Native Files

General	
`R ← ⎕NNAMES`	Lists the names of all tied native files.
`R ← ⎕NNUMS`	Lists the tie numbers of all tied native files.
`R ← {X} ⎕NPARTS Y`	Splits the filename Y into its constituent parts, returning a 3-element vector: • R[1] is the specified path. If X is 1 then the fully-qualified path is derived and returned. • R[2] is the base name, that is, the filename stripped of its path and extension. • R[3] is the file extension, including the leading . character.
File Operations	
`{R} ← X ⎕NCREATE Y`	Creates a new native file with name X and file tie number Y; a tie number of 0 allocates the next available tie number to the file.
`{R} ← {X} ⎕NDELETE Y`	Deletes the fully-qualified file/directory Y, returning a shy result of 1 if this is done successfully. If file/directory Y does not exist: • if X is 0 then an error is generated. This is the default. • if X is 1 then a value of 0 is returned (no error is generated).
`{R} ← X ⎕NERASE Y`	Erases the tied native file that has name X and file tie number Y.
`{R} ← X ⎕NRENAME Y`	Renames the tied native file that has file tie number Y to have name X.
`{R} ← X ⎕NRESIZE Y`	Changes the size of the native file that has file tie number Y to size X (either by truncating the file or by extending it with undefined additional bytes) .
`{R} ← X ⎕NTIE Y`	Ties the native file that has name X using file tie number Y[1]; optionally, Y[2] can specify the type of access needed by other users (see *Access Codes*) .
`{R} ← ⎕NUNTIE Y`	Unties all native files that have a tie number in vector Y (⎕NUNTIE ⍬ does not untie any files but flushes all file caches to disk) and returns the tie numbers of native files that have been untied.
File System Operations	

`{R} ← {X} ⎕MKDIR Y`	Creates new fully-qualified directory Y along with intermediate directories if required (determined by the value of X):
	• if X is 0 then directory Y is only created if its path already exists and its base name does not exist. This is the default.
	• if X is 1 then no action is taken if directory Y already exists.
	• if X is 2 then directory Y and any part of its path that does not already exist is created.
	• if X is 3 then:
	  o no action is taken if directory Y already exists
	  o directory Y and any part of its path that does not already exist is created
	Returns 1 if the directory Y is created successfully, 0 otherwise (if X is 0 or 2 then an error message is also generated if directory Y cannot be created successfully).

`R ← ⎕NEXISTS Y`	Returns 1 if the fully-qualified file/directory Y exists (can be accessed), 0 otherwise.
Data Transfer	
`{R} ← X ⎕NAPPEND Y`	Appends the ravel of array X to the end of the native file that has tie number Y[1]; optionally, Y[2] can specify the conversion code to use to convert array X (by default, 80 is assumed when using the Unicode version – see *Conversion Codes*) .

`R ← {X} ⎕NGET Y`	Reads a text file and returns a 3-element vector in which: • `[1]` is the character data in the file. • `[2]` is a character vector specifying the file encoding (see *File Encoding*). • `[3]` is numeric and is either `⍬` (if no line separator was found in the file) or a vector specifying the first newline separator found in the file (see *Line Separators*). `Y` is either a character vector/scalar containing the name of the file to be read or a 2-item vector in which `[1]` is the filename and `[2]` is an integer scalar specifying `flags`: • if `flags` is 0 then `R[1]` is a character vector. This is the default. • if `flags` is 1 then `R[1]` is a nested array of character vectors. `X` is a character vector specifying the decoding format to use if the specified file does not start with a recognised BOM (see *File Encoding*). If no BOM is present and no decoding format is specified, then the file is examined and its encoding format is deduced.
`{R} ← X ⎕NPUT Y`	Writes character data to a text file and returns (shy) the number of bytes successfully written to the file. `Y` is either a character vector/scalar containing the name of the file to be written or a 2-item vector in which `[1]` is the filename and `[2]` is an integer scalar specifying `flags`: • if `flags` is 0 then, if the file already exists, it will not be overwritten and an error is generated. This is the default. • if `flags` is 1 then the file will be written irrespective of whether it already exists. `X` can comprise up to three elements: • `[1]` is a vector of character vectors, each of which represents a line in the file to be written, or a simple character vector. • `[2]` is a character vector specifying the encoding to use (see *File Encoding*). Optional – the default is UTF-8-NOBOM. • `[3]` is numeric and is either `⍬` (same as the default) or a scalar/vector specifying the newline separator to use (see *Line Separators*). Optional – the default is (13 10) on Microsoft Windows and 10 on other platforms.
`R ← ⎕NREAD Y`	Reads the content of the native file identified by file tie number `Y[1]`; `Y[2]` specifies the conversion code to use (see *Conversion Codes*), `Y[3]` specifies the count (see *Conversion Codes*) and, optionally, `Y[4]` can define the offset from 0 of the first byte to read.
`{R} ← X ⎕NREPLACE Y`	Replaces content in a native file identified by file tie number `Y[1]` with `X`; `Y[2]` defines the offset from 0 of the first byte to replace and, optionally, `Y[3]` specifies the conversion code to use (by default, 80 is assumed when using the Unicode version) (see *Conversion Codes*) .
`{R} ←{X} ⎕NXLATE Y`	Associates the native file that has tie number `Y` with character translation vector `X`. Note that: • if `X` is not specified then the currently-associated translation vector is returned • if `X` has the value `(⍳256)-⎕IO` then the translation process is bypassed and raw input/output is provided • if `Y` is set to 0, then the translate vector used by `⎕DR` is used Unicode version only: This is only relevant when processing native files that contain characters expressed as indices into `⎕AV`.
Locking	
`{R} ← X ⎕NLOCK Y`	Changes the lock status (as defined by `X`) of part of the native file that has file tie number `Y[1]`; optionally, `Y[2]` can define the offset from 0 of the first byte to apply the lock change to (defaults to 0) and `Y[3]` can specify the number of bytes impacted by the lock change (defaults to the maximum possible file size) (see *File Encoding*).
File Properties	
`R ← ⎕NSIZE Y`	Returns the size in bytes of the native file that has file tie number `Y`.

