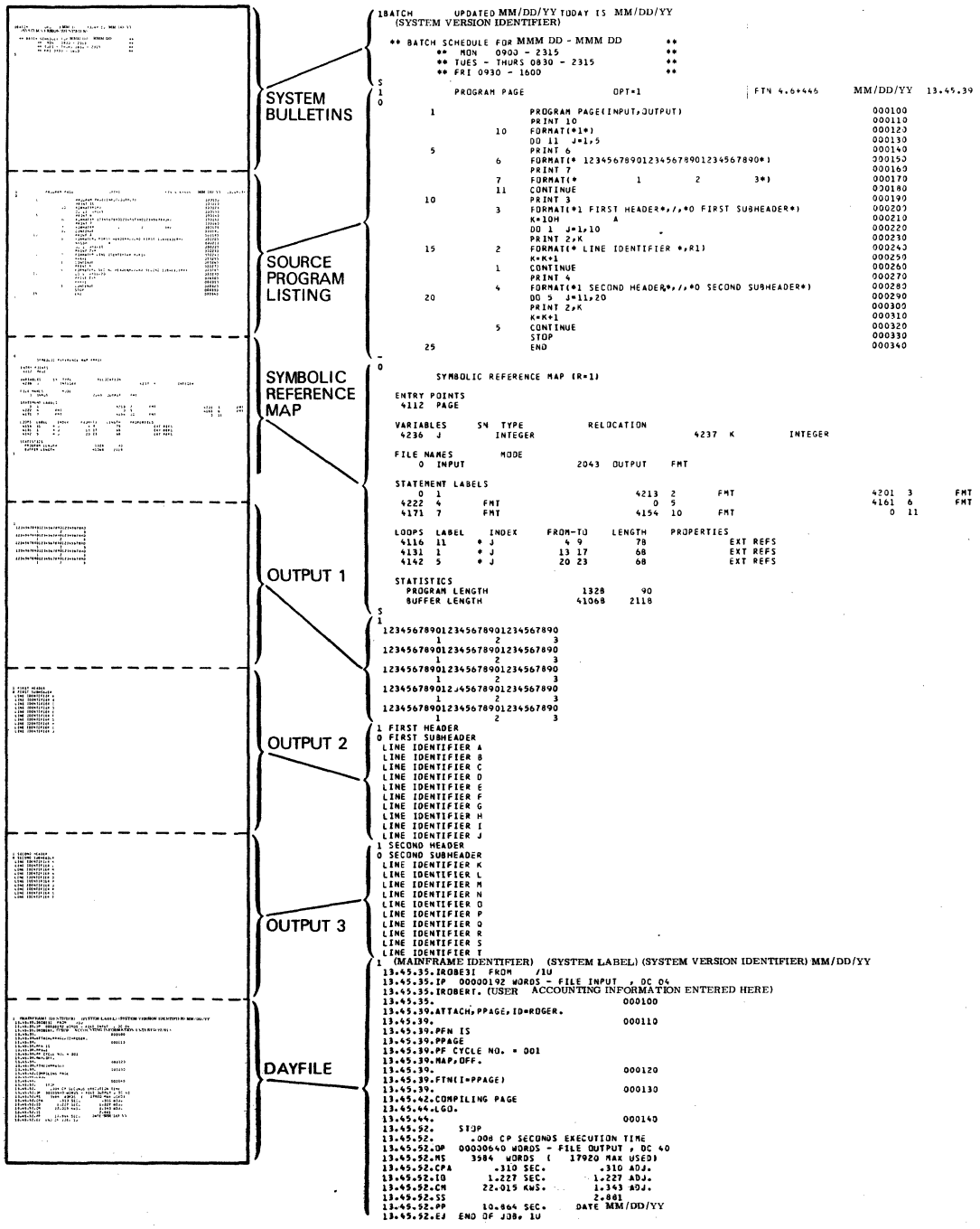

Figure 6-1. Remote Output File

Now the user wants to look at the output produced. He is interested in the third set of output, which follows a second header and a second subheader line. To locate the second header, he initiates a reverse search for the word SECOND in a header line as follows:

```
-h=/second/
```

The following output is listed.

```
      88=1 SECOND HEADER
      89=0 SECOND SUBHEADER
      90= LINE IDENTIFIER K
      91= LINE IDENTIFIER L
      92= LINE IDENTIFIER M
      93= LINE IDENTIFIER N
      94= LINE IDENTIFIER O
      95= LINE IDENTIFIER P
      96= LINE IDENTIFIER Q
      97= LINE IDENTIFIER R
      98= LINE IDENTIFIER S
Line    88
```

REFORMATTING THE DISPLAY LINE

Next, the user wants to reformat the output, now in the form LINE IDENTIFIER n. To do so, he enters the following.

```
90,t(20-55,2-6,18)
```

```
                                    LINE K
                                    LINE L
                                    LINE M
                                    LINE N
                                    LINE O
                                    LINE P
                                    LINE Q
                                    LINE R
                                    LINE S
                                    LINE T
{eor    }
Line     90
```

Since columns 20 through 50 contain blank characters, the result of the command is to shift the field that contains LINE n (columns 2 through 6 and 18) 31 spaces to the right and to delete the word IDENTIFIER.

COPYING TO A PRINT FILE

Finally, the user wants to copy the dayfile to the file PRINT. This is the default print file name; the user could have specified a different print file name when he first entered PAGE. Using the dayfile information listed in response to the first string search command, the user copies lines 102 through the end-of-file by entering the following.

```
p102-*

Ready..
e
```

Exit from PAGE

To recover the output, the user enters the following.

```
COMMAND- batch,print

TYPE DISPOSITION-print

TYPE FILE ID-abcd
```

Default file name

The output can be picked up at the central site under the id of IABCDss, where ss is the system-generated sequence characters.

REMOTE BATCH PROCESSING 7

The remote batch operations described in this section can be conducted at all 200 User Terminals and 714 and 73x Remote Batch Terminals equipped with a card reader, line printer, or card punch. These operations consist of submitting a job through a card reader for central site processing and receiving any subsequent output on an output device at the remote site.

In normal operation, the terminal operator initiates job processing by setting the status of the devices at the terminal via the peripheral device control remote batch commands. The next step is the submission of one or more job decks through a card reader. Job decks are generally in the same format as jobs submitted at the central site. Specific differences include:

- Binary code decks cannot be read at 200 User Terminals.
- ASCII code decks can be read at a 733 High Speed Batch Terminal.
- Only 7/8/9 and 6/7/8/9 end-of-record and end-of-file cards are recognized; level numbers are permitted.

After the jobs are executed at the central site, output from the remote job is returned to the initiating terminal for printing (refer to Printing Output) or for punching, if the terminal is equipped with a card punch (refer to Punching Cards). The output device must first be properly prepared to receive the output, as described in Peripheral Device Control Commands, section 4; for example, output marked for special printer paper is sent only to a printer which is defined as having that paper mounted.

Terminals used for remote batch processing can also be used as interactive terminals to execute INTERCOM and EDITOR interactive commands (sections 3 and 4, respectively) via terminal keyboard and CRT display. Although the INTERCOM login procedure must be completed at both dial-up and dedicated-line batch terminals before interactive commands can be used, it is not necessary to log in at dedicated-line terminals before using remote batch commands.

At any time during processing, the terminal operator can obtain status information about all the jobs, files, and peripheral devices associated with the issuing terminal. On the basis of the status information received, the status can be changed or some control can be exercised over the jobs and files associated with the terminal.

This section describes remote batch processing job flow. Individual remote batch commands are described in section 8.

READ COMMAND

The READ command initiates card reading, allowing the user to input jobs through a card reader. Cards are read into an input file which INTERCOM creates for each job. The input file for a job is placed in the system input queue. READ can be used only at a 200 User Terminal.

To initiate card reading, enter:

READ[,CRn]

CRn is the card reader, where n is the card reader device number 1 through 7. The default of CRn is CR1.

To begin reading cards, the terminal operator must enter the READ command. The first card read must be a job statement. More than one job can be stacked in the card reader for continuous reading without terminal operator intervention. Each time an end-of-information card is encountered (6/7/8/9 card), the job preceding it is terminated and placed in the input or dependency queue for processing. After the end-of-information card, the hopper must be empty or the next card must be a valid job statement. Extra end-of-information cards are ignored if no other cards separate them. Card reading continues until the hopper is empty. The last card read must be an end-of-information card. If the last card read is not an end-of-information card, INTERCOM expects more cards and displays the following message.

CRn NOT READY

n is the card reader device number. The user must place more cards or an end-of-information card in the card reader, press the LOAD button, and enter GO,CRn (refer to the GO command, section 8). When the hopper is empty and the last card read was an end-of-information card, the terminal operator† must enter another READ command before more cards can be inserted and read.

Card reading can be interrupted by display mode data such as messages from other users or from the central site operator. Following the display of this data, card reading can be resumed by entering CONTIN.

If the system input queue overloads during a heavy job load, all card readers are placed in the WAIT state and the following message is displayed.

INPUT SUSPENDED BY SYSTEM

Card reading continues when space becomes available except at a 200 User Terminal where the printer must be logically on. While input is suspended, all GO commands referencing card readers and READ commands are ignored, and the preceding message is displayed. All other operations, including END,CRn and READ,lfn (covered later in this section) are allowed. READ,lfn is allowed since it does not place files in the input queue.

If the first card read (or the first card after an end-of-information in a multijob read operation) is not a valid job statement, the following message is displayed and the entire file is ignored.

CRn,jstate,JOB CARD ERROR

n is the card reader device number, and jstate is the first 10 characters of the job statement. The job statement must be corrected and the job reread.

An uncorrectable parity error (or other equipment trouble) encountered while creating the input file causes the file to be ignored and the following message to be displayed.

CRn,jname,INPUT FILE ERROR

n is the card reader device number, and jname is the seven-character job name. The job should be reread from the beginning.

†The terminal operator can be either the user or the person whose function is to operate the terminal.

If a job statement or input file error occurs, the job being read is dropped by the system in exactly the same manner as if the user had entered an END,CRn command. Consequently, the H,S status display shows a device status of ERROR for all remote batch terminals except the 200 User Terminal, which displays a WAIT/E status.

READ,lfn COMMAND

The READ,lfn command creates a local INTERCOM file lfn from a deck read by a terminal card reader. File lfn is then accessible to the interactive user. The user must be logged in to use the READ,lfn command. READ,lfn can be used at both 73x Remote Batch Terminals and 200 User Terminals.

To create a local file lfn from a card deck, enter:

READ,lfn[,CRn]

lfn cannot currently exist as a local file.

CRn is the card reader, where n is the card reader device number 1 through 7. The default of CRn is CR1.

To create a local file lfn, the user inserts a card deck into the hopper, presses the LOAD button, and enters the READ,lfn command. The card reader must not be reading input when the user enters READ,lfn. If the user enters READ,lfn before card reading is completed, the following message is displayed. Card reading continues.

COMMAND IGNORED

The first card in the deck is not treated as a job statement and need not be a job statement. Transmission of the file begins with the next file in the card reader and continues to an end-of-information (6/7/8/9 card). The READ,lfn command transmits only one card file to lfn.

The READ,lfn command is allowed while input is suspended since it does not place files in the input queue.

The user can enter the READ,lfn command while printing is in process.

PRINTING OUTPUT

INTERCOM routes output from jobs submitted from the terminal to the terminal for printing. A file is printed on the first available printer with a compatible print train and forms code that is logically turned on and in a ready state. Two banner pages normally precede the actual output from the file to indicate the start of printing and to separate consecutively printed files.

Printing can be controlled by carriage control characters. The first character of each print line is interpreted as a carriage control character. If carriage control is suppressed by the SUP command (refer to section 8), the file is single spaced.

At a 200 User Terminal, printing or reading cannot occur simultaneously with interactive work, since the print data uses the CRT buffer. Consequently, the printer should not be turned logically on if printing is not desired. Once the printer is on, print data is sent when available and may interrupt a user's interactive work. When no print data is available and no reading is active, the H,S display (refer to Status Information) automatically appears, showing the status of the reader and printer; this mode of operation is designed for 200 User Terminal use as an unattended remote batch station. Turning the printer logically off prevents unsolicited printing and H displays. The initial state of the printer at a 200 User Terminal is off.

If the printer is left on and the terminal is being used for interactive work, INTERCOM waits approximately 1 minute after each entry before the output of unsolicited printing or H displays. The time lag is designed to allow the user to do occasional interactive work without having to turn the printer off.

If a file is sent to a printer at a 200 User Terminal or at a 714 Remote Batch Terminal that is not in a ready state, the message

LPn, NOT READY

is displayed. Correct the condition causing the not ready state and enter GO,LPn.

A number of commands affect printing; refer to the individual command descriptions for Peripheral Device Control Commands, Peripheral Device Resident-File Control Commands, and Queue Resident-File Control Commands in section 8.

PUNCHING CARDS

After the job has completed execution at the central site, INTERCOM routes any punch output to the terminal. Forms codes for the file and the punch must match. The first card of each deck is normally a laced card containing the file name. This card separates consecutively punched files.

ASCII, 026 and 029, coded, 80-column binary, and 7/9 binary cards can be punched at a 733-10 Remote Batch Terminal.

The remote batch commands which affect punching are explained in the individual command descriptions in section 8.

REMOTE BATCH COMMANDS 8

The remote batch commands described in this section are used to implement the job flow described in section 7. In addition to the functions previously described, these commands are used to control input/output devices, jobs, and files associated with the terminal and to obtain job and equipment status information.

COMMAND REPERTOIRE

The following remote batch commands allow the user to control the peripheral devices and manipulate the files. These commands fall into the following functional categories.

Peripheral Device Control Commands

ON	WAIT
OFF	GO
DEFINE	CONTIN (used only for 200 User Terminals)

Peripheral Device Resident-File Control Commands

BSP	REW
END	RTN
REP	SUP

Queue Resident-File Commands

DIVERT	EVICT
REVERT	KILL
DROP	PRIOR

Other commands that can be used in remote batch processing are:

H	LOGIN
READ	MESSAGE
READ,lfn	SCREEN
LOGOUT	

The H command is used to obtain status information. READ must be specified at a 200 User Terminal to start reading from the card reader. READ,lfn can only be used when the terminal is logged in (section 7). LOGIN, MESSAGE, and SCREEN are commands relevant to both batch and interactive work; they are described in detail in section 5. Login is required by INTERCOM before the interactive commands can be used at the terminal and is required at a dial-up terminal, before remote batch commands are entered. The MESSAGE command is used to send a message to the central site operator.

SCREEN is used to request or override the system installation default display screen format. The SCREEN command can be used only while the user is logged in. Users at installations with mixed screen size terminals using the same communications protocol must exercise caution to see that the terminal in use is not set to an incorrect screen size. Since only one default screen size can be established for a given communications protocol, some terminals can default to an incorrect format, which, in turn, can cause wraparound or loss of data during printing. The same problem can occur if the user selects an incorrect screen size.

An incorrect format can be detected by observing the location of the cursor. (After the entry of a command, the cursor should return to the left margin.) If any doubt exists, log in (if required) and use the SCREEN command to set the proper format. Once this has been accomplished, the user can log out.

COMMAND SYNTAX

Remote batch commands consist of a single command verb followed, in most cases, by one or more parameters. Some remote batch commands can be abbreviated to initial letters only. Permissible abbreviations are indicated in this text by an underscore; no other abbreviations are acceptable. Optionally, the command can be terminated by a period or right parenthesis. When a command requires one or more parameters, they are separated from the command word by a comma, a blank, or a left parenthesis. Except in the DEFINE command, parameters are order-dependent and are separated from each other by commas. Default values can be selected by substituting a comma, except for the final parameter; the command cannot terminate with a comma.

If a command is not recognized or the format is incorrect, the following message is displayed.

```
FORMAT ERROR
```

Correct the command or enter another command.

The majority of the commands allow selection of an input or output device via the equipment parameter (eqa, eqo, or LPn). Through this section, eqa is used to refer to any or all peripheral devices; a specific device can be referenced or all peripherals can be referenced through the entry ALL. Parameter eqo is used to refer to any output device. The card readers, card punch, and line printers are referred to as CRn, CPn, and LPn, respectively. If n is not specified, device number 1 is assumed. If the equipment parameter is not specified, the line printer (LP1) is assumed unless the END command is entered (refer to the END command description); the READ,lfn command assumes CR1.

In some cases, a parameter can be used only at a specific terminal type, or its use can vary according to the type of terminal from which it is issued. Such parameters are defined and explained in the individual remote batch command descriptions. The descriptions are presented in the functional categories shown in the command repertoire.

PERIPHERAL DEVICE CONTROL COMMANDS

The status of the terminal peripheral devices can be controlled by means of the following peripheral device control commands: ON, OFF, DEFINE, WAIT, GO, and CONTIN.

ON COMMAND

The ON command turns the peripheral device specified by the parameter eqa logically on, negating the effect of the OFF command. ON can also be used after the REW command (refer to Peripheral Device Resident-File Control Commands). To turn a peripheral device logically on, enter:

ON[,eqa]

Card readers are initially on; output devices are initially off.

