Celtic CE Documentation

Release 1.0.1

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OVERVIEW

CHAPTER

ONE

OVERVIEW

Celtic CE is a BASIC library written in eZ80 ASM for the TI-84 Plus CE/Premium CE family of calculators. This documentation aims to help users understand how to use Celtic in their programs. The documentation section contains information about Celtic CE in general. It is advised to read this before using Celtic in your programs if you do not have experience with BASIC libraries. The function syntax section contains detailed syntax for each function, along with possible error codes that might not be obvious.

CHAPTER

TWO

DOCUMENTATION

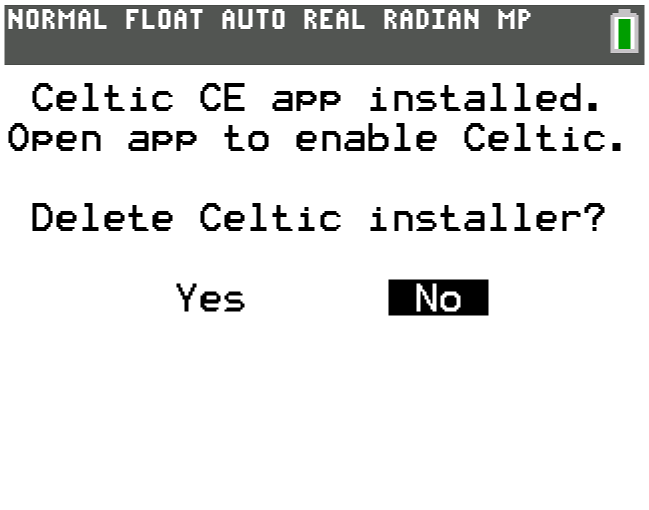
2.1 Installation

2.1.1 Downloading the Installer

- Download the latest release of Celtic CE from the GitHub releases page.
- Transfer `CelticCE.8xp` to your calculator using **`TI-Connect CE`** or **`TiLP`**.

2.1.2 Installing the App

- Open the programs menu and select **`CELTICCE`**.
- Run **`CELTICCE`** and follow through the installation process.

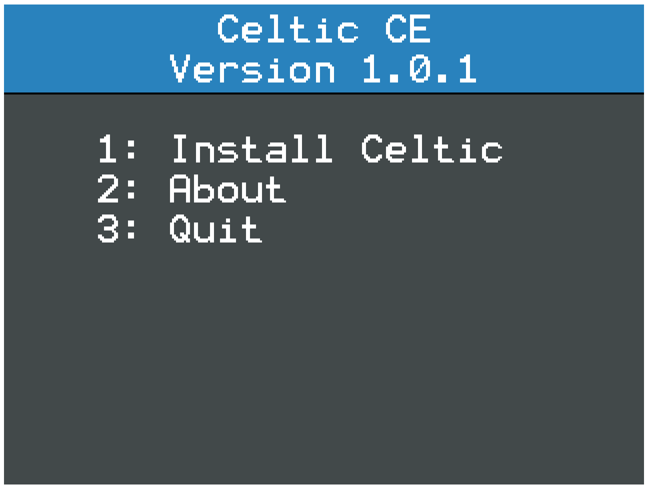


```
NORMAL FLOAT AUTO REAL RADIAN MP

 Celtic CE app installed.
Open app to enable Celtic.

 Delete Celtic installer?

       Yes      No
```

Fig. 1: The Celtic installer menu.

Note: If you delete the installer, you'll need to send it to the calculator again, should the app ever get deleted. However, you can still uninstall and re-install the Celtic CE library using the app. The program is only used for installing the app onto the calculator.

- Open the apps menu and select **`CelticCE`**.
- Press `1` to install. You can now exit the app by pressing `3` or `clear`.



```
Celtic CE
Version 1.0.1

1: Install Celtic
2: About
3: Quit
```

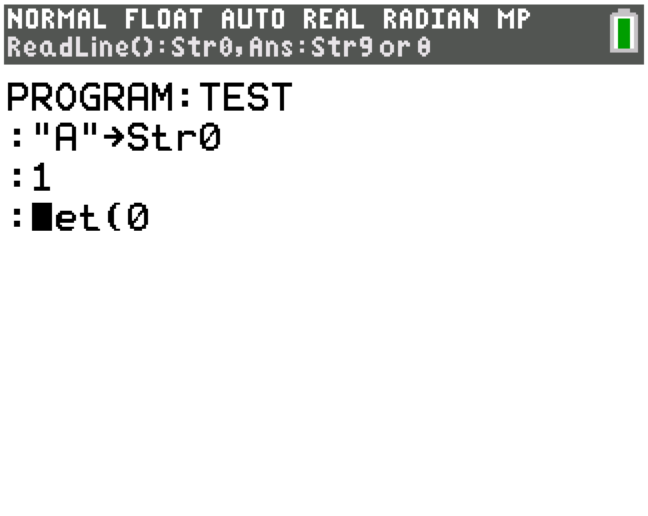
Fig. 2: The Celtic app.

Note: If you install Celtic CE when another parser hook (`ASMHOOK`, for example) is installed, it will chain with it in order to preserve it. This means that both hooks will be able to run in tandem. However, if Celtic gets uninstalled, you will need to re-install the second hook again.

2.2 General Syntax

2.2.1 Overview

Celtic uses a parser hook to search for a token in your program and run its ASM code if it finds it. When it encounters the `det(` token, Celtic will detect which function you are calling and any arguments with it. The first argument after the `det(` token tells Celtic which function you wish to call. If you have entered a valid argument, Celtic will tell you what function the argument is referencing in the status bar of the program editor when your cursor is over it.



```
NORMAL FLOAT AUTO REAL RADIAN MP
ReadLine():Str0,Ans:Str9 or θ
PROGRAM:TEST
:"A"→Str0
:1
:det(0
```

Fig. 3: Celtic’s function preview feature.

The function preview follows a general syntax: "`CommandName(Arguments)`: `Input Vars` (if any): `Output Vars` (if any)". As you can see in the example above, ReadLine is listed with no arguments, `Str0` and `Ans` as the input variables, and `Str9` or `theta` as the output variables. If no input variables are necessary (though there are still output variables), it will say "NA" instead. Nothing will be listed if there are no input and output variables.

Note: In the event that you pass invalid arguments to Celtic, it will return an error. All errors are returned in `Str9`. See the Error Codes page for more information.

2.2.2 Check if Celtic is Installed

If your program uses Celtic, it is recommended that it makes sure Celtic is installed when ran. To check if Celtic is installed, it is recommended you put something like this at the beginning of your program:

```
::DCS
:"Icon data...
:If 90>det([[20
:Then
:Disp "Get Celtic CE to run this:","bit.ly/CelticCE
:Return
:End
```

`det([[20]])` will equal 90 if Celtic CE is installed. If the program aims to be compatible with Celtic 2 CSE, you may wish to refer to the list of version codes on the DCS Wiki as well.

2.2.3 prgmAINSTALL

You'll notice that along with the CelticCE installer binary, Celtic also comes with a program called **AINSTALL**. This program can be used to install CelticCE's hooks (The part of the installation done after the app has been installed) by running it instead of needing to open the app. Like the **AINSTALL** program in Celtic III, this can be used if you wish to install CelticCE from a TI-BASIC program, by simply running **prgmAINSTALL** in it. Keep in mind that **prgmAINSTALL** will only work if the CelticCE app is present and installed on your calculator.

2.2.4 Argument Types

Arguments are passed to Celtic in three different ways. They can be passed in the `det(` function, in the `Ans` variable, or in a string. The method of passing arguments will differ, depending on the function and the type of argument that is being passed. The specific syntax for each function is listed in the documentation.

Most often, numerical arguments are passed in the `det(` function. Variable names are put in `Str0`, and strings arguments are put in `Str9`. The exact usage will vary depending on the function. Celtic only accepts positive real integers as arguments. If a decimal number is passed, Celtic will only take the integer part of it.

When using `Str0` as a program name, simply store the name of the program into `Str0`. When storing an AppVar, begin the string with the `rowSwap(` token. When storing a group, begin the string with the `*row(` For example:

```
:"FOO" -> Str0              //program FOO
:"rowSwap(FOO" -> Str0      //AppVar FOO
:"*row(FOO" ->              //group FOO
```

The system programs `prgm#` and `prgm!` are not supported, so if you attempt to use a Celtic command on them, the command will simply exit.

If a string is used, it must be in the RAM when the function is called.

2.2.5 Returns

Depending on the function, Celtic will return a value after it runs. For example, the `SpecialChars` command fills `Str9` with certain special characters.

String returns (including errors) are most often in `Str9`, while numerical returns are in the `Theta` variable. Almost all functions will return the initial contents of `Ans` (in order to preserve it).

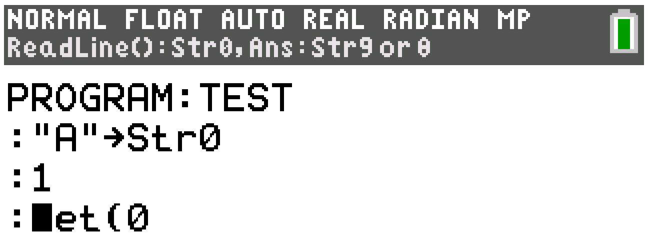
2.3 OS Editor Integrations

2.3.1 Overview

When the CelticCE hooks are installed, it will add a few useful features to the TI-OS editor which making programming, especially with Celtic commands, much easier. This section of the documentation will feature an overview of the two major features added to the TI-OS editor by CelticCE. Keep in mind that these features will only exist in the TI-OS editor when Celtic's hooks are installed, as they are a part of CelticCE!

2.3.2 Command Preview

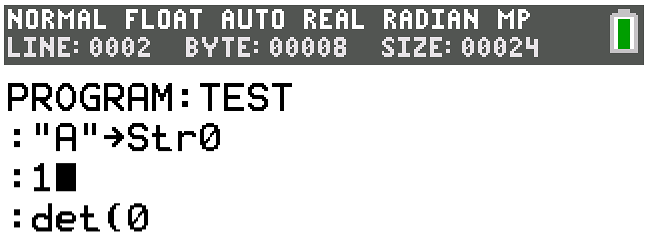
When hovering with the cursor over a valid Celtic command, the status bar will display the name of the command along with the command's syntax. The format of the info will begin with the name of the command, followed by any additional arguments to be included in the `det(` call after the function identifier in the set of parenthesis. For example, if the user hovered over the `FillScreen` command, the first section of the status bar would display `FillScreen(COLOR_L, COLOR_H)`. Next, listed after the first `:`, will be a list of additional TI-OS variables the command takes, like `Ans` or `Str0`. If the command takes no additional TI-OS variables but still has a return output, there will be an "NA" placeholder instead. Finally, after the last `:`, the status bar will list the variables that Celtic could write an output to for that command. Keep in mind that Celtic always has a chance of destroying `Str9`, as there is always the chance it will write an error to it if a command fails to run. A screenshot of the command preview feature in action is below:



```
NORMAL FLOAT AUTO REAL RADIAN MP
ReadLine():Str0,Ans:Str9 or θ

PROGRAM:TEST
:"A"→Str0
:1
:█et(0
```

2.3.3 Line / Byte Offset and Program Size

Another useful feature Celtic adds to the editor is the ability to check the current size of the program, along with the line and byte offset of the program the cursor is currently on. This can be useful for checking optimizations, and also for figuring out the line number or byte offset of a certain location for the SetParseLine and SetParseByte commands. You can view this information by pressing `2nd` + `enter` when in the OS editor. A screenshot of the line / byte offset and program size info is below:



```
NORMAL FLOAT AUTO REAL RADIAN MP
LINE: 0002  BYTE: 00008  SIZE: 00024
PROGRAM:TEST
:"A"→Str0
:1
:det(0
```

2.4 Error Codes

2.4.1 Overview

Celtic does its best to prevent errors. However, if something goes wrong with running a function, Celtic will return an error code. This can be from lack of memory, an incorrect argument, or something else. Keep in mind that Celtic might not always detect the exact error, or realize that there is one in the first place. You can use the error codes to help with the debugging process. This page also contains TI-OS errors and the corresponding values returned in the ErrorHandle command.

