


Burroughs 

B 1000 Systems

Command AND Edit (CANDE)

USER'S MANUAL

PRICED ITEM

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SECTION 1

INTRODUCTION

GENERAL

This document describes the B 1000 COMMAND and EDIT (CANDE) program, and defines the general operation of the system and its associated remote terminals. The CANDE program is provided for users of interactive data communications systems and offers the capability of generalized file preparation and updating.

It is assumed that the reader has a working knowledge of the basic hardware and software functions of the B 1000 Data Processing System.

Section 2 contains a general description of the CANDE program and the functions provided by CANDE. This section also identifies any system requirements and restrictions of the CANDE program.

Section 3 is intended for those users of CANDE who desire information on the CANDE mechanisms.

Section 4 describes the CANDE program operating instructions, including preliminary procedures and execution and termination of the CANDE program.

Section 5 describes the CANDE terminal and system operator input commands.

Appendix A contains the glossary of terms used in this document.

Appendix B describes the generation of the required Network Controller program.

Appendix C contains the CANDE Syntax Reference Guide.

RELATED DOCUMENTS

The following documents are referenced in this document:

- B 1000 Systems System Software Operation Guide, Volume 1, form number 1108982.
- B 1000 Systems System Software Operation Guide, Volume 2, form number 1108966.
- B 1000 Systems Network Definition Language (NDL) Reference Manual, form number 1073715.

NOTATION CONVENTIONS

Left and right broken brackets are used to enclose letters and digits which are supplied by the user. The letters and digits can represent a variable, a number, a file name, or a command.

Example:

<job-number>AX<command>

SECTION 2 CANDE SYSTEM OVERVIEW

GENERAL

The CANDE program is a message control system that provides generalized file preparation and updating capabilities in an interactive, terminal-oriented environment. The CANDE system software consists of the following programs:

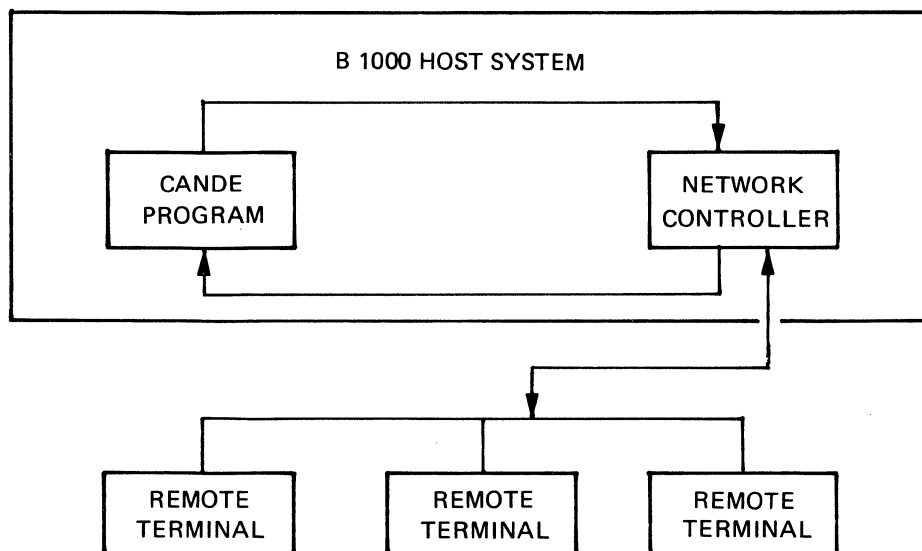
- The CANDE Program
- The Network Controller Program

To use the CANDE system, both the CANDE program and the Network Controller program must be executing. The Network Controller program is a data communications operating system and is responsible for handling all of the details of the data communications line discipline. Communication is achieved using remote files.

Typically, B 1000 system message flow is handled in the following way:

1. In response to a POLL from the Network Controller, a terminal transmits a message back to the Network Controller.
2. Upon receipt of the message, the Network Controller writes it into the CANDE program's input queue.
3. The CANDE program reads the message, the message is processed, and a reply message is generated.
4. The CANDE program then starts the reply message back to the remote terminal by writing it into the Network Controller's input queue.
5. Upon receipt of the message, the Network Controller initiates the appropriate procedures to transmit it to the designated remote terminal.

Figure 2-1 illustrates in block form the basic message flow in the CANDE system.



G50400

Figure 2-1. CANDE Basic Message Flow

HARDWARE REQUIREMENTS

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

- B 1900, B 1800, or B 1700 processor.
- Multiline control or single-line control.
- Line adapters as required.
- Disk storage (cartridge, pack, or head-per-track).
- Operator Display Terminal.
- TD800/TD700, TC series, or B 9350 terminals.

MEMORY REQUIREMENTS

The minimum memory requirements for the system software elements in an interactive system operating with the CANDE program are listed as follows.

| Minimum Memory | System Software Element |
|---------------------------|---|
| 64.0K bytes | Operating system in a data communications environment |
| 15.0K bytes | Network Controller |
| 1.7K bytes | Each additional line declared in the Network Controller |
| 45.0K bytes | CANDE program |
| 4.0K bytes | Each user logged on to CANDE who has a workfile. |

SOFTWARE REQUIREMENTS

The following software elements are required to execute the B 1000 CANDE program:

- Master Control Program
- Network Controller Program
- SYSTEM/MAKEUSER Program

Master Control Program (MCP)

The MCP is an operating system which manages the demands and resources of a B 1000 system. It reduces programming effort by providing commonly needed functions and services. The MCP requires strict adherence to program structures and procedures in order that there may be communication between different programs, interpreters, and the MCP itself.

The primary function of the MCP is to optimize the productivity of a system. External intervention is held to a minimum, and maximum throughput is achieved by incorporating into the MCP the tasks of input/output control, file handling, multiprogramming, system interrupts, memory allocation, and operator interfacing.

Network Controller Program

The Network Controller is a Network Definition Language (NDL) generated program whose prime function is to process and supervise the flow of messages between systems, terminals, and programs. The Network Controller performs all data communication line discipline functions necessary for proper line and terminal control. The Network Controller handles the initiation and completion of data communication I/O operations and services exception conditions. The Network Controller is configured to the specific needs of the system on which it is to be run.

SYSTEM/MAKEUSER Program

This program is a utility program used to create, access, or modify the system usercode file of allowable usercode and password combinations. A list of all valid usercode/password combinations is maintained in this file named (SYSTEM)/USERCODE.

RESTRICTIONS

Since the CANDE program requires that the Network Controller program be executing, any restrictions which apply to the Network Controller program also apply to the CANDE program. The following CANDE program restrictions apply in addition to any Network Controller restrictions:

- 64 Maximum number of stations
- 7 Maximum length for a user's usercode (bytes)
- 160 Maximum input from the ODT or from a Teletype* station (bytes)

*Teletype is a registered trademark of the Teletype Corporation.

SECTION 3

CANDE MECHANISMS

GENERAL

This section explains the CANDE mechanisms. An understanding of these mechanisms is necessary before the user can make use of the CANDE program capabilities. The following CANDE mechanisms are described in detail in this section:

- Log-On
- Usercodes and File Security
- File Types
- File-Naming Syntax Conventions
- Workfile
- Patch Mode
- File Positioning
- Record Modification
- Line Deletion
- Terminal Displays and Sequence Errors
- CRT-type Devices
- Scrolling
- Special Control Characters
- Recovery

LOG-ON

The user at a terminal must log on to CANDE before making use of the CANDE program capabilities. The CANDE program makes use of a basic usercode-password type of security. The user may log on to CANDE in any one of three ways:

1. The usercode/password may be entered.
2. HELLO (or USER) <usercode>/<password> may be entered.
3. HELLO or USER may be entered. The system then leads the user through the log-on sequence.

The usercode/password pair must be in the (SYSTEM)/USERCODE file.

The log-on sequence consists of the following steps:

1. The CANDE program responds with the following message:

ENTER USERCODE PLEASE

2. If the user enters a usercode but no password, the CANDE program responds with the following message:

ENTER PASSWORD PLEASE

For hardcopy terminal devices, the CANDE system blocks out a 10-character area on the next line into which area the user enters the password. For TD830 terminals, a secure video field is provided on the first line of the screen into which area the user enters the password.

If the usercode/password pair is valid, the log-on process is complete; otherwise, the log-on procedure begins again. Refer to Section 6 for information on the HELLO and USER commands which are used for logging on to CANDE.

USERCODES AND FILE SECURITY

If program switch 5 is not equal to 0, the CANDE program uses the file security mechanism implemented in the MCP. As a result, users must be aware of the following items:

1. The default family name of all files created by CANDE is the user's usercode delimited by parentheses. The usercode is limited to seven characters.
2. Usercodes and passwords may have a default pack associated with them. If a default pack has been defined for the usercode/password pair, CANDE reads and writes all files on this pack. The default pack may be overridden by explicitly specifying a pack-id with the ON attribute.
3. All files saved through CANDE are saved as PUBLIC or PRIVATE, according to the default protection specified in the (SYSTEM)/USERCODE file. PRIVATE files can be accessed only by a program running under the same usercode as that of the file or by running with a privileged usercode/password combination. The security of a file can be changed by using the MCP MH input message.
4. All MCP control strings transmitted from a terminal are zipped secured, meaning they are prefixed with a session number and the user's usercode/password. Responses to these MCP control strings are directed back to CANDE, which then routes the messages to the requesting terminal.

Examples:

?WY returns the status of only that user's job(s).

?TD returns the current time and date.

?MX returns the mix for only that user's job(s).

?MO modifies only files belonging to that user.

?RE <filename> removes the user's file, (<usercode>)/<filename>.

5. Printer backup files which have been created by jobs executed through the CANDE program are locked in the disk directory with a name in the form (<usercode>)/#<integer>. The command LIST #<integer> displays the backup file on the screen for review.

FILE TYPES

The following file types can be specified for editing with CANDE:

| | | | | | |
|---------------|-----------------|-------------|-------------|-------------|-------------------|
| <u>B</u> ASIC | <u>D</u> ATA | <u>M</u> IL | <u>R</u> PG | <u>S</u> EQ | <u>F</u> ORTRAN77 |
| <u>C</u> OBOL | <u>F</u> ORTRAN | <u>N</u> DL | <u>S</u> DL | <u>U</u> PL | <u>C</u> OBOL74 |
| <u>D</u> ASDL | | | | | |

The underlined letters indicate the valid abbreviation for the file type. The BASIC, COBOL, FORTRAN, MIL, NDL, SDL, UPL, COBOL74, and FORTRAN77 types denote files for the respective compilers. The DASDL type denotes a file for the DMS/DASDL compiler. The type SEQ is a data file with sequence numbers. The type DATA file specifies a file without sequence numbers.

The CANDE program uses file type as specified by the user to describe :

1. Where CANDE can expect to find valid sequence numbers and what size the sequence numbers are. For example, FORTRAN files have 8-digit sequence numbers in columns 73 through 80 and COBOL files have 6-digit sequence numbers in columns 1 through 6.
2. The valid separator characters to be accepted as part of the variable when scanning for a specified token. For example, in the token "A_B" in an SDL file, the underscore (_) is the separator. The assumed separator character for UPL, SEQ, and MIL file types is the period (.). The separator character for COBOL file type is the hyphen (-), and for SDL file type the separator character is the underscore (_).

Sequence Numbers

Files to be edited by the CANDE program must contain sequence numbers and must be properly sequenced. However, files of type DATA are assumed to be 80 characters in length, with no sequence number field. When a file of type DATA is loaded for editing CANDE automatically resequences the file using default sequence numbers with a base and increment of 100. This resequencing creates pseudo sequence numbers, and when the file is saved as a permanent disk file, these pseudo sequence numbers are removed.

FILE-NAMING SYNTAX CONVENTIONS

The CANDE program file-naming specifications are standardized for similarity in each input command. The symbol <filename> refers to any file to which a user has access privileges. A file name cannot exceed 10 characters; the COMPILE, EXECUTE, RUN, and WRITE commands allow up to nine characters when it is necessary for the commands to concatenate the file name with an additional character to form a new identifier. The following rules apply when creating a <filename>.

1. The asterisk (*) indicates that the following <filename> is to be used exactly as given, and the pack-id is assumed to be the system disk unless 'ON <pack-id>' is also specified.
2. <usercode> specified as (<usercode>), to access another user's directory.
3. 'ON <pack-id>' overrides a usercode's default pack-id or, if the asterisk (*) is used, overrides the use of the system disk for the file.
4. '\$' (dollar sign or currency symbol) is used to specify that an <object-file-id> has no 'O' suffix concatenated to it. (<usercode>) is still applied.

An output file name may be specified with a multi-file id if the user is logged on to the CANDE program with a privileged usercode/password. If the user is logged on to CANDE with a non-privileged usercode/password, the user cannot create a file without the user's usercode as the multi-file id.

Example:

Assume M = a <family name>
F = a <file-id>
P = a <pack-id>
(A), (U) = usercodes; (A) = current user

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Then <filename> is as follows:

Case 1: INPUT FILES.

| File Name Specified | Input File Name Sought | Comment |
|---------------------|------------------------|-----------------------|
| F | (A)/F | Applying default pack |
| M/F | M/F | Applying default pack |
| (U)/F | (U)/F | Applying default pack |
| *F | F | |
| *M/F | M/F | |
| *(U)/F | (U)/F | System disk only |
| F ON P | P/(A)/F | |
| M/F ON P | P/M/F | |
| (U)/F ON P | P/(U)/F | Non-default pack |
| *F ON P | P/F/ | |
| *M/F ON P | P/M/F | * superfluous |
| *(U)/F ON P | P/(U)/F | * superfluous |

Case 2: OUTPUT FILES (SAVE. :FILE<filename> in FIND, WRITE AS <filename> and file names used in REMOVE and TITLE.)

Case 2a: USER LOGGED ON WITH PRIVILEGED USERCODE/PASSWORD.

| File Name Specified | Output File Name Used | Comment |
|---------------------|-----------------------|-----------------------|
| F | (A)/F | Applying default pack |
| M/F | M/F | Applying default pack |
| (U)/F | (U)/F | Applying default pack |
| *F | F | |
| *M/F | M/F | System disk only |
| *(U)/F | (U)/F | System disk only |
| F ON P | P/(A)/F | |
| M/F ON P | P/M/F | |
| (U)/F ON P | P/(U)/F | Non-default pack |
| *F ON P | P/F/ | |
| *M/F ON P | P/M/F | * superfluous |
| *(U)/F ON P | P/(U)/F | * superfluous |

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Case 2b: USER LOGGED ON WITH A NON-PRIVILEGED USERCODE/PASSWORD

| File Name Specified | Output File Name Used | Comment |
|---------------------|-----------------------|-----------------------|
| <none> | (A)/<workfile-name> | Applying default pack |
| F | (A)/F | Applying default pack |
| M/F | | Invalid |
| (U)/F | | Invalid |
| *F | | Invalid |
| *(A)/F | (A)/F | On system disk |
| *M/F | | Invalid |
| *(U)/F | | Invalid |
| F ON P | P/(A)/F | Non-default pack |
| M/F ON P | | Invalid |
| (U)/F ON P | | Invalid |
| *F ON P | | Invalid |
| *(A)/F ON P | P/(A)/F | * superfluous |
| *M/F ON P | | Invalid |
| *(U)/F ON P | | Invalid |

Case 3: COMPILE object file name.

CASE 3a: USER LOGGED ON WITH PRIVILEGED USERCODE/PASSWORD:

| Source File Name | Object File Name | Comment |
|---------------------|------------------|-----------------------|
| F | (A)/FO | |
| F AS G | (A)/GO | 'O' still suffixed |
| F AS \$B/B | B/B | Applying default pack |
| F AS \$G | (A)/G | |
| F AS \$F | | Not allowed |
| F AS *H | H | Default pack not used |
| F AS *\$H (or \$*H) | | Not allowed |

CASE 3b: USER LOGGED ON WITH NON-PRIVILEGED USERCODE/PASSWORD:

| Source File Name | Object File Name | Comment |
|---------------------|------------------|--------------------|
| F | (A)/FO | |
| F AS G | (A)/GO | 'O' still suffixed |
| F AS \$G | (A)/G | |
| F AS \$F | | Not allowed |
| F AS *H | | Not allowed |
| F AS *(A)/H | (A)/H | On system disk |
| F AS *\$H (or \$*H) | | Not allowed |

WORKFILE

Users of CANDE perform editing on one file only, the workfile. Additions and corrections are performed on this workfile. The user creates a new workfile by entering a MAKE command, or may recall an existing file as the workfile by entering a GET command. The existing file is never modified by user editing; only the workfile is modified.

A workfile can consist of one or two parts. The first part is the user's original source file (present only if a GET command is performed to recall an existing file) and is never modified by user editing. The first part is removed and replaced by a complete, edited file when the user enters a SAVE command to make the workfile a permanent disk file.

The second part of the user's workfile consists of portions of the CANDE program's master workfile, named CANDE/WORK.FILE, assigned to the user. This contains added and changed records which modify the user's workfile. The CANDE program's master workfile is organized in a random fashion; access is directed by a set of tables maintained for each user in the disk file labeled CANDE/RECOVERY. Update entries are written directly to the master workfile labeled CANDE/WORK.FILE, their order being maintained in the set of tables for each user.

A SAVE command is required to make the workfile a permanent disk file. When this is done, the master workfile table entries and tables for that user are removed.

Certain commands can cause an intermediate file to be built for the user. An intermediate file is created when a RESEQ command is entered to resequence the workfile. The MERGE, RMERGE, and INSERT commands also cause an intermediate file to be built for the user if these commands result in a large number of master workfile records for the user. The intermediate file is a temporary disk file reflecting all editing performed, and is named CANDE<5-digit number>/<workfile name>. The intermediate file becomes the user's source file for editing purposes (part one of the user's workfile); if the user had recalled an existing source file as the workfile with the GET command, the originally recalled file is no longer used. After an intermediate file is created, there are no entries for that user in the master workfile (part one of the user's workfile).

PATCH MODE

Because saving a large workfile is time consuming, and because most compilers can merge source and patch files at compile time, the CANDE program has a mechanism to encourage saving only those records actually edited as a patch file, separate from the source file. If the user is editing in patch mode, the records actually edited can be saved as a permanent disk file.

A user is editing in patch mode if the user's patch-identification field is not null. The user's patch-identification field is not null if

1. The SPATCH command is used without a sequence range to set the field, or
2. The :PATCH option of the GET command is used when the file is loaded. In this case, CANDE sets the patch-identification field to blank, which is distinct from null.

In order to preserve the records actually edited (maintained in the master workfile), the CANDE program prohibits commands which would delete the user's portion of the master workfile. These prohibited commands include SAVE (without the PATCH option) and RESEQ. The commands MERGE, RMERGE, and INSERT are prohibited if they result in a large number of master workfile records for the user and, therefore, an intermediate file being built for the user.

A prohibited command may be forced by setting the patch-identification field to null. This is done by entering SPATCH <delimiter><delimiter>; however, the user is no longer editing in patch mode.

FILE POSITIONING

The CANDE program allows the user to page backward and forward throughout the workfile, once the PAGE or LIST command is invoked. The PAGE and LIST commands explicitly request a page to be displayed and cause the file-position pointers (for BACK, SAME, NEXT, -<n>, or +<n>) to be set to the requested position. The TERMINAL command sets the page size. Default page sizes are as shown in Table 3-1.

Table 3-1. Terminal Page Size.

| Device | Terminal Type | Page Size |
|-----------------|-------------------|-----------|
| B 9350 Teletype | 0 | 1 |
| MT686 | 0 | 1 |
| MT687 | 0 | 1 |
| TC Series | 21,23,24,25,26,27 | 1 |
| TD700 Series | 32,33,34 | 2 |
| TD801 | 41 | 10 |
| TD802 | 42 | 22 |
| TD821 | 43 | 10 |
| TD822 | 44 | 22 |
| TD831 | 45 | 10 |
| TD832 | 46 | 22 |
| MT983 | 46 | 22 |

File positioning is controlled through the following commands:

| Command | Function |
|----------|-------------------------------------|
| BACK <n> | Display current -<n>th page. |
| SAME | Display current page again. |
| NEXT <n> | Display current +<n>th page. |
| -<n> | Display current page -<n>th record. |
| +<n> | Display current page +<n>th record. |

If <n> is not specified, a value of 1 is assumed.

