O. J. Rees

The Compatible Time-Sharing System

A Programmer's Guide

SECOND EDITION

The M. I. T. Computation Center

P. A. Crisman, Editor

The M. I. T. Press
Massachusetts Institute of Technology
Cambridge, Massachusetts

```
logout
W 1529.8
 T0191  8001 LOGGED OUT 09/17/66    1529.9 FROM 20000.
 TOTAL  TIME USED=     .2 MIN.
-login t191 vistr1
W 1538.6
Password
 STANDBY LINE HAS BEEN ASSIGNED.
 T0191  8001 LOGGED IN  09/17/66    1538.8 FROM 20000.
 LAST LOGOUT WAS  09/17/66    1529.9

 CTSS BEING USED IS     MAC5A9
R 4.116+.516

edl djr5 lisp
W 1539.2
Edit
l edit
(EDIT (LAMBDA (E)(COND
n 7
p
    ((EQUAL (CADR E) (QUOTE TIMES)) (EDIT (CADDR E)))
i     ((equal (edit (caddr e))(quote zero))(quote one))
file
R 3.366+1.416

lisp dir5
```

```
W 1541.2
   VALUE
 (INTO OUTOF INOUT DIFF EDIT DIFFED)
edit ((one plus zero))
 ONE
diffed ((x times x) x)
 (X PLUS X)
diffed (((a plus b) times (a minus b)) a)
 ((A MINUS B) PLUS (A PLUS B))
 QUIT,
R 3.250+1.683
```

```
print djr5 lisp
W 1543.7

  DJR5   LISP      09/17  1543.8

DEFINE(((INTO (LAMBDA (X)(COND ((ATOM X) X)
 (T (LIST (CADR X)
  (INTO (CAR X))
  (INTO (CADDR X)))))))
(OUTOF (LAMBDA (X)(COND ((ATOM X) X)
 (T (LIST (OUTOF (CADR X))
  (CAR X)
  (OUTOF (CADDR X)))))))
(INOUT (LAMBDA (X)(OUTOF (INTO X))))
(DIFF (LAMBDA (E X) (COND
 ((ATOM E)(COND ((EQ E X)(QUOTE ONE))
  (T (QUOTE ZERO))))
 ((EQ (CADR E)(QUOTE PLUS))(LIST (DIFF (CAR E) X)
  (QUOTE PLUS)
  (DIFF (CADDR E) X)))
 ((EQ (CADR E)(QUOTE MINUS))(LIST (DIFF (CAR E) X)
  (QUOTE MINUS)
  (DIFF (CADDR E) X)))
 ((EQ (CADR E)(QUOTE TIMES))(LIST (LIST (DIFF (CAR E) X)
  (QUOTE TIMES)
  (CADDR E))
  (QUOTE PLUS)
  (LIST (CAR E)
```

```
   (QUOTE TIMES)
   (DIFF (CADDR E) X))))
 (T (QUOTE CLANG)))))
(EDIT (LAMBDA (E)(COND
  ((ATOM E) E)
  ((EQUAL (EDIT (CAR E)) (QUOTE ZERO))(COND
    ((EQUAL (CADR E) (QUOTE PLUS)) (EDIT (CADDR E)))
    ((EQUAL (CADR E) (QUOTE TIMES)) (QUOTE ZERO))
    (T (LIST (EDIT (CAR E)) (CADR E) (EDIT (CADDR E))))   ))
  ((EQUAL (EDIT (CAR E)) (QUOTE ONE))(COND
    ((EQUAL (CADR E) (QUOTE TIMES)) (EDIT (CADDR E)))
    ((EQUAL (EDIT (CADDR E))(QUOTE ZERO))(QUOTE ONE))
    (T (LIST (EDIT (CAR E)) (CADR E) (EDIT (CADDR E))))  ))
  ((EQUAL (EDIT (CADDR E)) (QUOTE ZERO))(COND
    ((EQUAL (CADR E) (QUOTE PLUS)) (EDIT (CAR E)))
    ((EQUAL (CADR E) (QUOTE MINUS)) (EDIT (CAR E)))
    (T (QUOTE ZERO))  ))
  ((EQUAL (EDIT (CADDR E)) (QUOTE ONE))(COND
    ((EQUAL (CADR E) (QUOTE TIMES)) (EDIT (CAR E)))
    (T (LIST (EDIT (CAR E)) (CADR E) (EDIT (CADDR E))))  ))
  (T (LIST (EDIT (CAR E)) (CADR E) (EDIT (CADDR E))))          )))
(DIFFED (LAMBDA (E X) (EDIT (DIFF E X))))
       ))
LISTEN NIL
R 1.400+1.116

lisp djr5
W 1546.4
 VALUE
 (INTO OUTOF INOUT DIFF EDIT DIFFED)
```

```
into (x)
 X
into (x plus y))
***  ERROR  A1LSA2
 ((X . X))
***  ERROR  READER
 ((NIL . FLOAT) . SPECIAL)
into ((x plus y))
 (PLUS X Y)
into ((x plus y"(y times z)))
 (PLUS X (TIMES Y Z))
into (((x plus y) times ((u minus v) times (u minus v))))
 (TIMES (PLUS X Y) (TIMES (MINUS U V) (MINUS U V)))
outof ((times (plus x y) (times (minus u v) (minus u v))))
 ((X PLUS Y) TIMES ((U MINUS V) TIMES (U MINUS V)))
inout (((x plus y) times ((u minus v) times (u minus v))))
 ((X PLUS Y) TIMES ((U MINUS V) TIMES (U MINUS V)))
diff (x x)
 ONE
diff (y x)
 ZERO
diff ((x plus y) x)
 (ONE PLUS ZERO)
diffed ((x plus y) x)
 ONE
diff ((x times y) x)
 ((ONE TIMES Y) PLUS (X TIMES ZERO))
do"iffed ((x times y) x)
 Y
```

```
 (((ONE TIMES Y) PLUS (X TIMES ZERO)) PLUS ZERO)
diffed (((x times y) plus z) x)
 Y
diffed((((x times x) times a) plus (x times b)))" x)
 (((X PLUS X) TIMES A) PLUS B)
diff ((a fred b) x)
                CLANG
diffed ((x times (x times (x times (x times x)))) x)
)))
 QUIT,
R 133.850+27.166

lisp djr5
   W 1604.3
 VALUE
 (INTO OUTOF INOUT DIFF EDIT DIFFED)
diffed ((x times (x times x)) x)
 ((X TIMES X) PLUS (X TIMES (X PLUS X)))
diffed ((x times (x times (x times x))) x)
 ((X TIMES (X TIMES X)) PLUS (X TIMES ((X TIMES X) PLUS (X TIMES
 (X PLUS X)))))
 QUIT,
R 20.033+4.366

ttpeek
W 1606.6

 9/17  1606.6 TUSED =  3.4

SHIFT        MINUTES
```

```
1        15       13.7
2        30       30.0
3        60       37.2
4        60       16.9
5        15        0.

      STORAGE
DEVICE   QUOTA   USED
DISK       100     73

R 1.600+.816
.
listf
W 1607.1

    56 FILES    73 RECORDS
 NAME1  NAME2 MOD NOREC   USED
  DJR5   LISP 000     1 09/17/66
PERMIT   FILE 120     1
  GAME    BSS 000     3
  GAME    MAD 000     2
 GAMET    BSS 000     1
 GAMET    MAD 000     1
  QUAD    BSS 000     2
  QUAD    MAD 000     1
SCHERE  ALGOL 000     4
STAMPE    MAD 000     2
  LOOP  ALGOL 000     4 09/16/66
SCSHFT    BSS 000     1
```

```
    SCSHFT  ALGOL 000     1
                      ANOI     MAD 000     1
                                        ANOI     KOP 000     1
    DJR4    LISP 000     1
                    FRIGG     BCD 000     1
                                      HW1   COMIT 000     1
                                                  (MDBG)     BSS 000


    SMTAB 000     1        R          O          T          C          A          F
            FACTOR     BSS 000     1
                              fc-INT. 0

     - QUIT,
      R .016+.000


listf
W 1608.7


     56 FILES     73 RECORDS
 NAME1   NAME2 MOD NOREC    USED
   DJR5    LISP 000      1 09/17/66
PERMIT    FILE 120      1
   GAME     BSS 000      3
   GAME     MAD 000      2
  GAMET     BSS 000      1
  GAMET     MAD 000      1
   QUAD     BSS 000      2
   QUAD     MAD 000      1
SCHERE   ALGOL 000      4
STAMPE     MAD 000      2
```

