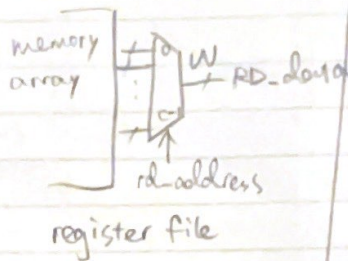
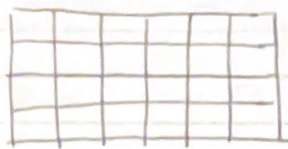
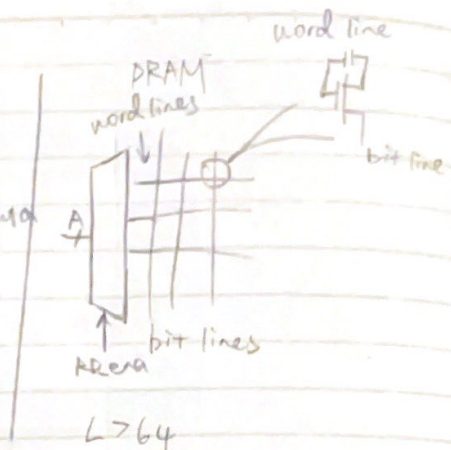


## Read out circuitry

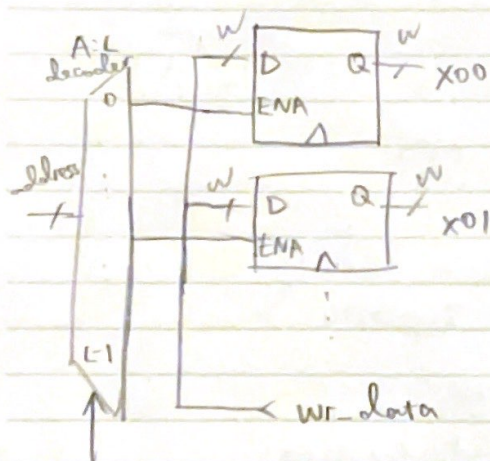
Fastest: MUXES



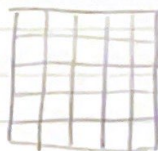
$L \leq 64$



## Write circuitry

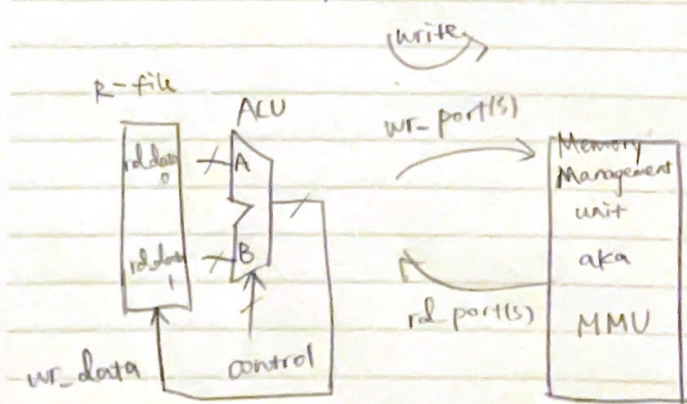


In general



## Big Picture

Thinky  $\xleftarrow{\text{read}}$  Memory



(1) (a)

$$MTBF = \frac{100 \text{ hours}}{1 \text{ failure}}$$

It's for toddlers who are not seriously learning piano, so the quality of the toy doesn't necessarily have to be that high.

$$(b) \quad MTBF = \frac{5000 \text{ hours}}{1 \text{ failure}}$$

which means 1-2 failures all year around. That is fairly high performance as the requirements for an industrial-use robot should be maintained as high as possible for safety and profit purposes.

$$(b) \quad MTBF = \frac{e^{+Rt_c}}{\text{Total } t_c}$$