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14. The optional Memory-Allocation word set

14.1 Introduction

See: A.14 The optional Memory-Allocation word set

14.2 Additional terms and notation

None.

14.3 Additional usage requirements

14.3.1 I/O Results data type

I/O results are single-cell numbers indicating the result of I/O operations. A value of zero indicates that the I/O operation completed successfully; other values and their meanings are implementation-defined.

Append table 14.1 to table 3.1.

Table 14.1 - Data types

Symbol	Data type	Size on stack
ior	I/O results	1 cell

14.3.2 Environmental queries

Append table 14.2 to table 3.5.

See: 3.2.6 Environmental queries

Table 14.2 - Environmental query strings

String	Value data type	Constant?	Meaning
MEMORY-ALLOC	flag	no	memory-allocation word set present
MEMORY-ALLOC-EXT	flag	no	memory-allocation extensions word set present

14.3.3 Allocated regions

A program may address memory in data space regions made available by ALLOCATE or RESIZE and not yet released by FREE.

See: 3.3.3 Data space

14.4 Additional documentation requirements

14.4.1 System documentation

14.4.1.1 Implementation-defined options

- values and meaning of ior (14.3.1 I/O Results data type, 14.6.1.0707 ALLOCATE, 14.6.1.1605 FREE, 14.6.1.2145 RESIZE).

14.4.1.2 Ambiguous conditions

- no additional requirements.

14.4.1.3 Other system documentation

- no additional requirements.

14.4.2 Program documentation

- no additional requirements.

14.5 Compliance and labeling

14.5.1 ANS Forth systems

The phrase **Providing the Memory-Allocation word set** shall be appended to the label of any Standard System that provides all of the Memory-Allocation word set.

The phrase **Providing name(s) from the Memory-Allocation Extensions word set** shall be appended to the label of any Standard System that provides portions of the Memory-Allocation Extensions word set.

The phrase **Providing the Memory-Allocation Extensions word set** shall be appended to the label of any Standard System that provides all of the Memory-Allocation and Memory-Allocation Extensions word sets.

14.5.2 ANS Forth programs

The phrase **Requiring the Memory-Allocation word set** shall be appended to the label of Standard Programs that require the system to provide the Memory-Allocation word set.

The phrase **Requiring name(s) from the Memory-Allocation Extensions word set** shall be appended to the label of Standard Programs that require the system to provide portions of the Memory-Allocation Extensions word set.

The phrase **Requiring the Memory-Allocation Extensions word set** shall be appended to the label of Standard Programs that require the system to provide all of the Memory-Allocation and Memory-Allocation Extensions word sets.

14.6 Glossary

14.6.1 Memory-Allocation words

14.6.1.0707 **ALLOCATE**
MEMORY

```
( u -- a-addr ior )
```

Allocate u address units of contiguous data space. The data-space pointer is unaffected by this operation. The initial content of the allocated space is undefined.

If the allocation succeeds, a-addr is the aligned starting address of the allocated space and ior is zero.

If the operation fails, a-addr does not represent a valid address and ior is the implementation-defined I/O result code.

See: 6.1.1650 HERE , 14.6.1.1605 FREE , 14.6.1.2145 RESIZE

14.6.1.1605 **FREE**
MEMORY

```
( a-addr -- ior )
```

Return the contiguous region of data space indicated by a-addr to the system for later allocation. a-addr shall indicate a region of data space that was previously obtained by ALLOCATE or RESIZE. The data-space pointer is unaffected by this operation.

If the operation succeeds, ior is zero. If the operation fails, ior is the implementation-defined I/O result code.

See: 6.1.1650 HERE

14.6.1.2145 **RESIZE**
MEMORY

```
( a-addr1 u -- a-addr2 ior )
```

Change the allocation of the contiguous data space starting at the address a-addr1, previously allocated by ALLOCATE or RESIZE, to u address units. u may be either larger or smaller than the current size of the region. The data-space pointer is unaffected by this operation.

If the operation succeeds, a-addr2 is the aligned starting address of u address units of allocated memory and ior is zero. a-addr2 may be, but need not be, the same as a-addr1. If they are not the same, the values contained in the region at a-addr1 are copied to a-addr2, up to the minimum size of either of the two regions. If they are the same, the values contained in the region are preserved to the minimum of u or the original size. If a-addr2 is not the same as a-addr1, the region of memory at a-addr1 is returned to the system according to the operation of FREE.

If the operation fails, a-addr2 equals a-addr1, the region of memory at a-addr1 is unaffected, and ior is the implementation-defined I/O result code.

See: 6.1.1650 HERE

14.6.2 Memory-Allocation extension words

None

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