(8)

1 09/15/66

TEST SYMTAB 000 1

TEST BSS 000 1

TEST MAD 000 1

LOOP	ALGOL	000	4	09/16/66
SCSHFT	BSS	000	1	
SCSHFT	ALGOL	000	1	
ANOI	MAD	000	1	
ANOI	KOP	000	1	
DJR4	LISP	000	1	
FRIGG	BCD	000	1	
HW1	COMIT	000	1	
(MDBG)	BSS	000	1	09/15/66
TEST	SYMTAB	000	1	
TEST	BSS	000	1	
TEST	MAD	000	1	
FACTOR	SYMTAB	000	1	
FACTOR	BSS	000	1	
FACTOR	MAD	000	1	
SCHT	BSS	000	2	
SCH	ALGOL	000	3	
STAMPE	BSS	000	2	
HW	COMIT	000	1	
FRG	BCD	000	1	
Q	MANE2	000	0	
DJR1	BSS	000	2	
DJR1	MAD	000	1	
DJR1	MADTRN	000	1	
FRIG	BCD	000	1	
EXP	(MEMO)	000	1	
MAD001	BSS	000	1	09/14/66
MAD001	MAD	000	1	
1	MAD	000	1	

```
     0     MAD 000      1

   ALL     BSS 000      1

   ALL     MAD 000      1

   MAD WALKER 100       1

  ANDU     MAD 000      1

   AND       U 000      1

   IBE     MAD 000      1

                    IB     MAD 000      1

   SCH     BSS 000      2 09/13/66

                         STAMP    BSS 000      1

                                  STAMP  ALGOL 000      1

VARD A   MAD 000       1

   ZYX     FGH 000      1

WALKER     BSS 000      2

   JIM   ALGOL 000      1 09/12/66

SIMPLE     MAD 000      1

 BLOGS   ALGOL 004      1


    17 LINKS

 NAME1   NAME2 MOD PROBN. PROGN. LNAME1 LNAME2

ASMPAK     BSS 144  T0113    2880

   DJR MADTRN 000  T0191    8002

 LOOPY   ALGOL 000           8003

  OPS3   ERROR 104  T0168 CMFL02

 OPS3A DIRECT 104

 OPS3A GUIDES 104

 OPS3B DIRECT 104

 OPS3B GUIDES 104

OPSLIB     BSS 104

READIN     BSS 144  T0113    2880

     *       * 000  T0191    8002

 SCHR1   ALGOL 000                 SCH1
```

```
STAMPA     MAD 000
STAMPB     MAD 000
STAMPC     MAD 000
STAMPD     MAD 000
   WHO  SAVED 104  M1416 CMFL04

R 2.116+1.000

print djr4 lisp
W 1611.8

  DJR4   LISP      09/17  1611.9

(EDIT (LAMBDA (E)(COND
  ((ATOM E) E)
  ((EQUAL (EDIT (CAR E)) (QUOTE ZERO))(COND
  INT. 0
R .950+.500

delete djr4 lisp
W 1612.4
R .383+.233

print djr1 madtrn
W 1613.0

  DJR1 MADTRN      09/17  1613.2

(11)   00010          PRINT 1
```

```
00020     1      FORMAT(21H HANOI AT PROJECT MAC)
00030            DIMENSION N(10),J(10),I(10),K(10)
00040            M=1
00050            READ 2,N(M),I(M),J(M)
00060     2      FORMAT (3I2)
00070            K(M)=1
00080     3      IF(N(M))4,5,4
00090     4      N(M+1)=N(M)-1
00100            I(M+1)=I(M)
00110            J(M+1)=6-I(M)-J(M)
00120            K(M+1)=2
00130            M=M+1
00140            GO TO 3
00150     6      PRINT 7,I(M),J(M)
00160     7      FORMAT(I1,
00170            N(M+1)=N(M)-1
00180            I(M+1)=6-I(M)-J(M)
00190            J(M+1)=J(M)
00200            K(M+1)=3
00210            M=M+1
00220            GO TO 3
00230     5      L=K(M)
00240            M=M-1
00250            IF(L-2)8,6,5
00260     8      STOP
00270            END
R 1.150+.483

print djr1 mad
W 1615.1

  DJR1     MAD       09/17  1615.1
```

