

# Serial Library

The **serial library** supports [serial communication](#) between the BBC micro:bit and another computer. Basically, this allows you to send data from the micro:bit to your own computer. This is very useful for debugging purposes: you can add `write line` statements in your code and see them display on your computer as the program executes.

The code below shows a simple script that sends a line when the BBC micro:bit starts and another line each time the button A is pressed.

```
function
main
()
serial→ write line("started...")
input→ on button pressed(A) do
serial→ write line("A pressed")
end
end function
```

## How to read the micro:bit's serial output from your computer

Unfortunately, using the serial library requires quite a bit of a setup.

### Windows

You must install a device driver (for the computer to recognize the serial interface of the micro:bit); then, you must also install a terminal emulator (which is going to connect to the micro:bit and read its output). Here's how to do it:

- Follow instructions at <https://developer.mbed.org/handbook/Windows-serial-configuration> in order to install the device driver
- Install a terminal emulator; we recommend [Tera Term](#). At the time of this writing, the latest version is 4.88 and can be downloaded [from here](#). Follow the instructions from the installer.

Once both the driver and the terminal emulator are installed, plug in the micro:bit and wait until the device is fully setup. Then, open TeraTerm.

- Hit `File > New Connection`
- Check "Serial"; in the dropdown menu, pick the COM port that says "mbed Serial Port". Hit `OK`.
- In the menus, hit `Setup > Serial Port` and set the baud rate to 115200.

You should be good. Feel free to hit `Setup > Save Setup` in the menus to erase the default configuration file with a new one so that you don't have to type in the settings again.

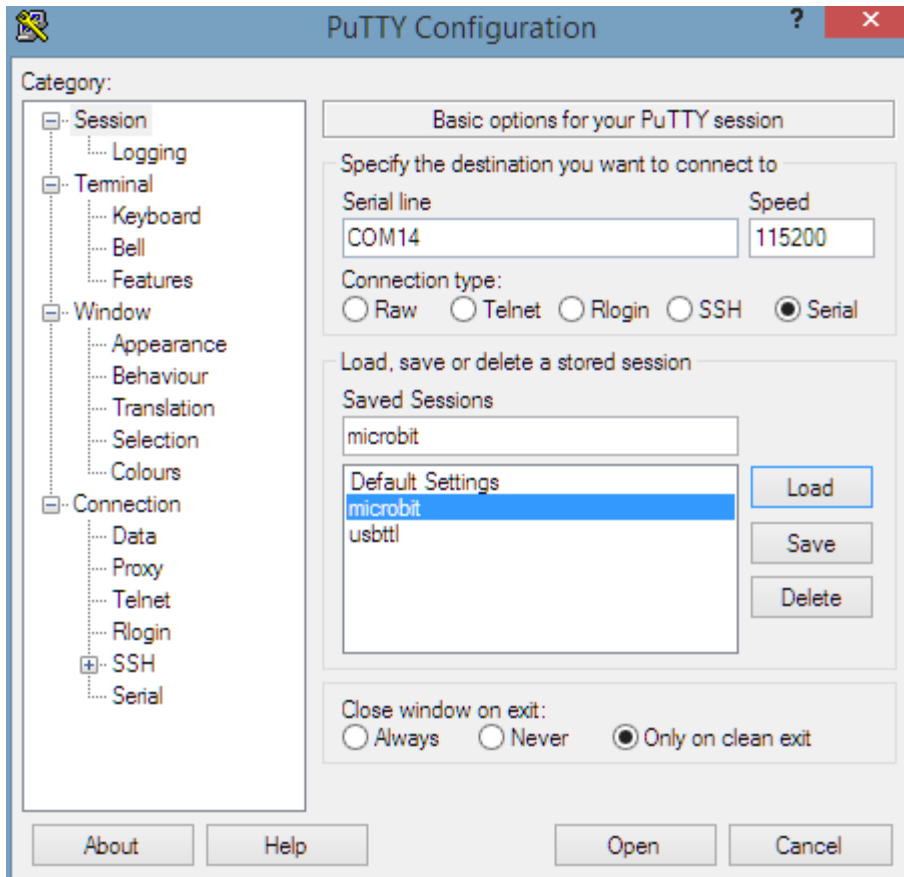
Please note that Windows will assign you a different COM port if you plug in another micro:bit. If you're juggling between micro:bits, you'll have to change the COM port every time.

### Alternative Windows setup with Putty

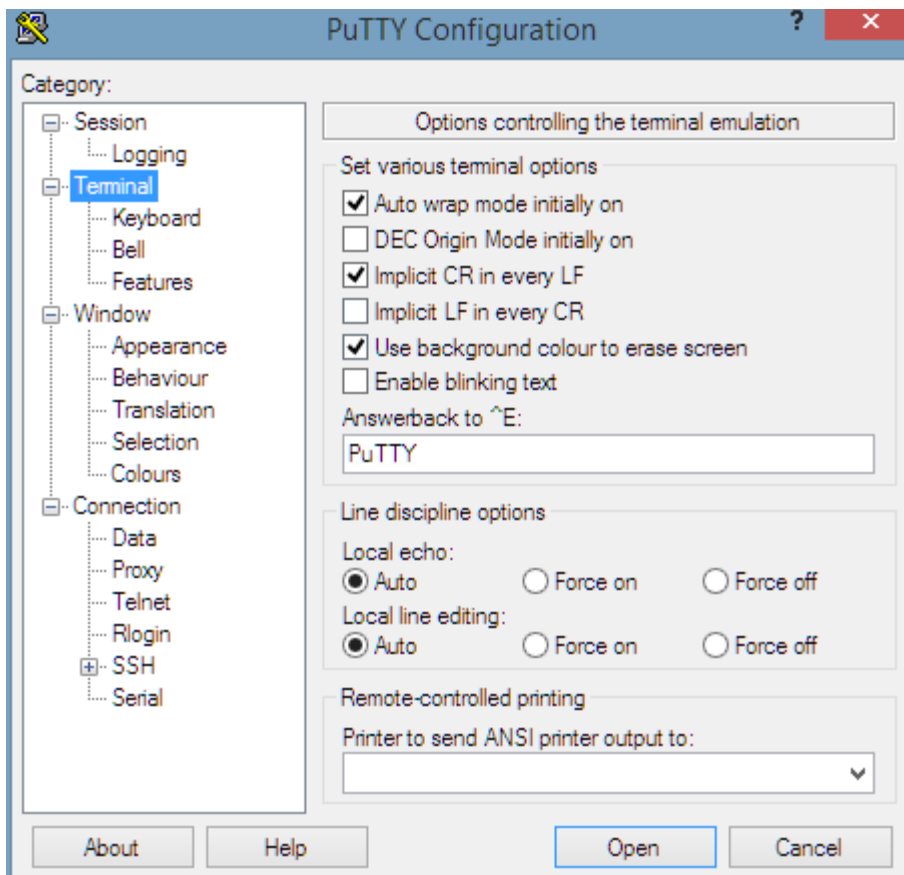
If you prefer another terminal emulator (such as [PuTTY](#)), here are some instructions.

- Open Windows's [Device Manager](#); expand the section called "Ports (COM & LPT)"; write down the com number for "mbed Serial Port" (e.g. COM14)

- Open PuTTY; on the main screen, use the following settings: Serial / COM14 / 115200. Replace COM14 with the COM port number you wrote down previously. Feel free to type in a name and hit "Save" to remember this configuration.



