

| MATX      | Matrix                        |                               |       |       |                               |                               |
|-----------|-------------------------------|-------------------------------|-------|-------|-------------------------------|-------------------------------|
| g-shift   | PUTM                          | GETM                          | STOEL | RCLEL | STOSEQ                        | RCLSEQ                        |
| f-shift   | CMIN                          | CMAX                          | R↯R   | C↯C   | FIND                          | INDEX                         |
| unshifted | I <sup>+</sup> <sub>row</sub> | I <sup>-</sup> <sub>row</sub> | STOIJ | RCLIJ | J <sup>-</sup> <sub>col</sub> | J <sup>+</sup> <sub>col</sub> |
| Page 3    | F1                            | F2                            | F3    | F4    | F5                            | F6                            |

Prev menu [https://47calc.com/doc/C47/Menus/C47\\_Menu\\_MATX\\_page\\_2.pdf](https://47calc.com/doc/C47/Menus/C47_Menu_MATX_page_2.pdf)

Next menu [https://47calc.com/doc/C47/Menus/C47\\_Menu\\_MENU\\_page\\_1.pdf](https://47calc.com/doc/C47/Menus/C47_Menu_MENU_page_1.pdf)

Ref 1 [https://47calc.com/doc/Application%20Notes/AN0020\\_C47\\_R47\\_Matrix\\_and\\_Vector.pdf](https://47calc.com/doc/Application%20Notes/AN0020_C47_R47_Matrix_and_Vector.pdf)

| Level      | Label             | Type               | FullName                                   | Extended description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Category          | Flag | Catalog | Default |
|------------|-------------------|--------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|---------|---------|
| Menu<br>p3 | MATX              | MENU               | Matrix                                     | Matrix functions ; a matrix is displayed in X and shown in other stack registers as [m×n Matrix] or [m×n C Matrix] when containing complex element(s) ; Ref : <a href="https://47calc.com/doc/Application%20Notes/AN0020_C47_R47_Matrix_and_Vector.pdf">https://47calc.com/doc/Application%20Notes/AN0020_C47_R47_Matrix_and_Vector.pdf</a> ; Info : monadic functions work per matrix element (except 1/x, which is a shortcut for [M] <sup>-1</sup> , use -1 y* instead ; and $\sqrt{x}$ , which is a shortcut for MSQRT, use 0.5 y* instead) ; in edit mode, all functions work per element ; use registers to input calculation results | Matrix operations |      | MATX    |         |
| F1         | I+ <sub>row</sub> | Command            | Increment row index                        | Increment row index I of indexed matrix ; wraps automatically ; does not put value on the stack ; menu button I+ on [MATX.3] F1 displays value as subscript (only if indexed matrix exists) ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]                                                                                                                                                                                                                                                                                                                                                                                   | Matrix operations |      | I+      | <row>   |
| F2         | I- <sub>row</sub> | Command            | Decrement row index                        | Decrement row index I of indexed matrix ; wraps automatically ; does not put value on the stack ; menu button I- on [MATX.3] F2 displays value as subscript (only if indexed matrix exists) ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]                                                                                                                                                                                                                                                                                                                                                                                   | Matrix operations |      | I-      | <row>   |
| F3         | ST0IJ             | Command            | Set current matrix index                   | Set current matrix index (row I and column J) ; Shortcut : [ST0] - ...IJ ; TI : M<name> :I <sub>r</sub> = ; M<name> :J <sub>c</sub> =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Matrix operations |      | ST0IJ   |         |
| F4         | RCLIJ             | Command            | Recall current matrix index                | Recall current matrix index (row I and column J) ; Shortcut : [RCL] - ...IJ ; TI : M<name> :I <sub>r</sub> = ; M<name> :J <sub>c</sub> =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Matrix operations |      | RCLIJ   |         |
| F5         | J- <sub>col</sub> | Command            | Decrement column index                     | Decrement column index J of indexed matrix ; wraps automatically ; does not put value on the stack ; menu button J- on [MATX.3] F5 displays value as subscript (only if indexed matrix exists) ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]                                                                                                                                                                                                                                                                                                                                                                                | Matrix operations |      | J-      | <col>   |
| F6         | J+ <sub>col</sub> | Command            | Increment column index                     | Increment column index J of indexed matrix ; wraps automatically ; does not put value on the stack ; menu button J+ on [MATX.3] F6 displays value as subscript (only if indexed matrix exists) ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]                                                                                                                                                                                                                                                                                                                                                                                | Matrix operations |      | J+      | <col>   |
| fF1        | CMIN              | Function (monadic) | Minimum column value                       | Minimum column value for column (J) of indexed matrix, returns row index (I) in Y and minimum in X ; Info : Set starting row and column index using ST0IJ before executing CMIN                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Matrix operations |      | M.CMIN  |         |
| fF2        | CMAX              | Function (monadic) | Maximum column value                       | Maximum column value for column (J) of indexed matrix, returns row index (I) in Y and maximum in X ; Info : Set starting row and column index using ST0IJ before executing CMAX                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Matrix operations |      | M.CMAX  |         |
| fF3        | R↔R               | Command            | Swap rows                                  | Swap rows X and Y of indexed matrix                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Matrix operations |      | M.R↔R   |         |
| fF4        | C↔C               | Command            | Swap columns                               | Swap columns X and Y of indexed matrix                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Matrix operations |      | M.C↔C   |         |
| fF5        | FIND              | Function (monadic) | Find element                               | Find element X of indexed matrix, setting row index I and column indexes if found (unchanged otherwise) ; Info : If used in a program, the next step after M.FIND is performed if the element is found, otherwise it is skipped                                                                                                                                                                                                                                                                                                                                                                                                             | Matrix operations |      | M.FIND  |         |
| fF6        | INDEX             | Command            | Index matrix                               | Index matrix in a register or variable ; set row I to 1, column J to 1 ; clear flags WRPEDG and WRPEND ; index wraps automatically, setting these flags ; index is dropped upon exit of matrix editor ; TAM : INDEX __ Tam menu ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]                                                                                                                                                                                                                                                                                                                                               | Matrix operations |      | INDEX   |         |
| gF1        | PUTM              | Command            | Put submatrix                              | Put submatrix in X into the indexed matrix starting at current element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Matrix operations |      | M.PUTM  |         |
| gF2        | GETM              | Command            | Get submatrix                              | Get submatrix with Y rows and X columns from the indexed matrix starting at current element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Matrix operations |      | M.GETM  |         |
| gF3        | ST0EL             | Command            | Store X into matrix element                | Store X into current element of indexed matrix ; Shortcut : [ST0] - Config ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]=                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Matrix operations |      | ST0EL   |         |
| gF4        | RCLLEL            | Command            | Recall matrix element                      | Recall current element of indexed matrix ; Shortcut : [RCL] - ...EL ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]=                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Matrix operations |      | RCLLEL  |         |
| gF5        | ST0SEQ            | Command            | Store X into matrix element and go to next | Store X into current element of indexed matrix, then increment column index J of indexed matrix ; wraps automatically ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]=                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Matrix operations |      | ST0SEQ  |         |
| gF6        | RCLSEQ            | Command            | Recall matrix element and go to next       | Recall current element of indexed matrix, then increment column index J of indexed matrix ; wraps automatically ; TI : M[I <sub>r</sub> J <sub>c</sub> ]=<name> [<row> <col>]=                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Matrix operations |      | RCLSEQ  |         |