TAPE 1

0 ROOT +

dir good_stuff

1 GOODSTUFF ~~dddd #~~

2 Release_Notices #

3 SYSGEN #

UDD: $CLASS #

5 : $QUINN #

: $RILEY #

4 : PSD #

TAPE 2 $UTIL # \ COMMON+

and ~~1 = :UDD #~~

1 4 36640

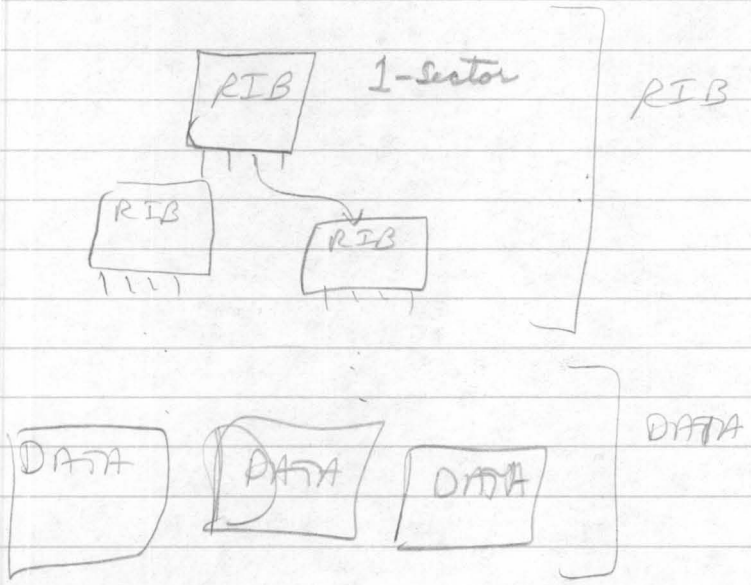
33774

14235