2.4.2 Celtic Errors

Error Code	Description
..P:IS:FN	A program already exists, and Celtic will not overwrite it.
..NUMSTNG	The specified line is past end of file. Used when getting the amount of lines in a program.
..NULLVAR	The specified variable did not contain useful data.
..L:NT:FN	The specified line in the program does not exist.
..S:NT:FN	The specified string was not found.
..S:FLASH	The specified string is archived.
..S:NT:ST	The input is not a string, but Celtic expects a string.
..NT:EN:M	There is not enough memory to complete the requested action.
..P:NT:FN	The specified program or appvar was not found.
..PGM:ARC	The specified program or appvar is archived, so it cannot be modified.
..NULLSTR	The specified line exists, but is empty.
..NT:REAL	The input was not a real number, but Celtic expects a real number.
..INVAL:A	An invalid argument was entered. This error code could refer to various issues.
..INVAL:S	An invalid string was entered.
..2:M:ARG	More arguments were entered than Celtic is able to handle.
..NT:A:LS	The argument was not a list, but Celtic expects a list.
..E:NT:FN	The entry was not found in the list specified.
..G:NT:FN	The specified group was not found.
..NT:A:GP	The file specified was not a group.
..SUPPORT	Whatever happened was not supported by Celtic.

2.4.3 TI-OS Errors

Value	Error
0	No Error
1	Overflow
2	DivBy0
3	SingularMat
4	Domain
5	Increment
6	Break
7	NonReal
8	Syntax
9	DataType
10	Argument
11	DimMismatch
12	Dimension
13	Undefined
14	Memory
15	Invalid
16	IllegalNest
17	Bound
18	GraphRange
19	Zoom
20	Label
21	Stat

continues on next page

Table 1 – continued from previous page

Value	Error
22	Solver
23	Singularity
24	SignChange
25	Iterations
26	BadGuess
27	StatPlot
28	TolTooSmall
29	Reserved
30	Mode
31	LnkErr
32	LnkMemErr
33	LnkTransErr
34	LnkDupErr
35	LnkMemFull
36	Unknown
37	Scale
38	IdNotFound
39	NoMode
40	Validation
41	Length
42	Application
43	AppErr1
44	AppErr2
45	ExpiredApp
46	BadAddr
47	Archived
48	Version
49	ArchFull
50	Variable
51	Duplicate
52	Date
53	UnknownCmd
54	OverLimit
55	Disabled
56	Xmit
57	MemFull

2.5 TI-84 Plus CE Hex Codes

2.5.1 Overview

This page contains a list of useful hex codes to be used with ExecHex. To use them, follow the ExecHex documentation with the preferred hex string. Some of these may perform similar utilities to pre-existing Celtic functions. A good number of these were taken/adapted from the TI-BASIC Developer 84 Plus CE Hexcodes page.

2.5.2 Documentation

`Invert LCD (High contrast mode/Dark mode)`

Inverts the colors of the LCD. Also sometimes referred to as “High contrast mode” or “Dark mode”:

```
"211808F874364436216C3601C9"
```

Credit: MateoConLechuga

`Uninvert LCD`

Does the opposite of the previous command and sets the LCD colors back to normal:

```
"211808F874364436206C3601C9"
```

`Toggle Program mode`

When used in a program, it allows you to use `Archive` and `UnArchive` on other programs:

```
"FD7E08EE02FD7708C9"
```

Warning: Make sure to switch back to “program mode” when you’re done by running the program again.

`Text Inverse`

This will switch from normal text mode to inverse (white text on black background) and vice versa:

```
"FD7E05EE08FD7705C9"
```

`Enable Lowercase`

Enables lowercase letters in TI-OS:

```
"FDCB24DEC9"
```

`Disable Lowercase`

Disables lowercase letters in TI-OS (default):

```
"FDCB249EC9"
```

`Toggle Lowercase`

Toggles lowercase letters on/off in TI-OS:

```
"FD7E24EE08FD7724C9"
```

`Clear LCD`

Clears the LCD:

```
"CD101A02C9"
```

`Run Indicator Off`

Turns off the run indicator:

```
"CD480802C9"
```

Run Indicator On

Turns on the run indicator:

```
"CD440802C9"
```

Toggle Run Indicator

Toggles the run indicator on/off:

```
"FD7E12EE01FD7712C9"
```

Disable APD

Disables Automatic Power Down (APD):

```
"CD341102C9"
```

Enable APD

Enables Automatic Power Down:

```
"CD381102C9"
```

Turn Off Cursor

This is harmless, but it stops displaying that blinking cursor :D Just press [2nd][MODE] to put it back to normal. What, jokes are allowed, right?

– TI-BASIC Developer

```
"FDCB0CE6C9"
```

Turn On Cursor

Turns on the cursor:

```
"FDCB0CA6C9"
```

Draw TI Logo

This is a strange function that draws the TI Logo. (Yes, there is a built in ASM call to do that) While there is no real reason you would probably want to do this, it's still interesting:

```
"CD001B02C9"
```

2.6 Colors

2.6.1 Overview

Some Celtic functions allow RGB 565 colors. A list of pre-defined colors can be found below. You can also use the 1555 color picker in 565 mode.

2.6.2 Colors

Refer to the DCS wiki for a list of pre-defined colors.

2.7 Converting Sprites

2.7.1 Overview

Converting sprites by hand can be a pain, but thankfully it is possible to automate the process using a tool called convimg created by MateoConLechuga.

2.7.2 Setup

First you'll need to download the latest version of convimg from the GitHub releases page. You should choose the zip for your platform. Next you'll need to add convimg to your Path. To do this follow the instructions for your OS below:

Note: If you already have the CE C toolchain installed, chances are that convimg has already been installed and is in your Path. You can check this by opening a terminal and running `convimg --version`.

On Windows:

- Extract the zip to a file path without spaces.
- Open the start menu, then search and choose *Edit the system environment variables*.
- Click *Environment Variables* and select *Path* under *System variables*. Then press the *Edit* button.
- Click *New* and enter the path to convimg.
- Click *OK* and exit the editor. You may need to restart your apps (Terminals, IDEs) for the changes to take effect.

On Linux/macOS:

- Extract the zip to a file path without spaces.
- Open your system's rc file to add convimg to the path. This might be called `.bashrc`, `.zshrc`, or something else depending on your system.
- On macOS you might add something like this:

```
export PATH=$PATH:/path/to/convimg
```

- On Linux it might be something like this:

```
export PATH=/path/to/convimg:$PATH
```

- You may need to restart your apps (Terminals, IDEs) for the changes to take effect.

Once you've added convimg to your path, open a new terminal window and type `convimg --version` to ensure it been added correctly. If everything worked, you should see something like this:

```
tiny@tinyUbuntu:~$ convimg --version
convimg v9.0 by mateoconlechuga
```

2.7.3 Conversion

In order to convert your sprites, you should first create a folder with all the sprites for your project, to keep it organized. Having different sprites all over the place gets very confusing and is not a good habit to have. Once you have your sprites in a directory, you'll need to create a `convimg.yaml` file in that directory as well. This file has configuration options and information for convimg to convert your sprites. You can start out with a template file like this:

```
converts:
  - name: images
    palette: xlibc
    width-and-height: false
    images:
      - image.png

outputs:
  - type: basic
    include-file: images.txt
    converts:
      - images
```

Warning: If you are using an older version of convimg you may need to specify the type as "ice" instead of "basic". You can also pick up the latest non-release build of convimg by going to the GitHub Actions tab of the repo, selecting the most recent run, and downloading the version for your OS under "Artifacts".

If you want to convert file names which follow specific patterns, you can use glob patterns. For example, to convert all png files in a directory, you can do something like this:

```
images:
    - "*.png"
```

Note: It is necessary for the pattern to be in quotes, even though that is not necessary for image names to be in quotes.

Once you have completed your yaml, navigate to the directory with the sprites and the yaml in a terminal and run `convimg`. If all goes well you should have a text file as specified in your yaml (In the example it is `images.txt`) containing the converted sprites. It will look something like this:

```
image | 256 bytes
"FFFFFFFF0000000000000000FFFFFFFFFFFFFFFF0000... (Data continues)
```

You can then use the data in your programs by copying it into the source code or pasting it into a TI-BASIC IDE like SourceCoder.

For more documentation on convimg, check out the README here. For more info on glob patterns, look here.

CHAPTER

THREE

FUNCTION SYNTAX

3.1 Celtic 2 CSE Functions

3.1.1 Overview

These functions are the same as those included in Doors CSE 8 for the TI-84 Plus CSE, unless noted otherwise. Most documentation is from the DCS Wiki.

3.1.2 Documentation

`ReadLine: det(0); Str0 = variable name; Ans = line number`

Reads a line from a program or AppVar. If `Ans` (line number) equals 0, then Theta will be overwritten with the number of lines in the program being read, though it will still return the `..NUMSTNG` error, like the original Celtic 2 CSE. Otherwise, `Ans` refers to the line being read.

> **Warning:** If you attempt to read the line of an assembly program, there is a risk of a reset. If Celtic passes an invalid token to `Str9`, it could cause a RAM clear.

Parameters:

- `Str0`: Name of file to read from. Follow the format documented here.
- `Ans`: Line number to read from, begins at 1.

Returns:

- `Str9`: Contents of the line read.
- `Theta`: Number of lines if `Ans` was 0.

Errors:

- `..NULLSTR` if the line is empty.
- `..NT:EN:M` if there is not enough memory to complete the action.

`ReplaceLine: det(1); Str0 = variable name; Ans = line number; Str9 = replacement`

Replaces (overwrites) a line in a program or AppVar. `Ans` refers to the line to replace.

Parameters:

- `Str0`: Name of file to read from. Follow the format documented here.
- `Ans`: Line number to replace, begins at 1.
- `Str9`: Contents to replace the line with.

Returns:

- `Str9`: Intact if no error occured; otherwise, contains an error code.

