Rocket Model 204

Terminal User's Guide

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Notices

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About this Guide

The *Rocket Model 204 Terminal User's Guide* describes the operation and use of the Model 204 Database Management System through a variety of terminals, access methods, and system interfaces.

Audience

This guide is written for both programmers and users who have no programming experience. Familiarity with Model 204 User Language is presumed. However, to use this guide, no further technical knowledge is required.

A note about User Language and SOUL

Model 204 version 7.5 provides a significantly enhanced, object-oriented, version of User Language called SOUL. All existing User Language programs will continue to work under SOUL, so User Language can be considered to be a subset of SOUL, though the name "User Language" is now deprecated. In this guide, the name "User Language" has been replaced with "SOUL."

Model 204 documentation set

To access the Rocket Model 204 documentation, see the Rocket Documentation Library (http://docs.rocketsoftware.com/), or go directly to the Rocket Model 204 documentation wiki (http://m204wiki.rocketsoftware.com/).

Notation conventions

This guide uses the following standard notation conventions in statement syntax and examples:

Convention	Description
`TABLE`	Uppercase represents a keyword that you must enter exactly as shown.
`TABLE` *`tablename`*	In text, italics are used for variables and for emphasis. In examples, italics denote a variable value that you must supply. In this example, you must supply a value for *tablename*.
`READ [SCREEN]`	Square brackets ([ ]) enclose an optional argument or portion of an argument. In this case, specify READ or READ SCREEN.

Convention	Description
UNIQUE | PRIMARY KEY	A vertical bar (|) separates alternative options. In this example, specify either UNIQUE or PRIMARY KEY.
TRUST | <u>NOTRUST</u>	Underlining indicates the default. In this example, NOTRUST is the default.
IS {NOT | LIKE}	Braces ({}) indicate that one of the enclosed alternatives is required. In this example, you must specify either IS NOT or IS LIKE.
item ...	An ellipsis (...) indicates that you can repeat the preceding item.
item ,...	An ellipsis preceded by a comma indicates that a comma is required to separate repeated items.
All other symbols	In syntax, all other symbols (such as parentheses) are literal syntactic elements and must appear as shown.
nested-key ::= *column_name*	A double colon followed by an equal sign indicates an equivalence. In this case, *nested-key* is equivalent to *column_name*.
Enter your account: **sales11**	In examples that include both system-supplied and user-entered text, or system prompts and user commands, boldface indicates what you enter. In this example, the system prompts for an account and the user enters **sales11**.
File > Save As	A right angle bracket (>) identifies the sequence of actions that you perform to select a command from a pulldown menu. In this example, select the Save As command from the File menu.
EDIT	Partial bolding indicates a usable abbreviation, such as E for EDIT in this example.

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Terminal Processing

Overview

This chapter provides information about the different types of terminals and system interfaces that Model 204 supports. It also provides general information that applies to all these types of terminals.

Chapter 2 provides a sample terminal session in which a user connects to Model 204, logs in, opens a file, and retrieves selected data. The rest of the chapters summarize the distinctive characteristics of each terminal type, access method, or system interface.

Each terminal category, system interface, and access method has its own unique operating characteristics such as display formats, keying procedures, pause and disconnect capabilities, and other special features. Read this chapter and Chapter 2 for general information, and then refer to the chapters that describe the your own terminal type, system interface, and access method.

Supported terminals, access methods, and interfaces

Supported access methods

Model 204 provides support for a variety of terminals that use the SNA Communications Server (formerly VTAM) (Virtual Telecommunications Access Method)

Supported SNA Communications Server terminals

SNA Communications Server supports the following terminals:

- IBM 3270s and compatible terminals

- IBM 3767 terminals

- Terminal types supported by the IBM Network Terminal Option (NTO)

Supported system interfaces

Model 204 also can be accessed by means of one of the following system interfaces:

- CICS (as a transaction)

- TSO (as a command processor or as a called program)

- CMS (through the Inter-User Communication Vehicle)

Note: The INTERCOMM interface (supporting the use of Teletype and 3270 terminals in line-at-a-time mode) is no longer supported as of Model 204 version 7.5.

Terminal emulators and the LANGUSER parameter

Many different terminal emulators are in existence today. You must ensure that the terminal emulator you use sends characters to the mainframe that are compatible with the characters that are defined in the IBM code page for the particular LANGUSER value set at your site. (See the *Model 204 Language Support Summary.*) In the event that certain characters from the your terminal emulator are not compatible with the IBM code page, you must provide translation commands for those particular characters. For example, the terminal emulator hexadecimal code for a particular character must be translated to the IBM hexadecimal code for the same character.

Note: An underlying problem could appear if you store incompatible characters into a Model 204 file using one terminal emulator and attempt to retrieve them with a different terminal emulator that has different hexadecimal codes for the particular characters.

In z/VM, for example, if LANGUSER=US you could use the following SET OUTPUT commands to translate the left ([) and right (]) bracket characters:

```
'SET OUTPUT ad' 'ba'x  /* Display TN square brackets */
'SET OUTPUT bd' 'bb'x
'SET INPUT 'ba'x ad  /* Transform Chameleon sq brackets */
'SET INPUT  'bb'x 'bd' /* to ones that C/370, LEXMARK, 7171 use */
```

Entering input

INMRL and INCCC parameters

In general, terminal input lines should not be longer than the line length of the terminal. However, the settings of the INMRL and INCCC parameters actually determine the maximum input line length at a particular terminal. INMRL and INCCC usually are set by the system manager for each terminal in the system. For 3270s, INMRL and INCCC also can be reset as a result of resetting the MODEL parameter. MODEL allows for alternate screen sizes within the 3270 family.

For information on these parameters, refer to the Rocket Model 204 documentation wiki parameter pages:

http://m204wiki.rocketsoftware.com/index.php/INMRL_parameter

http://m204wiki.rocketsoftware.com/index.php/INCCC_parameter

http://m204wiki.rocketsoftware.com/index.php/MODEL_parameter

The INMRL parameter specifies the maximum number of characters that the user can enter on an input line. If the user attempts to enter a line that is longer than the value of INMRL, the following error message is displayed:

```
*** M204.0481: TERMINAL INPUT LINE TOO LONG - IGNORED
```

and Model 204 ignores the entire line.

Line continuation

Lines that are longer than the value of INMRL can be continued. There are two types of line continuations. When entering a SOUL (User Language) request or a response to a $READ or $ENTER prompt, the user can enter a long line by breaking it into several shorter lines and entering each one separately, adding a hyphen to the end of all but the last line. Lines continued in this manner have no maximum length. For more information on line continuation, refer to the Rocket Model 204 documentation wiki SOUL page:

http://m204wiki.rocketsoftware.com/index.php/Basic_request_structure#Input_line_continuation

Other types of input lines can be broken up by entering a nonblank character in the column position specified by the INCCC parameter on all but the last line. The number of characters in all portions of the input line (the original line and all continuations, not including the continuation characters) is limited to the value of the LIBUFF (length of the input buffer) parameter. If the complete line exceeds LIBUFF, the line is lost and the following message is displayed:

```
*** M204.1251: LINE TOO LONG
```

If the value of INMRL is greater than the value of INCCC, and a nonblank character is in the column position specified by the INCCC parameter, any characters past this column position are lost. IF INCCC is set to zero, lines cannot be continued by using the INCCC facility; however, these lines can be continued by using hyphens.

Note: Any attempt to enter input while a terminal is displaying a line of output produces unpredictable results.

Retrieving input

For all 3270 or compatible full-screen terminals, previously-entered line input can be retrieved for review or modification by using a PF key. Full-screen Editor or SOUL screen input, however, cannot be retrieved in this way. Retrieved input lines are returned to the command line of the user's terminal from where they can be reissued.

RETRVKEY parameter

For a 3270 or compatible full-screen terminals, setting the Model 204 RETRVKEY parameter to a value from 1 to 24 designates a PF (program function) key whose number equals that value as the user's Retrieve PF Key. For example, RETRVKEY = 3 means that PF key 3 is the Retrieve PF Key.

Using the Retrieve PF key

If the Retrieve PF key is pressed when Model 204 requests a new input line from the user's terminal, Model 204 displays the user's most recently entered input line. The user can then perform any of the following actions:

- Press Enter; the unmodified input line is sent to Model 204.

- Using the 3270 cursor, insert, and delete keys, and the normal character keys, modify the input line and press Enter. The modified input line is sent to Model 204.

- Press the Retrieve PF key again. Model 204 displays the input line preceding the one just displayed, and the user can repeat any of the actions in this list.

Only a limited amount (as many as 268 bytes) of the user's previous input is available for retrieval. The input lines are kept in a circular format: if the Retrieve PF key is pressed enough times to display the oldest available input line and then is pressed again, the most recent input line (the first retrieved) is redisplayed and the entire sequence begins again.

Irretrievable input

Input for which or situations in which the Retrieve PF Key does not work are listed below. The following input lines are *not* saved for retrieval:

- Passwords and responses to the $READINV function

- Backpage requests

- Null input lines

- Lines directly handled by a system interface (for example, the z/OS SUBSET string)

- All but the first of a sequence of duplicate input lines (if a null input line is entered between the duplicate input lines)

Retrieval example

For example, if the following input lines are entered:

```
LOGIN JON
<password>
TIME
V VERSION
(a null input line)
V VERSION
```

Two lines are available for retrieval:

```
V VERSION
```

```
TIME
```

Null input lines

In the following cases, the Retrieve PF key returns a null input line to the terminal rather than performing the retrieve function:

- Passwords and responses to the $READINV function

- Responses to the end-of-page prompt

- Responses to certain *indented* error prompts (for example, INVALID BACKPAGE REQUEST)

- All lines saved for retrieval are cleared if the RESET MODEL command is used to change from MODEL 5 to some other value.

- The Retrieve PF key is not recognized if the input line entered is a line that is directly handled by a system interface (for example, the CMS SUBSET string).

Controlling output

Output on most terminals is displayed one line at a time. The format of terminal output is controlled by the settings of several parameters. This section discusses three of them:

- OUTMRL and OUTCCC parameter settings specify the maximum output line length at a particular terminal.

- OUTLPP determines the number of lines on an output page.

OUTMRL, OUTCCC, and OUTLPP usually are set by the system manager for each terminal in the system. For 3270s, these three parameters can be reset as a result of resetting the MODEL parameter. MODEL allows for alternate screen sizes within the 3270 family. For more information on MODEL, refer to the Rocket Model 204 documentation wiki parameter page:

http://m204wiki.rocketsoftware.com/index.php/MODEL_parameter

OUTMRL and OUTCCC can be reset individually, independent of the MODEL parameter setting, but OUTLPP is determined by MODEL, and can only be reset as the result of resetting the MODEL parameter for 3270s.

Settings of the HDRCTL and TERMOPT parameters that can affect output displays and pauses are discussed in later chapters of this guide, which discuss individual types of terminals.

Note: Any attempt to enter input while a terminal is displaying a line of output will produce unpredictable results.

Setting OUTMRL

The OUTMRL parameter specifies the maximum number of characters that Model 204 can display on an output line at a particular terminal. Note, however, that the number of characters specified in OUTMRL can be greater than the physical line length of the terminal being used. If the terminal is a CRT device, a long line wraps around and some of the characters are displayed on a second line. If the terminal is a hard-copy device, the characters beyond the last character on the physical line can be lost.

Setting OUTCCC

The OUTCCC parameter specifies the last available output position on the line. When Model 204 displays a line, it uses the smaller value of OUTMRL and OUTCCC as a line length. If the line is longer than this, a hyphen is placed in the column position specified by OUTCCC, and the rest of the characters are continued on subsequent lines. Any number of lines can be continued in this fashion.

OUTCCC can be reset by the user for 3270 terminals. The reset value remains in effect for the thread even after the user logs out.

If OUTCCC is set to zero, the value of OUTMRL is the maximum line length. No continuation occurs, and any text beyond the value of OUTMRL is lost.

Setting OUTLPP

The OUTLPP parameter specifies the number of lines on an output page, including headers and trailers. OUTLPP can be reset by the user. However, for 3270s, OUTLPP can only be reset as a result of resetting the MODEL parameter.

Model 204normally displays a line showing the current date in Julian date format, the current date in mon dd format, the time in hh.mm.ss format, and page number at the top of each page of output. For example:

```
91.010    JAN 10       05.15.29              PAGE 37
```

The page number is incremented automatically as new pages are produced. The user can specify alternative headers as described on the Rocket Model 204 documentation SOUL wiki page:

http://m204wiki.rocketsoftware.com/index.php/Report_generation#Formatting _page_headers_and_trailers

If the user has requested a page trailer, Model 204 displays it at the bottom of every page. Model 204 also pauses at the end of each page of output to allow the user to cancel future output, to change the terminal paper, or to read text that is displayed on a screen.

Production of all headers and trailers, except for the header on the first page, can be cancelled by setting the OUTLPP parameter to zero on hard-copy terminals. Setting OUTLPP = 0 also causes the pause at the bottom of each page to be suppressed. Output is displayed in a steady stream. Setting the OUTLPP parameter to -1 eliminates page counting, but it displays headers and trailers when a NEW PAGE command causes output of a new page.

Pausing

On all terminals described in this guide, Model 204 can pause at the bottom of the page and wait for the user to respond before continuing. If output consists of more than a single page, Model 204 will display one page or screen, pause at the bottom of the page or screen to await a user response, and continue displaying output at the top of the next page or screen after the user has requested continuation.