Examples:

To turn card reader number 2 logically on, enter:

ON,CR2

To turn line printer number 1 logically on, enter:

ON

OFF COMMAND

The OFF command turns the specified equipment logically off, negating the effect of the ON command. Cards cannot be read at card readers turned logically off, nor can output be sent to devices in an OFF condition. If a device is turned off while a file is being read, processing continues until the end of the file is reached, but no subsequent files are processed. At a 200 User Terminal, reading stops when the block containing the end of file card is read. The block can contain up to 11 cards of the next file; consequently, these cards should be reloaded prior to initiating the next read. A device is automatically turned off by the REW command (refer to Peripheral Device Resident-File Control Commands).

To turn a peripheral device logically off, enter:

OFF[,eqa]

Examples:

To turn card reader number 2 logically off, enter:	OFF,CR2
To turn line printer 1 logically off, enter:	OFF
To turn all peripheral equipment off, enter:	OFF,ALL

DEFINE COMMAND

The DEFINE command is used to specify various attributes of the printer or punch designated by output device parameter eqo. All parameters following eqo are order-independent.

To define a printer or punch and its nondefault characteristics, enter:

DEFINE [,eqo [= {IP / NIP}]] [,ECec] [,FCfc] [, {BANON / BANOFF}] [,FMfm]

IP and NIP indicate an impact or nonimpact printer, respectively. Selection of the IP or NIP option is required only for the 714 terminals and only when the type of printer is other than installation default.

ECec is relevant to 733 only. ec is a two-character code for the print train mounted on the printer.

ec	Print Train
B6	64-character BCD character set
B4	48-character BCD character set
A6	64-character ASCII character set
A9	95-character ASCII character set

Only those files whose character set (internal characteristics) and print train requirements (external characteristics), as identified by the IC and EC parameters of the ROUTE control statement, can be routed to that printer. The following table illustrates the results of the EC selection algorithm. The column at the left indicates the train request via ROUTE; the right column indicates the corresponding print trains on which the file can print.

ec	Print Train Code
None	B6, A6, or A9
B4	B4, B6, A6, or A9
B6	B6
A6	A6 or A9
A9	A9
A4	A4

Printer A4 has a 48-character ASCII character set, but it can be used for 580-12, 580-16, and 580-20 printers only.

Only the 733-10 printer is equipped with a changeable print train. Those with unchangeable print trains are:

Printer	Print Train Code
BCD 200 User Terminal	B6
ASCII 200 User Terminal	A6
IP or NIP (714)	A9
All others except 733	A6

The selection algorithm for IC is:

Binary (BIN)	Sent only to punches.
Display (DIS)	Sent to any device.
ASCII	Sent to any device.

If a DEFINE command is not used to inform INTERCOM of the actual train on a printer, an undefined character conversion occurs. If a requested print train is not capable of printing all the characters in a file (for example, B4 is requested for a 64-character DIS file or A6 for a 95-character ASCII file), a folding operation may take place. Appendix A, table A-3, illustrates the folding of 95-character ASCII into 64-character ASCII. Files that require a train that is already mounted have priority over files that do not specify a particular train.

fc is any two-character forms code recognized by the installation which identifies either the special-form paper or card stock in the output device or a special procedure defined by the installation. Files which are defined as requiring special forms (refer to the ROUTE control statement) are printed or punched only on devices whose forms codes match that associated with the file.

BANON and BANOFF indicate whether or not the file identification banner pages are to be printed at the beginning of each file. BANON causes the file identification banner pages to be printed; BANOFF suppresses their printing. Terminal hardware restrictions produce a printed banner page that differs slightly from the banner pages printed at the central site. Other printed pages may differ in appearance if the terminal printer does not recognize all of the printer carriage control characters supported for central site devices (refer to appendix B of this manual and the NOS/BE Reference Manual).

fm allows an installation-defined forms control matrix to be specified for a 73x-10 Remote Batch Terminal, using values 1 through 32. Values 1 through 16 specify a print spacing of six lines per inch; 17 through 32 specify eight lines per inch. These line-spacing default values can be changed as an installation option.

If the DEFINE command is entered with only the eqo parameter, the device is returned to a default status with the following characteristics.

ec = B6 for BCD 200 User Terminals; A6 for ASCII 200 User Terminals and 73x Remote Batch Terminals; A9 for IP or NIP printers at 714 Remote Batch Terminals

fc = none
BANON
fm = 1

The DEFINE command is ignored if entered while a file is in progress; a COMMAND IGNORED message is issued. If a change of print forms or card stock is required, the output device should be turned logically off before the DEFINE command is entered. Operations are resumed when the device is turned logically on.

Example:

To specify a B6 print train for line printer number 1 attached to a 733-10 Remote Batch Terminal, enter:

```
DEFINE,,ECB6
```

WAIT COMMAND

Reading, printing, or punching can be halted temporarily by entering the WAIT command. The halt can be cleared by the GO command. To halt reading, printing, or punching, enter:

WAIT[,eqa]

Using the ALL parameter causes reading, printing, and punching to be halted at all devices. If the eqa parameter is omitted, LP1 printing is halted. If input/output is not in progress when WAIT is entered, no new jobs are read, printed, or punched even if output becomes available.

To halt card reader number 2 temporarily, enter:

```
WAIT,CR2
```

To halt all printing, punching, and reading, and then resume these operations, enter:

```
WAIT,ALL
GO,ALL
```

To halt printing at line printer number 1 and then resume, enter:

```
WAIT
GO,LP1
```

GO COMMAND

Operations halted temporarily by the WAIT command are resumed when the GO command is entered.

To use the GO command, enter:

GO[,eqa]

A WAIT/GO sequence has no effect on the file contents. If WAIT halts file processing, the file continues from the point where it stopped. If no file activity is in progress when WAIT is entered, GO with an appropriate parameter ensures that printing or punching is initiated as soon as an output file becomes available or that all card input is accepted from the card reader. If card reading is suspended because of heavy system usage, card reading does not resume until the overload diminishes (refer to Reading Cards, section 7).

A GO command is also required to clear the WAIT status and restart reading or printing at a 200 User Terminal or 714 Remote Batch Terminal after the following error conditions have occurred.

Device not ready

Job statement error

Input file error

Output file error

Example:

To restart printing at line printer number 1 after WAIT has temporarily halted operations, enter:

```
GO,LP1
```

CONTIN COMMAND

The CONTIN command which has no parameters is applicable only at a 200 User Terminal; at all other remote terminals, it is treated as a no-op. The command is not related to the GO and WAIT commands but is used instead to restart file transmissions which have stopped because a message was sent to CRT display or the INTER key was pressed. Interrupted file transmissions are also restarted automatically after any of the following remote batch commands have reached a successful completion.

ON, OFF, GO, WAIT, DEFINE, READ, BSP, REW, RTN, REP, END, SUP

A successful completion is achieved if the command is accepted and a diagnostic is not issued. At remote batch terminals other than the 200 User Terminal, the CONTIN command can be used in response to an H,S display which shows the terminal configuration as undefined.

PERIPHERAL DEVICE RESIDENT-FILE CONTROL COMMANDS

Files which are currently being read, printed, or punched by a peripheral device can be controlled by means of the following commands.

BSP, END, REP, REW, RTN, and SUP

BSP COMMAND

Entry of the BSP command causes a print or punch file to be backspaced a specified number of file sectors. A sector is 64 central memory words. The format for the command is:

```
BSP,[eqo],[sss]
```

The sss parameter is a positive octal integer less than or equal to 777 which indicates the number of file sectors to be backspaced; the number of sectors backspaced is 10 octal times the value of sss. If sss is not specified, a value of 1 (10 octal sectors) is assumed.

Examples:

To backspace card punch number 1 fifty sectors, enter:

```
BSP,CP1,5
```

To backspace line printer number 1 twenty sectors, enter:

```
BSP,,2
```

To backspace line printer number 2 ten sectors, enter:

```
BSP,LP2
```

END COMMAND

The END command stops file reading, printing, or punching. The file on the device specified by parameter eqa is dropped.

Card reader files are dropped immediately. The file is not placed in the input queue and all data up to the next end-of-file is ignored. At a 200 User Terminal, the ignored card reader data can include up to 11 cards of the next file. These cards must be reloaded before the next READ command is issued.

On line printers, the remaining data is discarded and only the dayfile, if any, is printed. The repeat count, if any, is honored. If a second END command is entered, printing terminates immediately. The dayfile is not printed, and repeat counts are not honored.

Punch files are terminated immediately upon entry of the first END command. The repeat count, if any, is honored for punch files also.

To terminate the current job, enter:

END[,eqa]

END entered with no equipment parameter is used to terminate a number of commands; therefore, LP1 is not assumed.

Examples:

To terminate the file being read by card reader number 2, enter:

```
END,CR2
```

To terminate the file in progress at line printer number 1, enter:

```
END,LP1
```

REP COMMAND

REP causes the file on the designated device to be reprinted or repunched a specific number of additional times. To obtain additional copies, enter:

REP,[eqo],[m]

The m parameter is an octal integer (1 through 37) which specifies the number of additional copies required. If m is omitted, 1 is assumed. REP command entries are cumulative; the maximum number of copies yet to be processed cannot exceed 37 octal.

Example:

To obtain eight additional copies of the file on card punch number 1, enter:

```
REP,CP1,10
```

REW COMMAND

To rewind and return an output file to the output queue, enter:

REW[,eqo]

The file on the device indicated by the eqo parameter is rewound and the device turned logically off. The file may then be diverted to another terminal or the central site (refer to the DIVERT command). The device must be turned logically on for output to continue.

RTN COMMAND

To rewind a file being printed or punched and return it to the output queue with a specific priority, enter:

RTN,[eqo],[p]

Printing halts and the print or punch file on the eqo device is returned to the output queue with the priority specified by the p parameter (0 through 7777). If the priority is not specified, the file is returned to the output queue with the old priority. The residual repeat count is saved.

Unless the priority is zero, printing or punching of the file terminates, the file is rewound, and printing or punching resumes. When the priority is zero, the device is turned logically off. The file can then be diverted to another terminal or the central site (refer to the DIVERT command). Output does not continue until the device is turned logically on.

Example:

To delay the output of the file currently printing on line printer 1 until another output file of priority greater than 100 has printed, enter:

RTN,,100

SUP COMMAND

Spacing of a print file according to carriage control characters can be suppressed by entering the command:

SUP,LPn

n is the logical device number of the printer. Since data already formatted for printing is not suppressed, a small amount of data is printed with normal carriage control before SUP takes effect. The remainder of the file is then single-spaced.

QUEUE RESIDENT-FILE CONTROL COMMANDS

Jobs submitted from remote batch terminals reside in the input queue. At execution time, they are placed in the execution queue, and output from their execution is placed in the output and punch queues. Even though a job is under operating system control while in the queues, the terminal id continues to be associated with the job unless the terminal or central site operator specifically breaks that association with a DIVERT command. As a result, a terminal which disconnects or goes off-line can regain access to the files at a later time by reestablishing communications with INTERCOM; the terminal id is still associated with the files.

The following queue resident-file control commands enable the operator to control such files:

DIVERT, REVERT, DROP, PRIOR, EVICT, KILL

DIVERT COMMAND

Files and jobs from a remote terminal are normally associated with the terminal id. The DIVERT command causes the files to be associated with another location. The command format is:

DIVERT,[jobname],[id],[q][,DEF]

To divert output to the central site, enter:

DIVERT,jobname

Once this command has been entered, the input or output files for the job are associated with the central site; they are no longer accessible to the terminal issuing the command. All output is processed at the central site. The jobname is a seven-character identifier whose last two characters are unique. The jobname can be abbreviated to the last two characters.

To transfer output from a job to another terminal, enter:

DIVERT,jobname,id

The user or terminal id to be assigned to the job output is indicated by id. All files (input/output) associated with the job are associated with that user or terminal id and are no longer accessible to the user issuing the command. The output can be recovered by the terminal or user with the specified id.

All print and punch files that are diverted are given a priority calculated using file size. The DIVERT command can be specified only for a file in an input, output, or punch queue.

To transfer only print or punch output from a job to the central site or another terminal or user, enter:

DIVERT,jobname,id,q

The user or terminal id to be assigned the job output is indicated by the id parameter. The output type is specified by the q parameter, which can have a value of O (print) or P (punch). Input files can be transferred to another user, terminal, or the central site by specifying I as the q parameter. All current q-specified files associated with the job are associated with the specified user or terminal id and are no longer accessible to the user issuing the command. If no parameters are specified, all input, output, and punch files in the queues belonging to the current user are diverted to the central site.

If the q parameter is specified on the DIVERT command and no jobname is given, all specified q files currently available are diverted.

Using DEF with a specified id and a q specification of O or P causes all subsequent O or P files to be diverted as soon as they become available. DEF cannot be specified from a TTY, with a q entry of I, or in a DIVERT command containing a jobname.

DIVERT commands in which the DEF specification is used remain in effect until a REVERT command is issued to discontinue diverting the specified file type.

Examples:

To transfer printing of job JOBAA05 to the central site, enter:

```
DIVERT,JOBAA05,,O
```

To transfer printing and punching of job JOBAA06 to terminal AA, enter:

```
DIVERT,JOBAA06,AA
```

To transfer only punching of job JOBAA06 to terminal AA, enter:

```
DIVERT,06,AA,P
```

The abbreviated jobname (06) is sufficient identification.

To transfer all input, print, and punch files to the central site, enter:

```
DIVERT
```

To transfer all output files, print and punch, to terminal AA, enter:

```
DIVERT,,AA
```

To transfer all current punch files to the central site, enter:

```
DIVERT,,,P
```

To transfer all current and subsequent punch files to terminal AB, enter:

```
DIVERT,,AB,P,DEF
```

REVERT COMMAND

The REVERT command cancels the effect of a DIVERT command entered with a DEF parameter. Subsequent output specified by the q parameter is routed to the terminal issuing the command. To discontinue diverting specified q files, enter:

```
REVERT,q
```

Example:

To discontinue diverting punch files to terminal AB, enter:

REVERT,P

The effect of the DIVERT command is negated, and subsequent punch output is no longer diverted.

DROP COMMAND

To drop a job while it is in execution, enter:

DROP,jobname

The job is dropped from execution. Any output files already generated by a job dropped are placed in the output queue. The jobname is a seven-character identifier whose last two characters are unique; it can be abbreviated to those characters.

Example:

To drop JOBAB77 from execution, enter:

DROP,JOBAB77

or

DROP,77

PRIOR COMMAND

The priority of an output file can be changed by entering either of two commands:

PRIOR (see Peripheral Device Resident-File Control Commands)

or

RTN

For files not currently printing, enter:

PRIOR,jobname,p ,q

The jobname identifies the job. Parameter p is a 1 through 4 digit positive octal number defining the new priority; 7777 gives a file the highest priority. Jobs with priority 0000 remain in the queue; they are not punched or printed. Parameter q specifies in which queue the file resides, O (print) or P (punch). If q is omitted, all output files associated with the jobname change priority.

Examples:

To change punch file FILE2AB to priority 547 (octal), enter:

```
PRIOR,FILE2AB,547,P
```

To change all print and punch files for JOBAA22 to priority 172 (octal), enter:

```
PRIOR,JOBAA22,172
```

EVICT COMMAND

To drop an input or output file, enter:

```
EVICT,jobname[,q]
```

The file is eliminated from the queue. The q parameter specifies in which queue the file to be evicted resides: I (input), O (print), or P (punch). If q is not specified, all files with the specified jobname are eliminated from the three queues.

Examples:

To drop JOBX123 while executing and eliminate any output files that have been generated, enter:

```
DROP,JOBX123
EVICT,23
```

or

```
KILL,23
```

To eliminate all punch files of job JOBX124, enter:

```
EVICT,24,P
```

KILL COMMAND

To terminate an executing job, enter:

```
KILL,jobname
```

The job is terminated and eliminated from the system. No output or dayfile is produced for the job. The jobname is a seven-character identifier whose last two characters are unique. The jobname can be abbreviated to the last two characters.

