

EE2361 - lecture 36

12/5/16

~~10~~ PWM - two examples

ATD \rightarrow PWM

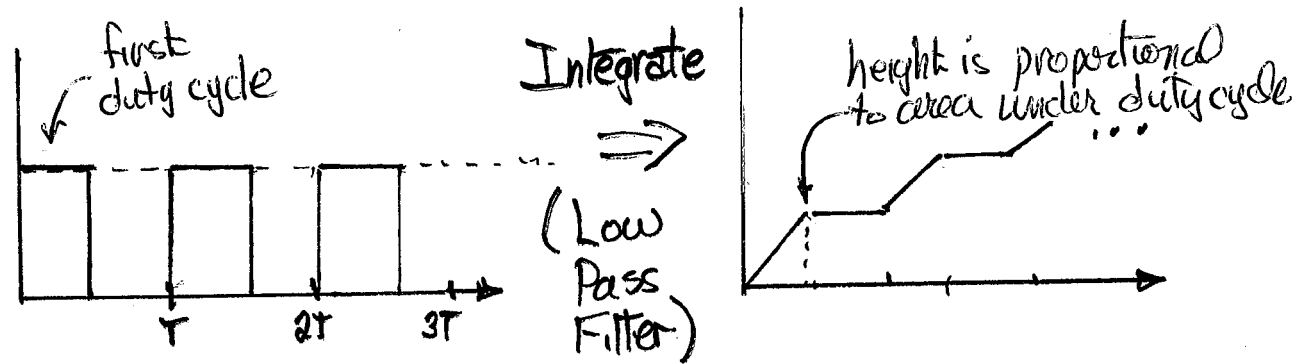
PWM \rightarrow analog output

• Rest of Week

— low-power, WDT

Can use PWM to generate an analog signal

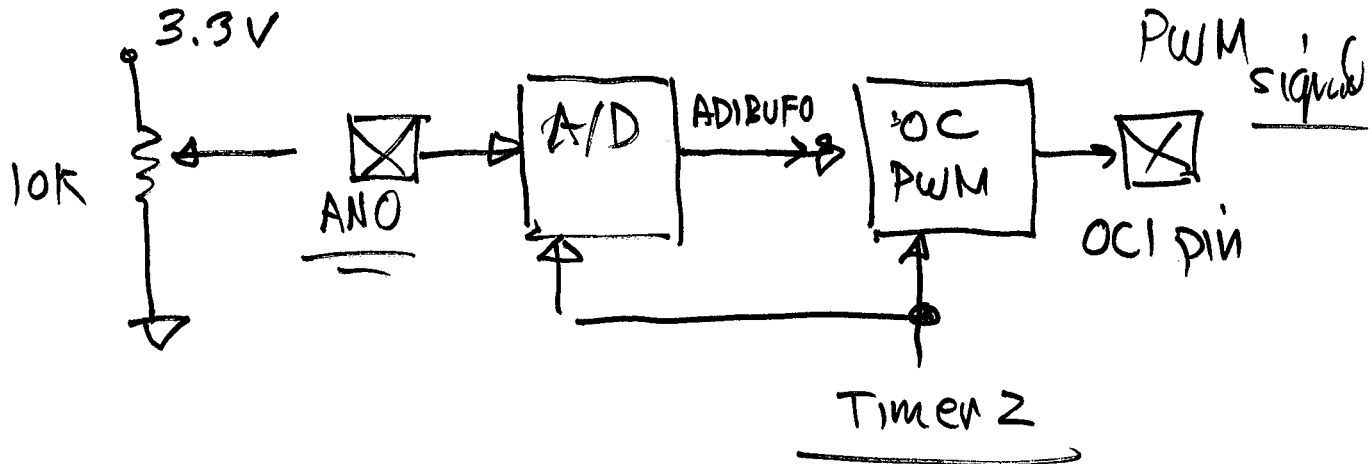
⇒ see microchip app note AN538, "Using PWM to generate analog output"



