5. ARRAYS

An array in Interlisp is an object representing a one-dimensional vector of objects. Arrays are generally created by the function **ARRAY**.

(ARRAY *SIZE TYPE INIT ORIG* —**)** [Function]

Creates and returns a new array capable of containing *SIZE* objects of type *TYPE*. If *TYPE* is **NIL**, the array can contain any arbitrary Lisp datum. In general, *TYPE* may be any of the various field specifications which are legal in **DATATYPE** declarations (see page 8.9): **POINTER**, **FIXP**, **FLOATP**, **(BITS** *N***)**, etc. The implementation will, if necessary, choose an "enclosing" type if the given one is not supported; for example, an array of **(BITS 3)** may be represented by an array of **(BITS 8)**.

INIT is the initial value in each element of the new array. If not specified, the array elements will be initialized with 0 (for number arrays) or **NIL** (all other types).

Arrays can have either 0-origin or 1-origin indexing, as specified by the *ORIG* argument; if *ORIG* is not specified, the default is 1.

Note: Arrays of type **FLOATP** are stored unboxed. This increases the space and time efficiency of **FLOATP** arrays. Users who want to use boxed floating point numbers should use an array of type **POINTER** instead of **FLOATP**.

(ARRAYP *X***)** [Function]

Returns *X* if *X* is an array, **NIL** otherwise.

Note: In some implementations of Interlisp (but not Interlisp-D), **ARRAYP** may also return *X* if it is of type **CCODEP** or **HARRAYP**.

(ELT *ARRAY N***)** [Function]

Returns the *N*th element of the array *ARRAY*.

Generates the error **ARG NOT ARRAY** if *ARRAY* is not an array. Generates the error **ILLEGAL ARG** if *N* is out of bounds.

(SETA *ARRAY N V***)** [Function]

Sets the *N*th element of the array *ARRAY* to *VAL*, and returns *VAL*.

Generates the error **ARG NOT ARRAY** if *ARRAY* is not an array. Generates the error **ILLEGAL ARG** if *N* is out of bounds. Can

generate the error **NON-NUMERIC ARG** if *ARRAY* is an array whose **ARRAYTYP** is **FIXP** or **FLOATP** and *VAL* is non-numeric.

(ARRAYTYP *ARRAY***)** [Function]

Returns the type of the elements in the array *ARRAY*, a value corresponding to the second argument to **ARRAY**.

Note: If **ARRAY** coerced the array type as described above, **ARRAYTYP** will return the *new* type. For example, **(ARRAYTYP (ARRAY 10 '(BITS 3)))** will return **BYTE** in Interlisp-D, and **FIXP** in Interlisp-10.

(ARRAYSIZE *ARRAY***)** [Function]

Returns the size of array *ARRAY*. Generates the error, **ARG NOT ARRAY**, if *ARRAY* is not an array.

(ARRAYORIG *ARRAY***)** [Function]

Returns the origin of array *ARRAY*, which may be 0 or 1. Generates an error, **ARG NOT ARRAY**, if *ARRAY* is not an array.

(COPYARRAY *ARRAY***)** [Function]

Returns a new array of the same size and type as *ARRAY*, and with the same contents as *ARRAY*. Generates an **ARG NOT ARRAY** error, if *ARRAY* is not an array.