S1

```
" S1

.. = 0
t = 0
orig:
    hlt
    jmp pibreak

. = orig+7
    =1

. = orig+020
    1f
    iof
    dae u.ac
    lac 020
    dae 1f
    lac 1f+1
    dae 020
    lac u.ac
    jmp 1f+1
    1f
1: 0
    iof
    dac u.ac
    lacq
    dac u.mq
    lae 8
    dae u.rg
    lae 9
    dae u.rg+1
    jms copyj 10; u.rg+2; 6
    lac 1b
    dac u.rg+8
    =1
    dac .savblk
    dae .insys
    lae uquant
    jms betwen; dq; maxquant
       jms swap
    ion
    =1
    tad u.rg+8
    jms lacl
    jms betwen; 020001; swn
       jmp badcal
    tad swp
    dae .+1
    jmp .. i

. = orig+0100
    jmp goldentry
    jms halt

okexit:
    dzm u.ac
sysexit:
    ion
    lac .savblk
    sza
    jmp 1f
    jms copyj sysdata; dskbuf; 64
```

```
    cla
    jms dskio; 07000          -> dzm dskadr
1;
    dzm .insys
    jms chkint
       skp
    jmp .save
    jms copy; u.rg+2; 10; 6
    lac u.rg+1
    dac 9
    lac u.rg
    dac 8
    lac u.rg
    lmq
    lac u.ac
    jmp u.rg+8 i

swap; 0
    ion
1;
    jms lookfor; 3 " out/ready
       jmp 1f
    jms lookfor; 1 " in/ready
       skp
    jmp 1b
    dzm maxquant
    jmp 3f
1;
    dac 9f+1
    jms lookfor; 2 " in/not-ready
       jmp 1f
    jms lookfor; 1 " in/ready
       jmp 1f
    jmp 2f
1;
    lac swap
    dac u.swapret
    iof
    lac o200000
    tad u.ulistp i
    dac u.ulistp i
    ion
    jms dsksvap; 07000
    lac u.dspbuf
    sna
    jmp 2f
    lav dspbuf
    jms movdsp
2;
    iof
    lac o600000
    tad 9f+1 i
    dac 9f+1 i
    ion
    jms dsksvap; 06000
    lac u.swapret
    dac swap
    lac o20
    dac maxquant
    lac u.dspbuf
    sza
```

```
    jms movdsp
3:
    dzm uquant
    iof
    jmp swap i
t = t+1

swp:
    jmp .
    .save; .getuid; .open; .read; .write; .creat; .seek; .tell
    .close; .link; .unlink; .setuid; .rename; .exit; .time; .intrp
    .chdir; .chmod; .chown; badcal; .syslog; badcal; .capt; .rel#
    .status; badcal; .smes; .rmes; .fork
swn:
    .=swp+1 i

.intrp:
    lac u.ac
    dac u.intflg
    jmp okexit

.sysloc:
    lac u.ac
    and o17777
    jms betwen; 0; locn
        jms error
    tad locsw
    dac .+1
    lac ..
    dac u.ac
    jmp sysexit

locsw:
    lac .
    iget; inode; userdata; sysdata; copy; copyz; betwen; dskrd
    dskwr; dskbuf; dpdata; namei; pbsflgs; alloc; free; dsrdata
    crdata
locn:
    .=locsw+1

chkint: 0
    lac .insys
    sza
    jmp chkint i
    lac .int1
    sna
    jmp 1f
    sad u.ofiles+2
    jmp 2f
1:
    lac .int2
    sna
    jmp chkint i
    sad u.ofiles+2
    skp
    jmp chkint i
    dzm .int2
    jmp 1f
2:
    dzm .int1
1:
```

```
        lac u.intflg
        sza
        jmp chkint i
        -1
        dac .insys
        ion
        isz chkint
        jmp chkint i
```

```
" s2

.status:
    jms arg
    dac .+5
    jms arg
    dac .+6
    lac u.cdir
    jms namei; ..
        jms error
    jms namei; ..
        jms error
    jms iget
    lac u.ac
    and o17777
    jms between; o100000; o17762
        jms error
    dac .+1
    jms copyi; inode; .-.; 12
    lac d.i
    dac 9 i
    jmp okexit

.capt:
    lac u.ac
    dac u.dspbuf
    jms movdsp
    jmp sysexit

.rele:
    dzm u.dspbuf
    lav dspbuf
    jms movdsp
    jmp sysexit

.chmod:
    jms isown
    lac u.ac
    and o17
    imq
    lac i.flags
    and o777760
    omq
    dac i.flags
    jms iput
    jmp okexit

.chown:
    jms isown
    lac u.ac
    dac i.uid
    jms iput
    jmp okexit

/getuid:
    lac u.uid
    dac u.ac
    jmp sysexit

.seek:
    jms seekteil
    tad u.base
```

```
    spa
    jms error
    lmq
    lac f.flags
    and d1
    sna
    jmp 1f
    laeq
    jms betwen; d0; i.size
       jms dacisize
    jmp 2f
1:
    laeq
    jms betwen; d0; i.size
       lac i.size
2:
    dac f.badd
    dac u.ac
    jms fput
    jmp sysexit

.tell:
    jms seektell
    cma
    tad d1
    tad u.base
    dac u.ac
    jmp sysexit

.link:
    jms arg
    dac 0f
    jms arg
    dac 1f
    jms arg
    dac 2f
    lac d4
    jms namei; 0:0
       jms error
    jms namei; 1:0
       jms error
    dac u.base
    jms copy; 2:0; name; 4
    lac u.cdir
    jms namei; name
       skp
    jms error
    lac d1
    dac mode
    jms access
    jms dslot
    lac u.base
    jms iget
    lac ii
    dac d.i
    jms copy; name; d.name; 4
    lac i.uniq
    dac d.uniq
    -1
    tad i.nlks
    dac i.nlks
```

jms betwen; d0; 070000
jms error

```
    jms iput
    jms dput
    jmp okexit

.unlink:
    jms argname
    dac u.base
    lac d1
    dac mode
    jms access
    dzm d.i
    jms dput
    lac u.base
    jms iget
    isz i.nlks
    jmp 1f
    jms itrunc
    dzm i.flags
1:
    jms iput
    jmp sysexit

.setuid:
    lac u.uid
    sma
    jms error
    lac u.ac
    dac u.uid
    jmp sysexit

.rename:
    jms arg
    dac 0f
    jms arg
    dac 1f
    lac u.cdir
    jms namei; 0:0
       jms error
    lac d1
    dac mode
    jms access
    jms copyi; 1:0; d.name; 0
    jms dput
    jmp okexit

.time:
    lac s.tim
    dac u.ac
    lac s.tim+1
    dac u.mq
    jmp sysexit

.chdir:
    jms argname
    jms iget
    lac i.flags
    and o20
    sna
    jms error
    lac ii
    dac u.cdir
```

