FAP

Ok

```
         INIT   FAP                                              
         ENTRY  INITAS                                      000010
         ENTRY  MTLIST                                      000020
         ENTRY  NUCELL                                      000030
         ENTRY  RCELL                                       000040
INITAS   SXA    FOUR,4                                      000050
         AXT    1000,4                                      000060
ZERO     STZ    SPACE,4                                     000070
         TIX    ZERO,4,1                                    000080
         STZ    SPACE,4                                     000090
         CLA    =998                                        000100
         STO    N                                           000110
MORE     CLA    ZERO                                        000120
         SUB    N                                           000130
         STA    *+1                                         000140
         AXC    **,4                                        000150
         STA    -2,4                                        000160
         CLA    N                                           000170
         SUB    =2                                          000180
         STO    N                                           000190
         TNZ    MORE                                        000200
         CLA    ZERO                                        000210
         ALS    18                                          000220
         SUB    =02000000                                   000230
         STO    AVSL                                        000240
         ARS    18                                          000250
         SUB    =998                                        000260
         STA    AVSL                                        000270
FOUR     AXT    **,4                                        000280
         TRA    2,4                                         000290
N        PZE                                                000300
AVSL     PZE                                                000310
SPACE    BES    1000                                        000320
MTLIST   SXA    OUT,4                                       000330
         CLA*   1,4                                         000340
         STO    LIST                                        000350
         STA    *+1                                         000360
H        CLA    **                                          000370
         STO    HEAD                                        000380
         TSX    $LISTMT,4                                   000390
         TXH    LIST                                        000400
         TZE    OUT                                         000410
         CLA    HEAD                                        000420
         STA    TOP                                         000430
         STO    BOT                                         000440
         CLA    LIST                                        000450
         STA*   H                                           000460
         STO*   H                                           000470
         CLA    AVSL                                        000480
         ARS    18                                          000490
         STA    *+2                                         000500
         CLA    TOP                                         000510
         STA    **                                          000520
         CLA    BOT                                         000530
         STO    AVSL                                        000540
         ARS    18                                          000550
         STA    *+2                                         000560
         ZAC    0                                           000570
         STA    **                                          000580
```

```
OUT     AXT     **,4  <-- CLA LIST                              000590
        TRA     2,4                                             000600
HEAD    PZE                                                     000610
LIST    PZE                                                     000620
TOP     PZE                                                     000630
BOT     PZE                                                     000640
NUCELL  SXA     SAVE,1                                          000660
START   CLA     AVSL                                            000670
        STA     RESULT                                          000680
        STA     *+1                                             000690
        AXC     **,1                                            000700
        CLA     0,1                                             000710
        STO     CELL                                            000720
        ANA     =077777                                         000730
        TZE     MORA                                            000740
        STA     AVSL                                            000750
        CLA     CELL                                            000760
        ANA     =0700000                                        000770
        CAS     =0100000                                        000780
        TRA     NOLIST                                          000790
        TRA     LUST                                            000800
NOLIST  CLA     ZERA                                            000810
        STO     0,1                                             000820
        STO     1,1                                             000830
        CLA     RESULT                                          000840
SAVE    AXT     **,1                                            000850
        TRA     2,4                                             000860
LUST    CLA     1,1                                             000870
        STO     NAME                                            000880
        SXA     SV4,4                                           000890
        TSX     $IRALST,4                                       000900
        TXH     NAME                                            000910
SV4     AXT     **,4                                            000920
        TRA     NOLIST                                          000930
MORA    SXA     SV5,4                                           000940
        TSX     $ADAS,4                                         000950
        TXH     THOUS                                           000960
SV5     AXT     **,4                                            000970
        TRA     START                                           000980
ZERA    PZE                                                     000990
NAME    PZE                                                     001000
RESULT  PZE                                                     001010
CELL    PZE                                                     001020
THOUS   DEC     1000                                            001030
RCELL   CLA     AVSL                                            001060
        ARS     18                                              001070
        STA     *+2                                             001080
        CLA*    1,4                                             001090
        STA     **                                              001100
        STA     *+3                                             001110
        ALS     18                                              001120
        STD     AVSL                                            001130
        STA     **                                              001140
        TRA     2,4                                             001150
        END                                                     001170
      PRIMIT    FAP                                             000010
        ENTRY   SETDIR                                          000020
        ENTRY   MADOV                                           000030
        ENTRY   MRKPOS                                          000040
        ENTRY   MRKNEG                                          000050
        ENTRY   LNKR                                            000060
```

```
        ENTRY   LNKL                                    000070
        ENTRY   ID                                      000080
        ENTRY   STRIND                                  000090
        ENTRY   SETIND                                  000100
        ENTRY   CONT                                    000110
LNKL    CAL*    1,4                                     000120
        ANA     =077777000000                           000130
        ARS     18                                      000140
        TRA     2,4                                     000150
LNKR    CAL*    1,4                                     000160
        ANA     =077777                                 000170
        TRA     2,4                                     000180
ID      CAL*    1,4                                     000190
        ANA     =0700000                                000200
        ARS     15                                      000210
        TRA     2,4                                     000220
STRIND  CLA*    2,4                                     000230
        STA     *+2                                     000240
        CLA*    1,4                                     000250
        STO     **                                      000260
        TRA     3,4                                     000270
SETDIR  CLA     4,4                                     000280
AAA     STA     A                                       000290
        STA     C                                       000300
        STA     E                                       000310
        CLA*    1,4                                     000320
        TMI     B                                       000330
        ALS     15                                      000340
A       STT     **                                      000350
B       CLA*    2,4                                     000360
        TMI     D                                       000370
        ALS     18                                      000380
C       STD     **                                      000390
D       CLA*    3,4                                     000400
        TMI     F                                       000410
E       STA     **                                      000420
F       CLA*    *-1                                     000430
        TRA     5,4                                     000440
SETIND  CLA*    4,4                                     000450
        TRA     AAA                                     000460
CONT    CLA*    1,4                                     000470
        STA     *+1                                     000480
        CLA     **                                      000490
        TRA     2,4                                     000500
MADDV   CAL     1,4                                     000510
        ANA     =077777                                 000520
        TRA     2,4                                     000530
MRKPOS  CLA*    1,4                                     000540
        STA     *+2                                     000550
        STA     *+3                                     000560
        CLA     **                                      000570
        SSP                                             000580
        STO     **                                      000590
        TRA     2,4                                     000600
MRKNEG  CLA*    1,4                                     000610
        STA     *+2                                     000620
        STA     *+3                                     000630
        CLA     **                                      000640
        SSM                                             000650
        STO     **                                      000660
        TRA     2,4                                     000670
```

```
        END                                                                 000680
      PUTGET    FAP                                                         000690
        ENTRY   KGETBL                                                      000700
        ENTRY   KGETIN                                                      000710
        ENTRY   KPUTBL                                                      000720
        ENTRY   KPUTIN                                                      000730
KGETBL  SYN     *                                                           000740
        SXA     SV1,1                                                       000750
        CLA*    1,4                                                         000760
        PAX     ,1                                                          000770
        CAL*    2,4                                                         000780
        XEC     BLGETS,1                                                    000790
        ANA     =077                                                        000800
        ORA     =H      0                                                   000810
        SLW     TEMP                                                        000820
        CLA     TEMP                                                        000830
        LXA     SV1,1                                                       000840
        TRA     3,4                                                         000850
KGETIN  SYN     *                                                           000860
        SXA     SV1,1                                                       000870
        CLA*    1,4                                                         000880
        PAX     ,1                                                          000890
        CAL*    2,4                                                         000900
        XEC     INGETS,1                                                    000910
        ANA     =077                                                        000920
        LXA     SV1,1                                                       000930
        TRA     3,4                                                         000940
KPUTIN  SYN     *                                                           000950
KPUTBL  SYN     *                                                           000960
        CAL*    2,4                                                         000970
        SLW     TEMP                                                        000980
        SXA     SV1,1                                                       000990
        CLA*    1,4                                                         001000
        PAX     ,1                                                          001010
        CAL     TEMP                                                        001020
        ANA     =077                                                        001030
        XEC     BLPUTS,1                                                    001040
        SLW     TEMP                                                        001050
        CAL*    3,4                                                         001060
        ANA     PUTM,1                                                      001070
        ORA     TEMP                                                        001080
        SLW*    3,4                                                         001090
        CLA*    3,4                                                         001100
        LXA     SV1,1                                                       001110
        TRA     4,4                                                         001120
        ARS     0                                                           001130
        ARS     6                                                           001140
        ARS     12                                                          001150
        ARS     18                                                          001160
        ARS     24                                                          001170
        ARS     30                                                          001180
BLGETS  SYN     *                                                           001190
INGETS  SYN     *                                                           001200
        ALS     0                                                           001210
        ALS     6                                                           001220
        ALS     12                                                          001230
        ALS     18                                                          001240
        ALS     24                                                          001250
        ALS     30                                                          001260
BLPUTS  SYN     *                                                           001270
        OCT     777777777700,777777770077,777777007777,777700777777        001280
```

```
        OCT     770077777777,007777777777                       001290
PUTM    SYN     *                                               001300
TEMP    PZE     **                                              001310
SV1     PZE     **                                              001320
        END                                                     001330
         SQIN   FAP                                             001340
        ENTRY   SQIN                                            001350
        ENTRY   SQOUT                                           001360
        ENTRY   LANORM                                          001370
        ENTRY   SHININ                                          001380
        ENTRY   SHINBL                                          001390
SQOUT   SYN     *                                               001400
        CAL*    2,4                                             001410
        ANA*    1,4                                             001420
        STQ     SVQ                                             001430
        XCL                                                     001440
        CAL*    1,4                                             001450
        TRA     *+2                                             001460
        LGR     1                                               001470
        LBT                                                     001480
        TRA     *-2                                             001490
        STQ     TEMP                                            001500
        LDQ     SVQ                                             001510
        CLA     TEMP                                            001520
        TRA     3,4                                             001530
LANORM  SYN     *                                               001540
        STQ     SVQ                                             001550
        CAL*    1,4                                             001560
        SLW     SAVE                                            001570
        LAS     =H                                              001580
        TRA     *+2                                             001590
        TRA     A                                               001600
        LDQ     =H                                              001610
        TRA     *+3                                             001620
        CAL     SAVE                                            001630
        LGL     6                                               001640
        SLW     SAVE                                            001650