When Model 204 pauses at the bottom of a page while displaying output, the user's response depends upon the terminal being used. (A variety of responses are described in subsequent sections.) If the user enters an input line instead of one of the expected responses, Model 204 saves this line in most cases. Output continues on the next page, and the saved input line is processed after the output is completed. However, if Model 204 fills another complete page or screen with output and once again pauses for a user response, the response causes the saved input line to be lost. Input lines entered in this fashion are never saved by the CICS, TSO or CMS interfaces.

If the last line of a page is used for input, Model 204 does not pause at the bottom of the page.

Backpaging

Model 204 supports a backpaging feature that allows the user to review previous pages of output. This feature is very useful to users of terminals that do not produce hard copy. The backpaging feature is available only if the system manager sets the NBKPG (number of backpages) parameter to a positive number during system initialization. For a description of NBKPG and the other parameters that affect terminal operations, refer to the Rocket Model 204 documentation wiki page:

http://m204wiki.rocketsoftware.com/index.php/NBKPG_parameter

Note: The backpaging feature is not available on all types of terminals and is not available during editing sessions.

Issuing a backpage request

When the terminal is ready to accept input, the user can request (except during editing) to have a backpage displayed by entering the backpage character, a single space, and a negative number. An appropriate backpage character can be selected by the system manager and specified as the value of the PAGE parameter. PAGE has a default value of P and can be reset by the user. Refer to the Rocket Model 204 documentation wiki page for a complete discussion of the PAGE parameter:

http://m204wiki.rocketsoftware.com/index.php/PAGE_parameter

For example, a user who is on page 17 and who wants to see page 16 enters:

```
P -1
```

Because Model 204 prepares for a new page before pausing at the bottom of a full page, at the following backpage request, entered at the end-of-page pause displays the page just ended:

```
P -1
```

A backpage request entered after an editing session refers only to output prior to the editing. That is, the user cannot page back into output generated as part of an editing session. Model 204 treats the backpage request as if that session did not occur.

If the user tries to page back beyond the number of backpages saved, the oldest available backpage is displayed. If the user tries to page forward beyond the most recent page (by using P followed by a positive number), that page is displayed. If the syntax of the PAGE parameter is invalid or the backpaging facility is not available to the terminal user, Model 204 responds:

```
*INVALID PAGE REQUEST*
```

This system response is followed by another prompt.

If the MODEL parameter is reset during a terminal session, the page size is redefined, and any existing backpages can no longer be displayed.

Whether or not the backpage request is valid, the terminal returns to input mode. The user can backpage again or enter a new line of input, which then is displayed in its proper place on the next most recent page.

Full-screen formatting

The Model 204 full-screen formatting feature, described in detail on the Rocket Model 204 documentation wiki SOUL pages, is designed for use with display terminals (that is, IBM 3270 and compatible terminals). This feature allows an entire screen to be formatted and displayed as a single entity.

When the full-screen feature is being used, the ordinary input, output, and pausing characteristics are not in effect.

In data entry applications, the terminal user can enter input fields in response to screen prompts and menus. Model 204 automatically validates these entered fields according to criteria specified in the SOUL request that defines the screen.

For example, the request can specify that a particular field can contain only digits, or that a field must contain one of a set of legal codes. The request also can control the terminal's brightness, color, and highlighting facilities.

For more informaiton on all SOUL screen definition and manipulation statements, refer to the Rocket Model 204 documentation wiki SOUL pages:

http://m204wiki.rocketsoftware.com/index.php/Full-screen_feature

Prerequisites

The full-screen feature is available only if the system manager sets the LFSCB parameter (size of full-screen buffer) to a positive number during system initialization, or if the user sets it online with the UTABLE command. Refer to the Rocket Model 204 documentation wiki page for a detailed description of the UTABLE command:

http://m204wiki.rocketsoftware.com/index.php/UTABLE_command

Menu feature

Two major capabilities are provided with the full-screen feature. The first full-screen capability is the menu feature. When a menu is displayed, the user is expected to choose from a set of numbered selection items, as in the example below :

```
EMPLOYEE MENU
```

```
1. ADD EMPLOYEE
2. CHANGE ADDRESS
3. CHANGE INSURANCE
4. ADD DEPENDENT
```

The user does this either by indicating the appropriate number with a Program Function (PF) key or by tabbing (using ==>|, |<==, or <==) to the desired selection number and pressing the ENTER key. The tab key automatically moves from one selection number to another.

Fill-in screens

The second full-screen capability supports data entry by displaying a screen to be filled in. When such a screen is displayed to the user, it contains formatted prompting information as well as areas in which the user enters data. For example:

```
FILL IN FOR NEW EMPLOYEE

NAME:
STREET:
CITY:
STATE:ZIP:
AGE:SEX:
SPOUSE'S NAME:
```

In this example, each prompt is followed by an input area. The user presses the tab key on the terminal to move between input areas, filling in data. The user can tab backward or forward on the screen, entering and correcting data. When the entire screen is filled in, the user presses the ENTER key or a PF key and the data is transmitted from the terminal. The prompts are protected and cannot be modified by the user. Pressing the tab key automatically positions the user at an input area.

Although the full-screen feature is designed to utilize the full-screen capabilities available on 3270-type devices, SOUL requests that contain full-screen statements also can run on line-at-a-time terminals such as Teletypes. Line-at-a-time terminals print all screen inputs and outputs on a line-by-line basis, as described on the Rocket Model 204 documentation wiki page:

http://m204wiki.rocketsoftware.com/index.php/Full-screen_feature#Line-at-a-time_terminal_support

Backpaging screens and menus

The Model 204 backpaging feature can be used to store and retrieve screens and menus that have been defined by the full-screen capabilities. (For more information about the backpaging feature, see "Backpaging" on page 8.) When a backpage is displayed, any display attributes (such as BLINK or BRIGHT) that originally were specified for fields on the screen are lost. Any input values

shown on the screen indicate final values entered by the terminal user, and they reflect any changes in response to validation errors. When a backpage that contains a menu is displayed, the display does not show the menu selection made by the terminal user.

Line-editing characters

Every terminal provides special keys that can be used for line-editing functions. On many terminals:

- At sign (@) backspaces and erases the most recently entered character. A series of @ symbols can be entered to delete successive characters in the input line.

- Pound sign (#) deletes the current line from the beginning of the line to the most recently entered character.

ERASE and FLUSH parameters

The characters used for line-editing functions at a particular terminal can be specified as the values of the ERASE and FLUSH parameters. The @ and # characters are the default values of these parameters. Use of these parameters depends on the setting of the EDIT parameter. The ERASE, FLUSH, and EDIT parameters are introduced in Chapter 2 and are discussed in detail on the Rocket Model 204 documentation wiki parameter pages:

http://m204wiki.rocketsoftware.com/index.php/Category:Parameters

Model 204 editors

Once the user has pressed the carriage return (or other character that signifies the end of the input line), the line-editing characters no longer can be used for the line just entered. The line can be corrected only by using the Model 204 full-screen or line editor. For more information on Model 204 editors, refer to the *Rocket Model 204 Editing Guide.*

Attention interrupt feature

The attention interrupt feature is used to abort the operation that is currently being performed and to cancel any output that is being displayed. The specific action taken by Model 204 depends upon the access method or system interface that is being used and the operation that is currently being performed at the terminal.

Invoking the attention interrupts

The attention interrupt feature can be invoked using any of the following keys or commands:

Keys

ATTN
BREAK
PA1

Commands

Use this command...	In these circumstances...
*CANCEL	in first seven positions of a terminal input line
C	Only at the pause point
K	Only at the pause point

The keys and commands available to a Model 204 user depend upon the terminal and access method or system interface being used. Throughout this guide, references to the *attention key* imply the use of any of these keys or commands.

ON ATTENTION statement

In SOUL, an ON ATTENTION statement can be specified in a request. Through this statement, the user specifies the action that Model 204 takes (that is, the flag to be set or the branch to be executed) when an end user invokes an attention interrupt.

If an ON ATTENTION statement has been specified, and the attention key is pressed while Model 204 is evaluating a SOUL request and not performing I/O to the terminal, the operation specified in the ON ATTENTION statement is performed.

If no ON ATTENTION statement has been specified, the action Model 204 takes when the attention key is pressed depends upon the operation being performed at the terminal. The following list summarizes the actions that are possible.

Model 204 responses to the attention key are:

*   If the attention key is pressed at any terminal when the user is entering a system control command or an Editor command, the current input line is ignored and the command is not executed. The user can reenter the command or statement. However, if an editor command has been completely entered at the time of the attention interrupt, the attention key has no effect on editor operations.

*   If the user presses the attention key when entering an ad hoc request, Model 204 stops compilation and returns to command level.

*   If the user presses the attention key while a procedure is compiling, Model 204 flushes the procedure and returns to command level.

- If the user responds to a dummy string prompt by pressing the attention key, and if an ON ATTENTION statement has not been specified, Model 204 terminates compilation, ends all procedures, and returns to command level.

- If the attention key is pressed in response to a $READ or $ENTER prompt, and if an ON ATTENTION statement has not been specified, the current request is aborted. Model 204 ends all procedures and returns to command level.

- If the user is entering a procedure after typing a PROCEDURE command, Model 204 treats the attention interrupt as an END PROCEDURE statement. Model 204 does not expect the user to enter additional statements, but the statements that already have been entered are saved.

- If the user is at the pause point on a 3270-type terminal, and if an ON ATTENTION statement has not been specified, the attention key cancels output from the current request. If a procedure is being executed, Model 204 flushes all input lines in the procedure and returns to command level.

Echoing

When echoing is enabled, Model 204 displays each input line on the user's output device as it is entered. Three classes of input lines can be echoed:

- Direct input to Model 204, either from the user's terminal or from an included procedure (see "Examples using LECHO and CECHO" on page 15).

- Lines in which the FLUSH and ERASE editing characters were used (see "Examples using LEECHO and CEECHO" on page 17). The line is echoed as it appears after line-editing.

- Lines that contain dummy strings. The line is echoed after the dummy string substitution has been made (see "Echoing parameters" on page 14).

A common example of echoing is the display of the input cards for a batch run on the line printer. If echoing is in effect, input from a terminal is displayed on the same terminal because it serves as both the input and the output device for that user.

See "Echoing examples" on page 15 for examples of echoing.

Physical and logical line echo

Echoing can take place at two levels: physical line echo and logical line echo. The Model 204 echo feature distinguishes between physical and logical input lines. A physical line is a single line entered on the terminal. A logical line consists of one or more physical lines of input.

Echoing can be specified at physical line level, logical line level, or both. Normally only one class of echoing is specified. If both physical and logical line echoing are enabled, the line is echoed twice.

If a physical line must be continued on another line, a nonblank character can be inserted in the specified continuation column indicated by the INCCC parameter. See "INMRL and INCCC parameters" on page 3 for more information about the INCCC parameter.

Echoing parameters

The following parameters control echoing functions:

- CECHO controls the echoing of user and procedure input at the physical line level.

- LECHO controls the echoing of user and procedure input at the logical line level.

- CEECHO controls the echoing of physical lines that contain ERASE or FLUSH characters.

- LEECHO controls the echoing of logical lines that contain ERASE or FLUSH characters.

- CSECHO controls the echoing of physical lines entered as dummy string substitutes.

- LSECHO controls the echoing of logical lines in which dummy string substitutes have been entered.

The initial Model 204 values for these parameters cause terminal input lines to be echoed. No other echoing takes place. The system manager can change these initial settings for an installation at the time of system initialization.

Model 204 echoes a given portion of input no more than once at each level. If the bits are set as follows and a given line includes editing characters and dummy strings, it is echoed only once at the line level, even though all three parameters call for the line to be echoed:

```
LECHO  = X'05'
LEECHO = X'05'
LSECHO = X'05'
```

For more information on these parameters, refer to the Rocket Model 204 documentation wiki parameter pages:

http://m204wiki.rocketsoftware.com/index.php/List_of_Model_204_parameters

PROMPT and SUB parameters

Use of LSECHO and CSECHO is related to the settings of the parameters PROMPT and SUB, although the actual echoing process operates independently of PROMPT and SUB.

For more information on these parameters, refer to the Rocket Model 204 documentation wiki parameter pages:

http://m204wiki.rocketsoftware.com/index.php/List_of_Model_204_parameters

Operations for line echo

Before lines are echoed, Model 204 performs the following operations on the input in this order:

1. FLUSH and ERASE editing characters are applied, if enabled (that is, if EDIT = 1 or 5).

2. Physical line is echoed, if specified by the physical line echo parameters CECHO, CEECHO, and CSECHO.

3. Line continuation is interpreted using INCCC, and succeeding physical lines are read in, if necessary. Physical input lines are echoed as in Step 2, until the reading of the logical line is completed.

4. All characters that follow the last nonblank character in a logical line are deleted.

5. Specified substitutions are made in dummy strings.

6. Logical line is echoed in accordance with the settings of the logical line echo parameters: LECHO, LEECHO, and LSECHO.

Echoing examples

Examples using LECHO and CECHO

In the first series of examples, LECHO and CECHO initially are set to 0, and no echoing occurs. LECHO is then set to values of 1, 4, and 5.