- (optional): in the "Terminal" section, check "implicit cr in every lf"



## Linux

(Untested).

- Plug in the micro:bit
- Open a terminal
- `dmesg | tail` will show you which `/dev/` node the micro:bit was assigned (e.g. `/dev/ttyUSB0`)
- Then, do: `screen /dev/ttyUSB0 115200` (install the `screen` program if you don't have it). To exit, run `Ctrl-A Ctrl-D`.

Alternative programs include `minicom`, etc.

## Mac OS

- Plug in the micro:bit
- Open a terminal
- `ls /dev/cu.*` will return to you a list of serial devices; one of them will look like `/dev/cu.usbmodem1422` (the exact number depends on your computer)
- `screen /dev/cu.usbmodem1422 115200` will open up the micro:bit's serial output. To exit, hit `Ctrl-A Ctrl-D`.

## Using the serial library in your programs

If the `serial` button is not available, you will need first to add the `micro:bit serial` library to your script:

- tap on `add new`
- tap on `library`
- select `micro:bit serial`

## Writing data

This is basically what you will use the serial library for: debugging purposes.

- write a number

`serial` → `write number(42)`

- write a string

`serial` → `write string("hello")`

- write a line of text

`serial` → `write line("this is a line")`

Theoretically, you can dump more sophisticated data and then read it back in the event that two micro:bits should be connected to each other over serial. We have not tested this scenario yet as we have yet to expose functionality that allows re-routing the serial ports to the edge connector.

- write an image

`var img := image` → `create image()`  
`serial` → `write image(img)`

- write the current screen LED status

serial → write screen

## Reading data

This is useful if you have something connected at the other end. As explained above, this is not yet a scenario.

- reads a line of text

var msg := serial → read string

- reads an image

img := serial → read image

- reads the state of the screen from serial

serial → read screen

<https://developer.mbed.org/handbook/SerialPC>

<https://developer.mbed.org/handbook/SerialPC>

[illegible]

[illegible]



Hallo Jürgen,

ich habe noch einmal Hand an das Microbit gelegt insbesondere im Hinblick auf die Benutzung von Mecrisp-Stellaris unter Windows (bei mir Win7) . Das ist ziemlich einfach.

Ich bin der Anleitung unter <https://www.microbit.co.uk/td/serial-library> gefolgt.

- 1) Microbit über USB an den Windows-PC angeschlossen. Öffnet ein Laufwerk mit Namen MICROBIT.
- 2) von <https://developer.mbed.org/handbook/Windows-serial-configuration> den aktuellen seriellen Treiber für mbed-Systeme wie das Microbit geladen und die Installation gestartet. Erkennt das Microbit und installiert den richtigen Treiber (dauert ein paar Minuten).
- 3) Mecrisp-Stellaris, mecrisp-stellaris-2.2.9.tar.gz, von <https://sourceforge.net/projects/mecrisp/files/> geladen und ausgepackt.
- 4) Das File mecrisp-stellaris-2.2.9/microbit/mecrisp-stellaris-microbit.bin per Windows Explorer auf das Microbit-USB-Laufwerk MICORBIT kopieren. Das flasht das Image ins Microbit - so einfach geht das.
- 5) Terra Term (serielles Terminalprogramm für Windows) von <https://tssh2.osdn.jp/index.html.en> geladen und installiert.
- 6) Terra Term auf der neuen seriellen Schnittstelle (bei mir COM19) geöffnet. In den seriellen Einstellungen die Geschwindigkeit auf 115200 bps eingestellt und in den Terminal Einstellungen beim Lesen die Zeilenendeerkennung auf LF gestellt. Dann gibt's den gute alten "ok."-Prompt :-)

Das wars. Nun kann man mittels Terra Term Mecrisp-Forth-Programme auf das Microbit laden. Neuflashen geht wie unter 4)

Für mich sieht das so aus, als wenn man Mecrisp/Microbit gut unter Windows benutzen kann. [Nur das neu-Assemblieren des Kerns benötigt einen Assembler unter Linux, mit Win10 geht das vermutlich aber mit der richtigen Toolchain auch dort].

Der richtige Weg vorwärts scheint mir zu sein, die Installation mit Screenshots exakt zu beschreiben und dann eine Folge von kleinen Tutorials zu bauen, wie man die Microbit-Hardware auf Mecrisp heraus anspricht. Bleibt die Frage, wer für letzteres Zeit hat.

Den Python-Weg würde ich nicht weiter verfolgen...