        ANA     =0770000000000                                  001660
        LAS     =H 00000                                        001670
        TRA     *+2                                             001680
        TRA     *-6                                             001690
A       CLA     SAVE                                            001700
        LDQ     SVQ                                             001710
        TRA     2,4                                             001720
SHININ  SYN     *                                               001730
SHINBL  SYN     *                                               001740
        CAL*    2,4                                             001750
        SLW     TEMP                                            001760
        SXA     SV1,1                                           001770
        CLA*    1,4                                             001780
        PAC     ,1                                              001790
        STQ     SVQ                                             001800
        CAL     TEMP                                            001810
        LGR     ,1                                              001820
        CAL*    3,4                                             001830
        LGL     ,1                                              001840
        SLW*    3,4                                             001850
        CLA*    3,4                                             001860
        LDQ     SVQ                                             001870
        LXA     SV1,1                                           001880
        TRA     4,4                                             001890
```

```
SQIN    SYN     *                                                   001900
        CAL*    1,4                                                 001910
        COM                                                         001920
        ANS*    3,4                                                 001930
        STQ     SVQ                                                 001940
        LDQ*    2,4                                                 001950
        CAL*    1,4                                                 001960
        TRA     *+3                                                 001970
        ARS     1                                                   001980
        RQL     1                                                   001990
        LBT                                                         002000
        TRA     *-3                                                 002010
        XCL                                                         002020
        ANA*    1,4                                                 002030
        ORS*    3,4                                                 002040
        LDQ     SVQ                                                 002050
        TRA     4,4                                                 002060
TEMP    PZE     **                                                  002070
SVQ     PZE     **                                                  002080
SAVE    PZE     **                                                  002090
SV1     PZE     **                                                  002100
        END                                                         002110
          ADV   FAP                                                 002120
        ENTRY   ADVLNR                                              002130
        ENTRY   ADVLER                                              002140
        ENTRY   ADVLWR                                              002150
        ENTRY   ADVLNL                                              002160
        ENTRY   ADVLEL                                              002170
        ENTRY   ADVLWL                                              002180
        ENTRY   ADVSNR                                              002190
        ENTRY   ADVSER                                              002200
        ENTRY   ADVSWR                                              002210
        ENTRY   ADVSNL                                              002220
        ENTRY   ADVSEL                                              002230
        ENTRY   ADVSWL                                              002240
ADVLWR  STI     SVI                                                 002250
        LDI     =01011                                              002260
        TRA     START                                               002270
ADVLER  STI     SVI                                                 002280
        LDI     =01001                                              002290
        TRA     START                                               002300
ADVLNR  STI     SVI                                                 002310
        LDI     =01010                                              002320
        TRA     START                                               002330
ADVLWL  STI     SVI                                                 002340
        LDI     =01111                                              002350
        TRA     START                                               002360
ADVLEL  STI     SVI                                                 002370
        LDI     =01101                                              002380
        TRA     START                                               002390
ADVLNL  STI     SVI                                                 002400
        LDI     =01110                                              002410
        TRA     START                                               002420
ADVSWR  STI     SVI                                                 002430
        LDI     =00011                                              002440
        TRA     START                                               002450
ADVSER  STI     SVI                                                 002460
        LDI     =00001                                              002470
        TRA     START                                               002480
ADVSNR  STI     SVI                                                 002490
        LDI     =00010                                              002500
```

```
        TRA     START                                   002510
ADVSWL  STI     SVI                                     002520
        LDI     =00111                                  002530
        TRA     START                                   002540
ADVSEL  STI     SVI                                     002550
        LDI     =00101                                  002560
        TRA     START                                   002570
ADVSNL  STI     SVI                                     002580
        LDI     =00110                                  002590
        TRA     START                                   002600
START   SXA     SV4,4                                   002610
        SXA     SV2,2                                   002620
        CAL*    1,4                                     002630
        PAC     ,4                                      002640
        CAL     1,4                                     002650
        SLW     LIST                                    002660
        CAL     0,4                                     002670
        SLW     CELL                                    002680
        PDC     ,4                                      002690
        CAL     0,4                                     002700
        SLW     CAND                                    002710
        ANA     =0700000                                002720
        LAS     =0100000                                002730
        TRA     ADV                                     002740
        TRA     XXX                                     002750
ADV     CAL     CAND                                    002760
ADV1    RNT     0100                                    002770
        ALS     18                                      002780
        STD     CELL                                    002790
        PDC     ,4                                      002800
        CAL     0,4                                     002810
        SLW     CAND                                    002820
        ANA     =0700000                                002830
        LAS     =0100000                                002840
        TRA     HEAD                                    002850
        TRA     NAME                                    002860
ELEM    RFT     0001                                    002870
        TRA     OKEXIT                                  002880
        TRA     ADV                                     002890
HEAD    RFT     1000                                    002900
        TRA     FAIL                                    002910
        LXA     LEVEL,4                                 002920
        TXL     FAIL,4,0                                002930
        LXA     NEXTR,2                                 002940
        LAC     NEXTR,4                                 002950
        CAL     0,4                                     002960
        SLW     CELL                                    002970
        CAL     1,4                                     002980
        SLW     LIST                                    002990
        SXA     X,2                                     003000
        TSX     $RCELL,4                                003010
        TXH     X                                       003020
        LDC     CELL,4                                  003030
        CAL     0,4                                     003040
        TRA     ADV1                                    003050
NAME    RFT     0010                                    003060
        TRA     OKEXIT                                  003070
XXX     RFT     1000                                    003080
        TRA     ADV                                     003090
        TSX     $NUCELL,4                               003100
        TXH     *                                       003110
```

```
        OCT     770077777777,007777777777                       001290
PUTM    SYN     *                                               001300
TEMP    PZE     **                                              001310
SV1     PZE     **                                              001320
        END                                                     001330
         SQIN   FAP                                             001340
        ENTRY   SQIN                                            001350
        ENTRY   SQOUT                                           001360
        ENTRY   LANORM                                          001370
        ENTRY   SHININ                                          001380
        ENTRY   SHINBL                                          001390
SQOUT   SYN     *                                               001400
        CAL*    2,4                                             001410
        ANA*    1,4                                             001420
        STQ     SVQ                                             001430
        XCL                                                     001440
        CAL*    1,4                                             001450
        TRA     *+2                                             001460
        LGR     1                                               001470
        LBT                                                     001480
        TRA     *-2                                             001490
        STQ     TEMP                                            001500
        LDQ     SVQ                                             001510
        CLA     TEMP                                            001520
        TRA     3,4                                             001530
LANORM  SYN     *                                               001540
        STQ     SVQ                                             001550
        CAL*    1,4                                             001560
        SLW     SAVE                                            001570
        LAS     =H                                              001580
        TRA     *+2                                             001590
        TRA     A                                               001600
        LDQ     =H                                              001610
        TRA     *+3                                             001620
        CAL     SAVE                                            001630
        LGL     6                                               001640
        SLW     SAVE                                            001650
        ANA     =0770000000000                                  001660
        LAS     =H 00000                                        001670
        TRA     *+2                                             001680
        TRA     *-6                                             001690
A       CLA     SAVE                                            001700
        LDQ     SVQ                                             001710
        TRA     2,4                                             001720
SHININ  SYN     *                                               001730
SHINBL  SYN     *                                               001740
        CAL*    2,4                                             001750
        SLW     TEMP                                            001760
        SXA     SV1,1                                           001770
        CLA*    1,4                                             001780
        PAC     ,1                                              001790
        STQ     SVQ                                             001800
        CAL     TEMP                                            001810
        LGR     ,1                                              001820
        CAL*    3,4                                             001830
        LGL     ,1                                              001840
        SLW*    3,4                                             001850
        CLA*    3,4                                             001860
        LDQ     SVQ                                             001870
        LXA     SV1,1                                           001880
        TRA     4,4                                             001890
```

```
        PAC     ,4                                              003120
        PAX     ,2                                              003130
        CLA     CELL                                            003140
        STO     0,4                                             003150
        CAL     LIST                                            003160
        SLW     1,4                                             003170
        ADD     =1                                              003180
        STA     LEVEL                                           003190
        SXA     NEXTR,2                                         003200
        LDC     CELL,4                                          003210
        CAL     1,4                                             003220
        STD     LIST                                            003230
        PDC     ,4                                              003240
        CAL     0,4                                             003250
        TRA     ADV1                                            003260
CELL    SYN     *                                               003270
NEXTR   SYN     *                                               003280
        PZE     ,3                                              003290
LIST    SYN     *                                               003300
LEVEL   SYN     *                                               003310
        PZE                                                     003320
CAND    PZE     **                                              003330
SVI     PZE     **                                              003340
SV4     SYN     *                                               003350
OKEXIT  AXT     **,4                                            003360
        STZ*    2,4                                             003370
EXIT    CAL*    1,4                                             003380
        PDC     ,2                                              003390
        CLA     CELL                                            003400
        STO     0,2                                             003410
        CLA     LIST                                            003420
        STO     1,2                                             003430
        STQ     SVQ                                             003440
        LDQ     SVQ                                             003450
        LDC     CELL,2                                          003460
        CLA     1,2                                             003470
SV2     AXT     **,2                                            003480
        LDI     SVI                                             003490
        TRA     3,4                                             003500
FAIL    LXA     SV4,4                                           003510
        STL*    2,4                                             003520
        TRA     EXIT                                            003530
SVQ     PZE     **                                              003540
Z       PZE     0                                               003550
X       PZE     ,,**                                            003560
        END                                                     003570
         MANY   FAP                                             003580
        ENTRY   MANY                                            003590
MANY    SYN     *                                               003600
        SXA     SV4,4                                           003610
        SXD     MANY-2,4                                        003620
        CLA     ORGNL                                           003630
        STO     START                                           003640
        CLA*    1,4                                             003650
        STO     LNAME                                           003660
BEGIN   CLA     START                                           003670
        ADD     =1                                              003680
        STO     START                                           003690
START   LDQ     1,4                                             003700
        STQ     PARM                                            003710
        ZAC                                                     003720
```

```
        LGL     21                                              003730
        SUB     TEST                                            003740
        TNZ     OUT                                             003750
        CLA     PARM                                            003760
        STA     *+1                                             003770
        CLA     **                                              003780
        STO     PARM                                            003790
        TSX     $NEWBOT,4                                       003800
        TXH     PARM                                            003810
        TXH     LNAME                                           003820
SV4     AXT     **,4                                            003830
        TRA     BEGIN                                           003840
OUT     CLA     START                                           003850
        STA     *+2                                             003860
        CLA     LNAME                                           003870