4H TO ,12)

```
MTR00001                PRINT ONLINE FORMAT QQ0002
MTR00002                VECTOR VALUES QQ0002=$21H HANOI AT PROJECT MAC*$
MTR00003                DIMENSION N(10),J(10),I(10),K(10)
MTR00004                M=1
MTR00005                READ FORMAT QQ0003,N(M),I(M),J(M)
MTR00006                VECTOR VALUES QQ0003=$3I2*$
MTR00007                K(M)=1
MTR00008    QQ0004      WHENEVER (N(M)).E.0, TRANSFER TO QQ0006
MTR00009    QQ0005      N(M+1)=N(M)-1
MTR00010                I(M+1)=I(M)
MTR00011                J(M+1)=6-I(M)-J(M)
MTR00012                K(M+1)=2
MTR00013                M=M+1
MTR00014                TRANSFER TO QQ0004
MTR00015    QQ0007      PRINT ONLINE FORMAT QQ0008,I(M),J(M)
MTR00016                VECTOR VALUES QQ0008=$I1,4H TO ,I2*$
MTR00017                N(M+1)=N(M)-1
MTR00018                I(M+1)=6-I(M)-J(M)
MTR00019                J(M+1)=J(M)
MTR00020                K(M+1)=3
MTR00021                M=M+1
MTR00022                TRANSFER TO QQ0004
MTR00023    QQ0006      L=K(M)
MTR00024                M=M-1
MTR00025                WHENEVER (L-2).L.0, TRANSFER TO QQ0009
MTR00026                WHENEVER (L-2).G.0, TRANSFER TO QQ0006
MTR00027                TRANSFER TO QQ0007
MTR00028    QQ0009      TRANSFER TO QQ0001
MTR00029                INTEGER M,N,I,J,K,L
```

```
MTR00030    QQ0001     END OF PROGRAM
R 1.416+.683

edl djr6 fap
W 1618.8
   FILE   DJR6   FAP NOT FOUND.
Input


Edit
 QUIT,
R 2.400+.566

ed djr6 fap
     W 1619.5
         DJR6   FAP NOT FOUND.
                        INPUT:
                tsx             rdflxa,4
                pze             0,,6
                end


EDIT:
file
R 2.783+1.733


ed djr7 fap
W 1621.3
  DJR7   FAP NOT FOUND.
INPUT:
                tsx             wrflxa,4
                pze             0,,6
                end


EDIT:
```

```
   file
   R 1.966+1.066


fap djr6
W 1622.6
   00010     U            TSX     RDFLXA,4
     LENGTH     2
   ASSEMBLY FAILED
R 4.200+.666


print djr6 fap
W 1623.5

  DJR6    FAP      09/17  1623.7

   00010            TSX     RDFLXA,4
   00020            PZE     0,,6
   00030            END
R .483+.983


fap djr6 (list)
W 1626.8
   00010     U            TSX     RDFLXA,4
     LENGTH     2
   ASSEMBLY FAILED
R 3.233+.600


print f"djr6 bcd
W 1627.6
```

(15)

```
 DJR6     BCD       09/17  1627.7

                    1

 U     00000  0074 00 4                TSX      RDFLXA,4
       00001  0 00006 0 00000          PZE      0,,6
                                       END

1

 DATA          L          B          M          E          S          S          A

          2 IS THE FIRST LOCATION NOT USED BY THIS PROGRAM

OREFERENCES TO UNDEFINED SYMBOLS
          0 RDFLXA      0

0     ERROR IN ABOVE ASSEMBLY.
R 1.250+1.000


delete djr6 bcd
W 1629.2
R .383+.350


befap djr6
W 1631.8
 U     00000  0074 00 4                      TSX      RDFLXA,4
      LENGTH 00002
        ERROR IN ABOVE ASSEMBLY
R 5.133+1.483


ed djr6 fap
W 1632.7
```

00010
00020
00030

PAGE 1

POST PROCE

R O S

```
EDIT:
l tsx
p
        TSX     RDFLXA,4
r         tsx     rdflxa,4
t
p 4

        TSX     RDFLXA,4
        PZE     0,,6
        END
file
R 6.566+1.783

fap djr6
W 1634.7
   00010     U           TSX     RDFLXA,4
     LENGTH     2
   ASSEMBLY FAILED
R 2.733+.483

pm
W 1635.7
 ILLEGAL SEQUENCE OF COMMANDS.
R .033+.083

resume squash djr6 fap djr7
W 1640.0
(17) ERROR 012 FOUND AT 22754 IN CALL TO OPEN   FOR SQUASH SAVED
```

```
R 1.183+.200


ed djr6 fap

     W 1640.4
       EDIT:
n
p

       TSX      RDFLXA,4
r                tia              =hrdflxa
t
p 4


       TIA      =HRDFLXA
       PZE      0,,6

       END

file
R 7.700+2.000

fap djr6

  W 1641.9

     LENGTH      3

R 2.483+.416


loadgo djr6

W 1642.3

EXECUTION.

djrees

 PROTECTION MODE VIOLATION AT 00357.

 INS.=606060606060, RI.=000000000000, PI.=005203000000

R 1.616+.650


fap djr7
```

```
W 1643.0
   00010     U            TSX      WRFLXA,4
     LENGTH      2
   ASSEMBLY FAILED
R 2.016+.450

ed djr7 fap
W 1643.9
EDIT:
n
r                tia              =hwrflxa
file
R 2.566+1.350

fap djr7
W 1644.5
     LENGTH      3
R 2.433+.466

loadgo djr7
W 1644.8
EXECUTION.
0(0-06H000010(0-01002000(0-00+003N0003L62000D62000E62000F5)0HA6)0H00(0-(6)0H
```

```
fap djr6
W 1646.2
     LENGTH      3
R 2.433+.333
```

004AR 1.733+.500

```
loadgo djr6
W 1646.5
EXECUTION.
     x
 PROTECTION MODE VIOLATION AT 00357.
                                    INS.=606060606060, RI.=000000000000, PI.=00
R  1.616+.666

ed djr6 fap
W 1647.0
EDIT:
1 0
c q0q1000q
p
        TIA     =HRDFLXA
n
p
        PZE     0,,6
c q0q1000q
    p
        PZE     1000,,6
file
R 3.650+1.833

fap djr6
W 1649.3
      LENGTH     3
R 3.333+.400

loadgo djr6
W 1649.7
EXECUTION.
```

5203000000

```
x
 PROTECTION MODE VIOLATION AT 00357.
 INS.=606060606060, RI.=000000000000, PI.=005203000000
R 2.400+.716

ed djr8 madtrn
W 1700.3
  DJR8MADTRN NOT FOUND.
INPUT:
                tia             =hrdflxa
                pze             i,,6
                end

EDIT:
file
R 2.516+1.800

madtrn djr8
W 1701.8
****ERROR 8
MORE THAN 6 CHARACTERS IN A VARIABLE NAME
PROBABLE ERROR IN MADTRN FILE.
MAD FILE CREATED,USE AT OWN RISK.
R 3.066+.416

delete djr8 *
W 1702.3
R 1.666+.200
```

W 1702.8

DJR8MADTRN NOT FOUND.