lac u.cdir
jms namei; 1:0
skp
jms error
lac ii
dac u.cdir

```
    jmp okexit

.open1
    jms arg
    dac 0f
    jms arg
    sza
    lac d1
    sna
    lac d2
    dac mode
    lac u.cdir
    jms namei; 0:0
       jms error
    jms iget
    jms access
    lac i.flags
    and o20
    sna
    jmp open1
    lac mode
    and d1
    sna
    jmp open1
    lac u.uid
    sma
    jms error
    jmp open1

.creat1
    lac d1
    dac mode
    jms arg
    dac .+2
    jms copyi ',; name; 4
    lac u.cdir
    jms namei; name
       jmp 1f
    jms iget
    jms access
    lac i.flags
    and o20
    sna
    jmp .+4
    lac u.uid
    sma
    jms error
    jms itrunc
    cla
    jms dacisize
    jmp open1
1:
    jms access
    lac u.ac
    and o17
    jms icreat
open1:
    jms fassign
       jms error
    jmp sysexit
```

```
.close;
    jms finac
    dzm f.flags
    jms fput
    jmp sysexit

.readf
    jms arg
    and o17777
    dac u.base
    jms arg
    dac u.count
    lac u.base
    jms betwen; o10000; o17777
       jms error
    tad u.count
    jms betwen; u.base; o17777
       jms error
    dac u.limit
1;
    jms finac
    lac f.flags
    and d1
    sza
    jms error
    lac i.flags
    and o40
    sna
    jmp 1f
    iof
    lac ii
    tad swr
    dac .+1
    jmp .. i
1;
    lac u.base
    dac 1f+1
    lac u.count
    dac 1f+2
    lac f.badd
1;
    jms iread; ..; ..
    jmp exitrw

.write;
    jms arg
    and o17777
    dac u.base
    jms arg
    dac u.count
    tad u.base
    jms betwen; u.base; o17777
       jms error
    dac u.limit
    jms finac
    lac f.flags
    and d1
    sna
    jms error
    lac i.flags
    and o40
```

```
    sna
    jmp 1f
    iof
    lac ii
    tad sww
    dac .+1
    jmp .. i
1:
    lac u.base
    dac 1f+1
    lac u.count
    dac 1f+2
    lac f.badd
1:
    jms iwrite; .. i ..

exitrvi
    dac u.ac
    tad f.badd
    dac f.badd
    jms iput
    jms fput
    jmp sysexit
```

53

```
" s3

searchu: 0
    lac searchu i
    dac 9f+t+1
    -mnproc
    dac 9f+t
    law ulist-1
    dac 8
1:
    lac 8 i
    dac lu
    lac 8 i
    dac lu+1
    lac 8 i
    dac lu+2
    lac 8 i
    dac lu+3
    jms 9f+t+1 i
    isz 9f+t
    jmp 1b
    isz searchu
    jmp searchu i
t = t+2

lookfor: 0
    jms searchu; 1f
    isz lookfor
    isz lookfor
    jmp lookfor i
1: 0
    lac lu
    rtl; rtl; and o7
    sad lookfor i
    skp
    jmp 1b i
    -3
    tad 8
    and o17777
    isz lookfor
    jmp lookfor i

.fork:
    jms lookfor; 0 " not-used
        skp
        jms error
    dac 9f+t
    isz uniqpid
    lac uniqpid
    dac u.ac
    law sysexit
    dac u.svapret
    lac o200000
    tad u.ulistp i
    dac u.ulistp i
    jms dsksvap; 07000
    lac 9f+t
    dac u.ulistp
    lac o100000
    xor u.ulistp i
    dac u.ulistp i
    lac u.pid
```

```
    dac u.ac
    lac uniqpid
    dac u.pid
    isz 9f*t
    dac 9f*t i
    isz u.rq*8
    dzm u.intflg
    jmp sysexit
t = t+1

badcall:
    clon
    -1
    dac 7
.savei:
    lac d1
    jms iget
    cla
    jms iwrite; 4096; 4096
    jms iwrite; userdata; 64
    jms iput

.exit:
    lac u.dspbuf
    sna
    jmp .+3
    law dspbuf
    jms movdsp
    jms awake
    lac u.ulistp i
    and o77777
    dac u.ulistp i
    isz u.ulistp
    dzm u.ulistp i
    jms swap

.rmes:
    jms awake
    lac o100000
    tad u.ulistp i
    dac u.ulistp i
    law 2
    tad u.ulistp
    dac 9f*t
    -1
    dac 9f*t i
    jms swap
    law 2
    tad u.ulistp
    dac 9f*t
    lac 9f*t i
    cma
    dac u.ac
    dzm 9f*t i
    isz 9f*t
    lac 9f*t i
    dac u.rq
    dzm 9f*t i
    jmp sysexit
t = t+1
```

set wait flg

p+2 = -1

get pid

get message

```
.smesi
    lac u.ac
    sna spa
    jms error
    jms searchui 1f
    lav 2
    tad u.ulistp
    dac 9f*t
    dzm 9f*t i
    jms error
1;  0
    lac lu*1
    sad u.ac
    skp
    jmp 1b i
    lac lu*2
    sad dm1
    jmp 1f
    lac o100000
    tad u.ulistp i
    dac u.ulistp i
    lav 2
    tad u.ulistp
    dac 9f*t
    lac u.ac
    dac 9f*t i
    jms swap
    lav 2
    tad u.ulistp
    dac 9f*t
    dzm 9f*t i
    jmp .smes
1;
    =3
    tad 8
    dac 9f*t
    lac o700000
    tad 9f*t i
    dac 9f*t i
    isz 9f*t
    isz 9f*t
    lac u.pid
    cma
    dac 9f*t i
    isz 9f*t
    lac u.rq
    dac 9f*t i
    jmp okexit
t = t*1

awake; 0
    jms searchui 1f
    jmp awake i
1;  0
    lac u.pid
    sad lu*2
    skp
    jmp 1b i
    =3
    tad 8
    dac 9f*t
```

```
    lac o700000
    tad 9f+t i
    dac 9f+t i
    jmp 1b i
t = t+1

swr;
swv;
    jmp .+4 i
    .halt; rttyi; rkbdi; rptpi; .halt
    .halt; wttyo; wdspo; wptpo

.halt; jms halt

rttyi;
    jms chkint1
    lac d1
    jms getchar
       jmp 1f
    and o177
    jms betwen; o101; o132
       skp
    tad o40
    alss 9
    jmp passone
1;
    jms sleep; sfiles+0
    jms swap
    jmp rttyi

wttyo;
    jms chkint1
    jms forall
    spa
    jmp fallr
    lmq
    lac sfiles+1
    spa
    jmp 1f
    xor o400000
    dac sfiles+1
    lacq
    tls
    sad o12
    jms putcr
    jmp fallr
1;
    lacq
    dac char
    lac d2
    jms putchar
       skp
    jmp fallr
    jms sleep; sfiles+1
    jms swap
    jmp wttyo

rkbdi;
    jms chkint1
    lac d3
    jms getchar
```