        TRA     **,4                                            003880
ORGNL   LDQ     1,4                                             003890
LNAME   PZE     0                                               003900
PARM    PZE     0                                               003910
TEST    OCT     3000000                                         003920
        END                                                     003930
        MEMST   FAP                                             003940
        ENTRY   MEMSET                                          003950
MEMSET  CLA*    1,4                                             003960
        SXA     X,4                                             003970
        TSX     $SETMEM,4                                       003980
X       AXT     **,4                                            003990
        TRA     2,4                                             004000
        END                                                     004010
          SEQ   FAP                                             004580
        ENTRY   SEQRDR                                          004590
        ENTRY   SEQLR                                           004600
        ENTRY   SEQLL                                           004610
SEQRDR  CLA*    1,4                                             004620
        STA     *+1                                             004630
        CLA     **                                              004640
        TRA     2,4                                             004650
SEQLR   CLA*    1,4                                             004660
        STA     LINK                                            004670
        TRA     START                                           004680
SEQLL   CLA*    1,4                                             004690
        ARS     18                                              004700
        STA     LINK                                            004710
START   SXA     SAVE,1                                          004720
LINK    AXC     **,1                                            004730
        CLA     2,4                                             004740
        STA     FLAG                                            004750
        CLA     1,4                                             004760
        STA     *+2                                             004770
        CLA     0,1                                             004780
        STO     **                                              004790
        ANA     =0700000                                        004800
        ARS     15                                              004810
        SUB     =1                                              004820
FLAG    STO     **                                              004830
        CLA     1,1                                             004840
SAVE    AXT     **,1                                            004850
        TRA     3,4                                             004860
        END                                                     004870
      DELFAP    FAP                                             004880
        ENTRY   REMOVE                                          004890
```

```
REMOVE  SXA     SV1,1                                   004900
        SXA     SV4,4                                   004910
        CLA*    1,4                                     004920
        STA     *+2                                     004930
        STA     CELL                                    004940
        AXC     **,1                                    004950
        CLA     1,1                                     004960
        STO     RESULT                                  004970
        CLA     0,1                                     004980
        STA     RIGHT                                   004990
        STD     LEFT                                    005000
        ANA     =0700000                                005010
        CAS     =0200000                                005020
        TRA     *+2                                     005030
        TRA     DONE                                    005040
        CLA     LEFT                                    005050
RIGHT   STD     **                                      005060
        ARS     18                                      005070
        STA     *+2                                     005080
        CLA     RIGHT                                   005090
        STA     **                                      005100
DONE    TSX     $RCELL,4                                005110
        TXH     CELL                                    005120
SV1     AXT     **,1                                    005130
SV4     AXT     **,4                                    005140
        CLA     RESULT                                  005150
        TRA     2,4                                     005160
CELL    PZE                                             005170
RESULT  PZE                                             005180
LEFT    PZE                                             005190
        END                                             005200
          POP   FAP                                     005210
        ENTRY   POPTOP                                  005220
        ENTRY   POPBOT                                  005230
POPTOP  CLA*    1,4                                     005240
        STA     *+1                                     005250
        CLA     **                                      005260
        STA     CELL                                    005270
        TRA     START                                   005280
POPBOT  CLA*    1,4                                     005290
        STA     *+1                                     005300
        CLA     **                                      005310
        ARS     18                                      005320
        STA     CELL                                    005330
START   SXA     SV4,4                                   005340
        TSX     $REMOVE,4                               005350
        TXH     CELL                                    005360
SV4     AXT     **,4                                    005370
        TRA     2,4                                     005380
CELL    PZE                                             005390
        END                                             005400
          PUT   FAP                                     005410
        ENTRY   NEWTOP                                  005420
        ENTRY   NEWBOT                                  005430
NEWTOP  CLA*    2,4                                     005440
        STA     *+1                                     005450
        CLA     **                                      005460
        STA     AA                                      005470
        STA     AB                                      005480
        TRA     START                                   005490
NEWBOT  CLA*    2,4                                     005500
```

```
        STA     AA                                              005510
        STA     AB                                              005520
START   SXA     SV1,1                                           005530
        SXA     SV4,4                                           005540
        CLA*    1,4                                             005550
        STO     DATUM                                           005560
        STA     DA                                              005570
        TSX     $NUCELL,4                                       005580
        TXH     *                                               005590
        STA     *+1                                             005600
        AXC     **,1                                            005610
        STA     NEW                                             005620
AA      CLA     **                                              005630
        ANA     =077777000000                                   005640
        STD     0,1                                             005650
        ARS     18                                              005660
        STA     LL                                              005670
        CLA     AA                                              005680
        STA     0,1                                             005690
        CLA     NEW                                             005700
LL      STA     **                                              005710
        ALS     18                                              005720
AB      STD     **                                              005730
        TSX     $NAMTST,4                                       005740
        TXH     DATUM                                           005750
        TNZ     DONE                                            005760
        CLA     =0100000                                        005770
        STT     0,1                                             005780
        CLA     DA                                              005790
        ADD     =1                                              005800
        STA     *+2                                             005810
        STA     *+3                                             005820
        CLA     **                                              005830
        ADD     =1                                              005840
        STO     **                                              005850
DONE    CLA     DATUM                                           005860
        STO     1,1                                             005870
        CLA     NEW                                             005880
SV1     AXT     **,1                                            005890
SV4     AXT     **,4                                            005900
        TRA     3,4                                             005910
DATUM   PZE                                                     005920
NEW     PZE                                                     005930
DA      PZE                                                     005940
        END                                                     005950
        NTEST   FAP                                             005960
        ENTRY   NAMTST                                          005970
NAMTST  SXA     SV4,4                                           005980
        CLA*    1,4                                             005990
        STO     CAND                                            006000
        TSX     $GETMEM,4                                       006010
        TXH     *                                               006020
        STO     LIMIT                                           006030
        CLA     CAND                                            006040
        STA     LINK                                            006050
        ARS     18                                              006060
        CAS     LINK                                            006070
        TRA     NO                                              006080
        TRA     *+2                                             006090
        TRA     NO                                              006100
        CLA     LINK                                            006110
```

```
        CAS     LIMIT                                   006120
        TRA     NO                                      006130
        TRA     *+1                                     006140
        CLA*    LINK                                    006150
        STO     HEAD                                    006160
        ANA     =0700000                                006170
        CAS     =0200000                                006180
        TRA     NO                                      006190
        TRA     *+2                                     006200
        TRA     NO                                      006210
        CLA     HEAD                                    006220
        ARS     18                                      006230
        CAS     LIMIT                                   006240
        TRA     NO                                      006250
        TRA     *+1                                     006260
        STA     *+1                                     006270
        CLA     **                                      006280
        ANA     =077777                                 006290
        CAS     LINK                                    006300
        TRA     NO                                      006310
        TRA     YES                                     006320
NO      CLA     =1                                      006330
        TRA     *+2                                     006340
YES     CLA     =0                                      006350
SV4     AXT     **,4                                    006360
        TRA     2,4                                     006370
CAND    PZE                                             006380
HEAD    PZE                                             006390
LINK    PZE                                             006400
LIMIT   PZE                                             006410
        END                                             006420
          LST   FAP                                     006430
        ENTRY   LIST                                    006440
LIST    SXA     SV1,1                                   006450
        SXA     SV4,4                                   006460
        CLA     1,4                                     006470
        STA     ADDR                                    006480
        CLA*    1,4                                     006490
        STO     DATUM                                   006500
        TSX     $NUCELL,4                               006510
        TXH     *                                       006520
        STO     CELL                                    006530
        STA     *+4                                     006540
        STA     *+4                                     006550
        LXA     CELL,1                                  006560
        SXD     CELL,1                                  006570
        SXA     **,1                                    006580
        SXD     **,1                                    006590
        CLA     =0200000                                006600
        STT*    CELL                                    006610
        CLA     DATUM                                   006620
        CAS     =9                                      006630
        TRA     *+2                                     006640
        TRA     DONE                                    006650
        CLA     CELL                                    006660
        STA     *+1                                     006670
        AXC     **,1                                    006680
        CLA     =1                                      006690
        STO     1,1                                     006700
        CLA     CELL                                    006710
ADDR    STO     **                                      006720
```

```
DONE    CLA     CELL                                    006730
SV1     AXT     **,1                                    006740
SV4     AXT     **,4                                    006750
        TRA     2,4                                     006760
CELL    PZE                                             006770
DATUM   PZE                                             006780
        END                                             006790
      TOPBOT    FAP                                     006800
        ENTRY   TOP                                     006810
        ENTRY   BOT                                     006820
TOP     CLA*    1,4                                     006830
        STA     *+1                                     006840
        CLA     **                                      006850
        ANA     =077777                                 006860
        ADD     =1                                      006870
        STA     ADDR                                    006880
        TRA     ADDR                                    006890
BOT     CLA*    1,4                                     006900
        STA     *+1                                     006910
        CLA     **                                      006920
        ARS     18                                      006930
        ANA     =077777                                 006940
        ADD     =1                                      006950
        STA     ADDR                                    006960
ADDR    CLA     **                                      006970
        TRA     2,4                                     006980
        END                                             006990
        LSTMT   FAP                                     007000
        ENTRY   LISTMT                                  007010
LISTMT  CLA*    1,4                                     007020
        STA     *+1                                     007030
        CLA     **                                      007040
        STO     HEAD                                    007050
        STA     *+1                                     007060
        CLA     **                                      007070
        CAS     HEAD                                    007080
        TRA     NOT                                     007090
        TRA     YES                                     007100
NOT     CLA     =1                                      007110
        TRA     2,4                                     007120
YES     CLA     =0                                      007130
        TRA     2,4                                     007140
HEAD    PZE                                             007150
        END                                             007160
        HASH    FAP                                     007170
        ENTRY   HASH                                    007180
HASH    LDQ*    1,4                                     007190
        CLA*    2,4                                     007200
        STA     SHIFT                                   007210
        ARS     1                                       007220
        STA     *+2                                     007230
        MPY*    1,4                                     007240
        LLS     **                                      007250
        STA     TEMP                                    007260
        LDQ     =0777777777777                          007270
        ZAC                                             007280
SHIFT   LLS     **                                      007290
        ANA     TEMP                                    007300
        TRA     3,4                                     007310
TEMP    PZE                                             007320
        END                                             007330
```

```
        PRINT,T0109,2531,NS,MAD                                          T0109  2531

         RVECT   MAD                                                              000340
              EXTERNAL FUNCTION(M,J)                                              000350
              NORMAL MODE IS INTEGER                                              000360
              ENTRY TO RVECT.                                                     000370
              THROUGH ADD, FOR I = M,2, I .G. J                                   000380
              MZ = M                                                              000390
              EXECUTE STRIND.(0,MZ)                                               000400
