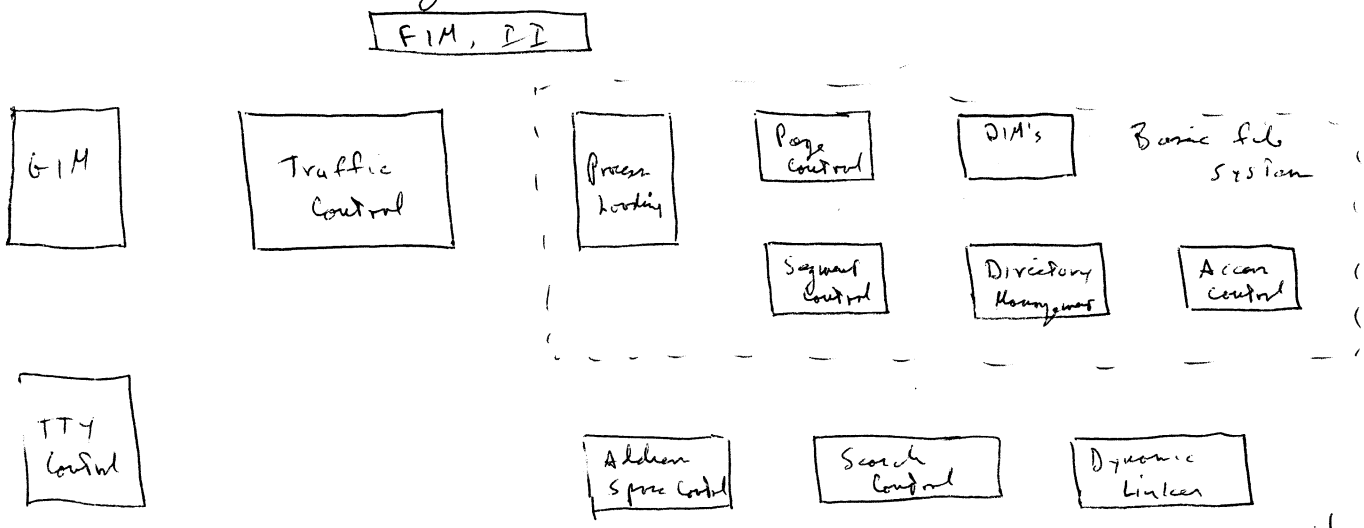