The +<n> and -<n> commands shift exactly <n> records in the direction requested. BACK <n> and NEXT <n> shift approximately <n> pages in the direction requested. In this way, the BACK and NEXT commands may be used to quickly position the file to approximately the desired area without reading through each record in moving from the current position to the requested one. Once in the approximate area, the position may be adjusted accurately by using +<n> and -<n> commands. The range of records shifted is:

r, where r is greater than or equal to 1 and less than or or equal to 131071, where $r = n$ for +<n> and -<n> and $r = n * \text{page size}$ for BACK and NEXT

For CRT devices, after displaying a page, NEXT is written at the home position leaving the cursor immediately after it. Thus, transmission without moving the cursor invokes the NEXT command automatically. Transmission of any string other than NEXT from the first line is treated as an input command. If transmission includes more than the first line, it is assumed to be input records, the first line is ignored, and the input is processed.

RECORD MODIFICATION

If a workfile is present the CANDE program assumes that the user is editing the file. Any input consisting only of records having valid sequence numbers, with no sequence errors is treated as records to be entered into the file. After the input is processed, a NEXT command is performed automatically, meaning that the next page is displayed, beginning with the record that follows the last record entered.

The PAGE, LIST (except from an external file), BACK, SAME, NEXT, <n>, and +<n> commands are explicit requests for a page to be displayed. For CRT devices, records may then be edited and the page (or partial page) transmitted back. For non-CRT devices, the records must be re-typed.

The CANDE program uses a buffer in static memory to 'roll in' the the last page sent to the terminal in order to compare the current page received from the terminal against it. This comparison allows CANDE to add to the workfile only those records which have changed, and is required to prevent writing unnecessary records to a file when the user initiates a SAVE :PATCH command to save only the records actually edited as a permanent disk file. The comparison also makes input processing more efficient.

The comparison of pages progresses on a record-by-record basis as long as the sequence numbers match. If a sequence number is encountered in the input which does not exist in the last output copy, then comparison ceases and the record is added. Processing continues in this manner until either the sequence number of an input record is greater than or equal to that of the last output record (at which time comparison ceases), or until all input records have been processed. Also, synchronization of record comparison is maintained and unchanged records are not added to the workfile. If any records initially displayed on the page of input returned to CANDE are missing because the user erased them from the screen before transmitting, the missing records are not automatically deleted from the workfile.

Inserts are defined as numbers that are in sequence but which were not put on the screen by CANDE. The action taken is to add the record(s) to the workfile and to discontinue comparison against the workfile until the next workfile sequence number is encountered.

For recovery purposes, the CANDE program does not clear the CRT screen at log-on time. The user may recover the file and transmit to CANDE any records left on the screen at the time of the failure.

Single lines may be deleted from the workfile through use of the VOID command. The letter V must be the first character of the line and the line must contain a valid sequence number. Any number of blanks may separate the letter V and the sequence number. If the sequence number is in error, the record is treated as a sequence error.

TERMINAL DISPLAYS AND SEQUENCE ERRORS

The TERMINAL command is used to set the page size. Refer to Section 5 for the TERMINAL command and default page sizes for the various terminal types.

All displays on a device having a page size greater than one begin on the second line of the screen and end with the column indicator on the last line.

A valid CANDE command that appears as the first token of any line except the top line is regarded as a new command and is executed after the records up to that point have been processed.

All numerics in sequence fields indicate to CANDE that the next page is to be displayed after the input is processed.

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CANDE Mechanisms

Sequence errors are defined as either (1) numeric but out of sequence, or (2) beginning with a non-numeric character which is not a valid CANDE verb or the letter V.

The action taken by CANDE in case of a sequence error is to leave the screen unchanged and notify the user by displaying a message on the top line of the screen. No updates from that page of input are applied.

For devices whose page size is one (for example, Teletype), the following characteristics are valid:

1. The BREAK key (Teletype only) clears the output queue and terminates the operation.
2. When the SEQ command displays an existing record, CANDE sends a CR (Carriage Return), an LF (Line Feed), re-types the sequence number, and leaves the carriage positioned immediately after the number to allow the line to be changed and re-entered. If only an ETX or CR character is transmitted, the record is not changed and the command continues. If other than an existing record was displayed (a new sequence number only), then transmitting only an ETX or CR character terminates the command.
3. The PAGE command treats displays as noted in item 2 for the SEQ command.
4. The LIST command is continuous, rather than paged.

CRT-TYPE DEVICE CONTROL CHARACTERS

Paged output to a CRT-type device is preceded by a 'HOME and CLEAR' character and has the CR (carriage return) character appended after the rightmost non-blank character in each line in order to decrease transmission time. If the line is blank, it consists of a CR (carriage return) character only. Single-line output to a TD820/830 series device has the LC (CLEAR to END of LINE) character appended to it, in order to clear the remainder of the line.

SCROLLING

The NDL CANDE library requests (CANDEPOLTD, CANDEFSLTD, and CANDESELTD) contain a scrolling capability available to users running the CANDE program and to those running an application program under CANDE. Scrolling is disabled by default. ?+ enables scrolling and ?- disables scrolling.

All output (except full page output produced by LIST, PAGE, and SEQ command) is written one line at a time at the bottom of the screen by shifting the screen up one line, thereby deleting the top line from the screen.

TELETYPE CONTROL CHARACTERS

The following special characters are used for Teletype devices:

| Character | Meaning |
|------------------------------|----------------------|
| Control-C or carriage return | End-of-message (ETX) |
| Left-arrow | Backspace |
| Rubout or control-E | Line delete |

RECOVERY

Recovery of a user's workfile is necessary when the user's terminal incurs consecutive timeouts or when CANDE terminates abnormally. When the user's terminal incurs consecutive timeouts (determined by RETRIES as specified in the Network Controller program), a recovery file is built for that user. If the CANDE program terminates abnormally CANDE must be re-executed to recover a user's workfile. The CANDE program must always be re-executed in the same way if recovery information is to be preserved and accessible. This applies to file equates, whether or not the CANDE program is executed with file security, and whether or not the CANDE program is executed under a usercode. The CANDE program internal files labeled CANDE/RECOVERY and CANDE/WORK.FILE must be present for the recovery procedure, which involves the creation of the individual recovery files for each user during the initialization phase of CANDE. The next time the user logs on to CANDE, the user is notified that a recovery file exists. The recovery file for each user is named <usercode>/RECVRY<xy><ab>. <xy> is the release version of CANDE. <ab> is a unique 2-character sequence created as follows:

a = (<usercode index>/36)th character of c
b = (<usercode index> mod 36)th character of c

where c = ABCDEFGHIJKLMNOPQRSTUVWXYZ 0123456789

For example, the character A is the 0th character of c, and the character 9 is the 35th character of c.

This scheme produces a unique recovery file for each usercode/password pair. To avoid loss of the file upon recovery, users must not intentionally create files named in this manner.

In order for a user's recovery file to be found when the user logs on to CANDE, the user's usercode index must be the same as it was at the time the failure occurred. To ensure this condition, the (SYSTEM)/USER-CODE file must be the same.

The next time the user who was on the system when it aborted logs on to CANDE and is notified that the recovery file exists, the user has the option of recovering the workfile. The user must enter 'RECOVER' to get the previous workfile. If the user does not wish to recover the workfile, then another session may be started. When a system failure occurs, it is possible that a few of the most recently entered workfile records will be lost.

The CANDE program cannot conduct recovery on files from a previous release of CANDE. Refer to Section 5 for information on the RECOVER command.

SECTION 4

CANDE PROGRAM OPERATING INSTRUCTIONS

PRELIMINARY PROCEDURES

Before the CANDE program can be executed, the following steps must be performed.

1. Set or reset CANDE program switches.
2. Create the (SYSTEM)/USERCODE file.
3. Assign program priorities.
4. Modify CANDE internal work files.
5. Compile the Network Controller program.
6. Set up MCP Program Name Table.

The preceding steps need only be performed prior to the first execution of CANDE.

CANDE Program Switches

If program switch 0 is not equal to 0, the CANDE program attempts to zip-execute a Network Controller program named CANDE/HANDLER. If program switch 1 is not equal to 0, the CANDE program is frozen in memory and is not eligible to be rolled out. If program switch 5 is not equal to 0, the CANDE program uses the file security mechanism implemented in the MCP (refer to Usercodes and File Security in Section 3).

(SYSTEM)/USERCODE File

The list of all valid usercode/password combinations is maintained in this file. Refer to the B 1000 Systems System Software Operation Guide, Volume 2, for a detailed description of the file and how it is created.

Program Priorities

For optimum system response, it is necessary that the Network Controller and the CANDE program run at higher priorities than other programs in the mix and that the Network Controller execute at a higher priority than the CANDE program. The following example shows how to permanently assign a priority of 15 to the Network Controller and a priority of 13 to the CANDE program.

Example:

```
MO <Network Controller program identifier> PR 15
MO CANDE PR 13
```

CANDE Internal Work Files

There are two ways to modify the three most heavily used internal CANDE files to access alternate packs. The two methods are as follows:

1. If the user is running CANDE with a usercode, a default pack can be assigned to that usercode. In this case, the CANDE/ANALYZER program must be executed with the same usercode as the CANDE program.

2. Use the MCP MODIFY command to change the pack destination of the three files.

Example:

```
?MODIFY CANDE FILE RECOVERY PID <pack-id>;  
?MODIFY CANDE FILE WORK PID <pack-id>;  
?MODIFY CANDE FILE PAGE.FILE PID <pack-id>;
```

CANDE/ANALYZER then must also be modified.

Example:

```
?MODIFY CANDE/ANALYZER FILE RECOVERY PID <pack-id>;  
?MODIFY CANDE/ANALYZER FILE WORK.FILE PID <pack-id>;
```

Any of the CANDE program's internal files which exist on disk from a previous release of the CANDE program must be removed.

Network Controller Compilation

Before executing the CANDE program, the user must write Network Definition Language (NDL) source specifications to generate the desired Network Controller for the CANDE system. The Network Controller is compiled using the NDL compiler. Refer to Appendix B and the NDL manual, form number 1073715, for more information on the Network Controller.

MCP Name Table Set-Up

In order for the Network Controller program to be automatically executed by the MCP, it is necessary to identify to the MCP the name of the Network Controller. This is done by placing the Network Controller program's identifier into the C entry (or slot) in the Name Table using the following MCP command:

```
CM C <Network Controller program identifier>
```

To verify that the C slot in the Name Table contains the correct Network Controller identifier, the following MCP command may be entered:

```
WWC
```

CANDE PROGRAM EXECUTION

Once the preceding steps have been performed, the CANDE program can be executed from the console keyboard using the MCP command EXECUTE.

If program switch 5 is not equal to 0, the CANDE program uses the file security mechanism implemented in the MCP. To execute CANDE using file security, enter the following:

```
EXECUTE CANDE SW5=1
```

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The CANDE program can be executed without setting program switch 5 to a non-zero value. However, if this is done, CANDE does not provide file security or MCP communication.

CANDE PROGRAM TERMINATION

The STOP command, which is valid only from the host ODT, provides the capability for an orderly termination of the CANDE program. Refer to Section 5 for an explanation of the STOP command.

DEBUGGING CANDE

The CANDE/ANALYZER program is provided to aid in debugging the CANDE program. In an interactive real-time program such as CANDE, errors can exist which become evident only upon entering some unusual sequence of commands or which involve a particular interaction between two or more users. When such errors occur, it is often difficult or impossible to know precisely what caused the failure. The CANDE/ANALYZER program helps resolve this problem.

If 5760 bits of dynamic memory are assigned at BOJ time, CANDE creates a trace file labeled CANDE/AUDIT and writes information about each user transaction into that file. The CANDE/AUDIT file is organized in such a manner that the time required to create the trace file is minimized, and is therefore not easily read. The CANDE/ANALYZER program reads the audit file and breaks it down into a format easily read by the user.

The CANDE/ANALYZER program produces two general types of information:

1. An analysis of the information included in the CANDE/WORK.FILE and CANDE/RECOVERY files.
2. A trace file of all messages sent and received by CANDE.

CANDE/ANALYZER runs even when the file labeled CANDE/AUDIT is not present.

All messages which go through the CANDE program's remote file are written to the audit file, a circular buffer of 1000 360-byte records. The first record in the file is called the Audit Parameter Block (APB) and is initialized by CANDE at BOJ time (or when the AUDIT option is turned ON) to contain information about CANDE itself such as compile date and time, and job number. The remaining 999 records constitute the circular buffer, into which the CANDE program packs as many as 15 messages per record. The first four bytes of each record describe the contents of that record.

Optional features associated with the CANDE/ANALYZER program are set through the program switches. Default (zero) settings mean that the program

1. Analyzes the USER.RESIDENT areas (which contain information about each station under CANDE) for logged-on stations only,
2. Analyzes the CANDE files CANDE/WORK.FILE and CANDE/RECOVERY even if CANDE/AUDIT is not present,
3. Prints the entire trace audit, and does not zip-execute CANDE,
4. Does not remove the audit file after analyzing CANDE's WORK and RECOVERY files.

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The functions of the program switches are defined in Table 4-1.

Table 4-1. CANDE/ANALYZER Program Switches.

| Switch | Value | Function |
|--------|-------|---|
| 0 | 0 | Print only those stations for which the LOGGED.ON bit in the USER.RESIDENT area is true. |
| 0 | 1-15 | Print all stations. |
| 1 | 0 | Analyze the CANDE/WORK.FILE and CANDE/RECOVERY files even if the CANDE/AUDIT file is not present. |
| 1 | 1-15 | Do not attempt analysis of CANDE files if the CANDE/AUDIT file is not present. |
| 2 | 0 | Print trace audit. |
| 2 | 1-15 | Do not print trace audit. |
| 3 | 0 | Print analysis of the USER.RESIDENT areas. |
| 3 | 1-15 | Do not print USER.RESIDENT areas. |
| 4 | 0 | When printing the USER.RESIDENT areas, also print the workfile contents for each user. |
| 4 | 1-15 | When printing the USER.RESIDENT areas, do not print the contents of the workfile. |
| 5 | 0 | Print the entire trace. |
| 5 | 1 | Print only the final 500 entries of the trace. |
| 5 | 2-15 | Print only the final 100 entries of the trace. |
| 6 | 0 | Do not zip-execute CANDE after analyzing the work and recovery files. |
| 6 | 1-15 | Zip-execute CANDE after analyzing the work and recovery files. |
| 7 | 0 | Do not remove the audit file after analysis. |
| 7 | 1-15 | Remove the audit file after analysis if there are no users of it. |
| 8 | 0 | Print information in the work and recovery files even if they are in use. The information may be of questionable integrity since CANDE may be changing the information as it is being accessed by the CANDE/ANALYZER program. |
| 8 | 1-15 | Do not print information in the work or recovery files when they are in use or missing. |
| 9 | 0 | Print information in the RECOVERY file fine tables. |
| 9 | 1 | Do not print information in the RECOVERY file fine tables. |

SECTION 5 CANDE INPUT COMMANDS

GENERAL

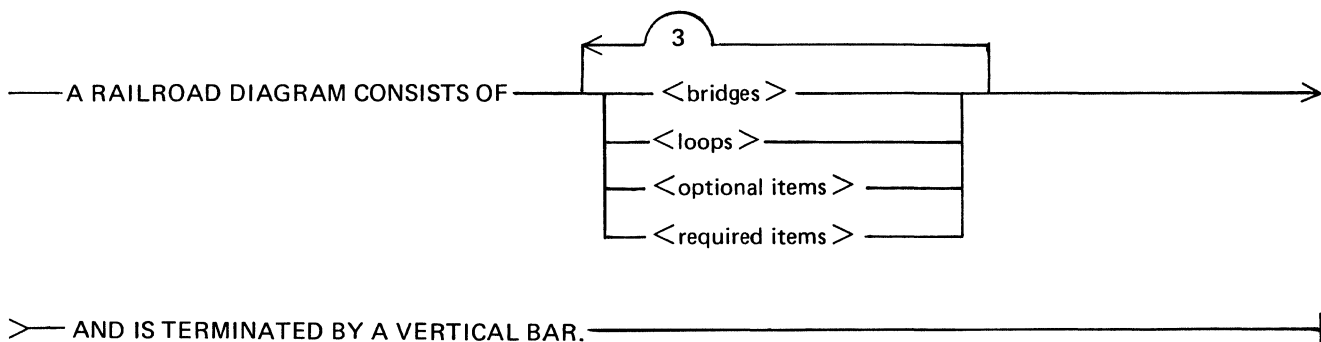
The CANDE input commands direct the CANDE program to perform various functions. The CANDE input commands are presented in this section in alphabetical order within two groups: terminal commands and host ODT commands. The input commands can be entered in upper- or lower-case characters.

COMMAND SYNTAX

Railroad diagrams show how syntactically valid statements can be constructed. Traversing a railroad diagram from left to right, or in the direction of the arrow heads, and adhering to the limits illustrated by bridges will produce a syntactically valid statement. Continuation from one line of a diagram to another is represented by a right arrow appearing at the end of the current line and beginning of the next line. The complete syntax diagram is terminated by a vertical bar (|).

Items contained in broken brackets (< >) are syntactic variables which are further defined, or which require the user to supply the requested information.

Upper-case items must appear literally. Minimum abbreviations of upper-case items are underlined.



G50051

The following syntactically valid statements may be constructed from the above diagram:

A RAILROAD DIAGRAM CONSISTS OF <bridges> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <optional items> AND IS TERMINATED BY A VERTICAL BAR.

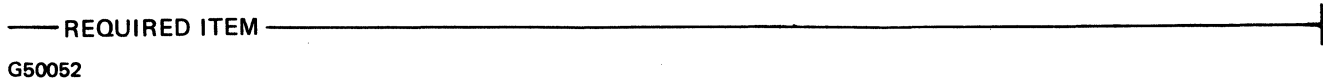
A RAILROAD DIAGRAM CONSISTS OF <bridges>, <loops> AND IS TERMINATED BY A VERTICAL BAR.

A RAILROAD DIAGRAM CONSISTS OF <optional items>, <required items>, <bridges>, <loops> AND IS TERMINATED BY A VERTICAL BAR.

Required Items

No alternate path through the railroad diagram exists for required items or required punctuation.

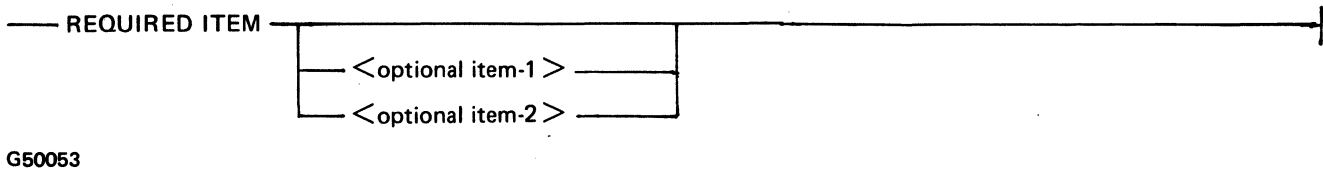
Example:



Optional Items

Items shown as a vertical list indicate that the user must make a choice of the items specified. An empty path through the list allows the optional item to be absent.

Example:

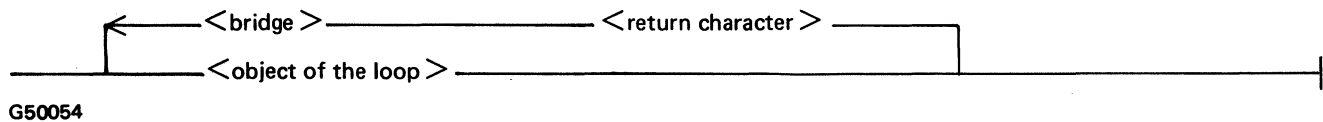


The following valid statements may be constructed from the above diagram:

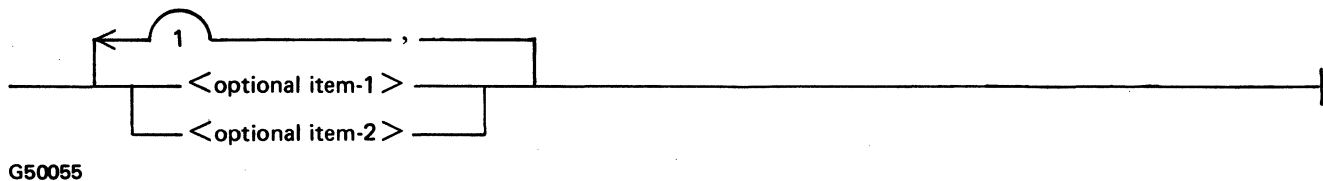
```
REQUIRED ITEM  
REQUIRED ITEM <optional item-1>  
REQUIRED ITEM <optional item-2>
```

Loops

A loop is a recurrent path through a railroad diagram and has the following general format.