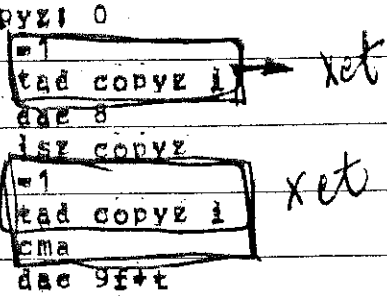
```
        jmp 3f
    lmq
    and o155
    sad o55
    jmp 1f
    lacq
    and o137
    sad o134
    skp
    jmp 2f
    lacq
    xor o40
    lmq
    jmp 2f
1:
    lacq
    xor o20
    lmq
2:
    lacq
    dac u.limit
1:
    jms chkint1
    lac u.limit
    jms dspput
        jmp 1f
    jms sleep; sfiles+6
    jms swap
    jmp 1b
1:
    lac u.limit
    alss 9
    jmp passone
3:
    jms sleep; sfiles+2
    jms swap
    jmp rkbdi

wdspo:
    jms chkint1
    jms forall
    jms dspput
        jmp fallr
    jms sleep; sfiles+6
    jms swap
    jmp wdspo

rppti:
    lac d4
    jms getchar
        jmp .+3
    alss 9
    jmp passone
    lac sfiles+3
    sma
    rsa
1:
    jms sleep; sfiles+3
    jms swap
    jmp rppti
```

```
wpptoi
    jms forall
    spa
    jmp fallr
    lmq
    lac sfiles+4
    spa
    jmp 1f
    xor o400000
    dac sfiles+4
    lacq
    psa
    jmp fallr
1i
    lacq
    dac char
    lac d5
    jms putchar
       skp
    jmp fallr
    jms sleepi sfiles+4
    jms swap
    jmp wpptoi

passonei
    sad o4000
    jmp okexit
    dac u.base i
    lac d1
    dac u.ac
    jmp sysexit

errori 0
    -1
    dac u.ac
    jmp sysexit

chkint1i 0
    dzm .insys
    jms chkint
       skp
    jmp .save
    -1
    dac .insys
    jmp chkint1 i
```

```
" s4

alloc: 0
    -1
    tad s.nfblks
    spa
    jmp 1f
    dac s.nfblks
    tad fblksp
    jms laci
    dac 9f-t
    jms copyz; dskbuf; 64
    lac 9f-t
    jms dskwr
    dzm .savblk
    lac 9f-t
    jmp alloc i
1:
    lac s.nxfblk
    sna
    jms halt " OUT OF DISK
    dac s.fblks
    jms dskrd
    lac dskbuf
    dac s.nxfblk
    jms copy; dskbuf+1; s.fblks+1; 9
    lac d10
    dac s.nfblks
    jmp alloc+1

free: 0
    lmq
    lac s.nfblks
    sad d10
    jmp 1f
    tad fblksp
    dac 9f-t
    lacq
    dac 9f-t i
    dzm .savblk
    isz s.nfblks
    jmp free i
1:
    lac s.nxfblk
    dac dskbuf
    jms copy; s.fblks-1; dskbuf+1; 9
    lacq
    dac s.nxfblk
    jms dskwr
    dzm .savblk
    lac d1
    dac s.nfblks
    jmp free i
t = t+1

laci: 0
    and o17777
    tad o200000
    dac .+1
    lac ..
    jmp laci i
```

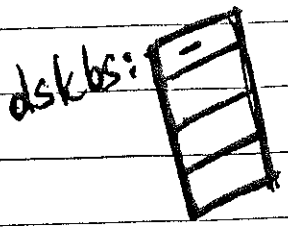
```
betwen: 0
    lmq cma
    lac betwen i
    dac 9f+t
    isz betwen
    lacq
    tad 9f+t i
    sma
    jmp 1f
    lac betwen i
    dac 9f+t
    isz betwen
    lacq
    tad 9f+t i
    cma
    spa sna
1:
    isz betwen
    lacq
    cma
    jmp betwen i

copy: 0
    -1
    tad copy i
    dac 8
    isz copy
    -1
    tad copy i
    dac 9
    isz copy
    -1
    tad copy i
    cma
    dac 9f+t
    isz copy
1:
    lac 8 i
    dac 9 i
    isz 9f+t
    jmp 1b
    jmp copy i

copyz: 0
    -1
    tad copyz i
    dac 8
    isz copyz
    -1
    tad copyz i
    cma
    dac 9f+t
    isz copyz
1:
    dzm 8 i
    isz 9f+t
    jmp 1b
    jmp copyz i
t = t+1

putchar: 0
```

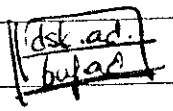
dac 9f+t
xct betwen i
tad 9f+t isz betwen
spa
jmp 1f
xct betwen i
isz betwen
jmp 9f+t
spa sna
1: isz betwen ; one 9f+t
jmp betwen i



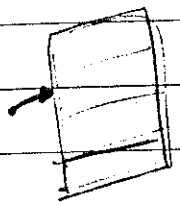
```
    dac 9f+t
    cla
    jms takeq
       jmp putchar i
    tad o40001
    dac .+4
    lac 9f+r
    jms putq
    lac char
    dac q2+1 ..
    isz putchar
    jmp putchar i
t = t+1

getchar: 0
    jms takeq
       jmp i getChar
    tad o200001
    dac .+3
    cla
    jms putq
    lac q2+1 ..
    isz getchar
    jmp i getchar

takeq: 0
    rcl
    tad lacq1
    dac .+7
    tad o640000
    dac .+17
    tad d1
    dac .+14
    tad o500000
    dac .+5
    lac q1 ..
    sna
    jmp takeq i
    dac lnkaddr
    sad q1+1 ..
    jmp .+5
    tad o200000
    dac .+1
    lac q2 ..
    jmp .+3
    cla
    dac q1+1 ..
    dac q1 ..
    isz takeq
    lac lnkaddr
    jmp i takeq

putq: 0
    rcl
    tad dacq1
    dac .+14
    tad d1
    dac .+13
    tad o140000
    dac .+1
    lac q1+1 ..
```

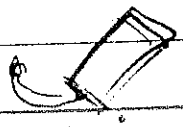
```
    sna
    jmp .+6
    tad o40000
    dac .+2
    lac lnkaddr
    dac q2 ..
    jmp .+3
    lac lnkaddr
    dac q1 ..
    dac q1+1 ..
    jmp putq i

srcdbs: 0
    dac 9f+t2
    -ndskbs
    dac 9f+t
    lav dskbs
    dac 9f+t+1
11
    tac srt+2
    sad srt+1
    jmp srcdbs i
    isz srt
    tad 9f+t+1
    dac 9f+t+1
    isz 9f+t
    jmp 1b
    isz srcdbs
    jmp srcdbs i

collapse: 0
    cla
    jms srcdbs
       jmp 1f
    lav dskbs
    dac 9f+t+1
11
    lac 9f+t+1
    dac 0f+1
    tad d65
    dac 0f
    cma
    tad d1
    tad edskbsp
    and o17777
    sna
    jmp 0f+3
    dac 0f+2
    jms copyi 01..1..1..
    -65
    tad edskbsp
    dac 9f+t
    tad d1
    dac 0f
    lac dskaddr
    dac 9f+t i
    jms copyi dskbuf: 01..1 64
    jmp collapse i

dskrd: 0
    jms between: d21 d7999
```





dskbs
ndskbs
edskbsp





```
        jms halt
    sad dskaddr
    jmp dskrd i
    dac dskaddr
    jms sredbs
        jmp 1f
    lac dskaddr
    jms dskio; 06000
    jmp 2f
1:
    dzm 9f+t+1 i
    law 1
    tad 9f+t+1
    dac .+2
    jms copy; ..; dskbuf; 64
2:
    jms collapse
    jmp dskrd i

dskwr: 0
    jms betwen; d2; d7999
        jms halt
    jms dskio; 07000
    lac dskaddr
    jms sredbs
        dzm 9f+t+1 i
    jms collapse
    jmp dskwr i
t = t+3

dskio: 0
    dac dskaddr
    cll; idiv; 60
    dac 9f+t
    lacq
    idiv; 10
    dac 9f+t+1
    lls 22
    xor 9f+t+1
    als 8
    dac 9f+t+1
    lac 9f+t
    idiv; 10
    dac 9f+t
    lls 22
    xor 9f+t
    xor 9f+t+1
    xor o200000
    dac 9f+t
    jms dsktrans; =60; dskbuf; 9f+t; dskio
    isz dskio
    jmp dskio i
t = t+1

dsktrans: 0
    =10
    dac 9f+t
1:
    =1
    tad dsktrans
    dac 12
```

