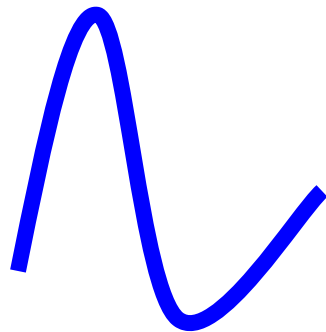# Analog to Digital Converters

Representing a continuously varying physical quantity by a sequence of discrete numerical values.

03 07 10 14 09 02 00 04
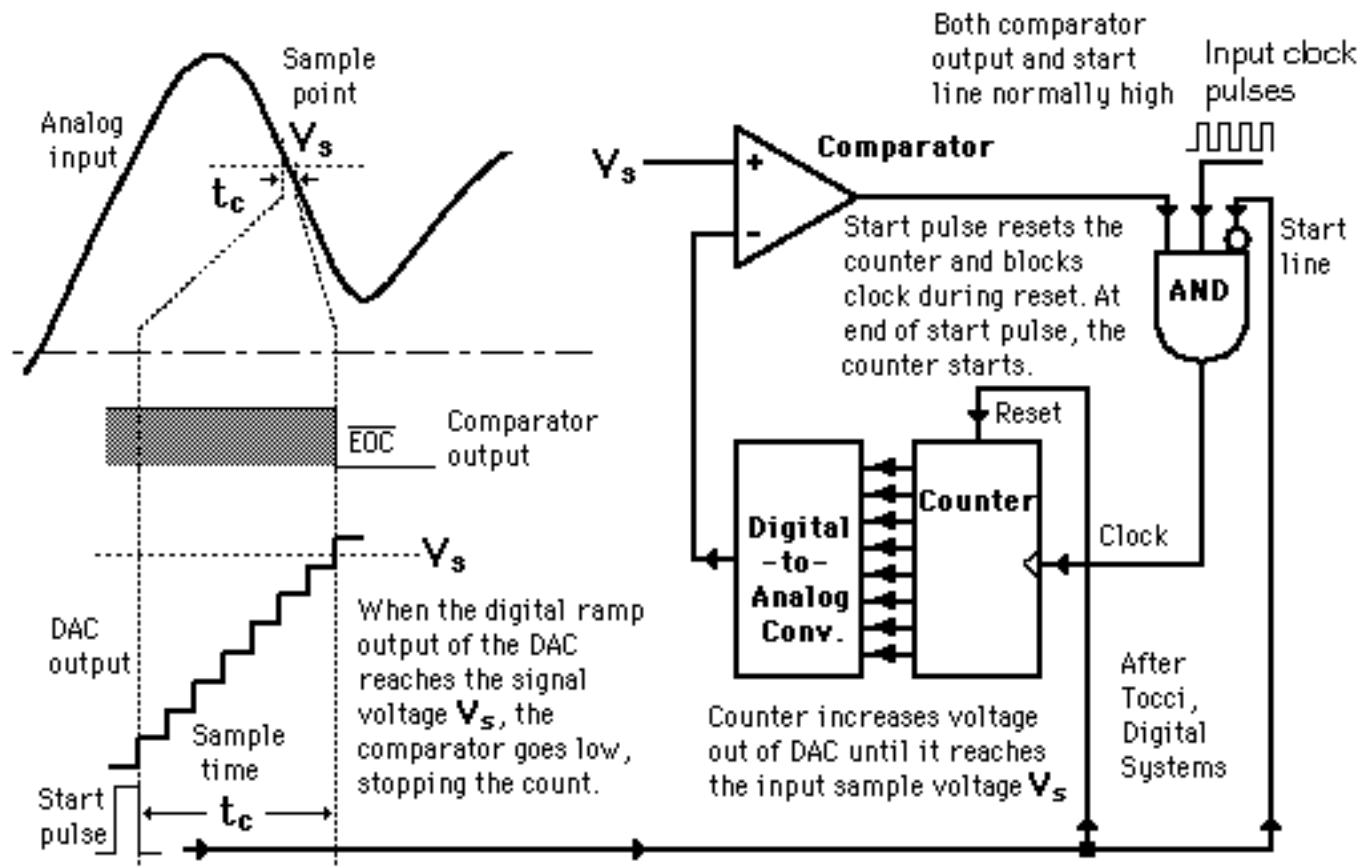
Conversion Methods