INPUT:

```
                tsx             rdflxa,4
                                pze             i,,6
                                end
```

EDIT:

file

R 1.950+1.450

madtrn djr8

W 1704.1

****ERROR 8

MORE THAN 6 CHARACTERS IN A VARIABLE NAME

PROBABLE ERROR IN MADTRN FILE.

MAD FILE CREATED,USE AT OWN RISK.

R 1.966+.566

loadgo djr8

W 1704.7

FILE DJR8 BSS NOT FOUND

NO MAIN PROGRAM

R .766+.416

mad djr8

W 1704.9

ERROR IN OPEN AT LOCATION 00136 INVOLVING DJR8 BSS

FILE NOT FOUND

R .783+.250

listf djr8 *

W 1705.3

2 FILES 1 RECORDS

NAME1 NAME2 MOD NOREC USED

```
        DJR8     MAD 000      0 09/17/66
        DJR8 MADTRN 000      1


      R 1.166+.333


print djr8 n"mad
W 1706.0

  DJR8     MAD       09/17  1706.1

R .616+.350

delete djr8 *
W 1706.4
R 1.416+.416

delete djr6 *
W 1707.9
R 3.833+.350

delete djr7 *
W 1708.1
R 1.366+.366

ed djr6 fap
W 1709.3
  DJR6   FAP NOT FOUND.
INPUT:
```

```
                txh             6
                bci             6,djrees

                            EDIT:
b
INPUT:
                end

EDIT:
file
R 2.550+1.633

fap djr6
W 1710.9
     LENGTH     11
R 2.983+.466

loadgo djr6
W 1711.2
EXECUTION.
DJREES

 PROTECTION MODE VIOLATION AT 05251.
 INS.=010100005252, RI.=000000000000, PI.=005354000000
R 4.233+.616

ed djr6 fap
W 1711.9
EDIT:
1 bci
p
```

```
        BCI     6,DJREES
i               stop
file
R 3.316+1.350


fap djr6
W 1713.0
   00040     0           STOP
     LENGTH    12
   ASSEMBLY FAILED
R 3.750+.550


delete djr6 *
W 1714.5
R 1.066+1.233


ed djr6 fap
W 1714.7
  DJR6   FAP NOT FOUND.
 INPUT:
                tia             =hrdflxa
                pze             0,,6
                tsx             =hwrflxa
                pze             0,,6
                end

 EDIT:
 c?
 INPUT:
```

```
EDIT:
t
c qtsxq tiaq 6 g
p
        END
t
p 6


        TIA     =HRDFLXA
        PZE     0,,6
         TIA     =HWRFLXA
        PZE     0,,6
        END
file
R 7.300+2.766


fap djr6
W 1717.5
    00030     U             TIA     =HWRFLXA
      LENGTH     5
    ASSEMBLY FAILED
R 2.500+.450


delete djr6 fap
W 1718.3
R .066+.683


ed djr6 fap
W 1718.4
   DJR6   FAP NOT FOUND.
```

```
INPUT:
                    tia             =hrdflxa
                    pze             0,,6
                    tia             =hwrflxa
                    pze             0,,6
                    end

    EDIT:
    file
    R 3.200+1.533


fap djr6
W 1719.8
     LENGTH     6
R 3.833+.466

link quad madINT. IGNORED.
?
permit quad mad 0 t191 9"8002
W 1721.1
R .466+1.000

loadgo djr6
W 1721.3
EXECUTION.
djrees
 PROTECTION MODE VIOLATION AT 00357.
 INS.=606060606060, RI.=000000000000, PI.=005206000000
R 1.266+.550
```

```
delete djr6 *
W 1721.8
R 1.383+.250


delete quad *
       W 1722.9
R 1.916+.300

ed djr6 fap
W 1723.9
    DJR6   FAP NOT FOUND.
                    INPUT:
                                  tsx              .clear,4
                opn               fred,,10
                                                   end

EDIT:
file
R 2.300+1.116

fap djr6
 W 1724.7
   00010     U            TSX      .CLEAR,4
   00020     UO           OPN      FRED,,10
          LENGTH     2
   ASSEMBLY FAILED
R 3.783+.450


delete djr6 *
W 1725.7
R 2.383+.850


ed djr6 fap
W 1726.4
  DJR6   FAP NOT FOUND.
 INPUT:
```

```
                tia             =n.clear
                pze             fred,,10
                end

EDIT:
fi-
INPUT:


EDIT:
file
R 2.616+1.516

fap djr6
W 1727.8
   00020     U            PZE     FRED,,10
     LENGTH     3
   ASSEMBLY FAILED
R 3.133+.433

delete?
ed djr7 fap
W 1729.6
  DJR7   FAP NOT FOUND.
INPUT:
                tsx             .dlete,4
                pze             djr6
                end

EDIT:
```

```
file
R 3.266+2.350

 fap djr7
W 1730.4
     00010      U              TSX      .DLETE,4
    00020      U             PZE      DJR6
                                    LENGTH      2

 ASSEMBLY FAILED
R 2.850+.483


delete djr7 fap
          W 1731.0
            R .166+2.833

delete djr6 fap
          W 1731.2
R .183+.383

ed  djr6 fap
       W 1732.8
   DJR6    FAP NOT FOUND.
 INPUT:
                 tsx              stomap,4
                 end


 EDIT:
 file
 R 5.550+1.000


 fap djr6
 W 1734.8
    00010      U              TSX      STOMAP,4
      LENGTH      1
    ASSEMBLY FAILED
```

```
R 2.333+.700


delete djr6 fap
W 1735.2
R .200+1.050


ed djr6 fap
     W 1735.5
  DJR6   FAP NOT FOUND.
INPUT:
                tia             =hstomap
                end


EDIT:
file
R 2.100+.833


fap djr6
W 1736.2
     LENGTH     2
R 4.150+1.100


loadgo djr6
W 1737.2
  EXECUTION.
 SUBROUTINE STOMAP NOT IN CORE
 PROTECTION MODE VIOLATION AT 05200.
 INS.=010100005201, RI.=000000000000, PI.=005202000000
R 1.816+1.100
```