-1
tad 8
dac 8
dzm 8 i
lac 8 i
dac .+2

2173:

```
    dscs
    lac 12 i
    dslv
    lac 12 i
    dslm
    lac 12 i
    jms laci
    dsld
    dzm .dskb
    lac 12 i
    jms laci
    jms laci
    dsls
    lac .dskb
    sna
    jmp .-2
    lac .dske  4110 - = 61400
    sma
    jmp 12 i
    isz 9f+t
    jmp 1b
    jms halt " 10 disk errors
t = t+1

halt; 0
    isz 9f+t
    jmp .+1
    iof
    hlt
    jms copy; law; 4096; 4096
    hlt; jmp .+1
t = t+1
```

but block 45

```
" s5

dsksvap: 0
    cli; als 3
    dac 9f+t
    jms dsktrans; =6u; userdata; 9f+t; dsksvap
    lac 9f+t
    tad o20
    dac 9f+t
    jms dsktrans; =4096; 4096; 9f+t; dsksvap
    isk dsksvap
    jmp dsksvap i
t = t+1

access: 0
    lac i.flags
    ims
    lac u.uid
    spa
    jmp access i
    sad i.uid
    lrs 2
    lacq
    and mode
    sza
    jmp access i
    jms error

fassign: 0
    =10
    dac 9f+t
1:
    lac 9f+t
    tad d10
    jms fget
        jms halt " will not happen
    lac f.flags
    sma
    jmp 1f
    isz 9f+t
    jmp 1b
    jmp fassign i
1:
    lac mode
    xor o400000
    dac f.flags
    lac ii
    dac f.i
    lac 9f+t
    tad d10
    dac u.ac
    dzm f.badd
    jms fput
    isz fassign
    jmp fassign i
t = t+1

fget: 0
    jms betwen; d0; d9
        jmp fget i
    cli; mul; 9
    lacq
```

```
    tad ofilesp
    dac 9f+t
    dac .+2
    jms copyi ',',i fnodei 3
    isz fget
    jmp fget i

fputi 0
    lac 9f+t
    dac .+3
    jms copyi fnodei '.',i 3
    jmp fput i
t = t+1

forali; 0
    lac u.base
    sad u.limit
    jmp 1f
    lac u.base
    ral
    lac u.base i
    sni
    lrs 9
    and o777
    jmp forall i
fallr:
    lac u.base
    add o400000
    dac u.base
    jmp forall+1
1:
    lac u.count
    dac u.ac
    jmp sysexit

sleep: 0
    law ulist-1
    dac 8
    lac o200000
    lmq
1:
    lac u.ulistp i
    sad 8 i
    jmp 1f
    isz 8
    isz 8
    isz 8
    cla; lrs 1
    jmp 1b
1:
    tad o100000
    dac u.ulistp i
    lac sleep i
    dac 9f+t
    lac 9f+t i
    omq
    dac 9f+t i
    isz sleep
    jmp sleep i
t = t+1
```

```
dslot; 0
    dzm di
    skp
1;
    isz di
    lac di
    jms dget
    lac d.i
    sza
    jmp 1b
    jmp dslot i

icreat; 0
    dac 9f+t
    jms dslot
    lac o20
    dac ii
 1;
    isz ii
    lac ii
    jms iget
    lac i.flags
    spa
    jmp 1b
    lac ii
    dac d.i
    jms copyz; name; d.name; 4
    isz s.uniq
    lac s.uniq
    dac d.uniq
    dac i.uniq
    lac 9f+t
    xor o400000
    dac i.flags
    lac u.uid
    dac i.uid
    =1
    dac i.nlks
    dzm i.size
    jms copyz; i.dskps; 7
    jms iput
    jms dput
    jmp icreat i
 t = t+1

 dspput; 0
    and o177
    sna
    jmp i dspput
    sad o14
    jmp 1f
    lmq
    sad o12
    jms dspnl
    lac dsploc i
    sad o400000
    jmp dspleft
    emq
    dac dsploc i
    isz dsploc
    jmp i dspput
```

```
1:
    jms dspinit
    jmp dspput i

dsplft:
    lac dsploc
    sad edspbuf
    jmp 1f
    dac 8
    lac o400000
    dac 8 i
    cla; llss 18+7
    dac dsploc i
    jmp dspput i

dspnl: 0
    lac dsplno
    sad d33
    jmp 1f
    isz dsplno
    jmp dspnl i
1:
    lac o2000
    vbl
    isz dspput
    jmp dspput i

dspinit: 0
    lac dspbufp3
    dac dsploc
    lac o400000
    dac dspbuf+3
    dzm dsplno
    jmp dspinit i

movdsp: 0
    iof
    cdf
    dac dspbufp
    -1
    dac .dspb
    ion
    jmp movdsp i

arg: 0
    lac u.arg+8 i
    isz u.arg+8
    jmp arg i

argname: 0
    jms arg
    dac .+2
    jms copyi ..; name: 4
    lac u.cdir
    jms namei; name
        jms error
    jmp argname i

seektell: 0
    jms arg
    dac u.base
```

```
    jms arg
    dac u.limit
    jms finac
    lac u.limit
    sna
    jmp seektell i
    sad d1
    jmp .+3
    lac i.size
    jmp seektell i
    lac f.badd
    jmp seektell i

isown1 0
    jms argname
    jms iget
    lac u.uid
    sma
    sad i.uid
    skp
    jms error
    jmp isown i
```

```
/ #6

itrunc: 0
    -7
    dac 9f+t
    lac idskpp
    dac 9f+t+1
1:
    lac 9f+t+1 i
    sna
    jmp 4f
    lac i.flags
    and o200000
    sna
    jmp 3f
    -64
    dac 9f+t+2
    lac dskbufp
    dac 9f+t+3
2:
    lac 9f+t+1 i
    jms dskrd
    lac 9f+t+3 i
    sza
    jms free
    isz 9f+t+3
    isz 9f+t+2
    jmp 2b
3:
    lac 9f+t+1 i
    jms free
    dzm 9f+t+1 i
4:
    isz 9f+t+1
    isz 9f+t
    jmp 1b
    lac i.flags
    and o577777
    dac i.flags
    jmp itrunc i
t = t+4

namei: 0
    jms iget
    -1
    tad namei i
    dac 9f+t+1
    isz namei
    lac i.flags
    and o20
    sna
    jmp namei i
    -8
    tad i.size
    cma
    irss 3
    dac 9f+t
    sna
    jmp namei i
    dzm di
1:
    lac di
```

```
    jms dget
    lac d.i
    sna
    jmp 2f
    lac 9f+t+1
    dac 8
    lac d.name
    sad 8 i
    skp
    jmp 2f
    lac d.name+1
    sad 8 i
    skp
    jmp 2f
    lac d.name+2
    sad 8 i
    skp
    jmp 2f
    lac d.name+3
    sad 8 i
    skp
    jmp 2f
    lac d.i
    isz namei
    jmp namei i
2:
    isz di
    isz 9f+t
    jmp 1b
    jmp namei i
t = t+2

iget: 0
    dac ii
    cll; idiv; 5
    dac 9f+t
    lacq
    tad d2
    dac 9f+t+1
    jms dskrd
    lac 9f+t
    cll; mul; 12
    lacq
    tad dskbufp
    dac 9f+t
    dac .+2
    jms copy; ..; inode; 12
    jmp iget i

iput: 0
    lac 9f+t+1
    jms dskrd
    lav inode-1
    dac 8
    -1
    tad 9f+t
    dac 9
    -12
    dac 9f+t+2
1:
    lac 8 i
```