Example:



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CANDE Input Commands

The following statements can be constructed from the railroad diagram in the example.


<optional item-1>
<optional item-1>,<optional item-1>
<optional item-2>,<optional item-1>

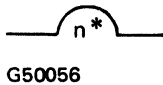
A <loop> must be traversed in the direction of the arrow heads, and the limits specified by bridges cannot be exceeded.

Bridges

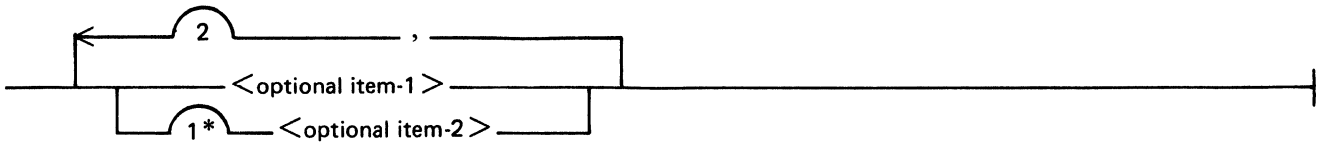
A bridge illustrates the minimum or maximum number of times a path may be traversed in a railroad diagram.

There are two forms of <bridges>.

 n is an integer which specifies the maximum number of times the path may be traversed.

 When n is followed by an asterisk, n is an integer which specifies the minimum number of times the path must be traversed.

Example:



G50057

The loop may be traversed a maximum of two times; however, the path for <optional item-2> must be traversed at least one time.

The following statements can be constructed from the railroad diagram in the example.

<optional item-1>,<optional item-2>
<optional item-2>,<optional item-2>,<optional item-1>
<optional item-2>

+ AND -

TERMINAL COMMANDS

The purpose of the general class of terminal commands is to create and save files, enter data, and perform editing functions. These commands are processed in serial order and are queued if they cannot be immediately executed.

Terminal control commands are a separate class of input messages preceded by the control command character (?). These commands provide the capability to control and interrogate the user's operating environment. The control commands are processed immediately and are not queued behind other commands from that terminal. The following terminal commands are control commands:

?BRK
?CQ
?DS
?SS
?WHERE

The terminal commands are presented in alphabetical order on the following pages.

+, -

The + and - commands are used to position the file. +<n> and -<n> shift exactly <n> records in the direction requested. The range of records shifted is n, where n is greater than or equal to 1 and less than or equal to 131071. If n is not specified, a value of 1 is assumed.

Syntax:

+ _____
- _____
 <n>

G50401

Semantics:

n
An integer value greater than or equal to 1 and less than or equal to 131071.

Examples:

+300
-500

BACK

BACK

The BACK command displays the current --<n>th page. If <n> is not specified, a value of 1 is assumed. The BACK command can be used to position the file to approximately the desired area without reading through each record moving from the current position to the requested one.

Syntax:

BACK _____|
 └─<n>─┘

G50402

Semantics:

n
 An integer value representing number of pages.

Examples:

BACK 6
BACK

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CANDE Input Commands

BRK (BREAK)

The BRK (BREAK) command terminates the current command in process. All output queued for the terminal is removed when the BRK command is processed. The BRK (BREAK) command applies to the following commands:

| | | | |
|--------|--------------|---------|--------|
| FIND | MERGE/RMERGE | RECOVER | SAVE |
| GET | MOVE | REPLACE | SPATCH |
| INSERT | PAGE | RESEQ | WRITE |
| LIST | | | |

Use of the break key on Teletype terminals terminates FIND, LIST, and REPLACE commands only.

Syntax:

?BRK

G50403

Example:

?BRK

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CANDE Input Commands

BYE

BYE

The **BYE** command is used to terminate the current **CANDE** session; switch lines can be disconnected. The user's workfile must be saved or removed for the command to be valid.

Syntax:

BYE _____|

G50404

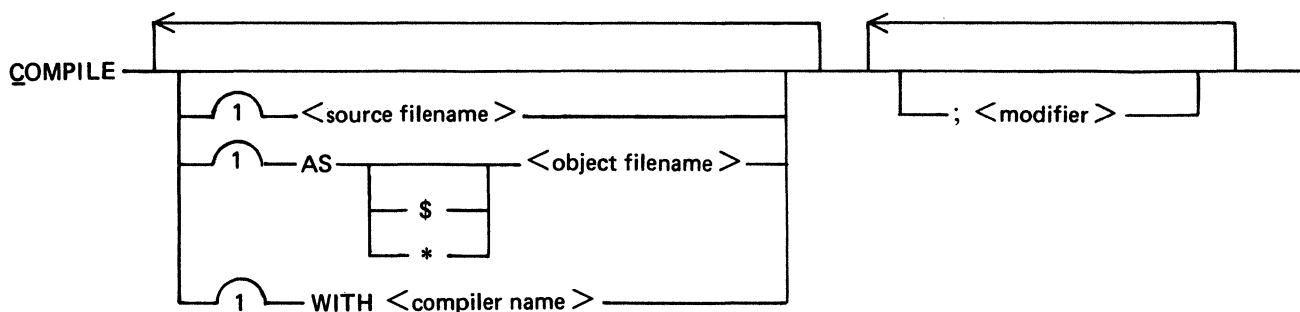
Example:

BYE

COMPILE

The COMPILE command is used to compile the user's workfile or an existing file with the standard system compilers.

If no options are specified in the command syntax, the workfile is compiled using the default compiler type which is the file type of the workfile. The source file name is used if an object file name is not specified. The dollar sign (\$) indicates that the letter O is not to be suffixed to the end of the file name to flag it as an object file. The asterisk (*) indicates that the literal to the right of the asterisk is the file name and the file is on the system disk. Refer to File-Naming Syntax Conventions in Section 3. A compiler must be specified if the workfile is not the source file name. Also, if the workfile is of type SEQ or DATA and a compiler is not specified, the UPL compiler is used. Syntax:



G50405

Semantics:

source filename

The name of the source file to be compiled. Refer to File-Naming Syntax Conventions in Section 3.

object filename

The file name of the object file. Refer to File Naming Syntax Conventions in Section 3.

compiler name

The compiler to be used.

modifier

MCP control strings to be included in the compile string.

Examples:

COMPILE

Compiles the workfile using the default compiler type.

COMPILE F AS G WITH COBOL

Compiles the file <usercode>/F as <usercode>/GO with the COBOL compiler.

COMPILE F AS \$G

C

C F WITH COBOL

CQ (CLEAR QUEUE)

The CQ (CLEAR QUEUE) command causes all pending output messages to a terminal (up to a maximum of MAX MESSAGES declared in the Network Controller) to be cleared.

Syntax:

?CQ _____|

G50406

Example:

?CQ

DCSTATUS

The DCSTATUS command provides information regarding the status of a user's station such as LSN, TERMINAL TYPE, and MAX RETRY.

Syntax:

DCSTATUS

G50407

Examples:

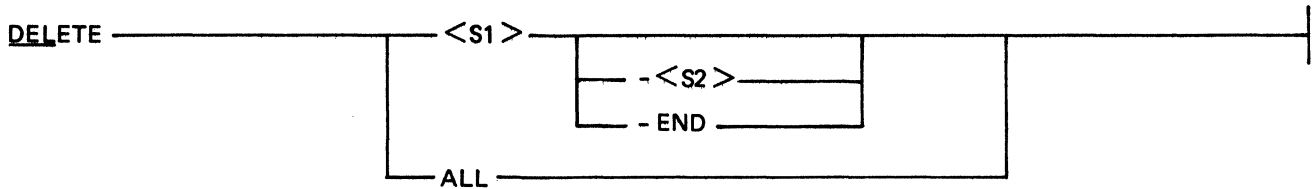
```
DCSTATUS  
DC
```

DELETE

DELETE

The DELETE command is used to delete records from the workfile. If ALL is specified, the entire contents of the workfile are deleted, but the name and other attributes are preserved.

Syntax:



G50408

Semantics:

S1

Sequence number to be deleted, or if both S1 and S2 appear, S1 is the beginning sequence number.

S2

The ending sequence number in the range of records to be deleted.

END

Used in place of S2 and represents the largest sequence number in the file.

Examples:

DEL ALL
DELETE 100-500
DEL 200-END

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CANDE Input Commands**

DS

The DS command discontinues the user's current program executed from CANDE which successfully opened a remote file.

Syntax:

?DS

G50409

Example:

?DS

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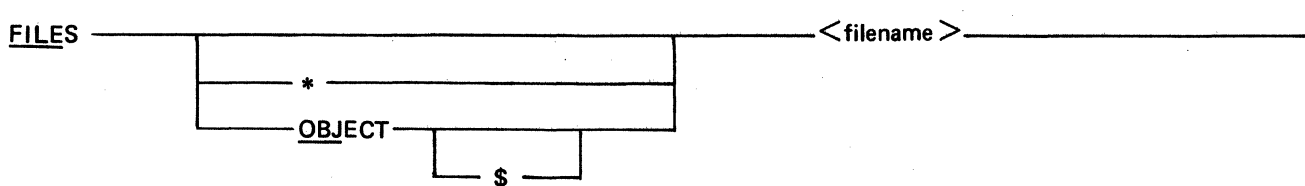
FILES

The FILES command searches the disk directory for the specified filename and reports whether or not the file is on disk. If the file is present, some general information about the file is included.

If the asterisk (*) option is used, the literal to the right of the asterisk is used as the file name and the file is assumed to be on the system disk.

The OBJECT option allows the user to inquire on object files created through the COMPILE and RUN commands. The dollar sign (\$) indicates that the 'O' suffix is not to be added to the object file-id.

Syntax:



G50411

Semantics:

filename

The name of the file to be inquired on. Refer to File-Naming Syntax Conventions in Section 3.

Examples:

FILES MYFILE

Displays whether or not the file <usercode>/MYFILE is present, the number of users, file type, size, blocking, creation date, and latest access date.

FILES *A

FILES A/B

FILES *(A)/B

FILES (A)/B

FILE OBJECT \$A

FIND

The FIND command searches a file for appearances of specific text. <text> has a maximum size of 30 characters. Output indicating the result of the search may be directed to the terminal. The output of a FIND command to a non-scrolling terminal is prompt-driven. This means that the command fills a screen to its page size and the user must then transmit a character to get the next page of output. A ?BRK command breaks the output as soon as possible.

Only one target may be sought with a FIND command. The <text> may contain any characters except the delimiter. The text field must not be empty. The LITERAL option must be used to search for literal strings. The text field must not contain any embedded spaces or special characters unless the LITERAL option is specified.

The search is successful whenever the string of characters in the field is found in a line of the file.

If the integer count is specified, the search for the associated text is terminated after the text has been found the number of times indicated by count.

If filename-1 is not specified, the workfile is searched by default. Specification of filename-1 causes searching of the designated file, which may be any file the user is allowed to read.

A file type may be specified to give the location of sequence numbers in the records to be searched. If no type is specified and the user does not have a workfile, a type of SEQ is assumed. Otherwise, the file type defaults to that of the workfile.

If a sequence range is specified, only records falling within that range are searched.

A column range, if provided, indicates that only a specified part of each record is to be examined. <column range> cannot fall within the sequence-number field (for example, columns 73-80 for FORTRAN files).

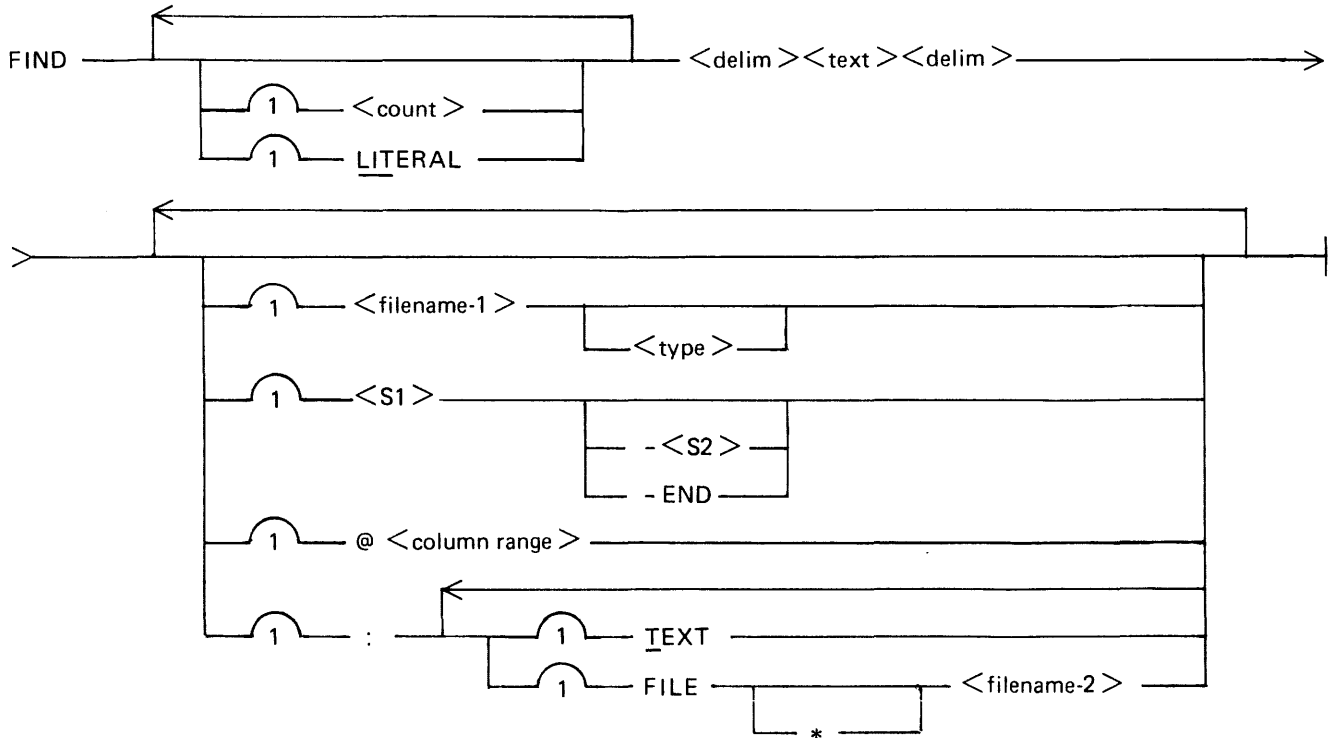
If a sequence range and column range is not specified, the default sequence range and column range are the entire file and the entire record, respectively.

The option :TEXT is used to display the entire line containing the <text> on the terminal. Otherwise, only the sequence numbers of those records containing the string are displayed.

The option ':FILE <filename-2>' directs output from the FIND command to a disk file. The asterisk (*) indicates that the literal to the right of the asterisk is used as the file name and the file is on the system disk.

FIND

Syntax:



G50412

Semantics:

delim

Any character except an alphanumeric, period (.), or underscore (_) which does not appear in the delimited field or have some other special meaning in the current context.

text

The target text to be sought.

count

An integer used to terminate the search after the text has been found the number of times indicated by count.

filename-1

The name of the file. Refer to File-Naming Syntax Conventions in Section 3.

type

The type of the file.

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FIND

S1

The sequence number to be searched or, if S2 appears, S1 is the beginning sequence number in the sequence range.

S2

The ending sequence number to be included in the sequence range.

END

Used in place of S2 and represents the largest sequence number in the file.

column range

Indicates one column or more of the record. If the range refers to more than one column, the beginning and ending columns are separated by a hyphen.

filename-2

The name of the file. Refer to File-Naming Syntax Conventions in Section 3.

Examples:

FIND /FILEID/ 100-900

Finds the occurrence of the token FILEID in the sequence range 100-900 and transmits the sequence numbers of the records containing the text to the terminal.

FIND LIT / users/ :TEXT

Finds the literal occurrence of ' users' and transmits the entire records containing the text to the terminal.

FIND 10 /STUFF/

Finds the first 10 occurrences of STUFF and transmits the sequence numbers of the records containing the text to the terminal.

FIX

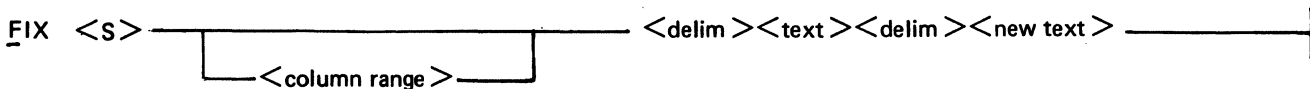
The FIX command alters the contents of a line in the workfile by inserting new text or replacing part of the text. The maximum size for the text field to be replaced is 30 characters. If text is given, the specified line is scanned from left to right for a literal appearance of the character string specified as text. If a column range is specified, the scan is only performed on the column(s) indicated. If the target text is found, it is replaced by the new text. Only one replacement is made on the line per FIX command.

The text field is considered empty if the two delimiters are in adjacent columns. If text is not given and no columns are specified, the new text replaces the entire line, with blank fill at the right. If only one column is specified, the new text replaces the character in that column. If a range is specified, the characters in the range are replaced by the new text.

The new text field begins after the second delimiter and continues to the end of the record. The new text field is empty if the end of the record immediately follows the second delimiter. Maximum size for the new text is 30 characters.

If the size of the new text is greater than the size of the string being replaced, the characters to the right of the string being replaced are shifted right to make room for the new text. This may cause overflow. If the size of the new text is less than the string being replaced, the characters to the right of the string are shifted left.

Syntax:



G50413

Semantics:

S

The sequence number of the line to be modified.

column range

Indicates one column or more. If the range refers to more than one column, the beginning and ending column numbers are separated by a hyphen.

delim

Any character other than an alphanumeric, period (.), or underscore (_) which does not appear in the delimited text or have some other special meaning in the current context.

text

Target text to be replaced.

new text

The new text.

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CANDE Input Commands**

FIX

Examples:

FIX 398 1-39 /AB/ABB

Locates the target text 'AB' within columns 1-39 of line 398 and replaces it with 'ABB'.

FIX 500 /END,/END ELSE

Replaces the text 'END,' within line 500 with 'END ELSE'.

FIX 10 40 // %ADJUST LINKAGE

Inserts the new text '%ADJUST LINKAGE' replacing the character in column 40 of line 10.

FIX 2 1-5 //

Deletes the contents of columns 1 through 5 of line 2, shifting the remainder of the record to the left.

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GET

The GET command recalls an existing file as the workfile. If an asterisk (*) is specified, the literal to the right of the asterisk is used as the filename and the file is assumed to be on the system disk. If type is omitted, the file is loaded as a SEQ type file.

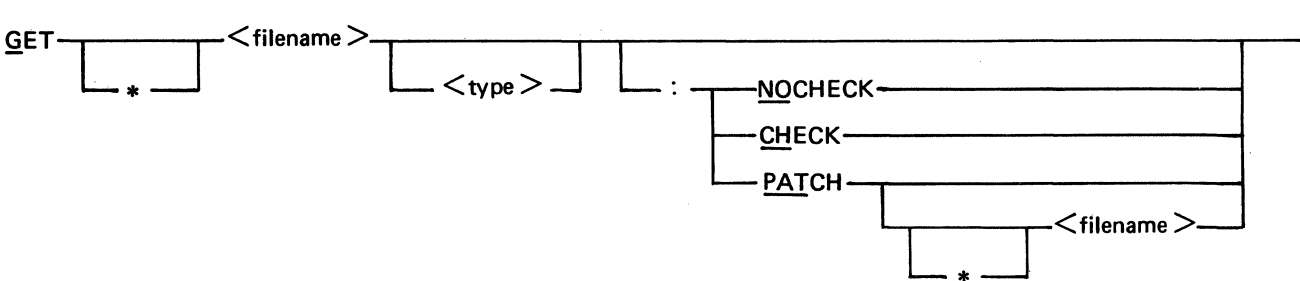
The :NOCHECK and :CHECK options provide for sequence field checking during execution of the GET command. NOCHECK is the default and CHECK performs sequence checking on the file. Sequence checking can be terminated by entering a ?BRK command. If the file was created by CANDE, the file is properly sequenced, but if the file was not created by CANDE, the user is responsible for sequence errors.

