```
freqIRQ         PORTA_PORTaddr  INTERRUPT   \ PortA zero crossing anl3 on PA3
freqOvlIRQ      TCA0_OVFaddr    INTERRUPT   \ TCA0 overflow IRQ vector
freqTriacIRQ    TCA0_CMP0addr   INTERRUPT   \ TCA0-CMP0  triac ignition generation
freqDvmIRQ      TCA0_CMP1addr   INTERRUPT


CODE getTper  ( -- n )
                        TPUSH
                        SEI
    tper        R26     LDS             \ TOS := tper
    tper 1+     R27     LDS
                        CLI
                        RET
END-CODE

\ ================================ ADC =======================================

\ Setup ADC to measure anl3 at 90 degrees on PA3
CODE adcInit  ( -- )
    $01     R16     LDI                 \ Enable 10 bit ADC
    R16 ADC0_CTRLA  STS
    $45     R16     LDI                 \ Select low Cin, Div 64 = 250 kHx, 75 uSec conversion
    R16 ADC0_CTRLC  STS
    $03     R16     LDI                 \ Connect to PA3
    R16 ADC0_MUXPOS STS
[DEFINED] tn817Drivers [IF]
    $20     R16     LDI                 \ Vcc = 3V3   Vref := 2.5 V
[ELSE]
    $30     R16     LDI                 \ Vcc = 5V0   Vref := 4.3 V
[THEN]
    R16 VREF_CTRLA  STS
                    RET
END-CODE


\ IRQ ADC on PA3 ready
LABEL adcIRQ
    R16                 PUSH            \ Save used registers
    ADC0_RESL   R16     LDS             \ anl3 := adc value
    R16         anl3    STS
    ADC0_RESH   R16     LDS
    R16         anl3 1+ STS
    2       VPORTA_DIR  CBI             \ Disable DVM shunt
    $02         R16     LDI             \ Enable positive edge IRQ on PA3
    R16 PORTA_INTFLAGS  STS
    R16 PORTA_PIN3CTRL  STS
    R16                 POP             \ Restore used registers
                        RETI
END-CODE

adcIRQ      ADC0_RESRDYaddr INTERRUPT


CODE getAnl3  ( -- n )
                        TPUSH
                        SEI
    anl3        R26     LDS             \ TOS := tper
    anl3 1+     R27     LDS
                        CLI
                        RET
END-CODE

\ ================================ USART ================================

CODE usartInit  ( -- )
    2   VPORTB_DIR      SBI         \ PB2 USART Tx as output
    $08         R16     LDI         \ Enable pull-up on Rx
    R16 PORTB_PIN3CTRL  STS
                        RET
```