21

105 (23) block 23_{10}

$\left(\frac{i}{5}+2\right)=43_{10}$

151
154
153
154
155

```
    sad 9 i
    skp
    jmp 2f
    isz 9f+t+2
    jmp 1b
    jmp iput i
2:
    -1
    tad 8
    dac 8
    -1
    tad 9
    dac 9
1:
    lac 8 i
    dac 9 i
    isz 9f+t+2
    jmp 1b
    lac 9f+t+1
    jms dskwr
    jmp iput i
t = t+3

dget: 0
    dac di
    alss 3
    dac 9f+t
    jms pget
    dac 9f+t+1
    jms dskrd
    lac 9f+t
    and o77
    tad dskbufp
    dac 9f+t+2
    dac .+2
    jms copy; .+3; dnode; 8
    lac 9f+t
    tad d8
    jms betwen; d0; i.size
       skp
    jmp dget i
    jms dacisize
    dzm d.i
    jmp dget i

dput: 0
    lac 9f+t+1
    jms dskrd
    lac 9f+t+2
    dac .+3
    jms copy; dnode; .+1; 8
    lac 9f+t+1
    jms dskwr
    jmp dput i

   = t+3

pget: 0
    lrss 6
    dac 9f+t
    lac i.flags
```

```
    and o200000
    sza
    jmp 2f
    lac 9f+t
    jms betwen; d0; d6
       jmp 1f
    tad idskpp
    dac 9f+t
    lac 9f+t i
    sna
    jms alloc
    dac 9f+t i
    jmp pget i
1:
    jms alloc
    dac 9f+t+1
    jms copy; i.dskps; dskbuf; 7
    jms copyz; dskbuf+7; 6447
    lac 9f+t+1
    jms dskwr
    lac 9f+t+1
    dac i.dskps
    jms copyz; i.dskps+1; 6
    lac i.flags
    xor o200000
    dac i.flags
2:
    lac 9f+t
    irss 6
    jms betwen; d0; d6
       jms halt " file too big
    tad idskpp
    dac 9f+t+1
    lac 9f+t+1 i
    sna
    jms alloc
    dac 9f+t+1 i
    dac 9f+t+2
    jms dskrd
    lac 9f+t
    and o77
    tad dskbufp
    dac 9f+t+1
    lac 9f+t+1 i
    sza
    jmp pget i
    jms alloc
    dac 9f+t
    lac 9f+t+2
    jms dskrd
    lac 9f+t
    dac 9f+t+1 i
    lac 9f+t+2
    jms dskwr
    lac 9f+t
    jmp pget i
t = t+3

ivrite; 0
    dac 9f+t
    lac ivrite
```

```
    dac iread
    lac cskp
    dac ivrite
    jmp 1f

iread; 0
    dac 9f+t
    lac cnop
    dac ivrite
1;
    -1
    tad iread i
    dac 10
    dac 11
    isz iread
    lac iread i
    dac 9f+t+1
    isz iread
    lac o70000
    xct ivrite
    lac i,size
    cma
    tad 9f+t
    cma
    jms betwen; d0; 9f+t+1
       lac 9f+t+1
    dac 9f+t+2
    cma
    tad d1
    sna
    jmp iread i
    dac 9f+t+1
1;
    lac 9f+t
    jms pget
    dac 9f+t+3
    jms dskrd
    lac 9f+t
    and o77
    tad dskbufp
    tad dm1
    xct ivrite
    jmp .+3
    dac 10
cskp;
    skp
    dac 11
2;
    lac 11 i
    dac 10 i
    isz 9f+t
    isz 9f+t+1
    jmp 3f
       xct ivrite
       jmp 4f
       lac 9f+t
       jms betwen; d0; i,size
          dac i,size
       lac 9f+t+3
       jms dskvr
    4;
```

```
        lac 9f+t+2
        jmp iread i
3:
    lac 9f+t
    and o77
    sza
    jmp 2b
    xct ivrite
    jmp 1b
    lac 9f+t+3
    jms dskwr
    jmp 1b
t = t+4

finac: 0
    lac u.ac
    jms fget
        jms error
    lac f.flags
    sma
    jms error
    lac f.i
    jms iget
    jmp finac i

dacisize: 0
    dac i.size
    jms iput
    lac i.size
    jmp dacisize i
```

```
" s7

pibreak:
	dac .ac

	dpsf
	jmp 1f

	dpcf
	dprs
	dac dpstat
	sma ral
	jmp 2f
	dprc
	dac dpchar
	-1
	dac dpread
	lac dpstat
	ral
2:
	sma
	jmp piret
	-1
	dac dpwrite
	jmp piret

1:	clsf
	jmp 1f

	lpb
	dac pbsflgs
	isz s.tim+1
	skp
	isz s.tim
	isz uquant
cnop:
	nop
	-1
	dac 7
	clon
	lac ttydelay
	spa
	isz ttydelay
	skp
	jms ttyrestart
	lac .dspb
	sna
	jmp piret
	isz .dsptm
	skp
	jmp dsprestart
	sad d3
	jmp piret
	isz .dspb
	jmp piret
	jmp dsprestart

1:	dssf
	jmp 1f

	-1
	dac .dskb
```

