

# WebMite 7.00.00RC3: original and Opt16

What the firmware **WEB-7.00.00RC3-Opt16.uf2** does differently · 23 October 2026

**WEB-7.00.00RC3-Opt16.uf2** is the original WebMite firmware 7.00.00RC3 with three additions: a 16 MB PSRAM can be used in full, the PSRAM timing follows the CPU clock, and ERASE frees memory at once.

Everything else is unchanged: commands, pins, WiFi, Telnet, the flash layout and the A: drive. Saved options stay valid.

## The differences

| TOPIC                                      | ORIGINAL RC3                                                                                                                                                                         | OPT16                                                                                                                                               |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 MB PSRAM                                | Used as 8 MB only.<br>PSRAM heap: 6 MB                                                                                                                                               | Without the option, as the original.<br>After <code>OPTION PSRAM 16</code> used in full.<br>PSRAM heap: <b>14 MB</b>                                |
| New command                                | –                                                                                                                                                                                    | <code>OPTION PSRAM 16</code> and <code>OPTION PSRAM 8</code><br>At the prompt only. Saves the option and restarts.                                  |
| SRAM heap                                  | 312 KB                                                                                                                                                                               | 312 KB, with <code>OPTION PSRAM 16</code> 297.75 KB<br>See “Loss of fast memory” below                                                              |
| Changing the clock at run time (CPU SPEED) | The PSRAM timing stays at the boot clock. Example: boot at 200 MHz, then <code>CPU SPEED 320000</code> : the PSRAM runs at 160 MHz, it is rated for 104 MHz.                         | The PSRAM timing is recalculated at every clock change.<br>Affects changes at run time only, not the boot clock from <code>OPTION CPUSPEED</code> . |
| ERASE                                      | An array that starts exactly at the beginning of a heap stays allocated until the next RUN. Programs with many strings and functions then run much slower (about 4 times in a test). | The array is freed at once.                                                                                                                         |
| OPTION LIST                                | –                                                                                                                                                                                    | Shows <code>OPTION PSRAM 16</code> when it is set.                                                                                                  |
| Boot message with a 16 MB chip             | PSRAM: 16 MB part, the first 8 MB used                                                                                                                                               | Without the option the same, plus<br>PSRAM: <code>OPTION PSRAM 16</code> uses all of it.<br>With the option no message.                             |

Loss of fast memory (SRAM)

The SRAM is the fast memory inside the RP2350. The PSRAM is an external chip and much slower. BASIC puts variables and arrays in SRAM. A block goes to PSRAM only when it is larger than half the SRAM heap or when the SRAM heap is full.

|                                | ORIGINAL RC3 | OPT16 WITHOUT OPTION                                            | OPT16 WITH OPTION PSRAM 16                                      |
|--------------------------------|--------------|-----------------------------------------------------------------|-----------------------------------------------------------------|
| SRAM heap                      | 312 KB       | 312 KB<br>no loss                                               | <b>297.75 KB</b><br>– 14.25 KB (–4.6 %)                         |
| PSRAM heap                     | 6 MB         | 6 MB                                                            | <b>14 MB</b><br>+8 MB                                           |
| Largest block in SRAM          | 156 KB       | 156 KB                                                          | <b>148.9 KB</b><br>larger arrays go straight to PSRAM           |
| Fixed RAM used by the firmware | –            | +256 bytes<br>from the free stack reserve,<br>not from the heap | +256 bytes<br>from the free stack reserve, not<br>from the heap |

**Bottom line:** without the option, Opt16 costs only 256 bytes of SRAM. With `OPTION PSRAM 16` it is 14.5 KB (14.25 KB of heap plus 256 bytes fixed), 4.6 % of the SRAM heap, for 8 MB more PSRAM heap.

**Where the 14.25 KB go:** the PSRAM heap is managed through a page table in SRAM, 2 bits per 256-byte page, which is 1 KB of SRAM per MB of PSRAM. 14 MB need 14 KB, plus 256 bytes of spacing. The table is taken from the top of the SRAM heap at boot. The original's 6 KB table stays in RAM, unused.

How to use 16 MB

- 1. Flash **WEB-7.00.00RC3-Opt16.uf2**.
- 2. The PSRAM must be enabled:  
`OPTION PSRAM PIN GP47`
- 3. At the prompt type `OPTION PSRAM 16` . The board restarts.
- 4. Check with `MEMORY` : PSRAM heap 14 MB.
- 5. Back to 8 MB: `OPTION PSRAM 8`

Good to know

With an 8 MB chip, `OPTION PSRAM 16` changes nothing.

The original RC3 can be flashed again at any time. It ignores the new option and uses 8 MB again.

The firmware is built for the WebMite RP2350 (WEBRP2350) only.

Built on 23 October 2026 from the tag PicoMite-V7.00.00RC3 (commit ed13ce2). Not yet tested on the hardware.  
Source changes: 7.00.00RC3-Retime.patch, 7.00.00RC3-Heap.patch, 7.00.00RC3-Opt16.patch, applied to RC3 with `git apply` in that order.