Example:

To kill JOBAB76 from execution, enter:

```
KILLJOBAB76
```

or

```
KILL,76
```

STATUS INFORMATION

The H command can be used to request a display of the terminal's queues or to show the status of the terminal's peripherals. The command's format is:

H {I / O / P / E / S}

To display the input queue (figure 8-1), enter:

H,I

The screen displays the file name (column FILE) and priority (PRI). Three columns of file names, eight to a column, are displayed from left to right in descending priority. If the permanent file catalog tables or the FNT is full, SUSP is displayed in the upper-right corner of the display.

```
      1              11             21             31             41            50
 1  INPUT QUEUE FOR TERMINAL AB=22.                                             -
 2  SYSTEM INPUT QUEUE=64.                                                      -
 3  JOBS OF HIGHER PRIORITY=11.                                                 -
 4                                                                              -
 5  FILE       PRI     FILE       PRI     FILE          PRI                    -
 6  DATAR1B    7773    EXPEN20    7605    QEDBU24       6742                   -
 7  TENKD1H    4321    PAYROHI    3210    ABCDEG2       2123                   -
 8  DDDBUT1    2075    EEGAXQ2    2070    CCCLM44       2064                   -
 9  .          .       .          .       .             .                      -
10  .          .       .          .       .             .                      -
11  .          .       .          .       .             .                      -
12  .          .       HIJKL57    1556    MNOPQR6       1733                   -
13  INVEN72    1472                                                           Δ
 .
 .
 .
```

Figure 8-1. Input Queue Display (H,I)

To display the output (print) queue (figure 8-2), enter:

H,O

The screen displays the file name, priority, forms code (FC), file size (FS), and requested print train (EC). The file size is shown as an octal integer in hundreds of sectors, including repetitions. A sector is 64 central memory words. The files are displayed in each of two columns, left to right in descending priority.

```
    1              11              21              31              41              50
1   OUTPUT QUEUE FOR TERMINAL AB=19.                                               -
2                                                                                  -
3   FILE     PRI   FC   FS   EC   FILE     PRI   FC   FS        EC               -
4   TIMECE5  7764  AA     3  A6   SORTAF6  6665        71                         -
5   JJOB790  6577         57       ICNSAG7  5467        16                         -
6   QMLSBX2  5356        265       JDOTBH8  5245        54                         -
7   AZBYCX4  5134         40       KEPUC19  4423       133                         -
8   FHLQVY5  4312  AB     2  A9    .        .           .                          -
9   .        .           .        .        .           .                          -
10  .        .           .        .        .           .                          -
11  .        .           .        .        .           .                          -
12  .        .           .        CHECKJ1  2521  AG   111        A6              -
13  RQSTUV9  1630         70                                                       Δ
.
.
.
```

Figure 8-2. Output Queue Display (H,O)

To display the punch queue (figure 8-3), enter:

H,P

The screen displays the file name, priority, forms code, and file size. The file names are displayed the same way as are those in the print queue.

```
    1              11              21              31              41              50
1   PUNCH QUEUE FOR TERMINAL AB=6.                                                 -
2                                                                                  -
3   FILE     PRI   FC   FS   FILE     PRI   FC        FS                          -
4   TIMECE5  7764  AA     3  PUNCH09  6654              375                        -
5   BFJNR26  6543        21  DYZHL85  5432             1625                        -
6   CGKOS37  5321         7  EWAIMP7  4210             1600                        Δ
7
8
.
.
.
```

Figure 8-3. Punch Queue Display (H,P)

To display the execution queue (figure 8-4), enter:

H,E

The screen displays the job name, priority, status, field length (FL), and elapsed time (ET) in octal seconds. The elapsed time is further broken into a field specifying CPU seconds used so far by the job and then the job time left. The status is displayed by one of the following codes.

W-SWAP	Waiting for a swap.
W-MEMORY	Waiting for a memory.
W-PFILE	Waiting for a permanent file.
W-DEVICE	Waiting for a device.
W-OPRTR	Waiting for operator action.
W-INTRCM	Waiting for INTERCOM.
W-P PACK	Waiting for a permanent pack.
W-MMFRME	Waiting for a multimainframe.
EXECUTING	Executing at a control point.
W-SCHED	Waiting for scheduler action.

The field length is an octal integer shown in hundreds (577 equals 57 700_8).

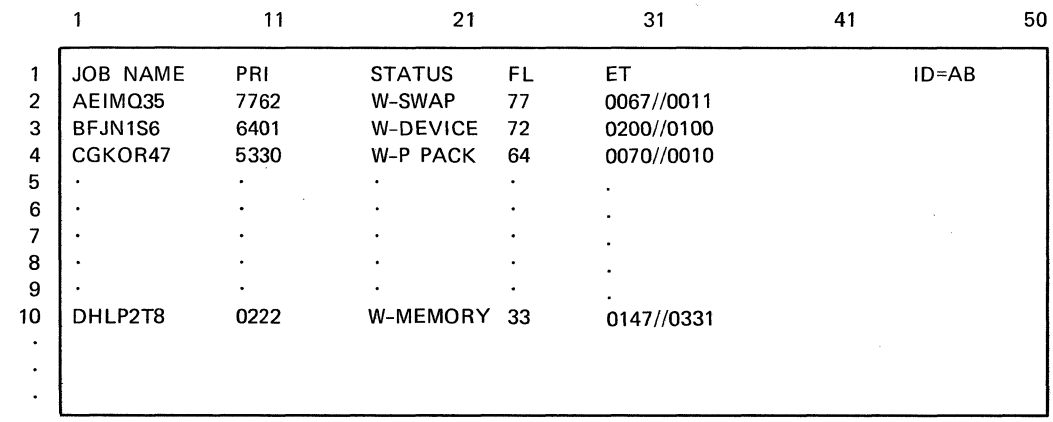

Figure 8-4. Execution Queue Display (H,E)

To display the terminal's status (figure 8-5), enter:

H,S

```
    1          11          21          31          41          50
1   DEVICE  STATUS  EC  FILE      FS  FC  FM          RC  -
2                       NAME                              -
3                                                         -
4   CR1                 CARDRPY                           -
5   CR2     OFF                                           -
6   CP1     WAIT        PUNCHW1   7                   1   -
7   LP1             A9  PAYRO73   25  AB  6               Δ
8   LP2     OFF     B6
.
.
.
```

Figure 8-5. Device Status Display (H,S)

The screen displays the device name (LPn, CP, or CPn); its status (ON, OFF, ERROR, SUSP, WAIT, WAIT/E, or GO), and (for printers) its print train; the file name; the number of sectors remaining to be printed (FS) as an octal integer in hundreds; the form code (FC); the forms control matrix (FM); and the repeat count (RC).

The H command cannot be used from a TTY or while in the EDITOR mode. A limit of 27 files can be displayed for input, output, and punch displays. This maximum number is further reduced if the screen length will not hold 27 entries. (The Q command, section 3, can be used to locate all of a terminal's jobs.) Only jobs associated with the terminal id appear on an H display. The display is updated automatically every 10 seconds and is terminated by entry of any command.

In figures 8-1 through 8-5, the screen size used is 50 by 20. The priority column alternatively displays the alphabetic dependency identification and, if applicable, the count.

STANDARD CHARACTER SETS A

Control Data operating systems offer the following variations of a basic character set.

CDC 64-character set

CDC 63-character set

ASCII 64-character set

ASCII 63-character set

The set in use at a particular installation was specified when the operating system was installed.

Depending on another installation option, the system assumes an input deck has been punched either in O26 or in O29 mode (regardless of the character set in use). Under NOS/BE, the alternate mode can be specified by a 26 or 29 punched in columns 79 and 80 of the job statement or any 7/8/9 card. The specified mode remains in effect through the end of the job unless it is reset by specification of the alternate mode on a subsequent 7/8/9 card.

Graphic character representation appearing at a terminal or printer depends on the installation character set and the terminal type. Characters shown in the CDC Graphic column of the standard character set table are applicable to BCD terminals; ASCII graphic characters are applicable to ASCII-CRT and ASCII-TTY terminals.

NOTE

In the following chart, characters identified by the heading CDC GRAPHIC are applicable to BCD-CRT models: 214-11, 214-12, 217-11, 217-12, 731-12, and 732-12.

Characters identified by the heading ASCII GRAPHIC are applicable to ASCII (CRT and TTY) as follows:

ASCII-CRT

217-13, 217-14, 731-12, 732-12

711-10

714

733-10

ASCII-TTY

Model 33, 35, or 38 Teletype

713-10

STANDARD CHARACTER SETS

CDC Graphic	ASCII Graphic Subset	Display Code	Hollerith Punch (026)	External BCD Code	ASCII Punch (029)	ASCII Code	CDC Graphic	ASCII Graphic Subset	Display Code	Hollerith Punch (026)	External BCD Code	ASCII Punch (029)	ASCII Code
:†	:	00††	8-2	00	8-2	072	6	6	41	6	06	6	066
A	A	01	12-1	61	12-1	101	7	7	42	7	07	7	067
B	B	02	12-2	62	12-2	102	8	8	43	8	10	8	070
C	C	03	12-3	63	12-3	103	9	9	44	9	11	9	071
D	D	04	12-4	64	12-4	104	+	+	45	12	60	12-8-6	053
E	E	05	12-5	65	12-5	105	-	-	46	11	40	11	055
F	F	06	12-6	66	12-6	106	*	*	47	11-8-4	54	11-8-4	052
G	G	07	12-7	67	12-7	107	/	/	50	0-1	21	0-1	057
H	H	10	12-8	70	12-8	110	(	(	51	0-8-4	34	12-8-5	050
I	I	11	12-9	71	12-9	111	)	)	52	12-8-4	74	11-8-5	051
J	J	12	11-1	41	11-1	112	$	$	53	11-8-3	53	11-8-3	044
K	K	13	11-2	42	11-2	113	=	=	54	8-3	13	8-6	075
L	L	14	11-3	43	11-3	114	blank	blank	55	no punch	20	no punch	040
M	M	15	11-4	44	11-4	115	, (comma)	, (comma)	56	0-8-3	33	0-8-3	054
N	N	16	11-5	45	11-5	116	. (period)	. (period)	57	12-8-3	73	12-8-3	056
O	O	17	11-6	46	11-6	117	≡	#	60	0-8-6	36	8-3	043
P	P	20	11-7	47	11-7	120	[	[	61	8-7	17	12-8-2	133
Q	Q	21	11-8	50	11-8	121	]	]	62	0-8-2	32	11-8-2	135
R	R	22	11-9	51	11-9	122	%	%	63††	8-6	16	0-8-4	045
S	S	23	0-2	22	0-2	123	≠	" (quote)	64	8-4	14	8-7	042
T	T	24	0-3	23	0-3	124	→	_ (underline)	65	0-8-5	35	0-8-5	137
U	U	25	0-4	24	0-4	125	∨	!	66	11-0 or 11-8-2†††	52	12-8-7 or 11-0†††	041
V	V	26	0-5	25	0-5	126							
W	W	27	0-6	26	0-6	127	∧	&	67	0-8-7	37	12	046
X	X	30	0-7	27	0-7	130	↑	' (apostrophe)	70	11-8-5	55	8-5	047
Y	Y	31	0-8	30	0-8	131	↓	?	71	11-8-6	56	0-8-7	077
Z	Z	32	0-9	31	0-9	132	<	<	72	12-0 or 12-8-2†††	72	12-8-4 or 12-0†††	074
0	0	33	0	12	0	060							
1	1	34	1	01	1	061	>	>	73	11-8-7	57	0-8-6	076
2	2	35	2	02	2	062	≤	@	74	8-5	15	8-4	100
3	3	36	3	03	3	063	≥	\	75	12-8-5	75	0-8-2	134
4	4	37	4	04	4	064	¬	^ (circumflex)	76	12-8-6	76	11-8-7	136
5	5	40	5	05	5	065	; (semicolon)	; (semicolon)	77	12-8-7	77	11-8-6	073

†Twelve or more zero bits at the end of a 60-bit word are interpreted as end-of-line mark rather than two colons. End-of-line mark is converted to external BCD 1632.

††In installations using a 63-graphic set, display code 00 has no associated graphic or card code; display code 63 is the colon (8-2 punch). The % graphic and related card codes do not exist and translations from ASCII/EBCDIC % yield a blank (55_8).

†††The alternate Hollerith (026) and ASCII (029) punches are accepted for input only.

ASCII 95-CHARACTER SET

ASCII Graphic	ASCII Code	ASCII Punch
Space	20	No punch
!	21	12-8-7
"	22	8-7
#	23	8-3
$	24	11-8-3
%	25	0-8-4
&	26	12
'	27	8-5
(	28	12-8-5
)	29	11-8-5
*	2A	11-8-4
+	2B	12-8-6
,	2C	0-8-3
-	2D	11
.	2E	12-8-3
/	2F	0-1
0	30	0
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7

ASCII Graphic	ASCII Code	ASCII Punch
8	38	8
9	39	9
:	3A	8-2
;	3B	11-8-6
<	3C	12-8-4
=	3D	8-6
>	3E	0-8-6
?	3F	0-8-7
@	40	8-4
A	41	12-1
B	42	12-2
C	43	12-3
D	44	12-4
E	45	12-5
F	46	12-6
G	47	12-7
H	48	12-8
I	49	12-9
J	4A	11-1
K	4B	11-2
L	4C	11-3
M	4D	11-4
N	4E	11-5
O	4F	11-6

ASCII 95-CHARACTER SET (Contd)

ASCII Graphic	ASCII Code	ASCII Punch
P	50	11-7
Q	51	11-8
R	52	11-9
S	53	0-2
T	54	0-3
U	55	0-4
V	56	0-5
W	57	0-6
X	58	0-7
Y	59	0-8
Z	5A	0-9
[	5B	12-8-2
\	5C	0-8-2
]	5D	11-8-2
^	5E	11-8-7
_	5F	0-8-5
`	60	8-1
a	61	12-0-1
b	62	12-0-2
c	63	12-0-3
d	64	12-0-4
e	65	12-0-5
f	66	12-0-6
g	67	12-0-7

ASCII Graphic	ASCII Code	ASCII Punch
h	68	12-0-8
i	69	12-0-9
j	6A	12-11-1
k	6B	12-11-2
l	6C	12-11-3
m	6D	12-11-4
n	6E	12-11-5
o	6F	12-11-6
p	70	12-11-7
q	71	12-11-8
r	72	12-11-9
s	73	11-0-2
t	74	11-0-3
u	75	11-0-4
v	76	11-0-5
w	77	11-0-6
x	78	11-0-7
y	79	11-0-8
z	7A	11-0-9
{	7B	12-0
:	7C	12-11
}	7D	11-0
~	7E	11-0-1

ASCII CODED CHARACTER SET

128-Character Set

95-Character Subset

64-Character Subset

Bits b_4	b_3	b_2	b_1	ROW / COLUMN	$b_7 b_6 b_5$ = 000	001	010	011	100	101	110	111
					0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	|
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

NOTE

95 to 64 character set conversion is accomplished by folding column 6→4 and column 7→5. Folding 128 to 95 character subset consists of deleting the excess characters if it is interactive data or replacing with blanks if it is batch data.

HEXADECIMAL-OCTAL CONVERSION TABLE

Second Hexadecimal Digit	First Hexadecimal Digit 0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	000	020	040	060	100	120	140	160	200	220	240	260	300	320	340	360
1	001	021	041	061	101	121	141	161	201	221	241	261	301	321	341	361
2	002	022	042	062	102	122	142	162	202	222	242	262	302	322	342	362
3	003	023	043	063	103	123	143	163	203	223	243	263	303	323	343	363
4	004	024	044	064	104	124	144	164	204	224	244	264	304	324	344	364
5	005	025	045	065	105	125	145	165	205	225	245	265	305	325	345	365
6	006	026	046	066	106	126	146	166	206	226	246	266	306	326	346	366
7	007	027	047	067	107	127	147	167	207	227	247	267	307	327	347	367
8	010	030	050	070	110	130	150	170	210	230	250	270	310	330	350	370
9	011	031	051	071	111	131	151	171	211	231	251	271	311	331	351	371
A	012	032	052	072	112	132	152	172	212	232	252	272	312	332	352	372
B	013	033	053	073	113	133	153	173	213	233	253	273	313	333	353	373
C	014	034	054	074	114	134	154	174	214	234	254	274	314	334	354	374
D	015	035	055	075	115	135	155	175	215	235	255	275	315	335	355	375
E	016	036	056	076	116	136	156	176	216	236	256	276	316	336	356	376
F	017	037	057	077	117	137	157	177	217	237	257	277	317	337	357	377
Octal	000 – 037		040 – 077		100 – 137		140 – 177		200 – 237		240 – 277		300 – 337		340 – 377	

DIAGNOSTIC MESSAGES B

Error messages displayed or printed out by INTERCOM are listed on the following pages. Messages described in this appendix are generated by the INTERCOM system, INTERCOM commands, EDITOR commands, and remote batch processing commands.

Error codes associated with permanent files and arithmetic error modes are listed at the end of this appendix.

Messages are listed in alphabetical order. Messages beginning with numbers follow the alphabetic listing. Messages in which the first characters change depending on the parameters of the job are listed after those that begin with a number; they are organized according to the second word of the message. Messages beginning with asterisks are alphabetized as if the asterisks were not present.

For system error messages not listed in this appendix, refer to the NOS/BE Diagnostic Handbook.

Some messages have inserts made into the text as they are generated. Inserts in messages are indicated by lowercase letters.

The format of the diagnostic messages consists of four columns listing the following information.

Message	The message is capitalized with all variables in lowercase letters.
Significance column	This column briefly describes the problem and defines variables in the message.
Action column	This column states the action required, if any, and how to perform it.
Issuing routine	This column states the routine(s) that generate the message.