Viele Grüße,  
Ulli



words

Address: 20000C54	Link: 20000C34	Flags: 0000FFFF	Code: 20000C62	Name: INVERT0
Address: 20000C34	Link: 20000C14	Flags: 0000FFFF	Code: 20000C40	Name: XOR01
Address: 20000C14	Link: 20000BF4	Flags: 0000FFFF	Code: 20000C20	Name: OR01
Address: 20000BF4	Link: 20000BD8	Flags: 0000FFFF	Code: 20000C00	Name: AND01
Address: 20000BD8	Link: 20000BBC	Flags: 0000FFFF	Code: 20000BE2	Name: A0L
Address: 20000BBC	Link: 20000BA0	Flags: 0000FFFF	Code: 20000BC6	Name: A1L
Address: 20000BA0	Link: 20000B84	Flags: 0000FFFF	Code: 20000BAA	Name: A2L
Address: 20000B84	Link: 20000B68	Flags: 0000FFFF	Code: 20000B8E	Name: A3L
Address: 20000B68	Link: 20000B4C	Flags: 0000FFFF	Code: 20000B72	Name: I0L
Address: 20000B4C	Link: 20000B30	Flags: 0000FFFF	Code: 20000B56	Name: I1L
Address: 20000B30	Link: 20000B14	Flags: 0000FFFF	Code: 20000B3A	Name: I2L
Address: 20000B14	Link: 20000AF8	Flags: 0000FFFF	Code: 20000B1E	Name: I3L
Address: 20000AF8	Link: 20000ADC	Flags: 0000FFFF	Code: 20000B02	Name: O0L
Address: 20000ADC	Link: 20000AC0	Flags: 0000FFFF	Code: 20000AE6	Name: O1L
Address: 20000AC0	Link: 20000AA4	Flags: 0000FFFF	Code: 20000ACA	Name: O2L
Address: 20000AA4	Link: 20000A88	Flags: 0000FFFF	Code: 20000AAE	Name: O3L
Address: 20000A88	Link: 20000A6C	Flags: 0000FFFF	Code: 20000A92	Name: T1L
Address: 20000A6C	Link: 20000A50	Flags: 0000FFFF	Code: 20000A76	Name: T2L
Address: 20000A50	Link: 20000A34	Flags: 0000FFFF	Code: 20000A5A	Name: T3L
Address: 20000A34	Link: 20000A18	Flags: 0000FFFF	Code: 20000A3E	Name: PWL
Address: 20000A18	Link: 200009FC	Flags: 0000FFFF	Code: 20000A22	Name: A0H
Address: 200009FC	Link: 200009E0	Flags: 0000FFFF	Code: 20000A06	Name: A1H
Address: 200009E0	Link: 200009C4	Flags: 0000FFFF	Code: 200009EA	Name: A2H
Address: 200009C4	Link: 200009A8	Flags: 0000FFFF	Code: 200009CE	Name: A3H
Address: 200009A8	Link: 2000098C	Flags: 0000FFFF	Code: 200009B2	Name: I0H
Address: 2000098C	Link: 20000970	Flags: 0000FFFF	Code: 20000996	Name: I1H
Address: 20000970	Link: 20000954	Flags: 0000FFFF	Code: 2000097A	Name: I2H
Address: 20000954	Link: 20000938	Flags: 0000FFFF	Code: 2000095E	Name: I3H
Address: 20000938	Link: 2000091C	Flags: 0000FFFF	Code: 20000942	Name: O0H
Address: 2000091C	Link: 20000900	Flags: 0000FFFF	Code: 20000926	Name: O1H
Address: 20000900	Link: 200008E4	Flags: 0000FFFF	Code: 2000090A	Name: O2H
Address: 200008E4	Link: 200008C8	Flags: 0000FFFF	Code: 200008EE	Name: O3H
Address: 200008C8	Link: 200008AC	Flags: 0000FFFF	Code: 200008D2	Name: T1H
Address: 200008AC	Link: 20000890	Flags: 0000FFFF	Code: 200008B6	Name: T2H
Address: 20000890	Link: 20000874	Flags: 0000FFFF	Code: 2000089A	Name: T3H
Address: 20000874	Link: 20000738	Flags: 0000FFFF	Code: 2000087E	Name: PWH
Address: 20000738	Link: 2000071C	Flags: 00000000	Code: 20000744	Name: ????
Address: 2000071C	Link: 200006FC	Flags: 0000FFFF	Code: 20000726	Name: SOS
Address: 200006FC	Link: 200006DC	Flags: 0000FFFF	Code: 2000070C	Name: SCOUNTER
Address: 200006DC	Link: 200006D0	Flags: 0000FFFF	Code: 200006EA	Name: COUNTER
Address: 200006D0	Link: 200006A0	Flags: 0000FFFF	Code: 200006DC	Name: MBV2
Address: 200006A0	Link: 20000608	Flags: 00000000	Code: 200006AE	Name: SPACES
Address: 20000608	Link: 200005E4	Flags: 00000000	Code: 20000614	Name: DATA
Address: 200005E4	Link: 200005B0	Flags: 00000000	Code: 200005F0	Name: 4dssp
Address: 200005B0	Link: 2000059C	Flags: 00000000	Code: 200005BC	Name: dssp
Address: 2000059C	Link: 20000568	Flags: 00000000	Code: 200005A6	Name: ds
Address: 20000568	Link: 20000550	Flags: 00000000	Code: 20000576	Name: disbit4
Address: 20000550	Link: 20000538	Flags: 00000040	Code: 2000055A	Name: ANI
Address: 20000538	Link: 2000051C	Flags: 00000040	Code: 20000542	Name: IN
Address: 2000051C	Link: 20000500	Flags: 00000040	Code: 20000528	Name: OUTP
Address: 20000500	Link: 2000048C	Flags: 00000040	Code: 2000050C	Name: PSWI
Address: 2000048C	Link: 20000410	Flags: 00000000	Code: 20000498	Name: Line3
Address: 20000410	Link: 2000038C	Flags: 00000000	Code: 2000041C	Name: Line2
Address: 2000038C	Link: 000000C0	Flags: 00000000	Code: 20000398	Name: Line1
Address: 000000C0	Link: 00000514	Flags: 0000FFFF	Code: 000000E6	Name: --- Mecrisp-Stellaris Core
---				
Address: 00000514	Link: 00000538	Flags: 00000242	Code: 00000520	Name: 2dup
Address: 00000538	Link: 00000558	Flags: 00000262	Code: 00000544	Name: 2drop
Address: 00000558	Link: 000005A0	Flags: 00000244	Code: 00000564	Name: 2swap
Address: 000005A0	Link: 000005C8	Flags: 00000262	Code: 000005AC	Name: 2nip
Address: 000005C8	Link: 000005E4	Flags: 00000044	Code: 000005D4	Name: 2over
Address: 000005E4	Link: 00000608	Flags: 00000044	Code: 000005F0	Name: 2tuck
Address: 00000608	Link: 0000062C	Flags: 00000046	Code: 00000614	Name: 2rot
Address: 0000062C	Link: 00000650	Flags: 00000046	Code: 00000638	Name: 2-rot
Address: 00000650	Link: 00000678	Flags: 00000220	Code: 0000065A	Name: 2>r
Address: 00000678	Link: 000006A4	Flags: 00000220	Code: 00000682	Name: 2r>
Address: 000006A4	Link: 000006D4	Flags: 00000220	Code: 000006AE	Name: 2r@
Address: 000006D4	Link: 00000700	Flags: 00000220	Code: 000006E2	Name: 2rdrop
Address: 00000700	Link: 00000718	Flags: 00000042	Code: 0000070A	Name: d2/
Address: 00000718	Link: 00000730	Flags: 00000262	Code: 00000722	Name: d2*
Address: 00000730	Link: 0000074C	Flags: 00000042	Code: 0000073C	Name: dshr
Address: 0000074C	Link: 00000798	Flags: 00000262	Code: 00000758	Name: dshl
Address: 00000798	Link: 000007AC	Flags: 00000042	Code: 000007A4	Name: dabs