The recall of a type DATA file results in an automatic resequencing of the file.

The :PATCH option allows the user to reload a patch file, created by terminating a prior CANDE session with SAVE AS <file-id> :PATCH, back into the user's portion of the master workfile. Editing can then continue as though it had been one continuous session. The CANDE program is signaled that the user intends to eventually perform a SAVE AS <file-id> :PATCH to save only the records actually edited as a permanent disk file, and the user's patch identification field is set to blank. If a filename is specified, no family name can be named, since the patch file is expected to be under the user's usercode. If the filename is prefixed with an asterisk (*) the default pack associated with the user's usercode/password pair is not used.

If a filename is not specified with the :PATCH option, the user's patch identification field is set to blank and CANDE is signaled that the user intends to eventually save only the records actually edited as a permanent disk file. Refer to Patch Mode in Section 3. The :PATCH option does not apply to type DATA workfiles.

Syntax:



G50414

Semantics:

type

The file type of the file to be loaded.

filename

The filename of the file to be loaded. Refer to File-Naming Syntax Conventions in Section 3.

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CANDE Input Commands

GET

Examples:

GET AFILE

Loads an existing file <usercode>/AFILE as the workfile as a type SEQ file.

GET USR/NEW UPL

GET AFILE :PATCH PATCHFILE

Loads the file <usercode>/AFILE as the workfile (type SEQ), and reloads the patch file <usercode>/PATCHFILE back into the user's portion of the master workfile.

GET AFILE :PATCH

Loads the file <usercode>/AFILE as the workfile (type SEQ), and notifies CANDE that the user is to be editing in patch mode.

GET *(A)/B

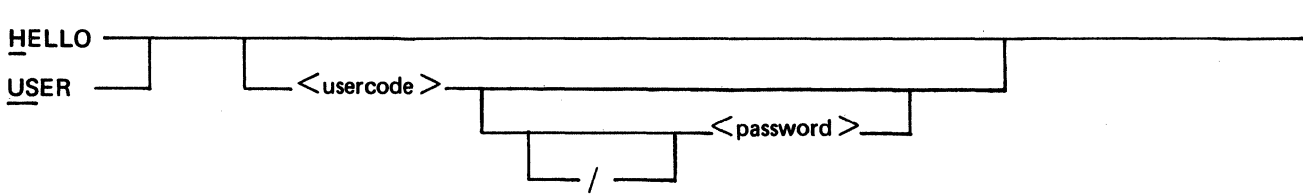
GET (A)/B

GET *AFILE

HELLO, USER

The HELLO/USER command initiates a new user session without explicitly terminating the current session. The current user's session is terminated and then the normal log-on process initiates a new session. If the station is not currently logged on to CANDE, the new user is logged on. If the usercode/password pair is not included in the command, the system leads the user through the log-on sequence.

Syntax:



G50415

Examples:

```
HELLO PRIV/USR
US MY/USR
USER MY/USR
```

INSERT

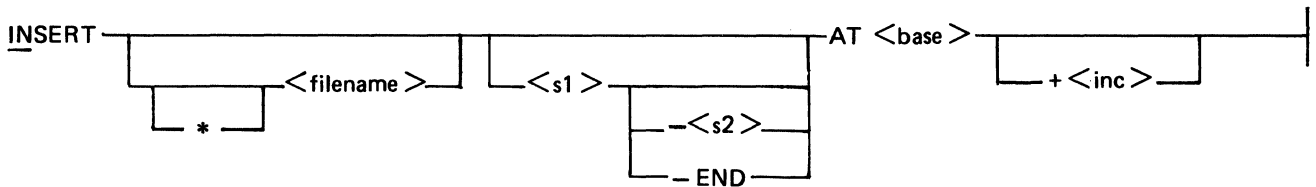
The INSERT command copies records from the workfile or a disk file and places the records in the workfile with new sequence numbers. If the asterisk (*) option is used, the literal to the right of the asterisk is used as the filename and the file is assumed to be on the system disk. If a filename is not specified in the command, the workfile is used as default.

New sequence numbers are determined by assigning an initial value to the first line and incrementing that value for each succeeding line. If an increment is not specified, a default value of 100 is used.

The range of new sequence numbers may not overlay any existing records in the workfile.

For workfiles of type DATA, a filename cannot be specified in the command syntax. Also, files of type DATA cannot be inserted into a workfile, since DATA type files are, by definition, unsequenced.

Syntax:



G50416

Semantics:

filename

The name of the file from which data is to be inserted into the workfile. Refer to File-Naming Syntax Conventions in Section 3.

s1

Sequence number to be inserted, or if both s1 and s2 appear, s1 is the beginning sequence number in the sequence range.

s2

The ending sequence number in the range of records to be inserted.

END

Used in place of s2 and represents the largest sequence number in the file.

base

The sequence number in the workfile at which the insert is to begin.

inc

The increment to be used when inserting the new records into the workfile.

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INSERT

Examples:

INSERT AT 3000 + 100

Inserts the entire workfile into the workfile starting at 3000 with an increment of 100.

INSERT AFILE 100-600 AT 4000

Inserts lines 100-600 from the file <usercode>/AFILE into the the workfile starting at 4000, using the default increment of 100.

INSERT 100-500 at 1000 +2

LIST

LIST

The LIST command displays the contents of the workfile or disk file at the user's terminal. The contents of the workfile are listed by default. If a filename is specified and the user has access privileges, the file is listed. If an asterisk (*) is specified, the literal to the right of the asterisk is used as the filename and the file is assumed to be on the system disk.

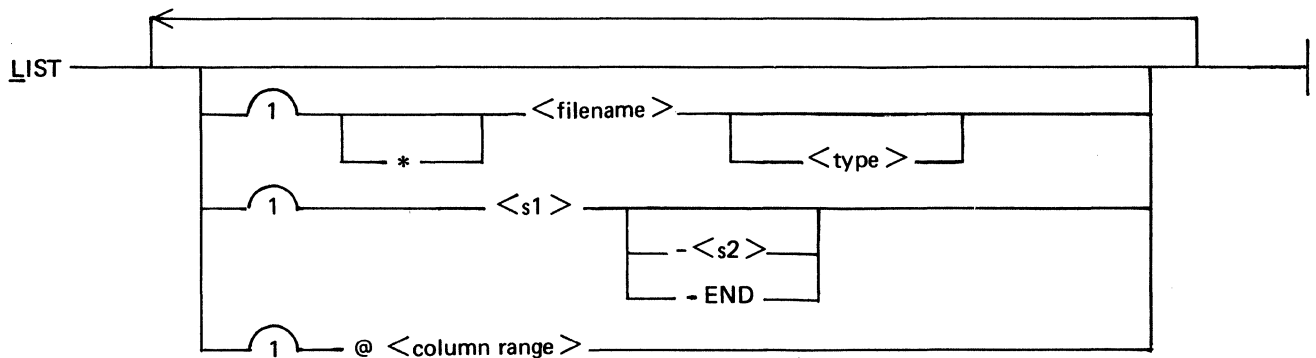
If file type is not specified and the user does not have a workfile, a type SEQ is used; otherwise, the file type used is the type of the workfile.

A sequence range and a column range can be specified. Specification of a single sequence number displays that sequence number only.

The lines transmitted to the terminal have the sequence number on the left side of the line.

The output of the LIST command to a non-scrolling terminal is prompt-driven. The user must transmit a character to get the next page of output.

Syntax:



G50417

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CANDE Input Commands

LIST

Semantics:

filename

The name of the file to be listed. Refer to File-Naming Syntax Conventions in Section 3.

type

The file type.

s1

Sequence number to be listed or, if both s1 and s2 are present, s1 is the beginning sequence number in the sequence range.

s2

The ending sequence number in the sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

column range

Indicates one column or more of the record. If the range refers to more than one column, the beginning and ending columns are separated by a hyphen.

Examples:

```
LIST AFILE
LIST
LIST AFILE 100-600
LIST A/B
LIST (A)/B
LIST *(A)/B
```


MERGE AND RMERGE

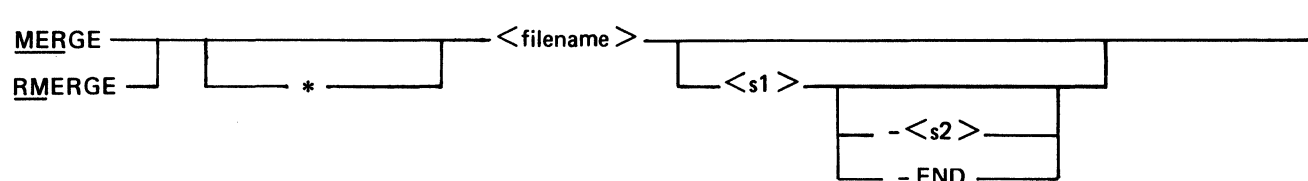
MERGE, RMERGE

The **MERGE** and **RMERGE** commands cause a file, or portions of a file, to be merged with the workfile. When a record in the file to be merged has the same sequence number as a record in the workfile, **MERGE** keeps the workfile record and discards the other; **RMERGE** discards the workfile record and keeps the record from the file to be merged.

The filename specifies any data file the user is allowed to read. The asterisk (*) indicates that the literal to the right of the asterisk is used as the filename and the file is assumed to be on the system disk.

If a sequence range is specified, only the selected records are merged. The sequence numbers of records in the file to be merged remain unchanged as they are put in the workfile.

Syntax:



G50420

Semantics:

filename

The name of the file to be merged. Refer to File-Naming Syntax Conventions in Section 3.

s1

Sequence number in the file or, if s1 and s2 are specified, s1 is the beginning sequence number in the sequence range.

s2

The ending sequence number in the sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

Examples:

MERGE SYMBOL

Merges the workfile with the file <usercode>/SYMBOL, keeping the workfile copy of records with identical sequence numbers.

RM PATCHES 400-END

Merges lines 400 through the end of the file <usercode>/PATCHES with the workfile, discarding the workfile copy of duplicate sequence numbers.

MERGE *(A)/SYMBOL

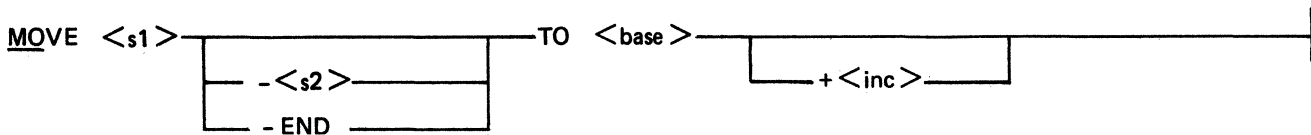
MOVE

The MOVE command moves lines from one point to another within the workfile, and changes their sequence numbers. The lines in the sequence range are deleted after being entered in the workfile as a continuous block.

New sequence numbers are determined by assigning an initial value to the first line and incrementing that value for each succeeding line. The integer specified for base is the initial value. If no increment value is specified, a default value of 100 is used.

The range of new sequence numbers cannot overlap any lines already in the file.

Syntax:



G50421

Semantics:

s1

Sequence number to be moved. If both s1 and s2 are specified, s1 is the beginning sequence number in the sequence range.

s2

The ending sequence number in sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

base

The sequence number in the workfile to which the records are to be moved.

inc

The increment to be used in sequencing the records moved.

Examples:

```
MOVE 100-600 to 900 +5  
MOVE 1000 TO 6000
```

NEXT

The NEXT command is used to display the current +<n>th page. If <n> is not specified, a default value of 1 is used. The NEXT command can be used to position the file to approximately the desired area without reading through each record when moving from the current position to the requested one.

Syntax:

NEXT _____
 └───<n>───┘

G50422

Semantics:

n
Integer value representing a page number.

Examples:

NEXT
NEXT 5

PAGE

The PAGE command displays a full screen of records from the workfile for editing and accepts full screens of input from the terminal. Operations continue until the command parameters have been satisfied or until the user enters another command.

If no options are specified in the command syntax, the entire file is displayed beginning at the first record.

The END option displays the last page of the current workfile.

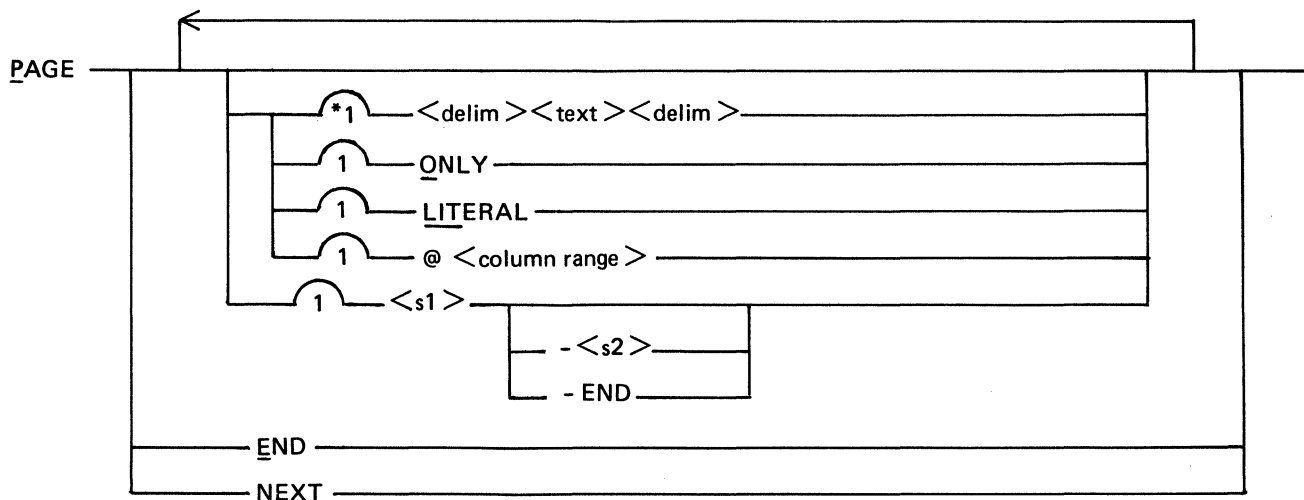
If NEXT is specified, action requested by the previous PAGE command is resumed provided that the previous PAGE command includes an option which specifies a search for a specific text.

If text is specified, each record is scanned within the sequence range for the delimited text. The display begins with the record in which the text is found. The text has maximum length of 30 characters.

If s1 is specified without s2, CANDE assumes that the range requested is from s1 to the end of the file and displays records in the file beginning at the sequence number s1. As many records as required to fill the screen are displayed.

If ONLY is specified, only the records with the target text are displayed. LITERAL must be specified if the target text is a literal string or contains imbedded spaces or special characters.

Syntax:



G50423

Semantics:

delim

Any character other than alphanumerics, periods (.), or underscores (_) which do not appear in the delimited field or have some other special meaning in the current context.

text

The target text sought.

column range

Indicates one column or more of the record. If the range refers to more than one column, the beginning and ending column numbers are separated by a hyphen.

s1

Beginning sequence number in the sequence range. If s1 appears without s2, the range is assumed to be s1-END.

s2

Ending sequence number in the sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

Examples:

PAGE ONLY /KK/ LITERAL

Displays only those records containing the literal string 'KK'.

PAGE ONLY /KK/ LITERAL 100-500

Display only those records containing the literal string 'KK' in the sequence range 100-500.

PAGE 2000

Displays records in the workfile beginning at sequence number 2000. As many records as are required to fill the screen are displayed.

PAGE /K K/ LITERAL

PAGE LITERAL /*L/ ONLY

PASSWORD

The PASSWORD command allows the user to change the password associated with the usercode. The user must enter the current password, the new password and, for verification purposes, repeat the new password. Passwords must contain no imbedded blanks and cannot consist of "" (two consecutive quotation marks), which indicates a blank password.

Syntax:

PASSWORD <current password> <new password> <new password> _____|

G50424

Semantics:

current password

The current password associated with the user's usercode.

new password

The new password to be associated with the user's usercode.

Example:

PASSWORD USR PRIV PRIV

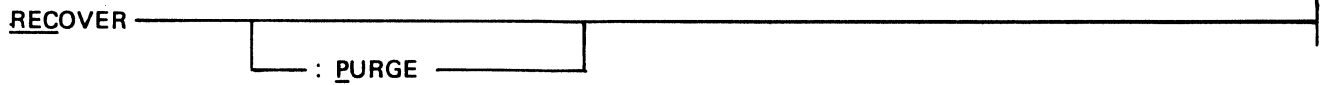
RECOVER

RECOVER

After an abnormal termination of the CANDE program, those users who were logged on to CANDE have the option of recovering the workfile being edited when CANDE abnormally terminated. After logging on to CANDE, the RECOVER command recalls a recovery file as the workfile.

The :PURGE option allows the user to remove a recovery file if recovery is not desired.

Syntax:



G50425

Examples:

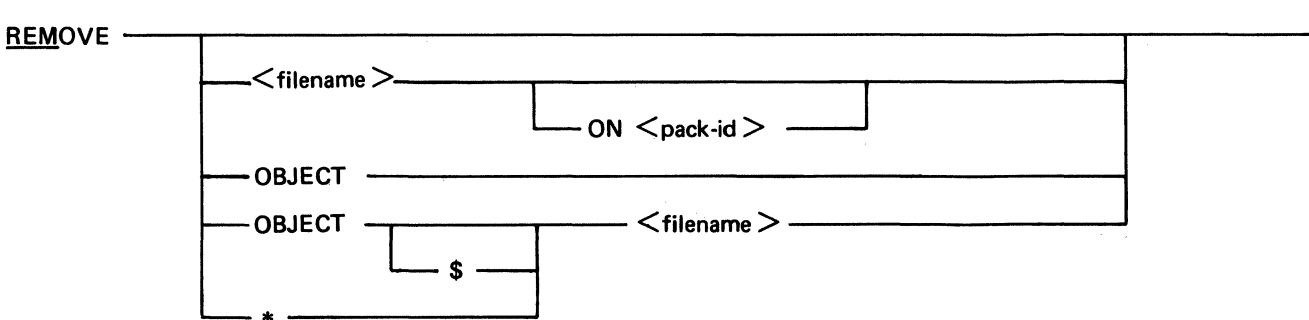
RECOVER
REC
REC :PURGE
RECOVER :P

REMOVE

The REMOVE command is used to remove the workfile or any file having the user's usercode as the family-name. If no options are specified, the user's workfile is removed by default.

The OBJECT option is used to remove an object file created through the COMPILE and RUN commands. If OBJECT is specified without a filename, the user's object file, <usercode>/<workfile name>O, is removed. The \$ option specifies that the letter O is not to be suffixed to the file-id. The asterisk (*) indicates that the literal to the right of the asterisk is used as the file name and the file is on the system disk.

Syntax:



G50426

Semantics:

pack-id

The disk pack identifier.

filename

The name of the file. Refer to File-Naming Syntax Conventions in Section 3.

Examples:

REMOVE

REMOVE AFILE

Removes the file <usercode>/AFILE.

REMOVE OBJECT

Removes the file <usercode>/<workfile name>O

REMOVE OBJECT AFILE

Removes the file <usercode>/AFILEO

REMOVE OBJECT \$AFILE

REM

REMOVE AFILE ON AUSE

REM *AFILE

REPLACE

REPLACE

The REPLACE command scans line by line through the workfile or a specified sequence range of the workfile, replacing the target text with the new text. Both the text and new text have a maximum length of 30 characters. Only one replacement can be specified in each REPLACE command; the replacement is defined by a target text or a column range and a new text field. The new text field can contain blanks. The text and new text fields can contain any characters except the delimiter.

Using COLUMN <col 1> causes the new text to be inserted at the column specified. Specifying COLUMN <col 1>-<col 2> causes the new text to replace the characters in columns <col 1> through <col 2>.

For purposes of the search, all strings are considered to be token strings. Each line of the file is considered to be a string of tokens, excluding blanks. The LITERAL option must be used to search for literal strings. LITERAL must be specified if the delimited text contains any imbedded spaces or special characters.

If the option FIRST is used, only the first appearance of the text on any line is sought and replaced. If an integer count is specified, the replacement is terminated after CANDE has replaced the text with the new text the number of times specified by count.

The replacement can be restricted to a sequence range or to a column range. If no sequence range or column range is specified, the replacement is performed on the entire record length and the entire file.