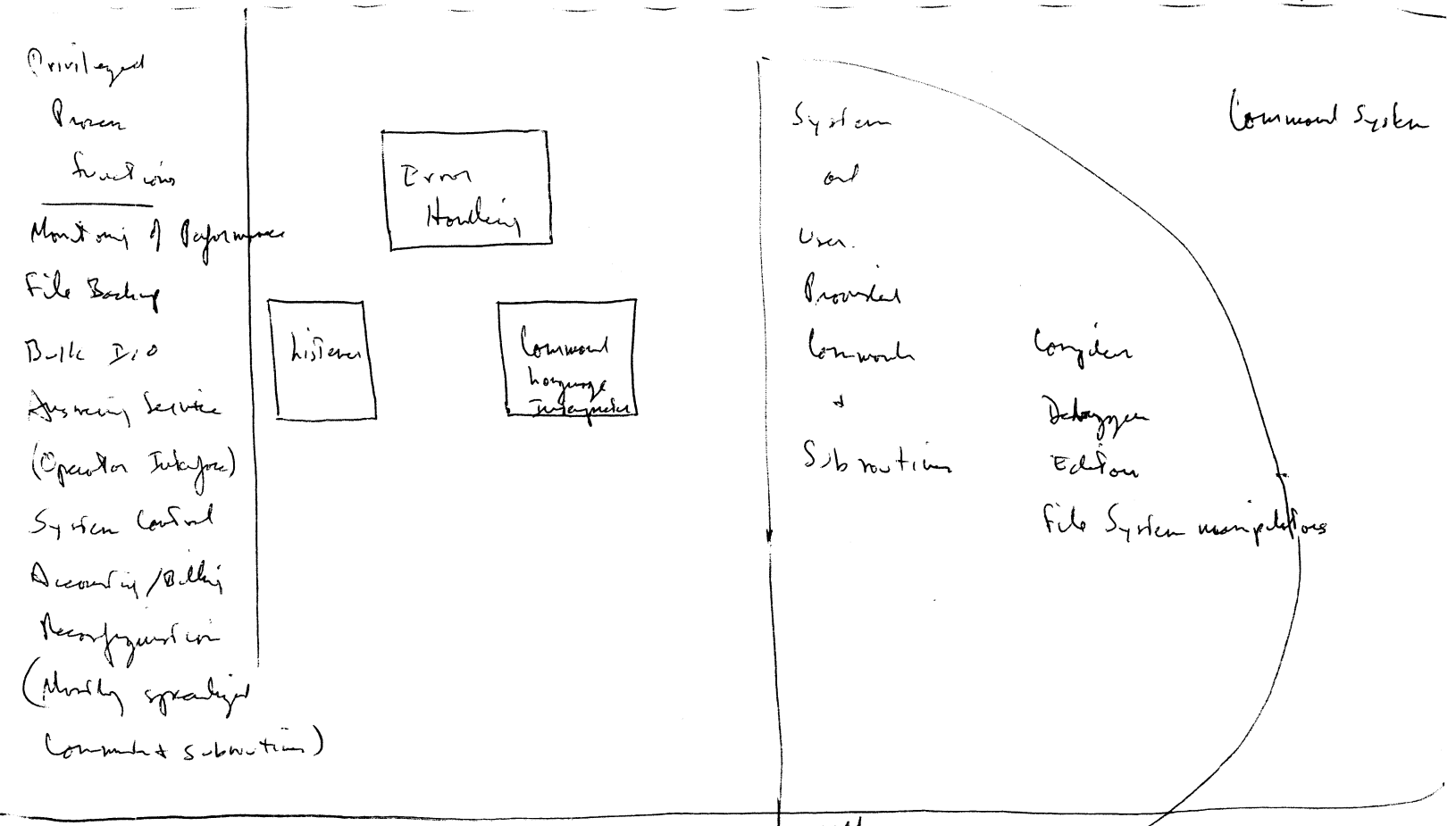
Sept 1971