Address: 000007AC	Link: 000007CC	Flags: 00000042	Code: 000007BA	Name: dnegate
Address: 000007CC	Link: 0000081C	Flags: 00000264	Code: 000007D6	Name: d-
Address: 0000081C	Link: 00000868	Flags: 00000264	Code: 00000826	Name: d+
Address: 00000868	Link: 0000089C	Flags: 00000261	Code: 00000872	Name: s>d
Address: 0000089C	Link: 000008C8	Flags: 00000042	Code: 000008A6	Name: um*
Address: 000008C8	Link: 000008F8	Flags: 00000042	Code: 000008D2	Name: m*
Address: 000008F8	Link: 00000938	Flags: 00000044	Code: 00000902	Name: ud*
Address: 00000938	Link: 000009CC	Flags: 00000044	Code: 00000944	Name: udm*
Address: 000009CC	Link: 000009F0	Flags: 00000043	Code: 000009D6	Name: */
Address: 000009F0	Link: 00000A14	Flags: 00000043	Code: 000009FC	Name: */mod
Address: 00000A14	Link: 00000A38	Flags: 00000043	Code: 00000A1E	Name: u*/
Address: 00000A38	Link: 00000A5C	Flags: 00000043	Code: 00000A46	Name: u*/mod
Address: 00000A5C	Link: 00000A7C	Flags: 00000043	Code: 00000A6A	Name: um/mod
Address: 00000A7C	Link: 00000A9C	Flags: 00000043	Code: 00000A88	Name: m/mod
Address: 00000A9C	Link: 00000AF0	Flags: 00000044	Code: 00000AAA	Name: ud/mod
Address: 00000AF0	Link: 00000B68	Flags: 00000044	Code: 00000AFC	Name: d/mod
Address: 00000B68	Link: 00000B80	Flags: 00000044	Code: 00000B72	Name: d/
Address: 00000B80	Link: 00000BC8	Flags: 00000044	Code: 00000B8A	Name: f*
Address: 00000BC8	Link: 00000C14	Flags: 00000044	Code: 00000BD2	Name: f/
Address: 00000C14	Link: 00000C5C	Flags: 00000220	Code: 00000C1E	Name: 2!
Address: 00000C5C	Link: 00000CA4	Flags: 00000220	Code: 00000C66	Name: 2@
Address: 00000CA4	Link: 00000CC4	Flags: 00000044	Code: 00000CAE	Name: du<
Address: 00000CC4	Link: 00000CE4	Flags: 00000044	Code: 00000CCE	Name: du>
Address: 00000CE4	Link: 00000D04	Flags: 00000044	Code: 00000CEE	Name: d<
Address: 00000D04	Link: 00000D24	Flags: 00000044	Code: 00000D0E	Name: d>
Address: 00000D24	Link: 00000D40	Flags: 00000262	Code: 00000D2E	Name: d0<
Address: 00000D40	Link: 00000D68	Flags: 00000262	Code: 00000D4A	Name: d0=
Address: 00000D68	Link: 00000D90	Flags: 00000244	Code: 00000D72	Name: d<>
Address: 00000D90	Link: 00000DDC	Flags: 00000244	Code: 00000D9A	Name: d=
Address: 00000DDC	Link: 00000DF0	Flags: 00000020	Code: 00000DE6	Name: sp@
Address: 00000DF0	Link: 00000E00	Flags: 00000020	Code: 00000DFA	Name: sp!
Address: 00000E00	Link: 00000E14	Flags: 00000020	Code: 00000E0A	Name: rp@
Address: 00000E14	Link: 00000E24	Flags: 00000020	Code: 00000E1E	Name: rp!
Address: 00000E24	Link: 00000E48	Flags: 00000261	Code: 00000E2E	Name: dup
Address: 00000E48	Link: 00000E74	Flags: 00000261	Code: 00000E54	Name: drop
Address: 00000E74	Link: 00000E8C	Flags: 00000061	Code: 00000E80	Name: ?dup
Address: 00000E8C	Link: 00000EB8	Flags: 00000262	Code: 00000E98	Name: swap
Address: 00000EB8	Link: 00000EE4	Flags: 00000262	Code: 00000EC2	Name: nip
Address: 00000EE4	Link: 00000F0C	Flags: 00000262	Code: 00000EF0	Name: over
Address: 00000F0C	Link: 00000F34	Flags: 00000262	Code: 00000F18	Name: tuck
Address: 00000F34	Link: 00000F6C	Flags: 00000263	Code: 00000F3E	Name: rot
Address: 00000F6C	Link: 00000F90	Flags: 00000263	Code: 00000F78	Name: -rot
Address: 00000F90	Link: 00000FA4	Flags: 00000020	Code: 00000F9C	Name: pick
Address: 00000FA4	Link: 00000FBC	Flags: 00000000	Code: 00000FB0	Name: depth
Address: 00000FBC	Link: 00000FD8	Flags: 00000000	Code: 00000FCA	Name: rdepth
Address: 00000FD8	Link: 0000100C	Flags: 00000220	Code: 00000FE2	Name: >r
Address: 0000100C	Link: 00001040	Flags: 00000220	Code: 00001016	Name: r>
Address: 00001040	Link: 00001060	Flags: 00000220	Code: 0000104A	Name: r@
Address: 00001060	Link: 00001084	Flags: 00000220	Code: 0000106C	Name: rdrop
Address: 00001084	Link: 00001098	Flags: 00000020	Code: 00001090	Name: rpick
Address: 00001098	Link: 000010C4	Flags: 00000000	Code: 000010A4	Name: roll
Address: 000010C4	Link: 00001104	Flags: 00000000	Code: 000010D0	Name: -roll
Address: 00001104	Link: 0000111C	Flags: 00000262	Code: 0000110E	Name: and
Address: 0000111C	Link: 00001138	Flags: 00000262	Code: 00001126	Name: bic
Address: 00001138	Link: 00001150	Flags: 00000262	Code: 00001142	Name: or
Address: 00001150	Link: 00001168	Flags: 00000262	Code: 0000115A	Name: xor
Address: 00001168	Link: 00001180	Flags: 00000262	Code: 00001170	Name: *
Address: 00001180	Link: 000011A0	Flags: 00000041	Code: 0000118A	Name: clz
Address: 000011A0	Link: 000011B0	Flags: 00000061	Code: 000011AA	Name: ror
Address: 000011B0	Link: 000011C4	Flags: 00000061	Code: 000011BA	Name: rol
Address: 000011C4	Link: 000011F8	Flags: 00000262	Code: 000011D2	Name: arshift
Address: 000011F8	Link: 00001220	Flags: 00000262	Code: 00001206	Name: rshift
Address: 00001220	Link: 00001304	Flags: 00000262	Code: 0000122E	Name: lshift
Address: 00001304	Link: 00001328	Flags: 00000261	Code: 0000130E	Name: 0=
Address: 00001328	Link: 00001350	Flags: 00000261	Code: 00001332	Name: 0<>
Address: 00001350	Link: 00001374	Flags: 00000261	Code: 0000135A	Name: 0<
Address: 00001374	Link: 0000138C	Flags: 00000060	Code: 00001380	Name: true
Address: 0000138C	Link: 000013A0	Flags: 00000060	Code: 00001398	Name: false
Address: 000013A0	Link: 000013C4	Flags: 00000242	Code: 000013AA	Name: >=
Address: 000013C4	Link: 000013E8	Flags: 00000242	Code: 000013CE	Name: <=
Address: 000013E8	Link: 00001408	Flags: 00000242	Code: 000013F0	Name: <
Address: 00001408	Link: 00001428	Flags: 00000242	Code: 00001410	Name: >
Address: 00001428	Link: 0000144C	Flags: 00000262	Code: 00001432	Name: u>=
Address: 0000144C	Link: 00001470	Flags: 00000262	Code: 00001456	Name: u<=