Example 1

No echoing: LECHO = 0

```
BEGIN
PRINT 'CASH'
END

CASH
```

```
INCLUDE 0

CASH
```

Example 2

Terminal echo, no procedure echo: LECHO = 1

```
BEGIN

BEGIN

PRINT 'CASH ON HAND'

PRINT 'CASH ON HAND'

END

END
CASH ON HAND

INCLUDE 0

INCLUDE 0
CASH ON HAND
```

Example 3

No terminal echo, procedure echo: LECHO = 4

```
INCLUDE 0

BEGIN
PRINT 'CASH ON HAND'
END
CASH ON HAND
```

Example 4

Terminal echo and procedure echo: LECHO = 5

```
INCLUDE 0

INCLUDE 0
BEGIN
PRINT 'CASH ON HAND'
END
CASH ON HAND
```

Examples using LEECHO and CEECHO

The next two examples illustrate how LEECHO and CEECHO can be used to control echoing of lines that include ERASE or FLUSH characters.

Example 1

No line-edit echo: LEECHO = 0

```
V ERASE, FLUSH

ERASE @ X'7C' ERASE-CHARACTER SYMBOL
FLUSH # X'7B' ERASE-LINE SYMBOL

BEGIN
PRINT 'CSL@@@CASH'
TODAT#END

CASH
```

Example 2

Terminal line-edit echo: LEECHO = 1

```
BEGIN
PRINT 'CSL@@@CASH'

PRINT 'CASH'

TODAT#END

END
CASH
```

Echoing also can be controlled for lines in which dummy string substitutes have been entered. In the echoed line, the substituted character string is displayed in place of the original dummy string. For example, the following line is entered in a request:

```
PRINT '??ENTER.NAME'
```

Model 204 responds with the prompt:

```
??ENTER.NAME
```

The user can reply with:

```
RICHARD JONES
```

If LSECHO is properly set, Model 204 now echoes the original PRINT'??ENTER.NAME' line as:

```
PRINT 'RICHARD JONES'
```

Echoing examples

2

Terminal Session

Overview

This chapter provides an example of using a terminal to perform a database retrieval and a variety of other operations.

This chapter is intended to serve as an introduction to Model 204 remote terminal facilities, not to describe SOUL or system control commands in any detail. For more information about these facilities, refer to the Rocket Model 204 documentation wiki pages:

http://m204wiki.rocketsoftware.com/index.php/SOUL

http://m204wiki.rocketsoftware.com/index.php/Category:Commands

The terminal used in this session is a Teletype-compatible device that connects to Model 204 by means of a dialup telephone line and an acoustical coupler. Refer to Chapter 4 for a discussion of this device.

The prompt character shown in this session is a question mark (?). The particular prompt that appears on a user's terminal can differ, depending on terminal type and the Model 204 system interface used.

Terminal dialog

The entire terminal session is shown on the next four pages. The remainder of this chapter describes the components of the session in detail.

After the user connects to Model 204 using the Teletype device (as described in "Getting online" on page 23), Model 204 displays the following message to indicate it is ready for the user to initiate a session:

```
MODEL 204
```

Logging in

The user logs in to Model 204:

?LOGIN CCA D0101500

```
*** M204.0347: PASSWORD
?########
*** M204.0353: CCA   D0101500   LOGIN    85 JUL 18 15:18
*** M204.0131: CHECKPOINT COMPLETED ON 85.199 15:09:29.75
```

Opening a file

The user opens the CLIENTS file:

?OPENC CLIENTS

```
*** M204.0620: FILE CLIENTS OPENED
```

Displaying a procedure

The user displays the procedures in the file:

?DISPLAY LIST

```
CONTRIB
POLICY
PROC50
SACRAMENTO
TRIAL
```

Viewing parameter settings

The user views settings of parameters:

?VIEW OUTLPP, PGSEP

```
OUTLPP     60        OUTPUT LINES PER PAGE
PGSEP       2        LINES BETWEEN PAGES
```

Resetting parameters

The user resets the values of the parameters:

?RESET OUTLPP=50, PGSEP=3

```
OUTLPP      50        OUTPUT LINES PER PAGE
PGSEP        3        LINES BETWEEN PAGES
```

Entering an ad hoc request

The user enters an ad hoc request：

```
?BEGIN
?FD.POL:   FIND ALL RECORDS FOR WHICH
?                     POLICY NO = 100035
?                     SEX = M
?                     STATE = OHIO OR NEW YORK
?          END FIND
?FR.POL:   FOR EACH RECORD IN GET.POL
?                     PRINT ALL INFORMATION
?                     SKIP 1 LINE
           END FOR
?END
```

Model 204 displays output from the request.

```
FULLNAME = ADAMS, CESAR O
POLICY NO = 100035
DRIVER ID = 100085
MARITAL STATUS = MARRIED
SEX = M
STATE = NEW YORK
INCIDENT = T2
INCIDENT DATE = 770513
INCIDENT = T1
INCIDENT DATE = 780614
INCIDENT = T2
INCIDENT DATE = 790715
DATE OF BIRTH = 640619
```

Displaying a stored procedure

The user displays a stored procedure:

```
?DISPLAY SACRAMENTO

BEGIN
CATEGORY.A:  FIND ALL RECORDS FOR WHICH
             TOTAL PREMIUM IS GREATER THAN 300
             AGENT = GOODRICH OR BATEMAN
             CITY = SACRAMENTO
             END FIND
COUNTER:     COUNT RECORDS IN CATEGORY.A
             PRINT COUNT IN COUNTER
             FOR EACH RECORD IN CATEGORY.A
             PRINT FULLNAME AND AGENT AT 30
             END FOR
END
```

Executing a procedure and viewing output

The user executes the procedure and Model 204 displays output:

```
?INCLUDE SACRAMENTO

5
ADAMS, KEN U GOODRICH
ELLIOTT, CHRISTINE Q BATEMAN
GOLDSMITH, CLAYTON C BATEMAN
GRIFFIN, EUGENE OBATEMAN
WRIGHT, FRANK I GOODRICH
```

Defining a new procedure

The user defines a new procedure:

```
?PROCEDURE TEST

*** M204.1144: DEFINE PROCEDURE

?BEGIN
?POL.100990: FIND ALL RECORDS FOR WHICH
?           POLICY NO = 100990
?           END FIND
?           FOR EACH RECORD IN POL.100990
?           PRINT SEX AND DATE OF BIRTH
            END FOR
?END
?END PROCEDURE

*** M204.1146: PROCEDURE ENDED
```

Printing the procedure

The user displays the procedure on the printer:

```
?USE OUTPRINT
?DISPLAY TEST

*** M204.1327: NUMBER OF U DD LINES OUTPUT=8
*** M204.0131: CHECKPOINT COMPLETED ON 85.199 15:35:29.75
```

Deleting a procedure

The user deletes a procedure：

```
? DELETE SACRAMENTO
```

Logging out

The user logs out of Model 204:

? LOGOUT

```
*** M204.0608: FILE CLOSED: CLIENTS
*** M204.0353: CCA  D0101500 LOGOUT 85 JUL 18 15:36
```

Disconnecting from Model 204

The user disconnects:

? DISCONNECT

Getting online

To connect to Model 204 using the Teletype device, the user must do the following:

1. Turn the power on.

2. Set the terminal mode switch to LINE and the duplex switch to HALF.

3. Dial the telephone number provided by the system manager and wait for the carrier tone.

4. Place the receiver in the acoustical coupler and wait for the terminal to type an acknowledgment. The particular acknowledgment depends on the system interface and type of connection. Model 204 indicates that it is ready by displaying the following:

```
MODEL 204
```

Logging in

LOGIN process

Having established a connection to Model 204, the user must log in if the LOGIN process is required at an installation. The following command is used to log in:

{LOGIN | LOGON} *userid* [*account*]

where:

userid	Is a 1- to 10-character name assigned by the system manager to identify the user.
account	Is an optional 1- to 10-character name assigned by the system manager to identify the user's group or department.

The user ID and password determine the types of operations that the user is allowed to perform.

The following dialog shows the procedure for logging in.

Sample LOGIN dialog

The user logs in under the user ID CCA and account D0101500:

```
?LOGIN CCA D0101500
```

Model 204 prompts for a valid password:

```
*** M204.0347: PASSWORD
```

Model 204 masks the password to protect it from unauthorized access. The user enters the password (1-8 characters). The # symbols represent the masked password:

```
?########
```

The login was successful, so Model 204 displays the user ID, account, date, and time:

```
*** M204.0353: CCA D0101500 LOGIN 85 JUL 18 15:18
*** M204.0131: CHECKPOINT COMPLETED ON 85.19915:09:29.75
```

Model 204 prompts for a command:

```
?
```

If the LOGIN had failed, Model 204 would have displayed the message:

```
*** M204.0349: LOGIN FAILED
```

Note: Once the user has successfully logged in to Model 204, the user can issue any commands or enter SOUL requests. Certain restricted commands can be issued only if the user has the proper privileges, as discussed in the Rocket Model 204 documentation wiki parameter overview:

http://m204wiki.rocketsoftware.com/index.php/Overview_of_Model_204_para
meters

Opening a file

Before the user can update or retrieve data, a file or group must be opened by means of either the OPEN or OPENC command. The user enters:

```
{OPEN | OPENC} filename
```

where:

filename	Identifies the file or group to be opened.

Files, groups, and the different characteristics of OPEN and OPENC are described on the Rocket Model 204 documentation wiki command pages:

http://m204wiki.rocketsoftware.com/index.php/OPEN_FILE_command

http://m204wiki.rocketsoftware.com/index.php/OPENC_command

Using OPEN with different file types

Using OPEN with different types of Model 204 files results in different actions:

- If a user attempts to OPEN a public file, Model 204 opens it.

- If a user attempts to OPEN a semipublic file, Model 204 prompts for a file password. If the user enters a valid password, the file is opened with all the file privileges that are associated with that password. If the user does not know the password and enters either an invalid password or a carriage return, the file is opened, and the user is granted the default privileges for the file.

- If a user attempts to OPEN a private file, Model 204 prompts for a file password and opens the file only if the user enters a valid password.

Opening a public file

The following example illustrates the opening of a public file:

```
?OPENC CLIENTS
```

CLIENTS is a public file and is opened without requiring a password. The following message is displayed:

```
*** M204.0620: FILE CLIENTS OPENED
```

Opening a semipublic file

The following example illustrates the opening of a semipublic file.

The user attempts to open CENSUS, which is a semipublic file:

```
?OPENC CENSUS
```

```
*** M204.0347: PASSWORD ?########
```

The user presses a carriage return. The file is opened, and the user is granted default privileges that do not allow the user to update the file. The following message is displayed:

```
*** M204.0620: FILE CENSUS OPENED -- NO UPDATES ALLOWED
```

Viewing and changing parameter settings

Before a user runs a file retrieval that results in a printed report, the user might want to check the values of the parameters that control the spacing of printed output. Parameters are variables that define terminal characteristics, the length of user input and output lines, file characteristics, table sizes, and other information at particular installations. The basic types of parameters are:

- System

- File

- User

Some parameters can be set or reset only by the system manager or by a file manager. Others can be reset by the user. All the parameters have default values provided by Model 204. The parameters that affect terminal operations are summarized on the Rocket Model 204 documentation wiki parameter pages:

http://m204wiki.rocketsoftware.com/index.php/List_of_Model_204_parameters

Using the VIEW command

The user can display the current values of all the parameters or a subset of parameters by means of the VIEW command, which can be abbreviated to V. The format of the VIEW command is as follows:

```
VIEW parameter [,parameter]   •••
```

Special sets of parameters also can be displayed. For example:

This command...	Displays all...
VIEW ALL	Parameters
VIEW SYSTEM	System parameters
VIEW USER	User parameters
VIEW FILE	File parameters

The RESET command, which can be abbreviated to R, allows the user to change the settings of user parameters. VIEW and RESET are illustrated in the following terminal session.

Example of the VIEW command

The user requests the selected parameters to be displayed:

```
?VIEW OUTLPP, PGSEP
```

```
OUTLPP    60      OUTPUT LINES PER PAGE
PGSEP      2      LINES BETWEEN PAGES
```

The user specifies new values for OUTLPP and PGSEP:

```
?RESET OUTLPP=50, PGSEP=3
```

```
OUTLPP    50      OUTPUT LINES PER PAGE
PGSEP      3      LINES BETWEEN PAGES
```

Running Model 204 requests and procedures

You can run a Model 204 SOUL request in one of the following ways:

- Enter SOUL statements at the terminal and invoke an immediate response.

- Enter SOUL statements and system control commands in the form of a procedure, save the procedure on disk, and then invoke the procedure at a later time.

Procedures

Statements and commands are entered in the form of a procedure when the user enters:

```
PROCEDURE name
.
.
.
statements and/or commands
.
.
.
END PROCEDURE
```

where:

name	Identifies the procedure being defined.

For example:

```
PROCEDURE CITY
```

This procedure can be executed at a later time by entering:

```
INCLUDE CITY
```

If the procedure is a temporary procedure, the user specifies a negative number (that is, -*n*) instead of a name.

A procedure need not always combine executable statements and commands. A procedure can contain only a portion of a SOUL request. It also can contain nonexecutable text such as program documentation.

Example

In the following example, the user enters and runs a request, checks the output, and decides to execute a previously stored procedure. The user then creates and saves a procedure for subsequent editing and execution.

