Memory Choices

**RAM** (Random Access Memory)
★ for main memory and caches
★ retains its state while the power is on

**ROM** (Read Only Memory)
★ retains state without power
★ acronym used for memories that now do permit writes
SRAM (Static RAM)

more expensive per bit, larger area required per bit due to more transistors than DRAM
DRAM (Dynamic RAM)

Needs refresh every 10-100 msec, since the state is implemented with a capacitor

(Much) the same technology as 1980, but smaller and more sensitive
ROM (Read Only Memory)

Retains state without power

PROM
EPROM
EEPROM

i1702 EPROM
designer: Dov Frohman
in 1971 at Intel
Historical Devices

core memory

drum memory
tape drive
RK07
movable hard disk
Time to read/write = seek + rotational latency + read/write time
A key point:
We want a standardized interface such that new devices can be added to an existing system without new HW.

The SW must be able to communicate firmware or device drivers over existing HW.
The SW is implemented hierarchically.

1) because we do not want to write the (extremely) low level ("real time") device routines that talk directly to devices.

2) there are "security" issues that we want control over…. who gets access to what, when