Address: 00001470	Link: 00001490	Flags: 00000262	Code: 0000147A	Name: u<
Address: 00001490	Link: 000014B0	Flags: 00000262	Code: 0000149A	Name: u>
Address: 000014B0	Link: 000014D0	Flags: 00000262	Code: 000014BA	Name: <>
Address: 000014D0	Link: 0000162C	Flags: 00000262	Code: 000014D8	Name: =
Address: 0000162C	Link: 00001648	Flags: 00000262	Code: 00001636	Name: min
Address: 00001648	Link: 00001664	Flags: 00000262	Code: 00001652	Name: max
Address: 00001664	Link: 00001684	Flags: 00000262	Code: 00001670	Name: umax
Address: 00001684	Link: 00001728	Flags: 00000262	Code: 00001690	Name: umin
Address: 00001728	Link: 00001768	Flags: 00000000	Code: 00001734	Name: move
Address: 00001768	Link: 0000178C	Flags: 00000000	Code: 00001774	Name: fill
Address: 0000178C	Link: 000017CC	Flags: 00000220	Code: 00001794	Name: @
Address: 000017CC	Link: 00001824	Flags: 00000220	Code: 000017D4	Name: !
Address: 00001824	Link: 0000185C	Flags: 00000220	Code: 0000182E	Name: +!
Address: 0000185C	Link: 000018A0	Flags: 00000220	Code: 00001866	Name: h@
Address: 000018A0	Link: 000018F8	Flags: 00000220	Code: 000018AA	Name: h!
Address: 000018F8	Link: 00001930	Flags: 00000220	Code: 00001902	Name: h+!
Address: 00001930	Link: 00001974	Flags: 00000220	Code: 0000193A	Name: c@
Address: 00001974	Link: 000019CC	Flags: 00000220	Code: 0000197E	Name: c!
Address: 000019CC	Link: 00001A1C	Flags: 00000220	Code: 000019D6	Name: c+!
Address: 00001A1C	Link: 00001A5C	Flags: 00000220	Code: 00001A28	Name: bis!
Address: 00001A5C	Link: 00001A9C	Flags: 00000220	Code: 00001A68	Name: bic!
Address: 00001A9C	Link: 00001ADC	Flags: 00000220	Code: 00001AA8	Name: xor!
Address: 00001ADC	Link: 00001B10	Flags: 00000220	Code: 00001AE8	Name: bit@
Address: 00001B10	Link: 00001B50	Flags: 00000220	Code: 00001B1C	Name: hbis!
Address: 00001B50	Link: 00001B90	Flags: 00000220	Code: 00001B5C	Name: hbic!
Address: 00001B90	Link: 00001BD0	Flags: 00000220	Code: 00001B9C	Name: hxor!
Address: 00001BD0	Link: 00001C04	Flags: 00000220	Code: 00001BDC	Name: hbit@
Address: 00001C04	Link: 00001C44	Flags: 00000220	Code: 00001C10	Name: cbis!
Address: 00001C44	Link: 00001C84	Flags: 00000220	Code: 00001C50	Name: cbic!
Address: 00001C84	Link: 00001CC4	Flags: 00000220	Code: 00001C90	Name: cxor!
Address: 00001CC4	Link: 00001D08	Flags: 00000220	Code: 00001CD0	Name: cbit@
Address: 00001D08	Link: 00001DA4	Flags: 00000000	Code: 00001D16	Name: hflash!
Address: 00001DA4	Link: 00001DE4	Flags: 00000000	Code: 00001DBA	Name: flashpageerase
Address: 00001DE4	Link: 00001E60	Flags: 00000000	Code: 00001DF6	Name: eraseflash
Address: 00001E60	Link: 00001E98	Flags: 00000000	Code: 00001E76	Name: eraseflashfrom
Address: 00001E98	Link: 00001EC4	Flags: 00000262	Code: 00001EA0	Name: +
Address: 00001EC4	Link: 00001F2C	Flags: 00000262	Code: 00001ECC	Name: -
Address: 00001F2C	Link: 00001F44	Flags: 00000261	Code: 00001F36	Name: 1-
Address: 00001F44	Link: 00001F5C	Flags: 00000261	Code: 00001F4E	Name: 1+
Address: 00001F5C	Link: 00001F74	Flags: 00000261	Code: 00001F66	Name: 2-
Address: 00001F74	Link: 00001F8C	Flags: 00000261	Code: 00001F7E	Name: 2+
Address: 00001F8C	Link: 00001FA4	Flags: 00000261	Code: 00001F98	Name: cell+
Address: 00001FA4	Link: 00001FD4	Flags: 00000261	Code: 00001FB2	Name: negate
Address: 00001FD4	Link: 00001FEC	Flags: 00000261	Code: 00001FDE	Name: not
Address: 00001FEC	Link: 00002004	Flags: 00000261	Code: 00001FF6	Name: shr
Address: 00002004	Link: 00002014	Flags: 00000261	Code: 0000200E	Name: shl
Address: 00002014	Link: 0000202C	Flags: 00000261	Code: 0000201E	Name: 2*
Address: 0000202C	Link: 00002044	Flags: 00000261	Code: 00002038	Name: cells
Address: 00002044	Link: 0000205C	Flags: 00000261	Code: 0000204E	Name: 2/
Address: 0000205C	Link: 00002094	Flags: 00000261	Code: 00002066	Name: abs
Address: 00002094	Link: 000020DC	Flags: 00000042	Code: 000020A0	Name: u/mod
Address: 000020DC	Link: 0000214C	Flags: 00000042	Code: 000020E8	Name: /mod
Address: 0000214C	Link: 00002160	Flags: 00000042	Code: 00002156	Name: mod
Address: 00002160	Link: 00002174	Flags: 00000042	Code: 00002168	Name: /
Address: 00002174	Link: 00002188	Flags: 00000061	Code: 00002180	Name: even
Address: 00002188	Link: 000021A0	Flags: 00000081	Code: 00002194	Name: base
Address: 000021A0	Link: 000021B8	Flags: 00000000	Code: 000021AE	Name: binary
Address: 000021B8	Link: 000021D0	Flags: 00000000	Code: 000021C6	Name: decimal
Address: 000021D0	Link: 000022E8	Flags: 00000000	Code: 000021DA	Name: hex
Address: 000022E8	Link: 00002304	Flags: 00000081	Code: 000022F8	Name: hook-emit
Address: 00002304	Link: 00002320	Flags: 00000081	Code: 00002314	Name: hook-key
Address: 00002320	Link: 00002340	Flags: 00000081	Code: 00002332	Name: hook-emit?
Address: 00002340	Link: 0000235C	Flags: 00000081	Code: 00002350	Name: hook-key?
Address: 0000235C	Link: 0000237C	Flags: 00000081	Code: 0000236E	Name: hook-pause
Address: 0000237C	Link: 00002394	Flags: 00000000	Code: 00002388	Name: emit
Address: 00002394	Link: 000023A8	Flags: 00000000	Code: 0000239E	Name: key
Address: 000023A8	Link: 000023BC	Flags: 00000000	Code: 000023B4	Name: emit?
Address: 000023BC	Link: 000023D0	Flags: 00000000	Code: 000023C8	Name: key?
Address: 000023D0	Link: 000023E8	Flags: 00000000	Code: 000023DC	Name: pause
Address: 000023E8	Link: 00002414	Flags: 00000000	Code: 000023FA	Name: serial-emit
Address: 00002414	Link: 00002444	Flags: 00000000	Code: 00002426	Name: serial-key
Address: 00002444	Link: 00002474	Flags: 00000000	Code: 00002458	Name: serial-emit?
Address: 00002474	Link: 0000251C	Flags: 00000000	Code: 00002486	Name: serial-key?
Address: 0000251C	Link: 00002540	Flags: 00000000	Code: 0000252A	Name: cexpect

