Predefined action! values

Bitwise actions

and~

```
USAGE:
     AND~ value1 value2

DESCRIPTION:
     Returns the first value ANDed with the second.
     AND~ is an action! value.

ARGUMENTS:
     value1       [logic! integer! char! bitset! binary! typeset! pair! tuple!
vector!]
     value2       [logic! integer! char! bitset! binary! typeset! pair! tuple!
vector!]

RETURNS:
     [logic! integer! char! bitset! binary! typeset! pair! tuple! vector!]
```

complement

```
USAGE:
     COMPLEMENT value

DESCRIPTION:
     Returns the opposite (complementing) value of the input value.
     COMPLEMENT is an action! value.

ARGUMENTS:
     value        [logic! integer! tuple! bitset! typeset! binary!]

RETURNS:
     [logic! integer! tuple! bitset! typeset! binary!]
```

or~

```
USAGE:
     OR~ value1 value2

DESCRIPTION:
     Returns the first value ORed with the second.
     OR~ is an action! value.

ARGUMENTS:
     value1       [logic! integer! char! bitset! binary! typeset! pair! tuple!
vector!]
     value2       [logic! integer! char! bitset! binary! typeset! pair! tuple!
vector!]

RETURNS:
     [logic! integer! char! bitset! binary! typeset! pair! tuple! vector!]
```

xor~

```
USAGE:
     XOR~ value1 value2

DESCRIPTION:
     Returns the first value exclusive ORed with the second.
     XOR~ is an action! value.

ARGUMENTS:
     value1       [logic! integer! char! bitset! binary! typeset! pair! tuple!
vector!]
     value2       [logic! integer! char! bitset! binary! typeset! pair! tuple!
vector!]

RETURNS:
     [logic! integer! char! bitset! binary! typeset! pair! tuple! vector!]
```

I/O actions

close

```
USAGE:
CLOSE port

DESCRIPTION:
Closes a port.
CLOSE is an action! value.

ARGUMENTS:
port [port!]
```

create

```
USAGE:
CREATE port

DESCRIPTION:
Send port a create request.
CREATE is an action! value.

ARGUMENTS:
port [port! file! url! block!]
```

delete

```
USAGE:
DELETE file

DESCRIPTION:
Deletes the specified file or empty folder.
DELETE is an action! value.

ARGUMENTS:
file [file! port!]
```

open

```
USAGE:
OPEN port

DESCRIPTION:
Opens a port; makes a new port from a specification if necessary.
OPEN is an action! value.

ARGUMENTS:
port [port! file! url! block!]

REFINEMENTS:
/new => Create new file - if it exists, deletes it.
/read => Open for read access.
/write => Open for write access.
/seek => Optimize for random access.
/allow => Specificies right access attributes.
access [block!]
```

open?

```
USAGE:
OPEN? port

DESCRIPTION:
Returns TRUE if port is open.
OPEN? is an action! value.

ARGUMENTS:
port [port!]
```

query

```
USAGE:
QUERY target

DESCRIPTION:
Returns information about a file.
QUERY is an action! value.

ARGUMENTS:
target [file! port!]
```

read

```
USAGE:
READ source

DESCRIPTION:
Reads from a file, URL, or other port.
READ is an action! value.

ARGUMENTS:
source [file! url! port!]

REFINEMENTS:
/part => Partial read a given number of units (source relative).
length [number!]
/seek => Read from a specific position (source relative).
index [number!]
/binary => Preserves contents exactly.
/lines => Convert to block of strings.
/info =>
/as => Read with the specified encoding, default is 'UTF-8.
encoding [word!]
```

rename

```
USAGE:
RENAME from to

DESCRIPTION:
Rename a file.
RENAME is an action! value.

ARGUMENTS:
from [port! file! url!]
to [port! file! url!]
```

update

```
USAGE:
UPDATE port

DESCRIPTION:
Updates external and internal states (normally after read/write).
UPDATE is an action! value.

ARGUMENTS:
port [port!]
```

write

```
USAGE:
WRITE destination data

DESCRIPTION:
Writes to a file, URL, or other port.
WRITE is an action! value.

ARGUMENTS:
destination [file! url! port!]
data [any-type!]

REFINEMENTS:
/binary => Preserves contents exactly.
/lines => Write each value in a block as a separate line.
/info =>
/append => Write data at end of file.
/part => Partial write a given number of units.
length [number!]
/seek => Write at a specific position.
index [number!]
/allow => Specifies protection attributes.
access [block!]
/as => Write with the specified encoding, default is 'UTF-8.
encoding [word!]
```