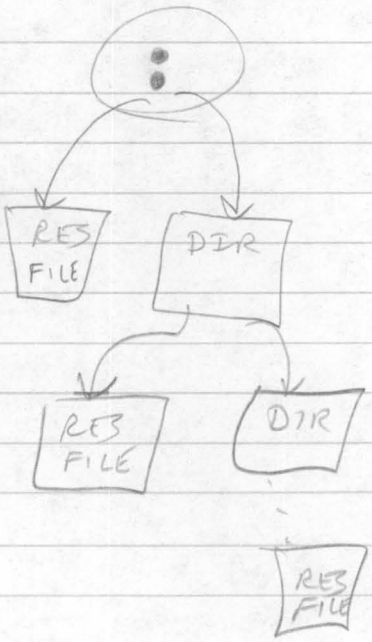
~~File Structure~~

0) Elements + sectors

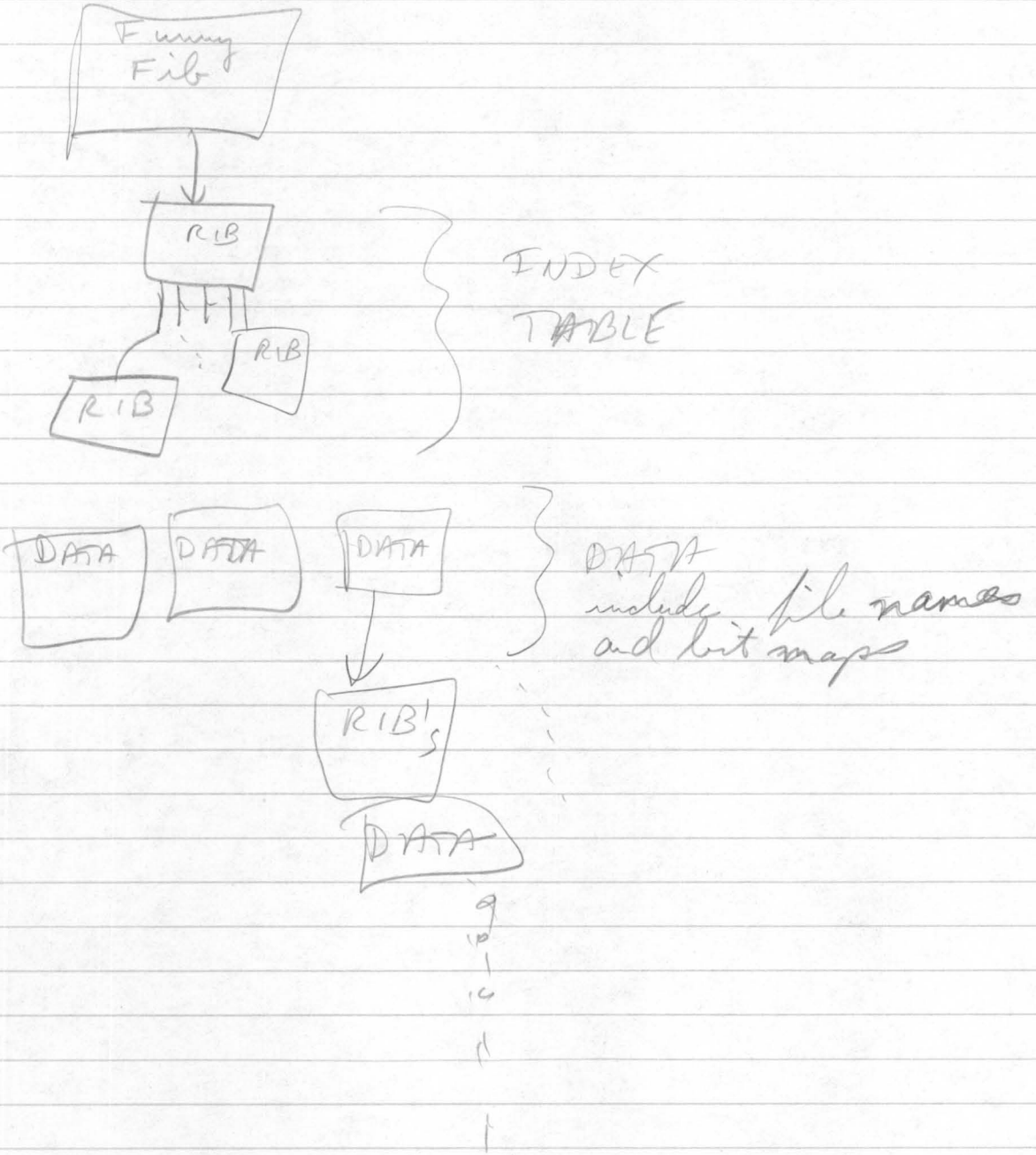
1) File Structure



2) AOS EXTERNAL DIR STRUCT



3) AOS internal Dir file Structure

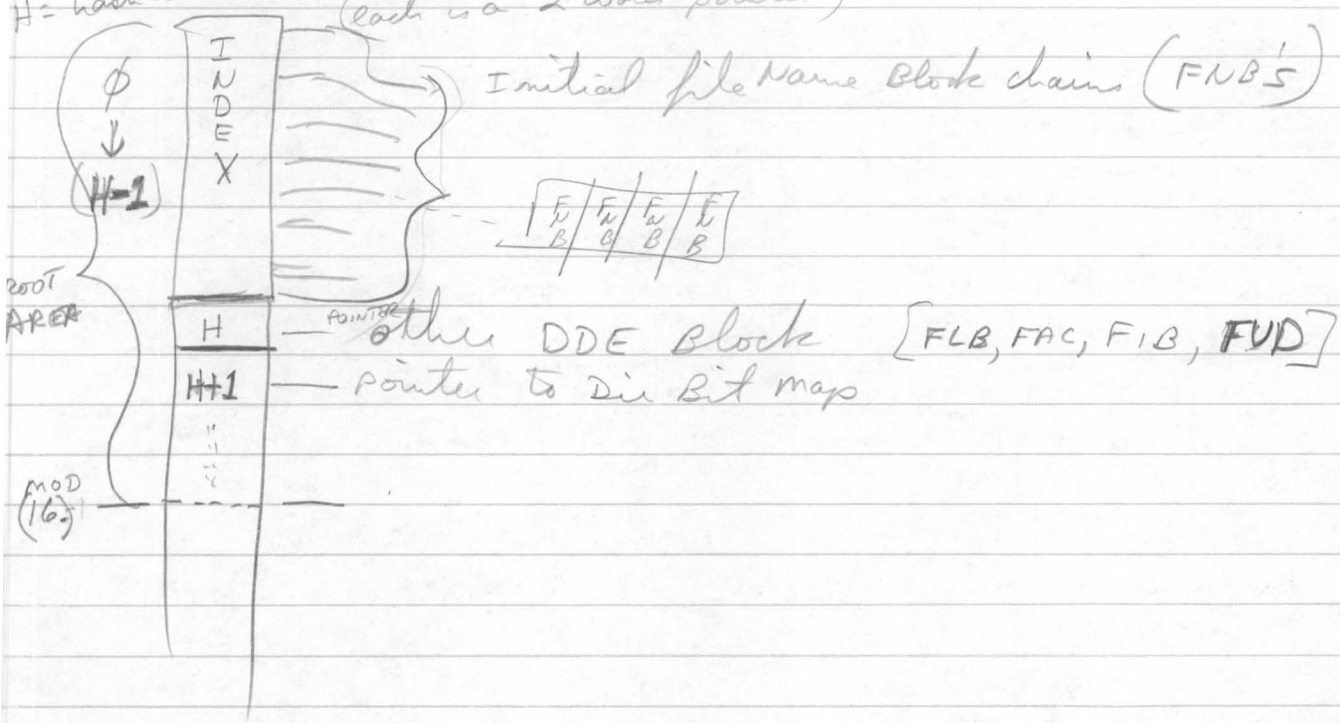