`R ← {X} ⎕NINFO Y`	Returns an array of the information specified by X about file/directory Y (a file/directory name or native file tie number). X can specify any of the following values, in any order: • 0 : Name of Y. This is the default. • 1 : Type of Y. This can be 0 (not known), 1 (directory), 2 (file), 3 (character device) or 4 (symbolic link). On UNIX and Mac OS, can also be 5 (block device), 6 (FIFO) or 7 (socket) • 2 : Size of Y in bytes. • 3 : The time Y was last modified as a timestamp in ⎕TS format. • 4 : The user ID of the owner of Y. • 5 : The name of the owner of Y. • 6 : Whether Y is hidden. The file/directory name can include wildcard options (requires variant); in this case the result R remains the same shape as X but its depth increases with the number of files/directories that match the name.

Access Codes

The access codes used by ⎕NTIE are integer values calculated as the sum of:

- the type of access needed from users who have already tied the native file
- the type of access to grant to users who subsequently try to open the file while you have it open

Needed from existing users	
0	read access
1	write access
2	read and write access

Granted to subsequent users	
0	compatibility mode
16	no access (exclusive)
32	read access
48	write access
64	read and write access

Conversion Codes

The conversion codes used by ⎕NAPPEND, ⎕NREAD and ⎕NREPLACE vary according to the installation of Dyalog APL that is used to read the native file; the following two tables show the conversion codes for the Unicode version and Classic version respectively.

Value	Number of Bytes	Result Type	Result Shape
11	count	1 bit Boolean	8 x count
80	count	8 bit character	count
82*	count	8 bit character	count
83	count	8 bit integer	count
160	2 x count	16 bit character	count
163	2 x count	16 bit integer	count
320	4 x count	32 bit character	count
323	4 x count	32 bit integer	count
645	8 x count	64 bit floating	count

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82	count	8 bit character	count
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163	2 x count	16 bit integer	count
-	-	-	-
323	4 x count	32 bit integer	count
645	8 x count	64 bit floating	count

* Conversion code 82 is permitted in the Unicode Edition for compatibility and causes 1-byte data on file to be *translated* (according to ⎕NXLATE) from ⎕AV indices into normal (Unicode) characters of type 80, 160 or 320.

File Encoding

The file encoding used by ⎕NGET and ⎕NPUT. The UTF formats can be qualified with -BOM (for example, UTF-8-BOM) or –NOBOM (for example, UTF-16LE-NOBOM) to specify whether a BOM is/should be present; this qualification is always present when returned by ⎕NGET.

Encoding	Description
UTF-8	Data is encoded into UTF-8 format. If -BOM or -NOBOM is not appended, the default is -NOBOM.
UTF-16 UTF-16BE UTF-16LE	Data is encoded into UTF-16 format with either big or little endianness. The default for UTF-16 is the endianness of the host system (BE on AIX platforms, LE on others). If -BOM or -NOBOM is not appended, the default is -BOM.
UTF-32 UTF-32BE UTF-32LE	Data is encoded into UTF-32 format with either big or little endianness. The default for UTF-32 is the endianness of the host system (BE on AIX platforms, LE on others). If -BOM or -NOBOM is not appended, the default is -BOM.
ASCII	Data is encoded into 7-bit ASCII format
Windows-1252	Data is encoded into 8-bit Windows-1252 format
ANSI	ANSI is a synonym of Windows-1252

Line Separators

The line terminators recognised by ⎕NGET and ⎕NPUT.

For ⎕NGET:

- if R[1] is simple, then it comprises the contents of the file with all line separators normalised to ⎕UCS 10.
- if R[1] is nested, then it comprises the contents of the file split on the occurence of any of the line separators.

Value	Char	Description	Notes
13	CR	Carriage Return (U+000D)	Newline separators recognised by ⎕NGET (R[3]) and ⎕NPUT (X[3]).
10	LF	Line Feed (U+000A)	
13 10	CRLF	Carriage Return followed by Line Feed	
133	NEL	New Line (U+0085)	
11	VT	Vertical Tab (U+000B)	
12	FF	Form Feed (U+000C)	
2028	LS	Line Separator (U+2028)	
2029	PS	Paragraph Separator (U+2029)	

File Locking

Unlike component files, which can be tied with an exclusive tie or a share tie, native files cannot be tied in different ways. Instead, ⎕NLOCK is used to lock byte ranges within files, thereby managing access between users. There are three possible lock statuses:

- 1 means unlock
- 2 means read (share) lock – multiple read locks can exist over the same byte-range. The presence of a read lock prevents a write lock being obtained
- 3 means write lock – only one write lock can exist for a specific byte-range of a native file. The presence of a write lock prevents a read lock being obtained

The lock status can also, optionally, define a timeout period in seconds; if this period is exceeded before the lock status change has occurred, then a TIMEOUT error is displayed (defaults to no timeout limit).

Different file servers can follow different locking standards – ⎕NLOCK does not standardise this.