The user enters retrieval statements:

```
?BEGIN
?FD.POL:  FIND ALL RECORDS FOR WHICH
?                   POLICY NO = 100035
?                   SEX = M
?                   STATE = OHIO OR NEW YORK
?         END FIND
?FR.POL:  FOR EACH RECORD IN FD.POL
?                   PRINT ALL INFORMATION
?                   SKIP 1 LINE
          END FOR
?END
```

Model 204 displays retrieved data:

```
FULLNAME = ADAMS, CESAR O
POLICY NO = 100035
DRIVER ID = 100085
MARITAL STATUS = MARRIED
SEX = M
STATE = NEW YORK
INCIDENT = T2
INCIDENT DATE = 770513
INCIDENT = T1
INCIDENT DATE = 780614
INCIDENT = T2
INCIDENT DATE = 790715
DATE OF BIRTH = 640619
```

The user executes a previously entered procedure:

```
?INCLUDE SACRAMENTO

5
ADAMS, KEN U            GOODRICH
ELLIOTT, CHRISTINE Q    BATEMAN
GOLDSMITH, CLAYTON C    BATEMAN
GRIFFIN, EUGENE O       BATEMAN
WRIGHT, FRANK I         GOODRICH
```

The user defines a procedure named TEST. The system prompts for
statements and the user enters them:

```
?PROCEDURE TEST

*** M204.1144: DEFINE PROCEDURE

?BEGIN
?POL.100990:  FIND ALL RECORDS FOR WHICH
?                          POLICY NO = 100990
?             END FIND
?POL.FR:      FOR EACH RECORD IN POL.100990
?                          PRINT SEX AND DATE OF BIRTH
             END FOR
?END
```

The user signals the end of procedure:

```
?END PROCEDURE
```

The system responds and then prompts for another command:

```
*** M204.1146: PROCEDURE ENDED
?
```

Displaying a procedure

Using the DISPLAY and USE commands

A procedure can be displayed by means of the DISPLAY command, which can
be abbreviated to D. The user requests that a procedure be displayed on the
terminal by entering either:

```
DISPLAY procname
```

or:

```
DISPLAY -n
```

All permanent procedures are displayed if the user enters:

```
DISPLAY ALL
```

To display a list of the procedures currently available in the file, the user enters:

```
DISPLAY LIST
```

A procedure also can be displayed on a device such as a line printer if the user
includes an appropriate USE command. For example, if the following command
is specified, the device associated with *ddname* in the system initialization deck
is used instead of the user's normal output device (usually the terminal):

```
USE ddname
```

The Rocket Model 204 documentation wiki command pages provide a detailed description of the DISPLAY and USE commands:

http://m204wiki.rocketsoftware.com/index.php/DISPLAY_PROCEDURE_command:_Procedure_names

http://m204wiki.rocketsoftware.com/index.php/DISPLAY_PROCEDURE_command:_Procedure_text

http://m204wiki.rocketsoftware.com/index.php/USE_command:_Directing_output

The user displays the available procedures :

```
?DISPLAY LIST

CONTRIB
POLICY
PROC50
SACRAMENTO
TRIAL
```

The user displays the procedure named SACRAMENTO:

```
?DISPLAY SACRAMENTO

BEGIN
CATEGORY.A:  FIND ALL RECORDS FOR WHICH
                        TOTAL PREMIUM IS GREATER THAN 300
                        AGENT = GOODRICH OR BATEMAN
                        CITY = SACRAMENTO
             END FIND
COUNTER:     COUNT RECORDS IN CATEGORY.A
             PRINT COUNT IN COUNTER
             FOR EACH RECORD IN CATEGORY.A
                        PRINT FULLNAME AND AGENT AT 30
             END FOR
END
```

Sample DISPLAY dialog

Several of the DISPLAY options are illustrated in the following dialog.

The user displays the procedure named TEST:

```
?DISPLAY TEST

BEGIN
POL.100990: FIND ALL RECORDS FOR WHICH
                        POLICY NO = 100990
             END FIND
FR.POL:      FOR EACH RECORD IN POL.100990
```

```
                           PRINT SEX AND DATE OF BIRTH
                 END FOR
END
```

The user specifies a printer data set:

```
?USE OUTPRINT
```

The user writes the procedure named TEST to the printer:

```
?DISPLAY TEST

*** M204.1327: NUMBER OF U DD LINES OUTPUT = 8
```

Deleting a procedure

Using the DELETE command

A saved procedure can be deleted when it is no longer needed by using the DELETE command. This conserves space on the disk. The user identifies the procedure by name:

```
DELETE procname
```

Temporary procedures, specified by number (*n*) in the form *-n*, need not be explicitly deleted. They are deleted automatically when the user logs out. In the terminal session, the user does not need procedure SACRAMENTO again and enters:

```
DELETE SACRAMENTO
```

Recovering from an error

When an error condition occurs, Model 204 displays a message, determines the severity of the error, and, depending on the type of error that occurred, can stop the run, restart the user, or save the contents of memory for subsequent debugging.

The basic types of error conditions, prompting messages, and informational messages in Model 204 are summarized in this section. For a detailed explanation about Model 204 messages, refer to the Rocket Model 204 messages documentation.

Prompting and informational messages

Model 204 displays a variety of prompting and informational messages during initialization, evaluation of SOUL requests, and execution of procedures. For example:

```
DO YOU REALLY WANT TO action?
```

```
PASSWORD?

FILE OPENED

FILE CLOSED

GROUP OPENED

GROUP CLOSED

FILE MAY BE LOGICALLY INCONSISTENT
```

Counting errors

Counting errors are the least severe types of errors. If a counting error occurs while Model 204 is compiling a SOUL request, the request cannot be executed. If the error occurs while Model 204 is evaluating a request, evaluation continues after the error message is displayed. If the error occurs while Model 204 is attempting to execute a system control command, execution of the command is halted.

These errors are called counting errors, because they cause a counter to be incremented. Counting error messages have the form:

```
*** n M204.1030: INVALID MODEL 204 COMMAND
```

where *n* indicates the current value of the counter. The system parameter ERMX specifies the maximum value that the counter can have. If this maximum is reached, the counter is reset and the user is restarted as described in "Soft restart" on page 33. The counter also is reset whenever a new BEGIN command is encountered.

Counting errors are not severe enough to cause a user restart. If the error occurs in a SOUL request, the user can correct the error using an editor and can then compile the request again. If the error occurs in a system control command, the user can simply reenter the command. If the error occurs in a procedure, the user must wait for Model 204 to process the entire procedure before correcting the error.

Severe errors

Severe errors occur when certain internal tables are filled up or when unreadable data structures are encountered. Model 204 cannot recover from these errors while the user is running it. In response to errors of this kind, Model 204 does the following:

1. Immediately stops the current request

2. Logs the user out

3. Closes all open files

4. Displays the message:

```
*** M204.1024: USER RESTARTED
```

The Model 204 connection is maintained and the user can log in again. Sometimes the user can resume the same operation that was being performed when the error occurred. However, if a file was being updated at that time, the physically inconsistent indicator is set (file status parameter FISTAT = X'02') and Model 204 displays the message:

```
*** M204.1221: FILE IS PHYSICALLY INCONSISTENT
```

The file structure might be damaged and the file manager must correct the damage before the user can proceed.

Unless a file is marked physically inconsistent as the result of an error condition, a user restart affects only the user who encountered the error.

Soft restart

Certain errors result in a user restart condition but do not physically damage the file. Errors in this category usually occur when the terminal line is dropped or when another terminal I/O problem occurs. Model 204 stops the request, logs the user out, and displays the message:

```
*** M204.1024: USER RESTARTED SOFTLY
```

The physically inconsistent indicator is not set in this case. However, if the user was executing an updating request, the logically inconsistent indicator (FISTAT = X'40') can be set. If this happens, the following message is displayed when the file is opened again:

```
*** M204.0623: filename MAY BE LOGICALLY INCONSISTENT
```

The user can proceed to use the file, but the file manager should be notified so that the consistency of the data can be verified and the FISTAT parameter can be reset.

Displaying messages

When a prompting, informational, or error message is displayed by Model 204, a prefix associated with the message specifies the type of message (that is, Model 204 or user) and the number of the message. The system manager can use this prefix information when changing the processing that is performed for particular error conditions.

The MSGCTL parameter can be used to suppress the display of the prefix or to suppress the display of error or informational messages. (Prompting messages cannot be suppressed.) This parameter can be set by the system manager for an installation during initialization. For more information about the

MSGCTL parameter, refer to the Rocket Model 204 documentation wiki parameter page:

http://m204wiki.rocketsoftware.com/index.php/MSGCTL_parameter

Closing a file

Using the CLOSE command

Having completed all file operations, the user can close the file using the CLOSE command:

```
CLOSE CENSUS
```

Files are closed automatically when the user logs out of Model 204 or if a system failure occurs.

Logging out and disconnecting

Using the LOGOUT command

When the user finishes submitting SOUL requests and issuing system control commands, the LOGOUT or LOGOFF command is used to log out of Model 204. At some installations, the user also must hang up the phone in addition to issuing the DISCONNECT command, as in the following example.

The user logs out of Model 204:

```
?LOGOUT
```

Model 204 closes any open files:

```
*** M204.0608: FILE CLOSED:CENSUS
```

Model 204 displays the user ID, account, date, and time:

```
*** M204.0352: CCA    D0101500   LOGOUT   85 JUL   18 15:28
```

The user disconnects and can now hang up the telephone:

```
?DISCONNECT
```

3

SNA Communications Server Terminal

Overview

This chapter describes the procedures to be followed when using SNA Communications Server (formerly VTAM) (Virtual Telecommunications Access Method). SNA Communications Server supports the use of:

- IBM 3270s and compatible terminals

- IBM 3767 terminals

- Terminals supported through IBM's Network Terminal Option (NTO).

Each type of terminal that can be used through SNA Communications Server provides slightly different capabilities, responses, and default parameter settings. Read the section of this chapter that corresponds to your terminal type.

Getting online

Procedures

To connect to Model 204 through SNA Communications Server, follow these steps:

1. Connect to Model 204 by issuing commands to the SNA Communications Server Control Program. Check with your system administrator for the procedures specific to your site. These procedures

might automatically log you on to Model 204.

2. After the connection has been established, the system unlocks the terminal keyboard. If you are not already logged on to Model 204, begin the session by entering the first input line, usually one of the following commands:

LOGIN *userid* [*account*]

or:

LOGON *userid* [*account*]

These commands are described in detail on the Rocket Model 204 documentation wiki command page:

http://m204wiki.rocketsoftware.com/index.php/LOGIN_or_LOGON_command

3. After successfully logging in, you can enter an input line, as described in "Input lines" on page 36.

IBM 3270 terminals (IODEV = 7)

This section summarizes the information needed to use IBM 3270s through SNA Communications Server.

Note: Model 204 translates all unprintable characters to question marks (?) for output to 3270 terminals, to avoid I/O errors.

Input lines

SNA Communications Server support is provided for two modes of operation: line-at-a-time and full-screen support. In full-screen mode, when Model 204 is prepared to accept input, it issues the prompt character (>) and unlocks the keyboard. The user can now enter an input line.

A physical input line cannot exceed 78 characters; however, using a line continuation character at the end of an input line causes Model 204 to treat the next line as a logical continuation of the previous one.

The user indicates that the line is complete and transmits the line by pressing the Enter key. No data is transmitted until Enter is pressed. The 3270 editing keys can be used to correct the line before Enter transmits it.

With the exception of the RTRVKEY, program function (PF) keys are supported by Model 204 only when the user accesses a screen formatted through the SOUL full-screen formatting feature (see "Full-screen formatting" on page 9). Otherwise, PF keys are not supported and cannot be used to enter data. Any line entered by means of a PF key is considered null, and any data entered is lost.

End-of-page pause

Model 204 pauses at the end of each output page and waits for the user to respond before continuing. This allows the user to examine the contents of the screen. Model 204 prompts with an end-of-page prompt (>), indented 25 spaces.

Valid user responses are:

*   Enter a null line (Return). The terminal goes on to the next page.

*   Press the attention key (PA1) or enter *CANCEL, C, or K, then press the Enter key. Unless an ON ATTENTION statement is in effect (see "Attention interrupt feature" on page 11), the current output and request are cancelled.

*   Enter a backpage request (see "Backpaging" on page 8).

*   Enter the next input line in anticipation of the next input prompt. The line cannot exceed 53 characters.

As discussed in the section "Pausing" on page 7, the user can enter only one line of anticipatory input at this time. If the terminal reaches the end-of-page pause for the next page of input, the saved input line is lost.

Attention key

The PA1 key serves as the attention key on IBM 3270 terminals, unless the attention key has been reassigned by the user through the FSATTN parameter. For more information on the FSATTN parameter, refer to the Rocket Model 204 documentation wiki parameter page:

http://m204wiki.rocketsoftware.com/index.php/FSATTN_parameter

Canceling the current request

When using SNA Communications Server, the evaluation of the current SOUL request can be canceled in one of the following ways:

*   When the terminal is waiting for a response from Model 204, the user can press the attention key (PA1).

*   When Model 204 is waiting for input from the terminal or is actively displaying output on the terminal, the user can press the attention key.

Note: When Model 204 is compiling a request or executing a command, the user cannot cancel the operation by pressing the attention key.

Logging out and disconnecting

To disconnect from Model 204, the user logs out (if the LOGOFF procedure is required at the installation) by entering either:

LOGOUT

or:

LOGOFF

The user can then disconnect completely from the system, reconnect to Model 204, or connect to a different application by following the specific procedures defined at the installation.