Errors:

- `..PGM:ARC` if the file is archived.
- `..NT:EN:M` if there is not enough memory to complete the action.

`InsertLine: det(2); Str0 = variable name; Ans = line number; Str9 = contents`

Inserts a line into a program or AppVar. `Ans` refers to the line number to write to.

Parameters:

- `Str0`: Name of file to write to. Follow the format documented here.
- `Ans`: Line number to write to, begins at 1.
- `Str9`: Material to insert into a program. The line that was occupied is shifted down one line and this string is inserted into the resulting location.

Returns:

- `Str9`: Intact if no error occured; otherwise, contains an error code.

Errors:

- `..PGM:ARC` if the file is archived.
- `..NT:EN:M` if there is not enough memory to complete the action.

`SpecialChars: det(3)`

Stores the -> and " characters into `Str9`.

Returns:

- `Str9`: -> and ", respectively. you can use substrings to extract them. There are also 7 more characters in `Str9`, which are junk.

`CreateVar: det(4); Str0 = variable name`

Create a program or AppVar given a name.

Parameters:

- `Str0`: Name of program or AppVar to create. Follow the format documented here.

Alternative method for appvars: `det(4, HEADER), Str0 = variable name`

- `HEADER`: whether or not to include a header which allows CEaShell to edit the appvar. This extra argument is optional. 1 to include the header, and 0 to not.

Returns:

- Creates the program or AppVar.

Errors:

- `..P:IS:FN` if the program already exists.

`ArcUnarcVar: det(5); Str0 = variable name`

Archive/unarchive a program or AppVar given a name.

Parameters:

- `Str0`: Name of program or AppVar to move between Archive and RAM. Follow the format documented here.

Returns:

- Moves a program or AppVar into RAM if it was in Archive, or into Archive if it was in RAM.

`DeleteVar: det(6); Str0 = variable name`

Delete a program variable or an AppVar given a name.

Parameters:

- `Str0`: Name of program or AppVar to delete. Follow the format documented here.

Returns:

- The indicated program or AppVar is deleted.

`DeleteLine: det(7); Str0 = variable name; Ans = line number`

Deletes a line from a program or AppVar. `Ans` is the line to delete.

Parameters:

- `Str0`: Name of program or AppVar to delete from. Follow the format documented here.
- `Ans`: Line number to delete from, begins at 1.

Returns:

- Deletes the specified line from the program or AppVar.

`VarStatus: det(8); Str0 = variable name`

Output a status string describing a program or AppVar's current state, including size, visibility, and more.

Parameters:

- `Str0`: Name of program or AppVar to examine. Follow the format documented here.

Returns:

- **`Str9`: Contains a 9 byte output code.**
  - 1st character: `A` = Archived, `R` = RAM
  - 2nd character: `V` = Visible, `H` = Hidden
  - 3rd character: `L` = Locked, `W` = Writable
  - 4th character: `_` (Space character)

    - 5th - 9th character: Size, in bytes
- Example: `AVL 01337` = Archived, visible, locked, 1337 bytes.

`BufSprite: det(9, width, x, y); Str9 = sprite data`

Draws indexed (palette-based) sprite onto the LCD and into the graph buffer. Copies the contents of the graph buffer under the sprite back into Str9, so that you can "erase" the sprite back to the original background. Good for moving player characters, cursors, and the like. Interacts politely with Pic variables and OS drawing commands like `Line(`, `Circle(`, `Text(`, and so on. If you want to draw a lot of different sprites to the screen and won't need to erase them back to the background, then use BufSpriteSelect instead.

Parameters:

- `Str9`: Sprite data as ASCII hex, one nibble per byte. The digits 1-F are valid colors (1 = blue, 2 = red, 3 = black, etc), while G will cause the routine to skip to the next line. 0 is normal transparency, and lets the background show through. H is a special kind of transparency that erases back to transparency instead of leaving the background color intact.
- `x`: x coordinate to the top-left corner of the sprite.
- `y`: y coordinate to the top-left corner of the sprite.
- `width`: Sprite width (height is computed).

Returns:

- `Str9`: Same length as input, contains the previous contents of the graph buffer where the sprite was drawn. you can call `det(9...)` again without changing Str9 to effectively undo the first sprite draw.

Errors:

- `..INVAL:S` if the string contains invalid characters.

`BufSpriteSelect: det(10, width, x, y, start, length); Str9 = sprite data`

Draws indexed (palette-based) sprite onto the LCD and into the graph buffer. Good for drawing tilemaps, backgrounds, and other sprites that you won't want to individually erase. If you want to be able to erase the sprite drawn and restore the background, you should consider BufSprite instead. This routine takes an offset into Str9 and a sprite length as arguments, so that you can pack multiple sprites of different lengths into Str9.

Parameters:

- `Str9`: Sprite data as ASCII hex, one nibble per byte. The digits 1-F are valid colors (1 = blue, 2 = red, 3 = black, etc), while G will cause the routine to skip to the next line. 0 is normal transparency, and lets the background show through. H is a special kind of transparency that erases back to transparency instead of leaving the background color intact.
- `x`: x coordinate to the top-left corner of the sprite.
- `y`: y coordinate to the top-left corner of the sprite.
- `width`: Sprite width (height is computed).
- `start`: Offset into `Str9` of the start of pixel data, begins at 0.
- `length`: Length of sprite data in characters.

Returns:

- Sprite drawn to LCD and stored to graph buffer.

Errors:

- `..INVAL:S` if the string contains invalid characters.

`ExecArcPrgm: det(11, function, temp_prog_number); Ans = program name`

Copies a program to the `XTEMP` program of the specified `temp_prog_number`. `temp_prog_number` can only be 0 - 15. `Ans` is the name of the program to copy. `function` refers to the behavior of the `ExecArcPrgm` command, as seen in the table below:

Code	Function
0	Copies the program in `Ans` to the `XTEMP` program specified.
1	Deletes the `XTEMP` program with the specified number.
2	Deletes all `XTEMP` programs.

Parameters:

- `function`: The requested behavior of the function. Can be 0, 1, or 2.
- `temp_prog_number`: The number of the `XTEMP` program to create/delete. This must be within 0 - 15.
- `Ans`: Name of program to copy from. Follow the format documented here.

Returns:

- Completes the specified function.

Errors:

- `..NT:EN:M` if there is not enough memory to complete the action.
- `..NT:EN:M` if there is not enough memory to complete the action. (Only when creating an `XTEMP` program.)

`DispColor: det(12, fg_low, fg_high, bg_low, bg_high)`

Changes the foreground and background color for `Output(`, `Disp`, and `Pause` to arbitrary 16-bit colors, or disables this feature. Due to technical limitations, the foreground and background for `Text()` cannot be changed to arbitrary colors. To disable this mode, you should call `det(12, 300)` before exiting your program.

Parameters:

- `fg_low`: low byte of foreground color.
- `fg_high`: high byte of foreground color.
- `bg_low`: low byte of background color.
- `bg_high`: high byte of background color.

Alternative method: `det(12, fg_os, bg_os)`

- `fg_os`: Foreground color from TI-OS Colors menu, like RED or BLUE or NAVY.
- `bg_os`: Background color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- See description.

3.2 Doors CE 9 Functions

3.2.1 Overview

These functions are roughly based/related to some of the functions made for Doors CE 9.

3.2.2 Documentation

`DispText: det(13, large_font, fg_low, fg_high, bg_low, bg_high, x, y); Str9 = text`

Displays colored text from `Str9` at `x` and `y` on the screen, using the OS large or small font.

Parameters:

- `large_font` = whether to use OS large or small font. 0 means to use the OS small font, and 1 means to use the large font.
- `fg_low`: low byte of foreground color.
- `fg_high`: high byte of foreground color.
- `bg_low`: low byte of background color.
- `bg_high`: high byte of background color.
- `x`: x location to display the text, starting from the top-left corner.
- `y`: y location to display the text, starting from the top-left corner.
- `Str9`: Text to display.

Alternative method: `det(13, large_font, fg_os, bg_os, x, y)`

- `fg_os`: Foreground color from TI-OS Colors menu, like RED or BLUE or NAVY.
- `bg_os`: Background color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Displays the specified text.

`ExecHex: det(14); Ans = hex code`

Executes the string of ASCII-encoded hexadecimal in Ans. Although a `C9` (ret) at the end of your hex string is highly encouraged, Celtic will automatically put one at the end for safety regardless. For a list of useful hex codes, refer to this page.

Warning: `Ans` must be under (not including) 8192 characters. It also must be an even number of characters.

Note: When executing the hex code, the bytes are executed at the address *$D0547A* in memory, or *pixelShadow2 + 436*.

Parameters:

- `Ans`: hex code to execute.

Returns:

- Runs the specified hex code.

Errors:

- `..INVAL:S` if there is an invalid hex digit or an odd number of characters in the string.

`FillRect: det(15, low, high, x, y, width, height)`

Draws a filled, colored rectangle on the screen.

Parameters:

- `low`: low byte of color.
- `high`: high byte of color.
- `x`: x location to draw the rectangle, beginning at the top-left corner.
- `y`: y location to draw the rectangle, beginning at the top-left corner.
- `width`: Width of rectangle.
- `height`: Height of rectangle.

Alternative method: `det(15, os_color, x, y, width, height)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Note: If you use the alternative method and use 0 for `os_color`, it will invert the section of the screen covered by the rectangle instead of drawing a color. This can be useful for blinking cursors, etc.

Colors:

- A list of colors can be found here.

Returns:

- Draws the colored rectangle.

3.3 Graphics Functions

3.3.1 Overview

These functions are related to graphical operations. This is not the only section containing graphical operations, as some are better categorized in other sections.

3.3.2 Documentation

`FillScreen: det(16, low, high)`

This function fills the screen with the color specified. It is faster than using FillRect to draw a rectangle over the entire screen.

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.

Alternative method: `det(16, os_color)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Fills the screen with the specified color.

`DrawLine: det(17, low, high, x1, y1, x2, y2)`

Draws a line of the specified color from (x1, y1) to (x2, y2).

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.
- `x1`: x location to begin drawing the line from, beginning from the top-left corner of the screen. x has a range of 0 - 319.
- `y1`: y location to begin drawing the line from, beginning from the top-left corner of the screen. y has a range of 0 - 239.
- `x2`: x location to finish drawing the line at, beginning from the top-left corner of the screen.
- `y2`: y location to finish drawing the line at, beginning from the top-left corner of the screen.

Alternative method: `det(17, os_color, x1, y1, x2, y2)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws a line of the specified color from (x1, y1) to (x2, y2).

`SetPixel: det(18, low, high, x, y)`

Sets the pixel located at (x, y) to the color specified.

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.

- `x`: x location of the pixel to set, beginning from the top-left corner of the screen.
- `y`: y location of the pixel to set, beginning from the top-left corner of the screen.

Alternative method: `det(17, os_color, x, y)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Note: If you use the alternative method and use 0 for `os_color`, it will invert the specified pixel instead of drawing a color.

Colors:

- A list of colors can be found here.