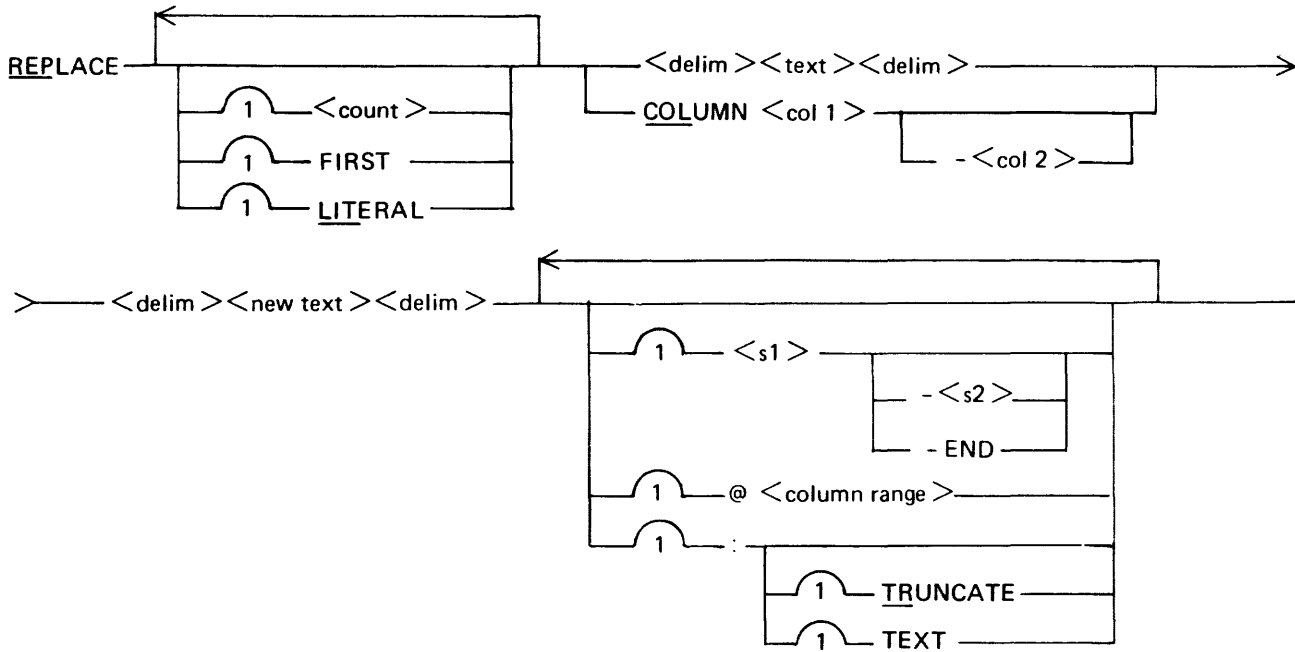
The option :TEXT is used to transmit the entire record to the user's terminal; otherwise, only the sequence numbers of the records affected by the replace are written to the terminal.

Whenever the target is found, the new text is substituted. If the size of the new text is greater than the size of the string being replaced, characters to the right of the string being replaced are shifted right to make room for the new text. If the :TRUNCATE option is not specified and the replace shifts nonblank characters beyond the end of the line or column range, the replace is not performed on that record and a warning message is displayed. If the :TRUNCATE option is specified, a line overflow warning is displayed whenever the adjustment shifts nonblank characters beyond the end of the line or column range when :TEXT is not specified. If the size of the new text is less than the string being replaced, the characters to the right of the string are shifted left.

The output of the REPLACE command to a nonscrolling terminal is prompt driven; output comes to the terminal after transmission of any character from the home position. ?BRK breaks the command as soon as possible.

REPLACE

Syntax:



G50427

Semantics:

delim

Any character other than an alphanumeric, period (.), or underscore (_), which does not appear in the delimited text or have some other special meaning in the current context.

text

The target text to be replaced.

col 1

The target column to be replaced or the beginning column number in the column range if col 2 is specified.

col 2

The ending column number in the target column range to be replaced.

count

An integer count.

new text

The new text to replace the target text or column range.

REPLACE

s1

Sequence number for replacement or, if s2 is specified, s1 is the beginning sequence number in the sequence range.

s2

Ending sequence number in the sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

column range

Indicates one column or more of the record. If the range refers to more than one column, the beginning and ending columns are separated by a hyphen.

Examples:

```
REPLACE /AB/ /AA/
```

Replaces every occurrence of the token "AB" with "AA".

```
REPLACE /AA/ /AAA/
```

```
REPLACE COL 1-5 / / 130-180
```

Replaces the contents of columns 1 through 5 in lines 130 through 180 with blanks.

```
REPLACE LIT /A A/ /AA/ @ 60-70
```

Replaces the literal occurrence of "A A" with "AA" in columns 60 through 70.

```
REPLACE LIT /XY/ /XYZ/ :TRUNCATE
```

Replaces the literal occurrence of "XY" with "XYZ" and allows an overflow condition to occur.

RESEQ

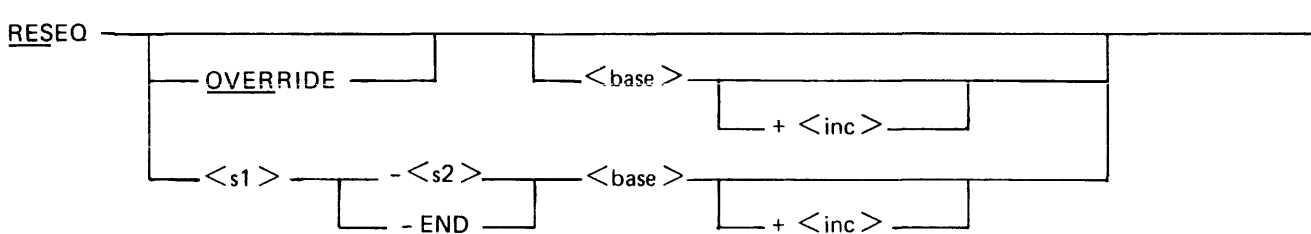
The RESEQ command assigns new sequence numbers to lines in the workfile without changing the order in which the lines appear. If a base or increment value is not specified, a base of 100 with an increment of 100 is used by default. Each subsequent line's sequence number is equal to its predecessor's number plus the increment value.

The OVERRIDE option is used to disregard any sequence errors (for example, a record with a blank sequence number field). If OVERRIDE is not specified and CANDE discovers a sequence error in the workfile, resequencing is discontinued at that point and CANDE informs the user that resequencing cannot continue. When the CANDE program fails during the resequencing, the OVERRIDE option is used to recover.

If a range of sequence numbers is specified, only the specified part of the workfile is resequenced. If a sequence range is not specified, the entire workfile is renumbered. When a sequence range is specified, an initial value must be specified as the base. s1 must be less than or equal to the base and the base plus the number of lines times the increment must not exceed s2 + the increment.

When resequencing BASIC file types, sequence numbers in the text are modified to match new sequence numbers on the appropriate records.

Syntax:



G50428

Semantics:

base
Sequence number used in resequencing as the sequence number of the first line to be renumbered; each subsequent line's number is equal to its predecessor's number plus the increment value.

inc
The integer value used as the increment in resequencing.

s1
Beginning sequence number in the sequence range to be resequenced.

s2
Ending sequence number in the sequence range.

END
Used in place of s2 and represents the largest sequence number in the file.

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RESEQ

Examples:

RESEQ 200

Renumbers the entire workfile starting with an initial record number of 200, using the default increment of 100.

RESEQ 100-700 100+10

Renumbers records 100 through 700 of the workfile using a base of 100 and increment of 10.

RESEQ +20

Renumbers the entire workfile using a base of 100 and increment of 20.

RESEQ OVERRIDE

RESEQ 1000-1500 1100+10

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RUN

The RUN command provides for compilation of the user's current workfile, followed by the execution of the resulting object program.

If a program executed by CANDE opens a remote file, CANDE specifies '?' as the signal character in the approval of the open. This means that all input which begins with a '?' is input to CANDE.

Syntax:

RUN _____
 └─ ; <modifier > ─┘

G50429

Semantics:

modifier

MCP control string.

Example:

RUN; FI LINE = REMOTE;

Performs a compile-and-go on the workfile and file equates the output to the user's terminal.

SAME

The SAME command is used to request a display of the current page.

Syntax:

SAME ————— |

G50430

Example:

SAME

SAVE

The SAVE command causes the current workfile to be saved. If no filename is specified, the workfile is saved under its workfile name. The workfile can be saved under a different name by using the 'AS <filename>' option regardless of whether or not a file currently exists with that filename. Specifying the asterisk (*) indicates the literal to the right of the asterisk is to be used as the file name and the file is on the system disk.

A user who is logged on with a non-privileged usercode/password cannot SAVE a file without it being saved under the user's own usercode; however, if the user logs on with a privileged usercode/password, the user may specify a multi-file id. Refer to File-Naming Syntax Conventions in Section 3.

The :RESEQ option resequences all or part of the new file. Incorporating the two commands, RESEQ and SAVE, decreases processing and I/O time required to handle the commands separately. The :RESEQ option cannot be used with workfiles of type BASIC and DATA, and cannot be used with the :PATCH option.

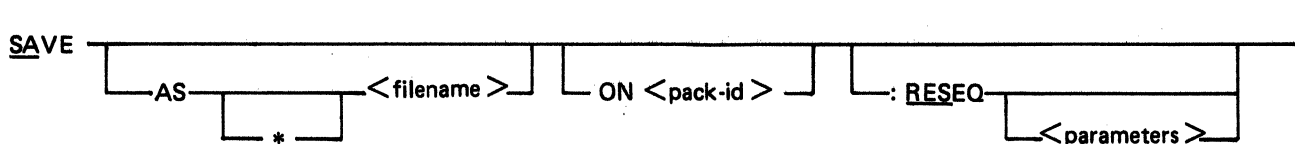
The :PATCH option allows the user to create a patch file consisting of only those records from a source file which were changed during an editing session. Deleted records are saved in the patch file as \$VOID records.

When SAVE with no options is entered, a SAVE :PATCH is performed if both the following options are in effect:

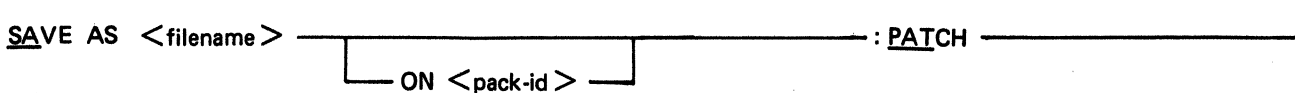
1. The users patch field is set by using the SPATCH command without a sequence range or by using the :PATCH option of the GET command.
2. A 'GET <filename> :PATCH <patchfile name>' was entered to start the session or a 'SAVE AS <patchfile name> :PATCH' was entered during the current session.

Syntax:

Format 1:



Format 2:



G50431

Semantics:

filename

The name of the file. Refer to File-Naming Syntax Conventions in Section 3.

pack-id

The name of the disk pack.

parameters

Parameters specified as in the RESEQ command, except for the OVERRIDE parameter.

Examples:

SAVE
SAVE AS AFILE
SAVE AS *AFILE
SAVE AS AFILE ON DATP

SAVE AS PATCHFILE :PATCH

Saves only the records actually edited in the disk file <usercode>/PATCHFILE.

SAVE :RESEQ 200-500 210+10

Resequences records 200 through 500 with a base of 210 and an increment of 10, and saves the workfile as <usercode>/<workfile name>.

SEQ

The SEQ command invokes the automatic sequence mode, causing the CANDE program to provide the sequence number for each line. An initial value is assigned as the sequence number of the next line to be entered; the value is incremented for each subsequent line.

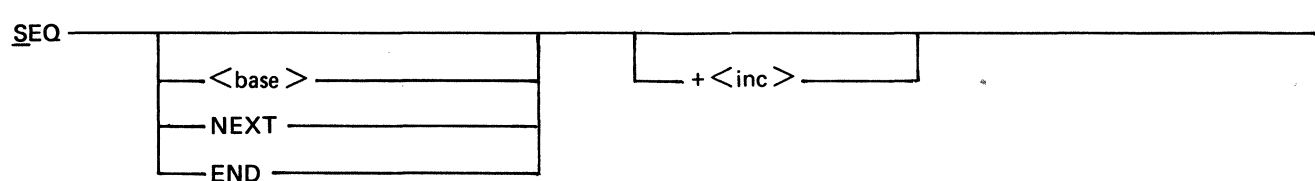
The NEXT option causes sequence numbering to continue from the point the last auto sequence mode for the user was terminated.

The END option causes sequence numbers to begin with the sequence number of the last record currently in the workfile.

If a base is not specified, a default value of 100 is used for the base value. If an increment value is not specified, a default value of 100 is used.

Sequence mode is terminated either by entering the end-of-text character immediately following the sequence mode or by transmitting only the sequence number. BACK, SAME, NEXT, $-\langle n \rangle$, and $+\langle n \rangle$ terminate the sequence mode and then display the requested page.

Syntax:



G50432

Semantics:

base

Integer value assigned as the next line to be entered.

inc

The integer value by which the base is incremented for each subsequent line.

Examples:

```
SEQ
SEQ NEXT
SEQ END +50
S 120+10
```

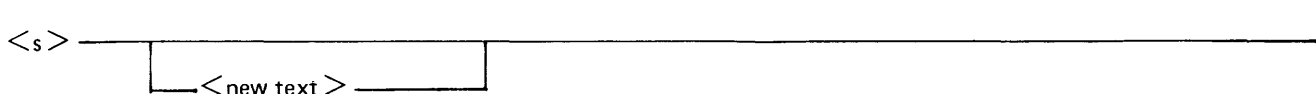
SINGLE-LINE ENTRY

Single-line Entry

A digit that starts at the beginning of a line and whose size is at least the sequence field length for the current workfile is a command to enter the sequence number in the workfile, or to replace the line already at the sequence number. The scan for the sequence number begins in the first column of the input line and continues until a nondigit character is encountered or until the maximum number of digits for the sequence number has been entered; the text begins in the column immediately following.

If there is already a line of text at the specified sequence number, that line of text is replaced by the new text. If new text is not specified, the line of text at the specified sequence number is blanked out, but not deleted.

Syntax:



G50433

Semantics:

s
The sequence number of the record.

new text
The text of the record.

Examples:

```
00100THIS IS A NEW LINE
00215 AND SO IS THIS
00300
```

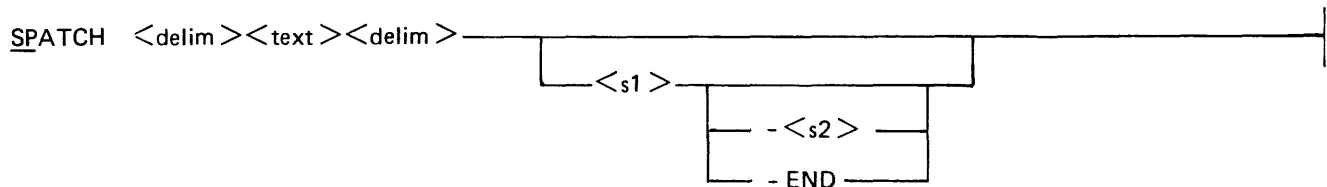

SPATCH

The SPATCH command allows the user to insert up to 10 characters of patch identification into columns 81 through 90 of the workfile for all file types except DATA. The SPATCH command, with no sequence range specified, sets the user's patch identification field to the text specified in the command. The user is then editing in patch mode, and CANDE is signaled that the user intends to eventually save only the records actually edited as a permanent disk file. For example, the user must either save the workfile as a patch file or clear the patch identification field by entering SPATCH <delimiter><delimiter> before a SAVE command is entered. Refer to Patch Mode in Section 3.

If text and sequence range are not specified in the command, the patch identification field is cleared.

If a sequence range is specified, the patch identifier string is only inserted into the workfile records within the sequence range. This option of the SPATCH command does not change any previous permanent setting of the patch identification field.

Syntax:



G50434

Semantics:

delim

Any character other than an alphanumeric, period (.), or underscore (_) which does not appear in the delimited text or have some other special meaning in the current context.

text

The new patch identification field.

s1

A sequence number or, if s2 is specified, the beginning sequence number in the sequence range.

s2

The ending sequence number in the sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

Examples:

```
SPATCH /ABC/ 100-END
SP /TUESDAY/
SPATCH /XYZ100/
SP //
```

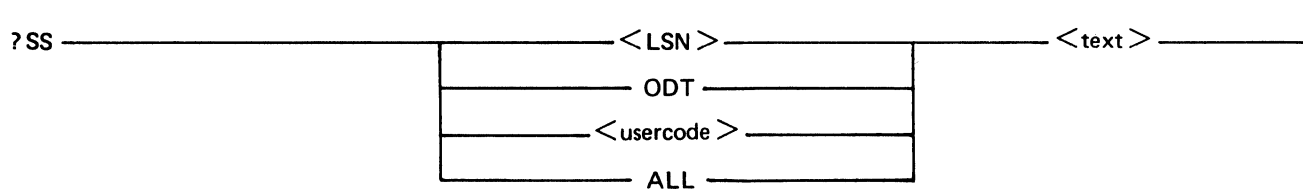
SS

The SS command sends a message to another station or to the host operator display terminal. The station can be referenced by LSN or by the usercode with which the user logged on.

The ALL option sends the message to all stations.

The maximum text size allowed is 240 characters.

Syntax:



G50435

Semantics:

LSN

Logical station number of the station.

ODT

The host operator display terminal.

usercode

The usercode with which the station logged on.

ALL

All stations.

Examples:

```
?SS 6 THIS IS A MESSAGE  
?SS ODT PLEASE MOUNT MY TAPE  
?SS ALL THIS IS A MESSAGE  
?SS USER1 HELLO HELLO
```


TERMINAL

TERMINAL

The **TERMINAL** command allows the user to inquire about or specify the number of lines per page or per screen for the terminal, or to modify the output mode of the terminal.

The number of lines per screen or per page is specified with the **PAGE** option. The page length is expressed as an integer value between 1 and 22 inclusive. Default page sizes are as follows:

| Device | Page Size |
|-----------------|-----------|
| B 9350 Teletype | 1 |
| TC Series | 1 |
| TD700 Series | 2 |
| TD801 | 10 |
| TD802 | 22 |
| TD821 | 10 |
| TD822 | 22 |
| TD831 | 10 |
| TD832 | 22 |

The default page sizes are the maximum possible values.

If a page length is not specified with the **PAGE** option, the current page size is displayed.

If no parameters are specified, the current page size, current output mode, and current delete character (if applicable) are displayed.

The **CONTINUOUS** option causes the terminal to remain in receive mode unconditionally after each output to the terminal, if scroll is enabled.

The **WAIT** option causes the terminal to switch to local mode after each output to the terminal. This is the default.

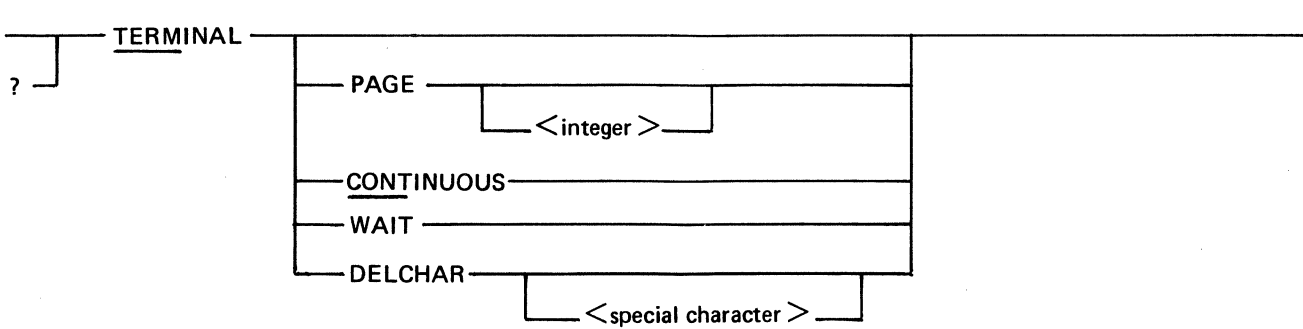
TD830 series terminals are treated as TD820 terminals, except for **FAST-SELECT** and the 'stop highlight' character. TD830 terminals on two-wire direct-connect lines must have the system adapter strapped for a 15-millisecond **WRITE** delay.