Screen-formatting parameters

The parameters listed in Table 3-1 apply to IBM 3270 terminals being used through SNA Communications Server. The HDRCTL and PGSEP parameters are not listed; they are not used with IBM 3270 terminals

Table 3-1.   Screen-formatting parameters for SNA Communications Server 3270s

Parameter	Meaning
INMRL	Maximum input line length for terminal
INCCC	Input continuation column
LOUTPB	Length of output page buffer
OUTMRL	Maximum output line length for terminal
OUTCCC	Output continuation column
OUTLPP	Number of lines per page, including headers and trailers
MODEL	Array of screen size parameters for the particular 3270 model
HDRCTL	Page formatting options

The values of the first five parameters, which determine the size of the screen, are established by the value of the MODEL parameter, which corresponds to the terminal model within the 3270 family. Model 204 automatically sets MODEL to the appropriate value for SNA Communications Server 3270s, but the user also can reset it.

Terminal model options

Table 3-2 shows the valid settings for MODEL, the corresponding 3270 terminal types, and the corresponding default values for the screen size parameters. The user can reset INCCC and OUTCCC to override the default values

established by the MODEL parameter. The new settings remain in effect for the thread until the user logs out.

Table 3-2.   Valid MODEL settings for SNA Communications Server 3270s

MODEL	INMRL	INCCC	OUTMRL	OUTCCC	OUTLPP	3270 terminal type
1	78	78	80	80	11	Model 1
2	78	78	80	80	23	Model 2
3	78	78	80	80	31	Model 3
4	78	78	80	80	42	Model 4
5	130	130	132	132	26	Model 5

Output page buffer settings

Note: MODEL is reset only if the size of the output page buffer (LOUTPB) is large enough to hold the new screen size. The minimum LOUTPB settings are:

MODEL	LOUTPB
0	1170
1	1170
2	2130
3	2770
4	3650
5	3774

TERMOPT parameter

TERMOPT consists of a series of switches that can be set independently and can be reset to the following values for 3270s (options can be summed):

0	SNA Communications Server input exception causes soft restart of user.
1	No soft restart of user.
2	Request exception response only (no definite response).
64	String 'LOGON' is placed before the first logical line of the SNA Communications Server LOGMSG.

IBM 3767 and NTO terminals (IODEV = 37)

This section summarizes the information needed to use IBM 3767s and the terminals supported by NTO through SNA Communications Server.

Input lines

When Model 204 is ready to accept input, it issues the prompt character and unlocks the keyboard. For 3767s supported by NTO, the prompt is the underscore character (_), which is backspaced over immediately after it is printed. For Teletypes supported by NTO, the prompt is the question mark (?). Once the keyboard is unlocked, the user can enter a single input line, which cannot exceed the number of characters specified in the INMRL parameter.

Therefore, Model 204 treats the following as end-of-message characters:

NL, FF	For 3767 terminals
CR, LF, XON, XOFF	For Teletypes and Teletype-compatible terminals

Pausing and canceling output

The system pauses at the end of each page of output if:

- OUTLPP (lines per page) parameter is positive.

- HDRCTL (header control) parameter has been set to 4.

Pausing at the bottom of the page allows the user to change the terminal paper or to cancel the current request, if too much output is being received. The system unlocks the keyboard at the bottom of each page to allow the user to enter a response. The user causes continuation of output by entering a null line (Return) or by entering any character.

If the user is receiving too much output, the attention key (BREAK or ATTN) can be pressed at any time. Unless an ON ATTENTION statement is in effect (see "Attention interrupt feature" on page 11), this cancels all output and aborts the currently running request. If a procedure is being executed at the time of the attention interrupt, all the input lines in the procedure are flushed, and the user is returned to command level. The terminal keyboard is then unlocked, and the terminal immediately signals that it is ready for input again.

Pressing the attention key while Model 204 is waiting for input causes the system to respond with an error message, after which it immediately prompts for input.

Parameter default values

Table 3-3 shows the parameter default values that apply to 3767s and NTO terminals being used through SNA Communications Server.

Table 3-3.   Parameter Default Values for 3767s and NTOs

Parameter	Meaning	Default
INMRL	Maximum input line length for terminal	80
INCCC	Input continuation column	72
LOUTPB	Length of output page buffer	0
OUTMRL	Maximum output line length for terminal	132
OUTCCC	Output continuation column	132
OUTLPP	Number of lines per page, including headers and trailers	56
PGSEP	Number of lines between output pages	2
HDRCTL	Page formatting options	0
TERMOPT	Terminal options	0

Resetting parameters

The settings of INMRL, INCCC, OUTMRL, and OUTCCC can be set individually on the first IODEV=37 CCAIN parameter line(s). They can be reset using the RESET command, but not to a value larger than the IODEV line setting, if any. If a value larger than an IODEV line value is specified, Model 204 automatically changes it to the IODEV line value.

HDRCTL consists of a series of switches that control the formatting of pages transmitted to the terminal. Each switch can be set independently of the others. HDRCTL can be reset to the following values for 3767s and NTOs:

0	Normal headers (system header with date, time, and page number).
1	Suppress header 0 (system header with date, time, and page number).
2	Suppress the blank line that normally follows header 0 for nonrequest output.
4	Pause at the end of an output page. An additional line is added to each page, in addition to OUTLPP plus PGSEP, to receive a reply.

TERMOPT consists of a series of switches that can be set independently and can be reset to the following values for 3767s and NTOs:

0	Default.
1	No idles are transmitted in the output lines.

2	Terminal is always unlocked.
64	String 'LOGON' is placed before the first logical line of the SNA Communications Server LOGMSG.

Note: A TERMOPT setting of 2 is required in order for Model 204 to send an XON character to Teletype and Teletype-compatible terminals.

4

CICS Interface

Overview

The CICS (Customer Information Control System) interface causes a CICS terminal to appear to be a Model 204 terminal. Using the CICS interface introduces changes to the usual responses and mode of operation of a CICS-owned terminal. These changes vary according to the type of terminal and the type of CICS interface.

This chapter summarizes terminal operation particulars for the CICS interface end user.

Terminals supported

The CICS interface supports the use of:

- IBM 3270 and compatible terminals

- Teletypes and Teletype-compatible terminals

Each of these terminals provides slightly different capabilities, responses, and default parameter settings. The information supplied for these terminals in Chapter 3 does not necessarily apply when the terminals are used through CICS.

Host language applications

Some host language application programs that communicate with Model 204 through the IFAM interface can be run as CICS transactions. Refer to the *Rocket Model 204 Host Language Interface Reference*

Manual and the CICS system documentation for information about using host language application programs.

Selection of terminal support mode

Two modes of CICS support are available to Model 204 users of IBM 3270 terminals: full-screen and line-at-a-time. Full-screen terminals allow the entire screen to be formatted and displayed as a single entity while line-at-a-time terminals print all screen inputs and outputs on a line-by-line basis.

To select the desired mode for an installation, your system manager must do the following:

• Assemble, link-edit, and install the appropriate CICS transactions.

• Set the IODEV parameter on the user's parameter line for the terminal, specifying 11 for full-screen CICS usage and 29 for line-at-a-time.

For more information about these system manager actions, see the Rocket Model 204 installation instructions for your operating system. See also the following Rocket Model 204 documentation wiki page:

http://m204wiki.rocketsoftware.com/index.php/Defining_the_user_environment_(CCAIN)

Much of the information in this chapter is presented according to terminal IODEV setting. IODEV 11 terminals are full-screen and IODEV 29 terminals are line-at-a-time. For the general features of full-screen and line-by-line terminal processing, see Chapter 1.

Note: If CICS cannot establish a connection for full-screen usage, the interface attempts to establish a line-at-a-time (sequential) connection, as described in "When full-screen login fails" on page 46. The decision whether or not to attempt a line-at-a-time connection depends on the configuration of the full-screen interface. For more information about this configuration, see your system manager.

Additional print capabilities

In addition to print capabilities described in this chapter, the DEFINE PRINTER and USE PRINTER commands also can be used to direct output to CICS 328x- and TTY/TWX-type printers.

Invoking and disconnecting from the CICS interface

The steps required for logging in to Model 204 through the CICS interface and for disconnecting from the CICS interface are described in this section.

Getting online

To connect to Model 204 using a CICS system interface, first log in to CICS. Check with your system manager for the login procedures defined at your site.

Invoke the Model 204 CICS interface by entering one of the following commands, according to your terminal mode:

For line-at-a-time mode, enter:

```
transid channelid
```

```
where:
```

transid	Is the name of the CICS transaction for M204CIUL. Check with your system manager for the name of the transaction ID for your installation.
channelid	Is the name of the CRAM channel to be used for the connection. The default channel name is M204PROD.

For full-screen mode, enter:

transid [[CHANNEL] *channelid*] [DATA *input1*; *input2*; ●●●]

where:

transid	Is the name of the CICS transaction for M204PSFS. Contact your supervisor for the name of the transaction ID for your installation.
CHANNEL	Is a keyword that must be specified if the channel ID is one of the following values: CHANNEL, TERMOFF, TERMON, or DATA.
channelid	Is the name of the CRAM channel to be used for the connection. The default channel name is M204FULL.
DATA	Specifies that input follows. The input is a series of input stream items that are passed to Model 204 after the connection is made. These items, separated by a semicolon, are processed by Model 204 as though each were an individual line of input from the terminal.

For example:

```
M204 TESTCHNL DATA LOGON userid;password;O USERFILE;I USERMENU
```

The terminal output that results from the transmission of the input stream items to Model 204 is not displayed. That is, the Model 204 output messages resulting from the logon, the password prompt, and the file open sequence are not displayed. The terminal output resulting from the last input stream item (that is, input) is always displayed.

When full-screen login fails

If a 3270 user attempts to log in to CICS with a full-screen connection and none is available, the user might be prompted to use the line-at-a-time interface. Whether or not this prompt is issued depends on the configuration of the full-screen interface. If so prompted, the user can also select an alternate channel name for the line-at-a-time interface.

If the interface responds with any other message, control automatically returns to CICS. Refer to the Rocket Model 204 messages documentation for a detailed description of CICS interface messages.

Disconnecting

To disconnect from the CICS interface, follow these steps:

1. Log out of Model 204 in the usual way by entering either:

   ```
   LOGOUT
   ```

   or:

   LOGOFF

   Model 204 acknowledges the command as shown in the preceding chapters.

2. If full-screen 3270 CICS support is available, control automatically returns to CICS. Otherwise, to end the CICS transaction, enter:

   ```
   *DISCONNECT
   ```

   The interface releases the connection and displays the message:

   ```
   MODEL 204 CONNECTION TERMINATED
   M204 TRANSACTION ENDING; RETURNING TO CICS
   ```

   Control then returns to CICS.

IBM 3270 terminals (IODEV = 11)

This section summarizes the information needed to use IBM 3270s (and compatible terminals) operating in full-screen mode under CICS.

Input lines

CICS users can use the full-screen input features, described in the section "Full-screen formatting" on page 9, which allow the entire screen to be formatted and displayed as a single entity. The user normally responds to prompts that are displayed on the screen. When the entire screen has been filled in, the user presses the ENTER key and the data is transmitted from the terminal to Model 204 for processing.

Program Function (PF) keys are supported by Model 204 only when you access a screen formatted through the SOUL full-screen formatting feature. Otherwise, PF keys are not supported and cannot be used to enter data. Any line entered by means of a PF key is considered null, and any data entered is lost.

Attention key

The PA1 key serves as the attention key on IBM 3270 terminals, unless you have reassigned the attention key through the FSATTN parameter. For more information on the FSATTN parameter, refer to the Rocket Model 204 documentation wiki parameter page:

http://m204wiki.rocketsoftware.com/index.php/FSATTN_parameter

Screen-formatting parameters

The screen-formatting parameters listed in Table 4-1 apply to IBM 3270 terminals being used through CICS. The PGSEP parameter is not listed; it is not used with IBM 3270 terminals.

Table 4-1.   Screen-formatting parameters for the CICS interface

Parameter	Meaning
INMRL	Maximum input line length for terminal
INCCC	Input continuation column
LOUTPB	Length of output page buffer
OUTMRL	Maximum output line length for terminal
OUTCCC	Output continuation column
OUTLPP	Number of lines per page, including headers and trailers
MODEL	Array of screen size parameters for the particular 3270 model
HDRCTL	Page formatting options

The values of the first five parameters, which determine the size of the screen, are established by the value of the MODEL parameter, which corresponds to the terminal model within the 3270 family. Model 204 automatically sets MODEL to the appropriate value for SNA Communications Server (formerly VTAM) 3270s used through CICS, but the user also can reset it.

Terminal model options

Table 5-2 below shows the valid settings for MODEL, the corresponding terminal type, and the corresponding default values for the screen size

parameters. The user can reset INCCC and OUTCCC to override the default values established by the MODEL parameter.

Table 4-2. Valid MODEL settings for CICS 3270s

MODEL	INMRL	INCCC	OUTMRL	OUTCCC	3270 terminal type
1	78	78	80	80	Model 1
2	78	78	80	80	Model 2
3	78	78	80	80	Model 3
4	78	78	80	80	Model 4
5	130	130	132	132	Model 5

Output page buffer settings

The MODEL parameter is reset only if the size of the output page buffer (LOUTPB) is large enough to hold the new screen size. The minimum LOUTPB settings are listed in Table 4-3.

