Title:

RC8000 MAGNETIC TAPE PROCESS (7 track)

Keywords:

RC8000, external process.

Abstract:

This paper describes the conventions of an external process controlling
a magnetic tape station connected to RC8000.

(12 printed pages)

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General Rules.

Operations can be initiated by an internal process that has <u>initialized</u> or <u>reserved</u> the device.

The device is sensed before each operation. If the status word indicates an intervention by the operator in the local mode, the name of the process is removed (together with the present reservation) and all messages are answered with the result: <u>receiver does not exist</u>. The device is now in the state: <u>document removed</u>.

When the operator switches back to <u>remote</u> mode, the device state will be set to: <u>unidentified document mounted</u>.

When the device is named by the monitor procedure <u>create peripheral process</u>, the device state becomes: <u>identified document mounted</u>.

File and Block Count.

All answers from magnetic tape contain a file and block number defining the position of the tape after the operation. These numbers are undefined after mounting. File and block number are reset to zero only when load point is sensed after an operation.

The file number is increased by one after the output of a tape mark or the sensing of a tape mark during a forward operation. It is decreased by one when a tape mark is sensed after a backward operation. The block number is increased by one when a block is input, output, or upspaced. If a tape mark is sensed during a forward operation, the block number is set to zero.

The block number is decreased by one when a block is backspaced.

These simple file and block numbers are based solely on a count of initiated operations and sensed status bits. There is no check against file and block numbers recorded in labels and data blocks.

Density.

The density of the station is 556 bpi (NRZI).

Block Size.

The storage area defined by input or output operations must not exceed 2080 halfwords. A violation will be treated as an <u>unintelligible message</u>.

Sense Operation.

The device is sensed and the status word delivered as an answer.

Input Operation.

A block of characters is input to a storage area within the sending process. Each storage word contains four 6-bit characters. Unused character positions in the last input word are filled with NUL characters.

Input is terminated, when

    1)   data have been transferred to the last storage address, or

    2)   the block on the tape is exhausted, or

    3)   data overrun is detected, or

    4)   timer error is detected,

whichever occurs first.

Output Operation.

A storage area within the sending process is output as one block. Each storage word is output as four 6-bit characters.

Output is terminated, when

    1)   the whole block has been output, or

    2)   output of an all-zero even parity character is attempted, or

    3)   data overrun is detected,

whichever occurs first.

Erase Operation.

Erases a length of tape.

Move Operation.

Moves the tape in accordance with the move operation defined in the message (if the move operation is negative or greater than six it is treated as a sense operation):

move operation: 0 upspace file

       1 upspace block

       2 backspace file

       3 backspace block

       4 rewind tape

       5 unload tape

       6 position tape

Move operation 6 positions the tape as specified in the message. If the specified file of block number is negative the operation is treated as a sense operation. If the block specified does not exist the tape will be positioned at the start of the file after the one specified.

Move operation 5 rewinds the tape and when BOT is sensed sets the unit off-line.

If the specified file and block number is zero, a rewind operation is always executed.

Output Tape Mark.

Outputs two tape marks and positions after the first.

Set Mode Operation.

Selects parity for subsequent I/O operations.

Mode.

Characters can be input or output in several ways defined by the sum of numbers specifying parity, density, and trail.

mode = trail < 4 + density < 2 + parity < 1

parity: 0   odd parity

           1   even parity

density: 1   556 bpi/nrz

trail: 0   (in NCP rev. 4.00: trail = 1, 2, 3, 4, 5
                    will omit the last 2, 3, 4, 6, 7 6-bit
                    characters in output operation). If trail
                    > 5 it will be set to 5.

Status Bits.

0   intervention
1   parity error (after input, output, and erase)
2   timer (after input and output)
3   data overrun (after input and output)
4   block length error (after input)
5   EOT sensed (after input, output, erase, and upspace)
6   BOT sensed (after rewind and backspace)
7   tape mark sensed (after input, output tape mark, upspace,
     and backspace)
8   write-enable sensed (permanent)
9   mode error

Special Status Actions.

Timer.

If a timer error is detected in the status word the unit will be rewound the file no and block no will be set to zero.

Write Enable.

If the operation is output, erase, or output tape mark and the status word does not indicate write-enable, the operation will be treated as a sense operation.

Mode Error.

Mode error will only occur when the commands input/output, or set mode are used. If a mode error is detected in the status word a possible input or output operation is not executed. File no and block no are unchanged. The command which causes the mode error will be treated as a sense operation.

Messages and Answers.

operation:	message:	answer:
sense	0	status word 0 0 file number block number
input	$3 < 12 +$ mode first storage address last storage address	status word number of halfwords number of 8-bit bytes file number block number
output	$5 < 12 +$ mode first storage address last storage address	status word number of halfwords number of 8-bit bytes file number block number
erase	$6 < 12 + 0$	status word 0 0 file number block number
move	$8 < 12 + 0$ move operation file number block number	status word 0 0 file number block number

operation:	message:	answer:
output tape mark	10 < 12 + 0	status word
		0
		0
		file number
		block number
set mode	14 < 12 + mode	status word
		0
		0
		file number
		block number

In the answer the number of 8-bit bytes is evaluated as follows:

$$\text{number of 8-bit bytes} = c6 - (c6//4)$$

c6 denotes no of 6-bit characters

It means that 0, 2, 4, or 6 zero bit are included.

RETURN LETTER

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