ttydelay -> ttydl
ttyrestart -> ttyres1

-> lac tty

```
    dsrs
    dac .dske
    dscs
    jmp piret

1:  lds
    sma ral
    jmp 1f
    cdf
    lac .dspb
    sna
    jmp piret
    tad dm3
    sna
    jmp dsprestart
    dac .dspb
    jmp piret
dsprestart1
    lac d1
    dac .dspb
    lac (spbufp
    beg
    -10
    dac .dspbm
    jmp piret

1:  sma ral
    jmp .+3
    waef
    jmp piret
    sma
    jmp 1f
    lda
    dac .lpba
    rlpd
    jmp piret

1:  ksf
    jmp 1f

    lac ttydelay
    sma
    isz ttydelay
    krb
    dac char
    sad o375
    jmp intrp1
    lac d1
    jms putchar
       dzm char
    lac sfiles*0
    jms wakeup
    dac sfiles*0
    lac char
    sad o212
    skp
    jmp piret
    lac sfiles*1
    sma
    xor o400000
    dac sfiles*1
```

```
    jms puscr
    jms ttyrestart
    jmp piret

1:  tsf
    jmp 1f

    tcf
    jms ttyrestart
    jmp piret

ttyrestart: 0
    lac ttydelay
    spa
    jmp ttyrestart i
    lac nttychar
    dzm nttychar
    sza
    jmp 3f
    isz ttydelay
    lac d2
    jms getchar
        jmp 2f
3:
    tls
    sad o12
    jms putcr
    sad o15
    skp
    jmp ttyrestart i
    lac ttydelay
    tad o20
    rcr
    cma
    dac ttydelay
    jmp ttyrestart i
2:
    lac sfiles+1
    jms wakeup
    dac sfiles+1
    jmp ttyrestart i

1:  sck
    jmp 1f

    cck
    lck
    dac char
    sad o33
    jmp iptrp2
    lac d3
    jms putchar
        nop
    lac sfiles+2
    jms wakeup
    dac sfiles+2
    jmp piret

1:  rsf
    jmp 1f
```

2 copies

```
    lac npptchar
    sna
    jmp .+5
    dac char
    rrb
    dac npptchar
    jmp .+3
    rrb
    dac char
3:
    lac char
    sna
    jmp 2f
    lac d4
    jms putchar
       jmp 3f
    lac char
    sad d4
    jmp 4f
2:
    lac npptchar
    sna
    jmp .+4
    dac char
    dzm npptchar
    jmp 3b
    rsa
    lac sfiles+3
    jms wakeup
    xor o400000
    dac sfiles+3
    jmp piret
3:
    lac char
    dac npptchar
4:
    lac sfiles+3
    jms wakeup
    dac sfiles+3
    jmp piret

1: psf
    jmp 1f

    pcf
    lac d5
    jms getchar
       jmp .+3
    psa
    jmp piret
    lac sfiles+4
    jms wakeup
    dac sfiles+4
    jmp piret

1: spb
    jmp 1f

    epb
    lpb
    dac phsflgs+1
```

```
    and o2000
    sna
    jmp piret
    jms dspinit
    lac sfiles*6
    jms wakeup
    dac sfiles*6
    cla
    wbl
    jmp piret

1:  crsf
    jmp 1f

    crrb
    dac crchar
    =1
    dac crread
    jmp piret

1:  crrb

piret:
    lac 0
    ral
    lac .ac
    ion
    jmp 0 i

wakeup: 0
    dac 9f*t
    =mnproc
    dac 9f*t*1
    lac tadu
    dac 2f
    lac dacu
    dac 2f*1
1:
    lac 9f*t
    ral
    dac 9f*t
    sma
    jmp 2f*2
    lac o700000
2:  tad ..
    dac ..
    lac 2b
    tad d4
    dac 2b
    lac 2b*1
    tad d4
    dac 2b*1
    isz 9f*t*1
    jmp 1b
    cla
    jmp wakeup i
t = t*2

putcr: 0
    lac o15
    dac ttychar
```

```
    cla
    jmp putcr i

intrp1:
    lac d6
    dac .int1
    lac d1
    jms getchar
       skp
    jmp .+3
    lac d2
    jms getchar
       skp
    jmp .+3
    lac sfiles+0
    jms wakeup
    dac sfiles+0
    lac sfiles+1
    jms wakeup
    dac sfiles+1
    jms chkint
       jmp piret
    jmp 1f
intrp2:
    lac d7
    dac .int2
    lac d3
    jms getchar
       skp
    jmp .+3
    lac sfiles+2
    jms wakeup
    dac sfiles+2
    lac sfiles+6
    jms wakeup
    dac sfiles+6
    jms chkint
       jmp piret
1:
    lac 0
    dac 020
    lac .ac
    jmp 021
```

```
" s8

" manifests
mnproc = 10
dspbsz = 270
ndskbs = 4

" flags
.insys: 0
.int1: 0
.int2: 0
.ac: 0
.savblk: 0
.dsptm: 0
.dskb: 0
.dske: 0

" pointers
tadu: tad u.list
dacu: dac u.list
maxquant: 30
ofilesp: u.pfiles
idskpp: i.dskps
dskbufp: dskbuf
edspbuf: dspbuf+dspbsz
dspbufp3: dspbuf+3
fblksp: s.fblks
dacq1: dac q1
lacq1: lac q1
q2p: q2

" strings
initf:
    <i>n:<i>t:< > j< > "

" constants
d0: 0
d1: 1
d2: 2
d3: 3
d4: 4
d5: 5
d6: 6
d7: o7: 07
d8: 8
d9: 9
o12: d10: 10
o14: 014
o15: 015
o17: 017
o20: 020
o33: 033
o40: 040
o55: 055
o77: 077
d65:o101: 0101
d33: 33
o132: 0132
o134: 0134
o137: 0137
o155: 0155
o177: 0177
```

```
o212; 0212
o375; 0375
o777; 0777
o2000; 02000
o4000; 04000
d7999; 7999
o10000; 010000
o17762; 017762
o17777; 017777
o20001; 020001
o40000; 040000
o40001; 040001
o70000; 070000
o77777; 077777
o100000; 0100000
o140000; 0140000
o200000; 0200000
o200001; 0200001
o300000; 0300000
o400000; 0400000
o500000; 0500000
o577777; 0577777
o600000; 0600000
o640000; 0640000
o700000; 0700000
o777700; 0777700
o777760; 0777760
dm3; =3
dm1; =1

9; .=.+t
c1; .=.+1
q1; q2;q2+98
    .=.+14
q2;
    .+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0
    .+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0
    .+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0
    .+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;.+2;0;0;0
dsplpc; .=.+1
dsplnk; .=.+1
dspbuf;
    0065057;0147740;0160000
    . = .+30
coldentry;
    dzm 0100 / not re-entrant
    caf
    ion
    clon
    law 3072
    wcga
    jms dspinit
    lav dspbuf
    jms movdsp
    cla
    jms dskio; 06000
    jms copy; dskbuf; sysdata; ulist-sysdata
    lac d3
    jms name1; initf
        jms halt
```

```
    jms iget
    cla
    jms ireadi 4096; 4096
    jmp 4096
    . = dspbuf+dspbsz+3
dskbuf = 07700
dskbs: .=.+65+65+65+65
edskbsp: .
uqlant: .=.+1
dspbufp: .=.+1
pbsflgs: .=.+2
mode: .=.+1
nttychar: .=.+1
npptchar: .=.+1
ttydelay: .=.+1
name: .=.+4
lnkaddr: .=.+1
char: .=.+1
dskaddr: .=.+1
uniqpid: 1
lu: .=.+4
sfiles: .=.+10
dpdata:
    dpstat: .=.+1
    dpread: .=.+1
    dpwrite: .=.+1
    dpchar: .=.+1
dspdata:
    .dspb: .=.+1
    .lppa: .=.+1
crdata:
    crread: .=.+1
    crchar: .=.+1
sysdata:
    s.nxfblk: .=.+1
    s.nfblks: .=.+1
    s.fblks: .=.+10
    s.uniq: .=.+1
    s.time: .=.+2
ulist:
    0131000;1;0;0
    0031040;0;0;0
    0031100;0;0;0
    0031140;0;0;0
    0031200;0;0;0
    0031240;0;0;0
    0031300;0;0;0
    0031340;0;0;0
    0031400;0;0;0
    0031440;0;0;0
userdata:
    u.ac: 0
    u.mq: 0
    u.rg: .=.+9
    u.uid: =1
    u.pid: 1
    u.cdir: 3
    u.ulistp: ulist
    u.swapret: 0
    u.base: 0
    u.count: 0
```

```
    u.limit: 0
    u.ofiles: .=.+30
    u.dspbuf: 0
    u.intflg: 1
        .=user+384
ii: .=.+1
inode:
    i.flags: .=.+1
    i.dskps: .=.+7
    i.uid: .=.+1
    i.nlks: .=.+1
    i.size: .=.+1
    i.uniq: .=.+1
        . = inode+12
di: .=.+1
dnode:
    d.i: .=.+1
    d.name: .=.+4
    d.uniq: .=.+1
        . = dnode+8
fnode:
    f.flags: .=.+1
    f.badd: .=.+1
    f.i: 0
```

