
RCSL No: 31-D580

Edition: September 1979

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Title:

RC8000 Terminal Process

Keywords:

RC8000, external process

Abstract:

This paper describes the conventions of an external process controlling a terminal connected to RC8000.

Replaces RCSL No 31-D538. Changes are marked with a vertical bar in the margin.

(10 printed pages)

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Printed by A/S Regnecentralen af 1979, Copenhagen

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General Rules.

Operations can be initiated by any internal process that is a user of the device. Initialization has no effect. A terminal process accepts messages simultaneously from more than one internal process provided no internal process has reserved it. Setting the terminal in the local state has no effect other than delaying input/output until the device is set remote again, while it works as disconnected and connected for the other devices served by this process. All input operations are started by outputting a bell character (value 7) on the device.

Attention Message.

The operator depresses the ESC button. This will cause the monitor to write 'att' on the device and the operator can now identify the internal process he wants to communicate with by writing its process name.

In normal cases the monitor sends an attention message to the internal process identifying the device by its process description address (sender(buf)). However, if the name does not identify an existing internal process the monitor answers 'unknown'.

If the terminal process is reserved, no 'att' is written, but an attention message is sent to the reserving internal process.

Attention message:

0
0
0
0

Sense Operation.

The operation is dummy and is answered with statusword = 0

Input Operation.

User Name.

If the name of the sender differs from the name of the last internal process that has communicated with the terminal process, the name of the sender is output in the following format:

<new line> to <name of sender> <new line>

Input.

A BELL-character is output, to signal the operator that input may take place.

Now the operator can input characters to a storage area within the sending process. Characters are stored with three 8-bit characters per word. Unused character positions in the last input word are filled with NUL characters.

Conversion.

To serve the teletype terminal a facility for converting capital letters to small letters is included.

Conversion takes place for input in mode 0 and 2 provided the conversion state is true. This state is set to true when one of the following conditions are satisfied:

- 1) EM is read (mode 0)
- 2) the device becomes disconnected (modes 0, 2, or 4)
- 3) at operator key interrupt (mode 0)

The conversion state is set to false when the first small letter is encountered.

Timer interrupt.

If the operator waits more than approx. 60 seconds (in mode 2 or 4 only 5 seconds) between input of two characters the input operation is terminated.

Input Termination.

Input termination depends on the input mode.

Input Mode.

The mode which is part of the message defines how the read charac-

ters are interpreted by the monitor.

Mode = 0.

The mode is intended for conversational operation by means of the keyboard. In this mode answers are returned to the sending process in the following situations:

- 1) when the area is full, or
- 2) at operator key interrupt, or
- 3) when timeout occurs, or
- 4) when the device is disconnected, or
- 5) when a NL character is read, or
- 6) when a EM character is read,

whichever occurs first.

The characters are interpreted as ISO characters in even parity. All odd parity characters are replaced by a SUBSTITUTE character (ISO 26).

Four characters have a special action in this mode; they are called:

ENQ	(ENQUIRY)	key CTRL + E
EM	(END MEDIUM)	key CTRL + Y
BS	(BACKSPACE)	key BACKSPACE
RUBOUT	(RUBOUT)	key RUBOUT

The ENQ character will cause all previously read characters (since last line termination or timeout) to be deleted, while the BS character and the RUBOUT character will delete the last read character (if any character was read since last line termination or timeout). EM will terminate input.

RC STANDARD:

	ISO value	Echoed as
ENQ	5	94 (↑)
EM	25	13 10 (CR LF)
BS	8	8 32 8 (BS SP BS)
RUBOUT	127	95 (←)

Mode = 2 and Mode = 4.

These two input modes are intended for paper input from teletype-

minals. The problem using the paper reader connected to the terminals arises from the fact that this reader cannot be program controlled. Once started the reader will continue to transmit characters either until manually stopped or until the end of the paper tape. This again means that the only way a program can determine whether the transmission of a paper tape is terminated, is through the timer interrupt generated when no characters have been input for a certain period. In these two modes answers are returned to the sending process in the following situations:

- 1) when the area is full, or
- 2) when one timer interrupt is received, or
- 3) when the device is disconnected,

whichever occurs first.

In mode 2 the characters read are interpreted as ISO characters in even parity. All odd parity characters are replaced by a SUBSTITUTE character (ISO 26).

In mode 4 the characters read are interpreted in no parity mode i.e. as 8-bit characters without parity. All 8-bit patterns are accepted and stored in the input area. This mode enables the user to have 8-bit paper tapes of any coding and in any parity transmitted from the terminal to RC8000.

Output Operation.

User Name.

If the name of the sender differs from the name of the last internal process that has communicated with the terminal process, the name of the sender is output in the following format:

<new line> from <name of sender> <new line>

Output.

A textstring consisting of one or more lines is output from a storage area within the sending process. Characters must be stored with three characters per word.

Output Termination.

Output is terminated,

- 1) when the area is empty, or

2) at operator key interrupt, or
 3) after timer interrupt, or
 4) when the device is disconnected,
 whichever occurs first.

Output is terminated by an answer defining the actual number of characters output. In case of abnormal termination (2, 3, and 4) the number of characters may be wrong using output in mode 0.

Output Mode.

Output can be performed in 3 modes: 0, 2, and 4. In all modes the char. 128 will cause the multiplexer to stop output.

Mode 0:

Normal text mode: The characters are interpreted as 7-bit ISO characters with or without parity. The characters with value ≥ 32 and ≤ 255 will be written without conversion. The character with value 10 (NL) will be converted to the following sequence:

<13><10><127><127><127><127>

The character with value 7 (BELL) will be output as <7>, all other characters with value <32 will be skipped.

Mode 2:

Transparent text mode: The characters are interpreted as ISO-characters in even parity. All characters will be written as (char and 127).

Mode 4:

Transparent output mode: The characters are interpreted in no parity mode i.e. as 8-bit characters without parity. All 8-bit patterns (256) excl. 128 are accepted and written.

Status Bits.

2 timer
 7 operator key

Messages and Answers.

Operation:	message:	answer:
sense	0	0 0 0
input	3 < 12 + mode first storage address last storage address	status word number of halfwords number of characters
output	5 < 12 + mode first storage address last storage address	status word number of halfwords number of characters

RETURN LETTER

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