Component Files

General	
`R ← ⎕FAVAIL`	Checks the file system availability (returns 1 if available, 0 otherwise)
`R ← ⎕FNUMS`	Lists the tie numbers of all tied files
`R ← ⎕FNAMES`	Lists the names of all tied files
`R ← ⎕FLIB Y`	Lists the names of the component files in directory Y
File operations	
`{R} ← X ⎕FCREATE Y`	Creates a new file with name (and, optionally, file size limit in bytes) X and file tie number (and, optionally, address size – can be 32 or 64, indicating the bit value in which address components are represented) Y; a tie number of 0 allocates the next available tie number to the file
`{R} ← X ⎕FTIE Y`	Exclusively-ties the file that has name X using file tie number* Y
`{R} ← X ⎕FSTIE Y`	Share-ties the file that has name X using file tie number* Y
`{R} ← ⎕FUNTIE Y`	Unties all files that have a tie number in vector Y
`R ← X ⎕FCOPY Y`	Copies the file that has tie number* Y to the new name X – this can be used to convert small span files to large span files without altering component access timestamps
`{R} ← X ⎕FERASE Y`	Erases the tied file that has name X and file tie number* Y
`{R} ← X ⎕FRENAME Y`	Renames the exclusively-tied file that has file tie number* Y to have name X
`R ← ⎕FHIST Y`	Returns the history of the file that has file tie number* Y
`R ← ⎕FSIZE Y`	Returns information on the number of the first component within the file that has file tie number* Y, the number of the next component to be appended, the current file size and the file size limit
`{R} ← {X} ⎕FRESIZE Y`	Relocates components within the file that has file tie number* Y to eliminate any redundant space between them and reduces the file size to a maximum size X – if X is not specified then the maximum possible size is allocated to the file
`R ← X ⎕FPROPS Y`	Reports and sets the properties of the file that has file tie number* Y according to the identifiers specified in X
`R ← ⎕FCHK Y`	Checks untied file Y – variants can be specified to indicate the action to take if this validation fails, for example `R ← ⎕FCHK ⍠ 1 ⊢ Y` attempts to repair file Y if a problem is found
Component operations	
`{R} ← X ⎕FAPPEND Y`	Appends array X as a component to the file that has tie number* Y
`{R} ← X ⎕FREPLACE Y`	Replaces a component in a file identified by file tie number and component number* Y with X
`R ← ⎕FREAD Y`	Reads the content of a component in the file identified by file tie number and component number* Y
`R ← ⎕FRDCI Y`	Returns information on the size of the component file that has file tie number* Y, the user number of the user who last updated it and the time since it was last updated in sixtieths of a second since 1st January 1970
`{R} ← ⎕FDROP Y`	Drops a block of components from the file as identified by Y – this comprises the file tie number* and the number of components to be dropped (a positive number indicates they are to be dropped from the beginning of the file, a negative number indicates they are to be dropped from the end of the file)
Manipulating access to a file	
`{R} ← X ⎕FSTAC Y`	Sets the access permissions of the file with file tie number* Y according to the access matrix X
`R ← ⎕FRDAC Y`	Returns a read-only version of the access matrix for the file that has file tie number* Y
`{R} ← ⎕FHOLD Y`	Holds the files that have file tie numbers* Y

* indicates that Y can, optionally, also include a passnumber

If no file extension is specified with a filename, then an extension of **.dws** is assumed (Microsoft Windows version only)