Ladder Comparison or Ramp
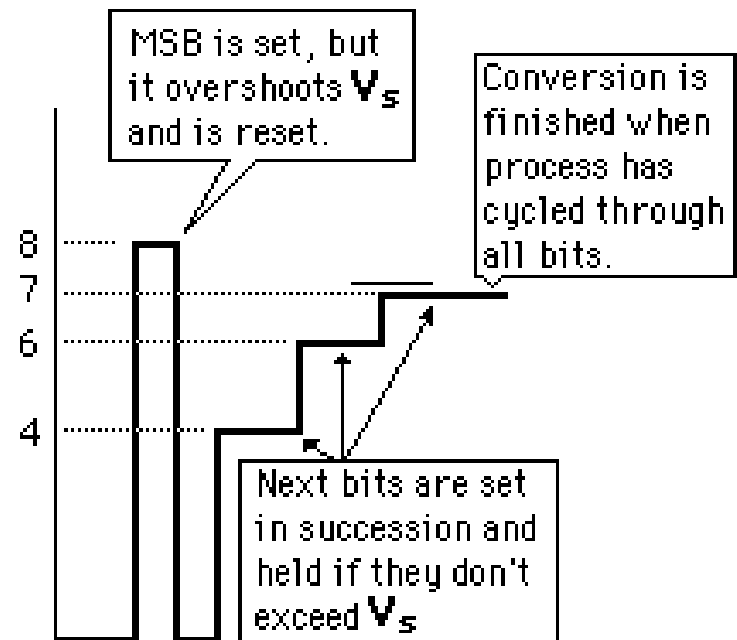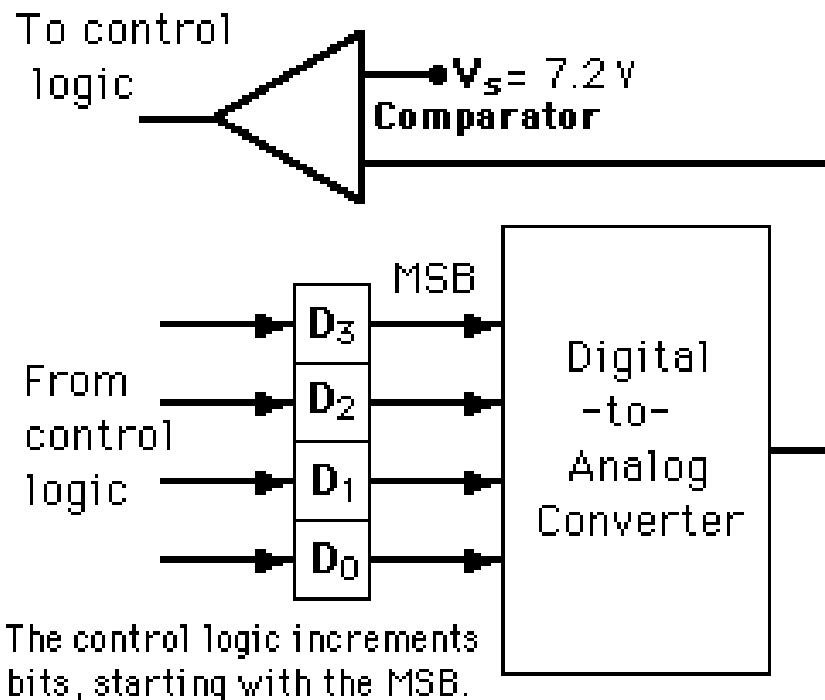
Successive Approximation

Flash or parallel Comparison

Voltage to frequency

Dual Slope

Ladder Comparison

Sample point

Analog input

V_s

t_c

Comparator output

$\overline{EOC}$

DAC output

V_s

When the digital ramp output of the DAC reaches the signal voltage V_s, the comparator goes low, stopping the count.

Sample time

Start pulse

t_c

Both comparator output and start line normally high

Input clock pulses

V_s

Comparator

Start pulse resets the counter and blocks clock during reset. At end of start pulse, the counter starts.

AND

Start line

Reset

Digital -to- Analog Conv.

Counter

Clock

Counter increases voltage out of DAC until it reaches the input sample voltage V_s

After Tocci, Digital Systems

Successive Approximation

Flash Comparison

If N is the number of bits in the output word….

Then 2^N comparators will be required.

With modern microelectronics this is quite possible, but will be expensive.