4) External Struct. of [1] dir file

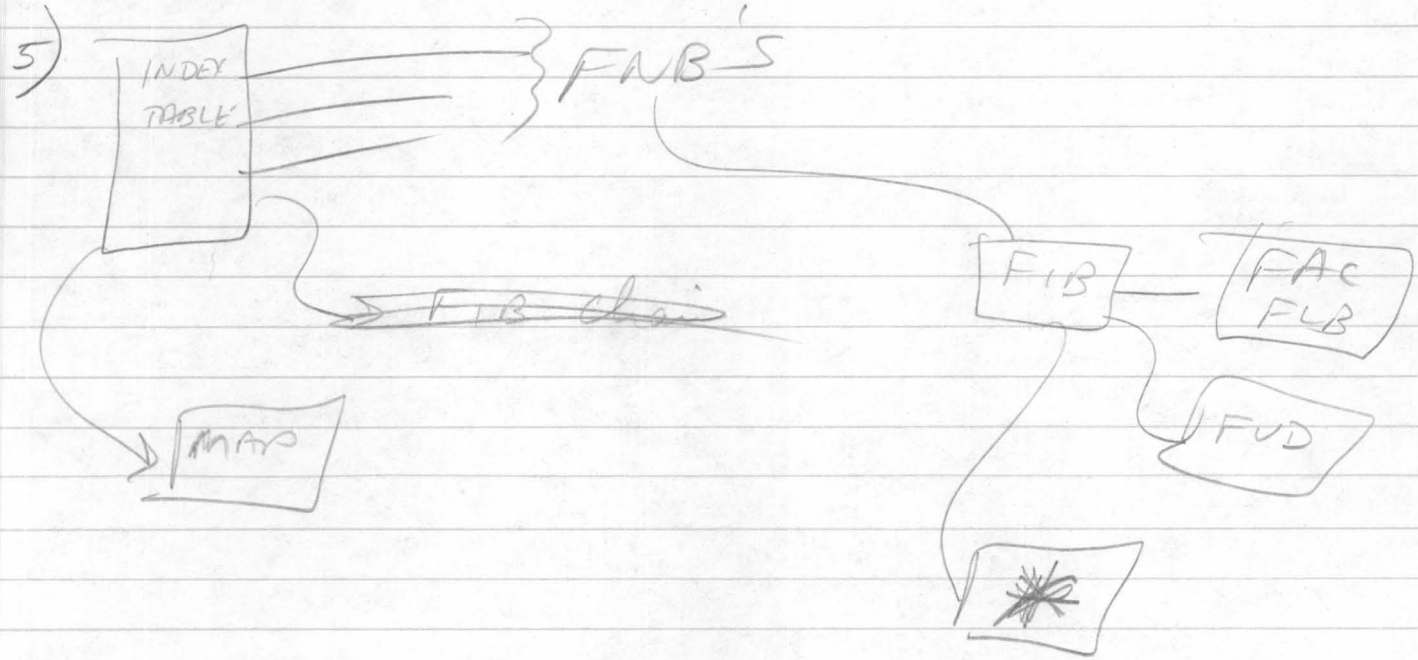
CREATE/DIR/HASH=H

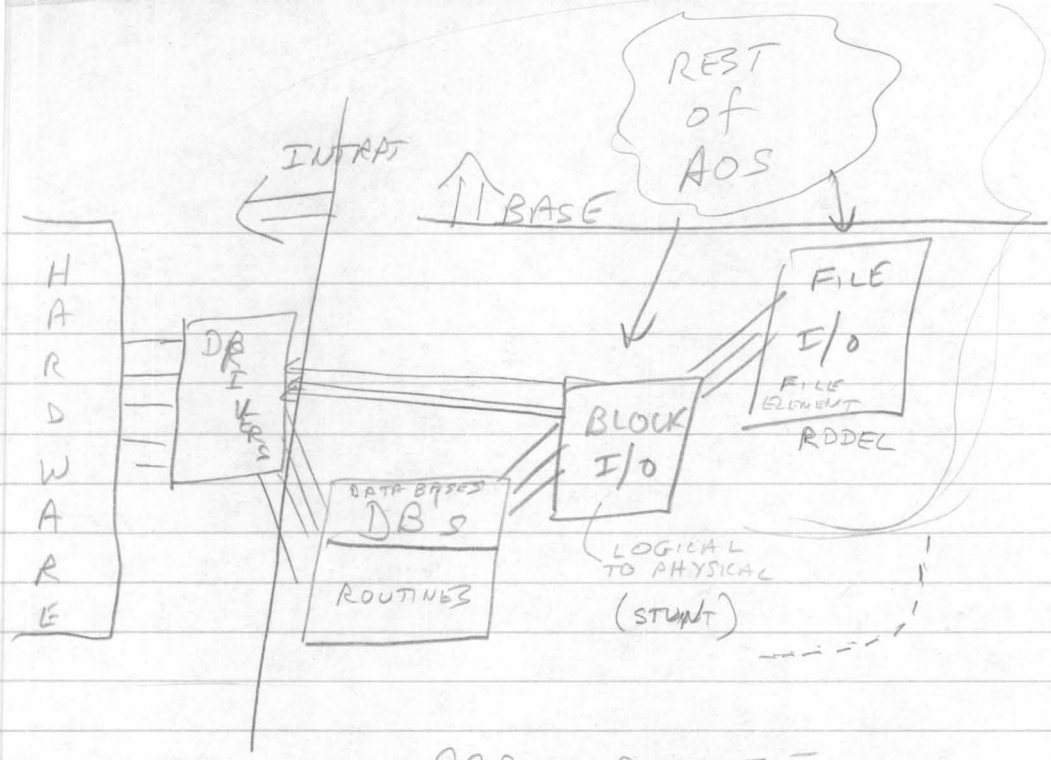
H = hash value

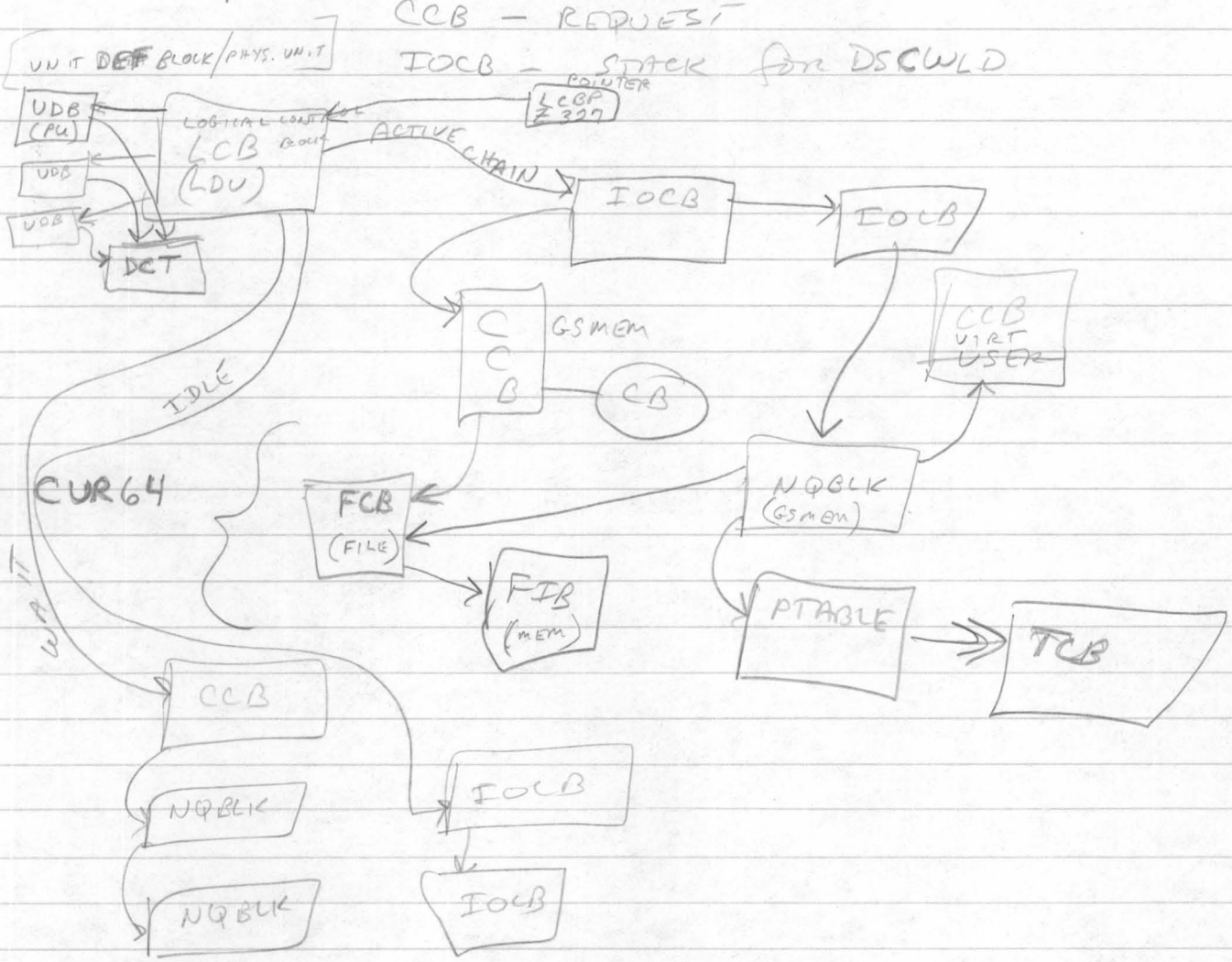
(each is a 2-word pointer)



5)







RUNLC starts I/O & receives some further control from INTS world

~~0~~	0	~~1~~	2	3	4	5 ~~-224?~~	6 -224?	+
ALMOST ALL DISCS	BOOT RT	BOOT	BAD BLK TBL	DIB				
FIRST PHYS DISC IN LDU				FUNNY FIB	LDU NAME BLK	ACL BLK	INSTALL SYSTEM	
LAST PHYS ON LDU								BIT MAP ≤ 478