Address: 00002540	Link: 000025B8	Flags: 00000000	Code: 0000254E	Name: accept
Address: 000025B8	Link: 000025CC	Flags: 00000040	Code: 000025C2	Name: tib
Address: 000025CC	Link: 000025E4	Flags: 00000081	Code: 000025D6	Name: >in
Address: 000025E4	Link: 0000260C	Flags: 00000082	Code: 000025FA	Name: current-source
Address: 0000260C	Link: 00002628	Flags: 00000000	Code: 0000261C	Name: setsource
Address: 00002628	Link: 00002648	Flags: 00000000	Code: 00002636	Name: source
Address: 00002648	Link: 00002680	Flags: 00000000	Code: 00002654	Name: query
Address: 00002680	Link: 000026D0	Flags: 00000000	Code: 0000268E	Name: compare
Address: 000026D0	Link: 000026E4	Flags: 00000000	Code: 000026DA	Name: cr
Address: 000026E4	Link: 000026F8	Flags: 00000000	Code: 000026EE	Name: bl
Address: 000026F8	Link: 0000270C	Flags: 00000000	Code: 00002704	Name: space
Address: 0000270C	Link: 0000272C	Flags: 00000000	Code: 0000271A	Name: spaces
Address: 0000272C	Link: 0000273C	Flags: 00000050	Code: 0000273A	Name: [char]
Address: 0000273C	Link: 00002754	Flags: 00000000	Code: 00002748	Name: char
Address: 00002754	Link: 00002764	Flags: 00000450	Code: 0000275C	Name: (
Address: 00002764	Link: 00002780	Flags: 00000450	Code: 0000276C	Name: \
Address: 00002780	Link: 000027C8	Flags: 00000010	Code: 0000278A	Name: ."
Address: 000027C8	Link: 000027F0	Flags: 00000010	Code: 000027D2	Name: c"
Address: 000027F0	Link: 0000281C	Flags: 00000010	Code: 000027FA	Name: s"
Address: 0000281C	Link: 00002834	Flags: 00000000	Code: 00002828	Name: count
Address: 00002834	Link: 0000285C	Flags: 00000000	Code: 00002840	Name: ctype
Address: 0000285C	Link: 0000288C	Flags: 00000000	Code: 00002868	Name: type
Address: 0000288C	Link: 000028C8	Flags: 00000000	Code: 00002898	Name: hex.
Address: 000028C8	Link: 000028D8	Flags: 00000000	Code: 000028D2	Name: h.s
Address: 000028D8	Link: 000028E8	Flags: 00000000	Code: 000028E2	Name: u.s
Address: 000028E8	Link: 00002968	Flags: 00000000	Code: 000028F2	Name: .s
Address: 00002968	Link: 00002A2C	Flags: 00000000	Code: 00002974	Name: words
Address: 00002A2C	Link: 00002B7C	Flags: 00000000	Code: 00002A44	Name: registerliteral,
Address: 00002B7C	Link: 00002BEC	Flags: 00000000	Code: 00002B88	Name: call,
Address: 00002BEC	Link: 00002C20	Flags: 00000000	Code: 00002BFC	Name: literal,
Address: 00002C20	Link: 00002C48	Flags: 00000000	Code: 00002C2E	Name: create
Address: 00002C48	Link: 00002CA0	Flags: 00000020	Code: 00002C54	Name: does>
Address: 00002CA0	Link: 00002D24	Flags: 00000000	Code: 00002CAE	Name: <builds
Address: 00002D24	Link: 00002D30	Flags: 00000050	Code: 00002D2E	Name: [']
Address: 00002D30	Link: 00002D48	Flags: 00000000	Code: 00002D38	Name: '
Address: 00002D48	Link: 00002D80	Flags: 00000030	Code: 00002D58	Name: postpone
Address: 00002D80	Link: 00002DCC	Flags: 00000000	Code: 00002D8E	Name: inline,
Address: 00002DCC	Link: 00002DE0	Flags: 00000000	Code: 00002DD8	Name: ret,
Address: 00002DE0	Link: 00002DF0	Flags: 00000030	Code: 00002DEC	Name: exit
Address: 00002DF0	Link: 00002E08	Flags: 00000030	Code: 00002DFE	Name: recurse
Address: 00002E08	Link: 00002E20	Flags: 00000081	Code: 00002E14	Name: state
Address: 00002E20	Link: 00002E34	Flags: 00000000	Code: 00002E28	Name: ]
Address: 00002E34	Link: 00002E44	Flags: 00000010	Code: 00002E3C	Name: [
Address: 00002E44	Link: 00002E64	Flags: 00000000	Code: 00002E4C	Name: :
Address: 00002E64	Link: 00002ED0	Flags: 00000830	Code: 00002E6C	Name: ;
Address: 00002ED0	Link: 00002EE4	Flags: 00000000	Code: 00002EDE	Name: execute
Address: 00002EE4	Link: 00002EFC	Flags: 00000010	Code: 00002EF4	Name: immediate
Address: 00002EFC	Link: 00002F14	Flags: 00000050	Code: 00002F0A	Name: inline
Address: 00002F14	Link: 00002F30	Flags: 00000010	Code: 00002F26	Name: compileonly
Address: 00002F30	Link: 00002F4C	Flags: 00000050	Code: 00002F42	Name: 0-foldable
Address: 00002F4C	Link: 00002F68	Flags: 00000050	Code: 00002F5E	Name: 1-foldable
Address: 00002F68	Link: 00002F84	Flags: 00000050	Code: 00002F7A	Name: 2-foldable
Address: 00002F84	Link: 00002FA0	Flags: 00000050	Code: 00002F96	Name: 3-foldable
Address: 00002FA0	Link: 00002FBC	Flags: 00000050	Code: 00002FB2	Name: 4-foldable
Address: 00002FBC	Link: 00002FD8	Flags: 00000050	Code: 00002FCE	Name: 5-foldable
Address: 00002FD8	Link: 00002FF4	Flags: 00000050	Code: 00002FEA	Name: 6-foldable
Address: 00002FF4	Link: 00003010	Flags: 00000050	Code: 00003006	Name: 7-foldable
Address: 00003010	Link: 00003040	Flags: 00000000	Code: 00003020	Name: constant
Address: 00003040	Link: 00003064	Flags: 00000000	Code: 00003050	Name: 2constant
Address: 00003064	Link: 000030C0	Flags: 00000000	Code: 00003072	Name: smudge
Address: 000030C0	Link: 00003138	Flags: 00000000	Code: 000030D0	Name: setflags
Address: 00003138	Link: 00003154	Flags: 00000041	Code: 00003146	Name: aligned
Address: 00003154	Link: 00003178	Flags: 00000000	Code: 00003160	Name: align
Address: 00003178	Link: 000031BC	Flags: 00000000	Code: 00003182	Name: h,
Address: 000031BC	Link: 000031D8	Flags: 00000000	Code: 000031C4	Name: ,
Address: 000031D8	Link: 000031F4	Flags: 00000000	Code: 000031E2	Name: ><,
Address: 000031F4	Link: 0000325C	Flags: 00000000	Code: 00003202	Name: string,
Address: 0000325C	Link: 000032B8	Flags: 00000000	Code: 00003268	Name: allot
Address: 000032B8	Link: 000032E0	Flags: 00000000	Code: 000032CC	Name: compiletoram?
Address: 000032E0	Link: 00003300	Flags: 00000000	Code: 000032F4	Name: compiletoram
Address: 00003300	Link: 0000338C	Flags: 00000000	Code: 00003316	Name: compiletoflash
Address: 0000338C	Link: 00003478	Flags: 00000000	Code: 0000339C	Name: (create)
Address: 00003478	Link: 00003490	Flags: 00000000	Code: 00003488	Name: variable
Address: 00003490	Link: 000034A8	Flags: 00000000	Code: 000034A0	Name: 2variable