Returns:

- Sets the pixel at (x, y) to the color specified, or inverts it if using the alternative method with `os_color` being 0.

`GetPixel: det(19, x, y)`

Returns a low and high byte representing the color of the pixel at (x, y) in `Ans` and `Theta` respectively.

Parameters:

- `x`: x location of the pixel to check, beginning from the top-left corner of the screen.
- `y`: y location of the pixel to check, beginning from the top-left corner of the screen.

Returns:

- `Ans`: Low byte of the color of the pixel checked.
- `Theta`: High byte of the color of the pixel checked.

`PixelTestColor: det(20, row, column)`

This function works just like the OS function pxl-Test() does, however, it will return 0 if no pixel is present and the OS color of the pixel if one is present. This only applies to the graph screen, like pxl-Test().

Parameters:

- `row`: Row of the graphscreen that contains the pixel to test.
- `column`: Column of the graphscreen that contains the pixel to test.

Tip: The arguments and functionality of this are identical to pxl-Test(), other than the fact that this returns the color of the pixel if one is present.

Returns:

- `Ans`: 0 if no pixel was present, otherwise will contain the OS color of the pixel tested.

PutSprite: det(21, x, y, width, height, string)

This function draws a sprite at (x, y) with a width of width and a height of height, using data specified by string. For example, if the user specifies the string as 0, it will read the data from Str0. It is designed to be fast, and so it does not have as much error checking, meaning that it will display a sprite of the given width and height regardless of the length of the given sprite data. The sprite data is made up of hex values referring to xLIBC colors, which can be found here. The data is stored left to right and top to bottom. For example, take a sprite that looks like this:

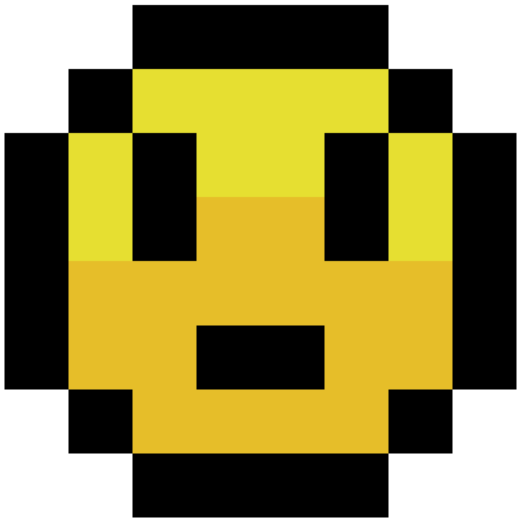


Fig. 1: A sample sprite.

We'll convert it into a matrix, where each pixel is replaced with the hex equivalent of its xLIBC color:

```
[FF, FF, 00, 00, 00, 00, FF, FF
 FF, 00, E6, E6, E6, E6, 00, FF
 00, E6, 00, E6, E6, 00, E6, 00
 00, E6, 00, E5, E5, 00, E6, 00
 00, E5, E5, E5, E5, E5, E5, 00
 00, E5, E5, 00, 00, E5, E5, 00
 FF, 00, E5, E5, E5, E5, 00, FF
 FF, FF, 00, 00, 00, 00, FF, FF]
```

Then, to make it into a string that we can use in a program, we'll remove the newlines and commas, like this:

```
"FFFF00000000FFFFFF00E6E6E6E600FF00E600E6E600E60000E600E5E500E600
00E5E5E5E5E5E50000E5E50000E5E500FF00E5E5E5E500FFFFFF00000000FFFF" -> Str9
```

More detailed instructions on converting sprites can be found here.

Parameters:

- `x`: x location to draw the sprite, beginning at the top-left corner of the screen.
- `y`: y location to draw the sprite, beginning at the top-left corner of the screen.
- `width`: Width of the sprite in pixels.
- `height`: Height of the sprite in pixels.
- `string`: Which string variable to read the data from, 0-9.

Colors:

- Uses hex codes referring to the xLIBC colors. A good resource for the xLIBC palette can be found here.

Returns:

- Draws a sprite of the specified width and height at (x, y).

> **Warning:** Keep in mind that the function will not check if your string is long enough for the provided width and height. If your string is an incorrect size, it will still draw a sprite of the specified width and height, though parts of the drawn sprite could be garbage.

`GetStringWidth: det(54, font); Ans = string`

Gets the width of a string in pixels. This command works with both the OS large and small fonts.

Parameters:

- `font`: Whether to use the OS large or small font. 0 for small font, 1 for large font.
- `Ans`: Contains the string to be checked.

Returns:

- `Theta`: Contains the width of the string in pixels.

Errors:

- `..S:NT:ST` if `Ans` is not a string.

`TransSprite: det(55, x, y, width, height, transparency, string)`

Draws a sprite where the user specifies the color to be interpreted as transparency. The rest of the functionality is identical to the PutSprite command.

Parameters:

- `x`: x location to draw the sprite, beginning at the top-left corner of the screen.
- `y`: y location to draw the sprite, beginning at the top-left corner of the screen.
- `width`: Width of the sprite in pixels.
- `height`: Height of the sprite in pixels.
- `transparency`: Color in the sprite to be interpreted as transparency (0-255).
- `string`: Which string variable to read the data from, 0-9.

Returns:

- Draws a sprite with transparency of the specified width and height at (x, y).

> **Warning:** Keep in mind that the function will not check if your string is long enough for the provided width and height. If your string is an incorrect size, it will still draw a sprite of the specified width and height, though parts of the drawn sprite could be garbage.

`ScaleSprite: det(56, x, y, width, height, scale_x, scale_y, string)`

Draws a scaled sprite where the user can specify the scale value of both X and Y. The rest of the functionality is identical to the PutSprite command.

Parameters:

- `x`: x location to draw the sprite, beginning at the top-left corner of the screen.
- `y`: y location to draw the sprite, beginning at the top-left corner of the screen.
- `width`: Unscaled width of the sprite in pixels.
- `height`: Unscaled height of the sprite in pixels.
- `scale_x`: Width scaling value.
- `scale_y`: Height scaling value.
- `string`: Which string variable to read the data from, 0-9.

Returns:

- Draws a scaled sprite of the specified (scaled) width and height at (x, y).

Warning: Keep in mind that the function will not check if your string is long enough for the provided width and height. If your string is an incorrect size, it will still draw a sprite of the specified width and height, though parts of the drawn sprite could be garbage.

`ScaleTSprite: det(57, x, y, width, height, scale_x, scale_y, transparency, string)`

Draws a scaled sprite where the user specifies the color to be interpreted as transparency. The rest of the functionality is identical to the PutSprite command.

Parameters:

- `x`: x location to draw the sprite, beginning at the top-left corner of the screen.
- `y`: y location to draw the sprite, beginning at the top-left corner of the screen.
- `width`: Unscaled width of the sprite in pixels.
- `height`: Unscaled height of the sprite in pixels.
- `scale_x`: Width scaling value.
- `scale_y`: Height scaling value.
- `transparency`: Color in the sprite to be interpreted as transparency (0-255).
- `string`: Which string variable to read the data from, 0-9.

Returns:

- Draws a scaled sprite with transparency of the specified (scaled) width and height at (x, y).

Warning: Keep in mind that the function will not check if your string is long enough for the provided width and height. If your string is an incorrect size, it will still draw a sprite of the specified width and height, though parts of the drawn sprite could be garbage.

`ShiftScreen: det(58, direction, amount, x, y, width, height)`

Shifts the pixels within a user-specified region of the screen a specified amount of pixels in a specified direction. The following directions and corresponding values are below:

Value	Direction
0	Up
1	Down
2	Left
3	Right

Parameters:

- `direction`: Direction to move the screen in, as seen in the table above.
- `amount`: The amount of pixels to move the screen.
- `x`: Starting X position of the region of the screen to shift, beginning at the top-left corner of the screen.
- `y`: Starting Y position of the region of the screen to shift, beginning at the top-left corner of the screen.
- `width`: Width of the region of the screen to shift.
- `height`: Height of the region of the screen to shift.

Alternative method: `det(58, direction, amount)`

This alternative method acts as a shorthand way to shift the entire screen, rather than a specified region.

Returns:

- Moves the screen in the specified direction.

`RGBto565: det(59, r, g, b)`

Converts an RGB color to a high and low byte that can be used in other Celtic functions.

Parameters:

- `r`: Red color value.
- `g`: Green color value.
- `b`: Blue color value.

Returns:

- `Ans`: Low byte of the color.
- `Theta`: High byte of the color.

`DrawRect: det(60, low, high, x, y, width, height)`

Draws an unfilled rectangle of user-specified color, location, and size.

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.
- `x`: x location to begin drawing the rectangle, starting at the top-left corner of the screen.
- `y`: y location to begin drawing the rectangle, starting at the top-left corner of the screen.

- `width`: Width of the rectangle to draw.
- `height`: Height of the rectangle to draw.

Alternative method: `det(60, os_color, x, y, width, height)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws the unfilled rectangle.

`DrawCircle: det(61, low, high, x, y, radius)`

Draws an unfilled circle with the user specified color. The `x` and `y` arguments refer to the center point of the circle.

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.
- `x`: x location of the center of the circle, starting at the top-left corner of the screen.
- `y`: y location of the center of the circle, starting at the top-left corner of the screen.
- `radius`: Radius of the circle.

Alternative method: `det(61, os_color, x, y, radius)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws the unfilled circle.

`FillCircle: det(62, low, high, x, y, radius)`

Draws a filled circle with the user specified color. The `x` and `y` arguments refer to the center point of the circle.

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.
- `x`: x location of the center of the circle, starting at the top-left corner of the screen.
- `y`: y location of the center of the circle, starting at the top-left corner of the screen.
- `radius`: Radius of the circle.

Alternative method: `det(62, os_color, x, y, radius)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws the filled circle.

DrawArc: det(63, low, high, x, y, radius, start_angle, end_angle)

Draws the outline of a circular arc. The `x` and `y` arguments refer to the center of the arc, which begins at `start_angle` and ends at `end_angle`. Angle values go from 0-360, and the end angle must be greater than the start angle. 0 degrees is the right most part of the circle, and goes counter-clockwise.