Table 4-3. Minimum LOUTPB settings

MODEL	LOUTPB
0	1170
1	1170
2	2130
3	2770
4	3650
5	3774

Page header formats

HDRCTL consists of a series of switches that control the formatting of pages transmitted to the terminal. Each switch can be set independently of the others. HDRCTL can be reset to the following values for 3270 terminals, but is not usually reset:

0	Normal headers (system header showing date, time, and page number)
1	Suppress header 0 (system header showing date, time, and page number)
2	Suppress the blank line that normally follows header 0 for nonrequest output

Pausing and canceling output

At the end of each page of output, Model 204 pauses to allow the user to read the contents of the screen or to cancel the current request if too much output is being received. A prompting greater than sign (>) is displayed, indented 25 spaces on the last line of the screen.

Valid user responses are:

•   Press Enter. The terminal goes on to the next page.

•   Press the attention key or enter *CANCEL, C (cancel), or K (kill), followed by Enter. Unless an ON ATTENTION statement is in effect (see "Attention interrupt feature" on page 11), the current output and request are canceled.

•   Enter a backpage request. (See "Backpaging" on page 8)

•   Enter the next input line, which cannot exceed 53 characters. The cursor moves as the user keys, to indicate the number of spaces used.

As discussed in the section "Pausing" on page 7, be aware that only one line of anticipatory input can be entered at this time, and that, if the terminal reaches the end-of-page pause for the next page of output, the saved input line is lost.

Canceling the current request

You can cancel the evaluation of the current Model 204 SOUL request by pressing the attention key in the following instances:

•   If the terminal is waiting for input

•   If Model 204 is waiting for input from the terminal or is actively displaying output on the terminal

Note: If Model 204 is compiling or executing a command, you cannot cancel the operation by pressing the attention key.

CICS printer

The contents of a 3270 screen can be routed to a printer in the CICS network by pressing the PA2 key.

If you press PA2, Model 204 prompts with:

```
COPY SCREEN (Y/N)? Y WITH PRINTER ID = xxxx
```

You must enter the 4-character terminal identifier that has been assigned to the selected printer. If you enter an invalid printer ID or enter three consecutive null responses (press Enter three times without keying any data), the interface displays:

```
PRINTER ID INVALID - RE-ENTER COPY SCREEN (Y/N)?
Y WITH PRINTER ID = xxx
```

```
PRINTER ID INVALID - RE-ENTER COPY SCREEN (Y/N)?
Y WITH PRINTER ID = xxx
```

If you answer Y, the interface prompts again for the printer ID. If you answer N, the interface continues to the next page, ignoring the previous print request.

IBM 3270 terminals (IODEV = 29)

This section summarizes the information need to use IBM 3270s (and compatible terminals) operating in line-at-a-time mode under CICS.

Output parameters

As soon as the Model 204 connection is made, the CICS interface sets the following output parameters to the default values shown in "CICS interface output parameters for IODEV 29" on page 50.

Table 4-4.   CICS interface output parameters for IODEV 29

Parameter	Meaning	Default
OUTMRL	Maximum output line length for terminal	72
OUTCCC	Output continuation column	72
OUTLPP	Number of lines per page, including headers and trailers	56

Pausing and canceling output

At the end of each page of output or after 23 lines have been displayed, the CICS interface pauses to allow you to interrupt Model 204 or to cancel the current request if too much output is being received. The CICS interface indicates that it is in pause mode by displaying the greater than sign (>) prompt in the 25th column of the 24th line on the display screen.

Valid user responses are:

- Press the PA1 key. The current request or operation is canceled, the screen is erased, and the cursor is positioned at the beginning of the first line. Model 204 is then ready to accept terminal input from the user.

- Press the PA2 key. The current screen image is printed on a 3284 or 3286 hard-copy printer, as described in the section "CICS printer".

- Press Enter or enter any other character (except C or P). The interface goes on to the next page.

CICS printer

The contents of the current 3270 screen can be routed to a printer in the CICS network by pressing the PA2 key.

If you press PA2, Model 204 prompts with:

```
COPY SCREEN (Y/N)? Y WITH PRINTER ID = xxxx
```

You must enter the 4-character terminal identifier that has been assigned to the selected printer. If you enter an invalid printer ID or enter three consecutive null responses (press Enter three times without keying any data), the interface displays:

```
PRINTER ID INVALID - RE-ENTER COPY SCREEN (Y/N)?
Y WITH PRINTER ID = xxx
```

If you answer Y, the interface prompts again for the printer ID. If N, the interface continues to the next page, ignoring the previous print request.

Teletypes (IODEV = 29)

This section summarizes the information needed to use Teletypes and compatible terminals operating under CICS.

Output parameters

As soon as the Model 204 connection is made, certain output conventions are established for Teletypes, and compatible terminals. The CICS interface sets the parameters in Table 4-5 to the default values shown.

Table 4-5.   CICS interface output parameters for teletypes

Parameter	Meaning	Default
OUTMRL	Maximum output line length for terminal	72
OUTCCC	Output continuation column	72
OUTLPP	Number of lines per page, including headers and trailers	56

Pausing and canceling output

At the end of each page of output, the CICS interface pauses to allow you to interrupt Model 204 or to cancel the current request if too much output is being received. The CICS interface indicates that it is in pause mode by displaying the question mark (?) prompt in the first five positions of the next line on the terminal.

Valid user responses are:

- Enter the letter C (cancel), followed by a carriage return. The current request or operation is canceled, and Model 204 is then ready to accept terminal input from the user.

- Enter a carriage return or any other character (except C). The interface goes on to the next page.

Because the pause and cancel capability is activated at the end of a page, be sure not to set the OUTLPP (number of lines per page) parameter to zero unless you want suppressed pausing and production of a header on the new page. If OUTLPP = 0, there is no logical end-of-page, and the interface never executes the pause.

The attention key facility is not available on Teletypes for the CICS interface. Pause mode is the only way to control requests that provide more output than desired.

5

TSO Interface

Overview

The TSO (Time Sharing Option) interface causes a TSO terminal to appear to be a Model 204 terminal. The TSO interface program is run as a program in the TSO user region, either as a command processor (CP) or as a called program.

This chapter summarizes terminal operation particulars for the TSO interface end user.

Terminals supported

The TSO interface supports the use of:

- IBM 3270 and compatible terminals

- Teletypes and Teletype-compatible terminals

Each of these terminals provide slightly different capabilities, responses, and default output parameter settings. The information supplied for these terminals in Chapter 3 does not necessarily apply when the terminals are used through TSO.

Host language applications

Most host language application programs that communicate with Model 204 through the host language interface can be run under TSO as called programs. Refer to the *Rocket Model 204 Host Language Interface Reference Manual* and to the TSO documentation for information about using host language application programs.

Selection of terminal support mode

Two modes of TSO support are available to Model 204 users of IBM 3270 terminals: full-screen and line-at-a-time. Full-screen terminals allow the entire screen to be formatted and displayed as a single entity whereas line-at-a-time terminals print all screen inputs and outputs on a line-by-line basis.

To select the desired mode for an installation, the system manager must do the following:

- Assemble, link-edit, and install the appropriate TSO programs.

- Set the IODEV parameter on the user's parameter line for the terminal, specifying 11 for full-screen TSO usage and 29 for line-at-a-time TSO usage.

For more information about these system manager actions, see the Rocket Model 204 documentation wiki:

http://m204wiki.rocketsoftware.com/index.php/Defining_the_user_environment_(CCAIN)

Much of the information in this chapter is presented according to terminal IODEV setting. IODEV 11 terminals are full-screen and IODEV 29 terminals are line-at-a-time. For the general features of full-screen and line-at-a-time terminal processing, see Chapter 1.

Using a CLIST

A CLIST can be established by the system manager when TSO line-at-a-time (IODEV = 29) and full-screen (IODEV = 11) SOUL connections are being used. This allows input to be passed to TSO from the CLIST, rather than from the terminal, as described in the section titled "CLIST input" on page 56.

Invoking and disconnecting from the TSO interface

The steps required for logging in to Model 204 through the TSO interface and for disconnecting from the TSO interface are described in this section.

Getting online

To connect to Model 204 by using the TSO system interface, the user must first log in to TSO using the procedures defined at the installation. The installation supervisor has the necessary installation-specific information. TSO normally indicates that it is ready to accept input by displaying:

```
READY
```

The user then invokes Model 204 by one of the following methods:

- If the TSO interface is installed as a command processor (CP) with the name M204, the user normally enters the following line for a full-screen connection:

```
M204FS [[subsystem:]channel_name]
```

For a line-at-a-time connection, the user enters:

```
M204TTY [[subsystem:]channel_name]
```

where:

subsystem:	Is an optional one-to-four character name, plus colon(:), of a subsystem to override the IGCLM244 value. Available for z/OS with XDM only.
channel name	Is an optional 1- to 8-character name to be used as the channel name.

If the *subsystem* is not specified, the default is taken from the IGCLM244 value.

If the *channel-name* is not specified, the default name usually is assumed. The full-screen default channel name is M204FULL; the line-at-a-time default name is M204PROD. Verify with the system manager whether the channel name is to be specified.

- If the TSO interface is not installed as a CP, the user invokes it via the CALL command. For full-screen connections, the CALL command is:

```
CALL 'library_name(M204FS)'
     ['[subsystem:]channel_name']
```

For line-at-a-time connections, the CALL command is:

```
CALL 'library_name(M204TTY)'
     ['[subsystem:]channel_name']
```

where:

library name	Is the fully qualified data set name for the load library containing the TSO interface module and M204 is the module name or alias.
subsystem	Specification is optional and available only for z/OS with XDM. The default is the IGCLM244 value.
channel name	Specification is optional, necessary only if the channel name is not the default name. The full-screen default channel name is M204FULL; the line-at-a-time default name is M204PROD. The supervisor can tell the user whether the channel name is to be included in the CALL.

The TSO interface establishes a connection to Model 204, locks the terminal to the command processor or called program, and replies:

```
CONNECTED TO MODEL 204
```

When the terminal is prepared to accept input, it issues a prompting character and/or unlocks the keyboard (see "Input lines" on page 58). The user can now enter any desired system control commands. If the interface responds with any other message, control returns automatically to TSO. See the Rocket Model 204 messages documentation for a detailed description of TSO: messages.

The user can now log in to Model 204. In general, Model 204 regards LOGIN and LOGON as equivalent commands.

CLIST input

Input can be passed to the TSO line-at-a-time or full-screen SOUL interface from a CLIST that has been defined by the system manager. Input can also be passed from a TSO file (in full-screen mode only). This alternate means of input to Model 204 is valid only when the interface is executed as a TSO command processor.

The use of a CLIST or file allows a series of commands to be defined and executed. If the user invokes a CLIST, Model 204 executes all of the commands in the CLIST and then allows additional lines to be entered from the terminal.

To invoke a CLIST or TSO file, use the following command:

Syntax
```
{M204FS | M204TTY} ['[subsystem:]channel_name']
    [FILE(ddname) | CLIST] [DEBUG]
```

where:

CLIST	Specifies that user input is obtained from the current CLIST.
FILE	Specifies that user inputs obtained from a file containing 80-byte records. If a *ddname* is not specified, then 'COMMAND' is assumed. This file must be allocated to the TSO user region before executing the command. **Note:** The FILE option can be used only if the user's terminal is set to full-screen mode (IODEV = 11). It cannot be used in line-at-a-time mode (IODEV = 29).
DEBUG	Specifies that all input and Model 204 output is sent to the terminal, regardless of origin. **Note:** The DEBUG option can be used only in full-screen mode (IODEV = 11).

The commands described in Table 5-1 on page 57 allow the terminal user to:

• Switch between a CLIST or file and the terminal (in full-screen mode only)

- Switch back and forth between a CLIST and the terminal (in line-at-a-time mode only)

- Suppress terminal output (in both full-screen and line-at-a-time modes).

These commands are processed immediately by the TSO interface. Each of the commands can be entered in one of the following ways:

- Directly from a terminal, CLIST, or file

- Produced as output from Model 204.

If one of the commands is entered from a terminal, it is not passed to Model 204. If it is produced by Model 204, it is not sent to the terminal.

Table 5-1.   CLIST commands

Command	Function
/INPUTTERM	Suspends processing of input from a CLIST or file. Subsequent input is expected from the terminal.
/INPUTLIST	Resumes processing of the CLIST, reversing the effect of the /INPUTTERM command. If this command is sent as an output line from Model 204 and if TSO was not invoked as a CP (command processor), the TSO user receives the message shown below and the session is ended: `APPLICATION REQUESTED DISCONNECT` **Note:** The /INPUTLIST command can be used only if the user's terminal is set to line-at-a-time mode (IODEV = 29). It cannot be used in full-screen mode (IODEV = 11).
/OUTPUTSTOP	Causes output from Model 204 to be discarded, rather than sent to the terminal.
/OUTPUTTERM	This command causes output from Model 204 to be sent to the user's terminal, reversing the effect of the /OUTPUTSTOP command.

/DISCONNECT	This command causes the session with Model 204 to be terminated as if the Model 204 DISCONNECT command were entered. Control is returned to TSO at the point where the interface was executed, either in a CLIST or at command level. This command is processed by the interface only if the command is received from the following procedure:
	
	 `BEGIN`
	 `  SCREEN DISCONNECT`
	 `  TITLE '/DISCONNECT'`
	 `  END SCREEN`
	 `  READ SCREEN DISCONNECT`
	 `END`

Return codes

The interface sets a return code that can be tested by the CLIST. If the interface is invoked by a CLIST, the messages corresponding to error return codes are suppressed. The following return codes are supported:

Register 15 code	Meaning
X'14'	Unable to open command file
X'11'	Unsupported terminal type
X'10'	Cross-Region Access Method not operative
X'0C'	Cross-Region Access Method is busy
X'04'	Model 204 has terminated

Refer to the Rocket Model 204 messages documentation for explanations of these messages.

