Chapter 5

FILE PARAMETERS

5.1 INTRODUCTION

The characteristics of a file are defined by a number of parameters such as file name, record length, blocking factor. These parameters are stored in the VTOC record of the first file extent. For an E file, there is an index descriptor stored in the first block of the I file.

The file parameters are transferred from the application to data management and vice versa. File parameters are contained in the File Parameter Block.

When a new file is created by data management, the application must provide most of the file parameters and the complete index description.

When opening an existing file the application must provide those file descriptor items that are subject to change, such as Protection, Growth Factor, the I/O Option, and the index descriptors of the indexes to be opened.

The fields that are not relevant are "reserved" and must contain zeroes.

After opening a file, the file parameters can be obtained by by the application with the DSC instruction to read the File Parameters (code X'19'). The file parameters can be printed offline with the TOSS utilities Print VTOC (PVC) and Print Descriptor Block (PDB), which are described in the TOSS Utilities Reference Manual, module M8A.

The file parameters and index descriptors are discussed in the following sections. All the parameters used in ADM, EDM and SDM are listed here. Which parameters are required for each instruction is explained in Chapter 6 of this manual and also found in the corresponding instruction references in the CREDIT Reference Manual, module M4A.

5.2 DATA FILE PARAMETERS

The following parameters apply for all E, S, L and X files.

Record length	The length of the data records in bytes. The status byte is not included in the record length. The Record length may have any value from 1 to 2047 for standard files or from 4 to 2047 for E files. The maximum record length for a file created and handled by TOSS utilities is 2047 bytes.
Blocking factor	The number of data records per block in the data file. The blocking factor may have any value from 1 to 255. The maximum block length in SDM is 2047 bytes.
File organization	This field indicates the file type. 0 = Standard file or data file of S-type opened without indexes. 1 = E file or indexed file of S-type For ADM it can also have the values: 2 = L file (load file) 3 = X file (undefined file)
Device type	This field must contain the value 1 to indicate disk.
I/O option	This field indicates the output mode selected for the file when it was opened by the program: 0 = Physical read/write with read after write check. 1 = Basic read/write, no check. For SDM: 2 = Physical read/write and delay: I/O is performed to an internal block buffer and not immediately to disk. (See also 8.7.2). 3 = Delay and basic read/write.
Reserved	A field where File Management stores the internal identification of the data file and index file. This field is only used by some of the TOSS utilities.
File name	Data file name, consisting of one alphabetic character followed by 0 to 7 alphanumeric characters. System reserved file names are found in section 3.6.
Logging type (only EDM)	0 = no logging done for this file. 1 = transaction logging. 2 = function logging. 3 = transaction logging and function logging. For SDM and ADM this field must contain zero.

Growth factor	For E- and S- files, this field contains the percentage of the initial file size by which the file must be extended when during a Write instruction the end of the file is reached.
Data volume name 1	The name of the first volume where the data file resides. Volume name consists of up to 6 alphanumeric characters.
File section size 1	Number of data records residing on the first volume.
Data volume name 2	The name of the second volume where the data file resides. Volume name consists of up to 6 alphanumeric characters.
File section size 2	Number of data records residing on the second volume.
Data volume name 3	The name of the third volume where the data file resides. Volume name consists of up to 6 alphanumeric characters.
File section size 3	Number of data records residing on the third volume.
Data volume name 4	The name of the fourth volume where the data file resides. Volume name consists of up to 6 alphanumeric characters.
File section size 4	Number of data records residing on the fourth volume.

5.3 L AND X FILE PARAMETERS (only ADM)

For L and X files, the values of some file parameters are fixed:

Record length	Must be 256 for L files or a multiple of 256 for X files.
Blocking factor	must be 1.
File organization	2 = L file 3 = X file

The following items are added to the File Parameter block:

File record number	The relative key of the last record of the file written by Sequential Write instructions.
Number of users	The number of successful Open instructions that have been performed for this file on this file code. At a Close instruction, this number is decreased by one.
Protection	0 = file is opened for shared access. 1 = the file is opened for exclusive access
Creation date	A string of 6 characters representing YYMMDD or YYDDD left adjusted. The format will not be checked by the system.