FIRST 224 SECTORS ARE INVISIBLE DISC SPACE

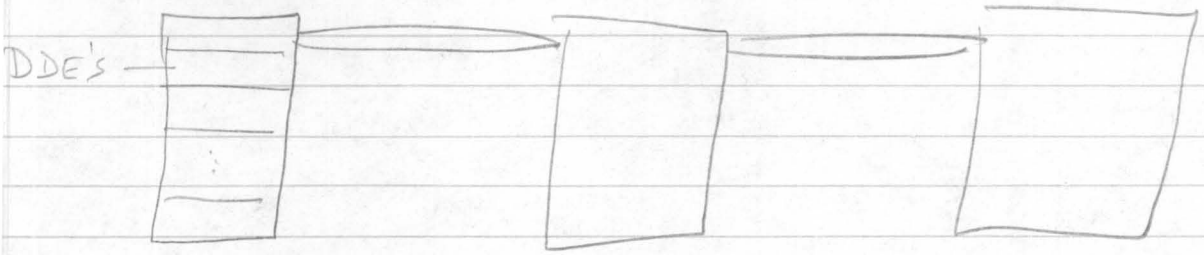
always @ beginning of VISIBLE space

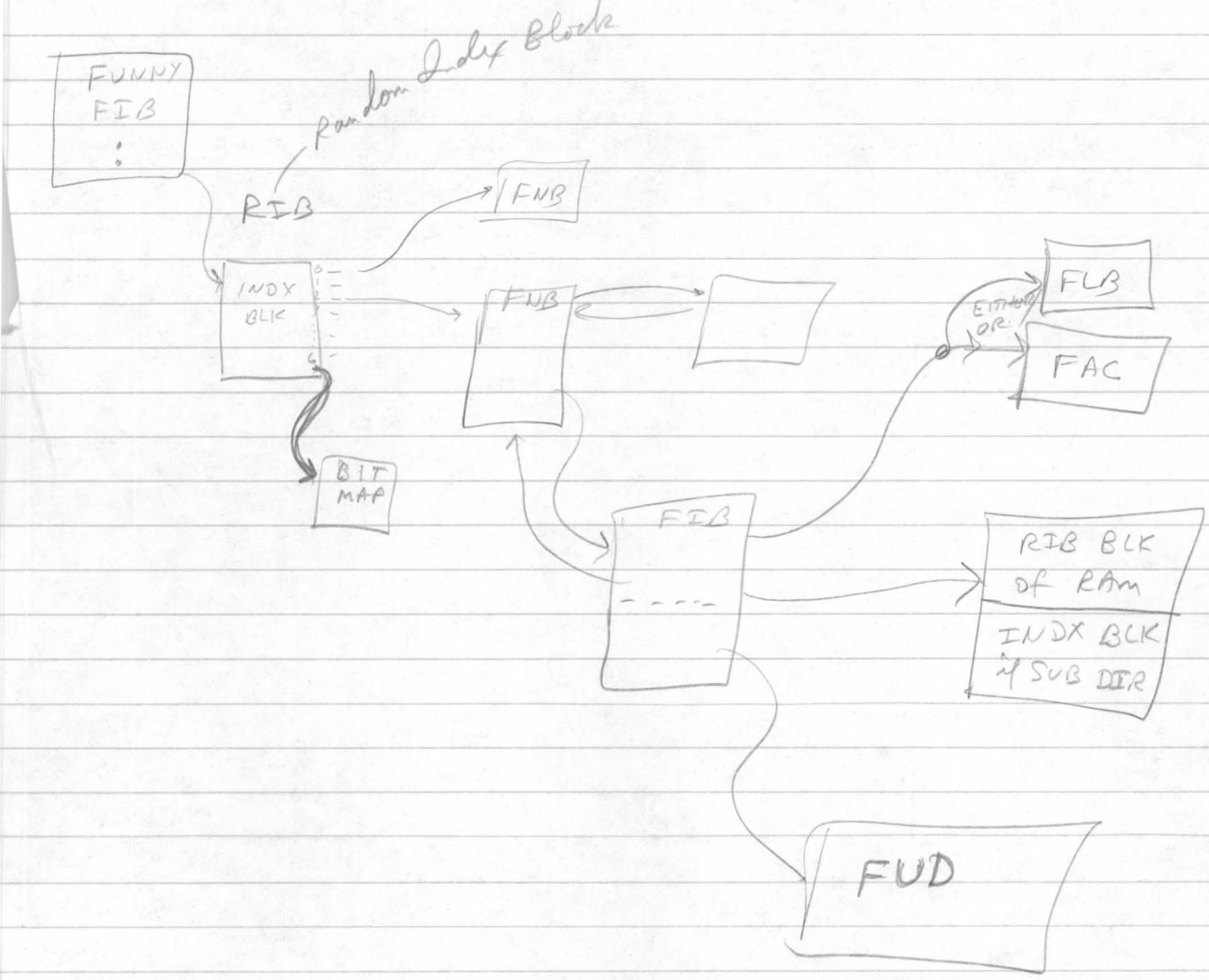
~~or 512~~ could possibly be on FIRST PU of LDU

First 7 sectors are always allocated for ~~the~~ above stuff even if not SYS DISC.

SYS.DR

DIR FILE TO AOS





Proc has new switches

you can start after,
let run and more than N CPU mins or seconds or hours, etc
let user make M system calls

ADA

LIST PRT
X ADA XXXX.SY XXX.ST
@PRINT PRT

SYSDMP

X SYSDMP/S=XXX.ST XXY.SY

or

X SYSDMP XXX.SY
+ STAB
+ Filename? XYX.ST

?MAP
000473

473: (SMAP) B-MAP
Beginning of OS maps stuff

+ MAP SMAP maps context of system address space
+ SYSIN: 000001
+ 400: 000000

+400: 021131
+ N$ instruction put
A$ ascii
H$ half-word
O$ octal
S$ symbol
B$ binary
D$ decimal
F$ floating point

+SYSIN+40: - - -
+SYSIN-40: - - -

+ 1117$ S = SYSIN+112

+ SYSIN = - - -

most are the same

+ ?MODE
A ascii
B binary
N instruction
F octal

AOS SYSTEM DEBUGGER

1) STOP

~~EXAMINE 33~~
~~should be 24XX~~

2) INST STEP until user mode off

3) step again until light on

4) Record address ~~XXXXXX~~ PC where interrupted goes

5) EXAMINE 33

6) CONTINUE

7) + $L 100000 ~~XXXXXX~~ example

~~MODE COMMAND~~
SYSIN/ 000001
~~400~~/

$; instruction
$= octal
$_ half-word
$' ascii
$: symbol
~~$U shows~~

$U shows map - should be SMAP

14204

OVTAB
ROVTB

PANIC @ 15 => Power fail

operating sys Debugger (cont.)

N$O N = overlay #

ie: 60$O loads overlay 60
~~$$~~ $P proceed

N$B N = address
sets breakpoint @ any address

$D Delete all breakpoint
$R @ run
$P proceede
$Z map state

.$B puts breakpoint @ call ~~@~~ open or just passed

PTABL Base + 42 = PID
+ 75 = MAP Slot

No name

365: pointer to Current PTABL or CB that is running
366: 000623
600+ is current overlay running (disc load)
OR
747 resident overlay running

ELQUE: 1127 address of eligible Q
BLKQ: xxxy Block Q same fmt as ELQUE

CB fmt

offset ϕ { = 76xx control block } either/or
= ϕ Deamon

15:→ owner of CB

4: is pstat, if bit 12 set, process is active
5: fwd link
6: back link

bit 6→15
16: 60400 extender address, ~~mapped~~
25: 60700 extender offset for user maps stuff
42: PID
75: physical page to be mapped to get extender
~~bits~~ bits 8→15