The **DELCHAR** option is used for a station defined as a B 9350 (Teletype device). **TERM DELCHAR** inquires as to the current character recognized by CANDE as a 'delete character'. The number of delete characters entered corresponds to the number of characters immediately preceding the delete characters that are to be deleted. **TERM DELCHAR <special character>** sets the delete character, which is by default the underscore (**_**).

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TERMINAL

Syntax:



G50437

Semantics:

page length

Integer value between 1 and 22 inclusive specifying the number of lines per screen or page.

special character

Any special character other than a question mark (?).

Examples:

```
TERM CONT
TERM PAGE 12
TERM WAIT
?TERMINAL WAIT
```

TITLE

The TITLE command changes the name of the workfile or a disk file. The file must be in the user's library, meaning the user's usercode is the family-name of the file.

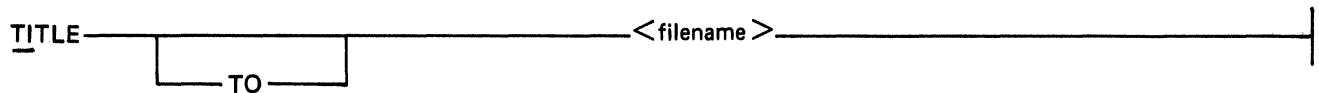
If the name of the workfile is changed, the new name is used in any subsequent SAVE.

The OBJECT option is used to change the name of an object file created through the COMPILE and RUN commands. The dollar sign (\$) indicates that the letter O suffix is not to be added to the object file name.

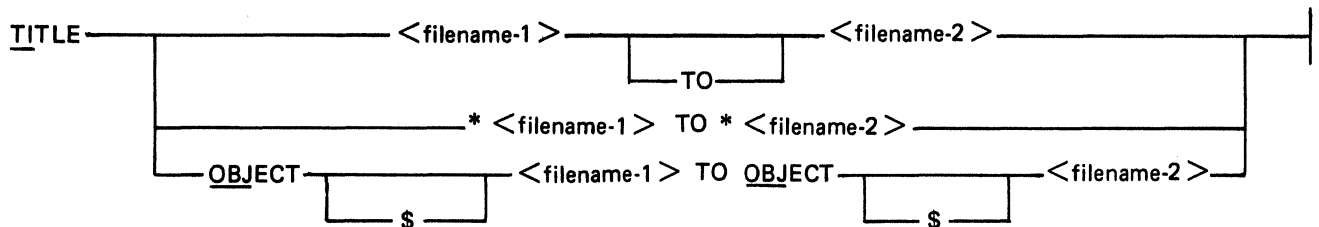
Prefacing filename-1 or filename-2 with an asterisk (*) indicates that the literal to the right of the asterisk is to be used as the file name and the file is assumed on the system disk.

Syntax:

Format 1: Workfile only.



Format 2: External file. When an asterisk (*) is used to precede one file-identifier, an asterisk must also precede the other file-identifier.



G50438

Semantics:

filename

The new name of the workfile.

filename-1

The disk file name. Refer to File-Naming Syntax Conventions in Section 3.

filename-2

The new file name. Refer to File-Naming Syntax Conventions in Section 3.

Examples:

```
TI AFILE
TITLE ZAP
TITLE A TO B
TITLE *AFILE TO *BFILE
TITLE OBJ A TO OBJ B
```

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V (VOID)

Single lines can be deleted from the workfile through the use of the VOID command. The letter V must be the first character of the line transmitted back, and the line must contain a valid sequence number and cannot be the first line of the screen. Any number of blanks may separate the V and the sequence number. In this way, lines from pages displayed on the user's terminal can be deleted from the workfile. If the sequence number is in error, the record is treated as a sequence error.

Example:

```
V00000100THIS IS THE LINE THAT IS GOING TO BE DELETED.  
00000200THIS LINE WILL NOT BE DELETED FROM THE WORKFILE.  
V 00000300BUT THIS LINE WILL BE DELETED FROM THE WORKFILE.
```

WHAT

The WHAT command gives information about the state of the workfile, such as workfile name, source file name, whether the workfile is not saved, number of workfile table entries, and the patch identification field.

Syntax:

WHAT

G50439

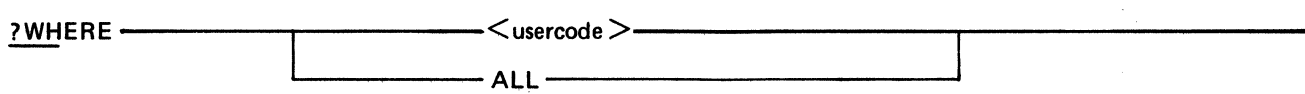
Example:

WHAT

WHERE

The WHERE command provides the logical station number (LSN) of the user. The ALL option provides the LSN of all the users of CANDE.

Syntax:



G50440

Semantics:

usercode

The usercode with which the station logged on.

Examples:

?WHERE PRIV

?WHERE ALL

WRITE

WRITE

The WRITE command creates a printer or punch backup file consisting of records from the user's workfile or from some other file. By default, the contents of the workfile are written to a printer backup file. If a filename is specified and the user has access rights (or if the file is PUBLIC), it is written to a backup file. The asterisk (*) indicates that the literal to the right of the asterisk is used as the filename and the file is assumed to be on the system disk.

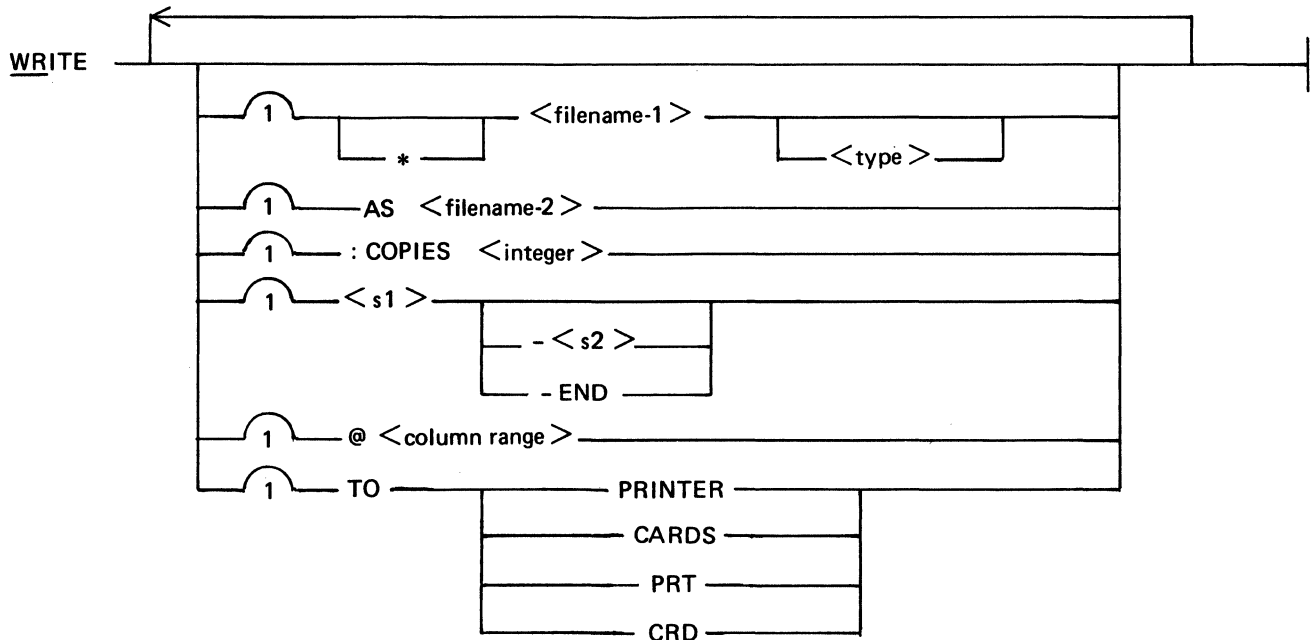
If a file type is not specified and the user does not have a workfile, type SEQ is used; otherwise, the workfile type is used.

A sequence range and a column range may be specified; otherwise, the whole file and the entire line are written to a backup file. The file-id is prefixed with a number sign (#) if the file is a backup print file, or prefixed with a percent sign (%) if the file is a backup punch file.

The COPIES option is used by the SYSTEM/BACKUP program unless overridden by the operator. If this option is not specified, the default number of copies produced is 1.

The WRITE command can be used in conjunction with the AUTOPRINT mechanism in the MCP. If AUTOPRINT is active, The WRITE command generates a backup file that can be printed or punched automatically.

Syntax:



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WRITE

Semantics:

filename-1

The name of the file. Refer to File-Naming Syntax Conventions in Section 3.

filename-2

The name of the file. Refer to File-Naming syntax Conventions in Section 3.

type

The type of the file.

integer

A value within the range 1 through 63.

s1

The sequence number or, if both s1 and s2 are specified, the beginning sequence number in the sequence range.

s2

The ending sequence number in the sequence range.

END

Used in place of s2 and represents the largest sequence number in the file.

column range

Indicates one column or more of the record. If the range refers to more than one column, the beginning and ending column numbers are separated by a hyphen.

PRINTER

Backup print file.

CARDS

Backup punch file.

PRT

Backup print file.

CRD

Backup punch file.

Examples:

WRITE A AS B

Writes all records in the file <usercode>/A to a backup print file <usercode>/#B.

WRITE

Writes all records in the workfile to a backup print file <usercode>/#<workfile name>.

WRITE A TO CARDS

Writes all records in the file <usercode>/A to a backup punch file <usercode>/%A.

WRITE 100-1000 TO PRT

WRITE *(PRIV)/A

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? < MCP control string >

?<MCP control string>

The MCP control string is sent to the MCP. The question mark (?) must be in column one. If the CANDE program is running under a privileged usercode/password, the MCP control instruction is spawned prefixed with the user's usercode/password and a session number; the first 250 characters of the MCP response are returned to the user's terminal; otherwise, the MCP control string is zipped without a usercode/password or a session number, and the user is notified only that the string was or was not accepted by the MCP. If the CANDE program is executed with switch 5 set to a non-zero value, the MCP control instructions are limited to the following list:

| | | | | |
|---------|---------|--------|--------|------|
| ADD | DS | LOAD | PP | SW |
| AD | DUMP | LP | PR | TD |
| AP | DYNAMIC | LS | PS | THEN |
| AX | END | MH | PV | TI |
| BF | EXECUTE | MODIFY | QF | TS |
| CD | FN | MP | QP | UL |
| CHANGE | FR | MR | QUEUE | USER |
| COMPILE | FS | MX | RB | WD |
| COPY | FW | NT | REMOVE | WM |
| CP | GO | OF | RF | WS |
| CU | GT | OK | RM | WT |
| DATA | HS | OL | RS | WY |
| DB | HW | OU | RV | ZQ |
| DF | IL | PD | SP | |
| DM | LD | PM | ST | |
| DP | | | | |

Syntax:

?<MCP control string>

G50442

Semantics:

MCP control string
MCP control string.

ALL

SYSTEM OPERATOR INPUT COMMANDS

The system operator has certain commands available that can be directed to the CANDE program. These commands are WHO, STOP, ALL, MAKE, and AUDIT. The WHO command displays a list of usercodes and associated logical station numbers that are currently logged on to CANDE. The STOP command brings CANDE to an orderly conclusion if there are no users logged on. The ALL command allows the operator to broadcast a message to all terminals. The MAKE command allows the operator to make a station ready or not ready. The AUDIT command allows the auditing function to be dynamically started or stopped.

All system operator input commands have a maximum size of 160 characters.

ALL

The ALL command allows the operator to broadcast a message to all stations logged on to CANDE.

Syntax:

<CANDE job number> AX ALL <message>

G50443

Semantics:

message

The message text to be broadcast to all stations logged on to CANDE.

Example:

200AX ALL HELLO HELLO

AUDIT

AUDIT

The CANDE program audits each user transaction whenever CANDE is executed with 5760 bits of dynamic memory. The AUDIT command allows the auditing capabilities to be set or reset without re-executing CANDE when dynamic memory has been provided.

The audit file is automatically created if CANDE is executed with a dynamic memory size of 5760 bits. If CANDE is not executed in this fashion, auditing is denied if requested (and the message NO DYNAMIC MEMORY FOR AUDITING appears) and CANDE must be re-executed with 5760 bits of dynamic memory.

If no options are specified, the current status of the audit option is displayed: 1) whether the audit option is on or off and 2) whether or not the audit file is open or closed.

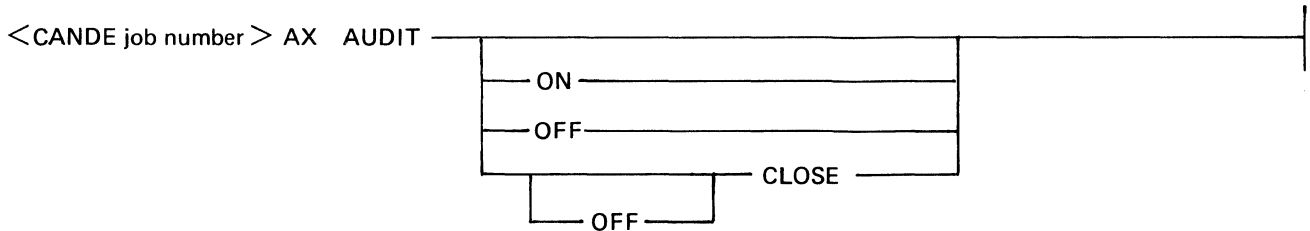
The ON option sets the audit option on and initializes the audit file if it was closed; the OFF option turns the audit option off, but leaves the audit disk file pointer unchanged and the audit file open so that the next AUDIT ON command begins where auditing previously terminated.

The OFF CLOSE and the CLOSE options reset the audit option and close the audit file on disk.

The CANDE program writes an 'audit-on' and 'audit-off' record into the audit file whenever the audit option is set or reset, so that those who examine the file know the period of time during which auditing was not performed.

Whenever an audit file is closed through the CLOSE or OFF CLOSE option, the user must immediately print it with CANDE/ANALYZER, remove it from the disk directory, or change its name so that the next CANDE/AUDIT file opened does not cause a duplicate-file error condition. Since initialization of the audit file is a time-consuming process, the user must be aware that an AUDIT CLOSE command followed by an AUDIT ON command causes a temporary suspension of service by the CANDE program while the audit file is being reinitialized.

Syntax:



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AUDIT

Semantics:

ON/
Sets the audit option on.

OFF/
Resets the audit option.

OFF CLOSE/
Resets the audit option and closes the audit file on disk.

CLOSE
Same as OFF CLOSE.

Examples:

200AX AUDIT
200AX AUDIT ON
200AX AUDIT OFF
200AX AUDIT OFF CLOSE
200AX AUDIT CLOSE


MAKE

MAKE

The MAKE command changes the ready flag in the Network Controller's tables for the specified logical station number (LSN).

The NOT option is used to make a station not ready.

Syntax:

<CANDE job number> AX MAKE <LSN>  READY

G50445

Semantics:

LSN

The logical station number as defined in the Network Controller program.

Examples:

200AX MAKE 3 NOT READY
200AX MAKE 6 READY

STOP

The STOP command provides for controlled shutdown of the CANDE system within <n> minutes. If <n> is not specified, a default of two minutes is used. The STOP command causes the following:

1. If no users are logged on, the CANDE program goes to EOJ.
2. Each logged-on user is sent the following message:

CANDE WILL STOP IN <n> MINUTES. PLEASE SAVE OR
REMOVE ANY ACTIVE FILE AND LOG-OFF.

3. At the same time, each logged-on station is reported at the ODT. After all logged-on stations are reported, the following message is displayed at the ODT:

CANDE WILL ADVISE AUTOMATICALLY AT <hh:mm:ss.t>
IF USERS ARE STILL ACTIVE.

From this point, only the following commands are allowed:

| | | |
|----------|--------|----------------------|
| BYE | UPDATE | Control Commands (?) |
| RECOVER | REMOVE | WHAT |
| DCSTATUS | SAVE | RESEQ |
| FILES | TEACH | |

One more page of input records can be processed from each station, so that a page in the process of being edited is not lost when the STOP command is processed by CANDE.

No further single-line input is allowed, except when that line comes from a device with a page size of 1, in which case it is treated as one more page of input records, as above.

All other commands receive the following response:

CANDE TERMINATION IN PROCESS. PLEASE SAVE OR
REMOVE ANY ACTIVE FILE AND LOG-OFF.

If <n> minutes elapse and there are still users logged on, the following message is displayed at the ODT:

SHUT DOWN TIME HAS ELAPSED WITH USERS STILL ACTIVE.
OPERATOR ACTION REQUIRED.

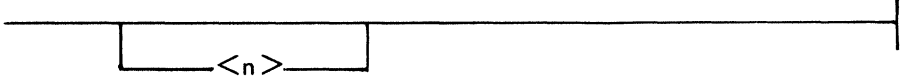
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CANDE Input Commands

STOP

None of the conditions just described change, except that CANDE does not notify the operator again.

The automatic shutdown function is intended for the system operator's convenience. The CANDE program never shuts down while users are active. It is the responsibility of the terminal user, however, to log off when no activity is anticipated for some time.

Syntax:

<CANDE job number> AX STOP 

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Semantics:

n

An integer representing number of minutes.

Examples:

200AX STOP
200AX STOP 6

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CANDE Input Commands

WHO

The WHO command displays on the ODT a list of usercodes and associated logical station numbers of the stations which are currently logged on to CANDE.

Syntax:

<CANDE job number> AX WHO

G50447

Example:

200AX WHO

APPENDIX A

GLOSSARY OF TERMS

active jobs

Programs that are currently executing in the mix of the system.

active schedule

Contains the names of those jobs that have satisfied all the requirements for execution and are only waiting for memory space to run.

active station

A work station that is currently eligible for entering or accepting messages.

application program

A program that processes data and is unique to one type of application. It is also referred to as a user program.

beginning of job (BOJ)

The execution of a single program unit to be performed by the system.

broadcast

The transmission of information to a number of terminals.

buffer

This is temporary storage that is used during the transfer of data from one device to another.

cathode ray tube (CRT)

A large electron tube used to emit electrons onto a phosphor screen, thus creating a visual display.

character

A digit, letter, or special character.

communication line

Any medium, such as a wire or a telephone circuit, that connects a terminal or computer to a computer.

conversational mode

An operational mode in which message data (full or partial messages) is used instead of, or in addition to, control characters as replies for message information.

data

Data is any representation of information, such as characters, to which meaning may be assigned.

data comm

The acronym for data communications.

data communications

Data communication is a method of transferring encoded data by means of electrical transmission between two or more terminals and/or systems.

disk directory

A disk-resident table that contains the name and type of file, together with a pointer to the disk file header or subdirectory for all permanent files which reside on disk.

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disk pack

A secondary data storage device that can be moved on line or off line.

dp-id

Disk pack identifier.

end of file (EOF)

Signals that the last record of a file has been read.

end of job (EOJ)

Signals that a job has been completed.

EOF message

A special interface message sent to an application program as a go to end-of-job directive.

family name

An identifier which is a file name or the name given to identify a main directory file name with subdirectory entries.

file identifier

The file-identifier incorporates all combinations allowed for a file-identification, such as the following:

file-identifier
family-name/file-identifier
dp-id/family-name/file-identifier
dp-id/family-name/

filename

Same as file identifier.

file security

The procedures or special devices used to prevent access to or use of data or programs without authorization.

host ODT

The operator display terminal.

identifier

A word consisting of from one to ten alphabetic, numeric, or special characters in combination.

integer

A whole number as distinguished from a fraction; that is, a number that contains the unit of 1 an exact number of times.

inter-program communication

A reference to the functional process of two or more jobs (programs) sending data messages back and forth between themselves. This process utilizes the MCP queue mechanism.

job

An application program or system software element (such as CANDE) that performs a job. It is generally composed of many job steps and usually performs many functions.

job number

A unique 4-digit number assigned by the system's MCP to each job that is executed under its control.

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job spawning

Job spawning is the ability to programmatically execute jobs and maintain an adequate level of control over these jobs during their execution.

keyboard

A device for the encoding of data by key depression, which causes the generation of the selected code element (character).

keyword

A symbol that identifies a parameter.

keyword parameter

A parameter that consists of a keyword followed by one or more values.

line adapter

A line adapter consists of a logic card used to interface a data set or communications line into a multi-line or single line I/O control.

logical station number (LSN)

The identification number assigned by the Network Controller to a given station. The logical station number has no relationship to file names, but is determined by the order in which a station is defined in the Network Controller.

