Array and Table Definitions

The array definition function is used to define the occurrences and layout of an array (X-arrays are not supported).

Array definition is initiated by the field command `.A` or by issuing the line command `..E` and then marking the required field with the function code A.

The table definition function is used to define the occurrences and layout of more than one array at the same time. The arrays must begin in the same map line.

Table definition is invoked by the line command `..A`.

This section contains information on the following:

- Array Definition
- Table Definition

Array Definition

The upper portion of the following screen is displayed for the purpose of array definition:

```
Name #001                          Top Dim 1__________ 1__________ 1__________
------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
0 . Index vertical              1__            ___________       0   Lines
0 . Index horizontal            1__            ___________       1   Columns
0 . Index (h/v) V               1__            ___________       0   Cls/Ls

001   --010---+----+----+---030---+----+----+---050---+----+----+---070---+----
   .AXXXXX


               Please enter starting name .AXXXXXXXXXXXXXXXXXXX









 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help  Mset  Exit              --    -     +           <     >     Let
```

You can specify the following:

Field	Explanation
Top Dim	Indicates the top dimension of the array; that is, the highest occurrence (from left to right) in the first, second and third dimension. If a field defined in a program is used to define the map array, the upper bounds of that field (user-defined variable or database field), as defined in the program, are used; these cannot be overwritten on the array definition screen. If you select a map array from a data definition in another Natural object, the dimensions of the map array must not exceed the dimensions shown in this field. If you do not select a map array from a data definition, the dimensions of the map array must not exceed the dimensions as defined in the Natural program.
Dimensions	An array can have up to three dimensions. The order in which the dimensions of the array are mapped to the map layout is determined by the values entered to the left of the **Index** operands.
Occurrences	The number of occurrences to be defined for a dimension.
Starting from	The starting index value for a dimension. A numeric value can be used, or a variable name can be used to indicate that the actual value is supplied in the Natural program which invokes the map definition. If the variable is not defined otherwise as a field in the map, it is assumed to be of Natural data format/length N7. If so, it can be edited using PF9 in the **Field and Parameter Definition** screen. **Note:** Removing a **Starting from** value from an array implies that the variable is removed from the map, too, unless it is a map field or it is associated with any other map field as a **Starting from** value or help parameter. To edit **Starting from** values, press PF9 in the **Field and Variable Definitions - Summary** screen.
Spacing	The number of blank lines (for vertical dimensions) or blank columns (for horizontal dimensions) to be inserted between each dimension occurrence.

Examples of Array Definitions

Example 1:

A one-dimensional array consisting of 10 vertical occurrences with 2 blank lines to be inserted between neighboring occurrences.

```
Name #001                          Top Dim 10_________ 1__________ 1__________
--------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
1 . Index vertical              10_            _________         2   Lines
0 . Index horizontal            1__            _________         1   Columns
0 . Index (h/v) V               1__            _________         0   Cls/Ls
```

Example 2:

Same as *Example 1* except that the array is to be horizontal.

```
Name #001                          Top Dim 10_________ 1__________ 1__________
-------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
0 . Index vertical              1__            _________         0   Lines
1 . Index horizontal            10_            _________         1   Columns
0 . Index (h/v) V               1__            _________         0   Cls/Ls
```

Example 3:

A two-dimensional array. The first dimension consists of 10 vertical occurrences with 1 blank line between neighboring occurrences. The second dimension consists of 5 horizontal occurrences with 2 blank columns between neighboring occurrences.

```
Name #001                          Top Dim 10_________ 5__________ 1__________
-------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
1 . Index vertical              10_            _________         1   Lines
2 . Index horizontal            5__            _________         2   Columns
0 . Index (h/v) V               1__            _________         0   Cls/Ls
```

Example 4:

Same as *Example 3* except that the order of the dimensions is reversed.

```
Name #001                          Top Dim 5_________ 10_________ 1__________
-------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
2 . Index vertical              10_            _________         1   Lines
1 . Index horizontal            5__            _________         2   Columns
0 . Index (h/v) V               1__            _________         0   Cls/Ls
```

Example 5:

A three-dimensional array. The first dimension consists of 3 vertical occurrences with 1 blank line between neighboring occurrences. The second dimension consists of 5 horizontal occurrences with 2 blank columns between neighboring occurrences. The third dimension consists of 2 occurrences, expanded vertically within each occurrence of the first dimension.

```
Name #001                          Top Dim 3__________ 5__________ 2__________
-------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
1 . Index vertical              3__            _________         1   Lines
2 . Index horizontal            5__            _________         2   Columns
3 . Index (h/v) V               2__            _________         0   Cls/Ls
```