MAP THE EXTENDER
then 466: MAP DIC ~~0400~~
400+124: SUPERVISOR ACϕ
+125: AC1
+126: AC2
+127: AC3
+130: PC+cry

PANIC
12+1ϕ

143: 100143

DR @.PNIC

.PNIC=143

PIDCN: # of PID's on PIDTB

PIDTB: address

address: ↓ addresses of PROCS, ordered by offset
PTABLS

offset 0 = CORE MGR
1 = PM GR
2 =

0 in Extender
+40 USER NAME
↓
+50

REG: panic code
+1: AC0
+2 AC1
+3 AC2
+4 AC3
+5 PC + cy

} what is printed out @ PANIC time

POINTS TO 4 word descriptor

CANCH: LRU shared pages
FMCHN: Free memory chain
FC8: 8
+1 16
+2 32
+3 64
+4 128
+5 256

first word is forward pointer

absolute address — system space

5 CMASK

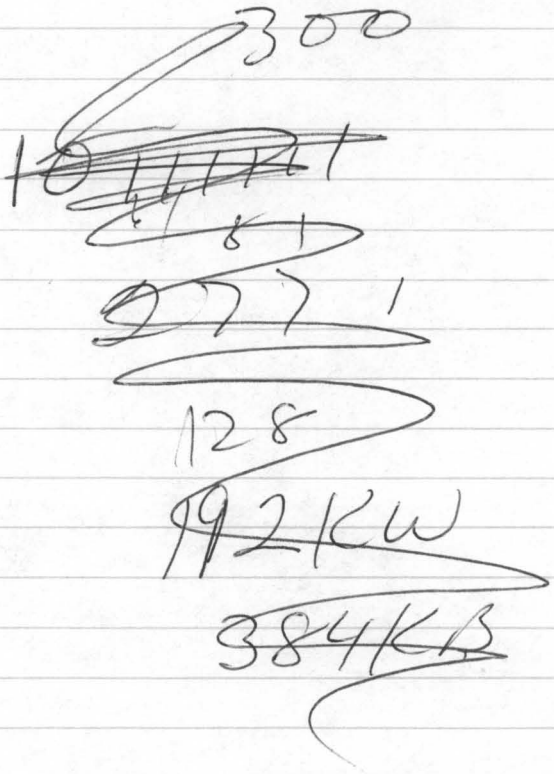
HPAGE: 177 128KW

HPAGE: ABC

ABC+1: XYZ

MAP XYZ

Ø
↓ DCU CODE [DCUI]
1562
1777: PC



DCU LOCKS

HOLK : Ø
DCULK : Ø
} in DCU lower page 2 space

DCU turns on HOLK

host will loops until DCU resets his lock

4: ISP interrupt stack pointer
6: ISL limit
7: Fault address
40: SP of current stack
41: FP frame ptr
42: stack limit
43: fault

INTLV: interrupt level

PSφφφ: pointer to system stacks
+1
+2
+3
+4
-1

PANICS

JSR @.PNIC

ACφ→AC3 if AC3 is 74000→75000 it was in an overlay

PANIC 1
check INTLV - one of
if -1, stack ovflo. on system stacks

See above
see loc 40-42
40 SP
42 SL
if 40+42 are not close, probably jumped into
Panic handler from no where

Loc 5 is current interrupt mask, may be of help

high order bit = 1) offset 5 of DCT is "in use" bit

symbol PCNT: ϕϕϕϕϕϕ
should be always ZERO - interrupt from device code ϕ
look for interrupt priority chain break

PANIC 2
master Disc failure, or any initted device

(365)+16: Error

75 = Read error
76 = Device timeout
121 = physical unit failure
123 = physical unit offline

(method 1)
~~[illegible]~~
find UDB

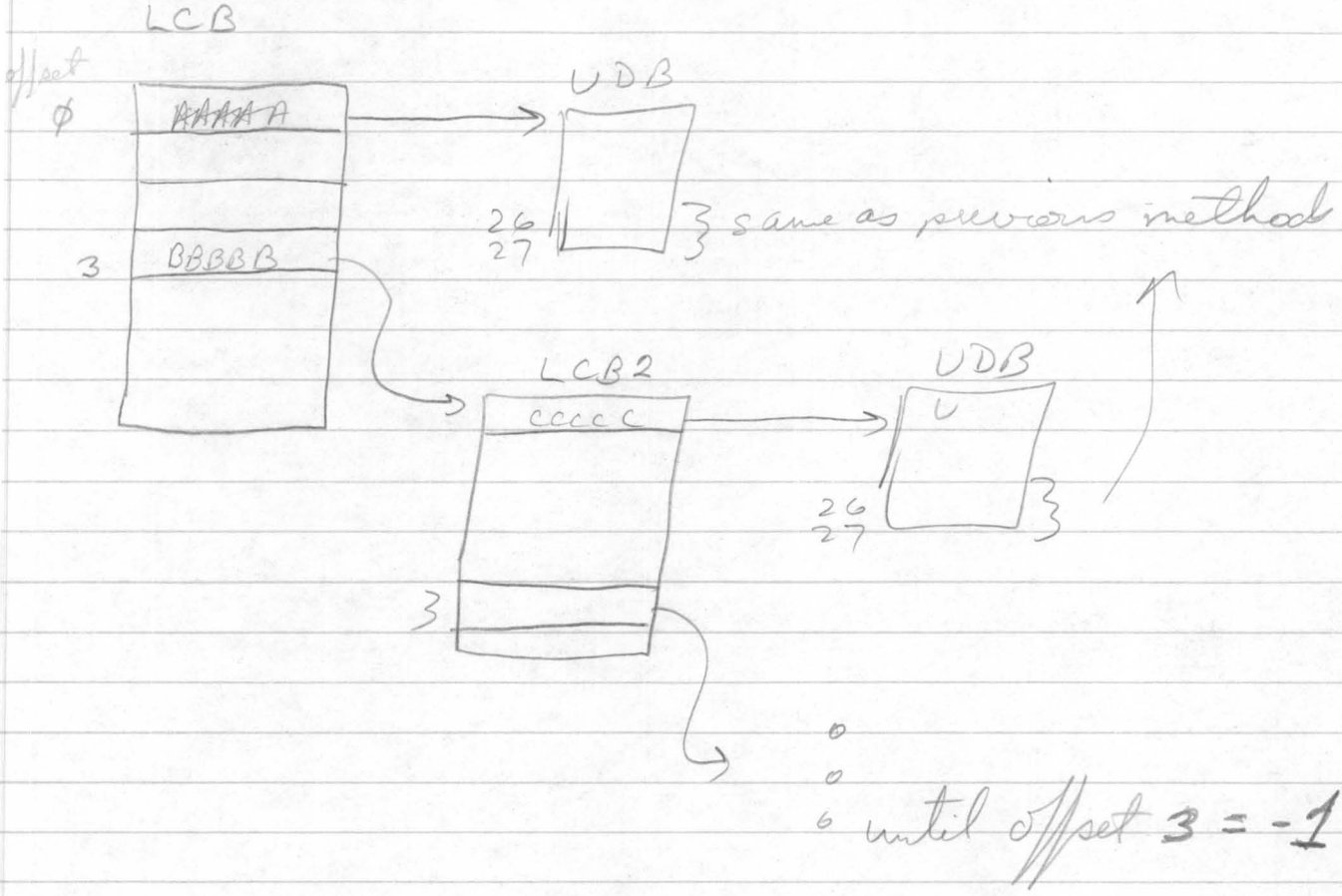
OVUDB: XXXXX
XXXXX+26: [illegible]
+27: ϕϕϕ15 — DIA, DIB, or DIC depending on type of drive
system status, bits 12-15 are # of retries