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```
" #9 == cold boot

. = coldentry+4

" zero i-list

    dzm ii
    jms copyz; dskbuf; 64
1:
    iac ii
    jms dskio; 07000
    isz ii
    -710
    tad ii
    sza
    jmp 1b

" free rest of disk

1:
    iac ii
    jms free
    isz ii
    -6400
    tad ii
    sza
    jmp 1b

" read in tapes

    dzm ii
1:
    dzm sum
    jms getw " count
    sza
    jmp .+3
    hlt
    jmp 1b " 0 count means pause
    dac xx
    isz ii
    iac ii
    jms iget
    jms copyz; inode; 12
    jms getw " flags
    dac i.flags
    -1
    dac i.uid
    jms getw " number links
    dac i.nlks
    -2
    tad xx
    dac i.size
    ias ii
    dac i.uniq
    iav 4096-1
    dac 8
    -1
    tad i.size
    cma
    sna
    jmp 3f
    dac xx
```

```
2:
    jms getw
    dac 8 i
    isz xx
    jmp 2b
3:
    lac sum
    dac xx
    jms getw " checksum
    sad xx
    skp
    jms halt
    lac i.size
    dac .+4
    cla
    jms iwrite; 4096; ..
    jms input
    cla
    jms dskio; 07000
    jmp 1b

getw: 0
    jms getc
    alss 12
    lmq
    jms getc
    alss 6
    omq
    lmq
    jms getc
    omq
    lmq
    add sum
    dac sum
    lacq
    jmp getw i

getc: 0
    iof
    rsa
    rsf
    jmp .-1
    rrb
    sna
    jmp getc+1
    and o77
    ion
    jmp getc i
xx: 0
sum: 0
```

jms copy, source, destination

CHANNEL		WAIT (SFILES)
0	FREELIST	
1	TTYI	+0
2	TTYO	+1
3	KBDI	+2
4	PPTI	+3
5	PPTO	+4
—	PUSHBUTTONS	+6
	SLEEP	+7

sm symbols

↓

SYSLOC	
1	IGET
2	INODE
3	USERDATA
4	SYSDATA ✓
5	COPY
6	COPY2
7	BETWEEN
8	DSKRD
9	DSKWR
10	DSKBUF
11	~~DSDATA~~ (STAT; RD; WR; CHAR)
12	NAMEI
13	POSHB (PB/OFC, PB/INT)
14	ALLOC
15	FREE
16	~~DSPB, LPBA~~ DSPDATA (.DSPB; .LPBA)
17	CRDATA (RD CHAR)

PC=126 PC=1377

MQ	AC	
SAVE		NAME NOT IN DIRECT
SETUID		NO ACCESS
OPEN		NO FNODE
READ		BAD FINDEX
WRITE		
CREAT		BAD ARGUMENTS
SEEK		
~~TELL~~		
CLOSE-		
~~TELL~~		
CLOSE		
LINK		
UNLINK		
SETUID		
RENAME		
EXIT		
TIME		
~~MKNOD~~		
MAKDIR		
CHDIR		
CHMODE		
CHOWNER		
~~ACCT~~		

```
.          004671 r
.ac        004102 r
.chown     000426 r
.close     000725 r
.cmpt      000404 r
.creat     000665 r
.chdir     000622 r
.chmod     000414 r
.dskb      004105 r
.dspb      005547 r
.dsptm     004104 r
.dske      004106 r
.exit      001170 r
.fork      001116 r
.getuid    000433 r
.halt      001343 r
.int1      004100 r
.insys     004077 r
.int2      004101 r
.intrp     000257 r
.link      000474 r
.lpbs      005550 r
.open      000633 r
.rmes      001204 r
.rele      000410 r
.rename    000574 r
.read      000731 r
.smes      001232 r
.savblk    004103 r
.sysloc    000262 r
.setuid    000566 r
.status    000352 r
.save      001156 r
.seek      000436 r
.tell      000466 r
.time      000615 r
.unlink    000547 r
.write     001000 r
access     002323 r
alloc      001556 r
argname    002642 r
arg        002636 r
awake      001311 r
badcal     001153 r
betwen     001654 r
c1         004270 r
chkint     000320 r
chkint1    001546 r
char       005522 r
cnop       003453 r
coldentr   004520 r
copyz      001723 r
collapse   002066 r
copy       001700 r
crdata     005551 r
crchar     005552 r
crread     005551 r
cskp       003346 r
d.name     005761 r
d.uniq     005765 r
d.i        005760 r
```

```
d0          004127 r
d10         004141 r
d1          004130 r
d2          004131 r
d33         004153 r
d3          004132 r
d4          004133 r
d5          004134 r
d6          004135 r
d65         004152 r
d7999       004166 r
d7          004136 r
d8          004137 r
d9          004140 r
dacq1       004120 r
dacu        004110 r
dacisize    003413 r
dget        003115 r
di          005757 r
dm1         004215 r
dm3         004214 r
dnode       005760 r
dpdata      005543 r
dput        003107 r
dpchar      005546 r
dpwrite     005545 r
dpstat      005543 r
dpread      005544 r
dskbufp     004114 r
dskio       002173 r
dspdata     005547 r
dskrd       002127 r
dsktrans    002231 r
dsploc      004455 r
dslot       002474 r
dsplno      004456 r
dspbufp3    004116 r
dspbufp     005506 r
dspresta    003523 r
dskaddr     005523 r
dskbs       005100 r
dskvr       002157 r
dsppue      002551 r
dspleft     002573 r
dspbuf      004457 r
dskswap     002300 r
dspinit     002617 r
dspnl       002605 r
edskbsp     005504 r
edspbuf     004115 r
error       001542 r
exitrv      001041 r
f.badd      005771 r
f.flags     005770 r
f.i         005772 r
fassign     002340 r
fallr       002436 r
fblksp      004117 r
fget        002371 r
finac       003401 r
fnode       005770 r
```