(3)

```
ed?

delete djr6 *
W 1739.5
R 1.666+.366

ed djr6 fap
W 1740.3
    DJR6   FAP NOT FOUND.
                    INPUT:
                cla             =7777
                                ts""tia         =hsetmem
                tsx             $.pcomt,4
                txh             6
bci             6,djrees
                end

EDIT:
fi""l bci
p
BCI     6,DJREES
          r       bci           6,djrees
file
R 7.000+2.883


fap djr6
W 1743.7
     LENGTH     15
R 3.016+.666


loadgo djr6
W 1744.0
EXECUTION.
R 4.350+.683
```

W 1744.5

```
  DJR6    FAP       09/17  1744.5


   00010            CLA     =7777
   00020            TIA     =HSETMEM
   00030            TSX     $.PCOMT,4
   00040            TXH     6
   00050            BCI     6,DJREES
   00060            END
```

R .583+.416

whoami

W 1748.5

WHOAMI NOT FOUND.

READY.

baf?befap djr6

W 1751.6

```
 U     00002  0074 00 4                        TSX     $.PCOMT,4
      LENGTH 00014
        ERROR IN ABOVE ASSEMBLY
```

R 2.983+.533

gpss

W 1753.4

ERROR 012 FOUND AT 70334 IN CALL TO OPEN FOR GPSS

NO ERROR RETURN SPECIFIED.

R 1.850+.600

```
gpss djr6
W 1754.2
  ERROR 012 FOUND AT 70334 IN CALL TO OPEN   FOR   DJR6  GPSS
 NO ERROR RETURN SPECIFIED.
R 1.733+.683

delete djr6
W 1754.5
          DJR6 INCOMPLETE SET OF ARGUMENTS
R .133+.366

de-delete djr6 *
W 1754.8
  R 1.633+.533

   edl djr6 gpss
          W 1755.1
 FILE   DJR6  GPSS NOT FOUND.
 Input
 mary had
   a little
 lamb

 Edit
 file
 R 3.366+1.133

 gpss djr6
 W 1755.9
* * END OF SIMULATION * *

R 2.183+.716
```

```
edl djr6 gpss
W 1756.5
#Edit
b
Input
print(fred)
t
i print(jim)

Edit
file
R 2.866+1.233

gpss djr6
W 1757.3
 LOC  NAME         X      Y      Z      SEL    NBA    NBB    MEAN  MOD    REMARKS
002MARY HAD002A LITTLE001LAMB002PRINT(FRED)001T002
   ERROR IN NAME   FIELD OF ABOVE CARD.   PLEASE CORRECT IT NOW OR TYPE IGNORE
ignore

 QUIT,
R 2.566+.600

delete djr6 *
W 1758.8
R 1.266+1.133

edl djr6 gpss
W 1759.1
 FILE   DJR6   GPSS NOT FOUND
```

57

```
Input
000mary

 QUIT,
R 1.183+.616

edl djr6 snobol
W 1800.2
   FILE   DJR6SNOBOL NOT FOUND.
Input
* ferd *
*fred *


Edit
file
R 1.650+1.100

snobol djr6
W 1801.1
END OF FILE READ ON SNOBOL FILE
 FATAL ERROR ENCOUNTERED DURING COMPILATION.
ERROR READING INPUT TAPE
R 2.083+.500


print djr6 bcd
W 1802.3

 DJR6    BCD      09/17  1802.3


PAGE   1                                                1801.2      09/17


     * FERD *
```

```
R 1.250+.400

delete djr6 *
W 1802.8
R 1.366+.366

strudl
W 1803.4
TYPE.
fred
FRED
 THE WORD *  FRED* CANNOT BE TRANSLATED
 PLEASE, TYPE CORRECT STATEMENT.
TYPE.
truss
TRUSS
 THE WORD * TRUSS* CANNOT BE TRANSLATED
 PLEASE, TYPE CORRECT STATEMENT.
TYPE.
mary had a little lamb
MARY HAD A LITTLE LAMB
 THE WORD *  MARY* CANNOT BE TRANSLATED
 PLEASE, TYPE CORRECT STATEMENT.
TYPE.
load
LOAD
 THE WORD *  LOAD* CANNOT BE TRANSLATED
 PLEASE, TYPE CORRECT STATEMENT.
```

```
TYPE.

stress

STRESS

 THE WORD *STRESS* CANNOT BE TRANSLATED
                                    PLEASE, TYPE CORRECT STATEMENT.
                                                          TYPE.

bar

BAR
 THE WORD *   BAR* CANNOT BE TRANSLATED
 PLEASE, TYPE CORRECT STATEMENT.

TYPE.
data

DATA
 THE WORD *  DATA* CANNOT BE TRANSLATED
                                    PLEASE, TYPE CORRECT STATEMENT.
                                                          TYPE.

screwdriver

     SCREWDRIVER
 THE WORD *SCREWD* CANNOT BE TRANSLATED

 PLEASE, TYPE CORRECT STATEMENT.

TYPE.

 QUIT,

R 4.200+5.400


tip

W 1807.5

TYPE YOUR REQUESTS.


1

INT. 0

library


THE DATE IS 00/00/08
```

THE VOLUMES AVAILABLE TODAY ARE...