Example 6:

An example of using **Starting from**. The first dimension consists of 10 vertical occurrences starting from index `I`. `I` is defined in the map editor with Natural data format/length N7 by default. The second dimension consists of 5 horizontal occurrences starting from the index 3.

```
Name #001                          Top Dim 10_________ 5__________ 1__________
-------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
1 . Index vertical              10_            I_______          1   Lines
2 . Index horizontal            5__            3_______          2   Columns
0 . Index (h/v) V               1__            ________          0   Cls/Ls
```

Example 7:

An example of making a two-dimensional display from a one-dimensional array. The array consists of 40 elements. It is displayed in two columns with 20 lines each. This is achieved by specifying 0 as the horizontal index.

```
Name #001                          Top Dim 40_________ 1__________ 1__________
-------------------------------------------------------------------------------
Dimensions                      Occurrences    Starting from     Spacing
1 . Index vertical              20_            ________          0   Lines
0 . Index horizontal            2__            ________          10  Columns
0 . Index (h/v) V               1__            ________          0   Cls/Ls
```

Table Definition

A table of one or more arrays which all begin in the same map line is defined with the `..A` line command. When you enter the `..A` line command, the following screen is invoked:

```
14:41:47               ***** NATURAL MAP EDITOR *****               2007-10-22
                         - Array Table Definition -

Main   Index:  Vert. Occur.   1    Starting from ____________ Spacing 0   Lines
Second Index:  Direction(H/V) V                  ____________         0   Cls/Ls
Third  Index:  Direction(H/V) V                  ____________         0   Cls/Ls
-------------------------------------------------------------------------------
Name of Variable         Col           Dimension Size            Order 2.  3.
(truncated)              Pos Ind1        Ind2        Ind3        M S T Occ Occ
-------------------------------------------------------------------------------
#001                       2 1           1           1
#002                      25 1           1           1









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        Help  Mset  Exit              --    -     +                      Let
```

Note:
When applying the `..A` command to arrays which were not defined by an `..A` command but by an `.A` command, may result in a modification or even a destruction of these arrays.

The example screen above contains the following fields:

Field	Explanation
Main Index	The number of vertical occurrences, the starting position and the number of lines to be skipped between dimension occurrences.
Second Index	The direction (horizontal or vertical), the starting position and the number of lines/columns to be skipped between dimension occurrences. The second dimension only applies if one of the arrays has more than one dimension. In this case the second dimension can be displayed either horizontally (in which case there must be enough space in the line for all selected occurrences) or vertically (in which case there must be enough lines on the map to display main dimension times second dimension occurrences, including line spacing).
Third Index	The direction (horizontal or vertical), the starting position and the number of lines/columns to be skipped between dimension occurrences. The third dimension only applies if one of the arrays has more than two dimensions. In this case the third dimension can be displayed either horizontally (in which case there must be enough space in the line for all selected occurrences) or vertically (in which case there must be enough lines on the map to display main dimension times second dimension times third dimension occurrences, including line spacing).
Name of Variable	All names of field arrays contained in the table are displayed.
Col Pos	The column position in which the field is located. This is displayed for informational purposes only.
Dimension Size	The upper bounds **Ind1**, **Ind2** and **Ind3** of an array. The dimensions of the array defined in the map must not exceed the dimensions of the corresponding array defined in the Natural object that invokes the map.
Order	The order in which the dimensions are to be defined: **M**, **S** and **T** correspond to Main, Second and Third.
2. Occ.	The number of occurrences to be defined for the second index.
3. Occ.	The number of occurrences to be defined for the third index.