              M=M+2                                                               000410
ADD           EXECUTE RCELL.(MZ)                                                  000420
              FUNCTION RETURN 0                                                   000430
              END OF FUNCTION                                                     000440
          ADAS   MAD                                                              000450
              EXTERNAL FUNCTION (N)                                               000460
              NORMAL MODE IS INTEGER                                              000470
              ENTRY TO ADAS.                                                      000480
              M1 = GETMEM.(0)                                                     000490
              W'R M1 .G. 32766, TRANSFER TO WRONG                                 000500
              M2 = XMINO. (M1+N,32767)                                            000510
              EXECUTE MEMSET.(M2)                                                 000520
              EXECUTE RVECT.(M1,M2-2)                                             000530
              FUNCTION RETURN 0                                                   000540
WRONG         PRNTP.(MESS)                                                        000550
              VECTOR VALUES MESS=$SPACE EXHAUSTED.  PROGRAM ENDED.$,              000560
             1777777777777K                                                       000570
              EXECUTE EXIT.(0)                                                    000580
              END OF FUNCTION                                                     000590
        IRALST   MAD                                                              000840
              EXTERNAL FUNCTION (LST)                                             000850
              NORMAL MODE IS INTEGER                                              000860
              ENTRY TO IRALST.                                                    000870
              EXECUTE SETIND.(-1,-1,LCNTR.(LST)-1,LST+1)                          000880
              W'R LCNTR.(LST) .NE. 0,TRANSFER TO DONE                             000890
              EXECUTE MTLIST.(LST)                                                000900
              MAYBE = LNKL.(CONT.(LST+1))                                         000910
              W'R MAYBE .E. 0, TRANSFER TO RETHED                                 000920
              EXECUTE SETIND.(1,-1,-1,LST)                                        000930
              EXECUTE SETIND.(0,-1,MAYBE,LST+1)                                   000940
RETHED        EXECUTE RCELL.(LST)                                                 000950
DONE          FUNCTION RETURN LST                                                 000960
              END OF FUNCTION                                                     000970
        LISTMT   MAD                                                              001120
              EXTERNAL FUNCTION (LST)                                             001130
              NORMAL MODE IS INTEGER                                              001140
              ENTRY TO LISTMT.                                                    001150
              W'R CONT.(LST) .E. CONT.(LNKR.(CONT.(LST))),T'O ZERO                001160
              TEST = 1                                                            001170
              T'O DONE                                                            001180
ZERO          TEST=0                                                              001190
DONE          FUNCTION RETURN TEST                                                001200
              END OF FUNCTION                                                     001210
         LCNTR   MAD                                                              001220
              EXTERNAL FUNCTION (LST)                                             001230
              NORMAL MODE IS INTEGER                                              001240
              ENTRY TO LCNTR.                                                     001250
              LEVEL = LNKR.(CONT.(LST+1))                                         001260
              T'O DONE                                                            001270
              ENTRY TO LSTNAM.                                                    001280
              LEVEL = LNKL.(CONT.(LST+1))                                         001290
              SETDIR.(0,LEVEL,LEVEL,LEVEL)                                        001300
```

```
DONE        FUNCTION RETURN LEVEL                                          001310
            END OF FUNCTION                                                001320
      LIST  MAD                                                            001330
            EXTERNAL FUNCTION (ADDR)                                       001340
            NORMAL MODE IS INTEGER                                         001350
            ENTRY TO LIST.                                                 001360
            CELL=NUCELL.(CELL)                                             001370
            EXECUTE SETDIR.(0,CELL,CELL,CELL)                              001380
            EXECUTE SETIND.(2,CELL,CELL,CELL)                              001390
            W'R ADDR .E. 9, T'O DONE                                       001400
            ADDR=CELL                                                      001410
            EXECUTE SETIND.(-1,-1,1,CELL + 1)                              001420
DONE        FUNCTION RETURN CELL                                           001430
            END OF FUNCTION                                                001440
      NAMTST  MAD                                                          001450
            EXTERNAL FUNCTION(CANDAT)                                      001460
            NORMAL MODE IS INTEGER                                         001470
            ENTRY TO NAMTST.                                               001480
            LST=CANDAT                                                     001490
            LIMIT=GETMEM.(0)                                               001500
            LINK=LNKR.(LST)                                                001510
            W'R LNKL.(LST) .NE. LINK .OR. LINK .G. LIMIT, T'O NO           001520
            HEAD=CONT.(LINK)                                               001530
            W'R ID.(HEAD) .NE. 2 .OR. LNKL.(HEAD) .G. LIMIT, T'O NO        001540
            W'R LNKR.(CONT.(LNKL.(HEAD))) .NE. LINK, T'O NO                001550
            F'N 0                                                          001560
NO          F'N 1                                                          001570
            E'N                                                            001580
      SEQRDR  MAD                                                          001590
            EXTERNAL FUNCTION(LST)                                         001600
            NORMAL MODE IS INTEGER                                         001610
            ENTRY TO SEQRDR.                                               001620
            IT=CONT.(LST)                                                  001630
            FUNCTION RETURN IT                                             001640
            END OF FUNCTION                                                001650
         TOP  MAD                                                          001660
            EXTERNAL FUNCTION (LST)                                        001670
            NORMAL MODE IS INTEGER                                         001680
            ENTRY TO TOP.                                                  001690
            ADDR=LNKR.(CONT.(LST))                                         001700
            TRANSFER TO START                                              001710
            ENTRY TO BOT.                                                  001720
            ADDR=LNKL.(CONT.(LST))                                         001730
START       IT=CONT.(ADDR + 1)                                             001740
            FUNCTION RETURN IT                                             001750
            END OF FUNCTION                                                001760
      NEWTOP  MAD                                                          001770
            EXTERNAL FUNCTION (OBJ,LST)                                    001780
            NORMAL MODE IS INTEGER                                         001790
            ENTRY TO NEWTOP.                                               001800
            ADDR=LNKR.(CONT.(LST))                                         001810
            TRANSFER TO START                                              001820
            ENTRY TO NEWBOT.                                               001830
            ADDR=LST                                                       001840
START       NEW=NUCELL.(NEW)                                               001850
            LL=LNKL.(CONT.(ADDR))                                          001860
            EXECUTE SETIND.(-1,-1,NEW,LL)                                  001870
            EXECUTE SETIND.(-1,NEW,-1,ADDR)                                001880
            EXECUTE SETIND.(0,LL,ADDR,NEW)                                 001890
            W'R NAMTST.(OBJ) .NE. 0, TRANSFER TO NOT                       001900
            EXECUTE SETIND.(1,-1,-1,NEW)                                   001910
```

```
            EXECUTE SETIND.(-1,-1,LCNTR.(OBJ)+1,OBJ+1)                    001920
NOT         EXECUTE STRIND.(OBJ,NEW+1)                                    001930
            FUNCTION RETURN NEW                                           001940
            END OF FUNCTION                                               001950
      REMOVE   MAD                                                        001960
            EXTERNAL FUNCTION(ADDR)                                       001970
            NORMAL MODE IS INTEGER                                        001980
            ENTRY TO REMOVE.                                              001990
            W'R ID.(CONT.(ADDR)) .E. 2, T'O HEADER                        002000
            IT = CONT.(ADDR +1)                                           002010
            LEFT=LNKL.(CONT.(ADDR))                                       002020
            RIGHT=LNKR.(CONT.(ADDR))                                      002030
            EXECUTE RCELL.(ADDR)                                          002040
            EXECUTE SETIND.(-1,-1,RIGHT,LEFT)                             002050
            EXECUTE SETIND.(-1,LEFT,-1,RIGHT)                             002060
            T'O DONE                                                      002070
HEADER      IT=0                                                          002080
            EXECUTE PRNTP.(MESSG)                                         002090
            VECTOR VALUES MESSG=$HEADER REMOVE$,777777777777K             002100
DONE        FUNCTION RETURN IT                                            002110
            END OF FUNCTION                                               002120
      POPPER   MAD                                                        002130
            EXTERNAL FUNCTION (LST)                                       002140
            NORMAL MODE IS INTEGER                                        002150
            ENTRY TO POPBOT.                                              002160
            IT=REMOVE.(LNKL.(CONT.(LST)))                                 002170
            T'O DONE                                                      002180
            ENTRY TO POPTOP.                                              002190
            IT=REMOVE.(LNKR.(CONT.(LST)))                                 002200
DONE        FUNCTION RETURN IT                                            002210
            END OF FUNCTION                                               002220
      MAKEDL   MAD                                                        002230
            EXTERNAL FUNCTION(DLST,LST)                                   002240
            NORMAL MODE IS INTEGER                                        002250
            ENTRY TO MAKEDL.                                              002260
            W'R LNKL.(CONT.(LST+1)) .NE. 0, T'O NOTMT                     002270
NORMAL      SETIND.(-1,DLST,-1,LST+1)                                     002280
            SETIND.(-1,-1,LCNTR.(DLST)+1,DLST+1)                          002290
            FUNCTION RETURN LST                                           002300
NOTMT       K=LNKL.(CONT.(LST+1))                                         002310
            EXECUTE SETDIR.(0,K,K,X)                                      002320
            IRALST.(X)                                                    002330
            T'O NORMAL                                                    002340
            END OF FUNCTION                                               002350
      READER   MAD                                                        002360
            EXTERNAL FUNCTION(LST)                                        002370
            NORMAL MODE IS INTEGER                                        002380
            ENTRY TO READER.                                              002390
            ENTRY TO LRDROV.                                              002400
            IT=NUCELL.(IT)                                                002410
            EXECUTE SETIND.(3,LST,0,IT)                                   002420
            EXECUTE SETIND.(0,LST,0,IT+1)                                 002430
            EXECUTE SETDIR.(0,IT,IT,IT)                                   002440
            FUNCTION RETURN IT                                            002450
            END OF FUNCTION                                               002460
      ERARDR   MAD                                                        002470
            EXTERNAL FUNCTION(READER)                                     002480
            NORMAL MODE IS INTEGER                                        002490
            ENTRY TO IRARDR.                                              002500
            ENTRY TO ERARDR.                                              002510
            M=READER                                                      002520
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```
MORE        N=LNKR.(CONT.(M))                                    002530
            EXECUTE RCELL.(M)                                    002540
            M=N                                                  002550
            W'R M .NE. 0, T'O MORE                               002560
            FUNCTION RETURN 0                                    002570
            END OF FUNCTION                                      002580
      MADIN   MAD                                                002590
            EXTERNAL FUNCTION (X)                                002600
            NORMAL MODE IS INTEGER                               002610
            ENTRY TO MADIN.                                      002620
            ENTRY TO LOCT.                                       002630
            ENTRY TO INTLBL.                                     002640
            ENTRY TO FLTLBL.                                     002650
            ENTRY TO MADOUT.                                     002660
            FUNCTION RETURN X                                    002670
            END OF FUNCTION                                      002680
      EQUAL   MAD                                                002690
            EXTERNAL FUNCTION(ONE,OTHER)                         002700
            NORMAL MODE IS INTEGER                               002710
            ENTRY TO EQUAL.                                      002720
            W'R ONE .E. OTHER,T'O SAME                           002730
            TEST = 1                                             002740
            T'O OUT                                              002750
SAME        TEST = 0                                             002760
OUT         FUNCTION RETURN TEST                                 002770
            ENTRY TO AND.                                        002780
            TEST= ONE .A. OTHER                                  002790
            TRANSFER TO OUT                                      002800
            END OF FUNCTION                                      002810
      MADATR   MAD                                               002820
            EXTERNAL FUNCTION(AT,LST)                            002830
            NORMAL MODE IS INTEGER                               002840
            ENTRY TO MADATR.                                     002850
            ADDR = LNKL.(CONT.(LST+1))                           002860
            W'R ADDR .E. 0, T'O FAIL                             002870
START       ADDR=LNKR.(CONT.(ADDR))                              002880
            W'R ID.(CONT.(ADDR)) .E. 2, T'O FAIL                 002890
            W'R CONT.(ADDR + 1) .E. AT, T'O SUCCES               002900
            ADDR= LNKR.(CONT.(ADDR))                             002910
            W'R ID.(CONT.(ADDR)) .E. 2, T'O FAIL                 002920
            T'O START                                            002930
SUCCES      FUNCTION RETURN ADDR                                 002940
FAIL        ADDR=-1                                              002950
            T'O SUCCES                                           002960
            END OF FUNCTION                                      002970
      NEWVAL   MAD                                               002980
            EXTERNAL FUNCTION (AT,VAL,LST)                       002990
            NORMAL MODE IS INTEGER                               003000
            ENTRY TO NEWVAL.                                     003010
            W'R LNKL.(CONT.(LST+1)) .E. 0, T'O NEWDL             003020
            ADDR = MADATR.(AT,LST)                               003030
            W'R ADDR .E. -1, T'O NEWAT                           003040
            IT = SUBST.(VAL,LNKR.(CONT.(ADDR)))                  003050
DONE        FUNCTION RETURN IT                                   003060
NEWDL       EXECUTE SETIND.(-1,LIST.(IT),-1,LST+1)               003070
NEWAT       IT=LSTNAM.(LST)                                      003080
            EXECUTE MANY.(IT,AT,VAL)                             003090
            IT = VAL                                             003100
            T'O DONE                                             003110
            END OF FUNCTION                                      003120
       SUBST   MAD                                               003130
```

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            EXTERNAL FUNCTION(DATUM,ADDR)                                   003140
            NORMAL MODE IS INTEGER                                          003150
            ENTRY TO SUBST.                                                 003160
            PRESNT = CONT.(ADDR+1)                                          003170
            W'R NAMTST.(PRESNT) .NE. 0, T'O NONAME                          003180
            N=NUCELL.(N)                                                    003190
            EXECUTE SETIND.(1,0,0,N)                                        003200
            EXECUTE STRIND.(PRESNT,N+1)                                     003210
            EXECUTE RCELL. (N)                                              003220
            EXECUTE STRIND.(DATUM,ADDR + 1)                                 003230