NOTE:
File Record Number, Number of Users and Protection are used by the system and must not be set or updated by the application!

Retention period	A string of 3 characters representing DDD. The format will not be checked by the system.
Reserved	This field must contain binary zeroes.

5.4 INDEX FILE PARAMETERS

The following parameters define the indexes for E files and indexed S file structures. Fields that are not relevant must be set to zero, for example all the fields defining a conditional index must be set to zero for indexed files of S-type.

Index volume name	Name of volume where the index files and master index files reside for an indexed file structure for the SDM package, or the I file for the EDM package. Volume name consists of up to 6 alphanumeric characters. The first character must be alphabetic.
Index size	Size of the I file in number of index blocks (only significant for EDM).
Number of indexes	The number of index descriptors that follow for this data file. This is the number of indexes specified for the file when it is opened by the application. Value from 1 to 4 for SDM, from 1 to 10 for EDM. This number may be less than the number of indexes that actually exist for the data file, if not all of these indexes are relevant for the task that has opened the file. NOTE: In that case, if the records are updated and any keys are changed of the indexes that are not opened, file consistency is lost.

The following fields must be repeated for every index of the file structure. The index specified first is the primary index.

Internal index identification	A value generated by EDM to identify the part of the I file containing the index records for the key defined by the key description that follows. This parameter is used by the Read and the Posit instruction.
Index type	0 = no duplicate keys allowed 1 = duplicate keys allowed For the prime key this field must be zero. This parameter is only significant for EDM. In SDM, duplicate keys are always allowed for alternate keys.
Conditional index	0 = no conditional index 1 = conditional index For SDM this parameter must be = 0

Conditional Index Descriptor (only EDM)

If conditional index is specified, the following parameters are significant. If not, these fields must contain zeroes.

Condition	0 = Equal, the key is included in the index file if the value of the conditional item in the data record equals the Conditional Item Value specified. 1 = Unequal, the key is included in the index file if the value of the conditional item on the data record is not the same as the Conditional Item Value specified.
Conditional item displacement	The character position of the conditional item within the data record. The first character position of the data record is counted as zero.
Conditional item value	Value with which the conditional item on the data record must be compared.

Symbolic Key Descriptor

Number of key-items	Number of items that make up the key. Value may be from 1 to 16.

There is one key-item descriptor for every key item. Note that for an indexed files of S-type the symbolic key can not consist of more than one key item.

Key-item displacement	Position of the key item concerned within the data record, expressed as character position. The first position is counted as zero.
Key-item length	The length in bytes of the key item concerned. The sum of the lengths of the key items must not exceed 64 characters.

5.5 Layout of the File Parameter Block

Byte	
01	reserved
09	record length
11	blocking factor
12	file organization
13	reserved, must contain 1
14	I/O option
15	reserved
17	file name
25	logging (only EDM)
26	growth factor
27	data volume name 1
33	file size 1
37	data volume name 2
43	file size 2
47	data volume name 3
53	file size 3
57	data volume name 4
63	file size 4
From here, only for indexed files	
67	index volume name
73	index file size, for EDM
77	number of indexes
78	reserved

Index descriptor 1	79	reserved
	80	index type
	81	conditional index (only EDM)
	82	expression
	83	conditional item displacement
	85	conditional item value
	86	number of key items
Key descriptor	87	key displacement
	89	key length
	90	reserved

For L- and X-files, bytes 67 - 88 contain:

67	file record number (LRN)
71	number of users
72	reserved
73	sharability
74	reserved
75	reserved
76	reserved
77	reserved
79	creation date
85	retention period
88	reserved