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
ADD WONT REPLACE OR BYPASS LINES	ADD does not bypass or replace existing lines.	Reenter command with new line and increment values.	ADD
ARITHMETIC ERROR MODE = m ADDRESS = addr	Central processor error exit occurred at address addr. m can be found in a list of error modes at end of this appendix.	Notify central site if not caused by user's program. Enter SAVEFL, ON and DMP to obtain a dump of program area.	1IM
ARRAY OVERFLOW IN x	Current number of users has exceeded x capability. x SEND SITUATE	Notify system analyst.	SEND, SITUATE
BAD PARAMETER	BRESEQ command was invalid due to an invalid parameter.	Check and correct parameters; reinitiate BRESEQ in program format.	BRESEQ
CANNOT BATCH LFN OF INPUT	It is illegal to route a file with file name INPUT.	Change file name and resubmit command.	BATCH, REMOTE BATCH
CANNOT STAGE YOUR FILE	File requested by an EDIT, SAVE, or RUN command was created by a GETPF statement. When EDITOR tried to stage file, staging failed.	Verify that file exists on other mainframe and reenter GETPF statement and EDITOR commands.	EDITOR
COMMAND IGNORED	Command is not appropriate in this context.	Check current processing and review command logic if necessary.	REMOTE BATCH
COMMAND NOT ALLOWED FROM A MUJ	Attempt was made to enter batch processing or some other illegal command from a multiuser job (MUJ).	Do not reenter command.	1CI
COMMAND/TERMINAL MISMATCH	Command is illegal from this type of terminal	Refer to appropriate section of this manual to determine applicability of command just entered.	BSP, CONTIN, DEFINE, DIVERT, END, GO, H, OFF, ON, READ, REP, REVERT, REW

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
COMMAND/TERMINAL MISMATCH IN A MUJ	Command is allowed from a multiuser job (MUJ) only at a remote batch terminal.	Do not reenter cmmand.	BSP, END, GO, REP, REW, RTN
CONFIGURATION ERROR - FIRST 5 REQUESTED DEVICES DEFINED	The autoload procedure at a 733-10 High Speed Batch Terminal has specified more than 5 peripheral devices. Only 5 have been accepted.	Re-autoload with correct configuration, if necessary.	REMOTE BATCH
CONNECT ERROR	BRESEQ cannot connect ZZZZZ00.	Reenter command; if error persists notify system analyst.	BRESEQ
CONNECT FNT FULL	File name table (FNT) contains its maximum allowable number of active files.	Reenter command; if message persists notify system analyst.	CONNECT
CONNECT PARAMETER OUT OF RANGE	CM program called PP program CON with bad parameter.	Correct error and reenter command; notify system analyst if diagnostic persists.	CONNECT
CONSOLE BUSY - TRY AGAIN LATER	Central site operator did not clear last user message displayed at central site.	Wait and reenter message.	MESSAGE
CONTROL CARD ERROR	Parameters entered with a control statement contained either invalid or too many characters, are separated by illegal delimiters, or are not in proper format.	Correct parameters and reenter input.	
CP TIME LIMIT	Command or user's program has exhausted allotted central processor time limit.	If a user program, compiler, or control statement was entered, ETL command may be entered to increase time limit for subsequent execution. If error is a result of an INTERCOM command, notify system analyst.	IIM
CPU ABORT	Central processor program requested abnormal job termination.	If user program, recheck for possible errors; otherwise notify system analyst.	IIM

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
CRn, jobname INPUT FLE ERROR	Uncorrectable parity error or terminal hardware error while reading job jobname at card reader CRn.	Reread job from beginning.	REMOTE BATCH
CRn, jstate JOB CARD ERROR	First statement is not a valid user job statement. First 10 characters (jstate) are displayed.	Supply correct job statement and rerun.	REMOTE BATCH
CRn NOT READY	n is the card reader device number. The last card read is not an end-of-information card. INTERCOM expects more cards.	Place more cards or an end-of-information card in the card reader, press the load button, and enter GO, CRn.	REMOTE BATCH
DMP NOT VALID WITHOUT SAVEFL, ON	DMP utility cannot be used unless central memory field length is saved.	Enter SAVEFL, ON and reenter DMP utility.	DMP
DUPLICATE FILE NAME	File name specified already exists.	Reenter READ, lfn command with different file name.	READ
ECS PARITY ERROR	System error during an ECS operation terminated job.	Notify system analyst.	IIM
ERR- lfn ALREADY EXISTS	User already has a local file lfn.	Discard, return, or rename file; or specify OVERWRITE. Reenter command.	FETCH, SAVE
ERR- CANT FIND FILE lfn	File lfn is not in list of user's files.	Reenter command with correct file name.	EDIT, DISCARD, FETCH, STORE
ERR- CH= MUST SPECIFY COUNT < 511	Character count specified exceeds maximum limit.	Reenter FORMAT command with legal character count.	FORMAT
ERR- COL. OR UNIT SPECIFIED BUT NO /TEXT1/	Column number(s) or UNIT parameter can be specified only with /text/ parameter.	Reenter command in correct format.	DELETE, LIST, SAVE
ERR- COMPILER NAME REQUIRED	Compiler or assembler name (language parameter) must be specified.	Reenter ERRORS command with language parameter.	ERRORS, RUN
ERR- lfn CONNECTED TO TERMINAL	File lfn is currently connected to user's terminal.	Disconnect file with DISCONT and reenter command.	EDIT, RUN, SAVE

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
ERR- EDIT FILE BAD-- REBUILD FILE	Edit file data is invalid, detected by last EDITOR command.	Rebuild edit file. If problem reoccurs, notify system analyst.	EDITOR
ERR- EDIT WITH SEQ, CREATE, ADD, RESEQ ILLEGAL UNDER BASIC FORMAT	ADD, CREATE, EDIT with SEQ parameter and RESEQ commands cannot be used with EDITOR BASIC format.	Use BRESEQ utility to resequence BASIC file. Enter BASIC lines in following format: line=text.	ADD, CREATE, EDIT, RESEQ
ERR- FILE NAME MUST BE ALPHANUM, < 8 CHAR, 1ST CHAR A-Z	File name specified contained special characters, was greater than 7 characters, or did not have a letter as first character.	Reenter command with valid file name.	DISCARD, EDIT, FETCH, SAVE, STORE
ERR- FILE NAME REQUIRED	No file name was specified on command.	Reenter command with a valid file name.	DISCARD, EDIT, FETCH, SAVE, STORE
ERR- ILLEGAL COLUMN RANGE	Column numbers must be in ascending order and range of columns must be at least equal to number of characters in text string (from /text/ parameter).	Reenter command in correct format.	EDITOR
ERR- ILLEGAL LEVEL NO. ON *EOR CARD	End-of-record (EOR) level number is greater than 15.	Reenter *EOR with valid level number.	SAVE
ERR- ILLEGAL LINE RANGE	Line number parameters are not in ascending order.	Reenter command with line numbers in ascending order.	EDITOR
ERR- lfn IMPROPERLY ATTACHED FOR THIS OPERATION	File lfn does not have permission required for this operation.	Attach file with required passwords and reenter command.	EDIT, RUN, SAVE
ERR- INCREMENT MUST BE > 0	Command was entered with a zero or negative increment value.	Reenter command with positive increment value.	ADD, CREATE, RESEQ
ERR- INVALID FILE TYPE FOR EDITOR	User entered an EDIT command for a file that does not have zero-byte line terminators; that is, not a standard coded sequential file.	Recreate file with zero-byte line terminators (record type = Z, or formatted FORTRAN WRITE) and reenter EDIT command.	EDIT

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
ERR- LINE NO. > 999999	Next line number generated for increment mode or file sequencing exceeds maximum limit.	Change increment or line value and reenter command.	ADD, CREATE, EDIT, RESEQ
ERR- LINE NUMBER OUT OF SEQUENCE	Line numbers are out of sequence or nonexistent.	Load file using EDIT command with SEQUENCE parameter.	EDIT
ERR- LINE NUMBER REQUIRED	No line number was included in DELETE command.	Reenter command with line number.	DELETE
ERR- id MUST BE ALPHANUMERIC, 1 - 9 CHARS	ID parameter id contained special characters, was greater than 9 characters, or was required but not specified.	Correct ID parameter and reenter command.	DISCARD, FETCH, STORE
ERR- NO INFORMATION IN EDIT FILE	Edit file contains no information.	Load a file with EDIT command or build a file with CREATE command and reenter command.	EDITOR
ERR- NO INFORMATION IN FILE	File specified contains no information.	Check file name for errors and reenter STORE command with correct file name. If file name is correct, ascertain if file specified is to be stored and rebuild file with CREATE, if necessary.	STORE
ERR- NO PUB SET HAS PF/Q ATTRIBUTES FOR LFN lfn, USE ANOTHER LFN	User specified lfn that resides on a queue device (device that allows files to go directly to queues such as input or output). SAVE makes a copy of edit file on a device with permanent file attributes. At this site there is not device on the public set with both queue and permanent file attributes.	Reenter the SAVE command with a different lfn.	SAVE
ERR- ec ON DISK I/O EDIT FILE	I/O error (code ec) detected on EDITOR edit file I/O.	Reenter EDITOR command. If error persists, notify system analyst.	EDITOR
ERR- OVERWRITE ILLEGAL ON PERM FILE	Specified file already exists as an attached permanent file.	If SAVE was entered, return or discard permanent file and reenter SAVE command, or reenter SAVE using a different file name. If RUN was entered, notify	RUN, SAVE

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
		system analyst.	
ERR- PARAM n: COLUMN SPECIFICATION INCOMPLETE	Column numbers in parameter n not specified in following format: col-1, col-2.	Reenter command in correct format.	EDITOR
ERR- PARAM n: DUPLICATE PARAMETER	Parameter n appears twice in command.	Reenter command with only one parameter n.	EDITOR
ERR- PARAM n: ILLEGAL LINE NUMBER	Line number at parameter n is <1 or> 999999.	Reenter command with a legal line number.	EDITOR
ERR- PARAM n: NUMBERIC PARAMETER REQUIRED	Parameter n should have been numeric but was not.	Correct parameter and reenter command.	ADD, CREATE, FORMAT, RESEQ
ERR- PARAM n: TOO MANY DIGITS	Parameter n exceeds maximum range. Line numbers and increment values can be 1 through 6 digits; column numbers and tab positions can be 1 through 3 digits.	Reenter command in correct format.	EDITOR
ERR- PARAM n: UNRECOGNIZABLE PARAMETER	Parameter n was not in correct format.	Check legal delimiters, separators, and spelling. Reenter command in correct format.	EDITOR
ERR- PARAM 1 /TEXT2/ REQUIRED	Text replacement string of form /text-2/ required following equal sign.	Reenter command with first parameter in following format: /text-1/=/text-2/ (null text replacement string is specified as //).	EDITOR
ERR- PERM. FILE ERROR, RETURN CODE = ec	Error ec occurred during attempt to attach, catalog, or purge permanent file.	Refer to list of error codes associated with permanent files at end of this appendix.	DISCARD, FETCH, LOGIN, STORE
ERR- RESERVED FILE NAME	User has specified a file name beginning with ZZZZZ.	Reenter command using a nonreserved file name.	EDIT, RUN, SAVE
ERR- STORE NOT DONE, lfn FULL	Permanent file directory or catalog is currently full, so file lfn was not stored.	Reenter STORE command at a later time.	STORE
ERR- TAB= MUST SPECIFY ONLY 1 CHAR	Tab character parameter was greater than 1 character.	Check that tab character is 1 character and followed by legal separator; reenter command.	FORMAT

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
ERR- TABS TOO BIG OR OUT OF ORDER	Tab positions are either not in ascending order or exceed 510 characters.	Reenter command in correct format.	FORMAT
ERR- /TEXT1/ MUST HAVE AT LEAST 1 CHAR	Text search string cannot be null.	Reenter command with a character string specified for /text1/.	EDITOR
ERR- TOO MANY PARAMETERS	User entered command with more than legal number of parameters.	Reenter command in correct format with fewer parameters.	DISCARD, EDITOR, ERRORS, FETCH, STORE
ERR- TOO MANY TABS	User's tab setting exceed installation maximum limit.	Reenter command with fewer tab settings or request installation to extend limit.	FORMAT
ERR- USER FILE LIMIT EXCEEDED	User exceeded maximum limit for number of files.	Eliminate one or more local fiiles using the RETURN command and reenter command.	RUN, SAVE
ERR- YOU ARE OUT OF TIME	User has exceeded maximum central processor time for this EDITOR session.	The only EDITOR commands allowed at this point are SAVE, FORMAT, and BYE.	EDITOR
ERROR AT LINE x	BRESEQ found an error at line x.	Correct line x and reenter BRESEQ command.	BRESEQ
FAD NOT CALLED BY INTERCOM MUJ	Internal error.	Notify system analyst.	FAD
FAD SYSERR FROM addr	Internal error. addr is addrress in FAD that issued error message.	Notify system analyst.	FAD
FILE ERRORCANNOT LOCATE FILE lfn	PAK returned an error while searching for the set name and VSN for file lfn.	Notify system analyst.	EDITOR
FILE NAME lfn MUST BE DISCONNECTED BEFORE BATCHING	File lfn is connected to user's terminal.	Disconnect lfn with DISCONT; reenter command.	BATCH
FILE NAME lfn NOT FOUND	Local file lfn not found.	Check lfn for errors and reenter command. For list of local files, enter FILES.	XEQ

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
FILE NOT AVAILABLE	File name specified not in user's file list or id does not match.	Check status of user files with FILES command. When file is available to user, reenter command. If id is incorrect, reenter commmand with correct id.	BATCH
FILE NOT FOUND	Specified job name not found.	Correct user job name and reenter remote batch processing command.	DIVERT, DROP, EVICT, KILL, PRIOR, RTN
FILE POSITION UNCERTAIN-- EXAMINE FILE lfn	On a SAVE, MERGE operation to a member device of a private device set, EDITOR cannot determine how many SAVE, lfn commands were executed previously.	Mount member device and reenter command.	EDITOR
FILE QUOTA EXCEEDED	User's maximum file limit has been exceeded.	User must unload, store as permanent files, batch to central site, or otherwise eliminate excess local files before other commands can be entered.	ICI
FILENAME REQUIRED	File name must be given; no default is assumed.	Reenter command specifying a file name.	EDITOR
FNT CALLED BY PROGRAM NOT ON SYSTEM LIBRARY	Internal error.	Notify system analyst.	FNT
FNT PARAMETER OUT OF RANGE	Internal error.	Notify system analyst.	FNT
FNT SPACE LOW, TRY BATCH LATER	System FNT is nearly full.	Return any unnecessary files and retry.	BATCH
FNT TABLE IS FULL	Central memory file name table (FNT) is full.	Return any unneccessary files and reenter command. If error persists, notify system analyst.	FNT
FORMAT ERR-TYPE + TO GET LIST OF COMMANDS	Input parameters are not recognized as valid PAGE command.	Type + to get a list of PAGE commands. Reenter PAGE command in correct format.	ICI

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
FORMAT ERROR	Command has improper verb, parameters, or separators.	Check command for errors and reenter in correct format.	1CI
HOST DOWN	The 2550 Host Communications Processor is notifying the terminals it supports that the central site system is not responding to the 2550 Communications.	Wait until HOST UP message or the INTERCOM banner is displayed.	CCP
HOST UP	The 2550 Host Communications Processor is notifying the terminals it supports that the central site system is again operational.	Log in if the INTERCOM banner is displayed. Continue with session if HOST UP message is displayed.	CCP
HUNG IN AUTOMATIC RECALL	A peripheral processor routine called with automatic recall has dropped without settng complete bit.	Correct error if caused by user program; otherwise notify system analyst.	1IM
IAP BUFFER OUT OF RANGE	Internal error.	If routine is supplied by CDC, notify system analyst; otherwise correct user program and rerun.	IAP
IAP PARAMETER OUT OF RANGE	Internal error.	If routine is supplied by CDC, notify system analyst; otherwise correct user program and rerun.	IAP
ILLEGAL COMMAND	Attempt was made to enter a command that is illegal in current user state.	Do not reenter command. If command should not be illegal, reenter command. If error persists, notify system analyst.	
ILLEGAL FILE NAME	File name specified either begins with ZZZZZ (reserved) or is not one through seven alphanumeric characters beginning with a letter.	Reenter command with name in correct format or with a nonreserved file name.	BATCH, CONNECT, DISCONT, PAGE
ILLEGAL PRESET PARAMETER	Parameter used was not recognizable.	Check parameter for errors and reenter command.	XEQ

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
INPUT STOPPED	Due to heavy INTERCOM activity, last teletypewriter input may have been lost.	User should not continue until RESUME INPUT message is received.	CCP
INVALID DISPOSITION	User-specified invalid disposition or file id exceeds four characters.	Check disposition and file id for errors; reenter command in correct format.	BATCH
INVALID FILE-ID	User-specified file id exceeds four characters.	Reenter command with valid file id.	BATCH
INVALID OPTION OR XEQ DIRECTIVE dir	Directive dir not recognized.	Check directive for errors and reenter command in correct form.	XEQ
INVALID PARAMETER, MUST BE NUMERIC AND NON-ZERO	Illegal to specify zero length or nonnumeric screen size.	Reenter command with valid screen size.	SCREEN
INVALID SEPARATOR	Separator other than comma was used between parameters.	Reenter command with commas for separators.	BATCH
INVALID USER ID SPECIFIED	User specified improper user or terminal identification.	Reenter command with correct user or terminal id.	BATCH
INVALID USER NAME OR PASSWORD	User specified illegal or misspelled user name or password.	Reenter LOGIN command with valid user name and password.	LOGIN
IO TIME LIMIT	Command or user's program has exhausted alloted IO time.	Notify system analyst.	IIM
JANUS DISPLAY NOT AVAILABLE FOR OTHER FRAMES	JANUS queue is not accessible from other mainframes in a multimainframe environment.	Attempt to access JANUS display from the user's present mainframe.	Q
JOB CARD ERROR	First statement is not a valid job statement.	Correct errors on job statement; reenter command.	BATCH
LINE n > FORMAT CH COUNT	Line n expanded beyond maximum character count currently in effect during text replacement operations. Truncation did not occur.	No action is required, but truncation occurs when file is saved (refer to FORMAT command).	EDITOR