NONAME      W'R NAMTST.(DATUM) .E. 0                                        003240
            EXECUTE SETIND.(1,-1,-1,ADDR)                                   003250
            COUNT=LNKL.(DATUM)                                              003260
            EXECUTE SETIND.(-1,-1,LNKR.(CONT.(COUNT+1))+1,COUNT+1)          003270
            EXECUTE STRIND.(DATUM,ADDR+1)                                   003280
            OTHERWISE                                                       003290
            EXECUTE STRIND.(DATUM,ADDR+1)                                   003300
            END OF CONDITIONAL                                              003310
            FUNCTION RETURN PRESNT                                          003320
            END OF FUNCTION                                                 003330
      ITSVAL   MAD                                                          003340
            EXTERNAL FUNCTION (ATRBT,LST)                                   003350
            NORMAL MODE IS INTEGER                                          003360
            ENTRY TO ITSVAL.                                                003370
            W'R LNKL.(CONT.(LST+1)) .E. 0, T'O FAIL                         003380
            ADDR = MADATR.(ATRBT,LST)                                       003390
            W'R ADDR .E. -1, T'O FAIL                                       003400
            FUNCTION RETURN CONT.(LNKR.(CONT.(ADDR))+1)                     003410
FAIL        FUNCTION RETURN 0                                               003420
            END OF FUNCTION                                                 003430
      NOATVL   MAD                                                          003440
            EXTERNAL FUNCTION (ATRBT,LST)                                   003450
            NORMAL MODE IS INTEGER                                          003460
            ENTRY TO NOATVL.                                                003470
            ADDR= MADATR.(ATRBT,LST)                                        003480
            W'R ADDR .E. -1                                                 003490
            FUNCTION RETURN -1                                              003500
            OTHERWISE                                                       003510
            IT=REMOVE.(LNKR.(CONT.(ADDR)))                                  003520
            EXECUTE REMOVE.(ADDR)                                           003530
            FUNCTION RETURN IT                                              003540
            END OF CONDITIONAL                                              003550
            END OF FUNCTION                                                 003560
        PUT   MAD                                                           003570
            EXTERNAL FUNCTION (IT,MODE,SIGN)                                003580
            PROGRAM COMMON AVSL,W                                           003590
            DIMENSION W(100)                                                003600
            NORMAL MODE IS INTEGER                                          003610
            FLOATING POINT WORT,SIGN                                        003620
            EQUIVALENCE (WORD,WORT)                                         003630
            ENTRY TO PUT.                                                   003640
            WORD=IT                                                         003650
            W'R WORD .E. $      $, T'O DONE                                 003660
            W'R MODE .L. 0                                                  003670
            EXECUTE NEWBOT.(LANORM.(WORD),TOP.(W(1)))                       003680
            OR W'R MODE .E. 0                                               003690
            WORD=WORT*SIGN                                                  003700
            EXECUTE NEWBOT.(WORD,TOP.(W(1)))                                003710
            OTHERWISE                                                       003720
            WORT=WORT*SIGN                                                  003730
            EXECUTE NEWBOT.(WORT,TOP.(W(1)))                                003740
```

```
            E'L                                                          003750
            FUNCTION RETURN 0                                            003760
DONE        MRKPOS.(LNKL.(CONT.(TOP.(W(1)))))                            003770
            FUNCTION RETURN 0                                            003780
            END OF FUNCTION                                              003790
      LISTRD   MAD                                                       003800
            EXTERNAL FUNCTION (NEW,N)                                    000001
            PROGRAM COMMON AVSL,W                                        000002
            DIMENSION W(100),CARD(14),KNOW(14)                           000003
            EQUIVALENCE (WORD,WORT)                                      000004
            NORMAL MODE IS INTEGER                                       000005
            FLOATING POINT WORD,SIGN,DEC,X                               000006
            ENTRY TO TREAD.                                              000016
            TEXT=$TEXT$                                                  000026
            SWITCH=1                                                     000036
            T'O START                                                    000046
            ENTRY TO COMNDR.                                             000056
            SWITCH = 0                                                   000066
            TEXT=0                                                       000076
            TRANSFER TO START                                            000086
            ENTRY TO LISTRD.                                             000096
            SWITCH=1                                                     000106
            TEXT=0                                                       000116
START       M= MADOUT.(N)                                                000126
            Q=$Q$                                                        000136
            IDENT=0                                                      000146
            SIGN=1.0                                                     000156
            MODE=-1                                                      000166
            IS=0                                                         000176
            COUNT=1                                                      000186
            WORT=$      $                                                000196
           R*********************************READ NEXT LINE*************** 000206
TESTM       WHENEVER M .E. 0,TRANSFER TO CARDS                           000216
            READ BCD TAPE M,DATFOR,CARD(1) ... CARD(14)                  000226
            TRANSFER TO ANALIZ                                           000236
CARDS       W'R IS .E. 0                                                 000246
            PRINT ON LINE FORMAT STAR                                    000256
            IS=1                                                         000266
            NEWTOP.(NEW,W(1))                                            000276
            T'O READCR                                                   000286
            O'E                                                          000306
READCR      READ FORMAT DATFOR, CARD(1) ... CARD(14)                     000316
            T'H ENDTST, FOR I=1,1, I .G. 14                              000326
ENDTST      W'R CARD(I) .NE. $ $, T'O  ANALIZ                            000336
            T'H RP, FOR I=1,1, I.G. 14                                   000346
RP          CARD(I)=343434343434K                                        000356
            E'L                                                          000366
ANALIZ      THROUGH AA, FOR I=1,1,I .G. 14                               000376
AA          KNOW(I)=LETTER.(CARD(I))                                     000386
            IW=1                                                         000396
A108        IC=1                                                         000406
           R*********************************GET NEXT CHARACTER********** 000416
A105        CHAR=KGETBL.(MADIN.(IC),CARD(IW))                            000426
            PREV=IDENT                                                   000436
            IDENT=MADOUT.(KGETIN.(MADIN.(IC),KNOW(IW)))                  000446
           R*********************************TRANSFER APPROPRIATLY********* 000456
            TRANSFER TO Z(IDENT)                                         000466
Z(1)        TRANSFER TO W6                                               000476
Z(2)        W'R SWITCH .E. 0 .OR. TEXT .E. $TEXT$, T'O W6                000486
            TRANSFER TO W5                                               000496
Z(3)        TRANSFER TO W6                                               000506
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Z(4)        TRANSFER TO W4                                                  000516
Z(5)        TRANSFER TO W8                                                  000526
Z(6)        TRANSFER TO W9                                                  000536
Z(7)        TRANSFER TO W6                                                  000546
Z(8)        TRANSFER TO W6                                                  000556
Z(9)        TRANSFER TO W10                                                 000566
Z(10)       TRANSFER TO LEFTP                                               000576
Z(11)       TRANSFER TO W6                                                  000586
Z(12)       WHENEVER PREV .NE. 4,TRANSFER TO W12                            000596
            IDENT=4                                                         000606
            TRANSFER TO W4                                                  000616
Z(13)       TRANSFER TO W10                                                 000626
Z(14)       WHENEVER SWITCH .E. 0,TRANSFER TO  W6                           000636
            TRANSFER TO W4                                                  000646
           R*****************************SINGULAR CHARACTER*************  000656
W6          EXECUTE PUT.(WORD,MODE,SIGN)                                    000666
            EXECUTE PUT.(CHAR,-1,1.0)                                       000676
            TRANSFER TO A109                                                000686
           R*****************************SUBLIST CREATION***************  000696
W11         WHENEVER IS .E. 0,TRANSFER TO A112                              000706
            IS=IS+1                                                         000716
            WHENEVER WORT .E. $ DLIST$,TRANSFER TO DLIST                    000726
            EXECUTE PUT.(WORD,MODE,SIGN)                                    000736
REST        EXECUTE NEWBOT.(LIST.(MADIN.(9)),TOP.(W(1)))                    000746
            EXECUTE NEWTOP.(BOT.(TOP.(W(1))),W(1))                          000756
            TRANSFER TO A109                                                000766
DLIST       EXECUTE MAKEDL.(LIST.(MADIN.(9)),TOP.(W(1)))                    000776
            EXECUTE NEWTOP.(LSTNAM.(TOP.(W(1))),W(1))                       000786
            TRANSFER TO A109                                                000796
           R*****************************FIRST LEFT PARENTHESIS*********  000806
A112        IS=1                                                            000816
            EXECUTE NEWTOP.(NEW,W(1))                                       000826
            TRANSFER TO A102                                                000836
           R*****************************RIGHT PARENTHESIS**************  000846
W9          IS=IS-1                                                         000856
            EXECUTE PUT.(WORD,MODE,SIGN)                                    000866
            WHENEVER IS .E. 0,TRANSFER TO A92                               000876
            EXECUTE POPTOP.(W(1))                                           000886
            TRANSFER TO A109                                                000896
           R*****************************CLOSING RIGHT PARENTHESIS******  000906
A92         EXECUTE POPTOP.(W(1))                                           000916
            FUNCTION RETURN NEW                                             000926
           R**********************INTEGER************************           000936
W12         WHENEVER MODE .L. 0                                             000946
            MODE = 0                                                        000956
            WORD= 0.0                                                       000966
            TRANSFER TO A122                                                000976
            OR WHENEVER MODE .E. 0                                          000986
            TRANSFER TO A122                                                000996
            OTHERWISE                                                       001006
           R*****************************FRACTIONAL PART****************  001016
            X=MADOUT.(KGETIN.(MADIN.(IC),CARD(IW)))                         001026
            WORD=WORD+(X/DEC)                                               001036
            DEC=10.0*DEC                                                    001046
            TRANSFER TO A102                                                001056
            END OF CONDITIONAL                                              001066
           R*****************************INTEGRAL PART******************  001076
A122        X=MADOUT.(KGETIN.(MADIN.(IC),CARD(IW)))                         001086
            WORD=WORD*10.0+X                                                001096
            TRANSFER TO A102                                                001106
           R*****************************PERIOD*************************  001116
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W8          W'R TEXT .E. $TEXT$ .OR. PREV .E. 4, T'O A101                  001126
            WHENEVER MODE .L. 0                                            001136
            WORD=0.0                                                       001146
            TRANSFER TO W81                                                001156
            OR WHENEVER MODE .E. 0                                         001166
W81         MODE=1                                                         001176
            DEC=10.0                                                       001186
            TRANSFER TO A102                                               001196
            OTHERWISE                                                      001206
            TRANSFER TO W10                                                001216
            END OF CONDITIONAL                                             001226
           R*********************************MINUS SIGN (LISTRD MODE ONLY) * 001236
W5          EXECUTE PUT.(WORD,MODE,SIGN)                                   001246
            SIGN=-1.0                                                      001256
            TRANSFER TO MINUS                                              001266
           R*********************************ALPHABETIC CHARACTER*********** 001276
W4          WHENEVER IS .E. 0,TRANSFER TO A102                             001286
            EXECUTE SHINBL.(MADIN.(6),CHAR,WORD)                           001296
            WHENEVER COUNT .E. 6,TRANSFER TO A43                           001306
            COUNT=COUNT+1                                                  001316
            TRANSFER TO A102                                               001326
A43         MRKNEG.(NEWBOT.(WORD,TOP.(W(1))))                              001336
            TRANSFER TO A109                                               001346
           R*********************************INITIALIZE AFTER PUT*********** 001356
A109        SIGN=1.0                                                       001366
MINUS       COUNT=1                                                        001376
            WORT=$      $                                                  001386
            MODE=-1                                                        001396
           R*********************************INPUT SCAN ADJUSTER************ 001406
A102        WHENEVER IC .E. 6,TRANSFER TO A104                             001416
            IC=IC+1                                                        001426
            TRANSFER TO A105                                               001436
A104        WHENEVER IW .E. 14,TRANSFER TO TESTM                           001446
            IW=IW+1                                                        001456
            TRANSFER TO A108                                               001466
           R*********************************BLANK*************************** 001476
W10         WHENEVER IS .E. 0, TRANSFER TO A102                            001486
A101        EXECUTE PUT.(WORD,MODE,SIGN)                                   001496
            WHENEVER SWITCH .E. 0,TRANSFER TO A109                         001506
            EXECUTE PUT.(CHAR,-1.0,1.0)                                    001516
            TRANSFER TO A109                                               001526
           R*********************************LEFT PARENTHESIS*************** 001536
LEFTP       WHENEVER PREV .NE. 13,TRANSFER TO W11                          001546
            WHENEVER SWITCH .E. 1,TRANSFER TO W11                          001556
            EXECUTE PUT.(WORD,MODE,SIGN)                                   001566
            EXECUTE PUT.(Q,-1,1)                                           001576
            IS=IS+1                                                        001586
            PREV=4                                                         001596
            TRANSFER TO REST                                               001606
            VECTOR VALUES STAR = $5HINPUT *$                               001616
            VECTOR VALUES DATFOR = $14A6 *$                                001626
            END OF FUNCTION                                                001636
      PLACE   MAD                                                          005500
            EXTERNAL FUNCTION(A,KOUNT)                                     005510
            DIMENSION OUT(12)                                              005520
            NORMAL MODE IS INTEGER                                         005530
            ENTRY TO PLACE.                                                005540
            WHENEVER KOUNT .L. 0                                           005550
            AMAD=MADOUT.(A)                                                005560
            WHENEVER AMAD .E. 1                                            005570
            AFMT(0)=$(1P5E1$                                               005580
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            OR WHENEVER AMAD .E. 2                                          005590
            AFMT(0)=$(5014)$                                                005600
            END OF CONDITIONAL                                              005610
            WHENEVER K .NE. 0,TRANSFER TO PRINT                             005620
            OR WHENEVER KOUNT .E. 0                                         005630
            N=MADOUT.(A)                                                    005640