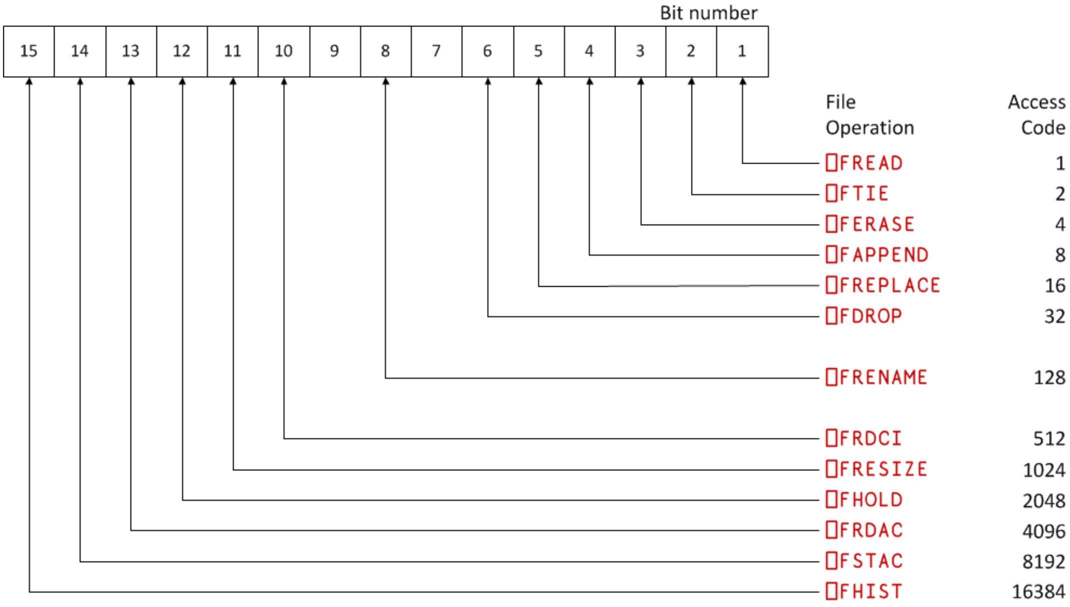
See the Dyalog APL documentation set for full details of these system functions, including variant options

Access Control

Dyalog APL's access matrix is an integer matrix with 3 columns and any number of rows.

- column 1 contains user numbers (as defined by the APLNID environment variable)
- column 2 contains an encoding of permitted file operations
- column 3 contains passnumbers

Each row specifies the file operations that can be performed by that row's user number/passnumber combination. The pertinent file operations and their associated access codes are shown in the following integer representation of a Boolean mask (where each bit in the mask indicates whether or not a particular file operation is permitted):



File Operation	Access Code
⎕FREAD	1
⎕FTIE	2
⎕FERASE	4
⎕FAPPEND	8
⎕FREPLACE	16
⎕FDROP	32
⎕FRENAME	128
⎕FRDCI	512
⎕FRESIZE	1024
⎕FHOLD	2048
⎕FRDAC	4096
⎕FSTAC	8192
⎕FHIST	16384

To determine the appropriate access code for a user, sum the access codes for that user's permitted file operations. A value of ¯1 (all bits set) permits all operations; this means that an alternative way of determining the appropriate access code for a user is to subtract the access codes of any file operations that are forbidden to that user from -1. Note that:

- Any non-zero permission code allows ⎕FSTIE and ⎕FSIZE
- ⎕FCREATE, ⎕FUNTIE, ⎕FLIB, ⎕FNAMES and ⎕FNUMS are not subject to access control
- Passnumbers can be used to establish different levels of access for the same user

Component File Properties (⎕FPROPS)

Identifier	Property	Valid Values	Default
S	File Size (read-only)	32 = small-span component files (maximum file size < 4 GB) 64 = large-span component files	64
E	Endianness (read-only)	0 = little-endian 1 = big-endian	depends on computer architecture
U	Unicode	0 = characters are written as type 82 arrays 1 = characters can be written as Unicode arrays	1 for Unicode edition and 64-bit file, 0 otherwise
J	Journaling	0 = disable journaling 1 = enable *APL crash proof* journaling 2 = enable *System crash proof* journaling; repair needed on recovery 3 = enable full *System crash proof* journaling	1 (can be changed using the APL_FCREATE_PROPS_J environment variable)
C	Checksum	0 = disable checksum 1 = enable checksum	1 (can be changed using the APL_FCREATE_PROPS_C environment variable)