General actions

form

```
USAGE:
     FORM value

DESCRIPTION:
     Returns a user-friendly string representation of a value.
     FORM is an action! value.

ARGUMENTS:
     value        [any-type!]

REFINEMENTS:
     /part        => Limit the length of the result.
        limit        [integer!]

RETURNS:
     [string!]
```

make

```
USAGE:
     MAKE type spec

DESCRIPTION:
     Returns a new value made from a spec for that value's type.
     MAKE is an action! value.

ARGUMENTS:
     type         [any-type!] "The datatype, an example or prototype value."
     spec         [any-type!] "The specification of the new value."

RETURNS:
     Returns the specified datatype.
     [any-type!]
```

mold

```
USAGE:
     MOLD value

DESCRIPTION:
     Returns a source format string representation of a value.
     MOLD is an action! value.

ARGUMENTS:
     value        [any-type!]

REFINEMENTS:
     /only        => Exclude outer brackets if value is a block.
     /all         => TBD: Return value in loadable format.
     /flat        => TBD: Exclude all indentation.
     /part        => Limit the length of the result.
        limit        [integer!]

RETURNS:
     [string!]
```

random

```
USAGE:
     RANDOM value

DESCRIPTION:
     Returns a random value of the same datatype; or shuffles series.
     RANDOM is an action! value.

ARGUMENTS:
     value         "Maximum value of result (modified when series)."

REFINEMENTS:
     /seed        => Restart or randomize.
     /secure      => Returns a cryptographically secure random number.
     /only        => Pick a random value from a series.

RETURNS:
     [any-type!]
```

reflect

```
USAGE:
     REFLECT value field

DESCRIPTION:
     Returns internal details about a value via reflection.
     REFLECT is an action! value.

ARGUMENTS:
     value        [any-type!]
     field        [word!] {spec, body, words, etc. Each datatype defines its own
reflectors.}
```

to

```
USAGE:
     TO type spec

DESCRIPTION:
     Converts to a specified datatype.
     TO is an action! value.

ARGUMENTS:
     type         [any-type!] "The datatype or example value."
     spec         [any-type!] "The attributes of the new value."
```

Series actions

append

```
USAGE:
     APPEND series value

DESCRIPTION:
     Inserts value(s) at series tail; returns series head.
     APPEND is an action! value.

ARGUMENTS:
     series       [series! bitset! port!]
     value        [any-type!]

REFINEMENTS:
     /part        => Limit the number of values inserted.
        length       [number! series!]
     /only        => Insert block types as single values (overrides /part).
     /dup         => Duplicate the inserted values.
        count        [integer!]

RETURNS:
     [series! port! bitset!]
```

at

```
USAGE:
     AT series index

DESCRIPTION:
     Returns a series at a given index.
     AT is an action! value.

ARGUMENTS:
     series       [series! port!]
     index        [integer! pair!]

RETURNS:
     [series! port!]
```

back

```
USAGE:
     BACK series

DESCRIPTION:
     Returns a series at the previous index.
     BACK is an action! value.

ARGUMENTS:
     series       [series! port!]

RETURNS:
     [series! port!]
```

change

```
USAGE:
     CHANGE series value

DESCRIPTION:
     Changes a value in a series and returns the series after the change.
     CHANGE is an action! value.

ARGUMENTS:
     series       [series! port!] "Series at point to change."
     value        [any-type!] "The new value."

REFINEMENTS:
     /part        => Limits the amount to change to a given length or position.
        range        [number! series!]
     /only        => Changes a series as a series.
     /dup         => Duplicates the change a specified number of times.
        count        [number!]
```

clear

```
USAGE:
     CLEAR series

DESCRIPTION:
     Removes series values from current index to tail; returns new tail.
     CLEAR is an action! value.

ARGUMENTS:
     series       [series! port! bitset! map! none!]

RETURNS:
     [series! port! bitset! map! none!]
```

