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* Sigma Delta Driver                 v1 *
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 History:
                            Version 1 - 04-09-2013)     initial concept


Schematic:

               10k
      +3.3V ──┳─WWW──┫ Vss
                ↑
                ≷ 470Ω
Drive Pin     ──┫
                ≷ 10k    R
Feedback Pin  ──╋─────────WW───→ A (see text)
                ═ .01uF
                ▽
               Vss


Theory:

 Note: A key feature with this sigma-delta ADC is that the drive pin is set to an input shortly after the sample
       period.  A Typical configuration usually has the drive pin always set as an output and driven either HIGH
       or LOW and the external analog input is connected to a node I have labeled as "A". That method creates more
       of a voltage overshoot as the ADC tries to search introducing unnecessary noise. By placing the analog
       input on the drive pin, the analog signal is blocked from the feedback pin during the sample period.  When
       the drive pin becomes an input the analog signal is then allowed to charge or discharge the capacitor. In
       this way you minimize antenna effects caused by long distances from the analog source that would normally
       interfere during a sample period.

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CON

  _CLKMODE = XTAL1 + PLL16X
  _XINFREQ = 5_000_000


    Drive = 1                   'sigma-delta feedback
    Feedback = 0                'sigma-delta input
OBJ

PST            : "Parallax Serial Terminal"
VAR

long    Sample

PUB start
    PST.Start(19200{<- Baud})

    cognew(@PASM, @Sample)


    repeat
      PST.dec(Sample)
      PST.Char(13{<- Return character})


DAT
              org
PASM          andn      dira,    _Drive           'Set Drive pin to an input
ADC_Start     mov       ADC_sample,#0             'Clear ADC_Sample
              mov       Counter,samples           'Set number of iterations
ADC_loop      test      _FB,    ina wz            'Read ADC feedback pin ; set Z flag
              muxz      outa,   _Drive            'Preset drive pin to opposite state of feedback pin
              or        dira,   _Drive            'Set Drive pin to an output
              andn      dira,   _Drive            'Set Drive pin to an input
        if_z  add       ADC_sample, #1            'Increment ADC
              djnz      Counter, #ADC_loop        'next itteration
              wrlong    ADC_sample,par            'write ADC_sample back to Spin variable "sample"
              jmp       #ADC_Start                'read next ADC sample

ADC_sample    long      0
Counter       long      0

samples       long      1000                      'Range ; Adjust this to suit the output range that you need
                                                  '        i.e. For measuring voltage, a value of 3300 might be
                                                  '             convienient to display the result in mV

_FB           long      |<Feedback
_Drive        long      |<Drive


DAT
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