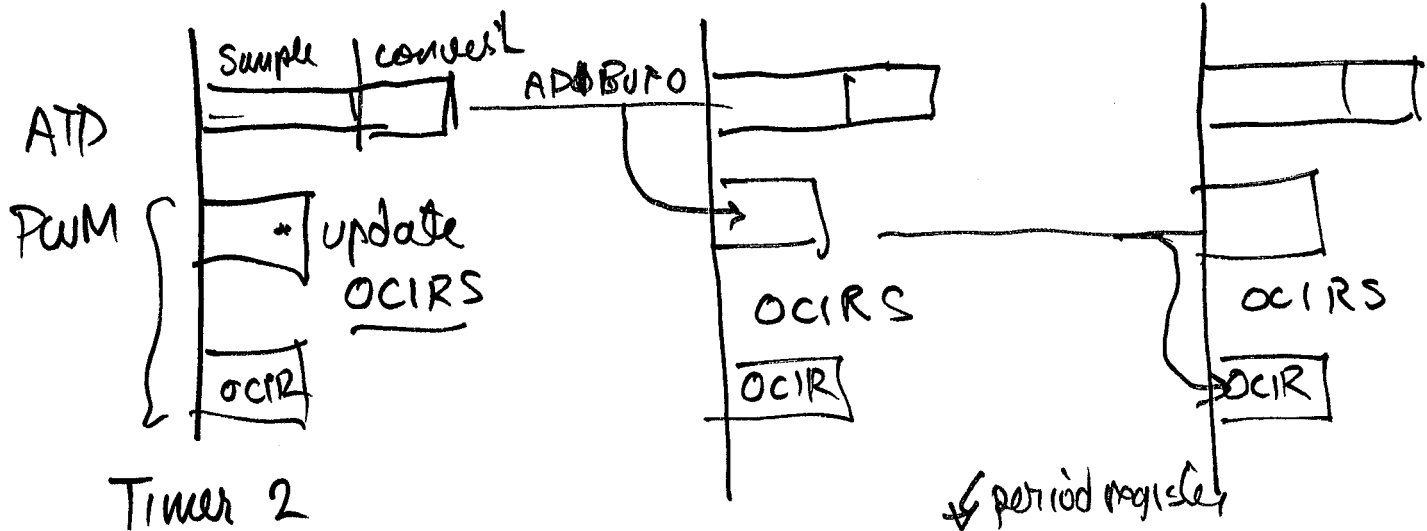
The "low-pass filter", basically a resistor and capacitor, acts as an integrator.

Second Example

Digitize the valve output from a potentiometer and use it to control the duty cycle of a PWM output



Timer 2 for both



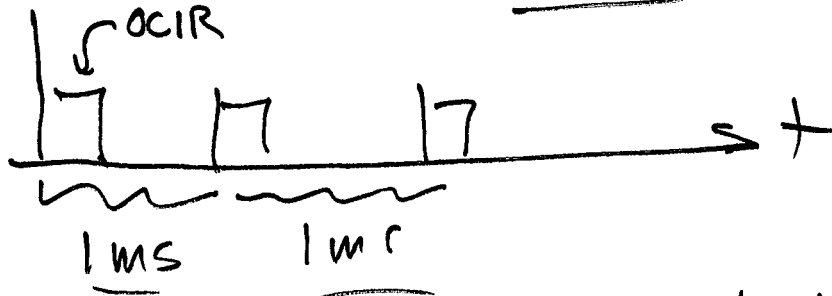
Timer 2
rollover

a delay of 2 cycles for the
sampled value to determine
the duty cycle

ATD - Timer 2 as the sample/convert
period
⇒ manually start sampling
in Timer 2 ISR, automatically
convert
⇒ one sample, use only
ADIBUFO

At the end of a cycle we move the
value in ADIBUFO to OCIRS

PWM - set the period for
PWM \Rightarrow 1 kHz @



we only use Timer 2 interrupts in this.

Use Timer 2 interrupt and move
the new value in ~~ADIBUFO~~ to OC1RS
in the ISR

how
long
?

look at the code

make A0 analog input

make RPIS will be 001 output pin

make RPIS pin an output

Set Up Timer 2 (turn on later)

Initialize $TMR2 = 0$

Put the appropriate value in PR2
for a prescaler of 1:1

Use the equation for PWM period $= (PR2 + 1) T_{cy} \cdot \text{Prescaler}$

We turn on this module later

Set $PR2 = 16000 - 1$

Configure the ATD

Timed conversion ✓
manual sampling, start ✓
ANO will be input channel ✓

Configure the Output Compare
for PWM \Rightarrow no fault mode

Set OC1R, OC1RS to 0

Then configure and enable interrupt
Turn on Timer 2

\Rightarrow good to go!

Most the work is then done
in the Timer2 ISR

Code example