Input lines

Whenever the terminal is prepared to accept input, it displays a prompt character and/or unlocks the keyboard, depending on terminal type. Table 5-2 lists the terminal type and corresponding character/action.

Table 5-2. Terminal input prompts and action

Terminal	Character	Action
3270	>	Keyboard unlocked
Teletype		Keyboard unlocked

The user enters a line of characters and then signals the end of the line by pressing the Return or Enter key. No data is sent to Model 204 until the Return or Enter key is pressed. You can edit the input line (before it is entered) in one of the following ways:

- Use the TSO input edit conventions defined in the TSO profile.

- Reset the EDIT parameter to 1 or 5 and use the Model 204 input editing conventions.

    For more information on the EDIT parameter, refer to the Rocket Model 204 documentation wiki page:

    http://m204wiki.rocketsoftware.com/index.php/EDIT_parameter

Backpaging

TSO supports the Model 204 backpaging feature. (For more information about backpaging, see "Backpaging" on page 8). Backpaging is available through

TSO only if the system manager sets the NBKPG (number of backpages) parameter to a positive number on User 0's parameter line during system initialization. In addition, the user must have the OUTLPP parameter set to a positive number.

For more information on these parameters, refer to the Rocket Model 204 documentation wiki pages:

http://m204wiki.rocketsoftware.com/index.php/NBKPG_parameter

http://m204wiki.rocketsoftware.com/index.php/OUTLPP_parameter

Occasionally a displayed backpage can contain more lines than the original display of the page contained. This can occur when the attention key is used to interrupt output from Model 204. Output lines can be generated by Model 204 during the delay between TSO's receiving the attention interrupt and Model 204's receiving this interrupt from TSO. These lines are ignored by TSO but are stored in the backpage buffer.

Disconnecting

To disconnect from the TSO interface, follow these steps:

1. Log out of Model 204 in the normal way by entering:

    LOGOUT

    or:

    LOGOFF

    Model 204 acknowledges the command as shown in the preceding sections.

2. To close the TSO connection to Model 204, enter:

    DISCONNECT

    or:

    DISC

    The interface then releases the connection and returns control to TSO.

If the interface detects that Model 204 has terminated while a connection is active, the following message is issued, and control returns to TSO:

```
MODEL 204 HAS TERMINATED EXECUTION
```

IBM 3270 terminals (IODEV = 11)

This section summarizes the information needed to use IBM 3270s (and compatible terminals) operating under TSO in full-screen mode.

Input lines

TSO users can utilize the full-screen input features described in "Full-screen formatting" on page 9. These features allow the entire screen to be formatted and displayed as a single entity. The user usually responds to prompts that are displayed on the screen. When the entire screen has been filled in, the user presses the Enter key, and the data is transmitted from the terminal to Model 204 for processing.

Program Function (PF) keys are supported by Model 204 only when the user accesses a screen formatted through the SOUL full-screen formatting feature. Otherwise, PF keys are not supported and cannot be used to enter data. Any line entered by means of a PF key is considered null, and any data entered is lost.

Attention key

The PA1 key serves as the attention key on IBM 3270 terminals, unless the attention key has been reassigned by the user through the FATTN parameter. For more information on the FSATTN parameter, refer to the Rocket Model 204 documentation wiki parameter page:

http://m204wiki.rocketsoftware.com/index.php/FSATTN_parameter

Screen-formatting parameters

The screen-formatting parameters listed in Table 5-3 apply to IBM 3270 terminals being used through TSO. The PGSEP parameter is not listed; it is not used with IBM 3270 terminals.

Table 5-3. Screen-formatting parameters for TSO interface

Parameter	Meaning
INMRL	Maximum input line length for terminal
INCCC	Input continuation column
LOUTPB	Length of output page buffer
OUTMRL	Maximum output line length for terminal
OUTCCC	Output continuation column
OUTLPP	Number of lines per page, including headers and trailers
MODEL	Array of screen size parameters for the particular 3270 model
HDRCTL	Page formatting options

The values of the first five parameters, which determine the size of the screen, are actually established by the value of MODEL, which corresponds to the terminal model within the 3270 family. Model 204 automatically sets MODEL to

the appropriate value for SNA Communications Server (formerly VTAM) 3270s used through TSO, but the user also can reset it.

Terminal model options

Table 5-4 shows the valid settings for MODEL, the corresponding terminal types, and the corresponding default values for the screen size parameters. You can reset INCCC and OUTCCC to override the default values established by the MODEL parameter.

Table 5-4.   Valid MODEL settings for TSO interface

MODEL	INMRL	INCCC	OUTMRL	OUTCCC	3270 terminal type
1	78	78	80	80	Model 1
2	78	78	80	80	Model 2
3	78	78	80	80	Model 3
4	78	78	80	80	Model 4
5	130	130	132	132	Model 5

Output page buffer settings

Note that MODEL is reset only if the size of the output page buffer (LOUTPB) is large enough to hold the new screen size. The minimum LOUTPB settings are listed in Table 5-5.

Table 5-5.   Minimum LOUTPB settings

MODEL	LOUTPB
0	1170
1	1170
2	2130
3	2770
4	3650
5	3774

Page header formats

HDRCTL consists of a series of switches that control the formatting of pages transmitted to the terminal. Each switch can be set independently of the others. HDRCTL can be reset to the following values for 3270 terminals, but is usually not reset:

0	Normal headers (system header showing date, time, and page number)
1	Suppress header 0 (system header showing date, time, and page number)
2	Suppress the blank line that normally follows header 0 for nonrequest output

Pausing and canceling output

At the end of each page of output, Model 204 pauses to allow the user to read the contents of the screen and to cancel the current request if too much output is being received. A prompting greater than sign (>) is displayed, indented 25 spaces on the last line of the screen.

Valid user responses are:

- Press Enter. The terminal goes on to the next page.

- Press the attention key or enter *CANCEL, C (cancel), or K (kill), followed by Enter. Unless an ON ATTENTION statement is in effect (see "Attention interrupt feature"), the current output and request are cancelled.

- Enter a backpage request. (See "Backpaging" on page 8).

- Enter the next input line, which cannot exceed 53 characters. As the user enters input, the cursor moves in order to indicate the number of spaces used.

As discussed in the section "Pausing" on page 7, enter only one line of anticipatory input at this time. If the terminal reaches the end-of-page pause for the next page of output, the saved input line is lost.

Canceling the current request

The user can cancel the evaluation of the current SOUL request in one of the following ways:

- If the terminal is waiting for input, press the attention key.

- If Model 204 is waiting for input from the terminal or is actively displaying output on the terminal, press the attention key.

Note: If Model 204 is compiling or executing a command, the user cannot cancel the operation by pressing the attention key.

IBM 3270 terminals (IODEV = 29)

This section summarizes the information needed to use IBM 3270s (and compatible terminals) operating under TSO in line-at-a-time mode.

PA1 key

The PA1 key can be used to cancel either a single line or multiple lines of output. It cannot be used to terminate the TSO interface and return to TSO.

Output parameters

As soon as the Model 204 connection is made, the TSO interface sets the following parameters to the default values shown in Table 5-6.

Table 5-6.   TSO interface output parameters for 3270s

Parameter	Meaning	Default
OUTMRL	Maximum output line length for terminal	80
OUTCCC	Output continuation column	80
OUTLPP	Number of lines per page, including headers and trailers	60

Pausing and canceling output

On the 3270, the TSO interface does not ordinarily pause at the bottom of the screen to allow the user to interrupt Model 204 or to cancel the current request if too much output is being received. The user can cause TSO to pause by specifying a page size in the OUTLPP parameter. If OUTLPP = 23, the interface pauses after 23 lines have been displayed and allows the final line (line 24) on the screen to be used for a backpage request. The TSO interface indicates that it is in pause mode by pausing and unlocking the keyboard.

Valid user responses are:

*   Press the attention key. The current request or operation is canceled and Model 204 is then ready to accept terminal input from the user.

*   Press Enter. The interface goes on to the next page.

*   Specify a backpage to be displayed, as described in "Backpaging" on page 58.

If too much output is being received, press the PA1 key at any time. It cancels all output and aborts the currently running request.

Teletypes (IODEV = 29)

This section summarizes the information needed to use Teletypes and compatible terminals operating under TSO.

Output parameters

As soon as the Model 204 connection is made, certain output conventions are established for Teletypes and compatible terminals. The TSO interface sets the following parameters to the default values shown in Table 5-7.

Table 5-7.   TSO interface output parameters for teletypes

Parameter	Meaning	Default
OUTMRL	Maximum output line length for terminal	80
OUTCCC	Output continuation column	80
OUTLPP	Number of lines per page, including headers and trailers	60

Pausing and canceling output

At the end of each page of output, the TSO interface pauses to allow the user to interrupt Model 204 or to cancel the current request if too much output is being received. The TSO interface indicates that it is in pause mode by ringing the teletype bell twice.

Valid user responses are:

- Press the attention key. The current request or operation is canceled and Model 204 is ready to accept any terminal input from the user.

- Enter a carriage return or any other character. The interface goes on to the next page.

- Specify a backpage to be displayed, as described in "Backpaging" on page 58.

Because the pause and cancel capability is activated at the end of a page, be sure not to set the OUTLPP (number of lines per page) parameter to zero, unless you want suppressed pausing and production of a header on the new page. If OUTLPP = 0, there is no logical end-of-page, and the interface never executes the pause.

If you find that you are receiving too much output, you can press the attention (BREAK) key at any time. This is equivalent to entering C or K. It cancels all output and aborts the currently running request. BREAK can be used to cancel either a single line or multiple lines of output. It cannot be used to terminate the TSO interface and return to TSO.

6

CMS Terminal Interface

Overview

CMS (Conversational Monitor System) is an interactive operating system that runs within z/VM. The z/VM system control program provides each user with a virtual machine (that is, an operating environment that appears to be a separate system).

This chapter describes the procedures to be followed when connecting to Model 204 through the CMS terminal interface.

Terminals supported

The CMS terminal interface supports the use of:

- IBM 3270 and compatible terminals

- Teletypes and Teletype-compatible terminals

Each of these terminal types provides slightly different capabilities, responses, and default parameter settings. The information supplied for these terminals in Chapter 3 does not necessarily apply when teletypes are used.

Selection of terminal support mode

Two modes of CMS terminal support are available to Model 204 users: multiuser and single-user. To select multiuser mode, the system manager must set the IODEV parameter on the user's parameter line

for the terminal. To select single-user mode, the system manager must set the ALTIODEV parameter in the single-user EXEC.

For more information about these system manager actions, see the CMS installation instructions for your operating system. See also the Rocket Model 204 documentation wiki:

http://m204wiki.rocketsoftware.com/index.php/Defining_the_User_Environme nt_(CCAIN)

Invoking and disconnecting from the CMS terminal interface

The steps required for logging in to Model 204 through the CMS terminal interface and for disconnecting from the CMS terminal interface are described in this section.

Getting online

To connect to Model 204 through CMS, follow these steps:

1. Gain access to CMS by following the z/VM connect procedures defined at the installation. Check with the system manager for specific information. CMS indicates that it has gained control by displaying a ready message.

2. Connect to Model 204 by using the M204 EXEC (described in "M204 EXEC"), which formats the Model 204 command. The M204 EXEC establishes the environment in which to run Model 204. After this command has been accepted, a prompt is displayed. On the 3270, for example, a greater than sign (>) is displayed.

   Refer to the Rocket Model 204 documentation wiki for more information on the M204 EXEC:

   http://m204wiki.rocketsoftware.com/index.php/Defining_the_User_Environ ment_(CCAIN)

3. Log in to Model 204 in the usual way, if not already logged in by a command file in the M204 EXEC (see the CMD option in the section "M204 EXEC options" on page 67).

M204 EXEC

The format of the M204 EXEC, as distributed by Rocket Software, is shown below. If an option is not specified, Model 204 provides a default. Defaults can be established for an installation by the system manager, as described in the Rocket Model 204 documentation wiki:

http://m204wiki.rocketsoftware.com/index.php/Defining_the_user_environmen t_(CCAIN)

The user can obtain more information about the M204 EXEC by issuing the HELP 204 M204 command.

Syntax `M204 [() [[LINE | DISPLAY]`

`[USERID userid | CHANNEL channel | DISCONN string`
`|`
`  SUBSET string | CMS filename]`

`  [LOGIN] [NOLOGIN]`

`  [DCSS] [NUCEXT] [UAREA]`

`  [ONLINE] [IFDIAL]`

`  [VMCF]] [)]`

M204 EXEC options

The M204 EXEC options have the following meanings:

This option...	Specifies...
LINE or DISPLAY	Mode in which the communication is to be performed. LINE represents line mode and DISPLAY represents full-screen mode. The user can select LINE or DISPLAY, but not both. LINE is the default for all terminals except 3270 terminals; DISPLAY is the default for 3270 terminals. If DISPLAY is the default and a CHANNEL option is not specified, an unsuccessful connection attempt results in an automatic attempt to connect in LINE mode.
USERID *userid*	User ID of the virtual machine in which the Model 204 program to be accessed is executing. If *userid* is specified as an asterisk (*), Model 204 is invoked in single-user mode.
CHANNEL *channel*	Name of the channel (1-8 characters) to which the connection is desired. If the IUCV interface is used, a channel name of M204VMFS must be specified for IODEV 41; a channel name of M204VMIO must be specified for IODEV 39. **Note:** If the CHANNEL option is used, a mode (either LINE or DISPLAY) also must be specified.
DISCONN *string*	Character string that is the Model 204 disconnect sequence. If this string is entered, a DISCONNECT command is transmitted to Model 204. The DISCONN option is ignored if Model 204 is invoked in single-user mode.