copy

```
USAGE:
     COPY value

DESCRIPTION:
     Returns a copy of a non-scalar value.
     COPY is an action! value.

ARGUMENTS:
     value        [series! any-object! bitset! map!]

REFINEMENTS:
     /part        => Limit the length of the result.
        length       [number! series! pair!]
     /deep        => Copy nested values.
     /types       => Copy only specific types of non-scalar values.
        kind         [datatype!]

RETURNS:
     [series! any-object! bitset! map!]
```

find

```
USAGE:
     FIND series value

DESCRIPTION:
     Returns the series where a value is found, or NONE.
     FIND is an action! value.

ARGUMENTS:
     series       [series! bitset! typeset! port! map! none!]
     value        [any-type!]

REFINEMENTS:
     /part        => Limit the length of the search.
        length       [number! series!]
     /only        => Treat a series search value as a single value.
     /case        => Perform a case-sensitive search.
     /same        => Use "same?" as comparator.
     /any         => TBD: Use * and ? wildcards in string searches.
     /with        => TBD: Use custom wildcards in place of * and ?.
        wild         [string!]
     /skip        => Treat the series as fixed size records.
        size         [integer!]
     /last        => Find the last occurrence of value, from the tail.
     /reverse     => Find the last occurrence of value, from the current index.
     /tail        => Return the tail of the match found, rather than the head.
     /match       => Match at current index only and return tail of match.
```

head

```
USAGE:
     HEAD series

DESCRIPTION:
     Returns a series at its first index.
     HEAD is an action! value.

ARGUMENTS:
     series       [series! port!]

RETURNS:
     [series! port!]
```

head?

```
USAGE:
     HEAD? series

DESCRIPTION:
     Returns true if a series is at its first index.
     HEAD? is an action! value.

ARGUMENTS:
     series       [series! port!]

RETURNS:
     [logic!]
```

index?

```
USAGE:
     INDEX? series

DESCRIPTION:
     Returns the current index of series relative to the head, or of word in a
context.
     INDEX? is an action! value.

ARGUMENTS:
     series       [series! port! any-word!]

RETURNS:
     [integer!]
```

insert

```
USAGE:
     INSERT series value

DESCRIPTION:
     Inserts value(s) at series index; returns series past the insertion.
     INSERT is an action! value.

ARGUMENTS:
     series       [series! port! bitset!]
     value        [any-type!]

REFINEMENTS:
     /part        => Limit the number of values inserted.
        length       [number! series!]
     /only        => Insert block types as single values (overrides /part).
     /dup         => Duplicate the inserted values.
        count        [integer!]

RETURNS:
     [series! port! bitset!]
```

length?

```
USAGE:
     LENGTH? series

DESCRIPTION:
     Returns the number of values in the series, from the current index to the tail.
     LENGTH? is an action! value.

ARGUMENTS:
     series       [series! port! bitset! map! tuple! none!]

RETURNS:
     [integer! none!]
```

move

```
USAGE:
     MOVE origin target

DESCRIPTION:
     Moves one or more elements from one series to another position or series.
     MOVE is an action! value.

ARGUMENTS:
     origin       [series! port!]
     target       [series! port!]

REFINEMENTS:
     /part        => Limit the number of values inserted.
        length       [integer!]

RETURNS:
     [series! port!]
```

next

```
USAGE:
     NEXT series

DESCRIPTION:
     Returns a series at the next index.
     NEXT is an action! value.

ARGUMENTS:
     series       [series! port!]

RETURNS:
     [series! port!]
```

pick

```
USAGE:
     PICK series index

DESCRIPTION:
     Returns the series value at a given index.
     PICK is an action! value.

ARGUMENTS:
     series       [series! port! bitset! pair! tuple! money! date! time!]
     index        [scalar! any-string! any-word! block! logic! time!]

RETURNS:
     [any-type!]
```

poke

```
USAGE:
     POKE series index value

DESCRIPTION:
     Replaces the series value at a given index, and returns the new value.
     POKE is an action! value.

ARGUMENTS:
     series       [series! port! bitset!]
     index        [scalar! any-string! any-word! block! logic!]
     value        [any-type!]

RETURNS:
     [series! port! bitset!]
```

put

```
USAGE:
     PUT series key value

DESCRIPTION:
     Replaces the value following a key, and returns the new value.
     PUT is an action! value.

ARGUMENTS:
     series       [series! port! map! object!]
     key          [scalar! any-string! any-word! binary!]
     value        [any-type!]

REFINEMENTS:
     /case        => Perform a case-sensitive search.

RETURNS:
     [series! port! map! object!]
```

