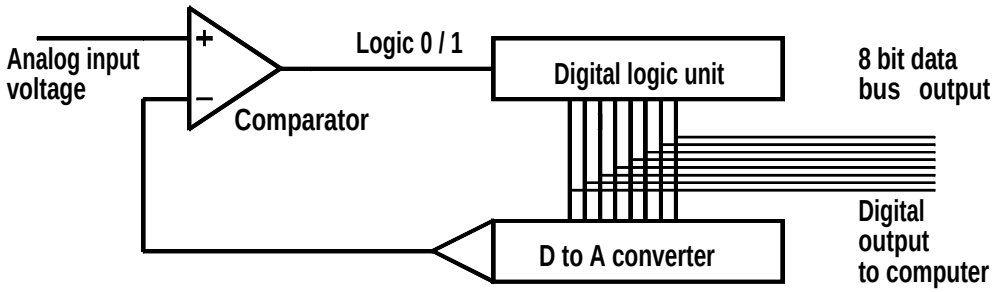
- Feedback analog to digital converters include a DA converter.

- The algorithms used to drive the DA are:—
  1. Ramp type conversion
  2. Tracking conversion
  3. Successive aproximation.

- Flash converters carry out the conversion at high speed using a resistor network and a bank of comparators.

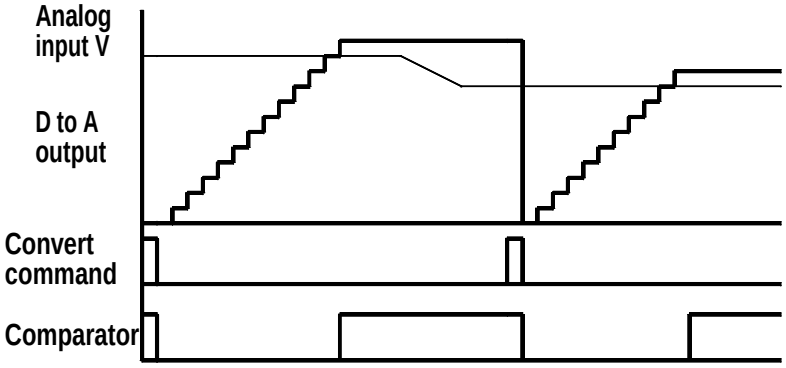
- Integrating converters integrate the input voltage for a fixed time and then measure the time required to restore the output of the integrator to zero using a negative reference voltage.



Feedback Analog to Digital Converters.

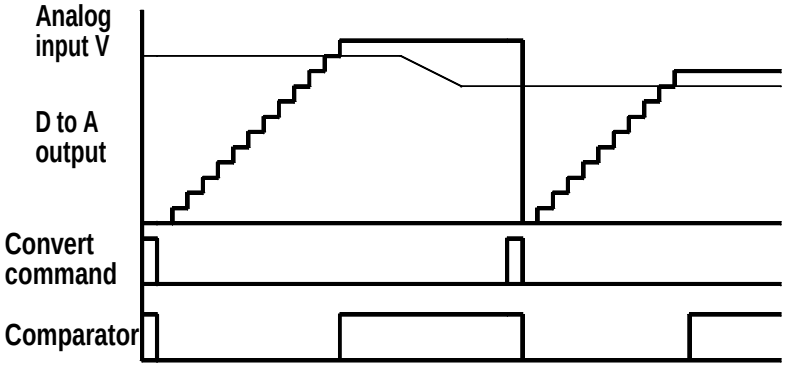
A digital logic unit (DLU) generates an 8 bit binary number according to some algorithm.
This number is fed to a digital to analog converter which generates the corresponding analog voltage
Which is fed to a comparator.
The comparator output is fed to the DLU and controls the execution of the algorithm.

Output of the digital to analog converter is matched to the analog input voltage
Three algorithms.



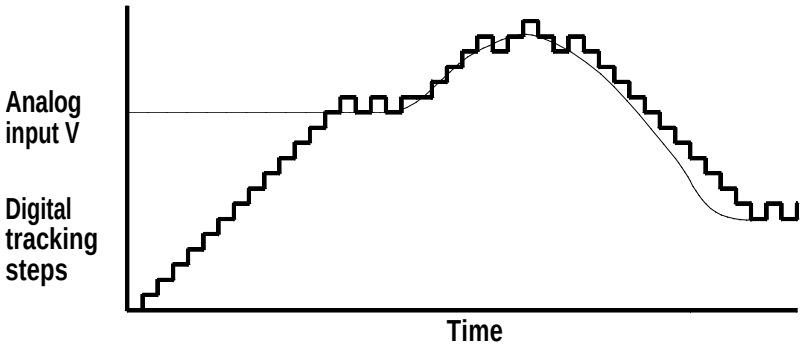
A ramp type conversion algorithm

The DLU which counts clock cycles.
The output of the counter is fed to the DA
Output of DA ramps up



