

```
.include <m2560def.inc>
.cseg
.org 0x00
rjmp start
.org 0xF6
start: ldi r20,low(RAMEND)
out SPL,r20
ldi r20,high(RAMEND)
out SPH,r20
```

```
; ----- ↙
```

```
; The following subroutine sends out a character via the USART in MSPI mode. The character to be
; sent is passed in r16.
```

```
; ----- ↙
```

```
putch_USART_MSPI:
    lds r20,UCSROA ; wait until USART data register is empty
    sbrs r20,UDRE0 ; "
    rjmp putch_USART_MSPI ; "
    sts UDRO,r16 ; start data transmission
waitTXCO: lds r20,UCSROA ; wait until the character has been shifted out
    sbrs r20,RXC0 ; (by checking reception complete flag)
    rjmp waitTXCO ; "
    lds r22,UDRO ; read UDRO to clear RXCO flag
    ret
```

```
; ----- ↙
```

```
; The following subroutine reads a character via the USART in MSPI mode. The received character
; is returned in r22. This subroutine is identical to the previous subroutine.
```

```
; ----- ↙
```

```
getch_USART_MSPI:
    lds r20,UCSROA ; wait until USART data register is empty
    sbrs r20,UDRE0 ; "
    rjmp getch_USART_MSPI ; "
    sts UDRO,r16 ; trigger clock pulses to shift in data
waitRXCO: lds r20,UCSROA ; wait until the character has been shifted in
    sbrs r20,RXC0 ; (by checking reception complete flag)
    rjmp waitRXCO ; "
    lds r22,UDRO ; read UDRO to clear RXCO flag
    ret ; received character is returned in r22
```