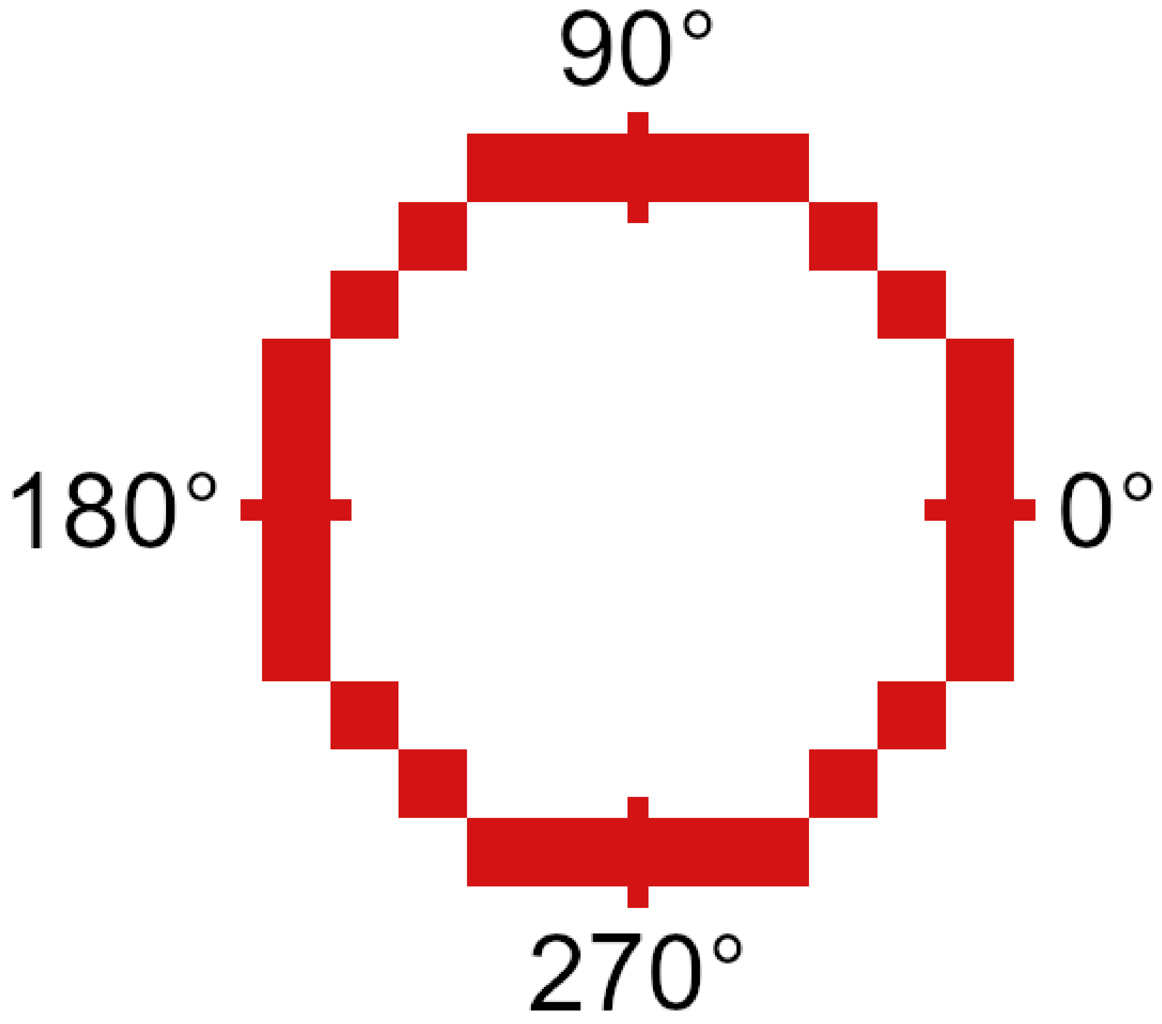


Fig. 2: A diagram showing various points along the circle.

Parameters:

- `low`: Low byte of color.
- `high`: High byte of color.
- `x`: x location of the center of the arc, starting at the top-left corner of the screen.

- `y`: y location of the center of the arc, starting at the top-left corner of the screen.
- `radius`: Radius of the arc.
- `start_angle`: Angle to begin drawing the arc at.
- `end_angle`: Angle to finish drawing the arc at.

Alternative method: **`det(63, os_color, x, y, radius, start_angle, end_angle)`**

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws the user-specified arc.

`DispTransText: det(64, font, low, high, x, y); Str9 = string to display`

Draws colored text with a transparent background in either the OS large or small font.

Parameters:

- `font`: Whether to use the OS large or small font. 0 for small font, 1 for large font.
- `low`: Low byte of color.
- `high`: High byte of color.
- `x`: x location to begin drawing the text at, starting at the top-left corner of the screen.
- `y`: y location to begin drawing the text at, starting at the top-left corner of the screen.
- `Str9`: String to display.

Alternative method: **`det(64, font, os_color, x, y)`**

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

`ChkRect: det(65, x0, y0, width0, height0, x1, y1, width1, height1)`

Checks if a rectangle intersects with another rectangle.

Parameters:

- `x0`: x coordinate of rectangle 0, starting at the top-left corner of the screen.
- `y0`: y coordinate of rectangle 0, starting at the top-left corner of the screen.
- `width0`: Width of rectangle 0.
- `height0`: Height of rectangle 0.
- `x1`: x coordinate of rectangle 1, starting at the top-left corner of the screen.
- `y1`: y coordinate of rectangle 1, starting at the top-left corner of the screen.
- `width1`: Width of rectangle 1.
- `height1`: Height of rectangle 1.

Returns:

- `Ans`: 0 if the rectangles do not intersect, and 1 if they do.

`PutChar: det(66, font, fg_low, fg_high, bg_low, bg_high, x, y, char)`

Displays a character specified by the user at `x`, `y`, with a user-specified background color as well. `char` can range from 0 - 255. In order to figure out the `char` value for your preferred character, you can use the handy images below. Simply take the X and Y values on the chart and add them together.

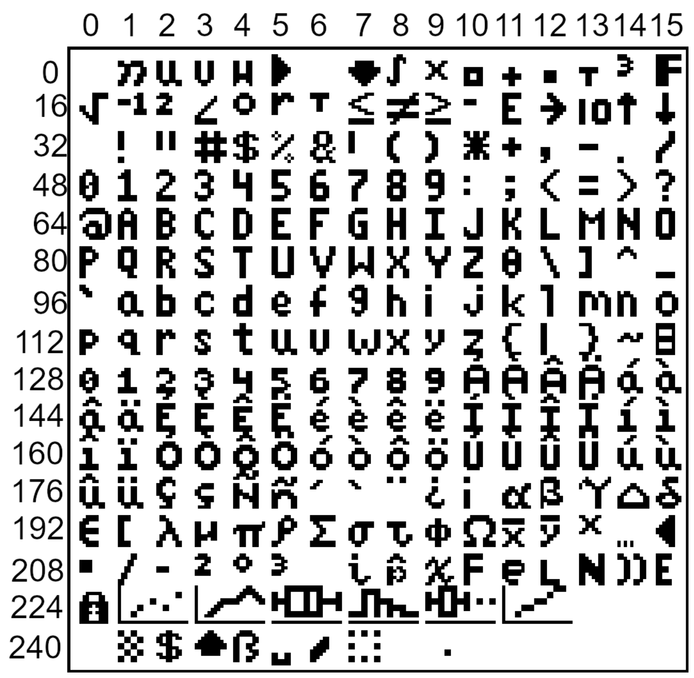


Fig. 3: Small Font

Parameters:

- `font`: Whether to use the OS large or small font. 0 for the small font and 1 for the large font.
- `fg_low`: Low byte of the foreground color.
- `fg_high`: High byte of the foreground color.
- `bg_low`: Low byte of the background color.
- `bg_high`: High byte of the background color.
- `x`: X coordinate to display the character at, beginning at the top-left corner of the screen.
- `y`: Y coordinate to display the character at, beginning at the top-left corner of the screen.
- `char`: The numeric code associated with the character to display. See images above for more info.

Alternative method: `det(66, font, fg_os, bg_os, x, y, char)`

- `fg_os`: Foreground color from TI-OS Colors menu, like RED or BLUE or NAVY.
- `bg_os`: Background color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

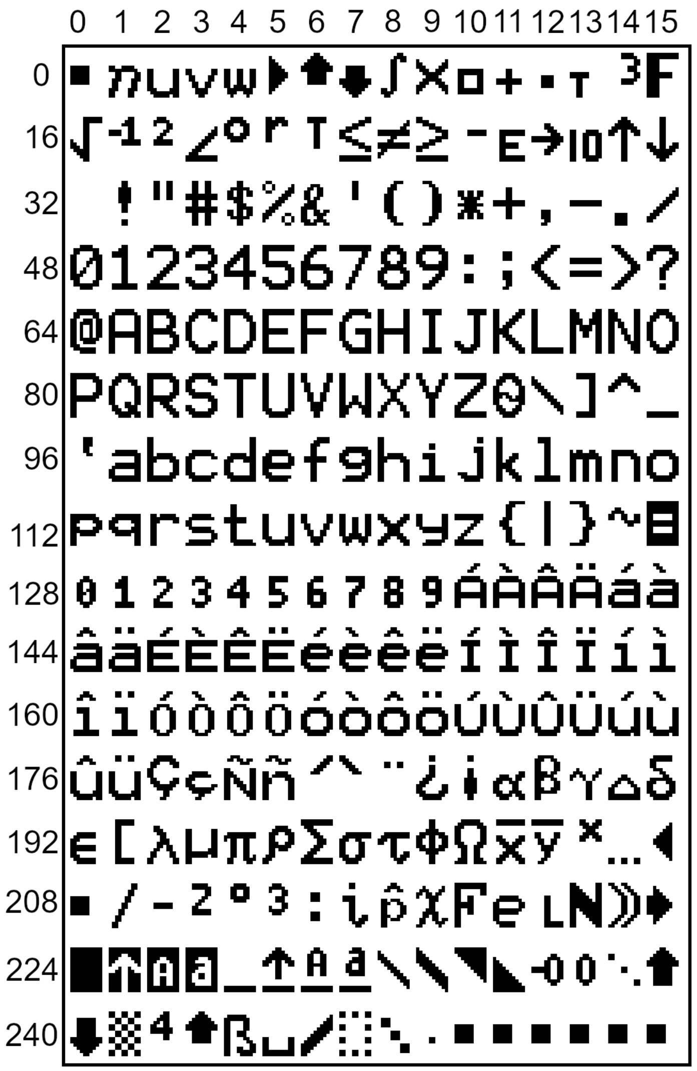


Fig. 4: Large Font

- A list of colors can be found here.

Returns:

- Displays the specified character.

`PutTransChar: det(67, font, low, high, x, y, char)`

Displays a character specified by the user at `x`, `y`, with a transparent background. See the above command for information on character codes.

Parameters:

- `font`: Whether to use the OS large or small font. 0 for the small font and 1 for the large font.
- `low`: Low byte of the color.
- `high`: High byte of the color.
- `x`: X coordinate to display the character at, beginning at the top-left corner of the screen.
- `y`: Y coordinate to display the character at, beginning at the top-left corner of the screen.
- `char`: The numeric code associated with the character to display. See images above for more info.

Alternative method: `det(67, font, os_color, x, y, char)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Displays the specified character.

`HorizLine: det(68, low, high, x, y, length)`

Draws a horizontal line beginning at `x`, `y`, with a length of `length`.

Parameters:

- `low`: Low byte of the color.
- `high`: High byte of the color.
- `x`: X coordinate to begin drawing the line at, beginning at the top-left corner of the screen.
- `y`: Y coordinate to begin drawing the line at, beginning at the top-left corner of the screen.
- `length`: The length of the horizontal line.

Alternative method: `det(68, os_color, x, y, length)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws a horizontal line `length` pixels long, beginning at `x`, `y`.