remove

```
USAGE:
     REMOVE series

DESCRIPTION:
     Returns the series at the same index after removing a value.
     REMOVE is an action! value.

ARGUMENTS:
     series       [series! port! bitset! map! none!]

REFINEMENTS:
     /part        => Removes a number of values, or values up to the given series
index.
        length       [number! char! series!]
     /key         => Removes a key in map.
        key-arg      [scalar! any-string! any-word! binary! block!]

RETURNS:
     [series! port! bitset! map! none!]
```

reverse

```
USAGE:
     REVERSE series

DESCRIPTION:
     Reverses the order of elements; returns at same position.
     REVERSE is an action! value.

ARGUMENTS:
     series       [series! port! pair! tuple!]

REFINEMENTS:
     /part        => Limits to a given length or position.
        length       [number! series!]
     /skip        => Treat the series as fixed size records.
        size         [integer!]

RETURNS:
     [series! port! pair! tuple!]
```

select

```
USAGE:
     SELECT series value

DESCRIPTION:
     Find a value in a series and return the next value, or NONE.
     SELECT is an action! value.

ARGUMENTS:
     series       [series! any-object! map! none!]
     value        [any-type!]

REFINEMENTS:
     /part        => Limit the length of the search.
        length       [number! series!]
     /only        => Treat a series search value as a single value.
     /case        => Perform a case-sensitive search.
     /same        => Use "same?" as comparator.
     /any         => TBD: Use * and ? wildcards in string searches.
     /with        => TBD: Use custom wildcards in place of * and ?.
        wild         [string!]
     /skip        => Treat the series as fixed size records.
        size         [integer!]
     /last        => Find the last occurrence of value, from the tail.
     /reverse     => Find the last occurrence of value, from the current index.
```

skip

```
USAGE:
     SKIP series offset

DESCRIPTION:
     Returns the series relative to the current index.
     SKIP is an action! value.

ARGUMENTS:
     series       [series! port!]
     offset       [integer! pair!]

RETURNS:
     [series! port!]
```

sort

```
USAGE:
     SORT series

DESCRIPTION:
     Sorts a series (modified); default sort order is ascending.
     SORT is an action! value.

ARGUMENTS:
     series       [series! port!]

REFINEMENTS:
     /case        => Perform a case-sensitive sort.
     /skip        => Treat the series as fixed size records.
        size         [integer!]
     /compare     => Comparator offset, block (TBD) or function.
        comparator   [integer! block! any-function!]
     /part        => Sort only part of a series.
        length       [number! series!]
     /all         => Compare all fields (used with /skip).
     /reverse     => Reverse sort order.
     /stable      => Stable sorting.
```

swap

```
USAGE:
     SWAP series1 series2

DESCRIPTION:
     Swaps elements between two series or the same series.
     SWAP is an action! value.

ARGUMENTS:
     series1      [series! port!]
     series2      [series! port!]
```

tail

```
USAGE:
     TAIL series

DESCRIPTION:
     Returns a series at the index after its last value.
     TAIL is an action! value.

ARGUMENTS:
     series       [series! port!]

RETURNS:
     [series! port!]
```

tail?

```
USAGE:
     TAIL? series

DESCRIPTION:
     Returns true if a series is past its last value.
     TAIL? is an action! value.

ARGUMENTS:
     series       [series! port!]

RETURNS:
     [logic!]
```

take

```
USAGE:
     TAKE series

DESCRIPTION:
     Removes and returns one or more elements.
     TAKE is an action! value.

ARGUMENTS:
     series       [series! port! none!]

REFINEMENTS:
     /part        => Specifies a length or end position.
        length       [number! series!]
     /deep        => Copy nested values.
     /last        => Take it from the tail end.
```

trim

```
USAGE:
     TRIM series

DESCRIPTION:
     Removes space from a string or NONE from a block.
     TRIM is an action! value.

ARGUMENTS:
     series       [series! port!]

REFINEMENTS:
     /head        => Removes only from the head.
     /tail        => Removes only from the tail.
     /auto        => Auto indents lines relative to first line.
     /lines       => Removes all line breaks and extra spaces.
     /all         => Removes all whitespace.
     /with        => Same as /all, but removes characters in 'str'.
        str          [char! string! binary! integer!]
```