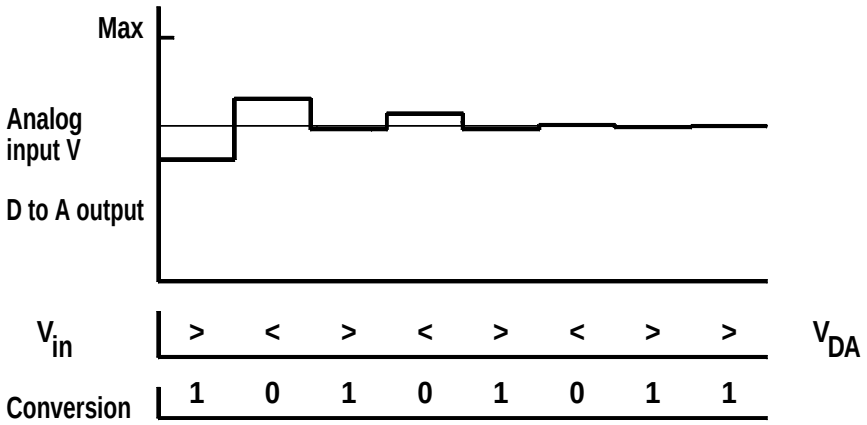
Use a subroutine of the form:—

- Issue convert command
- Read end of conversion state until end of conversion becomes 1
- Read data into computer
- Return from subroutine



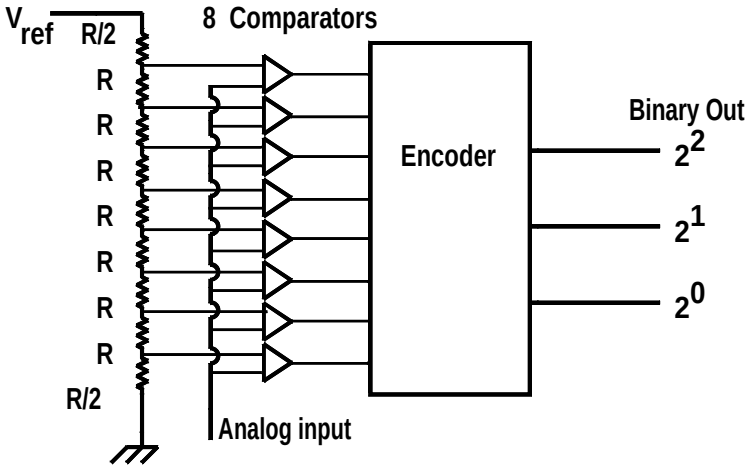
Tracking Converter

Initially operates as a ramp type converter iand then switches to tracking mode
Record changes since previous digitization.
Count up — Count down.
Advantages:— Faster, smaller data storage requiredment.



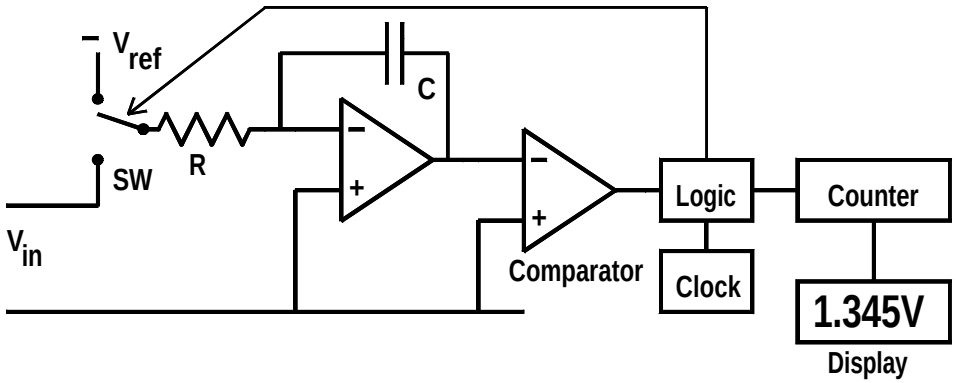
successive approximation converter. Initially all 8 bits at the output of the DLU are set to 0.

In 8 time intervals, it is possible to carry out an 8 bit conversion to an accuracy of 1 part in 2^8 or 1 part in 256.



A Flash Converter

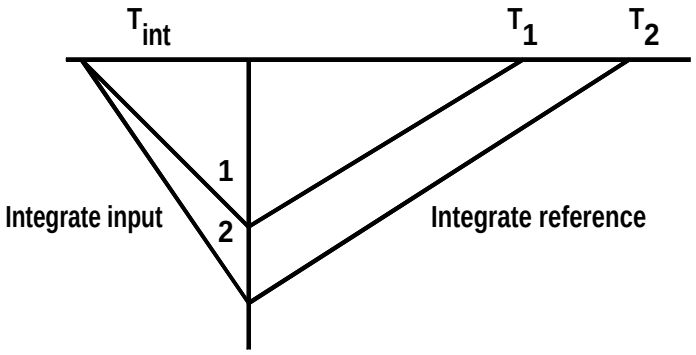
Resistor network to give reference voltages
n comparators
Digitize number of highest untriggered comparator.
High speed operation.



Integrating AD converters. Used in digital multimeters.

Input voltage is integrated for a fixed time in an op-amp integrator

Input voltage is then disconnected from the integrator and a negative reference voltage is switched to the input to the integrator.



The integrator therefore converts a voltage measurement to a time measurement.

The only critical component is the voltage reference