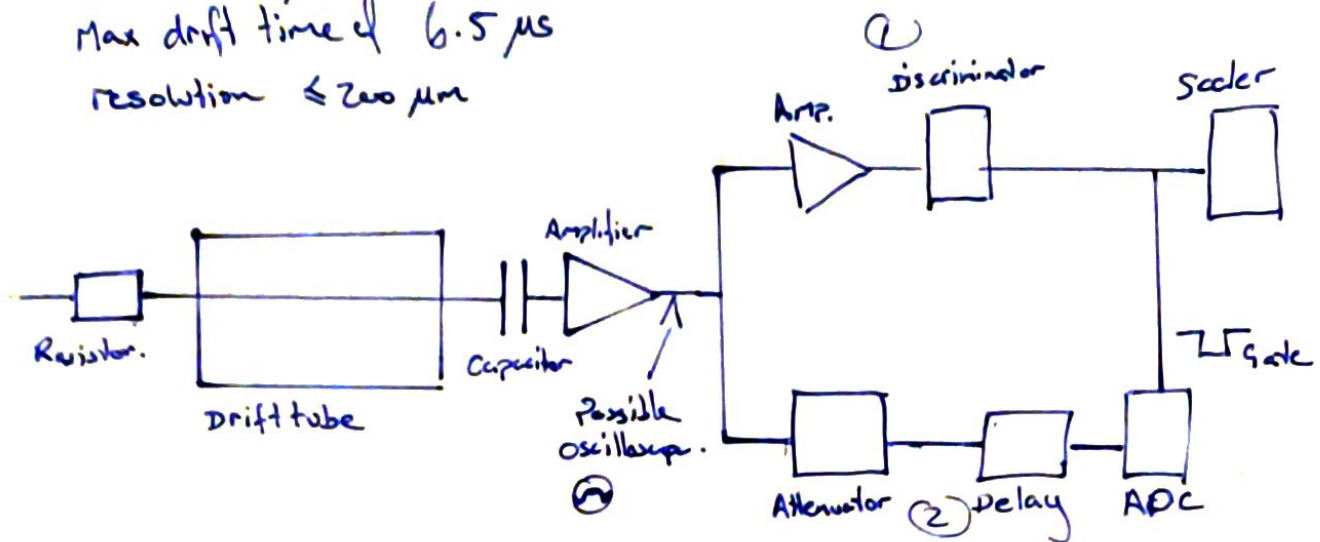


3. 384 anode wires  
 $V_d = 1 \text{ cm}/\mu\text{s}$   
 Max drift time of  $6.5 \mu\text{s}$   
 resolution  $\leq 200 \mu\text{m}$



The capacitor detects the charge from the electrons reaching the end of the drift chamber.

$$C = Q/V \quad \text{Time to charge } \tau = RC$$

The voltage created by the discharging capacitor is then amplified. The signal is then split to ① & ② where in ① the signal is again amplified and passed to a discriminator which decides if the input is of interest (above a certain voltage value).

In ② the attenuator reduces the amplitude of the signal to help protect further components from potential damage.

The signal is then delayed as a short pulse will take longer to go from low to high for measurement. The signal is then converted to a digital signal via an ADC which will give a completed signal to the Scaler if the discriminator decides the signal is of interest.

Covers  $1 \text{ cm}/\mu\text{s}$  at a min rate of  $6.5 \mu\text{s} \therefore$  covering a max distance of  $65,000 \mu\text{m}$ . At a resolution of at least  $200 \mu\text{m}$  to resolve the signal  $\Rightarrow 65,000/200 = 325$  detectable pulses (maximum)  
 Signals coming from 384 wires  $\therefore 325 \times 384 \text{ signals} = 124,800$   
 $\therefore$  bit resolution of output signal must be at least 17 bits ( $16.92$ )