(method 2) TOP of INTERRUPT VECTOR TABL.
in device code
BTBL +33: XXXXXX — pointer to DCT
XXXXX +12: AAAAAA — UDB add.
↗ POINTS TO UDB

AAAAA+26: — same as above
+27: " " "

(method 3)

• MLCB: xxxxx pointer to first LCB on system



PANIC 4 unclearable spurious interrupt Tries 2000 times to clear w/ NIOC

PCNT: ØØØØØØ if this overflows, panic 4

PANIC 5 logical error swap file

at beginning of swap file, a bit map exists
~~it is 4c~~ 1 bit is 4 sectors

1) AC3 = 74336± or 75336±

```
SZBO
JSR  @.PNIC
```

or

```
SNB
JSR  - - -
```

PANIC 6 Data Base error in CCB or LCB

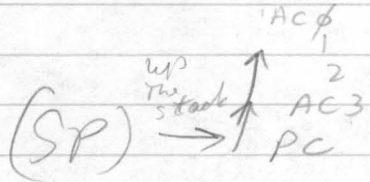
AC3 = 74447±, 75447±

PANIC 7 Operating System maps violation (Trap)

INTLV: -1 interrupt level

REG: 000007
+1 AC0
+2 1
+3 2
+4 3
+5 PC

40 SP



PC = 74XXY, 75XXX means it was in overlay

Go back & look @ SMAP
in offset 0 has high order bit = 1, page is write protected

CNM60: 60000
↓ 62000
:
76: 76000

PC should be somewhere 2000 → 43777 (in normal)
or 74XXX → 75XXX - in overlay

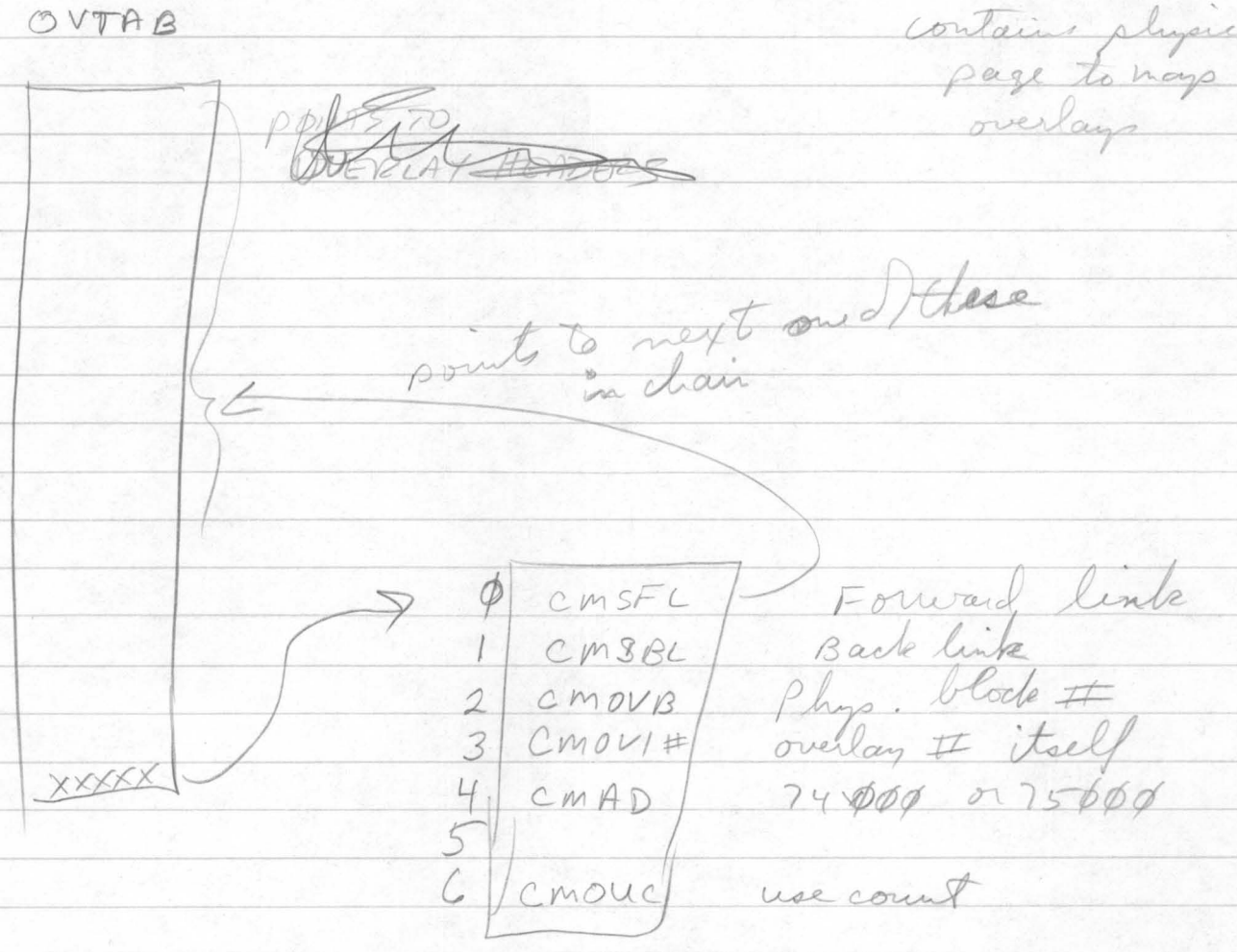
overlay
0-11 system overlays, resident
12-61 disc based system overlays