This option...	Specifies...
SUBSET *string*	Character string that is the CMS SUBSET entry sequence. If this string is entered as the only input data on the screen, the user enters CMS SUBSET mode. In this mode, the user can execute any CMS commands that are nucleus-resident or that load in the Transient Area. For a summary of these commands, refer to the IBM *z/VM CMS Command and MACRO Reference*.
	After the user returns from CMS SUBSET mode (by use of the RETURN command in CMS), the subset string is redisplayed on the terminal at the same point the user had entered it.
	The SUBSET option is ignored if Model 204 is invoked in single-user mode.
CMD *filename*	Name (1-8 characters) of a user-created file containing commands that are to be read as the initial input to Model 204. The command file must have a file type of M204CMND and reside on a disk accessed by the CMS user's virtual machine.
LOGIN or NOLOGIN	Whether Model 204 automatically generates the initial LOGIN command. LOGIN specifies that Model 204 generate the command. NOLOGIN specifies that Model 204 *not* generate the command. The user can select LOGIN or NOLOGIN, but not both. LOGIN is the default.
	The LOGIN/NOLOGIN option is ignored if Model 204 is invoked in single-user mode.
ONLINE or IFDIAL	Connection type for a single user invocation (that is, USER *). ONLINE runs a normal Online connection type; IFDIAL runs an IFDIAL connection type. ONLINE is the default.
VMCF or IUCV	Type of communication used (that is, the VMCF or IUCV interface). Although either VMCF or IUCV can be specified, IUCV communication is always used.
	Note: In future releases, specifying VMCF might not be supported.

DCSS, NUCEXT, and UAREA specify how the EXEC runs. The meanings of these options are as follows:

This option...	Causes the EXEC to...
DCSS (the default)	Load M204USR, the saved segment version of the CMS or IUCV interface program.
NUCEXT	Load the CMS or IUCV interface program as a nucleus extension. This option is valid only for CMS Release 3 or later.
UAREA	Run the CMS or IUCV interface program by running a module in the user area.

Input lines

Support is provided for two modes of operation: line-at-a-time and full-screen support. In line-at-a-time mode, when Model 204 is prepared to accept input, it issues the appropriate prompting character and unlocks the keyboard. After entering an input line, the user indicates that the line is complete and transmits the line by pressing the Enter or Return key. In full-screen mode, the user presses Enter to transmit the contents of the entire screen. The full-screen mode of operation is described in "Full-screen formatting" on page 9.

PF keys

Program Function (PF) keys are supported by Model 204 only when the user accesses a screen formatted through the SOUL full-screen formatting feature. Otherwise, PF keys are not supported and cannot be used to enter data. Any line entered by means of a PF key is considered null, and any data entered is lost.

Disconnecting

To disconnect, follow these steps:

1. Log out of Model 204 in the normal way by entering either:

    LOGOUT

    or:

    LOGOFF

    These commands can cause an automatic disconnect to occur.

2. If an automatic disconnect has not occurred, enter:

    DISCONNECT

    or the disconnect sequence for the installation.

CMS displays the Ready message.

Turning off the terminal

If the terminal is turned off during Model 204 processing, subsequent operations depend upon the type of terminal used.

If Model 204 is accessed in full-screen mode, the power-off condition is not detected until the terminal is turned on again. At this point, z/VM forcibly disconnects the user and starts a timer. After 15 minutes, unless the user reconnects to the virtual machine, the user is logged out of Model 204. Model 204 detects the logout and restarts.

If Model 204 is accessed in line-at-a-time mode, z/VM detects the power-off condition immediately, disconnects the user, and starts a timer. After 15 minutes, unless the user reconnects to the virtual machine, the user is logged out of Model 204. Model 204 detects the logout and restarts.

IBM 3270 terminals (IODEV = 41, ALTIODEV =47)

This section summarizes the information needed to use IBM 3270s (and compatible terminals) operating in full-screen mode. For full-screen usage in a multiuser environment, the IODEV parameter must be set to 41. For full-screen usage in a single-user environment, the ALTIODEV parameter must be set to 47.

Attention key

The PA1 key serves as the attention key on IBM 3270 terminals, unless the attention key has been reassigned by the user through the FSATTN parameter. For more information on the FSATTN parameter, refer to the Rocket Model 204 documentation wiki parameter page:

http://m204wiki.rocketsoftware.com/index.php/FSATTN_parameter

An attention interrupt also can be transmitted by first pressing the RESET key when the keyboard is locked (for example, during request compilation) and then pressing either Enter, PA1, PA2, CLEAR, or any PF key.

Pausing and canceling output

In full-screen mode, Model 204 pauses at the end of each page of output to allow the user to read the contents of the screen or to cancel the current request if too much output is being received.

Valid user responses are.

- Press Enter. The terminal goes on to the next page.

- Press the attention key. Unless an ON ATTENTION statement is in effect (see"Attention interrupt feature" on page 11), the current output and request are canceled.

- Enter a backpage request. (See "Backpaging" on page 8.)

  Note: The system manager must have set the NBKPG (number of backpages) parameter to allow the user to utilize this feature.

- Enter the next input line.

Screen-formatting parameters

The screen-formatting parameters listed in Table 6-1 apply to IBM 3270 terminals used in full-screen mode through CMS. The PGSEP parameter is not used with IBM 3270 terminals.

Table 6-1. Screen-formatting parameters for CMS 3270s

Parameter	Meaning	Default
INMRL	Maximum input line length for terminal	*78
INCCC	Input continuation column	*72
OUTMRL	Maximum output line length for terminal	80
OUTCCC	Output continuation column	80
OUTLPP	Number of lines per page, including headers and trailers	**23
HDRCTL	Page formatting options	0

*Corresponds to single line on screen after prompt and 3270 control characters.

** Last line on screen (24) reserved for end-of-page pause control.

Parameters that describe the physical characteristics of the terminal (INMRL, INCCC, OUTMRL, OUTCCC, OUTLPP) are set automatically when the terminal is logged on. The values of these parameters are set implicitly according to the MODEL parameter setting. See the next section, "Terminal model options", for more information on the MODEL parameter.

Terminal model options

Table 6-2 shows the valid settings for MODEL, the corresponding terminal type, and the corresponding default values for the screen size parameters. The user can reset INCCC and OUTCCC to override the default values established by the MODEL parameter.

Table 6-2. Valid MODEL settings for CMS 3270s

MODEL	INMRL	INCCC	OUTMRL	OUTCCC	3270 terminal type
1	78	78	80	80	Model 1
2	78	78	80	80	Model 2
3	78	78	80	80	Model 3
4	78	78	80	80	Model 4
5	130	130	132	132	Model 5

Output page buffer settings

MODEL is reset only if the size of the output page buffer (LOUTPB) is large enough to hold the new screen size. The minimum LOUTPB settings are listed in Table 6-3.

Table 6-3. Minimum LOUTPB settings

MODEL	LOUTPB
0	1170
1	1170
2	2130
3	2770
4	3650
5	3774

Page header formats

HDRCTL consists of a series of switches that control the formatting of pages transmitted to the terminal. Each switch can be set independently of the other. HDRCTL can be reset to the following values for 3270 terminals, but usually is not reset:

0	Normal headers (system header showing date, time, and page number)
1	Suppress header 0 (system header showing date, time, and page number)
2	Suppress the blank line that normally follows header 0 for nonrequest output

Handling messages from other terminals

When Model 204 is running in full-screen mode and one user sends a message or a file to another user's terminal using the z/VM facilities, confusion can sometimes result. For example, suppose that user A sends a message to user B's terminal. The z/VM system interrupts user B's Model 204 output and displays the following message at the top of the terminal screen:

```
14: 02: 31
MSG FROM OPERATOR:  TESTING
```

The HOLDING message appears in the status area at the bottom right corner of the screen. User B must press the CLEAR or PA2 key to clear the screen and return to Model 204. The remainder of the output is then displayed.

Suppose that user A sends a file to user B's terminal. The z/VM system interrupts user B's Model 204 output and displays a file message such as the following, at the top of user B's terminal screen.

```
PUN FILE 4545 FROM MAINT COPY 001 NOHOLD
```

The MORE... prompt appears in the status area of the screen. At this point, if user B presses Enter, the status area prompt switches to HOLDING; if user B presses Enter again, the prompt switches to MORE... once again. The user must press the CLEAR key to clear the screen. If the user does not press the CLEAR key, the terminal waits 50 seconds, sounds the alarm, waits 10 more seconds, and then clears the screen and continues with Model 204 output.

The system manager can use the Message System Service (*MSG) to control the display of messages on the terminal. See your IBM z/VM system documentation for details.

Teletype terminals (IODEV = 39, ALTIODEV = 45)

This section summarizes the information needed to use Teletypes and Teletype-compatible devices operating under CMS in line-at-a-time mode. For line-at-a-time usage in a multiuser environment, the IODEV parameter must be set to 39. For line-at-a-time usage in a single-user environment, the ALTIODEV parameter must be set to 45.

Attention key

The BREAK key serves as the attention key on Teletype-compatible terminals. The ATTN key serves as the attention key on IBM 2741 and compatible terminals.

Pausing and canceling output

In line-at-a-time mode, Model 204 pauses at the end of each page of output to allow the user to cancel the current request if too much output is being received.

Valid user responses are:

- Press Return (or any other character) to go on to the next page.

- Press the attention key. Unless an ON ATTENTION statement is in effect (see"Attention interrupt feature" on page 11), the current output and request are canceled.

Parameters

The parameters listed in Table 6-4 apply to Teletypes and compatible devices being used through CMS.

Table 6-4.   Screen-formatting parameters for CMS Teletypes

Parameter	Meaning	Default
INMRL	Maximum input line length for terminal	80

Table 6-4.   Screen-formatting parameters for CMS Teletypes

Parameter	Meaning	Default
INCCC	Input continuation column	72
OUTMRL	Maximum output line length for terminal	132
OUTCCC	Output continuation column	132
OUTLPP	Number of lines per page, including headers and trailers	56
PGSEP	Number of lines between output pages	2
HDRCTL	Page formatting options	0
TERMOPT	Terminal options	0

These parameters can be reset using the RESET command. The settings of INMRL, INCCC, OUTMRL, and OUTCCC cannot exceed 132. If a larger value is specified, it is automatically changed to 132.

Page header formats

HDRCTL consists of a series of switches that control the formatting of pages transmitted to the terminal. Each switch can be set independently of the others. HDRCTL can be reset to the following values for Teletypes and compatible terminals:

0	Normal headers (system header showing date, time, and page number)
1	Suppress header 0 (system header showing date, time, and page number)
2	Suppress the blank line that normally follows header 0 for nonrequest output
4	Pause at the end of an output page; add a line to each page, in addition to OUTLPP plus PGSEP, to receive a reply.

TERMOPT consists of a series of switches that can be set independently and can be reset to the following values for Teletypes and compatible terminals:

0	Terminal is hard copy (not CRT); no backpaging.
2	Terminal is soft copy (CRT); save and display backpages.

Line-editing characters

When Model 204 is being run in line-at-a-time mode, all the line-editing characters supported by z/VM can be specified. Refer to the IBM *z/VM: CMS User's Guide* for a summary of these characters.

Table 6-5 lists the defaults for the z/VM logical line-editing symbols.

Table 6-5.   Defaults for z/VM logical line-editing symbols

Symbol	Character	Function
Logical character delete	@	Deletes a character
Logical line end	#	Indicates logical end-of-line to enable multiple logical lines to be entered on a single physical line.
Logical line delete	¢	Deletes a line.
Logical escape	"	Causes z/VM to consider the next character to be a data character, not a line-editing symbol; used when the input contains a character such as @ or #.

The user can define special line-editing characters for a particular virtual machine. Use the z/VM CP QUERY TERMINAL command to determine characters in effect for a virtual machine, and the CP TERMINAL command to change characters. In the following example, the line-end character is reset to slash (/):

```
CP QUERY TERMINAL

LINEND #, LINEDEL ¢, CHARDEL @, ESCAPE " TABCHAR ON

CP TERMINAL LINEND /
```

Model 204 provides its own line-editing characters, defined as parameters, some of which are the same as those used by z/VM.

Table 6-6 lists the Model 204 parameters that affect line editing.

Table 6-6.   Model 204 line-editing parameters

Parameter	Default	Function
ERASE	@	Deletes a character
FLUSH	#	Deletes a line
LINEND	;	Indicates a logical end-of-line

To avoid confusion between the z/VM and Model 204 line-editing characters, the user might want to redefine either the z/VM or Model 204 characters, depending upon whether z/VM or Model 204 is to handle certain types of editing functions.

Note: If identical z/VM and Model 204 symbols are in effect at the same time, unpredictable results can occur.

Teletype terminals (IODEV = 39, ALTIODEV = 45)

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