Master Control Program (MCP)

The Master Control Program is the operating system used within the B 1000 system.

message

A sequence of characters arranged in a form suitable for the purpose of conveying information. A message contains the data to be conveyed (the text) and may, in addition, contain communication characters to aid in the routing or handling of the message.

Message Control System

A program that controls message flow between application programs and the Network Controller.

message header

Every message moved between the Network Controller and the CANDE program is prefixed with a message header. This message header contains station attributes necessary to identify a station.

multiline control (MLC)

The MLC is an I/O control device that provides the functional control between computer hardware and the line adapters. The MLC control is an integral part of a multiline communications subsystem.

network

A number of data communication lines connecting the host system with remote stations (terminals).

Network Controller

The NDL-generated data communication program used by the CANDE program to interface with the stations (terminals).

Network Definition Language (NDL)

A descriptive, free-form language for defining and implementing a data communications network. The NDL compiler analyzes the input statements and generates a custom Network Controller.

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Appendix A

Network Information File (NIF)

This file contains tables that describe the physical and logical attributes of the network. The initialization values for the line, station, terminal, and file tables of the Network Controller are contained in the NIF.

ODT

The acronym for operator display terminal.

off-line

This term refers to terminal equipment which is not connected to a transmission line. It can also describe other devices not in direct communication with the central processing unit.

on-line

Refers to terminal equipment which is connected to a transmission line. It can also describe other devices in direct communication with the central processing unit.

password

A unique string of characters that a program, computer operator, or user must supply to meet security requirements before gaining access to files.

queue

A logical collection of messages awaiting transmission or processing.

relative station number (RSN)

The number by which a user program with a remote file using a remote key uniquely identifies a station. An RSN equal to 1 implies the first station declared in the remote file's FAMILY statement in the FILE section of the Network Controller program. Relative station numbers proceed sequentially through the stations declared in the FAMILY statement, except that a Controlling Remote File may modify the LSN list of the file and thereby modify the RSNs of the remote file. If a station is detached from a file with a remote key, the RSNs remain unchanged. If a station is attached to a file with a remote key, the new RSN is the same as the old RSN if the station was attached previously; otherwise, the RSN is one larger than the greatest RSN previously associated with the file.

remote file

A file declared in a program which, in conjunction with the Network Controller, provides input, output, or input/output with a set of data communication devices.

remote job entry (RJE)

The Remote Job Entry program is a method by which a remote computer executes or compiles programs sent to it by other computers which are considered terminal devices.

semantics

The relationship between symbols and their meanings.

sequence range

A sequence range specifies an inclusive range of sequence numbers which define a line or lines to be included in a particular operation.

single-line control (SLC)

An I/O control device that provides the functional control between a computer's main frame and a line adapter. This control is an integral part of a single-line communications subsystem.

spawning

Same as job spawning.

station identifier

A station identifier is the logical station number or station name assigned in the Network Controller program.

system disk

A disk pack or disk cartridge that is initialized as a system disk. A system disk is under control of the MCP, and one or more system disks must be present on the system for the MCP to function.

system software

System software programs reference basic utility programs required by the system to operate.

system software element

A specific program from a system software package, such as DMPALL or CANDE.

task

A routine or machine run. A program may be broken into several tasks to more effectively utilize the B 1000 computer's processing time.

terminal

An input/output device designed to both receive and send source data in an environment associated with the job to be performed. Also, it is capable of sending entries to, and obtaining output from, the system of which it is a part.

user program

This is a program that processes data and is unique to one type of application. Also referred to as an application program.

usercode

A symbol which consists of from one to seven characters to identify a user to the CANDE program.

usercode index

The relative record number of the usercode/password pair in the (SYSTEM)/USERCODE file.

video display terminal (VDT)

A video type work station (terminal) such as the TD820 and TD830 terminal devices.

waiting schedule

Contains the names and run-time attributes of jobs that are waiting to be placed into the active schedule.

zip execute

An execute statement sent from a program to the MCP requesting that a job be scheduled and run.

Acronyms

| | |
|-----|-----------------------------|
| BOJ | Beginning Of Job |
| EOJ | End Of Job |
| I/O | Input/Output |
| LSN | Logical Station Number |
| MCP | Master Control Program |
| NDL | Network Definition Language |
| NIF | Network Information File |
| RJE | Remote Job Entry |
| RSN | Relative Station Number |
| sid | Station Identifier |
| SOG | Software Operation Guide |
| VDT | Video Display Terminal |

APPENDIX B

GENERATING THE NETWORK CONTROLLER

GENERAL

The user must write Network Definition Language (NDL) source specifications to generate the desired Network Controller for the B 1000 CANDE system. The following guidelines are intended to aid the user in generating a proper Network Controller. For detailed information that describes how to generate a Network Controller, refer to the B 1000 Systems Network Definition Language (NDL) Reference Manual, form number 1073715.

PROGRAM NAME

The selection of the Network Controller program name is at the discretion of the user.

DECLARATION SECTION

The Network Information File (NIF) file name and MAX FILES can be specified in the DECLARATION section. The NIF name declaration allows the user to change the name of the NIF file created by the NDL compiler without using file equate cards. THE MAX FILES declaration allows the user to increase the number (to a maximum of 255) of application programs opening a remote file to a number greater than the number of remote files declared in the FILE section.

Example:

```
DECLARATION :  
    NIF = 'NIF'/'CANDE'.  
    MAX FILES = 20.
```

REQUEST SECTION

A file of library CANDE REQUESTS exists to handle common line disciplines.

Example:

```
$ LIBRARY CANDEDEC  
$ LIBRARY CANDEPOLTD  
$ LIBRARY CANDESELTD  
$ LIBRARY CANDEIOTTY
```

CONTROL SECTION

A file of library CANDE CONTROLS exists to handle common line-driving techniques.

Example:

```
$ LIBRARY CONVERCTL  
$ LIBRARY CANDETDCTL
```

TERMINAL SECTION

The TERMINAL section is used to describe each different type of remote device connected to the data communication system.

Example:

```
TERMINAL TD830:  
  REQUEST = CANDEPOLTD: RECEIVE, CANDESELTD: TRANSMIT.  
  TRANSMISSION = 0.  
  ADDRESS = 2.  
  TYPE = 46.  
  BUFFERSIZE = 2250.
```

```
TERMINAL TTY:  
  REQUEST = CANDEIOTTY:RECEIVE, CANDEIOTTY:TRANSMIT.  
  TRANSMISSION = 0.  
  ADDRESS = 0.  
  TYPE = 0.  
  BUFFERSIZE = 150.
```

STATION SECTION

The STATION section is used to define each individual remote device in the system.

Example:

```
STATION S1:  
  MYUSE = INPUT, OUTPUT.  
  RETRY = 15.  
  TERMINAL = TD832.  
  ADDRESS = '1A'.
```

```
STATION S2:  
  MYUSE = INPUT, OUTPUT  
  RETRY = 15.  
  TERMINAL = TD832. ADDRESS = '1B'.
```

LINE SECTION

The address (<port>:<channel>: <adapter>) of the line to be used is in the LINE section. This address may vary from system to system and can be obtained from a Burroughs field engineer. The following is an example of LINE section specifications.

Example:

```
LINE MULTI01:  
  CONTROL = CANDETDCTL.  
  AUTOPOLL = 20.  
  STATION = S1, S2.  
  ADDRESS = 1:0:0.
```

FILE SECTION

The CANDE remote file labeled CANDEQUEUE is the only remote file required. All stations to be included in the CANDE system are declared in this remote file family. An example of declarations for the FILE section follows.

Example:

```
FILE CANDEQUEUE:  
  FAMILY = ALL.  
  RESIDENT = DISK.
```

NETWORK CONTROLLER EXAMPLE

The following is an example of the control instructions and the NDL source specifications necessary to generate a CANDE Network Controller program.

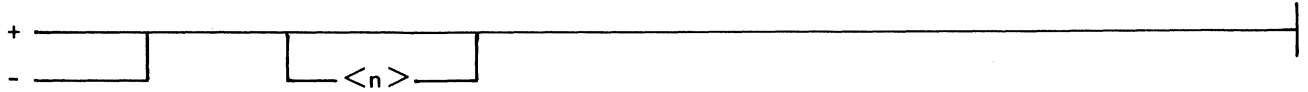
Example:

```
? COMPILE CANDE/HANDLER NDL LIBRARY  
? DATA CARDS  
DECLARATION:  
  NIF = 'NIF'/'CANDE'.  
  MAX FILES = 20.  
$ LIBRARY CANDEDEC  
$ LIBRARY CANDEPOLTD  
$ LIBRARY CANDESELTD  
$ LIBRARY CANDETDCTL  
TERMINAL TD832:  
  REQUEST = CANDEPOLTD: RECEIVE, CANDESELTD: TRANSMIT.  
  TRANSMISSION = 0.  
  ADDRESS = 2.  
  TYPE = 46.  
  BUFFERSIZE = 2250.  
STATION S1:  
  MYUSE = INPUT, OUTPUT.  
  RETRY = 15.  
  TERMINAL = TD832.  
  ADDRESS = '1A'.  
STATION S2:  
  MYUSE = INPUT, OUTPUT.  
  RETRY = 15.  
  TERMINAL = TD832.  
  ADDRESS = '1B'.  
LINE MULTI01:  
  CONTROL = CANDETDCTL.  
  AUTOPOLL = 20.  
  STATION = S1, S2.  
  ADDRESS = 1:0:0.  
FILE CANDEQUEUE:  
  FAMILY = ALL.  
  RESIDENT = DISK.  
?END
```

APPENDIX C CANDE SYNTAX REFERENCE GUIDE

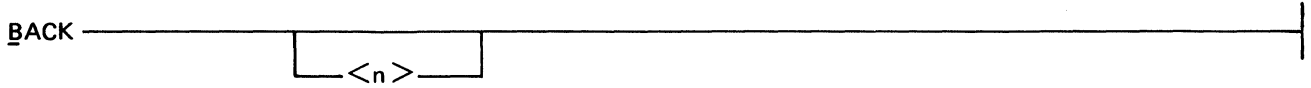
REMOTE STATION COMMANDS

< + and ->



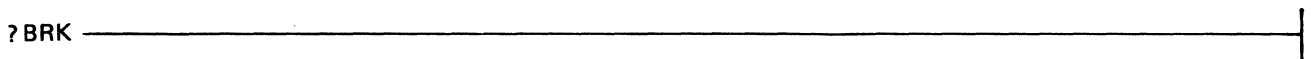
G50401

<BACK>



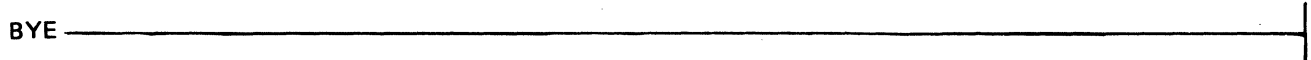
G50402

<BREAK>



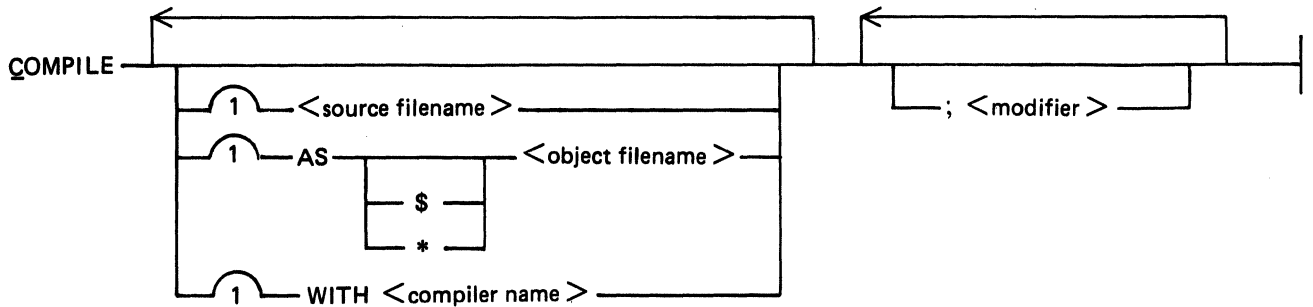
G50403

<BYE>



G50404

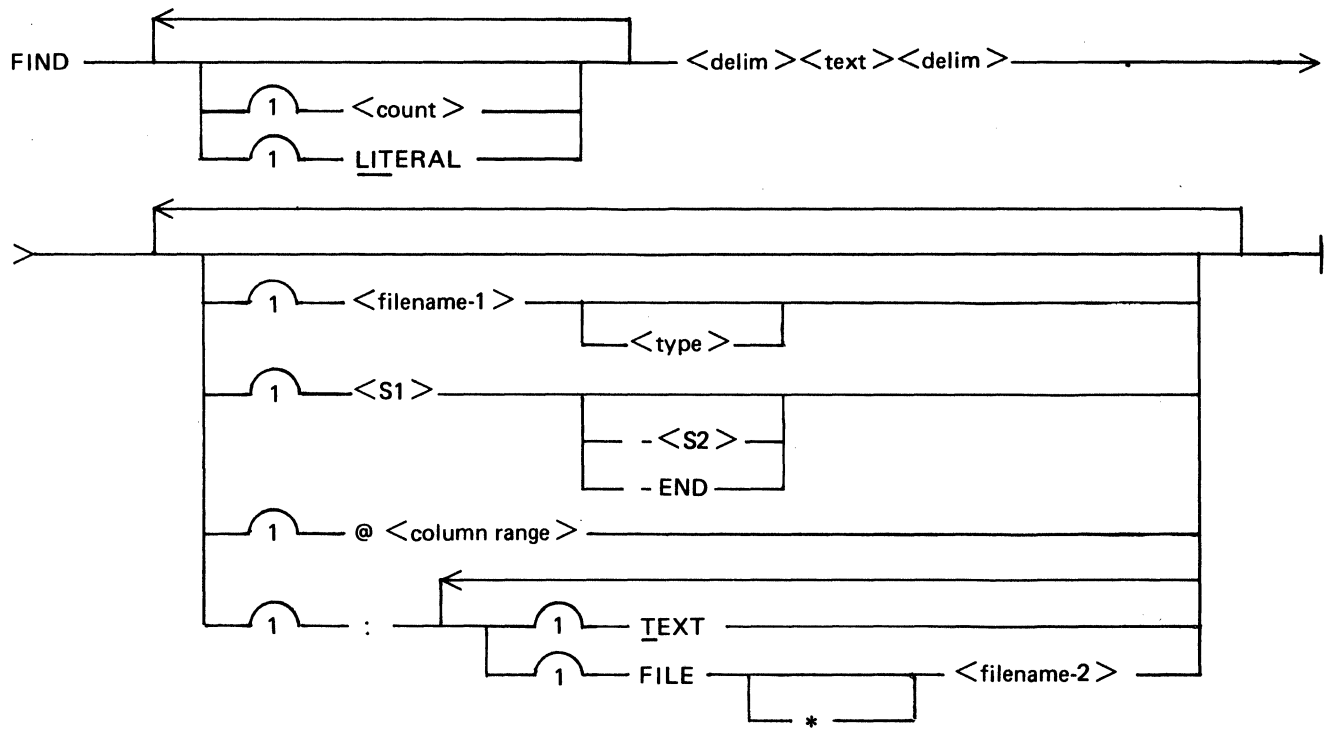
<COMPILE>



G50405

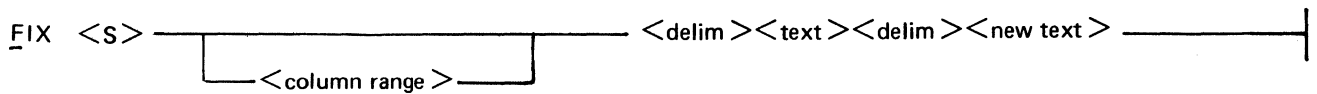
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<FIND>



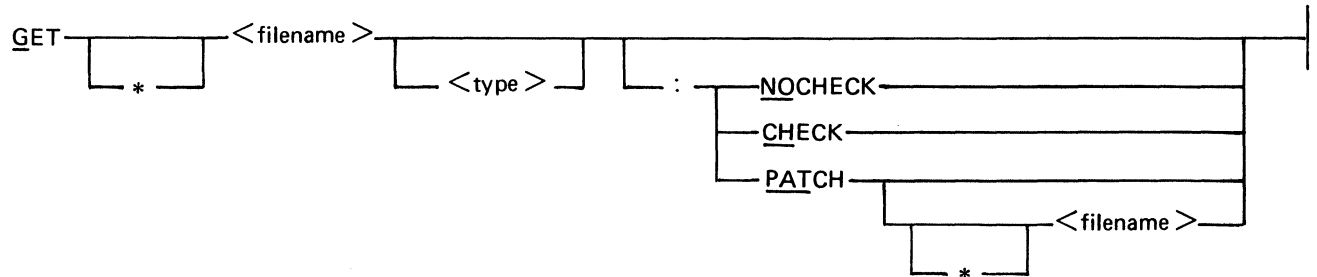
G50412

<FIX>



G50413

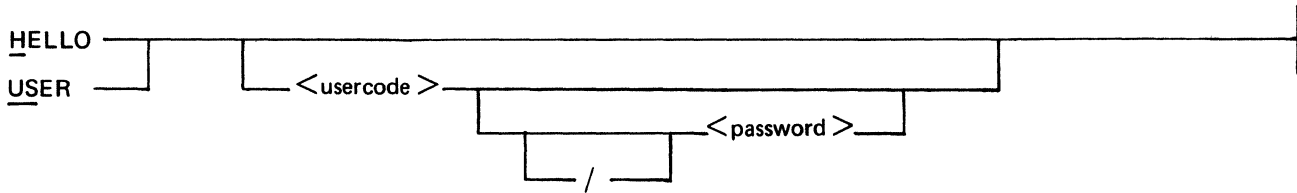
<GET>



G50414

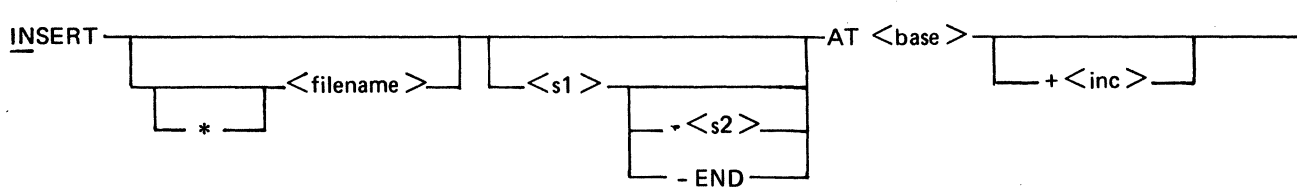
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<HELLO/USER>