Example of a Table Definition

This is an example of defining map fields that correspond to the following program definition:

```
DEFINE DATA
  1 ARRAY1 (A3/1:10)
  1 ARRAY2 (A5/1:10,1:2)
  1 ARRAY3 (A7/1:10,1:2,1:3)
END-DEFINE
```

Table Definition:

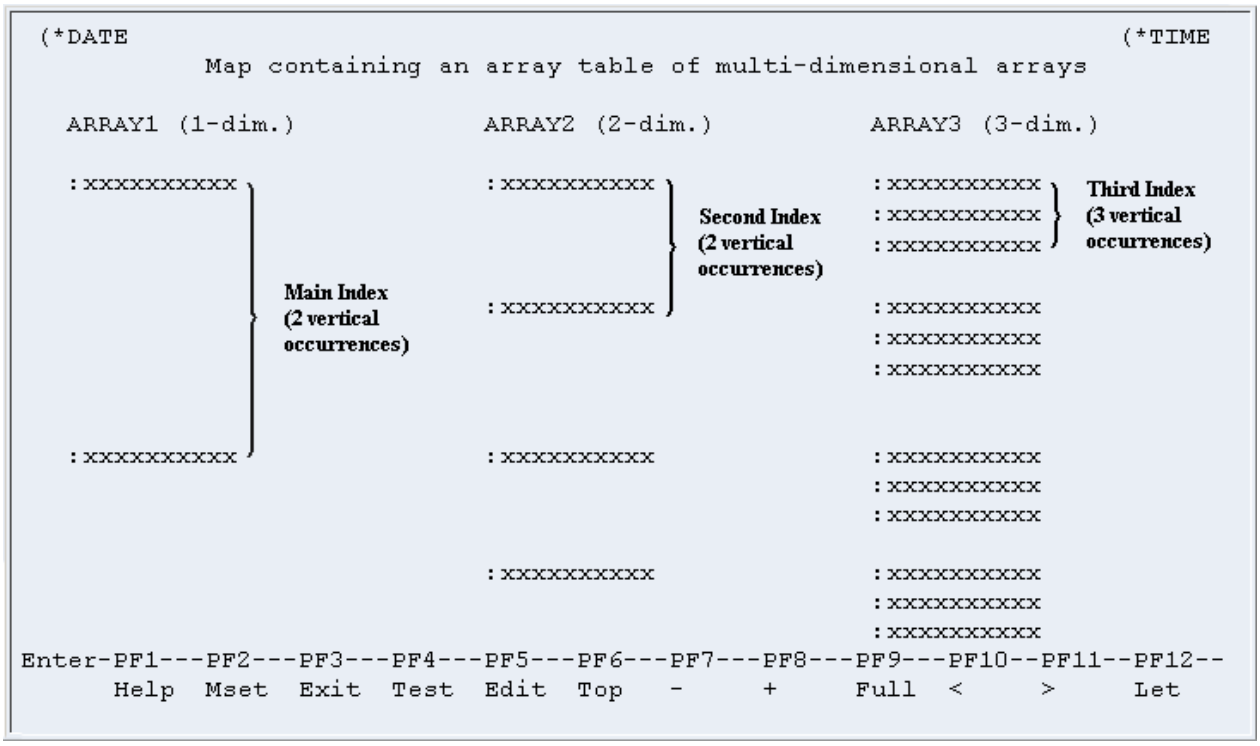
```
14:41:47                ***** NATURAL MAP EDITOR *****                2006-07-24
                          - Array Table Definition -

Main   Index:  Vert. Occur.   1    Starting from ____________ Spacing 0   Lines
Second Index:  Direction(H/V) V                   ____________         0   Cls/Ls
Third  Index:  Direction(H/V) V                   ____________         0   Cls/Ls
------------------------------------------------------------------------------
Name of Variable         Col           Dimension Size            Order 2.  3.
(truncated)              Pos Ind1        Ind2        Ind3        M S T Occ Occ
------------------------------------------------------------------------------
  ARRAY1                  3  10          1           1           1
  ARRAY2                 32  10          2           1           1 2    2
  ARRAY3                 58  10          2           3           1 2 3  2  3









Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Mset  Exit              --    -     +                     Let
```

ARRAY1 is a one-dimensional array with ten occurrences. The first two occurrences are expanded in the table.

ARRAY2 is a two-dimensional array. The first index consists of ten occurrences and the second index consists of two occurrences. The first two occurrences of the first index and both occurrences of the second index are expanded in the table.

ARRAY3 is a three-dimensional array. The first index consists of ten occurrences, the second index consists of two occurrences and the third index consists of three occurrences. The first two occurrences of the first index, both occurrences of the second index and all three occurrences of the third index are expanded in the table.

Table Layout:



The table is defined as a collection of arrays which share the following characteristics:

- The number of occurrences of the main index must be the same for each array of the table. The main index is always expanded vertically.
- All elements of a specific index must be placed in the same line. Thus, spacing between the elements of a specific index depends on the array with the largest dimension.