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
LINE NUMBER LIMIT EXCEEDED	A line number was encountered greater than 99999.	Reenter the command, specifying a lower starting value or a lower increment.	BRESEQ
LINE TOO LONG	Input has exceeded physical length for terminal.	Condense input and reenter command.	
LINE n TRUNCATED TO 510 CHARS	Line n expanded beyond 510 characters in text replacement operation, truncation occurred.	No action required.	EDITOR
LINES TRUNCATED: CH=n CHARS LONGEST LINE WAS m	Lines in excess of n characters were truncated; longest line was m characters.	If truncation is not acceptable, change character count by using FORMAT, CH=nnn command and reenter command.	RUN, SAVE
LINES > 510 CHARS WERE TRUNCATED	Lines in edit file in excess of 510 characters were truncated. Files with lines greater than 510 characters cannot be edited.	No action required.	EDIT
LOADER ERROR	Program was not successfully loaded.	Check user program for errors and try again. If no errors in program, notify system analyst.	
LOGIN NOT PERMITTED AT THIS TIME	Central site operator has locked system or FNT is nearly full which prohibits new users from logging in.	Try again later.	LOGIN
LPn, NOT READY	n is the line printer device number. A file has been sent to a printer that is not ready.	Correct the condition causing the not ready state and enter GO, LPn.	REMOTE BATCH
MAC NOT CALLD BY INTERCOM MUJ	Internal error.	Notify system analyst.	MAC
MAC SYSERR FROM addr	Internal error. addr is address in MAC that detected error.	Notify system analyst.	MAC
MASS STORAGE UNIT EXCEEDED	User attempted to use more mass storage than allowed.	Enter LIMIT command to increase amount of the user's allowed mass storage.	IIM

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
MAXIMUM CRT WIDTH OR SIZE EXCEEDED, MAX=w MAX SCREEN SIZE=ss	User has entered a line length (width) that is too large or product of width and depth is too large for screen. Width cannot be larger than w and screen size cannot be larger than ss.	Reduce line length and reenter command.	SCREEN
MAXIMUM TTY LINE SIZE EXCEEDED MAX LINE SIZE = ll	User has entered a line length (width) that is too large for the teletypewriter. The line length or width cannot be larger than ll.	Determine the actual maximum size and reenter.	SCREEN
MES RECEIVED BAD PARAMETER	Internal error.	Notify system analyst.	MES
MUJ ABORT, USER DETACHED	Multiuser job (either a user MUJ or a system MUJ such as EDITOR) has aborted; user is returned to command mode.	Reenter job. If error persists, notify system analyst.	MUJ
MUJ NOT CALLED BY INTERCOM MUJ	Internal error.	Notify system analyst.	MUJ
MUJ REQUEST NOT ALLOWED HERE	User requested a multiuser job under an illegal condition.	Ascertain operating mode and reenter command.	MUJ
MUJ SYSTEM ERROR ec hh.mm.ss mm/dd/yy or MUJ SYSTEM ERROR ec hh.mm.ss mm/dd/yy (FATAL)	Header message indicating the error code ec of a multi-user job processing error. Values of ec that are less than 50 indicate error conditions encountered by the system MUJ subroutines; values of 50 or greater indicate errors detected by SCED. Refer to each error code for the action and routine name.		
	ec Description		
	0 System error, such as operator drop, mode error, or PP abort, occurred.	Notify systems analyst.	REKOVER
	1 MUJSUBS software error.	Notify systems analyst.	ADJUAR, SRCUAR
	3 Bit KWCON was set for this value of MMACT. (FATAL)	Notify systems analyst.	SERVICE
	4 An error from CIO occurred on last user area swap.	Notify systems analyst.	SWAPOK
	5 Illegal CIO function was received on last user area swap. (FATAL)	Notify systems analyst.	SWAPOK
	6 User area was lost on swapout. (FATAL)	Notify systems analyst.	SWAPOK, BEGSWPO

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
MUJ SYSTEM ERROR ec hh.mm.ss. mm/dd/yy or MUJ SYSTEM ERROR ec hh.mm.ss. mm/dd/yy (FATAL)	7 If routine SERVICE issues this error code, CIO error occurred during terminal output. or If routine STLKCOM issues this error code, an illegal IFIELD parameter was encountered.	Notify systems analyst. Notify systems analyst.	SERVICE STLKCOM
	9 MUJ program returned user area not currently assigned to it. (FATAL)	Notify MUJ programmer.	USER
	10 Invalid ACTN code was sent by the MUJ program. (FATAL)	Notify MUJ programmer.	USER
	11 Invalid information was received from IQP.	Notify systems analyst.	USER
	12 New user already exists in MUJTERM.	Notify systems analyst.	USER
	13 Nonready user was marked ready.	Notify systems analyst.	USER
	16 MUJ program is returning user not assigned to it. (FATAL)	Notify MUJ programmer.	USER
	17 User's files cannot be returned when the user leaves MUJ program.	Notify systems analyst.	USER
	43 Binary-to-decimal conversion error from MSYSERR routine.	Error code passed to MSYSERR was out of range.	NUMCHAR
	50 If routine SCED issues the error code, INIT was called out of sequence. or If routine SCED issues the error code, there is an EDITOR error.	INIT must be first call to SCED in MUJ program. Refer to dump to determine which routine called SYSERR.	SCED SYSERR
	51 If routine SCED issues the error code, CONNECT was called out of sequence. or If routine SYSERR issues the error code, EDITOR debugging code is on.	CONNECT call must be preceded by a call to INIT. Refer to dump to determine which routine called SYSERR.	SCED SYSERR
	52 Terminal session function was called out of sequence.	Calls to INIT and CONNECT must precede calls to terminal session functions.	SCED
	53 DISCON was called out of sequence.	DISCON call must be preceded by call to CONNECT.	SCED

MESSAGE		SIGNIFICANCE	ACTION	ROUTINE
MUJ SYSTEM ERROR ec hh.mm.ss. mm/dd/yy or MUJ SYSTEM ERROR ec hh.mm.ss. mm/dd/yy (FATAL)	54	EXITMUJ was called out of sequence.	EXITMUJ call must be preceded by call to DISCON.	SCED
	60	Interlock number specified in GETINT call is outside of range specified during installation.	Notify SCED application programmer.	SCED
	61	User attempted to reserve an unreserved interlock.	Notify SCED application programmer.	SCED
	62	Interlock number specified in RETINT call outside of range specified during installation.	Notify SCED application programmer.	SCED
	63	User attempted to release an unreserved interlock.	Notify SCED application programmer.	SCED
	64	User attempted to disconnect from MUJ program while an interlock is still reserved for the user.	Notify SCED application programmer.	SCED
	70	Buffer type is outside range specified during installation.	Notify SCED application programmer.	SCED
	71	Word count is greater than size specified for buffer type requested.	Notify SCED application programmer.	SCED
	72	TIO error, usually caused by incorrectly formatted terminal output.	Notify SCED application programmer.	SCED
	80	TIO error occurred on read.	Notify systems analyst.	SCED
	81	No free user ordinal is available for new user. (Maximum number of users specified during installation exceeded.)	Notify systems analyst.	SCED
	82	ID of new user is already in use.	Notify SCED application programmer.	SCED
	83	MUJ subroutines returned ID unknown to SCED.	Notify systems analyst.	SCED
	84	MUJ subroutines status code is not handled by SCED.	Notify systems analyst.	SCED

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
MULTI-MAINFRAME ENVIRONMENT NOT UP	User has entered a multi-mainframe parameter when the multi-mainframe environment was not defined for the installation.	Wait until the specified mainframe is available.	Q
NO ID AVAILABLE	User attempted to log in with unrestricted password for first time with current user name; all available user id's have been assigned.	Try later; notify system analyst if diagnostic persists.	LOGIN
NO PERMISSION TO ROUTE THIS FILE	Incorrect permissions exist for user to dispose of this file.	File may have to be recreated and stored with correct permissions.	BATCH
NO SUCH LINES	The lines specified on command do not exist.	Reenter command with valid lines or ALL parameter.	LIST
NO USER NAME/PASSWORD ID AVAILABLE	No id bit map found on unrestricted password files. User attempted to log in with unrestricted password for first time with current user name; all available user id's have been assigned.	Notify system analyst.	LOGIN
***NOT ALLOWED FROM UNRESTRICTED USER	User has unrestricted password and cannot send messages to all logged-in users.	No action required.	SEND
OPERATOR DROP	Central site operator dropped last command or user's program.	Notify central site operator with MESSAGE command, determine cause of DROP, and reenter command or program.	
OVERSIZE WORD COUNT FOR IAP	Central memory program specified more words than IAP can transfer to control point area. Word count includes IAJ terminators added by IAP when not provided by user.	If user program caused, correct program. Otherwise, notify system analyst.	IAP
PARAMETER IS TOO LONG	User entered a parameter that exceeds 10 characters.	Correct parameter and reenter command.	BATCH, SEND
PARAMETER OUT OF RANGE IN MES	Internal error.	Notify system analyst.	MES
PARAMETER TOO LARGE, MUST BE 3 CHARACTERS OR LESS	Illegal to specify a SCREEN command parameter that is larger than 3 octal digits.	Correct parameter and reenter command.	SCREEN

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
PERM FILE ERR, RETURN CODE=ecB	Error ec occurred during attempt to access password file; password file may not be loaded at central site.	Refer to list of return codes at end of this appendix for code ecB. Notify system analyst.	LOGIN, SEND, SITUATE
PFC FULL-BATCH COMMAND IGNORED	No table entries are available to catalog on input or output file.	Reenter command at a later time.	BATCH
PLEASE LOGIN	User did not enter LOGIN as first entry.	Enter LOGIN with user name and password in correct format.	1CI
PP CALL ERROR	Central processor program issued illegal PP call.	If user program, recheck for possible errors; otherwise notify system analyst.	1IM
PP CALL WITH RECALL ERROR	PP program called by central processor program with recall, but complete bit was already set.	If user program, recheck for possible errors, otherwise notify system analyst.	1IM
PREVIOUS USER AUTO LOGGED OUT	LOGIN was entered at a terminal which was already logged in.	Previous user is logged out automatically, after which the new LOGIN command is processed.	LOGIN
PRINT OUT OF RANGE AT LINE n	The line number(s) n which the user has requested to be put on the print file is beyond limit of file being paged.	Specify valid line number and reenter command.	PAGE
REPEAT LINE	Because of heavy INTERCOM activity, last user input was lost.	Reenter last input.	1M1
REQUEST EXCEEDS AUTHORIZATION	User requested either a field length greater than authorized or a time limit greater than authorized.	Enter ASSETS command to see maximum value authorized. Reenter command with smaller value.	EFL, ETL
REQUEST FOR ARCHIVED FILE-WAITING FOR CENTRAL OPERATOR DROP OR GO	After user requests an attach (FETCH) of an archived file, operator is asked to respond GO or DROP to indicate if file retrieval should be initiated.	No action required. If operator responds DROP, user is informed OPERATOR DROP. User may wish to use MESSAGE command to ask operator why command was dropped. If operator responds GO, user is informed WAITING FOR	FETCH

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
		ARCHIVED FILE.	
RERUN	Remote job restarted by central site operator.	No action required.	
RESEQ CONTROL CARD ERROR	RESEQ command contained invalid parameters.	Check parameters for errors and reenter command with valid parameters.	BRESEQ
RESEQ ERRORS	Fatal errors in resequencing procedure. This message is normally preceded by other messages indicating specific errors.	Correct errors and reenter commands.	BRESEQ
RESEQ NUMERIC PARM ERROR	Command had nonnumeric characters in a numeric parameter.	Reenter command with numeric parameters.	BRESEQ
RESUME INPUT	Teletypewriter user can continue entering input. Message appears only after occurrence of INPUT STOPPED message.	Continue entering input.	CCP
RETURN CARD WITH NO PARAMETERS IS ILLEGAL	User failed to specify any file names with the RETURN command.	Reenter command specifying at least one file name.	RETURN
RETURN, REWIND, OR UNLOAD MUST HAVE AT LEAST ONE PARAMETER	User failed to specify any file names with the command.	Reenter command specifying at least one file name.	RETURN, REWIND, UNLOAD
SEND I/O ERROR ON PASSWORD FILE	Internal error.	Reenter command; if error persists, notify system analyst.	SEND
SEND-SYSTEM ERROR	Internal error.	Reenter command; if error persists, notify system analyst.	SEND
SESSION TIME EXCEEDED - YOU HAVE A FEW SECONDS TO SAVE YOUR WORK AND LOGOUT	User has exceeded maximum central processor time for user's entire INTERCOM session. INTERCOM logs out user who is still logged in after 5 seconds of CP time have elapsed.	User should catalog any files to be saved and log out.	EDITOR
SITUATE I/O ERROR ON PASSWORD FILE	Internal error.	Reenter command; if error persists, notify system analyst.	SITUATE
STATION NOT RESPONDING	In a multi-mainframe environment, a call to the station was not completed within the time limit.	Notify systems personnel.	Q

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
SYNTAX ERROR IN PARAMETER n of Q CALL.	Syntax error appears in parameter n of call Q.	Correct parameter n and reenter command.	Q
SYSTEM FILE LIMIT EXCEEDED	User has more than allowed number of files of form ZZZZZxx.	Return files generated by user; system analyst may wish to be informed of this condition.	
TABS > CH VALUE CLEARED	User specified new character count; tab settings which were cleared from previous format specification contain column number beyond new count.	No action required.	FORMAT
TBL ADDRESS OUT OF FIELD LENGTH AT SEND2	Internal error.	Notify system analyst.	TBL
TBL BUFFER OVERFLOW	Internal error.	Notify system analyst.	TBL
TBL CALLED BY PROGRAM NOT ON SYSTEM LIBRARY	Internal error.	Notify system analyst.	TBL
TBL PARAMETER ERROR	Internal error.	Notify system analyst.	TBL
TBL SWAP CALL NOT BY LOGIN	Internal error.	Notify system analyst.	TBL
TBL-TOO MUCH DATA FOR CM BUFFER	Internal error.	Notify system analyst.	TBL
TBL WAITED TOO LONG FOR COMMAND	Internal error.	Notify system analyst.	TBL
TEXT TRUNCATED TO 20 CHARS - AUTOMATIC VETO SET	User specified a text string greater than 20 characters, automatic VETO option has been set.	No action required.	EDITOR
THE ABOVE LIST MAY BE INCOMPLETE	Buffer not large enough for complete list of file names.	No action required; system analyst may wish to be informed of this condition.	FILES
TID IS NOT ALPHABETIC	User has entered special characters for terminal or user id.	Correct terminal or user id and reenter command.	BATCH
TIME LIMIT	User has exhausted allotted time in PAGE mode.	Leave PAGE mode. If more time is needed, enter ETL before returning to PAGE mode.	PAGE
TIO SYSTEM ERROR	Internal error.	Notify system analyst.	MUJSUBS
TOO MANY PARAMETERS	User specified too many parameters on command.	Reenter command in correct format.	

