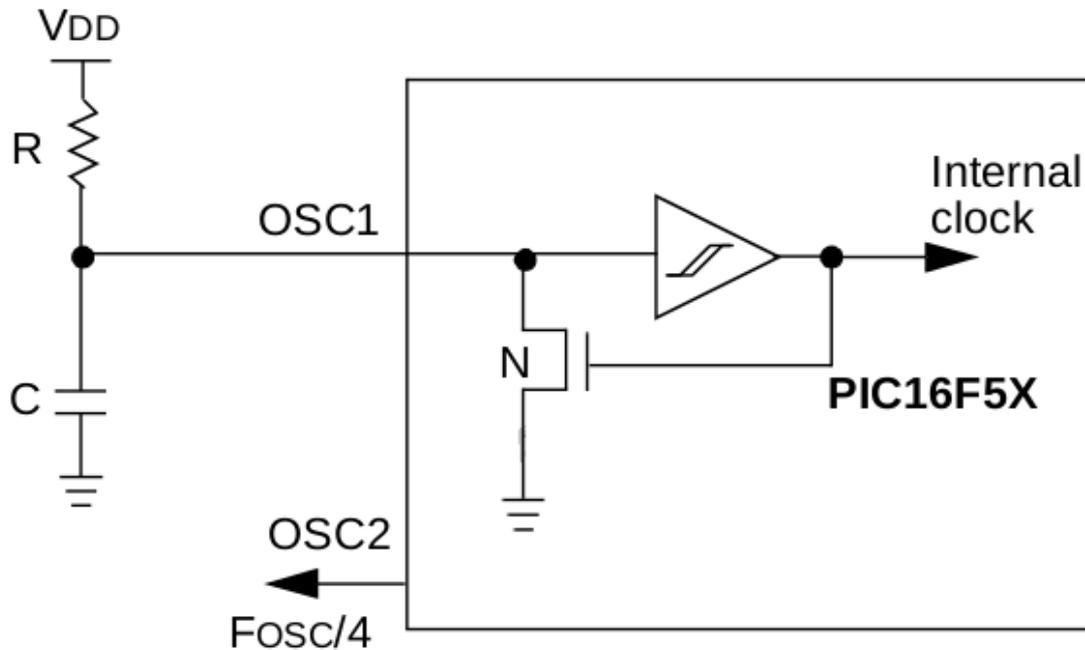
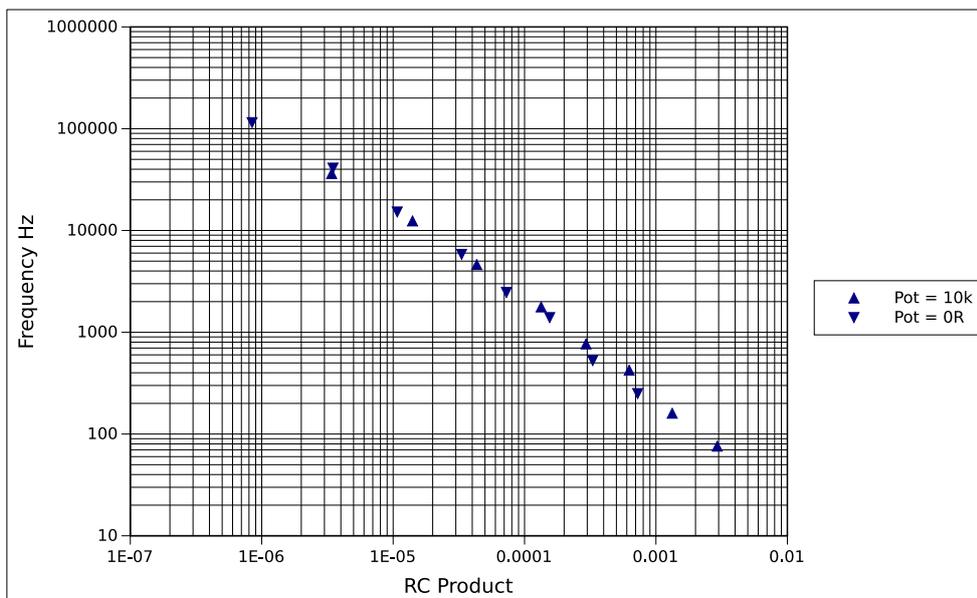


A novel PIC implementation of a 50% duty cycle square wave oscillator.

Un-programmed, that is blank or erased PIC16F baseline parts have the RC oscillator enabled which means that if you connect them up, appropriately, that is pull MCLR up to rail and supply the R and C for the oscillator, the oscillator will run with a divided by 4 output on the clock out pin. This divided by 4 output is very close to a perfect 50% duty cycle square wave.



For example the plot below shows the result of using different caps with a 10k pot set to max and min (10k pot + 3k3).



This is all very well but it still requires switching to change capacitor value etc. It occurred to me that the PIC could be programmed to do the capacitor changes, with no extra components apart from the caps. This because the GPIO pins can be configured as hi


```

000C          loop

000C 0625          btfsc PORTA,1    ;wait for button press
000D 0A0C          goto loop

000E 0247          comf caps,w      ;delay mod to account for
000F 0028          movwf temp
0010 07E7          btfss caps,7
0011 03A8          swapf temp,f
0012          delay
0012 0000          nop
0013 02E8          decfsz temp,f
0014 0A12          goto delay

0015 0725          btfss PORTA,1
0016 0A0C          goto loop

0017 0A06          goto update

                                END

```

With a 10k pot + 3k3 as in the schematic above the table below shows approximate frequencies, by selecting the caps and or paralleling values overlapping ranges can be achieved from a few Hz to a few hundred kHz.

Range	Min Freq (Pot Max)	Centre Freq	Max Freq (Pot Min)	Cap
1	76	163	250	220n
2	160	343	527	100n
3	424	909	1394	47n
4	768	1614	2461	22n
5	1774	3801	5828	10n
6	4622	9916	15211	3.2n
7	12413	26722	41031	1n
8	36259	75582	114905	200p