VertLine: `det(69, low, high, x, y, length)`

Draws a vertical line beginning at `x`, `y`, with a length of `length`.

Parameters:

- `low`: Low byte of the color.
- `high`: High byte of the color.
- `x`: X coordinate to begin drawing the line at, beginning at the top-left corner of the screen.
- `y`: Y coordinate to begin drawing the line at, beginning at the top-left corner of the screen.
- `length`: The length of the vertical line.

Alternative method: `det(69, os_color, x, y, length)`

- `os_color`: Color from TI-OS Colors menu, like RED or BLUE or NAVY.

Colors:

- A list of colors can be found here.

Returns:

- Draws a vertical line `length` pixels long, beginning at `x`, `y`.

3.4 OS Utility Functions

3.4.1 Overview

These functions perform various actions related to the OS and its various features.

3.4.2 Documentation

GetMode: `det(22, mode)`

Checks a specified mode, from 0 to 14. A table containing the information on the modes and possible outcomes is below.

Input	Mode	Possible Returns
0	Mathprint	0 if not enabled, 1 if enabled.
1	Notation	0 for Normal, 1 for Scientific, 2 for Engineering.
2	Trig Mode	0 for Radian, 1 for Degree.
3	Graph Mode	0 for Function, 1 for Parametric, 2 for Polar, 3 for Sequence.
4	Graph Equations	0 for Sequential, 1 for Simultaneous.
5	Numeric Format	0 for Real, 1 for a + bi mode, 2 for re^(Thetai). Theta is the theta token.
6	Window Mode	0 for Full, 1 for Horizontal, 2 for Graph-Table.
7	Coordinate Mode	0 for Rectangular coordinates, 1 for Polar coordinates
8	Grid Mode	0 if the grid is off, 1 if the grid is on.
9	Axis Mode	0 if the axis is off, 1 if it is on.
10	Axis Labels	0 if the axis labels are off, 1 if they are on.
11	Detect Asymptotes	0 if Asymptotes are off, 1 if they are on.
12	Stat Wizards	0 if Stat Wizards are off, 1 if they are on.
13	Mixed Fractions	0 if Mixed Fractions are off, 1 if they are on.
14	Decimal Answers	0 for Auto Answers, 1 for Decimal Answers.

Parameters:

- `mode`: Which mode to check. Refer to the table above. Must be between 0 and 14.

Returns:

- `Theta`: Varies based on the specified mode. See table above.

`RenameVar: det(23); Str0 = variable to rename; Str9 = new name`

Renames the variable specified in `Str0` with a new name specified in `Str9`. For appvars, the name in `Str0` must be preceeded with the `rowSwap(` token, however, the new name does not need the `rowSwap(` token. Renaming a program will result in the program being locked.

Parameters:

- `Str0`: The name of the variable you wish to rename. If it is an appvar, it must be preceeded by the `rowSwap(` token.
- `Str9`: The new name that you wish to rename the specified file to. It does not need to be preceeded by the `rowSwap(` token, regardless of whether it is a program or appvar.

Returns:

- Renames the variable specified in `Str0` with the new name specified in `Str9`.

Errors:

- `..NT:EN:M` depending on the amount of remaining memory and the size of the variable being renamed.

`LockPrgm: det(24); Str0 = variable to lock / unlock`

Toggles the locked attribute of the program referenced by `Str0`.

> **Warning:** If you lock/unlock an archived program, Celtic un-archives it when running the function and then re-archives it when the function is complete. This means that it could result in a garbage collect.

Parameters:

- `Str0`: The name of the program to toggle the locked attribute of. Follow the format documented here.

Returns:

- Toggles whether or not the specified program is locked.

Errors:

- `..SUPPORT` if you attempt to use this function on an appvar.

`HidePrgm: det(25); Str0 = variable to hide / unhide`

Toggles the hidden attribute of the program referenced by `Str0`.

> **Warning:** If you hide/unhide an archived program, Celtic un-archives it when running the function and then re-archives it when the function is complete. This means that it could result in a garbage collect.

Parameters:

- `Str0`: The name of the program to toggle the hidden attribute of. Follow the format documented here.

Returns:

- Toggles whether or not the specified program is hidden.

Errors:

- `..SUPPORT` if you attempt to use this function on an appvar.

`PrgmToStr: det(26, string_number); Str0 = variable to read`

Copies the contents of a file specified in `Str0` to the string specified by `string_number`. If you wish to read the contents of an appvar, you must preceed the name with the `rowSwap(` token in `Str0`.

Warning: Using this command on ASM programs and AppVars could cause the string to contain invalid tokens, resulting in a crash. Keep this in mind when using the command and ensure that you do not accidentally try to get invalid tokens.

Parameters:

- `string_number`: The number of the string to copy to. Can be from 0 to 9. 0 means `Str0`, 1 means `Str1` and so on.
- `Str0`: Name of the variable to copy. The name must be preceeded by the `rowSwap(` token if you wish to read an appvar.

Returns:

- The contents of the specified variable in the string specified by `string_number`.

Errors:

- `..NT:EN:M` if there is not enough memory to create the string with the contents of the specified variable.
- `..NULLVAR` if the specified file contains no data.

`GetPrgmType: det(27); Str0 = program to check`

Gets the type of program specified in `Str0`. This is not the OS type, it is the actual program type (C, ASM, etc). A table with the return codes and filetypes they signify is below.

Code	Filetype
0	eZ80 Assembly
1	C
2	TI-BASIC
3	ICE
4	ICE Source

Parameters:

- `Str0`: Name of the program to check. It cannot be an AppVar. Follow the format documented here.

Returns:

- `Theta`: Contains the number referencing the filetype. See the table above.

Errors:

- `..INVAL:S` if you attempt to use this function on an AppVar.

`GetBatteryStatus: det(28)`

Gets the current status of the battery, as a number between 0 and 4, 0 being no charge and 4 being fully charged. If the battery is charging, 10 will be added. For example, a battery that is partially charged and also actively charging would return 12.

Returns:

- `Theta`: Current status of the battery.

`SetBrightness: det(29, brightness)`

Sets the LCD to the specified `brightness`. The brightness can be between 0 and 255, with 0 being the brightest and 255 being the darkest. If no argument is passed for the brightness, it will instead return the current brightness of the screen.

Note: The brightness will not persist after the calculator is turned off. Instead, it will go back to what it was previously.

Parameters:

- `brightness`: The level of brightness to set the screen to, between 0 and 255. No brightness argument will instead return the current level of brightness.

Returns:

- `Theta`: If no brightness argument is passed, `Theta` will contain the current brightness.
- If `brightness` is between 0 and 255, it will instead set the screen to the specified brightness, with 0 being the lightest and 255 the darkest.

`SearchFile: det(52, offset); Str0 = file name, Str9 = search string`

Searches a program or AppVar specified by `file name`, for a `search string`, beginning at the user-specified (0-indexed) `offset`.

Parameters:

- `offset`: Byte offset in the file to start searching, with 0 being the first byte of the file.
- `Str0`: Name of the file to search in. Follow the format documented here.
- `Str9`: String to search for.

Returns:

- `Theta`: The byte offset of the located string.

Errors:

- `..E:NT:FN` if the string is not located.

- `..INVAL:S` if the string is bigger than the file to search for.

`CheckGC: det(53); Str0 = variable name`

Checks if the archiving of the file specified by `variable name` will trigger a Garbage Collect.

Note: If the file is already archived, the command will not say that archiving it will cause a Garbage Collect, regardless of size.

Parameters:

- `Str0`: Name of variable to check for. Follow the format documented here.

Returns:

- `Ans`: 0 if a Garbage Collect will not occur, and 1 if it will.

`RunAsmPrgm: det(70); Ans = variable name`

This command works similarly to ErrorHandle, though for assembly programs instead of BASIC ones. This includes assembly programs, C programs, and (compiled) ICE programs. It can be useful in newer versions of TI-OS where assembly is blocked. Unlike ErrorHandle, `Ans` should not begin with the `prgm` token.

Parameters:

- `Ans`: Name of the ASM program to run. Follow the format documented here.

Returns:

- `Theta`: Contains the error code returned by the program, or 0 if no error occured.

Errors:

- `..SUPPORT` if the program name in `Ans` is not an assembly program.
- `..NT:EN:M` if there is not enough free RAM to execute the program.

`LineToOffset: det(71, line); Str0 = variable name`

Gets the byte offset of a newline in the program or AppVar specified by `Str0`. Lines begin at 1 and bytes begin at 0.

Parameters:

- `line`: Line to get the byte offset of.
- `Str0`: Name of the variable to search for the byte offset in. Follow the format documented here.

Returns:

- `Theta`: Contains the byte offset of `line`.

Errors:

- `..L:NT:FN` if the line is not found in the file.

OffsetToLine: det(72, offset); Str0 = variable name

Gets the line at which a specific byte (specified by `offset`) occurs in the program or AppVar specified by `Str0`. Lines begin at 1 and bytes begin at 0.

Parameters:

- `offset`: Byte offset to detect the line it occurs in.
- `Str0`: Name of the variable to search for the line in. Follow the format documented here.

Returns:

- `Theta`: Line containing `offset`.

Errors:

- `..E:NT:FN` if the offset does not exist in the file.

GetKey: det(73)

This command acts as a faster version of the TI-OS GetKey command, though it returns different keycodes, including keycodes for diagonal keypresses and other combinations of arrow keys. A map with the keycodes for different keys (returned in `Ans`) is below:

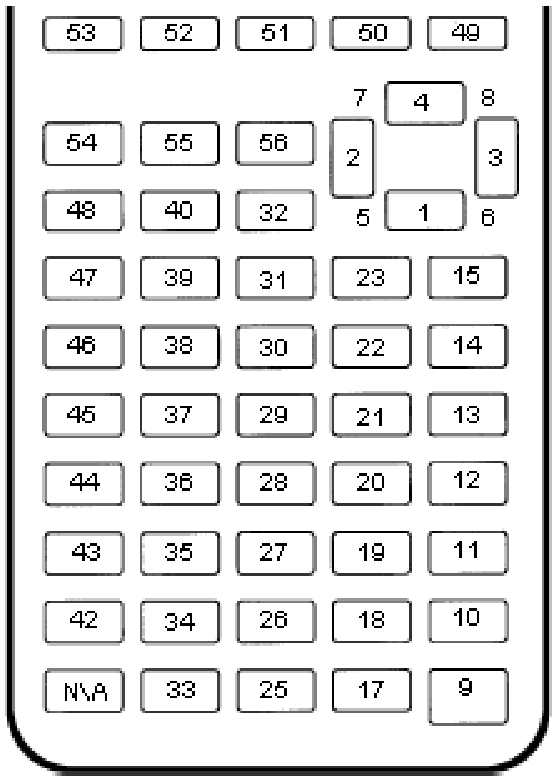


Fig. 5: A map of buttons and their corresponding keycodes

There are also a few "unofficial" combinations of arrow keys with codes as well:

Keycode	Keys
57	Left / Right
58	Left / Right / Down
59	Up / Down
60	Up / Left / Down
61	Up / Right / Down
62	Up / Right / Left
63	All arrow keys

Returns:

- `Ans`: The keycode of the key(s) pressed.