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
TOO MANY PARAMETERS, MAXIMUM IS 2	User specified more than two parameters on SCREEN command.	Remove excess parameters and reenter command.	SCREEN
TOO MANY PARAMETERS, ONLY ONE FILE PROCESSED	User specified too many BATCH disposition parameters. BATCH discarded extra parameters.	No action required.	BATCH
TOO MANY PARAMETERS, n PARMS IGNORED	User entered n more parameters than necessary to process current file; BATCH ignores extra parameters.	No action required.	BATCH
T76 BAD COMMAND CODE	Internal error.	Notify system analyst.	T76
T76 CM ARRAY ADDR ERROR	Internal error.	Notify system analyst.	T76
T76 IR PARAMETER WORD ADDR ERROR	Internal error.	Notify system analyst.	T76
T76 LOADED BY NONSYSTEM LIBRARY ROUTINE	Internal error.	Notify system analyst.	T76
T76 NOT CALLED FROM INTERCOM CP	Internal error.	Notify system analyst.	T76
T76 REQUEST REJECTED	Internal error.	Notify system analyst.	T76
UNEXPECTED SEPARATOR IN COL. col	Directive begins with a separator or contains two consecutive separators. col indicates column of user input that is in error.	Reenter command in correct format.	XEQ
UNLOAD NOT ALLOWED ON INPUT	User attempted to destroy INPUT file with RETURN or UNLOAD command.	If necessary to return INPUT, rename INPUT with RENAME command and enter RETURN or UNLOAD command.	RETURN, UNLOAD
UNRESTRICTED PERM FILE PROBLEMS	No information found on unrestricted password file.	Notify system analyst.	LOGIN
USER ABORT	User requested command or program to be aborted.	No action required.	ICI
USER NAME username IS NOT ACCESSIBLE	User username is logged out, has locked out incoming messages, or has a different password (if sender has unrestricted password).	No action required.	SEND
USER NAME/PASSWORD IN USE AT ANOTHER TERMINAL	Another user is currently logged in with same name and password.	Enter different user name and password or try logging in at later time.	LOGIN

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
WAITING FOR ACCESS TO FILE	Permanent file without multiread permission is in use by another job.	No action required. File is accessed when not used by other job.	ATTACH, DISCARD, FETCH, PURGE
WAITING FOR APF SPACE	Because of heavy permanent file activity, no more permanent files can be attached or created in system.	Wait; command will be processed. If user tires of waiting, user can enter %A to abort command and try again later.	DISCARD, FETCH, STORE
WAITING FOR ARCHIVED FILE	After user requested an attach (FETCH) of an archived file, operator responded with GO, indicating file retrieval should be initiated. Job is put into permanent file queue.	No action required.	FETCH
WAITING FOR FNT SPACE	There are no available FNT entries. Job waits for a FNT entry to finish execution.	No action required. If user tires of waiting, user can enter %A to abort job.	BATCH, READ
WAITING FOR INPUT	System is waiting for input. Message usually occurs after DISCONT recovery.	Continue entering commands as before. No work has been lost.	TBL
WAITING FOR - MOUNT VSN=vsn, SN=setname	EDITOR has issued the MOUNT command MOUNT VSN=vsn, SN=setname for a member device of a private device set.	No action required.	EDITOR
WAITING FOR PF UTILITY	No permanent file activity allowed during permanent file dump.	No action required; command is processed when dump done.	DISCARD, FETCH, STORE
WARNING - EDIT FILE NOT SAVED	User entered command that would destroy user's edit file; command was not processed.	Save edit file with SAVE, delete edit file with DELETE, or reenter command to delete file automatically.	BYE, CREATE, EDIT, END
WARNING - TERMINATORS ADDED BY IAP	Central memory (CM) program called peripheral processor (PP) program IAP without terminator required by IAJ at end of card buffer. If terminators were supplied by user, buffer length passed to IAP is incorrect. CM program still is executed.	If user program, correct program. Otherwise, notify system analyst.	IAP

MESSAGE	SIGNIFICANCE	ACTION	ROUTINE
YOU ALREADY HAVE A FILE BY THIS NAME	User specified LOCAL or RENAME disposition with file name that currently exists as a local file.	Reenter command with file name not in user's local file list. Enter FILES to see list of user's local files.	BATCH
YOU HAVE AN EXISTING EDIT FILE	User has an edit file from a previous EDITOR session or from a recovery deadstart.	User can work with existing file, delete it with DELETE, or save it with SAVE. Entering a BYE, CREATE, EDIT, or END command twice deletes edit file automatically.	EDITOR
YOU HAVE HAD THREE TRIES - GET HELP	Incorrect user name or password was entered three successive times.	Obtain correct user name and password; reenter LOGIN in correct format.	LOGIN
YOU HAVE TOO MANY FILES - PLEASE RETURN SOME	User's file quota has been exceeded and last command entered was not executed.	Enter DISPOSE or RETURN commands to reduce number of user local files.	ICI
ZERO WORD COUNT FOR IAP	Peripheral processor (PP) program IAP called to transfer information, did not find any information.	Notify system analyst.	IAP
eqa NOT READY	Device not ready initially or became not ready.	Ready device and enter GO,eqa.	TBL
eqo, OUTPUT FILE ERROR	Parity error or trouble with mass storage device.	Reposition file and enter GO,eqo to resume printing, or enter END,eqo or REW,eqo as desired. Notify sytem analyst.	REMOTE BATCH
str...TRUNCATED FROM LONG LINE	Line exceeds current maximum character count; first 3 characters truncated were str.	Reenter command with format specifications with FORMAT command.	EDITOR

ERROR RETURN CODES

Certain errors generate messages which include one of the following error codes.

Code (Octal)	Meaning
00	Function successful.
01	PFN/ID error.
02	Lfn is already in use.
03	Unknown lfn.
04	No room for extra cycle (limit is five).
05	Permanent file catalog (PFC) full.
06	No local file name or permanent file name.
07	Not used.
10	Latest index not written for a random file.
11	File not on PF device.
12	File not cataloged, SN=setname (setname is the set name of the device set searched).
13	Archive retrieval aborted.
14	Invalid load permanent file (LPF) communication.
15	Cycle number limit reached; maximum value of cycle number is 999.
16	Permanent file directory (PFD) full.
17	Permanent file function attempted on nonpermanent file.
20	Permanent file function attempted on nonlocal file.
21	Improper archive retrieval call.
22	File never assigned to a device.
23	Cycle incomplete or dumped.
24	Permanent file already attached.
25	Permanent file archived.
26	Illegal character in file definition block (FDB) parameter.
27	Illegal lfn.

Code (Octal)	Meaning
30	File dumped.
31	Illegal function code.
32	Purge attempt ignored; use RB parameter.
33	ALTER needs exclusive access.
34	File definition block (FDB) is too large.
35	File already in system.
36	No attached permanent file (APF) space.
37	Permanent file permission conflicts.
40	Illegal setname specified.
41	Device set not mounted at control point.
42	Record block table (RBT) chain too large for permanent file catalog (PFC).
43	File resides on unavailable device.
44-67	Not used.
70	Permanent file manager (PFM) stopped by system.
71	Incorrect permission.
72	File definition block (FDB) address invalid (not returned to FDB).
73	Input or output error on read or write by permanent file catalog or directory.

ARITHMETIC ERROR MODES

Arithmetic errors encountered during processing are displayed to the user in the following form, which indicates the address at which the error occurred.

ARITHMETIC ERROR MODE = m ADDRESS = addr

Error Modes	Meaning
0	Any nonnegatable condition (refer to NOS/BE Reference Manual MODE statement description).
1	Address is out-of-field length range.
2	Operand is infinite.
3	Address is out-of-field length range or operand is infinite.

Error Modes	Meaning
4	Operand is floating-point number with undefined point.
5	Address is out-of-field length range or operand is a floating-point number with undefined point.
6	Operand is infinite or is a floating-point number with undefined point.
7	Operand is infinite, floating-point number with undefined point, or address is out-of-field length range.

GLOSSARY C

Absolute Location (Address)

The actual physical location of a word in central memory. Contrast with relative location.

ALGOL

ALGOL stands for algorithmic language and is a language for expressing algorithms.

ASCII

Americal National Standard Code for Information Interchange; the 128-character set used by some terminals and the network.

Asynchronous

A type of terminal that has successive bits, characters, or events transmitted at variable time intervals. In data transmission this is usually limited to a variable time interval between characters and is often known as start-stop transmission. Contrast with synchronous.

Attach

To make a permanent file accessible to a job by specifying the proper permanent file identification and passwords.

BASIC

Beginner's all-purpose symbolic instruction code is an elementary programming language available to the user.

BCD

Binary-coded decimal character set. BCD code represents individual decimal digits by a binary code group.

BOI

Beginning-of-information.

Catalog

To place a file under jurisdiction of the permanent file manager, making it a permanent file.

COBOL

Common business-oriented language that describes business-data processing in a standard form.

COMPASS

The assembly language of the CYBER 170, CYBER 70, and 6000 Series computers.

Compile

To translate a program from a higher level programming language (for example, FORTRAN or BASIC) into machine instructions called object code.

Configure

Defining the attributes of a device.

Control Statement

An instruction to the operating system or its loader. It is found in a section at the beginning of a job deck.

Control Statement Record

The first, and possibly only, record on an INPUT file or a BATCH file consisting of statements that start with a job statement and end with the first EOR, EOF, or EOI.

CYBER Control Language (CCL)

A group of control statements and commands that manipulate all control statements. With CCL, the user can conditionally skip or process control statements, process and reprocess a group of control statements, and process control statements in a file other than the job file. CCL is common to both NOS/BE and SCOPE 2 and is virtually identical in both systems.

CYBER Record Manager

A software package running under the NOS and NOS/BE operating systems that allows a variety of record types, blocking types, and file organizations to be created and accessed. The execution time input/output of COBOL 4, COBOL 5, FORTRAN Extended 4, FORTRAN 5, Sort/Merge 4, ALGOL 4, and the DMS-170 products is implemented through CYBER Record Manager. Neither the input/output of the NOS/BE operating system nor any of the system utilities such as COPY or SKIPF is implemented through CYBER Record Manager. All CYBER Record Manager file processing requests ultimately pass through the operating system input/output routines. SCOPE 2 record manager performs input/output for the SCOPE 2 operating system and its products. SCOPE 2 record manager is similar in capabilities and use to CYBER Record Manager.

Dayfile

A chronological system permanent file, maintained on a permanent file device, which forms an accounting and job history file. Entries, called dayfile messages, are generated by operator action or by the system when control statements are processed or other significant action occurs. The system dayfile has entries for the entire system. Every job receives a job dayfile with entries pertinent to that job.

Deadstart

The process of initializing the system by loading the system library programs and any of the product set from magnetic tape or a public device. Deadstart recovery is reinitialization after system failure.

Default

A system-supplied parameter value or name used when a value or name is not supplied by the user.

Device Set

A group of rotating mass storage devices. No device can belong to more than one device set. Every file must be contained within one device set but can be on different devices in that device set.

Device Set Member

A rotating mass storage device belonging to a device set.

Directive

Control information that appears on a separate file or in a separate section of the job deck.

Display Code

Character code used internally in the computer. Each character consists of 6 bits (two octal digits). Refer to appendix A.

EBCDIC

Extended binary coded decimal interchange is an 8-bit code used by IBM in which individual decimal digits are each represented by a binary code group.

End-of-File

End-of-file is a boundary within a sequential file but not necessarily the end of a file that can be referenced by name. The actual end of a named file is defined by an EOI. CYBER Record Manager divides files into partitions; therefore, a NOS/BE multifile file is a multipartition file.

End-of-Information

Physical end of data. In card decks, a card with a 6/7/8/9 multiple punch in column 1. On mass storage devices, the position of the last written data. CYBER Record Manager defines end-of-information in terms of file residency and organization.

End-of-Record

End-of-record is the terminator of a logical record.

EOF

End-of-file (refer to End-of-File).

EOI

End-of-information (refer to End-of-Information).

EOR

End-of-record (refer to End-of-Record).

EST Ordinal

The number designating the position of an entry within the equipment status table established at each installation.

Extended Core Storage (ECS)

A secondary form of memory. It can be a directly accessible memory device or a mass storage device accessible with control statements.

Field Length (FL and FE)

FL is the number of central memory words assigned to a job. FE is the number of words in the direct access area of extended core storage assigned to a job. Within central memory or extended core storage, the field length added to the reference address defines the upper address limit of a job.

File

A file is a set of information that begins at beginning-of-information, ends at end-of-information, and has a logical file name. All files have at least one partition, which is delimited by a system-logical record of level 17 on mass storage files.

File Environment Table (FET)

A table used for communication between a user program and the operating system when files are processed. An FET created by a compiler or by the assembly language programmer is required within the user field length for each file in the program.

Flag

A character or bit that signals the occurrence or presence of a particular condition.

FORTRAN

The formula translation compiler that converts algebraic and scientific problems into machine language instructions.

Full Duplex

Simultaneous, two-way, independent transmission in both directions. Contrast with half duplex.

Full Track (FT)

Reading/writing sequential sectors on an 844 or 885 disk pack (1:1 interlace).

Half Duplex

Alternate, one way at a time, independent transmission. Contrast with full duplex.

Half Track (HT)

Reading/writing alternate sectors on an 844 or 885 disk pack (2:1 interlace).

INPUT

A file name assigned by the system to every job. It contains the image of user job deck.

Interactive

Job processing in which the user and the computer communicate with each other, rather than the user submitting his job, receiving output, and having no control over the job while processing occurs.

JANUS

A group of system peripheral processor routines which controls the processing of input and output files. JANUS controls up to four card readers, three card punches, and 12 line printers. It normally functions at control point but can be assigned to another control point by the operator.

Job Step

Each individual control statement is a job step. A group of job steps forms a job stream.

Job Stream

A job stream is the group of control statements found at the beginning of a deck (also known as control statement record).

Keyword

A parameter or part of a parameter that is entered into the command exactly as shown in the command format. It is not changed by any user-supplied information.

Level

An indicator specifying relative position in a hierarchy. For priority considerations, level 0 is the lowest priority. For system-logical-records, octal level numbers 0 through 17 can be used to organize files. For overlay and segment loading, a pair of numbers specifies level, with (0,0) being the portion of the program remaining in memory.

Level Number

An octal number from 0 through 17 in a short physical record unit or zero-length physical record unit marker to form system-logical-record groups within files. Level number 17 indicates a logical end-of-partition. Level number 16 is used by checkpoint/restart and should not otherwise be specified by the user. The system creates a system-logical-record with a level number of 0 for mass storage files and SI tapes when the user does not specify otherwise.

Library

A file or collection of files containing executable programs and tables needed to locate and load the programs. A system library can contain peripheral processor programs in addition to the central processor programs. A user library is file formatted as a library but is not available to a job until it has been explicitly brought to the job.

Line

Refer to Zero-Byte Terminator.

Load Sequence

A sequence of load operations which encompasses all the processing of the loader from the time that nothing is loaded until the time execution begins. It includes initialization, specification of specified loader requests, and completion of load.

Local File

Any file that is currently associated with a job.

Logical File Name (lfn)

The one through seven display coded alphabetic or numeric characters by which the operating system recognizes a file. Every lfn in a job must be unique and begin with a letter.

Login

A procedure that must be performed by the terminal user to initially establish communication with an application.

Macro

A COMPASS language statement which generates other source language code.

Master Device

The member of a device set designated as the device to contain all device set related tables. Every device set has one device that is a master device.

Mode 3

Asynchronous, half-duplex communication lines that are either hardwired (for 2550 NPUs only) or dial-in and connect a single remote station to the computer. Mode 3 also refers to the type of terminal that uses mode 3 communication lines. Teletypewriters are mode 3 terminals.

Mode 4

Synchronous, half-duplex communication lines that are either dial-in or hardwired. Mode 4 lines either connect a single remote station to the computer or interconnect several sites. Mode 4 also refers to the type of terminal that uses mode 4 communication lines.

There are two types of mode 4 lines or terminals, mode 4A and mode 4C. Mode 4A terminals use the ASCII or BCD character sets and are 200 User Terminals or 73x-12 terminals. Mode 4C terminals use the ASCII character set, have a separate buffer for each device (or station), and are 714 terminals.

MUJ

Refer to Multiuser Job.

Multiuser Job

A program that serves multiple users at any given time. EDITOR is an example of a system multiuser job.

Object Code

Executable machine language instructions. An object code program need not be recompiled each time it is executed.

On-Line

Equipment under direct control of the computer.

Order-Dependent

Items which must appear in a specific order.

Order-Independent

Items which need not be given in any specific order. Parameters may be order-independent.

OUTPUT

A file name assigned by the system to each job to receive information such as assembly listing, diagnostics, load map, dayfile, and program output. It is printed at job termination unless otherwise disposed by the user.

Parameter

A variable that is given a specific value for a particular purpose or process.

Partition

A partition is a system-logical-record of level 17 on a mass storage file or a tape in SI format. On an S or L tape, it is delimited by a tape mark.

Password

1. A system access character string that must be used in addition to the user name at login time.

2. A character string of one through nine letters or digits defining permanent file access permission. Passwords are defined when the file is cataloged and are needed for attaching and purging. Each password designates one type of access permission such as control, extend, modify, read, or turnkey.

Permanent File

A mass storage file cataloged by the system so that its location and identification are always known to the system. Permanent files cannot be destroyed accidentally during normal system operation (including deadstart). They are protected by the system from unauthorized access according to privacy controls specified when they are created. The user can create a permanent file via the STORE command or CATALOG control statement.

Physical Record Unit (PRU)

The smallest amount of information transmitted by a single physical operation of a specified equipment, measured in central memory words. A PRU for mass storage devices is 64 decimal words long.

Port

The point at which a communication line is attached to the computer system.

Postradix

A letter following a numeral that indicates the base numbering system.

Private Device

A mass storage device which can be used only by specific request. It is logically removable and is a member of a private device set.

PRU

Refer to Physical Record Unit.

Public Device

An allocatable mass storage device available to the operating system for assignment of default residence files.

PUNCH

A file name that causes the file to be punched on cards in Hollerith format when the job terminates.

PUNCHB

A file name which causes the file to be punched on cards in binary format when the job terminates.

Queue Device

A device that allows a file to go directly to a queue, such as the input queue or output queue. A device with permanent file attributes might not also be a queue device, depending on the site.