366: 000 6XX disc based overlay
or 000747 resident

366 is "current overlay executing" location

NOTE:
(RDHDR = 747)

CUR74: ≈ 121
contains physical page to map for overlays



ROVTB: 174 223 = 2,3
+1 174 224 4,5
225 6,7
231 10,11 (SLM ONLY)

what Cur 74 will contain
ie: physical page

366; 747

ROHDR
747 9
}
2
3 CMOV1 overlay #
4 74000, 75000 which half

PANIC 1Ø operator CLI trap

PTBL +25: = 60700 shared code 4000~77777
+75: = 000162

PIDTB: ADRS

ADRS+5: XXXXX

XXXXX+16:
+25:
+75: ABCDE

MAP ABCDE
400
↓
466
700 LMP TBL

PANIC 11 Checksum Error

20-37, 50-305 usually memory error

PANIC 12 PMGR TRAP

AC3 = 74133, 75133

+ MAP SMAP
+ PIDTB: ADDRS

BITS 6-15

+ ADDRS+1: XXXXX beginning address of PMGR PTBL
+ XXXXX+16: 60700 beg. ADDRS of EXTENSION
+ " +25: 60700 USER MAP
+ " +75: 2175 use Bits 8-15

CURG0: 175
MAP 175
400+66: map DIC indicates map violation

20000 write protect
10000 validity
4000 INDIRECTION
2000 I/P instruction
20 Data base error

400 + 124 SAC0
5 1
6 2
7 3
130 PC @ Time of panic

440 USER name

↓

450

700:XXX map LMP stuff

↓

+ MAP XXX

+ [PC]@. ——— open pc of trap

should JSR @.PNIC

STAB

filename? PMGR.ST

HOLK: —— Host lock (DCU sys)

DCUR: XXXX

XXXX = — DLOAD + ~~AAA~~

LOCH + ~~BBB~~

DCUPC: xxxx PC of stopped DCU

PANIC 13 multi bit ERCC Error

HARDWARE

>2 bits in error

for 21 Bit 8KW memory

AC0 = low order 0-15
AC1 = 15 bit Hi-order bits

PANIC 14 Internal Inconsistency Error

REG: 14
+1:
+2:
+3: > 31232 ie
+4:
+5:

31232; S= GSMEM+257

41: Frame Pointer
ie 20313

20313: PC
AC3
AC2
AC1
<—> AC0 will hold requested # of words

Free Chains should be small or ∅

FC8:
+1
+2
+3
+4
:
:
!

PANIC 15 power fail
doesn't work

---

17 IOP TRAP

HANGS

STOP CPU, Record PC, + all lights
STEP, check LOOP unless IDN is ON

14 jump to Core Dump RTN

365: PTBL or CB
366: OVLY
INTLV: -1

SYSIN: ∅

ie: 365: PTBL

700: 000024

MAP 24

~~LST:~~ (~~actual task currently running~~)

412: REV #

414: (TCB ADRS) ACTIVE TCB

TCB		
	0	FWD LNK
	1	TCB ~~B~~STATUS
	⋮	
	6	AC0
	7	AC1
	10	AC2
	11	AC3
	12	PC + Cry
	⋮	
	17	SYSCALL if active, high order bit set means in ghost

REV 2

400 PTBL extender Start

400+67 maps Status

400+131 Supervisor AC's + PC

↓

135

PIDTB: ADRS

ADRS: ↓ 0 ordered PID's

34560 ~~[redacted]~~

100000 ← high bit designates VELQUE, NOT ELQ

100000

VPTBB: 000131 physical pages

~~Take PI?~~ (PID II) / 16 = I + Remainder

VELQUE

VELCN: # of PID's on ~~Ready Chain~~

~~VELQUE~~

VELQU: ~~# of PID~~
PID of first PROC on VELQ
if -1, empty

PN1

PANIC 1,
ACφ = 171766
1 = 1442φ
2 = 3φ4
3 = 153φ7
PC = φ, CRY = φ

SP = 34φφ5
FP = 34φφ5
SLM = 34233
FAULT = 153φ5

} ms pulses