            AFMT(0)=$(12A6)$                                                005650
            K=0                                                             005660
            OR WHENEVER KOUNT .G. 0                                         005670
            WHENEVER K .E. 0                                                005680
            THROUGH BLBUF, FOR J=1,1,J.G.12                                 005690
BLBUF       OUT(J)=$      $                                                 005700
            END OF CONDITIONAL                                              005710
            K=K+1                                                           005720
            COUNT=MADOUT.(KOUNT)                                            005730
            TRANSFER TO CONV(COUNT)                                         005740
CONV(2)     OUT(K)=A                                                        005750
            TRANSFER TO ISBFUL                                              005760
CONV(1)     F=FRBCD.(A,B)                                                   005770
            OUT(K)=B                                                        005780
            WHENEVER F.E.0,TRANSFER TO ISBFUL                               005790
            WHENEVER K.E.12                                                 005800
            WHENEVER N.G.0                                                  005810
            WRITE BCD TAPE N,AFMT,OUT(1) ... OUT(11)                        005820
            OR WHENEVER N .E. 0                                             005830
            PRINT ON LINE FORMAT AFMT,OUT(1) ... OUT(11)                    005840
            END OF CONDITIONAL                                              005850
            THROUGH BLBU,FOR J=3,1,J.G.11                                   005860
BLBU        OUT(J)=$      $                                                 005870
            OUT(1)=B                                                        005880
            K=1                                                             005890
            END OF CONDITIONAL                                              005900
            K=K+1                                                           005910
            OUT(K)=F                                                        005920
ISBFUL      WHENEVER K.E.12                                                 005930
PRINT       WHENEVER N.G.0                                                  005940
            WRITE BCD TAPE N,AFMT,OUT(1) ... OUT(K)                         005950
            OR WHENEVER N.E.0                                               005960
            PRINT ON LINE FORMAT AFMT,OUT(1) ... OUT(K)                     005970
            END OF CONDITIONAL                                              005980
            K=0                                                             005990
            END OF CONDITIONAL                                              006000
            END OF CONDITIONAL                                              006010
            FUNCTION RETURN 0                                               006020
            VECTOR VALUES AFMT=$(1P5E14.3)$                                 006030
            END OF FUNCTION                                                 006040
      FRBCD   MAD                                                           006050
            EXTERNAL FUNCTION (A0,B0)                                       006060
            NORMAL MODE IS INTEGER                                          006070
            FLOATING POINT AF,KF,FF,BCDFT.                                  006080
            EQUIVALENCE (A,AF) , (K,KF) , (F,FF)                            006090
            ENTRY TO FRBCD.                                                 006100
            A=A0                                                            006110
            FF=0.0                                                          006120
            W'R ALBCD.(A) .E.0 , T'O LETTER                                 006130
            W'R ALPHA.(A) .E. $444444$, T'O LETTER                          006140
            ALL = A .A. $H00Y00$                                            006150
            W'R ALL .NE. 0, T'O FLOAT                                       006160
            LEFT=LNKL.(A)                                                   006170
            W'R LEFT .E. 0, T'O FOUR                                        006180
FLOAT       K=AF                                                            006190
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            KF=K                                                    006200
            FF= .ABS. AF - .ABS. KF                                 006210
            FF=BCDFT.(FF)                                           006220
            K=AF                                                    006230
            K = K*262144                                            006240
TEN         B=BCDIT.(K)                                             006250
DONE        BO=B                                                    006260
            FUNCTION RETURN FF                                      006270
LETTER      B=A                                                     006280
            T'O DONE                                                006290
FOUR        K=A*262144                                              006300
            T'O TEN                                                 006310
            END OF FUNCTION                                         006320
      LISTP   MAD                                                   006330
            EXTERNAL FUNCTION (LST,TAPE)                            006340
            NORMAL MODE IS INTEGER                                  006350
            ENTRY TO LPRINT.                                        006360
            EXECUTE PLACE.(TAPE,0)                                  006370
            LEFTP = 606074606060K                                   006380
            RIGHTP= 606034606060K                                   006390
            BOTH  = 607460603460K                                   006400
            EXECUTE NEWTOP.(SEQRDR.(LST),LIST.(STACK))              006410
            S=POPTOP.(STACK)                                        006420
BEGIN       EXECUTE PLACE.(LEFTP,1)                                 006430
NEXT        WORD=SEQLR.(S,FLAG)                                     006440
            W'R FLAG .L. 0                                          006450
            EXECUTE PLACE.(WORD,1)                                  006460
            T'O NEXT                                                006470
            OR W'R FLAG .G. 0                                       006480
            EXECUTE PLACE.(RIGHTP,1)                                006490
            W'R LISTMT.(STACK) .E. 0, T'O DONE                      006500
            S=POPTOP.(STACK)                                        006510
            T'O NEXT                                                006520
            OTHERWISE                                               006530
            W'R LISTMT.(WORD) .E. 0                                 006540
            EXECUTE PLACE.(BOTH,1)                                  006550
            T'O NEXT                                                006560
            OTHERWISE                                               006570
            EXECUTE NEWTOP.(S,STACK)                                006580
            S=SEQRDR.(WORD)                                         006590
            T'O BEGIN                                               006600
            E'L                                                     006610
            E'L                                                     006620
DONE        EXECUTE PLACE.(0,-1)                                    006630
            EXECUTE IRALST.(STACK)                                  006640
            FUNCTION RETURN LST                                     006650
            END OF FUNCTION                                         006660
     RDRREV   MAD                                                   006670
            EXTERNAL FUNCTION (READER)                              006680
            NORMAL MODE IS INTEGER                                  006690
            ENTRY TO LVLRV1.                                        006700
            ENTRY TO UPONE.                                         006710
            W'R LNKR.(CONT.(READER+1)) .E. 0, T'O DONE              006720
            COUNT = 1                                               006730
            T'O GENRL                                               006740
            ENTRY TO LVLRVT.                                        006750
            ENTRY TO UPALL.                                         006760
            COUNT=LNKR.(CONT.(READER+1))                            006770
GENRL       THROUGH RAISE, FOR I=COUNT,-1, I .E. 0                  006780
            LINK=LNKR.(CONT.(READER))                               006790
            FIRST=CONT.(LINK)                                       006800
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            SECOND=CONT.(LINK+1)                                    006810
            STRIND.(FIRST,READER)                                   006820
            STRIND.(SECOND,READER+1)                                006830
RAISE       RCELL.(LINK)                                            006840
            T'O DONE                                                006850
            ENTRY TO INITRD.                                        006860
            SETIND.(-1,LNKL.(CONT.(READER+1)),-1,READER)            006870
DONE        FUNCTION RETURN READER                                  006880
            END OF FUNCTION                                         006890
      SEQUEN   MAD                                                  006900
            EXTERNAL FUNCTION (READER, FLAG)                        006910
            NORMAL MODE IS INTEGER                                  006920
            ENTRY TO SEQLL.                                         006930
            LINK=LNKL.(READER)                                      006940
            TRANSFER TO START                                       006950
            ENTRY TO SEQLR.                                         006960
            LINK=LNKR.(READER)                                      006970
START       IT=CONT.(LINK + 1)                                      006980
            READER=CONT.(LINK)                                      006990
            FLAG=ID.(READER)-1                                      007000
            FUNCTION RETURN IT                                      007010
            END OF FUNCTION                                         007020
       XMINO   MAD                                                  007030
            EXTERNAL FUNCTION(A,B)                                  007040
            NORMAL MODE IS INTEGER                                  007050
            ENTRY TO XMINO.                                         007060
            W'R A .L. B                                             007070
            IT=A                                                    007080
            OTHERWISE                                               007090
            IT=B                                                    007100
            E'L                                                     007110
            FUNCTION RETURN IT                                      007120
            END OF FUNCTION                                         007130
      LSTEQL   MAD                                                  007140
            EXTERNAL FUNCTION (ONE,OTHER)                           007150
            NORMAL MODE IS INTEGER                                  007160
            ENTRY TO LSTEQL.                                        007170
            MANY.(LIST.(STACK),ONE,OTHER)                           007180
START       W'R LISTMT.(STACK) .E. 0, T'O DONE                      007190
            FIRST = POPTOP.(STACK)                                  007200
            SECOND = POPTOP.(STACK)                                 007210
            W'R FIRST .E. SECOND, T'O START                         007220
            SA=SEQRDR.(FIRST)                                       007230
            SB=SEQRDR.(SECOND)                                      007240
READ        DATUMA=SEQLR.(SA,FLAGA)                                 007250
            DATUMB=SEQLR.(SB,FLAGB)                                 007260
            W'R FLAGA .NE. FLAGB, T'O FAIL                          007270
            W'R FLAGA .L. 0                                         007280
            W'R DATUMA .NE. DATUMB, T'O FAIL                        007290
            OR W'R FLAGA .E. 0                                      007300
            MANY.(STACK,DATUMA,DATUMB)                              007310
            OTHERWISE                                               007320
            T'O START                                               007330
            E'L                                                     007340
            T'O READ                                                007350
FAIL        TEST=-1                                                 007360
            T'O END                                                 007370
DONE        TEST=0                                                  007380
END         IRALST.(STACK)                                          007390
            FUNCTION RETURN TEST                                    007400
            END OF FUNCTION                                         007410
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      LSSCPY   MAD                                                    007420
               EXTERNAL FUNCTION ( ORGNL,COPY)                        007430
               NORMAL MODE IS INTEGER                                 007440
               ENTRY TO LSSCPY.                                       007450
               NEWBOT.(ORGNL,LIST.(STACK))                            007460
               NEWBOT.(COPY,STACK)                                    007470
               NEWVAL.(ORGNL,COPY,STACK)                              007480
START          W'R LISTMT.(STACK) .E. 0, T'O DONE                     007490
               OLD=POPTOP.(STACK)                                     007500
               LST=POPTOP.(STACK)                                     007510
               DLIST=LSTNAM.(OLD)                                     007520
               W'R DLIST .E. 0,T'O GO                                 007530
               SEE = ITSVAL.(DLIST,STACK)                             007540
               W'R SEE .E. 0                                          007550
               NEXT=LIST.(9)                                          007560
               MAKEDL.(NEXT,LST)                                      007570
               NEWBOT.(DLIST,STACK)                                   007580
               NEWBOT.(NEXT,STACK)                                    007590
               NEWVAL.(DLIST,NEXT,STACK)                              007600
               T'O GO                                                 007610
               O'E                                                    007620
               MAKEDL.(SEE,LST)                                       007630
               E'L                                                    007640
GO             READER=SEQRDR.(OLD)                                    007650
READ           DATUM=SEQLR.(READER,FLAG)                              007660
               W'R FLAG .L. 0                                         007670
               W'R READER .L. 0                                       007680
               MRKNEG.(NEWBOT.(DATUM,LST))                            007690
               O'E                                                    007700
               NEWBOT.(DATUM,LST)                                     007710
               E'L                                                    007720
               OR W'R FLAG .E. 0                                      007730
               SEE = ITSVAL.(DATUM,STACK)                             007740
               W'R SEE .E. 0, T'O NEW                                 007750
               NEWBOT.(SEE,LST)                                       007760
               T'O READ                                               007770
NEW            NEWBOT.(DATUM,STACK)                                   007780
               NEWBOT.(LIST.(9),STACK)                                007790
               NEWBOT.(BOT.(STACK),LST)                               007800
               NEWVAL.(DATUM,BOT.(STACK),STACK)                       007810
               OTHERWISE                                              007820
               T'O START                                              007830
               END OF CONDITIONAL                                     007840
               T'O READ                                               007850
DONE           IRALST.(STACK)                                         007860
               FUNCTION RETURN COPY                                   007870
               END OF FUNCTION                                        007880
      LSPNTR   MAD                                                    007890
               EXTERNAL FUNCTION (SEQRDR)                             007900
               NORMAL MODE IS INTEGER                                 007910
               ENTRY TO LSPNTR.                                       007920
               ENTRY TO SEQPTR.                                       007930
               F'N LNKL.(CONT.(LNKR.(SEQRDR)))                        007940
               E'N                                                    007950
       SPLIT   MAD                                                    007960
               EXTERNAL FUNCTION (A,B,C)                              007970
               NORMAL MODE IS INTEGER                                 007980
               ENTRY TO NULSTL.                                       007990
               SWITCH=1                                               008000
               T'O COMMON                                             008010
               ENTRY TO NULSTR.                                       008020
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                SWITCH=2                                                    008030
    COMMON      LIST=A                                                      008040
                CELL=B                                                      008050
                NEWLST=C                                                    008060
                W'R LISTMT.(LIST) .E. 0, T'O DONE                           008070
                W'R ID.(CONT.(CELL)) .E. 2                                  008080
                STRIND.(CONT.(LIST),NEWLST)                                 008090
                SETIND.(-1,LIST,LIST,LIST)                                  008100
                T'O DONE                                                    008110
                OTHERWISE                                                   008120
                T'O CMPLX(SWITCH)                                           008130
    CMPLX(1)    TOP=LNKR.(CONT.(LIST))                                      008140
                NUTOP=LNKR.(CONT.(CELL))                                    008150
                SETIND.(-1,CELL,TOP,NEWLST)                                 008160
                SETIND.(-1,-1,NUTOP,LIST)                                   008170