Address: 000034A8	Link: 00003580	Flags: 00000000	Code: 000034B8	Name: nvariable
Address: 00003580	Link: 0000366C	Flags: 00000000	Code: 0000358E	Name: buffer:
Address: 0000366C	Link: 0000369C	Flags: 00000000	Code: 00003682	Name: dictionarystart
Address: 0000369C	Link: 000036D8	Flags: 00000000	Code: 000036B2	Name: dictionarynext
Address: 000036D8	Link: 0000370C	Flags: 00000000	Code: 000036EA	Name: skipstring
Address: 0000370C	Link: 000037A0	Flags: 00000000	Code: 00003718	Name: find
Address: 000037A0	Link: 000037FC	Flags: 00000000	Code: 000037AE	Name: cjump,
Address: 000037FC	Link: 00003834	Flags: 00000000	Code: 00003808	Name: jump,
Address: 00003834	Link: 0000384C	Flags: 00000000	Code: 00003840	Name: here
Address: 0000384C	Link: 00003974	Flags: 00000000	Code: 00003860	Name: flashvar-here
Address: 00003974	Link: 000039A0	Flags: 00000030	Code: 00003980	Name: then
Address: 000039A0	Link: 000039BC	Flags: 00000030	Code: 000039AC	Name: else
Address: 000039BC	Link: 00003A10	Flags: 00000630	Code: 000039C6	Name: if
Address: 00003A10	Link: 00003A2C	Flags: 00000030	Code: 00003A1C	Name: ahead
Address: 00003A2C	Link: 00003A48	Flags: 00000030	Code: 00003A3A	Name: repeat
Address: 00003A48	Link: 00003A8C	Flags: 00000630	Code: 00003A54	Name: while
Address: 00003A8C	Link: 00003AEC	Flags: 00000630	Code: 00003A98	Name: until
Address: 00003AEC	Link: 00003B00	Flags: 00000030	Code: 00003AF8	Name: again
Address: 00003B00	Link: 00003B54	Flags: 00000030	Code: 00003B0C	Name: begin
Address: 00003B54	Link: 00003B6C	Flags: 00000220	Code: 00003B5C	Name: k
Address: 00003B6C	Link: 00003B98	Flags: 00000220	Code: 00003B74	Name: j
Address: 00003B98	Link: 00003BC4	Flags: 00000220	Code: 00003BA0	Name: i
Address: 00003BC4	Link: 00003C04	Flags: 00000030	Code: 00003BD0	Name: leave
Address: 00003C04	Link: 00003C18	Flags: 00000020	Code: 00003C12	Name: unloop
Address: 00003C18	Link: 00003C50	Flags: 00000030	Code: 00003C24	Name: +loop
Address: 00003C50	Link: 00003C94	Flags: 00000030	Code: 00003C5C	Name: loop
Address: 00003C94	Link: 00003CDC	Flags: 00000230	Code: 00003C9E	Name: do
Address: 00003CDC	Link: 00003DC8	Flags: 00000230	Code: 00003CE6	Name: ?do
Address: 00003DC8	Link: 00003DE8	Flags: 00000030	Code: 00003DD4	Name: case
Address: 00003DE8	Link: 00003E00	Flags: 00000030	Code: 00003DF2	Name: ?of
Address: 00003E00	Link: 00003EA0	Flags: 00000230	Code: 00003E0A	Name: of
Address: 00003EA0	Link: 00003ED8	Flags: 00000030	Code: 00003EAC	Name: endof
Address: 00003ED8	Link: 00003F28	Flags: 00000030	Code: 00003EE6	Name: endcase
Address: 00003F28	Link: 00003F3C	Flags: 00000000	Code: 00003F34	Name: token
Address: 00003F3C	Link: 00003FAC	Flags: 00000000	Code: 00003F48	Name: parse
Address: 00003FAC	Link: 00003FEC	Flags: 00000000	Code: 00003FB8	Name: digit
Address: 00003FEC	Link: 000040F8	Flags: 00000000	Code: 00003FFA	Name: number
Address: 000040F8	Link: 0000411C	Flags: 00000000	Code: 00004106	Name: .digit
Address: 0000411C	Link: 00004154	Flags: 00000000	Code: 00004128	Name: hold
Address: 00004154	Link: 00004174	Flags: 00000000	Code: 00004160	Name: hold<
Address: 00004174	Link: 0000418C	Flags: 00000000	Code: 00004180	Name: sign
Address: 0000418C	Link: 000041A0	Flags: 00000000	Code: 00004196	Name: #>
Address: 000041A0	Link: 000041B8	Flags: 00000000	Code: 000041AA	Name: f#S
Address: 000041B8	Link: 000041DC	Flags: 00000000	Code: 000041C2	Name: f#
Address: 000041DC	Link: 000041F8	Flags: 00000000	Code: 000041E6	Name: #S
Address: 000041F8	Link: 00004224	Flags: 00000000	Code: 00004200	Name: #
Address: 00004224	Link: 00004238	Flags: 00000000	Code: 0000422E	Name: <#
Address: 00004238	Link: 0000424C	Flags: 00000000	Code: 00004242	Name: f.
Address: 0000424C	Link: 0000429C	Flags: 00000000	Code: 00004256	Name: f.n
Address: 0000429C	Link: 000042B4	Flags: 00000000	Code: 000042A6	Name: ud.
Address: 000042B4	Link: 000042E8	Flags: 00000000	Code: 000042BE	Name: d.
Address: 000042E8	Link: 000042FC	Flags: 00000000	Code: 000042F2	Name: u.
Address: 000042FC	Link: 000044C4	Flags: 00000000	Code: 00004304	Name: .
Address: 000044C4	Link: 0000450C	Flags: 00000000	Code: 000044D4	Name: evaluate
Address: 0000450C	Link: 00004608	Flags: 00000000	Code: 0000451C	Name: interpret
Address: 00004608	Link: 00004624	Flags: 00000081	Code: 00004618	Name: hook-quit
Address: 00004624	Link: 000046B8	Flags: 00000000	Code: 00004630	Name: quit
Address: 000046B8	Link: 000046D4	Flags: 00000000	Code: 000046C4	Name: eint?
Address: 000046D4	Link: 000046E4	Flags: 00000020	Code: 000046E0	Name: eint
Address: 000046E4	Link: 000046F4	Flags: 00000020	Code: 000046F0	Name: dint
Address: 000046F4	Link: 0000470C	Flags: 00000020	Code: 00004700	Name: ipsr
Address: 0000470C	Link: 00004718	Flags: 00000000	Code: 00004716	Name: nop
Address: 00004718	Link: 0000475C	Flags: 00000000	Code: 00004728	Name: unhandled
Address: 0000475C	Link: 00004770	Flags: 00000000	Code: 00004768	Name: reset
Address: 00004770	Link: 00004794	Flags: 00000081	Code: 00004782	Name: irq-systick
Address: 00004794	Link: 000047B8	Flags: 00000081	Code: 000047A4	Name: irq-fault
Address: 000047B8	Link: 000047E0	Flags: 00000081	Code: 000047CE	Name: irq-collection
Address: 000047E0	Link: 00004804	Flags: 00000081	Code: 000047F0	Name: irq-power
Address: 00004804	Link: 00004828	Flags: 00000081	Code: 00004814	Name: irq-radio
Address: 00004828	Link: 0000484C	Flags: 00000081	Code: 00004838	Name: irq-uart
Address: 0000484C	Link: 00004870	Flags: 00000081	Code: 0000485C	Name: irq-spi0
Address: 00004870	Link: 00004894	Flags: 00000081	Code: 00004880	Name: irq-spi1
Address: 00004894	Link: 000048B8	Flags: 00000081	Code: 000048A6	Name: irq-gpiote
Address: 000048B8	Link: 000048D8	Flags: 00000081	Code: 000048C6	Name: irq-adc