The Multics organization: Three views

I Procedural





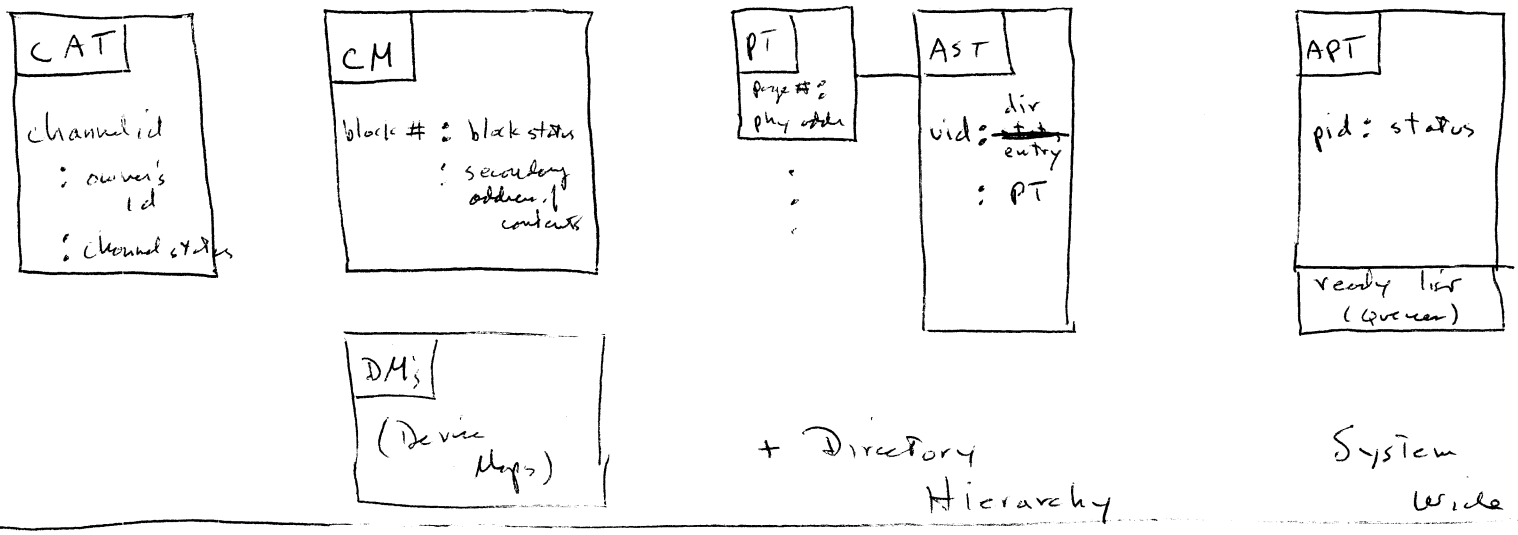
Other

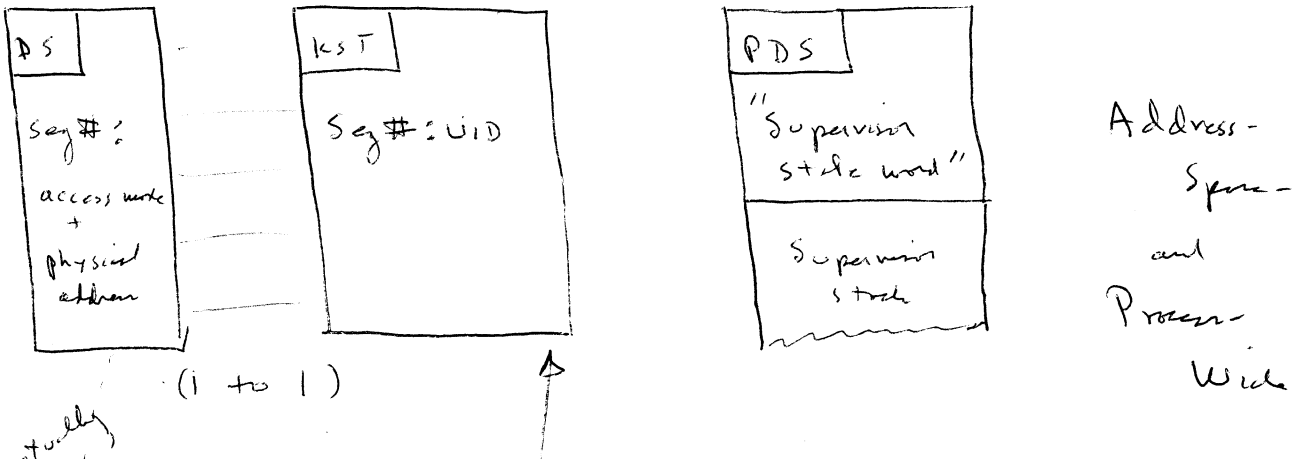
Bootload / Initialize
shutdown
Reconfiguration
BOS