                SETIND.(-1,LIST,-1,NUTOP)                                   008180
                SETIND.(-1,NEWLST,-1,TOP)                                   008190
                SETIND.(-1,-1,NEWLST,CELL)                                  008200
                T'O DONE                                                    008210
    CMPLX(2)    BOT=LNKL.(CONT.(LIST))                                      008220
                NUBOT=LNKL.(CONT.(CELL))                                    008230
                SETIND.(-1,BOT,CELL,NEWLST)                                 008240
                SETIND.(-1,NUBOT,-1,LIST)                                   008250
                SETIND.(-1,-1,LIST,NUBOT)                                   008260
                SETIND.(-1,-1,NEWLST,BOT)                                   008270
                SETIND.(-1,NEWLST,-1,CELL)                                  008280
                END OF CONDITIONAL                                          008290
    DONE        FUNCTION RETURN NEWLST                                      008300
                END OF FUNCTION                                             008310
          LNKBOT   MAD                                                      008320
                EXTERNAL FUNCTION (OBJ,LST)                                 008330
                NORMAL MODE IS INTEGER                                      008340
                ENTRY TO LNKBOT.                                            008350
                W'R LISTMT.(LST) .E. 0,T'O PLACE                            008360
                MRKNEG.(LNKL.(CONT.(LST)))                                  008370
    PLACE       F'N NEWBOT.(OBJ,LST)                                        008380
                E'N                                                         008390
          NODLST   MAD                                                      008400
                EXTERNAL FUNCTION(LST)                                      008410
                NORMAL MODE IS INTEGER                                      008420
                ENTRY TO NODLST.                                            008430
                IT=LSTNAM.(LST)                                             008440
                W'R IT .E. 0, T'O DONE                                      008450
                IRALST.(IT)                                                 008460
                SETIND.(-1,0,-1,LST+1)                                      008470
    DONE        F'N IT                                                      008480
                E'N                                                         008490
          CONLST   MAD                                                      008500
                EXTERNAL FUNCTION(LEFT,RIGHT)                               008510
                NORMAL MODE IS INTEGER                                      008520
                R                                                           008530
                R

HIS FUNCTION ATTACHES THE LIST 'RIGHT' TO THE                   008540
                R
IST 'LEFT'.  THE LIST 'RIGHT' IS EMPTIED.                       008550
                R                                                           008560
                ENTRY TO CONLST.                                            008570
                W'R LISTMT.(RIGHT) .E. 0, T'O DONE                          008580
                LBOT=LNKL.(CONT.(LEFT))                                     008590
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            RBOT=LNKL.(CONT.(RIGHT))                                    008600
            SETIND.(-1,RBOT,-1,LEFT)                                    008610
            SETIND.(-1,-1,LEFT,RBOT)                                    008620
            SETIND.(-1,-1,LNKR.(CONT.(RIGHT)),LBOT)                     008630
            SETIND.(-1,LBOT,-1,LNKR.(CONT.(RIGHT)))                     008640
            SETIND.(-1,RIGHT,RIGHT,RIGHT)                               008650
DONE        F'N LEFT                                                    008660
            E'N                                                         008670
      PARTN   MAD                                                       008680
            EXTERNAL FUNCTION(SLST,PART,SIGNAL)                         008690
            NORMAL MODE IS INTEGER                                      008700
            ENTRY TO PARTN.                                             008710
            TAG=SIGNAL                                                  008720
            COUNT=0                                                     008730
            READER=SEQRDR.(SLST)                                        008740
READ        COUNT=COUNT+1                                               008750
            DATUM=SEQLR.(READER,FLAG)                                   008760
            W'R FLAG .G. 0, T'O DONE                                    008770
            W'R LNKL.(DATUM) .E. 0                                      008780
            PART(COUNT) = DATUM                                         008790
            T'O READ                                                    008800
            O'E                                                         008810
            W'R NAMTST.(DATUM) .NE. 0, T'O PLAIN                        008820
            W'R TOP.(DATUM) .NE. TAG, T'O PLAIN                         008830
            COUNT=COUNT-1                                               008840
            LSSCPY.(DATUM,LIST.(IT))                                    008850
            POPTOP.(IT)                                                 008860
            MAKEDL.(IT,PART(COUNT))                                     008870
            IRALST.(IT)                                                 008880
            T'O READ                                                    008890
PLAIN       NEWBOT.(DATUM,LIST.(PART(COUNT)))                           008900
ATTCH       W'R READER .GE. 0, T'O READ                                 008910
            LNKBOT.(SEQLR.(READER,FLAG),PART(COUNT))                    008920
            T'O ATTCH                                                   008930
            E'L                                                         008940
DONE        COUNT=COUNT-1                                               008950
            PART(0)=COUNT                                               008960
            F'N COUNT                                                   008970
            E'N                                                         008980
     XMATCH   MAD                                                       008990
            EXTERNAL FUNCTION(A,B,AA,AB,AC,BA)                          009000
            NORMAL MODE IS INTEGER                                      009010
            ENTRY TO XMATCH.                                            009020
            BLAST=B(0)                                                  009030
            LIST.(NUMBER)                                               009040
            W'R LNKL.(A(AB)) .NE. 0, T'O NORMAL                         009050
            W'R BA .E. 1 .AND. A(AA) .NE. 0                             009060
            BB=1                                                        009070
            T'H SUMB, FOR I=1,1, I.G. AB                                009080
SUMB        BB=BB + A(I)                                                009090
            BMARK=BB                                                    009100
            O'E                                                         009110
            BB = BLAST + 1                                              009120
            E'L                                                         009130
            AB=AC                                                       009140
            T'O ENDSTR                                                  009150
NORMAL      AMARK=AB                                                    009160
            BMARK=BA                                                    009170
            T'H INIT, FOR I=AA,1, I .E. AB                              009180
INIT        BMARK=BMARK+A(I)                                            009190
START       OBJ=A(AB)                                                   009200
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            T'H LOCATE, FOR I=BMARK,1, I .G. BLAST                    009210
            W'R LSTEQL.(OBJ,B(I)) .E. 0, T'O GOOD                     009220
            W'R NAMTST.(TOP.(OBJ)) .E. 0                              009230
            LST=TOP.(OBJ)                                             009240
            W'R GOODY.(LST,B(I)) .NE. 0, T'O LOCATE                   009250
            T'O GOOD                                                  009260
            O'E                                                       009270
            T'O LOCATE                                                009280
            E'L                                                       009290
LOCATE      CONTINUE                                                  009300
            T'O FAIL                                                  009310
GOOD        BMARK=I                                                   009320
            BB=I                                                      009330
            OBJ=1                                                     009340
            T'O FOUND                                                 009350
GO          AMARK=AMARK+1                                             009360
            W'R AMARK .E. AC, T'O ENDSTR                              009370
            W'R BMARK .G. BLAST, T'O FAIL                             009380
            OBJ=A(AMARK)                                              009390
            W'R LNKL.(OBJ) .E. 0                                      009400
FOUND       NEWBOT.(SETDIR.(0,OBJ,BMARK,IT),NUMBER)                   009410
            BMARK=BMARK+OBJ                                           009420
            T'O GO                                                    009430
            O'E                                                       009440
            W'R LSTEQL.(OBJ,B(BMARK)) .E. 0                           009450
            OBJ=1                                                     009460
            T'O FOUND                                                 009470
            O'E                                                       009480
            W'R NAMTST.(TOP.(OBJ)) .NE. 0, T'O FEHLER                 009490
            LST=TOP.(OBJ)                                             009500
            W'R GOODY.(LST,B(BMARK)) .NE. 0, T'O FEHLER               009510
            OBJ=1                                                     009520
            T'O FOUND                                                 009530
FEHLER      MTLIST.(NUMBER)                                           009540
            BMARK=BB+1                                                009550
            AMARK=AB                                                  009560
            T'O START                                                 009570
            E'L                                                       009580
            E'L                                                       009590
ENDSTR      T'H MORE , FOR I=AB-1,-1, I .L. AA                        009600
            OBJ=A(I)                                                  009610
            LIST.(A(I))                                               009620
            W'R OBJ .E. 0, OBJ = BB-BA                                009630
            BB=BB - OBJ                                               009640
            W'R BB .L. BA, T'O FAIL                                   009650
            T'H CONC, FOR J=0,1, J .E. OBJ                            009660
CONC        INLSTL.(B(BB+J),A(I))                                     009670
MORE        CONTINUE                                                  009680
            I=AB-1                                                    009690
FORWRD      W'R LISTMT.(NUMBER) .E. 0                                 009700
            IRALST.(NUMBER)                                           009710
            BA=BMARK                                                  009720
            F'N 0                                                     009730
            O'E                                                       009740
            I=I+1                                                     009750
            IT=POPTOP.(NUMBER)                                        009760
            OBJ=LNKL.(IT)                                             009770
            J=LNKR.(IT)                                               009780
            W'R NAMTST.(A(I)) .E. 0, IRALST.(A(I))                    009790
            LIST.(A(I))                                               009800
            T'H PLACE, FOR K=0,1, K .E. OBJ                           009810
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PLACE       INLSTL.(B(J+K),A(I))                                        009820
            E'L                                                         009830
            T'O FORWRD                                                  009840
FAIL        IRALST.(NUMBER)                                             009850
            F'N 1                                                       009860
            E'N                                                         009870
      YMATCH   MAD                                                      009880
            EXTERNAL FUNCTION (SLST,OLST,OUTLST)                        009890
            NORMAL MODE IS INTEGER                                      009900
            DIMENSION A(100),B(100)                                     009910
            ENTRY TO YMATCH.                                            009920
            PARTN.(SLST,A,$ NONE$)                                      009930
            PARTN.(OLST,B,$/$)                                          009940
            BA=1                                                        009950
            LIMIT=A(0)                                                  009960
            MARKC=1                                                     009970
MORE        MARKA=MARKC                                                 009980
            MKA=MARKA                                                   009990
            W'R A(MKA) .NE. 0, T'O FINDB                                010000
            W'R MKA .E. LIMIT, T'O AMARK                                010010
            MKA=MKA+1                                                   010020
FINDB       T'H FINDB, FOR I = MKA,1 , I .E. LIMIT                      010030
           1.OR. LNKL.(A(I)) .NE. 0 .OR. A(I) .E. 0                     010040
            W'R A(I) .NE. 0, T'O BMARK                                  010050
            MARKB=I-1                                                   010060
            MARKC=I                                                     010070
            T'O MATCH                                                   010080
AMARK       I=LIMIT                                                     010090
BMARK       MARKB=I                                                     010100
FINDC       T'H FINDC, FOR J=I+1,1, J.G. LIMIT                          010110
           1.OR. A(J) .E. 0                                             010120
            MARKC=J                                                     010130
MATCH       W'R XMATCH.(A,B,MARKA,MARKB,MARKC,BA) .E. 0                 010140
            W'R MARKC .G. LIMIT, T'O SUCCES                             010150
            T'O MORE                                                    010160
            O'E                                                         010170
            SWITCH=1                                                    010180
            T'O FAIL                                                    010190
            E'L                                                         010200
SUCCES      SWITCH=2                                                    010210
FAIL        T'H MTB, FOR I=1,1, I .G. B(0)                              010220
MTB         IRALST.(B(I))                                               010230
            T'H MTA, FOR I=1,1, I .G. LIMIT                             010240
            W'R LNKL.(A(I)) .NE. 0                                      010250
            NEWBOT.(A(I),OUTLST)                                        010260
            IRALST.(A(I))                                               010270
            O'E                                                         010280
            E'L                                                         010290
MTA         CONTINUE                                                    010300
            T'O END(SWITCH)                                             010310
END(1)      MTLIST.(OUTLST)                                             010320
            F'N 0                                                       010330
END(2)      F'N OUTLST                                                  010340
            E'N                                                         010350
      ASSMBL   MAD                                                      010360
            EXTERNAL FUNCTION(RHS,PART,NEW)                             010370
            DIMENSION A(100)                                            010380
            NORMAL MODE IS INTEGER                                      010390
            ENTRY TO ASSMBL.                                            010400
            S=SEQRDR.(PART)                                             010410
            FLAG=0                                                      010420
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            T'H PLACE, FOR I =1,1, FLAG .G. 0                          010430
PLACE       A(I)=SEQLR.(S,FLAG)                                        010440
            LIMIT=I-1                                                  010450
            S=SEQRDR.(RHS)                                             010460
READ        DATUM=SEQLR.(S,FLAG)                                       010470
            W'R FLAG .G. 0, T'O END                                    010480
            W'R LNKL.(DATUM) .E. 0                                     010490
            W'R DATUM .GE. LIMIT,T'O FAIL                              010500
            INLSTL.(LSSCPY.(A(DATUM),LIST.(COPY)),NEW)                 010510
            IRALST.(COPY)                                              010520
            O'E                                                        010530
            NEWBOT.(DATUM,NEW)                                         010540
            T'H LONG, FOR I=1,0, S .G. 0                               010550
LONG        LNKBOT.(SEQLR.(S,FLAG),NEW)                                010560
            E'L                                                        010570
            T'O READ                                                   010580
END         F'N NEW                                                    010590
FAIL        F'N 0                                                      010600
            E'N                                                        010610
         DAS   MAD                                                     010620
            EXTERNAL FUNCTION (SPEC,OBJ,NEW)                           010630
            NORMAL MODE IS INTEGER                                     010640
            ENTRY TO REGEL.                                            010650
            MTLIST.(NEW)                                               010660