`TurnCalcOff: det(74)`

This command turns the calculator off. When the user presses the [on] key, it will resume program execution after the command.

Returns:

- See above.

`BackupString: det(75, string_number)`

Backs up the contents of a string to be restored later with the RestoreString command. `string_number` refers to the string to back up, with 0 being `Str0`, 1 being `Str1`, and so on. Keep in mind that if the string being backed up is greater than 256 bytes in size, only the first 256 bytes will be backed up by the command. If a string has previously been backed up, backing up a new string will overwrite the old one.

Parameters:

- `string_number`: Which string to back up, with 0 being `Str0`, 1 being `Str1`, and so on. This number can range between 0 - 9.

Returns:

- Backs up the string specified by the user to be restored at a future time in the program.

Errors:

- `..INVAL:S` if the string being backed up has a length of 0.

`RestoreString: det(76, string_number)`

Restores the contents of a string backed up by the BackupString command. `string_number` refers to the string to copy the backup into. This does not need to be the same string as the one previously backed up.

Warning: It is advised to not restore a string if no string has previously been backed up, as you could end up loading invalid tokens into the string and corrupting it.

Parameters:

- `string_number`: Which string to restore to, with 0 being `Str0`, 1 being `Str1`, and so on. This number can range between 0 - 9.

Returns:

- Copies the data backed up from the BackupString command into the user-specified string.

Errors:

- `..NT:EN:M` if there is not enough memory to complete the action.

`BackupReal: det(77, variable)`

This command functions similarly to BackupString, though it backs up a real number instead. `variable` is a number referencing the variable to be backed up, and can range from 1 to 27, with 1 being `A`, 2 being `B`, and so on up until 27 which represents `Theta`. This command will only allow you to back up variables with real values.

Parameters:

- `variable`: A number referencing the variable to back up, with 1 being `A`, 2 being `B`, and so on until 27, which is `Theta`.

Returns:

- Backs up the variable specified by the user, which can be restored into a variable later with RestoreReal.

Errors:

- `..NT:REAL`: If the value of the variable being backed up is not a real number.

`RestoreReal: det(78, variable)`

This command functions similarly to RestoreString, though it restores a real number instead. `variable` is a number referencing the variable to copy the backed up value into, and can range from 1 to 27, with 1 being `A`, 2 being `B`, and so on up until 27 which represents `Theta`. The variable restored to does not need to be the same one previously backed up.

Warning: It is advised to not restore a variable if no variable has previously been backed up, as you could end up corrupting it like RestoreString.

Parameters:

- `variable`: A number referencing the variable to restore to, with 1 being `A`, 2 being `B`, and so on until 27, which is `Theta`.

Returns:

- Copies the value backed up by BackupReal into a variable specified by the user.

Errors:

- `..NT:REAL`: If the value of the currently backed up number is not a real number.

`SetParseLine: det(79, line)`

This command jumps to a specific line in the program that is currently being executed. This can save space in your program by avoiding the need of Labels and Gotos. This makes it a useful command for optimizing programs or creating a “function-like” structure in your programs as well. It will also return the line that is currently being parsed (The one with the jump command) in `Theta` before jumping, making returning to the previous location much easier, as seen in this example:

```
1: Disp "PROGRAM START"
2: det(79,5) // Jump to the fifth line of the program
3: Disp "PROGRAM FINISH"
4: Return
5: Disp "PROGRAM MIDDLE"
6: det(79,Theta+1) // Jump to the line after the previous jump, in this case, line 3
```

To make using this command easier, you can view the line number of the line your cursor is currently on in the editor by pressing `2nd` + `enter` if Celtic is installed. This will display the current line number in the status bar, along with the current byte offset and size of the program in bytes as well.

Alternative method: `det(79)` OR `det(79, 0)`
If no line argument is included or you attempt to jump to line 0, Celtic will only return the current line offset without jumping.

Parameters:

- `line`: The line of the program currently being executed to jump to.

Returns:

- `Theta`: The line of the program that the SetParseLine command was ran on.

Errors:

- `..L:NT:FN` if the line being attempted to jump to does not exist in the currently running program.

`SetParseByte: det(80, offset)`

This command jumps to a specific byte offset in the program currently being executed. It acts essentially the same as SetParseLine, other than working with byte offsets instead of lines. This also means that the command will run faster. It will also return the byte offset after the command in `Theta`.

Note: If the byte offset specified is past the end of program, SetParseByte will simply jump to the end of the program, which will end the program.

To make using this command easier, you can view the current offset in your program of the byte your cursor is currently on in the editor by pressing `2nd` + `enter` if Celtic is installed. This will display the current byte offset in the status bar, along with the current line number and size of the program in bytes as well.

Alternative method: `det(80)`
If you do not include an offset argument, SetParseByte will only return the byte offset after the SetParseByte command without jumping.

Parameters:

- `offset`: Byte offset in the currently executing program to jump to.

Returns:

- `Theta`: Contains the byte offset after the SetParseByte command.

`SwapFileType: det(81); Str0 = variable name`

This command swaps the type of a given file from program to AppVar, or vice versa. For example, if used on the AppVar “FOOBAR”, it will change said AppVar’s file type to a program. If used again, this time on the program “FOOBAR”, it will change the program’s file type to become an AppVar. Swapping an AppVar to a program type will swap to a locked program, for safety purposes.

Warning: If you swap the file type of a file in the archive, Celtic un-archives it when running the function and then re-archives it when the function is complete. This means that it could result in a garbage collect.

Parameters:

- `Str0`: The name of the variable to run the operation on. Like other Celtic commands, AppVar names must be prefaced with the `rowSwap(` token.

Returns:

- Swaps the file type between AppVar and program.

`ResetScreen: det(82)`

This command clears the screen, restores the status bar, and essentially resets / cleans up the entire screen. You can think of it like ClrHome, but applying to the entire screen as well.

Returns:

- See above.

3.5 Celtic III Functions

3.5.1 Overview

Essentially all of the functions from Celtic III are included in Celtic CE.

3.5.2 Documentation

`GetListElem: det(30, list_element); Ans = list name`

Gets a value at `list_element` in the list specified. For example, with `Ans` equal to "$_L$FOO" (Where $_L$ is the list token found in *List* → *OPS*). This is useful if the list being accessed is archived, for example.

Parameters:

- `list_element`: Element of the list to access, beginning at 1. Accessing 0 will return the dimension of the list.
- `Ans`: Name of the list to access. The data in `Ans` must be a string beginning with the $_L$ token found in the *List* → *OPS* (`2nd` + `stat` + `left arrow` + `alpha` + `apps`), unless you are using a default OS list such as L $_1$. When using default OS lists, simply use the corresponding list name token, such as L $_1$or L $_2$.

Returns:

- `Theta`: The number at the element of the list accessed, or the dimension of the list if `list_element` was 0.

Errors:

- `..NT:A:LS` if the user did not specify a valid list.
- `..E:NT:FN` if the entry was not found in the list specified.

`GetArgType: det(31); Ans = argument to check`

Outputs a real number depicting the type of argument in `Ans`.

Parameters:

- `Ans`: Argument to check the type of.

Returns:

- `Theta`: The number corresponding to the argument's type. A table with the possible types is below.

Number	Type
0	Real
1	List
2	Matrix
4	String
12	Complex
13	Cplx List

`ChkStats: det(32, function)`

This is a multi-purpose command used to read various system statuses. The output will vary based on the specified function. A table with the possible functions and their resulting outputs is below.

Function	Output
0	Total free RAM (In `Str9`)
1	Total free ROM (Also in `Str9`)
2	Bootcode (Also in `Str9`)
3	OS Version (Also in `Str9`)
4	Hardware version: 0 for 84 Plus CE, 1 for 83 Premium CE (Returns in `Theta`)

Parameters:

- `function`: Function to complete.

Returns:

- Varies based on input.

`FindProg: det(33, type); Ans = search string`

This does not search for file names, instead it searches for file contents. The search string checks for the beginning contents of a program. Type refers to the type of file to search, with 0 being programs and 1 being appvars. The function will return a string containing the names of the files containing the search phrase, with each name separated by a space. For example, to look for all the programs beginning with ":DCS", your code would look something like this:

```
":DCS
det(33, 0)
```

Parameters:

- `type`: Type of file to search. 0 for programs, 1 for appvars.

- `Ans`: Content string to search for. If `Ans` does not contain a string, it will return a complete list of all the files of the specified type.

Returns:

- `Str9`: Contains a list with the names of files containing the search string, separated by spaces. If `Ans` was not a string, it returns a list of all files of the specified type.

Errors:

- `..P:NT:FN` if no files are found containing the specified search string.
- `..NT:EN:M` if there is not enough memory to complete the action.

`UngroupFile: det(34, overwrite); Str0 = group name`

This function ungroups the programs and AppVars from a group file specified in `Str0`. It will only apply to files that are programs and AppVars, not other types like lists. If `overwrite` is true (not 0), files which already exist will be overwritten. If it is false (0), files will be preserved. The group name (in `Str0`) must be preceded by the `*row(` token, as specified in General Syntax.

Parameters:

- `overwrite`: Whether or not to overwrite files that already exist when extracting.
- `Str0`: Contains the name of the specified group. The name must be preceded by the `*row(` token.

Returns:

- Ungroups all programs and AppVars from the specified group.

Errors:

- `..G:NT:FN` if the group specified does not exist.
- `..P:NT:FN` if no files in the group are able to be ungrouped (no programs or AppVars).
- `..NT:EN:M` if there is not enough memory to complete the action.

`GetGroup: det(35); Str0 = group name`

Puts the names of all program and AppVar files present in the specified group into `Str9`, separated by spaces. The names will be in the same order in the string as they are found in the group. The group name (in `Str0`) must be preceded by the `*row(` token, as specified in General Syntax.

Parameters:

- `Str0`: Contains the name of the specified group. The name must be preceded by the `*row(` token.

Returns:

- `Str9`: Contains a list of the names of all programs and AppVars in the group, separated by spaces.

Errors:

- `..G:NT:FN` if the group specified does not exist.
- `..P:NT:FN` if no files in the group are valid (no programs or AppVars).
- `..NT:EN:M` if there is not enough memory to complete the action.

ExtGroup: det(36, item); Str0 = group name

Extracts the program or AppVar specified by `item` from the group specified in `Str0`. If `item` is 1, it extracts the first program or AppVar, 2 extracts the second, and so on. This can be useful paired with `GetGroup` to figure out the order of the files in the group. If the file already exists with the same name, it will not be overwritten. The group name (in `Str0`) must be preceded by the `*row(` token, as specified in General Syntax.

Warning: `item` only counts programs and AppVars, and ignores other types, like lists. If `item` is 2, it refers to the second **valid** file, not necessarily the second file including all types.

Parameters:

- `item`: The item in the group to extract. Only applies to programs and AppVars, and begins at 1.

Returns:

- Extracts the specified program or AppVar from the group.