~~core~~ VM Dump
~~Salvager~~
Save / Restore
Reloader

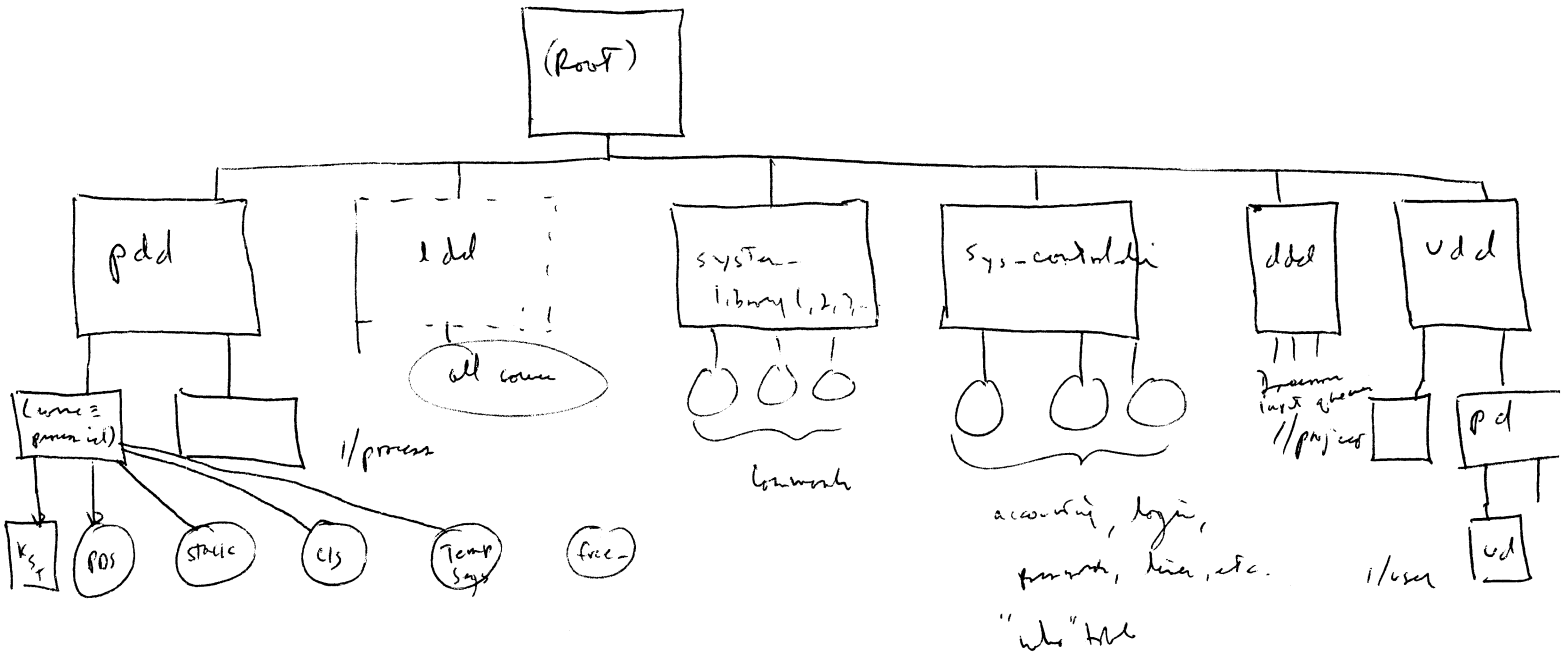
+ Development Tools

View II: Data


CAT
channel id
: owner's id
: channel status
CM
block # : block status
: secondary address / contents
PT
page # :
phy addr
AST
uid : dir entry
: PT
APT
pid : status
ready list (queue)
DM's
(Device Maps)
+ Directory Hierarchy
System Wide


DS
seg # :
access mode + physical address
KST
Seg # : UID
(1 to 1)
actually
PDS
"Supervisor state word"
Supervisor stack
Address-Space and Process-Wide
(Implemented on KST trailers)
DS
Ref. Name table
ref name : uid
linkage / static storage
stack
Per-ring