RA

Refer to Reference Address.

RE

Refer to Reference Address.

Record

CYBER Record Manager defines a record or a portion thereof as the smallest collection of information passed between CYBER Record Manager and a user program. Eight record types exist, as defined by the RT field of the file information table (FIT). Other parts of the operating systems and their products might have additional or different definition of records. EDITOR creates an edit file of Z-type records.

Recovery

The process by which a terminal user reestablishes communication with INTERCOM after an inadvertent disconnection and is able to continue processing at the point of disconnection.

Reference Address (RA and RE)

RA is the absolute central memory address that is the starting or zero relative address assigned to a program. Addresses within the program are relative to RA. RA + 1 is used as the communication word between the user program and monitor. RE is the absolute extended core storage starting address assigned to file.

Relative Location (Address)

All addresses in a relocatable program are relative to a base address of zero. When a relocatable program is loaded for execution, the zero base address is assigned to a reference address. At that time, all addresses in the program become relative to the reference address. Contrast with absolute location.

Retention Period

The number of days a permanent file or a device set is to be valid.

RMS

Rotating mass storage (refer to Rotating Mass Storage).

Rotating Mass Storage

Disk storage device.

Sequential File

A file in which records are accessed in the logical order in which they occur. Any file can be accessed sequentially. Sequential files must be accessed sequentially because no key or address is associated with each record in the files.

Source Code

Code input to the computer for later translation into executable machine language instructions (object code).

Synchronous

A type of terminal that has successive bits, characters, or events transmitted at constant time intervals. In data transmission, this is usually limited to a constant time interval between characters. Contrast with asynchronous.

System Device

A system device is a device that holds system information. All system devices are PRU devices but not all PRU devices are system devices.

System File

A file that can be accessed only by a system program.

System Libraries

The collection of tables and object language programs residing in central memory or on mass storage, which are necessary for running the system and its product set.

System Utilities

System programs used to perform system functions.

Terminal ID

A two-character terminal identifier assigned by the system. A hardwired terminal has a fixed terminal id, and a dial-in terminal has its terminal id set to the user id of the user that is currently logged in.

Time Slice (CPU)

The amount of CPU time a job is allowed to use before the system lowers its priority to allow other jobs to execute.

Transparent Data

Transparent data is transmitted to or from remote batch input or output devices without being interpreted by the system. Character conversion does not occur; the low-order 8 bits of each 12-bit byte are transmitted without alteration. Transparent data uses the EBCDIC punched card code (refer to appendix A). The user can punch up to six holes per column. Normally, characters are translated and stored as 6-bit or 12-bit internal display code.

Update

A utility program that allows a source statement program stored on mass storage or tape in Update format to be modified and restored.

User ID

A two-character user identifier assigned by the system. A user id indicates that a user is currently logged in.

User Library

Library file a programmer created through the EDITLIB utility. It contains loader tables referencing the assembled central processor programs, subroutines, text records, or overlays.

User Name

A system access word that must be supplied by the user for validation purposes at login. This is sometimes referred to as the user number.

Verb

The part of a command appearing at the beginning of the command. The verb precedes any separators or terminators.

Wideband

Synchronous, full-duplex, hardwired communication lines. Wideband also refers to the type of terminal that uses wideband communication lines. Import terminals are wideband terminals.

Z-Type Records

A record terminated by a zero-byte terminator.

Zero-Byte Terminator

The 12 bits of zero in the low-order position of a central memory word terminate a line of coded information to be output to a line printer or to represent cards input through a card reader. Files with names INPUT and OUTPUT have such terminators while in storage. Any file to be displayed at a terminal must also have such terminators for each line to be displayed correctly. A record with such a terminator in CYBER Record Manager is a zero-byte record (Z-type record).

In display code, two colons create 12 bits of zeros. If two consecutive colons occur in a file that contains zero-byte records, they may be stored in the lower-order portion of a word and create a zero-byte record.

Files created at a terminal using the EDITOR command mode contain zero-byte terminated records.

CARRIAGE CONTROL CHARACTERS D

Carriage control characters control the spacing of batch output sent to a line printer and also of interactive output sent to the terminals. A carriage control character must be the first character of an output line.

BATCH OUTPUT

Output to a line printer at a remote batch terminal is treated like output to a line printer at the central site. The carriage control characters are shown in table D-1.

When the Q, R, S, T, and V characters are used for carriage control, no printing takes place. The remainder of the line is ignored. The function S and T should be given at the top of a page. In other positions, S and T can cause spacing to be different from the stated spacing. Q, R, and V need not be given at the top of a page as each causes a page eject before performing its function. These functions are not available on the 200 User Terminal printers, the 714 character printer, and some models of printers on the 73X-10 and IMPORT Terminals.

If a character of the print line is put in the position reserved for carriage control characters, that character is not printed and the line is spaced accordingly.

INTERCOM supports print messages for print files on mode 4 terminals (200UT, CDC 714, and so on).

INTERCOM detects a print line having characters PM in columns 1 and 2. This line is not printed; instead, the characters PM and the first 30 characters following the PM carriage control are sent to the terminal CRT. The printer is placed in WAIT status until the operator enters GO and CONTIN to acknowledge the message.

On a 200 User Terminal, if the card reader is on and active at the time of the print message, card reading resumes after 1 minute; the printer remains in WAIT status.

INTERACTIVE OUTPUT

Carriage control characters should be specified for all terminal output generated from within user programs written in all programming languages except BASIC and COBOL. If omitted, the results are unpredictable. Carriage control characters cannot be specified with the COBOL DISPLAY verb. BASIC supplies the characters automatically.

The carriage control character used depends on whether the terminal is a teletypewriter or display. Table D-2 illustrates the effect of carriage control characters before and after print action at teletypewriter and display terminals. The letters CR specify a carriage return to beginning of line; LF specify line feed to the next line.

When the following characters are used for carriage control, no output takes place, the remainder of the line is ignored, and the following action is specified.

Q Clear auto-page wait.

V Clear WRITE. If the first two characters are VC, this line and the next line are not printed.

R Select auto-page wait.

These characters apply to a display terminal only.

INTERCOM normally enters page wait at a display terminal if a full screen of information has been output since the last input entered from the terminal or if a CLEAR WRITE or RESET WRITE is followed immediately by an output to the terminal. The character Q causes INTERCOM to suspend temporarily an automatic page wait, until either the character R reselects automatic page wait or the end of the program.

TABLE D-1. INTERCOM PRINTER CARRIAGE CONTROL CHARACTERS

Character	Before Print†	After Print
A	Space 1	Skip to top of next page
B	Space 1	Skip to last line of page
C	Space 1	Skip to channel 6
D	Space 1	Skip to channel 5
E	Space 1	Skip to channel 4
F	Space 1	Skip to channel 3
G	Space 1	Skip to channel 2
H	Space 1	Skip to channel 11
I	Space 1	Skip to channel 7
J	Space 1	Skip to channel 8
K	Space 1	Skip to channel 9
L	Space 1	Skip to channel 10
1††	Skip to top of next page	No space
2	Skip to last line on page	No space
3	Skip to channel 6	No space
4	Skip to channel 5	No space
5	Skip to channel 4	No space
6	Skip to channel 3	No space
7	Skip to channel 2	No space
8	Skip to channel 11	No space
9	Skip to channel 7	No space
X	Skip to channel 8	No space
Y	Skip to channel 9	No space
Z	Skip to channel 10	No space
+ ††	No space	No space
0 ††	Space 2	No space
- ††	Space 3	No space
blank††	Space 1	No space
Q	Clear auto page eject.	
R	Select auto page eject.	
S	Clear eight vertical lines per inch.	
T	Select eight vertical lines per inch.	
V	Page eject, line not printed. If the first two characters are VC, the next line is also not printed.	

†Any preprint skip operation of one, two, or three lines that follows a postskip operation will be reduced to zero, one, or two lines.

††Valid codes for 200 User Terminal printers and 714 character printers. All other codes produce a single space.

TABLE D-2. INTERCOM TELETYPE AND CRT CARRIAGE CONTROL CHARACTERS

	Teletype†		CRT††	
Character	Before Output	After Output	Before Output	After Output
1	CR,3LF	None	CLEAR WRITE††	New line
*	CR,3LF	None	RESET WRITE	New line
+	CR	None	None	New line
0	CR,LF,CR,LF	None	New line	New line
-	CR,LF,CR,LF,CR,LF	None	New line, new line	New line
blank	CR,LF	None	None	New line

† INTERCOM always returns an LF after an input line from a Teletype; this effectively adds an additional LF for each of the carriage control characters for an output line which immediately follows an input line.

†† Output to a CRT always causes the cursor to be positioned at the beginning of the next line. CLEAR WRITE causes the screen to be cleared, and output starts at the top of the screen. RESET WRITE does not cause the screen to be cleared, and output starts at the top of the screen overwriting the existing display.

COMMAND SUMMARY E

INTERCOM commands are structured as command verbs that may be followed by parameters. Some verbs require at least one parameter, and others require none. The format of each command is listed below, alphabetically by command type: INTERCOM interactive, EDITOR, and INTERCOM remote batch. The remote batch command list includes allowable terminals.

INTERCOM INTERACTIVE COMMANDS

ASSETS

BATCH,lfn,disposition[,ident] or BATCH,lfn,RENAME,newlfn

BRESEQ,lfn[,start[,incr]]

CONNECT,lfn_1[,lfn_2,...,lfn_n]

CRT,n

DISCARD,lfn[,ident]

DISCONT,lfn_1[,lfn_2,...,lfn_n]

EDITOR

EFL[,fl]

ERRORS, { ALGOL / COBOL / COMPASS / FTN } [,SUP]

ETL[,t]

FETCH,lfn[,ident]

FILES

LOCK, { ON / OFF }

LOGIN,username,password[,SUP]

LOGOUT

MESSAGE,mmm...m

PAGE [,[lfn_1] [,lfn_2]]

PAUSE

```
Q   [ [,X] [,YYY] [,OURS]  ]
    [  ,ID                 ]
    [  ,SYNTAX             ]
```

where X = I,O,P,E,J or A

REDUCE,ECS

```
REDUCE, { ON  }
        { OFF }
```

RFL,EC=fl

```
SAVEFL, { ON  }
        { OFF }
```

SCREEN[,width[,length]]

SEND,username

SITUATE

STORE,lfn[,ident]

SYSBULL

TEACH

XEQ[,option$_1$[,...[,option$_n$]]]

EDITOR COMMANDS

ADD[,line[,incr]][,SUP] [,OVERWRITE]

BYE[,BYE]

CREATE [,line[,incr]][,SUP]

```
DELETE,  { ALL  } [ ,{ line-2 } ] [ ,/text/ [ , (col-1 [,col-2]) ] [,UNIT] ] [,VETO]
         { line-1 }   { LAST   }
         { LAST   }
```

EDIT,lfn[,SEQUENCE]

END

```
FORMAT [ { name                                          } ]
       [ { [,TAB=c] [,tab-1 [,... [,tab-n]]] [,CH=nnn]   } ]
       [ { ,SHOW                                         } ]
```

```
LIST , [ { ALL  [ , { line-2 } ] } ] [,SUP] [ ,/text [ , (col-1 [,col-2]) ] [,UNIT] ]
       [ { line-1   { LAST   } } ]
       [ { LAST                  } ]
```

RESEQ [,line[,incr]]

RUN,language[,FILE=lfn] [,NOEX] [,SUP]

SAVE,lfn[,NOSEQ] [,OVERWRITE] [,MERGE], [{ All / line-1 [, { line-2 / LAST }] / LAST- }]

[,/text/ [,(col-1[,col-2])] [,UNIT] [,VETO]

[=]line=text

/text-1/=/text-2/ [, { ALL / line-1 [, { line-2 / LAST }] }] [, (col-1[,col-2])] [,UNIT] [,VETO]

INTERCOM REMOTE BATCH COMMANDS

BSP,[eqo],[sss]		714, 200UT,RBT†
CONTIN		714, 200UT
DIVERT,[jobname],[id],[q],[DEF]		All types (DEF not allowed from a TTY)
DEFINE ,eqo = [[{ IP / NIP }]] [,ECec] [,FCfc] , [{ BANON / BANOFF }] [,FMfm]		714, 200UT,RBT†
DROP,jobname	All types	
END[,eqa]	714, 200UT,RBT†	
EVICT,jobname[,q]	All types	
GO[,eqa]	714, 200UT,RBT†	
H, { I / O / P / E / S }		Non-TTY types
KILL,jobname		All types
MESSAGE,mmm...m		All types
OFF[,eqa]		714, 200UT,RBT†
ON[,eqa]		714, 200UT,RBT†
PRIOR,jobname,p[,q]		All types
READ[,CRn]		200UT
READ,lfn[,CRn]		All types

†73x-10 Remote Batch Terminal

REP,[eqo],[m]	714, 200UT,RBT†
REVERT,q	714, 200UT,RBT†
REW[,eqo]	714, 200UT,RBT†
RTN,[eqo] [,p]	714, 200UT,RBT†
SUP,LPn	714, 200UT,RBT†
WAIT[,eqa]	714, 200UT,RBT†

†73x-10 Remote Batch Terminal

TELETYPE OPERATING SUMMARY F

INTERCOM supports the models 33, 35, and 38 Teletypes. This appendix contains a brief summary of operating procedures including an explanation of pertinent controls as they apply to INTERCOM. For more detailed information, refer to the manuals provided by the equipment manufacturer.

OPERATING CONTROLS

Operating controls for the models 33, 35, and 38 Teletypes are illustrated in figures F-1 through F-3. The use of these controls is described in section 2.