```
forall   002423 r
fput     002413 r
free     001615 r
getchar  001756 r
getv     004635 r
getc     004654 r
halt     002265 r
i.flags  005743 r
i.dskps  005744 r
i.unit   005756 r
i.size   005755 r
i.nlks   005754 r
i.uid    005753 r
icreat   002506 r
idskpp   004113 r
iget     003030 r
ii       005742 r
inode    005743 r
intrp1   004032 r
intrp2   004055 r
initf    004123 r
iput     003057 r
iread    003277 r
isown    002675 r
itrunc   002706 r
iwrite   003270 r
lacl     001646 r
lacq1    004121 r
lnkaddr  005521 r
lookfor  001073 r
locsw    000275 r
locn     000317 r
lu       005525 r
maxquant 004111 r
mode     005511 r
movdsp   002626 r
name     005515 r
namei    002750 r
npptchar 005513 r
nttychar 005512 r
o10000   004167 r
o17      004144 r
o177     004160 r
o101     004152 r
o17762   004170 r
o17777   004171 r
o12      004141 r
o132     004154 r
o134     004155 r
o137     004156 r
o100000  004177 r
o140000  004200 r
o14      004142 r
o15      004143 r
o155     004157 r
o2000    004164 r
o200001  004202 r
o20001   004172 r
o20      004145 r
o212     004161 r
o200000  004201 r
```

```
o375      004162 r
o33       004146 r
o300000   004203 r
o4000     004165 r
o40000    004173 r
o40001    004174 r
o40       004147 r
o400000   004204 r
o500000   004205 r
o55       004150 r
o577777   004206 r
o600000   004207 r
o640000   004210 r
o777      004163 r
o77       004151 r
o70000    004175 r
o77777    004176 r
o777760   004213 r
o7        004156 r
o700000   004211 r
o777700   004212 r
ofilesp   004112 r
okexit    000102 r
open1     000722 r
orig      000000 r
passone   001534 r
pbsflgs   005507 r
pget      003163 r
piret     003766 r
pibreak   003420 r
putchar   001741 r
putq      002022 r
puter     004025 r
q1        004271 r
q2p       004122 r
q2        004311 r
rkbdi     001415 r
rppti     001472 r
rttyi     001344 r
s.tim     005570 r
s.nxfblk  005553 r
s.uniq    005567 r
s.nfblks  005554 r
s.fblks   005555 r
seektell  002656 r
searchu   001047 r
sfiles    005551 r
sleep     002445 r
srcdbs    002046 r
sum       004670 r
swr       001331 r
swp       000220 r
swn       000256 r
sww       001331 r
swap      000136 r
sysdata   005553 r
sysexit   000103 r
takeq     001770 r
tadu      004107 r
ttydelay  005514 r
ttyresta  003603 r
```

```
u.dspbuf 005723 r
u.intflg 005724 r
u.ulistp 005660 r
u.pid    005656 r
u.ofiles 005665 r
u.svapre 005661 r
u.mg     005643 r
u.uid    005655 r
u.ac     005642 r
u.limit  005664 r
u.cdir   005657 r
u.count  005663 r
u.base   005662 r
u.rg     005644 r
ulist    005572 r
uniqpid  005524 r
uquant   005505 r
userdata 005642 r
wakeup   003773 r
wdspo    001462 r
wpprto   001506 r
wttyo    001364 r
xx       004667 r
```

```
" sop

dac = 0040000
jms = 0100000
dzm = 0140000
lac = 0200000
xor = 0240000
add = 0300000
tad = 0340000
xct = 0400000
isz = 0440000
and = 0500000
sad = 0540000
jmp = 0600000
nop = 0740000
i = 020000
law = 0760000
cma = 0740001
las = 0750004
ral = 0740010
rar = 0740020
hlt = 0740040
sma = 0740100
sza = 0740200
snl = 0740400
skp = 0741000
spa = 0741100
sna = 0741200
szl = 0741400
rtl = 0742010
rtr = 0742020
cil = 0744000
rcl = 0744010
rcr = 0744020
cla = 0750000
lrs = 0640500
lrss = 0660500
lls = 0640600
llss = 0660600
als = 0640700
alss = 0660700
mul = 0653122
idiv = 0653323
lacq = 0641002
clq = 0650000
omq = 0640002
cmq = 0640004
lmq = 0652000

dscs = 0707141
dslw = 0707124
dslm = 0707142
dsld = 0707104
dsls = 0707144
dssf = 0707121
dsrs = 0707132

iof = 0700002
ion = 0700042
caf = 0703302
cion = 0700044
cisf = 0700001
```

```
clcf = 0700004
ksf = 0700301
krb = 0700312
tsf = 0700401
tcf = 0700402
tis = 0700406
sck = 0704301
cck = 0704304
lck = 0704312
rsf = 0700101
rsa = 0700104
rrb = 0700112
psf = 0700201
pcf = 0700202
psa = 0700204
cdf = 0700501
lds = 0701052
lda = 0701012
vcga = 0704206
raef = 0700742
ripd = 0700723
beg = 0700547
spb = 0704401
cpb = 0704404
lpb = 0704412
vbl = 0704424
dprs = 0704752
dpsf = 0704741
dpcf = 0704761
dpre = 0704712
crsf = 0706701
crrb = 0706712
```

```
" copy a.out to disk track 10x
" where x is the argument

    lac 017777 i; sad d8; skp; jmp error
    lac 017777; tad d5; dac track
    lac i track; lrss 9; tad om60
    spa; jmp error; dac track
    tad dm10; sma; jmp error

    sys open; a.out; 0
    spa; jmp error
    sys read; bufp; buf; 3072
    sad .-1
    jmp error


    dscs
    -3072; dslw
    lac bufp; dslm
    lac track; alss 8; xor o300000; dsld
    lac o3000; dsls
    dssf; jmp .-1
    dsrs; spa; jmp error
    -1024; dslw
    lac d3072; dslm
    lac track; alss 8; xor o300110; dsld
    lac o3000; dsls
    dssf; jmp .-1
    dsrs; spa; jmp error
    sys exit

error:
    lac d1; sys write; 1f; 2
    sys exit
1: 077077;012

dm10: -10
d5: 5
om60: -060
o300000: 0300000
o300110: 0300110
d8: 8
d3072: 3072
o3000: 03000
d1: 1
a.out:
    <a.>;<ou>;<t 040;040040

track: .=.+1

buf:
```

make8go

```
" trysys

    sys open; a.out; 0
    spa
    jmp error
    sys read; buf; 3072
    sad .-1
    jmp error
    iof
    caf
    cdf
    clof
    law buf
    dac t1
    dzm t2
    -3072
    dac c1
1:
    lac t1 i
    dac t2 i
    isz t1
    isz t2
    isz c1
    jmp 1b
    jmp 0100

error:
    lac d1
    sys write; 1f; 1
    sys exit
1: 077012

a.out:
    <a.>;<ou>;<t 040; 040040
t1: 0
t2: 0
c1: 0
d1: 1
buf:
```