ANNALS OF PHYSICS

J384 - ANNPHY - ANN PHYS

V 26 - 38

APPLIED PHYSICS LETTERS

J646 - APPLET - APPL PHYS LETTERS

V 3 - 8

CANADIAN JOURNAL OF PHYSICS

J55 - PHYCAN - CAN J PHYS

V 42 - 44

HELVETICA PHYSICA ACTA

J43 - PHYHEL - HELV PHYS ACTA

V 37 - 39

INDIAN JOURNAL OF PHYSICS

J164 - INDJPH - IND J PHYS

V 38 - 39

JETP LETTERS

J821 - JETLET - JETP LETTERS

V 1 - 3

JAPANESE JOURNAL OF APPLIED PHYSICS

J612 - PHAPJA - JAPAN J APPL PHYS

V 3 - 5

JOURNAL OF APPLIED PHYSICS

J11 - PHYAPP - J APPL PHYS

V 35 - 37

JOURNAL OF CHEMICAL PHYSICS

J12 - JCHEPH - J CHEM PHYS

V 40 - 44

JOURNAL OF MATHEMATICAL PHYSICS

J227 - MAP QUIT,

R 8.316+2.166

tip
W 1812.4

TYPE YOUR REQUESTS.
search j11 v35

find title layer

output print title,author

go

JOURNAL OF APPLIED PHYSICS

VOLUME 35

EFFECT OF GROWTH RATE ON STACKING-FAULT DENSITY IN EPITAXIAL SILICON LAYERS

NOTIS M. R.

WESTERN ELECTRIC COMPANY

CONARD G. P.

MAGNETIC TRANSITION LAYER SPIN CONFIGURATION

SOOHOO R. F.

ANALYTICAL FORMULATION OF INCREMENTAL ELECTRICAL CONDUCTIVITY

IN SEMICONDUCTORS ARISING FROM AN ACCUMULATION SPACE CHARGE

LAYER

LEE VIN-JANG

MASON DONALD R.

DAMAGED LAYERS IN ABRADED (111) SURFACES OF LNSB

PUGH E. N.

SAMUELS L. E.

ANALYSIS OF THE DEPLETION LAYER TRANSDUCER

STRAUSS WALTER

EXPERIMENTAL ANALYSIS OF THE SCHOTTKY BARRIER LAYER MODEL F

REDUCED RUTILE DIODES

BECHTEL RICHARD

STRUCTURE OF ANODIC LAYERS ON THE (100) FACE OF ALUMINUM

MODIFICATION OF THE THRESHOLD CURRENT AND NEAR-FIELD EMISSI

PATTERN OF A GAAS LASER BY AN ADSORBED DIELECTRIC LAYER

WALKER E. J.

MICHEL A. E.

METHOD FOR HALL MOBILITY AND RESISTIVITY MEASUREMENTS ON THIN

LAYERS

LANGE JULIUS

AMORPHOUS OXIDE LAYERS ON GOLD AND NICKEL OBSERVED BY ELECTRON

MICROSCOPY

GIMPL M. L.

FUSCHILLO N.

SEARCH COMPLETED, 711 ARTICLES.
6.88 SECONDS, 103.3 ARTICLES/SEC.

10 A

search v284""""j384 v38
find author rees
output print title
go

ANNALS OF PHYSICS
VOLUME 38

SEARCH COMPLETED, 17 ARTICLES.
.79 SECONDS, 21.5 ARTICLES/SEC.

0 ARTICLES FOUND.

search j384 v38
find title twist
output print title
go

ANNALS OF PHYSICS
VOLUME 38

SEARCH COMPLETED, 17 ARTICLES.
.79 SECONDS, 21.5 ARTICLES/SEC.

0 ARTICLES FOUND.

search j384 v38
find title the

RTICLES FOUND.

output pt"rint title

go

ANNALS OF PHYSICS

VOLUME 38

IMPLICATIONS OF THE ALGEBRA OF CURRENTS APPROACH TO HIGHER SYMMETRIES

STATISTICAL THEORY OF RADIATIVE PROCESSES IN PLASMAS

REPRESENTATION THEORY FOR CLASSICAL MECHANICS

QUASI-PARTICLE EXCITATIONS AND THE MANY-BOSON PROBLEM

INELASTIC LEVINSON'S THEOREM, CDD SINGULARITIES, AND MULTIPLE RESONANCE POLES

TRANSPORT PROPERTIES OF AN ELECTRON GAS IN A MAGNETIC FIELD I. THE NONOSCILLATORY TRANSPORT COEFFICIENTS

MICROSCOPIC THEORY OF A NORMAL FERMI LIQUID AT ZERO TEMPERATURE

SEARCH COMPLETED, 17 ARTICLES.

1.79 SECONDS, 9.4 ARTICLES/SEC.

7 ARTICLES FOUND.

formac

$

QUIT

```
R 47.483+8.783


formac

W 1832.3

READY

a=x*y$

READY

deriv(a,x,1)


 FORMAC ERROR NO.  7900 HAS OCCURRED

READY

b=deriv(a,x,1)

$

READY

print b$

 B       =    Y$

READY

a=x**2+x+1$

READY

b=deriv(a,x,1)$

READY

print b$

 B       =    X*2.0+1.0$

READY

a=x*x+x+1$

READY

b=deriv(a,x,1)$

READY

print b$
```

```
 B        =    X*2.0+1.0$
READY
a=sin(x**2)$
READY
print deriv(a,x,1)$

 FORMAC ERROR NO.  7896 HAS OCCURRED
READY
b=deriv(a,x,1)$
READY
print b$
 B        =    X*COS(X**2.0)*2.0$
READY
dump$
 A        =    SIN(X**2.0)$
 B        =    X*COS(X**2.0)*2.0$
READY
print fred$

 FORMAC ERROR NO.  7896 HAS OCCURRED
READY
harry=nit$
READY
print harry$
        HARRY    =    NIT$
READY
nit=2$

 FORMAC ERROR NO.  7910 HAS OCCURRED
                                READY
print harry$
```

```
 HARRY    =    NIT$
READY
nit=twit$

 FORMAC ERROR NO.  7910 HAS OCCURRED
                              READY
                              dump$
                               A          =    SIN(X**2.0)$
                                                        B          =    X*COS(X**2.0)*2.
                                                                                        HA


erase harry$
READY
nit=twit$

 FORMAC ERROR NO.  7910 HAS OCCURRED
                              READY
harry=nit$
    READY
erase nit$


 FORMAC ERROR NO.  7910 HAS OCCURRED
READY
expand harry$


 FORMAC ERROR NO.  7900 HAS OCCURRED
READY
a=expand harry$
READY
print a$
 A          =    NIT$
READY
print nit$
```

```
0$
RRY    =    NIT$
            READY
```

```
READY
subst$

 FORMAC ERROR NO.  7900 HAS OCCURRED
READY
b=subst harry,(nit,twit)$
READY
print harry$
 HARRY    =    NIT$
READY
c=param(nit,twit)$
READY
print b$
 B        =    TWIT$
READY
harry=subst harry,c$
READY
print harry$
 HARRY    =    TWIT$
READY
x=deriv(harry,nit,1)$

 FORMAC ERROR NO.  7910 HAS OCCURRED
READY
x=harr$

 FORMAC ERROR NO.  7910 HAS OCCURRED
READY
x=deriv(harry,harry,1)$
```

```
 FORMAC ERROR NO.  7910 HAS OCCURRED
READY
x=deriv(harry,y,1)$

 FORMAC ERROR NO.  7910 HAS OCCURRED
                              READY
                              dump$
                               A          =    NIT$
                                               B          =    TWIT$
                                                               HARRY    =    TWIT$
                                                                            READY

c=expand harry**2$

 FORMAC ERROR NO.  7910 HAS OCCURRED
READY
 QUIT,
R 3.933+26.383

pm
W 1855.5
INT. 0
READY
pm 0 10
 QUIT,
R .033+1.650

edl djr6
W 1859.3
 FILE   DJR6(MEMO) NOT FOUND.
input
mary
```