Scalar actions

absolute

```
USAGE:
     ABSOLUTE value

DESCRIPTION:
     Returns the non-negative value.
     ABSOLUTE is an action! value.

ARGUMENTS:
     value        [number! money! char! pair! time!]

RETURNS:
     [number! money! char! pair! time!]
```

add

```
USAGE:
     ADD value1 value2

DESCRIPTION:
     Returns the sum of the two values.
     ADD is an action! value.

ARGUMENTS:
     value1       [scalar! vector!] "The augend."
     value2       [scalar! vector!] "The addend."

RETURNS:
     The sum.
     [scalar! vector!]
```

divide

```
USAGE:
     DIVIDE value1 value2

DESCRIPTION:
     Returns the quotient of two values.
     DIVIDE is an action! value.

ARGUMENTS:
     value1       [number! money! char! pair! tuple! vector! time!] "The dividend
(numerator)."
     value2       [number! money! char! pair! tuple! vector! time!] "The divisor
(denominator)."

RETURNS:
     The quotient.
     [number! money! char! pair! tuple! vector! time!]
```

multiply

```
USAGE:
     MULTIPLY value1 value2

DESCRIPTION:
     Returns the product of two values.
     MULTIPLY is an action! value.

ARGUMENTS:
     value1       [number! money! char! pair! tuple! vector! time!] "The
multiplicand."
     value2       [number! money! char! pair! tuple! vector! time!] "The multiplier."

RETURNS:
     The product.
     [number! money! char! pair! tuple! vector! time!]
```

negate

```
USAGE:
     NEGATE number

DESCRIPTION:
     Returns the opposite (additive inverse) value.
     NEGATE is an action! value.

ARGUMENTS:
     number       [number! money! bitset! pair! time!]

RETURNS:
     [number! money! bitset! pair! time!]
```

power

```
USAGE:
     POWER number exponent

DESCRIPTION:
     Returns a number raised to a given power (exponent).
     POWER is an action! value.

ARGUMENTS:
     number       [number!] "Base value."
     exponent     [integer! float!] "The power (index) to raise the base value by."

RETURNS:
     [number!]
```

remainder

```
USAGE:
     REMAINDER value1 value2

DESCRIPTION:
     Returns what is left over when one value is divided by another.
     REMAINDER is an action! value.

ARGUMENTS:
     value1       [number! money! char! pair! tuple! vector! time!] "The dividend
(numerator)."
     value2       [number! money! char! pair! tuple! vector! time!] "The divisor
(denominator)."

RETURNS:
     The remainder.
     [number! money! char! pair! tuple! vector! time!]
```

round

```
USAGE:
     ROUND n

DESCRIPTION:
     Returns the nearest integer. Halves round up (away from zero) by default.
     ROUND is an action! value.

ARGUMENTS:
     n            [number! money! time! pair!]

REFINEMENTS:
     /to          => Return the nearest multiple of the scale parameter.
        scale        [number! money! time!] "Must be a non-zero value."
     /even        => Halves round toward even results.
     /down        => Round toward zero, ignoring discarded digits. (truncate).
     /half-down   => Halves round toward zero.
     /floor       => Round in negative direction.
     /ceiling     => Round in positive direction.
     /half-ceiling => Halves round in positive direction.
```

subtract

```
USAGE:
     SUBTRACT value1 value2

DESCRIPTION:
     Returns the difference between two values.
     SUBTRACT is an action! value.

ARGUMENTS:
     value1       [scalar! vector!] "The minuend."
     value2       [scalar! vector!] "The subtrahend."

RETURNS:
     The difference.
     [scalar! vector!]
```

even?

```
USAGE:
     EVEN? number

DESCRIPTION:
     Returns true if the number is evenly divisible by 2.
     EVEN? is an action! value.

ARGUMENTS:
     number       [number! money! char! time!]

RETURNS:
     [logic!]
```

odd?

```
USAGE:
     ODD? number

DESCRIPTION:
     Returns true if the number has a remainder of 1 when divided by 2.
     ODD? is an action! value.

ARGUMENTS:
     number       [number! money! char! time!]

RETURNS:
     [logic!]
```