23.2.5 Simple Assembly Code Example for a Boot Loader

Note that the RWWSB bit will always be read as zero in ATmega48P. Nevertheless, it is recommended to check this bit as shown in the code example, to ensure compatibility with devices supporting Read-While-Write.

```
  ;-the routine writes one page of data from RAM to Flash
  ; the first data location in RAM is pointed to by the Y pointer
  ; the first data location in Flash is pointed to by the Z-pointer
  ;-error handling is not included
  ;-the routine must be placed inside the Boot space
  ; (at least the Do_spm sub routine). Only code inside NRWW section can
  ; be read during Self-Programming (Page Erase and Page Write).
  ;-registers used: r0, r1, temp1 (r16), temp2 (r17), looplo (r24),
  ; loophi (r25), spmcrval (r20)
  ; storing and restoring of registers is not included in the routine
  ; register usage can be optimized at the expense of code size
  ;-It is assumed that either the interrupt table is moved to the Boot
  ; loader section or that the interrupts are disabled.
.equ PAGESIZEB = PAGESIZE*2   ;PAGESIZEB is page size in BYTES, not words
.org SMALLBOOTSTART
Write_page:
  ; Page Erase
  ldi  spmcrval, (1<<PGERS) | (1<<SELFPRGEN)
  rcallDo_spm

  ; re-enable the RWW section
  ldi  spmcrval, (1<<RWWSRE) | (1<<SELFPRGEN)
  rcallDo_spm

  ; transfer data from RAM to Flash page buffer
  ldi  looplo, low(PAGESIZEB)   ;init loop variable
  ldi  loophi, high(PAGESIZEB)  ;not required for PAGESIZEB<=256
Wrloop:
  ld   r0, Y+
  ld   r1, Y+
  ldi  spmcrval, (1<<SELFPRGEN)
  rcallDo_spm
  adiw ZH:ZL, 2
  sbiw loophi:looplo, 2         ;use subi for PAGESIZEB<=256
  brne Wrloop

  ; execute Page Write
  subi ZL, low(PAGESIZEB)       ;restore pointer
  sbci ZH, high(PAGESIZEB)      ;not required for PAGESIZEB<=256
  ldi  spmcrval, (1<<PGWRT) | (1<<SELFPRGEN)
  rcallDo_spm

  ; re-enable the RWW section
  ldi  spmcrval, (1<<RWWSRE) | (1<<SELFPRGEN)
  rcallDo_spm

  ; read back and check, optional
  ldi  looplo, low(PAGESIZEB)   ;init loop variable
  ldi  loophi, high(PAGESIZEB)  ;not required for PAGESIZEB<=256
  subi YL, low(PAGESIZEB)       ;restore pointer
```