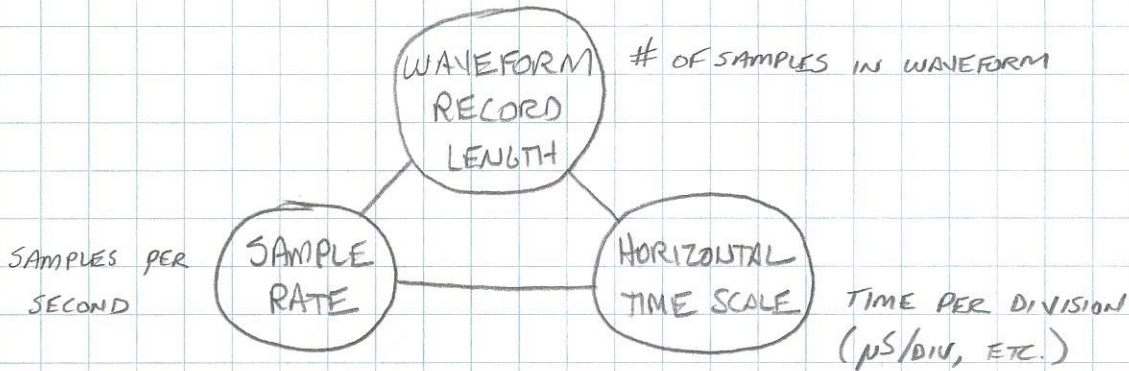
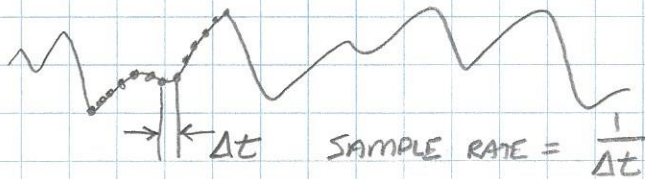
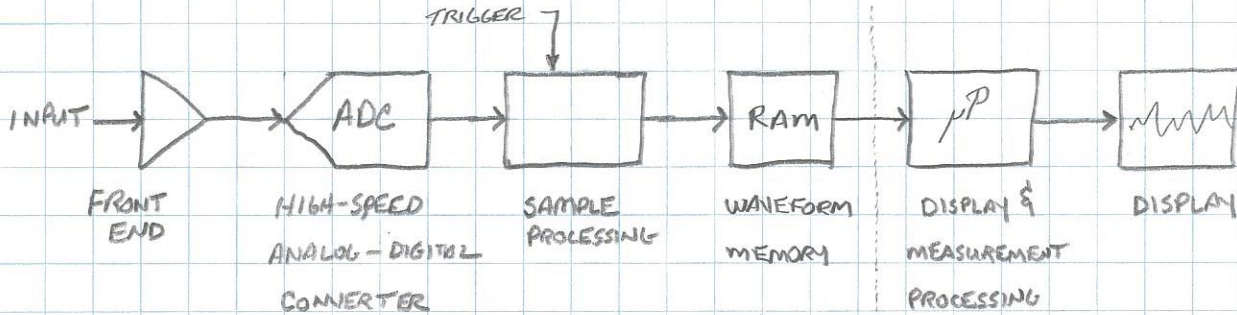


WZREW

DIGITAL OSCILLOSCOPE

SAMPLE RATE, RECORD LENGTH & WAVEFORM MEMORY
(AND WHAT GETS DISPLAYED)

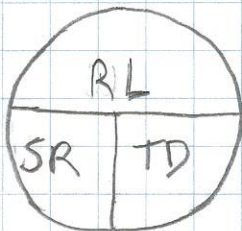


EXAMPLE:

SAMPLE RATE = 5 GS / s

HORIZONTAL = 20 μS / DIV

RECORD LENGTH = $\frac{5 \text{ GSAMPLES}}{\text{SEC}} \times \frac{20 \mu\text{S}}{\text{DIV}} \times 10 \text{ DIV} = 1 \text{ MILLION}$