            DATUM=0                                                    010670
            RESULT = 0                                                 010680
            LIST.(LHS)                                                 010690
            LIST.(RHS)                                                 010700
            LIST.(INT)                                                 010710
            S=SEQRDR.(SPEC)                                            010720
            T'H LEFT, FOR I=0,0, DATUM .E. $=$                         010730
            DATUM=SEQLR.(S,F)                                          010740
            CELL=NEWBOT.(DATUM,LHS)                                    010750
            W'R S .L. 0, MRKNEG.(CELL)                                 010760
LEFT        CONTINUE                                                   010770
            POPBOT.(LHS)                                               010780
            T'H RIGHT, FOR I=0,0 , F .G. 0                             010790
            CELL=NEWBOT.(SEQLR.(S,F),RHS)                              010800
            W'R S .L. 0, MRKNEG.(CELL)                                 010810
RIGHT       CONTINUE                                                   010820
            POPBOT.(RHS)                                               010830
            W'R YMATCH.(LHS,OBJ,INT) .E. 0, T'O END                    010840
            W'R ASSMBL.(RHS,INT,NEW) .E. 0, T'O END                    010850
            RESULT=NEW                                                 010860
END         IRALST.(LHS)                                               010870
            IRALST.(RHS)                                               010880
            IRALST.(INT)                                               010890
            F'N RESULT                                                 010900
            E'N                                                        010910
      CNTSPC   MAD                                                     010920
            EXTERNAL FUNCTION(X)                                       010930
            NORMAL MODE IS INTEGER                                     010940
            ENTRY TO CNTSPC.                                           010950
            ALL=0                                                      010960
COUNTS      COUNT = 0                                                  010970
            M1=NUCELL.(X)                                              010980
            RCELL.(M1)                                                 010990
ONE         M2=NUCELL.(X)                                              011000
            RCELL.(M2)                                                 011010
            COUNT=COUNT+1                                              011020
            W'R M1 .E. M2, T'O TWO                                     011030
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            T'O ONE                                                    011040
TWO         W'R COUNT .E. ALL, T'O FOUR                                011050
            ALL=COUNT                                                  011060
            T'O COUNTS                                                 011070
FOUR        F'N ALL                                                    011080
            E'N                                                        011090
      GOODY   MAD                                                      011100
            EXTERNAL FUNCTION (LST,B)                                  011110
            NORMAL MODE IS INTEGER                                     011120
            ENTRY TO GOODY.                                            011130
            W'R TOP.(LST) .E. $/$                                      011140
            S=SEQRDR.(LST)                                             011150
READ        WORD=SEQLL.(S,F)                                           011160
            W'R WORD .E. $/$,T'O FAIL                                  011170
            W'R XLOOK.(WORD,B) .E. 0,T'O SUCCES                        011180
            T'O READ                                                   011190
            O'E                                                        011200
            W'R TOP.(LST) .NE. $*$, T'O FAIL                           011210
            S=SEQRDR.(LST)                                             011220
            SEQLR.(S,F)                                                011230
            LIST.(TEMP)                                                011240
RDA         WORD=SEQLR.(S,F)                                           011250
            W'R F .G. 0, T'O FAILA                                     011260
PUT         NEWBOT.(WORD,TEMP)                                         011270
TST         W'R S .GE. 0                                               011280
            W'R LSTEQL.(TEMP,B) .E. 0, T'O GOOD                        011290
            MTLIST.(TEMP)                                              011300
            T'O RDA                                                    011310
            O'E                                                        011320
RDB         WORD=SEQLR.(S,F)                                           011330
            T'O PUT                                                    011340
            E'L                                                        011350
            E'L                                                        011360
GOOD        IRALST.(TEMP)                                              011370
SUCCES      F'N 0                                                      011380
FAILA       IRALST.(TEMP)                                              011390
FAIL        F'N 1                                                      011400
            E'N                                                        011410
      XLOOK   MAD                                                      011420
            EXTERNAL FUNCTION(VALUE,LST)                               011430
            NORMAL MODE IS INTEGER                                     011440
            ENTRY TO XLOOK.                                            011450
            DL=LSTNAM.(LST)                                            011460
            W'R DL .E. 0, T'O FAIL                                     011470
            S=SEQRDR.(DL)                                              011480
READ        WORD=SEQLR.(S,F)                                           011490
            W'R F .G. 0, T'O FAIL                                      011500
            W'R WORD .E. VALUE,T'O SUCCES                              011510
            T'O READ                                                   011520
FAIL        F'N 1                                                      011530
SUCCES      F'N 0                                                      011540
            E'N                                                        011550
      TXTPRT   MAD                                                     011560
            EXTERNAL FUNCTION(LST,N)                                   011570
            DIMENSION OUT(14)                                          011580
            NORMAL MODE IS INTEGER                                     011590
            ENTRY TO TXTPRT.                                           011600
            END = 0                                                    011610
            S=SEQRDR.(LST)                                             011620
            BLANK=$ $                                                  011630
            CARCTR=BLANK                                               011640
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                T'H CLEAR, FOR I=1,1, I .G. 14                          011650
CLEAR           OUT(I)=BLANK                                            011660
                WCOUNT=1                                                011670
                CCOUNT=1                                                011680
SEQ             W'R S .G. 0 .AND. CARCTR .NE. BLANK, T'O BLANKS         011690
SEQA            C=SEQLR.(S,F)                                           011700
                W'R F .G. 0, T'O DONE                                   011710
                COUNT=1                                                 011720
FETCH           CARCTR=KGETBL.(COUNT,C)                                 011730
                W'R CARCTR .E. BLANK, T'O BLANKS                        011740
                PREVUE=0                                                011750
SHIN            KPUTBL.(CCOUNT,CARCTR,OUT(WCOUNT))                      011760
                W'R CCOUNT .E. 6, T'O UPW                               011770
                CCOUNT=CCOUNT + 1                                       011780
TSTCNT          W'R COUNT .E. 6, T'O SEQ                                011790
                COUNT=COUNT + 1                                         011800
                T'O FETCH                                               011810
UPW             W'R WCOUNT .E. 14, T'O TYPE                             011820
                WCOUNT=WCOUNT+1                                         011830
                CCOUNT=1                                                011840
                T'O TSTCNT                                              011850
TYPE            T'H SBA, FOR K=14,-1, K .E. 0                           011860
                T'H SBA, FOR I=6,-1, I .E. 0                            011870
                W'R KGETBL.(I,OUT(K)) .E. BLANK, T'O FOUNDB             011880
SBA             KPUTBL.(I,BLANK,OUT(K))                                 011890
FOUNDB          W'R N .E. 0, T'O ONLINE                                 011900
                WRITE BCD TAPE N, OUTFRM, OUT(1) ... OUT(14)            011910
                T'O ENDTYP                                              011920
ONLINE          PRINT ONLINE FORMAT OUTFRM, OUT(1) ... OUT(14)          011930
                VECTOR VALUES OUTFRM = $14A6 *$                         011940
ENDTYP          W'R K .E. 14 .AND. I .E. 6, T'O NORMAL                  011950
                S=LASTS                                                 011960
                C=LASTW                                                 011970
                COUNT=LASTC                                             011980
                CARCTR=BLANK                                            011990
                PREVUE=BLANK                                            012000
                END=0                                                   012010
NORMAL          W'R END .E. 0                                           012020
                T'H CLAR, FOR I=1,1, I.G. 14                            012030
CLAR            OUT(I)=BLANK                                            012040
                WCOUNT=1                                                012050
                CCOUNT=1                                                012060
                T'O TSTCNT                                              012070
                O'E                                                     012080
                F'N LST                                                 012090
                E'L                                                     012100
DONE            END=1                                                   012110
                T'O TYPE                                                012120
BLANKS          LASTS=S                                                 012130
                LASTW=C                                                 012140
                LASTC=COUNT                                             012150
                W'R PREVUE .E. BLANK, T'O SEQA                          012160
                PREVUE=BLANK                                            012170
                CARCTR=BLANK                                            012180
                T'O SHIN                                                012190
                E'N                                                     012200
        SUBTOP  MAD                                                     012210
                EXTERNAL FUNCTION(OBJ,LST)                              012220
                NORMAL MODE IS INTEGER                                  012230
                ENTRY TO SUBSTP.                                        012240
                ADDR=LNKR.(CONT.(LST))                                  012250
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            T'O START                                                   012260
            ENTRY TO SUBSBT.                                            012270
            ADDR=LNKL.(CONT.(LST))                                      012280
START       F'N SUBST.(OBJ,ADDR)                                        012290
            E'N                                                         012300
      LPNTR   MAD                                                       012310
            EXTERNAL FUNCTION(LST)                                      012320
            NORMAL MODE IS INTEGER                                      012330
            ENTRY TO LPNTR.                                             012340
            F'N LNKL.(CONT.(LST))                                       012350
            E'N                                                         012360
           WB   MAD                                                     012370
            EXTERNAL FUNCTION (LST,NAM)                                 012380
            NORMAL MODE IS INTEGER                                      012390
            ENTRY TO WBLST.                                             012400
            LIST.(SLSTS)                                                012410
            LIN=1                                                       012420
            LNO=LIN                                                     012430
            NEWVAL.(LST,LNO,SLSTS)                                      012440
            IL=LNO                                                      012450
            R=SEQRDR.(LSTNAM.(SLSTS))                                   012460
            WBLSTO.(NAM)                                                012470
READ1       SL=SEQLR.(R,F)                                              012480
            W'R F .G. 0, T'O DONE4                                      012490
            WBLST1.(2,ITSVAL.(SL,SLSTS))                                012500
            S=SEQRDR.(SL)                                               012510
READ2       A=SEQLR.(S,F)                                               012520
            W'R F .L. 0                                                 012530
            W'R S .L.0                                                  012540
            TAG=-1                                                      012550
            O'E                                                         012560
            TAG=0                                                       012570
            E'L                                                         012580
            WBLST1.(TAG,A)                                              012590
            T'O READ2                                                   012600
            OR W'R F .E. 0                                              012610
AVAL        IL=ITSVAL.(A,SLSTS)                                         012620
            W'R IL .E. 0                                                012630
            LNO=LNO+LIN                                                 012640
            NEWVAL.(A,LNO,SLSTS)                                        012650
            IL=LNO                                                      012660
            E'L                                                         012670
            W'R F .E. 0                                                 012680
            WBLST1.(1,IL)                                               012690
            T'O READ2                                                   012700
            O'E                                                         012710
            WBLST1.(3,IL)                                               012720
READ14      SL=SEQLR.(R,F)                                              012730
            T'O READ 1                                                  012740
            E'L                                                         012750
            O'E                                                         012760
            A=LSTNAM.(SL)                                               012770
            W'R A .E. 0, T'O READ14                                     012780
            T'O AVAL                                                    012790
            E'L                                                         012800
DONE4       WBLST1.(2,0)                                                012810
            WBLST2.                                                     012820
            IRALST.(SLSTS)                                              012830
            F'N 0                                                       012840
            E'N                                                         012850
          RB   MAD                                                      012860
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            EXTERNAL FUNCTION(LST,NAM)                                  012870
            NORMAL MODE IS INTEGER                                      012880
            ENTRY TO RBLST.                                             012890
            LIST.(SLSTS)                                                012900
            NEWVAL.(I,LST,SLSTS)                                        012910
            RBLSTO.(NAM)                                                012920
START       RBLST1.(I,A)                                                012930
            W'R I .LE. 0                                                012940
            N=NEWBOT.(A,L)                                              012950
            W'R I .L. 0, MRKNEG.(N)                                     012960
            O'E                                                         012970
            W'R I .NE. 2, T'O NOT2                                      012980
            W'R A .E. 0, T'O DONE                                       012990
            L=ITSVAL.(A,SLSTS)                                          013000
            W'R L .NE. 0, T'O START                                     013010
            NEWVAL.(A, LIST.(L) , SLSTS)                                013020
            T'O START                                                   013030
            E'L                                                         013040
NOT2        LS=ITSVAL.(A,SLSTS)                                         013050
            W'R LS .E. 0, NEWVAL.(A,LIST.(LS),SLSTS)                    013060
            W'R I .E. 1                                                 013070
            NEWBOT.(LS,L)                                               013080
            O'E                                                         013090
            MAKEDL.(LS,L)                                               013100
            E'L                                                         013110
            T'O START                                                   013120
DONE        IRALST.(SLSTS)                                              013130
            RBLST2.                                                     013140
            F'N 0                                                       013150
            E'N                                                         013160
```