Errors:

- `..G:NT:FN` if the group specified does not exist.
- `..E:NT:FN` if the specified item did not exist.
- `..P:IS:FN` if the program already exists
- `..NT:EN:M` if there is not enough memory to complete the action.

GroupMem: det(37, item); Str0 = group name

Returns the size of the program or AppVar specfied by `item` from the group specified in `Str0`. `item` behaves the same way as in `ExtGroup`. The group name (in `Str0`) must be preceded by the `*row(` token, as specified in General Syntax.

Parameters:

- `item`: The item in the group to extract. Only applies to programs and AppVars, and begins at 1.

Returns:

- `theta`: The size of the specified program or AppVar from the group.

Errors:

- `..G:NT:FN` if the group specified does not exist.
- `..E:NT:FN` if the specified item did not exist.

BinRead: det(38, byte_start, number_of_bytes); Str0 = file name

Reads the contents of a file starting at `byte_start` for `number_of_bytes` bytes. `byte_start` is 0-indexed, meaning that the first byte of the program is 0, the second is 1, and so on. The output will be a hex string representing the bytes. For example, if the following bytes were in memory:

Byte	0	1	2	3	4
Data	EF	7B	66	6F	6F

`Str9` would contain this:

```
EF7B666F6F
```

Parameters:

- `byte_start`: The byte of the file to start reading from. It is 0-indexed, so the first byte of the file is 0, the second is 1, and so on.
- `number_of_bytes`: The number of bytes to read, starting at `byte_start`. You can also read past the end of the file.
- `Str0`: The name of the file to read from. For AppVars, the name should be preceded by the `rowSwap(` token. Follow the format documented here.

Returns:

- `Str9`: Contains a text string of hex representing the bytes read.

BinWrite: det(39, byte_start); Str9 = hex string to write; Str0 = file name

Writes the hex bytes represented in `Str9` to the file specified by `Str0`, starting at `byte_start`. `byte_start` is 0-indexed, meaning that the first byte of the program is 0, the second is 1, and so on.

Parameters:

- `byte_start`: The byte of the file to start writing to. It is 0-indexed, so the first byte of the file is 0, the second is 1, and so on.
- `Str9`: Contains a text string of hex representing the bytes to write.
- `Str0`: The name of the file to write to. For AppVars, the name should be preceded by the `rowSwap(` token. Follow the format documented here.

Returns:

- Writes the bytes specified in `Str9` to the specified file.

Errors:

- `..E:NT:FN` if `byte_start` is past the end of the file.
- `..INVAL:S` if there is not an even number of characters in the string or an invalid hex character is present.
- `..NT:EN:M` if there is not enough memory to complete the write.

BinDelete: det(40, byte_start, number_of_bytes); Str0 = file name

Deletes `number_of_bytes` bytes from the file specified by `Str0`, starting at `byte_start`. `byte_start` is 0-indexed, meaning that the first byte of the program is 0, the second is 1, and so on.

Parameters:

- `byte_start`: The byte of the file to start deleting from. It is 0-indexed, so the first byte of the file is 0, the second is 1, and so on.
- `number_of_bytes`: The number of bytes to delete.
- `Str0`: The name of the file to delete from. For AppVars, the name should be preceded by the `rowSwap(` token. Follow the format documented here.

Returns:

- Deletes the specified number of bytes from the specified file.

Errors:

- `..E:NT:FN` if `byte_start` is past the end of the file, or the number of bytes deleted would exceed the end of the file.

`HexToBin: det(41); Ans = hex string`

Outputs the binary equivalent of the input string in `Ans`. For example, if you did this:

```
:"464F4F424152
:det(41)
```

The result would be `"FOOBAR"`.

Parameters:

- `Ans`: Hex string to convert.

Returns:

- `Str9`: The converted string.

Errors:

- `..INVAL:S` if there is not an even number of characters in the string or an invalid hex character is present.
- `..NT:EN:M` if there is not enough memory to complete the action.

`BinToHex: det(42); Ans = token string`

Outputs the hex equivalent of the input string in `Ans`. For example, if you did this:

```
:"FOOBAR
:det(42)
```

The result would be `"464F4F424152"`.

Parameters:

- `Ans`: Binary string to convert.

Returns:

- `Str9`: The converted string.

Errors:

- `..NT:EN:M` if there is not enough memory to complete the action.

`GraphCopy: det(43)`

Copies the graph buffer to the screen.

`Edit1Byte: det(44, string_number, target_byte, replace_byte)`

Replaces the byte at `target_byte` of the specified string with the byte specified by `replace_byte`. `target_byte` is 0-indexed, meaning that the first byte of the program is 0, the second is 1, and so on. For example:

```
:det(44, 0, 0, 255)
```

This code will replace byte 0 of `Str0` with the byte 255 in decimal, or 0xFF in hex.

Parameters:

- `string_number`: The string to modify. 0 is `Str0`, 1 is `Str1`, and so on.
- `target_byte`: The byte of the string to modify. It is 0-indexed, so the first byte of the file is 0, the second is 1, and so on.
- `replace_byte`: The byte to replace the target byte with, in decimal format. Can be 0 - 255 (0x00 - 0xFF).

Returns:

- Replaces the target byte of a string with the specified replacement byte.

Errors:

- `..E:NT:FN` if the target byte does not exist in the string.

`ErrorHandle: det(45, get_offset); Ans = program to run`

Executes BASIC code with an error handler installed. That means the code you execute can do anything it wants including divide by zero, and it will simply end the execution but an obvious system error will not trigger. Instead, this command will return with a value that indicates the error condition. This command has two different modes. If `Ans` contains a program name (beginning with the `prgm` token), it will run that program. If `Ans` contains program code, it will execute that code instead. This will also work with programs beginning with the `Asm84CEPrgm` token.

A list of return values and their corresponding errors can be found in the error codes section, under TI-OS Errors.

Warning: ErrorHandle cannot be used recursively. This means that if you attempt to run ErrorHandle on a program and then run ErrorHandle again inside that second program, the ErrorHandle command in that second program will be ignored.

Note: When using ErrorHandle from the homescreen, it will not run BASIC programs, though it can still run programs beginning with the Asm84CEPrgm token.

Parameters:

- `Ans`: The name of the program to run, or TI-BASIC code to be executed. Note that this does not follow the syntax here, and instead must begin with `prgm`.
- `get_offset`: If `get_offset` is 1, ErrorHandle will return the byte offset the error occured at in `Ans`. If it is 0, it will not. This only works with running programs, not strings.

Returns:

- `Theta`: Contains the error code returned by the program, or 0 if no error occured.

- `Ans`: Contains the byte offset the error occured at, if `get_offset` 1 and an error occured. Otherwise `Ans` is not modified.

Errors:

- `..NULLVAR` if the program is empty.
- `..SUPPORT` if the file is not a TI-BASIC program.
- `..NT:EN:M` if there is not enough memory to complete the action.

`StringRead: det(46, string, start, bytes);`

Works almost identically to BASIC's sub() command, except that the output will be in hexadecimal and two-byte tokens will read as two instead of one byte. It is particularly useful for extracting data from a string that may contain nonsensical data that simply needs to be manipulated. If you allow the start point to be zero, the size of the string in bytes is returned instead. For data manipulation, you should use the Edit1Byte command.

Parameters:

- `string`: Which string variable to read from, where 0 = Str0, 9 = Str9, and so on.
- `start`: The byte of the string to begin reading at.
- `bytes`: How many bytes to read.

Returns:

- `Str9`: The extracted substring.
- `Theta`: The size of the string in bytes, if `start` was 0.

Errors:

- `..NT:EN:M` if there is not enough memory to complete the action.

`HexToDec: det(47); Ans = hex`

Converts up to 4 hex digits back to decimal. If you pass a string longer than 4 digits, only the first four are read.

Parameters:

- `Ans`: Hex string to convert.

Returns:

- `Theta`: Decimal integer converted from hex string.

Errors:

- `..INVAL:S` if an invalid hex digit is passed.

`DecToHex: det(48, number, override)`

Converts a number between 0 and 65535 to its hexadecimal equivalent. The number of hexadecimal output to the string will have its leading zeroes stripped so inputting 15 will result in "F" and 16 will result in "10". If override is 1, it will output all leading zeroes, which may be useful for routines that require four hex digits at all times but cannot spend the memory/time whipping up a BASIC solution to fill the missing zeroes.

Parameters:

- `number`: Decimal integer to convert.

- `override`: 1 to output all leading zeroes, or 0 to not.

Returns:

- `Str9`: Hex string converted from decimal integer.

`EditWord: det(49, string, start, word)`

This command, otherwise, works just like Edit1Byte. Its documentation is rewritten here for convenience. Replaces a word in some string variable, Str0 to Str9, with a replacement value 0 through 65535 starting at some specified byte (start is at 0). The string supplied is edited directly so there's no output. See Edit1Byte for more details.

The replacement is written in little-endian form and if the number is between 0 and 255, the second byte is written in as a zero.

Note: Note: A "word" in this sense is two bytes. Useful for editing a binary string which entries are all two bytes in length, such as a special string tilemap. You're required, however, to specify offset in bytes. Also know that all words are stored little-endian. That means that the least significant byte is stored before the most significant byte is.

Parameters:

- `string`: Which string variable to read from, where 0 = Str0, 9 = Str9, and so on.
- `start`: The byte to start editing in the string.
- `word`: The two bytes to rewrite.

Returns:

- Modifies the string with the specified word.

Errors:

- `..E:NT:FN` If the offset is past the end of the string.

`BitOperate: det(50, value1, value2, function)`

Performs a bitwise operation between value1 and value2 using a supplied function value. It will only work with up to 16-bit numbers.

The different functions are below:

Value	Operation
0	NONE
1	AND
2	OR
3	XOR
4	Left Shift
5	Right Shift

This command really helps mask out hex digits but if you use strings to store those digits, you'll need to use the HexToDec command for each value you need.

Parameters:

- `value1`: First value to perform bit operation with.
- `value2`: Second value to perform bit operation with.
- `function`: Which operation to perform, as seen in the table above.

Returns:

- `Theta`: Result of the bit operation.

`GetProgList: det(51, type); Ans = search string`

This function will return a space-delimited string consisting of the names of programs, appvars, or groups whose names partially match the search string. Which is to say:

```
"TEMP
det(51, 0)
```

would return all program names that start with the characters "TEMP", which may be something like "TEMP001 " or "TEMP001 TEMP002 TEMP003 ", etc.

Value	File Type
0	Programs
1	AppVars
2	Groups

Note: This command is NOT to be confused with FindProg, which outputs a string consisting of files whose CONTENTS starts with the specified string. Also use the fact that the final name in the list is terminated with a space to make extracting names from the list easier. It also will not find hidden variables.

Parameters:

- `type`: The type of file to search for, as seen above.
- `Ans`: String to find in file names.

Returns:

- `Str9`: Filtered list of files.

Errors:

- `..S:NT:FN` if `Ans` is not a string.
- `..P:NT:FN` if no files were found containing the search string.
- `..NT:EN:M` if there is not enough memory to complete the action.