View III : Stored information



Hardware overview

- Ideas overload on GE-600 line

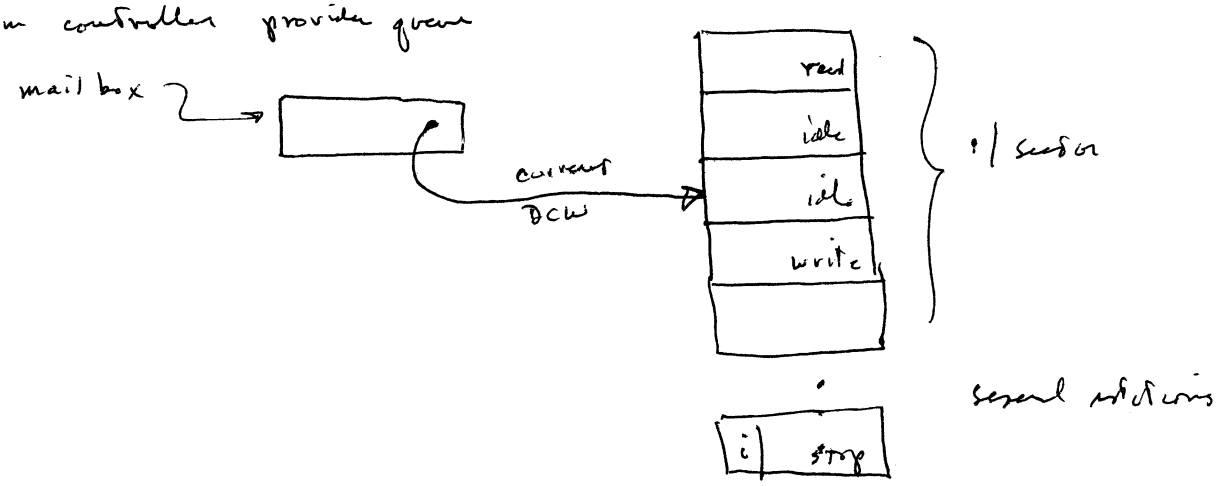
  why? 1. 600-line was cleanly modular, needed for multi-cpu
  2. GE offered to put hdwe engineers on project, and work cooperatively.

- Overall cpu/memory interconnection pattern
  port selection strategy breakdown down ~ 8 ports.

- Address scheme overkill on 36-bit CPU
  comparison: - bit to address don't have full words.
  - limited # of pointer register pairs

- High performance drum
  Orig specs: 16 ms rotation, 8 ms avg. wait
  8 sectors around, 2 ms per 1000 word transfer
  Decreased to 32 ms, 16 sectors, still 2 ms per 1000 words

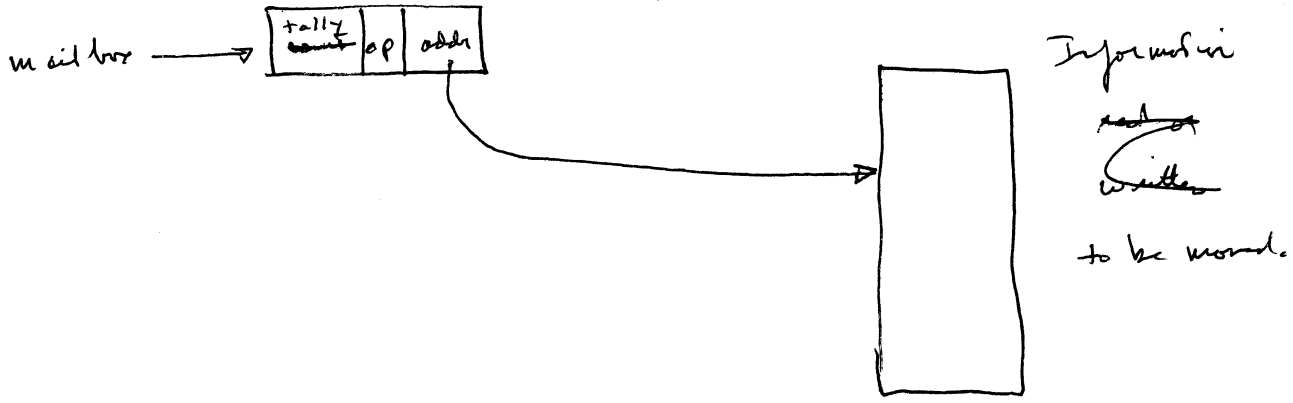
- Drum controller provides queue



- Clock

- General I/O controller

Simple idea used over and over again.



Typical channel for typewriter control:

channel pair.
1. one simple channel to move data to I/O
2. one simple channel to move DCW's to the mailbox of the first channel!

Overall: 4000 channels maximum (often ~200 I/O's)

Each channel is charge: 1 flip flop to say I need to do my job (set by I/O device when it has accepted the last item)
1 buffer of data size (e.g., 9 bits)

+ A multiplexer which scans for flip-flops on and does the transfer.

Status returned through another simple channel.