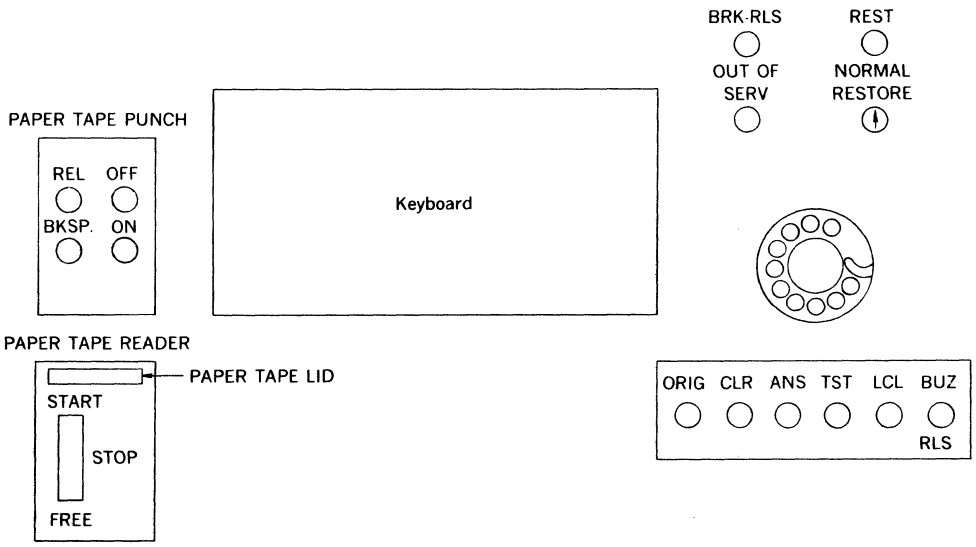

Figure F-1. Model 33 Teletype Operating Controls

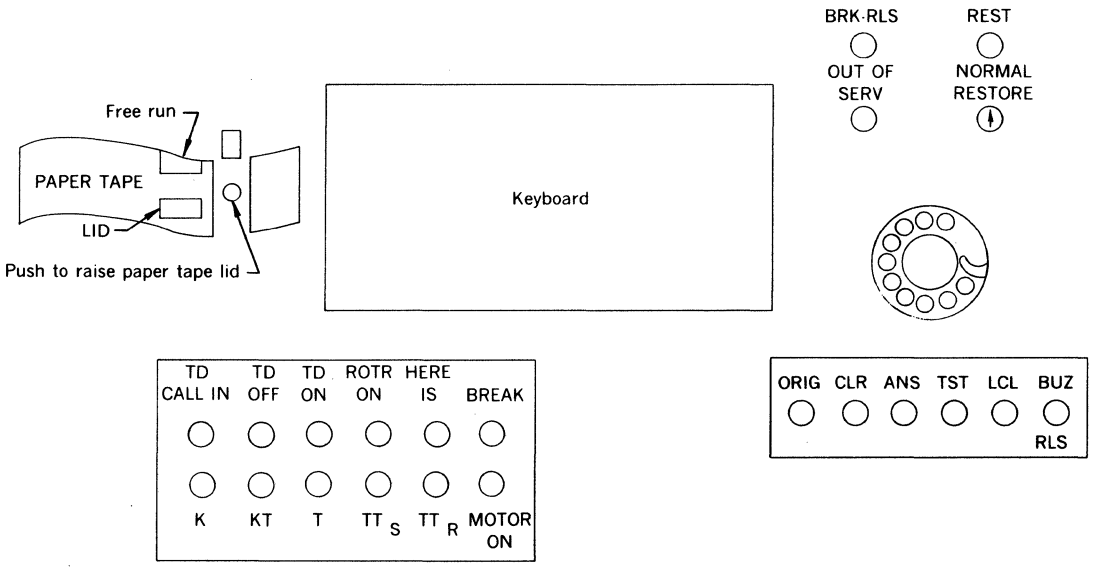

Figure F-2. Model 35 Teletype Operating Controls

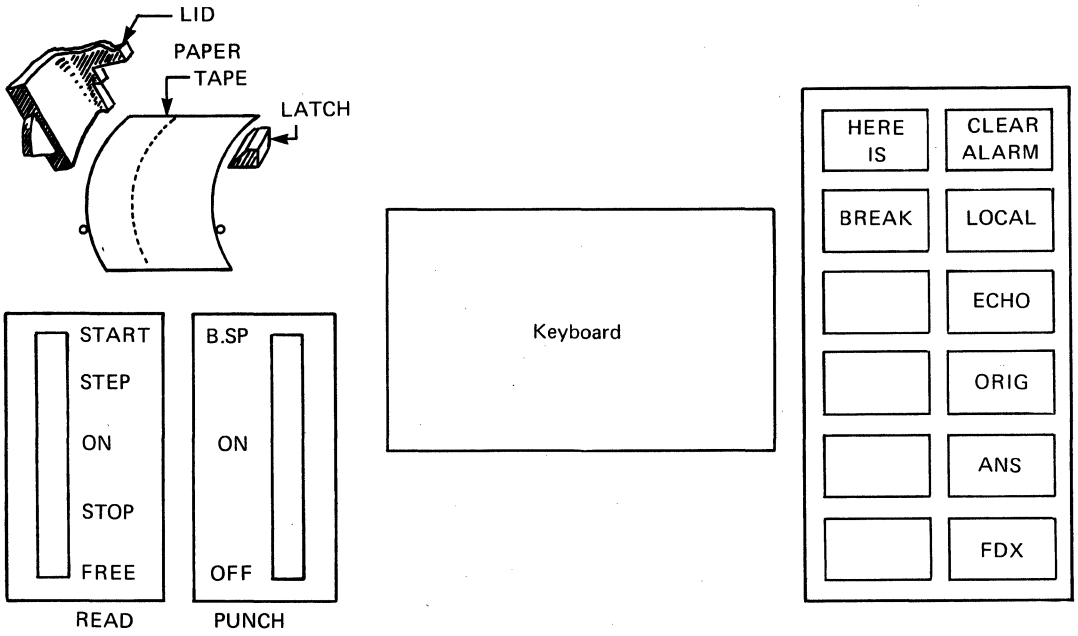

Figure F-3. Model 38 Teletype Operating Controls

KEYBOARDS

MODELS 33 AND 35

The Teletype keyboard for both models 33 and 35 (figure F-4) resembles a standard typewriter keyboard. Special characters shown on the upper portion of the keys are entered by holding the SHIFT or CTRL key down while pressing the special character key.

INTERCOM requires special function keys as well as special characters. The keys used and interpreted by INTERCOM are described below the figures illustrating the keyboards. Information is included as to what is stored, what action is taken, and what is printed on the Teletype listing.

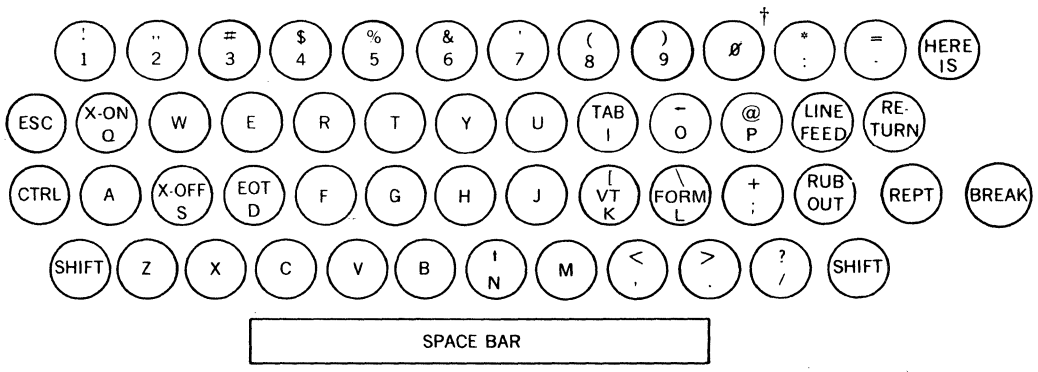

Figure F-4. Typical Model 33/35 Teletype Keyboard

†On some Teletype keyboards, the letter O is distinguished from the digit 0 by a slash; on other models, this distinction is reversed or omitted.

SHIFT — The SHIFT key accesses the characters or functions shown on the upper portion of most Teletype keys. If pressed alone, SHIFT has no effect.

CTRL — The CTRL key is used to access the special function keys (TAB, X-OFF, EOT, and so on) and character and line delete functions. If pressed alone, it has no effect.

RETURN — The RETURN key signals the end of a message to INTERCOM. It also returns the Teletype printer carriage to its leftmost position; the computer returns a line feed to advance the carriage to the succeeding line. No character is stored or printed.

LINE FEED — The LINE FEED key spaces to the next line. INTERCOM issues a carriage return to the beginning of the new line. No end-of-message signal is sent. No character is stored or printed.

SPACE — The space bar generates the space (blank) character. A blank is stored and printed.

CTRL H — CTRL H directs INTERCOM to erase the previous character from its input buffer. The Teletype listing is not erased. For example, if the user types FILEY and then enters CTRL H and types S to replace the Y, the listing appears as FILEYS. The corrected command FILES is entered in the buffer. No character is stored or printed.

REPEAT — Pressing the REPEAT key along with another character key produces character repetition for as long as the key is pressed. If the repeated character requires use of the SHIFT or CTRL key, it must be pressed along with the REPEAT key and desired character key.

CTRL X — CTRL X deletes all data entered since the previous RETURN. No character is stored or printed.

CTRL Z (ESC or ALT MODE)

CTRL Z (on some models, ESC or ALT MODE also may be used) is pressed to interrupt current Teletype activity. The user then enters a control directive: %A, %S, followed by a RETURN or just a return to define terminal action.

Alphanumeric — The alphanumeric keys are used to input commands, data, and programs. Each is stored and printed as the key is pressed.

MODEL 38

In appearance and general layout, the model 38 Teletype keyboard (figure F-5) is similar to the model 33/35 Teletype; however, the model 38 generates both uppercase and lowercase alphabets, as well as additional ASCII characters through use of the SHIFT key. Characters are also repeated automatically by holding a key down until the required number of repeats is completed. Printing at the terminal is switched from black to red by pressing the ESCAPE key in conjunction with the 3 key, or from red to black by using ESCAPE with the 4 key. Pressing the NULL key sends a zero; the NULL is discarded. Operation of the remaining keys is the same as for the model 33/35 Teletype.

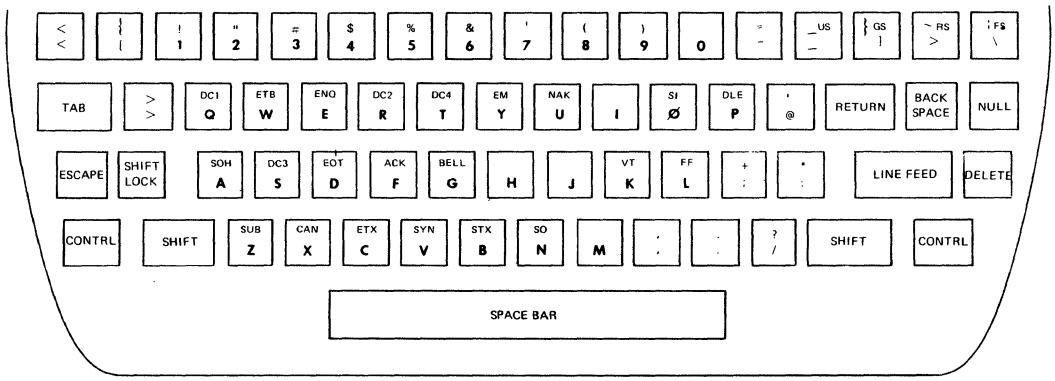

Figure F-5. Typical Model 38 Teletype Keyboard

KEYBOARD ENTRY

Data can be entered into the INTERCOM system through the Teletype keyboard in the form of a series of lines of indefinite length. A line is entered by typing the characters and then pressing the RETURN key. A physical line is limited to 72 characters on the model 33/35 Teletype and 132 characters on the model 38 Teletype. The LINE FEED key can be pressed at any point in a line to return the carriage to the beginning of the next line; however, a line is not entered into the system until RETURN is pressed. Thus, lines of more or less than the physical length can be formed and entered.

When a Teletype is connected to the system through a 6671 or 6676 multiplexer, the physical limitation on line length does not affect INTERCOM input; data can be entered without pressing the LINE FEED key, and INTERCOM accepts the data. However, if the Teletype is connected via the LCC (791), input cannot be entered beyond the physical line limit without a LINE FEED. If the LINE FEED is not entered and input is attempted, the message LINE TOO LONG is output; reentry with LINE FEED is required.

When output lines are longer than the physical line length, the INTERCOM system issues a carriage return and line feed at the end of the line to prevent overprinting. Some model 33/35 Teletypes are equipped with an automatic carriage return/line feed feature which also issues a carriage return and line feed after 72 characters; on these models, long output lines are double-spaced.

ERROR CORRECTION

Typing errors can be corrected either by deleting incorrect characters from the line or by discarding the entire line and retyping it. In the following descriptions, the CTRL key on the model 33/35 Teletype corresponds to the CONTRL key on the model 38 Teletype; ESC corresponds to ESCAPE.

CTRL H

Holding the CTRL key down while pressing the letter H (CTRL H) causes the last valid character to be ignored, effectively backspacing the character string. No character is printed or stored; the carriage does not move. Any number of CTRL H entries can be entered in succession; however, when the beginning of the line is reached, further backspaces are ignored.

CTRL X

Holding the CTRL key down while pressing the letter X (CTRL X) causes the entire line of characters to be ignored so that it can be reentered. Data entered between the previous RETURN and CTRL X is not sent to INTERCOM.

PAPER TAPE OPERATION

If the Teletype is equipped with a paper tape punch and reader, paper tapes can be prepared off-line on the punch and input to the central computer through the reader. Output can be received as punched tape under user control.

Some versions of Teletype equipment permit interactive reading of paper tape. The special function key X-OFF on the model 33/35 TTY or DC3 on the model 38 stops tape reading and signals INTERCOM that any output accumulated for the user is to be returned to the terminal. Tape reading resumes automatically when all output has been returned. On other versions, X-OFF/DC3 is ignored unless punched as the last data character following the TAPE(OFF) command described below.

A description of the paper tape functions available can be obtained from a representative of the Teletype equipment supplier.

PAPER TAPE PUNCH

The following procedures describe how a paper tape can be prepared on a Teletype equipped with a paper tape punch for eight-level paper tape (punched tape format is shown in figure F-6).

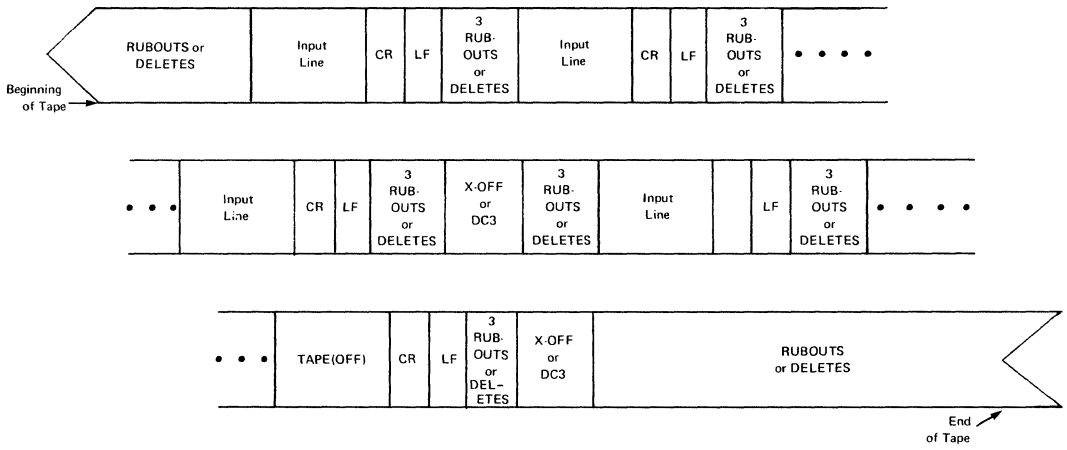

Figure F-6. Punched Tape Format

Off-line

1. If the terminal is connected to the computer, first log out and then disconnect it by switching to LOCAL or LCL mode.

2. Models 33 and 38: Press ON button.
   Model 35: Press KT button.

3. Models 33 and 35: Punch 2 or 3 inches of rubouts by holding REPT down while pressing RUBOUT.
   Model 38: Hold down DELETE until 2 or 3 inches of tape have been punched.

4. Type the characters of an input line on the keyboard.

5. Type RETURN once, LINE FEED once, and type RUBOUT at least three times on the model 33/35 or DELETE on the model 38.

6. To continue a line, enter LINE FEED, RETURN, and at least three rubouts or deletes.

The first character punched at the end of the line signifies whether an end of message occurs. If the first character is a LINE FEED, the logical line is continued with the next input. If the first character is a RETURN, an end-of-message signal is sent.

If another line is to be input, repeat steps 4 and 5.

The last line punched on the tape should consist of

TAPE(OFF)

followed by RETURN, LINE FEED, RUBOUT, or DELETE (at least three), X-OFF, or DC3 and a few inches of rubouts or deletes as at the start of the tape.

When interactive tape reading is possible, X-OFF/DC3 followed by at least three RUBOUT/DELETE characters can be punched on the tape following the RETURN, LINE FEED, and rubouts/deletes to allow accumulated output to be returned to the terminal.

Any occurrence of X-OFF/DC3 that does not follow a RETURN, LINE FEED sequence (logical end of line) is ignored, although it can cause some Teletype models to stop reading tape. If this stop occurs, paper tape reading must be restarted manually.

Errors made while punching paper tape can be corrected by pressing the backspace button (BKSP on model 33 paper tape punch panel and model 35 at lower right of keyboard; B.SP on model 38 punch) once for each character mispunched. The paper tape backspaces, and the user can punch RUBOUT or DELETE over each erroneous character. RUBOUT/DELETE is ignored in the text of a punched tape.

On-line

Paper tape also can be punched at a logged in terminal under user control during interactive program execution. No special requests are needed in the program generating the output; if the paper tape punch is on, any output normally displayed at the terminal is also punched on the tape. The necessary line feed, carriage return, and timing characters are provided automatically; however, if X-OFF or DC3 is wanted, it can be added only to the end of the paper tape from the keyboard.

On all models, the Teletype is turned on and connected to the computer. If not logged in, the user should log in and then turn on the paper tape punch. On model 35, either the tape alone or the tape and printer can be selected to receive output by pressing TTR (tape only) or KT (keyboard and tape) in addition to turning on the punch. On models 33 and 38, only the punch needs to be turned on; the keyboard and printer are on automatically.

PAPER TAPE READER

To read a paper tape, enter:

TAPE(ON)

To terminate a paper tape read, enter:

TAPE(OFF)

RETURN

LINE FEED

3 RUBOUTS/DELETES

X-OFF/DC3

The procedure for entering input to the central computer through the paper tape reader at a Teletype is as follows:

1. Load the paper tape in the reader: open the lid and place the tape across the cogs of the feeder wheel so the cogs fit the feeder holes punched in the tape leader, and the tape moves in the correct direction (usually arrows are printed on the tape). Snap the lid shut.

2. Models 33 and 38: Set reader switch to STOP position.
   Model 35: Activate TD CALL-IN switch (left of keyboard); if forgotten, turn it on later, and then press TD-ON.

3. Enter the command TAPE(ON) from the keyboard.

4. Wait for system response from INTERCOM (COMMAND-) or EDITOR (. .).

5. Models 33 and 38: On some versions, reading begins automatically. Otherwise, set reader switch to start position; reading begins.
   Model 35: Tape reading begins automatically.

On equipment that permits interactive paper tape reading, the tape is read until X-OFF or CD3 is encountered. Reading stops automatically at that point. If X-OFF/DC3 occurs after a RETURN, LINE FEED (logical end of line) sequence, any accumulated output is returned to the terminal; tape reading resumes automatically if the tape contains more data.

On equipment where automatic start and stop of the reader is not possible, the tape is read until the end. If the TAPE(OFF) sequence described previously is on the tape, any output accumulated to that point is returned to the user.

On either type of equipment, if the end of the tape is reached and the TAPE(OFF) command was not punched on the tape, type TAPE(OFF) followed by a RETURN, a LINE FEED, and X-OFF or DC3 to return the terminal to normal keyboard entry mode. INTERCOM continues to expect paper tape input until the command TAPE(OFF) is received.

INDEX

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