nad

a

little

lamb

Edit

file

Not a request:

ILE

file

R 1.700+1.350

runoff djr6

W 1900.2

Load paper, hit return

Ay A ite aB

```
 QUIT,
R .016+.000

log
W 1901.2
ERROR 003 FOUND AT 20772 IN CALL TO ATTACH FOR  T0191CMFL02
R 1.250+.366

copy s syslog bcd
W 1902.2
R 1.700+.316

print syslog bcd
W 1902.4

SYSLOG    BCD       09/17  1902.4
```

```
   00020    MESSAGE ORIGINALLY ENTERED ON 11-4-65 AND LATER LOST WAS ..
   00030    SYSTEM MAC2C2.  (1) MODULE COMD3G.  COMMAND STRESS REPLACED BY
                                                                      00040
                                                                  D
   00050    BACKSPACE AFTER WRITE ERROR FIXED.

R .633+.283

delete syslog bcd
            W 1903.3
               R .116+.316

info
W 1904.0
  INFO NOT FOUND.
READY.

info gpss
W 1904.6
  INFO NOT FOUND.
READY.

list
W 1905.0
  LIST NOT FOUND.
READY.

resume .
W 1906.9
ERROR 012 FOUND AT 22754 IN CALL TO OPEN   FOR      . SAVED
R .100+.383

link . saved ts525 x6029
W 1908.2
```

COMMAND STRUDL AT REQUEST OF AUTHORS. (2) MODULE T

2 . P A

52

```
R 1.516+.416

link . saved
W 1908.7
PROPER FORMAT IS
  LINK NAME1 NAME2 PROB PROG -NAME3- -NAME4-
IF RENAMING, NAME3 NAME4 IS THE OLD NAME,
I.E., THE ONE TO WHICH THE LINK IS DIRECTED.

R .350+.316

resume gpm
W 1909.3
ERROR 012 FOUND AT 22754 IN CALL TO OPEN   FOR    GPM SAVED
R .166+.383

r enciph djr6 lisp djr7 psil
W 1911.3
ERROR 012 FOUND AT 22754 IN CALL TO OPEN   FOR ENCIPH SAVED
R .283+.383

r slave 0 111
       W 1913.8
ERROR 012 FOUND AT 22754 IN CALL TO OPEN   FOR  SLAVE SAVED
R .050+.783

r who
W 1914.1

MAC5A9 STARTED AT  845.2 09/16
```

```
  BACKGROUND USED 1327.7.      PERCENTAGE =      0
 14  USERS AT  1914.1 09/17

LINE   USER     NAME  GRP UNIT  TUSED TIMEON
 1 C0056 99995 FIBMON  0 (FIB)     .9  312.1 09/17
 2 C0056 99999 DAEMON  0 DAEMON 237.0  845.3 09/16
                                          3 T0113  4121  CRAFT  1 20000+

T0191  8001 MISTR1  1 20000.  10.3 1538.8
                                        5 T0269  8037sp QUIT,

R .016+.000

r who 1
 W 1914.9

MAC5A9 STARTED AT  845.2 09/16

  BACKGROUND USED 1328.2.      PERCENTAGE =      0
 14  .erINT. IGNORED.
 QUIT,
R .983+.533


r who t191 1
W 1916.1


MAC5A9 STARTED AT  845.2 09/16


 14  USERS AT  1916.2 09/17


USERS NOT FOUND.


R .533+.533


r who1?
```

1.5 1809.7 09/17

```
r who 1
W 1917.8

MAC5A9 STARTED AT  845.2 09/16

  BACKGROUND USED 1329.7.      PERCENTAGE =      0
 13  USERS AT  1917.9 09/17

LINE   USER      NAME   GRP UNIT   TUSED TIMEON
 1 C0056 99995 FIBMON   0 (FIB)      .9  312.1 09/17
 2 C0056 99999 DAEMON   0 DAEMON  237.1  845.3 09/16
 4 T0191  8001 VISTR1   1 20000.   10.3 1538.8 09/17
 5 T0269  8037 SOTSKY   1 20000.    .7 1843.8
 6 T0109  2531 ENBAUM   4 20000W  15.6  938.2
 7 T0168  2528 MORRIS   1 600054   2.5 1818.9
 8 T0252  4675   WARE   1 20000.    .9 1852.0
 9 T0107  4103 OWSTON   1 20000S    .4 1856.5
10 T0191  8002 VISTR2   1 600034   8.4 1730.8
11 T0252  4712 HSKENS  16 20000,    .7 1912.4
13 T0168  1235   NESS  17 600016   2.9 1753.6
14 T0191  8003 VISTR3   1 20000K   8.5 1550.1
19 T0169  2750 MILLER   1 600057  17.0 1438.5

  BACKGROUND USED 1329.7.      PERCENTAGE =      0
 13  USERS AT  1918.9 09/17

LINE   USER      NAME   GRP UNIT   TUSED DUSED
 1 C0056 99995 FIBMON   0 (FIB)      .9    .0
```

```
 2 C0056 99999 DAEMON  0 DAEMON 237.6    .5
 4 T0191  8001 VISTR1  1 20000.  10.4    .0
 5 T0269  8037 SOTSKY  1 20000.    .7    .0
 6 T0109  2531 ENBAUM  4 20000W  15.7    .0
 7 T0168  22 QUIT,
R .000+.000

listf
W 1920.7

    55 FILES     70 RECORDS
 NAME1  NAME2 MOD NOREC   USED
  DJR6 (MEMO) 000     1 09/17/66
(MOVIE TABLE) 001     1
PERMIT   FILE 120     1
  DJR5   LISP 000     1
  GAME    BSS 000     3
  GAME    MAD 000     2
 GAMET    BSS 000     1
 GAMET    MAD 000     1
SCHERE  ALGOL 00 QUIT,
R 1.816+.316

delete djr6 *
W 1921.3
R 1.166+.316

delete (movu"ie table)
W 1921.6
```

```
R .416+.300


delete permit file
W 1921.8
PERMIT  FILE   120 MODE. DO YOU WANT TO DELETE IT,     yes
R .216+.383


loadgo game
W 1922.3
EXECUTION.
WHO IS TO START
XORO EQUALS X OR O AS APPROPRIATE
x
****** BAD CARD,  X


****  X       IS NOT A VARIABLE IN THE CALLING PROGRAM
 TO PROCEED, RETYPE THIS CARD AND ALL SUCCEEDING ONES.
   OTHERWISE, HIT QUIT.
 QUIT,
R 6.166+.733


loadgo game
      W 1923.5
EXECUTION.
WHO IS TO START
XORO EQUALS X OR O AS APPROPRIATE

xoro=x
****** BAD CARD,  XORO=X

***** ILLEGAL CHARACTER IN COLUMN 06,     X
```

