

MEMORANDUM



TYMSHARE INC.

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TO ►

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FROM ► David Gardner

SUBJECT ► RANDOM FILES

This write-up describes the BRSS and SYSPOPS that a user will issue to control random file I/O.

COMPATABILITY

The non-privileged SYSPOPS for opening, reading, writing, and closing sequential files will work the same way at the user level. Additional SYSPOPS will be available for manipulating random files.

IMPORTANT FILE PARAMETERS

The following parameters are associated with a file.

- F The familiar file number that is returned by the open BRSS.
- CP Cursor position. The address of the next character, word, or block to be read or written. The lowest possible character address is 0. The highest is 14B6-1.
- CBOF Lowest character address in the file character space.
- CEOF Highest character address in the file character space.
CBOF and CEOF may be manipulated to restrict the users access to a file. Information may be read or written in the file space set by CBOF, CEOF. Characters that have been erased (See PCE, below) or have never been written are considered undefined. Input from undefined file areas yields zeros.

OPENING RANDOM FILES

The old open file BRSS call the EXEC which executes privileged BRSS which precisely control the opening of a file. In the Random Files operating system, the EXEC will set the initial values of CBOF, CEOF, and CP in a convenient way. The EXEC will also enable or disable certain user privileges.

The privileges are:

- P1 User may set file to read mode
- P2 User may set file to write mode
- P3 User may erase information from a file
- P4 User may change CBOF
- P5 User may change CEOF
- P6 User may effectively execute the SCP SYSPOP.

Normally all these privileges will be enabled when a file is open for output. P2 on P3 will be disabled when a file is open for input.

CLOSING RANDOM FILES

The same BRSSs that close sequential files will be used. If the file is closed when in write mode, all the information following the current CP is erased. If the file is closed when in read mode, all the file information, including updates and erasures, is saved.

FILE SYSPOPs

All of the file SYSPOPs trap if the file argument, F, is bad.

WIO F works the same as always and
WIO will increment the value of CP by 3.
WIO will trap if CP is not a multiple of 3.

CIO F same as always and CIO increments CP by 1.

BIO F same as always and
BIO will increment the value of CP by 3 times the number of words transferred.
BIO traps if CP is not a multiple of 3.

RCP F Read Cursor Position.
Puts the value of CP in bits of 1-23 of A.
The sign bit of A is set if in write mode.
The sign bit of A is zero if in read mode.
Bit 0 and bits 9-23 of X are unchanged.
Bits 1 and 2 are set to 0. Bits 3-8 contain a 6 bit privilege mask which most often will be uninteresting to the program, but will occasionally be vital information.
Bit 3 is on only if P1 is enabled.
Bit 4 is on only if P2 is enabled.
Bit 5 is on only if P3 is enabled.
Bit 6 is on only if P4 is enabled.
Bit 7 is on only if P5 is enabled.
Bit 8 is on only if P6 is enabled.
B is unchanged. RCP never skips.

SCP F Set cursor position
Sets the value of CP to agree with bits 1-23 of A.
Sets mode to read if sign bit of A = 0
Sets mode to write if sign bit of A = 1

Error return - no skip.

A,B, are unchanged. X contains error number.
X = 1. Cannot set mode specified by sign bit of A.
(See P1, P2 and P6 above)
X = 2 argument out of range set by CBOF, CEOF.

Normal single skip return

A, B, X are unchanged. CIO, WIO and BIO will operate on updated CP.

RBE F Read CBOF and CEOF
Bits 1-23 of A and B contain the values of CBOF and CEOF respectively. The sign bits of A and B are always set to zero. Also, bits 1 to 8 of X are changed to show the privilege mask in the same way as for RCP.
Bit 0 and bits 9-24 of X are unchanged.
RBE never skips.

SBE F Set CBOF and CEOF
Error return. No skip.
A and B unchanged
X = 1, Argument out of range. See definition of CP above.

Normal return 1 skip.
The privilege mask is inserted into X in the same way as for RCP.
If P4 is enabled, CBOF is set according to A.
If P4 is disabled, CBOF remains unchanged.
If P5 is enabled, CEOF is set according to B.
If P5 is disabled, CEOF remains unchanged.
Note that if bit 6 and bit 7 of X are set to zero, then execution of SBE does nothing useful except for reading the privilege mask into X.

PCE F Position cursor and erase.
This SYSPOP should only executed when file is in write mode. PCE increases the cursor position from the current value to the value specified in bits 1-23 of A. Bit 0 of A is ignored. Let CP1 be the current CP. Let CP2 be the final CP. All the characters from CP1 to CP2-1 are erased from the file. The physical file space may decrease.

Exception return. No skip. A, B, unchanged.
X = 1. Argument greater than or equal to CEOF.
The erase was completed as far as CEOF.

Errors
No skip. A, B, unchanged. File unchanged
X = 2. File not in output mode.
X = 3. P3 is disabled.
X = 4. Argument less than current CP.

Normal Return.
1 skip. A, B, X unchanged.
Erase completed.

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That is all for now. Additional information can be had from Dave Gardner. Suggestions are welcome.