Address: 000048D8 Link: 000048FC Flags: 00000081 Code: 000048E8 Name: irq-tim0  
Address: 000048FC Link: 00004920 Flags: 00000081 Code: 0000490C Name: irq-tim1  
Address: 00004920 Link: 00004944 Flags: 00000081 Code: 00004930 Name: irq-tim2  
Address: 00004944 Link: 00004968 Flags: 00000081 Code: 00004954 Name: irq-rtc0  
Address: 00004968 Link: 0000498C Flags: 00000081 Code: 00004978 Name: irq-temp  
Address: 0000498C Link: 000049AC Flags: 00000081 Code: 0000499A Name: irq-rng  
Address: 000049AC Link: 000049CC Flags: 00000081 Code: 000049BA Name: irq-ecb  
Address: 000049CC Link: 000049F0 Flags: 00000081 Code: 000049DE Name: irq-ccm\_aar  
Address: 000049F0 Link: 00004A10 Flags: 00000081 Code: 000049FE Name: irq-wdt  
Address: 00004A10 Link: 00004A34 Flags: 00000081 Code: 00004A20 Name: irq-rtc1  
Address: 00004A34 Link: 00004A58 Flags: 00000081 Code: 00004A44 Name: irq-qdec  
Address: 00004A58 Link: 00004A7C Flags: 00000081 Code: 00004A6A Name: irq-lpcomp  
Address: 00004A7C Link: 00004AA0 Flags: 00000081 Code: 00004A8C Name: irq-swi0  
Address: 00004AA0 Link: 00004AC4 Flags: 00000081 Code: 00004AB0 Name: irq-swi1  
Address: 00004AC4 Link: 00004AE8 Flags: 00000081 Code: 00004AD4 Name: irq-swi2  
Address: 00004AE8 Link: 00004B0C Flags: 00000081 Code: 00004AF8 Name: irq-swi3  
Address: 00004B0C Link: 00004B30 Flags: 00000081 Code: 00004B1C Name: irq-swi4  
Address: 00004B30 Link: 00004BCC Flags: 00000081 Code: 00004B40 Name: irq-swi5  
Address: 00004BCC Link: 00005000 Flags: 0000FFFF Code: 00004BEC Name: --- Flash Dictionary ---  
ok.

words - includes the words from VFXTESTAPP  
INVERT0  
XOR01  
OR01  
AND01  
A0L  
A1L  
A2L  
A3L  
I0L  
I1L  
I2L  
I3L  
O0L  
O1L  
O2L  
O3L  
T1L  
T2L  
T3L  
PWL  
A0H  
A1H  
A2H  
A3H  
I0H  
I1H  
I2H  
I3H  
O0H  
O1H  
O2H  
O3H  
T1H  
T2H  
T3H  
PWH  
????  
SOS  
SCOUNTER  
COUNTER  
MBV2  
SPACES  
DATA  
4dssp  
dssp  
ds  
disbit4  
ANI  
IN  
OUTP  
PSWI  
Line3  
Line2  
Line1

--- Mecrisp-Stellaris Core ---

2dup  
2drop  
2swap  
2nip  
2over  
2tuck  
2rot  
2-rot  
2>r  
2r>  
2r@  
2rdrop  
d2/  
d2\*  
dshr  
dshl  
dabs

dnegate  
d-  
d+  
s>d  
um\*  
m\*  
ud\*  
udm\*  
\*/  
\*/mod  
u\*/  
u\*/mod  
um/mod  
m/mod  
ud/mod  
d/mod  
/  
f\*  
f/  
2!  
2@  
du<  
du>  
d<  
d>  
d0<  
d0=  
d<>  
d=  
sp@  
sp!  
rp@  
rp!  
dup  
drop  
?dup  
swap  
nip  
over  
tuck  
rot  
-rot  
pick  
depth  
rdepth  
>r  
r>  
r@  
rdrop  
rpick  
roll  
: -roll  
and  
bic  
or  
xor  
\*  
clz  
ror  
rol  
arshift  
rshift  
lshift  
0=  
0<>  
0<  
true  
false  
>=  
<=  
<  
>  
u>=  
u<=



u<  
u>  
<>  
=  
min  
max  
umax  
umin  
move  
fill  
@  
!  
+!  
h@  
h!  
h+!  
c@  
c!  
c+!  
bis!  
bic!  
xor!  
bit@  
hbit@  
hbic!  
hbic!  
hxor!  
hbit@  
cbis!  
cbic!  
cxor!  
cbit@  
hflash!  
flashpageerase  
eraseflash  
eraseflashfrom  
+  
-  
1-  
1+  
2-  
2+  
cell+  
negate  
not  
shr  
shl  
2\*  
cells  
2/  
abs  
u/mod  
/mod  
mod  
/  
even  
base  
binary  
decimal  
hex  
hook-emit  
hook-key  
hook-emit?  
hook-key?  
hook-pause  
emit  
key  
emit?  
key?  
pause  
serial-emit  
serial-key  
serial-emit?  
serial-key?  
cexpect

accept  
tib  
>in  
current-source  
setsource  
source  
query  
compare  
cr  
bl  
space  
spaces  
[char]  
char  
(  
\.  
."  
c"  
s"  
count  
ctype  
type  
hex.  
h.s  
u.s  
.s  
words  
registerliteral,  
call,  
literal,  
create  
does>  
<builds  
[']  
,  
postpone  
inline,  
ret,  
exit  
recurse  
state  
]  
[  
:  
;  
execute  
immediate  
inline  
compileonly  
0-foldable  
1-foldable  
2-foldable  
3-foldable  
4-foldable  
5-foldable  
6-foldable  
7-foldable  
constant  
2constant  
smudge  
setflags  
aligned  
align  
h,  
,  
><,  
string,  
allot  
compiletoram?  
compiletoram  
compiletoflash  
(create)  
variable  
2variable

nvariable  
buffer:  
dictionarystart  
dictionarynext  
skipstring  
find  
cjump,  
jump,  
here  
flashvar-here  
then  
else  
if  
ahead  
repeat  
while  
until  
again  
begin  
k  
j  
i  
leave  
unloop  
+loop  
loop  
do  
?do  
case  
?of  
of  
endof  
endcase  
token  
parse  
digit  
number  
.digit  
hold  
hold<  
sign  
#>  
f#S  
f#  
#S  
#  
<#  
f.  
f.n  
ud.  
d.  
u.  
.  
evaluate  
interpret  
hook-quit  
quit  
eint?  
eint  
dint  
ipsr  
nop  
unhandled  
reset  
irq-systick  
irq-fault  
irq-collection  
irq-power  
irq-radio  
irq-uart  
irq-spi0  
irq-spi1  
irq-gpiote  
irq-adc

```
irq-tim0
irq-tim1
irq-tim2
irq-rtc0
irq-temp
irq-rng
irq-ecb
irq-ccm_aar
irq-wdt
irq-rtc1
irq-qdec
irq-lpcomp
irq-swi0
irq-swi1
irq-swi2
irq-swi3
irq-swi4
irq-swi5
--- Flash Dictionary ---
ok.
```