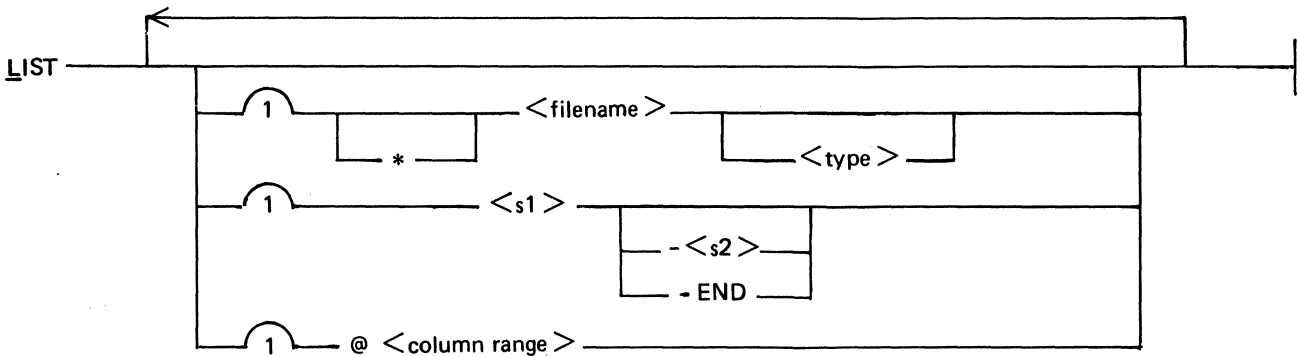
G50415

<INSERT>



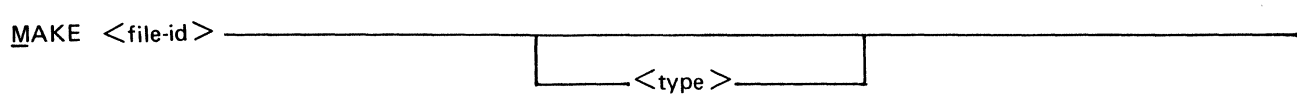
G50416

<LIST>



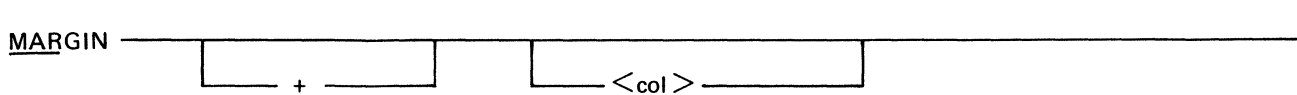
G50417

<MAKE>



G50418

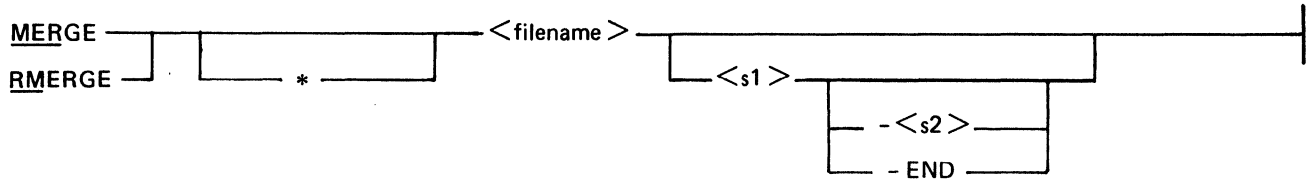
<MARGIN>



G50419

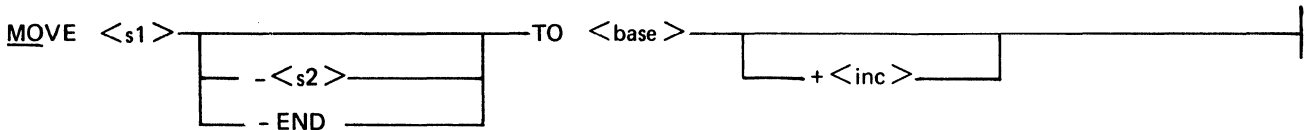
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<MERGE/RMERGE>



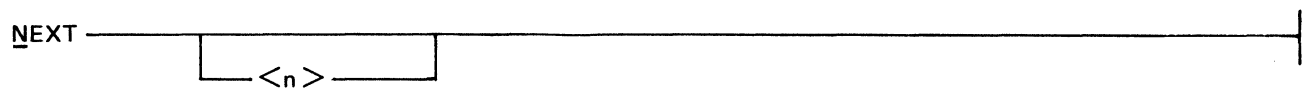
G50420

<MOVE>



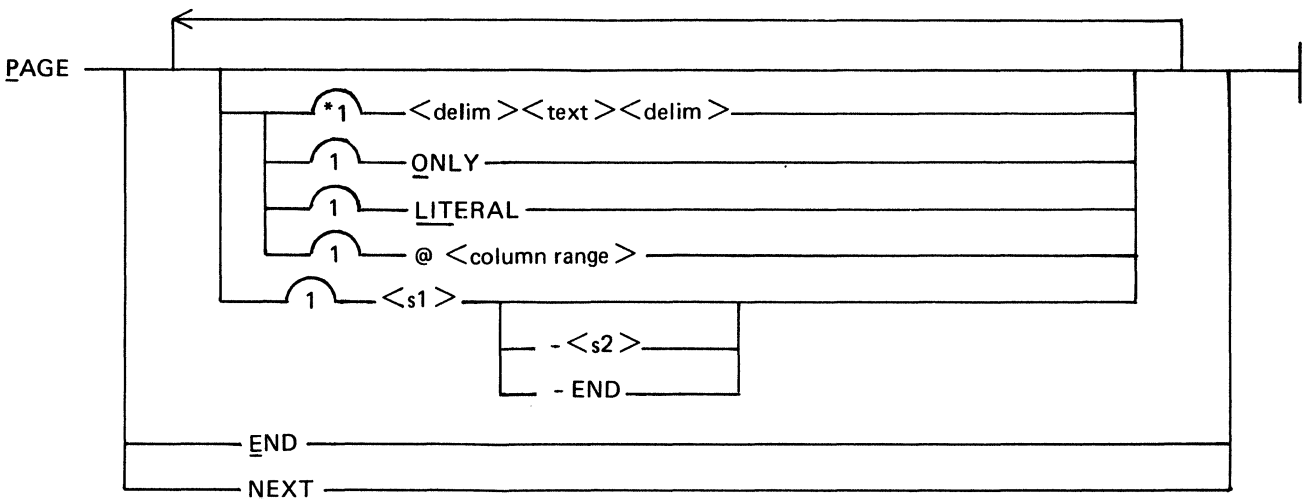
G50421

<NEXT>



G50422

<PAGE>



G50423

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<PASSWORD>

PASSWORD <current password> <new password> <new password>

G50424

<RECOVER>

RECOVER : PURGE

G50425

<REMOVE>

REMOVE <filename>
ON <pack-id>
OBJECT
OBJECT <filename>
\$
*

G50426

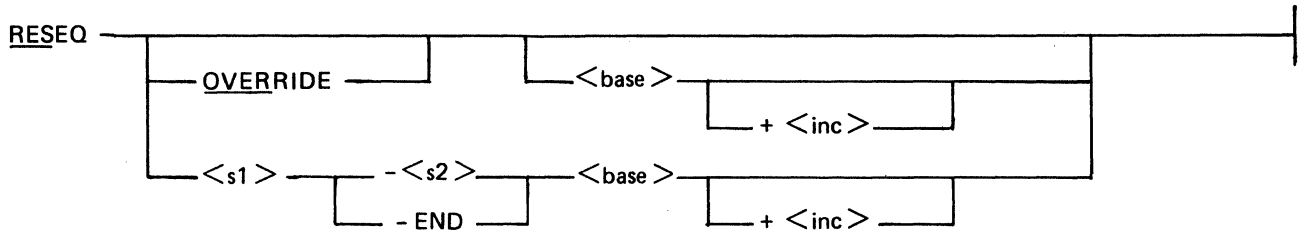
<REPLACE>

REPLACE <delim><text><delim>
1 <count>
1 FIRST
1 LITERAL
COLUMN <col 1> -<col 2>
<delim><new text><delim>
1 <s1> -<s2>
- END
1 @ <column range>
1 : TEXT

G50427

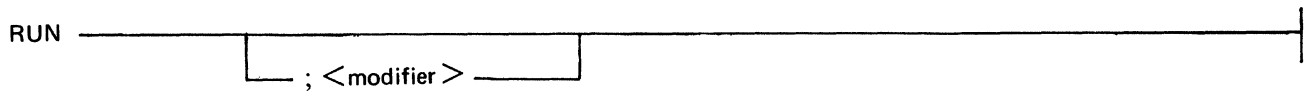
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<RESEQ>



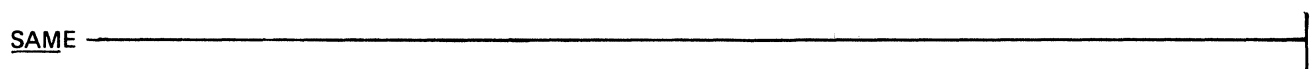
G50428

<RUN>



G50429

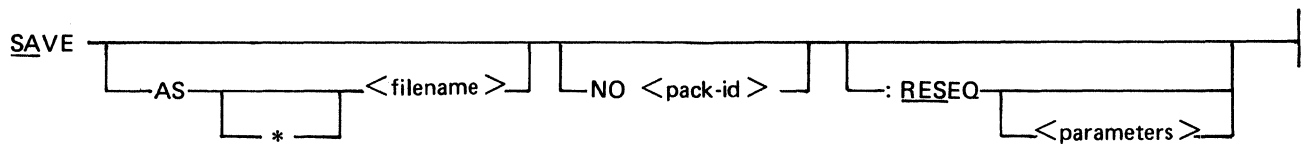
<SAME>



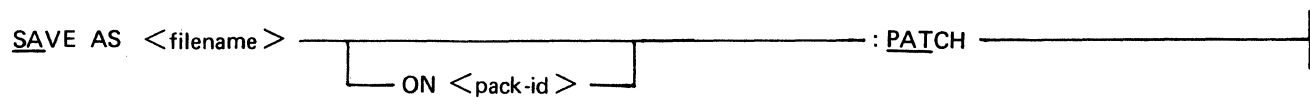
G50430

<SAVE>

Format 1:



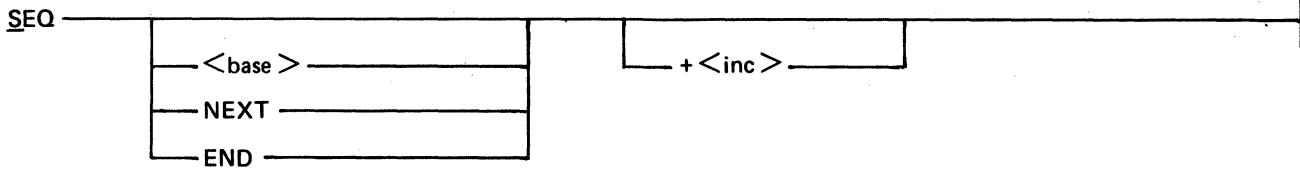
Format 2:



G50431

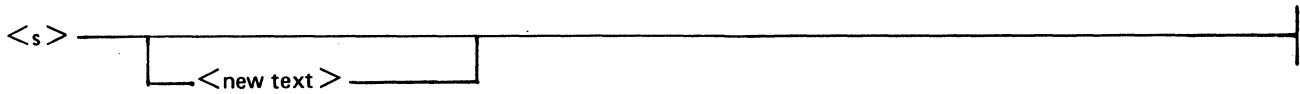
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<SEQ>



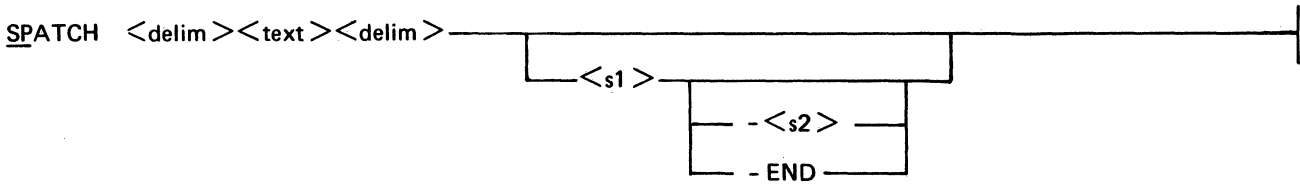
G50432

<SINGLE-LINE ENTRY>



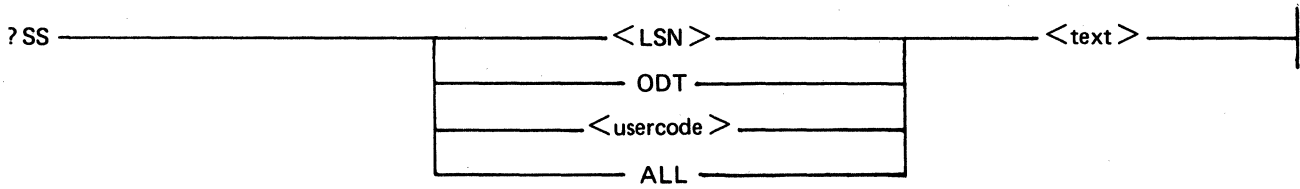
G50433

<SPATCH>



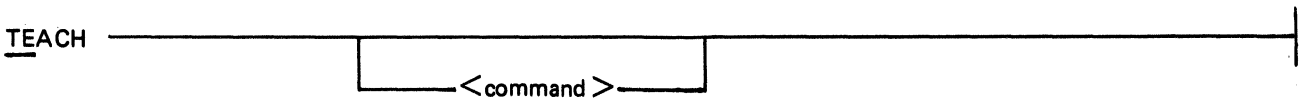
G50434

<SS>



G50435

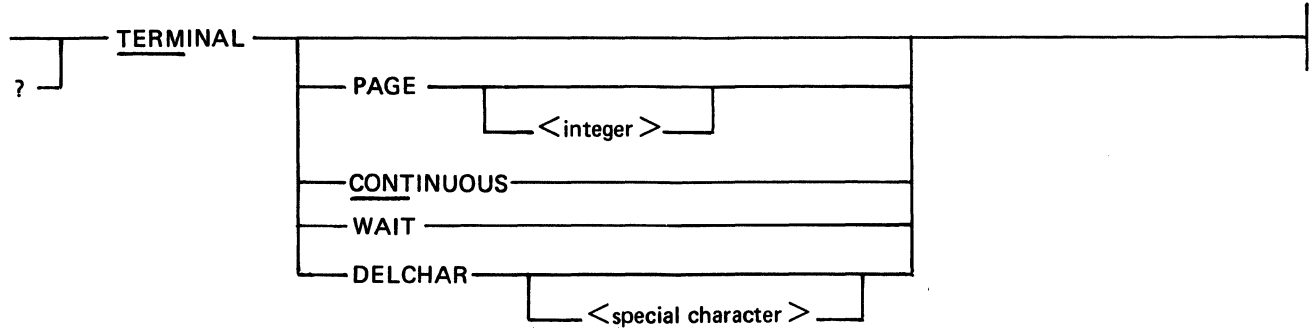
<TEACH>



G50436

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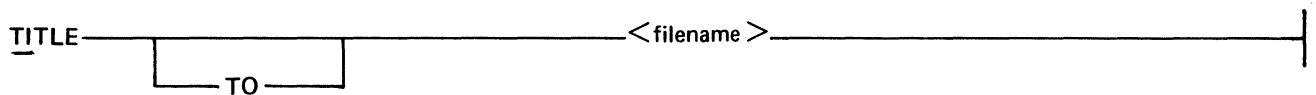
<TERMINAL>



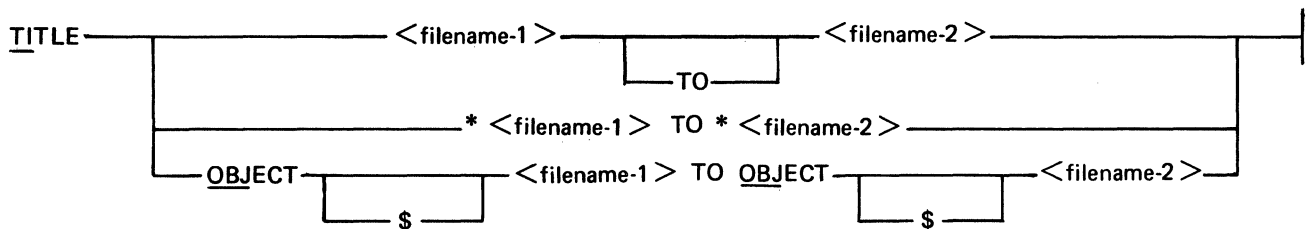
G50437

<TITLE>

Format 1: Workfile only.



Format 2: External file. '*' used preceding one file-identifier requires that '*' be used preceding the other file-identifier.

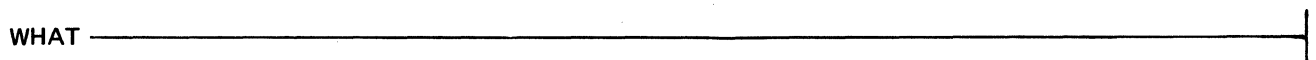


G50438

<VOID>

V <sequence number>

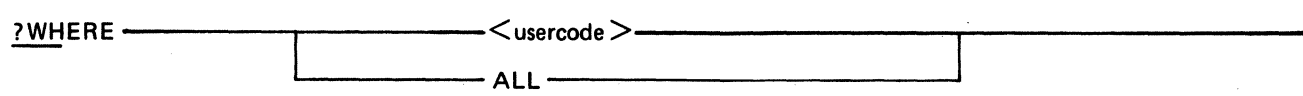
<WHAT>



G50439

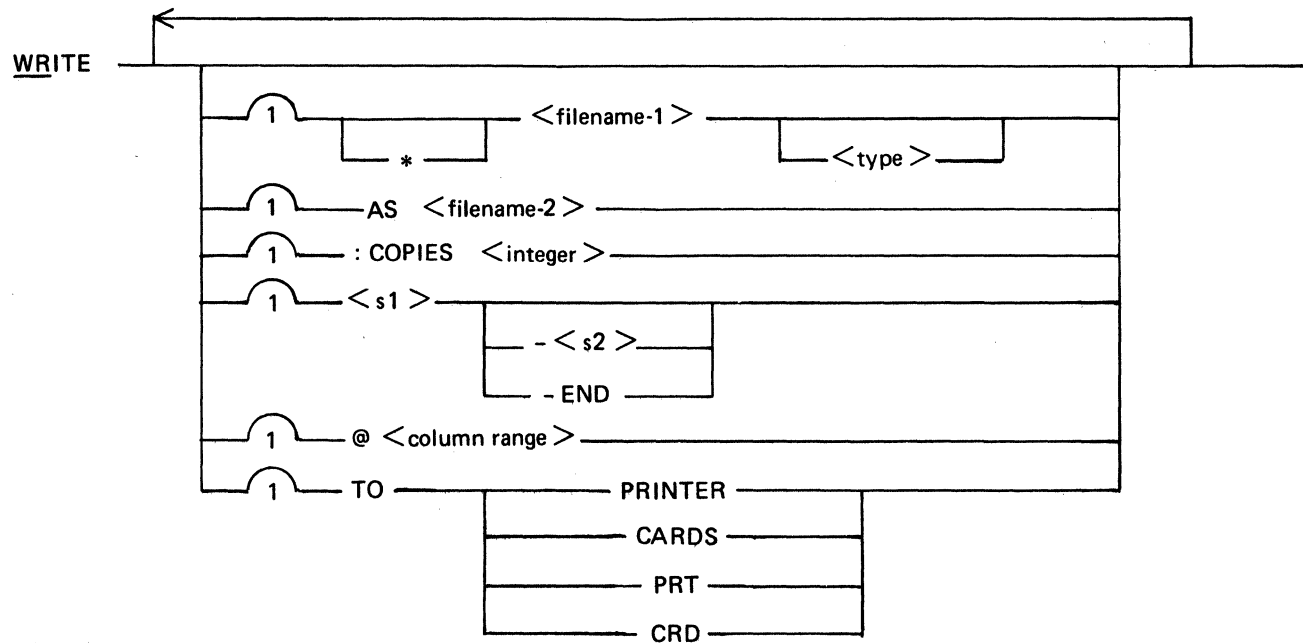
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<WHERE>



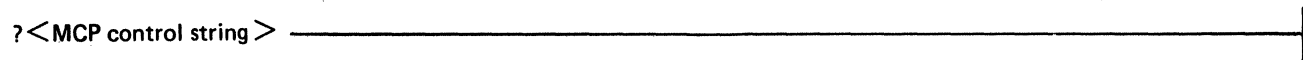
G50440

<WRITE>



G50441

<? MCP CONTROL STRING>



G50442

SYSTEM OPERATOR INPUT COMMANDS

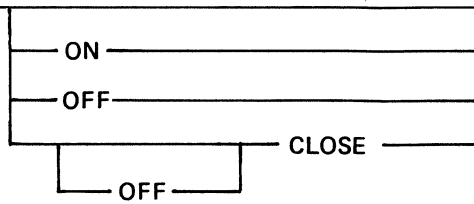
<ALL>

<CANDE job number> AX ALL <message>

G50443

<AUDIT>

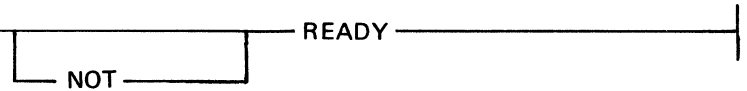
<CANDE job number> AX AUDIT



G50444

<MAKE>

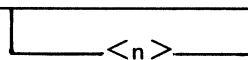
<CANDE job number> AX MAKE <LSN>



G50445

<STOP>

<CANDE job number> AX STOP



G50446

<WHO>

<CANDE job number> AX WHO

G50447

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Date: September 1980

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