TO PROCEED, RETYPE THIS CARD AND ALL [illegible]

```
 QUIT,
R 5.433+1.133

  print game nad""""mad
W 1924.6
    GAME     MAD NOT FOUND
                      R .233+.350

                     list game mad
                             W 1925.3
                                  LIST NOT FOUND.
                                          READY.


listf game mad
        W 1925.5

NAMES NOT FOUND:

  GAME     MAD


R 1.183+.383


listf

W 1925.7


  NAME1 FNAME2 MODE2 NORECORDS USED

 (MOVIE TABLE) 001      1 09/17/66

   DJR5    LISP 000      1

   GAME     BSS 000      3

  GAMET     BSS 000      1

  GAMET     MAD 000      1

 STAMPE     MAD 000      2

     HW   COMIT 000      1
```

EDITING ONES.

OTHERWISE, HIT QUIT.

```
  DJR1     MAD 00    QUIT,
R 2.100+.716


delete (movie table)
W 1926.4
R .166+.333


print gamet mad
W 1926.6


 GAMET    MAD       09/17  1926.7


                DIMENSION V(10)
                DIMENSION B(9)
                NORMAL MODE IS INTEGER
                X=$X$
                Y=$Y$
                Z=$Z$
                B(1)=X
                B(2)=Y
                B(3)=Z
                B(4)=Y
                B(5)=Z
                B(6)=X
                                B(7)=Z
                B(8)=X
                B(9)=Y
                PRINT COMMENT$TEST$
                PRINT FORMAT V, B(1),B(2),B(3),B(4),B(5),B(6),B(7),B(8),B(9)
                PRINT COMMENT$ENDTEST$
```

```
                VECTOR VALUES V=$3(C1,S1)/3(C1,S1)/3(C1,S1)*$

                END OF PROGRAM
R .950+.350


loadgo gamet
W 1927.5
EXECUTION.
TEST
X Y Z
Y Z X
Z X Y
ENDTEST
   EXIT CALLED. PM MAY BE TAKEN.
R 5.816+.416

delete gamet *
         W 1928.0
            R 1.233+.383


comit hw
W 1928.4


SUCCESSFUL COMPILATION, WORKSPACE CONTAINS 21443 REGISTERS.


 THE MAN IS OLD.THE END .
21419 REGISTERS OF THE WORKSPACE WERE UNUSED.


COMDUMP OF CHANGED DATA AFTER 10 RULES.
  THE WORKSPACE IS EMPTY.
  SHELF 1 IS EMPTY.


R 3.133+.483


comit hw1
W 1928.9
```

SUCCESSFUL COMPILATION, WORKSPACE CONTAINS 21497 REGISTERS.

HARRY WHITFIELD IS A NIT

21477 REGISTERS OF THE WORKSPACE WERE UNUSED.

COMDUMP OF CHANGED DATA AFTER 2 RULES.

THE WORKSPACE IS EMPTY.

R 2.833+.466

print hw1 comit

W 1929.5

HW1 COMIT 09/17 1929.6

* $ =-HARRY-WHITFIELD-IS-A-NIT-*. // *WAL1 *

STOP *

END

R .550+.333

print hw comit

W 1929.9

HW COMIT 09/17 1929.9

* $=-DER +-MANN + -IST +-ALT +. *

* -DER =-THE *

* -MANN =-MAN *

* -IST = -IS *

```
* -ALT = -OLD    *
          * $=1 // *Q1 1 *
* $=THE-END-. // *Q1 1 *
                * $=1 // *A1 1 *
                        * $=1 // *WAL1 *
                                STOP  *
                                  END

.700R+.166

ttpeek
W 1930.7

 9/17  1930.7 TUSED = 11.1

             SHIFT        MINUTES
                               ALLOTTED   USED
                                      1      15      13.7
                                                  2       30

  15       0.                                     5

       STORAGE

DEVICE   QUOTA   USED

DISK       100     60

R 1.616+.350

ttpeek

W 1931.2

 9/17  1931.2 TUSED = 11.2

SHIFT       MINUTES

      ALLOTTED   USED

 1      15      13.7
```

30.0

3	60	37.2		
		4	60	24.7

```
    2        30        30.0
    3        60        37.2
    4        60        24.7
    5        15         0.

          STORAGE
    DEVICE    QUOTA    USED
    DISK        100      60

    R 1.016+.416

logout
W 1932.1
 T0191  8001 LOGGED OUT 09/17/66    1932.2 FROM 20000.
 TOTAL  TIME USED=  11.1 MIN.
-login t191 vistr1
W 1933.1
Password
 T0191  8001 LOGGED IN  09/17/66    1933.3 FROM 20000.
 LAST LOGOUT WAS  09/17/66    1932.2

 CTSS BEING USED IS     MAC5A9
R 3.600+.833
```