TOTAL TIME DURATION OF WAVEFORM RECORD (TD)

$$RL = SR * TD$$

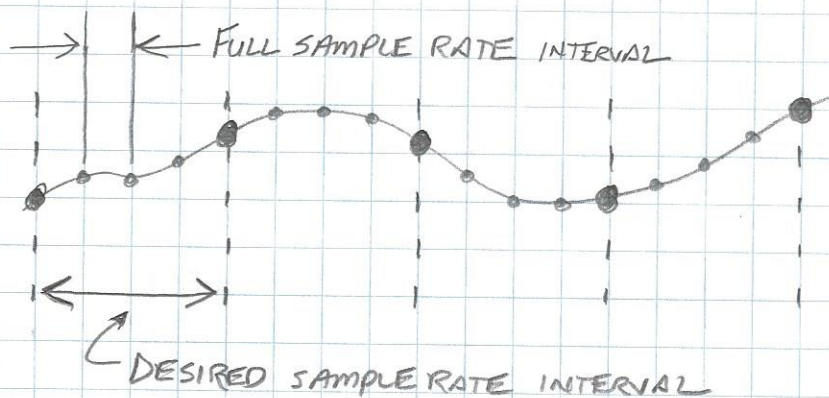
$$\begin{aligned} \# \text{ SAMPLES} &= \text{SAMPLE RATE} * \text{TIME DURATION} \\ &= \text{SAMPLES} / \text{SEC} * \text{SEC} / \text{DIV} * \# \text{ DIV} \end{aligned}$$

- AT LONGER TIME DURATIONS (SLOWER TIME/DIV)
LOTS OF MEMORY IS REQUIRED ...

... UNLESS SAMPLE RATE IS REDUCED.

HOW IS SAMPLE RATE REDUCED?

DEPENDS ON SAMPLE MODE SETTING...



① SAMPLE MODE: ONE SAMPLE PER DESIRED INTERVAL IS SAVED, OTHERS ARE SIMPLY LOST.

② PEAK MODE: HIGHEST & LOWEST VALUES IN CONSECUTIVE INTERVALS ARE SAVED, OTHERS ARE LOST.

③ HI-RESOLUTION: ALL SAMPLES IN DESIRED INTERVAL ARE AVERAGED INTO A SINGLE POINT.

④ ENVELOPE MODE: PEAK MODE, UPDATED MIN/MAX WITH NEW ACQUISITIONS

⑤ AVERAGE MODE: SAMPLE MODE, MULTIPLE ACQUISITIONS AVERAGED TOGETHER

SINGLE-SHOT

MULTIPLE ACQ

- CONTROLS FOR SAMPLE RATE, RECORD LENGTH, SAMPLE MODE, ETC.
WILL VARY BY SCOPE AND MANUFACTURER - LEARN HOW TO USE YOURS!

... THE NEXT BIG QUESTION ...

HOW IS THE WAVEFORM RECORD DISPLAYED ON SCREEN?

... BECAUSE THE WAVEFORM RECORD USUALLY HAS MORE POINTS THAN THE NUMBER OF PIXELS IN THE DISPLAY HORIZONTALLY.

- VARIES BY SCOPE & MANUFACTURER ...
... LEARN HOW YOURS WORKS!

... AND ...

WHAT SAMPLES ARE USED FOR MEASUREMENTS LIKE RISE/FALL TIME, FREQUENCY, ETC.?

- WAVEFORM RECORD SAMPLE POINTS?
- DISPLAYED POINTS?
- SOMETHING ELSE?

THIS CAN HAVE A BIG IMPACT ON MEASUREMENT ACCURACY & SPEED.

IMPORTANT TO UNDERSTAND HOW YOUR SCOPE WORKS, SO YOU DON'T GET FOOLED BY RESULTS.